

**The Trauma Chain of Survival Under Extreme Conditions:
Is There a Limit to Survival?**

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[abstract not available]

— Session 1A —

**Utstein Symposium on Patient Safety, Simulation, and
Medical Education in Trauma and Critical Care (Part I)**

Part A. What is the Role of Patient Safety?

Introduction
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The End of the Beginning: Lessons Learned from the Patient Safety Movement

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Learning objectives: To appreciate 1) the incidence and causes of iatrogenic injuries, 2) the need to create effective and sustainable incident reporting systems, and 3) current international efforts directed at enhancing patient safety and reducing patient harm.

It has long been recognized that medical care itself has the potential to cause harm. However, general acknowledgment that much iatrogenic injury may be due to preventable human error or system failure appears to have been slow in coming. The epidemiology of this silent epidemic is currently being unraveled and the figures are startling. About 10% of patients admitted to hospital will be harmed; half of these events are considered preventable. Of these, some 6% will suffer permanent disability and 8% will die. In many instances this is put down to "medical error." None of this is new. What has changed, however, is that the problem and its extent are being recognised and, most importantly, are now being openly discussed and addressed. To implement effective solutions, we need to report all incidents and understand how and why they occur and we need to change health care and professional culture.

A fundamental guarantee that we cannot give our patients is that they won't be harmed by faults/errors in the health care system. Of course, health care is by nature risky. Many interventions carry risk. But these are mostly small by and large quantifiable. Ideally, patients make choices about undergoing any procedures, understanding possible risks and benefits. For some these are difficult decisions. Not every one undergoing surgery for an aortic aneurysm survives. But although we may discuss treatment risks, we do not speak about risks of harm from the system. Often, those who suffer such harm are not told.

Recent studies from the United States, Australia, and the United Kingdom¹⁻³ and reports from the U.S. Institute of Medicine and the United Kingdom⁴⁻⁷ have drawn attention to the chronic "unsafeness" of health systems worldwide. These are not new developments. For example, adverse drug reactions have become a national beacon in the United States. Studies show that adverse drug events (defined as an injury resulting from a medical drug intervention) occurred in 6.5% of hospitalisations.⁸ By calling for specific solutions, these reports have fuelled the polemics of classic tensions between accountability and improvement, individual needs and societal benefit, and production goals and safety.

Most causes—and solutions—lie in the systems of care, and how we work. The trouble is that health care professionals focus most energy on individual patients, tackling difficulties in the system as they appear often as a series of separate problems and not in parallel. We must instill a "chronic sense of unease"—a constant awareness of risks in every action.⁹ Such attention to risk enables crews of aircraft carriers to launch and land hundreds of planes every day on decks the size of two football fields, whilst sailing in high seas, with virtually zero adverse events. All hands on board know that one oversight can lead to disaster.¹⁰ Making the systems of care safer is a demanding and continual process involving all stakeholders and may be as important as the attention given to individuals.

Ensuring patient safety is an ethical imperative for health care providers both individually and collectively. But just how long should we wait before all medical schools and training programs implement curriculums that explicitly include patient safety as a central objective? Care will be safer only when we learn to work together as genuine teams and understand the team as a "microsystem"—these are small, focused, organized patient care units with a set of patients, technologies, and practitioners.¹¹

Perhaps things are about to change, with increased awareness and research support for patient safety in both the United States and abroad. The U.S. Agency for Healthcare Research and Quality has been tasked by the President, with an initial budget increase of \$100 million, to aggressively to promote and support patient safety research.¹² If the social sciences seem soft, it is largely because the subject matter is so difficult, not because human behaviour is somehow unworthy of scientific inquiry. Patients expect that we will offer safer care. Ensuring patient safety is an ethical imperative for health care providers both individually and collectively. Changing attitudes, professional habits, and working practice will be hard work.

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Are That Many People Actually Being Hurt? Epidemiological Controversies and Perspectives from the First Danish Patient Safety Study

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[abstract not available]

Leadership in Crisis: Trauma Team Leadership—Does It Matter?

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Learning objective: To understand the changing role of trauma team leadership.

Trauma care is intrinsically complex and is often time-limited. Several specialists converge on the patient in the emergency department, each concentrating on the injuries within their own specialist territory. Under these circumstances, a senior trauma team leader is essential to provide the cohesion and direction to early trauma care and to guard against the narrow bias of a single specialty viewpoint. Nevertheless, it must be acknowledged that the role of the team leader has not been subjected to scrutiny. There is currently little evidence of benefit in the literature, although the presence of an attending team leader (rather than a trainee) has been associated with quicker decision-making and earlier emergency operative interventions, but without an improvement in mortality or morbidity.^{1,2}

Many publications have stressed the need for a trauma surgeon to act as the leader, but without any supporting evidence. In inner-city "war zones," where penetrating trauma is rife, the immediate presence of a general trauma surgeon is essential. Elsewhere, where blunt trauma predominates, general surgical intervention is rarely required. Many trauma surgeons have become disillusioned with this situation³—penetrating injuries and little reimbursement in a violent neighbourhood or little operative work in a peaceful environment—and are retreating from the leadership role. There is no doubt that effective team leaders can be recruited from a range of specialties, though there is little infrastructure in place. The commitment to trauma and the ability to manage a multi-disciplinary team are ultimately more important than the individual speciality.

