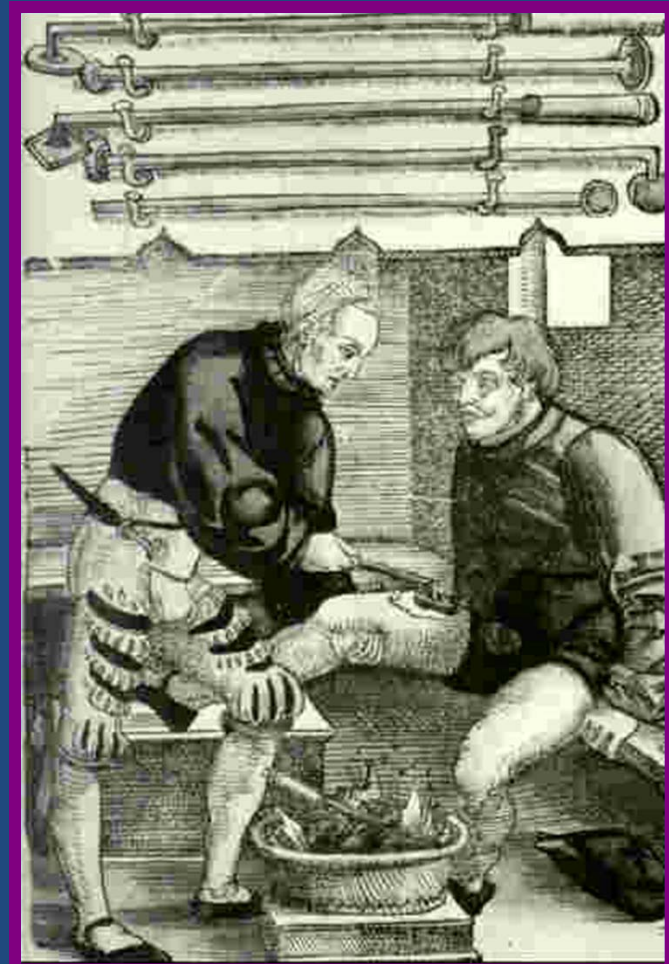


ACS Antisepsis/Asepsis Module

Thomas Schlich and Peter Kernahan

Traditional Surgery

- No special operating rooms
- No knowledge of germs
- “Laudable pus”
 - Natural part of healing



- Higher rate of wound complications in the 19th century -- factors:
- More, and more extensive surgery (e.g. amputations)
- Because of existence of anesthesia and new, localist views of disease as rationale for surgery
- Higher density of patients in hospitals or in wars (e.g. Civil War)



