Tele-trauma and Tele-presence Resuscitation in Rural America: Southern Arizona Experience

Latifi, R.


http://hdl.handle.net/123456789/3539
Presentation

Downloaded from PRISM: https://prism.ucalgary.ca
Teletrauma and Telepresence Resuscitation: Southern Arizona Experience

Rifat Latifi, MD, FACS
Associate Professor of Clinical Surgery
Director, Surgical Critical Care
Director, Southern Arizona Teletrauma and Telepresence Program (SATT)
The University of Arizona, Tucson, Arizona, USA
“Trauma kills. Trauma is a disease; it is not an accident. Like heart disease and cancer, trauma has identifiable causes with established methods of treatment and defined methods of prevention.”
Trauma is predictable

“ It happened yesterday, it is happening today, and it will happen tomorrow.”

Med@Tel 2005, Luxembourg
Serious Problem

- 1995 in the USA:
  - 148,000 deaths from trauma
  - $260 billion in cost
- 12% of all national medical spending
- Most trauma patients are young!
Facts:

- 23%-25% of population resides in rural America; 56.9% of deaths from MVC!
- Only 15 states have state wide 911 or enhanced 911!
- 600 people die each day or sustain long term disability from trauma!
- 40% of deaths could have been prevented!
- 600 times more likely to die from MCV if you live in Loving, Texas than if you live in Manhattan!
Courtesy: S. Fergusson, Alaska
Rural world lacks

- Trauma surgeons...
- Neurosurgeons...
- Orthopedic surgeons...
- Vascular surgeons...
- Good emergency medicine...
- Technology...
Major trauma centers

- Are concentrated in urban settings.
- Subsequently, most of the population of the world is not covered by specialized trauma systems.
Trauma in the 21st Century: Main Issues for the next decades

- Organizational (creating systems)
- Medical advances in the resuscitation of trauma patient
- Technological advances
- Distance education
There is a tremendous need

“For new approaches in trauma care in order to reduce death and disability from the disease of trauma”.

Med@Tel 2005, Luxembourg
Trauma...

- Unpredictable to time, place, severity and the number of injured people
- Require different types of treatment
- Often real-time information missing
- Organized infrastructure and protocols
Causes:

Earth behavior (floods, tornados, hurricanes, avalanches, landslides, storms, earthquakes, epidemics...)

Man made disasters: wars, terrorist attacks, other catastrophes...
During disasters

- Radio communication causes transmission mistakes and radio-overload.
- Manual distribution of the same data for many receivers using different communication lines causes confusion.
What is needed:

- Computer-assisted Command and Control System (CACCS)
- Telemedical support through ad-hoc networks and running services
- Database-dependent resources networks
- Medical intelligence
- Real-time information
Key infrastructure elements of trauma systems

- Leadership
- Professional Resources
- Education and Advocacy
- Information Management
- Finances
- Research
- Technology; Disaster Preparedness and Response - Conventional & Unconventional
Question:

Where do we stand with tele-trauma and telepresence (telemedicine) for injured and critically ill patients?
Answer:

- No where, really!
Why not?

- We have communication technology, we have telemedicine, we know how to do it?
- So, what is wrong then?
Reason(s):

- Telemedicine and telepresence from nine to five does not work when it comes to trauma!
Another question:

- So, is there a crisis in trauma care and trauma education world wide?
Yes!
How can we change this?

- Have expertise of trauma centers available and accessible to small hospital ERs in rural regions 24 hours a day seven days a week through VIRTUAL TRAUMA SURGERY PRESENCE
Remote Presence/Telepresence

ControlStation
- Computer
- Software
- Camera
- Microphone
- Joy Stick

RP-6
- Remote piloted vehicle
- ‘Human like’ mobility
- Two way audio-video
- Pan, tilt and zoom
- ‘Virtually there’ interaction