Four styles of leadership have been defined: autocratic, participative, democratic, and laissez-faire, depending on the extent to which authority is imposed or freedom permitted. Strong autocratic leadership has often been assumed to be essential in urgent situations. However, examples from the airline industry have caused this to be questioned. Pilots were previously selected on the basis of dominant, self-confident, independent personality traits, but an analysis of air accidents has shown that in many cases, such characters assumed full control and ignored advice from other cockpit members, making unnecessary errors. Pilots are now regarded as cockpit coordinators and are selected for their ability to work with other team members, while still retaining overall responsibility.

In a time-limited situation, it is often quicker and easier for senior personnel to carry out interventions, rather than spending extra time teaching. If the junior team members do not get opportunities to extend their skills, they will become disillusioned by their lack of progress and will ultimately be vulnerable when they attain senior positions. It is up to the team leader to achieve a balance. The leader should treat team members differently depending on their level of expertise, commitment, and confidence and on the nature of the task in hand.

Leadership of the trauma team is often best carried out in a hands-off fashion. In getting involved in performing technical tasks, the overall direction of the assessment and resuscitation process may be lost. Nevertheless, it is important for the leader to have a broad knowledge base and to be proficient in a range of practical skills, intervening in critical situations if it becomes apparent that other team members are failing to achieve what is required.

There has been a vogue for leadership training within health care institutions, but it has tended to be too generic in nature, lacking direct relevance to clinical situations. Such training has usually been provided by business consultants rather than by clinicians. Leading others in a contrived "away-day" team game may provide some insight into human group behaviour, but it lacks the sense of urgency, importance, and detail that are inherent in acute trauma care. The use of simulators in team scenarios will allow more specific training for team leaders, but videotape review and peer feedback from actual clinical situations will remain the gold standard.

Although very little has been written on the role of the trauma team leader, few doubt its importance. In small, close-knit teams, whose members share a common set of goals and who work and practice together regularly, it may not be necessary to declare which of two senior clinicians is the boss. More commonly, where the trauma team is drawn from a larger pool, it is wise to ascribe overall responsibility to a single person.

The leader must be proficient in the non-technical aspects of team care. It has been demonstrated that the team leader is more commonly deficient in people management and other organisational skills than in technical performance.⁴ The impact of poor communication has not yet been quantified.

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Do We Need a National Agenda to Change our Culture of Care?

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[abstract not available]

Part B. Can Medical Education Improve Quality and Safety of Care?**Do We Learn High Quality Patient Care the Way We Teach It? A Critical View on How We Teach Trauma Care**

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[abstract not available]

Animal Models and Use of Cadavers—An Unethical Mess? The Pros and Cons of Traditional Training

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Training the Local Trauma Team Together—The Next Step to Improve Trauma Care?

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Learning objective: *Improving trauma team performance by simulation training locally at each hospital, by focusing on leadership, communication, and leadership.*

The initial treatment of the trauma patient is a demanding challenge, and well recognised to be the phase with most protocol deviations and diagnostic errors. The resuscitation must be made in correct order to ensure that no valuable time is lost. In Norway, very few hospitals get enough trauma cases to enable the trauma teams to perform optimally just by doing the regular work. Training is one of the ways to make up for this gap between expected and actual experience. Aviation safety work has shown that human factors and suboptimal team cooperation can lead to disasters; crew resource management (CRM) training has been developed to address this. This is even truer in medicine. Modern medicine is complicated, and the human factors tend to be forgotten in technology. For trauma patients, it is the joined action of the trauma team that matters. We have developed a multi-professional course with simulated trauma patients, organized locally at each hospital called BEST (Better & Systematic Trauma Care). The one-day course consists of lectures, followed by practical training with a simulated patient. The hospital's team set-up, procedures, and equipment are used, and team members play their own professional roles. The practical training sessions are video-recorded, and in the subsequent structured debriefing the team is encouraged to focus on areas for improvement in leadership, communication, and co-operation. The case histories used are based on real patient stories, with appropriate X-rays and laboratory results. After the course, all the educational material is left at the hospital for local training purposes. Trauma team leaders receive no formal training in leadership, so for many the BEST course is the first training in which their performance as a leader can be addressed and improved without jeopardising patient safety. A voluntary network between all hospitals has also been established, as a national quality improvement collaborative. BEST is now established at 18 of the 50 Norwegian trauma hospitals. More than 1,900 professionals have followed the lectures and 600 have simulated. In addition, a number of subsequent training sessions, using the simulation set-up, have been arranged locally at many of the hospitals. The feedback is overwhelmingly positive; in particular, many of the health care workers find the local training with their own well-known colleagues, procedures, and equipment very useful. The focus on team performance rather than individuals is important, but there seems to be need for training the instructors, so that the debriefing is performed in a reassuring and safe way. Another important feature of BEST is that after each training session the team members can use what they have learned immediately on real trauma patients. This kind of cross-professional team training in trauma care has never been done before in Norway, and the project seems to be a cost-effective improvement tool that ought to be further explored.