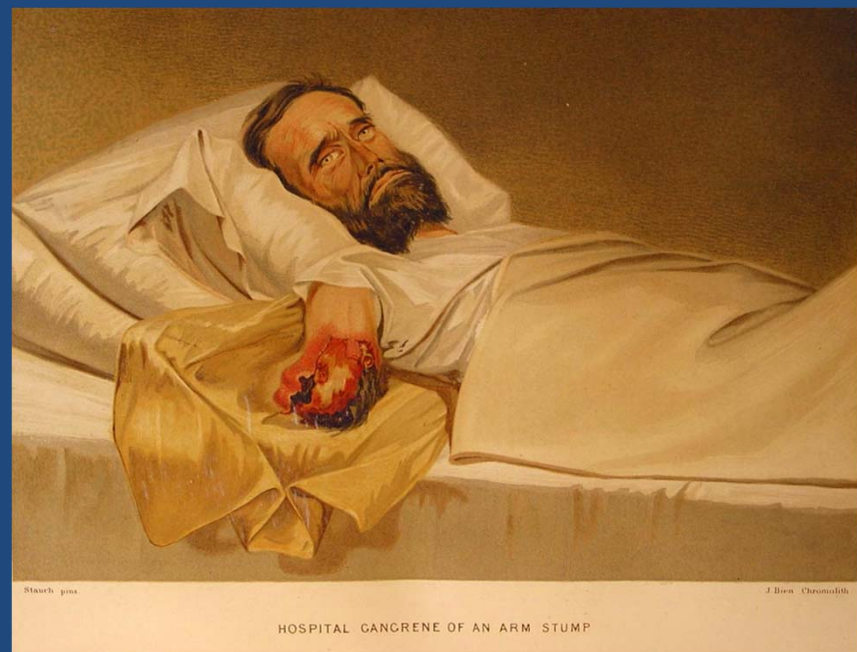
Operating Room - 1847



- First use of anesthesia
- Calm environment
- Note: surgeons in street clothes, touching the patient, no antiseptic or aseptic measures

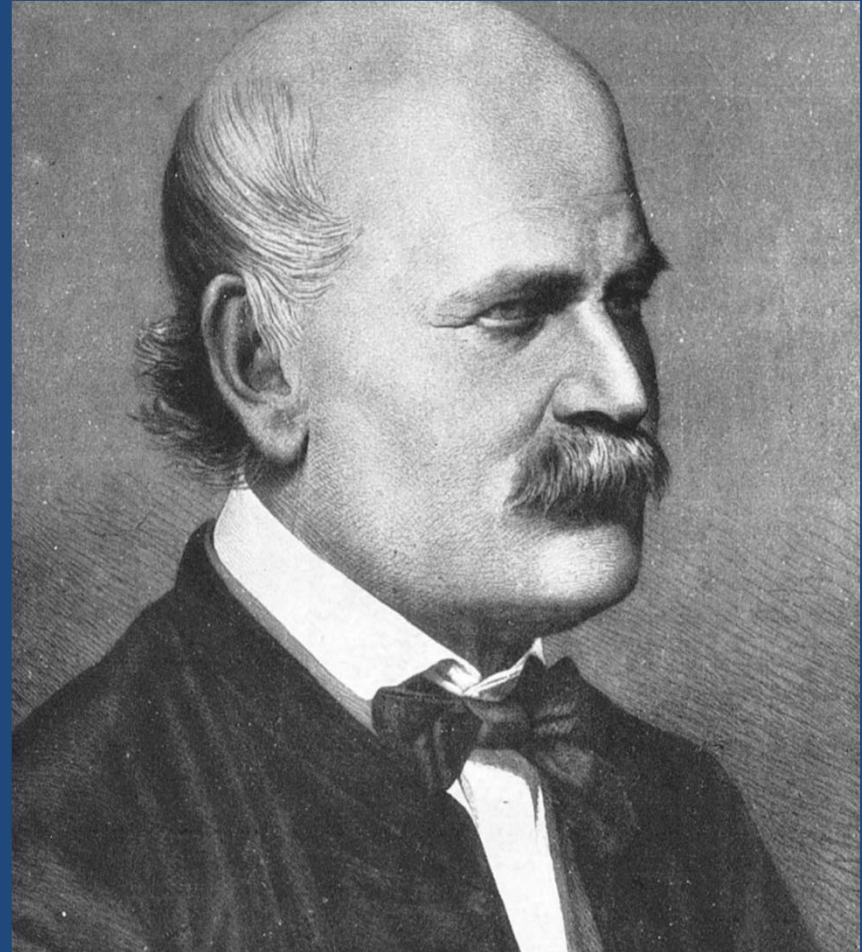
Sanitary Response

- Various strategies for dealing with higher complication rates
- Sanitation: better and cleaner hospitals, better air circulation against “miasmas”
- General hygiene, sanitary environment



Technologies of Cleanliness

- Ignaz Semmelweis
- Vienna 1840s
- Hand disinfection
- Drastic decrease of puerperal fever
- Not much impact on practices