Internet

Remote Expert

Wireless Network

Hospital
ControlStation Dashboard
Satisfaction

- In 61% of cases trauma surgeon felt that teletrauma improved patient’s care
- 83% of cases referring providers felt that teletrauma improved patient’s care
- Easy to use: 86%-88%
- Will have not been able to provide adequate consultation via telephone - 67% of cases
1,950 the cruelest border miles on earth...
130 degrees on the ground
Over Crowded Roll Over Vehicles Smuggling Illegal Immigrants:
41 people in a pick up truck
Arizona-Mexico Teletrauma and Telepresence Program

1. University Medical Center Trauma Center, Tucson, AZ
2. Arizona Burn Center, Phoenix, AZ
3. Holy Cross Hospital, Nogales, AZ
4. Sierra Vista Regional Health Center, Sierra Vista, AZ
5. Copper Queen Hospital, Bisbee, AZ
6. Southeast Arizona Medical Center, Douglas, AZ
7. Hospital General de Puerto Penasco, Puerto Penasco, Sonora
8. Hospital General de Nogales, Nogales, Sonora
9. Hospital General de Agua Prieta, Agua Prieta, Sonora
10. Hospital General de Caborca, Caborca, Sonora
11. Hospital General del Estado, Hermosillo, Sonora
12. Hospital Infantil, DIF, Hermosillo, Sonora

Med@Tel 2005, Luxembourg
Case Presentation

- 18 months old baby brought to SAMC ER in Douglas, AZ, three hours after motor vehicle with three fatalities
- Injuries: Severe and complex scalp laceration, right tib-fracture, left femur fracture
- In coma
- Hypoxic (saturation in the 70s), hypotensive (SBP in the 50s), severe acidosis (Base deficit 9.0, anemic (hemoglobin 5.8)
- No IV access
Once Intubated...
Advise:
Pull the tube back, decompress the stomach...

Results:
Clinical Improvement
Better SBP
Improvement of Saturation
Able to see even detailed attempt to place an IV…
Transferred to UMC trauma team: Surgery and pediatric intensivist meet the patient.
Severe femoral fracture
At trauma room at UMC: Femoral IV access lost in flight, hypotensive.
Cut down and ligation of right femoral vein (dr. Latifi), intraosseous access (dr. Berg)
Interventions

- Intubate the patient
- Able to evaluated chest raising after intubation
- Reposition the ET tube from the right main bronchus
- Assessed the CR, Bag her with small tidal volumes
- Sedate, paralyze the patient
- Obtain femoral vein/arterial access
- Aggressively resuscitate with lactated ringer
- Obtain a blood gas, CBC, Start blood transfusion, Give antibiotics, Suction the ET tube
- Place the orogastric tube to decompress stomach
Hospital Course

- Acidosis treated, Fractures fixed
- Large mesenteric hematoma managed non-operatively
- ARDS treated with lung protective strategy
- Child was discharged back to home in Agua Prieta
Continuous Telepresence...

- Is it possible technically?
- Is it acceptable by first responders?
- Is it acceptable by trauma and emergency docs
- “The big brother is watching concept”
Conclusions

- Trauma resuscitation can be done via telemedicine and will save lives!
- Creativity and commitment by Trauma Centers to render care to its population-key!
- Use your telemedicine network and expertise: It is here in your doorstep!
- Talk to each other!
Real Limitation of Telesurgery and Teletrauma: Nontechnical

- Ethical
- Re-imbursement
- Legal issues
- Referral pattern
- Patient behavior pattern
- Physicians behavior pattern
Telemedicine Updates

- A Life Saved through New Teletrauma Service
- Arizona Achieves Number One Status in Telemedicine
- Telemedicine Saves Millions of Dollars for Arizona
- Telemedicine Benefits Thousands of Arizona Patients
- Prison Telemedicine Promotes Public Safety in Arizona
- Arizona Telemedicine Program Builds Cost-Effective Rural Health Care Telecom Network
- Arizona Leads the Nation in Native American Telemedicine
- ATP’s Arizona Diabetes Virtual Center of Excellence
Thank You!

Rlatifi@pol.net
Rlatifi@email.arizona.edu