

Simulation Based Medical Education: Is There Evidence That Simulation Can Reduce Medical Errors and Improve Patient Safety?

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[abstract not available]

**Use of the Internet to Improve Trauma Care:
An Update from www.trauma.org**

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Learning objectives: To describe the genesis and evolution of trauma on the Internet, to discuss how the Internet impacts on global trauma care, and to identify some future applications of the medium.

The Internet has changed the way much of the world communicates. Near-instantaneous global interaction and a planet-sized distributed information database have allowed the Internet to penetrate areas where textbooks, journals, and conferences cannot.

There are many reasons why the Internet has become such a potent method of communication during its brief history. Primarily, it is the invisible social network aspect of the Internet that makes it so different from broadcast media. People from either ends of the planet, both geographically and economically, can find and communicate with each other. Communities spring up based not on physical location but on interests and concerns. We are living in a global village.

Trauma is a worldwide, multidisciplinary disease and is therefore highly suited to using the Internet as a medium for communication and education. The multispecialty, multinational discussions and case conferences that take place on the Internet are difficult, if not impossible, to recreate in a physical location.

Using the Internet as an education tool allows the rapid, inexpensive dissemination of guidelines, protocols, latest research, and opinions. Areas where textbooks or journals are impossible to find can now have instant access to Medline, textbooks, and Internet-only education tools.

The quality of information provided on the Internet is an issue. There is little peer review and much vanity publishing. A lot of the information carries no details of authorship, date of publication, references, or disclosure of conflicts of interest. This problem has been recognised by several organisations, and some Web sites now subject themselves to internal and external audit of the quality of information provided on their pages.

[Trauma.org](http://trauma.org), founded in 1995, was one of the first medical specialty sites on the Internet. It now serves 900,000 pages of information to 80,000 users each month. The e-mail discussion group has about 1600 members and exchanges more than 3000 messages per year. It has since been joined by several other trauma-related Web sites from specialty associations and various trauma centres around the world.

The site carries several innovative features such as interactive trauma simulations, global databases trauma fellowships and medical student electives, and a database of educational trauma images for download and use in presentations.

In the future, the Internet will become further integrated with all aspects of trauma care. Coordination, management, and communication within local, regional, and national trauma networks are ideally suited to the Internet. New distributed trauma registries will combine with educational resources and patient management systems. Multicentre research trials will be coordinated via secure sites. Published research will bear little resemblance to the print journals available today. Wireless access will take the benefits of the Internet to the prehospital environment. The ultimate applications of the medium have yet to be discovered.

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Trauma Nurse Training: TNCC, ENPC, ATNC, or ATCN? More Than Just a Difference in Names?

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[abstract not available]

— Session 2B —

Symposium on Living with the Trauma Deaths

**When Children Die Suddenly and Unexpectedly:
A Study of the Parents' Grief Reactions**

Leif Jon Paulsen
Stavanger, Norway

"Life—a prison with walls made of loss and mourning"

Learning objectives: To discuss parental reaction to the death of a child and to understand the need for and use of coping mechanisms in this devastating situation.

The results of a survey among eight couples and one single parent in the middle phase of adulthood are presented. These parents all lost young adult children to sudden, unexpected death. A fairly broad presentation of the parents' own descriptions of their grief is given. Their mourning periods varied from 9 months to 8 years. The author's findings imply that the mourning process for this group of people will last for the rest of their lives. However, they will gradually adapt to the new situation. The article questions the accepted description of grief as a process limited in time and passing through stages. The author claims that a crucial element of the mourning process is to preserve an inner picture of the deceased. The presentation also touches upon the implications of such bereavement on religious and existential questions.

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How Do We Cope with the Trauma Deaths? The Nurse Perspective

Kerstin Sluys
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[abstract not available]

Colleague Support—A Report from a Project Aimed at Helping the Ambulance Staff in South Rogaland

Arne Ove Østebrot
Stavanger, Norway
[abstract not available]

Ethical Aspects of Brain Death and Organ Donation

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Learning objectives: 1) To appreciate how medical definitions of death are not easily reconciled with religious and cultural definitions, 2) to recognize the importance of cadaveric organ donation in the treatment of end stage heart, renal, and liver disease, 3) to review methods of discussing death and organ donation and identify some that appear to be best accepted