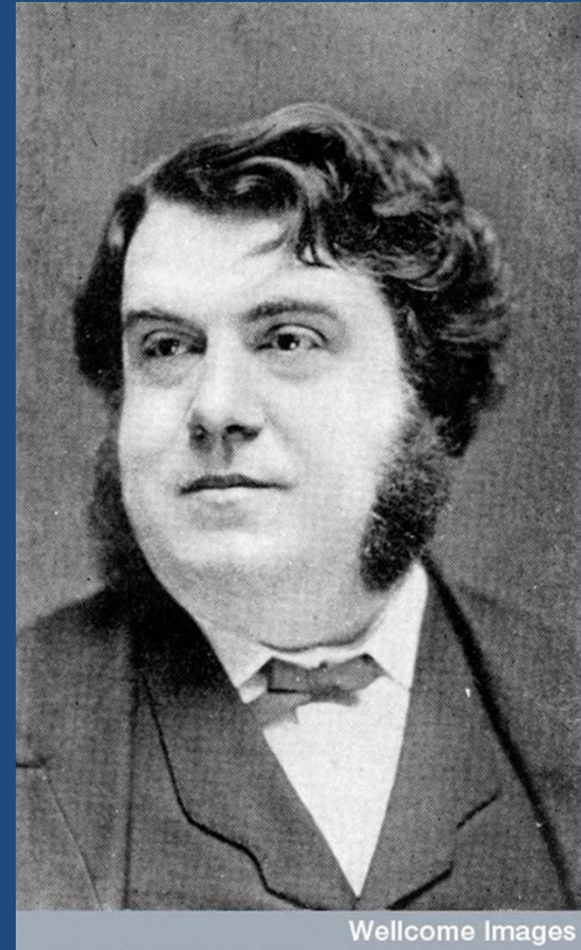
Technologies of Cleanliness

- clean hospitals, hands, towels, wounds,
- e.g. Thomas Spencer Wells’
 - “cleanliness and cold water” surgery
 - good results for abdominal surgery



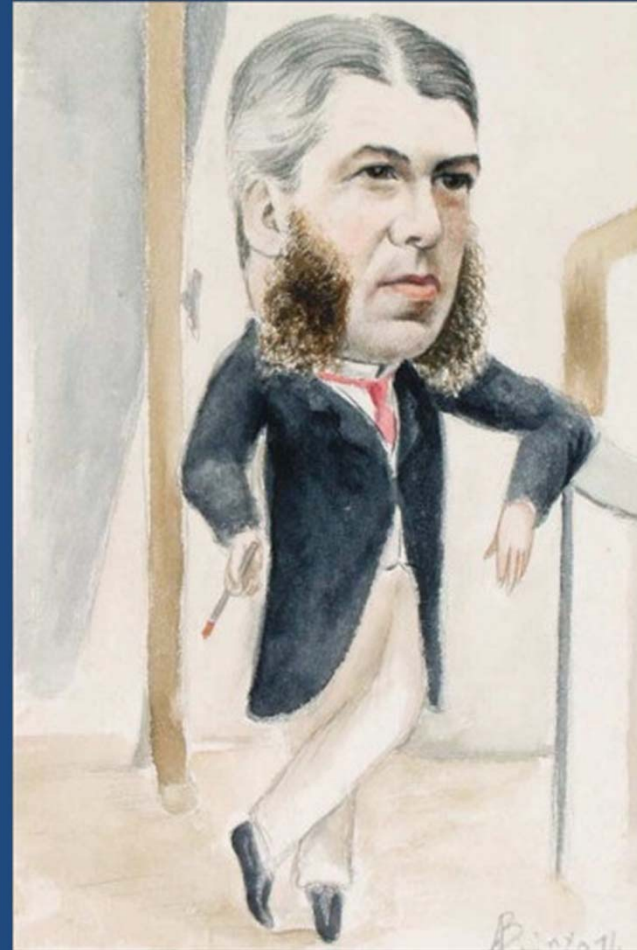
Technologies of Cleanliness

- Cleanliness allowed Robert Lawson Tait to remove gall bladders safely in the 1870s



