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**MANUAL FOR**  
**staging**  
**OF cancer**

**second edition**

**American Joint Committee  
on Cancer**

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MANUAL FOR  
**STAGING**  
OF  
**CANCER**

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# MANUAL FOR STAGING OF CANCER

S E C O N D   E D I T I O N

AMERICAN JOINT COMMITTEE  
ON CANCER

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Chicago, Illinois 60611

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*Dedicated to the memory of  
Murray M. Copeland, M.D.*

*The first chairman of  
The American Joint Committee on Cancer  
Staging and End-Results Reporting*

*A native of McDonough, Georgia, Murray Copeland received his medical degree from Johns Hopkins University School of Medicine in 1927, followed by training in surgery and oncology at the Mayo Clinic, Memorial Hospital in New York City, and Union Memorial Hospital in Baltimore.*

*Among Dr. Copeland's numerous distinctions were his leadership positions as national president of the American Cancer Society in 1965 and secretary-general of the 1970 UICC Cancer Congress.*

*He was known and loved by physicians around the world for his willingness and ability to support organizations designed to facilitate the spread of knowledge about cancer.*

*Murray Copeland was internationally acclaimed for his superior knowledge of and efforts against large bowel cancer and bone cancer.*



# Introduction

This manual brings together all currently available information on the state of the art of staging cancer at various anatomic sites as developed by the American Joint Committee on Cancer (AJCC). Although not all of the schemes included here are uniform in design, and some are more firmly established than others, the manual permits consistency in describing the extent of the neoplastic diseases of different anatomic parts, systems, or organs.

Proper classification and staging of cancer will allow the physician to determine treatment for the patient more appropriately, to evaluate results of management more reliably, and to compare statistics reported from various institutions on a local, regional, and national basis more confidently.

Staging of cancer is not an exact science. As new information becomes available about etiology and various methods of diagnosis and treatment, the classification and staging of cancer will change. Periodically, this manual will be revised so that it reflects the changing state of the art. However, revisions will occur only at reasonable periods. At the present time the anatomic extent of the cancer is the primary basis for staging; the degree of differentiation of the tumor and the age of the patient are also factors in some cases. In the future, biologic markers and other factors may also play a part.

It is hoped that the staging recommendations included in this manual may be used as published—or at least modified only minimally—so that consistency in data gathering will be possible. The recommendations in the manual are to be used in the cancer programs approved by the Commission on Cancer of the American College of Surgeons. Also, future reports by the Statistics, Epidemiology, and End-Results group (SEER) of the National Cancer Institute (NCI) will be based on the staging recommended by the AJCC.

The AJCC was first organized on January 9, 1959, as the American Joint Committee for Cancer Staging and End-Results Reporting (AJC), for the purpose of developing a system of clinical staging of cancer by site acceptable to the

American medical profession. The sponsoring organizations are the American College of Surgeons, the American College of Radiology, the College of American Pathologists, the American College of Physicians, the American Cancer Society, and the National Cancer Institute. Each of the sponsoring organizations designates three members to the Committee. The American College of Surgeons serves as administrative sponsor. Subcommittees, called "task forces," have been appointed to consider malignant neoplasms of selected anatomic sites in order to develop classifications. Each task force is composed of committee members and other professional appointees whose special interests and skills are appropriate to the site under consideration.

During its 22 years of activity, various special consultants have worked with the Committee, as well as liaison representatives from the American Academy of Pediatrics, the American College of Obstetricians and Gynecologists, the American Urological Association, the Association of American Cancer Institutes, and the SEER program of the NCI. More than 400 individuals have contributed to the work of the various task forces appointed by the Committee. Dr. Murray Copeland was Chairman from the inception until 1969, Dr. W.A.D. Anderson from 1969 to 1974, Dr. Oliver H. Beahrs from 1974 to 1979, and Dr. David T. Carr from 1979 to 1982. The current Chairman is Dr. Harvey W. Baker.

Pioneer work on the clinical classification of cancer was done by the League of Nations Health Organization (1929), the International Commission on Stage Grouping and Presentation of Results (ICPR) of the International Congress of Radiology (1953), and the International Union Against Cancer (Union Internationale Contre le Cancer, UICC). The latter organization became most active in the field through its Committee on Clinical Stage Classification and Applied Statistics (1954), later known as the TNM Committee.

The AJC decided to use the TNM system, where applicable, to describe the anatomic extent of the cancer at the time of diagnosis (before the application of definitive treatment), and from this to develop classification into stages, which would be useful as a guide to treatment and prognosis and in comparing the end results of treatment. Subsequently, the system has been extended to other points during the natural history and treatment of a cancer. Task forces to accomplish this extension were appointed to focus on particular sites of cancer. Retrospective studies have resulted in recommendations for stage classifications for cancer at various sites or systems, which have been published and distributed in separate fascicles and articles.

The TNM Committee of the UICC and the AJC have been working along similar lines and with similar objectives, although points of view and methods sometimes have differed. Cooperation between the two groups is necessary if the same internationally used classification systems are to be achieved. Toward this goal a meeting of representatives of the UICC and the AJC was held in Toronto on November 21 to 22, 1969. As a result of this meeting, consultation between the two groups was agreed upon before publication of a classification scheme by either group, and a joint exhibit was presented at the UICC International Cancer Congress in Houston in 1970. Several joint meetings of representatives of the UICC and the AJC on the classifications for specific cancer sites have been held in Houston and Geneva.

The AJC sponsored a National Cancer Conference on Classification and Staging in Atlanta on March 27 to 28, 1976. This conference delineated the accomplishments to that time and brought into focus future needs and activities.

In January 1970 a revised statement of the "Objectives, Rules and Regulations of the American Joint Committee" was adopted. Among other things, it broadened the scope of the Committee by including in its objectives the formulation and publication of systems of classification of cancer not limited to but including staging and end-results reporting.

It was recognized that for cancer of certain sites the information made available by observation at the time of a surgical procedure, as well as information from the pathologic examination of the operatively removed cancer, could form the basis of useful classifications. From this evolved a "surgical-evaluative staging" and a "postsurgical treatment-pathologic staging." These are often useful supplements to the clinical-diagnostic staging; for a few sites where a purely clinical classification is not feasible, they may be the only classifications recommended.

It also became evident that in certain organs (*e.g.*, thyroid) the biologic potentiality of different histologic types of cancer is such that different types cannot be mixed together in a meaningful classification. Therefore, cases should be analyzed separately by histologic type. In some kinds of cancer, such as soft-tissue sarcomas, grading is of such significance that it becomes a necessary component of the classification system. For certain cancers, widely used and accepted classifications, such as the Ann Arbor classification of Hodgkin's disease and the FIGO classification of carcinoma of the cervix, were adopted.

The various data in previously published individual-



site fascicles, with revisions and the addition of other material, were brought together to form a *Manual for Staging of Cancer*, the first edition of which was published in 1977. A second printing, slightly revised, appeared in 1978.

The importance of a data-collecting form for use in the staging system of each site has been realized for some years. Such forms ensure the recording of the data necessary for stage classification. Recent emphasis has been given to the development of a checklist for each cancer site for which there is a stage classification and to the availability of such checklists as a part of each staging recommendation.

The expanding role of the Committee in a variety of cancer classifications, including their significance and value and the promotion of indicated usage in cancer diagnosis and therapy, suggested that the original name of the Committee no longer portrayed the broader scope of its interests and activities. The name was therefore changed in 1980 to the American Joint Committee on Cancer (AJCC). The publication of this new edition of the *Manual* reflects the widening interests and activities of the Committee.

The AJCC attempts to develop classifications that are compatible, as far as possible, with those published by the UICC\* and that are within the current standards of practice in American medicine. In developing its classifications, the AJCC has employed the principles of the TNM system as described by the UICC where

appropriate, but not if other staging recommendations are already accepted and widely used.

The TNM Committee and the AJCC have attempted to come to agreement on staging of cancer at many anatomic sites. The differences in the recommendations of the two committees are gradually decreasing.

Members of the AJCC, its task forces, and its committees, as well as the sponsoring organizations, owe a debt of gratitude to the many physicians and others who have voluntarily contributed so greatly to this effort in the hope that in the future more patients with cancer would survive and that the quality of life of the cancer patient could be as near normal as possible. The contributions of the TNM Committee of the UICC and other international organizations with the same purposes are gratefully acknowledged.

Staging recommendations are included in the *Manual* for cancers at most anatomic sites. However, there are several regions or organs as yet not considered, such as the adrenal, small intestine, urethra, and penis. Several of the recommendations are preliminary, based on earlier studies by the AJCC, current studies now under way but not yet completed, or expert opinion by specialists in the field. These include cancer of the pancreas, brain, and bone. Last, when in certain instances data are not available to arrive at preliminary recommendations, none are given, but reference to other studies and protocols for prospective studies is made.

Under any circumstance, a cancer at any anatomic site can be recorded as localized, regional, or distant, depending on the findings, until a more refined classification and staging are developed.

\*TNM Classification of Malignant Tumors, Third Edition, 1978. International Union Against Cancer, 3 Rue du Conseil-General, 1205 Geneva, Switzerland



## Introduction to the Second Edition

Sixty thousand copies of the first two printings of the *Manual for Staging of Cancer 1977* and *1978* have been distributed. Based on the demand for the manual and for the subsequently published separate pamphlets on Reporting of Cancer Survival and End Results and Staging for Cancer of Head and Neck Sites, and Melanoma, Lung, Gynecologic Sites, and Soft-Tissue Sarcoma, there is an indication that the staging of cancer at the time of diagnosis and management is more universally applied now than previously. The Commission on Cancer of the American College of Surgeons, with 900 approved cancer programs, has recently requested that the recommendations of the American Joint Committee on Cancer (AJCC) be used in their programs and cancer registries. This will lead to further uniformity in recording the extent of cancers at the time of diagnosis and treatment and will make statistical data on follow-up and end results more meaningful.

This second edition of the *Manual* contains some revised recommendations based on new and added

information. In a few instances, arbitrary changes have been made to make the recommendations of the AJCC consistent with those of the TNM Committee of the International Union Against Cancer (UICC). Consistency at all anatomic sites has not as yet been achieved.

The data-collecting forms have been modified to reflect more usefully the information required to stage cancer. These forms can become part of the patient's record but are not considered to be a replacement for history, treatment, or follow-up data forms. In some instances they list the information essential for staging as well as data that may be useful for future staging systems or research studies.

The AJCC wishes to thank all of those physicians, nurses, registrars, and others who have made suggestions regarding the contents of this manual, but in particular all of the more than 400 persons who, over 20 years, have contributed so greatly to the evaluation of the material and recommendations made in this revision. Likewise, great credit and thanks go to Mr. Robert Rowan and J.B. Lippincott Company for their cooperation and help in undertaking this *Manual for Staging of Cancer* for the American Joint Committee on Cancer.



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**MANUAL FOR  
STAGING  
OF  
CANCER**

P A R T

I

GENERAL  
INFORMATION ON  
CANCER STAGING  
AND END-RESULTS  
REPORTING

## Purposes and Principles of Staging

### Philosophy of Classification and Staging by the TNM System

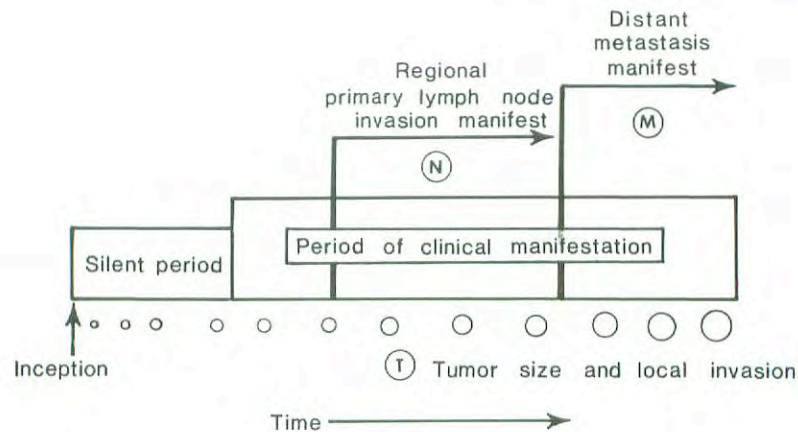
A classification scheme for cancer must encompass all attributes of the tumor that define its life history. The American Joint Committee on Cancer (AJCC) classification is based on the premise that cancers of similar histology or site of origin share similar patterns of growth and extension.

The size of the untreated primary cancer or tumor (**T**) increases progressively and at some point in time regional lymph node involvement (**N**) and, finally, distant metastases (**M**) occur. A simple classification scheme, which can be incorporated into a data form for staging and universally applied, is the goal of the TNM system as proposed by the AJCC. This classification is largely consistent with that of the Union Internationale Contre le Cancer (UICC) and is a distillate of several existing systems.

For most cancer sites the staging recommendations in this manual are concerned only with anatomic extent of disease, but in several instances, grade (soft-tissue sarcoma) and age (thyroid cancer) are factors that must be considered. In the future, biologic markers and other parameters may have to be added to those of anatomic extent in classifying cancer, but they are not necessarily components of stage.

As the primary tumor increases in size throughout its time span, at some point (probably early) local invasion occurs, followed by spread to the regional lymph nodes draining the area of the tumor. The period when this spread is manifest or discernible by available methods of clinical examination is thus another significant marker in the progression of the cancer (**N**). It is usually later, and often in the middle or older period of the life span of the cancer, that distant spread or metastasis (**M**) becomes evident from clinical examination. Thus metastasis (**M**) is the third and usually the latest time marker.

These three significant events in the life history of a cancer—tumor growth (**T**), spread to primary lymph nodes (**N**), and



metastasis (M)—are used as they appear (or do not appear) on clinical examination, before definitive therapy begins, to indicate the degree of extension of the cancer. This shorthand method of indicating the extension of disease at a particular designated time is the stage of the cancer in its evolution. However, it may be used, sometimes with other features added, in a scheme of stage classification. When retrospective or prospective studies of cases show that certain groupings of TNM or other features can be made that have valid significance for staging, a stage classification may be devised.

Events such as local spread, including spread to primary lymph nodes, and metastasis sometimes occur before they are discernible by clinical examination. Thus, examination at the time of a surgical procedure and histologic examination of the surgically removed tissues may identify the significant markers of the life history of the cancer (T, N, and M) as being different from what could be discerned clinically before therapy. Although this may be the basis of a stage classification (surgical-evaluative or pathologic, based on examination of a surgically resected specimen), it cannot be mixed with clinical diagnostic staging for evaluative and reporting purposes. Nevertheless, it may be a more accurate depiction of the period in the life history of the cancer and may be valuable for prognostic purposes.

Therapeutic procedures, even if not curative, may alter the course and life history of cancer. Although cancers that recur after therapy may be staged with the same markers as are used in pretreatment clinical-diagnostic staging, their significance may not be the same. Hence the stage classification of recurrent cancer must be considered separately for therapeutic guidance, prognosis, and end-results reporting.

The significance of the marker points in their life history differs for tumors of different sites and of different histologic types. Hence the marker points,

even if T, N, and M, must be defined for each type of tumor in order to be valid and to have maximum significance. In certain types of tumors, such as Hodgkin's disease and lymphomas, a different system for designating the extent of the disease and for classifying its stage is necessary to accomplish the goal of usefulness. In these cases other symbols or descriptive markers are used rather than T, N, and M.

Classification and stage-grouping is thus a method of designating the state of a cancer at various points in time and is related to the natural course of the particular type of cancer. It is intended to provide a way by which this information can be readily communicated to others, to assist in decisions regarding treatment, and to be a factor in determining prognosis. Ultimately, it provides a mechanism for comparing like or unlike groups of cases, particularly in regard to the results of different therapeutic procedures.

In addition to anatomic extent, the histopathologic analysis and grade of the tumor are important determinants in classification. The type of tumor and the grade are also most important variables affecting choices of treatment. For sarcomas the tumor grade may prove to be the most important index.

## Nomenclature in Morphology of Cancer

Cancer therapy decisions are made after an assessment of the patient and tumor, using many methods that often include sophisticated technical procedures. For most types of cancer, the extent to which the disease has spread is probably the most important factor determining prognosis and must be given prime consideration in evaluating and comparing different therapeutic regimens.

Staging classifications are based on description of the extent of disease, and their design requires a

Thorough knowledge of the natural history of each type of cancer. Such knowledge has been and continues to be derived primarily from morphologic studies, which also provide us with the definitions and classifications of tumor types.

An accurate histologic diagnosis, therefore, is an essential element in a meaningful evaluation of the tumor patient. In certain types of cancer, biochemical or immunologic measurements of normal or abnormal cellular function have become important elements in typing tumors precisely. Increasingly, definitions and classifications should include function as a component of the pathologist's anatomic diagnosis. One may also anticipate that special techniques in histochemistry, cytogenetics, and tissue culture will be used more routinely for typing and characterizing tumor behavior.

The most complete and best known compendium of tumor definitions and illustrations in English is the *Atlas of Tumor Pathology*, published in many volumes by the Armed Forces Institute of Pathology. These are under constant revision and are used as a basic reference by pathologists throughout the world.

In 1956, the World Health Organization initiated a program designed to provide an internationally acceptable histologic classification of tumors. For each tumor site, a draft classification is prepared by a small group of international experts. A reference center and several collaborating laboratories are then designated by the World Health Organization. After intensive review of large amounts of histologic and clinical material, the proposed classification is revised

and tested in the field. The product is the "blue book" publication, which includes the definition of the tumors in a given organ site or system, along with numerous illustrations. The terms used for each tumor type represent the preferred nomenclature, and their arrangement may be considered a working classification.

In the interest of promoting national and international collaboration in cancer research, and specifically to facilitate cooperation in clinical investigation, the AJCC recommends that the International Classification of Diseases for Oncology (ICD-O) be accepted and its use encouraged for coding neoplasms by topography and histology (morphology) and for indicating behavior (malignant, benign, *in situ*, uncertain, or metastatic). This coded nomenclature is based on the *Manual of Tumor Nomenclature and Coding* (MOTNAC), published by the American Cancer Society in 1968.

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## General Rules for Staging of Cancer

To facilitate the use of the TNM system and to standardize its application in the classification of various cancers, the AJCC has adopted the following general rules:

1. The TNM system provides a basis for categorizing the extent of disease and, when appropriate, it will be used. When the TNM system is used, the letter **T** represents the primary tumor, with appropriate suffixes to describe increasing sizes of the tumor, involvement by direct extension, or both. The letter **N** represents the regional lymph node involvement, with appropriate suffixes to describe the absence of involvement or increasing degrees of such involvement. The letter **M** represents distant metastasis, with appropriate suffixes to describe the absence of such metastasis or increasing degrees of such dissemination of the tumor. The various categories of T, N, and M may be grouped into appropriate combinations to create a small number of stages of the disease.
2. All available evaluative evidence for classifying the extent of disease at different sites and at different points during the natural history and treatment should be used. Histologic confirmation of cancer is mandatory if a case is to be included in a series for evaluation. The chronology of classification and terms are as follows:
  - cTNM *Clinical-diagnostic staging*: using all information available prior to first definitive treatment, including pathologic confirmation of extent of disease by biopsy or invasive techniques
  - pTNM *Postsurgical resection-pathologic staging*: using all data available at the time of surgery and on examination of a completely resected specimen
  - sTNM *Surgical-evaluative staging*: using all clinical information available plus that obtained on surgical exploration; usually done for a few inaccessible tumors that are not amenable to definitive resection
  - rTNM *Retreatment staging*: classification when restaging is necessary for additional or secondary definitive treatment after a (disease-free) interval following first treatment
  - aTNM *Autopsy staging*: used only when the cancer is first diagnosed at autopsy
3. Clinical-diagnostic staging. For cancers at certain accessible sites, especially those that can be treated in an appropriate manner by more than one treatment modality, the extent of the cancer should be determined and recorded before definitive treatment is carried out. Included is pathologic information available from biopsies for confirmation of disease. This provides a clinical-diagnostic stage classification and makes it possible to compare the results of different modalities of treatment of certain accessible lesions.
4. Postsurgical resection-pathologic staging. This term *postsurgical resection-pathologic staging* is to be used to describe the known extent of the disease following the complete examination of the therapeutically resected specimen. Residual tumors, if any, following surgical resection should be recorded (see rule 9).
5. Surgical-evaluative staging. The term *surgical evaluative stage classification* is to be used to describe the known extent of disease after a major surgical exploration to identify the extent of a cancer for which definitive surgical resection is not the anticipated or appropriate treatment.
6. For cancers of some sites it may be desirable to record a clinical-diagnostic stage classification, a surgical-evaluative stage classification and/or a postsurgical resection-pathologic stage classification.
7. Varying amounts of information may be used in determining each stage classification for each primary site. Specific recommendations about which information should be used for each type of staging is given in the recommendations for each primary site.
8. Once the extent of disease has been established, the stage classification should not be modified as a result of information obtained either during follow-up or from more definitive observation. For example, clinical diagnostic staging should not be influenced either by the fact that a patient experienced early recurrence or by information from surgical notes or a pathology report. The cancer, however, can be staged cTNM and, if treated surgically, it can then also be staged pTNM. Data comparison must be based on cases with comparable available information on extent of disease.
9. At the time of surgical resection of a cancer, all gross evidence of cancer may have been removed. On the other hand, gross residual cancer may have been left behind. This residual tumor must be identified under **R** to facilitate and aid in additional or further treatment of the patient. **R** does not enter into the staging of the tumor.

10. Retreatment staging. Cases in which a cancer recurs after a period of freedom from disease may be described by TNM but must be identified by the symbol **r** before the appropriate TNM category. Such cases should not be combined with a primary treatment series but should be grouped together and evaluated and reported separately. However, they must not be deleted from the original primary treatment series.
11. Autopsy staging. At times it might be desirable to stage cancer when it is first diagnosed at autopsy. Staging at this time period should be designated aTNM. All available clinical and pathologic information may be used.
12. Histologic or cytologic verification of cancer is always necessary for classification and to establish the extent of tumor or stage.
13. The degree of anaplasia, whether well differentiated, moderately well differentiated, or undifferentiated, should be recorded as determined on histologic study under the letter **G**. If grading is well accepted at an anatomic site by numbers 1 through 4, then four groups may be used.
14. The performance index of the host, considering all cofactors, should be recorded at the time of each stage classification and at follow-up examinations. This should be done on the data record form under the letter designation **H**. This factor may be an influencing one in determining treatment.

In stage classification of cancer at various anatomic sites, an attempt has been made to simplify the staging as much as possible, consistent with accuracy. Also an attempt is made to have definitions of the various symbols as similar as possible from one site to another.

## Definitions of Symbols

Three capital letters are used to describe extent of cancer

- T Primary tumor
- N Regional lymph nodes
- M Distant metastasis

### Chronology of classification

- c Clinical-diagnostic
- p Postsurgical treatment-pathologic
- s Surgical-evaluative
- r Retreatment
- Autopsy

This classification is extended by the following designations:

## Tumor

- TX The minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1, T2, T3, T4 Progressive increase in tumor size or involvement

## Nodes

- NX The minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional node involvement
- N1, N2, N3, N4 Increasing degrees of demonstrable abnormality of regional lymph nodes

## Metastasis

- MX The minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No evidence of distant metastasis
- M1 Distant metastasis present  
Specify sites of metastasis \_\_\_\_\_

The category M1 may be subdivided according to the following notations:

- Pulmonary PUL
- Osseous OSS
- Hepatic HEP
- Brain BRA
- Lymph nodes LYM
- Bone marrow MAR
- Pleura PLE
- Skin SKI
- Eye EYE
- Other OTH

## Histopathology

Histopathology refers to the histologic type of cancer.

### Grade (G)

- GX Grade cannot be assessed.
- G1 Well-differentiated
- G2 Moderately well-differentiated
- G3-G4 Poorly to very poorly differentiated; use whichever indicator is most appropriate (term or G + number).

In certain sites further information regarding the primary tumor may be recorded under the following headings:

### Lymphatic invasion (L)

- LX Lymphatic invasion cannot be assessed.
- L0 No evidence of lymphatic invasion
- L1 Evidence of invasion of superficial lymphatics
- L2 Evidence of invasion of deep lymphatics



*Venous invasion (V)*

- VX Venous invasion cannot be assessed.  
 V0 Veins do not contain tumor.  
 V1 Efferent veins contain tumor.  
 V2 Distant veins contain tumor.

**Residual Tumor (R)**

This information does not enter into establishing stage of tumor but should be recorded on data form for use in considering additive therapy. When the cancer is treated by definitive surgical procedures, residual cancer, if any, is recorded.

*Residual tumor following surgical treatment*

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor  
 Specify \_\_\_\_\_

**Host Performance Scale**

The host performance status is determined at the time of classification. The condition of the patient does not enter into determination of stage of the tumor but may be a factor in deciding type and time of treatment. Three suggested scales are illustrated. The simplified AJCC scale is preferred because of simplicity. The other scales are shown so comparisons can be seen.

**Host (AJCC)**

- H The physical state (performance scale) of the patient, considering all cofactors determined at the time of stage classification and subsequent follow-up examinations  
 H0 Normal activity  
 H1 Symptomatic and ambulatory; cares for self  
 H2 Ambulatory more than 50% of time; occasionally needs assistance  
 H3 Ambulatory 50% or less of time; nursing care needed  
 H4 Bedridden; may need hospitalization

The Karnofsky scale and the Eastern Cooperative Oncology Group (ECOG) scale are frequently used to record the physical state of patients and are listed for information and comparison

*Karnofsky Scale: Criteria of Performance Status (PS)*

- |  |     |  |
|--|-----|--|
| Able to carry on normal activity; no special care is needed. | 100 | Normal; no complaints; no evidence of disease                        |
|  | 90  | Able to carry on normal activity; minor signs or symptoms of disease |

- |   |    |   |
|---|----|---|
|   | 80 | Normal activity with effort; some signs or symptoms of disease              |
| Unable to work; able to live at home and care for most personal needs; a varying amount of assistance is needed.    | 70 | Cares for self; unable to carry on normal activity or to do active work     |
|   | 60 | Requires occasional assistance but is able to care for most of own needs    |
|   | 50 | Requires considerable assistance and frequent medical care                  |
| Unable to care for self; requires equivalent of institutional or hospital care; disease may be progressing rapidly. | 40 | Disabled; requires special care and assistance                              |
|   | 30 | Severely disabled; hospitalization indicated although death not imminent    |
|   | 20 | Very sick; hospitalization necessary; active supportive treatment necessary |
|   | 10 | Moribund, fatal processes progressing rapidly                               |
|   | 0  | Dead  |

*Eastern Cooperative Oncology Group Scale (ECOG)*

## GRADE

- 0 Fully active, able to carry on all predisease activities without restriction (Karnofsky 90-100)
- 1 Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature; for example, light housework, office work (Karnofsky 70-80)
- 2 Ambulatory and capable of all self-care but unable to carry out any work activities. Up and about more than 50% of waking hours (Karnofsky 50-60)
- 3 Capable of only limited self-care, confined to bed or chair 50% or more of waking hours (Karnofsky 30-40)
- 4 Completely disabled. Cannot carry on any self-care. Totally confined to bed or chair (Karnofsky 10-20)

**Data Forms for Cancer Staging**

Each site-specific data form is to be used for recording the classification of the tumor and the stage of the cancer. The anatomic site of the cancer

should be indicated, as well as the histologic cell type and grade. The appropriate period of the chronology of classification must be recorded. If a cancer is staged during several time periods in the chronology, separate forms must be used for each time period.

The T, N, and M classification can be checked opposite the appropriate definitions of the extent of the primary tumor, the regional nodes, and distant metastasis. The lesion(s) can be marked on the diagram and, finally, the stage can be checked according to the grouping of TNM. In some instances information regarding other characteristics of the tumor (not leading to stage) might be asked for. This data may be pertinent in deciding management of the cancer. On the obverse side of the data form is information and definitions that are important in proper classification of a cancer.

The data form for cancer staging is not a replacement for history, treatment, or follow-up records but might become part of the patient file.

## Screening for the Early Detection of Cancer

The entire concept of cancer staging is built upon the foundation of progression of disease from clinically undetectable cancer to very limited disease, to involvement by direct extension of immediately adjacent organs or tissues, to metastatic spread of disease into regional lymph nodes or into distant sites or lymph nodes. The literature on cancer patient

survival is filled with reports reflecting the survival advantage of patients whose cancer was diagnosed before direct extension or metastatic spread has taken place. Thus, one approach to improving overall survival for patients who develop cancer is to diagnose it while it can be managed more effectively with currently available therapeutic modalities. This idea has led to the search for methods of detecting cancers that heretofore could not be identified by routine clinical examination. The Pap smear for detection of cervical abnormality or cancer, mammography for detection of breast cancer, sputum cytology for detection of lung cancer, and the fecal occult blood test for early diagnosis of colon cancer are examples of methods currently being used.

There is substantial evidence that the Pap smear has been instrumental in reducing mortality due to carcinoma of the cervix. Mammography, in addition to clinical examination, has been shown by means of a randomized trial to be effective in reducing mortality due to breast cancer. The other two methods are currently being evaluated by controlled trials. Results from these studies are demonstrating that earlier detection is possible for cancers of the lung and colon, two of the most frequently occurring cancers.

The American Joint Committee on Cancer supports efforts to develop and evaluate early detection methods for these and other cancers as rapidly as possible, so that screening can be offered to a wide segment of the population. Thus, persons who are unaware of the existence of small cancers could have them identified and treated before the cancers have had the chance to grow and disseminate.

## Reporting of Cancer Survival and End Results

To evaluate the efficacy of treatment and to provide a sound base for therapeutic planning for cancer patients, it is necessary to describe the survival and the results of treatment of different patient groups in comparable form. The objective of this report is to define a method of reporting end results that may have wide application. Throughout this chapter, the term *survival time* is used, although the guidelines apply equally to reporting length of response time, time to recurrence of disease, time to development of tumor, or any other function of response time.

Certain basic information must be included in every report on cancer survival and end results. Such information should include the following:

1. A description of the cancer patients whose survival experiences are to be summarized
2. A definition of the starting time or "zero" time for the measurement of survival
3. An explanation of the method used in calculating survival rates

The specific definitions and methods used in a particular study depend on the nature and purpose of that study.

### DESCRIPTION OF CASE MATERIAL

Before any meaningful interpretation of survival data can be made, the case material from which the data are derived must be described. A fact not adequately appreciated is that the description of case material is quite independent of the actual mechanics of handling the data and determining survival rates.

In organizing the material for presentation, consideration should be given to the following:

1. Reports should account for every case diagnosed as having the particular cancer under consideration. If some cases are excluded, the characteristics and number of these cases should be stated. The report should give the dates during which the patients were studied and should state whether the results are based on the experience of an entire institution,



on the experience of a single clinic or hospital service, or on the experience of a single physician or group of physicians. The general nature of the institution and the general characteristics of the patients should be indicated, because factors such as race and socioeconomic status may influence end results.

2. All diagnoses should be confirmed histologically or cytologically. Those not confirmed at any time during the course of the disease or at autopsy should be reported and tabulated separately. Where indicated, the findings for histologically distinct types of cancers should be reported separately. So that the effects of morphology on survival may be appreciated, reports should be stratified by histologic type where indicated.
3. The clinical stage or anatomic extent of disease at the time of diagnosis is of particular importance in evaluating treatment and in making valid comparisons of end results reported from different sources. Where it is applicable, patients should be stratified by stage of disease. The TNM system provides a common language for categorizing the primary lesion and the extent of involvement.

The TNM assignments are grouped into appropriate combinations to create a small number of stages, usually four, such that the force of mortality increases from one stage to the next.

Specific criteria modify this system according to the primary site. The clinical-diagnostic classification for cancer at certain accessible sites, such as the uterine cervix, includes all diagnostic and evaluative information obtained up to the date that tumor-directed treatment begins or the decision for no treatment is made. Information obtained by surgical exploration or histopathologic studies, or both, may be used in describing extent of disease at sites inaccessible to clinical evaluation, such as carcinoma of the ovary, kidney, and stomach. These cancers are reported in terms of surgical-evaluative stage or postsurgical treatment-pathologic stage of disease.

4. Data on groups of patients previously treated should be presented separately from the data on new patients who have not been previously treated. Such patients are classified according to the stage at time of retreatment.
5. The number of groups into which a patient series is subdivided depends on the total number of patients, the purpose of the study, and the nature of the case material. For example, in reporting on cancer of the prostate, the patients might be grouped into three age groups, such as: under 60, 60 to 69, and 70 and over. An entirely different age grouping would be used in reporting on patients

with leukemia. Generally, it is desirable to subdivide with respect to histologic type, sex, stage and treatment.

## DEFINITION OF STARTING TIME

The starting time for determining survival of patients depends on the purpose of the study. For example, the starting time for studying the natural history of a particular cancer might be defined in reference to the appearance of the first symptom. Various reference dates are commonly used as starting times for evaluating the effects of therapy. These include: (1) date of diagnosis; (2) date of first visit to physician or clinic; (3) date of hospital admission; and (4) date of beginning treatment. If the time to recurrence of a tumor after apparently complete remission is being studied, the starting time is the date of apparently complete remission. The specific reference date used should be specified clearly in every report.

The date of initiation of therapy should be used as the starting time for evaluating therapy. For untreated patients, the most comparable date is the time at which it was decided that no tumor-directed treatment would be given. For both treated and untreated patients, the above times from which survival rates are calculated will usually coincide with the date of the initial staging of cancer.

## VITAL STATUS

At any given time the vital status of each patient is defined as alive, dead, or unknown (*i.e.*, lost to follow-up). The end point of each patient's participation in the study is (1) a specified "terminal event" such as death, (2) survival to the completion of the study, or (3) loss to follow-up. In each case *survival time* is the time from the starting point to the terminal event, or to the end of the study, or to the date of last observation. This survival time may be described further in terms of patient status at the end point such as the following:

Alive, tumor-free; no recurrence  
 Alive, tumor-free; after recurrence  
 Alive with recurrent or metastatic disease  
 Alive with primary tumor  
 Dead; tumor-free  
 Dead; with cancer (primary, recurrent, or metastatic disease)  
 Dead; postoperative  
 Unknown; lost to follow-up

Completeness of the follow-up is crucial in a study of survival time because even a small number of patients lost to follow-up may bias the data.

## SURVIVAL INTERVALS

The total survival time is broken up into arbitrary units or intervals in terms of days, months, or years. This provides a description of the population under study, with respect to the dynamics of survival, over a specified time. The time interval used should be selected with regard to the natural history of the disease under consideration. In diseases with a long natural history, the duration of study could be 5 to 10 years and survival intervals of 6 to 12 months will provide a meaningful description of the survival dynamics. If the population being studied has a very poor prognosis (e.g., patients with carcinoma of the esophagus or pancreas), the total duration of study may be 2 to 3 years and the survival intervals described in terms of 1 to 3 months. In interpreting survival rates one must also take into account the number of individuals entering a survival interval. *Survival rates probably should not be computed for intervals in which fewer than 10 patients enter the interval alive.*

## CALCULATION OF SURVIVAL RATES

A properly calculated survival rate is the best single statistical index available for measuring the efficacy of cancer therapy. The basic concept is simple: Of a given number of patients, what percentage will be alive at the end of a specified interval, such as 5 years? For example, let us begin with 1000 patients in a defined diagnostic category such as localized carcinoma of the uterine cervix. If we observe each member of this group until death and enumerate those alive 5 years, 10 years, and 15 years after initiation of therapy, then the ratios of these numbers to the original 1000 patients give, respectively, the 5-year, 10-year, and 15-year survival rates. In practice, however, we do not begin literally with a given group and follow them all continuously until death before calculating survival rates. In a body of actual data, the group considered generally contains persons who were treated at different times, so that different persons are observed for different lengths of time. On the closing date of the study, some are known to be dead, others are known to be alive, and some have been lost to follow-up and it is not known whether they are alive or dead.

To illustrate the approach to dealing with this type of situation, let us consider in detail a moderately small series of patients. Table 2-1 lists 50 patients with melanoma of the skin treated in one hospital during the 15-year period from October 1952 to June 1967. The survival experience of these patients is to be assessed on the basis of information available through the end of 1969, that is, the *nominal closing date* of the

study is December 31, 1969. For each patient, the list provides the following basic information:

1. Sex
2. Age at initiation of treatment
3. Date treatment started (month and year)
4. Date of last contact (month and year)
5. Vital status at date of last contact (alive or dead)
6. Presence of melanoma at date of last contact (yes or no)

Patients are listed consecutively by date of first treatment.

**Calculation by the Direct Method.** The simplest procedure for summarizing patient survival is to calculate the percentage of patients alive at the end of a specified interval such as 5 years, using for this purpose only patients exposed to the risk of dying for at least 5 years. This approach is known as the *direct method*.

In this set of data there were contacts with patients during 1969, but these contacts occurred during different months of the year. We know that all patients last contacted in 1969 were alive on December 31, 1968, but we do not know whether they were all alive at the end of 1969. Thus, we will designate December 31, 1968, as the *effective closing date* of the study. Consequently, all patients first treated on January 1, 1964, or later were not at risk of dying for at least 5 years as of the closing date. This means that 20 of the 50 patients (numbers 31 to 50) must be excluded from the calculation by the direct method.

Examining the entries in the "vital status" column in Table 1 for the 30 patients at risk for at least 5 years, we find that 16 patients were alive at last contact and 14 had died before December 1968. However, patient 2, although known to have died in January 1960, had been alive on his fifth anniversary. Therefore we have 17 of the 30 patients alive 5 years after their respective dates of first treatment and, thus, the 5-year survival rate is 57%.

**Calculation by the Actuarial Method.** The direct method for calculating a survival rate does not use all the information available. For example, we know that patient 31 died in the fourth year after treatment was started and that patient 32 lived for more than 4 years. Such information should be useful, but we were unable to use it under the rules of the direct method because the patients were diagnosed after December 1963.

The *actuarial*, or *life-table*, method provides a means for using all follow-up information accumulated up to the closing date of the study. The actuarial method has the further advantage of providing

Table 2-1. Listing of 50 White Patients With Melanoma of the Skin

PATIENT NUMBER	SEX	AGE	DATE TREATMENT STARTED	LAST CONTACT			INTERVAL OF LAST OBSERVATION (YEARS)
				Date	Vital status*	Melanoma present?	
1	M	63	Oct. 1952	Nov. 1952	D	Yes	1
2	M	42	Jul. 1954	Jan. 1960	D	No†	6
3	M	41	Mar. 1955	Apr. 1955	D	Yes	1
4	F	57	Jun. 1955	Jul. 1956	D	Yes	2
5	M	35	Sep. 1955	Oct. 1969	A	No	15
6	F	48	Oct. 1955	Aug. 1956	D	Yes	1
7	M	43	Apr. 1956	Feb. 1959	D	Yes	3
8	F	27	Jan. 1957	Jan. 1957	D	Yes	1
9	F	56	Dec. 1958	Oct. 1969	A	No	11
10	F	33	Jan. 1959	Nov. 1969	A	Yes	11
11	F	37	Apr. 1959	Apr. 1969	A	No	11
12	F	58	Sep. 1959	Aug. 1969	A	No	10
13	M	21	Feb. 1960	May 1960	D	No†	1
14	M	71	Feb. 1960	Nov. 1968	A	No	9
15	F	66	Jun. 1961	Aug. 1961	D	Yes	1
16	F	35	Jul. 1961	Dec. 1969	A	No	9
17	F	31	Oct. 1961	Nov. 1969	A	No	9
18	M	35	Mar. 1962	Jun. 1969	A	No	8
19	F	44	Apr. 1962	Jul. 1969	A	No	8
20	M	26	Apr. 1962	Oct. 1969	A	No	8
21	M	57	Oct. 1962	Jun. 1963	D	Yes	1
22	M	54	Dec. 1962	Feb. 1963	D	Yes	1
23	M	63	Jan. 1963	Jan. 1964	D	Yes	2
24	F	32	Jan. 1963	Oct. 1965	D	Yes	3
25	F	43	Apr. 1963	Feb. 1969	A	No	6
26	F	76	Jul. 1963	Feb. 1968	D	Yes	5
27	M	31	Sep. 1963	Nov. 1969	A	No	7
28	M	77	Nov. 1963	Feb. 1969	A	No	6
29	F	59	Nov. 1963	Apr. 1969	A	No	6
30	F	76	Dec. 1963	Sep. 1969	A	No	6
31	M	39	Mar. 1964	Aug. 1967	D	Yes	4
32	F	50	Jul. 1964	Apr. 1969	A	No	5
33	F	38	Sep. 1964	Jun. 1969	D	Yes	5
34	F	82	Mar. 1965	Dec. 1969	A	No	5
35	M	65	Apr. 1965	Jul. 1965	D	Yes	1
36	M	40	Apr. 1965	Oct. 1969	A	Yes	5
37	M	22	Jun. 1965	Feb. 1969	A	No	4
38	F	25	Jan. 1966	Nov. 1969	A	No	4
39	M	33	Apr. 1966	Nov. 1969	A	No	4
40	F	51	May 1966	Jul. 1969	A	No	4
41	F	40	Jul. 1966	Nov. 1969	A	No	4
42	M	70	Sep. 1966	Sep. 1967	D	No†	2
43	M	47	Sep. 1966	Dec. 1967	D	Yes	2
44	M	67	Oct. 1966	Apr. 1968	D	No†	2
45	F	58	Jan. 1967	Aug. 1969	A	No	3
46	M	75	Jan. 1967	Oct. 1969	A	No	3
47	M	40	Apr. 1967	Jul. 1969	A	No	3
48	F	35	Apr. 1967	Jul. 1969	A	Yes	3
49	F	49	May 1967	Dec. 1968	D	Yes	2
50	F	21	Jun. 1967	Mar. 1969	A	No	2

\* A, alive; D, dead

† Died of intercurrent disease

information on the survival pattern, that is, the manner in which the patient group was depleted during the total period of observation.

The procedures described here are designed for the individual investigator who wants to analyze carefully the survival experience of a small series of patients—in this illustration, 50 patients. However, the same underlying methodology is used in analyzing large series with electronic computers.

*Patient Data Card.* To facilitate sorting and counting, it is advisable to prepare a data card on each patient,

such as the one shown in Figure 2-1. The upper part (above the double line) provides the following items of basic descriptive information:

1. Name: a case number, in addition to the name, may be useful for identification.
2. Age: completed years of age at time of initiation of treatment
3. Race and sex
4. Dates of first treatment and of last contact: month and year
5. The interval of last observation (designated fol-

John Doe (Name)	42 (Age)	W (Race)	M (Sex)	July 1954 (Date treatment started)
January 1960 (Date of last contact)	6 (Follow-up year)	Dead (Vital status)	No (Melanoma present)	
Right forearm (Site)	Melanoma (Type)	Localized (Stage)	Surgery (Treatment)	
Interval of observation 0-5	Age at entry 42	Year of entry 1954	Expected survival probability 0.979	

Fig. 2-1. Data card: patient 2, Table 2-1.

low-up year on card) is the interval during which an event occurred, either death (or other appropriate response such as recurrence) or withdrawal from observation. The interval of last observation is the number of completed entire intervals of follow-up plus 1; for example, 5 years 6 months = 5 completed years, which implies an event occurring in the sixth year. Patients followed for 5 years, up to but not including the sixth year, have a follow-up interval of last observation of 6 years.

6. Vital status and presence of disease: information on presence or absence of cancer at time of death is highly desirable.
7. Diagnostic: site of the tumor, histologic type, and stage of disease
8. Treatment: brief summary

**Observed Survival Rate.** The life-table method for calculating a survival rate, using all the follow-up information available on the 50 patients under study, is illustrated in Table 2-2. There are six steps necessary in preparing such a table:

1. The patient data cards are tallied for vital status and follow-up year of last observation (columns 3 and 4). The sum of the entries in columns 3 and 4 must equal the total number of patients. Note that the 17 patients alive at the beginning of the last interval of observation in column 2 (6 years and

over) were also entered in column 4 (number last seen alive during year).

2. The number of patients alive at the beginning of each year is entered in column 2 and is obtained by successive subtraction. Thus, of 50 patients alive at start of treatment, that is, at the beginning of the first year of observation, 9 died during the first year and 41 were alive at the beginning of the second year.
3. The "effective number exposed to risk of dying" (column 5) is based on the assumption that patients last seen alive during any year of follow-up were, on the average, observed for one half of that year. Thus, for the third year the "effective number" is  $34 - (\frac{1}{2} \times 4) = 32.0$ , and for the fourth year it is  $28 - (\frac{1}{2} \times 5) = 25.5$ .
4. The proportion dying during any year (column 6) is found by dividing the entry in column 3 by the entry in column 5. Thus, for the first year, the proportion dying is  $9 \div 50.0 = 0.180$  and for the second year it is  $6 \div 40.5 = 0.148$ .
5. The proportion surviving the year (column 7), that is, the observed annual survival rate, is obtained by subtracting the proportion dying (column 6) from 1 (1.000).
6. The proportion surviving from first treatment to the end of each year (column 8), that is, the observed cumulative survival rate, is the product

Table 2-2. Calculation of Observed Survival Rate by the Actuarial (Life-Table) Method

YEAR OF LAST OBSERVATION (1)	NO. ALIVE AT BEGINNING OF YEAR (2)	NO. DYING DURING YEAR (3)	NO. LAST SEEN ALIVE DURING YEAR (4)	EFFECTIVE NO. EXPOSED TO RISK OF DYING (5)	PROPORTION DYING DURING YEAR (6)	PROPORTION SURVIVING YEAR (7)	PROPORTION SURVIVING FROM FIRST TREATMENT TO END OF YEAR (8)
1	50	9	0	50.0	0.180	0.820	0.820
2	41	6	1	40.5	0.148	0.852	0.699
3	34	2	4	32.0	0.063	0.937	0.655
4	28	1	5	25.5	0.039	0.961	0.629
5	22	2	3	20.5	0.098	0.902	0.567
≥6	17	—	17	—	—	—	—
Total		20	30				

of the annual survival rates for the given year and all preceding years. For example, for the fifth year the proportion 0.567 is the product of all entries in column 7 from the first through the fifth years.

The 5-year survival rate calculated by the life-table method is 0.567, or 57%. In this instance, the calculation obtained by using the information available on all 50 patients agrees with the rate based on the 30 patients eligible for inclusion in the calculation by the direct method. Such close agreement by the two methods usually does not occur when some patients have to be excluded from the calculation of a survival rate by the direct method. In such instances, the life-table method is more reliable because it is based on more information.

One advantage of the life-table method is that it provides information about changes in the risk of dying in successive intervals of observation. Thus, we see from column 6 that the proportion of patients dying in each of the first 4 years after treatment decreased from 18% in the first year to 4% in the fourth. (The increase to 10% in the fifth year may be due to chance, since we are dealing here with small numbers—only 22 patients were alive at the beginning of the fifth year.)

The cumulative rates in column 8 may be used to plot a survival curve, providing a pictorial description of the survival pattern as shown in Figure 2-2. In Figure 2-3, the survival pattern for patients with

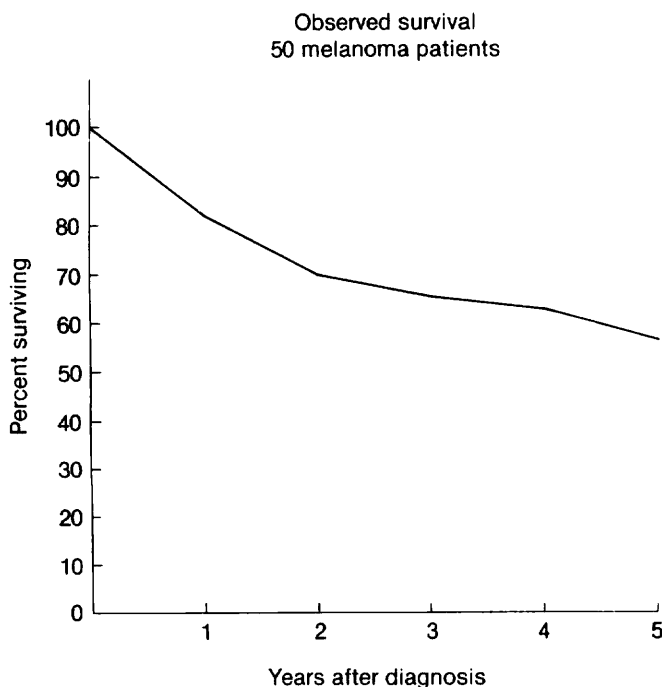


Fig. 2-2. Survival curve for 50 white patients with melanoma of the skin

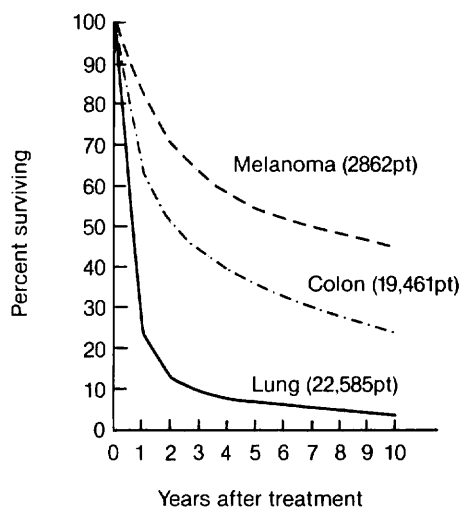


Fig. 2-3. Survival curves for patients with melanoma, colon cancer, and lung cancer: arithmetic scale. (Data from End-Results Group: End Results in Cancer, Report No. 4, DHEW Publication NIH 73-272. Bethesda, MD, National Cancer Institute, 1972)

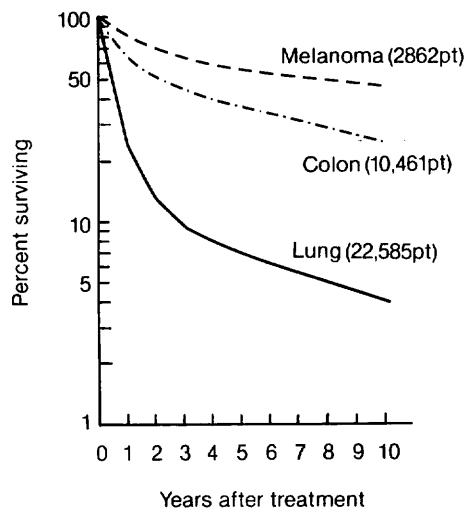


Fig. 2-4. Survival curves for patients with melanoma, colon cancer, and lung cancer: logarithmic scale. (Data from End-Results Group: End Results in Cancer, Report No. 4, DHEW Publication NIH 73-272. Bethesda, MD, National Cancer Institute, 1972)

melanoma of the skin (based on a large series) is compared with the patterns for cancers of the colon and of the lung for a 10-year period of observation.

The same set of survival rates was plotted in Figure 2-4 using a logarithmic scale, which provides a pictorial representation of changes in the rate at which patients are dying—a steep slope indicates a high rate, a shallow slope indicates a low rate. For each disease group, the death rate slowed appreciably



Table 2-3. Calculation of Adjusted Survival Rate

YEAR OF LAST OBSERVATION (1)	NO. ALIVE AT BEGINNING OF YEAR (2)	NO. DYING DURING YEAR		NO. LAST SEEN ALIVE DURING YEAR (4)	EFFECTIVE NO. EXPOSED TO RISK OF DYING (5)	PROPORTION DYING DURING YEAR (6)	PROPORTION SURVIVING TO END OF YEAR (7)	CUMULATIVE PROPORTION SURVIVING (8)
		WITH DISEASE (3a)	WITHOUT DISEASE (3b)					
1	50	8	1	0	49.5	0.162	0.838	0.838
2	41	4	2	1	39.5	0.101	0.899	0.754
3	34	2	0	4	32.0	0.063	0.937	0.706
4	28	1	0	5	25.5	0.039	0.961	0.679
5	22	2	0	3	20.5	0.098	0.902	0.613
≥6	17	—	—	17	—	—	—	—
Total		17	3	30				

after the third year; the slope of each curve becomes shallower. However, it is clear from Figure 2-4 that patients with lung cancer were dying at a greater rate from the third through the tenth years than patients with cancer of the colon or with melanoma. In contrast, examination of Figure 2-3 might lead one to the erroneous conclusion that beyond the third year, lung cancer patients died at a lower rate. This is because Figure 2-3 portrays *absolute* changes, while Figure 2-4 provides a true picture of *relative* changes.

**Adjusted Survival Rate.** The *observed* survival rate described above accounts for all deaths, regardless of cause. While this is a true reflection of total mortality in the patient group, we are frequently interested in describing mortality attributable to the disease under study. Examination of Table 2-1 reveals that in four instances melanoma was not present at time of death (patients 2, 13, 42, and 44). Three of these deaths occurred within the first 5 years of follow-up and thus influenced the 5-year survival rate calculated in Table 2-2.

Whenever reliable information on cause of death is available, an adjustment can be made for deaths due to causes other than the disease under study. The procedure is shown in Table 2-3. Observed deaths are recorded as “with disease” (column 3a) or “without disease” (column 3b). Patients who died “without disease” are treated in the same manner as patients “last seen alive during year” (column 4); that is, both groups are withdrawn from the risk of dying from melanoma. Thus, the “effective number exposed to risk of dying” (from melanoma) in the second year of observation is equal to  $41 - (\frac{1}{2}[2 + 1]) = 39.5$ .

The 5-year *adjusted* survival rate is 61% compared to an *observed* rate of 57%. The adjusted rate indicates that 61% of patients with melanoma escaped the risk of death from the disease within 5 years of treatment.

Use of the adjusted rate is particularly important in comparing patient groups that may differ with respect to factors such as sex, age, race, and socioeconomic status. Of the 50 patients listed in

Table 2-1, 24 are males and 26 females. The observed survival curves are plotted in the upper part of Figure 2-5. There is a large gap between the curves for the two sexes. However, 3 of the 12 males who died during the first 5 years of observation had no evidence of melanoma at time of death. In contrast, melanoma was present at time of death in all eight females who died. The effect of the adjustment for cause of death is shown in the lower portion of Figure 2-5. The survival curve for males is still below the curve for females, but the gap has been narrowed. The 5-year adjusted survival rate is 58% for males and 65% for females. The corresponding observed rates are 48% and 65%, a much larger difference.

**Relative Survival Rate.** Information on cause of death is sometimes unavailable or unreliable. Under such circumstances, it is not possible to compute an adjusted survival rate. However, it is possible to account for differences among patient groups in *normal mortality expectation*, that is, differences in the risk of dying from causes other than the disease

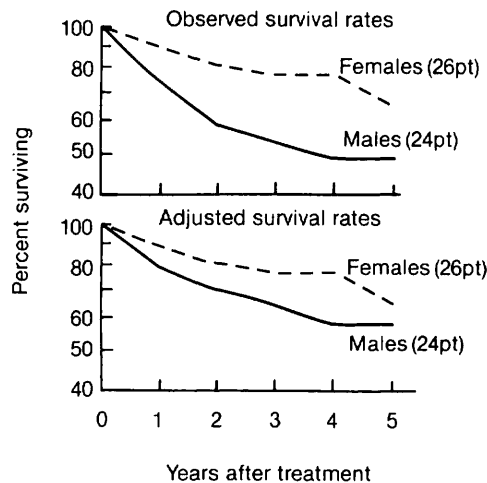


Fig. 2-5. Comparison of survival curves (logarithmic scale) for males and females with melanoma: observed and adjusted survival rates

under study. This can be done by means of the relative survival rate, which is the ratio of the observed survival rate to the expected rate for a group of people in the general population similar to the patient group with respect to race, sex, age, and calendar period of observation.

Table 2-4 provides 5-year "normal" survival probabilities for white males and females in the United States, based on mortality experience in calendar years 1950, 1955, 1960, 1965, 1970, and 1975. The appropriate probability, depending on the sex and age of the patient and the calendar year of entry to observation, is taken from this table and entered in the lower portion of the patient data card (Fig. 2-1). Thus, for example, for patient 2 (Table 2-1), who is a 42-year-old man with a 1954 date of entry, the 5-year expected survival probability is 0.979. For patient 17, a

31-year-old woman who entered observation in 1961, the expected probability is 0.995. Thus, for the hypothetical group of patients in Table 2-1, the average expected 5-year survival probability is the sum of the individual probabilities (46.257) divided by the number of patients (50) and equals 0.92. The ratio of the observed (57%) to the expected (92%) survival rate is 62%. This is the relative rate and in this instance it is almost identical with the adjusted rate.

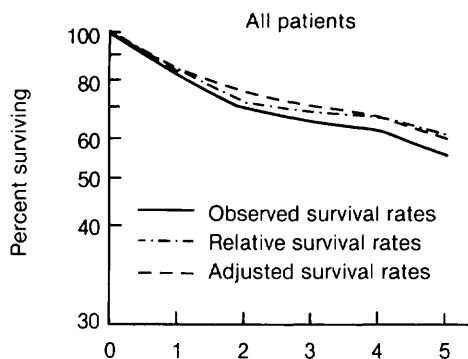
Although in this illustration 5-year results were used to depict the relative survival rate calculation, it is conventional to calculate relative survival rates for each interval and cumulatively for successive follow-up intervals. For the more detailed analysis, one must consult more extensive expected rate tables and more explicit methodology (see bibliography entry 6).

In Figure 2-6, comparison is made between the

**Table 2-4.** Five-Year Survival Probabilities for U.S. Whites: 1950, 1955, 1960, 1965, 1970, and 1975

AGE IN YEARS (INCLUSIVE RANGE)	1950 (1948-1952)	1955 (1953-1957)	1960 (1958-1962)	1965 (1963-1967)	1970 (1968-1972)	1975 (1973-1977)
<i>Male</i>						
<1	0.964	0.969	0.970	0.972	0.977	0.981
1 and 2	0.995	0.996	0.996	0.996	0.996	0.997
5 (3-7)	0.997	0.997	0.998	0.998	0.998	0.998
10 (8-12)	0.997	0.997	0.997	0.998	0.998	0.998
15 (13-17)	0.993	0.994	0.994	0.994	0.993	0.993
20 (18-22)	0.991	0.991	0.992	0.991	0.990	0.991
25 (23-27)	0.992	0.992	0.992	0.992	0.992	0.992
30 (28-32)	0.991	0.991	0.991	0.991	0.991	0.992
35 (33-37)	0.986	0.987	0.988	0.987	0.987	0.989
40 (38-42)	0.978	0.979	0.980	0.980	0.979	0.982
45 (43-47)	0.963	0.965	0.966	0.966	0.967	0.970
50 (48-52)	0.942	0.944	0.943	0.944	0.947	0.952
55 (53-57)	0.912	0.916	0.915	0.913	0.915	0.926
60 (58-62)	0.869	0.873	0.872	0.873	0.873	0.884
65 (63-67)	0.814	0.815	0.815	0.813	0.816	0.834
70 (68-72)	0.741	0.746	0.745	0.741	0.745	0.759
75 (73-77)	0.633	0.642	0.650	0.649	0.642	0.658
80 (78-82)	0.499	0.504	0.509	0.520	0.523	0.547
≥85	0.350	0.349	0.349	0.350	0.379	0.421
<i>Female</i>						
<1	0.972	0.976	0.977	0.979	0.982	0.985
1 and 2	0.996	0.997	0.997	0.997	0.997	0.997
5 (3-7)	0.998	0.998	0.998	0.998	0.998	0.999
10 (8-12)	0.998	0.998	0.999	0.999	0.999	0.999
15 (13-17)	0.997	0.997	0.998	0.998	0.997	0.997
20 (18-22)	0.996	0.997	0.997	0.997	0.997	0.997
25 (23-27)	0.996	0.996	0.996	0.997	0.996	0.997
30 (28-32)	0.994	0.995	0.995	0.995	0.995	0.996
35 (33-37)	0.991	0.992	0.993	0.993	0.993	0.994
40 (38-42)	0.987	0.988	0.988	0.988	0.988	0.990
45 (43-47)	0.980	0.982	0.982	0.982	0.982	0.984
50 (48-52)	0.969	0.972	0.972	0.972	0.973	0.975
55 (53-57)	0.953	0.959	0.960	0.959	0.960	0.963
60 (58-62)	0.925	0.934	0.937	0.939	0.941	0.944
65 (63-67)	0.883	0.890	0.900	0.901	0.908	0.920
70 (68-72)	0.816	0.832	0.841	0.846	0.854	0.869
75 (73-77)	0.708	0.727	0.746	0.754	0.761	0.784
80 (78-82)	0.558	0.580	0.592	0.611	0.633	0.672
≥85	0.406	0.394	0.400	0.405	0.472	0.512

Source: National Center for Health Statistics



**Fig. 2-6.** Comparison of survival curves based on observed, adjusted, and relative rates (logarithmic scale)

survival curves based on the observed, adjusted, and relative rates. It can be seen that the values along the adjusted and relative survival curves are not always nearly identical. In practice, if the series is not too small and the patients are roughly representative of the population of the United States (taking race, sex, and age into account), the relative survival rate provides a useful estimate of the probability of escaping the risk of dying from the specific disease under study. However, if reliable information on cause of death is available, it is preferable to use the adjusted rate. This is particularly true if the series is small or if the patients are drawn largely from a particular socioeconomic segment of the population.

In reporting on patient survival, the exact method used in calculating the rates must be specified. The different types of rates described above are all useful, but rates computed by different methods are not directly comparable with each other. Thus, in comparing the survival of different patient groups, rates must be computed by the same method.

