A Survey on Trauma Systems and Education in Europe

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Abstract

Purpose: To assess the current stage of trauma system development and trauma surgery training in Europe.

Methods: Email-based survey from 53 physicians representing 25 European countries.

Results: On a scale of 0–10, the mean (SD) score for trauma system development was 5.4 (2.4) and for trauma surgery specialization 4.1 (2.9). There was a significant positive correlation between trauma system development and trauma surgery specialization (p = 0.018). Countries with ties to the Austro-German surgical tradition had higher scores both in trauma system development (p = 0.003) and in trauma surgery specialization (p = 0.000), whereas the size, economic performance or geographical location were not associated with either.

Conclusions: Despite the great variation from country to country, three trends in developing trauma care and education can be identified: trauma system development based exclusively on major (life-threatening) trauma care (the old United States model), combining trauma and emergency surgery into a single regionalized system (the acute care surgery model), or maintaining the orthopedic surgery-oriented all-inclusive trauma care model as practiced in most central European countries today. Although each country and region might proceed along their own line depending on local circumstances, some kind of general guidelines and recommendations at least at the European Union level would be urgently needed.

Key Words

Trauma · Trauma systems · Surgical education · Trauma centers · Europe

Introduction

In the United States, the organized approach to major trauma care started in 1966 with the creation of two trauma centers, in San Francisco and in Chicago. Soon after that, the first statewide trauma system was established in Maryland, and under the leadership of the American College of Surgeon Committee on Trauma, a systematic approach resulted in the creation of trauma centers, trauma systems, and a surgical specialty of trauma surgery and surgical critical care.

Trauma system is an organized approach to provide severely injured patients rapid initial treatment, and is designed to promote optimum care along a continuum from prehospital care through rehabilitation to provide patients with the best outcome possible [1]. Several studies have shown the survival benefit of treating trauma patients within a trauma system and in specialized centers [2]. However, the expansion of nonoperative treatment and the availability of interventional radiological or endoscopic procedures reduced the operative load and operating room presence of trauma surgeons leading to decreased operative experience and exposure of trauma surgeons-in-training that at least partly lead to the creation of a new specialty, Acute Care Surgery, essentially combining visceral and vascular trauma surgery with non-trauma emergency general surgery and surgical critical care [3].

In Europe, the first civilian trauma centers were Bergmannsheil in Bochum founded in 1890 and the Böhler-Clinic founded in 1925, and the first trauma system was created in Germany in 1972. Because of the dominance of blunt trauma, general surgeons with an
additional specialization in fracture management have been mainly responsible for trauma care and coordination, whereas visceral and vascular injuries have been managed first by general surgeons and subsequently with the fragmentation of surgical training by surgical subspecialists or even organ-specific surgeons.

Today, some European countries and hospitals have started to adopt the old exclusive trauma center and trauma surgery model from the United States, whereas others promote the concept of emergency surgeons caring for all acute surgical problems, whether caused by external trauma or acute disease process [4].

The aim of this survey was to assess the current stage of development of trauma systems and the level of trauma surgery specialization in Europe. Preliminary conclusions have been published earlier [5].

**Methods**

The survey was based on two questions sent by email to 70 physicians treating trauma patients daily in different European countries with special emphasis on the current structure of trauma system as well as trauma surgery training, respectively, in individual countries. The selection of the respondents was not systematic but based on personal contact to individuals interested in trauma care and education with updated knowledge of their respective countries, even if working currently in another country.

**Question 1:** On a scale of 0–10, what is the level of trauma system development in your country? Examples of things to consider and give points to:

1. Existing activities for trauma system development, legislation for trauma care, identified national leadership, financial support from government or others: if 3–4 of the above present, give 2 points; if 1–2 present, give 1; otherwise give 0.
2. Existence of regionalized trauma care: inclusive system (major and minor trauma included in the regional plan), give 2 points; exclusive system (regionalization for major trauma only), give 1 point; no regionalized trauma care, give 0.
3. Existing trauma centers (roughly the type found in the United States): several (with > 50% coverage of the population), give 2 points; some, isolated with 25–50% coverage of the population, give 1 point; no real trauma centers, give 0.
4. Prehospital care of trauma patients integrated in the trauma system: full integration (centralized dispatch, regional plan, jointly agreed triage criteria for major trauma), give 2 points; some (or one) characteristics of the above, give 1 point, no integration, give 0.
5. Trauma registry: national trauma registry covering > 75% of major hospitals receiving severe trauma, give 2 points; hospital or region-based registries with varying criteria, give 1 point; no trauma registries, give 0.

Add points and that is the answer to question 1 (maximum 10, minimum 0).

**Question 2:** On a scale of 0–10, what is the level of specialization for trauma surgery providers in your country? Examples of things to consider and give points to:

1. Trauma surgery is an individual specialty covering all aspects of trauma care from prehospital care, ED resuscitation, operative care (visceral, orthopedic, and neurosurgical), intensive care (surgical critical care) and rehabilitation: give 8–10 points depending on how completely the aforementioned aspects are covered.
2. Trauma surgery in an individual specialty, but some aspects of trauma care are by agreement left outside the expertise of the trauma surgeon training, such as neurosurgery, intensive care, prehospital care, and orthopedic injuries: give 5–7 points depending on the amount of excluded areas of expertise.
3. Trauma surgery is recognized by name in a specialty, which includes other areas too, such as “orthopedics and traumatology” or “trauma and emergency surgery”: give 3–4 points depending on how large part of the specialty includes trauma surgery (> 50%), give 4 points, < 50%, give 3 points.
4. Some aspects of trauma surgery are considered to be an important part of a specialty, such as “general surgery”: give 2 points.
5. More or less all significant injuries are cared for by individual specialties, e.g., vascular surgeons treat most of major vascular injuries, cardiothoracic surgeons treat significant cardiothoracic injuries, urologists treat urogenital injuries, orthopedic surgeons treat bone and joint injuries, neurosurgeons treat head injuries, gastroenterological or general surgeons treat abdominal organ injuries, etc.; give 1 point, if there is someone who is in charge of the overall management (such as the general surgeon or the anesthesiologist); give 0 points if no single specialty is in charge but everything depends on what injuries the patients has.