Essentials of Rural Performance Improvement Development

Arkansas Trauma Update 2012
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North Little Rock, AR

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Acknowledgments

• Chris Ballard, MDH Trauma System Director
• Deb Horsman, Terri Elsbernd and Carol Immermann, Paul Drucker from Mayo Trauma Center
The Trauma Problem in Minnesota

- 2400 deaths/year
- Highest cost in years of life lost of any disease
- #1 cause of death ages 1-44
- Pediatric impact = more deaths than all other causes of death combined
- 9 hospitalizations for every death
- Staggering costs
  - Motor Vehicle Crash deaths alone = > $568 million/year
Comparative Demographics

- Arkansas
  - 52,035 square miles
  - 2,937,979 population (56/sq mi)

- Minnesota
  - 86,943 square miles
  - 5,344,861 population (61/sq mi)

- Southeast and Southcentral Minnesota
  - 11,902 square miles
  - 678,536 population (57/sq mi)

- Little Rock:
  - 119 square miles
  - 193,524 population (1,623/sq mi)
Minnesota Trauma Mortality

- Population: 5,344,861 July 2011
- Per capita trauma deaths & rate (/100k): 20,756/(45.41) over 10 years

Minneapolis/St. Paul vs. Outstate Mortality

- Metro:
  - Population: ~ 2.8 million
  - 10,110/44.52

- Outstate:
  - Population: ~ 2.5 million
  - 10,626/48.05
Regionalization of Trauma Care

- Distinct catchment area
- Natural referral patterns
- Urban vs Rural injury patterns/mortality
- Differing needs/resources/challenges
- Common goals
MINNESOTA’S 15 DEADLIEST COUNTIES FOR IMPAIRED DRIVING

1. Hennepin
2. Ramsey
3. Anoka
4. Dakota
5. St. Louis
6. Stearns
7. Wright
8. Crow Wing
9. Washington
10. Sherburne
11. Rice
12. Blue Earth
13. Beltrami
14. Cass
15. Olmsted

15 Counties’ Facts, 2004-2006
74,485 DWI arrests
272 alcohol-related traffic deaths
762 serious injuries
$350 million economic impact of alcohol-related crashes

NightCAP (Nighttime Concentrated Alcohol Patrol) targets the state’s 15 deadliest counties to arrest impaired drivers and to prevent alcohol-related traffic deaths and injuries. Enhanced patrols saturate state, county and city law enforcement resources to saturate the deadliest traffic corridors.

Driving Minnesota Toward Zero Deaths.
Population = 678,536 inhabitants
Land area = 11,902 square miles

Trauma Death Rate per 100k population 90-99

>50/100k =
>MN Avg =
<MN Avg =

15 Deadliest Counties for Impaired Driving =

Goodhue
Sibley
Le Sueur
Rice
Steele
Dodge
Olmsted
Wabasha
Fillmore
Houston
Watonwan
Blue Earth
Brown
Nicollet
Waseca
Martin
Faribault
Freeborn
Mower
MN Southern Tier Trauma Facilities Designation Status

- Regional hospital trauma center designation
  - Southeast counties = 3/12 designated
  - Southcentral = 3/12 designated

- Only **25%** of available facilities designated!!!
  - How to track time to transfer?
  - How to institute regional trauma triage protocols?
  - How to effect Regional Performance Improvement?
Regional Trauma System Development

- Why start now?
  - Statewide system development mandate
    - Legislation in 2005
  - American College of Surgeons state system review 2007
    - Shortfalls noted: “Establish clear geographical catchment districts for designated trauma center, based upon patient needs and resource optimization”
  - To save lives
    - # of Trauma deaths, years of life lost and societal costs/impact
Rural Facility PI:
The Barrier to Trauma Center Designation

- Difficult because trauma nurse manager has so many hats to wear
- Confusion that PI = M&M or Peer Review
  - M&M = bad memories from residency
  - Peer Review = just plain bad
  - M&M and Peer Review = Blame Game
- Why would we review cases where nothing went wrong?
- Where is the course to learn about this?
Trauma PI

- Evaluate
  - patient care
  - provider response
  - system performance
- Improves patient care
- Identifies opportunities for improvement

- Fosters competency among clinicians at all levels
- Measures performance, validates care
- Essence of trauma program development
Quality Care