### STANDARD ERROR OF A SURVIVAL RATE

A survival rate describes the experience of the specific group of patients from which it is computed. These results are frequently used to generalize to a larger population or universe. The existence of universal values is postulated and these values are estimated from the group under study, which thus represents a sample from the larger population. If a survival rate were calculated from a second sample taken from the same universe, it is unlikely that the results would be exactly the same. The difference between the two results is called the *sampling variation* (chance variation or sampling error). The *standard error* is a measure of the extent to which sampling variation influences the computed survival rate. In repeated observations under the same

conditions, the true or population survival rate will lie within the range of two standard errors on either side of the computed rate about 95 times in 100. This range is called the *95% confidence interval*.

When the observed survival rate has been computed by the direct method, the standard error is computed from the formula

$$\sqrt{\frac{p(1-p)}{n}}$$

where "p" is the survival rate and "n" is the number of patients exposed to risk of death. In the illustration of the direct method, a 5-year survival rate of 57% was obtained based on the experience of 30 patients ( $17 \div 30 = 0.567$ ). Thus, the standard error is equal to 0.090 (square root of  $[0.567 \times 0.433 \div 30]$ ). To obtain the 95% confidence interval, twice the standard error (18%) is subtracted from and added to the survival rate. This means that the chances are about 95 in 100 that the true 5-year rate is between 39% and 75% for our example.

**Standard Error of the Actuarial Survival Rate.** In order to calculate the standard error of the 5-year survival rate when the actuarial method is used (see bibliography entries 4, 12, 14), two columns of figures may be added to Table 2-2 as shown in Table 2-5. The first additional column (column 9) is obtained by subtracting the values in column 3 from the values in column 5 of Table 2-2. The last column needed (column 10) is obtained by dividing the entries in column 6 by the corresponding figures in column 9. The sum of the figures in column 10 is also entered into the table and in this example equals 0.0177.

The standard error of the 5-year survival rate by the actuarial method is the calculated 5-year survival rate multiplied by the square root of the total of the entries in column 10 of Table 2-5, that is,  $0.567 \sqrt{0.0177} = 0.075$ . The approximate 95% confidence interval for the population 5-year survival rate is found, as shown earlier for the direct method, by adding and subtracting two times the standard error to and from the 5-year survival rate that has been calculated, that is, 0.567 plus and minus ( $2 \times 0.075$ ), which gives an interval from 0.42 to 0.72.

If the above computations seem to be too involved, an approximation to the standard error of the actuarial survival rate may be quickly obtained from published tables prepared by Ederer (see bibliography entry 5).

It is noteworthy that the standard error of the survival rate obtained by the actuarial method is smaller than the standard error of the survival rate calculated by the direct method (0.075 vs 0.090). This difference reflects the advantage in terms of statistical reliability of using all available information, that is,

**Table 2-5.** Calculation of Standard Error of Survival Rate by Actuarial (Life-Table) Method

YEAR OF LAST OBSERVATION (1)	NO. ALIVE AT BEGINNING OF YEAR (2)	NO. DYING DURING YEAR (3)	NO. LAST SEEN ALIVE DURING YEAR (4)	EFFECTIVE NO. EXPOSED TO RISK OF DYING (5)	PROPORTION DYING DURING YEAR (6)	PROPORTION SURVIVING YEAR (7)	PROPORTION SURVIVING FROM FIRST TREATMENT TO END OF YEAR (8)	ENTRY (5) MINUS ENTRY (3) (9)	ENTRY (6) DIVIDED BY ENTRY (9) (10)
1	50	9	0	50.0	0.180	0.820	0.820	41.0	0.0044
2	41	6	1	40.5	0.148	0.852	0.699	34.5	0.0043
3	34	2	4	32.0	0.063	0.937	0.655	30.0	0.0021
4	28	1	5	25.5	0.039	0.961	0.629	24.5	0.0016
5	22	2	3	20.5	0.098	0.902	0.567	18.5	0.0053
≥6	17	—	17	—	—	—	—	—	—
Total		20	30						0.0177

Standard error of 5-year survival rate = 5-year survival rate  $\times$   $\sqrt{\text{total of column (10)}}$   
 $= 0.567 \times \sqrt{0.0177} = 0.567 \times 0.1330 = 0.075$

information on patients under observation for less than 5 years. The issue is discussed in detail by Cutler (bibliography entry 4).

**Standard Error of Relative Survival Rate.** The standard error of the relative survival rate is easily obtained by dividing the standard error of the observed survival rate (obtained by either the direct or actuarial method) by the expected survival rate. Thus, from the actuarial method the 5-year survival rate is 57% and the expected survival rate is 92%, with a resulting relative survival rate of 62%. The standard error of the observed survival rate is 0.075.

In this example the standard error of the 5-year relative survival rate is as follows:

$$\frac{\text{Standard error of observed rate}}{\text{Expected survival rate}} = \frac{0.075}{0.920} = 0.082$$

The 95% confidence limits for the 5-year relative survival rate are, therefore, as shown below:

$$0.62 = 2(0.08) = 0.46, 0.78.$$

**Comparison of Survival Rates in Two Patient Groups.** In comparing survival rates of two patient groups, the statistical significance of the observed difference is of interest. The essential question is: What is the probability that the observed difference may have occurred by chance? The standard error of the survival rate provides a simple means for appraising this question. If the 95% confidence intervals of two survival rates do not overlap, the observed difference would be customarily considered as statistically significant, that is, unlikely to be due to chance.

Standard statistical tests describe the z-test, which provides a numeric estimate of the probability that a difference as large as that observed would have occurred if only chance were operating. The statistic z is calculated by the following formula:

$$z = \frac{|p_1 - p_2|}{\sqrt{(SE_1)^2 + (SE_2)^2}}$$

in which

1.  $p_1$  is the survival rate for group 1.
2.  $p_2$  is the survival rate for group 2.
3.  $|p_1 - p_2|$  is the *absolute* value of the difference (*i.e.*, the *magnitude* of the difference, whether positive or negative).
4.  $SE_1$  is the standard error of  $p_1$ .
5.  $SE_2$  is the standard error of  $p_2$ .

If  $z \geq 1.96$ , the probability that a difference as large as that observed occurred by chance is  $\leq 5\%$ . If  $z \geq 2.56$ , the probability is  $\leq 1\%$ . It is conventional in most (but not all) applications to regard as statistically significant a difference that would occur by chance with a probability of 5% or less. For example, let us apply the z-test to the difference in observed 5-year survival rates by the actuarial method for the 24 males and 26 females among the 50 melanoma patients (*i.e.*, let us test whether there is a statistically significant difference in survival of the males with melanoma compared with the females).

Designate the 5-year survival rate for males by  $p_1$  and for females by  $p_2$ . We find  $p_1 = 0.485$  and  $p_2 = 0.646$ . Employing the method shown in Table 2-5,  $SE_1 = 0.105$  and  $SE_2 = 0.105$ .

Then,

$$z = \frac{|0.485 - 0.646|}{\sqrt{0.105^2 + 0.105^2}} = \frac{0.161}{0.148} = 1.09$$

The calculated z value is smaller than 1.96 and therefore not statistically significant at the 5% level. This result indicates that for a study of this size (24 males and 26 females) the difference in  $p$ 's (0.485 vs 0.646) is not large enough for us to reject chance or sampling variation as the cause.

In a study with more patients, the same size difference in survival rates as seen here would be less likely to be due to chance and might be statistically significant (*i.e.*,  $z$  might equal or exceed 1.96). In order for this to come about, the value of the denominator in the equation for  $z$  would have to decrease in value. The denominator,  $\sqrt{(SE_1)^2 + (SE_2)^2}$ , is called the *standard error of the difference in rates* and does tend to become smaller as study size increases. It should also be noted that superior survival of female patients with melanoma compared with males has been observed in large series of patients with resultant significant  $z$  values.

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P A R T

II

STAGING OF CANCER  
AT SPECIFIC  
ANATOMIC SITES

# HEAD AND NECK SITES

## 3

### Lip and Oral Cavity

Cancers of the head and neck may arise on all lining membranes of the upper aerodigestive tract. The "T" classifications indicating the extent of the primary tumor are generally similar but differ in specific details for each site because of anatomic considerations. The "N" classification for cervical lymph node metastasis is uniform for all sites. The staging systems presented in this section are all clinical-diagnostic staging, based on the best possible estimate of the extent of disease before treatment. Although surgical-evaluative classifications and pathologic classifications are possible, they are of less practical importance in the management of these tumors. However, when surgical treatment is carried out, cancer of the head and neck can be staged during these periods of management using all information available.

This section presents the staging classification for four major head and neck sites: the oral cavity, the pharynx (nasopharynx, oropharynx, hypopharynx), the larynx, and the paranasal sinuses.

#### ORAL CAVITY

##### **Anatomy (International Classification of Diseases for Oncology—ICD-O 140-145)**

**Primary Site.** The oral cavity extends from the skin-vermilion junction of the lips to the junction of the hard and soft palate above and to the line of circumvallate papillae below and is divided into the following specific areas:

*Lip (ICD-O 140).* The lip begins at the junction of the vermilion border with the skin and includes only the vermilion surface or that portion of the lip which comes into contact with the opposing lip. It is well defined into an upper and lower lip joined at the commissures of the mouth.

*Buccal Mucosa (ICD-O 140).* This includes all the membrane lining of the inner surface of the cheeks and lips, from the line of contact of the opposing lips to the line of attachment of mucosa of the alveolar ridge (upper and lower) and pterygomandibular raphe.



*Lower Alveolar Ridge (ICD-O 143).* This ridge includes the alveolar process of the mandible and its covering mucosa, which extends from the line of attachment of mucosa in the buccal gutter to the line of free mucosa of the floor of the mouth. Posteriorly it extends to the ascending ramus of the mandible.

*Upper Alveolar Ridge (ICD-O 143).* The upper ridge is the alveolar process of the maxilla and its covering mucosa, which extends from the line of attachment of mucosa in the upper gingival buccal gutter to the junction of the hard palate. Its posterior margin is the upper end of the pterygopalatine arch.

*Retromolar Gingiva (Retromolar Trigone) (ICD-O 145).* This is the attached mucosa overlying the ascending ramus of the mandible from the level of the posterior surface of the last molar tooth to the apex superiorly, adjacent to the tuberosity of the maxilla.

*Floor of the Mouth (ICD-O 144).* This is a semilunar space over the mylohyoid and hyoglossus muscles, extending from the inner surface of the lower alveolar ridge to the undersurface of the tongue. Its posterior boundary is the base of the anterior pillar of the tonsil. It is divided into two sides by the frenulum of the tongue and contains the ostia of the submaxillary and sublingual salivary glands.

*Hard Palate (ICD-O 145).* This is the semilunar area between the upper alveolar ridge and the mucous membrane covering the palatine process of the maxillary palatine bones. It extends from the inner surface of the superior alveolar ridge to the posterior edge of the palatine bone.

*Anterior Two Thirds of the Tongue (Oral Tongue) (ICD-O 144).* This is a freely mobile portion of the tongue that extends anteriorly from the line of circumvallate papillae to the undersurface of the tongue at the junction of the floor of the mouth. It is composed of four areas: the tip, the lateral borders, the dorsum, and the undersurface (nonvillous surface of the tongue). The undersurface of the tongue is considered as a separate category by the World Health Organization (WHO) (ICD-O 141.3).

**Nodal Stations.** The main routes of drainage are into the first station nodes, which are the jugulodigastric, jugulo-omohyoid, upper deep cervical, lower deep cervical, and submaxillary and submental lymph nodes. Some primary sites drain bilaterally. Second station nodes include parotid lymph nodes (juxtaposition nodes).

**Metastatic Sites.** Distant spread to the lungs is common; skeletal or hepatic metastases occur less often. Mediastinal lymph node metastases are considered distant metastases.

## Staging Procedures

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following minimum requirements are made for staging a cancer of the oral cavity:

### *Essential for staging*

1. Complete physical examination of the head and neck including indirect laryngoscopy and nasopharyngoscopy
2. Biopsy of primary tumor
3. Chest roentgenogram
4. Panorex films or other x-ray films for tumors overlying the jaws
5. Roentgenograms of paranasal sinuses for tumors overlying the palate

### *Possibly useful for staging or patient management*

1. Multichemistry screen
2. Staining of surface mucosa with toluidine blue
3. Performance status (Karnofsky or ECOG scale)

### *Possibly useful for future staging systems or research studies*

1. Panendoscopy (direct laryngoscopy, bronchoscopy, esophagoscopy)
2. Studies of immune competence

## RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** The assessment of the primary tumor is based upon inspection and palpation of the oral cavity and neck. Additional studies may include plain, tomographic, and contrast roentgenograms, particularly evaluating bone invasion of the mandible or upper alveoli. Examinations for distant metastases include chest film, blood chemistries, blood count, and other routine studies as indicated. The tumor must be confirmed histologically and any other pathologic data obtained on biopsy may be included.

**Postsurgical Resection-Pathologic Staging.** Complete resection of the primary site, radical nodal dissections, and pathologic examination of the resected specimens allow the use of this designation. Specimens that are resected after radiation or chemotherapy need to be especially noted.

**Surgical-Evaluative Staging.** Confirmation of the extent of disease is made by biopsy of suspected mucosal or submucosal spread, aspiration, or open biopsy of suspicious nodes. Biopsy of suspected distant metastasis is desirable but not required. This time period would be used infrequently.



**Retreatment Staging.** Utilization of available procedures noted above is required, particularly confirmation by biopsy, since previous treatment by surgery or irradiation leads to scarring and induration. A reevaluation for distant metastases is important, as are T and N classifications. This time period should be used after a disease-free interval and when further definitive treatment is planned.

**TNM Classification**

**Primary Tumor (T)**

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 Greatest diameter of primary tumor 2 cm or less
- T2 Greatest diameter of primary tumor more than 2 cm but not more than 4 cm
- T3 Greatest diameter of primary tumor more than 4 cm
- T4 Massive tumor more than 4 cm in diameter with deep invasion to involve antrum, pterygoid muscles, base of tongue, skin of neck

**Nodal Involvement (N)**

**Cervical Node Classification.** The following regional node classification is applicable to all squamous cell carcinoma of the upper aerodigestive tract. In clinical evaluation, the actual size of the nodal mass should be measured and allowance should be made for intervening soft tissues. It is recognized that most masses over 3 cm in diameter

- N3a Clinically positive homolateral node(s), one more than 6 cm in diameter
- N3b Bilateral clinically positive nodes (in this situation, each side of the neck should be staged separately; *i.e.*, N3b: right, N2a; left, N1)
- N3c Contralateral clinically positive node(s) only

**Distant Metastasis (M)**

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No evidence of distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

- Pulmonary PUL
- Osseous OSS
- Hepatic HEP
- Brain BRA
- Lymph nodes LYM
- Bone marrow MAR
- Pleura PLE
- Skin SKI
- Eye EYE
- Other OTH

**Postsurgical Treatment Residual Tumor (R)**

Does not enter into staging tumor but may be a factor in deciding management

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

**Grouping**

- T1, N0, M0
- T2, N0, M0
- T3, N0, M0
- T1, T2, T3; N1, M0
- T4, N0 or N1, M0
- Any T, N2 or N3, M0
- Any T, any N, M1

**Pathology**

Primary cancer is squamous cell carcinoma; histopathologic diagnosis is required to utilize this classification. Tumor grading is recommended using WHO classification. Other tumors of glandular, mesenchymal, odontogenic apparatus, lymphoid tissue, soft tissue, and bone and cartilage origin require special consideration and are not to be included. Reference to the WHO nomenclature is recommended. Although the grade of the tumor does not enter into staging of the tumor, it should be recorded.

- N2b Multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- N3 Massive homolateral node(s), bilateral nodes, or contralateral node(s)



**Tumor Grade (G)**

- G1 Well differentiated  
 G2 Moderately well differentiated  
 G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number)

**Performance Status of Host (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

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- Spiro RH, Strong EW: Epidermoid carcinoma of the mobile tongue. *Am J Surg* 122:707-713, 1971

**LIP AND ORAL CAVITY (ICD-O 140, 141, 143-145)**

**Data Form for Cancer Staging**

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

**Oncology Record**

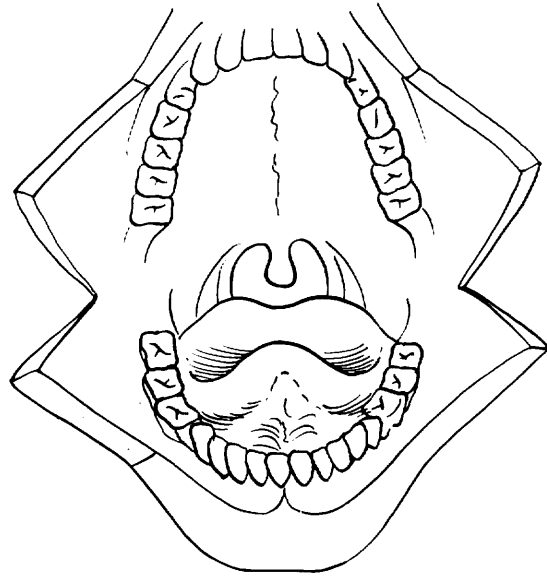
Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
 [ ] Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 [ ] Postsurgical resection-pathologic (pTNM)  
 [ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

**Definitions for All Time Periods**

**Primary Tumor (T)**

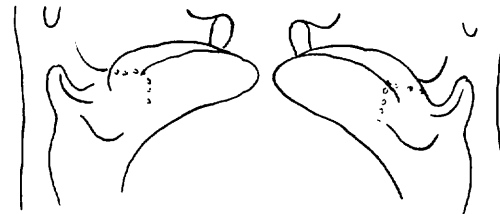
- [ ] TX Minimum requirements to assess the primary tumor cannot be met.
- [ ] T0 No evidence of primary tumor
- [ ] Tis Carcinoma *in situ*
- [ ] T1 Greatest diameter of primary tumor 2 cm or less
- [ ] T2 Greatest diameter of primary tumor more than 2 cm but not more than 4 cm
- [ ] T3 Greatest diameter of primary tumor more than 4 cm
- [ ] T4 Massive tumor more than 4 cm in diameter with deep invasion to involve antrum, pterygoid muscles, base of tongue, skin of neck



**Lymph Nodes (N)**

Same definitions to be used if postsurgical treatment-pathologic staging is used:

- [ ] NX Minimum requirements to assess the regional nodes cannot be met.
- [ ] N0 No clinically positive node
- [ ] N1 Single clinically positive homolateral node 3 cm or less in diameter
- [ ] N2 Single clinically positive homolateral node more than 3 but not more than 6 cm in diameter or multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- [ ] N2a Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter
- [ ] N2b Multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- [ ] N3 Massive homolateral node(s), bilateral nodes, or contralateral node(s)
- [ ] N3a Clinically positive homolateral node(s), one more than 6 cm in diameter
- [ ] N3b Bilateral clinically positive nodes (in this situation, each side of the neck should be staged separately; *i. e.*, N3b: right, N2a; left, N1)
- [ ] N3c Contralateral clinically positive node(s) only



Tumor size: \_\_\_\_\_ cm

**Location of Tumor**

- [ ] Lips: Upper  
Lower
- [ ] Buccal mucosa
- [ ] Floor of mouth
- [ ] Oral tongue
- [ ] Hard palate
- [ ] Gingivae: Upper  
Lower  
Retromolar trigone

**Distant Metastasis (M)**

- [ ] MX Minimum requirements to assess the presence of distant metastasis
- [ ] M0 No (known) distant metastasis
- [ ] M1 Distant metastasis present  
Specify \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\*Use a separate form each time a case is staged.  
 †See reverse side for additional information.

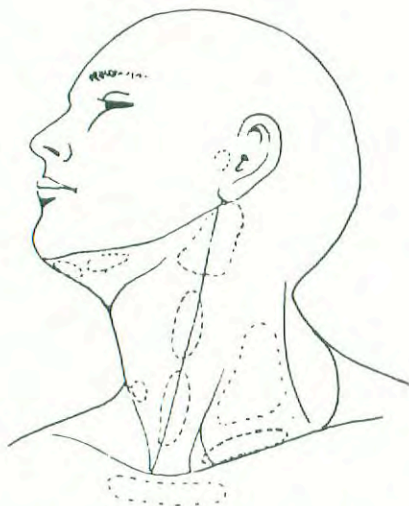


### Characteristics of Tumor

- Exophytic
- Superficial
- Moderately infiltrating
- Deeply infiltrating
- Ulcerated
- Extends to or overlies bone
- Gross erosion of bone
- Radiographic destruction of bone

### Involvement of Neighboring Regions

- Tonsillar pillar or soft palate
- Nasal cavity or antrum
- Nasopharynx
- Pterygoid muscles
- Soft tissues or skin of neck



Indicate on diagram primary tumor and regional nodes involved.

### Stage Grouping

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0
- Stage IV T1, T2, T3; N1, M0
- Stage IV T4, N0, N1; M0
- Stage IV Any T, N2, N3; M0
- Stage IV Any T, any N, M1

### Staging Procedures

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the oral cavity.

#### Essential for staging

1. Complete physical examination of the head and neck including indirect laryngoscopy and nasopharyngoscopy
2. Biopsy of primary tumor
3. Chest roentgenogram
4. Panorex films or other x-ray films for tumors overlying the jaws
5. Roentgenograms of paranasal sinuses for tumors overlying the palate

#### May be useful for staging or patient management

1. Multichemistry screen
2. Staining of surface mucosa with toluidine blue
3. Performance status (Karnofsky or ECOG scale)

#### May be useful for future staging systems or research studies

1. Panendoscopy (direct laryngoscopy, bronchoscopy, esophagoscopy)
2. Studies of immune competence

### Histologic Type of Cancer

Predominant cancer is squamous cell carcinoma.

### Histologic Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

### Postsurgical Resection-Pathologic Residual Tumor (R)

This does not enter into staging but may be a factor in deciding further treatment.

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

### Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent, as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## Pharynx

### **OROPHARYNX (ICD-O 146), NASOPHARYNX (ICD-O 147), and HYPOPHARYNX (ICD-O 148)**

#### **Anatomy**

**Primary Site.** The pharynx is divided into three regions: oropharynx, nasopharynx, and hypopharynx.

*Oropharynx.* The oropharynx extends from the plane of the hard palate superiorly to the plane of the hyoid bone inferiorly and is continuous with the oral cavity. The faucial arch includes both the surfaces of the entire soft palate and the uvula, the anterior border and base of the anterior tonsillar pillar, and the line of the circumvallate papillae. The base of the tongue extends from the line of the circumvallate papillae to the junction with the base of the epiglottis (the vallecula) and includes the pharyngoepiglottic and glossoepiglottic folds. The lateral wall of the oropharynx is comprised largely of the tonsil and tonsillar fossae. The posterior tonsillar pillar, the narrow lateral wall, and the posterior wall make up the pharyngeal wall.

*Nasopharynx.* The anterior limit of the nasopharynx is the choana, through which it is continuous with the nasal cavity. Its roof is attached to the base of the skull and slopes downward to become continuous with the posterior pharyngeal wall. The lateral wall is composed of the torus tubarius, the eustachian tube orifice, and that portion of the mucosa of the fossa of Rosenmueller extending up to its apex and junction with the roof. The inferior limit of the nasopharynx is level with the plane of the hard palate.

*Hypopharynx.* The hypopharynx extends from the plane of the hyoid bone superiorly to the plane of the lower border of the cricoid cartilage inferiorly. It is made up of three distinct regions: the piriform sinus, the posterior surface of the larynx (the posterocricoid area), and the lower posterior pharyngeal wall.

Each region is subdivided into sites that are summarized as follows:

#### **Oropharynx (146)**

1. Anterior wall (glosso-epiglottic area)—tongue posterior to the vallate papillae; base of tongue or posterior third (141.0)

2. Lateral wall
  - a. Tonsil (146.0)
  - b. Tonsillar fossa (146.1) and faucial pillars (146.2)
  - c. Glossotonsillar sulci
3. Posterior wall
4. Superior wall
  - a. Inferior surface of soft palate (146.3)
  - b. Uvula (146.4)

#### **Nasopharynx (147)**

1. Posterosuperior wall, extends from the level of the junction of the hard and soft palates to the base of the skull (147.0, 147.1).
2. Lateral wall, includes the fossa of Rosenmueller (147.2).
3. Inferior wall, consists of the superior surface of the soft palate (147.3).

*Note:* The margin of the choanal orifices including the posterior margin of the nasal septum is included with the nasal fossa.

#### **Hypopharynx (148)**

1. Pharyngo-esophageal junction (postcricoid area) extends from the level of the arytenoid cartilages and connecting folds to the inferior border of the cricoid cartilage (148.0).
2. Piriform sinus extends from the pharyngo-epiglottic fold to the upper end of the esophagus (148.1). It is bounded laterally by the thyroid cartilage and medially by the surface of the arytenoepiglottic fold (148.2) and the arytenoid and cricoid cartilages.
3. Posterior pharyngeal wall extends from the level of the floor of the vallecula to the level of the cricoarytenoid joints (148.3).

**Nodal Stations.** The main routes of drainage are into the first station nodes—jugulodigastric, jugulo-omohyoid, upper deep cervical, lower deep cervical, and submaxillary and submental lymph nodes. Some primary sites drain bilaterally. There are additional first station nodes that include retropharyngeal and parapharyngeal lymph nodes. Second station nodes include parotid nodes.

**Metastatic Sites.** Distant spread to lungs is common. Skeletal and other distant metastases occur less often. Mediastinal lymph node metastases are considered distant metastases.

#### **Staging Procedures**

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the pharynx:

#### *Essential for staging*

1. Complete physical examination of the head and neck, including indirect laryngoscopy and nasopharyngoscopy
2. Biopsy of primary tumor
3. Chest roentgenogram
4. Roentgenograms of skull (nasopharynx)
5. Direct examination of oropharynx and hypopharynx

#### *Possibly useful for staging or patient management*

1. Multichemistry screen
2. Soft tissue roentgenograms of neck; computed tomography (CT) scans
3. Barium swallow
4. Performance status (Karnofsky or ECOG scale)

#### *Possibly useful for future staging systems or research studies*

1. Panendoscopy (direct laryngoscopy, bronchoscopy, esophagoscopy)
2. Studies of immune competence
3. Assay of antibodies to Epstein-Barr viral capsid antigen (nasopharynx)

#### **Rules for Classification**

**Clinical-Diagnostic Staging.** The assessment of the pharynx is based primarily upon inspection by indirect mirror examination and direct endoscopy. Palpation of sites (when feasible) and neck nodes is essential. Neurologic evaluation of all cranial nerves is required. Additional studies include plain, tomographic, and contrast roentgenograms of the pharynx according to the site of interest. Examinations for distant metastases include chest film, blood chemistries, blood count, and other routine studies as indicated. The tumor must be confirmed histologically, and any other pathologic data obtained on biopsy may be included.

**Postsurgical Resection-Pathologic Staging.** Complete resection of primary sites and radical nodal dissections and pathologic examination of the resected specimen allow for the use of this designation. Specimens that are resected after radiation or chemotherapy need to be noted especially.

**Surgical-Evaluative Staging.** Confirmation of the extent of disease by biopsy of suspected mucosal or submucosal spread, aspirations or open biopsy of suspicious nodes, and biopsy of suspected distant metastases is desirable, but not required. This time period would be used infrequently.

**Retreatment Staging.** Utilization of available procedures noted above is required, particularly con-

firmation by biopsy, because previous treatment by surgery or irradiation leads to scarring and induration. A reevaluation for distant metastases is important, as well as T and N classifications. This time period should be used after a disease-free interval and when further definitive treatment is planned.

## TNM Classification

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.  
 T0 No evidence of primary tumor

### Oropharynx

- Tis Carcinoma *in situ*  
 T1 Tumor 2 cm or less in greatest diameter  
 T2 Tumor more than 2 cm but not more than 4 cm in greatest diameter  
 T3 Tumor more than 4 cm in greatest diameter  
 T4 Massive tumor more than 4 cm in diameter with invasion of bone, soft tissues of neck, or root (deep musculature) of tongue

### Nasopharynx

- Tis Carcinoma *in situ*  
 T1 Tumor confined to one site of nasopharynx or no tumor visible (positive biopsy only)  
 T2 Tumor involving two sites (both posterosuperior and lateral walls)  
 T3 Extension of tumor into nasal cavity or oropharynx  
 T4 Tumor invasion of skull, cranial nerve involvement, or both

### Hypopharynx

- Tis Carcinoma *in situ*  
 T1 Tumor confined to one site  
 T2 Extension of tumor to adjacent region or site without fixation of hemilarynx  
 T3 Extension of tumor to adjacent region or site with fixation of hemilarynx  
 T4 Massive tumor invading bone or soft tissues of neck

### Nodal Involvement (N)

**Cervical Node Classification.** The following regional node classification is applicable to all squamous cell carcinoma of the upper aerodigestive tract. In clinical evaluation, the actual size of the nodal mass should be measured and allowance should be made for intervening soft tissues. It is recognized that most masses over 3 cm in diameter are not single nodes but are confluent nodes or tumor in soft tissues of the neck.

There are three stages of clinically positive nodes: N1, N2, and N3. The use of subgroups a, b, and c is not required but is recommended. Midline nodes are considered homolateral nodes.

- NX Minimum requirements to assess the regional nodes cannot be met.  
 N0 No clinically positive node  
 N1 Single clinically positive homolateral node 3 cm or less in diameter  
 N2 Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter, or multiple clinically positive homolateral nodes, none more than 6 cm in diameter  
 N2a Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter  
 N2b Multiple clinically positive homolateral nodes, none more than 6 cm in diameter  
 N3 Massive homolateral node(s), bilateral nodes, or contralateral node(s)  
 N3a Clinically positive homolateral node(s), one more than 6 cm in diameter  
 N3b Bilateral clinically positive nodes (in this situation, each side of the neck should be staged separately; *i.e.*, N3b: right, N2a; left, N1)  
 N3c Contralateral clinically positive node(s) only

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.  
 M0 No evidence of metastasis  
 M1 Distant metastasis present  
 Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

### Postsurgical Treatment Residual Tumor (R)

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor  
 Specify \_\_\_\_\_

### Stage Grouping

Stage I T1, N0, M0



Stage II	T2, N0, M0
Stage III	T3, N0, M0 T1 or T2 or T3, N1, M0
Stage IV	T4, N0 or N1, M0 Any T, N2 or N3, M0 Any T, any N, M1

### Histopathology

The predominant cancer is squamous cell carcinoma; pathologic diagnosis is required to utilize this classification. Tumor grading is recommended using Broders' classification. Other tumors of glandular epithelium, odontogenic apparatus origin, lymphoid tissue, soft tissue, and bone and cartilage origin require special consideration and are not to be included. Reference to the WHO nomenclature is recommended.

### Tumor Grade (G)

G1	Well differentiated
G2	Moderately well differentiated
G3-G4	Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number).

### Performance Status of Host (H)

Performance status of the host should be recorded

because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
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H4	Bedridden; may need hospitalization	4	10-20

### BIBLIOGRAPHY

1. Barkley HT Jr, Fletcher GT, Jesse RH et al: Management of cervical lymph node metastases in squamous carcinoma of the tonsillar fossa, base of tongue, supraglottic larynx and hypopharynx. *Am J Surg* 124:462-467, 1972
2. Futrell JW, Bennett SH, Hoyer RC et al: Predicting survival in cancer of the larynx or hypopharynx. *Am J Surg* 122:451-457, 1971
3. Jesse RH, Sugarbaker EV: Squamous cell carcinoma of the oral pharynx: Why we fail. *Am J Surg* 132:435-439, 1976

**PHARYNX (ICD-O 146-148)**

**Data Form for Cancer Staging**

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

**Oncology Record**

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
 [ ] Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 [ ] Postsurgical resection-pathologic (pTNM)  
 [ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

**Definitions: TNM Classification**

**Primary Tumor (T)**

- [ ] TX Minimum requirements to assess the primary tumor cannot be met.
- [ ] T0 No evidence of primary tumor

**Oropharynx**

- [ ] Tis Carcinoma *in situ*
- [ ] T1 Tumor 2 cm or less in greatest diameter
- [ ] T2 Tumor more than 2 cm but not more than 4 cm in greatest diameter
- [ ] T3 Tumor more than 4 cm in greatest diameter
- [ ] T4 Massive tumor more than 4 cm in diameter with invasion of bone, soft tissues of neck, or root (deep musculature) of tongue

**Nasopharynx**

- [ ] Tis Carcinoma *in situ*
- [ ] T1 Tumor confined to one side of nasopharynx or no tumor visible (positive biopsy only)
- [ ] T2 Tumor involving two sites (both posterosuperior and lateral walls)
- [ ] T3 Extension of tumor into nasal cavity or oropharynx
- [ ] T4 Tumor invasion of skull, cranial nerve involvement, or both

**Hypopharynx**

- [ ] Tis Carcinoma *in situ*
- [ ] T1 Tumor confined to one site
- [ ] T2 Extension of tumor to adjacent region or site without fixation of hemilarynx
- [ ] T3 Extension of tumor to adjacent region or site with fixation of hemilarynx
- [ ] T4 Massive tumor invading bone or soft tissues of neck

**Nodal Involvement (N)**

- [ ] NX Minimum requirements to assess regional nodes cannot be met.
- [ ] N0 No clinically positive node
- [ ] N1 Single clinically positive homolateral node 3 cm or less in diameter
- [ ] N2 Single clinically positive homolateral node more than 3 but not more than 6 cm in diameter or multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- [ ] N2a Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter

- [ ] N2b Multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- [ ] N3 Massive homolateral node(s), bilateral nodes, or contralateral node(s).
- [ ] N3a Clinically positive homolateral node(s), one more than 6 cm in diameter
- [ ] N3b Bilateral clinically positive nodes (in this situation, each side of the neck should be staged separately; i.e., N3b: right, N2a; left, N1)
- [ ] N3c Contralateral clinically positive node(s) only

**Distant Metastasis (M)**

- [ ] MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- [ ] M0 No (known) distant metastasis
- [ ] M1 Distant metastasis present  
Specify \_\_\_\_\_

**Location of Tumor**

**Oropharynx**

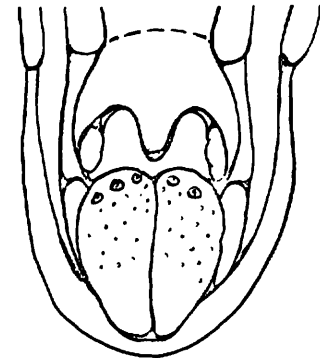
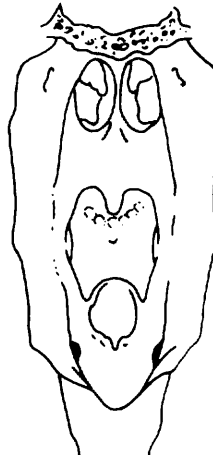
- [ ] Faucial arch
- [ ] Tonsillar fossa, tonsil
- [ ] Base of tongue
- [ ] Pharyngeal wall

**Nasopharynx**

- [ ] Posterosuperior wall
- [ ] Lateral wall

**Hypopharynx**

- [ ] Piriform fossa
- [ ] Postcricoid area
- [ ] Posterior wall



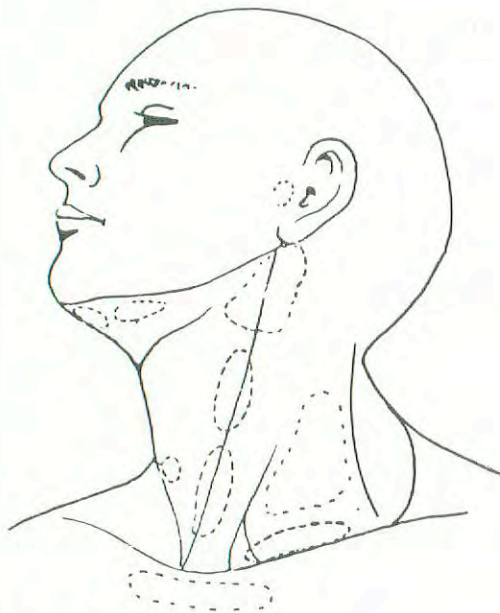
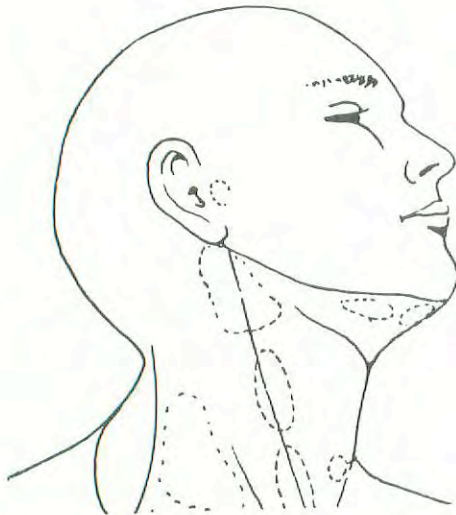
Size of primary tumor: \_\_\_\_\_ cm

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\*Use a separate form each time a case is staged.  
 †See reverse side for additional information.

### Characteristics of Tumor (check one)

- Superficial
- Exophytic
- Moderate infiltration
- Deep infiltration



Regional lymph nodes; illustrate if metastatic.

#### Stage Grouping

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0
- Stage IV T1, T2, T3; N1, M0
- Stage IV T4, N0, N1; M0
- Stage IV Any T, N2, N3; M0
- Stage IV Any T, any N, M1

### Staging Procedures

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the pharynx:

#### Essential for staging

1. Complete physical examination of the head and neck, including indirect laryngoscopy and nasopharyngoscopy
2. Biopsy of primary tumor
3. Chest roentgenogram
4. Roentgenograms of skull (nasopharynx)
5. Direct examination of oropharynx and hypopharynx

#### May be useful for staging or patient management

1. Multichemistry screen
2. Soft tissue roentgenograms of neck; CT scans
3. Barium swallow
4. Performance status (Karnofsky or ECOG scale)

#### May be useful for future staging systems or research studies

1. Panendoscopy (direct laryngoscopy, bronchoscopy, esophagoscopy)
2. Studies of immune competence
3. Assay of antibodies to Epstein-Barr viral capsid antigen (nasopharynx)

### Histologic Type of Cancer

Predominant cancer is squamous cell carcinoma.

### Histologic Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

### Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into staging but may be a factor in deciding further treatment

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

### Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
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<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## Larynx

### ANATOMY (ICD-O 161)

**Primary Site.** The following anatomic definition of larynx allows classification of carcinomas arising in the encompassed mucous membranes but excludes cancers arising on the lateral or posterior pharyngeal wall, piriform fossa, postcricoid area, and the vallecula or base of tongue.

The anterior limit of the larynx is composed of the anterior or lingual surface of the suprahyoid epiglottis, the thyrohyoid membrane, the anterior commissure, and the anterior wall of the subglottic region, which is composed of the thyroid cartilage, the cricothyroid membrane, and the anterior arch of the cricoid cartilage.

The posterior and lateral limits include the arytenoepiglottic folds, the arytenoid region, the interarytenoid space, and the posterior surface of the subglottic space, represented by the mucous membrane covering the cricoid cartilage.

The superolateral limits are composed of the tip and the lateral borders of the epiglottis.

The inferior limits are made up of the plane passing through the inferior edge of the cricoid cartilage.

For purposes of this clinical-stage classification, the larynx is divided into three regions: supraglottis, glottis, and subglottis. The *supraglottis* is composed of the epiglottis (both its lingual and laryngeal aspects), arytenoepiglottic folds, arytenoids, and ventricular bands (false cords). The inferior boundary of the supraglottis is a horizontal plane passing through the apex of the ventricle. The *glottis* is composed of the true vocal cords, including the anterior and posterior commissures. The lower boundary is the horizontal plane 1 cm below the apex of the ventricle. The *subglottis* is the region extending from the lower boundary of the glottis to the lower margin of the cricoid cartilage.

The division of the larynx is summarized in the following table:

REGION	SITE
Supraglottis	Ventricular bands (false cords) Arytenoids Epiglottis (both lingual and laryngeal aspects) Suprahoid epiglottis Infrahyoid epiglottis Arytenoepiglottic folds
Glottis	True vocal cords including anterior and posterior commissures
Subglottis	Subglottis

**Nodal Stations.** The first station nodes include jugulodigastric, jugulo-omohyoid, paratracheal, and deep cervical nodes.

**Metastatic Sites.** Distant spread to lungs is common. Skeletal and other distant metastases occur less often. Mediastinal lymph node metastases are considered distant metastases.

## STAGING PROCEDURES

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the larynx:

### *Essential for staging*

1. Complete physical examination of the head and neck, including indirect laryngoscopy and nasopharyngoscopy
2. Direct laryngoscopy and biopsy of primary tumor
3. Chest x-ray film

### *Possibly useful for staging or patient management*

1. Multichemistry screen
2. Laryngeal tomograms
3. Soft-tissue films of the neck, CT scans
4. Performance status (Karnofsky or ECOG scale)

### *Possibly useful for future staging systems or research studies*

1. Bronchoscopy, esophagoscopy
2. Studies of immune competence

## RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** The assessment of the larynx is accomplished primarily by inspection using indirect mirror examination and direct laryngoscopy. Additional studies include plain films of soft tissue, tomograms, contrast roentgenograms (*e.g.*, laryngograms), and barium studies of the pharynx according to suspected extension and spread. Nodal stations are

examined by careful palpation. Examinations for distant metastases include chest film, blood chemistries, blood count, and other routine studies as indicated.

**Surgical-Evaluative Staging.** Confirmation of the extent of disease by biopsy of suspected mucosal or submucosal spread, aspirations or open biopsy of suspicious nodes, and biopsy of suspected distant metastases is desirable but not required.

**Postsurgical Resection-Pathologic Staging.** Complete resection of primary sites and radical nodal dissections allow the use of this designation. Specimens that are resected after radiation or chemotherapy need to be noted especially.

**Retreatment Staging.** Utilization of available procedures noted above is required, particularly confirmation by biopsy, because previous treatment by surgery or irradiation leads to scarring and induration. A reevaluation for distant metastases is important, as well as T and N classifications.

## TNM CLASSIFICATION

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.  
T0 No evidence of primary tumor

#### *Supraglottis*

- Tis Carcinoma *in situ*  
T1 Tumor confined to region of origin with normal mobility  
T2 Tumor involving adjacent supraglottic site(s) or glottis without fixation  
T3 Tumor limited to larynx with fixation or extension to involve postcricoid area, medial wall of piriform sinus, or preepiglottic space  
T4 Massive tumor extending beyond the larynx to involve oropharynx, soft tissues of neck, or destruction of thyroid cartilage

#### *Glottis*

- Tis Carcinoma *in situ*  
T1 Tumor confined to vocal cord(s) with normal mobility (includes involvement of anterior or posterior commissures)  
T2 Supraglottic or subglottic extension of tumor with normal or impaired cord mobility, or both  
T3 Tumor confined to the larynx with cord fixation  
T4 Massive tumor with thyroid cartilage destruction or extension beyond the confines of the larynx, or both



**Subglottis**

- Tis Carcinoma *in situ*
- T1 Tumor confined to the subglottic region
- T2 Tumor extension to vocal cords with normal or impaired cord mobility
- T3 Tumor confined to larynx with cord fixation
- T4 Massive tumor with cartilage destruction or extension beyond the confines of the larynx, or both

**Nodal Involvement (N)**

**Cervical Node Classification.** The following regional node classification is applicable to all squamous cell carcinoma of the upper aerodigestive tract. In clinical evaluation, the actual size of the nodal mass should be measured and allowance should be made for intervening soft tissues. It is recognized that most masses over 3 cm in diameter are not single nodes but are confluent nodes or tumor in soft tissues of the neck. There are three stages of clinically positive nodes: N1, N2, and N3. The use of subgroups a, b, and c is not required, but is recommended. Midline nodes are considered homolateral nodes.

- NX Minimum requirements to assess the regional node cannot be met.
- N0 No clinically positive node
- N1 Single clinically positive homolateral node 3 cm or less in diameter
- N2 Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter or multiple clinically positive homolateral nodes, none more than 6 cm in diameter
  - N2a Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter
  - N2b Multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- N3 Massive homolateral node(s), bilateral nodes, or contralateral node(s)
  - N3a Clinically positive homolateral node(s), one more than 6 cm in diameter
  - N3b Bilateral clinically positive nodes (in this situation, each side of the neck should be staged separately; *i.e.*, N3b: right, N2a; left, N1)
  - N3c Contralateral clinically positive node(s) only

**Distant Metastasis (M)**

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Ossaceous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

**STAGE GROUPING**

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0  
T1 or T2 or T3, N1, M0
- Stage IV T4, N0 or N1, M0  
Any T, N2 or N3, M0  
Any T, any N, M1

**HISTOPATHOLOGY**

The predominant cancer is squamous cell carcinoma; pathologic diagnosis is required to utilize this classification. Tumor grading is recommended using Broders' classification. Other tumors of glandular epithelium, odontogenic apparatus origin, lymphoid tissue, soft tissue, and bone and cartilage origin require special consideration and are not to be included. Reference to the WHO nomenclature is recommended.

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number)

**POSTSURGICAL TREATMENT  
RESIDUAL TUMOR (R)**

This does not enter into staging of the tumor but may be a factor in deciding management.

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

### DATA FORM

The data form for staging of cancer of the larynx, in addition to permitting recording of the extent of the cancer, also indicates the examinations necessary for staging and what examinations and data are necessary for each time period of staging.

### BIBLIOGRAPHY

1. Flynn MB, Jesse RH, Lindberg RT: Surgery and irradiation in the treatment of squamous cell cancer of the supraglottic larynx. *Am J Surg* 124:477-481, 1972
2. Futrell JW, Bennett SH, Hoyer RC et al: Predicting survival in cancer of the larynx or hypopharynx. *Am J Surg* 122:451-457, 1971
3. Harris HS, Watson FR, Spratt JS Jr: Carcinoma of the larynx. *Am J Surg* 118:676-684, 1969
4. Powell RW, Redd BL, Wilkins SA: An evaluation of treatment of cancer of the larynx. *Am J Surg* 110:635-643, 1965
5. Shah JP, Tollefsen HR: Epidermoid carcinoma of the supraglottic larynx: Role of neck dissection in initial surgical treatment. *Am J Surg* 128:494-499, 1974
6. Wang CC, Schultz MD, Miller D: Combined radiation therapy and surgery for carcinoma of the supraglottis and pyriform sinus. *Am J Surg* 124:551-544, 1972

**Data Form for Cancer Staging**

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

**Oncology Record**

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
 [ ] Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 [ ] Postsurgical resection-pathologic (pTNM)  
 [ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

**Definitions: TNM Classification**

**Primary Tumor (T)**

- [ ] TX Minimum requirements to assess the primary tumor cannot be met.
- [ ] T0 No evidence of primary tumor

**Supraglottis**

- [ ] Tis Carcinoma *in situ*
- [ ] T1 Tumor confined to site of origin with normal mobility
- [ ] T2 Tumor involves adjacent supraglottic site(s) or glottis without fixation
- [ ] T3 Tumor limited to larynx with fixation or extension to involve postcricoid area, medial wall of piriform sinus, or preepiglottic space
- [ ] T4 Massive tumor extending beyond the larynx to involve oropharynx, soft tissues of neck, or destruction of thyroid cartilage

**Glottis**

- [ ] Tis Carcinoma *in situ*
- [ ] T1 Tumor confined to vocal cord(s) with normal mobility (including involvement of anterior or posterior commissures)
- [ ] T2 Supraglottic or subglottic extension of tumor with normal or impaired cord mobility
- [ ] T3 Tumor confined to the larynx with cord fixation
- [ ] T4 Massive tumor with thyroid cartilage destruction or extension beyond the confines of the larynx, or both

**Subglottis**

- [ ] Tis Carcinoma *in situ*
- [ ] T1 Tumor confined to the subglottic region
- [ ] T2 Tumor extension to vocal cords with normal or impaired cord mobility
- [ ] T3 Tumor confined to larynx with cord fixation
- [ ] T4 Massive tumor with cartilage destruction or extension beyond the confines of the larynx, or both

**Nodal Involvement (N)**

- [ ] NX Minimum requirements to assess the regional nodes cannot be met.
- [ ] N0 No clinically positive nodes
- [ ] N1 Single clinically positive homolateral node 3 cm or less in diameter
- [ ] N2 Single clinically positive homolateral node more than 3 but not more than 6 cm in diameter or multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- [ ] N2a Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter

- [ ] N2b Multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- [ ] N3 Massive homolateral node(s), bilateral nodes, or contralateral node(s)
- [ ] N3a Clinically positive homolateral node(s), one more than 6 cm in diameter
- [ ] N3b Bilateral clinically positive nodes (in this situation, each side of the neck should be staged separately; i.e., N3b: right, N2a: left, N1)
- [ ] N3c Contralateral clinically positive node(s) only

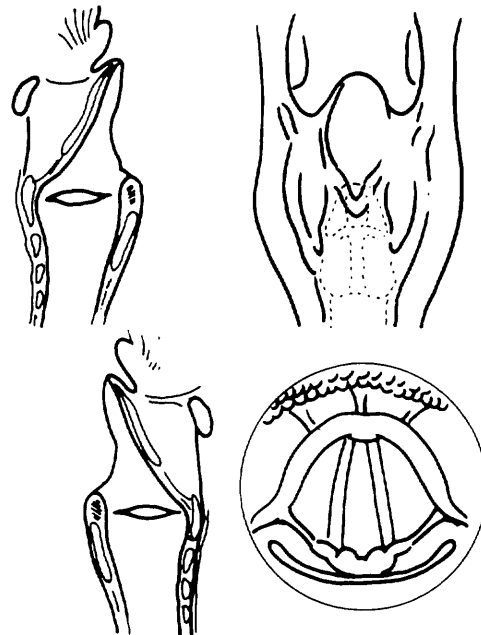
**Distant Metastasis (M)**

- [ ] MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- [ ] M0 No (known) distant metastasis
- [ ] M1 Distant metastasis present  
Specify \_\_\_\_\_

**Location of Tumor**

**Supraglottis**

- [ ] Ventricular band [ ] Infrahyoid epiglottis
- [ ] Arytenoid [ ] Arytenoepiglottic fold
- [ ] Suprahoid epiglottis



Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\* Use a separate form each time a case is staged.  
 † See reverse side for additional information.

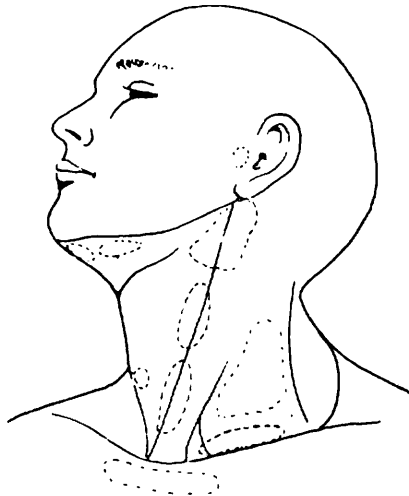
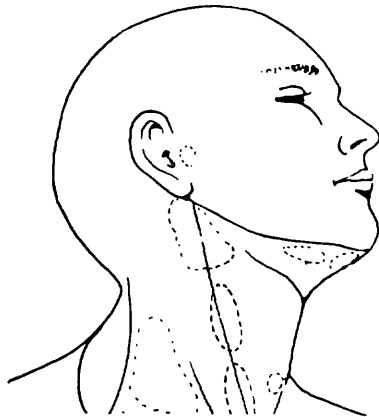
**Glottis**

Vocal cords (including commissures)

**Subglottis**

**Characteristics of Tumor**

- |   |  |
|---|--|
| <input type="checkbox"/> Superficial              | <input type="checkbox"/> Tumor extension to the      |
| <input type="checkbox"/> Exophytic                | following:   |
| <input type="checkbox"/> Moderate infiltration    | <input type="checkbox"/> Base of tongue              |
| <input type="checkbox"/> Deep infiltration        | <input type="checkbox"/> Piriform sinus              |
| <input type="checkbox"/> Impaired cord mobility   | <input type="checkbox"/> Postcricoid region          |
| <input type="checkbox"/> Cord fixation            | <input type="checkbox"/> Preepiglottic space         |
| <input type="checkbox"/> Cartilage destruction    | <input type="checkbox"/> Trachea                     |
| <input type="checkbox"/> Tumor confined to larynx | <input type="checkbox"/> Soft tissue or skin of neck |



Indicate on diagram primary tumor and regional nodes involved.

**Stage Grouping**

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0
- Stage IV T1, T2, T3, N1, M0
- Stage IV T4, N0, N1, M0
- Stage IV Any T, N2, N3, M0
- Stage IV Any T, any N, M1

**Staging Procedures**

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the larynx:

*Essential for staging*

1. Complete physical examination of the head and neck including indirect laryngoscopy and nasopharyngoscopy
2. Biopsy of primary tumor
3. Chest roentgenogram
4. Roentgenograms of skull (nasopharynx)
5. Direct examination of hypopharynx

*May be useful for staging or patient management*

1. Multichemistry screen
2. Soft-tissue roentgenograms of neck, CT scans
3. Barium swallow
4. Performance status (Karnofsky or ECOG scale)

*May be useful for future staging systems or research studies*

1. Panendoscopy (direct laryngoscopy, bronchoscopy, esophagoscopy)
2. Studies of immune competence
3. Assay of antibodies to Epstein-Barr viral capsid antigen (nasopharynx)

**Histologic Type of Cancer**

The predominant cancer is squamous cell carcinoma.

**Histologic Grade**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

**Postsurgical Resection-Pathologic Residual Tumor (R)**

Does not enter into the staging but may be a factor in deciding further treatment

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

**Performance Status of Host (H)**

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## Paranasal Sinuses

### ANATOMY (ICD-O 160.9)

**Primary Site.** Cancer of the maxillary sinus is the most common of the paranasal sinus cancers; it is the only site to which the following classification applies. The ethmoid sinuses and nasal cavity may ultimately be defined similarly with further study. Tumors of the sphenoid and frontal sinuses are so rare as not to warrant staging.

Ohngren's line, a theoretic plane joining the medial canthus of the eye with the angle of the mandible, may be used to divide the maxillary antrum into the anteroinferior portion (the infrastructure) and the superoposterior portion (the suprastructure).

**Nodal Stations.** The major lymphatic drainage of the maxillary antrum is through the lateral and inferior collecting trunks to first station submaxillary, parotid, and jugulodigastric nodes and through the superoposterior trunk to retropharyngeal and deep cervical nodes.

**Metastatic Sites.** Distant spread to lungs is most common; occasionally there is spread to bone and remote lymph nodes.

### STAGING PROCEDURES

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the paranasal sinuses:

#### *Essential for staging*

1. Complete physical examination of the head and neck including indirect laryngoscopy and nasopharyngoscopy
2. Biopsy of the primary tumor (antrotomy if necessary)
3. Chest roentgenogram
4. Roentgenograms of paranasal sinuses

#### *Possibly useful for staging or patient management*

1. Multichemistry screen
2. Roentgenograms of base of skull, CT scans
3. Performance status (Karnofsky or ECOG scale)



*Possibly useful for future staging systems or research studies*

1. Panendoscopy (direct laryngoscopy, bronchoscopy, esophagoscopy)
2. Studies of immune competence

## RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** The assessment of primary maxillary antrum tumors is based upon inspection, palpation, including examination of the orbit, nasal and oral cavities, and nasopharynx, and neurologic evaluation of the cranial nerves. Radiographic studies include plain films and tomograms for evaluation of bone destruction. Neck nodes are assessed by palpation. Examinations for distant metastases include chest film, blood chemistries, blood count, and other routine studies as indicated.

**Surgical-Evaluative Staging.** Confirmation of the extent of disease by biopsy of suspected mucosal or submucosal spread, aspirations or open biopsy of suspicious nodes, and biopsy of suspected distant metastases is desirable but not required.

**Postsurgical Resection-Pathologic Staging.** Complete resection of primary sites and radical nodal dissections allow the use of this designation. Specimens that are resected after radiation or chemotherapy need to be noted especially.

**Retreatment Staging.** Utilization of available procedures noted above is required, particularly confirmation by biopsy, because previous treatment by surgery or irradiation leads to scarring and induration. A reevaluation for distant metastases is important, as well as T and N classifications.

## TNM CLASSIFICATION

### Primary Tumor (T)

- TX** Minimum requirements to assess the primary tumor cannot be met.
- T0** No evidence of primary tumor
- T1** Tumor confined to the antral mucosa of the infrastructure with no bone erosion or destruction
- T2** Tumor confined to the suprastructure mucosa without bone destruction or to the infrastructure, with destruction of medial or inferior bony walls only
- T3** More extensive tumor invading skin of cheek, orbit, anterior ethmoid sinuses, or pterygoid muscle
- T4** Massive tumor with invasion of cribriform plate, posterior ethmoids, sphenoid, nasopharynx, pterygoid plates, or base of skull

## Nodal Involvement (N)

**Cervical Node Classification.** The following regional node classification is applicable to all squamous cell carcinoma of the upper aerodigestive tract. In clinical evaluation, the actual size of the nodal mass should be measured and allowance should be made for intervening soft tissues. It is recognized that most masses over 3 cm in diameter are not single nodes but are confluent nodes or tumor in soft tissues of the neck. There are three stages of clinically positive nodes: N1, N2, and N3. The use of subgroups a, b, and c is not required but is recommended. Midline nodes are considered homolateral nodes.

- NX** Minimum requirements to assess the regional nodes cannot be met.
- N0** No clinically positive node
- N1** Single clinically positive homolateral node 3 cm or less in diameter
- N2** Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter or multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- N2a** Single clinically positive homolateral node, more than 3 cm but not more than 6 cm in diameter
- N2b** Multiple clinically positive homolateral nodes none more than 6 cm in diameter
- N3** Massive homolateral node(s), bilateral nodes, or contralateral node(s)
- N3a** Clinically positive homolateral node(s), one more than 6 cm in diameter
- N3b** Bilateral clinically positive nodes (in this situation, each side of the neck should be staged separately; *i.e.*, N3b: right, N2a; left, N1)
- N3c** Contralateral clinically positive node(s) only

## Distant Metastasis (M)

- MX** Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0** No evidence of distant metastasis
- M1** Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

## POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

R0 No residual tumor

R1 Microscopic residual tumor

R2 Macroscopic residual tumor

Specify \_\_\_\_\_

## STAGE GROUPING

Stage I T1, N0, M0

Stage II T2, N0, M0

Stage III T3, N0, M0

T1, T2, T3; N1, M0

Stage IV T4, N0 or N1, M0

Any T, N2 or N3, M0

Any T, any N, M1

## HISTOPATHOLOGY

The predominant cancer is squamous cell carcinoma; pathologic diagnosis is required to utilize this classification. Tumor grading is recommended using Broders' classification. Other tumors of glandular epithelium, odontogenic apparatus, lymphoid tissue, soft tissue, and bone and cartilage origin require special consideration and are not to be included. Reference to the WHO nomenclature is recommended.

## Tumor Grade (G)

G1 Well differentiated

G2 Moderately well differentiated

G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number)

## Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

## DATA FORM

The data form for staging of cancer of the paranasal sinuses, in addition to permitting recording of the extent of the cancer, also indicates the examinations necessary for staging and what examinations and data are necessary for each time period of staging.

## BIBLIOGRAPHY

1. Goepfert H, Jesse RH, Lindberg RD: Arterial infusion and radiation therapy in the treatment of advanced cancer of the nasal cavity and perinasal sinuses. *Am J Surg* 126:464-468, 1973
2. Jesse RH: Preoperative versus postoperative radiation in the treatment of squamous carcinoma of the perinasal sinuses. *Am J Surg* 110:552-556, 1965
3. Sisson GA, Johnson NE, Ammiri CS: Cancer of the maxillary sinus: Clinical classification and management. *Ann Otol Rhinol Laryngol* 72:1050-1059, 1963

# PARANASAL SINUSES (ICD-O 160.9)

## Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

### Definitions: TNM Classification

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 Tumor confined to the antral mucosa of the infrastructure with no bone erosion or destruction
- T2 Tumor confined to the suprastructure mucosa without bone destruction, or to the infrastructure with destruction of medial or inferior bony walls only
- T3 More extensive tumor invading skin of cheek, orbit, anterior ethmoid sinuses, or pterygoid muscle
- T4 Massive tumor with invasion of cribriform plate, posterior ethmoids, sphenoid, nasopharynx, pterygoid plates, or base of skull

#### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No clinically positive nodes
- N1 Single clinically positive homolateral node 3 cm or less in diameter
- N2 Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter or multiple clinically positive homolateral nodes, none more than 6 cm in diameter
  - N2a Single clinically positive homolateral node more than 3 cm but not more than 6 cm in diameter
  - N2b Multiple clinically positive homolateral nodes, none more than 6 cm in diameter
- N3 Massive homolateral node(s), bilateral nodes, or contralateral node(s)
  - N3a Clinically positive homolateral node(s), one more than 6 cm in diameter
  - N3b Bilateral clinically positive nodes (in this situation, each side of the neck should be staged separately; i.e., N3b: right, N2a: left, N1)
  - N3c Contralateral clinically positive node(s) only

#### Distant Metastasis (M)

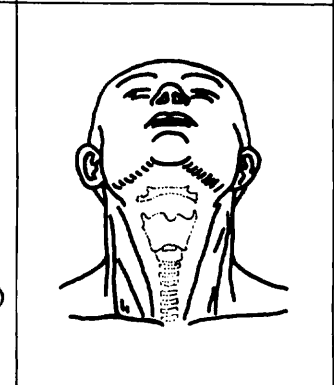
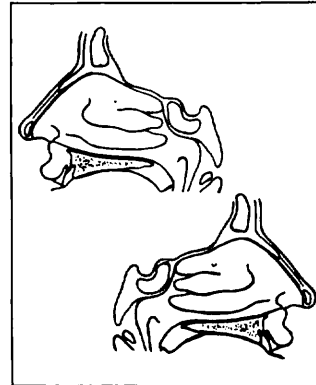
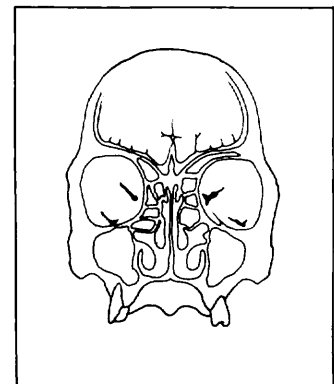
- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

### Site-Specific Information

Status before treatment anywhere is noted here.