- One donor can save the lives of 10 other people and can improve the quality of life for many others.
- In the UK, renal patients undergo most transplants but despite this the waiting list for all organs continues to grow.
- In Europe, Spain averages 33 donors per million population. Most other countries average only 10 to 15 donors. For each donor, approximately three solid organs are used per donor and this figure is common to all countries.
- In the UK, the criteria for diagnosing brain stem death involve meeting preconditions that ensure the patient is in an irreversible apnoeic coma followed by simple bedside tests of cranial nerves and demonstration of apnoea. These criteria are unique to the UK. Other countries have their own methods of diagnosis and sometimes require confirmatory tests. This illustrates that even the medical profession is not united on the diagnosis of medical brain death.
- It is not universally agreed outside medicine whether death implies death of the organism as a whole or death of the whole organism. Nor is it agreed that death of the brain equates to traditional cardiorespiratory death.
- These issues are further complicated by the fact that the body dies cell by cell. Put simply, death is a physiological process, not an event. Thus we can say that death has occurred but pinpointing the time of death is impossible without an adequate medical definition.
- Perhaps the most useful definition of death is "the irreversible cessation of all integrated functioning of the human organism as a whole, mental or physical."
- Were this definition to be accepted world wide, the literature would not contain articles describing seizures in 10% and respiratory arrest in 4% of organ donors! Nor would anaesthesia be advocated for donors during organ retrieval.
- Ideally, the diagnosis of death should be separated from the issue of organ donation.
- Clarification is also needed on who may give consent for donation, how consent should be given, and who has the greatest success in obtaining agreement for donation.
- Another ethical issue that has yet to be debated is the right of donors to specify who may and may not receive the organs.
- A cultural problem is the relative reluctance of some groups to donate when many of their number need organs and are either denied them or have greater rejection rates because of genetic differences between them and the donor pool.

Further Reading

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- Nygaard CE, Townsend RN, Diamond DL. Organ donor management and organ outcome: a 6-year review from a Level I trauma center. *J Trauma* 1990; 30:728–32.
- Internet searches using the terms *brain death* and *organ donation* will provide a vast array of information on cultural and religious view across the world and details of donation rates and transplantation outcome.

**How Do We Cope with the Trauma Deaths?
Psychological Reactions and Coping Strategies**

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Learning objective: To describe the variety of psychological reactions in trauma care providers and describe coping mechanisms that can be used to manage these reactions in a professional way.

Most trauma deaths occur immediately in the prehospital period and during the first hours after admission to the hospital. A considerable number of immediate survivors die because of complications to the primary injuries after a period in the ICU. We as trauma care

physicians are involved in all types of death. We are confronted with various challenging situations, which affect emotions, psychological reactions, and behavior.

Death and coping with it is a neglected subject in our society and especially in our action-focused profession. This lecture aims to point out circumstances with trauma death, which can lead to acute and chronic stress reactions in helping personnel, followed by a brief summary of these reactions and possible coping strategies. Then we'll try to find an answer to the question "How do we cope with trauma death?" and finally promote some visions for the future.

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— Session 2C —

Hospital Topics

Is the Emergency Department the Weak Link in the Trauma Chain of Survival? ABCDE = Airway, Breathing, CT Scan, Death, Eternity?

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[abstract not available]

What the Clinician Needs to Know About Ultrasound and CT Scan Diagnostics in the Severely Traumatized Patient

Abe Fingerhut
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[abstract not available]

Echocardiography for Rapid Assessment of the Trauma Patient: What Does It Offer?

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Learning objectives: 1) To review the situations in which echocardiography contributes to diagnostic decision making in the evaluation of trauma patients and 2) to compare various echocardiographic approaches.

Echocardiography can play a major role in the diagnosis of injuries in patients with major thoracic trauma. These include the following:

- Hypovolaemia
- Tamponade
- Myocardial damage
- Valvular pathology
- Aortic injuries
- Valve injuries

It can also be used in the initial and ongoing assessment of volume resuscitation, inotropic requirements, and cardiac function.

Transthoracic echocardiography is less invasive, but provides poorer quality images because of lower ultrasound wavelength frequency and air in the chest wall or pleural spaces. Transoesophageal echocardiography provides higher quality images because of higher frequency and proximity to the heart and aorta, without intervening air-containing tissues/spaces.

Emergency physicians and trauma surgeons are increasingly using ultrasound for the diagnosis of intraabdominal pathology. It is even more important that this technology is extended to the care of patients with thoracic injuries also.

The Role of the Smaller Community Hospital: Just Initial Stabilisation and Further Referral? (Pro-Con Debate)

Mace Ramsay, FFCANZCA, FANZCA
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Learning objectives: 1) To understand the capabilities of community hospitals in the stabilization and treatment of trauma patients and 2) to describe emerging telemedicine linkages between community hospitals and tertiary care centers.

Southern New Zealand has 320,000 people in an area the size of Norway south of Bergen. The area has one tertiary hospital, two smaller community hospitals (SCHs), and four rural hospitals. Interhospital transport is by road or ICU retrieval using a BK117. There are good personal communication links and teleradiology. The SCHs perform stabilizing surgery and transfer those who need complex, specialized, or prolonged care to the tertiary hospital. This system preserves the ability to manage patients when the SCHs are cut off from the tertiary hospital and works because staff at both SCH and the tertiary hospital communicate with each other and decide what is best for the patient.

For this debate, the smaller community hospital (SCH) is a hospital that has 24-hour orthopaedics and general surgery services; limited ICU capacity (can ventilate, but does not offer dialysis or full resident or specialist cover); and does not offer neurosurgery, cardiovascular surgery, spinal surgery, or specialised burn care.

I will describe the system we have in southern New Zealand. The 350-bed tertiary university hospital is at Dunedin. There are SCHs at Invercargill (100 beds) and Timaru (120 beds), 2.5 hours travel time by ambulance or 45 min by BK117. Both SCHs have orthopaedics,

general/vascular surgery, otorhinology, ophthalmology, ob/gyn, general medicine, and CT scan, and we have teleradiology links with them.

