



Trauma Advisory Council

December 16, 2014

1:00 p.m.

Minutes

MEMBERS PRESENT

Kathryn Blackman
Terry Collins
Dr. Clint Evans
R. T. Fendley
John Gray
Dr. Charles Mabry
Dr. Corey Montgomery
Michelle Murtha
Freddie Riley
Dr. Ronald Robertson
Dr. Nathaniel Smith
Dr. Viviana Suarez
Tim Tackett
Brian Thomas
Jon Wilkerson

MEMBERS ABSENT

Dr. Mary Aitken
Janet Curry
Dr. James Graham
John E. Heard
Thomas Jenkins
K.C. Jones
Dr. Barry Pierce
Dr. Michael Pollock
Jamey Wallace
Christi Whatley
Col. Stan Witt (rep. by Sr.
Cpl. Karen E. Clark)

GUESTS

Pam Adams
Jami Blackwell
Dr. James Bledsoe
Kim Brown
Jennifer Carger
Denise Carson
Dr. Kirk Coker
D'borai Cook
Teresa Ferricher
Jasper Fultz
Lee Galbraith
Laura Guthrie
Terri Imus
Carla Jackson
Paula Lewis
Dr. Scott Lewis
Lana Martin
Carla McMillan
Susan Minge
Dr. Rosemary Nabaweesi
Sam Norwood
Donna Parnell-Beasley
Susan Pastor
Mandy Pender
John Recicar
Velvet Reed-Shoults
Patti Rogers
Keith Schaefer
Johnnie Schaumleffel
Ashlee Stockard

GUESTS (Cont.)

Dr. Michael Sutherland
Jeff Tabor
Annette Tatum
Robert Trowbridge
S. Ryan Tyler
Allen "Bubba" Usrey
Tim Vandiver
Samuel A. Webb
Jason White

STAFF

Katy Allison
Teresa Belew
Dr. James Booker
Greg Brown
Melissa Foust
Diannia Hall-Clutts
Rick Hogan
Margaret Holaway
Renee Joiner
Marie Lewis
Renee Mallory
Joe Martin
Dr. Todd Maxson
Brenda Pagan
Austin Porter
Donnie Smith
Karis Strevig
Bill Temple
Mandy Thomas
Vaishali Thombre

I. Call to Order – Dr. Ronald Robertson (Vice-Chair)

The Trauma Advisory Council (TAC) meeting was called to order on Tuesday, December 16, 2014, at 1:03 p.m. by Dr. Robertson.

II. Welcome and Introductions

Dr. Robertson welcomed all guests and members and asked those on the conference call to introduce themselves. He asked TAC members and guests on the conference call who wish their attendance noted for the official minutes to send the appropriate e-mail.

III. Approval of Draft Minutes From September 16, 2014 and October 21, 2014

The TAC reviewed the September 16, 2014 (regular TAC meeting) and the October 21, 2014 (TAC strategic planning meeting) minutes. A motion to approve the minutes was made by Ms. Terry Collins and seconded by Dr. Charles Mabry. The motion carried and the minutes were approved.

IV. Trauma Section Operations Report – Bill Temple

Mr. Temple introduced a new member of the Trauma/Injury and Violence Prevention (IVP) Branch, Vaishali Thombre. Vaishali will replace Majida Kdeiss as the Epidemiologist.

Mr. Temple stated that Arkansas has been selected to receive the Garrett Lee Smith Youth Suicide Prevention grant. This is a five-year grant at \$736,000 per year and will allow three additional people to be hired in the IVP Section. Mr. Temple complimented Teresa Belew, IVP Section Chief, and her staff on the work involved to secure this grant. The goal of the IVP Program is to utilize evidence-based interventions that address our major injury mechanisms and have measurable outcomes. In order to move our program toward this goal, we have asked an outside consultant to come and evaluate our program. The funds for this endeavor are available within the IVP Program.

There is a new pre-review questionnaire being developed that is based on the new *Arkansas Trauma System Rules and Regulations*. This document will be electronic and will be available on a secure web-portal that is under development at the Arkansas Department of Health. Dr. Maxson added that this electronic submission will allow for system-wide evaluation. Filming has begun on a trauma video project that will be used as a teaching tool for emergency medical services (EMS) and hospital emergency department (ED) personnel.

V. State Clinical Operations Report – Dr. Jim Booker and Dr. Todd Maxson

Dr. Booker has developed the metrics for hospitals that will be used to measure and compare trauma patient care and outcomes. Once the metrics are in place, the hospitals should receive reports regarding this data on a quarterly basis. The hospital metrics document is attached.

Dr. Maxson stated that the first phase of the preventable mortality study is almost complete. The goal of the study is to look at trauma mortality in the state and identify opportunities for improvement. The reviewers are examining trauma death records and will compare preventable mortality rates in 2009 (pre-trauma system) to those in 2013-2014 (post-trauma system). The initial findings of the first phase (pre-trauma system) were presented by Dr. Maxson. His presentation is attached. In working with the

professional societies and practicing members in the specialties of orthopaedics and neurosurgery, Dr. Maxson has developed a set of basic procedures or conditions (minimum standards) that should be provided by the specialties of orthopedic surgery and neurosurgery in a trauma center if they are represented as available (on call) on the Arkansas Trauma Communications Center (ATCC) dashboard. Dr. Maxson presented the list that the task force developed and took comments from the members. The list that was presented is attached.

VI. Hospital Cost Study Findings – Dr. Charles Mabry

Dr. Mabry reported that the Arkansas Hospital Association completed a trauma financial survey involving many of the hospitals across our state. The survey is attached. An additional study and paper, titled *Determining the Hospital Trauma Financial Impact (TFI) in a State Wide Trauma System*, was presented by Dr. Mabry. The presentation is attached.

VII. TAC Committee Reports

(Note: Committee minutes are attached, where appropriate; only official action and additional information provided to the TAC is documented in this section.)

- Finance Committee (Dr. Charles Mabry)

Dr. Mabry stated that the Committee met on November 18, 2014 and again today to review the trauma system budget. The following new recommendations with funding amounts were made by the Committee:

- hospitals and EMS agencies should go to base level funding for fiscal year (FY) 2016;
- an EMS Medical Director should be funded for \$125,000 for FY 2016 with a decrease each consecutive year should other funds become available for this purpose;
- \$60,000 for FY 2016 should be allotted for air ambulance Geographic Information System (GIS) software;
- a maintenance fee of \$25,000 should be provided for air ambulance GIS software for FY 2016 and subsequent years;
- \$60,000 should be allotted for one full-time equivalent technical support position for the Trauma Image Repository (TIR) for FY 2016 and subsequent years;
- the ongoing Trauma Death Review should be funded for \$145,000 for FY 2016 and subsequent years;
- the Arkansas Trauma Education and Research Foundation should receive full funding in the amount of \$1,046,788 for FY 2016;
- base funding for the System Enhancement “bucket” should be no less than \$160,000 for FY 2016 and subsequent years;
- \$750,000 for FY 2016 should be allotted for EMS Registry Software;
- \$10,800 for FY 2016 should be allotted for text messaging software; and,
- \$20,000 for FY 2016 should be allotted for upgrades to the TIR server.