#### Location of Tumor

- Antrum
- Infrastructure
- Suprastructure
- Both
- Nasal Cavity
- Septum
- Roof
- Lateral wall
- Floor
- Ethmoid
- Anterior
- Posterior
- Sphenoid
- Frontal



Indicate on diagram primary tumor and regional nodes involved.

#### Characteristics of Tumor

- Radiographic destruction of bone
- Invasion of adjacent areas
  - Skin  Orbit
  - Palate  Base of skull
  - Nasopharynx  Pterygoid muscles
  - Cribriform plate  Pterygoid bone

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\*Use a separate form each time a case is staged.  
 †See reverse side for additional information.



### Stage Grouping

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0  
T1, T2, T3, N1, M0
- Stage IV T4, N0, N1, M0  
Any T, N2, N3, M0  
Any T, any N, M1

### Staging Procedures

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the pharynx.

#### Essential for staging

1. Complete physical examination of the head and neck including indirect laryngoscopy and nasopharyngoscopy
2. Biopsy of primary tumor
3. Chest roentgenogram
4. Roentgenograms of skull (nasopharynx)
5. Direct examination of hypopharynx

#### May be useful for staging or patient management

1. Multichemistry screen
2. Soft-tissue roentgenograms of neck; CT scans
3. Barium swallow
4. Performance status (Karnofsky or ECOG scale)

#### May be useful for future staging systems or research studies

1. Panendoscopy (direct laryngoscopy, bronchoscopy, esophagoscopy)
2. Studies of immune competence
3. Assay of antibodies to Epstein-Barr viral capsid antigen (nasopharynx)

### Histologic Type of Cancer

Predominant cancer is squamous cell or undifferentiated carcinoma. Adenocarcinoma and other cellular types also occur.

### Histologic Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

### Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into the staging but may be a factor in deciding further treatment.

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

### Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## Salivary Glands

This staging system is based on an extensive retrospective study of malignant tumors of the major salivary glands collected from eleven participating U.S. and Canadian institutions. Computer analysis of the data revealed that numerous factors affected patient survival, including the histologic diagnosis, cellular differentiation of the tumor, its site, size, degree of fixation, or local extension and nerve involvement. The status of regional lymph nodes and of distant metastases were also of major significance. The classification here proposed involves only four clinical variables: tumor size, local extension of the tumor, the palpability and suspicion of nodes, and the presence or absence of distant metastasis. It offers a simple but effective and accurate method of evaluating the stage of salivary gland cancer.

### **ANATOMY (ICD-O 142)**

**Primary Site.** The major salivary glands include the parotid, submaxillary, and sublingual glands. Tumors arising in minor salivary glands (mucus-secreting glands in the lining membrane of the upper aerodigestive tract) are not included in this staging system.

**Nodal Stations.** The first station nodes are immediately adjacent to the salivary glands and include parotid, submaxillary, and submental lymph nodes. The first station also includes the deep cervical lymph nodes.

### **STAGING PROCEDURES**

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the salivary glands:

#### *Essential for staging*

1. Complete physical examination of the head and neck
2. Pathologic study of surgically removed specimen
3. Known residual tumor if present after resection of tumor
4. Chest roentgenogram



*Possibly useful for staging or patient management*

1. Multichemistry screen
2. Parotid or submaxillary sialogram
3. Roentgenograms of mandible and CT scans
4. Radioactive technetium scan
5. Performance status (Karnofsky or ECOG scale)

*Possibly useful for future staging systems or research studies*

Studies of immune competence

## RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** The assessment of primary tumor includes inspection and palpation and neurologic evaluation of the seventh cranial or other nerves. Radiologic studies may include films of the mandible and possibly sialograms.

**Surgical-Evaluative Staging.** This should be based on all clinical data including that obtained on surgical exploration of the salivary gland and the nodal areas but not the pathologic data obtained on the resected specimen if a definitive resection of the cancer is carried out.

**Postsurgical Resection-Pathologic Staging.** The surgical pathology report and all other available data should be used to assign a pathologic classification to those patients who have a resection of the cancer.

**Retreatment Staging.** After a cancer has once been treated definitively with a disease-free interval and recurs, the recurrence can be reclassified using all available information; the patient should again be staged using procedures noted for clinical-diagnostic and surgical-evaluative classifications.

## TNM CLASSIFICATION

### Primary Tumor (T)

- TX** Minimum requirements to assess the primary tumor cannot be met.
- T0** No evidence of primary tumor
- T1** Tumor 2.0 cm or less in greatest diameter without significant local extension\*
- T2** Tumor more than 2.0 cm but not more than 4.0 cm in greatest diameter without significant local extension
- T3** Tumor more than 4.0 cm but not more than 6.0 cm in greatest diameter without significant local extension
- T4a** Tumor over 6.0 cm in greatest diameter without significant local extension
- T4b** Tumor of any size with significant local extension\*

\*Significant local extension is defined as evidence of tumor involvement of skin, soft tissues, bone, or the lingual or facial nerves.

### Nodal Involvement (N)

- NX** Minimum requirements to assess the regional nodes cannot be met.
- N0** No evidence of regional lymph node involvement
- N1** Evidence of regional lymph node involvement

### Distant Metastasis (M)

- MX** Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0** No (known) distant metastasis
- M1** Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

## POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0** No residual tumor
- R1** Microscopic residual tumor
- R2** Macroscopic residual tumor  
Specify \_\_\_\_\_

## STAGE GROUPING

- Stage I** T1, N0, M0  
T2, N0, M0
- Stage II** T3, N0, M0
- Stage III** T1, T2; N1, M0  
T4a, T4b; N0, M0
- Stage IV** T3, N1, M0  
T4a, T4b; N1, M0  
Any T, any N, M1

## HISTOPATHOLOGY

The histologic classification recommended is a modification of the WHO classification of salivary gland tumors. The major malignant varieties include the following:

- Acinic cell carcinoma
- Adenoid cystic carcinoma (cylindroma)
- Adenocarcinoma
- Squamous cell carcinoma
- Carcinoma in pleomorphic adenoma (malignant mixed tumor)

- Mucoepidermoid carcinoma
  - Well differentiated (low grade)
  - Poorly differentiated (high grade)
- Other

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number)

**DATA FORM**

The data form for staging of cancer of the salivary glands, in addition to permitting recording of the extent of the cancer, also indicates the examinations necessary for staging and what examinations and data are necessary for each time period of staging.

**Data Form for Cancer Staging**

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

**Oncology Record**

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
    Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)    Autopsy (aTNM)

**Definitions: TNM Classification**

**Primary Tumor (T)**

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 Tumor 2 cm or less in greatest diameter without significant local extension
- T2 Tumor more than 2 cm but not more than 4 cm in greatest diameter without significant local extension
- T3 Tumor more than 4 cm but not more than 6 cm in greatest diameter without significant local extension
- T4a Tumor more than 6 cm in greatest diameter without significant local extension
- T4b Any size tumor with significant local extension

*Note:* Significant local extension is defined as evidence of tumor involvement of skin, soft tissues, bone, or the lingual or facial nerves.

**Nodal Involvement (N)**

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of regional lymph node involvement

**Distant Metastasis (M)**

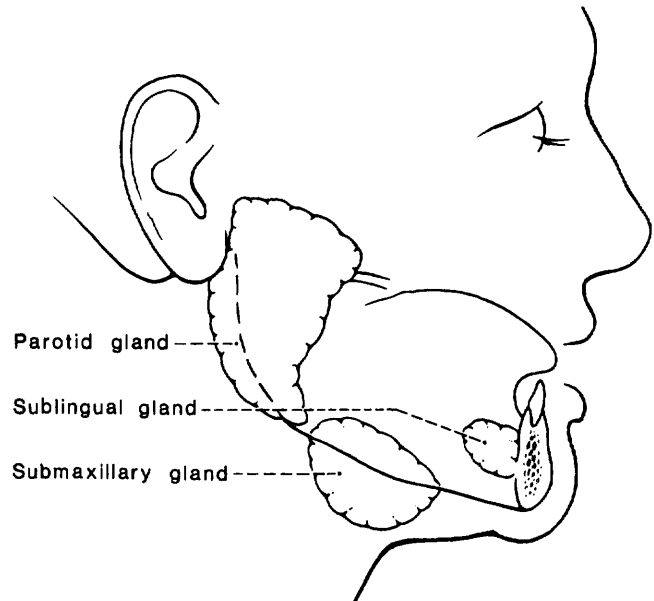
- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) metastasis
- M1 Distant metastasis present  
 Specify \_\_\_\_\_

**Site-Specific Information—Salivary Glands; Location of Tumor**

- Parotid
- Submaxillary
- Sublingual
- Side
- Right
- Left
- Bilateral

**Size of Tumor**

Largest diameter \_\_\_\_\_ cm



Indicate on diagram primary tumor and regional nodes involved.

**Characteristics of Tumor**

- Mobile
- Limited mobility
- Fixed
- Hard
- Soft
- Cystic
- Adjacent tissues involved. No. \_\_\_\_\_  
 Specify \_\_\_\_\_

**Nerve involvement**

- None
- Facial
- Hypoglossal
- Lingual
- Vagus
- Other \_\_\_\_\_
- Partial paralysis
- Complete paralysis

\*Use a separate form each time a case is staged.  
 †See reverse side for additional information.

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

### Stage Grouping

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0
- Stage IV T1, T2, T3, N1, M0
- Stage IV T4, N0, N1, M0
- Any T, N2, N3, M0
- Any T, any N, M1

### Staging Procedures

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the salivary glands:

#### Essential for staging

1. Complete physical examination of the head and neck including indirect laryngoscopy and nasopharyngoscopy
2. Biopsy of primary tumor
3. Chest roentgenogram
4. Roentgenograms of skull (nasopharynx)
5. Direct examination of hypopharynx

#### May be useful for staging or patient management

1. Multichemistry screen
2. Soft-tissue roentgenograms of neck; CT scans
3. Barium swallow
4. Performance status (Karnofsky or ECOG scale)

#### May be useful for future staging systems or research studies

1. Panendoscopy (direct laryngoscopy, bronchoscopy, esophagoscopy)
2. Studies of immune competence
3. Assay of antibodies to Epstein-Barr viral capsid antigen (nasopharynx)

### Histologic Type of Cancer

- Mucoepidermoid carcinoma
- Adenoid cystic carcinoma
- Squamous cell carcinoma
- Acinic cell carcinoma
- Malignant mixed tumor

### Histologic Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

### Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into staging but may be a factor in deciding further treatment

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

### Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## Thyroid Gland

The following staging system for cancer of the thyroid gland was developed after an analysis of more than 1000 case protocols. Although staging for cancers in other head and neck sites is based entirely on the anatomic extent of disease, it is not possible to follow this pattern for the unique group of malignant tumors that arise in the thyroid. Both the histologic diagnosis and the age of the patient are of such importance in the behavior and prognosis of thyroid cancer that these factors have to be accounted for in any staging system.

### **ANATOMY (ICD-O 193)**

**Primary site.** The thyroid gland ordinarily is composed of a right and a left lobe lying adjacent and lateral to the upper trachea and esophagus. An isthmus connects the two lobes and in some cases a pyramidal lobe is present extending upward anterior to the thyroid cartilage.

**Nodal Stations.** Lymphatic drainage from the thyroid gland is in several directions: to the tracheoesophageal nodes bilaterally, to upper anterior mediastinal nodes, to the delphian node overlying the thyroid cartilage, to nodes of the jugular chain bilaterally, and toward the base of the skull to retropharyngeal nodes.

**Metastatic Sites.** Distant spread occurs by contiguous lymphatic or hematogenous routes, for example, to lungs and bones, but many other sites may be involved.

### **STAGING PROCEDURES**

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the thyroid:

#### *Essential for staging*

1. Complete physical examination of the head and neck including indirect laryngoscopy
2. Chest roentgenograms, AP and lateral views
3. Pathologic study of surgically removed specimen
4. Known residual tumor if present after resection of tumor



Possibly useful for staging or patient management

1. Multichemistry screen
2. Radioactive thyroid scan
3. Serum calcitonin determination
4. Ultrasound examination
5. Soft-tissue films of the neck, CT scans
6. Bone scans
7. Performance status (Karnofsky or ECOG scale)

Possibly useful for future staging systems or research studies

1. Studies of immune competence
2. Thyroid function tests

## RULES FOR CLASSIFICATION

(See introductory paragraphs on General Rules for the Staging of Cancer). Both clinical-diagnostic staging (cTNM) and surgical-evaluative staging (sTNM) may be used as a basis for staging thyroid cancer. However, postsurgical resection-pathologic staging (pTNM) furnishes the greatest amount of evaluative evidence and proves most useful.

## TNM CLASSIFICATION

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 Greatest diameter of primary tumor 3 cm or less
- T2 Greatest diameter of primary tumor more than 3 cm
- T3 Multiple intraglandular foci of primary tumor
- T4 Fixation of primary tumor, direct invasion through thyroid capsule

### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No clinically or histologically positive node(s)
- N1 Clinically positive or histologically positive node(s)

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Eye	EYE
Lymph nodes	LYM	Other	OTH

## HISTOPATHOLOGY

The World Health Organization (WHO) classification of thyroid cancer should be used, including at least the four major types:

- Papillary carcinoma (with or without follicular foci)
- Follicular carcinoma (extent of invasion of tumor capsule should be noted)
- Medullary carcinoma
- Undifferentiated (anaplastic) carcinoma
- Unclassified malignant tumor

## TUMOR GRADE (G)

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number)

## STAGE GROUPING

Two different stage groupings are required due to the role played by the patient's age in the behavior of the tumor. The 10-year relative survival rates observed are indicated for each stage (see Stage Grouping, Table 8-1).

Table 8-1. Stage Grouping

CANCER TYPE	UNDER 45 YEARS	45 YEARS AND OVER
<i>Papillary</i>		
Stage I	Any T, any N, M0	Any T, N0, M0 T1, N1, M0
Stage II	Any T, any N, M1	T2-4, N1, M0
Stage III	None*	None
Stage IV	None	Any T, any N, M1
<i>Follicular</i>		
Stage I	Any T, any N, M0	T1, N0, M0
Stage II	Any T, any N, M1	T2-4, N0, M0
Stage III	None	Any T, N1, M0
Stage IV	None	Any T, any N, M1
<i>Medullary</i>		
Stage I	None	None
Stage II	Any T, any N, M0	None
Stage III	None	Any T, any N, M0
Stage IV	Any T, any N, M1	Any T, any N, M1
<i>Undifferentiated</i>		
Stage I	None	None
Stage II	None	None
Stage III	None	None
Stage IV	Any T, any N, any M	Any T, any N, any M

\*"None" is used to indicate that cases are assigned to other defined stages.

## POSTSURGICAL RESECTION RESIDUAL TUMOR (R)

This does not enter into staging of the tumor but may be a factor in deciding further treatment.

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

**DATA FORM**

The data form for staging of cancer of the thyroid, in addition to permitting the recording of the extent of

the cancer, also indicates the examinations necessary for staging and those examinations and data necessary for each time period of staging.

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## THYROID (ICD-O 193)

### Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
    Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)     Autopsy (aTNM)

### Definitions: TNM Classification

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 Greatest diameter of primary tumor 3 cm or less
- T2 Greatest diameter of primary tumor more than 3 cm
- T3 Multiple intraglandular foci of primary tumor
- T4 Fixation of primary tumor; direct invasion through thyroid capsule

#### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No clinically or histologically positive node(s)
- N1 Clinically positive or histologically positive node(s)

#### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

### Stage Grouping

Cancer Type	Under 45 Years	45 Years and Over
<i>Papillary</i>		
<input type="checkbox"/> Stage I	Any T, any N, M0	Any T, N0, M0, T1, N1, M0
<input type="checkbox"/> Stage II	Any T, any N, M1	T2-4, N1, M0
<input type="checkbox"/> Stage III	None	None
<input type="checkbox"/> Stage IV	None	Any T, any N, M1
<i>Follicular</i>		
<input type="checkbox"/> Stage I	Any T, any N, M0	T1, N0, M0
<input type="checkbox"/> Stage II	Any T, any N, M1	T2-4, N0, M0
<input type="checkbox"/> Stage III	None	Any T, N1, M0
<input type="checkbox"/> Stage IV	None	Any T, any N, M1
<i>Medullary</i>		
<input type="checkbox"/> Stage I	None	None
<input type="checkbox"/> Stage II	Any T, any N, M0	None
<input type="checkbox"/> Stage III	None	Any T, any N, M0
<input type="checkbox"/> Stage IV	Any T, any N, M1	Any T, any N, M1
<i>Undifferentiated</i>		
<input type="checkbox"/> Stage I	None	None
<input type="checkbox"/> Stage II	None	None
<input type="checkbox"/> Stage III	None	None
<input type="checkbox"/> Stage IV	Any T, any N, any M	Any T, any N, any M

### Staging Procedures

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging a cancer of the thyroid:

#### *Essential for staging*

1. Complete physical examination of the head and neck including indirect laryngoscopy and nasopharyngoscopy
2. Biopsy of primary tumor
3. Chest roentgenogram
4. Roentgenograms of skull (nasopharynx)
5. Direct examination of hypopharynx

#### *May be useful for staging or patient management*

1. Multichemistry screen
2. Soft-tissue roentgenograms of neck; CT scans
3. Barium swallow
4. Performance status (Karnofsky or ECOG scale)

#### *May be useful for future staging systems or research studies*

1. Panendoscopy (direct laryngoscopy, bronchoscopy, esophagoscopy)
2. Studies of immune competence
3. Assay of antibodies to Epstein-Barr viral capsid antigen (nasopharynx)

### Histologic Type of Cancer

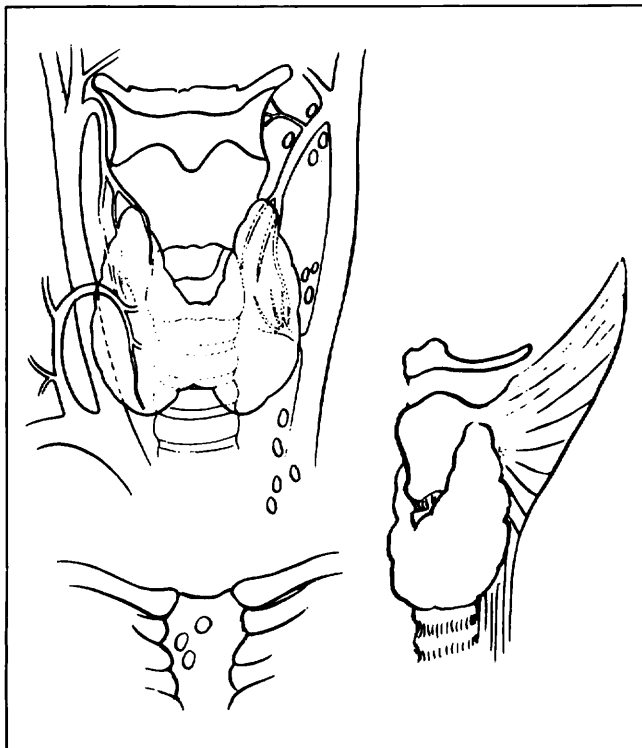
- Papillary (with or without follicular foci)
- Follicular
- Medullary
- Undifferentiated
- Unclassified

### Histologic Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\*Use a separate form each time a case is staged.



Tumor size: \_\_\_\_\_ cm (greatest diameter)

Check site of nodal involvement:

- Cervical unilateral \_\_\_\_\_  
 Cervical bilateral \_\_\_\_\_  
 Delphian \_\_\_\_\_  
 Mediastinal \_\_\_\_\_

Indicate on diagram primary tumor and regional nodes involved.

### Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into staging but may be a factor when deciding further treatment

- [ ] R0 No residual tumor  
 [ ] R1 Microscopic residual tumor  
 [ ] R2 Macroscopic residual tumor  
 Specify \_\_\_\_\_

### Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
[ ] H0	Normal activity	0	90-100
[ ] H1	Symptomatic but ambulatory; cares for self	1	70-80
[ ] H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
[ ] H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
[ ] H4	Bedridden; may need hospitalization	4	10-20

### Site-Specific Information

#### Thyroid History

History of previous irradiation to head & neck area

Yes \_\_\_\_\_ No \_\_\_\_\_

Other endocrine disease present

Yes \_\_\_\_\_ No \_\_\_\_\_

Family history of thyroid cancer

Yes \_\_\_\_\_ No \_\_\_\_\_

Family history of endocrine tumors

Yes \_\_\_\_\_ No \_\_\_\_\_

#### Primary Tumor

Location:

Right \_\_\_\_\_ Left \_\_\_\_\_ Midline \_\_\_\_\_

Size:

Largest diameter \_\_\_\_\_ cm

Characteristics:

Single \_\_\_\_\_ Multiple \_\_\_\_\_ Bilateral \_\_\_\_\_

Fixation (extension through thyroid capsule)

Yes \_\_\_\_\_ Massive \_\_\_\_\_ No \_\_\_\_\_

Neurologic involvement

Yes \_\_\_\_\_ No \_\_\_\_\_

Blood vessel invasion

Yes \_\_\_\_\_ No \_\_\_\_\_

Radioactive scan done

Yes \_\_\_\_\_ (Type) \_\_\_\_\_ No \_\_\_\_\_  
 Cold \_\_\_\_\_ Hot \_\_\_\_\_ Neither \_\_\_\_\_

# DIGESTIVE SYSTEM SITES

## 9

### Esophagus

#### ANATOMY (ICD-O 150)

**Primary Site.** For purposes of classification, staging, and reporting of cancer of the esophagus, the esophagus is considered as consisting of three principal regions. These regions are to be classified and reported separately. The *cervical esophagus* extends from the pharyngeal-esophageal junction (the cricopharyngeal sphincter) down to the level of the thoracic inlet, about 18 cm from the upper incisor teeth (approximately the upper one third of the esophagus). The *upper and midthoracic esophagus* extends from the thoracic inlet to a point 10 cm above the esophagogastric junction, which is usually at the level of the lower border of the eighth thoracic vertebra and about 31 cm from the upper incisor teeth (approximately the middle one third of the esophagus). The *lower thoracic esophagus* extends from a point 10 cm above the esophagogastric junction to the cardiac orifice of the stomach, which is about 40 cm from the upper incisor teeth (approximately the lower one third of the esophagus).

**Nodal Stations.** The regional lymph nodes for the cervical esophagus are the cervical or supraclavicular nodes, or both. For the thoracic esophagus, the regional nodes are the adjacent mediastinal lymph nodes. Involvement of more distant nodes is considered distant metastasis.

**Metastatic Sites.** The liver, lungs, and adrenals are the most common sites of distant metastases in other organs. Remote metastasis from carcinoma of the esophagus, although ultimately fatal, often carries a better intermediate prognosis than when the primary lesion has extended outside the esophagus—the latter a condition that is rapidly fatal.

#### RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** This classification is based on the anatomic extent of cancer that can be detected by examination before any treatment. Such an examination may include a medical history, physical examination, routine and special roentgenograms, endoscopic examinations including mediastinoscopy, mediastinotomy, thoracentesis, or thoracoscopy,



and other special examinations, including those used to demonstrate the presence of distant metastasis. Clinical assessment of regional lymph nodes for thoracic esophageal segments is not ordinarily possible. Thus, this classification is only appropriate for the cervical esophagus.

**Surgical-Evaluative Staging.** Patients on whom evaluative procedures are performed, such as exploratory thoracotomy (including biopsy), are included in this classification. The surgical-evaluative classification should be based on all data obtained for the clinical classification and information derived from exploratory surgery, including biopsy of mediastinal and abdominal nodes but not including information obtained by gross and histologic examination of therapeutically resected specimens.

**Postsurgical Resection-Pathologic Staging.** Esophageal cancer patients having similar therapeutic resections may be classified in a postsurgical treatment classification. This classification should be based on all data described in the clinical-diagnostic and surgical-evaluative classifications, as well as on that information derived from complete histologic examination of resected specimens.

**Retreatment Staging.** In the course of follow-up examinations, a patient may manifest evidence of progressive disease indicating treatment failure. Before initiating further treatment, the extent of tumor should be reassessed carefully, using all available information, and the patient should again be staged under the retreatment classification.

**Autopsy Staging.** In case of death of an esophageal cancer patient, the extent of the cancer, if any is found at autopsy, may be recorded by the TNM system; an autopsy stage may be reported, which is used only when the cancer is first diagnosed at autopsy.

## TNM CLASSIFICATION

### Primary Tumor (T)

For all three segments of the esophagus

- TX Minimum requirements to assess the primary tumor cannot be met.  
 T0 No evidence of primary tumor  
 Tis Carcinoma *in situ*  
 T1 A tumor that involves 5 cm or less of esophageal length, that produces no obstruction,\* and

\*Roentgenographic evidence of significant impediment to the passage of liquid contrast material past the tumor or endoscopic evidence of esophageal obstruction

that has no circumferential involvement and no extraesophageal spread†

- T2 A tumor that involves more than 5 cm of esophageal length without extraesophageal spread† or a tumor of any size that produces obstruction\* or that involves the entire circumference but without extraesophageal spread  
 T3 Any tumor with evidence of extraesophageal spread†

### Nodal Involvement (N)

**Cervical esophagus.** The regional lymph nodes in the cervical esophagus are the cervical and supraclavicular nodes.

- NX Minimum requirements to assess the regional nodes cannot be met.  
 N0 No clinically palpable nodes  
 N1 Movable, unilateral, palpable nodes  
 N2 Movable, bilateral, palpable nodes  
 N3 Fixed nodes

**Thoracic esophagus.** NX (clinical evaluation): Regional lymph nodes for the upper, midthoracic, and lower thoracic esophagus that are not ordinarily accessible for clinical evaluation

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.  
 M0 No evidence of distant metastasis‡  
 M1 Distant metastasis present  
 Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

†Extension of cancer outside the esophagus is seen by clinical, roentgenographic, or endoscopic evidence of any of the following:  
 Recurrent laryngeal, phrenic, or sympathetic nerve involvement  
 Fistula formation  
 Involvement of the tracheal or bronchial tree  
 Vena cava or azygos vein obstruction  
 Malignant effusion: mediastinal widening itself is not evidence of extraesophageal spread.

‡In the cervical esophagus, any lymph node involvement other than that of cervical or supraclavicular lymph nodes is considered distant metastasis. For the thoracic esophagus any cervical, supraclavicular, scalene, or abdominal lymph nodes are considered distant metastasis sites.

**DEFINITIONS FOR POSTSURGICAL RESECTION CLASSIFICATION (pTNM)**

**Primary Tumor (T)**

- TX Minimum requirements to assess the primary tumor cannot be met.
- Tis Preinvasive carcinoma (carcinoma *in situ*)
- T0 No evidence of tumor found on histologic examination of specimen
- T1 Tumor with invasion of the mucosa or submucosa but not the muscle coat
- T2 Tumor with invasion of the muscle coat
- T3 Tumor with invasion beyond the muscle coat or with gross invasion of contiguous structures
  - pT3a Tumor with invasion beyond the muscle coat
  - pT3b Tumor with gross invasion of contiguous structures

**Regional Lymph Nodes (N)**

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 Regional nodes not involved
- N1 Unilateral regional nodes involved
- N2 Bilateral regional nodes involved
- N3 Extensive multiple regional nodes involved

The pN categories correspond to N categories

**Distant Metastasis (M)**

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No distant metastasis
- M1 Distant metastatic involvement

**Postsurgical Treatment Residual Tumor (R)**

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor

**STAGE GROUPING\***

The various TNM classifications can be gathered together to represent four groups of patients: (1) those patients having an excellent prognosis (83% 5-yr survival); (2) those patients having only a fair outcome (46% 5-yr survival); (3) those patients with progressive disease and a poor outlook (26% survival);

\*The cervical regional lymph nodes are accessible to clinical evaluation when the primary tumor is in the cervical esophagus, so these lesions can be staged on a clinical-diagnostic basis. This is not true for other segments of the cervical esophagus. If surgical resection has been carried out, all tumors in all segments of the esophagus can be staged on a postsurgical resection-pathologic basis.

and (4) those patients with distant spread (only 7% surviving at 5 yr) (see bibliographic reference 2).

**Clinical-diagnostic classification for cervical esophagus**

- Stage 0 Tis, N0, M0
- Stage I T1, N0, M0
- Stage II T1, N1, N2; M0  
T2, N0-N2; M0
- Stage III T3, any N, M0  
Any T, N3, M0
- Stage IV Any T, any N, M1

**Postsurgical resection-pathologic classification of all segments**

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0  
Any T, N1-N3; M0
- Stage IV Any T, any N, M1

**HISTOPATHOLOGY**

Approximately 98% of esophageal cancers are squamous cell carcinomas and approximately 2% are adenocarcinomas. Rarely do various sarcomas and melanomas occur.

**TUMOR GRADE (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number).

**PERFORMANCE STATUS OF HOST (H)**

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

**BIBLIOGRAPHY**

1. Appelqvist P: Carcinoma of the oesophagus and gastric cardia: A retrospective study based on statistical and clinical material from Finland. *Acta Chir Scand [Suppl]* 430:1-92, 1972
2. Huang G: *Chinese Medical Journal* 94, No. 5:305-307, 1981
3. Moertel CG: Alimentary tract cancer. In Holland JF, Frei E III (eds): *Cancer Medicine*, pp 1519-1525. Philadelphia, Lea & Febiger, 1973

# ESOPHAGUS (ICD-O 150)

## Data Form for Cancer Staging

Patient identification  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
[ ] Surgical-evaluative (sTNM)  
Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
[ ] Postsurgical resection-pathologic (pTNM)  
[ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

## Definitions: TNM Clinical-Diagnostic Classification for Cervical Esophagus Only

Further definitions for postsurgical resection-pathologic classification on reverse side apply to all segments.

### Primary Tumor (T)

- [ ] T0 No demonstrable tumor in the esophagus
- [ ] Tis Carcinoma *in situ*
- [ ] T1 A tumor that involves 5 cm or less of esophageal length, that produces no obstruction, and that has no circumferential involvement and no extraesophageal spread†
- [ ] T2 A tumor that involves more than 5 cm of esophageal length without extraesophageal spread or a tumor of any size that produces obstruction or that involves the entire circumference but without extraesophageal spread
- [ ] T3 Any tumor with evidence of extraesophageal spread

### Nodal Involvement (N)

#### Cervical Esophagus

The regional lymph nodes in the cervical esophagus are the cervical and supraclavicular nodes.

#### Thoracic Esophagus

Regional lymph nodes for the upper, midthoracic, and lower thoracic esophagus are not ordinarily accessible for clinical evaluation.

- [ ] NX Minimum requirements to assess the regional nodes cannot be met.
- [ ] N0 No clinically palpable nodes
- [ ] N1 Movable, unilateral, palpable nodes
- [ ] N2 Movable, bilateral, palpable nodes
- [ ] N3 Fixed nodes

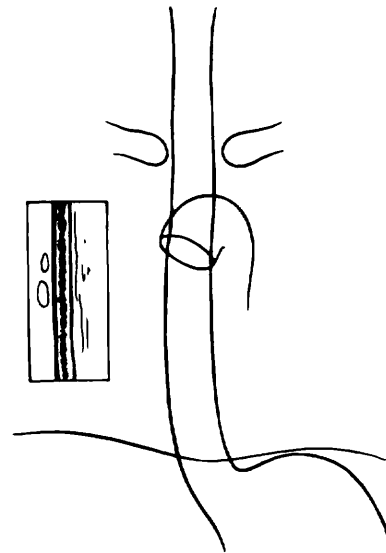
### Distant Metastasis (M)

- [ ] MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- [ ] M0 No (known) distant metastasis\*
- [ ] M1 Distant metastasis present  
Specify \_\_\_\_\_

## Site-Specific Information

See reverse side.

\*Use a separate form each time a case is staged.  
†See reverse side for additional information.



Length of tumor: \_\_\_\_\_ cm

Indicate on diagram primary tumor and regional nodes involved.

## Stage Grouping

### Clinical-diagnostic classification for cervical esophagus

- [ ] Stage 0 Tis, N0, M0
- [ ] Stage I T1, N0, M0
- [ ] Stage II T1, N1, N2; M0  
T2, N0-N2; M0
- [ ] Stage III T3, any N, M0  
Any T, N3, M0
- [ ] Stage IV Any T, any N, M1

### Postsurgical resection-pathologic classification

- [ ] Stage I T1, N0, M0
- [ ] Stage II T2, N0, M0
- [ ] Stage III T3, N0, M0  
Any T, N1-N3, M0
- [ ] Stage IV Any T, any N, M1

Examination by \_\_\_\_\_ M.D.  
Date \_\_\_\_\_

## Site-Specific Information

### Esophagus Location

- Cervical
- Supraclavicular
- Abdominal

### Distance From Incisors

- Cervical 18 cm
- Upper thoracic 18–30 cm
- Lower thoracic 30 cm

## Histology

Squamous cell epithelioma \_\_\_\_\_

Other \_\_\_\_\_

Length of tumor \_\_\_\_\_ cm

- Encircles esophagus
- Evidence of obstruction
- Extraesophageal extension
  - Nerve involvement
  - Tracheobronchial tree
  - Caval obstruction
  - Pleural effusion
  - Mediastinal widening (not necessarily evidence of extra-esophageal spread)

## Lymph Nodes

- Palpable
- Bilateral
- Fixed
  - Number \_\_\_\_\_
  - Size of largest node \_\_\_\_\_ cm<sup>2</sup>

## Definitions for Postsurgical Resection–Pathologic Classification

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- Tis Preinvasive carcinoma (carcinoma *in situ*)
- T0 No evidence of tumor found on histologic examination of specimen
- T1 Tumor with invasion of the mucosa or submucosa but not the muscle coat
- T2 Tumor with invasion of the muscle coat
- T3 Tumor with invasion beyond the muscle coat or with gross invasion of contiguous structures
  - T3a Tumor with invasion beyond the muscle coat
  - T3b Tumor with gross invasion of contiguous structures

### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional nodes cannot be met.

- N0 Regional nodes not involved
- N1 Unilateral regional nodes involved
- N2 Bilateral regional nodes involved
- N3 Extensive multiple regional nodes involved

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present
  - Specify \_\_\_\_\_

## Histologic Type of Cancer

Approximately 98% of esophageal cancers are squamous cell carcinomas and approximately 2% are adenocarcinomas. Rarely do various sarcomas and melanomas occur.

### Tumor Grade (G)

- G1 Well differentiated
- G2 Moderately well differentiated
- G3–G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number).

## Postsurgical Resection Residual Tumor (R)

Does not enter into staging tumor but may be a factor in deciding management

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor
  - Specify \_\_\_\_\_

## Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90–100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70–80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50–60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30–40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10–20



## Stomach

### ANATOMY (ICD-O 151)

The stage classification for carcinoma of the stomach as an aid in selecting treatment is based on the clinical extent of the disease as demonstrated by clinical examination and by roentgenographic and endoscopic studies. A staging classification for end-results reporting is based on the extent of disease at the time of surgical exploration of the abdomen, histopathologic study of the excised surgical specimen, or clinical examination (in advanced disease).

Only those cases that have histologically proven primary carcinoma or histologically proven metastasis with clinical evidence of a primary tumor in the stomach are to be included in this classification.

The prognosis of carcinoma of the stomach depends on the degree of penetration of the stomach wall by the primary lesion. Size or location of the primary tumor is of less significance. The histologic classification of carcinoma of the stomach is not helpful in assessing prognosis.

The clinical classification defines the extent of disease in terms of three components: (1) the primary tumor, designated by the letter T and expressed in terms of the degree of penetration by the cancer through the stomach wall; (2) the regional lymph nodes, designated by the letter N, which are the intra-abdominal subdiaphragmatic nodes; and (3) distant metastasis, designated by the letter M.

For clinical-diagnostic classification, the primary tumor is always designated by the letter cT and for postsurgical treatment-pathologic classification, by the letters pT. The description of the primary lesion is similar for the clinical-diagnostic and postsurgical treatment-pathologic classifications.

**Primary Site.** The stomach is the first part of the abdominal alimentary tract. Its first portion is the esophagogastric junction, which is immediately below the diaphragm. The pylorus is the part of the stomach through which the stomach contents empty into the duodenum, the first segment of the intestine. The upper portion of the stomach is the fundus and the lower part is the antrum. The shorter right border is the lesser curvature and that

on the left is the greater curvature. The wall of the stomach comprises three tissue layers: an inner mucosal layer, a smooth muscular layer (circular, oblique, and longitudinal), and an outer serosal or visceral peritoneal surface.

**Nodal Stations.** The major lymphatic collecting trunks are parallel with the left gastric artery, the splenic artery, and the hepatic artery. The major first station nodes are the lesser curvature, left gastropancreatic, juxtacardiac, gastroduodenal, gastropyloric, suprapyloric, pancreatoduodenal, celiac, splenic, and hepatic lymph nodes. The second station nodes include the para-aortic nodes.

**Metastatic Sites.** Distant spread to liver, bone, supraclavicular lymph nodes, and lung is common, but widespread visceral involvement occurs.

## RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** The clinical assessment of the primary tumor includes medical history, physical examination, radiological examinations, and related imaging techniques (radionuclide scans, ultrasound, NMR, etc.), endoscopy, and laparoscopy. The cancer must be confirmed by cytology or biopsy.

**Surgical-Evaluative Staging.** All information obtained on surgical exploration is used along with clinical data when resection is not carried out.

**Postgastrectomy Resection-Pathologic Staging.** Partial and total gastric resection specimens, including all macroscopic tumor and regional nodes, provide for the use of this staging designation.

## TNM CLASSIFICATION

### Primary Tumor (T)

The principal factor is the degree of penetration of the stomach wall by carcinoma.

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Tumor limited to mucosa without penetration into the lamina propria
- T1 Tumor limited to mucosa or mucosa and submucosa regardless of its extent (or location)
- T2 Tumor involves the mucosa and the submucosa (including the muscularis propria), and extends to or into the serosa but does not penetrate through the serosa.
- T3 Tumor penetrates through the serosa without invading contiguous structures.

T4a Tumor penetrates through the serosa and involves immediately adjacent tissues such as lesser omentum, perigastric fat, regional ligaments, greater omentum, transverse colon, spleen, esophagus, or duodenum by way of intraluminal extension.

T4b Tumor penetrates through the serosa and involves the liver, diaphragm, pancreas, abdominal wall, adrenal glands, kidney, retroperitoneum, small intestine or esophagus, or duodenum by way of serosa.

### Nodal Involvement (N)

The regional lymph nodes are the intra-abdominal subdiaphragmatic nodes.

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No metastases to regional lymph nodes
- N1 Involvement of perigastric lymph nodes within 3 cm of the primary tumor along the lesser or greater curvature
- N2 Involvement of the regional lymph nodes more than 3 cm from the primary tumor, that are removed or removable at operation, including those located along the left gastric, splenic, celiac, and common hepatic arteries
- N3 Involvement of other intra-abdominal lymph nodes such as the para-aortic, hepatoduodenal, retropancreatic, and mesenteric nodes

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Peritoneal	PER
Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes (above diaphragm or nonabdominal)	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

## STAGE GROUPING

Staging solely on clinical-diagnostic measures is not completely satisfactory. For this reason staging can be done on clinical-diagnostic and pathologic infor-

mation as c-pTNM or as surgical-evaluative, sTNM, or, if resection has been carried out, as pTNM.

*Stage Grouping of Carcinoma of the Stomach*

- Stage 0 Tis, N0, M0
- Stage I T1, N0, M0
- Stage II T2, T3; N0, M0
- Stage III T1-T3; N1, N2; M0  
T4a, N0-N2; M0
- Stage IV T1-T3; N3, M0  
T4b, any N, M0  
Any T, any N, M1

**HISTOPATHOLOGY**

The staging recommendations relate only to adenocarcinoma and not to other types such as lymphoma or sarcomas. Adenocarcinomas should be divided into the following subtypes:

1. Intestinal
2. Diffuse
3. Mixed

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number).

**POSTGASTRECTOMY RESIDUAL TUMOR (R)**

This does not enter into staging tumor but may be a factor in deciding management.

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

**DATA FORM**

The data form for staging of cancer of the stomach, in addition to permitting recording of the extent of the cancer, also indicates the examinations necessary for staging and the examinations and data necessary for each time period of staging.

**BIBLIOGRAPHY**

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2. Lauren P: The two histological main types of gastric carcinoma. *Acta Pathol Microbiol Scand* 64:31-49, 1965
3. Lim FE, Hartman AS, Tan EG et al: Factors in the prognosis of gastric lymphoma. *Cancer* 39:1715-1720, 1977
4. Wronkowski Z, Stemmermann G, Rellahan W: Stomach carcinoma among Hawaiians and Caucasians in Hawaii. *Cancer* 39:2310-2316, 1977

**STOMACH (ICD-O 151)**

**Data Form for Cancer Staging**

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

**Oncology Record**

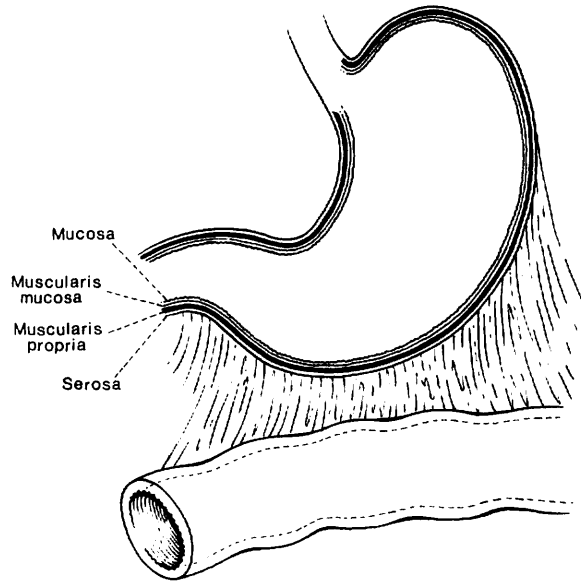
Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

**Definitions: TNM Classification**

**Primary Tumor (T)**

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 Tumor limited to mucosa and submucosa regardless of its extent or location
- T2 Tumor involves the mucosa, the submucosa (including the muscularis propria), and extends to or into the serosa, but does not penetrate through the serosa.
- T3 Tumor penetrates through the serosa without invading contiguous structures.
- T4a Tumor penetrates through the serosa and involves immediately adjacent tissues such as lesser omentum, perigastric fat, regional ligaments, greater omentum, transverse colon, spleen, esophagus, or duodenum by way of intraluminal extension.
- T4b Tumor penetrates through the serosa and involves the liver, diaphragm, pancreas, abdominal wall, adrenal glands, kidney, retroperitoneum, small intestine or esophagus, or duodenum by way of serosa.



Indicate on diagram primary tumor and regional nodes involved.

**Nodal Involvement (N)**

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No metastases to regional lymph nodes
- N1 Involvement of perigastric lymph nodes within 3 cm of the primary tumor along the lesser or greater curvature
- N2 Involvement of the regional lymph nodes more than 3 cm from the primary tumor that are removed or removable at operation, including those located along the left gastric, splenic, celiac, and common hepatic arteries
- N3 Involvement of other intra-abdominal lymph nodes which are not removable at operation, such as the para-aortic, hepatoduodenal, retropancreatic, and mesenteric nodes

**Distant Metastasis (M)**

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

**Primary Tumor**

Site \_\_\_\_\_  
 Size \_\_\_\_\_  
 Depth of penetration \_\_\_\_\_  
 Layers involved \_\_\_\_\_

**Method(s) of Determination**

\_\_\_\_\_  
 \_\_\_\_\_

**Nodes**

Negative \_\_\_\_\_  
 Positive \_\_\_\_\_  
 Groups involved \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\*Use a separate form each time a case is staged.  
 †See reverse side for additional information.



### Stage Grouping

- Stage 0 Tis, N0, M0
- Stage I T1, N0, M0
- Stage II T2 or T3; N0, M0
- Stage III T1–T3; N1, N2; M0  
T4a, N0–N2; M0
- Stage IV T1–T3; N3, M0  
T4b, any N, M0  
Any T, any N, M1

### Clinical-Diagnostic Stage

The clinical assessment of the primary tumor includes medical history, physical examination, routine and special roentgenograms (e.g., fluoroscopy, barium studies), endoscopy, laparoscopy, ultrasound, and computerized tomography. The cancer must be confirmed by biopsy. As newer techniques are improved and gain wider use, clinical staging can be more reliable.

### Postgastrectomy–Pathologic Stage

Partially and completely resected stomach specimens and regional nodes provide for the use of this staging designation.

### Surgical-Evaluative Stage

All information obtained on surgical exploration is used along with clinical-diagnostic data when resection is not carried out.

### Histopathology

Predominant cancer is adenocarcinoma.

- Intestinal type
- Diffuse type
- Mixed type

### Histologic Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3–G4 Poorly to very poorly differentiated

### Residual Tumor (R)

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

### Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90–100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70–80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50–60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30–40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10–20



## Colon and Rectum

In retrospective studies, inadequacies of the clinical data prohibited the development of meaningful clinical staging (cTNM) for either site individually. Generally, however, the data were sufficiently reliable and consistent when based on postsurgical treatment-pathologic information to permit development of a staging system for those cases in which histopathologic examination of therapeutically resected specimens was done (pTNM). In both sites, analysis of the postsurgical treatment data suggested that prognosis was related to the depth of penetration of the tumor, regional lymph node involvement, presence or absence of distant metastases, and complications, such as the presence of fistula. A comparison of survival data for the colon with that of the rectum based on penetration (pT), lymph node status (N), and distant metastases (M) showed such a similarity that it suggested the practicality of developing from the retrospective data one set of pTNM categories for postsurgical treatment evaluation and one set of stage grouping definitions. However, in any analysis of postsurgical treatment evaluation and stage groupings, the two sites should be kept separate.

It may well be that, as various biologic markers relevant to host resistance become identified, factors in addition to those of anatomic extent will become important in the classification and staging of cancer of the colon and of the rectum.

### **ANATOMY (ICD-O 153 and 154)**

**Primary Site.** The large intestine (or colon) extends from the terminal ileum to the anal canal, although for simplicity it may be divided into three subdivisions exclusive of the rectum: right, middle, and left. Still more simply, the large intestine may be divided into the intraperitoneal colon and the rectum (distal 10 cm). All intraperitoneal colonic lesions are treated similarly. The rectal lesions are handled quite differently; some have a somewhat worse prognosis. However, the conventional, more minute subdivisions are described briefly, inasmuch as they may be of relevance in prospective studies concerned with carcinogenesis, classification, staging, and reporting of cancer of the colorectum.



The junction of the ileum and cecum is marked by the ileocecal valve, which is an anteroposterior slit formed by the partial invagination of the distal end of the ileum into the cecum.

The cecum is a large pouch that constitutes the proximal segment of the large intestine, measures about 6 cm by 9 cm, and is invested completely by the peritoneum. The vermiform appendix arises from the medial and posterior aspect of the cecum below the ileocecal junction. The appendix, therefore, may lie in any axis of a circle, the center of the circle being represented by the cecal attachment. The ascending colon is 15 cm to 20 cm long and is ordinarily retroperitoneal.

Lying at the undersurface of the right lobe of the liver and close to the duodenum and the right kidney, the hepatic flexure presents a difficult problem of *differential diagnosis*, and cancer at this site may invade these organs relatively early.

The transverse colon lies in a more anterior position than do other portions of the colon, so tumors here should be more readily palpable. It is supported by the transverse mesocolon, which in turn is attached to the pancreas. Anteriorly, its serosa is contiguous with the gastrocolic ligament, which is attached to the stomach.

The splenic flexure lies at a higher level and is more fixed than the hepatic flexure; it is intimately related to the spleen, the tail of the pancreas, and the left kidney. The descending colon, 10 cm to 15 cm long, is only partially invested by peritoneum, the posterior portion being in a retroperitoneal position.

The sigmoid loop extends from the medial border on the left psoas major muscle to the beginning of the rectum. It is suspended by its mesocolon (the sigmoid mesocolon), which is variable in length. When the mesocolon is excessively long, the resulting "redundant" sigmoid may come to lie in the right lower quadrant of the abdomen.

The rectum, about 12 cm long, extends from a point opposite the third sacral vertebra down to the apex of the prostate in the male and to the apex of the perineal body in the female, that is, to a point 4 cm anterior to the tip of the coccyx. (Arbitrarily, it may be defined as the distal 10 cm of the large intestine, as measured by preoperative sigmoidoscopy from the anal verge.) From the anal mucocutaneous junction, it extends approximately 10 cm to 12 cm. The rectosigmoid area is considered as being 10 cm to 15 cm from the anal mucocutaneous junction. In this retrospective study, all rectosigmoid cases have been grouped with those of the rectum. The rectum has no epiploic appendages, no haustrations, and no taeniae. It is covered by peritoneum in front and on both sides in its upper third and on the anterior wall only in its middle third; there is no peritoneal covering in the lower third. In

the lower rectum, the mucosa is thrown into longitudinal folds known as the rectal columns or the columns of Morgagni. Between them, just above the white line of Hilton, are the anal pits or sinuses.

About 4 cm long, the anal canal courses downward and backward from the apex of the prostate or the perineal body. The anocutaneous line, or white line of Hilton, at the base of the rectal columns marks the site of the original anal membrane that separated the entodermal gut from the ectodermal proctoderm.

**Nodal Stations.** Whenever possible, the status of the principal lymph nodes at the base of the mesocolon should be recorded, namely those proximal to the origins of the ileocolic, right colic, middle colic, and inferior mesenteric arteries. As will be noted in the definitions under N and for stage, involvement of the principal (para-aortic) lymph nodes, in contrast to involvement of intervening nodes, constitutes distant metastasis. Intervening, or regional, nodes are as follows: *intermediate* (along the course of the major vessels supplying the colon), *paracolic* (following the vascular arcades of Drummond's marginal artery), and *epicolic* (in close proximity to the colon, being found along the mesocolic border of the colon and often in the epiploic appendages).

Although the flow of lymph usually traverses each group of nodes from the epiploic to the principal nodes, occasionally it flows directly to the intermediate or even to the principal nodes, bypassing those that intervene. (Increasing use of the "no-touch" isolation technique in resecting colonic lesions has been thought by some to minimize the degree to which lymph node involvement (N) can be assessed as a component of the surgical-evaluative classification. However, nodes can be evaluated after the vascular supply has been ligated, even with the no-touch technique.)

Listed below are the regional lymph nodes for each colorectal segment:

SEGMENT	REGIONAL LYMPH NODES
Cecum	Anterior cecal; posterior cecal; ileocolic
Ascending colon	Ileocolic; right colic; middle colic
Hepatic flexure	Right colic; middle colic
Transverse colon	Middle colic
Splenic flexure	Left colic; inferior mesenteric
Descending colon	
Sigmoid colon	
Rectosigmoid	Perirectal; left colic; sigmoid mesenteric; inferior mesenteric



## SEGMENT

## REGIONAL LYMPH NODES

Rectum

Perirectal; left colic; sigmoid mesenteric; inferior mesenteric; internal iliac (hypogastric); lateral sacral; common iliac; sacral promontory (Gerota)

*Note:* Lymph nodes between origins of the inferior and superior mesenteric arteries are nonresectable, for example, superior mesenteric lymph nodes. Therefore, although regional in the classic anatomic sense, they are designated "distant" for purposes of clinical stage classification. (Colonic resections are distal to the superior mesenteric artery and its contiguous nodes.) Similarly, lymph flow from the lower rectum may be to regional lymph nodes (*i.e.*, internal iliac [hypogastric], common iliac, lateral sacral, or sacral promontory), which are not resected at the time of an abdominoperineal resection but may be resected as a separate procedure.

In summary, regional lymph nodes are to be distinguished from juxtaregional. In the colon, the regional lymph nodes are the pericolic nodes and the nodes located along the ileocolic, right colic, middle colic, and inferior mesenteric arteries. The juxtaregional lymph nodes are the periaortic and other subdiaphragmatic intra-abdominal nodes. In the rectum, the regional nodes are the perirectal nodes and the nodes distal to the origin of the inferior mesenteric artery. The juxtaregional nodes are the para-aortic and other subdiaphragmatic intra-abdominal nodes.

### RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** Clinical assessment includes medical history, physical examination, routine and special roentgenograms (including barium enema and fluoroscopy), sigmoidoscopy, colonoscopy (with biopsy of lesions above the level of the sigmoid colon), fiberoptics (with biopsy when possible), cytologic examination of colon washings, laboratory examinations (*e.g.*, occult blood determination in the stool), carcinoembryonic antigen (CEA) assay, and special examinations used to demonstrate the presence of extracolonic metastasis (*e.g.*, chest films, blood counts, liver chemistries).

**Surgical-Evaluative Staging.** Surgical-evaluative assessment should include all the data that would be obtained for clinical classification, as well as the information obtained at the time of exploratory laparotomy, including biopsy but not including information obtained by complete histopathologic examination of a therapeutically resected specimen.

**Postsurgical Resection-Pathologic Staging.** This classification describes the known extent of the colorectal carcinoma after complete examination of the resected

specimen. Important determinants of survival in the pTNM classification are the depth of tumor penetration, involvement of regional lymph nodes, and presence of distant metastasis. Other anatomic factors associated with survival are local intravascular invasion (venous or lymphatic) and grade.

### TNM CLASSIFICATION

The definitions of TNM categories for carcinoma of the colon and rectum follow. Each case must be assigned the highest category of T, N, and M that describes the full extent of disease in that case.

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ* (no invasion of lamina propria)
- T1 Tumor confined to the mucosa or submucosa (*e.g.*, carcinoma *de novo* or carcinomatous adenoma, either polypoid or papillary/villous)
- T2 Tumor limited to wall of colon or rectum but not beyond—*viz.*, invasion into muscularis propria or subserosa (colon and proximal rectum) and into muscularis propria but not beyond (distal rectum)
- T2a Tumor extending into muscularis propria but not penetrating through it
- T2b Tumor extending through the wall with complete penetration of the muscularis propria
- T3 Tumor invades all layers of bowel wall including serosa (colorectal) with or without extension to adjacent or contiguous tissues. Fistula may or may not be present.
- T4 Tumor has spread by direct extension beyond contiguous tissue or the immediately adjacent organs.
  - T Multiple primary carcinoma. The greatest extent of the tumor is indicated as usual by a suffix as described above, and the number of multiple tumors is indicated by a parenthetical numerical prefix

#### Regional Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 Nodes not involved
- N1 One to three involved regional nodes adjacent to primary lesion
- N2 Regional nodes involved extending to line of resection or ligation of blood vessels

N3 Nodes contain metastasis, location not identified. Specify number examined; number involved. (Case cannot be properly staged.)

**Distant Metastasis (M)**

MX Minimum requirements to assess the presence of distant metastasis cannot be met.

M0 No (known) distant metastasis

M1 Distant metastasis present (including extra-abdominal nodes; intra-abdominal nodes proximal to mesocolon and inferior mesenteric artery (juxtaregional); peritoneal implants, liver, lungs, and bones).

Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Eye	EYE
Lymph nodes	LYM	Other	OTH

Add + to the abbreviated notation to indicate that the pathology (p) is proved.

**POSTSURGICAL RESECTION**

**RESIDUAL TUMOR (R)**

R0 No residual tumor

R1 Microscopic residual tumor

R2 Macroscopic residual tumor

Specify \_\_\_\_\_

**STAGE GROUPING**

**Stage 0**

Tis, N0, M0

Carcinoma *in situ*

**Stage I**

Stage IA: T1, N0, M0

Tumor confined to mucosa or submucosa

Stage IB: T2, N0, M0

Tumor involves muscularis propria but not beyond.

**Stage II**

T3, N0, M0

Tumor involves all layers of bowel wall with or without invasion of immediately adjacent structures.

**Stage III**

Any T, N1-N3; M0

Any degree of bowel wall invasion with regional node metastasis

T4, N0, M0

Tumor extends beyond the contiguous tissue or immediately adjacent organs with no regional node metastasis (see bibliography reference 2).

**Stage IV**

Any T, any N, M1

Any degree of invasion of bowel wall with or without metastasis to regional lymph nodes but with evidence of distant metastasis

**HISTOPATHOLOGY**

The predominant cancer is adenocarcinoma; pathologic diagnosis is required for this classification. Tumor grading is recommended. Reference to WHO nomenclature is advised. Other determinants of probable importance to be evaluated in prospective studies of postsurgical treatment assessment are tumor margin circumscription, histopathologic differentiation (e.g., nuclear grade, growth pattern, and mucin production), and host-cellular reaction (lymphocyte and plasma cell infiltration in and about the tumor as well as in contiguous tissues). It is essential that in each case the specific histologic type and the presence or absence of intravasal permeation (lymphatic, venous, or both) be recorded routinely.

**TUMOR GRADE (G)**

GX Grade or differentiation not determined, not stated, or not applicable

G1 Well differentiated

G2 Moderately well differentiated

G3 Poorly differentiated

G4 Undifferentiated

Note: The Dukes classification for cancer of the rectum and subsequently, with modifications, for cancer of the colon, has been widely in use. For that reason a grid is presented before the data form to show the comparisons.

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

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**CARCINOMA OF THE COLORECTUM**

**Stage Classification and Stage Grouping (AJCC, UICC, Dukes, Astler-Coller)**

AJCC 1982	UICC 1978 (3rd ed)	Dukes (1932, 1935)*	Astler-Coller†
<b>Stage 0</b> Carcinoma <i>in situ</i> Tis N0 M0	<b>Stage 0</b> Tis, N0, M0		<b>Stage 0</b> 0
<b>Stage I</b> IA Tumor confined to mucosa or submucosa T1, N0, M0 IB Tumor involves muscularis propria but not beyond T2, N0, M0	<b>Stage I</b> 1A T1, N0, M0 1B T2, N0, M0	A A A	<b>Stage I</b> A B1
<b>Stage II</b> Involvement of all layers of bowel wall with or without invasion of immediately adjacent structures T3, N0, M0	<b>Stage II</b> T3, T4, N0, M0 (T3a with fistula) (T3b without fistula)	B	<b>Stage II</b> B2
<b>Stage III</b> Any degree of bowel wall with regional node metastasis Any T, N1-N3; M0 Extends beyond contiguous tissue or immediately adjacent organs with no regional lymph node metastasis T4, N0, M0	<b>Stage III</b> Any T, N1, M0	C (1932) C1 (1935) C2 (1935)	<b>Stage III</b> C1 C2
<b>Stage IV</b> Any invasion of bowel wall with or without regional lymph node metastasis but with evidence of distant metastasis Any T, any N, M1	<b>Stage IV</b> Any T, any N, M1	Type 4 (so-called D)	<b>Stage IV</b> D

\*Dukes: A = Limited to bowel wall; B = Spread to extramural tissue; C = Involvement of regional nodes (C1: Near primary lesion; C2: Proximal node involved at point of ligation); Type 4 (so-called D) = Distant metastasis  
 †Astler-Coller: A = Limited to mucosa; B1 = Same as AJCC Stage IB (T2a); B2 = Same as AJCC Stage IB (T2b); C1 = Limited to wall with involved nodes; C2 = Through all layers of wall with involved nodes



# COLON (ICD-O 153) AND RECTUM (ICD-O 154)

## Data Form for Cancer Staging

Patient identification  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
[ ] Surgical-evaluative (sTNM)  
Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
[ ] Postsurgical resection-pathologic (pTNM)  
[ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

- [ ] TX Minimum requirements to assess the primary tumor cannot be met.
- [ ] T0 No evidence of primary tumor
- [ ] Tis Carcinoma *in situ*
- [ ] T1 Tumor confined to mucosa or submucosa
- [ ] T2 Tumor limited to bowel wall but not beyond
  - [ ] T2a Partial invasion of muscularis propria
  - [ ] T2b Complete invasion of muscularis propria
- [ ] T3 Tumor invasion of all layers of bowel wall with or without invasion of adjacent or contiguous tissues; fistula may or may not be present.
- [ ] T4 Tumor spread by direct extension beyond contiguous tissue or the immediately adjacent organs
- [ ] T Multiple primary carcinoma; classify most extensive tumors. (Indicate number in brackets.)