- All levels of centers should scrutinize their trauma care
  - Systematically
  - Critically
Characteristics of PI

- Data-driven
- Outcomes focused
- Systematic evaluation of the care of each patient
- Measurable
- Directly improves care at the beside
- Committee structure consistent
- Judgment/categories consistent
Characteristics of PI

- Spans the continuum of care
Standards of Care

- Local, regional, state or national
- Filters (indicators)
  - Non-discretionary
    - State or regional
      - Ex: Trauma patients admitted to surgeons
  - Discretionary
    - Local/hospital-specific
      - Ex: Definitive airway secured w/in 10 minutes of arrival
Analysis

• What was the outcome?
• Were policies followed?
• Was supervision adequate?
• What were the pre-existing conditions?
• Were practice management guidelines and protocols followed?
• Was standard of care followed (e.g. ATLS®)?
• Examine the circumstances (multiple, simultaneous patients)
• System failures
Getting Started

1. Define a trauma patient
2. Locate the patients in your hospital
3. Establish Standards (PI Filters)
4. Review
   • Objective
   • Subjective
Filters

- Length of stay in ED >75 minutes
- Under-triaged/trauma team not activated when criteria met
- Emergency department provider arrival >15/30 minutes
- Trauma care provided by mid-level or provider who does not meet the educational requirement (e.g., ATLS)
- Admitted by non-surgeon
- GCS ≤10 & no intubation or surgical airway
- EMS scene time >20 minutes
- C spine injury missed on initial evaluation
- GCS <14 and head CT >2 hours after admission
- EMS report not in patient chart
- Fewer than two IV lines
- Absent hourly charting
Levels of Review

Action plans established
Loop closure defined

• Primary review
  • Trauma Program Manager (TPM)
  • Close or refer to next level

• Secondary review
  • Trauma program team: TPM + Trauma Medical Director (TMD)
  • Close or define steps to resolve or refer to next level

• Tertiary review
  • Committee chaired by TPM/TMD
  • Close or define steps to resolve
Automatic Tertiary Review (suggested)

- Deaths
- Complications
  - Ex: DVT, nosocomial pneumonia, missed injury
- Unexpected outcomes
- Sentinel events
Automatic Secondary Review (suggested)

- Admits
- Trauma team activations
- Direct to OR
Creating a Trauma Performance Improvement Program

- Consensus on need
- Focus on Improvement and Outcome
- Non Punitive Environment
- Data is helpful in many initiatives
- Participation by Trauma Team
- Integration into Hospital Program
Authority for the PI Program

- Trauma Program Director empowered
- Reporting structure within Hospital hierarchy
- Stick to the written PI plan

- Trauma Panel Requirement
  - General Surgery
  - Emergency Medicine
  - Orthopedic Surgery
  - Anesthesia
  - Radiology
Leadership in Trauma PI

• The hospital leadership must set the tone
  • Expectation for staff participation
  • Endorse trauma standards/criteria
  • Encourage continuous improvement in the organization
  • Support the ‘blameless’ culture
Pitfalls in PI Program

- Wait for problems to happen
- Only look for complications instead of opportunity (like an M&M program)
- Not addressing debatable issues (a ‘status quo’ type approach)
- Waiting for something bad to happen before taking action
- Not doing surveillance on your own guidelines
- Not capturing and communicating pre-hospital issues
More PI Pitfalls

- Failing to actually trend and report back
- Trauma director should review charts at least every quarter looking for issues
- Trying to ‘go it alone’
  - Bring in other experts, services and nurses
- Being punitive
  - No one will participate
- Failure to look at/adhere to time lines
Albert Lea Hospital has 129 beds
Became Level IV State Trauma Center 2009
Rural Trauma Team Development Course held 17 June 2010
Held State COT-sponsored rural ATLS course May 2011
Mr Ron Woodside’s Story
Mayo Clinic Medical Transport

- Albert Lea Hospital findings and treatment
  - Decreasing Blood Pressure
  - Crystalloid resuscitation
  - Left hemo/pneumothorax on Chest X-Ray
  - Chest tube placement
  - Get him into ambulance to go to Rochester
Mayo Clinic Medical Transport