Dr. Robertson called for a vote. All the above new recommendations were approved, as was the overall trauma system budget.

- Hospital Committee and Site Survey and Assessment Panel (SSAP) (Dr. James Booker, Chair)

Dr. Booker shared that the SSAP met November 18, 2014 and reviewed the trauma site survey documents for the University of Arkansas for Medical Sciences (UAMS) and Arkansas Children's Hospital (ACH). The panel recommended to the full Committee that UAMS be designated as a Level I adult trauma center and ACH be designated as a Level I pediatric trauma center. The Committee accepted these recommendations and the results were reported to the TAC for information.

- System Outcomes and Evaluations Committee – (Mr. Austin Porter reported for Dr. Steve Bowman, the Committee Chair)

Mr. Porter reported that the first meeting of this Committee was held on December 8, 2014. The meeting consisted of review of the Committee's Charter; review of the data sources that are available, such as mortality reports, Trauma Registry data, and ED Registry data; and review of the component success metrics proposed by the Hospital Committee and ATCC.

- Injury and Violence Prevention Committee (Dr. Mary Aitken – Chair) (no report)
- Rehabilitation Committee (Jon Wilkerson – Chair)

Mr. Wilkerson reported that the Committee has been working on updating their strategic plan. The Arkansas Trauma Rehabilitation Program, Baptist Health Rehabilitation Institute, Disability Rights Arkansas, and NeuroRestorative Timber Ridge are co-sponsoring a Brain Injury Survivors Day on March 11, 2015, at the Benton Event Center.

VIII. Other

Dr. Robertson commended all the work that is being done with the Arkansas trauma system.

IX. Next Meeting Date

The next regularly scheduled meeting is on Tuesday, March 17, 2015, at 1:00 p.m.

X. Adjournment

Without objection, Dr. Robertson adjourned the meeting at 2:45 p.m.

Respectfully Submitted,

Nathaniel Smith, MD, MPH
Secretary Treasurer of the Trauma Advisory Council
Director and State Health Officer, Arkansas Department of Health

2014

Arkansas Trauma Cost Study

**DETERMINING THE HOSPITAL
TRAUMA FINANCIAL IMPACT IN A
STATE-WIDE TRAUMA SYSTEM**

A project commissioned by the Arkansas Hospital Association



BKD LLP
CPAs & Advisors

Introduction

- First of its kind study of actual costs of trauma incurred by hospitals
 - Study planning began in early 2013
 - Requests sent to hospitals fall 2013
 - Included four distinct data sources
 - State trauma registry
 - Hospital claims data
 - Survey data of hospital participation cost
 - Hospital cost reports



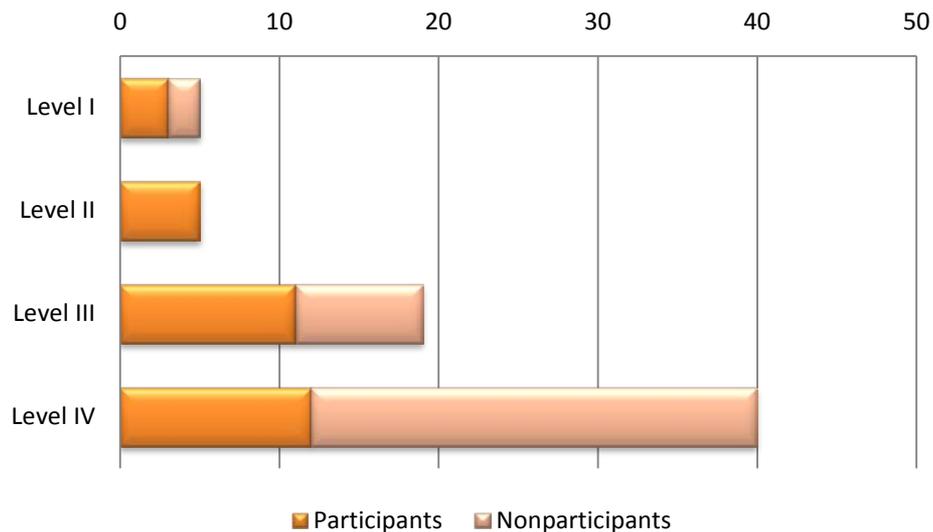
Introduction

- Segregated costs into two areas
 - Patient care costs (PCC)
 - Trauma participation costs
 - Verification
 - Response
 - Other
- Compared cost to reimbursement



Participation

- Participating hospitals represented over 75% of trauma claims.
 - Included hospitals from all trauma center designations:



Study Methodology

- Patient care costs
 - Medicare cost report
 - Detailed hospital claims records
- Trauma system participation costs
 - Detailed survey
- Trauma band number allows hospital data to be joined to trauma registry data



Study Methodology

- Patient care costs
 - Based on Medicare cost finding principles
 - Standard guidelines for what type of expenses are reasonable
 - For instance, exclude fines and penalties, country club dues
 - Standardized cost centers
 - Radiology, pharmacy, etc.
 - Full allocation of overhead



Study Methodology

- Patient care costs
 - Medicare cost report summarizes charges and reasonable direct and indirect costs by revenue-generating cost center
 - $\text{Cost} / \text{Charges} = \text{Cost-to-charge ratio (CCR)}$
 - Adjustments to cost reports
 - Physician costs added back
 - ER and anesthesiology
 - Trauma system participation costs were removed



Study Methodology

- Patient care costs
 - Once adjustments are complete, CCRs recalculated.
 - Charges from trauma claims were summarized by cost center
 - Charges by cost center were multiplied by adjusted CCRs to arrive at estimated patient care costs for trauma claims



Study Methodology

- Patient care costs
 - Cost estimates were compared to several larger facilities' internal cost estimates
 - Average variance less than 10%
 - Supported methodology was reasonable and accurate.