### Nodal Involvement (N)

- [ ] NX Minimum requirements to assess the regional nodes cannot be met.
- [ ] N0 Nodes not involved
- [ ] N1 One to three involved regional nodes adjacent to primary lesion [ ]
- [ ] N2 Regional nodes involved extending to line of resection or ligature of blood vessels [ ]
- [ ] N3 Nodes contain metastasis, location not identified. Specific number examined [ ]; number involved [ ]

### Distant Metastasis (M)

- [ ] MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- [ ] M0 No (known) distant metastasis
- [ ] M1 Evidence of distant metastasis  
Specify \_\_\_\_\_

## Stage Grouping

- [ ] Stage 0 Tis, N0, M0
- [ ] Stage I
  - IA T1, N0, M0
  - IB T2, N0, M0
- [ ] Stage II T3, N0, M0
- [ ] Stage III Any T, N1-N3, M0  
T4, N0, M0
- [ ] Stage IV Any T, any N, M1

## Site-Specific Information

History  
Symptoms \_\_\_\_\_  
Duration \_\_\_\_\_  
Physical examination  
Rectal \_\_\_\_\_  
Abdominal palpation \_\_\_\_\_  
Proctosigmoidoscopy \_\_\_\_\_  
Fiberoptic colonoscopy \_\_\_\_\_  
Laparoscopy \_\_\_\_\_  
Liver edge palpable Yes \_\_\_\_\_ No \_\_\_\_\_

Roentgenographic Studies  
Type \_\_\_\_\_  
Findings \_\_\_\_\_  
Site or level \_\_\_\_\_

Laboratory studies  
Hb \_\_\_\_\_  
CEA (serum) \_\_\_\_\_ ng  
Other markers (Specify) \_\_\_\_\_  
Fecal occult blood smear [ ] Positive  
[ ] Negative  
[ ] Not done  
Cytology [ ] Positive  
[ ] Negative  
[ ] Not done

Pathologic findings  
Primary tumor Biopsy [ ] Resected tumor [ ]  
Site (note diagrams):  
Indicate by numeral \_\_\_\_\_  
Size greatest diameter \_\_\_\_\_  
Gross characteristics \_\_\_\_\_  
Depth of penetration of bowel wall \_\_\_\_\_  
Blood vessel invasion: Venous \_\_\_\_\_  
Arterial \_\_\_\_\_  
Not stated \_\_\_\_\_  
Additional tissues involved: Adjacent \_\_\_\_\_  
Distant \_\_\_\_\_  
Complications: Fistula \_\_\_\_\_ Other \_\_\_\_\_  
Other neoplasms: Number [ ] Location \_\_\_\_\_  
Type \_\_\_\_\_

Nodal involvement  
Cannot assess \_\_\_\_\_  
None \_\_\_\_\_  
Regional \_\_\_\_\_ (Specify \_\_\_\_\_)  
Distant \_\_\_\_\_ (Number \_\_\_\_\_ Proved \_\_\_\_\_)  
Metastasis  
None \_\_\_\_\_ Yes \_\_\_\_\_ Specify \_\_\_\_\_  
Proved \_\_\_\_\_ Histologically confirmed Yes \_\_\_\_\_  
No \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.  
Date \_\_\_\_\_

\*Use a separate form each time a case is staged.  
†See reverse side for additional information.

## Histologic Type of Cancer

The predominant cancer is adenocarcinoma (98%).

## Histologic Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

## Postsurgical Resection-Pathologic Residual Tumor (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

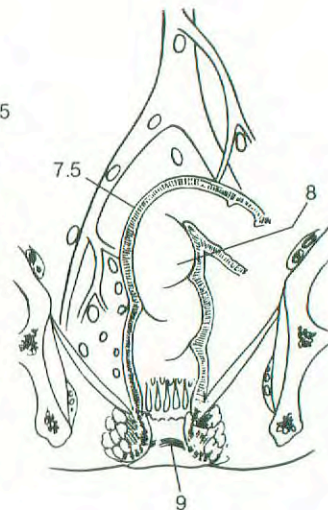
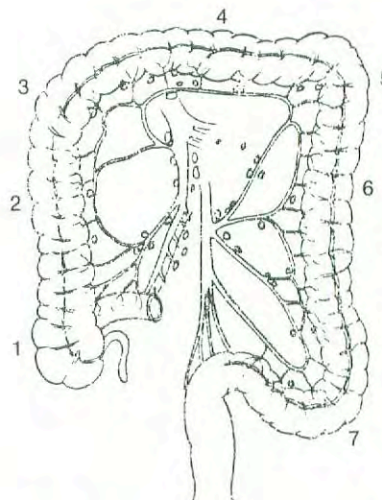
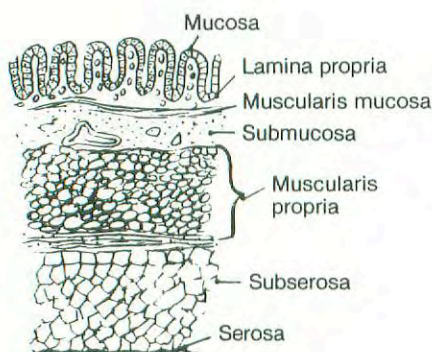
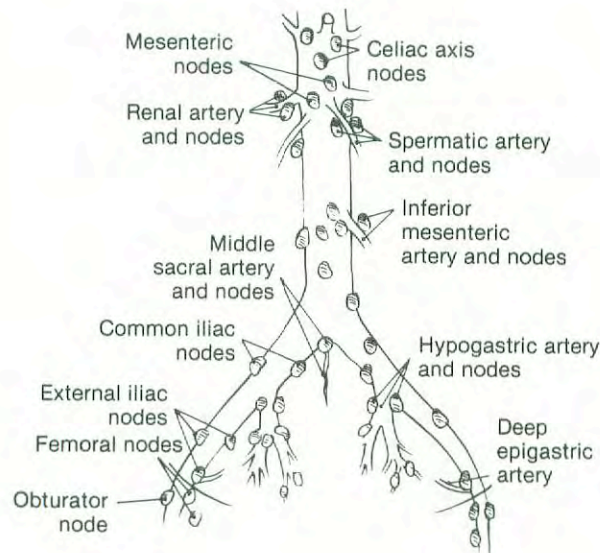
## Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## Anatomic Areas of Colon and Rectum

- |                     |                     |
|---------------------|---------------------|
| 1. Cecum            | 6. Descending colon |
| 2. Ascending colon  | 7. Sigmoid          |
| 3. Hepatic flexure  | 7.5. Rectosigmoid   |
| 4. Transverse colon | 8. Rectum           |
| 5. Splenic flexure  | 9. Anal canal       |



For anatomic areas corresponding to numbers, see list above.

## Liver and Biliary Tract

Staging of primary cancer of the liver, gallbladder, and biliary tract has just recently been proposed by a task force of the American Joint Committee. Suggestions for staging of these cancers are based on published data and the experience of members of the task force. Retrospective and prospective studies are needed to validate the proposed staging system in order to confirm the recommendations or suggest modifications. In the meantime, all pertinent information in individual cases which might contribute to staging should be recorded.

### ANATOMY (ICD-O 155-156)

**Primary Sites.** The liver is the largest parenchymatous organ in the body and is situated in the right upper quadrant of the abdomen. It is divided into two major lobes. The intrahepatic ducts drain into large extrahepatic ducts, fusing into a single common bile duct, which drains into the duodenum through the ampulla of Vater. The gallbladder drains most often into the common hepatic bile duct, which is usually situated on the undersurface of the liver at the juncture of the right and left lobes. The lymphatics of the liver drain into regional hilar nodes and into those located along the common bile duct, and subsequently into the para-aortic lymph nodes.

### TNM CLASSIFICATION

#### Primary Tumor (T)

- TX Tumor is present but cannot be assessed.
- T0 No evidence of tumor
- T1 Small solitary tumor (<3.0 cm) confined to one lobe
- T2 Large tumor (>3.0 cm) confined to one lobe
  - T2a Single tumor nodule
  - T2b Multiple tumor nodules (any size)
- T3 Tumor involving both major lobes
  - T3a Single tumor nodule (with direct extension)
  - T3b Multiple tumor nodules
- T4 Tumor invading adjacent organs

**Nodal Involvement (N)**

- NX Nodes cannot be assessed.  
 N0 No histological evidence of metastasis to regional or distant lymph nodes  
 N1 Histologically confirmed spread to regional lymph nodes in porta hepatis  
 N2 Histologically confirmed spread to lymph nodes beyond porta hepatis

**Distant Metastasis (M)**

- MX Not assessed  
 M0 No known metastasis  
 M1 Distant metastasis present  
 Specify site \_\_\_\_\_

**Stage Grouping**

- Stage IA T1, N0, M0, without cirrhosis  
 Stage IB T1, N0, M0, with cirrhosis  
 Stage IIA T2, N0, M0, without cirrhosis  
 Stage IIB T2, N0, M0, with cirrhosis  
 Stage IIIA T3, N0, N1; M0, without cirrhosis  
 Stage IIIB T3, N0, N1; M0, with cirrhosis  
 Stage IVA T4, N0-N2; M0, M1; without cirrhosis  
 Stage IVB T4, N0-N2; M0, M1, with cirrhosis

**Postsurgical Resection Residual Tumor (R)**

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor

**Other Site-Specific Information**

- Symptom [ ] Pain  
 [ ] Weight loss  
 Sign [ ] Jaundice  
 [ ] Ascites  
 [ ] Mass

Paraneoplastic syndrome; specify \_\_\_\_\_

Congenital or metabolic liver disease; specify \_\_\_\_\_

**Laboratory Tests**

Bilirubin \_\_\_\_\_ mg/dl  
 Alkaline phosphatase \_\_\_\_\_ U/ml (specify type of unit)

Albumin \_\_\_\_\_ mg/dl

ALT \_\_\_\_\_ U/ml

AFP \_\_\_\_\_ ng/ml

HBSAg Positive [ ] Negative [ ]

Other markers of HB infection; specify \_\_\_\_\_

Portal vein obstruction by angiography present [ ]

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

**HISTOPATHOLOGY****A. Epithelial Tumors****A. Benign**

1. Liver cell adenoma (hepatocellular adenoma)
2. Intrahepatic bile duct adenoma
3. Intrahepatic bile duct cystadenoma

**B. Malignant**

4. Hepatocellular carcinoma (liver cell carcinoma)
5. Hepatocellular carcinoma (fibrolamellar type)
6. Cholangiocarcinoma (intrahepatic bile duct carcinoma)
7. Mixed hepatocellular cholangiocarcinoma
8. Bile duct cystadenocarcinoma
9. Hepatoblastoma
  - a. Predominantly fetal type
  - b. Predominantly embryonal type
  - c. Small cell undifferentiated type
10. Undifferentiated carcinoma

**B. Nonepithelial tumors**

11. Hemangioma
12. Infantile hemangioendothelioma
13. Embryonal sarcoma
14. Other  
Specify \_\_\_\_\_

**C. Miscellaneous tumors**

15. Teratoma
16. Carcinosarcoma
17. Other  
Specify \_\_\_\_\_

**D. Unclassified tumors****E. Hemopoietic and lymphoid neoplasms****BIBLIOGRAPHY**

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# LIVER (ICD-O 155)

## Data Form for Cancer Staging

Patient identification  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_  
Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
[ ] Surgical-evaluative (sTNM)  
Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G) \_\_\_\_\_  
[ ] Postsurgical resection-pathologic (pTNM)  
[ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

### Definitions: TNM Classification

#### Primary Tumor (T)

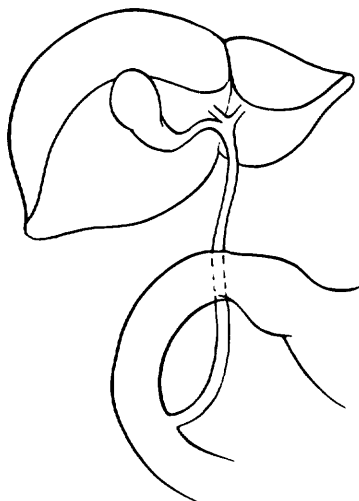
- [ ] TX Tumor is present but cannot be assessed.
- [ ] T0 No evidence of tumor
- [ ] T1 Small solitary tumor (<2.0 cm) confined to one lobe
- [ ] T2 Large tumor (>2.0 cm) confined to one lobe
  - [ ] T2a Single tumor nodule
  - [ ] T2b Multiple tumor nodules (any size)
- [ ] T3 Tumor involving both major lobes
  - [ ] T3a Single tumor nodule (with direct extension)
  - [ ] T3b Multiple tumor nodules
- [ ] T4 Tumor invading adjacent organs

#### Distant Metastasis (M)

- [ ] MX Not assessed
  - [ ] M0 No known metastasis
  - [ ] M1 Distant metastasis present
- Specify \_\_\_\_\_

#### Stage Grouping

- [ ] Stage IA T1, N0, M0, without cirrhosis
- [ ] Stage IB T1, N0, M0, with cirrhosis
- [ ] Stage IIA T2, N0, M0, without cirrhosis
- [ ] Stage IIB T2, N0, M0, with cirrhosis
- [ ] Stage IIIA T3, N0, N1; M0, without cirrhosis
- [ ] Stage IIIB T3, N0, N1; M0, with cirrhosis
- [ ] Stage IVA T4, N0-N2; M0, M1; without cirrhosis
- [ ] Stage IVB T4, N0-N2; M0, M1; with cirrhosis



Indicate on diagram primary tumor and regional nodes involved.

#### Nodal Involvement (N)

- [ ] NX Nodes cannot be assessed.
- [ ] N0 No histological evidence of metastasis to regional or distant lymph nodes
- [ ] N1 Histologically confirmed spread to regional lymph nodes in porta hepatis
- [ ] N2 Histologically confirmed spread to lymph nodes beyond porta hepatis

#### Site-Specific Information

Symptom [ ] Pain  
[ ] Weight loss  
Sign [ ] Jaundice  
[ ] Ascites  
[ ] Mass  
Paraneoplastic syndrome  
Specify \_\_\_\_\_  
Congenital or metabolic liver disease; specify \_\_\_\_\_

#### Laboratory Tests

Bilirubin \_\_\_\_\_ mg/dl  
Alkaline phosphatase \_\_\_\_\_ U/ml (specify type of unit)  
Albumin \_\_\_\_\_ mg/dl  
ALT \_\_\_\_\_ U/ml  
HBsAg Positive [ ] Negative [ ]  
Other markers of HB infection  
Specify \_\_\_\_\_  
Portal vein obstruction by angiography present [ ]

#### Histologic Type of Cancer

- A. Epithelial Tumors
- [ ] Benign
  - [ ] Liver cell adenoma (hepatocellular adenoma)
  - [ ] Intrahepatic bile duct adenoma
  - [ ] Intrahepatic bile duct cystadenoma

Examination by \_\_\_\_\_ M.D.  
Date \_\_\_\_\_

\* Use a separate form each time a case is staged.

- Malignant
  - Hepatocellular carcinoma (liver cell carcinoma)
  - Hepatocellular carcinoma (fibrolamellar type)
  - Cholangiocarcinoma (intrahepatic bile duct carcinoma)
  - Bile duct cystadenocarcinoma
  - Hepatoblastoma
  - Undifferentiated carcinoma

**B. Nonepithelial Tumors**

- Hemangioma
- Infantile hemangioendothelioma
- Embryonal sarcoma
- Other

Specify \_\_\_\_\_

**C. Miscellaneous Tumors**

- Teratoma
- Carcinosarcoma
- Other

Specify \_\_\_\_\_

**D. Unclassified tumors**

**E. Hemopoietic and lymphoid neoplasms**

**Postsurgical Resection Residual Tumor (R)**

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor

Specify \_\_\_\_\_

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly differentiated

**Performance Status of Host (H)**

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## Gallbladder

### TNM CLASSIFICATION (ICD-O 156)

#### Primary Tumor (T)

- TX Presence of tumor cannot be assessed.  
 T0 No evidence of tumor  
 Tis Carcinoma *in situ*  
 T1 Invasion limited to the submucosa or to the muscle layer  
 T2 Invasion limited to perimuscular connective tissue; no extension beyond serosa or into liver  
 T3 Involvement of all layers and direct extension beyond serosa or into one adjacent organ, or both (must be less than 2 cm into the liver)  
 T4 Involvement of all layers and direct extension 2 cm or more into liver or into two or more adjacent organs (includes stomach, duodenum, colon, pancreas, omentum, extrahepatic bile ducts, and any involvement of liver)

#### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.  
 N0 No histologic evidence of metastasis to regional lymph nodes  
 N1 Histologically proven metastasis to first station regional lymph nodes  
 N2 Histologically proven metastasis to second station regional lymph nodes

#### Distant Metastasis (M)

- MX Not assessed  
 M0 No (known) distant metastasis  
 M1 Distant metastasis present

#### Stage Grouping

- Stage 0 Tis, N0, M0  
 Stage I T1, T2; N0, M0  
 Stage II T3, T4; N0, M0  
 Stage III T3, T4; N1, N2; M0  
 Stage IV T3, T4; N0-N2; M1

### Postsurgical Resection Residual Tumor (R)

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor

Specify \_\_\_\_\_

### Other Site-Specific Information

- Pain [ ] Yes  
 [ ] No  
 Duration \_\_\_\_\_
- Jaundice [ ] Yes  
 [ ] No  
 Duration \_\_\_\_\_
- Weight loss [ ] Yes  
 [ ] No  
 Pounds \_\_\_\_\_

### Laboratory Tests

Alkaline phosphatase \_\_\_\_\_ U/ml (specify type of unit)  
 Total bilirubin \_\_\_\_\_ mg/dl  
 Alpha-fetoprotein (AFP) \_\_\_\_\_ ng/ml  
 Carcinoembryonic antigen (CEA) \_\_\_\_\_ ng/ml

### HISTOPATHOLOGY

- A. Malignant epithelial tumors
1. Adenocarcinoma
    - a. Well differentiated
    - b. Papillary
    - c. Intestinal type
    - d. Pleomorphic giant cell
    - e. Poorly differentiated, small cell
    - f. Signet ring cell

- g. Clear cell
- h. Colloid
  - i. With choriocarcinoma-like areas

2. Squamous cell carcinoma
3. Adenosquamous carcinoma
4. Oat cell carcinoma
5. Others

- B. Malignant mesenchymal tumors
1. Embryonal rhabdomyosarcoma (sarcoma botryoides)
  2. Leiomyosarcoma
  3. Malignant fibrous histiocytoma
  4. Others

- C. Miscellaneous
1. Carcinosarcoma
  2. Carcinoid tumor
  3. Malignant lymphoma
  4. Malignant melanoma
  5. Others

### BIBLIOGRAPHY

1. Albores-Saavedra J, Cruz-Ortiz H, Alcantara-Vazques A, Henson DE: Unusual types of gallbladder carcinoma. *Arch Pathol Lab Med* 105:287-293, 1981
2. Albores-Saavedra J, Henson D: Tumors of the gallbladder and extrahepatic bile ducts. Washington, D.C., Armed Forces Institute of Pathology (in press)
3. Bivins BA, Meeker WR Jr, Griffen WO Jr: Importance of histologic classification of carcinoma of the gallbladder. *Am Surg* 41:121-124, 1975
4. Nevin JE, Moran TJ, Day S, King R: Carcinoma of the gallbladder: Staging, treatment, and prognosis. *Cancer* 37:141-148, 1976
5. Richard PF, Cantin J: Primary carcinoma of the gallbladder: Study of 108 cases. *Can J Surg* 19:27-32, 1976

## GALLBLADDER (ICD-O 156)

### Data Form for Cancer Staging

Patient identification

Name \_\_\_\_\_

Address \_\_\_\_\_

Hospital or clinic number \_\_\_\_\_

Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification

Hospital or clinic \_\_\_\_\_

Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_

Chronology of classification\*  Clinical-diagnostic (cTNM)

Surgical-evaluative (sTNM)

Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G)† \_\_\_\_\_

Postsurgical resection-pathologic (pTNM)

Retreatment (rTNM)  Autopsy (aTNM)

### Definitions: TNM Classification

#### Primary Tumor (T)

- TX Presence of tumor cannot be assessed.
- T0 No evidence of tumor
- Tis Carcinoma *in situ*
- T1 Invasion limited to the lamina propria or to the muscle layer
- T2 Invasion limited to perimuscular connective tissue; no extension beyond serosa or into liver
- T3 Involvement of all layers and direct extension beyond serosa or into one adjacent organ, or both (must be less than 2 cm into the liver)
- T4 Involvement of all layers and direct extension 2 cm or more into liver or into 2 or more adjacent organs (includes stomach, duodenum, colon, pancreas, omentum, extrahepatic bile ducts, and any involvement of liver)

#### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No histologic evidence of metastasis to regional lymph nodes
- N1 Histologically proven metastasis to first station regional lymph nodes
- N2 Histologically proven metastasis to second station regional lymph nodes

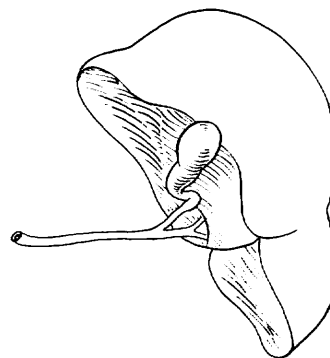
#### Distant Metastasis (M)

- MX Not assessed
- M0 No (known) distant metastasis
- M1 Distant metastasis present

#### Stage Grouping

- Stage 0 Tis, N0, M0
- Stage I T1, T2; N0, M0
- Stage II T3, T4; N0, M0
- Stage III T3, T4; N1, N2; M0
- Stage IV T3, T4; N0-N2; M1

\* Use a separate form each time a case is staged.  
† See reverse side for additional information.



Indicate on diagram primary tumor and regional nodes involved.

#### Site-Specific Information

- Pain  Yes  
 No  
Duration \_\_\_\_\_
- Jaundice  Yes  
 No  
Duration \_\_\_\_\_
- Weight loss  Yes  
 No  
Pounds \_\_\_\_\_

#### Laboratory tests

Alkaline phosphatase \_\_\_\_\_ U/ml (specify type of unit)  
Total bilirubin \_\_\_\_\_ mg/dl  
Alpha-fetoprotein (AFP) \_\_\_\_\_ ng/ml  
Carcinoembryonic antigen (CEA) \_\_\_\_\_ ng/ml

#### Histologic Type of Cancer

- A. Malignant epithelial tumors
- Adenocarcinoma
- Well differentiated
- Papillary
- Intestinal type
- Pleomorphic giant cell
- Poorly differentiated, small cell

Examination by \_\_\_\_\_ M.D.

Date \_\_\_\_\_



- Signet ring cell
- Clear cell
- Colloid
- With choriocarcinoma-like areas
- Squamous cell carcinoma
- Adenosquamous carcinoma
- Oat cell carcinoma
- Others

**B. Malignant mesenchymal tumors**

- Embryonal rhabdomyosarcoma (sarcoma botryoides)
- Leiomyosarcoma
- Malignant fibrous histiocytoma
- Others

**C. Miscellaneous**

- Carcinosarcoma
- Carcinoid tumor
- Malignant lymphoma
- Malignant melanoma
- Others

**Postsurgical Resection Residual Tumor (R)**

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly differentiated

**Performance Status of Host (H)**

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

<i>AJCC</i>	<i>Performance</i>	<i>ECOG Scale</i>	<i>Karnofsky Scale (%)</i>
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

**Extrahepatic  
Bile Ducts  
(Exclusive of  
Ampulla and  
Intrapancreatic  
Bile Duct)**

**TNM CLASSIFICATION (ICD-O 156.1)**

**Primary Tumor (T)**

- TX Presence of tumor cannot be assessed.
- T0 No evidence of tumor
- Tis Carcinoma *in situ*
- T1 Invasion limited to wall
- T2 Invasion limited to periductal connective tissues
- T3 Involvement of all layers and direct extension into one adjacent major vessel or organ
- T4 Involvement of all layers and direct extension beyond secondary ductal bifurcation or into two or more adjacent organs including the following:
  - Liver
  - Pancreas
  - Duodenum
  - Stomach
  - Colon
  - Omentum
  - Gallbladder

**Nodal Involvement (N)**

- NX Minimum requirements to assess regional nodes cannot be met.
- N0 No histologic evidence of metastasis to regional lymph nodes
- N1 Histologically proven metastasis to first station regional lymph nodes
- N2 Histologically proven metastasis to second station regional lymph nodes

**Distant Metastasis (M)**

- MX Not assessed
- M0 No (known) distant metastasis
- M1 Distant metastasis

**Stage Grouping**

- Stage 0 Tis, N0, M0  
 Stage I T1, T2; N0, M0  
 Stage II T3, T4; N0, M0  
 Stage III T3, T4; N1, N2; M0  
 Stage IV T3, T4; N0-N2; M1

**Postsurgical Resection Residual Tumor (R)**

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor  
 Specify \_\_\_\_\_

**Other Site-Specific Information**

- Location of tumor [ ] Upper third  
 [ ] Middle third  
 [ ] Lower third  
 [ ] Diffuse  
 Duct obstruction [ ] Complete  
 [ ] Incomplete  
 Jaundice [ ] Yes  
 [ ] No  
 Duration \_\_\_\_\_  
 Cholangiographic appearance [ ] Papillary or polypoid  
 [ ] Nodular or protuberant  
 [ ] Diffusely infiltrating or sclerosing  
 [ ] Annular stricture or constriction  
 [ ] Not classifiable

**Laboratory Tests**

- Bilirubin \_\_\_\_\_ mg/dl  
 Alkaline phosphatase \_\_\_\_\_ U/ml (specify type of unit)  
 Carcinoembryonic antigen (CEA) \_\_\_\_\_ ng/ml  
 Alpha-fetoprotein (AFP) \_\_\_\_\_ ng/ml

**HISTOPATHOLOGY**

- A. Malignant epithelial tumors  
 1. Adenocarcinoma  
 a. Well differentiated  
 b. Papillary  
 c. Intestinal type  
 d. Pleomorphic giant cell  
 e. Poorly differentiated, small cell  
 f. Signet ring cell  
 g. Clear cell  
 h. Colloid  
 i. With choriocarcinoma-like areas  
 2. Squamous cell carcinoma  
 3. Adenosquamous carcinoma  
 4. Oat cell carcinoma  
 5. Others  
 B. Malignant mesenchymal tumors  
 1. Embryonal rhabdomyosarcoma (sarcoma botryoides)  
 2. Leiomyosarcoma  
 3. Malignant fibrous histiocytoma  
 4. Others  
 C. Miscellaneous  
 1. Carcinosarcoma  
 2. Carcinoid tumor  
 3. Malignant lymphoma  
 4. Malignant melanoma  
 5. Others

**BIBLIOGRAPHY**

- Albores-Saavedra J, Henson D: Tumors of the Gallbladder and Extrahepatic Bile Ducts. Washington, D.C., Armed Forces Institute of Pathology (in press)
- Bedikian AY, Valdivieso M, de la Cruz A et al: Cancer of the extrahepatic bile ducts. *Med Ped Oncol* 8:53-61, 1980
- Braasch JW, Warren KW, Kune GA: Malignant neoplasms of the bile ducts. *Surg Clin North Am* 47:627-628, 1967

# EXTRAHEPATIC BILE DUCTS (ICD-O 156.1)

## Data Form for Cancer Staging

Patient identification  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
[ ] Surgical-evaluative (sTNM)  
Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
[ ] Postsurgical resection-pathologic (pTNM)  
[ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

- TX Presence of tumor cannot be assessed.
- T0 No evidence of tumor
- Tis Carcinoma *in situ*
- T1 Invasion limited to wall
- T2 Invasion limited to periductal connective tissues
- T3 Involvement of all layers and direct extension into one adjacent major vessel or organ
- T4 Involvement of all layers and direct extension beyond secondary ductal bifurcation or into two or more adjacent organs including: liver, pancreas, duodenum, stomach, colon, omentum, gallbladder

### Nodal Involvement (N)

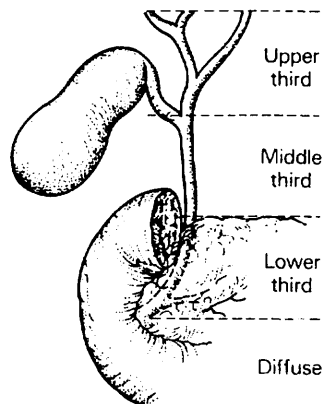
- NX Minimum requirements to assess regional nodes cannot be met.
- N0 No histologic evidence of metastasis to regional lymph nodes
- N1 Histologically proven metastasis to first station regional nodes
- N2 Histologically proven metastasis to second station regional lymph nodes

### Distant Metastasis (M)

- MX Not assessed
- M0 No (known) distant metastasis
- M1 Distant metastasis

### Stage Grouping

- Stage 0 Tis, N0, M0
- Stage I T1, T2; N0, M0
- Stage II T3, T4; N0, M0
- Stage III T3, T4; N1, N2; M0
- Stage IV T3, T4; N0-N2; M1



Indicate on diagram primary tumor and regional nodes involved.

### Site-Specific Information

- Location of tumor [ ] Upper  
[ ] Middle  
[ ] Lower  
[ ] Diffuse
- Duct obstruction [ ] Complete  
[ ] Incomplete
- Jaundice [ ] Yes  
[ ] No  
Duration \_\_\_\_\_
- Cholangiographic appearance [ ] Papillary or polypoid  
[ ] Nodular or protuberant  
[ ] Diffusely infiltrating or sclerosing  
[ ] Annular stricture or constriction  
[ ] Not classifiable

### Laboratory Tests

Bilirubin \_\_\_\_\_ mg/dl  
Alkaline phosphatase \_\_\_\_\_ U/ml (specify type of unit)  
Carcinoembryonic antigen (CEA) \_\_\_\_\_ ng/ml  
Alpha-fetoprotein (AFP) \_\_\_\_\_ ng/ml

Examination by \_\_\_\_\_ M.D.  
Date \_\_\_\_\_

\*Use a separate form each time a case is staged.  
†See reverse side for additional information.

## Histologic Type of Cancer

- A. Malignant epithelial tumor
- Adenocarcinoma
    - Well differentiated
    - Papillary
    - Intestinal type
    - Pleomorphic giant cell
    - Poorly differentiated, small cell
    - Signet ring cell
    - Clear cell
    - Colloid
    - With choriocarcinoma-like areas
  - Squamous cell carcinoma
  - Adenosquamous carcinoma
  - Oat cell carcinoma
  - Others
- B. Malignant mesenchymal tumors
- Embryonal rhabdomyosarcoma (sarcoma botryoides)
  - Leiomyosarcoma
  - Malignant fibrous histiocytoma
  - Others
- C. Miscellaneous
- Carcinosarcoma
  - Carcinoid tumor
  - Malignant lymphoma
  - Malignant melanoma
  - Others

## Postsurgical Resection Residual Tumor (R)

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

## Tumor Grade (G)

- G1 Well differentiated
- G2 Moderately differentiated
- G3-G4 Poorly differentiated

## Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20



## Pancreas

Collection of objective data to classify and stage cancer of the exocrine pancreas is still in progress. A protocol exists and can be obtained from the AJCC.\* The following classification is recommended to be field-tested prospectively and evaluated for future refinement.

### ANATOMY (ICD-O 157)

**Primary Site.** The *pancreas* is a long, lobulated structure that lies transversely in the posterior abdomen, located retroperitoneally in the concavity of the duodenum on its right end and touching the spleen on its left end. The shape of the pancreas may be compared to the letter "J" placed sideways. It is divisible into a head with an uncinete process, a neck, a body, and a tail.

**Nodal Stations.** There is a rich lymphatic network surrounding the pancreas, with left splenic and superior and inferior right side truncal drainage. The first station nodes include celiac, splenic, suprapancreatic, left gastropancreatic, hepatic artery, inferior pancreatic, juxta-aortic, anterior pancreatic duodenal, and posterior pancreatic duodenal. Juxtaregional nodes include the inferior portion of the para-aortic nodal drainage and mediastinal and mesenteric nodes.

**Metastatic Sites.** Distant spread occurs mainly to liver and lungs, with a lesser degree of involvement of bones and brain and other anatomic sites.

### RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** The pancreas is inaccessible to physical examination. Laboratory and radiographic procedures are available but are largely diagnostic and investigative. These studies include upper gastrointestinal x-ray films, hypotonic duodenography, computed tomography (CT), pharmacodynamic angiography, ultrasonic scanning, aspiration biopsy or cytology of the pancreas, radioisotopic scanning of the pancreas,

\*The American Joint Committee Office, 55 East Erie Street, Chicago, IL 60611

endoscopic retrograde cholangiopancreatography, and laparoscopy. Routine procedures to identify metastases include roentgenogram of the chest, SMA-12, and liver scan (radionuclide or CT).

**Surgical-Evaluative Staging.** Laparotomy and surgical exploration of the pancreas is a more accurate means of assessing the true anatomic extent of the tumor. Fine needle aspiration biopsy or biopsy of the tumor and associated nodes may confirm the anatomic and pathologic extent of the cancer.

**Postsurgical Resection-Pathologic Staging.** Complete or subtotal resection of the pancreas and its tumor and associated nodes with pathologic analysis is assigned to the pathologic classification.

**Retreatment Staging.** Biopsy is essential to establish recurrence of the disease, and complete workup of metastatic disease in other compartments is recommended.

## TNM CLASSIFICATION

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 No direct extension of the primary tumor beyond the pancreas
- T2 Limited direct extension to duodenum, bile ducts, or stomach, still possibly permitting tumor resection
- T3 Further direct extension (incompatible with surgical resection)

### Regional Lymph Node Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 Regional nodes not involved
- N1 Regional nodes involved

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Eye	EYE
Lymph nodes	LYM	Other	OTH

Add + to the abbreviated notation to indicate that the pathology (p) is proved.

## POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

## STAGE GROUPING

- Stage I T1, T2, N0, M0; no (or unknown) direct extension, or limited direct extension of tumor to adjacent viscera, with no (or unknown) regional node extension and absence of distant metastases. *Limited direct extension* is defined as involvement of organs adjacent to the pancreas (duodenum, common bile duct, or stomach) that could be removed *en bloc* with the pancreas if a curative resection were attempted.
- Stage II T1-T3, N1, M0; regional node metastases tumor into adjacent viscera with no (or unknown) lymph node involvement and no distant metastases, which preclude surgical resection.
- Stage III T1-T3, N1, M0; regional node metastases without clinical evidence of distant metastases
- Stage IV T1-T3, N0-N1, M1; distant metastatic disease in liver or other sites

## HISTOPATHOLOGY

- Duct cell adenocarcinoma
- Giant cell carcinoma (pleomorphic carcinoma)
- Giant cell carcinoma (epulis type) with osteoid
- Adenosquamous carcinoma
- Microadenocarcinoma
- Mucinous (colloid) carcinoma
- Cystadenocarcinoma
- Acinar cell adenocarcinoma
- Pancreatoblastoma
- Papillary cystic tumor
- Mixed type
- Unclassified  
Specify \_\_\_\_\_

## TUMOR GRADE (G)

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated
- Use whichever indicator is most appropriate (term or G + number).

## BIBLIOGRAPHY

- Pollard HM et al: Staging of cancer of the pancreas. *Cancer* 47:1631-1637, 1981

# PANCREAS (ICD-O 157)

## Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G)† \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

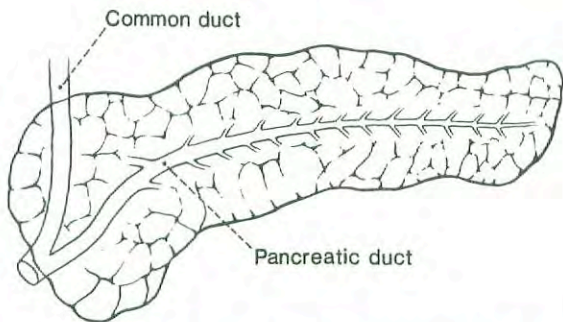
- TX Minimum requirements to assess the primary tumor cannot be met.
- T1 No direct extension of the primary tumor beyond the pancreas
- T2 Limited direct extension to duodenum, bile ducts, or stomach, still possibly permitting tumor resection
- T3 Further direct extension (incompatible with surgical resection)

### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 Regional nodes not involved
- N1 Regional nodes involved

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_



Indicate on diagram primary tumor and regional nodes involved.

### Location in Pancreas

- Head
  - Body
  - Tail
  - Diffuse
- Size (largest diameter) \_\_\_\_\_ cm

\*Use a separate form each time a case is staged.  
 †See reverse side for additional information.

## Nodes

Number positive \_\_\_\_\_  
 Location \_\_\_\_\_

### Stage Grouping

- Stage I T1, T2; N0, M0
- Stage II T3, N0, M0
- Stage III T1-T3, N1, M0
- Stage IV T1-T3, N0-N1, M1

## Other Site-Specific Information

### Diagnostic Confirmation

- History  Pain Duration \_\_\_\_\_  
 Jaundice Duration \_\_\_\_\_  
 Weight loss Duration \_\_\_\_\_  
 Diabetes mellitus Duration \_\_\_\_\_
- Physical findings  Abdominal mass  
 Ascitic fluid
- Roentgenogram  Arteriography  
 CT scan  
 Endoscopic retrograde cholangiopancreatography (ERCP)  
 Ultrasound results \_\_\_\_\_
- Cytology  Duodenal fluid  
 ERCP  
 Needle  
 Ascitic fluid
- Pathology  From pancreas  
 Extrapancreatic  
 Type \_\_\_\_\_

### Histopathology

- Duct cell adenocarcinoma
- Giant cell carcinoma (pleomorphic carcinoma)
- Giant cell carcinoma (epulis type) with osteoid
- Adenosquamous carcinoma
- Microadenocarcinoma
- Mucinous (colloid) carcinoma
- Cystadenocarcinoma
- Acinar cell adenocarcinoma
- Pancreatoblastoma
- Papillary cystic tumor
- Mixed type
- Unclassified  
Specify \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

### Postsurgical Resection Residual Tumor (R)

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

### Tumor Grade (G)

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

### Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

# LUNG

16

## ANATOMY (ICD-O 162)

**Primary Site.** The mucosa lining the bronchus is the usual site of origin of cancer of the lung. The trachea, which lies in the anterior mediastinum, divides into right and left main bronchi that extend into the right and left lungs, respectively, and then divide into lobar bronchi for the upper, middle, and lower lobes on the right and the upper and lower lobes on the left. The lungs are encased in membranes called visceral pleura and the chest cavity is lined by a similar membrane called parietal pleura. The potential space between these two membranes is the pleural space.

**Nodal Stations.** The first station lymph nodes are the intrapulmonary, peribronchial, and hilar lymph nodes, which are contained within the visceral pleural reflections. Second station lymph nodes are those in the mediastinum and may be paraesophageal, subcarinal, paratracheal, aortic, and pretracheal or retrotracheal. Involvement of scalene and more distant nodes is considered distant metastasis.

**Metastatic Sites.** Lung cancer may metastasize to any distant site, the more common being scalene, supraclavicular, and other cervical lymph nodes, liver, brain, bones, adrenals, kidney, and contralateral lung, including contralateral hilar lymph nodes.

## RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** This should be based on the anatomic extent of the disease that can be detected by examination before thoracotomy or the implementation of any treatment. Such an examination may include a medical history, physical examination, routine and special roentgenograms, endoscopic examinations including bronchoscopy, esophagoscopy, mediastinoscopy, mediastinotomy, thoracentesis, or thoracoscopy, and any other examinations, including those used to demonstrate the presence of extrathoracic metastasis.

**Postsurgical Resection-Pathologic Staging.** The surgical pathology report and all other available data should be used to assign



a postsurgical treatment classification to those patients who have a resection.

**Surgical-Evaluative Staging.** This should be based on all of the data obtained for the clinical-diagnostic classification and on information obtained at the time of exploratory thoracotomy, including biopsy but not including that information obtained by complete examination of a therapeutically resected specimen.

**Retreatment Staging.** In the course of follow-up examinations, a patient may manifest evidence of progressive disease indicating treatment failure. Before initiating further treatment, the extent of tumor should be reassessed carefully, using all available information, and the patient should again be staged under the retreatment classification.

**Autopsy Staging.** In case of death of a lung cancer patient, the extent of the cancer, if any, found at autopsy may be recorded by the TNM system and an autopsy stage may be reported.

## TNM CLASSIFICATION

### Primary Tumor (T)

- TX Tumor either proven by the presence of malignant cells in bronchopulmonary secretions but not visualized roentgenographically or bronchoscopically or cannot be assessed
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 A tumor that is 3.0 cm or less in greatest diameter, surrounded by lung or visceral pleura, and without evidence of invasion proximal to a lobar bronchus at bronchoscopy
- T2 A tumor more than 3.0 cm in greatest diameter or a tumor of any size that either invades the visceral pleura or has associated atelectasis or obstructive pneumonitis extending to the hilar region. At bronchoscopy, the proximal extent of demonstrable tumor must be within a lobar bronchus or at least 2.0 cm distal to the carina. Any associated atelectasis or obstructive pneumonitis must involve less than an entire lung, and there must be no pleural effusion.
- T3 A tumor of any size with direct extension into an adjacent structure such as the parietal pleura or chest wall, the diaphragm, or the mediastinum and its contents; a tumor bronchoscopically demonstrable to involve a main bronchus less than 2.0 cm distal to the carina; any tumor associated with atelectasis or obstructive pneumonitis of an entire lung or pleural effusion

### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No evidence of involvement of regional lymph nodes
- N1 Metastasis to lymph nodes in the peribronchial or the ipsilateral hilar region, or both, including direct extension
- N2 Metastasis to lymph nodes in the mediastinum

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No evidence of distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Eye	EYE
Lymph nodes	LYM	Other	OTH

## POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

## STAGE GROUPING

Occult Stage: TX, N0, M0

An occult carcinoma with bronchopulmonary secretions containing malignant cells but without other evidence of the primary tumor or evidence of metastasis to the regional lymph nodes or distant metastasis

### Stage I: Tis, N0, M0

Carcinoma *in situ*

- T1, N0, M0  
T1, N1, M0  
T2, N0, M0

A tumor that can be classified T1 without any metastasis or with metastasis to the lymph nodes in the peribronchial or ipsilateral hilar region only, or a tumor that can be classified T2 without any metastasis to nodes or distant metastasis

*Note:* TX, N1, M0 and T0, N1, M0 are also theoretically possible, but such a clinical diagnosis would be difficult if not impossible to make. If such a diagnosis is made, it would be included in stage I.

**Stage II: T2, N1, M0**

A tumor classified as T2 with metastasis to the lymph nodes in the peribronchial or ipsilateral hilar region only

**Stage III**

T3 with any N or M

N2 with any T or M

M1 with any T or N

Any tumor more extensive than T2, any tumor with metastasis to the lymph nodes in the mediastinum, or any tumor with distant metastasis

*Note:* Staging grouping is significant for all cell types listed under Histopathology except undifferentiated small cell (oat cell) carcinoma in which there is no significant relation between stage and survival rates. Nevertheless, the anatomic extent of small cell cancers may be recorded by the TNM system for future reference. This system has not been applied to the rarer lung tumors such as carcinoids, cylindromas, mucoepidermoids, and so forth.

**HISTOPATHOLOGY**

There are four major cells types of lung cancer:

1. Squamous cell (epidermoid) carcinoma
2. Adenocarcinoma including alveolar cell or terminal bronchiolar carcinoma
3. Undifferentiated large cell carcinoma
4. Undifferentiated small cell carcinoma including oat cell carcinoma

**Tumor Grade (G)**

G1 Well differentiated

G2 Moderately well differentiated

G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G+ number).

**PERFORMANCE STATUS OF HOST (H)**

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

**SOME SUGGESTIONS FOR THE APPLICATION OF THE LUNG CANCER STAGING SYSTEM**

The TNM system can be applied to most patients with lung cancer with certainty and the proper stage can be designated with consistency. One group of 15 patients was staged independently by 26 physicians and research assistants with more than 90% consistency in the TNM designation and the assignment of a stage for each patient.

However, it has become apparent that there are some areas of uncertainty and disagreement about the application of the system to certain confusing combinations of circumstances, and the following suggestions are made in the hope that they will increase the consistency of staging patients with lung cancer.

T0 is to be used when there is no demonstrable evidence of the primary tumor in the lung but there is evidence of metastatic cancer in a lymph node or elsewhere justifying an N1, N2, or M1 designation and it is concluded clinically that the primary is in the lung. T0 may also be used in the retreatment staging of a patient who had resection of his cancer and has proof of recurrence in the regional lymph nodes or a distant metastasis without evidence of recurrence in the lung.

TX is used when a patient has a positive sputum for malignant cells but a negative roentgenogram of the chest and a negative bronchoscopic examination. Such a designation is usually temporary because in most cases the source of the positive sputum can be localized and a proper T designation can be assigned. TX may also be used in the retreatment staging when it is impossible to evaluate the extent of residual primary tumor after radiotherapy and the development of radiation pneumonitis and fibrosis in the field of the radiotherapy.

Multiple synchronous tumors of different histologic cell types should be considered separate primary lung cancers and each one should be staged separately. If they are of the same cell type, they may be separate primaries or one may be the primary and the other one a metastasis. If there is evidence that both are primary lesions (*e.g.*, typical transition from normal bronchial epithelium to carcinoma *in situ* to invasive carcinoma), they should be staged separately even though they are of the same cell type. If there is inadequate evidence to support a diagnosis of separate primary cancers and the "metastatic lesion" is in the contralateral lung, the designation M1 should be used. If both lesions are in the same lung, it is recommended that the designation T2 be used unless there is evidence of T3 disease. This recommendation is based on preliminary unpublished data suggesting

that such cases have a relatively favorable prognosis following surgical treatment. However, more data are needed, so these cases should be analyzed in a separate group to determine the significance of such multiple ipsilateral lesions of the same cell type.

T2 is used when there is direct extension into the visceral pleura, but T3 is used if the lesion invades directly the parietal pleura covering the mediastinum and pericardium as well as that lining the chest wall and covering the diaphragm. Any ipsilateral discontinuous lesion or lesions in or on the visceral or parietal pleura should be designated T3. However, a discontinuous lesion outside the parietal pleura in the chest wall or diaphragm should be designated M1. In contrast, a similar lesion in the mediastinum is most likely a lymph node that has been replaced completely by cancer cells and should be designated N2.

Accurate clinical-diagnostic classification of hilar masses may be difficult. If the hilar mass can be separated from the mediastinum, hilar tomograms may indicate whether the mass is the primary tumor or metastatic disease in the hilar lymph nodes and the appropriate T and N designation may be assigned to the patient. If the hilar mass cannot be separated from the mediastinum, especially if there is a broad base of the lesion against the mediastinum, direct extension into the mediastinum is probable and the lesion should be designated T3. Vocal cord paralysis, superior vena caval obstruction, and compression of the trachea or the esophagus are usually related to metastases to the mediastinal lymph nodes and should be classified N2.

N1 is to be used whenever there is lymph node involvement within the lung or the hilar area within the reflections of the visceral pleura or its sagittal plane. Any nodal involvement medial to this should be considered mediastinal nodal metastasis and designated N2.

The M1 designation should be used *only* when there is reasonable proof of metastatic cancer, not

just when it is possible. For example, elevated serum alkaline phosphatase without other evidence of metastatic cancer in liver or bone would not justify the designation M1.

In all cases, the designation of the greatest extent of disease that is applicable for a given patient should be used but only when there is reasonable evidence of that extent of the disease.

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3. Ishikawa S: Staging system on TNM classification for lung cancer. *Jpn J Clin Oncol* 6:19-30, 1973
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8. Mountain CF: A method for the assessment of operation in the control of lung cancer. *Ann Thorac Surg* 24:365-373, 1977
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10. Suemasu K, Ogata T, Yoneyama T, Naruke T, Ishikawa S: Evaluation of the clinical TNM in comparison with the surgico-pathological TNM in peripheral type lung cancer. *Jpn J Clin Oncol* 7:9-13, 1977
11. TNM Classification of Malignant Tumours, 3rd ed. Geneva, International Union Against Cancer (UICC), 1978



# LUNG (ICD-O 162)

## Data Form for Cancer Staging

### Patient identification

Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

### Institutional identification

Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

- TX Tumor proven by the presence of malignant cells in bronchopulmonary secretions but not visualized roentgenographically or bronchoscopically; any tumor that cannot be assessed
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 Tumor 3.0 cm or less in greatest diameter, surrounded by lung or visceral pleura, and without evidence of invasion proximal to a lobar bronchus at bronchoscopy
- T2 Tumor more than 3.0 cm in greatest diameter, or a tumor of any size that either invades the visceral pleura or has associated atelectasis or obstructive pneumonitis extending to the hilar region. At bronchoscopy, the proximal extent of demonstrable tumor must be within a lobar bronchus or at least 2.0 cm distal to the carina. Any associated atelectasis or obstructive pneumonitis must involve less than an entire lung and there must be no pleural effusion.
- T3 Tumor of any size with direct extension into an adjacent structure such as the parietal pleura or the chest wall, the diaphragm, or the mediastinum and its contents; a tumor bronchoscopically demonstrable to involve a main bronchus less than 2.0 cm distal to the carina; any tumor associated with atelectasis or obstructive pneumonitis of an entire lung or pleural effusion

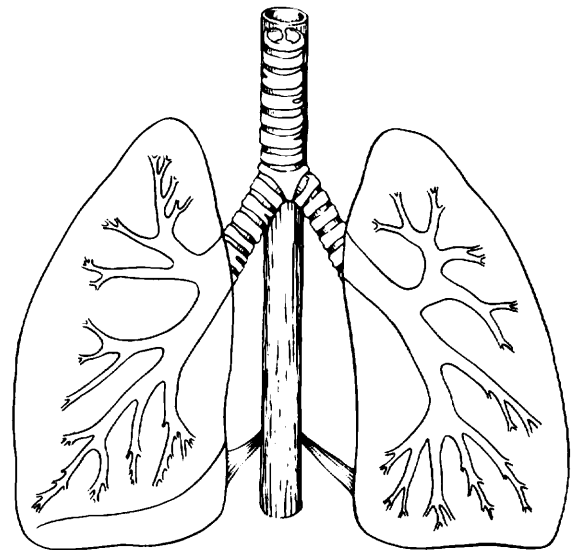
### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No evidence of involvement of regional lymph nodes
- N1 Metastasis to lymph nodes in the peribronchial or the ipsilateral hilar region, or both, including direct extension
- N2 Metastasis to lymph nodes in the mediastinum

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No evidence of distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Further definition of T, N, M can be found on reverse side.



Show primary tumor, indicating size in cm (greatest diameter) and measurability:

EV = evaluable  
ME = measurable  
NE = nonevaluable

Show lymph node metastasis.

## Stage Grouping

- Occult stage TX, N0, M0  
Occult carcinoma with bronchopulmonary secretions containing malignant cells but without other evidence of the primary tumor or evidence of metastasis to the regional lymph nodes or distant metastasis
- Stage I Tis, N0, M0  
Carcinoma *in situ*  
T1, N0, M0  
T1, N1, M0  
T2, N0, M0  
Tumor that can be classified T1 without any metastasis or with metastasis to the lymph nodes in the peribronchial or ipsilateral hilar region only or a tumor that can be classified T2 without any metastasis to nodes or distant metastasis  
*Note:* TX, N1, M0 and T0, N1, M0 are also theoretically possible, but such a clinical diagnosis would be difficult if not impossible to make. If such a diagnosis is made, it should be included under stage I.

\*Use a separate form each time a case is staged.  
†See reverse side for additional information.

Examination by \_\_\_\_\_ M.D.  
Date \_\_\_\_\_

- Stage II T2, N1, M0  
Tumor classified as T2 with metastasis to the lymph nodes in the peribronchial or ipsilateral hilar region only
- Stage III T3 with any N or M  
N1 with any T or M  
N2 with any T or M

Any tumor more extensive than T2, any tumor with metastasis to the lymph nodes in the mediastinum, or any tumor with distant metastasis

### Histopathology

Squamous cell carcinoma, adenocarcinoma, undifferentiated small cell (oat cell) cancer

Cell type (check one):

- Squamous
- Small
- Large
- Adenocarcinoma
- Alveolar
- Other \_\_\_\_\_

### Histologic Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

### Postsurgical Resection-Pathologic Residual Tumor (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

### Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

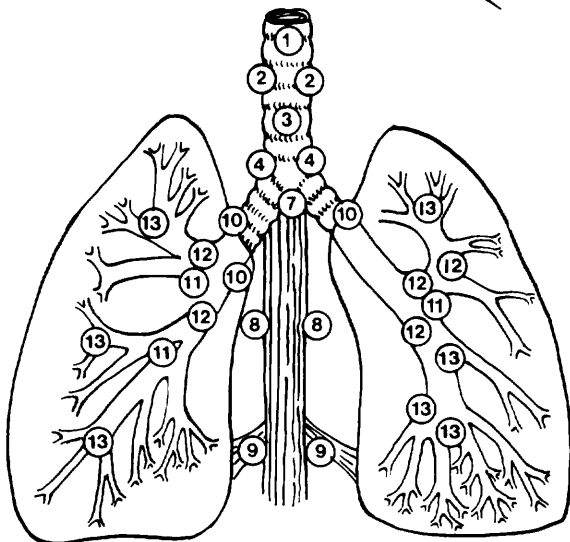
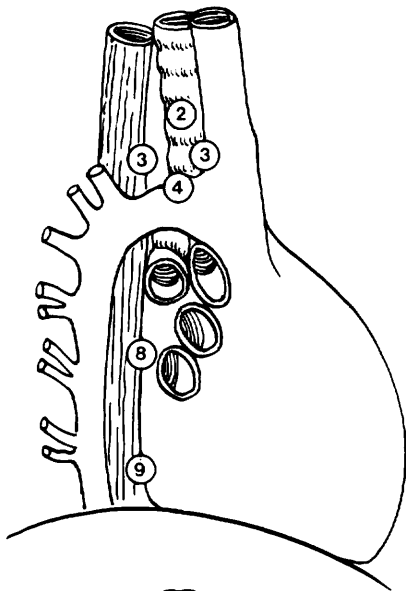
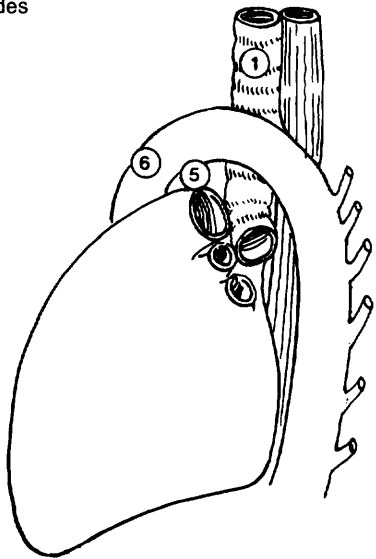
AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

### TNM Classification

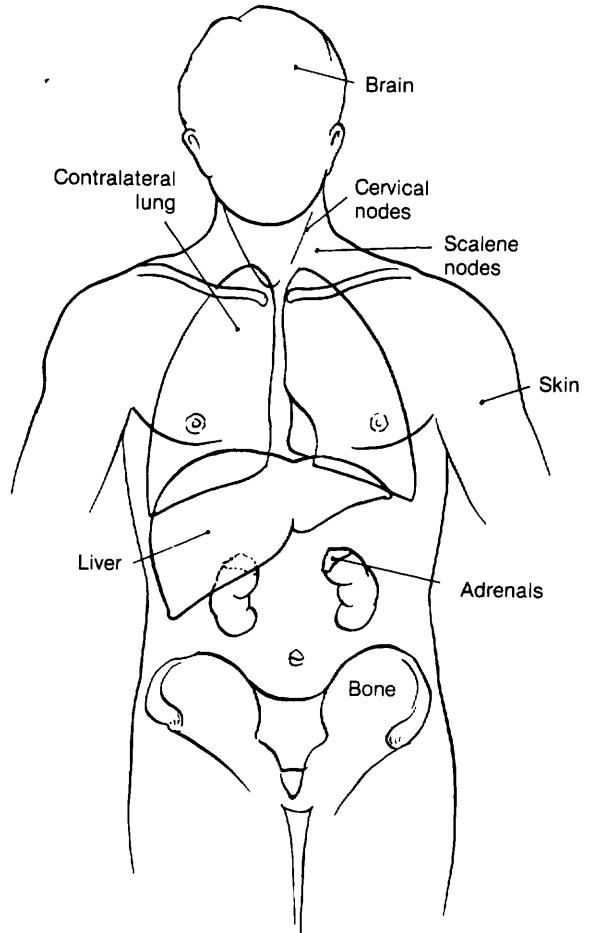
Primary Tumor					TNM Classification
Size	Intra-bronchial Location	Extra-pulmonary Extension	Atelectasis or Pneumonitis	Pleural Effusion	
Positive bronchopulmonary secretions without demonstrable tumor or cannot be assessed					<input type="checkbox"/> TX
No evidence of primary tumor					<input type="checkbox"/> T0
Carcinoma <i>in situ</i>					<input type="checkbox"/> Tis
3 cm or less <input type="checkbox"/>	Not proximal to lobar bronchus <input type="checkbox"/>	None <input type="checkbox"/>	None or peripheral only <input type="checkbox"/>	None <input type="checkbox"/>	T1
More than 3 cm <input type="checkbox"/>	≥2 cm distal to carina <input type="checkbox"/>	None <input type="checkbox"/>	Extends to hilar region but < entire lung <input type="checkbox"/>	None <input type="checkbox"/>	T2
Any size <input type="checkbox"/>	<2 cm distal to carina <input type="checkbox"/>	Chest wall, diaphragm, or mediastinum <input type="checkbox"/>	Involves entire lung <input type="checkbox"/>	Present <input type="checkbox"/>	T3
Regional Nodes					
No demonstrable metastasis to regional lymph nodes					<input type="checkbox"/> N0
Metastasis to peribronchial or ipsilateral hilar nodes					<input type="checkbox"/> N1
Metastasis to mediastinal lymph nodes					<input type="checkbox"/> N2
Distant Metastasis					
No (known) distant metastasis					<input type="checkbox"/> M0
Distant metastasis present (specify)					<input type="checkbox"/> M1



N-Regional nodes



Indicate on diagrams primary tumor and regional nodes involved.



Distant metastases beyond hemithorax  
Indicate all known metastases.

**N2 Nodes**

**Superior mediastinal nodes**

1. Highest mediastinal
2. Upper paratracheal
3. Pre- and retrotracheal
4. Lower paratracheal (including azygos nodes)

**Aortic nodes**

5. Subaortic (aortic window)
6. Para-aortic (ascending aorta or phrenic)

**Inferior mediastinal nodes**

7. Subcarinal
8. Paraesophageal (below carina)
9. Pulmonary ligament

**N1 Nodes**

10. Hilar
11. Interlobar
12. Lobar
13. Segmental

# MUSCULOSKELETAL SITES

# 17

## Bone

Classification and staging of bone tumors is still being considered by the Task Force on Bone Tumors, and further recommendations may be made in the future. In the meantime, it is suggested that the following definitions and stage grouping be used.

### **TNM CLASSIFICATION (ICD-O 170)**

#### **Primary Tumor (T)**

- TX Minimum requirements to assess primary tumor cannot be met.  
T0 No evidence of primary tumor  
T1 Tumor confined within the cortex of the bone  
T2 Tumor extending beyond the cortex of the bone

*Note:* Juxtacortical (parosteal) sarcomas should be considered separately.

#### **Regional Lymph Nodes (N)**

- NX Minimum requirements to assess the regional nodes cannot be met.  
N0 Regional lymph nodes do not contain metastatic deposits.  
N1 Regional lymph nodes contain metastatic deposits.

#### **Distant Metastasis (M)**

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.  
M0 No (known) metastasis  
M1 Distant metastasis  
Specify \_\_\_\_\_

#### **Histologic Grade**

- G1 Well differentiated  
G2 Moderately well differentiated  
G3-G4 Poorly differentiated, anaplastic

*Note:* Ewing's sarcoma and malignant lymphoma are G3-G4.

**STAGE GROUPING**

Stage IA	G1, G2; T1, N0, M0
Stage IB	G1, G2; T2, N0, M0
Stage IIA	G3-G4; T1, N0, M0
Stage IIB	G3-G4; T2, N0, M0
Stage III	None yet defined
Stage IVA	Any G, any T, N1, M0
Stage IVB	Any G, any T, any N, M1

**HISTOPATHOLOGY**

See bibliography for reference material.

- A. Bone-forming
  1. Osteosarcoma (osteogenic sarcoma)
  2. Juxtacortical osteosarcoma (parosteal osteosarcoma)
- B. Cartilage-forming
  1. Chondrosarcoma
  2. Juxtacortical chondrosarcoma
  3. Mesenchymal chondrosarcoma
- C. Giant cell tumor, malignant
- D. Marrow tumors
  1. Ewing's sarcoma
  2. Malignant lymphoma of bone
  3. Myeloma
- E. Vascular tumors
  1. Hemangioendothelioma
  2. Hemangiopericytoma
  3. Angiosarcoma
- F. Connective tissue tumors
  1. Fibrosarcoma
  2. Liposarcoma
  3. Malignant mesenchymoma
  4. Undifferentiated sarcoma
- G. Other tumors
  1. Chordoma
  2. "Adamantinoma" of long bones

**RESIDUAL TUMOR (R)**

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor  
 Specify \_\_\_\_\_

**PERFORMANCE STATUS OF HOST**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

**PROCEDURES RECOMMENDED FOR STAGING BY AJCC SYSTEM**

- A. Essential procedures
  1. History
  2. Physical examination
  3. Usual admission clinical pathology tests (such as blood chemistry, *etc.*)
  4. Plain radiography of involved site
  5. Cytohistologic examination of the lesion (Plan biopsy site anticipating field of later therapy.)
- B. Selected procedures
  1. Computed tomography for lesions of trunk, pelvic girdle, shoulder girdle to determine anatomic extent and site for biopsy
  2. The following are indicated if plain radiograph indicates malignant tumor:
    - a. Radiographs of chest
    - b. Radionuclide bone scan  
Comparison radiograph of positive areas
  3. If biopsy diagnosis is primary sarcoma of bone and not a metastasis, perform pulmonary tomography or computed tomography.

