

Role of the rural general surgeon in a statewide trauma system:



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Trauma care in a rural setting is unique and challenging because of long transport distances, difficult communication, variable levels of prehospital care, and limited hospital resources. General surgeons in rural areas are often called upon to provide care to an injured patient in small hospitals with few ancillary services and no additional surgical subspecialists. Regardless of these challenges, there is tremendous need for general surgeons who can deliver surgical and trauma care to patients in these small communities. Statewide trauma systems in sparsely populated states rely heavily on rural surgeons to treat injured patients with rapid triage, resuscitation, stabilization, and transport to a referral center or to provide definitive care themselves. In order to better characterize the role of general surgeons in rural trauma care, the experience in Wyoming will be examined in this article.

Wyoming is a rural state with a population density of only five people per square mile. A surgical practice has been defined as *rural* in communities with a population smaller than 10,000 people and *large rural* for those with a population of 10,000 to 50,000.^{1,2} Only eight communities in Wyoming have more than 10,000 residents and only one city has more than 50,000. Wyoming established a statewide trauma system in 1996. The system consisted of two referral trauma centers in Casper (pop. 49,644) and Cheyenne (pop. 53,011). Other small facilities were designated by the state as area trauma hospitals, community trauma hospitals, or rural triage centers based on available resources. Access to a full-time general surgeon was used as a key criterion for designation.

Survey of rural surgeons

We hypothesized that rural surgeons play a vital role in the success of the statewide trauma system in Wyoming. To better define the role of the general surgeon in rural trauma, we designed a two-part survey instrument that was sent to all 25 general surgeons practicing in rural Wyoming. Surveys were not sent to surgeons located in the cities of Casper or Cheyenne. The first part of the survey focused on resources available at the local facilities in which the rural surgeons practiced. Surgeons were asked about the level of prehospital care, hospital capabilities, and access to surgical subspecialists. In addition, surgeons indicated the referral trauma centers to which trauma patients were transferred from their institutions. The second part of the survey consisted of eight case scenarios with multiple-choice treatment options aimed at defining each surgeon's level of care and commitment to trauma patients.

Twenty-one (84%) of 25 surveys were completed and returned. All rural surgeons had 24-hour access to conventional X rays, computed tomography, and standard laboratory tests. Ultrasound was available to 95 percent of surgeons. An intensive care unit was available to 95 percent of surgeons. Fourteen (67%) surgeons had in-house orthopaedic surgery consultation, but neurosurgeons and cardiothoracic surgeons were not on the staff of any rural facility. Trauma patients were often transferred

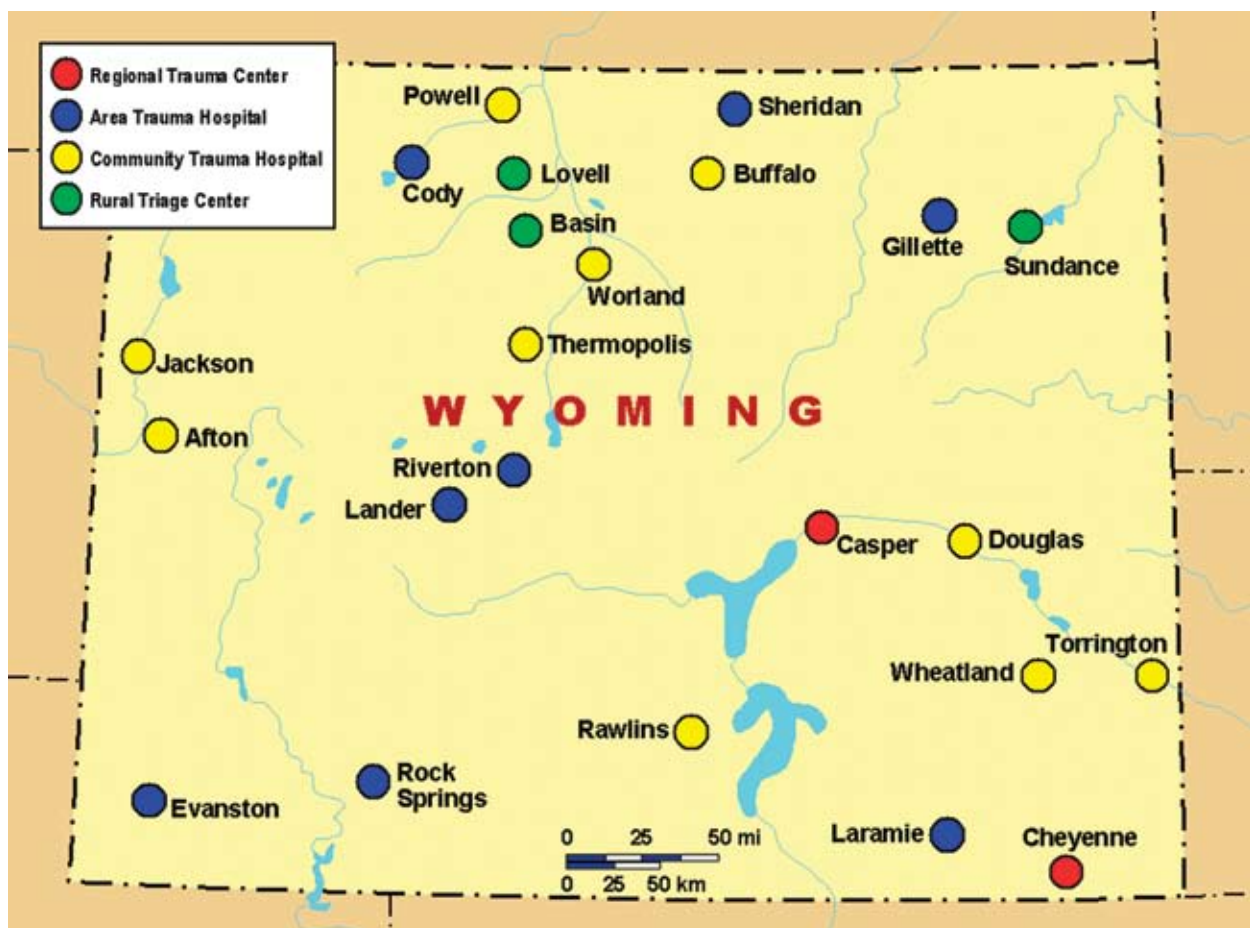
from these rural hospitals for definitive care. The majority of surgeons transferred patients to the two Wyoming referral trauma centers in Casper and Cheyenne. However, a considerable number of surgeons indicated that patients from their facilities were transported to 18 larger hospitals in five adjacent states. Transfer distances ranged from 35 to 600 miles; patients were transported by ground, helicopter, or fixed-wing air services.