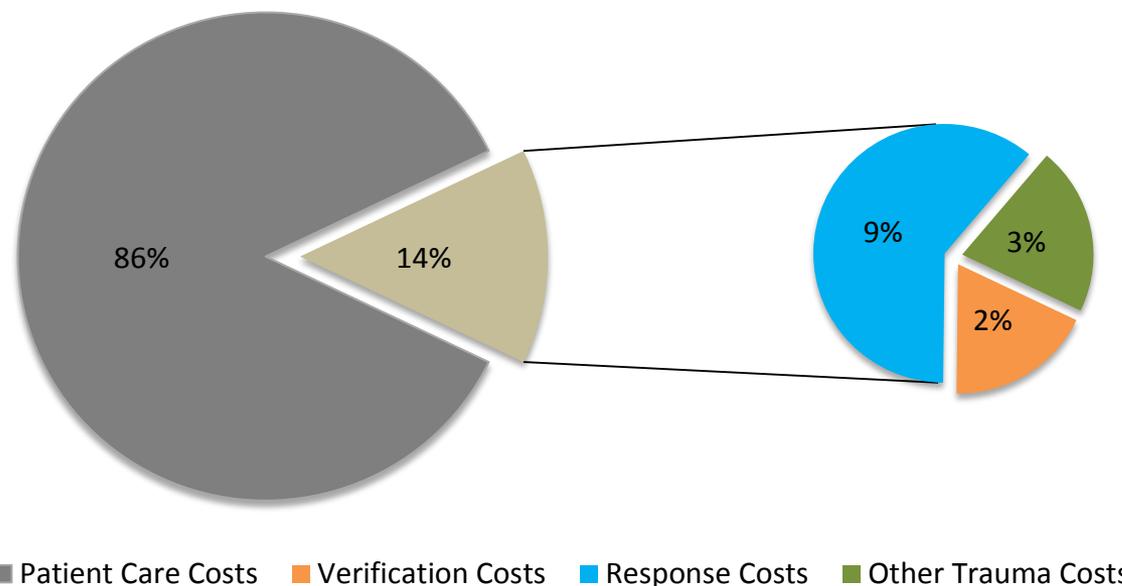
Study Methodology

- Trauma System Participation Costs
 - Detailed cost survey
 - Physician costs
 - Trauma team and activation costs
 - Other costs specific to the trauma system
 - Survey also captured
 - ER and anesthesia subsidies
 - Additional Medicaid reimbursement
 - Not captured in claims detail



Study Results

- Total cost of trauma care
 - ~\$150,000,000
 - Costs by type:



Study Results

- Average trauma care per case

Trauma Center Level	Patient Care Cost	Verification Costs	Response Costs	Other Trauma Costs	Total
I	\$ 57,560,450	\$ 2,039,894	\$ 7,037,890	\$ 1,963,048	\$ 68,601,282
II	35,284,094	623,404	3,874,819	604,231	40,386,547
III	34,843,614	556,754	2,494,561	1,236,932	39,131,860
IV	4,964,806	757,920	15,048	816,669	6,554,444
Total	\$ 132,652,963	\$ 3,977,973	\$ 13,422,317	\$ 4,620,880	\$ 154,674,133
Average Cost per Case	\$ 7,685	\$ 230	\$ 778	\$ 268	\$ 8,960



Survey Results

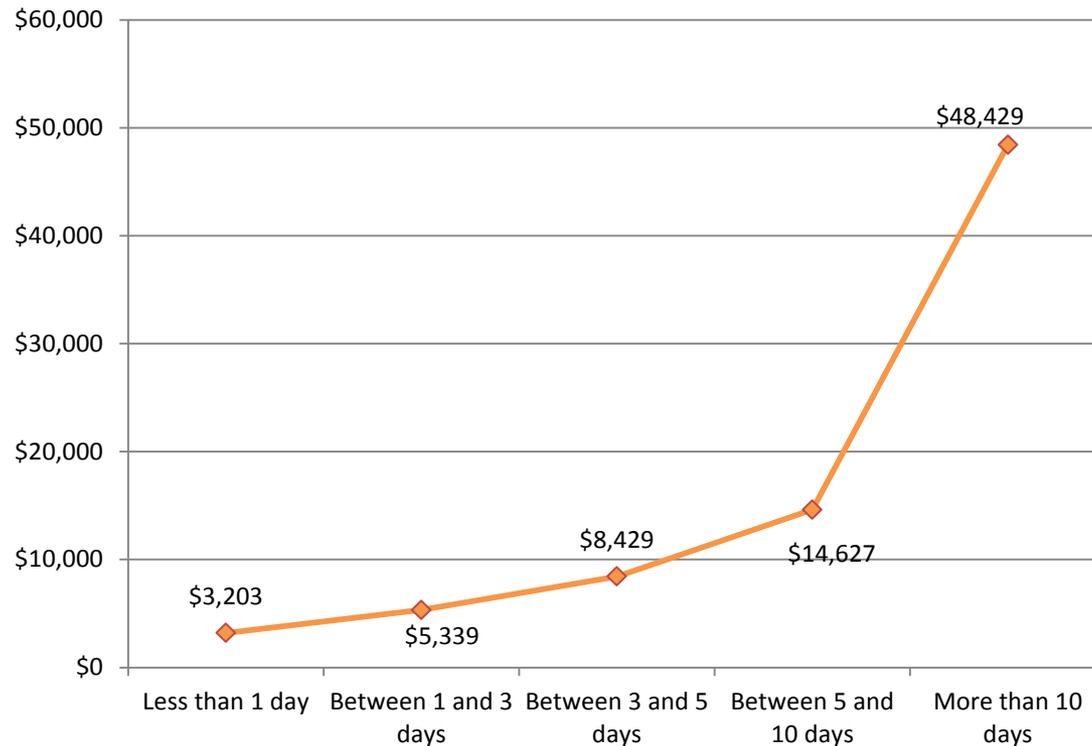
- Cost per case by TC Level

Level	Average Cost per Case
I	\$ 16,237
II	\$ 10,024
III	\$ 6,677
IV	\$ 2,083
Total	\$ 8,960