**BIBLIOGRAPHY**

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# BONE (ICD-O 170)

## Data Form for Cancer Staging

### Patient identification

Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

### Institutional identification

Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_

Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)

Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G)† \_\_\_\_\_

Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

TX Minimum requirements to assess the primary tumor cannot be met.

T0 No evidence of primary tumor

T1 Tumor confined within the cortex of the bone.

T2 Tumor extends beyond the cortex of the bone.

Note: Juxtacortical (parosteal) sarcomas should be considered separately.

### Regional Lymph Nodes (N)

NX Minimum requirements to assess the regional nodes cannot be met.

N0 Regional lymph nodes do not contain metastatic deposits.

N1 Regional lymph nodes contain metastatic deposits.

### Distant Metastasis (M)

MX Minimum requirements to assess the presence of distant metastasis cannot be met.

M0 No (known) metastasis

M1 Distant metastasis  
Specify \_\_\_\_\_

Describe location, size, and characteristics of tumor.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Stage Grouping

STAGE I

IA: G1, G2; T1, N0, M0

IB: G1, G2; T2, N0, M0

STAGE II

IIA: G3-G4, T1, N0, M0

IIB: G3-G4, T2, N0, M0

STAGE III

None yet defined

STAGE IV

IVA: Any G, any T, N1, M0

IVB: Any G, any T, any N, M1

## Procedures Recommended for Staging by AJCC System

### Essential for staging

1. History
2. Physical examination
3. Usual admission clinical pathology tests (blood chemistry, etc.)
4. Plain radiography of involved site
5. Cytohistologic examination of the lesion  
Plan biopsy site, anticipating field of later therapy.

### Selected procedures

1. Computed tomography for lesions of the trunk, pelvic girdle, and shoulder girdle to determine the anatomic extent of the tumor and the site for biopsy
2. The following are indicated if the plain radiograph indicates the presence of a malignant tumor:
  - a. Radiographs of the chest
  - b. Radionuclide bone scan  
Comparison radiograph of positive areas
3. If the biopsy diagnosis is a primary sarcoma of the bone and not a metastasis:  
Pulmonary tomography or computed tomography

## Histopathology‡

### A. Bone-forming tumors

Osteosarcoma (osteogenic sarcoma)

Juxtacortical osteosarcoma (parosteal osteosarcoma)

### B. Cartilage-forming tumors

Chondrosarcoma

Juxtacortical chondrosarcoma

Mesenchymal chondrosarcoma

### C. Giant cell tumor, malignant

### D. Marrow tumors

Ewing's sarcoma

Malignant lymphoma

Myeloma

### E. Vascular tumors

Hemangioendothelioma

Hemangiopericytoma

Angiosarcoma

### F. Connective-tissue tumors

Fibrosarcoma

Liposarcoma

Malignant mesenchymoma

Undifferentiated sarcoma

‡World Health Organization: Histological Typing of Bone Tumours: International Classification of Tumours, No. 6. Geneva, World Health Organization, 1972

\* Use a separate form each time a case is staged.

† See reverse side for additional information.

Examination by \_\_\_\_\_ M.D.

Date \_\_\_\_\_

G. Other tumors

- Chordoma
- Adamantinoma of long bones

**Histologic Grade**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3–G4 Poorly to very poorly differentiated

**Postsurgical Resection–Pathologic Residual Tumor (R)**

Does not enter into staging but may be a factor in deciding further treatment.

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

**Performance Status of Host (H)**

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90–100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70–80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50–60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30–40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10–20



## Soft Tissues

The staging system applies to all soft-tissue sarcomas except Kaposi's sarcoma, dermatofibrosarcoma, and fibrosarcoma grade 1 (desmoid type). Excluded from the soft-tissue category are those sarcomas arising within the confines of the dura mater, including the brain, and sarcomas arising in parenchymatous organs and from hollow viscera. The system is based on an analysis of 1215 cases obtained from 13 institutions. Cases were collected on the basis of the histology, diagnosis, and type of soft tissue and included cases from all age groups.\*

In the analysis of the collected material, it was determined early in the study that, in addition to clinical information, the histologic type and grade of the tumor, as well as its size, were essential information for a meaningful staging system. The histologic diagnosis identifying the type of tumor and the pathologist's assessment of the inherent degree of malignancy of that type are fundamentals on which staging must be based.

Determination of the histologic grade and type of tumor is required for staging soft-tissue sarcomas and must be established by a qualified pathologist working with adequate sampling of the tumor.

### HISTOPATHOLOGY

#### Tumor Type

Tumors included in the analysis and evaluations are listed below:

- Alveolar soft-part sarcoma
- Angiosarcoma
- Epithelioid sarcoma
- Extraskeletal chondrosarcoma
- Extraskeletal osteosarcoma
- Fibrosarcoma
- Leiomyosarcoma
- Liposarcoma

\*For the most part, and with only a few variations, recommendations regarding staging of soft-tissue sarcoma in children are similar to those of the task force on this cancer. Grading of soft-tissue sarcoma has not been utilized, however, in the stage grouping of pediatric tumors.

Malignant fibrous histiocytoma  
 Malignant hemangiopericytoma  
 Malignant mesenchymoma  
 Malignant schwannoma  
 Rhabdomyosarcoma  
 Synovial sarcoma  
 Sarcoma, unclassified  
 Sarcoma, other

### Tumor Grade (G)

G1 Well differentiated  
 G2 Moderately well differentiated  
 G3 Poorly differentiated

Once the histologic type has been determined, the tumor should be graded according to the accepted criteria of malignancy, including cellularity, cellular pleomorphism, and mitotic activity. In addition, the amount of intercellular substance such as collagen or mucoid material should be considered as a favorable factor in assessing the grade.

Also, there are tumors that are highly malignant regardless of their cellular differentiation, and they should be classified as grade 3 neoplasms. The most common of these are rhabdomyosarcoma and certain types of angiosarcoma and synovial sarcoma. The age of the patient may also be an important factor in determining the aggressiveness of a given tumor. For example, the prognosis of childhood fibrosarcoma is better than that of the adult forms of this neoplasm. Moreover, superficially located tumors have a more favorable prognosis than those deeply located. For the sake of simplicity, these features have been incorporated into the "G" designation, which has, in turn, been added to the TNM scheme for tumor evaluation.

### ANATOMY (ICD-O 171)

**Primary Site.** A large variety of soft tissues can give rise to these sarcomas. The tissues include fibrous connective tissue, fat, smooth and striated muscle, vascular tissue, and peripheral neural tissue, as well as undifferentiated mesenchyme. Depending upon the location, different structures are at risk and they are included in the "T" classification.

**Nodal Stations.** Nodal stations or regions are related to site of origin of the sarcoma (see bibliography).

**Metastatic Sites.** The lung is the most common site that may be involved, but any viscous (liver, brain, etc.) or other site may be implicated.

### RULES FOR CLASSIFICATION

The time of staging a tumor must be identified by a subset so it will be clearly understood when, in the

course of diagnosis and treatment, the stage of disease was established.

cGTNM Clinical-diagnostic stage

pGTNM Postsurgical pathologic stage if the lesion is considered definitively treated by operation

rGTNM Retreatment stage

Initial steps for diagnosis and treatment planning include physical examination and roentgenographic evaluation of primary and metastatic sites, including chest films and skeletal survey, blood chemistries, blood counts, and other laboratory tests. Lymphangiography is an optional procedure. Radioisotopic, CT, ultrasonographic, and radionucleotide scans should be obtained as indicated. These procedures are of benefit in evaluating the patient's condition and in determining the optimal treatment; they are not necessarily required for staging. Biopsy of the tumor is required for diagnosis and grading.

Postsurgical pathologic (pGTNM) staging consists of the removal and pathologic evaluation of the primary tumor and, if indicated, of extensions of the tumor, nodes, or suspected metastases.

In retreatment (rGTNM) staging, questionable metastases or recurrences must be examined by biopsy and, if confirmed, complete restaging must be carried out.

### TNM CLASSIFICATION

#### Primary Tumor (T)

TX Minimum requirements to assess the primary tumor cannot be met.  
 T0 No demonstrable tumor  
 T1 Tumor 5 cm or less in diameter  
 T2 Tumor more than 5 cm in diameter  
 T3 Clear radiographic evidence of destruction of cortical bone, with invasion; histopathologic confirmation of invasion of major artery or nerve

#### Nodal Involvement (N)

NX Minimum requirements to assess the regional nodes cannot be met.  
 N0 No histologically verified metastases to lymph nodes  
 N1 Histologically verified regional lymph node metastasis

#### Distant Metastasis (M)

MX Minimum requirements to assess the presence of distant metastasis cannot be met.  
 M0 No (known) distant metastasis  
 M1 Distant metastasis present  
 Specify \_\_\_\_\_

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> Pulmonary   | <input type="checkbox"/> Bone Marrow |
| <input type="checkbox"/> Osseous     | <input type="checkbox"/> Pleura      |
| <input type="checkbox"/> Hepatic     | <input type="checkbox"/> Skin        |
| <input type="checkbox"/> Brain       | <input type="checkbox"/> Eye         |
| <input type="checkbox"/> Lymph Nodes | <input type="checkbox"/> Soft Tissue |
|                                      | <input type="checkbox"/> Other       |

### POSTSURGICAL RESECTION RESIDUAL TUMOR (R)

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor  
 Specify \_\_\_\_\_

### PERFORMANCE STATUS OF HOST (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

### STAGE GROUPING

- Stage IA G1, T1, N0, M0, well-differentiated tumor 5 cm or less in diameter; no regional lymph nodal or distant metastases
- Stage IB G1, T2, N0, M0, well-differentiated tumor more than 5 cm in diameter; no regional lymph nodal or distant metastases
- Stage IIA G2, T1, N0, M0, moderately differentiated tumor 5 cm or less in diameter; no regional lymph nodal or distant metastases
- Stage IIB G2, T2, N0, M0, moderately differentiated tumor more than 5 cm in diameter; no regional lymph nodal or distant metastases
- Stage IIIA G3, T1, N0, M0, poorly differentiated tumor 5 cm or less in diameter; no regional lymph nodal or distant metastases

- Stage IIIB G3, T2, N0, M0, poorly differentiated tumor more than 5 cm in diameter; no regional lymph nodal or distant metastases
- Stage IIIC Any G, T1, T2; N1, M0, tumor of any differentiation, any size; regional lymph nodal metastases but no distant metastases
- Stage IVA Any G, T3, any N, M0, tumor of any differentiation of malignancy demonstrating clear radiographic evidence of destruction of cortical bone (with invasion) and histopathologic confirmation of invasion of major artery or nerve, with or without regional lymph nodal metastases but without distant metastases
- Stage IVB Any G, any T, any N, M1, tumor with distant metastases

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# SOFT-TISSUE SARCOMA (ICD-O 171)

## Data Form for Cancer Staging

Patient identification

Name \_\_\_\_\_

Address \_\_\_\_\_

Hospital or clinic number \_\_\_\_\_

Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification

Hospital or clinic \_\_\_\_\_

Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_

Chronology of classification\*  Clinical-diagnostic (cTNM)

Surgical-evaluative (sTNM)

Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_

Postsurgical resection-pathologic (pTNM)

Retreatment (rTNM)  Autopsy (aTNM)

## Histopathology (Tumor Type)

- Alveolar soft-part sarcoma
- Angiosarcoma
- Epithelioid sarcoma
- Extraskeletal chondrosarcoma
- Extraskeletal osteosarcoma
- Fibrosarcoma
- Leiomyosarcoma
- Liposarcoma
- Malignant fibrous histiocytoma
- Malignant hemangiopericytoma
- Malignant mesenchymoma
- Malignant schwannoma
- Rhabdomyosarcoma
- Synovial sarcoma
- Sarcoma, unclassified
- Sarcoma, other

- Pleura
- Skin
- Eye
- Soft tissue
- Other

## Tumor Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3 Poorly differentiated

## Stage Grouping

- Stage I  
Well-differentiated tumor 5 cm or less in diameter, no regional lymph nodal or distant metastases  
 IA: G1, T1, N0, M0  
Well-differentiated tumor more than 5 cm in diameter, with no regional lymph nodal or distant metastases  
 IB: G1, T2, N0, M0
- Stage II  
Moderately differentiated tumor 5 cm or less in diameter, with no regional lymph nodal or distant metastases  
 IIA: G2, T1, N0, M0  
Moderately differentiated tumor, more than 5 cm in diameter, with no regional lymph nodal or distant metastases  
 IIB: G2, T2, N0, M0
- Stage III  
Poorly differentiated tumor 5 cm or less in diameter, with no regional lymph nodal or distant metastases  
 IIIA: G3, T1, N0, M0  
Poorly differentiated tumor, more than 5 cm in diameter with no regional lymph nodal or distant metastases  
 IIIB: G3, T2, N0, M0  
Tumor of any differentiation, any size, with regional lymph nodal metastases but without distant metastases  
 IIIC: Any G, T1, T2; N1, M0
- Stage IV  
Tumor of any differentiation of malignancy, demonstrating clear radiographic evidence of destruction of cortical bone (with invasion) and histopathologic confirmation of invasion of major artery or nerve, with or without regional lymph nodal metastases but without distant metastases  
 IVA: Any G, T3, any N, M0  
Tumor with distant metastases  
 IVB: Any G, any T, any N, M1

## Definitions: TNM Classification

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No demonstrable tumor
- T1 Tumor less than 5 cm in diameter
- T2 Tumor 5 cm or more in diameter
- T3 Clear radiographic evidence of destruction of cortical bone, with invasion; histopathologic confirmation of invasion of major artery or nerve

### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No histologically verified metastases to lymph nodes
- N1 Histologically verified regional lymph node metastasis

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present; specify: \_\_\_\_\_
  - Pulmonary
  - Osseous
  - Hepatic
  - Brain
  - Lymph nodes
  - Bone marrow

\*Use a separate form each time a case is staged.

†See reverse side for additional information.

Examination by \_\_\_\_\_ M.D.

Date \_\_\_\_\_

## Site-Specific Information

### Clinical Information

#### Anatomic site (S)

- Head and neck  
 Trunk  
 Extremities  
     Shoulder or arm  
     Elbow or below  
     Buttocks or thigh  
     Knee or below  
 Retroperitoneum or mediastinum  
 Other  
Specify \_\_\_\_\_

#### Major localization

- Subcuti  
 Muscle

#### Secondary invasion

- Bones  
 Blood vessels  
 Other

#### Tumor size (largest dimension in cm)

- Less than 5 cm  
 5 cm or larger

#### Regional lymph node involvement

- Not assessed  
 Negative  
 Positive

#### Metastasis

- None  
 Bone  
 Lymph Node  
 Lung  
 Liver  
 Soft Tissue  
 Other  
Specify \_\_\_\_\_

#### Oncogenic exposure

- Irradiation  
 Chemical  
 Other  
Specify \_\_\_\_\_

### Pathologic Information

#### Site or origin

- Subcutis  
 Muscle  
 Tendon  
 Major nerve  
 Other  
Specify \_\_\_\_\_

#### Histologic type

- Alveolar soft-part sarcoma  
 Angiosarcoma  
 Epithelioid sarcoma  
 Extraskeletal chondrosarcoma  
 Extraskeletal osteosarcoma  
 Fibrosarcoma  
 Leiomyosarcoma  
 Liposarcoma  
 Malignant fibrous histiocytoma  
 Malignant hemangiopericytoma  
 Malignant mesenchymoma  
 Malignant schwannoma  
 Rhabdomyosarcoma

- Synovial sarcoma  
 Sarcoma, unclassified  
 Sarcoma, other

#### Tumor invasion

- Skin  
 Subcutis  
 Muscle  
 Blood vessel  
 Nerve  
 Bone  
 Viscus  
 Other  
Specify \_\_\_\_\_

#### Margin evaluation

- Negative  
 Positive

#### Grade of malignancy

- G1 Well differentiated  
 G2 Moderately well differentiated  
 G3 Poorly differentiated

#### Tumor size

- Less than 5 cm  
 5 cm or larger

#### Postsurgical residual tumor

- Negative  
 Positive  
 Gross residual tumor

#### Lymph node involvement

- Not assessed  
 Negative  
 Positive

#### Distant metastasis

- None  
 Lung  
 Bone  
 Liver  
 Lymph node  
 Other  
Specify \_\_\_\_\_

### Postsurgical Resection-Pathologic Residual Tumor (R)

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

### Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20



## Melanoma of the Skin

In adopting a classification and staging system for malignant melanoma, the American Joint Committee on Cancer has utilized case material available from more than 2000 cases and has integrated this information with the melanoma studies of the UICC, WHO, and numerous authors.

### **CLINICAL-PATHOLOGIC CLASSIFICATION (ICD-O 173, with histologic type M872-M874)**

The clinical and histologic types of malignant melanoma are as follows:

1. *Malignant melanoma, lentigo maligna type.* This refers to melanoma that develops within a Hutchinson melanotic freckle. It grows radially, producing complex colored, highly distinctive, clinical lesions varying from tan to brown to black. After this radial growth phase, the cells in focal areas penetrate deeper into the dermis; this is referred to as the vertical growth phase.
2. *Malignant melanoma, with radial growth phase of the radial (superficial) spreading type.* This is characterized by a biphasic growth pattern, and about 70% of all cutaneous melanomas are of this type. Whereas the proliferating melanocytes of the radial growth phase of melanoma of the lentigo maligna (Hutchinson) type are confined to the basilar regions of the epidermis, the melanocytes of the radial growth phase of malignant melanoma of the radial (superficial) spreading type essentially grow in the epidermis and invade the papillary dermis.
3. *Malignant melanoma, nodular type.* This has no radial intraepidermal growth phase. Such a lesion is usually convex and is always palpable due to its growth elevation above the level of the adjacent normal skin.
4. *Malignant melanoma, acral lentiginous type.* This biological variant of melanoma occurs primarily on the soles and palms of the feet and hands (volar) or the nail bed matrix of fingers and toes (subungual). It is characterized by indirect tumor progression manifested by development through a radial and a vertical growth phase.

5. *Malignant melanoma, unclassified.* This is a term used to denote a melanoma for which the radial growth phase cannot or has not been assigned to the above-mentioned types.

Most melanomas fall into one of these categories. However, there are occasional malignant melanomas that arise in either the pigmented tissues of the eye or a giant hairy nevus; that have a special location such as volar-subungual; that arise from oral, nasopharyngeal, conjunctival, vaginal, urethral, or anal mucous membranes. Melanomas may rarely arise from a visceral site or appear without a demonstrable primary lesion. All of these variations should be specifically coded separately, with identification of specific sites and types.

### ULCERATION

Breakdown of the surface of the lesion, either grossly or microscopically, appears to suggest a poor prognosis. Data are not yet available to indicate the necessity of including this in the actual staging system, but breakdown must be recorded.

### STAGING PROCEDURES

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and the cost efficiency must be considered. The following suggestions are made for staging of malignant melanoma:

#### *Essential for staging*

1. Complete physical examination
2. Pathologic study of surgically removed material, including depth of invasion and thickness of primary tumor
3. Chest roentgenogram
4. Known residual tumor at primary site if present

#### *Possibly useful for staging or patient management*

1. Multichemistry screen
2. Gallium scan
3. Bone scan
4. Liver-spleen scan
5. CT scans
6. Brain scans
7. Performance status (Karnofsky or ECOG)

#### *Possibly useful for future staging systems or research studies*

1. Studies of immune competence
2. Lymphangiograms

### HISTOLOGY

Both the depth of invasion (Clark) and the thickness of the tumor (Breslow) have been shown to have prognostic significance, and both parameters should be reported by the pathologist.

Five levels of the skin have been designated for identification of depth of invasion:

Level I (epidermis to epidermal-dermal interface).

Lesions involving only the epidermis have been designated level I. These lesions are considered to be "atypical melanocytic hyperplasia" and will not be included in the staging of malignant melanoma, for they do not represent a malignant lesion.

Level II (papillary dermis). Invasion of the papillary dermis; does not reach the papillary-reticular dermal interface

Level III (papillary-reticular dermis interface). Invasion involves the full thickness of, fills, and expands the papillary dermis; it abuts upon but does not penetrate the reticular dermis.

Level IV (reticular dermis). Invasion occurs into the reticular dermis but not into the subcutaneous tissue.

Level V (subcutaneous tissue). Invasion occurs through the reticular dermis into the subcutaneous tissue.

Maximal thickness of tumor invasion is measured with an ocular micrometer at right angle to the adjacent normal skin. The upper reference point is the top of the granular cell layer of the epidermis of the overlying skin or its estimated level if the lesion is ulcerated. The lower reference point is usually the deepest point of invasion. It is sometimes the invading edge of a single tumor mass and sometimes an isolated cell or group of cells deep to the main mass. Actual measurement is to be recorded, but for staging it will be categorized as follows:

1. 0.75 mm or less
2. 0.76 mm to 1.50 mm
3. 1.51 mm to 4.0 mm
4. More than 4.0 mm

**Nodal Stations.** The regional nodes are related to the region of the body in which the tumor is located; such first station nodes are the following:

1. For head and face: preauricular, cervical
2. For neck and upper chest wall: cervical (anterior-posterior), supraclavicular, axillary
3. For chest wall—anterior and posterior—and upper extremities above the elbow: axillary
4. For hands and upper extremities below the elbow: epitrochlear or axillary
5. For the abdominal wall—anterior and posterior—

and lower extremities above the knee: femoral inguinal nodes (groin)

6. For the feet and below the knees: popliteal or femoral inguinal nodes (groin)

Lesions arising in the midtransverse axis of the trunk at a level between the umbilicus and the lower costal margin anteriorly, and extending laterally to the posterior level between the 10th thoracic spine (T10) and the first lumbar spine (L1), may spread (drain) with equal propensity to either homolateral or ipsilateral (or both) axillae or the groin.

**Metastatic Sites.** Melanomas metastasize widely and, in addition to skin, subcutaneous tissues, and lymph nodes, they commonly involve the liver, bone, lung, brain, and viscera. For staging purposes, two distinct M categories are identified. Metastasis to skin or subcutaneous tissue beyond the site of primary lymph node drainage is considered M1, whereas metastasis to other distant sites—often referred to as visceral metastasis—is considered M2. This distinction is based on the more favorable response to therapy of patients with only skin or subcutaneous metastases.

## RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** A careful clinical examination; inspection for tumor size, ulceration, and nodularity; inspection of the surrounding skin and subcutaneous tissue for satellites and in-transit metastases leading toward the regional lymph node-bearing areas and other suspicious skin lesions; and palpation of the regional nodes are essential. Chest films and hemograms are required, and blood chemistry profiles are encouraged. Other radiographic and radioisotopic procedures are optional depending on clinical presentation. However, a clinical-diagnostic staging classification has not been developed for melanoma of the skin. Clinical observations may contribute in a meaningful way to postsurgical resection-pathologic staging.

**Surgical-Evaluative Staging (Intraoperative).** This staging is rarely employed.

**Postsurgical Resection-Pathologic Staging.** Evaluation of the entire primary tumor is always advised and, rather than just a wedge or punch biopsy, the entire thickness of the skin is needed for accurate classification. Regional nodes should be meticulously evaluated if made available with the specimen and recorded as the number of positive lymph nodes found with the total number of lymph nodes removed (e.g., N1, 3/21).

**Retreatment Staging.** Any recurrence or metastatic lesion should be biopsied for confirmation if possible. A complete metastatic workup is advised.

## TNM CLASSIFICATION

### Primary Tumor (T)

Both the depth of invasion and the maximum measured thickness determine the T classification and should be recorded. When the depth invasion and the thickness do not match the categories of T classification, whichever of the two is greatest should take precedence in assigning a T status. Satellite lesions or nodules within 2.0 cm of the primary tumor are included in the T classification and the primary tumor is automatically considered T4, regardless of the primary tumor depth of invasion or thickness. Satellite lesions or subcutaneous nodules at a greater distance from the primary tumor but not beyond the site of primary lymph node drainage are considered in-transit metastases and are listed under N categories.

- TX No evidence of primary tumor (unknown primary or primary tumor removed and not histologically examined)
- T0 Atypical melanocytic hyperplasia (Clark Level I); not a malignant lesion
- T1 Invasion of papillary dermis (Level II) or 0.75-mm thickness or less
- T2 Invasion of the papillary-reticular-dermal interface (Level III) or 0.76- to 1.5-mm thickness
- T3 Invasion of the reticular dermis (Level IV) or 1.51- to 4.0-mm thickness
- T4 Invasion of subcutaneous tissue (Level V) or 4.1-mm or greater thickness, or satellite(s) within 2 cm of any primary melanoma

### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No regional lymph node involvement
- N1 Involvement of only one regional lymph node station; node(s) movable and not over 5 cm in diameter, or negative regional lymph nodes and the presence of less than five in-transit metastases beyond 2 cm from the primary site
- N2 Any one of the following: (1) involvement of more than one regional lymph node station; (2) regional node(s) over 5 cm in diameter or fixed; (3) five or more in-transit metastases or any in-transit metastases beyond 2 cm from the primary site with regional lymph node involvement

### Distant Metastasis (M)

- MX Not assessed
- M0 No known distant metastasis
- M1 Involvement of skin or subcutaneous tissue beyond the site of primary lymph node drainage
- Specify \_\_\_\_\_

M2 Visceral metastasis (spread to any distant site other than skin or subcutaneous tissues)  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Gastrointestinal	GI
Subcutaneous	SUBC
Other	OTH

### RECURRENT TUMOR (r)

The development of local recurrence at the site of the previous surgery calls for specific recognition when staging, by using the prefix "r" (rTNM).

### NEW PRIMARY TUMOR

A new or second primary melanoma or the simultaneous presentation of more than one primary melanoma is to be staged with the specific identification of this unusual second primary phenomenon. The detailed pathology interpretation justifying the diagnosis of a second melanoma rather than metastatic disease will justify the staging and specific identification of this clinical circumstance.

### STAGE GROUPING

Stage IA	T1, N0, M0
Stage IB	T2, N0, M0
Stage IIA	T3, N0, M0
Stage IIB	T4, N0, M0
Stage III	Any T, N1, M0
Stage IV	Any T, N2, M0
	Any T, any N, M1 or M2

### HISTOPATHOLOGY

The types of malignant melanoma are as follows: lentigo maligna (Hutchinson's), with adjacent intraepidermal component of radial spreading type

(superficial spreading), without adjacent intraepidermal component (nodular) and unclassified, and specific type or sites of melanoma such as mucosal, ocular, sublingual, and so forth.

### Tumor Grade (G)

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number).

### POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

This does not enter into staging tumor but may be a factor in deciding management.

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

### PERFORMANCE STATUS OF HOST (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

### DATA FORM

The data form for staging of melanoma, in addition to permitting the recording of the extent of the cancer, indicates the examinations necessary for staging and the examinations and data necessary for each time period of staging.

# MELANOMA OF THE SKIN (ICD-O 173 With Histologic Type 872-879)

## Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

## Oncology Record

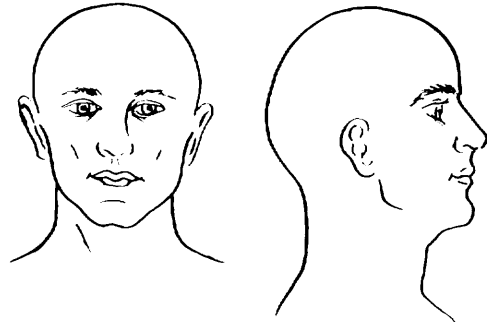
Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
 [ ] Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 [ ] Postsurgical resection-pathologic (pTNM)  
 [ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

## Definitions: TNM Classification

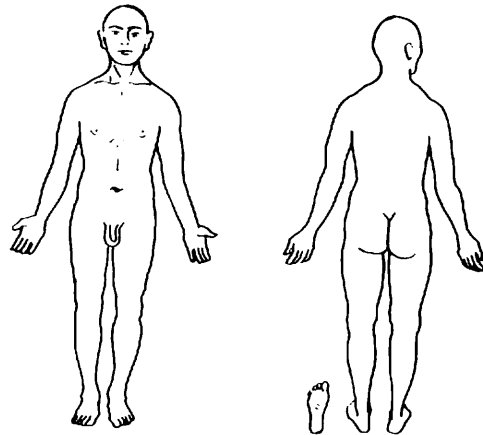
### Primary Tumor (T)

- [ ] TX No evidence of primary tumor (unknown primary or primary tumor removed and not histologically examined)
- [ ] T0 Atypical melanocytic hyperplasia (Clark Level I); not a malignant lesion
- [ ] T1 Invasion of papillary dermis (Level II) or 0.75-mm thickness or less
- [ ] T2 Invasion of the papillary-reticular-dermal interface (Level III) or 0.76- to 1.5-mm thickness
- [ ] T3 Invasion of the reticular dermis (Level IV) or 1.51- to 4.0-mm thickness
- [ ] T4 Invasion of subcutaneous tissue (Level V) or 4.1 mm or more in thickness or satellite(s) within 2 cm of any primary melanoma



### Nodal Involvement (N)

- [ ] NX Minimum requirements to assess the regional nodes cannot be met.
- [ ] N0 No regional lymph node involvement
- [ ] N1 Involvement of only one regional lymph node station; node(s) movable and not over 5 cm in diameter or negative regional lymph nodes and the presence of less than five in-transit metastases beyond 2 cm from primary site
- [ ] N2 Any one of the following: (1) involvement of more than one regional lymph node station; (2) regional node(s) over 5 cm in diameter or fixed; (3) five or more in-transit metastases or any in-transit metastases beyond 2 cm from primary site with regional lymph node involvement



Indicate on diagrams primary tumor and regional nodes involved.

### Distant Metastasis (M)

- [ ] MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- [ ] M0 No known distant metastasis
- [ ] M1 Involvement of skin or subcutaneous tissue beyond the site of primary lymph node drainage  
Specify \_\_\_\_\_
- [ ] M2 Visceral metastasis (spread to any distant site other than skin or subcutaneous tissues)  
Specify \_\_\_\_\_

### Depth of Invasion

- [ ] Level I (not a melanoma and further characterization is not necessary)
- [ ] Level II [ ] Level IV
- [ ] Level III [ ] Level V

Other description \_\_\_\_\_

Maximal thickness (mm) \_\_\_\_\_

Site of primary lesion (check diagram) \_\_\_\_\_

Extent of primary lesion (include all pigmentation) \_\_\_\_\_

Size in greatest diameter \_\_\_\_\_ cm

### Type of Lesion

- [ ] Lentigo maligna [ ] Radial spreading
- [ ] Nodular [ ] Acral lentiginous
- [ ] Unclassified

### Characteristics

- [ ] Ulceration
- [ ] Other \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.

Date \_\_\_\_\_

\*Use a separate form each time a case is staged.  
 †See reverse side for additional information.



## Stage Grouping

- Stage IA T1, N0, M0
- Stage IB T2, N0, M0
- Stage IIA T3, N0, M0
- Stage IIB T4, N0, M0
- Stage III Any T, N1, M0
- Stage IV Any T, N2, M0  
Any T, any N, M1 or M2

## Staging Procedures

A variety of procedures and special studies may be employed in the process of staging a given tumor. Both the clinical usefulness and cost efficiency must be considered. The following suggestions are made for staging of malignant melanoma:

### Essential for staging

1. Complete physical examination
2. Pathologic study of surgically removed material, including depth of invasion and thickness of primary tumor
3. Chest roentgenogram
4. **Known residual tumor** at primary site if present

### May be useful for staging or patient management

1. Multichemistry screen
2. Gallium scan
3. Bone scan
4. Liver-spleen scan
5. CT scans
6. Brain scans
7. Performance status (Karnofsky or ECOG)

## Primary Tumor (T)

Both the depth of invasion and the maximum measured thickness determine the T-classification and should be recorded. When the depth of invasion and the thickness do not match the categories of T-classification, whichever of the two is greatest should take precedence.

## Regional Nodes (N)

The regional nodes are related to the region of the body in which the tumor is located; such first station nodes are as follows:

1. For head and face: preauricular, cervical
2. For neck and upper chest wall: cervical (anterior-posterior), supraclavicular, axillary
3. For chest wall, anterior and posterior, and arms above elbow: axillary
4. For hands and upper extremities below the elbow: epitrochlear or axillary
5. For the abdominal wall, anterior and posterior, and lower extremities above the knee: femoral inguinal nodes (groin)
6. For the feet and below the knees: popliteal or femoral inguinal nodes (groin)

## Histopathology

Types of malignant melanoma: lentigo maligna (Hutchinson's) with adjacent intraepidermal component of radial spreading type

(superficial spreading), without adjacent intraepidermal component (nodular), and unclassified.

Both the depth of invasion (Clark) and the thickness of the tumor (Breslow) have been shown to have prognostic significance and both parameters should be reported by the pathologist.

Five levels of the skin have been designated for identification of depth of invasion:

- Level I (epidermis to epidermal-dermal interface). Lesions involving only the epidermis have been designated level I. These lesions are considered to be "atypical melanocytic hyperplasia" and are not included in the staging of malignant melanoma, *for they do not represent a malignant lesion.*
- Level II (papillary dermis). Invasion of the papillary dermis does not reach the papillary-reticular dermal interface.
- Level III (papillary-reticular dermis interface). Invasion involves the full thickness of, fills, and expands the papillary dermis; it abuts upon but does not penetrate the reticular dermis.
- Level IV (reticular dermis). Invasion occurs into the reticular dermis but not into the subcutaneous tissue.
- Level V (subcutaneous tissue). Invasion moves through the reticular dermis into the subcutaneous tissue.

## Histologic Grade

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

## Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into staging but may be a factor in deciding further treatment

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

## Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## Squamous and Basal Cell Carcinoma

Only squamous cell and basal cell carcinoma of the skin are considered in these classification recommendations.

### **ANATOMY (ICD-O 173, EXCLUDING MELANOMA 872-874)**

**Primary Site.** Skin cancers usually arise on those skin surfaces exposed to sunlight, which include the face, ears, hands, scalp, and, to a much lesser degree, the protected truncal regions of the body and extremities.

**Nodal Stations.** Depending upon the origin of the skin cancer, the regional nodes are the first chain of nodes draining the primary tumor site. The common sites of the face drain to the parotid, submaxillary, and cervical nodal areas. The hands drain to the epitrochlear axillary and supraclavicular nodal areas.

**Metastatic Sites.** The most common site of metastases is the lung. Other sites for distant spread are rare.

### **RULES FOR CLASSIFICATION**

**Clinical-Diagnostic Staging.** The assessment of the skin cancer is based upon inspection and palpation of the involved area and regional nodes. Roentgenographic examination of underlying bony structures, particularly in the scalp around the mastoid region where there is bony involvement, is important, especially if the lesion is fixed.

**Surgical-Evaluative Staging.** Confirmation of the extent of disease by biopsy of suspected cutaneous or subcutaneous spread is necessary. Nodal aspiration or biopsy of suspicious nodes is desirable but not required.

**Postsurgical Treatment - Pathologic Staging.** Complete resection of the primary site is indicated.

**Retreatment Staging.** Biopsy for confirmation is recommended. Reevaluation of nodal involvement or spread to lung is important as basal cell carcinomas become more extensive.



**TNM CLASSIFICATION****Primary Tumor (T)**

- TX Minimum requirements to assess the primary tumor cannot be met.
- Tis Preinvasive carcinoma (carcinoma *in situ*)
- T0 No primary tumor present
- T1 Tumor 2 cm or less in its largest dimension, strictly superficial or exophytic
- T2 Tumor more than 2 cm but not more than 5 cm in its largest dimension or with minimal infiltration of the dermis, irrespective of size
- T3 Tumor more than 5 cm in its largest dimension or with deep infiltration of the dermis, irrespective of size
- T4 Tumor involving other structures such as cartilage, muscle, or bone

**Nodal Involvement (N)**

The nodal involvement for cervical nodes is identical to that of the head and neck cancers, and this can also be applied to other nodal regions as well.

- NX The minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of movable homolateral regional lymph nodes
- N2 Evidence of involvement of movable contralateral or bilateral regional lymph nodes
- N3 Evidence of involvement of fixed regional lymph nodes

**Distant Metastasis (M)**

- MX The minimum requirements to assess distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

**POSTSURGICAL RESECTION RESIDUAL TUMOR (R)**

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

**STAGE GROUPING**

No stage grouping is recommended at this time, and no data form is suggested.

*Note:* At the present time stage might be recorded as follows:

- Stage I Localized T1
- Stage II Regional nodal involvement (first chain of drainage)
- Stage III Distant metastases

**HISTOPATHOLOGY**

The predominant tumors are squamous cell and basal cell carcinoma. The pathologic diagnosis is required to utilize this classification. Tumor grading for squamous cell carcinoma is recommended. Reference to the World Health Organization (WHO) nomenclature is advised.

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G+ number).

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

# SQUAMOUS CELL AND BASAL CELL CARCINOMA (ICD-O 173)

## Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

## Oncology Record

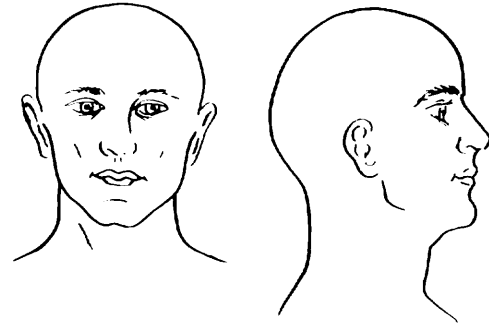
Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G)† \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

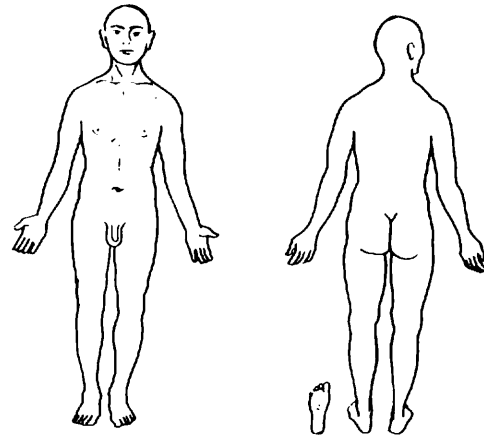
- TX Minimum requirements to assess the primary tumor cannot be met.
- Tis Preinvasive carcinoma (*carcinoma in situ*)
- T0 No primary tumor present
- T1 Tumor 2 cm or less in its largest dimension, strictly superficial or exophytic
- T2 Tumor more than 2 cm but not more than 5 cm in its largest dimension or with minimal infiltration of the dermis, irrespective of size
- T3 Tumor more than 5 cm in its largest dimension or with deep infiltration of the dermis, irrespective of size
- T4 Tumor involving other structures such as cartilage, muscle, or bone



### Nodal Involvement (N)

The nodal involvement for cervical nodes is identical to that of the head and neck cancers, and this can also be applied to other nodal regions.

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of movable homolateral regional lymph nodes
- N2 Evidence of involvement of movable contralateral or bilateral regional lymph nodes
- N3 Evidence of involvement of fixed regional lymph nodes



Indicate on diagrams primary tumor and regional nodes involved.

### Distant Metastasis (M)

- MX Minimum requirements to assess distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present; specify: \_\_\_\_\_  
Specify sites according to the following notations:

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> Pulmonary   | <input type="checkbox"/> Bone marrow |
| <input type="checkbox"/> Osseous     | <input type="checkbox"/> Pleura      |
| <input type="checkbox"/> Hepatic     | <input type="checkbox"/> Skin        |
| <input type="checkbox"/> Brain       | <input type="checkbox"/> Eye         |
| <input type="checkbox"/> Lymph nodes | <input type="checkbox"/> Other       |

### Stage Grouping

Note: At the present time, stage might be recorded as follows:

- Stage I Localized T1
- Stage II Regional nodal involvement (first chain of drainage)
- Stage III Distant metastases

### Histopathology

- Squamous cell carcinoma
- Basal cell carcinoma

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\* Use a separate form each time a case is staged.  
 † See reverse side for additional information.

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3–G4 Poorly to very poorly differentiated

**Postsurgical Resection Residual Tumor (R)**

Does not enter into staging but may be a factor in deciding further treatment.

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

**Performance Status of Host (H)**

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90–100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70–80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50–60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30–40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10–20



The staging system for cancer of the breast applies to *in situ* carcinoma and to infiltrating cancer of the breast. Histologic verification is mandatory and the cell type must be recorded. Unconfirmed cases must be reported separately.

Although there have been minor differences in the recommendations for staging of cancer of the breast by the Union Internationale Contre le Cancer (UICC) and the AJCC in the past, the recommendations of the UICC are now consistent with those of the AJCC.

## **ANATOMY (ICD-O 174)**

**Primary Site.** The mammary gland consists of glandular tissue within a dense fibroareolar stroma situated on the anterior chest wall. Deep to the breast is the fascia overlying the pectoralis major, which in turn covers the ribs and intercostal muscles of the first six intercostal spaces.

**Nodal Stations.** The breast lymphatics drain by way of three major routes—axillary, transpectoral, and internal mammary trunks—into numerous surrounding first station nodes such as axillary (low, middle), axillary apex, and infraclavicular (referred to as levels I, II, and III, respectively), and internal mammary, interpectoral, and subclavicular. Supraclavicular nodes are juxtaregional on the homolateral side. Disease involvement in all other nodes—cervical, contralateral supraclavicular, and internal mammary—is equivalent to distant metastases.

**Metastatic Sites.** All distant visceral sites are potential sites of metastatic disease. The four major sites are bone, lung, brain, and liver, but this widely metastasizing disease has been found in virtually all remote sites.

## **RULES FOR CLASSIFICATION**

**Clinical-Diagnostic Staging.** In the clinical-diagnostic stage, the following are required: physical examination, including careful inspection of skin and palpation of mammary glands and

regional nodes; determination of the degree of fixation with and without flexing pectoral muscles; routine laboratory studies and hemograms; and chest films. Bilateral breast imaging by a validated technique such as x-ray mammography is recommended. Also, pathologic examination of the primary cancer or other tissues to establish the diagnosis of breast cancer is required.

**Postsurgical Resection-Pathologic Staging.** The postsurgical resection-pathologic stage includes the following:

1. All data used for clinical-diagnostic staging
2. Pathologic examination of the primary cancer, the entire breast, and all levels of axillary lymph nodes as with standard or modified radical mastectomy

**Surgical-Evaluative Stage.** The surgical-evaluative stage includes the following:\*

1. All data used for clinical-diagnostic staging
2. Pathologic examination of tissues in addition to the primary cancer, but less than with a modified radical mastectomy. Therefore, there is pathologic examination of the primary cancer *and* some of the axillary lymph nodes or other tissues.

## TNM CLASSIFICATION

### Primary Tumor (T)

Definitions for the primary tumor (T) for clinical-diagnostic classification are the same as those for postsurgical resection-pathologic classification.

- TX** Minimum requirements to assess primary tumor cannot be met.
- T0** No evidence of primary tumor.
- Tis** *In situ* cancer (*in situ* lobular, pure intraductal, and Paget's disease of the nipple without palpable tumor)

*Note:* Paget's disease with a demonstrable tumor is classified according to size of the tumor. Inflammatory carcinoma should be reported separately.

- T1†** Tumor 2 cm or less in greatest dimension
- T1a** No fixation to underlying pectoral fascia or muscle

\*This time period of staging for breast cancer would be used very infrequently, because data obtained during surgical exploration and multiple biopsies (without definitive resection) would most often contribute to clinical-diagnostic staging.

†Dimpling of the skin, nipple retraction, or any other skin changes except those in T4b may occur in T1, T2, or T3 without changing the classification.

- T1b** Fixation to underlying pectoral fascia or muscle
- i tumor  $\leq 0.5$  cm
  - ii tumor  $> 0.5 \leq 1.0$  cm
  - iii tumor  $> 1.0 \leq 2.0$  cm

- T2†** Tumor more than 2 cm but not more than 5 cm in its greatest dimension
- T2a** No fixation to underlying pectoral fascia or muscle
- T2b** Fixation to underlying pectoral fascia or muscle
- T3†** Tumor more than 5 cm in its greatest dimension
- T3a** No fixation to underlying pectoral fascia or muscle
- T3b** Fixation to underlying pectoral fascia or muscle
- T4** Tumor of any size with direct extension to chest wall or skin  
(Chest wall includes ribs, intercostal muscles, and serratus anterior muscle, but not pectoral muscle.)
- T4a** Fixation to chest wall
- T4b** Edema (including *peau d'orange*), ulceration of the skin of the breast, or satellite skin nodules confined to the same breast
- T4c** Both of the above

### Nodal Involvement (N)

The definition of N categories varies somewhat as to time period of staging, as follows.

#### Definitions for Clinical-Diagnostic Stage

- NX** Regional lymph nodes cannot be assessed clinically.
- N0** Homolateral axillary lymph nodes not considered to contain growth
- N1** Movable homolateral axillary nodes considered to contain growth
- N2** Homolateral axillary nodes considered to contain growth and fixed to one another or to other structures
- N3** Homolateral supraclavicular or infraclavicular nodes considered to contain growth or edema of the arm. (Edema of the arm may be caused by lymphatic obstruction and lymph nodes may not then be palpable.)

#### Definitions for Surgical-Evaluative and Postsurgical Resection-Pathologic Stage

- NX** Regional lymph nodes cannot be assessed (not removed for study or previously removed).
- N0** No evidence of homolateral axillary lymph node metastasis

**N1** Metastasis to movable homolateral axillary nodes not fixed to one another or to other structure

**N1a** Micrometastasis  $\leq 0.2$  cm in lymph node(s)

**N1b** Gross metastasis in lymph node(s)

I Metastasis more than 0.2 cm but less than 2.0 cm in one to three lymph nodes

II Metastasis more than 0.2 cm but less than 2.0 cm in four or more lymph nodes

III Extension of metastasis beyond the lymph node capsule (less than 2.0 cm in dimension)

IV Metastasis in lymph node 2.0 cm or more in dimension

**N2** Metastases to homolateral axillary lymph nodes that are fixed to one another or to other structures

**N3** Metastasis to homolateral supraclavicular or infraclavicular lymph node(s)

*Note:* Edema of the arm may be caused by lymphatic obstruction, and lymph nodes may not then be palpable. Homolateral internal mammary nodes considered to contain growth are included in N3 for surgical-evaluative classification and postsurgical resection-pathologic classification.

### Distant Metastasis (M)

All time periods

**MX** Minimum requirements to assess the presence of distant metastasis cannot be met.

**M0** No (known) distant metastasis

**M1** Distant metastasis present

Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

### POSTSURGICAL RESECTION RESIDUAL TUMOR (R)

This does not enter into staging tumor but may be a factor in deciding management.

**R0** No residual tumor

**R1** Microscopic residual tumor

**R2** Macroscopic residual tumor

Specify \_\_\_\_\_

### HISTOLOGIC TYPE OF CANCER

Cancer, NOS\*

Ductal

Intraductal (*in situ*)

Invasive with predominant intraductal component

Invasive, NOS\*

Comedo

Inflammatory†

Medullary with lymphocytic infiltrate

Mucinous (colloid)

Papillary

Scirrhus

Tubular

Other

Specify \_\_\_\_\_

Lobular

*In situ*

Invasive with predominant *in situ* component

Invasive

Nipple

Paget's disease, NOS\*

Paget's disease with intraductal carcinoma

Paget's disease with invasive ductal carcinoma

Other

Specify \_\_\_\_\_

### HISTOLOGIC GRADE

G1 Well differentiated

G2 Moderately well differentiated

G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G+ number).

### STAGE GROUPING

Always indicate time of classification.

### Clinical-Diagnostic (cTNM), Surgical-Evaluative (sTNM), and Postsurgical Resection-Pathologic (pTNM) Staging

Stage Tis *In situ*

Stage X Cannot stage

Stage I T1ai, N0, M0

T1aii, N0, M0

T1aiii, N0, M0

\*Not otherwise specified

†Inflammatory carcinoma is a clinicopathologic entity characterized by diffuse brawny induration of the skin of the breast with an erysipeloid edge, usually without an underlying palpable mass. Histologically infiltrating mammary carcinoma diffusely permeates dermal lymphatics. (Inflamed cancers that are clinically similar to the above owing to inflammation, infection, or necrosis but that lack microscopic dermal lymphatic permeation are *not* classified as inflammatory carcinoma.)

Stage I	T1bi, N0, M0 T1bii, N0, M0 T1biii, N0, M0
Stage II	T0, N1a or N1b, M0 T1a or T1b, N1a or N1b, M0 T2a or T2b, N0, M0 T2a or T2b, N1a or N1b, M0
Stage IIIA	T0, N2, M0 T1a or T1b, N2, M0 T2a or T2b, N2, M0 T3a or T3b, N0, M0 T3a or T3b, N1, M0 T3a or T3b, N2, M0
Stage IIIB	Any T, N3, M0 Any T4, any N, M0
Stage IV	Any T, any N, M1

Measurements of 2 cm or less for T1a, T1b, and N1b do not necessarily need to be recorded.

### PERFORMANCE STATUS OF HOST (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

### DATA FORM

The data form for staging of cancer of the breast, in addition to permitting recording of the extent of the cancer, also indicates the examinations necessary for staging and the examinations and data necessary for each time period of staging.

**Data Form for Cancer Staging**

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

**Oncology Record**

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

**Definitions: TNM Classification**

**Primary Tumor (T)**

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Paget's disease of the nipple with no demonstrable tumor.  
 (Note: Paget's disease with a demonstrable tumor is classified according to the size of the tumor.)
- T1‡ Tumor 2 cm or less in greatest dimension
  - T1a No fixation to underlying pectoral fascia or muscle
  - T1b Fixation to underlying pectoral fascia or muscle  
 (Check below in addition to T1a or T1b.)
    - i Tumor ≤ 0.5 cm
    - ii Tumor > 0.5 ≤ 1.0 cm
    - iii Tumor > 1.0 ≤ 2.0 cm
- T2‡ Tumor more than 2 cm but not more than 5 cm in its greatest dimension
  - T2a No fixation to underlying pectoral fascia or muscle
  - T2b Fixation to underlying pectoral fascia or muscle
- T3‡ Tumor more than 5 cm in its greatest dimension
  - T3a No fixation to underlying pectoral fascia or muscle
  - T3b Fixation to underlying pectoral fascia or muscle
- T4 Tumor of any size with direct extension to chest wall or skin  
 Note: Chest wall includes ribs, intercostal muscles, and serratus anterior muscle, but not pectoral muscle.
  - T4a Fixation to chest wall
  - T4b Edema (including *peau d'orange*), ulceration of the skin of the breast, or satellite skin nodules confined to the same breast
  - T4c Both of the above

‡Dimpling of the skin, nipple retraction, or any other skin changes except those in T4b may occur in T1, T2, or T3 without affecting the classification.  
 Note: Cases of inflammatory carcinoma should be reported separately

**Lymph Nodes (N)**

Definitions for clinical-diagnostic stage

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 Homolateral axillary lymph nodes not considered to contain growth
- N1 Movable homolateral axillary nodes considered to contain growth
- N2 Homolateral axillary nodes considered to contain growth and fixed to one another or to other structures
- N3 Homolateral supraclavicular or infraclavicular nodes considered to contain growth, or edema of the arm

Edema of the arm may be caused by lymphatic obstruction, and lymph nodes may not then be palpable.

\* Use a separate form each time a case is staged.  
 † See reverse side for additional information.

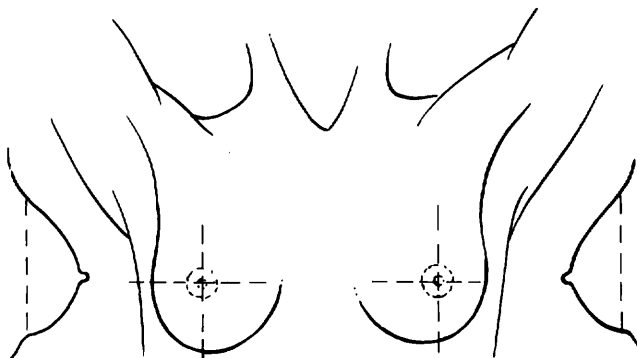
**Lymph Nodes (N)**

Definitions for surgical-evaluative and postsurgical resection-pathologic stages

- NX Minimum requirements to assess the presence of distant metastasis cannot be met.
- N0 No evidence of homolateral axillary lymph node metastasis
- N1 Metastasis to movable homolateral axillary nodes not fixed to one another or to other structure
  - N1a Micrometastasis ≤ 0.2 cm in lymph node(s)
  - N1b Gross metastasis in lymph node(s)
    - i Metastasis more than 0.2 cm, but less than 2.0 cm, in one to three lymph nodes
    - ii Metastasis more than 0.2 cm, but less than 2.0 cm, in four or more lymph nodes
    - iii Extension of metastasis beyond the lymph node capsule (less than 2.0 cm in total dimension)
    - iv Metastasis in lymph node 2.0 cm or more in dimension
- N2 Metastases to homolateral axillary lymph nodes that are fixed to one another or to other structures
- N3 Metastasis to homolateral supraclavicular or infraclavicular lymph node(s)

**Distant Metastasis (M) All time periods**

- MX Not assessed
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
 Specify \_\_\_\_\_



Indicate on diagram primary tumor and regional nodes involved.

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_



Tumor Size \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_ cm.

Predominant Lesion

Measured on  Patient  Mammogram  
 Pathologic specimen

Location  OUQ  Nipple/areola  
(multiple when  OLQ  IUQ  ILQ  
necessary)

Lymph Nodes Total Number \_\_\_\_\_  
Number with metastasis \_\_\_\_\_

### Stage Grouping

- Clinical-diagnostic (cTNM)  
 Surgical-Evaluative (sTNM)  
 Postsurgical resection-pathologic (pTNM)
- STAGE Tis *In situ*  
 STAGE X Cannot stage
- STAGE I  T1ai, N0, M0  
 T1aii, N0, M0  
 T1aiii, N0, M0  
 T1bi, N0, M0  
 T1bii, N0, M0  
 T1biii, N0, M0
- STAGE II  T0, N1a or N1b, M0  
 T1a or T1b; N1a or N1b, M0  
 T2a or T2b; N0, M0  
 T2a or T2b; N1a or N1b, M0
- STAGE IIIA  T0, N2, M0  
 T1a or T1b; N2, M0  
 T2a or T2b; N2, M0  
 T3a or T3b; N0, M0  
 T3a or T3b; N1, M0  
 T3a or T3b; N2, M0
- STAGE IIIB  Any T, N3, M0  
 Any T4, any N, M0
- Stage IV  Any T, any N, M1

### Recommended Examinations for Staging

- Essential examinations
  - Physical examination
  - Bilateral breast imaging by a validated technique such as x-ray mammography
  - Usual admission clinical pathology examinations including a liver profile with enzyme studies
  - Chest x-ray examination
- Selected examinations
  - Radionuclide liver scan when there is
    - Abnormal liver profile
    - Hepatomegaly
  - Radionuclide bone scan for any of the listed conditions
    - Advanced local disease (T3, T4)
    - Lymph node metastasis (N1, N2, N3)
    - Distant metastases (M1)

### Clinical-Diagnostic Stage

The clinical-diagnostic stage includes the following:

- Physical examination
- Diagnostic imaging (such as mammography)
- Clinical pathology tests (such as blood tests)
- Pathologic examination of the primary cancer or other tissues to establish the diagnosis of breast cancer

### Postsurgical Resection-Pathologic Stage

The postsurgical resection-pathologic stage includes the following:

- All of the data used for clinical-diagnostic or surgical-evaluative staging.
- Pathologic examination of the primary cancer, the entire breast, and all levels of axillary lymph nodes, as with standard or modified radical mastectomy

### Surgical-Evaluative Stage

The surgical-evaluative stage includes the following:

- All data used for clinical-diagnostic staging
- Pathologic examination of tissues in addition to the primary cancer, but less than with a modified radical mastectomy. (Therefore, there is pathologic examination of the primary cancer and some of the axillary lymph nodes or other tissues.)

### Histologic Type of Cancer

Check predominant type

Cancer, NOS\*

Ductal

- Intraductal (*in situ*)  
 Invasive with predominant intraductal component  
 Invasive, NOS\*  
 Comedo  
 Inflammatory  
 Medullary with lymphocytic infiltrate  
 Mucinous (colloid)  
 Papillary  
 Scirrhous  
 Tubular  
 Other \_\_\_\_\_  
Specify \_\_\_\_\_

Lobular

- In situ*  
 Invasive with predominant *in situ* component  
 Invasive

Nipple

- Paget's disease, NOS\*  
 Paget's disease with intraductal carcinoma  
 Paget's disease with invasive ductal carcinoma

Other: Specify \_\_\_\_\_

### Histologic Grade

- GX Cannot be assessed  
 G1 Well differentiated  
 G2 Moderately well differentiated  
 G3-G4 Poorly to very poorly differentiated.

### Postsurgical Resection-Pathologic Residual Tumor (R)

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor

\*Not otherwise specified

## Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
[ ] H0	Normal activity	0	90-100
[ ] H1	Symptomatic but ambulatory; cares for self	1	70-80
[ ] H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
[ ] H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
[ ] H4	Bedridden; may need hospitalization	4	10-20

# GYNECOLOGIC SITES

22

## Cervix Uteri

In 1976 the AJCC adopted the classification of the International Federation of Gynecology and Obstetrics (FIGO), which is the format used in the "Annual Report on the Results of Treatment in Gynecological Carcinoma." Published every 3 years, this report has used the FIGO classification with periodic modifications since 1937. Numerous institutions throughout the world contribute their statistics for inclusion in this voluntary collaborative presentation of data.

Since 1966 the TNM Committee of the Union Internationale Contre le Cancer (UICC) has promulgated its recommendations for the classification of gynecologic tumors. From time to time, often in concert with representatives of FIGO, these recommendations also have been modified. The most recent revision in 1976 has brought the TNM and FIGO definitions into full conformity with each other. At this time, therefore, all systems are substantially in full agreement about both categories and details. No substantive changes have been made in gynecologic classification since the first publication of the *Manual for Staging of Cancer* by the AJCC in 1977.

### ANATOMY (ICD-O 180)

**Primary Site.** The cervix is the lower third of the uterus. It is roughly cylindrical in shape, projects through the upper, anterior vaginal wall, and communicates with the vagina through an orifice called the external os. Cancer of the cervix may originate on the vaginal surface or in the canal.

**Nodal Stations.** The cervix is drained by preureteral, post-ureteral, and uterosacral routes into the following first station nodes: parametrial, hypogastric (obturator), external iliac, presacral, and common iliac. Para-aortic nodes are second station and juxtaregional.

**Metastatic Sites.** The most common sites of distant spread include the lungs and skeleton.

### RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** Careful clinical examination should be performed in all cases, preferably by an experienced exam-



iner and with anesthesia. The clinical staging must not be changed because of subsequent findings. When there is doubt as to which stage a particular cancer should be allocated, the earlier stage is mandatory. The following examinations are permitted: palpation, inspection, colposcopy, endocervical curettage, hysteroscopy, cystoscopy, proctoscopy, intravenous urography, and x-ray examination of the lungs and skeleton. Suspected bladder or rectal involvement should be confirmed by biopsy and histologic evidence. Optional examinations include lymphangiography, arteriography, venography, laparoscopy, and others. Because these are not yet generally available and also because the interpretation of results is variable, the findings of optional studies should not be the basis for changing the clinical staging.

**Surgical-Evaluative Staging.** Surgical evaluation is applicable only after laparotomy and examination of tumor and nodes. Conization or amputation of the cervix is regarded as a clinical examination. Invasive cancers so identified are to be included in the reports.

**Postsurgical Resection-Pathologic Staging.** In cases treated by surgical procedures, the pathologist's findings in the removed tissues can be the basis for extremely accurate statements on the extent of disease. These findings should not be allowed to change the clinical staging but should be recorded in the manner described for the pathologic staging of disease. The pTNM nomenclature is appropriate for this purpose. Infrequently, it happens that hysterectomy is carried out in the presence of unsuspected extensive invasive cervical carcinoma. Such cases cannot be clinically staged or included in therapeutic statistics, but it is desirable that they be reported separately. Only if the rules for clinical staging are strictly observed will it be possible to compare results among clinics and by differing modes of therapy.

**Retreatment Staging.** Complete examination using the procedures cited above, including a search for distant metastases, is recommended in cases known or suspected to have recurrence. Biopsy and histologic confirmation are particularly desirable when induration and fibrosis from previously treated disease are present.