- Critical Care Ground Transport findings and treatment in the ambulance
  - Respiratory distress
  - Tracheal Intubation & mechanically ventilated
  - Worsening Blood Pressure
  - 3 units Red Blood Cells
  - 2 units Thawed Plasma
  - Additional vascular access
  - Intraosseous device placed
Mayo Clinic Medical Transport Program Overview

- Ground – 60,000 transports/year
- Rotor Wing – 2,000 transports/year
- Fixed Wing – 400 transports/year
- Emergency Communications Center – 100,000 calls/year
Critical Care Transport
Mayo Clinic Medical Transport

- Quality Program
  - Transport record review
  - Pre-flight risk assessment tool
  - Vascular access
  - Blood & plasma
Trauma Room Resuscitation
Saint Marys Hospital
Level I Trauma Center

• Trauma evaluation (20 min)
  • Mixed metabolic & respiratory acidosis
  • Continued resuscitation
  • Ventilatory management
  • CT scan & subspecialty evaluation
  • SICU admission (60 minutes after arrival)
Trauma Service
Injuries on admission

- Closed Head Injury with Cerebral Hemorrhage
- Facial fractures
- Multiple bilateral rib fx
- Bilateral scapular fx
- L hemo/pneumothorax

- Bilateral pulmonary contusions
- Grade I splenic injury
- R elbow dislocation
- Lumbar 3 fracture
- Tornado rash

Probability of Survival = 7%
Definitive Care

- Performance Improvement initiative to improve rib fracture patient outcomes
- Dr Brian Kim’s experience and training
- Institutional support of the endeavor
  - Operating Room personnel training
  - New equipment/supplies
  - New imaging paradigm
  - New clinical evaluation scheme with nursing and respiratory therapy
- Role of the trauma mid-level providers
Level I Trauma Center Functions

- Trauma Committee
  - Adult
  - Pediatric
- Trauma PI
  - Near real-time
  - Use of trauma data
  - Audit filters
- Trauma Registry
  - 400+ fields of entry
  - Trauma data
  - Ortho trauma data
  - Audit filters
  - Complications
  - State reporting
  - TQIP reporting
Adult Trauma Allied Health Providers

- Jennifer Cooper, CNP
- Angela Fink, CNP
- Stacey Zimmerman, CNP
Trauma Subcommittee

- Debra Anderson, RN
- John Atkinson, MD
- Venkatesh Bellamkonda, MD
- Athmaram, MD
- Allen Brown, MD
- Jennifer Cooper, CNP
- Amy Determan, RN
- Terri Elsbernd, RN
- Angela Fink, CNP
- Matthew Frick, MD
- Robin Goetz, RN
- Jodi Hellickson, RN
- Debra Horsman, RN
- Carol Immermann, RN
- Donald Jenkins, MD
- Brian Kim, MD
- Jason Kinniburgh, RN
- Mark Mannenbach, MD
- Brian McGlinch, MD
- Christopher Moir, MD
- Delayna Nitz, CNP
- Richard O'Meara, RN
- John Osborn
- Bethany Piotrowski, PA-C
- Dean Potter, MD
- Kyle Satterblom, PA-C
- Andy Sems, MD
- Rosalie Vondrashek, RN
- Martin Zielinski, MD
- Stacey Zimmerman, CNP
Emergency Department Trauma Nursing Committee
Adult Trauma PI Committee

- Dr. Brian Kim – Chair
- Carol Immermann-Sec
- Dr. Beth Ballinger
- Dr. Michael Bannon
- Dr. Venk Bellamkonda
- Dr. Joseph Cass
- Dr. Mark Dekutoski
- Dr. Matthew Frick
- Dr. Daniel Hankins
- Dr. Stephanie Heller
- Dr. Donald Jenkins
- Dr. Brian McGlinch
- Dr. Myung Park
- Dr. Dean Potter

- Dr. Mariela Rivera
- Dr. Mark Sawyer
- Dr. Henry Schiller
- Dr. Andrew Stockland
- Dr. Martin Zielinski
- Dr. Scott Zietlow
- Kath Berns, RN
- Paul Drucker, RN
- Terri Elsbernd, RN
- Scott Feigal, RN
- Rick O’Meara, RN
- Delayna Nitz, CNP
- John Osborn
- Debra Anderson, RN
How to Improve Trauma Outcomes