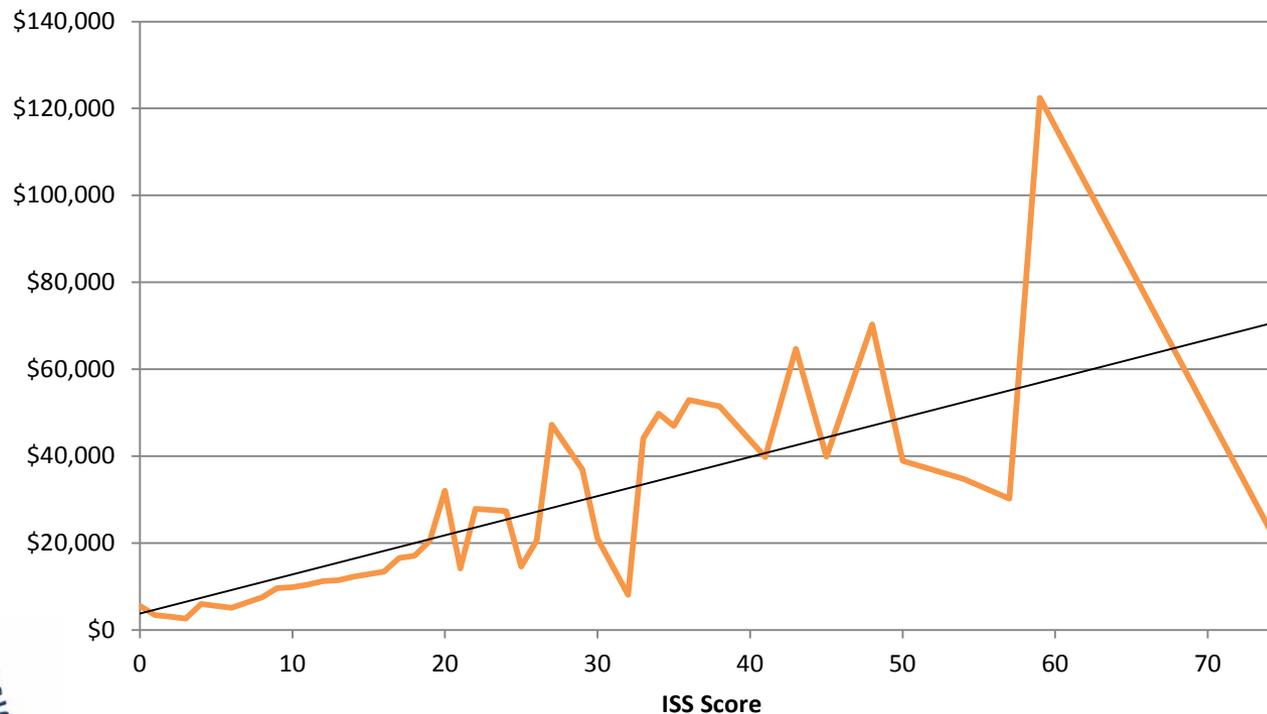
Survey Results

- Primary factors affecting cost of trauma care
 - Length of stay



Survey Results

- Primary factors affecting cost of trauma care
 - Injury severity score



Survey Results

- Primary factors affecting cost of trauma care
 - Bed size

Bed Size	Medicare	Medicaid	Commerical	Self-Pay	Total
25 or fewer	\$ 1,504	\$ 1,055	\$ 1,556	\$ 2,244	\$ 1,572
26–100	3,864	1,082	2,112	1,184	2,361
101–200	5,751	2,450	3,926	3,718	4,354
201–400	10,056	15,909	11,519	8,121	11,318
400 or more	8,114	9,105	8,774	6,388	8,139
Total	\$ 8,134	\$ 12,411	\$ 9,173	\$ 6,921	\$ 8,960



Survey Results

- Cost comparison to reimbursement

	Level I	Level II	Level III	Level IV	Total
Patient Care Payments	\$ 26,983,896	\$ 40,369,405	\$ 18,896,604	\$ 1,098,975	\$ 87,348,879
Grants	3,739,487	3,722,320	1,831,737	407,387	9,700,930
Prov. Assmt/UPL	3,637,536	1,336,088	1,941,732	521,221	7,436,577
Total Reimbursement	34,360,919	45,427,813	22,670,072	2,027,583	104,486,387
Total Cost*	40,040,274	40,386,547	29,016,732	1,681,128	111,124,682
Gain (Loss)	\$ (5,679,356)	\$ 5,041,266	\$ (6,346,660)	\$ 346,455	\$ (6,638,295)

**Does not include estimated costs for nonparticipating hospitals and certain participating hospitals that did not provide reimbursement data.*



Conclusion

- Sources of trauma funding are inadequate to cover hospitals' costs of providing trauma care
- Existing trauma funding distribution methodology is not reflected of costs incurred



1. **Hospital and ICU LOS by ISS (L 1-4)**
2. **Mortality by ISS; inpatient, ED, total (L 1-4)**
3. **ED LOS for hypotensive patient transferred out (L2-4)** LOS defined as arrival time to physical departure from ER
4. **Time to contact ATCC for hypotensive patient transferred out (L2-4)** LOS defined as arrival time to physical departure from ER
5. **ED LOS for patient with head/neck AIS >2 or GCS<9 transferred out (L2-4)** LOS defined as arrival time to physical departure from ER
6. **Time to Contact ATCC LOS for patient with head/neck AIS >2 or GCS<9 transferred out (L2-4)** LOS defined as arrival time to physical departure from ER
7. **ED LOS for patients that are transferred out and have ISS 16+. (L2-4)** ER LOS defined as arrival time to physical departure from ER. Based on ISS at receiving facility
8. **Time to contact ATCC for patients that are transferred out and have ISS 16+. (L2-4)** ER LOS defined as arrival time to physical departure from ER. Based on ISS at receiving facility
9. **Patient hypotensive upon arrival that did not trigger the highest level of activation.** Reported as a percentage of all patients that arrived hypotensive (L1-4)
10. **Urgent transfers / all transfers (L 1-4)**
11. **ED Disposition (L1-4)**
 - % of trauma patients ED disposition – admitted
 - % of trauma patients ED disposition – transferred
 - % of trauma patients ED disposition - discharged
 - % of trauma patients ED disposition – dead
12. **% of patients (ages 5-70) who arrived hypotensive(1st systolic BP < 90) who had exploratory lap more than one and less than 24 hours after arrival** Enter procedure and time in the registry entry (ICD-9 - 42.00-54.99)
13. **Surgeon at bedside within timeframe for high level activations (L 1-4, Any facility with general surgery capability)** Not currently available for web based entry but facilities are urged to begin to track. Will report as % over time from activation
14. required for the facility based on level of designation
15. **% of intubations > 30 minutes from arrival for patients with first ED GCS < 9 (L1-4)** Enter intubation as a procedure with time performed. (ICD9 – 96.04) If patient is intubated on arrival the GCS should have the suffix “T”
Reported as a percentage of all registry eligible patients with GCS <9 who are intubated in the ER
16. **Ortho patients ED disposition**
 - % of Ortho patients ED disposition – admitted
 - % of Ortho patients ED disposition – transferred