## STAGING CLASSIFICATION

### FIGO Nomenclature

**Stage 0.** Carcinoma *in situ*, intraepithelial carcinoma

**Stage I.** The carcinoma is strictly confined to the cervix (extension to the corpus should be disregarded).

Stage IA Microinvasive carcinoma (early stromal invasion)

Stage IB All other cases of stage I; occult cancer should be marked "occ."

**Stage II.** The carcinoma extends beyond the cervix but has not extended to the pelvic wall. The carcinoma involves the vagina, but not as far as the lower third.

Stage IIA No obvious parametrial involvement

Stage IIB Obvious parametrial involvement

**Stage III.** The carcinoma has extended to the pelvic wall. On rectal examination, there is no cancer-free space between the tumor and the pelvic wall. The tumor involves the lower third of the vagina. All cases with hydronephrosis or nonfunctioning kidney are included, unless they are known to be due to other cause.

Stage IIIA No extension to the pelvic wall

Stage IIIB Extension to the pelvic wall or hydronephrosis or nonfunctioning kidney

**Stage IV.** The carcinoma has extended beyond the true pelvis or has clinically involved the mucosa of the bladder or rectum. A bullous edema as such does not permit a case to be allotted to stage IV.

Stage IVA Spread of the growth to adjacent organs

Stage IVB Spread to distant organs

**Notes About the Staging.** Stage IA (microinvasive carcinoma) represents those cases of epithelial abnormalities in which histologic evidence of early stromal invasion is unambiguous. The diagnosis is based upon microscopic examination of tissue removed by biopsy, conization, portio amputation, or removal of the uterus. Cases of early stromal invasion should thus be allotted to stage IA.

In the interest of accuracy, when cases are staged IA on the basis of punch biopsy material, it is recommended that the material be sufficiently sampled to rule out a more advanced histology. In most instances, conization and examination of the lesion in its entirety are preferable.

The remaining stage I cases should be allotted to stage IB. As a rule these cases can be diagnosed by routine clinical examination.

Occult cancer is a histologically invasive cancer that cannot be diagnosed by routine clinical examination. As a rule it is diagnosed either on the basis of a cone or the amputated portio, or on the removed uterus. Such cancers should be included in stage IB and should be marked "stage IB, occ."

Stage I cases can thus be indicated in the following ways:



- Stage IA Carcinoma *in situ* with early stromal invasion diagnosed either on tissue removed by biopsy, conization, portio amputation, or on the removed uterus
- Stage IB Clinically invasive carcinoma confined to the cervix
- Stage IB, occ Histologically invasive carcinoma of the cervix that could not be detected at routine clinical examination but that was diagnosed on the basis of a large biopsy specimen, a cone, the amputated portio, or the removed uterus

As a rule, it is impossible to estimate clinically whether a cancer of the cervix has extended to the corpus or not. Extension to the corpus should therefore be disregarded.

A patient with a growth fixed to the pelvic wall by a short and indurated but not nodular parametrium should be allotted to stage IIB. It is impossible, at clinical examination, to decide whether a smooth and indurated parametrium is truly cancerous or only inflammatory. Therefore, the case should be placed in stage III only if the parametrium is nodular to the pelvic wall or if the growth itself extends to the pelvic wall.

The presence of hydronephrosis or nonfunctioning kidney due to stenosis of the ureter by cancer permits a case to be allotted to stage III even if, according to the other findings, the case should be allotted to stage I or stage II.

The presence of bullous edema, as such, should not permit a case to be allotted to stage IV. Ridges and furrows into the bladder wall should be interpreted as signs of submucous involvement of the bladder if they remain fixed to the growth at palpation (*i.e.*, examination from the vagina or the rectum during cystoscopy). Finding malignant cells in cytologic washings from the urinary bladder requires further examination and a biopsy from the wall of the bladder.

## TNM Nomenclature

### Primary Tumor (T)

Tis Carcinoma *in situ*  
See Stage 0

T1, 1a, 1b

T2a, 2b

T3a, 3b

T4

See corresponding FIGO stages.

### Nodal Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No involvement of regional nodes
- N1 Evidence of regional node involvement
- N4 Involvement of lumbo-aortic nodes

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

## POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

## STAGE GROUPING

(Correlation of AJCC, TNM, and FIGO nomenclatures)

Stage 0	Tis
Stage IA	T1a, N0, M0
Stage IB	T1b, N0, M0
Stage IIA	T2a, N0, M0
Stage IIB	T2b, N0, M0
Stage IIIA	T3a, N0, M0
Stage IIIB	T3b, N0-N1, M0
Stage IVA	T4a, NX-N1, M0
Stage IVB	Any T, any N, M1

## HISTOPATHOLOGY

Cases should be classified as carcinoma of the cervix if the primary growth is in the cervix. All histologic types must be included. Grading by any of several methods is encouraged but is not a basis for modifying the stage groupings. When surgery is the primary treatment, the histologic findings permit the case to have pathologic staging. In this the pTNM



nomenclature is to be used. It is desirable that all tumors be microscopically verified, but cases that clinically are likely to be cancer without such confirmation should be included with special attention to descriptive detail. The number should be kept to a minimum.

### **DATA FORMS**

The data collecting forms that follow Chapter 26 have been designed for use by institutions in summarizing the described information on individual cases. Forms should be on file in the registry for each accession.

Additional checklists are recommended whenever a patient arrives at a new point for staging such as postsurgical, pathologic, and so forth.

The checklists include the relevant items of information desirable at all gynecologic sites, but only those need be used that apply in a given case. However, as complete a record as possible is necessary for accuracy in staging and analysis of results.

The diagrams are most helpful to those who review cases subsequently. Individuals are urged to mark in contrasting color (red) the location of tumor and satellites on the relevant diagrams at the time of initiation of the forms.

## Corpus Uteri

### ANATOMY (ICD-O 182)

**Primary Site.** The upper two thirds of the uterus above the level of the internal cervical os is called the corpus. The fallopian tubes enter at the upper lateral corners of a pear-shaped body. That portion of the muscular organ that is above a line joining the tubo-uterine orifices is often referred to as the fundus.

**Nodal Stations.** The major lymphatic trunks are the utero-ovarian (infundibulo-pelvic), parametrial, and presacral, which drain into the hypogastric, external iliac, common iliac, presacral, and para-aortic nodes.

**Metastatic Sites.** The vagina and lung are the common metastatic sites.

### RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** Careful clinical examination should be performed, preferably by an experienced examiner and with anesthesia, before any definitive therapy. The clinical staging must not be changed because of subsequent findings. When there is doubt as to which stage a particular cancer should be allocated, the earlier stage is mandatory. The following examinations are permitted: palpation, inspection, colposcopy, endocervical curettage, hysteroscopy, cystoscopy, proctoscopy, intravenous urography, and x-ray examination of lungs and skeleton. Optional examinations include lymphangiography, arteriography, venography, and laparoscopy. Sounding and determination of the depth of the uterine cavity is an important step. Fractional curettage is essential with separation of endometrial and endocervical curettings. Careful inspection and palpation of the vagina should be carried out to assess the entire length of the vaginal tube from the apex to the urethra.

**Surgical-Evaluative Staging.** Biopsy proof is advised for suspected vaginal, bladder, or rectal invasion. Laparotomy is needed for evaluation and examination of pelvic and para-aortic lymph nodes.

**Postsurgical Resection-Pathologic Staging.** Hysterectomy with or without pelvic node dissection provides the basis for surgical-pathologic staging and should not be substituted for clinical staging.

**Retreatment Staging.** Utilization of available procedures noted above is required, particularly since induration and necrosis can occur after irradiation; scarring and nodularity to a vaginal cuff can occur after surgery. A reevaluation of distant metastases, as well as T and N compartments, is recommended.

## STAGING CLASSIFICATION

### FIGO Nomenclature

**Stage 0.** Carcinoma *in situ*. Histologic findings are suspicious of malignancy; cases of stage 0 should not be included in any therapeutic statistics.

**Stage I.** The carcinoma is confined to the corpus.

Stage IA The length of the uterine cavity is 8 cm or less.

Stage IB The length of the uterine cavity is more than 8 cm.

It is desirable that the stage I cases be subgrouped with regard to the histologic type of the adenocarcinoma as follows:

- G1 Highly differentiated adenomatous carcinoma
- G2 Moderately differentiated adenomatous carcinoma with partly solid areas
- G3 Predominantly solid or entirely undifferentiated carcinoma

**Stage II.** The carcinoma has involved the corpus and the cervix but has not extended outside the uterus.

**Stage III.** The carcinoma has extended outside the uterus but not outside the true pelvis.

**Stage IV.** The carcinoma has extended outside the true pelvis or has obviously involved the mucosa of the bladder or rectum. A bullous edema as such does not permit a case to be allotted to stage IV.

Stage IVA Spread of the growth to adjacent organs

Stage IVB Spread to distant organs

**Notes About the Staging.** Studies of large series of cases of endometrial carcinoma limited to the corpus have shown that the prognosis is related to some extent to the size of the uterus. However, an enlargement of the uterus may be caused by fibroids, adenomyosis, and other disorders. Therefore, the size of the uterus cannot serve as a basis for subgrouping stage I cases. The length and the width of the uterine

cavity are related to the prognosis. The great majority of cases of corpus cancer belong to stage I. A subdivision of these cases is desirable. Therefore, the Cancer Committee recommends a subdivision of stage I cases with regard to the length of the sound used and to the histologic examination of the curettings.

Extension of the carcinoma to the endocervix is confirmed by fractional curettage, hystero-graphy, or hysteroscopy. Scraping the cervix should be the first step of the curettage and the specimens from the cervix should be examined separately. Occasionally, it may be difficult to decide whether the endocervix is involved by the cancer. In such cases, the simultaneous presence of normal cervical glands and cancer in the same section will give the final diagnosis.

Extension of the carcinoma outside the uterus should refer a case to stage III or stage IV. The presence of metastases in the vagina or in the ovary permits allotment of a case to stage III.

### TNM Nomenclature

#### Primary Tumor (T)

Tis Carcinoma *in situ*

T1, 1a, 1b

T2

T3

T4

See corresponding FIGO stages.

#### Nodal Involvement (N)

NX Minimum requirements to assess the regional nodes cannot be met.

N0 No involvement of regional nodes

N1 Evidence of regional node involvement

#### Distant Metastasis (M)

MX Minimum requirements to assess the presence of distant metastasis cannot be met.

M0 No (known) distant metastasis

M1 Distant metastasis present

Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

**POSTSURGICAL TREATMENT  
RESIDUAL TUMOR (R)**

- R0 No residual tumor  
R1 Microscopic residual tumor  
R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

**STAGE GROUPING**

(Correlation of AJCC, TNM, and FIGO nomenclatures)

- Stage 0 Tis  
Stage IA T1a, N0, M0  
Stage IB T1b, N0, M0  
Stage II T2, N0, M0  
Stage III T3, N0, M0  
T1-T3; N1; M0

- Stage IVA T4a, N0, N1; M0  
Stage IVB Any T, any N, M1

**HISTOPATHOLOGY**

It is desirable that stage I cases be subgrouped according to the degree of differentiation described on microscopic examination. The predominant lesion is adenocarcinoma, but all histologic types should be reported. However, choriocarcinomas, sarcomas, mixed mesodermal tumors, and carcinosarcomas should be presented separately.

**DATA FORMS**

The forms presented after Chapter 26 are suitable for tumors at all gynecologic sites. Forms should be filled out for each new case entered into the registry.

## Ovary

### ANATOMY (ICD-O 183.0)

**Primary Site.** Ovaries are a pair of solid bodies, flattened ovoids 2.0 to 4.0 cm in diameter, that are connected by a peritoneal fold to the broad ligament and by the infundibulo-pelvic ligament to the lateral wall of the pelvis.

**Nodal Stations.** The lymphatic drainage occurs by the utero-ovarian and round ligament trunks and an external iliac accessory route into the following regional nodes: external iliac, common iliac, hypogastric, lateral sacral, and para-aortic nodes, and, rarely, to inguinal nodes.

**Metastatic Sites.** The peritoneum, including the omentum and pelvic and abdominal viscera, is a common site for seeding. Diaphragmatic involvement and liver metastases are common. Pulmonary and pleural involvement also occurs.

### RULES FOR CLASSIFICATION

It is desirable to have a clinical stage grouping of ovarian tumors similar to those already existing for other malignant tumors in the female pelvis. Rarely is it possible to come to a final diagnosis by inspection or palpation or by any of the other methods recommended for clinical staging of carcinoma of the uterus and vagina. Therefore, the Cancer Committee of FIGO has recommended that the clinical staging of primary carcinoma of the ovary should be based on findings by laparoscopy or laparotomy, as well as on the usual clinical examination and roentgen studies.

**Clinical-Diagnostic Staging.** Although clinical studies similar to those for other sites may be used, the establishment of a diagnosis most often requires a laparotomy, which is most widely accepted in surgical-pathologic staging. Clinical studies, if carcinoma of the ovary is diagnosed, include routine radiography of chest. CT may be helpful in both initial staging and follow-up of the tumors.

**Surgical-Evaluative Staging.** Laparotomy and biopsy of all suspected sites of involvement provide the basis for this type of



staging; this staging is often identical to postsurgical staging. The role of laparoscopy needs to be better defined. Histologic and cytologic data are required.

**Postsurgical Resection-Pathologic Staging.** This should include laparotomy and resection of ovarian masses, as well as hysterectomy. Biopsies of all suspicious sites, such as the omentum, mesentery, liver, diaphragm, and pelvic and para-aortic nodes, are required.

**Retreatment Staging.** Second-look laparotomies and laparoscopies are being evaluated, owing to the limitation of routine pelvic and abdominal examinations in detecting early recurrence. Other optional and investigative procedures include ultrasound and computerized axial tomography. All suspected recurrences need biopsy confirmation.

**STAGING CLASSIFICATION**

**FIGO Nomenclature**

Staging is based on findings at clinical examination and surgical exploration. The final histologic findings after surgery (and cytologic ones when available) are to be considered in the staging.

**Stage I.** Growth is limited to the ovaries.

- Stage IA Growth limited to one ovary; no ascites
  - IA1 No tumor on the external surface; capsule intact
  - IA2 Tumor present on the external surface, or capsule (s) ruptured, or both
- Stage IB Growth limited to both ovaries; no ascites
  - IB1 No tumor on the external surface; capsule intact
  - IB2 Tumor present on the external surface, or capsule(s) ruptured, or both
- Stage IC Tumor either stage IA or IB, but with ascites\* present or with positive peritoneal washings

**Stage II.** Growth involves one or both ovaries, with pelvic extension.

- Stage IIA Extension or metastases to the uterus or tubes
- Stage IIB Extension to other pelvic tissues
- Stage IIC Tumor either stage IIA or stage IIB, but with ascites\* present or with positive peritoneal washings

**Stage III.** Growth involving one or both ovaries with intraperitoneal metastases outside the pelvis, positive retroperitoneal nodes, or both. Tumor is limited to the

\* Ascites is peritoneal effusion that, in the opinion of the surgeon, is pathologic, or clearly exceeds normal amounts, or both.

true pelvis but with histologically proven malignant extension to small bowel or omentum

**Stage IV.** Growth involving one or both ovaries with distant metastases. If pleural effusion is present there must be positive cytology to allot a case to stage IV. Parenchymal liver metastasis equals stage IV.

**Special Category.** Unexplored cases that are thought to be ovarian carcinoma are included here.

**TNM Nomenclature**

**Primary Tumor (T)**

- T1ai, 1aii, 1bi, 1bii, 1c
- T2a, 2b, 2c
- T3

See corresponding FIGO stages.

**Nodal Involvement (N)**

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No involvement of regional nodes
- N1 Evidence of regional node involvement

**Distant Metastasis (M)**

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

- Pulmonary PUL
- Osseous OSS
- Hepatic HEP
- Brain BRA
- Lymph nodes LYM
- Bone marrow MAR
- Pleura PLE
- Skin SKI
- Eye EYE
- Other OTH

**POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)**

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

**STAGE GROUPING**

(Correlation of AJCC, TNM, and FIGO nomenclatures)

- Stage IA1 T1ai, N0, M0
- Stage IA2 T1aii, N0, M0

Stage IB1	T1bi, N0, M0
Stage IB2	T1bii, N0, M0
Stage IC	T1c, N0, M0
Stage IIA	T2a, N0, M0
Stage IIB	T2b, N0, M0
Stage IIC	T2c, N0, M0
Stage III	T3, N0, M0
	T1, T2, T3; N1, M0
Stage IV	Any T, any N, M1

## HISTOPATHOLOGY

The task force of the AJCC endorses the histologic typing of ovarian tumors as presented in the WHO publication no. 9, 1973, and recommends that all ovarian epithelial tumors be subdivided according to a simplified version of this. The types recommended at the present time are as follows: serous tumors, mucinous tumors, endometrioid tumors, clear cell (mesonephroid) tumors, undifferentiated tumors, and unclassified tumors.

- A. Serous cystomas
  1. Serous benign cystadenomas
  2. Serous cystadenomas with proliferating activity of the epithelial cells and nuclear abnormalities, but with no infiltrative destructive growth (low potential malignancy)
  3. Serous cystadenocarcinomas
- B. Mucinous cystomas
  1. Mucinous benign cystadenomas
  2. Mucinous cystadenomas with proliferating activity of the epithelial cells and nuclear abnormalities, but with no infiltrative destructive growth (low potential malignancy)
  3. Mucinous cystadenocarcinomas
- C. Endometrioid tumors (similar to adenocarcinomas in the endometrium)
  1. Endometrioid benign cysts
  2. Endometrioid tumors with proliferating activity of the epithelial cells and nuclear abnormalities, but with no infiltrative destructive growth (low potential malignancy)
  3. Endometrioid adenocarcinomas

- D. Clear cell (mesonephroid) tumors
  1. Benign clear cell tumors
  2. Clear cell tumors with proliferating activity of the epithelial cells and nuclear abnormalities, but with no infiltrative destructive growth (low potential malignancy)
  3. Clear cell cystadenocarcinomas
- E. Unclassified tumors that cannot be allotted to one of the groups A-D
- F. No histology
- G. Other malignant tumors—Malignant tumors other than those of the common epithelial types are not to be included with the categories listed above. However, the more common ones such as granulosa cell tumor, immature teratoma, dysgerminoma, and endodermal sinus tumor may be collected and reported separately by institutions so desiring, particularly those with a pediatric population among their patients.

In some cases of inoperable widespread malignant tumor, it may be impossible for the gynecologist and the pathologist to decide the origin of the growth. In order to evaluate the results obtained in the treatment of carcinoma of the ovary, it is, however, necessary that all patients are reported on, as well as those who are thought to have a malignant ovarian tumor. If clinical examination cannot exclude the possibility that the lesion is a primary ovarian carcinoma, a case should be reported in the group "special category" and will belong to either histologic group E or F. Cases in which exploratory surgery has shown that obvious ovarian malignant tumor is present, but in which no biopsy has been taken, should be classified as ovarian carcinoma, "no histology."

## DATA FORMS

The forms presented after Chapter 26 are applicable to tumors of all gynecologic sites. Forms should be filled out on each new case as it is entered into the registry. The diagrams are particularly useful in ovarian cancer.

## Vagina

The rules for classification are similar to those for the cervix uteri and should be referred to accordingly.

### STAGING CLASSIFICATION (ICD-O 184.0)

#### FIGO Nomenclature

**Stage 0.** Carcinoma *in situ*, intraepithelial carcinoma

**Stage I.** The carcinoma is limited to the vaginal wall.

**Stage II.** The carcinoma has involved the subvaginal tissue but has not extended to the pelvic wall.

**Stage III.** The carcinoma has extended to the pelvic wall.

**Stage IV.** The carcinoma has extended beyond the true pelvis or has involved the mucosa of the bladder or rectum. Bullous edema as such does not permit a case to be allotted to stage IV.

Stage IVA Spread of the growth to adjacent organs

Stage IVB Spread to distant organs

#### TNM Nomenclature

##### Primary Tumor (T)

Tis Carcinoma *in situ*

T1

T2

T3

T4

See corresponding FIGO stages.

##### Nodal Involvement (N)

NX Minimum requirements to assess the regional nodes cannot be met.

N0 No involvement of regional nodes

N1 Evidence of regional node involvement

##### Distant Metastasis (M)

MX Minimum requirements to assess the presence of distant metastasis cannot be met.

M0 No (known) distant metastasis

M1 Distant metastasis present

Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

## Vulva

The rules for classification are similar to those at the other gynecologic sites. Tumors present in the vulva as secondary growths from either a genital or extragenital site should be excluded. Malignant melanoma should be separately reported. The femoral, inguinal, external iliac, and hypogastric nodes are the sites of regional spread.

### STAGING CLASSIFICATION (ICD-O 184.4)

#### FIGO Nomenclature

**Stage 0.** Carcinoma *in situ*

**Stage I.** Tumor confined to vulva; 2 cm or less in diameter. Nodes are not palpable or, if palpable in either groin, are not enlarged, and are mobile (not clinically suspicious of neoplasm).

**Stage II.** Tumor confined to the vulva; more than 2 cm in diameter. Nodes are not palpable or, if palpable in either groin, are not enlarged, and are mobile (not clinically suspicious of neoplasm).

**Stage III.** Tumor of any size with (1) adjacent spread to the urethra and any or all of the vagina, the perineum, and the anus; (2) nodes palpable in either or both groins (enlarged, firm, and mobile, not fixed but clinically suspicious of neoplasm); (3) both

**Stage IV.** Tumor of any size (1) infiltrating the bladder mucosa or the rectal mucosa or both, including the upper part of the urethral mucosa; (2) fixed to the bone or other distant metastases, (3) both. Fixed or ulcerated nodes in either or both groins

#### TNM Nomenclature

##### Primary Tumor (T)

Tis  
T1  
T2  
T3  
T4

See corresponding FIGO stages.



**Nodal Involvement (N)**

- NX** Minimum requirements to assess the regional nodes cannot be met.
- N0** No involvement of regional nodes
- N1** Evidence of regional node involvement
- N3** Fixed or ulcerated nodes
- N4** Juxtaregional node involvement

**Distant Metastasis (M)**

- MX** Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0** No (known) distant metastasis
- M1** Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Eye	EYE
Lymph nodes	LYM	Other	OTH

**DATA FORMS**

Use of the forms is recommended in every new case entered into the registry regardless of site. The first data form is the one recommended by the Task Force on Gynecologic Sites. The second one contains the same information but is formulated like other AJCC forms.

## GYNECOLOGIC SITES (ICD-O 180, 182-184)

### Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  
 Date of classification \_\_\_\_\_

Histologic cell type \_\_\_\_\_  
 Grade \_\_\_\_\_  
 cTNM \_\_\_\_\_ sTNM \_\_\_\_\_ pTNM \_\_\_\_\_ rTNM \_\_\_\_\_ aTNM \_\_\_\_\_

### Site-Specific Information: Cervix Uteri, Corpus Uteri, Ovary, Vagina, and Vulva

Anatomic site \_\_\_\_\_  
 FIGO stage \_\_\_\_\_  
 TNM \_\_\_\_\_  
 Histology \_\_\_\_\_  
 Grade 1  2  3   
 Depth of invasion \_\_\_\_\_  
 Lymphatic No  Yes   
 Blood vessel No  Yes   
 Nodal No  Yes   
 Metastases No  Yes   
 Specify \_\_\_\_\_

Uterine sound  $\leq 8$  cm   $>8$  cm   
 Cyst ruptured No  Yes  Specify \_\_\_\_\_  
 Ascites No  Yes  Cytology \_\_\_\_\_  
 Pleural effusion No  Yes  Cytology \_\_\_\_\_

Treatment planned:  
 Chemotherapy  Radiotherapy   
 Surgery  Immunotherapy   
 Hormone   
 Treatment given:  
 Chemotherapy  Hormone   
 Surgery  Radiotherapy   
 Immunotherapy   
 Reason for change \_\_\_\_\_

Relevant surgery \_\_\_\_\_  
 Residual disease No  Micro  Macro   
 Relevant radiotherapy:  
 Transvag  75-140 kV  200-300 kV   
 External  1-6 meV  18-35 meV   
 Tumor dose \_\_\_\_\_  
 Time \_\_\_\_\_  
 Intracavitary  Interstitial  Isotope

Relevant medical treatment \_\_\_\_\_  
 \_\_\_\_\_  
 Complications \_\_\_\_\_  
 Performance status \_\_\_\_\_  
 Special comment \_\_\_\_\_

The classification on this sheet is for guidance in completing the form. For details and explanations, consult the manual.

For the use of registry secretaries. This space is available for follow-up information.

Status at: 6 mo \_\_\_\_\_ 4 yr \_\_\_\_\_  
 1 yr \_\_\_\_\_ 5 yr \_\_\_\_\_  
 2 yr \_\_\_\_\_  $>5$  yr \_\_\_\_\_  
 3 yr \_\_\_\_\_

### Definitions

#### Cervix Uteri (ICD-O 180)

Stage 0 (Tis) Carcinoma *in situ*  
 Stage I (T1) Carcinoma confined to cervix  
     IA (T1a) Microinvasive carcinoma  
     IB (T1b) All other cases of stage I  
 Stage II (T2) Carcinoma extending beyond cervix but not to pelvic wall or lower vagina  
     IIA (T2a) No obvious parametrial involvement  
     IIB (T2b) Obvious parametrial involvement  
 Stage III (T3) Carcinoma extending to pelvic wall or lower vagina, or ureteral obstruction  
     IIIA (T3a) No extension to pelvic wall  
     IIIB (T3b) Extension to one or both pelvic walls, or ureteral obstruction  
 Stage IV (T4) Carcinoma beyond true pelvis or invading bladder or rectum  
     IVA (T4a) Spread to adjacent organs  
     IVB (M1) Spread to distant organs

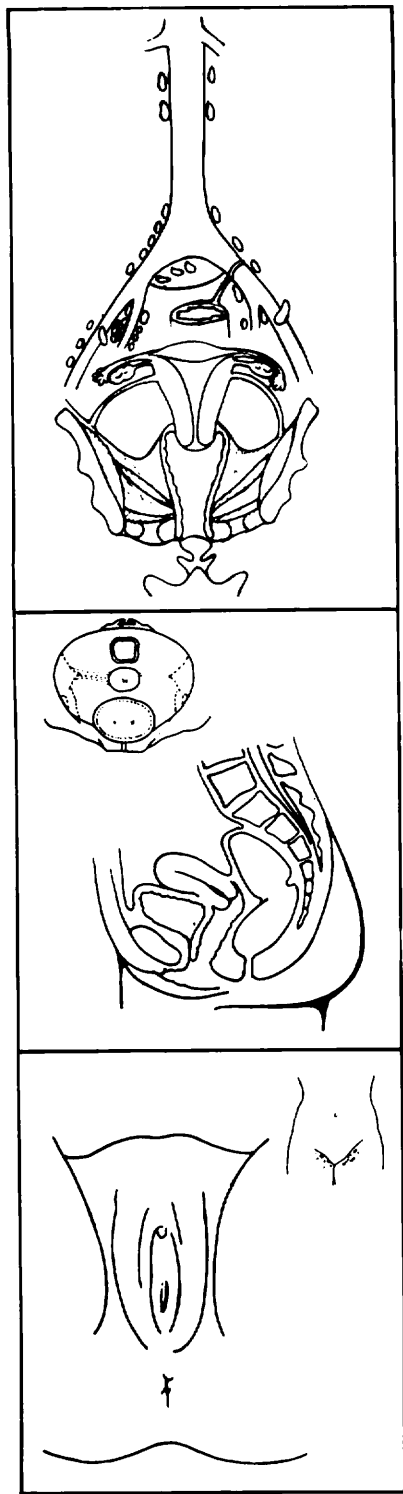
#### Corpus Uteri (ICD-O 182)

Stage 0 (Tis) Carcinoma *in situ*  
 Stage I (T1) Carcinoma confined to the corpus  
     IA (T1a) Uterine cavity 8 cm or less in length  
     IB (T1b) Uterine cavity greater than 8 cm in length  
     Stage I should be subgrouped by histology as follows:  
         G1, highly differentiated; G2, moderately differentiated; G3, undifferentiated  
 Stage II (T2) Extension to cervix only  
 Stage III (T3) Extension outside the uterus but confined to true pelvis  
 Stage IV (T4) Extension beyond true pelvis or invading bladder or rectum

#### Ovary (ICD-O 183)

Stage I (T1) Growth limited to ovaries  
     IA (T1a) Limited to one ovary; no ascites  
         (IAi) Capsule intact  
         (IAii) Capsule ruptured or tumor on external surface, or both

\*cTNM, clinical-diagnostic; sTNM, surgical-evaluative; pTNM, postsurgical treatment-pathologic; rTNM, retreatment; aTNM, autopsy



Indicate on diagrams primary tumor and regional nodes involved.

- IB (T1b) Limited to both ovaries, no ascites
- (IBi) Capsule intact
- (IBii) Capsule ruptured or tumor on external surface, or both
- IC (T1c) Either IA or IB with ascites
- Stage II (T2) Growth involving one or both ovaries with pelvic extension only
- IIA (T2a) Extension to uterus or tubes only
- IIB (T2b) Extension to other pelvic tissues
- IIC (T2c) Either IIA or IIB with ascites

- Stage III (T3) Spread outside pelvis or to retroperitoneal nodes, or both
- Stage IV (M1) Spread to distant sites (pleural effusion must be confirmed histologically)  
Ovarian tumors should be catalogued histologically as serous, mucinous, endometrioid, clear cell (mesonephroid), and undifferentiated. A grade of low potential malignancy should be separately recorded from the invasive lesions.

#### Vagina (ICD-O 184)

- Stage 0 (Tis) Carcinoma *in situ*
- Stage I (T1) Carcinoma limited to vaginal wall
- Stage II (T2) Carcinoma involves subvaginal tissues but does not extend to pelvic wall.
- Stage III (T3) Carcinoma extends to pelvic wall.
- Stage IV (T4) Extension beyond true pelvis or invading bladder or rectum
- IVA (T4) Spread to adjacent organs
- IVB (M1) Spread to distant organs

#### Vulva (ICD-O 184)

- Stage 0 (Tis) Carcinoma *in situ*
- Stage I (T1) Tumor 2 cm or less, confined to vulva
- Stage II (T2) Tumor more than 2 cm, confined to vulva
- Stage III (T3) Tumor of any size extending to urethra, vagina, or anus or (T1-2, N1-2, M0). Nodes obviously involved but mobile
- Stage IV (T4) Tumor invading bladder or rectum or bone or any N3 (fixed nodes); or any M1 (distant metastasis)

#### Uniform TNM Classification

##### Nodal Involvement

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No evidence of regional node involvement
- N1 Evidence of regional node involvement
- N3 Fixed or ulcerated regional nodes
- N4 Juxtaregional node involvement

##### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
  - M0 No (known) distant metastasis
  - M1 Distant metastasis present
- Specify \_\_\_\_\_

Specify sites according to the following notations:

- Pulmonary PUL
- Osseous OSS
- Hepatic HEP
- Brain BRA
- Lymph nodes LYM
- Bone marrow MAR
- Pleura PLE
- Skin SKI
- Eye EYE
- Other OTH

#### Postsurgical Resection-Pathologic Residual Tumor (R)

- [ ] R0 No residual tumor
  - [ ] R1 Microscopic residual tumor
  - [ ] R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

#### Histologic Grade

- [ ] G1 Well differentiated
- [ ] G2 Moderately well differentiated
- [ ] G3-G4 Poorly to very poorly differentiated

### Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

<i>AJCC</i>	<i>Performance</i>	<i>ECOG Scale</i>	<i>Karnofsky Scale (%)</i>
[ ] H0	Normal activity	0	90–100
[ ] H1	Symptomatic but ambulatory; cares for self	1	70–80
[ ] H2	Ambulatory more than 50% of time; occasionally needs as- sistance	2	50–60
[ ] H3	Ambulatory 50% or less of time; nursing care needed	3	30–40
[ ] H4	Bedridden; may need hospitali- zation	4	10–20

## GYNECOLOGIC SITES (ICD-O 180, 182-184)

### Data Form for Cancer Staging

Patient identification

Name \_\_\_\_\_

Address \_\_\_\_\_

Hospital or clinic number \_\_\_\_\_

Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification

Hospital or clinic \_\_\_\_\_

Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_

Chronology of classification\*  Clinical-diagnostic (cTNM)

Surgical-evaluative (sTNM)

Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_

Postsurgical resection-pathologic (pTNM)

Retreatment (rTNM)  Autopsy (aTNM)

### Definitions: TNM Classification

#### Cervix Uteri (ICD-O 180)

- Stage 0 (Tis) Carcinoma *in situ*
- Stage I (T1) Carcinoma confined to cervix
- IA (T1a) Microinvasive carcinoma
- IB (T1b) All other cases of stage I
- Stage II (T2) Carcinoma extends beyond cervix but not to pelvic wall or lower vagina
- IIA (T2a) No obvious parametrial involvement
- IIB (T2b) Obvious parametrial involvement
- Stage III (T3) Carcinoma extending to pelvic wall or lower vagina, or ureteral obstruction
- IIIA (T3a) No extension to pelvic wall
- IIIB (T3b) Extension to one or both pelvic walls, or ureteral obstruction
- Stage IV (T4) Carcinoma beyond true pelvis or invading bladder or rectum
- IVA (T4a) Spread to adjacent organs
- IVB (M1) Spread to distant organs

#### Corpus Uteri (ICD-O 182)

- Stage 0 (Tis) Carcinoma *in situ*
- Stage I (T1) Carcinoma confined to the corpus
- IA (T1a) Uterine cavity 8 cm or less in length
- IB (T1b) Uterine cavity greater than 8 cm in length
- Stage I should be subgrouped by histology as follows:
- G1, highly differentiated
- G2, moderately differentiated
- G3, undifferentiated
- Stage II (T2) Extension to cervix only
- Stage III (T3) Extension outside the uterus but confined to true pelvis
- Stage IV (T4) Extension beyond true pelvis or invading bladder or rectum

#### Ovary (ICD-O 183)

- Stage I (T1) Growth limited to ovaries
- IA (T1a) Limited to one ovary; no ascites
- (IA1) Capsule intact
- (IA2) Capsule ruptured or tumor on external surface, or both
- IB (T1b) Limited to both ovaries; no ascites
- (IB1) Capsule intact
- (IB2) Capsule ruptured or tumor on external surface, or both
- IC (T1c) Either IA or IB with ascites
- Stage II (T2) Growth involving one or both ovaries with pelvic extension only

- IIA (T2a) Extension to uterus or tubes only
- IIB (T2b) Extension to other pelvic tissues
- IIC (T2c) Either IIA or IIB with ascites
- Stage III (T3) Spread outside pelvis or to retroperitoneal nodes, or both
- Stage IV (M1) Spread to distant sites (pleural effusion must be confirmed histologically)
- Ovarian tumors should be catalogued histologically as serous, mucinous, endometrioid, clear cell (mesonephroid), and undifferentiated. A grade of low potential malignancy should be recorded separately from the invasive lesions.

#### Vagina (ICD-O 184)

- Stage 0 (Tis) Carcinoma *in situ*
- Stage I (T1) Carcinoma limited to vaginal wall
- Stage II (T2) Carcinoma involving subvaginal tissues but not extending to pelvic wall
- Stage III (T3) Carcinoma extending to pelvic wall
- Stage IV (T4) Extension beyond true pelvis or invading bladder or rectum
- IVA (T4) Spread to adjacent organs
- IVB (M1) Spread to distant organs

#### Vulva (ICD-O 184)

- Stage 0 (Tis) Carcinoma *in situ*
- Stage I (T1) Tumor 2 cm or less, confined to vulva
- Stage II (T2) Tumor more than 2 cm, confined to vulva
- Stage III (T3) Tumor of any size extending to urethra, vagina, or anus or (T1-T2, N1-N2, M0). Nodes obviously involved but mobile
- Stage IV (T4) Tumor invading bladder or rectum or bone or any N3 (fixed nodes); or any M1 (distant metastasis)

#### Nodal Involvement (N)

- NX Minimal requirements to assess the regional nodes cannot be met.
- N0 No evidence of regional node involvement
- N1 Evidence of regional node involvement
- N3 Fixed or ulcerated regional nodes
- N4 Juxtaregional node involvement

#### Distant Metastasis (M)

- MX Minimal requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) metastasis
- M1 Distant metastasis present
- Specify \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.

Date \_\_\_\_\_

\* Use a separate form each time a case is staged.

† See reverse side for additional information.



Specify sites according to the following notations:

- Pulmonary PUL
- Osseous OSS
- Hepatic HEP
- Brain BRA
- Lymph nodes LYM
- Bone marrow MAR
- Pleura PLE
- Skin SKI
- Eye EYE
- Other OTH

**Site-Specific Information:  
Cervix Uteri, Corpus Uteri, Ovary, Vagina, and Vulva**

Anatomic site \_\_\_\_\_  
 FIGO stage \_\_\_\_\_  
 TNM \_\_\_\_\_

Histology \_\_\_\_\_  
 Grade 1  2  3   
 Depth of invasion \_\_\_\_\_  
 Lymphatic No  Yes   
 Blood vessel No  Yes   
 Nodal No  Yes   
 Metastases No  Yes   
 Specify \_\_\_\_\_

Uterine sound  $\leq 8$  cm   $>8$  cm   
 Cyst ruptured No  Yes  Specify \_\_\_\_\_  
 Ascites No  Yes  Cytology \_\_\_\_\_  
 Pleural effusion No  Yes  Cytology \_\_\_\_\_

Treatment planned:  
 Chemotherapy  Radiotherapy   
 Surgery  Immunotherapy   
 Hormone   
 Treatment given:  
 Chemotherapy  Hormone   
 Surgery  Radiotherapy   
 Immunotherapy

Reason for change \_\_\_\_\_

Relevant surgery \_\_\_\_\_  
 Residual disease No  Micro  Macro

Relevant radiotherapy:  
 Transvag  75-140 kV  200-300 kV   
 External  1-6 meV  18-35 meV   
 Tumor dose \_\_\_\_\_  
 Time \_\_\_\_\_  
 Intracavitary  Interstitial  Isotope

Relevant medical treatment \_\_\_\_\_

Complications \_\_\_\_\_

Special comment \_\_\_\_\_

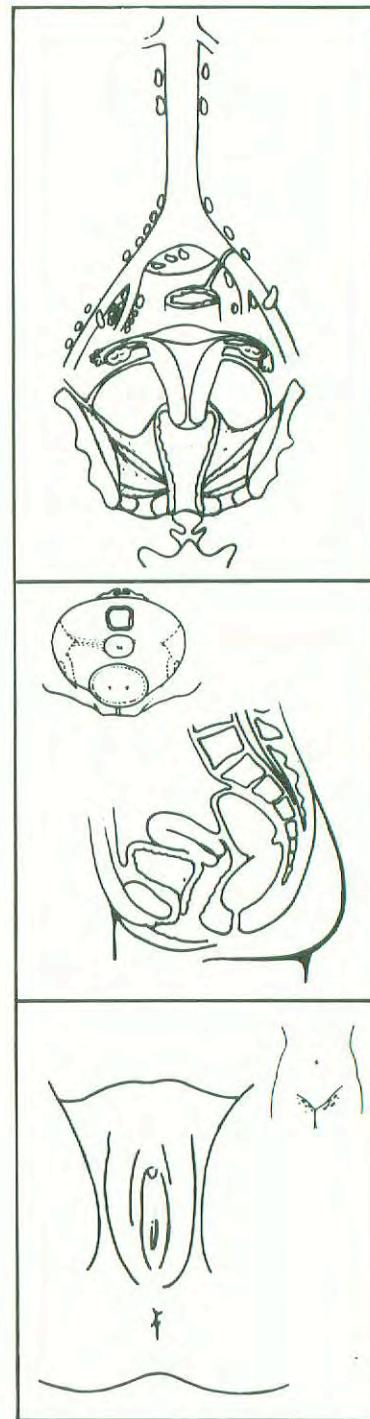
An abbreviated classification is printed on the opposite side of this sheet for guidance in completing the form. For details and explanations, consult the manual.

For the use of registry secretaries. This space is available for follow-up information.

Status at: 6 mo \_\_\_\_\_ 4 yr \_\_\_\_\_  
 1 yr \_\_\_\_\_ 5 yr \_\_\_\_\_  
 2 yr \_\_\_\_\_  $>5$  yr \_\_\_\_\_  
 3 yr \_\_\_\_\_

**Histologic Type of Cancer**

See text and WHO publication No. 9, 1973.



Indicate on diagrams primary tumor and regional nodes involved.

**Histologic Grade**

- [ ] G1 Well differentiated
- [ ] G2 Moderately well differentiated
- [ ] G3-G4 Poorly to very poorly differentiated

**Postsurgical Resection-Pathologic Residual Tumor (R)**

- [ ] R0 No residual tumor
- [ ] R1 Microscopic residual tumor
- [ ] R2 Macroscopic residual tumor

Specify \_\_\_\_\_

## Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

# GENITOURINARY SITES

27

The four sites included in this section—kidney, bladder, prostate, and testis—have their unique staging problems but can be classified according to the definitions of T, N, and M. Minimal requirements for TNM categorization are described under Rules for Classification and include arteriography, lymphography, and laparotomy for deep-seated tumors; symbols used are consistent with those used in staging procedures. These classifications require further field testing.

## SUBSETS AND THEIR USE

Under most circumstances a clinical estimate of tumor extent is made according to the TNM classification. This may vary according to the rules of classification for a given site, but this initial classification will not be altered, regardless of subsequent events. Further information obtained by surgical-evaluative procedures (s), postsurgical treatment-pathologic staging (p), or other techniques that relate to a determination of extent of disease should be used as appropriate subsets to the relevant part of T, N, or M (see below). In some circumstances, as the neoplastic process progresses locally (T), in regional nodes (N), or in distant sites (M), further clinical evidence of extent of disease may be obtained. In such instances, cT or some element of TNM may be altered. By such additions, one might subsequently characterize a patient as being stage cT3, sN2, pM, (PUL), indicating clinical extent of the local tumor, regional nodal involvement as proven by a surgical-evaluative procedure, and actual pathologic proof of a metastatic pulmonary lesion. Again, it should be emphasized that the first clinical staging classification that determined the initial therapeutic plan should not be changed. This remains with the patient for the duration of the disease. Further subsets of TNM classification are introduced to provide a means of communicating the changes in disease status and to report the results of therapeutic strategies employed at given stages in the progression of the disease.

The present stage and grade classification of cancer of the prostate has had general acceptance for many years and fortunately corresponds quite amenable to this proposed

## Prostate

classification of the TNM system. The latter system has been developed to provide more uniform and increased usage for end-results reporting.

### ANATOMY (ICD-O 185)

**Primary Site.** Adenocarcinoma of the prostate usually arises within the true gland and rarely seems to begin in the benign hyperplastic enlargement that occurs around the prostatic urethra in older men. Pathologically, this cancer tends to be multifocal in origin. It is more commonly found in the peripheral posterior portion of the gland and therefore clinically is highly amenable to early detection by rectal examination.

There is general agreement that the incidence of both clinical and latent carcinoma increases progressively with age, but clinically this cancer is rarely diagnosed in men under 40 years of age. Outlining the size of the malignant prostate on a diagram (even when drawn on a plain surface) is valuable, because there also appears to be a correlation of the size to the extent of the malignancy. Any induration should be considered suspicious for malignant change. The area of induration is accessible at least to percutaneous perineal biopsy or, as some prefer, to transrectal needle biopsy. Transurethral biopsy ordinarily provides diagnosis in advanced prostatic cancer.

The grade of the prostatic cancer is as important for the prognosis as the extent of its growth. The histopathologic grading of these tumors can be complex because of the heterogeneity so often encountered in surgical specimens. This classification allows either an anaplasia or a pattern type of grading method to be used.

**Nodal Stations.** The regional lymph nodes are the nodes of the true pelvis, whose anatomic boundaries are subtended by the arcuate line and planes involved. The fixed points of the pelvis are the pubic crest, perineal line, medial border of ilium, ala of sacrum, and sacral promontory. Distant nodes are all others.

**Metastatic Sites.** Distant spread to bones, lung, and liver is most common.

### RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** Primary tumor assessment includes digital examination of the prostate and histologic confirmation of prostatic carcinoma. Clinical examination, lymphangiography, and urography are required for nodal metastases.

*Note:* Newer diagnostic modalities (e.g., computed

body isotope scans) may be used subsequently to provide the minimum required information.

**Surgical-Evaluative Staging.** Laparotomy or extra-peritoneal surgical evaluation of primary tumor and lymph nodes with biopsy material other than endoscopic are required for this staging. Presence or absence of tumor by histologic confirmation is required for staging at this time period.

**Postsurgical Resection-Pathologic Staging.** Histologic examination and confirmation of extent is required. Total prostatoseminal vesiculectomy and pelvic lymph node dissection are required for this staging.

**Retreatment Staging.** Histopathologic biopsy is required for confirmation of local recurrence following surgical or radiation treatment. A reevaluation for metastatic disease is highly desirable at this time for improved end results reporting.

### TNM CLASSIFICATION

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No tumor present
  - T1a No palpable tumor; on histologic sections no more than three high-power fields of carcinoma found
  - T1b No palpable tumor; histologic sections revealing more than three high-power fields of prostatic carcinoma
  - T2a Palpable nodule less than 1.5 cm in diameter with compressible, normal-feeling tissue on at least three sides
  - T2b Palpable nodule more than 1.5 cm in diameter or nodule or induration in both lobes
- T3 Palpable tumor extending into or beyond the prostatic capsule
  - T3a Palpable tumor extending into the periprostatic tissues or involving one seminal vesicle
  - T3b Palpable tumor extending into the periprostatic tissues, involving one or both seminal vesicles; tumor size more than 6 cm in diameter
- T4 Tumor fixed or involving neighboring structures

#### Nodal Involvement (N)

The regional nodes are those within the true pelvis; all others are distant nodes. Histologic examination is required for stages N0 through N3, except for subset "c."

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No involvement of regional lymph nodes
- N1 Involvement of a single homolateral regional lymph node
- N2 Involvement of contralateral, bilateral, or multiple regional lymph nodes
- N3 A fixed mass present on the pelvic wall with a free space between this and the tumor

**Distant Metastasis (M)**

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

- Distant lymph nodes LYM
- Pulmonary PUL
- Osseous OSS
- Hepatic HEP
- Brain BRA
- Pleura PLE
- Skin SKI
- Eye EYE
- Other OTH

**POSTSURGICAL RESECTION RESIDUAL TUMOR (R)**

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

**STAGE GROUPING**

Follow rules for classification as follows:

- Stage I T1a or b, T2a; N0, M0
- Stage II T2b, N0, M0

- Stage III T3a or b; N0, M0  
Any T, N1, M0
- Stage IV T4, N0, M0,  
Any T, N2 or 3; M0  
Any T, any N, M1

**HISTOPATHOLOGY**

Almost always adenocarcinoma, grades variable

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly differentiated

Use whichever indicator is most appropriate (term or G+ number).

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of the time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

# PROSTATE (ICD-O 185)

## Data Form for Cancer Staging

Patient identification  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
[ ] Surgical-evaluative (sTNM)  
Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
[ ] Postsurgical resection-pathologic (pTNM)  
[ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

- [ ] TX Minimum requirements to assess the primary tumor cannot be met.
- [ ] T0 No tumor present
- [ ] T1a No palpable tumor; on histologic sections no more than three high-power fields of carcinoma found
- [ ] T1b No palpable tumor; histologic sections revealing more than three high-power fields of prostatic carcinoma
- [ ] T2a Palpable nodule less than 1.5 cm in diameter with compressible, normal-feeling tissue on at least three sides
- [ ] T2b Palpable nodule more than 1.5 cm in diameter or nodule or induration in both lobes
- [ ] T3 Palpable tumor extending into or beyond the prostatic capsule
- [ ] T3a Palpable tumor extending into the periprostatic tissues or involving one seminal vesicle
- [ ] T3b Palpable tumor extending into the periprostatic tissues, involving one or both seminal vesicles; tumor size more than 6 cm in diameter
- [ ] T4 Tumor fixed or involving neighboring structures

### Nodal Involvement (N)

- [ ] NX Minimum requirements to assess the regional nodes cannot be met.
- [ ] N0 No involvement of regional lymph nodes
- [ ] N1 Involvement of a single homolateral regional lymph node
- [ ] N2 Involvement of contralateral, bilateral, or multiple regional lymph nodes
- [ ] N3 A fixed mass present on the pelvic wall with a free space between this and the tumor

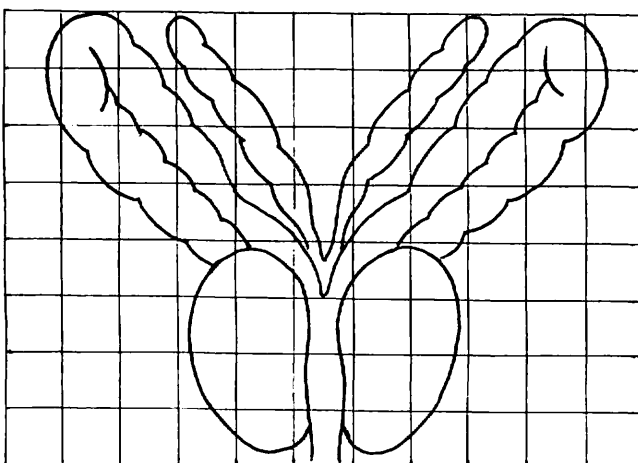
### Distant Metastasis (M)

- [ ] MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- [ ] M0 No (known) distant metastasis
- [ ] M1 Distant metastasis present  
Specify \_\_\_\_\_

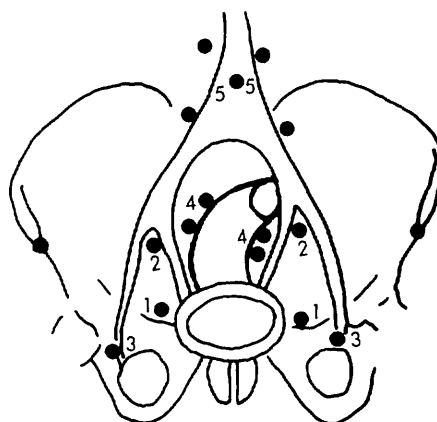
## Stage Grouping

- [ ] Stage I T1a or b, T2a; N0, M0
- [ ] Stage II T2b, N0, M0
- [ ] Stage III T3a or b; N0, M0  
Any T, N1, M0

- [ ] Stage IV T4, N0, M0  
Any T, N2 or 3; M0  
Any T, any N, M1



This diagram is for use with prostate diagram. Sketch in extent of tumor.



Indicate on diagram primary tumor and regional nodes involved.

\*Use a separate form each time a case is staged.  
†See reverse side for additional information.

Examination by \_\_\_\_\_ M.D.  
Date \_\_\_\_\_



## Site-Specific Information

### Symptoms

- None
- Frequency
- Hematuria
- Nocturia
- Infection
- Pain from cancer  
Specify \_\_\_\_\_
- Weight loss
- Gynecomastia
- Other  
Specify \_\_\_\_\_

### Diagnosis

Specify diagnosis for each study.

- Biopsy \_\_\_\_\_
- Radiology \_\_\_\_\_
- Biochemical study \_\_\_\_\_
- Cytology \_\_\_\_\_
- Prostatectomy \_\_\_\_\_
- Other \_\_\_\_\_

### Histopathology

Almost always adenocarcinoma, grades variable

### Tumor Grade (G)

- G1 Well differentiated
- G2 Moderately well differentiated
- G3–G4 Poorly differentiated

## Postsurgical Resection Residual Tumor (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

## Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90–100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70–80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50–60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30–40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10–20

## Testis

### ANATOMY (ICD-O 186)

**Primary Site.** The testes are composed of convoluted seminiferous tubules with a stroma containing functional endocrine interstitial cells. Both are encased in a dense barrier capsule, the tunica albuginea, with fibrous septa extending into and separating the testes into lobules. The tubules converge and exit at the mediastinum of the testis into the rete testis and efferent ducts, which join a single duct. This duct, the epididymis, coils outside the upper and lower pole of the testicle, then joins a muscular conduit, the vas deferens, which accompanies the vessels and lymphatic channels of the spermatic cord. The major route for local extension is through the lymphatic channels. The tumor emerges from the mediastinum of the testis and courses through the spermatic cord. Occasionally the epididymis is invaded early and then the external iliac nodes may become involved. If there has been previous scrotal or inguinal surgery with invasion of the scrotal wall (though this is rare), then the lymphatic spread may be to inguinal nodes.

**Nodal Stations.** The spermatic lymphatic collecting ducts on the right side tend to follow the vascular components of the cord and drain into the paracaval lymph nodes in the area where the vein enters the vena cava and the artery arises from the aorta. The spermatic lymphatic collecting ducts on the left side also tend to follow the vascular components of the cord; they drain both into the para-aortic nodes in the region where the spermatic and the inferior mesenteric arteries arise from the aorta and into the nodes of the renal hilus in the region where the spermatic vein joins the left renal vein. These are regional nodes. Spread of the tumor into contralateral regional or first station nodes of the area occurs in at least 20% of cases. When there has been previous inguinal or scrotal surgery, inguinal nodes also are considered as regional or first station nodes. All nodes outside the regional nodes are distant.

**Metastatic Sites.** Distant spread of testicular tumors occurs most commonly to the lung, followed by metastases to the liver, viscera, and bones.



## RULES FOR CLASSIFICATION

See Subsets and Their Use in Chapter 27 for discussion of how tumor was determined.

**Clinical-Diagnostic Staging.** Clinical examination and radical orchiectomy are required. Clinical examination with lymphangiography, urography, computed tomography, or ultrasonography is necessary for nodal evaluation. Chest films, serum human gonadotropin, and alpha-fetoprotein are needed to evaluate for distant metastases. Markers should be obtained before orchiectomy or retroperitoneal lymph node dissection and thereafter at every follow-up visit.

**Surgical-Evaluative Staging.** Use of this staging classification requires histologic verification of biopsy material removed from any site. The testis and cord are not to be included in this section.

**Postsurgical Resection-Pathological Staging.** Histologic evaluation of the radical orchiectomy specimen must be used for the pT stage. The specimens from a defined node-bearing area (*i.e.*, retroperitoneal periaortic node dissection) must be used for the pN stage. Histologic verification is required.

**Retreatment Staging.** A histopathologic biopsy is required for confirmation of local recurrence following surgical or radiation treatment. Reevaluation for metastatic disease is required at the time of the positive biopsy.

## TNM CLASSIFICATION

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met. (In the absence of orchiectomy, TX must be used.)
- T0 No evidence of primary tumor
- T1 Limited to body of testis
- T2 Extension beyond the tunica albuginea
- T3 Involvement of the rete testis or epididymis
- T4a Invasion of spermatic cord
- T4b Invasion of scrotal wall

*Note:* Involvement of the rete testis without evidence of further extension may well be a T1 lesion in behavior but continues to be classified as a T3 lesion along with the involvement of the epididymis.

### Nodal Involvement (N)

Histologic examination is required for N0-N3, except for subset "c."

- NX Minimum requirements to assess the presence of distant metastasis cannot be met.
- N0 No evidence of involvement of regional lymph nodes

- N1 Involvement of a single homolateral regional lymph node that, if inguinal, is mobile
- N2 Involvement of contralateral or of bilateral or multiple regional lymph nodes that, if inguinal, are mobile (specify number)
- N3 Palpable abdominal mass present or fixed inguinal lymph nodes

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present
- Specify \_\_\_\_\_

Specify sites according to the following notations:

Distant lymph nodes	LYM
Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

## POSTSURGICAL RESECTION RESIDUAL TUMOR (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

## STAGE GROUPING

Follow rules for classification as follows:

Stage I	T1-T3; N0, M0
Stage II	T4, N0, M0
	Any T, N1, M0
Stage III	Any T, N2, M0
Stage IV	Any T, N3, M0
	Any T, any N, M1

## HISTOPATHOLOGY

Cell types can be divided into seminomatous and nonseminomatous tumors. The latter can be divided into teratoma, embryonal cell carcinoma, yolk sac and choriocarcinoma. Mixtures of these types are to be denoted. Lymphomas are excluded. Combinations of embryonal cell carcinoma and teratoma can be designated as teratocarcinoma. Reference to WHO nomenclature and classification is recommended.

**Tumor Grade (G)**

Testicular tumors are not graded.

**PERFORMANCE STATUS OF HOST (H)**

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of the time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

# TESTIS (ICD-O 186)

## Data Form for Cancer Staging

Patient identification  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
[ ] Surgical-evaluative (sTNM)  
Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
[ ] Postsurgical resection-pathologic (pTNM)  
[ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met. (In the absence of orchiectomy, TX must be used.)
- T0 No evidence of primary tumor
- T1 Limited to body of testis
- T2 Extension beyond the tunica albuginea
- T3 Involvement of the rete testis or epididymis
- T4a Invasion of spermatic cord
- T4b Invasion of scrotal wall

### Regional Involvement (N)

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No evidence of involvement of regional lymph nodes
- N1 Involvement of a single homolateral regional lymph node which, if inguinal, is mobile
- N2 Involvement of contralateral or of bilateral or multiple regional lymph nodes which, if inguinal, are mobile (specify number)
- N3 Palpable abdominal mass present or fixed inguinal lymph nodes

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

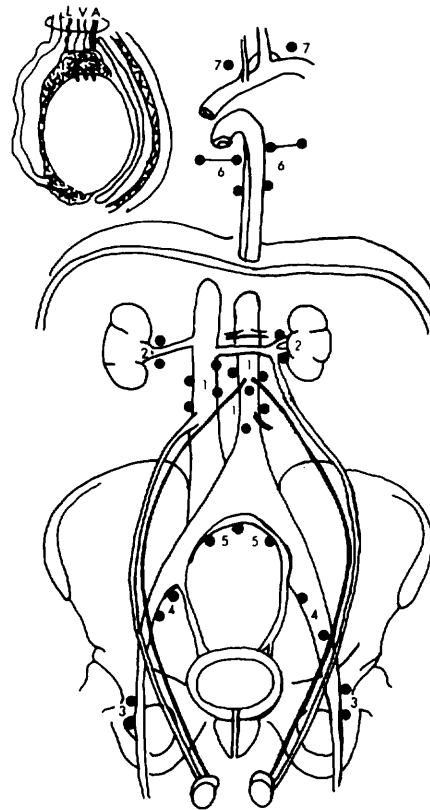
### Stage Grouping

- Stage I T1-T3; N0, M0
- Stage II T4, N0, M0  
Any T, N1, M0
- Stage III Any T, N2, M0
- Stage IV Any T, N3, M0  
Any T, any N, M1

### Site-Specific Information

Symptoms  
 Pain (specify) \_\_\_\_\_

\* Use a separate form each time a case is staged.  
† See reverse side for additional information.



Indicate on diagram primary tumor and regional nodes involved.

- Weight loss
- Gynecomastia
- Testes ever undescended
- Surgical history
  - Orchiopexy
  - Inguinal
  - Scrotal
  - Other (specify) \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.  
Date \_\_\_\_\_

**Diagnosis**

- Orchiectomy (specify) \_\_\_\_\_
- Biopsy of testes \_\_\_\_\_
- Node biopsy (specify) \_\_\_\_\_
- Scrotal \_\_\_\_\_
- Inguinal/Cord \_\_\_\_\_
- Biochemical (specify) \_\_\_\_\_
- Other (specify) \_\_\_\_\_

Date of radical orchiectomy \_\_\_\_\_  
 Right \_\_\_\_\_ Left \_\_\_\_\_

- cT Extent of tumor invasion
- Limited to body of testis
  - Extension beyond tunica albuginea
  - Extension into rete
  - Extension into epididymis
  - Invasion of spermatic cord
  - cT stage \_\_\_\_\_

cN	Stage	Used	+ or -
	Urography	_____	_____
	Lymphangiography	_____	_____
	CT	_____	_____
	Ultrasound	_____	_____
	None	_____	_____
	<input type="checkbox"/> cN stage		

- cM Site \_\_\_\_\_ Study used \_\_\_\_\_
- HCG
  - AFP

Indicative of M if elevated after orchiectomy. Use "Other," "Blood" under M1.

**Pathologic (p) Stage of Tumor**

Extent histologically evident according to limits mentioned under cT. For testis, cT=pT.

- pT Stage \_\_\_\_\_
- pN Stage \_\_\_\_\_
- pM Metastatic site \_\_\_\_\_
- Was tissue obtained by excision, needle biopsy, skinny needle, etc.?
- If AFT or HCG is abnormal, indicate as under cM.
- pM Stage \_\_\_\_\_

**Histopathology**

Cell types can be divided into seminomatous and nonseminomatous tumors. The latter can be divided into teratoma, embryonal cell carcinoma, yolk sac and choriocarcinoma. Mixtures of these types are to be denoted. Lymphomas are excluded. Combinations of embryonal cell carcinoma and teratoma can be designated as teratocarcinoma. Reference to WHO nomenclature and classification is recommended.

**Tumor Grade (G)**

Testicular tumors are not graded.

**Postsurgical Resection Residual Tumor (R)**

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

**Performance Status of Host (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20



## Bladder

### ANATOMY (ICD-O 188)

**Primary Site.** The urinary bladder is a hollow viscus consisting of three layers: the mucosa and submucosa (lamina propria), the muscularis, and the serosa (peritoneum covering the superior surface and upper part of the base). In the male, it adjoins the rectum and seminal vesicle posteriorly, the prostate inferiorly, and the pubis and peritoneum anteriorly. In the female, the vagina is located posteriorly and the uterus superiorly. The bladder is extraperitoneal in location.