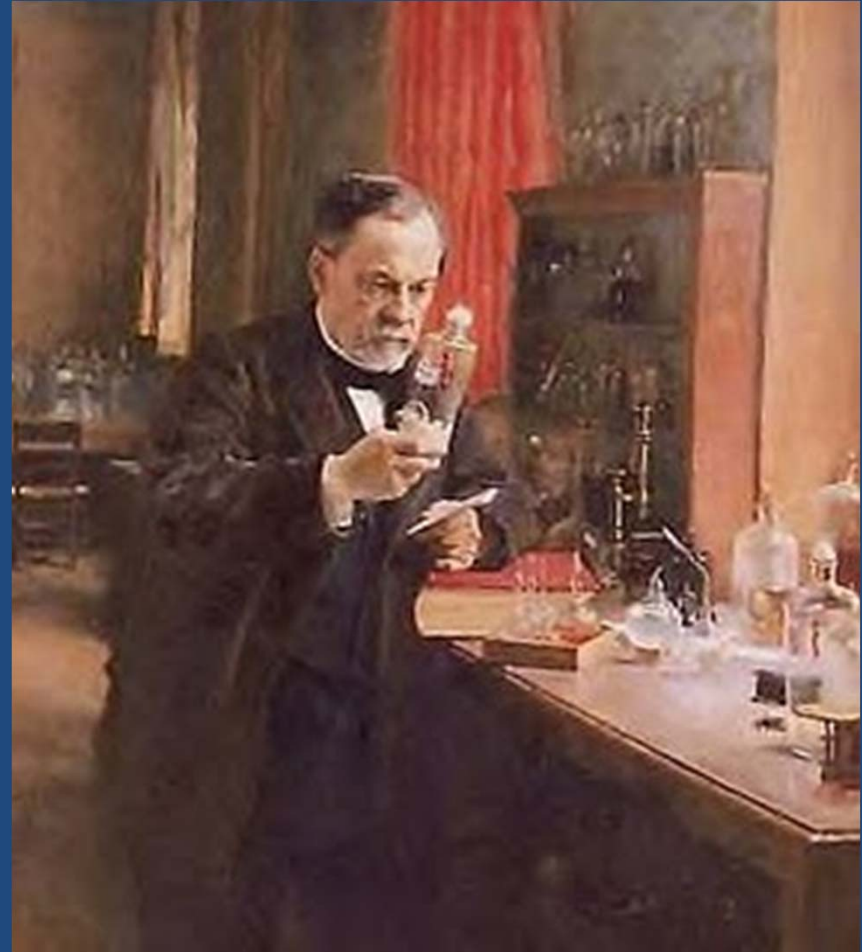
Technologies of Cleanliness

- E.g. George Callender, St. Bartholomew's, London
- Camel hair brush for every patient to keep wound clean, as seen in this caricature in his right hand