Report as a % of registry eligible patients seen in ER and surviving to either admission or transfer with ICD code showing orthopedic injury
17. **Timing of appropriate antibiotic administration for open fracture (L 1-4)** Enter antibiotic administration as a procedure with time (ICD9 - 99.21) Will report average time and percentage over one hours

18. **ED to washout time for open fractures (L1-L4)** Arrival to OR start time. Enter operative procedure code and time. (ICD9 – 78.10-78.19; 78.10-78.59; 79.60-79.69; 86.2; 96.59) Will report average time and percentage over 8 hours
19. **Elderly patients (> 64 years of age) with head AIS >1 time to CT (L 1-4)** Enter CT as a procedure with times (ICD9 – 87.03) Arrival time to scan time. Will be reported for first facility where CT head is recorded
20. **FIM for head AIS > 3 and LOS > 72, and age >8 (L1-2)** Report includes number of incomplete records
21. **Complications; total count of each complication, incidences per 100 admitted patients for each complication (L1-3)**
Track all complications on NTDB list reported separately
Report that lists any of the complications as YES and none of the complications as NO
Report with a percent of YES and NO for each complication

*Arrival time values begin with physical arrival or first documentation of patient contact

Orthopaedics

- Evaluation of all patients with musculoskeletal trauma
- Reduction of traumatic dislocations - non-spine
- Diagnosis and treatment of compartment syndrome
- Closed reduction and casting of extremity injuries all ages
- Closed reduction, percutaneous pinning extremity injuries – age > 12
- External fixation for unstable fractures including sacroiliac fractures.
- Washout and debridement of open fractures
- Evaluation and triage of mangled extremities
- IM nailing of long bone fractures of the lower extremities

Neurosurgery

- Craniotomy for extra-axial hematoma
- Craniotomy for intra-cranial hematoma due to trauma
- Placement of an intra-cranial pressure monitor
- Evaluation of patients with decreased level of consciousness due to injury
- Evaluation and initial stabilization of acute spinal column injury

Preventable Mortality Review in Arkansas

12/17/2014

Background

- Performance improvement of the Arkansas Trauma System
- Compare Preventable Mortality rates from pre-system (2009) to present (2013/2014)
- Identify areas of opportunity for improvement within the system.

Method

- Engaged Nationally known group to educate
- Death records from Vital Stats
 - ◆ Statistical sampling
 - ★ Urban/rural
 - ★ Peds/adult
 - ★ Mechanistic
 - ★ Intent
 - ★ Racial

Method

- Records Reviewed
 - ◆ Traffic data
 - ◆ Pre-hospital (s)
 - ◆ Hospital (s)
 - ◆ Autopsy

Method

- Out of State Project Coordinator and Trauma Physician
 - ◆ ED Physician
 - ◆ Surgeons
 - ★ Adult, level I, II, & III
 - ★ Peds
 - ◆ Paramedic – ground and air
 - ◆ Trauma nurse – Level I & III

Method

- Modified Delphi technique
 - ◆ Expert Consensus with agreement by out of State chair

 - ◆ Care appropriate
 - ◆ Potentially preventable with OFI
 - ◆ Frankly preventable with OFI

 - ◆ List OFIs and the “owner” of the OFI in a ranked order.

 - ◆ IVC data

Method

- One year of data - 2500 deaths
- 35% reviewed
 - ◆ 75% never reach hospital
 - ◆ 25% (290) reached hospital
- ◆ >800 man hours to review charts and gather PI data

Findings

- 65% died at the scene of event
- 74% Caucasian, 22% AA, 4% other
- 55% MVC,
- 24% firearm – ½ homicide, ½ suicide
- 21 % other

Findings

- 30% preventable mortality
- Nationally
 - ◆ 20% in new systems
 - ◆ 3- 5% - mature system states
- 54% had additional OFI
- 16% care was deemed appropriate

Findings

- Death < 24 hours
 - ◆ Bleeding – 57%
 - ◆ CNS -17%
 - ◆ Airway – 13%
 - ◆ Indeterminate – 12%

Findings

- > 24 hours
 - ◆ CNS – 42%
 - ◆ Other – 23%
 - ◆ In determinant – 15%
 - ◆ Sepsis -12%
 - ◆ Bleeding – 4%
 - ◆ Airway – 4%

Findings

- In the **prehospital** phase of care OFI included:
 - ◆ Airway control,
 - ◆ Breathing support,
 - ◆ Intravenous fluids administration,
 - ◆ Excessive scene time, and
 - ◆ Bleeding control.

Findings

In the **emergency department (ED)**
OFI included:

- ◆ CT scan imaging (time spent in CT or decedent was taken to CT in shock),
- ◆ Failure to recognize injury,
- ◆ Chest injury treatment,
- ◆ Fluid resuscitation in shock patients,
- ◆ Delay/lack of blood products, and
- ◆ Delay in airway control.

Findings

- In the post ED phase OFI included:
 - ◆ Delays to operating room,
 - ◆ Therapeutic procedure delays,
 - ◆ Inappropriate operations,
 - ◆ Failure to prevent blood clots, and
 - ◆ Diagnostic procedure delays.

Future

- Final report for 2009
- “Post implementation” 2013/2014 phase completed January
- Report Feb/March 2015
- Ongoing

**Trauma Advisory Council
Injury and Violence Prevention Committee
Minutes**

Time and Date: 3:00pm November 13, 2014

Location: Freeway Medical Tower

Meeting Room: Room 906

Attending: Lacye Vance, Beverly Miller, Mary Aitken, Teresa Belew, Brian Nation, Katy Allison, Sherry Johnson, Ashley Lentz, Jennifer Carger, Kim Brown, Mandy Thomas, Alan Mease, & Gabriela Lane