**Nodal Stations.** The regional lymph nodes are the nodes of the true pelvis, whose anatomic boundaries are subtended by the arcuate line and planes involved. The fixed points of the pelvis are the pubic crest, pectineal line, medial border of ilium, ala of sacrum, and sacral promontory. Distant nodes are all others.

**Metastatic Sites.** Distant spread to lung, bone, and liver is most common.

### RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** Primary tumor assessment includes bimanual examination under anesthesia before and after endoscopic surgery (biopsy or transurethral resection) or histologic verification of the presence or absence of tumor. Add "m" for multiple tumors. Lymphography is necessary for nodal evaluation. Evaluation for distant metastases requires chest films, biochemical and blood profiles, and isotopic studies as indicated.\*

**Surgical-Evaluative Staging.** Laparotomy or extraperitoneal surgical evaluation of primary tumor and lymph nodes, with biopsy material other than that from endoscopy, is required for this staging. Presence or absence of tumor by histologic confirmation is required for staging at this time period.

**Postsurgical Resection-Pathologic Staging.** Histologic examination and confirmation of extent is required. Total cystectomy and lymph node dissection are required for this staging.

\*Computed body scan or other modalities may subsequently be used to supply information concerning minimal requirements for staging.

**Retreatment Staging.** Biopsy confirmation when feasible is desirable to determine persistence after irradiation or surgery. Other procedures as noted above may be used, particularly in distant visceral sites.

*Note:* See Subsets and Their Use in Chapter 27 for the use of subsets ("c," "s," "p," and "r") to indicate source of material used for determining T, N, and M.

## TNM CLASSIFICATION

### Primary Tumor (T)

The suffix "m" should be added to the appropriate T category to indicate multiple lesions. Papilloma is classified as "GO."

- TX** Minimum requirements to assess the primary tumor cannot be met.
- T0** No evidence of primary tumor
- Tis** Carcinoma *in situ* (If used without subscript, Tis indicates bladder alone.)
- b Bladder
  - u Ureter
  - pr.u. Prostatic urethra
  - p.d. Prostatic ducts
- Ta** Papillary noninvasive carcinoma
- T1** Carcinoma without microscopic invasion beyond the lamina propria. On bimanual examination a freely mobile mass may be felt; this should not be felt after complete transurethral resection of the lesion.
- T2** Microscopic invasion of superficial muscle of the bladder. On bimanual examination there may be induration of the bladder wall, which is mobile. There is usually no residual induration after complete transurethral resection of the lesion.
- T3** On bimanual examination there may be induration or a nodular mobile mass palpable in the bladder wall that persists after transurethral resection (T3 may not be used alone).
- T3a** Microscopic invasion of deep muscle is defined as histologic evidence of tumor clearly extending through muscle bundles to both edges of a resected specimen.
  - T3b** Invasion into perivesical fat
- T4** Microscopic evidence of muscle invasion; tumor is fixed or invades neighboring structures. The following subclassifications should be used when these conditions are met:
- T4a** Tumor invading substance of prostate (microscopically proven), uterus, or vagina
  - T4b** Tumor fixed to the pelvic wall or infiltrating the abdominal wall

### Nodal Involvement (N)

The regional lymph nodes are those within the true pelvis; all others are distant nodes. Histologic examination is required for stages N0 through N3, except for subset "c."

- NX** Minimum requirements to assess the regional nodes cannot be met.
- N0** No involvement of regional lymph nodes
- N1** Involvement of a single homolateral regional lymph node
- N2** Involvement of contralateral, bilateral, or multiple regional lymph nodes
- N3** A fixed mass on the pelvic wall with a free space between it and the tumor

### Distant Metastasis (M)

- MX** Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0** No (known) distant metastasis
- M1** Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Distant lymph nodes	LYM
Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

## POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0** No residual tumor
- R1** Microscopic residual tumor
- R2** Macroscopic residual tumors  
Specify \_\_\_\_\_

## STAGE GROUPING

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3a or b; N0, M0
- Stage IV T4, N0, M0  
Any T, N1-N3; M0  
Any T, any N, M1

## HISTOPATHOLOGY

The predominant cancer is a transitional cell cancer. Grading of the tumor is as follows:

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number).

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of the time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

# BLADDER (ICD-O 188)

## Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
 [ ] Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 [ ] Postsurgical resection-pathologic (pTNM)  
 [ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

### Definitions: TNM Classification

#### Primary Tumor (T)

The suffix "m" should be added to the appropriate "T" category to indicate multiple lesions. Papilloma is classified as "GO."

- [ ] TX Minimum requirements to assess the primary tumor cannot be met.
- [ ] T0 No evidence of primary tumor
- [ ] Tis Carcinoma *in situ* (If used without subscript, Tis indicates bladder alone.)  
 b: bladder pr.u.: prostatic urethra  
 u: ureter p.d.: prostatic ducts
- [ ] Ta Papillary noninvasive carcinoma
- [ ] T1 Carcinoma without microscopic invasion beyond the lamina propria. On bimanual examination a freely mobile mass may be felt; this should not be felt after complete transurethral resection of the lesion.
- [ ] T2 Microscopic invasion of superficial muscle of the bladder. On bimanual examination there may be induration of the bladder wall, which is mobile. There is usually no residual induration after complete transurethral resection of the lesion.
- [ ] T3 On bimanual examination there may be induration or a nodular mobile mass palpable in the bladder wall that persists after transurethral resection (T3 may not be used alone).
  - [ ] T3a Microscopic invasion of deep muscle; this is defined as histologic evidence of tumor clearly extending through muscle bundles to both edges of a resected specimen.
  - [ ] T3b Invasion into perivesical fat
- [ ] T4 Microscopic evidence of muscle invasion; tumor is fixed or invades neighboring structures. The subclassifications below should be used when conditions are met.
  - [ ] T4a Tumor invades substance of prostate (microscopically proven), uterus, or vagina.
  - [ ] T4b Tumor is fixed to the pelvic wall or infiltrates the abdominal wall.

#### Nodal Involvement (N)

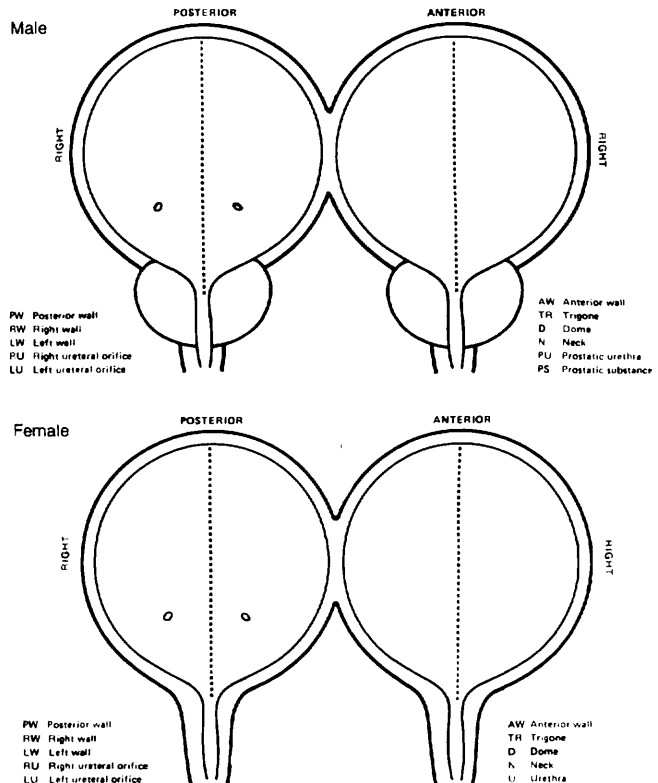
The regional lymph nodes are those within the true pelvis. All others are distant nodes. Histologic examination is required for stages N0 through N3, except for subscript "c."

- [ ] NX Minimum requirements to assess the regional nodes cannot be met.
- [ ] N0 No involvement of regional lymph nodes

- [ ] N1 Involvement of a single homolateral regional lymph node
- [ ] N2 Involvement of contralateral, bilateral, or multiple regional lymph nodes
- [ ] N3 There is a fixed mass on the pelvic wall with a free space between the wall and the tumor.

#### Distant Metastasis (M)

- [ ] MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- [ ] M0 No (known) distant metastasis
- [ ] M1 Distant metastasis present  
 Specify \_\_\_\_\_



Indicate on diagrams primary tumor and regional nodes involved.

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\* Use a separate form each time a case is staged.  
 † See reverse side for additional information.

### Stage Grouping

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3a or b; N0, M0
- Stage IV T4, N0, M0  
Any T, N1–N3; M0  
Any T, any N, M1

### Site-Specific Information

#### Symptoms

- Hematuria
- Frequency
- Dysuria
- Weight loss
- Pain
- Other  
Specify \_\_\_\_\_

#### Clinical Extent

Intravenous urogram

- Hydronephrosis
- Hydroureter
- Nonfunctioning kidney
- Not done

Cystoscopy

Site (indicate on diagrams)

No. of tumors (circle number): 1, 2, 3, 4, >4

Size in cm (circle largest): 1, 2, 3, 4, >4

Bimanual examination

- Anesthesia
- Induration
- Mass
  - Mobile
  - Fixed to pelvic wall or invading abdominal wall

- Invading neighboring structures  
Specify \_\_\_\_\_

### Histopathology

The predominant cancer is a transitional cell.

### Postsurgical Resection Residual Tumor (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

### Tumor Grade (G)

- G1 Well differentiated
- G2 Moderately well differentiated
- G3–G4 Poorly to very poorly differentiated

### Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90–100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70–80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50–60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30–40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10–20

## Kidney

### ANATOMY (ICD-O 189)

**Primary Site.** The kidney is encased by a fibrous capsule and is surrounded by perirenal fat. The kidney is composed of the cortex (glomeruli, convoluted tubules) and the medulla (Henle's loops, pyramids of converging tubules). Each papilla opens into the minor calices; these in turn unite in the major calices and drain into the renal pelvis. At the hilus are the pelvis, ureter, and renal artery and vein. Gerota's fascia overlies the psoas and quadratus lumborum.

**Nodal Stations.** The major collecting lymphatic trunks are the anterior, middle, and posterior channels that drain into the para-aortic lymph nodes located above and below the renal artery (*i.e.*, high suprarenal and infrarenal arteries). There is a lateral caval node on the right and a hilar-located renal vein node on the left, more lateral to the para-aortic nodal chain. The lower para-aortic nodes complete the first station at the bifurcation of the aorta; these are regional lymph nodes. All other nodes are distant.

**Metastatic Sites.** Common metastatic sites include bone, liver, lung, and brain.

### RULES FOR CLASSIFICATION

See Subsets and Their Use in Chapter 27 for determination of extent of tumor.

**Clinical-Diagnostic Staging.** Clinical examination, urography, angiography, or venocavography are required for the assessment of the primary tumor. Additional studies may include lymphography, CT scan, and ultrasound. Evaluation for distant metastases should be done by routine laboratory biochemical studies, a hemogram, bone films, and isotopic studies. Computed body scan, ultrasound, or other modalities may subsequently be used to supply information concerning minimal requirements for staging.

**Surgical-Evaluative Staging.** Laparotomy, mediastinotomy, and biopsy can be used. Presence or absence of tumor by histologic confirmation is required for staging at this time period.



**Postsurgical Resection-Pathologic Staging.** Histologic examination and confirmation of extent is required. Resection of the primary tumor, kidney, Gerota's fascia, perinephric fat, and renal vein is required.

**Retreatment Staging.** Utilization of the above procedures, when indicated, and biopsy confirmation are required whenever feasible.

**TNM CLASSIFICATION**

**Primary Tumor (T)**

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Small tumor; minimal renal and caliceal distortion or deformity; circumscribed neovasculation surrounded by parenchyma
- T2 Large tumor with deformity or enlargement of kidney or collecting systems
  - T3a Large tumor involving perinephric tissues
  - T3b Tumor involving renal vein
  - T3c Tumor involving renal vein and infradiaphragmatic vena cava
- T4 Tumor extending into neighboring organs or abdominal wall

**Nodal Involvement (N)**

The regional lymph nodes are the para-aortic and paracaval nodes.

- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No evidence of involvement of regional nodes
- N1 Single, homolateral regional nodal involvement
- N2 Involvement of multiple regional or of contralateral or bilateral nodes
- N3 Fixed regional nodes (assessable only at surgical exploration)

**Distant Metastasis (M)**

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastasis
- M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Eye	EYE
Distant		Other	OTH
lymph nodes	LYM		

**POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)**

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

**STAGE GROUPING**

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3a, N0, M0  
T1 or T2; N1, M0  
T3b or T3c; N1, M0
- Stage IV Any T, any N, M1  
T4, any N, M0

**HISTOPATHOLOGY**

The predominant cancer is adenocarcinoma; subtypes are clear-cell and granular-cell carcinoma. A grading system as below is recommended when feasible. Reference to World Health Organization (WHO) nomenclature is advised.

*Tumor Grade (G)*

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

Use whichever indicator is most appropriate (term or G + number).

**PERFORMANCE STATUS OF HOST (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	PERFORMANCE	ECOG SCALE	KARNOFSKY SCALE (%)
H0	Normal activity	0	90-100
H1	Symptomatic but ambulatory; cares for self	1	70-80
H2	Ambulatory more than 50% of the time; occasionally needs assistance	2	50-60
H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
H4	Bedridden; may need hospitalization	4	10-20

# KIDNEY (ICD-O 189)

## Data Form for Cancer Staging

Patient identification

Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification

Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Small tumor, minimal renal and caliceal distortion or deformity; circumscribed neovasculature surrounded by parenchyma
- T2 Large tumor with deformity or enlargement of kidney or collecting systems
- T3a Large tumor involving perinephric tissues
- T3b Tumor involving renal vein
- T3c Tumor involving renal vein and infradiaphragmatic vena cava
- T4 Tumor extending into neighboring organs or abdominal wall

### Nodal Involvement (N)

The regional lymph nodes are the para-aortic and paracaval nodes.

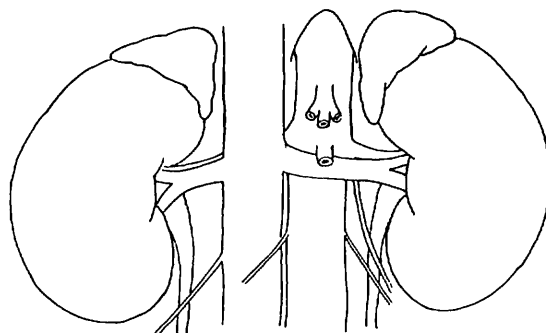
- NX Minimum requirements to assess the regional nodes cannot be met.
- N0 No evidence of involvement of regional nodes
- N1 Single, homolateral regional nodal involvement
- N2 Involvement of multiple regional, contralateral, or bilateral nodes
- N3 Fixed regional nodes (assessable only at surgical exploration)

### Distant Metastasis (M)

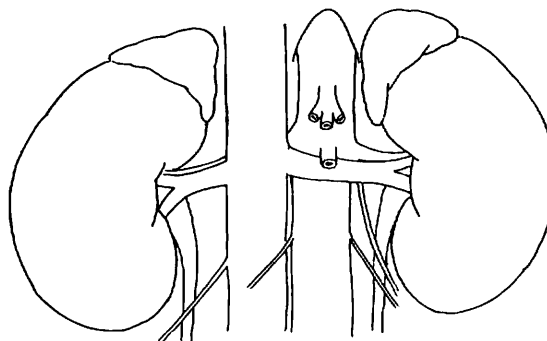
- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No (known) distant metastases
- M1 Distant metastases present  
Specify \_\_\_\_\_

## Stage Grouping

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3a, N0, M0  
T1, T2; N1, M0  
T3b, T3c; N1, M0
- Stage IV Any T, any N, M1  
T4, any N, M0



This drawing is to be used with the checklist. Sketch in the urographic, angiographic, ultrasound, or CT extent of tumor.



This drawing is to be used with the checklist and the upper drawing. Sketch in the pathologic extent of tumor.

## Site-Specific Information

This sheet is designed to aid in assigning TNM stages of renal cell carcinoma. The subsets may be clinical (c), surgical-evaluative (s), pathologic (p), and retreatment (r). The most commonly used will be "c" and "p," the latter always requiring histologic confirmation. See Subsets and Their Use in Chapter 27 for use of all subsets.

Side involved  Right  
 Left

Date of nephrectomy \_\_\_\_\_

cT

Urography done \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.  
Date \_\_\_\_\_

\* Use a separate form each time a case is staged.  
† See reverse side for additional information.

Distortion of collecting system

- Minimal
- Moderate
- Marked

**Angiography**

- Tumor confined to kidney substance
- Tumor confined to kidney capsule
- Tumor confined to tumor capsule but outside renal capsule
- Tumor invading perinephric tissues

- CT
  - Ultrasound
  - Neither
- } Used to determine cT
- cT stage \_\_\_\_\_

**cN**

- Lymphography
  - CT
  - Ultrasound
  - None
- } Used to determine cN
- cN stage \_\_\_\_\_

**cM**

- Site \_\_\_\_\_
- Study used \_\_\_\_\_
- cM stage \_\_\_\_\_
- Clinical TNM \_\_\_\_\_

**Pathologic (p) Stage of Tumor**

- pT  No tumor found  
Tumor confined to renal substance (small tumor, <3.5 cm)
- Tumor confined to renal substance but larger than 3.5 cm
- Tumor invading perinephric fat
- Tumor involving renal vein
- Tumor involving infradiaphragmatic vena cava
- Tumor involving neighboring structures
- Tumor involving supradiaphragmatic vena cava
- pT stage \_\_\_\_\_

- pN  No nodes in specimen (requirements not met)
- Nodes negative on histology
- Single, homolateral regional node positive
- Multiple regional or contralateral or bilateral nodes

- Fixed regional nodes; histology is required for pN stages greater than pNX.

pN stage \_\_\_\_\_

- pM Metastatic site \_\_\_\_\_
- How was tissue obtained (excisional, skinny needle, core-producing, etc.)?

**Histopathology**

The predominant cancer is adenocarcinoma; subtypes are clear-cell and granular-cell carcinoma. A grading system as below is recommended when feasible. Reference to WHO nomenclature is advised.

**Postsurgical Resection Residual Tumor (R)**

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

**Tumor Grade (G)**

- G1 Well differentiated
- G2 Moderately well differentiated
- G3-G4 Poorly to very poorly differentiated

**Performance Status of Host (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## EYE AND ADNEXA (ICD-O 190)

The ocular orbit and its contents—primarily the eye—contain many types of tissues, and as a result a wide variety of malignant tumors occur in this anatomic area. Included in this section are recommendations for staging these cancers based on data available in the literature and knowledge of the experts serving on the Task Force for Staging of Cancer of the Eye of the American Joint Committee on Cancer.

The following regions are included:

- Eyelid (ICD-O 173.1)
- Conjunctiva (ICD-O 190.3)
- Uvea (ICD-O 190.0)
- Retina (ICD-O 190.5)
- Orbit (ICD-O 190.1)
- Lacrimal gland (ICD-O 190.2)

For histologic nomenclature and diagnostic criteria, reference to the WHO classification\* is recommended.

Each site is described under the following headings:

Rules for classification, with the minimum requirements for assessing the T, N, and M categories. Additional methods may be used when they enhance the accuracy of appraisal up to the time of the decision as to definitive treatment.

Anatomic sites, where appropriate

Definition of regional lymph node involvement

TNM pretreatment clinical classification (see General Rules for Staging of Cancer, p 6)

pTNM postsurgical histopathologic classification (see General Rules for Staging of Cancer, p 6). If required, G (histopathologic grading), V (venous invasion), and S (scleral invasion) may be recorded.

Stage grouping, where applicable

\*Zimmerman LE, Sobin LH et al: Histological typing of tumors of the eye and its adnexa. In International Histological Classification of Tumours. Geneva, World Health Organization, 1980

## Carcinoma of the Eyelid

### ANATOMY AND HISTOLOGY (ICD-O 173.1)

**Primary Sites.** The eyelids are covered externally by epidermis and internally by conjunctiva, which becomes continuous with the conjunctiva that covers the eyeball. Basal cell carcinomas and squamous cell carcinomas arise from the epidermal surface. Sebaceous carcinomas arise from the meibomian glands in the tarsus, the Zeis glands at the lid margin, and the sebaceous glands of the caruncle. Other adnexal carcinomas arise from Moll's glands, the sweat glands, and the hair follicles of the lids.

**Nodal Stations.** The eyelids are supplied with lymphatics that drain into the preauricular, submandibular, and cervical lymph nodes.

**Metastatic Sites.** Tumors of the eyelids not only metastasize to distant sites by way of the regional lymphatics and bloodstream but also spread directly backward into the orbit, including the lacrimal gland, and into the eyeball.

### RULES FOR CLASSIFICATION

The classification applies only to carcinomas.

There should be histologic verification of the disease. This verification permits a division of cases by histologic type (*i.e.*, basal cell, squamous cell, and sebaceous carcinoma). Any unconfirmed case must be reported separately.

The following are the minimum requirements for assessment of the T, N, and M categories. If these cannot be met, the symbols TX, NX, and MX will be used.

T categories: clinical examination

N categories: clinical examination

M categories: clinical examination and radiography

**Clinical-Diagnostic Staging (cTNM).** The assessment of the cancer is based on inspection, slit-lamp examination, palpation of the regional lymph nodes, and, when indicated, radiologic (including computed tomography [CT]) and ultrasonographic examination of the orbit, paranasal sinuses, and chest.

**Surgical-Evaluative Staging (sTNM).** Confirmation of the extent of the disease by biopsy and histologic study of the margins and the deep aspect of resected tissues are necessary. Resection or needle biopsy aspiration of enlarged regional nodes or orbital masses is desirable.

**Postsurgical Resection-Pathologic Staging (pTNM).** Complete resection of the primary site is indicated.

**Retreatment Staging (rTNM).** Each recurrence must be treated as a new problem and requires complete reevaluation as in the primary workup. Biopsy for confirmation is recommended. Reevaluation of nodal, orbital, or distant spread is indicated.

### PRETREATMENT CLINICAL CLASSIFICATION (cTNM)

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 Tumor, regardless of size, not involving the tarsal plate or, if at the eyelid margin, not more than 5 mm in its greatest dimension
- T2 Tumor involving the tarsal plate or, if at the eyelid margin, more than 5 mm but not more than 10 mm in its greatest dimension
- T3 Tumor involving the full eyelid thickness or, if at the eyelid margin, more than 10 mm in its greatest dimension
- T4 Tumor extending to adjacent structures

#### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of the regional lymph nodes

#### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL
Ossseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Other	OTH

### POSTSURGICAL HISTOPATHOLOGIC CLASSIFICATION (pTNM)

The pT categories correspond to the T categories.

#### Histopathologic Grade (G)

- GX Grade cannot be assessed
- G1 High degree of differentiation
- G2 Medium degree of differentiation
- G3 Low degree of differentiation or undifferentiated

#### Regional Lymph Nodes (pN)

The pN categories correspond to the N categories.

#### Distant Metastases (pM)

The pM categories correspond to the M categories.

### POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

### STAGE GROUPING

No stage grouping is at present recommended by the Union Internationale Contre le Cancer or by the American Joint Committee.



# CARCINOMA OF THE EYELID (ICD-O 173.1)

## Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

### Definitions: TNM Classification

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- Tis Carcinoma *in situ*
- T1 Tumor, regardless of size, not involving the tarsal plate or, if at the eyelid margin, not more than 5 mm in its greatest dimension
- T2 Tumor involving the tarsal plate or, if at the eyelid margin, more than 5 mm but not more than 10 mm in its greatest dimension
- T3 Tumor involving the full eyelid thickness or, if at the eyelid margin, more than 10 mm in its greatest dimension
- T4 Tumor extending to adjacent structures

#### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of the regional lymph nodes

#### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases  
Specify \_\_\_\_\_

### Postsurgical Histopathologic Classification (pTNM)

The pT categories correspond to the T categories.

### Histopathology

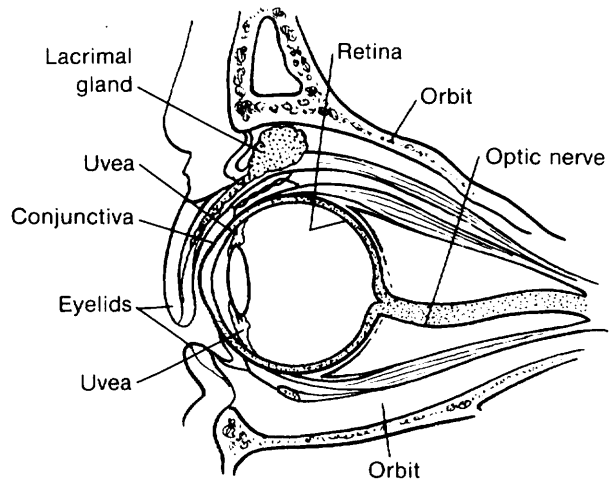
Tumors that are included in the analysis and evaluation are as follows:

- Basal cell carcinoma
- Squamous cell carcinoma
- Sebaceous carcinoma
- Adnexal carcinoma

### Histopathologic Grade (G)

- GX Grade cannot be assessed.
- G1 High degree of differentiation
- G2 Medium degree of differentiation
- G3 Low degree of differentiation or undifferentiated

\*Use a separate form each time a case is staged.



Indicate on diagram and describe exact location and characteristics of tumor.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Stage Grouping

None recommended at this time

### Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into staging but may be a factor in deciding further treatment.

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

### Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

<i>AJCC</i>	<i>Performance</i>	<i>ECOG Scale</i>	<i>Karnofsky Scale (%)</i>
[ ] H0	Normal activity	0	90-100
[ ] H1	Symptomatic but ambulatory; cares for self	1	70-80
[ ] H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
[ ] H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
[ ] H4	Bedridden; may need hospitalization	4	10-20

## Melanoma of the Eyelid

This chapter has been adapted from the discussion of melanoma of the skin from the third edition of the TNM classification, since that discussion is considered to be applicable to melanoma of the skin of the eyelid.

No cT categories are presently recommended.

The pT categories correspond to those in the third edition of the TNM classification and are based on Clark's "levels" and Breslow's "thickness of invasion." Thickness of invasion into the skin is recorded as an actual measurement as determined by the ocular micrometer. The measurement extends from the normal level of the basement membrane to the greatest depth of tumor penetration.

The N and M categories correspond to those of carcinoma of the eyelid.

### **RULES FOR CLASSIFICATION (ICD-O 173.1)**

The classification applies only to melanoma.

There should be histologic verification of the disease. Any unconfirmed case must be reported separately.

The following are the minimal requirements for assessment of the T, N, and M categories. If these cannot be met, the symbols TX, NX, and MX will be used.

T categories: clinical examination

N categories: clinical examination

M categories: clinical examination and radiography

**Clinical-Diagnostic Staging (cTNM).** The assessment of the cancer is based on inspection, slit-lamp examination, palpation of the regional lymph nodes, and, when indicated, radiologic (including computed tomography [CT]) and ultrasonographic examination of the orbit, paranasal sinuses, and chest.

**Surgical-Evaluative Staging (sTNM).** Confirmation of the extent of disease by biopsy and histologic study of the margins and the deep aspect of resected tissues are necessary. Resection or needle biopsy aspiration of enlarged regional nodes or orbital masses is desirable.

**Postsurgical Resection-Pathologic Staging (pTNM).** Complete resection of the primary site is indicated.

**Retreatment Staging (rTNM).** Each recurrence must be treated as a new problem and requires complete reevaluation as in the primary workup. Biopsy for confirmation is recommended. Reevaluation of nodal, orbital, or distant spread is indicated.

### PRETREATMENT CLINICAL CLASSIFICATION (cTNM)

#### Primary Tumor (T)

No classification is recommended at present.

#### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.  
 N0 No evidence of regional lymph node involvement  
 N1 Evidence of involvement of the regional lymph nodes

#### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.  
 M0 No evidence of distant metastases  
 M1 Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Other	OTH

### POSTSURGICAL HISTOPATHOLOGIC CLASSIFICATION (pTNM)

#### Primary Tumor (pT)

- pTX Minimum requirements to assess the primary tumor cannot be met.  
 pT0 No evidence of primary tumor  
 pTis Atypical melanocytic hyperplasia (not malignant) Level I  
 pT1 Tumor invading the papillary dermis, and/or not more than 0.75 mm thick Level II

- pT2 Tumor extending to but not invading the reticular dermis and/or more than 0.75-1.50 mm thick Level III  
 pT3 Tumor invading the reticular dermis and/or more than 1.50-3 mm thick Level IV  
 pT4 Tumor invading the subcutaneous tissue and/or more than 3 mm thick Level V

#### Regional Lymph Nodes (pN)

The pN categories correspond to the N categories.

#### Distant Metastases (pM)

The pM categories correspond to the M categories.

### POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor  
 Specify \_\_\_\_\_

### STAGE GROUPING

- Stage IA pT1-pT2; pN0, pM0  
 Stage IB pT3-pT4; pN0, pM0  
 Stage II Any pTa, pTb; pN0, pM0  
 Any pT, pN1, pM0  
 Any pTa, pTb; pN1, pM0  
 Stage III Not applicable  
 Stage IV Any pT, any pN, pM1  
 Any pTa, pTb; any pN, pM1

### DATA FORM

No data form is recommended at this time for melanoma of the eyelid.

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1. Breslow A: Tumor thickness, level of invasion and node dissection in Stage 1 cutaneous melanoma. *Ann Surg* 182:572-575, 1975
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## Carcinoma of the Conjunctiva

### **RULES FOR CLASSIFICATION (ICD-O 190.3)**

The classification applies only to carcinoma.

There should be histologic verification of the disease. This verification permits division of cases by histologic type, namely, mucoepidermoid and squamous cell carcinomas. Any unconfirmed case must be reported separately.

The following are the minimum requirements for assessment of the T, N, and M categories. If these cannot be met, the symbols TX, NX, or MX will be used.

T categories: clinical examination

N categories: clinical examination

M categories: clinical examination and radiography

### **REGIONAL LYMPH NODES**

The regional lymph nodes are the preauricular, submandibular, and cervical nodes.

### **PRETREATMENT CLINICAL CLASSIFICATION (cTNM)**

#### **Primary Tumor (T)**

TX Minimum requirements to assess the tumor cannot be met.

T0 No evidence of primary tumor

Tis Carcinoma *in situ*

T1 Tumor not more than 5 mm in its greatest dimension

T2 Tumor more than 5 mm, without extension into adjacent structures

T3 Tumor with extension into adjacent structures

T4 Tumor with extension into the orbit

#### **Regional Lymph Nodes (N)**

NX Minimum requirements to assess the regional lymph nodes cannot be met.

N0 No evidence of regional lymph node involvement

N1 Evidence of involvement of the regional lymph nodes

**Distant Metastases (M)**

**MX** Minimum requirements to assess the presence of distant metastases cannot be met.

**M0** No evidence of distant metastases

**M1** Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Other	OTH

**POSTSURGICAL HISTOPATHOLOGIC CLASSIFICATION (pTNM)**

The pT categories correspond to the T categories.

**Histopathologic Grade (G)**

**GX** Grade cannot be assessed.

**G1** High degree of differentiation

**G2** Medium degree of differentiation

**G3** Low degree of differentiation or undifferentiated

**Regional Lymph Nodes (pN)**

The pN categories correspond to the N categories.

**Distant Metastases (pM)**

The pM categories correspond to the M categories.

**POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)**

**R0** No residual tumor

**R1** Microscopic residual tumor

**R2** Macroscopic residual tumor

Specify \_\_\_\_\_

**STAGE GROUPING**

No stage grouping is recommended at present by the Union Internationale Contre le Cancer or by the American Joint Committee.



# CARCINOMA OF THE CONJUNCTIVA (ICD-O 190.3)

## Data Form for Cancer Staging

Patient identification

Name \_\_\_\_\_

Address \_\_\_\_\_

Hospital or clinic number \_\_\_\_\_

Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification

Hospital or clinic \_\_\_\_\_

Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_

Chronology of classification\*  Clinical-diagnostic (cTNM)

Surgical-evaluative (sTNM)

Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G) \_\_\_\_\_

Postsurgical resection-pathologic (pTNM)

Retreatment (rTNM)  Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

TX Minimum requirements to assess the primary tumor cannot be met.

T0 No evidence of primary tumor

Tis Carcinoma *in situ*

T1 Tumor not more than 5 mm in its greatest dimension

T2 Tumor more than 5 mm, without extension into adjacent structures

T3 Tumor with extension into adjacent structures

T4 Tumor with extension into the orbit

### Regional Lymph Nodes (N)

NX Minimum requirements to assess the regional lymph nodes cannot be met.

N0 No evidence of regional lymph node involvement

N1 Evidence of involvement of the regional lymph nodes

### Distant Metastases (M)

MX Minimum requirements to assess the presence of distant metastases cannot be met.

M0 No evidence of distant metastases

M1 Evidence of distant metastases

Specify \_\_\_\_\_

## Postsurgical Histopathologic Classification (pTNM)

The pT categories correspond to the T categories.

## Histopathology

Tumors that are included in the analysis and evaluation are as follows:

Squamous cell carcinoma

Mucoepidermoid carcinoma

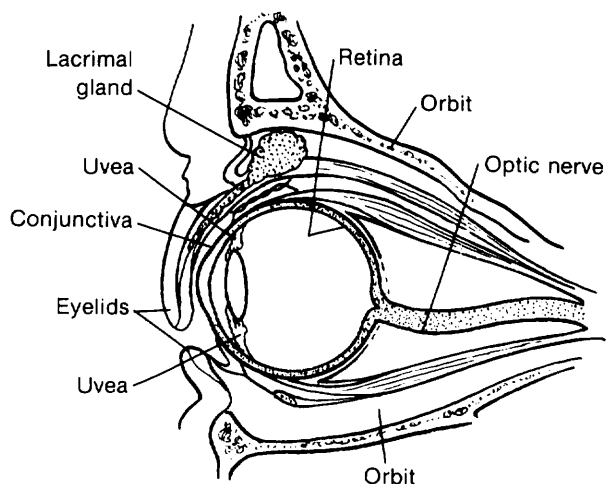
## Histopathologic Grade (G)

GX Grade cannot be assessed.

G1 High degree of differentiation

G2 Medium degree of differentiation

G3 Low degree of differentiation or undifferentiated



Indicate on diagram and describe exact location and characteristics of tumor.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Stage Grouping

None recommended at this time

## Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into staging but may be a factor in deciding further treatment.

R0 No residual tumor

R1 Microscopic residual tumor

R2 Macroscopic residual tumor

Specify \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.

Date \_\_\_\_\_

\* Use a separate form each time a case is staged.

## Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
[ ] H0	Normal activity	0	90-100
[ ] H1	Symptomatic but ambulatory; cares for self	1	70-80
[ ] H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
[ ] H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
[ ] H4	Bedridden; may need hospitalization	4	10-20

## Melanoma of the Conjunctiva

### **RULES FOR CLASSIFICATION (ICD-O 190.3)**

The classification applies only to melanoma. (See Chapter 33 for classification of carcinoma of the conjunctiva.)

There should be histologic verification of the disease. The tumor should be distinguished from nontumorous pigmentation. Primary acquired melanosis is excluded, but such cases may be listed under the category *G0*; however, in the absence of histologic confirmation they may be listed under *T0*. Any unconfirmed case must be reported separately.

The following are the minimum requirements for assessment of the T, N, and M categories. If these cannot be met, the symbols TX, NX, or MX will be used.

T categories: clinical examination

N categories: clinical examination and radiography

M categories: clinical examination and radiography

### **REGIONAL LYMPH NODES**

The regional lymph nodes are the preauricular, submandibular, and cervical nodes.

### **PRETREATMENT CLINICAL CLASSIFICATION (CTNM)**

#### **Primary Tumor (T)**

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Tumor(s) of the bulbar conjunctiva occupying not more than one quadrant
- T2 Tumor(s) of the bulbar conjunctiva occupying more than one quadrant
- T3 Tumor(s) of the conjunctival fornix and/or palpebral conjunctiva and/or caruncle
- T4 Tumor with extension into the eyelid and/or cornea and/or orbit

**Regional Lymph Nodes (N)**

- NX Minimum requirements to assess the regional lymph nodes cannot be met.  
 N0 No evidence of regional lymph node involvement  
 N1 Evidence of involvement of the regional lymph nodes

**Distant Metastases (M)**

- MX Minimum requirements to assess the presence of distant metastases cannot be met.  
 M0 No evidence of distant metastases  
 M1 Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Other	OTH
Lymph nodes	LYM		

**POSTSURGICAL HISTOPATHOLOGIC CLASSIFICATION (pTNM)****Primary Tumor (pT)**

- pTX Extent of invasion cannot be assessed.  
 pT1 Corresponds to T1 when tumor is not more than 2 mm thick  
 pT2 Corresponds to T2 when tumor is not more than 2 mm thick  
 pT3 Corresponds to T3 and to T1 or T2 when tumor is more than 2 mm thick  
 pT4 Corresponds to T4

**Histopathologic Grade (histogenetic classification) (G)**

- GX Grade cannot be assessed.  
 G0 Primary acquired melanosis

- G1 Melanoma arising from a nevus  
 G2 Melanoma(s) arising from primary acquired melanosis  
 G3 Melanoma(s) arising *de novo*

**Regional Lymph Nodes (pN)**

The pN categories correspond to the N categories.

**Distant Metastases (pM)**

The pM categories correspond to the M categories.

**POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)**

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor  
 Specify \_\_\_\_\_

**STAGE GROUPING**

No stage grouping is recommended at present by the Union Internationale Contre le Cancer or by the American Joint Committee.

**BIBLIOGRAPHY**

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- Zimmerman LE: The histogenesis of conjunctival melanomas. The First Algernon B. Reese Lecture. In Jakobiec FA (ed): *Ocular and Adnexal Tumors*. Birmingham, Aesculapius, 1978

# MELANOMA OF THE CONJUNCTIVA (ICD-O 190.3)

## Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

### Definitions: TNM Classification

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Tumor(s) of the bulbar conjunctiva occupying not more than one quadrant
- T2 Tumor(s) of the bulbar conjunctiva occupying more than one quadrant
- T3 Tumor(s) of the conjunctival fornix and/or palpebral conjunctiva and/or caruncle
- T4 Tumor with extension into the eyelid and/or cornea and/or orbit

#### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of the regional lymph nodes

#### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases  
Specify \_\_\_\_\_

### Postsurgical Histopathologic Classification (pTNM)

#### Primary Tumor (T)

- pTX Extent of invasion cannot be assessed.
- pT1 Corresponds to T1 when tumor is not more than 2 mm thick.
- pT2 Corresponds to T2 when tumor is not more than 2 mm thick.
- pT3 Corresponds to T3 and to T1 or T2 when tumor is more than 2 mm thick.
- pT4 Corresponds to T4.

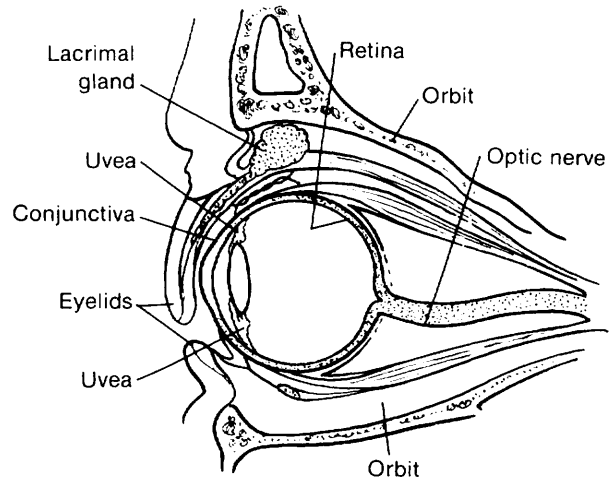
#### Stage Grouping

None recommended at this time

#### Histopathologic Grade (G)

- GX Grade cannot be assessed.
- G0 Primary acquired melanosis
- G1 Melanoma arising from a nevus

\*Use a separate form each time a case is staged.



Indicate on diagram and describe exact location and characteristics of tumor.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- G2 Melanoma(s) arising from primary acquired melanosis
- G3 Melanoma(s) arising *de novo*

### Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into staging but may be a factor in deciding further treatment.

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

### Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
[ ] H0	Normal activity	0	90–100
[ ] H1	Symptomatic but ambulatory; cares for self	1	70–80
[ ] H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50–60
[ ] H3	Ambulatory 50% or less of time; nursing care needed	3	30–40
[ ] H4	Bedridden; may need hospitalization	4	10–20



## Melanoma of the Uvea

The classification applies only to melanoma (ICD-O: M. 8720/3).

### **ANATOMY (ICD-O 190.0)**

The uveal tract (uvea) is the middle layer of the eyeball, situated between the cornea and sclera externally and the retina and its analogues internally. The uveal tract is divided into three regions: iris, ciliary body, and choroid. It is a highly vascular structure, with the choroid in particular being composed of large blood vessels with little intervening connective tissue. There are no lymphatic channels in the uvea. Systemic metastasis from uveal melanomas occurs by hematogenous routes. Uveal melanomas are believed to arise from uveal melanocytes and are therefore of neural crest origin. Melanomas may spread by local extension through Bruch's membrane to involve the retina and vitreous, or by extension through the sclera or optic nerve into the orbit.

Most uveal melanomas occur in the choroid. The ciliary body is less commonly the site of origin, and the iris is least commonly involved. Iris melanomas are relatively benign and slow growing, and they rarely metastasize. Melanomas of the ciliary body and choroid are cytologically more malignant and metastasize more frequently.

**Nodal Stations.** Since there are no intraocular lymphatics, this category applies only to extrascleral extension anteriorly.

**Metastatic Sites.** Uveal melanomas can metastasize through hematogenous routes to various organs. The liver is most commonly involved and is usually the first site of clinically detectable metastasis. Less commonly, the lung, pleura, subcutaneous tissues, bone, and other sites may be involved.

### **RULES FOR CLASSIFICATION**

There should be histologic verification of the disease. Any unconfirmed case must be reported separately.

The following are the minimum requirements for assessment of the T, N, and M categories. If these cannot be met, the symbols TX, NX, or MX will be used.

T categories: clinical examination. Additional methods such as fluorescein angiography and isotope examination may enhance the accuracy of appraisal.

N categories: clinical examination

M categories: clinical examination

## REGIONAL LYMPH NODES

The regional lymph nodes are the preauricular, submandibular, and cervical nodes; involvement implies subconjunctival extension of the primary tumor.

## ANATOMIC SITES

1. Iris
2. Ciliary Body
3. Choroid

### 1. IRIS

#### Pretreatment Clinical Classification (cTNM)

##### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Tumor of any size, limited to the iris
- T2 Tumor involving not more than one quadrant, with extension into the anterior chamber angle
- T3 Tumor involving more than one quadrant, with extension into the anterior chamber angle
- T4 Tumor with extraocular extension

##### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of the regional lymph nodes

##### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Other	OTH
Lymph nodes	LYM		

## Postsurgical Histopathologic Classification (pTNM)

The pT categories correspond to the T categories.

### Regional Lymph Nodes (pN)

The pN categories correspond to the N categories.

### Distant Metastases (pM)

The pM categories correspond to the M categories.

## 2. CILIARY BODY

### Pretreatment Clinical Classification (cTNM)

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Tumor limited to the ciliary body
- T2 Tumor with extension into the anterior chamber and/or iris
- T3 Tumor with extension into the choroid
- T4 Tumor with extraocular extension

#### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of the regional lymph nodes

#### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Other	OTH
Lymph nodes	LYM		

## Postsurgical Histopathologic Classification (pTNM)

The pT categories correspond to the T categories.

### Regional Lymph Nodes (pN)

The pN categories correspond to the N categories.

### Distant Metastases (pM)

The pM categories correspond to the M categories.

**3. CHOROID**

**Pretreatment Clinical Classification (cTNM)**

**Primary Tumor (T)**

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1\*† Tumor not more than 10 mm in its greatest dimension, and/or with an elevation not more than 3 mm
  - T1a† Tumor not more than 7 mm in its greatest dimension and with an elevation not more than 2 mm
  - T1b† Tumor more than 7 mm but not more than 10 mm in its greatest dimension and with an elevation more than 2 mm but not more than 3 mm
- T2\* Tumor more than 10 mm but not more than 15 mm in its greatest dimension and with an elevation of more than 3 mm but not more than 5 mm
- T3\* Tumor more than 15 mm in its greatest dimension or with an elevation of 5 mm or more
- T4 Tumor with extraocular extension

*Note:* When dimension and elevation show a difference in classification, the highest category should be used for classification.

**Regional Lymph Nodes (N)**

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of regional lymph nodes

**Distant Metastases (M)**

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Other	OTH
Lymph nodes	LYM		

\*In clinical practice the tumor base may be estimated in optic disc diameters (dd) (average: 1 dd, or 1.5 mm). The elevation may be estimated in diopters (average: 3 diopters, or 1 mm).

†Other techniques utilized, such as ultrasonography and computerized stereometry, may provide a more accurate measurement. ‡It may be impossible to distinguish a large nevus from a small melanoma.

**Postsurgical Histopathologic Classification (pTNM)**

The pT categories correspond to the T categories.

**Histopathologic Grade (G)**

- GX Grade not assessed
- G1 Spindle cell melanoma
- G2 Mixed cell melanoma
- G3 Epithelioid cell melanoma

**Venous Invasion (V)**

- VX Venous invasion not assessed
- V0 Veins do not contain tumor.
- V1 Veins in melanoma contain tumor.
- V2 Vortex veins contain tumor.

**Scleral Invasion (S)**

- SX Scleral invasion not assessed
- S0 Sclera does not contain tumor.
- S1 Intrasceral‡ invasion of tumor
- S2 Extrascleral extension of tumor

**Regional Lymph Nodes (pN)**

The pN categories correspond to the N categories.

**Distant Metastases (pM)**

The pM categories correspond to the M categories.

**Postsurgical Treatment Residual Tumor (R)**

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

**STAGE GROUPING**

In case more than one of the uveal structures is involved, the classification of the structure mainly affected is used.

**Iris and Ciliary Body**

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0
- Stage IVA T4, N0, M0
- Stage IVB Any T, N1, M1

**Choroid**

- Stage I T1, N0, M0
- Stage IA T1a, N0, M0
- Stage IB T1b, N0, M0
- Stage II T2, N0, M0

‡Includes perineural and perivascular invasion of scleral canals.

Stage III T3, N0, M0  
Stage IVA T4, N0, M0  
Stage IVB Any T, N1, M1

**POSTSURGICAL HISTOPATHOLOGIC  
STAGE GROUPING**

Corresponds to the clinical stage grouping.

# MELANOMA OF THE UVEA (ICD-O 190.0)

## Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*     Clinical-diagnostic (cTNM)  
     Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)     Autopsy (aTNM)

## Anatomic Sites

- Iris
- Ciliary body
- Choroid

### 1. Iris

#### Definitions: TNM Classification

##### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Tumor of any size, limited to the iris
- T2 Tumor involving not more than one quadrant, with extension into the anterior chamber angle
- T3 Tumor involving more than one quadrant, with extension into the anterior chamber angle
- T4 Tumor with extraocular extension

##### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of the regional lymph nodes

##### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
  - M0 No evidence of distant metastases
  - M1 Evidence of distant metastases
- Specify \_\_\_\_\_

### Stage Grouping†

In case more than one of the uveal structures is involved, the classification of the structure mainly affected is used.

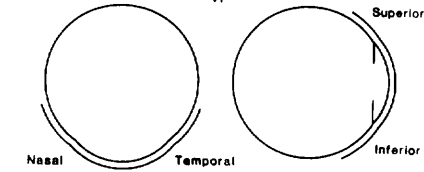
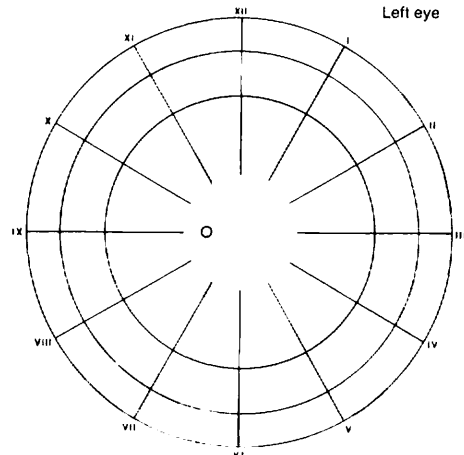
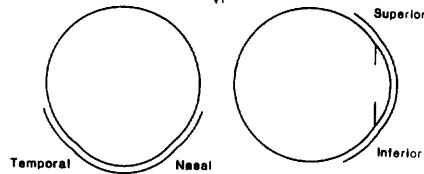
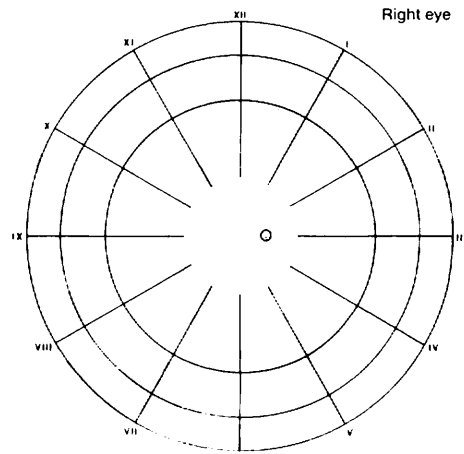
Indicate on diagrams and describe exact location and characteristics of tumor.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



\* Use a separate form each time a case is staged.  
 † See reverse side for additional information.

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_



## Postsurgical Histopathologic Classification (pTNM)

The pT categories correspond to the T categories.

### 2. Ciliary Body

#### Definitions: TNM Classification

##### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Tumor limited to the ciliary body
- T2 Tumor with extension into the anterior chamber and/or iris
- T3 Tumor with extension into the choroid
- T4 Tumor with extraocular extension

##### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of regional lymph nodes

##### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases  
Specify \_\_\_\_\_

## Postsurgical Histopathologic Classification (pTNM)

The pT categories correspond to the T categories.

### 3. Choroid

#### Definitions: TNM Classification

##### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1\*† Tumor not more than 10 mm in its greatest dimension and with elevation not more than 3 mm
- T1a† Tumor not more than 7 mm in its greatest dimension and with elevation not more than 2 mm
- T1b† Tumor more than 7 mm but not more than 10 mm in its greatest dimension and with an elevation more than 2 mm but not more than 3 mm
- T2\* Tumor more than 10 mm but not more than 15 mm in its greatest dimension and with an elevation of more than 3 mm but not more than 5 mm
- T3\* Tumor more than 15 mm in greatest dimension or with an elevation of 5 mm or more
- T4 Tumor with extraocular extension

##### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of the regional lymph nodes

##### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases  
Specify \_\_\_\_\_

\*†Refer to manual.

## Postsurgical Histopathologic Classification (pTNM)

The pT categories correspond to the T categories

### Histopathologic Grade (G)

- GX Grade not assessed
- G1 Spindle cell melanoma
- G2 Mixed cell melanoma
- G3 Epithelioid cell melanoma

### Venous Invasion (V)

- VX Venous invasion not assessed
- V0 Veins do not contain tumor.
- V1 Veins in melanoma contain tumor.
- V2 Vortex veins contain tumor.

### Scleral Invasion (S)

- SX Scleral invasion not assessed
- S0 Sclera does not contain tumor.
- S1 Intrasceral‡ invasion of tumor
- S2 Extrasccleral extension of tumor

## Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into staging but may be a factor in deciding further treatment.

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

## Stage Grouping

In case more than one of the uveal structures is involved, the classification of the structure mainly affected is used.

### Iris and Ciliary Body

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0
- Stage IVA T4, N0, M0
- Stage IVB Any T, N1, M1

### Choroid

- Stage I T1, N0, M0
- Stage IA T1a, N0, M0
- Stage IB T1b, N0, M0
- Stage II T2, N0, M0
- Stage III T3, N0, M0
- Stage IVA T4, N0, M0
- Stage IVB Any T, N1, M1

## Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

‡Includes perineural and perivascular invasion of scleral canals.



## Retina

The classification applies only to retinoblastoma (ICD-O: M-9510/3).

### **ANATOMY (ICD-O 190.5)**

The retina is composed of neurons and glial cells. The neurons give rise to retinoblastoma, whereas the glial cells give rise to astrocytomas, which in the retina are benign and extremely rare. The retina is limited internally by a membrane that separates it from the vitreous cavity. Externally it is limited by the retinal pigment epithelium and Bruch's membrane, which separate it from the choroid and act as natural barriers to extension of retinal tumors into the choroid. The continuation of the retina with the optic nerve allows direct extension of retinoblastomas into the optic nerve and then to the subarachnoid space. Since the retina has no lymphatics, spread of retinal tumors is either by direct extension into adjacent structures or by distant metastasis through hematogenous routes.

**Nodal Stations.** Since there are no intraocular lymphatics, the category applies only to anterior extrascleral extension.

**Metastatic Sites.** Retinoblastoma can metastasize through hematogenous routes to various sites, most notably the skull, long bones, brain, lymph nodes, and viscera.

### **RULES FOR CLASSIFICATION**

Each eye must be classified separately. The classification does not apply to complete spontaneous regression of the tumor. There should be histologic verification of the disease in an enucleated eye. Any unconfirmed case must be reported separately.

The following are the minimal requirements for assessment of the T, N, and M categories. If these cannot be met, the symbol TX, NX, or MX will be used.

T categories: clinical examination. Additional methods such as radiography, ultrasonography, computed tomography [CT], and examination of bone marrow and cerebrospinal fluid may enhance the accuracy of appraisal.

N categories: clinical examination

M categories: clinical examination

### REGIONAL LYMPH NODES

The regional lymph nodes are the preauricular, submandibular, and cervical nodes; involvement implies subconjunctival extension of the tumor.

### PRETREATMENT CLINICAL CLASSIFICATION (cTNM)

The extent of retinal involvement is indicated as a percentage. In bilateral cases the extent of involvement of the more affected eye determines the T category.

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Tumor(s) confined to and occupying not more than 25% of the retina
- T2 Tumor(s) confined to and occupying more than 25% but not more than 50% of the retina
- T3 Tumor occupying more than 50% of the retina and/or with extension beyond the retina but still intraocular
- T3a Tumor occupying more than 50% of the retina and/or clumps of tumor cells in the vitreous
- T3b Tumor involvement of the optic disc
- T3c Tumor involvement of the anterior chamber and/or uveal involvement
- T4 Tumor with extraocular extension
- T4a Tumor involvement of the retrobulbar optic nerve
- T4b Extraocular extension other than to the optic nerve

*Note:* The following suffixes may be added to the appropriate T categories:

- (m) to indicate multiple tumors (*e.g.*, T2 [m2])
- (f) to indicate cases with a known family history
- (d) to indicate diffuse retinal involvement without the formation of discrete masses

#### Regional Lymph Nodes (N)

NX Minimum requirements to assess the regional lymph nodes cannot be met.

- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of the regional lymph nodes

#### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Other	OTH

### POSTSURGICAL HISTOPATHOLOGIC CLASSIFICATION (pTNM)

#### Primary Tumor (pT)

- pTX Extent of invasion cannot be assessed.
- pT0 No evidence of tumor found on histologic examination of specimen
- pT1 Corresponds to T1
- pT2 Corresponds to T2
- pT3 Corresponds to T3
- pT3a Corresponds to T3a
- pT3b Tumor invasion of the optic nerve as far as the lamina cribrosa
- pT3c Tumor in the anterior chamber and/or invasion with thickening of the uvea and/or intrascleral invasion
- pT4 Corresponds to T4
- pT4a Intraneural tumor beyond the lamina cribrosa but not at the line of resection
- pT4b Tumor at the line of resection or other extraocular extension

#### Histopathologic Grade (G)

For the purpose of TNM, grading is not considered appropriate at present.

#### Regional Lymph Nodes (pN)

The pN categories correspond to the N categories.

#### Distant Metastases (pM)

The pM categories correspond to the M categories.

**POSTSURGICAL TREATMENT  
RESIDUAL TUMOR (R)**

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor

Specify \_\_\_\_\_

**STAGE GROUPING**

In cases of bilateral disease the more affected eye is used for the stage grouping.

- Stage IA T1, N0, M0  
 Stage IB T2, N0, M0

- Stage II T3, N0, M0  
 Stage IIA T3a, N0, M0  
 Stage IIB T3b, N0, M0  
 Stage IIC T3c, N0, M0  
 Stage III T4, N0, M0  
 Stage IIIA T4a, N0, M0  
 Stage IIIB T4b, N0, M0  
 Stage IV Any T, N1, M1

**POSTSURGICAL HISTOPATHOLOGIC  
STAGE GROUPING**

Corresponds to the clinical stage grouping.



### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases  
Specify \_\_\_\_\_

### Postsurgical Histopathologic Classification (pTNM)

#### Primary Tumor (T)

- pTX Extent of invasion cannot be assessed.
- pT0 No evidence of tumor found on histologic examination of specimen
- pT1 Corresponds to T1
- pT2 Corresponds to T2
- pT3 Corresponds to T3
  - pT3a Corresponds to T3a
  - pT3b Tumor invasion of optic nerve as far as the lamina cribrosa
  - pT3c Tumor in the anterior chamber and/or invasion with thickening of the uvea and/or intrascleral invasion
- pT4 Corresponds to T4
  - pT4a Intraneural tumor beyond the lamina cribrosa but not at the line of resection
  - pT4b Tumor at the line of resection or other extraocular extension

#### Histopathologic Grade (G)

For the purpose of TNM, grading is not considered appropriate at present.

#### Postsurgical Resection-Pathologic Residual Tumor (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

### Stage Grouping

In cases of bilateral disease, the more affected eye is used for the stage grouping.

- Stage IA T1, N0, M0
- Stage IB T2, N0, M0
- Stage II T3, N0, M0
- Stage IIA T3a, N0, M0
- Stage IIB T3b, N0, M0
- Stage IIC T3c, N0, M0
- Stage III T4, N0, M0
- Stage IIIA T4a, N0, M0
- Stage IIIB T4b, N0, M0
- Stage IV Any T, N1, M1

### Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

## Sarcoma of the Orbit

Sarcomas of the orbit include a broad spectrum of soft-tissue tumors and sarcomas of bone. Malignant lymphomas and other neoplasms of the reticuloendothelial system are discussed in separate manuals, and malignant tumors of the optic nerve are too rare to warrant discussion here. The posterior orbit is generally believed to be devoid of lymphatics; however, anterior spread of tumor to involve the eyelids and conjunctiva may gain access to the lymphatic circulation. Metastatic spread occurs by way of the bloodstream.

### RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging (cTNM).** Clinical-diagnostic staging is based on symptoms and signs relating to visual loss, degree of proptosis or displacement, papilledema, and optic atrophy. Diagnostic tests include radiographs of the orbit, computed tomography (CT), and angiography.

**Surgical-Evaluative Staging (sTNM).** Surgical-evaluative staging is based on the findings at orbitotomy or frontal craniotomy and includes the tumor size, the extent of resection, and the nature of the surgical margins.

**Postsurgical Resection-Pathologic Staging (pTNM).** Postsurgical resection-pathologic staging is based on the histopathology of the tumor, its grade, and the extent of removal.

**Retreatment Staging (rTNM).** Recurrence and local or distant spread are confirmed by all of the modalities used for the initial investigation, and a complete restaging procedure is performed.

**Autopsy Staging (aTNM).** Autopsy staging is based on the extent of the tumor and its histopathology when first diagnosed at autopsy.

### TNM CLASSIFICATION (ICD-O 190.1)

#### Primary Tumor (T)

TX Minimum requirements to assess the primary tumor cannot be met.



- T0 No evidence of primary tumor  
 T1 Tumor 1.5 cm or less  
 T2 Tumor more than 1.5 cm  
 T3 Diffuse involvement of the orbital tissues and/or bony walls  
 T4 Spread beyond the orbit to the adjacent sinuses and/or to the cranium

### Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.  
 N0 No regional lymph node involvement  
 N1 Histologically verified lymph node involvement

### Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.  
 M0 No evidence of distant metastases  
 M1 Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Other	OTH

### POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0 No residual tumor  
 R1 Microscopic residual tumor  
 R2 Macroscopic residual tumor  
 Specify \_\_\_\_\_

### STAGE GROUPING

No stage grouping is recommended at present by the Union Internationale Contre le Cancer or by the American Joint Committee.

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## Lacrimal Gland

The classification applies only to epithelial tumors of the lacrimal gland.

A retrospective study of 265 epithelial tumors of the lacrimal gland has been completed from material on file in the Registry of Ophthalmic Pathology at the Armed Forces Institute of Pathology. The histologic classification used is a modification of the WHO classification of salivary gland tumors. The lacrimal gland includes both lobules, the superficial (palpebral lobe) portion and the deep intraorbital portion.

### HISTOPATHOLOGY

The major malignant primary epithelial tumors include the following:

Carcinoma in pleomorphic adenoma (malignant mixed tumor).

This includes adenocarcinoma and adenoid cystic carcinoma arising in benign mixed tumor (BMT).