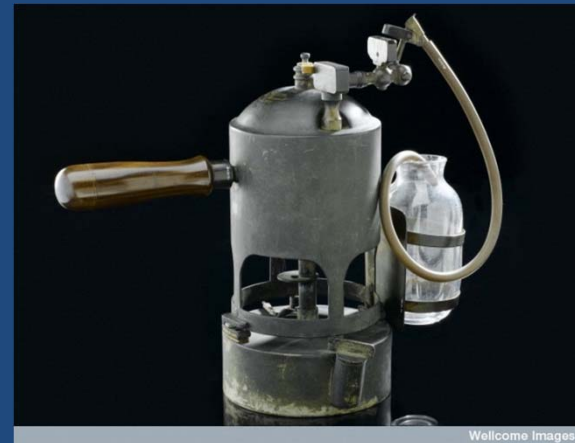
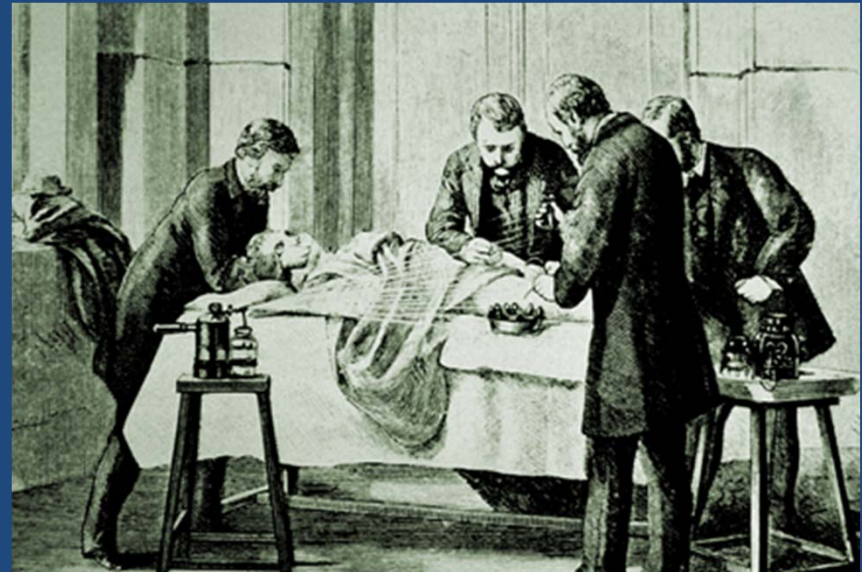
Germs and Antisepsis

- One technical measure: use of carbolic acid to kill living germs in the air and the environment
- Suggested by Joseph Lister in 1867
- Theoretical basis: Louis Pasteur's germ theory – environment is full of microscopically small germs – if they enter the wound, suppuration and wound fever results



Germs and Antisepsis

- Developed into a complex system of antiseptic surgery
- Disinfection of surrounding air by antiseptic spray



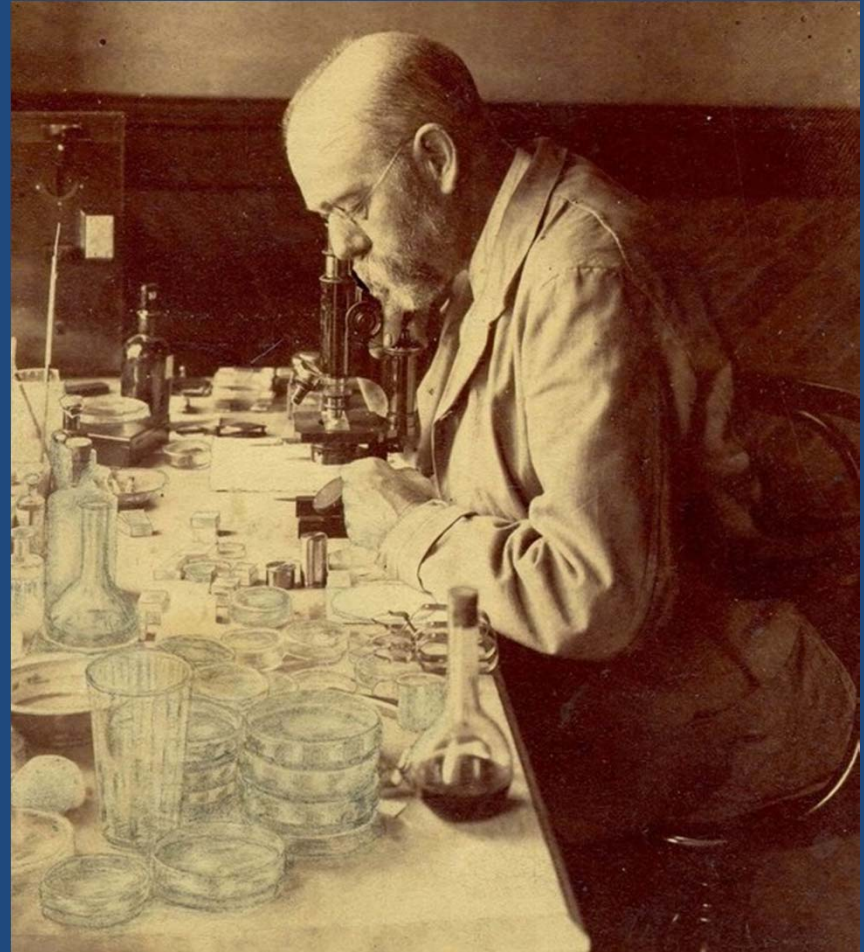
Images: (1) Cheyne, *Antiseptic Surgery*, Elder: London, 1882, fig. 23.