Call In: Robert Mabe, Patty Braun, Carla McMillan, & Mandy Pender

- I. Welcome and Introductions
- II. Review of minutes-
 - a. August 14, 2014 minutes reviewed and accepted by unanimous vote
- III. TRAC Retreat Summary and Metrics
 - a. Summary-
 - i. The TAC retreat was held at Petit Jean in October 2014. This time was spent looking at outcomes of the last five years.
 - ii. The TAC also started planning for the future. This included discussing the focus of the next few years, how to measure what we do, how to prioritize metrics.
 - b. Metrics-
 - i. The TAC challenged attendees to start thinking about how to move forward including the focus of IVP efforts in the future. Metrics for IVP should include not only injury mortality and morbidity but other measures—please send suggestions to Dr. Aitken.
 - ii. ADH plans to bring in a consultant to look at IVP globally.
- IV. TRAC Activities Report-
 - a. Pay for Performance initiative-suggestions discussed:
 - i. Suicide Prevention Clinical Awareness
 1. Resources in ED
 2. Posters in staff areas
 3. Triage and evaluation guidelines
 - ii. Motor Vehicle Safety
 1. Update and enforce hospital policy on seat belt use and no texting while driving
 2. Adopt signage in parking lots
 - iii. Dr. Aitken will be sending out revised guidelines and metrics to be voted on and presented to TAC Finance Committee. All will need to be implemented by March 31, 2015 to qualify for the P4P funds.
 - b. TRAC IVP Chair updates-current plans either approved or under consideration include:
 - i. North Central has chosen two candidates to attend an ASIST T4T in the spring. There is an ASIST Workshop was scheduled to take place in December 2014 but has been postponed until spring 2015. The TRAC will also order and dispense life jackets, smoke detectors, and bike helmets to EMS. They are also interested in holding a CPS technician class.
 - ii. North East has chosen two candidates to attend an ASIST T4T in the spring. They held a Bike Safety/Helmet event in September and will plan another for the spring. The TRAC would also like to offer A Matter of Balance and Safety Baby Shower programs. They are working to schedule T4T's after the first of the New Year.
 - iii. North West has chosen two candidates to attend and ASIST T4T in the spring. They will continue to implement the KOGNITO license the purchased last fiscal year. They also plan to focus on suicide prevention and safe driving in local schools.

- iv. Arkansas Valley has purchased 130 KOGNITO license to be used in TRAC ED's. They are scheduling A Matter of Balance Classes with the coaches trained last fiscal year. AR Valley has also furnished ATV helmets purchased last year to surrounding ATV Safety Events. They have also furnished car seats to local Police Departments who have technicians.
- v. Central has implemented two hospital based seat belt challenges.
- vi. South East is seeking candidates to send to an ASIST T4T. They have also discussed the possibility of purchasing KOGNITO license. South East will also continue implementing CPS events in communities.
- vii. South West considering options focusing on schools.

V. HHI Report-

- a. New reporting system in place, this will lead to improved reporting on activities. The HHI staff around the state continues to participate in IVP activities. ADH, SIPP, and HHI are working to compile a list of HHI staff that has been trained in specific mechanism programs.

VI. SIPP Activity Report-

- a. SIPP staff is working to find and implement IVP programs that fill in gaps of service.
 - i. CarFit program for senior adults is a one on one car evaluation for senior drivers. It focuses on improving motor vehicle education and safety practices.
 - ii. Smoke detector installation program focuses on partnerships between communities and fire departments to increase the amount of homes with working smoke detectors.
 - iii. Senior adult medication label literacy programs focus on decreasing drug misuse.
 - iv. Zac's Camp is a water safety program implemented through the Boys and Girls Clubs. Arkansas has never participated in this program and is working with interested Boys and Girls Clubs.
 - v. Suicide and Bully prevention training conducted this fall for school counsellors has created a possible link between schools and community programs.

VII. RPE Report-

- a. No report given

VIII. ADH Injury Prevention Report –

- a. Fifty Seven people with approximately 30,000 social medial friends participated in a Thunder Clap awareness campaign. It focused on five years of GDL and Five safety messages.
- b. Arkansas Statewide Suicide Initiative has initiated the Arkansas Youth Suicide Prevention Project. The project will focus on 18-24 year olds with social history of military service and/or other high risk groups including LGBT. The group will meet on the first Friday of even month to continue planning and implementation of training and other activities.
- c. Concussion protocols are online and available for use; may continue to be modified as needed. Dr. RJ Elbin sponsored a free four hour online webinar pertaining to concussions on Friday November 14, 2014. Link to the recording is: <https://ice.waltoncollege.uark.edu/Mediasite/Play/265c2579be334f3ba7b032963535a4a41d>
- d. The Statewide IVP Conference is scheduled for April 20-22 2015. A large TRAC presence is wanted.

IX. TBI Registry/Rehabilitation Report-

- a. Arkansas Trauma Rehabilitation Conference 2015
 - i. May 13 and 14, 2015 Embassy Suites Hotel Little Rock
 - 1. See attached conference update
 - ii. MSKTC-Model Systems Knowledge Translation Center, national center that helps make research meaningful and understandable to those with spinal cord injury, traumatic brain injury, and burn injury. www.MSKTC.org

X. Next Meeting Date: February 12, 2015 at 3pm.

TRAUMA DEATH QUALITY IMPROVEMENT FORM

This is a **privileged and confidential** document. The contents shall not be disclosed to any person, agency or entity not directly associated with hospital peer review or the TRAC quality improvement process. The Trauma System Act (Ark. Code Ann., Section 20-13-819 et seq) authorizes this process. Violations of privacy and security requirements may lead to civil and criminal penalties pursuant to state and federal laws and regulations.

		Findings at Reporting Facility																							
		Determination:	Death Adjudication:	Preventability:	CF/J:																				
Trauma Death (A trauma death is being defined as any patient that is treated at the scene and dies, dies enroute, arrives to the hospital pulseless (whether CPR is in progress or not), or dies while admitted to the hospital (this does not include transfers to hospice or long term care) that has received a trauma band and is in the Arkansas trauma system.)																									
Determination: ISR = Internal (Hospital)System Related ESR=External System Related DR = Disease Related PR = Provider Related	Death Adjudication: UM = Unanticipated Mortality with OFI AM = Anticipated Mortality with OFI M = Mortality without OFI CD = Cannot be determined	Contributing Factors/Judgment: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1. Delay in Diagnosis</td> <td style="width: 50%;">11. Communication Issue</td> </tr> <tr> <td>2. Delay in Decision to Transfer</td> <td>12. Equipment Issue</td> </tr> <tr> <td>3. Delay in Acceptance of Transfer/Urgent Transfer</td> <td>13. Triage Issue</td> </tr> <tr> <td>4. Delay in Communication with ATCC</td> <td>14. Failure of Scene EMS to Contact ATCC</td> </tr> <tr> <td>5. Delay in Contacting EMS</td> <td>15. Incorrect Recommendation by ATCC</td> </tr> <tr> <td>6. Delay in Executing Transfer by EMS</td> <td>16. Transport Availability Issue</td> </tr> <tr> <td>7. Error in Diagnosis</td> <td>17. Service not allowed to Intubate</td> </tr> <tr> <td>8. Error in Judgment</td> <td>18. Other</td> </tr> <tr> <td>9. Error in Technique</td> <td></td> </tr> <tr> <td>10. Error in Management</td> <td></td> </tr> </table>				1. Delay in Diagnosis	11. Communication Issue	2. Delay in Decision to Transfer	12. Equipment Issue	3. Delay in Acceptance of Transfer/Urgent Transfer	13. Triage Issue	4. Delay in Communication with ATCC	14. Failure of Scene EMS to Contact ATCC	5. Delay in Contacting EMS	15. Incorrect Recommendation by ATCC	6. Delay in Executing Transfer by EMS	16. Transport Availability Issue	7. Error in Diagnosis	17. Service not allowed to Intubate	8. Error in Judgment	18. Other	9. Error in Technique		10. Error in Management	
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Opportunity for Improvement: <input type="checkbox"/> Yes <input type="checkbox"/> No	Preventability: FP=Frankly preventable PP=Possibly preventable NPA=Non-preventable care appropriate NPO=Non-preventable OFI NPC=Non-preventable no care																								
Trauma Band #:	Trauma Registry #:	Age:	ISS:	TRAC:(circle all that apply) AV NE NC NW SE SW CA	Date of Patient Death:																				
Reporting Facility and Designation Level:	Transferring Facility and Designation Level:	Contact person:	Phone #:	Email:																					
Transferring Facility made aware of Pt Death by receiving facility? Y/N	Date Transferring Facility Made Aware of Pt Death:				<i>*Transferring Facilities must also submit a death form after the receiving facility notifies them of patient death*</i>																				
Case Summary: (Attach other pertinent information to this form for TRAC MD and TRAC QI Chair review)																									
Hospital QI Findings with OFI's: (Attach meeting minutes or summary)																									
Hospital Trauma Medical Director Signature/ Date : _____																									