Adenoid cystic carcinoma (cylindroma) arising *de novo*

Adenocarcinoma (arising *de novo*)

Mucoepidermoid carcinoma

Squamous cell carcinoma

### ANATOMY (ICD-O 190.2)

The lacrimal gland lies in a bony excavation that is covered by periosteum. It is located in the lateral orbital wall (the fossa of the lacrimal gland). The smaller palpebral portion projects into the lateral portion of the upper lid between the palpebral fascia and the conjunctiva.

**Nodal Stations.** The regional lymph nodes include the preauricular, submandibular, and cervical nodes.

**Metastatic Sites.** The lung is the most common primary site, followed by bone and a variety of remote viscera.



## RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging (cTNM).** A complete physical examination, x-ray films of the orbit including computed tomography [CT] scans, ultrasonograms, and plain films, and tomograms of the adjacent paranasal sinuses should be carried out. Chest x-ray films, radionuclide bone scans, and blood chemistries (SMA-12) should also be available.

**Surgical-Evaluative Staging (sTNM).** The extent of orbital involvement should be carefully evaluated by histologic study of biopsies of extensions of the tumor, as well as by studies of the margins of resection of the exenterated orbital contents, if done as part of the evaluation procedure. Needle biopsy aspirations of orbital masses may be helpful in some cases.

**Postsurgical Resection-Pathologic Staging (pTNM).** After complete resection of the mass, the entire specimen should be evaluated to determine the type of tumor and the grade of malignancy.

**Retreatment Staging (rTNM).** Each recurrence must be completely reevaluated as the primary workup. Questionable recurrences or metastases must be confirmed by biopsy. Complete staging, particularly for metastatic disease, is recommended.

## TNM CLASSIFICATION (based on clinical x-ray films and operative findings)

### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Tumor 2.5 cm or less in diameter, well demarcated, and mobile within the fossa of the lacrimal gland
- T2 Tumor 2.5 cm or less in diameter invading the periosteum of the fossa of the lacrimal gland
- T3a Tumor more than 2.5 cm in diameter but less than 5 cm, well demarcated, and mobile within the fossa of the lacrimal gland
- T3b Tumor more than 2.5 cm in diameter but less than 5 cm, fixed or invading the periosteum of the fossa of the lacrimal gland
- T4a Tumor more than 5 cm in diameter with extensive invasion of the orbital soft tissues, optic nerve, or globe, but without bone involvement
- T4b Tumor more than 5 cm in diameter with extensive invasion of the orbital soft tissues, optic nerve, or globe, with invasion of bone

## Regional Lymph Nodes (N)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of involvement of the regional lymph nodes

## Distant Metastases (M)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases

Specify sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Other	OTH

## POSTSURGICAL HISTOPATHOLOGIC CLASSIFICATION (pTNM)

The pT categories correspond to the T categories.

### Histopathologic Grade (G)

- G1 Well differentiated
- G2 Moderately well differentiated; includes adenoid cystic carcinoma without basaloid (solid) pattern
- G3 Poorly differentiated; includes adenoid cystic carcinoma with basaloid (solid) pattern

## POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0 No residual tumor
- R1 Microscopic residual tumor
- R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

## STAGE GROUPING

No stage grouping is recommended at present by the Union Internationale Contre le Cancer or by the American Joint Committee.

## BIBLIOGRAPHY

- Font RL, Gamel JW: Epithelial tumors of the lacrimal gland: An analysis of 265 cases. In Jakobiec FA (ed), *Ocular and Adnexal Tumors*, pp 787-805. Birmingham, Aesculapius, 1978

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## LACRIMAL GLAND (ICD-O 190.2)

### Data Form for Cancer Staging (Applies Only to Epithelial Tumors)

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
 [ ] Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 [ ] Postsurgical resection-pathologic (pTNM)  
 [ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

### Definitions: TNM Classification

#### Primary Tumor (T)

- [ ] TX Minimum requirements to assess the primary tumor cannot be met.
- [ ] T0 No evidence of primary tumor
- [ ] T1 Tumor 2.5 cm or less in diameter, well demarcated, and mobile within the fossa of the lacrimal gland
- [ ] T2 Tumor 2.5 cm or less in diameter invading the periosteum of the fossa of the lacrimal gland
- [ ] T3a Tumor more than 2.5 cm in diameter but less than 5 cm, well demarcated, and mobile within the fossa of the lacrimal gland
- [ ] T3b Tumor more than 2.5 cm in diameter but less than 5 cm, fixed or invading the periosteum of the fossa of the lacrimal gland
- [ ] T4a Tumor more than 5 cm in diameter with extensive invasion of the orbital soft tissues, optic nerve, or globe, but without bone involvement
- [ ] T4b Tumor more than 5 cm in diameter with extensive invasion of the orbital soft tissues, optic nerve, or globe, with invasion of bone

#### Regional Lymph Nodes (N)

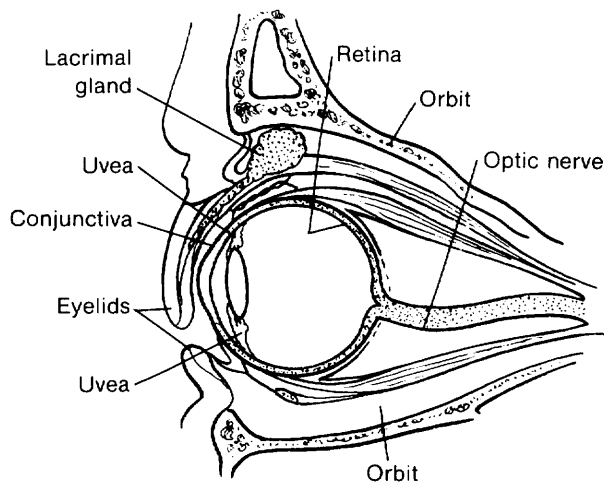
- [ ] NX Minimum requirements to assess the regional lymph nodes cannot be met.
- [ ] N0 No evidence of regional lymph node involvement
- [ ] N1 Evidence of involvement of the regional lymph nodes

#### Distant Metastases (M)

- [ ] MX Minimum requirements to assess the presence of distant metastases cannot be met.
- [ ] M0 No evidence of distant metastases
- [ ] M1 Evidence of distant metastases  
Specify \_\_\_\_\_

#### Histopathologic Grade (G)

- [ ] G1 Well differentiated
- [ ] G2 Moderately well differentiated; includes adenoid cystic carcinoma without basaloid (solid) pattern
- [ ] G3 Poorly differentiated; includes adenoid cystic carcinoma with basaloid (solid) pattern



Indicate on diagram and describe exact location and characteristics of tumor.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

#### Stage Grouping

None recommended at this time

#### Postsurgical Resection-Pathologic Residual Tumor (R)

Does not enter into staging but may be a factor in deciding further treatment.

- [ ] R0 No residual tumor
- [ ] R1 Microscopic residual tumor
- [ ] R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\* Use a separate form each time a case is staged.  
 † See reverse side for additional information.



## Histopathology

- Carcinoma in pleomorphic adenoma (malignant mixed tumor) includes adenocarcinoma and adenoid cystic carcinoma arising in benign mixed tumor (BMT).
- Adenoid cystic carcinoma (cylindroma) arising *de novo*
- Adenocarcinoma (arising *de novo*)
- Mucoepidermoid carcinoma
- Squamous cell carcinoma

## Performance Status of Host (H)

Several systems for recording a patient's activity and symptoms are in use and are more or less equivalent as follows:

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90–100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70–80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50–60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30–40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10–20

The most critical feature in the classification of brain tumors is histopathology. Accurate pathologic criteria and classification are essential to an understanding of the clinical and biologic behavior of the gliomas in particular, and most other tumors as well. The anatomic location and extent of tumors within the central nervous system are also of clinical and prognostic significance. Neuroradiologic-diagnostic procedures have become increasingly more accurate and reliable in providing topographic and morphologic information on tumors of the central nervous system and are useful at various points in diagnosis and management.

## HISTOPATHOLOGY

Tumors that are included in the analysis and evaluation are as follows:

1. Astrocytomas
2. Oligodendrogliomas
3. Ependymal and choroid plexus tumors
4. Glioblastomas
5. Medulloblastomas
6. Meningiomas
7. Neurilemmomas (neurinomas, schwannomas)
8. Hemangioblastomas
9. Neuronal tumors
10. Sarcomas
11. Reticulum cell sarcomas (microgliomas)

Histologic grade usually correlates with biologic activity of the tumor. This is particularly the case with malignant astrocytomas, the most common form of glioma. The age of the patient at the time of diagnosis is also of major importance for prognosis.

- G1 Well differentiated
- G2 Moderately well differentiated; no mitoses
- G3 Poorly differentiated; occasional mitoses
- G4 Very poorly differentiated; frequent mitoses, necrosis, marked pleomorphism

There is some criticism of the use of morphologic criteria alone for purposes of grading, but most classification systems are capable of incorporating such a system as an index of aggressiveness. This is further discussed in the Appendix to the chapter.

### ANATOMY (ICD-O 191)

**Primary Site.** A variety of tissues within the central nervous system can give rise to neoplasms. These include astrocytes and other glial cells, meninges, blood vessels, pituitary and pineal cells, and neural elements proper. The major structural sites involved are the various lobes of the cerebral hemispheres; the midline structures including midbrain, pons, and medulla; the posterior fossa; and the spinal cord.

**Nodal Stations.** There are no lymphatic structures draining the central nervous system.

**Metastatic Sites.** Certain brain tumors can seed into the subarachnoid space. Hematogenous spread is very uncommon but on rare occasions has occurred in bone and other sites.

### RULES FOR CLASSIFICATION

**Clinical-Diagnostic Staging.** This staging is based on neurologic symptoms and signs and neurologic diagnostic tests including skull radiographs, electroencephalograms, isotopic brain scans, cerebral angiography, pneumoencephalography, and computed tomographic scanning.

**Surgical-Evaluative Staging.** This staging is based on the findings at craniotomy or other surgical procedures, including extent of tumor resection and the nature of the surgical margins.

**Postsurgical Resection-Pathologic Staging.** This staging is based on histopathology, grade, and microscopic evidence of completeness of removal.

**Retreatment Staging.** Each recurrence must be treated as a new problem and requires complete reevaluation as in the primary workup.

**Autopsy Staging.** This staging is based on autopsy findings of histopathology, grade, and extent of disease and is appropriate when diagnosis is first made at autopsy.

### TNM CLASSIFICATION

#### Primary Tumor (T)

- TX Minimum requirements to assess the primary tumor cannot be met.  
T0 Primary tumor is undetectable

#### Supratentorial tumor:

- T1 Greatest diameter 5 cm or less; confined to one side  
T2 Greatest diameter more than 5 cm; confined to one side  
T3 Invades or encroaches upon the ventricular system; greatest diameter 5 cm or less  
T4 Crosses the midline, invades the opposite hemisphere, or extends infratentorially

#### Infratentorial tumor:

- T1 Greatest diameter 3 cm or less; confined to one side  
T2 Greatest diameter more than 3 cm; confined to one side  
T3 Invades or encroaches upon the ventricular system; greatest diameter 3 cm or less  
T4 Crosses the midline, invades the opposite hemisphere, or extends supratentorially

### Nodal Involvement (N)

This category does not apply to this site.

### Distant Metastasis (M)

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.  
M0 No (known) distant metastasis  
M1 Distant metastasis present  
Specify \_\_\_\_\_

Specify sites according to the following notations:

Subarachnoid space	CSF
Pulmonary	PUL
Lymph nodes	LYM
Osseous	OSS
Hepatic	HEP
Bone marrow	MAR
Occult	OCC
Other	OTH

Add "+" to the abbreviated notation to indicate that the pathology (p) is proved.

### POSTSURGICAL TREATMENT RESIDUAL TUMOR (R)

- R0 No residual tumor  
R1 Microscopic residual tumor  
R2 Macroscopic residual tumor  
Specify \_\_\_\_\_

### STAGE GROUPING

The essential feature in determining stage is the histologic grade.

- Stage IA G1, T1, M0  
Stage IB G1, T2, T3; M0

- Stage IIA G2, T1, M0
- Stage IIB G2, T2, T3; M0
- Stage IIIA G3, T1, M0
- Stage IIIB G3, T2, T3; M0
- Stage IV G4, T1-T4; M0  
G1-G3; T4, M0  
Any G, any T, any M

Studies in progress may produce findings that will alter these recommendations when refined data on end results are available.

# BRAIN (ICD-O 191)

## Data Form for Cancer Staging

Patient identification  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
Hospital or clinic number \_\_\_\_\_  
Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
Hospital or clinic \_\_\_\_\_  
Address \_\_\_\_\_

## Oncology Record

Anatomic site of cancer \_\_\_\_\_  
Chronology of classification\* [ ] Clinical-diagnostic (cTNM)  
[ ] Surgical-evaluative (sTNM)  
Date of classification \_\_\_\_\_

Histologic type† \_\_\_\_\_ Grade (G) \_\_\_\_\_  
[ ] Postsurgical resection-pathologic (pTNM)  
[ ] Retreatment (rTNM) [ ] Autopsy (aTNM)

## Definitions: TNM Classification

### Primary Tumor (T)

- [ ] TX No available information on primary tumor
- [ ] T0 Primary tumor undetectable

### Supratentorial tumor

- [ ] T1 Greatest diameter 5 cm or less; confined to one side
- [ ] T2 Greatest diameter more than 5 cm; confined to one side
- [ ] T3 Greatest diameter 5 cm or less; invades or encroaches upon the ventricular system
- [ ] T4 Crosses the midline, invades the opposite hemisphere, or extends infratentorially

### Infratentorial tumor

- [ ] T1 Greatest diameter 3 cm or less; confined to one side
- [ ] T2 Greatest diameter more than 3 cm; confined to one side
- [ ] T3 Greatest diameter 3 cm or less; invades or encroaches upon the ventricular system
- [ ] T4 Crosses the midline, invades the opposite hemisphere, or extends supratentorially

### Nodal Involvement (N)

Does not apply to this site

\*Use a separate form each time a case is staged.  
†See reverse side for additional information.

### Distant Metastasis (M)

- [ ] MX Not assessed
- [ ] M0 No (known) metastasis
- [ ] M1 Distant metastasis present  
Specify \_\_\_\_\_

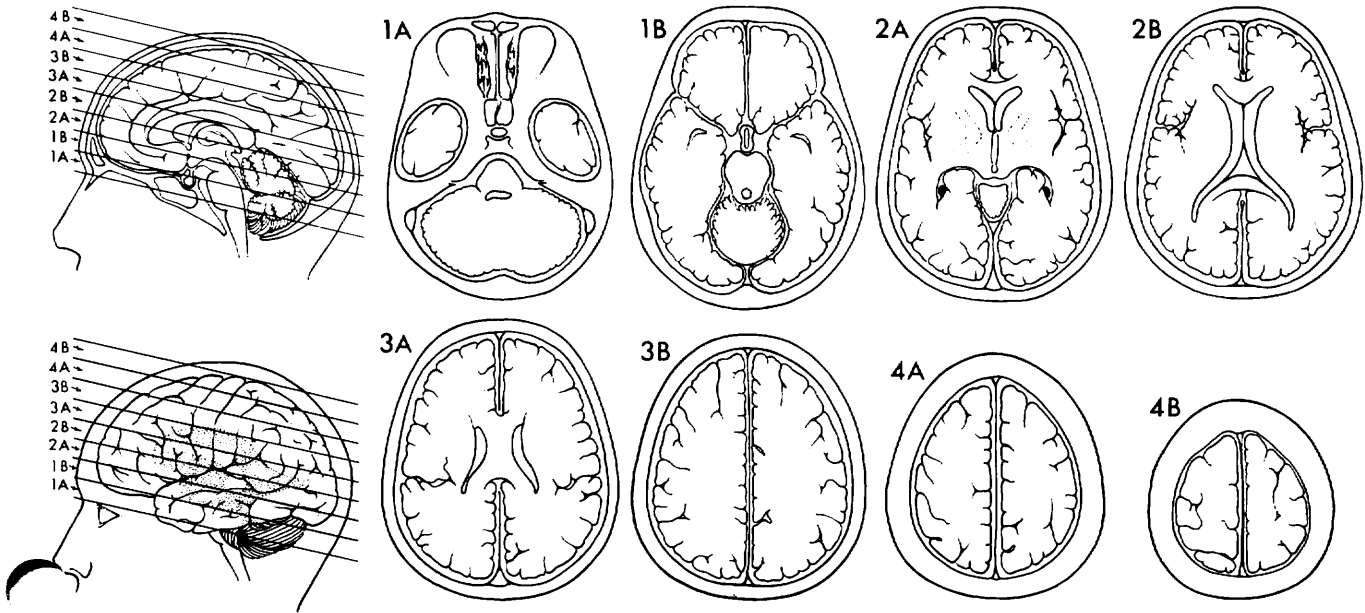
Specify according to the following notations:

Subarachnoid space	CSF
Pulmonary	PUL
Lymph nodes	LYM
Osseous	OSS
Hepatic	HEP
Bone marrow	MAR
Occult	OCC
Other	OTH

Add "+" to the abbreviated notation to indicate that the pathology (p) is proved.

### Grade

- [ ] G1 Well differentiated
- [ ] G2 Moderately well differentiated; no mitoses
- [ ] G3 Poorly differentiated; occasional mitoses
- [ ] G4 Very poorly differentiated; frequent mitoses, necrosis, and marked pleomorphism



Size: \_\_\_\_\_ cm  
Weight: \_\_\_\_\_ g

Examination by \_\_\_\_\_ M.D.  
Date \_\_\_\_\_

**Stage Grouping**

- Stage IA G1, T1, M0
- Stage IB G1, T2, T3; M0
- Stage IIA G2, T1, M0
- Stage IIB G2, T2, T3; M0
- Stage IIIA G3, T1, M0
- Stage IIIB G3, T2, T3; M0
- Stage IV G4, T1-T4; M0
- G1-G3; T4, M0
- Any G, any T, any M

**Site-Specific Information**

Initial symptom(s) \_\_\_\_\_  
 Duration \_\_\_\_\_  
 Pertinent family history \_\_\_\_\_  
 Antecedent illness \_\_\_\_\_  
 Previous therapy \_\_\_\_\_  
 Concomitant illness \_\_\_\_\_

**Clinical Evaluation**

<i>Symptom</i>	<i>Duration (wk)</i>
Headache	_____
Mental change	_____
Visual disturbance	_____
Seizure	_____
Motor loss (R) _____ (L) _____	_____
Sensory loss (R) _____ (L) _____	_____
Speech disturbance	_____
Other _____	_____
<i>Sign</i>	<i>Degree of Deficit</i>
Altered state of consciousness	_____
Papilledema	_____
Cranial nerve palsy (R) _____	_____
(L) _____	_____
Cerebellar deficit (R) _____	_____
(L) _____	_____
Motor paresis (R) _____ (L) _____	_____
Sensory deficit (R) _____ (L) _____	_____
Other _____	_____

**Diagnostic Studies**

<i>Study</i>	<i>Date(s)</i>
EEG	_____
CT scan	_____
Angiogram	_____
Other _____	_____

**Therapy**

<i>Surgery</i>	<i>Date(s)</i>
Biopsy only	_____
Subtotal resection	_____
Radical subtotal resection	_____
"Total" resection	_____
Lobectomy	_____
Shunt	_____
Other _____	_____

**Tumor Character**

Encapsulated \_\_\_\_\_  
 Vascular \_\_\_\_\_  
 Cystic \_\_\_\_\_  
 Infiltrative \_\_\_\_\_

**Complications of Therapy**

Surgical morbidity \_\_\_\_\_  
 Surgical mortality \_\_\_\_\_  
 Operative complication \_\_\_\_\_  
 Radiation toxicity \_\_\_\_\_

*Radiotherapy* Dates \_\_\_\_\_  
 Type \_\_\_\_\_ Total dose \_\_\_\_\_  
 Method \_\_\_\_\_

*Chemotherapy* Dates \_\_\_\_\_  
 Drug(s) \_\_\_\_\_  
 Drug toxicity \_\_\_\_\_

*Other Adjunctive Therapy* \_\_\_\_\_

**Histologic Type of Cancer**

- Astrocytomas
- Oligodendrogliomas
- Ependymal and choroid plexus tumors
- Glioblastomas
- Medulloblastomas
- Meningiomas
- Neurilemmomas (neurinomas, schwannomas)
- Hemangioblastomas
- Neuronal tumors
- Sarcomas
- Reticulum cell sarcomas (microgliomas)

**Postsurgical Resection-Pathologic Residual Tumor (R)**

Does not enter into staging, but may be a factor in deciding treatment

- R0 No residual tumor
  - R1 Microscopic residual tumor
  - R2 Macroscopic residual tumor
- Specify \_\_\_\_\_

**Performance Status of Host (H)**

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20



## APPENDIX

### Histologic Grading of Tumors of the Central Nervous System

#### Criteria for the Diagnosis of Malignancy in Tumors of the Central Nervous System and Allied Structures

The uncritical application, to tumors of the central nervous system and allied structures, of those criteria for histologic and biologic malignancy that generally pertain to other neoplasms is inadequate for the following reasons:

1. Irrespective of the histologic malignancy of the tumor, its unimpeded growth within the confines of the skull as a space-occupying and expanding lesion inevitably leads to a fatal termination, which by definition is equated with clinical malignancy.
2. Similarly, the local pressure caused by an intracranial tumor upon vital neural structures may result in the clinical effects of malignancy, irrespective of the histologic type of tumor.
3. The obstructive effect of a growing tumor leads to the production of secondary occlusive hydrocephalus.
4. Certain criteria of malignancy of neoplasms that, in other body systems, pertain to their growth and spread (especially the characteristic of infiltrative growth and the capacity to metastasize, either within or outside the central nervous system), do not necessarily pertain, or have to be modified, to the evaluation of the malignant behavior of central nervous system tumors.

Thus, tumors of the central nervous system and allied structures, in addition to their intrinsic benign or malignant histologic character that, to a considerable extent, determines their biologic behavior, may by their specific localization acquire certain characteristics that collectively will add up to the picture of what is regarded as benign, semi-benign, relatively malignant, or highly malignant.

The numerical grading used in this classification is based upon histologic criteria of malignancy and should be considered as an estimate of the usual behavior of each type of tumor. Numerical grade I is considered to be the least malignant and grades II, III, and IV indicate increasing degrees of malignancy.

In this general evaluation, the pathologist confronted with the problem of malignancy and prognosis is faced with two sets of data. In the first analysis the evaluation of malignancy must clearly be based on a retrospective assessment of the postoperative prognosis and survival rates of other known similar examples, so that a final and reasonably accurate clinicopathologic correlation is arrived at which both

reinforces the purely histopathologic evaluation of malignancy and is reinforced by it.

Second, the pathologist deduces malignancy from a number of purely histologic and cytologic data. These include increase of cellularity, the presence and rate of mitotic figures, the presence of atypical mitotic figures, pleomorphism of tumor cells, pleomorphism of tissue architecture—particularly necroses, abnormally prominent stromal reaction, disorderly stromal reaction and overgrowth—and the formation of pathologic blood vessels (corresponding to the angiographic appearance of arteriovenous fistulas).

On the other hand, other features that are usually regarded as indicative of or synonymous with malignancy need not necessarily be recognized in the case of tumors of the central nervous system, especially those of neuroectodermal origin. For instance, lack of circumscription and focal parenchymatous invasion is not a necessary accompaniment of cellular anaplasia or ultimate clinical malignancy. Also the actual presence of mitotic figures (as in oligodendroglioma) does not necessarily imply a particularly malignant behavior; the overall number of mitoses and the presence of abnormal mitotic figures are more important in evaluation. Similarly, local invasion of the leptomeninges is often clearly dissociated from either of the two features just quoted. This is, for example, the case in the pilocytic astrocytoma that involves the wall of the third ventricle, the optic nerve, the cerebellum, and so on.

Although distant meningeal and ventricular metastases are often characteristic of highly malignant tumors such as medulloblastoma, this phenomenon again is not always to be correlated with the highest degrees of cytologic malignancy, as seen in some oligodendrogliomas.

### The Question of Grading

Following Broders' classification of epithelial tumors elsewhere in the body, an attempt has been made by Kernohan and his school to apply a system of grading by ascending degrees of malignancy numbered 1 to 4 to certain tumors of neuroectodermal origin, namely astrocytoma, oligodendroglioma, ependymoma, and neuroastrocytoma. This attempt stemmed both from a desire to simplify the then current classification of tumors of the central nervous system and from a need to offer to the neurosurgeon a prognostic evaluation of the tumor removed at surgery, based on certain definite histologic and cytologic criteria. Attractive though this attempt at simplification might be, it has, however, to meet with a number of objections:

1. The sample of tissue so analyzed may from surgical necessity not be representative of the tumor as a whole.
2. The specific evolution of the particular tumor in terms of its anaplastic potentialities is not fully expressed by such a scheme of grading. For example, a cerebellar pilocytic astrocytoma graded I does not have the same anaplastic potential as a cerebral astrocytoma or some other tumors also graded I.
3. The pleomorphism of cell and tissue structures so frequently inherent in primary neuroectodermal tumors poses additional difficulties to the application of a simplified system of grading.
4. This cytologic grading makes it extremely difficult to place tumors with mixed cell populations into an already predetermined tumor category.

Nevertheless, the above remarks should not be regarded as basically antagonistic to some attempts at expressing the degree of malignancy of a particular tumor of the central nervous system. Indeed, from the clinical and therapeutic points of view, no classification based on purely histologic entities is satisfactory unless adequate cognizance is taken of, and information provided on, the degree of malignancy of a particular tumor submitted for examination. Thus, it is the duty and prerogative of the pathologist to provide his clinical colleagues with an informed opinion on the likely evolution of a particular tumor, and to some extent this prognostic

opinion is embodied in the recognition of specific clinicopathologic neuro-oncologic entities. As an illustration, it might be pointed out that two tumors of similar cellularity, isomorphous appearance, and mitotic rate, such as the medulloblastoma and some oligodendrogliomas, usually do not exhibit the same biologic behavior. This acquired body of knowledge is clearly the result of previous collaboration among clinicians and pathologists in the field of neuro-oncology.

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# HODGKIN'S AND NON-HODGKIN'S LYMPHOMA

40

The pathologic classification of Hodgkin's disease (ICD-O 965-966) and of the non-Hodgkin's malignant lymphomas (ICD-O 954-961, 969, 970, 974), developed by Rappaport, Lukes, Butler, Dorfman, and others, is generally accepted and is coming into general use. The anatomic staging system developed for Hodgkin's disease at the Ann Arbor conference has become a worldwide standard, too, and appears to be reasonably satisfactory for the lymphocytic and histiocytic lymphomas. The TNM system, however, is not a workable system for staging the malignant lymphomas. The site of origin of these diseases is usually occult, and there is no way to differentiate T from N from M. In these entities the type of neoplastic cell(s), the degree of cellular differentiation, and the pattern of node involvement, that is, nodular (follicular) *versus* diffuse proliferation, are often more important than anatomic considerations.

## ANATOMY

The major lymphatic structures include groups and chains of lymph nodes (LYM), the spleen (SPL), thymus, Waldeyer's ring, appendix, and Peyer's patches. Minor lymphoid collections are widely dispersed in other viscera and tissues, such as the bone marrow, liver, skin, pulmonary parenchyma, pleurae, gonads, and so on. Extranodal (E) lymphoid malignancies are those that arise in tissues away from the major lymphatic aggregates.

## RULES FOR CLASSIFICATION

The diagnosis of malignant lymphoma requires the biopsy of lymph nodes or of an extranodal lymphoid tumor.

**Clinical-Diagnostic Staging.** Staging generally involves the use of a sequence of clinical, radiologic, surgical, and histopathologic procedures designed to provide a sound basis for planning therapy. Clinical-diagnostic staging includes a carefully recorded medical history, physical examination, urinalysis, chest roentgenograms, blood chemistry determinations, a competent blood examination, and an aspiration biopsy of the bone marrow.

Bilateral lower-extremity lymphangiograms are usually necessary unless there is a contraindication of this procedure. Biopsy of accessible extranodal primary tumors, such as in Waldeyer's ring, is desirable. Bilateral bone marrow biopsies from the iliac crest using the Jamshidi needle frequently obviate the need for bone marrow biopsy at laparotomy. Radioisotope scans of the spleen and liver, additional radiologic studies of the skeleton, and technetium 99m-labeled polyphosphate bone scans may be helpful in some instances. Gallium scans, ultrasound, and CT scans are useful alternative procedures for assessing tumor bulk in nodal and extranodal sites.

**Surgical-Evaluative Staging.** Nearly one third of patients who appear to have stage I or II Hodgkin's disease with involvement of the cervical or mediastinal lymph nodes have occult disease in the spleen. About 25% of patients with non-Hodgkin's lymphoma present with evidence of abdominal disease requiring laparotomy for diagnosis; in some of these patients, the spleen is not or cannot be removed. In many instances, laparotomy is necessary for biopsy of suspicious lymph nodes disclosed by lymphangiograms. Splenectomy may be necessary in Hodgkin's disease to identify microscopic foci of neoplasia. The liver may be biopsied by a percutaneous needle procedure, sometimes directed by peritoneoscopy, or by needle or wedge specimens obtained at laparotomy.

**Postsurgical Resection-Pathologic Staging.** Occasionally an extranodal site of tumor is resected along the gastrointestinal tract, which permits the examination of the entire specimen along with adjacent mesenteric lymph nodes. Involvement of tissues is indicated as + or -.

**Retreatment Staging.** Suspected recurrence or relapses require biopsy confirmation. Patients may be restaged at this juncture using the procedures outlined above.

## STAGING CLASSIFICATION

- Stage I Involvement of a single lymph node region (I) or of a single extralymphatic organ or site (I<sub>E</sub>)
- Stage II Involvement of two or more lymph node regions (number to be stated) on the same side of the diaphragm (II); or, localized involvement of an extralymphatic organ or site of one or more lymph node regions on the same side of the diaphragm (II<sub>E</sub>)

Stage III Involvement of lymph node regions on both sides of the diaphragm (III), which may also be accompanied by localized involvement of extralymphatic organ or site (III<sub>E</sub>), by involvement of the spleen (III<sub>S</sub>), or both (III<sub>E+S</sub>)

Stage IV Diffuse or disseminated involvement of one or more extralymphatic organs or tissues with or without associated lymph node enlargement. The reason for classifying the patient as stage IV is identified further by specifying sites according to the following notations:

Pulmonary	PUL
Osseous	OSS
Hepatic	HEP
Brain	BRA
Lymph nodes	LYM
Bone marrow	MAR
Pleura	PLE
Skin	SKI
Eye	EYE
Other	OTH

**Systemic Symptoms.** Each stage is subdivided into "A" and "B" categories, "B" for those with defined general symptoms and "A" for those without. The B designation is given to those patients with (1) unexplained loss of more than 10% of body weight in the 6 months before admission; (2) unexplained fever with temperatures above 38°C; (3) night sweats. Pruritus alone does not qualify for B classification, nor does a short febrile illness associated with a known infection (see bibliographic reference 1).

Regarding systemic B symptoms in Hodgkin's disease, opinion is divided about pruritus. This symptom is hard to define quantitatively and uniformly, but when it is recurrent or otherwise unexplained, and when it ebbs and flows parallel to disease activity, it may be the equivalent of a B symptom of major significance.

Patients with lymphocytic lymphomas often have remarkably few symptoms even though many node areas or extranodal sites are involved. An accurate assessment of the performance status (ECOG or Karnofsky scale), with allowances for unrelated diseases, is most important in patients with early disease. Those with advanced or progressive disease may present with malaise, reduced exercise tolerance, weight loss, fever, and sweating.

## GENERAL CONSIDERATIONS

In dealing with extranodal disease in non-Hodgkin's lymphomas, the name of the organ or site, such as Waldeyer's ring, should be stipulated following the numeric designation of stage. The symbol "E" when

used alone would, thus, signify only the direct extension of disease to an adjacent organ; such extension usually occurs only in Hodgkin's disease.

The anatomic extent of disease in the malignant lymphomas is defined by an appropriate sequence of diagnostic procedures selected for a given disease in a particular individual. Forty to 85% of patients with lymphocytic lymphoma have readily demonstrable blood or bone marrow involvement. With appropriate hematologic studies, lymphangiography, and percutaneous needle biopsies of the liver when indicated, more than 80% of these patients can be demonstrated to have stage IV disease without being subjected to laparotomy. In histiocytic lymphomas, occult foci of disease may occur in the abdomen and the incidence of blood and bone marrow involvement is considerably less. Laparotomy may be necessary in selected patients for optimal therapeutic planning.

On the basis of physical findings, roentgenographic observations, scans, and histologic and cytologic data, one eventually arrives at a designation of stage. There is always some variation, often with good reason, in the degree of completeness and adequacy of the data used for staging (see Data Form for Cancer Staging). In patients with Hodgkin's disease who appear to have stage IA or IIA disease by clinical staging with foci only above the diaphragm, splenic involvement can be demonstrated in one third by splenectomy. In those who have enlarged lymph nodes in both cervical and inguinal regions, the standard group of studies on which staging can be based should include biopsy of a lymph node, chest and skeletal roentgenograms, blood chemistry determinations, urinalysis, blood studies, and bone marrow biopsy. Lymphangiograms are always necessary unless there are contraindications to this procedure. Their importance should not be denigrated despite problems that may be involved in their interpretation. They are obviously a demonstration of gross anatomy and not histology. A staging celiotomy is not an adequate procedure if it is done without previous lymphangiography. The dye remains in the nodes for at least 4 to 6 months, often for 1 to 2 years, and changes in size and displacement can be followed serially by plain roentgenograms during this period.

Foci of lymphoreticular disease in the para-aortic region above the level of the second lumbar vertebra, in the porta hepatis, splenic hilus, mesentery, gut wall, and other sites in the abdomen cannot be demonstrated by lymphangiography. In these and other instances, additional staging data may be obtained by CT scans. CT scans are not a substitute in most instances for lymphangiography but are a useful supplement.

Laparotomy with splenectomy may be necessary

to detect foci of disease in the spleen, to establish the etiology of splenomegaly, or to investigate equivocal lymphangiographic findings. Hypersplenism in patients who tolerate radiotherapy or chemotherapy poorly may be corrected by splenectomy, and at the same time liver and node biopsies may be obtained. In elderly patients; in many of those who have extensive or diffuse disease with B systemic symptoms, lymphocyte-depleted Hodgkin's disease, or recurrent histiocytic lymphoma; and in those in whom total nodal radiotherapy or cycles of multi-agent chemotherapy will be given anyway, there is usually nothing to gain from laparotomy.

Current-generation CT scanners have the ability to define enlarged nodes in areas not reached by the dye during lymphangiography. Examples of these anatomic sites easily visualized by CT are mesenteric node groups, retrocrural nodes, and the hypogastric nodes. CT is unable to detect small sites of nodal disease that lymphangiography can visualize. A dual or complimentary role of CT scanning and lymphography is therefore suggested. In lymphomas characterized by bulky lymph node involvement and a tendency to affect the mesenteric group (non-Hodgkin's lymphomas), CT scanning should be used initially. With Hodgkin's lymphomas, lymphangiography is still indicated as an initial screening method.

## HISTOPATHOLOGY

The scheme of classifying Hodgkin's disease developed at the Rye Conference and that of Rappaport for the non-Hodgkin's lymphomas should be adopted generally and followed meticulously. Descriptive terms should be rigorously standardized, with all observers being aware that there is considerable variation in technical skill and in histologic interpretation in different institutions and localities. Questionable interpretations should be submitted to a panel of experts.

### *Hodgkin's Disease*

Nodular sclerosis  
Lymphocyte predominance  
Mixed cellularity  
Lymphocyte depletion  
Unclassified

### *Non-Hodgkin's Lymphomas (nodular or diffuse)*

Lymphocytic, well differentiated  
Lymphocytic, poorly differentiated  
Mixed histiocytic-lymphocytic  
Immunoblastic  
Histiocytic medullary reticulosis  
Unclassifiable (Burkitt's lymphoma, T-cell lymphomas, mycosis fungoides, etc.)

**PERFORMANCE STATUS (ECOG OR KARNOFSKY SCALE)**

See introduction.

**DATA FORM**

The data form serves as a reminder in acquiring and summarizing data for the classification and staging of malignant lymphomas. Appropriate boxes should be checked.

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# HODGKIN'S AND NON-HODGKIN'S LYMPHOMA (ICD-O 965-966 and ICD-O 954-961, 969, 970, 974)

## Data Form for Cancer Staging

Patient identification  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Hospital or clinic number \_\_\_\_\_  
 Age \_\_\_\_\_ Sex \_\_\_\_\_ Race \_\_\_\_\_

Institutional identification  
 Hospital or clinic \_\_\_\_\_  
 Address \_\_\_\_\_

### Oncology Record

Anatomic site of cancer \_\_\_\_\_  
 Chronology of classification\*  Clinical-diagnostic (cTNM)  
 Surgical-evaluative (sTNM)  
 Date of classification \_\_\_\_\_

Histologic type \_\_\_\_\_ Grade (G) \_\_\_\_\_  
 Postsurgical resection-pathologic (pTNM)  
 Retreatment (rTNM)  Autopsy (aTNM)

### Site-Specific Information

#### Hodgkin's Disease

- Nodular sclerosis
- Lymphocyte predominance
- Mixed cellularity
- Lymphocyte depletion
- Unclassified

#### Staging Classification

- Stage I Involvement of a single lymph node region (I) or of a single extralymphatic organ or site (I<sub>E</sub>)
  - A
  - B
- Stage II Involvement of two or more lymph node regions (number to be stated) on the same side of the diaphragm (II); or, localized involvement of an extralymphatic organ or site of one or more lymph node regions on the same side of the diaphragm (II<sub>E</sub>)
  - A
  - B
- Stage III Involvement of lymph node regions on both sides of the diaphragm (III), which may be accompanied by localized involvement of extralymphatic organ or site (III<sub>E</sub>), by involvement of the spleen (III<sub>S</sub>), or both (III<sub>E+S</sub>)
  - A
  - B
- Stage IV Diffuse or disseminated involvement of one or more extralymphatic organs or tissues with or without associated lymph node enlargement. The reason for classifying the patient as stage IV is identified further by specifying sites according to the following notations:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Eye	EYE
Lymph nodes	LYM	Other	OTH

#### Non-Hodgkin's Lymphoma

- Nodular (follicular)  Diffuse
- Lymphocytic, well differentiated
- Lymphocytic, poorly differentiated
- Mixed histiocytic-lymphocytic
- Immunoblastic
- Histiocytic medullary reticulosis
- T-cell lymphoma
- Unclassifiable
- Burkitt's sarcoma
- Other \_\_\_\_\_  
Specify \_\_\_\_\_

### Classification of Symptoms

- A Symptoms absent
- B Symptoms present; Check all that apply.
  - Weight loss
  - Fever
  - Sweats
  - Pruritus

### Symptoms and Findings

	+	-	?	Duration (mo)
Fever	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Sweats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Weight loss (10% in 6 mo)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Pruritus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Performance status (Karnofsky scale)	_____			
Other disabling diseases	_____			
Immunoglobulin abnormal, serum	_____			
urine	_____			

### Diagnostic Procedures (pretreatment studies done)

Physical and blood exam	<input type="checkbox"/>	Tomograms, chest	<input type="checkbox"/>
Blood chemistry survey	<input type="checkbox"/>	Bone scans	<input type="checkbox"/>
Chest roentgenogram	<input type="checkbox"/>	Liver biopsy, needle	<input type="checkbox"/>
Marrow aspiration	<input type="checkbox"/>	Liver biopsy, with peri-	<input type="checkbox"/>
Marrow biopsy	<input type="checkbox"/>	toneoscopy	
Lymphangiograms	<input type="checkbox"/>	Celiotomy with splenec-	<input type="checkbox"/>
I.V. pyelograms	<input type="checkbox"/>	tomy, node and liver	
Inferior vena cavogram	<input type="checkbox"/>	biopsies	
GI roentgenograms	<input type="checkbox"/>	Other _____	<input type="checkbox"/>
Liver/spleen scan	<input type="checkbox"/>		

### Performance Status of Host (H)

Performance status of the host should be recorded because this information at times is pertinent to the treatment of the patient.

AJCC	Performance	ECOG Scale	Karnofsky Scale (%)
<input type="checkbox"/> H0	Normal activity	0	90-100
<input type="checkbox"/> H1	Symptomatic but ambulatory; cares for self	1	70-80
<input type="checkbox"/> H2	Ambulatory more than 50% of time; occasionally needs assistance	2	50-60
<input type="checkbox"/> H3	Ambulatory 50% or less of time; nursing care needed	3	30-40
<input type="checkbox"/> H4	Bedridden; may need hospitalization	4	10-20

Examination by \_\_\_\_\_ M.D.  
 Date \_\_\_\_\_

\*Use a separate form each time a case is staged.

**Extent of Disease**

Area	Abnormal Physical Findings		Abnormal X-Ray Findings (including scans)		Abnormal Biopsy Sites (+ or -)	
	Right	Left	Bilateral	Bilateral	Right	Left
Waldeyer's ring	[ ]	[ ]			[ ]	[ ]
Cervical nodes	[ ]	[ ]			[ ]	[ ]
Supraclavicular nodes	[ ]	[ ]			[ ]	[ ]
Infraclavicular nodes	[ ]	[ ]			[ ]	[ ]
Axillary nodes	[ ]	[ ]			[ ]	[ ]
Mediastinum	[ ]	[ ]		[ ]		[ ]
Hilar nodes	[ ]	[ ]	[ ]		[ ]	[ ]
Lung parenchyma	[ ]	[ ]	[ ]		[ ]	[ ]
Inguinal-femoral nodes	[ ]	[ ]			[ ]	[ ]
Para-aortic nodes	[ ]	[ ]	[ ]		[ ]	[ ]
Others (or extranodal sites)	[ ]	[ ]		[ ]		[ ]
Spleen	[ ]	Size ____ cm		[ ]		[ ]
Liver	[ ]	Size ____ cm		[ ]		[ ]
Bones and marrow				[ ]		[ ]

## Nephroblastoma

The tumors classified are nephroblastoma, neuroblastoma, and soft-tissue sarcomas of childhood. The appropriate ICD-O topography (T) and ICD-O morphology (M) rubrics are as follows:

Nephroblastoma: ICD-O T. 189.0; ICD-O M. 8960/3

Neuroblastoma: ICD-O M. 9500/3

Ganglioneuroblastoma: ICD-O M. 9490/3

Soft-tissue sarcomas of childhood: ICD-O M. 8800/3

These tumors are classified according to the recommendations of the Société Internationale d'Oncologie Pédiatrique (SIOP). They have the approval of the SIOP, Union Internationale Contre le Cancer (UICC), and the American Joint Committee on Cancer (AJCC).

The rules for the classification of pediatric tumors differ in one respect from those applicable to other sites. It is necessary to include a category for those cases in which a surgical exploration is done and in which a nonresectable tumor is found. Such cases are designated pT3c, or, if following previous nonsurgical treatment, ypT3c.

Each site is described under the following headings:

Rules for classification with the minimum requirements for assessing the TNM categories; additional methods may be used when they enhance the accuracy of appraisal up to the time of the decision about definitive treatment, the fact to be stated.

Anatomic regions where appropriate

Definition of the regional lymph nodes

TNM pretreatment clinical classification

### **CLINICAL-DIAGNOSTIC CLASSIFICATION (DESIGNATED cTNM)**

Clinical-diagnostic classification is based on evidence acquired prior to the decision about definitive treatment. Such evidence arises from clinical, radiologic, endoscopic, and other relevant findings. *Note:* When TNM is used without a prefix, it implies clinical-diagnostic timing (cTNM).



### POSTSURGICAL RESECTION-PATHOLOGIC CLASSIFICATION (pTNM)

Postsurgical resection-pathologic classification is based on the evidence acquired prior to the decision about definitive treatment and is supplemented or modified by the additional evidence acquired from definitive surgery and from the examination of the therapeutically resected specimen.

When definitive surgery is preceded by other treatment, the prefix "y" should be added.

### SURGICAL-EVALUATIVE CLASSIFICATION (sTNM)

This time period is used when surgical exploration is carried out but no resection of the tumor is done. All clinical-diagnostic and surgical findings are used.

### STAGE GROUPING

Classification by the TNM system achieves reasonably precise description and recording of the apparent anatomic extent of disease. A tumor with four degrees of T, four degrees of N, and two degrees of M has 32 TNM categories. For purposes of tabulation and analysis, except in very large series, it is necessary to condense these categories into a convenient number of TNM stage groups, usually four in number.

The grouping adopted is such that it ensures, as far as possible, that each group is more or less homogeneous in survival and that the survival rates in these groups for each cancer site are distinctive.

The T and N categories for some regions may seem to be defined in lengthy and even confusing terms. This is necessary in order to achieve the most precise definitions possible and to cover all eventualities in identification of spread to the regional lymph nodes and of distant metastases.

As an *aide-mémoire* or as a reference during the clinical examination of a patient, a simple summary of the chief points distinguishing the most important categories is added at the end of each region. These definitions are abridged and do not pretend to be completely adequate; the full definitions should always be consulted.

#### Distant Metastasis

For all regions the categories M1 and pM1 may be subdivided according to the following notation:

Pulmonary	PUL	Bone marrow	MAR
Osseous	OSS	Pleura	PLE
Hepatic	HEP	Skin	SKI
Brain	BRA	Eye	EYE
Lymph nodes	LYM	Other	OTH

### Additional Descriptors

When appropriate, the "y" symbol, the "r" symbol, and the C-factor category may be added to the classification (see bibliographic reference 1).

**"y" Symbol.** In those cases in which definitive surgery is performed after treatment by other methods, the pTNM categories may be identified by a "y" prefix (e.g., ypT2, pN1, pM0). These cases must be reported separately.

**"r" Symbol.** Recurrent tumors may be described by TNM but must be identified by the symbol "r" placed before the appropriate TNM or pTNM category.

**C-Factor.** A flexible system for indicating the information on which the TNM categories are based is recommended for optional use. Named the *level of certainty* or *C-factor*, it reflects the information available at a given point in time and according to the diagnostic methods employed.

The C-factor category definitions are as follows:

- C1 Evidence from clinical examination only
- C2 Evidence obtained by special diagnostic means
- C3 Evidence from surgical exploration only
- C4 Evidence of the extent of disease following definitive surgery and including the complete examination of the therapeutically resected specimen
- C5 Evidence from autopsy

As an example, degrees of C may be applied to the TNM categories. A case might be described as T3C2, N2C1, M0C2.

The clinical-diagnostic classification is therefore equivalent to C1 and C2 in varying degrees of certainty; C3 refers to surgical-evaluative, whereas the pTNM surgical resection-pathologic classification is equivalent to C4. The merit of the C-factor classification lies in the fact that a particular case may be recategorized from time to time as new evidence comes to light. The whole course of a patient's malignancy over time can therefore be expressed in a chronologic manner suitable for computerization.

### RULES FOR CLASSIFICATION OF NEPHROBLASTOMA (ICD-O T. 189.0: M. 8960/3)

The classification applies only to nephroblastoma (Wilms' tumor). There should be histologic verification of the disease. Any unconfirmed cases must be reported separately.

The following are the minimum requirements for assessment of the T, N, and M categories. If these cannot be met, the symbols TX, NX, and MX are used.



Additional methods may be used when they enhance the accuracy of appraisal, up to the time of the decision about definitive treatment. The additional methods and results are to be stated.

- T categories Clinical examination and urography; any other diagnostic technique may be employed prior to definitive treatment.
- N categories Clinical examination and radiography  
*Note:* The assessment of N categories is not considered relevant.
- M categories Clinical examination and radiography

### REGIONAL LYMPH NODES

The regional lymph nodes are the hilar nodes, the para-aortic nodes, and the paracaval nodes between the diaphragm and the bifurcation of the aorta. Other lymph nodes involved are considered distant metastases.

### Clinical-Diagnostic Classification (cTNM)

#### Primary Tumor (cT)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Evidence of unilateral tumor 80 cm or less in area (including kidney)
- T2 Evidence of unilateral tumor more than 80 cm<sup>2+</sup> in area (including kidney)
- T3 Evidence of unilateral tumor rupture before treatment
- T4 Evidence of bilateral tumors before treatment

*Note:* The area is calculated by multiplying the vertical and horizontal dimensions of the radiologic shadow of the tumor and kidney.

#### Regional Lymph Nodes (cN)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of regional lymph node involvement
- NX The minimum requirements to assess the regional lymph nodes cannot be met.

#### Distant Metastases (cM)

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases

### Postsurgical Resection-Pathologic Classification (pTNM)

#### Primary Tumor (pT)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of tumor found on histologic examination of specimen
- T1 Intrarenal tumor completely encapsulated; excision complete and margins histologically free
- T2 Tumor with invasion beyond the capsule or renal parenchyma; excision complete. *Note:* This includes breach of the renal capsule or tumor seen microscopically outside the capsule; tumor adhesions microscopically confirmed; infiltrations of, or tumor thrombus within, the renal vessels outside the kidney; infiltration of the renal pelvis or ureter, peripelvis, and pericaliceal fat.
- T3 Tumor with invasion beyond the capsule or renal parenchyma. Excision incomplete or with evidence of preoperative or operative rupture
- T3a Evidence of microscopic residual tumor confined to tumor bed
- T3b Evidence of macroscopic residual tumor or spillage or malignant ascites
- T3c Nonresectable tumor found on surgical exploration
- T4 Evidence of bilateral tumors

#### Regional Lymph Nodes (pN)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of tumor found on histologic examination of regional lymph nodes
- N1 Evidence of invasion of regional lymph nodes
- pN1a Evidence of invasion of regional lymph nodes; involved nodes considered to be completely resected
- pN1b Evidence of invasion of regional lymph nodes; involved nodes considered to be incompletely resected

#### Distant Metastases (pM)

These categories include information previously obtained from the pretreatment clinical classification (TNM) and information obtained from surgery and histopathology.

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases, including those detected clinically

**Clinical Stage Grouping (cTNM)**

Stage I	T1, N0, M0
Stage II	T2, N0, M0
Stage III	T1, T2; N1, M0 T3, any N, M0
Stage IV	T1, T2, T3; any N, M1
Stage V	T4, any N, any M

**Postsurgical Resection-Pathologic Stage Grouping (pTNM)**

Stage I	T1, N0, M0
Stage II	T2, N0, N1a; M0 T1, N1a, M0
Stage IIIA	T3a, N0, N1a; M0
Stage IIIB	T3b or c, any N, M0 T1, T2, T3a; N1b, M0
Stage IV	T1, T2, T3a, b, or c; any N, M1
Stage V	T4, any N, any M

## Summary of Nephroblastoma Staging

cTNM	NEPHROBLASTOMA		pTNM
	<i>Clinical Description</i>	<i>Pathologic Description</i>	
T1	Tumor $\leq$ 80 cm <sup>2</sup>	Encapsulated; excision complete	T1
T2	Tumor > 80 cm <sup>2</sup>	With invasion; excision complete	T2
T3	Rupture before treatment	Excision incomplete Microscopic residual tumor Excision incomplete; macroscopic residual tumor; nonresectable tumor	T3a T3b T3c
T4	Bilateral tumors	Bilateral tumors	T4

**BIBLIOGRAPHY**

1. UICC: TNM Classification of Malignant Tumors, 3rd ed., 1978



## Neuroblastoma

The same principles apply to ganglioneuroblastoma (M. 9490/3) and ganglioneuroma (M. 9490/0). The tumors were classified in 1980 and are approved by SIOP, UICC, and AJCC.

### **RULES FOR CLASSIFICATION OF NEUROBLASTOMA (ICD-O M. 9500/3)**

There should be histologic verification of the disease, verification by biochemical tests, or both. Any unconfirmed cases must be reported separately.

The following are the minimum requirements for assessment of the T, N, and M categories. If these cannot be met, the symbols TX, NX, and MX are used. Additional methods may be used when they enhance the accuracy of appraisal up to the time of the decision on definitive treatment, the fact to be stated.

T categories	Clinical examination; radiography including intravenous urography and chest roentgenogram
N categories	Clinical examination and radiography
M categories	Clinical examination and radiography including skeletal survey and bone marrow examination

### **ANATOMIC REGIONS**

The primary tumor site should be indicated according to the following notation:

Cervical	CER
Thoracic	THO
Abdominal	ABD
Pelvic	PEL
Other	OTH

*Note:* Dumbbell tumors should be identified by the prefix "D."

### **REGIONAL LYMPH NODES**

The regional lymph nodes are defined as follows:

Cervical region	Cervical and supraclavicular nodes
Thoracic region	Intrathoracic and supraclavicular nodes

Abdominal and pelvic regions	Subdiaphragmatic, intra-abdominal, and pelvic nodes, including the external iliac nodes
Other regions	The appropriate regional lymph nodes

### Clinical-Diagnostic Classification (cTNM)

#### Primary Tumor (cT)

Because it is often impossible to differentiate between the primary tumor and the adjacent lymph nodes, the T assessment relates to the total mass. When there is doubt about multicentricity and metastasis, the latter is presumed. *Note:* Size is estimated clinically or radiologically; for classification, the larger measurement should be used.

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Single tumor 5 cm or less in its greatest dimension
- T2 Single tumor more than 5 cm but not more than 10 cm in its greatest dimension
- T3 Single tumor more than 10 cm in its greatest dimension
- T4 Multicentric tumor occurring simultaneously

#### Regional Lymph Nodes (cN)

- NX Minimal requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of regional lymph node involvement

#### Distant Metastases (cM)

- MX Minimal requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases

### Surgical Resection-Pathologic Classification (pTNM)

#### Primary Tumor (pT)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of tumor found on histologic examination of specimen
- T1 Excision of tumor complete and margins histologically free
- T2 The category does not apply to neuroblastoma.
- T3 Evidence of residual tumor
  - T3a Evidence of microscopic residual tumor
  - T3b Evidence of macroscopic residual tumor or grossly incomplete excision

T3c Nonresectable tumor found on surgical exploration

T4 Evidence of multicentric tumor

#### Regional Lymph Nodes (pN)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of tumor found on histologic examination
- N1 Evidence of invasion of regional lymph nodes
  - N1a Evidence of invasion of regional lymph nodes; involved nodes considered to be completely resected
  - N1b Evidence of invasion of regional lymph nodes; involved nodes considered to be incompletely resected

#### Distant Metastases (pM)

These categories include information previously obtained from the pretreatment clinical classification (TNM) and information obtained from surgery and histopathology.

- MX Minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases, including those detected clinically

### Clinical Stage Grouping (cTNM)

- Stage I T1, N0, M0
- Stage II T2, N0, M0
- Stage III T1, T2; N1, M0  
T3, any N, M0
- Stage IV T1, T2, T3; any N, M1
- Stage V T4, any N, any M

### Surgical Resection-Pathologic Staging (pTNM)

- Stage I T1, NX, N0; M0
- Stage II T1, N1a, M0
- Stage IIIA T3a, N0, N1a; M0
- Stage IIIB T3b or c; any N, M0  
T1, T2, T3a; N1b, M0
- Stage IV T1, T2, T3a, b or c; any N, M1
- Stage V T4, any N, any M

Summary of Neuroblastoma Staging

cTNM	NEUROBLASTOMA		pTNM
	<i>Clinical Description</i>	<i>Pathologic Description</i>	
T1	Tumor $\leq$ 5 cm	Excision complete	T1
T2	Tumor > 5-10 cm	(Not applicable)	T2
T3	Tumor > 10 cm	Microscopic residual tumor	T3a
		Macroscopic residual tumor	T3b
		Nonresectable tumor	T3c
T4	Multicentric tumor	Multicentric tumor	T4
N1	Regional involvement	Nodes completely resected	N1a
		Nodes incompletely resected	N1b

## Soft-Tissue Sarcomas

### RULES FOR CLASSIFICATION

The classification for soft-tissue sarcomas (ICD-O M. 8800/3) is designed to apply particularly to rhabdomyosarcoma in childhood (ICD-O M. 8900/3) but may be used for other soft-tissue sarcomas in childhood.

There should be histologic verification of the disease. Any unconfirmed cases must be reported separately.

The following are the minimum requirements for assessment of the T, N, and M categories. If these cannot be met, the symbols TX, NX, and MX are used. Additional methods may be used when they enhance the accuracy of appraisal up to the time of the decision on definitive treatment; the additional methods and results are stated.

- T categories Clinical examination and radiography appropriate to the anatomic region  
 N categories Clinical examination and relevant radiography  
 M categories Clinical examination and radiography. In rhabdomyosarcoma, bone marrow examination is recommended.

### ANATOMIC REGIONS

The primary tumor site should be indicated according to the following notations:

Orbit	ORB
Head and neck	HEA
Limbs	LIM
Pelvis (including walls, genital tract, and viscera)	PEL
Abdomen (including walls and viscera)	ABD
Thorax (including walls, diaphragm, and viscera)	THO
Other	OTH



## REGIONAL LYMPH NODES

The regional lymph nodes are those appropriate to the situation of the primary tumor, as in the following:

Head and neck	Cervical and supraclavicular lymph nodes
Abdominal and pelvic	Subdiaphragmatic, intra-abdominal, and ilio-inguinal lymph nodes
Upper limbs	Homolateral epitrochlear and axillary lymph nodes
Lower limbs	Homolateral popliteal and inguinal lymph nodes

In the case of unilateral tumors, all contralateral involved lymph nodes are considered to be distant metastases.

## Clinical-Diagnostic Classification (cTNM)

### Primary Tumor (cT)

- TX Minimum requirements to assess the primary tumor cannot be met.
- T0 No evidence of primary tumor
- T1 Tumor confined to the organ or tissue of origin
  - T1a Tumor 5 cm or less in its greatest dimension
  - T1b Tumor more than 5 cm in its greatest dimension
- T2 Tumor involving one or more contiguous organs or tissues or with adjacent malignant effusion
  - T2a Tumor 5 cm or less in its greatest dimension
  - T2b Tumor more than 5 cm in its greatest dimension

*Note:* The categories T3 and T4 do not apply. The existence of more than one tumor is described as a primary tumor with distant metastases.

### Regional Lymph Nodes (cN)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of regional lymph node involvement
- N1 Evidence of regional lymph node involvement

### Distant Metastases (cM)

- MX The minimum requirements to assess the presence of distant metastases cannot be met.
- M0 No evidence of distant metastases
- M1 Evidence of distant metastases

## Surgical Resection Classification (pTNM)

- TX The minimum requirements to assess the primary tumor cannot be met.

- T0 No evidence of tumor found on histologic examination of specimen.
- T1 Tumor limited to organ or tissue of origin; excision complete and margins histologically free
- T2 Tumor with invasion beyond the organ or tissue of origin; excision complete and margins histologically free
- T3 Tumor with invasion beyond the organ or tissue of origin; excision incomplete
  - T3a Evidence of microscopic residual tumor
  - T3b Evidence of macroscopic residual tumor or adjacent malignant effusion
  - T3c Nonresectable tumor found on surgical exploration

## Regional Lymph Nodes (pN)

- NX Minimum requirements to assess the regional lymph nodes cannot be met.
- N0 No evidence of tumor found on histologic examination of regional lymph nodes
- N1 Evidence of invasion of regional lymph nodes
  - N1a Evidence of invasion of regional lymph nodes; involved nodes considered to be completely resected
  - N1b Evidence of invasion of regional lymph nodes; involved nodes considered to be incompletely resected

## Distant Metastasis (pM)

These categories include information previously obtained from the pretreatment clinical classification (TNM) and information obtained from surgery and histopathology.

- MX Minimum requirements to assess the presence of distant metastasis cannot be met.
- M0 No evidence of distant metastasis
- M1 Evidence of distant metastasis, including those detected clinically

## Provisional Clinical Stage Grouping (cTNM)

It is recommended that the full TNM classification always be used. The stage grouping has not been tested adequately and is therefore considered provisional.

- Stage I T1a or b; N0, M0
- Stage II T2a or b; N0, M0
- Stage III Any T, N1, M0
- Stage IV Any T, any N, M1

1. Each of these stage groups may be subdivided by the size of the primary tumor.
2. When the regional lymph nodes cannot be assessed clinically or radiologically, NX should be considered N0 in stages I and II.
3. Further studies are required to determine the exact significance of N0, N1, and NX in such cases as pelvic tumors.

**Postsurgical Histopathologic Staging (pTNM)**

- Stage I T1, N0, M0
- Stage II T2, N0, N1a; M0  
T1, N1a, M0
- Stage IIIA T3a, N0, N1a; M0
- Stage IIIB Any T, N1b, M0  
T3b or c, any N, M0
- Stage IV Any T, any N, M1

**Summary of Soft-Tissue Sarcoma Staging**

cTNM	SOFT-TISSUE SARCOMA		pTNM
	<i>Clinical Description</i>	<i>Pathologic Description</i>	
T1	Confined to organ or tissue	Limited to organ	T1
T1a	≤ 5 cm	Excision complete	
T1b	> 5 cm		
T2	Involving other organs or tissues; effusion	Invasion beyond organ	T2
T2a	≤ 5 cm	Excision complete	T3a
		Microscopic residual tumor	
T2b	> 5 cm	Macroscopic residual tumor	T3b
T3/4	(Not applicable)	Nonresectable tumor	T3c
N1	Regional involvement	Nodes completely resected	N1a
		Nodes incompletely resected	N1b



**P A R T**

**III**

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