US PD-1923

(2) Lister Spray Wellcome Images Creative Commons CC BY 4.0 License

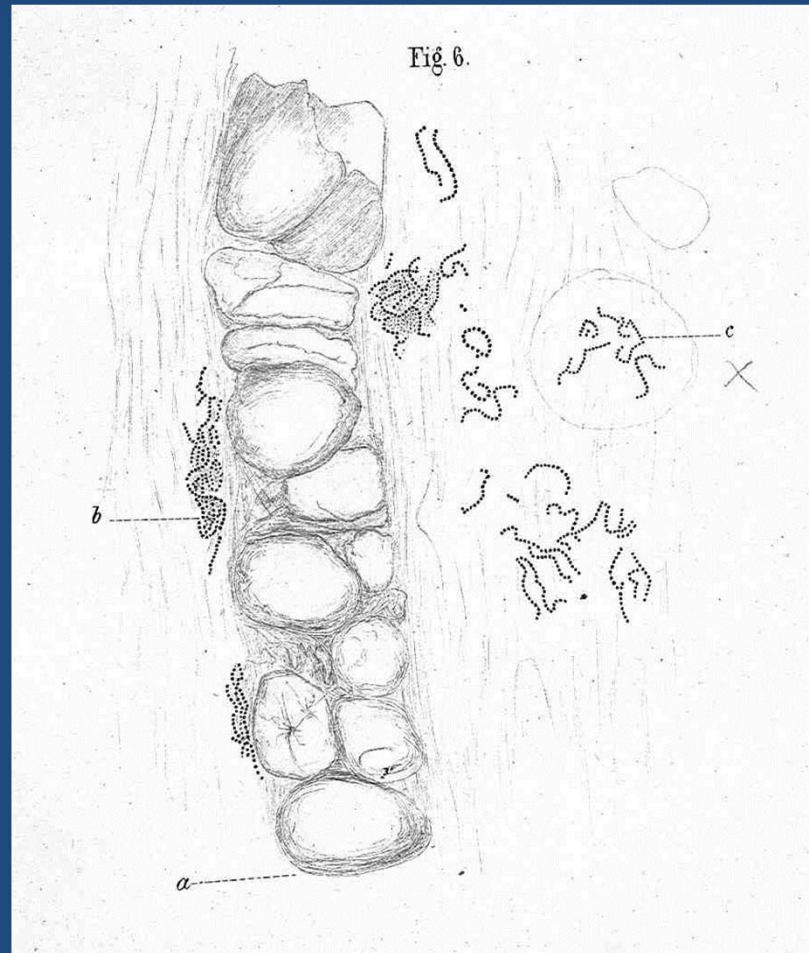
Germs and Asepsis

- Strategy: Avoiding contamination in the first place by keeping everything sterile that might touch the wound
- Based on Robert Koch's bacteriology