System Partners Involved: please note all hospital, EMS and ATCC personnel involved with case	Contact person:	Phone #:	Email:	Aware of Case (Y/N)

Date sent to state TNC: _____ **Date received by state TNC:** _____

TRAC QI Chair/ TRAC MD Summary:

TRAC Medical Director: _____ **TRAC QI Chair:** _____
Date: _____ **Date:** _____

Opportunity for Improvement:

- | | | |
|---------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------|
| <input type="checkbox"/> Referral to Regional QI for focused review
Date referred: | <input type="checkbox"/> Trend | <input type="checkbox"/> Hospital FYI Letter |
| <input type="checkbox"/> No Action required
Date comments sent back to facility: | <input type="checkbox"/> Refer to State QI | <input type="checkbox"/> Additional Information
Required |

TRAC QI Subcommittee summary of deliberation:

TRAC MD: _____ **Date of TRAC QI Subcommittee meeting:** _____

Quality Improvement Actions (s):	Date Completed:	Trend Evaluation:
<input type="checkbox"/> None Required		
<input type="checkbox"/> Trend		
<input type="checkbox"/> Guideline or Protocol		
<input type="checkbox"/> Letter with Corrective Action Plan Required		
<input type="checkbox"/> Education-Specify:		
<input type="checkbox"/> Enhanced Resources, Facilities, Communication		
<input type="checkbox"/> FYI Letter		
<input type="checkbox"/> Referral for M&M Peer Review/Operational Committee Presentation		
<input type="checkbox"/> Referral to ATCC _____		
<input type="checkbox"/> Referral to TAC State QI Committee		
Re-Evaluation Dates:		
Loop Closure Date:		

Trauma band# _____ **Received by ADH Section** _____

State TMD Comments:

STMD: _____ **Date:** _____

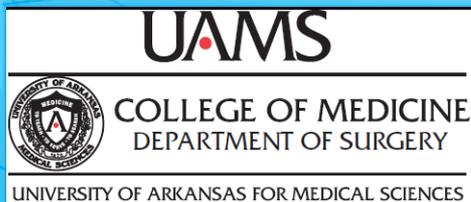
Determining the Hospital Trauma Financial Impact (TFI) in a State Wide Trauma System

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Ron Robertson*
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Funded in part by a grant from Blue & You Foundation for a Healthier Arkansas



Study Development: 2011-2013

- * **ACS COT Trauma System Consultation-**

“...routine collection of financial data from all participating health care facilities is encouraged, to fully identify the costs and revenues of the trauma system, including costs and revenues pertaining to patient care, administrative, and trauma center operations.”

- * **TAC Finance Committee-**

- * Worked with Arkansas Hospital Association and ADH to develop survey of hospital costs and trauma financial impact (TFI)
- * Identified Baird, Kurtz, and Dobson (BKD) as contractor to help develop methodology and conduct survey
- * **Divided TFI into 3 components:**
 - * Patient Care,
 - * Response, and
 - * Verification costs

Study Methodology

Trauma Registry Data

Table A-- Trauma Registry Components

TCS ID	ED Temp
Age	ED Respiratory Rate
Sex	ED SBP
Race	Pulse Ox
Ethnicity	ED Eye GCS
Patient Zip Code	ED Verbal GCS
Injury Date	ED Motor GCS
Injury Type	ED GCS Total
Work Related	HCT
Occupation	Injury Time
Occupation Industry	Complications
ECode	Comorbidities
Injury Location Site	Autopsy Done
ECode 2	Discharge Date Time
Injury Zip Code	Discharge Destination Hospital
EMS Agency	Physician Call Time
EMS Transport Mode	Physician Arrive Time
Scene Report Trip Form	ED GCS Qualifiers
Arrived From	Height
Direct Admit	Weight
ED Arrival Date Time	Base Deficit
ETOH Tested	Supplemental Oxygen
Drug Tested	EMS SBP
Trauma Team Activation	EMS Pulse Rate
ED Disposition	EMS Respiratory Rate
Admit Service	EMS Respiratory Assistance
Referring Hospital	EMS Oxygen Saturation
Referring Hospital Arrival Date	EMS GCS Eye
Body Region	EMS GCS Verbal
ISS	EMS GCS Motor
ICU Days	EMS GCS Total
Vent Days	EMS GCS Qualifiers
Hospital Disposition	Scene Related Delays
Organs Donated	EMS Dispatch Date Time
Hospital Charges	EMS Scene Arrival Date Time
Reimbursement	EMS Departure Date Time
Insurance 1	EMS Arrival Destination Date Time
Insurance 2	EMS Level of Provider
AIS Region	Airbag Deployment
AIS Severity	Child Specific Restraint

Study Methodology

- * 6 Financial measures:
 - * Charge
 - * Payment
 - * Adjustment / Refund
 - * Estimated Cost
 - * Total Margin = Payment - Estimated Cost
 - * Internal Cost- used to test validity of estimated cost for those centers reporting internal cost
- * Multiple payer classes grouped into 4 major classes:
 - * Medicare
 - * Medicaid
 - * Other 3rd party (commercial, worker's comp., etc.)
 - * Self-pay

Study Methodology

- * Data manipulation and analysis:

- * BKD prepared a de-identified dataset for research purposes with unique ID # for each patient
- * Hospitals were identified only by their TC level
- * Standard statistical analysis:
 - * Kruskal-Wallis (KW) tests and Wilcoxon rank sum tests (WRST) compared TCs with respect to continuous and ordinal variables
 - * Pearson's χ^2 tests were used for categorical variables
 - * Spearman's rho correlation coefficient assessed the association between financial measures and patient medical/ hospitalization characteristics (e.g., ISS and LOS).