Eight case scenarios were designed to examine the range of trauma care that rural general surgeons would provide to patients with a wide variety of injury severity. Twenty (95%) of 21 surgeons indicated that they would resuscitate and admit a 16-year-old with an isolated, stable splenic injury for nonoperative management, whereas the remaining surgeon elected to stabilize and transfer the patient for definitive care. Similarly, 20 (95%) of 21 surgeons elected to perform splenectomy in a 20-year-old with an isolated, unstable splenic injury; 19 would then admit the patient to their own facility, though one surgeon would stabilize and transfer the patient for definitive care.

Sixteen (76%) surgeons would provide definitive care for an adult with a mild closed head injury and a large scalp laceration, whereas five (24%) preferred to repair the laceration and transfer the patient. In contrast, every respondent would stabilize and transport a patient with severe head injury.

Sixteen (76%) surgeons would admit a patient with an isolated, mid-shaft femur fracture and consult an orthopaedic surgeon. Four (19%) would stabilize and transport this patient, and one (5%) would admit the patient and repair the fracture personally. In a patient with multiple orthopaedic injuries, nine (43%) surgeons would admit the patient to their own facility with subsequent orthopaedic consultation, 11 (52%) would stabilize and transport this patient, and one (5%) would admit the patient and repair the fractures personally.

Twenty (95%) of 21 surgeons chose to place a chest tube and admit a stable young adult with an isolated pneumothorax from a penetrating lateral chest wound. However, in an unstable young adult with a precordial penetrating wound, 12 (57%) surgeons would perform a tho-



Components of 2005 Wyoming statewide trauma system

racotomy followed by transfer for eight surgeons and admission for four. The remaining nine (43%) surgeons would stabilize the patient with chest tube placement and/or pericardiocentesis before transfer to another facility.

At the end of the survey, each participant was asked to provide any additional concerns or suggestions. The most frequently voiced concerns focused on future recruitment and retention of additional general surgeons to these rural locations and the need for upgrades in communication and prehospital care capabilities. Valuable suggestions that have led to improvement of the Wyoming statewide trauma system have origi-


nated from rural surgeons who see problems in the system from a unique perspective.

Survey results

It is clear from the results of this survey that general surgeons in rural Wyoming play a major role in the resuscitation and treatment of trauma patients. The vast majority of surgeons surveyed demonstrated surprising commitment to the definitive care of these patients. This stands in sharp contrast to the disaffection for trauma care expressed by most general surgeons.³ This refreshing characteristic is extraordinarily important to the success of a

statewide trauma system that depends on the skill, leadership, and commitment of general surgeons in large, rural areas.

Shortages of surgeons practicing in sparsely populated areas, resulting from retirements of existing general surgeons and difficult recruitment of replacements, may imperil the efficacy of trauma systems in rural states. These trends should be brought to the attention of health care planners and politicians responsible for trauma systems design. Imagine how differently a trauma system might function in a sparsely populated state like Wyoming if *no* general surgeons were available to provide trauma and surgical care in the small communities distributed throughout vast areas in the state. For example, many small hospitals might be forced to close or curtail services without a general surgeon, resulting in significantly increased transport times to definitive care and more strain on the few remaining components of the trauma system.

Trauma care remains an integral part of a rural general surgeon's practice.^{4,5} This fact underscores the ongoing need for trauma and critical care training as an essential piece of the core curriculum in general surgery residencies. Furthermore, rural general surgeons remain leaders and advocates for trauma care in their regions. They must stay involved in teaching Advanced Trauma Life Support® and Rural Trauma Team Development courses in order to help train other individuals in their areas who care for injured patients. Finally, committed rural general surgeons are essential in helping institutions organize themselves as part of systems designed to provide optimal care to trauma patients in vast geographic regions of North America. 

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