• PERFORMANCE IMPROVEMENT
  • Establishing practice guidelines
  • Case review
    • Real time
    • PI Committee
  • Database development
    • Track and trend outcomes
    • Identify issues
    • Validate success of interventions
  • Benchmarking
CONTINUOUS SYSTEM PI

Route from Injury to Definitive Care

- **Regional PI**
- **State PI**
- **Regional and State Data**

**Incident**

**EMS**
- 30-60 minutes

**Auto Launch**
- 30-60 minutes

**Ground Transfer**
- 30-60 minutes

**Level III or IV Trauma Center**
- 30-60 minutes

**Definitive Care Level III or IV Trauma Center**
- 30-60 minutes

**Trauma Center PI**

**Resuscitation and Surgical Capability**
Regional Trauma Advisory Committee Role

• Organize and operationalize trauma care within unique regions
  • Prevention through Rehab/Outcome
  • Triage and bypass criteria
  • Treatment algorithms
  • Performance Improvement along the continuum
  • Funding
  • Resource allocation/utilization
  • Plan for the future
The Major Problems

- Lack of a coordinated system
  - Pre-, In- and Post-trauma center care issues
- Lack of designated facilities
- Lack of agreed-upon triage criteria
- Dependency upon un-mandated system development and altruism alone
- Lack of system development funding
What Should We Expect the RTAC to do?

• Bring stakeholders together for the common cause of improving Regional trauma care
• Advise the State Trauma Advisory Committee of problems in the region
• Devise, adopt, implement and monitor Region-specific solutions where possible
• Identify obstacles to successful implementation and devise/promote solutions
• Advise STAC on Region-specific modifications to STAC initiatives for optimal success
How would the RTAC do That?

- Collaborate
  - Meet
  - Value each other
  - Develop plans
  - Share resources
  - Encourage participation
  - Resolve conflicts
  - ↓ duplicate effort
  - Obtain grants
  - Advocate

- Communicate and Educate
  - Triage protocols
  - Train
  - Benchmark outcomes
  - Injury prevention
  - Performance improvement
  - Committees and open forums
  - Advocate

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Specific Initiatives

• Lower Motorcycle Crash Deaths
  • Investigate recent crashes
  • Develop mitigation strategy
    • Education
    • Law enforcement
    • Design
    • Safety
Specific Initiatives con’t

• Lower EtOH-related Crash Deaths
  • Investigate recent crashes
  • Develop mitigation strategy
    • Education
    • Law enforcement
    • Design
    • Safety
Specific Initiatives con’t

• Other issue identification (falls, etc)
  • Investigate recent data
  • Develop mitigation strategy
    • Education
    • Prevention
    • Implementation
    • Monitor
Education Activities

• Provider Education
  • PHTLS
  • TNCC
  • ATLS
  • RTTDC
• Center/System Support Staff
  • Registry/Coding Courses
  • TOPIC
Resource Utilization

- FTE sharing/splitting
- Multi-casualty response
- Data collection
  - Multi-institutional
  - Multi-disciplinary
  - Pre-hospital through post-discharge
- Outcome surveillance and PI
  - Monitor success of interventions
  - Detect /Respond to unnoticed trends
Advocacy

- Identify system development shortfalls
  - Devise region specific solutions
  - Advocate with local/regional officials
  - Educate public on the issues
- Assist STAC in legislative relief initiatives
  - Propose legislative initiatives
  - Advocate with elected officials
  - Educate public
SMRTAC Level III and IV Regional PI Initiative

- Developed 5-part seminar
  - Each is one day long
  - Each focuses on the basics of PI
  - Each builds on the previous course
  - Each has 50% lecture and 50% practical
  - Each is designed to bring PI team together at the table and learn together
- Only course specifically designed to meet the needs of Level III and IV trauma centers (which also happen to be in rural locations)
4 Regional Practice Management Guidelines
Approved at SMRTAC December 2011 for use in Level III and IV centers
Expected Outcomes From Systematic Regional Trauma PI

- Decrease in preventable deaths
  - 9% decrease in Motor vehicle crash deaths
  - Increase survival overall 15-20%
- Increase in quality of life of injured
- Decrease years of life lost
- Decrease cost of trauma care overall
Arkansas Trauma Mortality

- 3rd highest motor vehicle death rate in USA
- 7th highest unintentional death rate in USA
- Per capita trauma deaths & rate (/100k): 2,168/(73.79) in 2006
Thank You!

Questions?