In addition there are four rural hospitals, which offer ATLS (trauma stabilisation plus blood transfusion). They have laboratory and x-ray facilities. From the Dunedin hospitals at Oamaru, Balclutha are 1 hour by road and 15 to 20 minutes by BK117; Alexandra is 2.5 hours by road and 45 min by BK117; Queenstown is 3.5 hours by road and 55 min by BK117. None of these hospitals has surgery or CT. There are teleradiology but not yet working telemedicine links with them. We tried Internet-based systems, but they were too unstable in our hands. We do use video conferencing for case discussions. Now that we have ISDN lines we are re-experimenting with real-time telemedicine for emergencies.

Rogers et al¹ described the use of telemedicine trauma specialists to support rural hospitals, and Celi et al² described remote ICUs controlled by central ICU. For those interested in telemedicine, good start points are <http://web.utk.edu/~twelsb/teleweb/telemed.htm> and the American Telemedicine Association <http://www.atmeda.org/>.

Our system functions as a network. Trauma cases are usually taken to the nearest facility that can stabilize them. There is a direct line to the tertiary ICU, where there is always a registrar/trainee specialist on duty and there is always a specialist on call for the ICU, who is also aeromedically trained.

If the base hospital can cope, they manage the case, e.g., fractured femur, ruptured spleen, haemothorax. If they want help/advice, they call the tertiary hospital. They can discuss the case with the relevant specialty registrar or consultant—ICU, cardiothoracic, neurosurgery, etc. Information is shared, including teleradiology of CT scans or x-ray films. They decide if the patient's condition can be managed locally and, if it can, the SCH staff carry on and seek further advice as needed. If cannot, when is it optimal for transfer?

- At SCH, we keep patients with
- Stabilised trauma with GCS >11 and clear CT head

but WITHOUT

- Major lung contusions requiring FIO₂ >0.6 PEEP >7.5
- Thoracic vascular trauma
- Major liver haematoma
- Mobile pelvic fractures
- Need for renal replacement therapy

Patients we transfer to the tertiary hospital:

- Head injury for ICP monitoring/possible neurosurgery (GCS <12)
- Thoracic vascular trauma
- Abdominal/hepatic injury that may require major transfusion or complex hepatic repair
- Cases predictable to need >2 days ventilation or renal support
- And anything else the SCH staff is uncomfortable managing or think would be managed better at a tertiary hospital. The tertiary ICU operates on a "You Call, We Haul" system.

In turn, the tertiary hospital transfers after stabilisation:

- Spinal injury with cord injury
- Burns >20% or involving hands, face, etc.
- Complex paediatric trauma

Why does it work? **Communication and trust.**

Tertiary hospitals must delete the Ivory Tower attitude from their staff. If somebody wants advice, they have acknowledged they need help – give it. You have to get your staff to be supportive, not condescending or even arrogant.

Why do we do it this way? We can't always fly because of freezing/icing conditions for 40% of nights in winter, storms, or cloud meets ground. Sometimes even the roads are cut by floods or landslides. Our approach preserves skills in the base hospital for initial resuscitation/stabilisation and preserves SCH confidence when transfer is not possible. It also keeps patients in their own communities. The bigger the hospital, the bigger the problems. Bringing all the patients to one place actually removes the teaching and training from those in first contact with the patients who are often capable of dealing with many of them.

The role of the smaller community hospital in trauma is more than just stabilise and refer. It's stabilise, consult, and do what's best for the patient.

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The Role of the Smaller Community Hospital: Just Initial Stabilization and Further Referral? (Pro-Con Debate)

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Learning objective: To explore the extent and level of centralization in managing critically injured patients, especially those presenting with hemorrhagic shock.

Background and Setup. The modern management of critically injured trauma patients requires considerable surgical, anesthesiological, critical care, radiological, and laboratory resources, including rapid availability of blood products. How far these are available in a small community hospital, as well as the distance to a major trauma center, dictate the type of emergency medical and surgical aid provided in the small community hospital level to achieve optimal results relevant to the trauma care system in general.

Hemorrhagic Shock. The most common sources of traumatic blood loss include internal truncal injuries (thoracic and abdominal vascular systems, and parenchymatous organs, especially the liver), external bleeding (cervical and extremity vascular injuries, nasopharynx, scalp lacerations), and pelvic and long-bone fractures. The severity of shock reflects the amount of blood loss varying from less than 750 ml (class I) to more than 2000 ml (>40% of blood volume, class IV shock).

Options

1. Resuscitate the patient immediately to the trauma center (with limited fluid resuscitation during transport).
2. Stabilize the patient with fluid resuscitation and transfer to the trauma center.
3. Damage control surgery in the community hospital and transfer to the trauma center.
4. Definitive treatment (surgery, ICU) in the community hospital.

Solutions. The first priority in any model is to establish airway and breathing. External bleeding should be controlled with suturing (scalp lacerations), external pressure with pressure