Germs and Asepsis

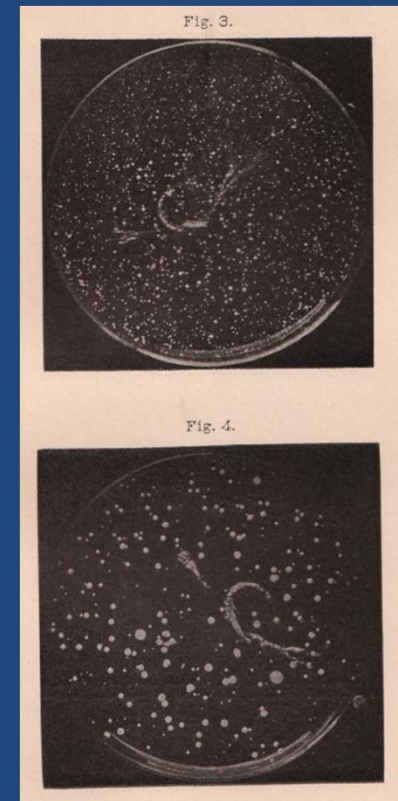
- “Infection” of wounds by specific bacteria
- Image: shows bacteria invading living tissue



Germs and Asepsis

Technologies from the laboratory

- To kill bacteria
 - heat sterilization of instruments, towels, dressings
- To monitor sources of infection
 - systematic taking of samples and bacterial cultures.



Bacterial colonies on solid culturing media,
from swabs taken from hands washed
with different methods (1909) ¹⁴

Technologies of Asepsis



- New technologies keep germs out:
 - sterility of operating field
 - sterile gowns, drapes
 - autoclave for instruments
- “Local cultures of asepsis”
 - a lot of variation
 - example Ziegelstrasse Hospital on Berlin ca. 1906 , depicted in a celebratory painting
 - no masks, gloves, or caps
 - nurse & observers in street clothes

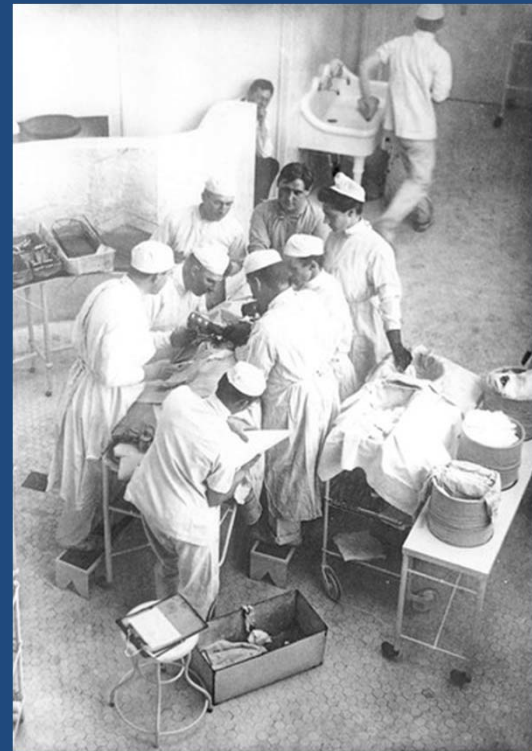
Technologies of Asepsis

- New elements in surgical equipment:
 - masks introduced by Johann Mikulicz, Germany
- Image shows him in aseptic gear in 1899
 - gloves, masks, caps
 - Note: elbow-length fabric gloves



Operating Room - 1904

- New elements in surgical equipment:
 - William Halsted at Johns Hopkins introduced rubber gloves
- Image shows him operating in 1904
 - Note: separate room, no audience, gowns, rubber gloves, no masks



The “all star operation”, 1904
William Halsted operating with his senior staff
to inaugurate the new operating theatre

Operating Room – 1930s

Conclusion



“It can be demanded of us that we improve as much as possible the arrangements for the safety of the people who are entrusted to us”

Johann Mikulicz, 1897

Further Reading

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- Thomas P. Gariepy, 'The Introduction and Acceptance of Listerian Antisepsis in the United States', *Journal of the History of Medicine and Allied Sciences*, 1994, 49: 167-206
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- Michael Worboys, *Spreading Germs. Disease Theories and Medical Practice in Britain, 1865-1900* (Cambridge: Cambridge University Press, 2000)