PHTLS® and ATLS®—American Imperialism or the Road to Improved Outcome? Should We Replace Them with European-Based Training Models? (Yes)

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Learning objectives: *To appreciate the influence of ATLS and PHTLS approaches in the management of trauma patients and to examine their limitations.*

For nearly two decades, the American College of Surgeons (ACS) has promoted the ATLS and PHTLS educational packages to improve trauma care. These have proved immensely successful not only in the USA, but also worldwide, including within Europe and in particular the UK.

The principles of ATLS, inherent within PHTLS, are unquestionable; when faced with a trauma victim, one must treat the greatest threat to life first, not allowing the lack of a definitive diagnosis or detailed history to impede management. However, beyond this fundamental message, there are a number of concepts that I would question.

Despite their firm belief in all things ATLS, the ACS has been extremely restrictive in the way they have allowed it to flourish. For example, despite running ATLS courses for 14 years, the Royal College of Surgeons of England is not permitted to establish an ATLS program in any other country, even within Europe. Only the ACS can do this, irrespective of the (considerable) cost or inconvenience to the host nation. ATLS educational material is available only from the ACS and even when purchased, can be used only in conjunction with approved ATLS courses. In addition, PHTLS can be imported only where there is an established ATLS program. Consequently the ACS dominates any organisation, anywhere in the world, and in turn this generates total dependence on the ACS, even once ATLS has been established.

As a result of the promotion of ATLS and PHTLS, many health care professionals or their employers have spent millions of dollars to attend these courses, but incontrovertible evidence of improved outcome is still lacking. Knowledge and skills improve, ATLS techniques are utilised at the roadside and in hospital, and medical personnel feel more confident, but these do not automatically equate to better outcome. Furthermore, there are numerous confounding factors in trauma patients that, along with local variations in trauma systems, mean perceived effectiveness in one area is not automatically transferable to others.

Finally, do PHTLS and ATLS reflect our experience, practice, and needs in Europe? In North America, apart from the significant difference in the prevalence of penetrating trauma, prehospital care is delivered predominantly by emergency medical technicians. In contrast, in Europe there is an increasing involvement of physicians. In addition, ATLS is surgically dominated, with virtually no input from other specialties, but in Europe, trauma is the provenance of emergency physicians, anaesthetists, and intensivists to name but a few. The lack of involvement of such specialists is reflected in the core content, which is frequently at variance with practice in Europe—tracheal intubation without the use of drugs and the reliance on crystalloids for resuscitation being obvious examples. Finally, in an area where there is increasing recognition of a "team approach," this appears to remain an enigma to the ACS.

ATLS and, to a lesser extent, PHTLS have probably been the major influence on trauma management for the past decade. However, there is a growing awareness that time has come for us to develop courses that reflect both European practice and the problems we face when dealing with our victims of trauma. We should not be afraid to rise to this challenge.

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PHTLS® and ATLS®—American Imperialism or the Road to Improved Outcome? Should We Replace Them with European-Based Training Models? (No)

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[abstract not available]

**— Session 1B —
Pain Management in Trauma****Pain Relief in Trauma—More Than Just Humanitarian Action? And, If So, Can We Secure Adequate Pain Control Throughout the Trauma Chain of Survival?**

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[abstract not available]

Prehospital Analgesia—Experiences from the Norwegian Air Ambulance

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[abstract not available]

Prehospital Pain Therapy with Acupressure Performed by Paramedics

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Learning objective: *To understand the application and benefits of acupressure as used by paramedics treating trauma patients.*

Background: Untreated pain during the transportation of minor trauma is a common problem in emergency medicine. Because paramedics usually are not allowed to do invasive procedures or to give drugs for pain treatment, a noninvasive, non-drug-based method would be helpful. Acupressure is a traditional Chinese treatment for pain, based on pain release followed by short mechanical stimulation of specific points. Consequently, we tested the hypothesis whether effective pain therapy is possible by paramedics who are trained in acupressure.

Methods: In a double-blind trial we included 60 trauma patients. We randomly assigned them into three groups ("true points," "sham points," "no acupressure"). We recorded vital parameters and visual analogue scales for pain and anxiety before and after treatment. At the end of transport we asked for overall satisfaction. For statistical evaluation, one-way ANOVA and Scheffe's F test were used. $P < 0.05$ was considered statistically significant.

Results: Morphometric, demographic data, and potential confounding factors such as age, gender, pain, anxiety, blood pressure, and heart rate before treatment did not differ between the groups. At the end of transport, we found a significant difference in pain, anxiety, heart rate, and satisfaction between the three groups ($P < 0.01$).

Discussion: Our results show that acupressure is an effective and simple-to-learn treatment of pain in emergency trauma care, leading to improvement of the quality of care. We suggest that this technique is easy to learn and risk free and may improve paramedic-based rescue systems.