Study Development: 2014

- * **ADH Scientific Advisory Committee reviewed and approved 6 goals:**
- * Determine for each level of trauma center, the Trauma Center Verification costs
- * Determine for each level of trauma center, the Trauma Center Response costs
- * Determine for each major type of trauma the primary cost drivers and the magnitude of impact for each cost driver on the overall costs of care
- * Determine the variation in cost between similar trauma centers and for similar patient trauma types, so that efficient providers and techniques of trauma care delivery can be identified.
- * Determine if excess or unnecessary costs exist in the provision of trauma patient care, trauma response, or trauma center verification, so that these areas of cost-savings opportunities can be identified.
- * Determine the increased costs associated with poor outcomes (excessive complications, morbidity, or mortality) from the care delivered to trauma patients.

Study Development: 2014

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Study Results

- * PCC Response- 32 out of 69 TCs submitted data
 - * Level I (5)- 3
 - * Level II (5)- 5
 - * Level III (20)- 12
 - * Level IV (39)- 12
- * 13,215 out of 17,539 patients included (75.3%) in state trauma registry
- * Verification and response cost survey- 27 out of 69 TCs submitted data

Study Methodology

- * **Verification and response costs- data analysis:**
 - * Wide variation in how each hospital captured and accounted for these costs
 - * Some TCs had all employed MDs, some paid for on-call coverage, while others did not pay for on-call coverage
 - * Wide gap between on-call MD requirements between Level I & II TCs and Level III & IV TCs
 - * Numbers of patients treated annually: Wide variation between TCs
 - * **Decision:**
 - * **Combine Level I & II into one group, and Level III & IV into a second group**
 - * **Sum both verification and response costs for each TC and,**
 - * **Express as cost per patient treated for two levels of TCs**

Study Results

- * Patients empirically divided into groups:
 - * All patients
 - * LOS < 2 days,
 - * LOS 2+ days (48 hours or more from ED arrival)
- * TC: Levels I, II, and combined levels III & IV
- * Analysis of TFI by level of TC and ISS score groups
- * ISS score groups-
 - * “minor trauma”= ISS <9 vs.
 - * “major trauma” = ISS 9+
 - * ISS- <9, 9-15, 16-14, 25+

Summary of all patients

All Patients		Patient Care Costs per Patient			Response & Verification Costs per Patient	Total Cost per Patient
Level of TC		Total Cost	Payments	Margin		
I	Mean	\$13,057	\$11,571	(\$1,486)	\$1,492	\$14,549
	Std Dev	\$23,457	\$30,823	\$22,498	\$647	\$24,104
	Median	\$4,696	\$1,602	(\$1,116)	\$1,689	\$6,385
	N	2332				
II	Mean	\$8,758	\$10,020	\$1,262	\$1,492	\$10,250
	Std Dev	\$13,017	\$22,419	\$17,346	\$647	\$13,664
	Median	\$4,426	\$4,358	\$50	\$1,689	\$6,115
	N	4029				
III & IV	Mean	\$5,201	\$3,817	(\$1,384)	\$636	\$5,837
	Std Dev	\$8,547	\$8,054	\$7,765	\$431	\$8,978
	Median	\$2,394	\$1,091	(\$443)	\$450	\$2,844
	N	5239				

Summary of all patients

Level of TC		ISS	LOS	ICU Days	Vent Days	Age	Male %	Mortality
I	Mean	10.5	5.7	2.2	1.4	42.4	72%	4.00%
	Std Dev	10.0	10.3	6.4	6	18.6		
	Median	9.0	2.5	0	0	39.5		
	N	2332						
II	Mean	8.5	4.3	1.6	0.7	50.4	59%	3.70%
	Std Dev	7.6	5.8	4.2	2.9	23.7		
	Median	5.0	2.7	0	0	51.0		
	N	4029						
III & IV	Mean	6.3	2.2	0.4	0.2	48.9	54%	2.00%
	Std Dev	5.3	3.2	1.9	1.3	26.2		
	Median	4.0	1.1	0	0	51.0		
	N	5239						

Patients LOS \geq 2 Days

Level of TC		CHARGES	PAYMENTS	TOTAL EST. COST	Margin	Response & Verification Costs	Total Cost per Patient
I	Mean	\$85,353	\$20,577	\$23,241	(\$2,665)	\$1,492	\$24,733
	Std Dev	\$131,480	\$41,083	\$29,164	\$30,925	\$647	\$29,811
	Median	\$47,782	\$8,385	\$13,712	(\$3,640)	\$1,689	\$15,401
	N	1177					
II	Mean	\$54,251	\$14,882	\$13,515	\$1,368	\$1,492	\$15,007
	Std Dev	\$60,622	\$27,782	\$15,296	\$22,263	\$647	\$15,943
	Median	\$34,254	\$7,837	\$8,555	\$22	\$1,689	\$10,244
	N	2313					
III & IV	Mean	\$30,420	\$7,784	\$10,719	(\$2,935)	\$636	\$11,355
	Std Dev	\$32,403	\$11,412	\$11,827	\$11,870	\$431	\$12,258
	Median	\$23,752	\$6,584	\$8,115	(\$1,147)	\$450	\$8,565
	N	1950					

Patients LOS \geq 2 Days

Level of TC		ISS	LOS	ICU Days	Vent Days	Age	Male %	Mortality %
I	Mean	14.5	9.6	4.0	2.6	45.0	70.8%	3.0%
	Std Dev	10.1	12.3	8.3	8.1	18.8		
	Median	12.0	5.9	1.0	0.0	43.0		
	N	1177						
II	Mean	9.6	6.8	2.7	1.2	56.0	53.6%	1.7%
	Std Dev	7.4	6.5	5.1	3.8	22.2		
	Median	9.0	4.7	0.0	0.0	57.0		
	N	2313						
III & IV	Mean	7.1	5.0	0.9	0.3	60.8	43.9%	1.6%
	Std Dev	5.2	3.8	2.8	2.0	21.9		
	Median	5.0	3.9	0.0	0.0	63.0		
	N	1950						

Data for ISS Groups- All Patients with LOS ≥ 2 days

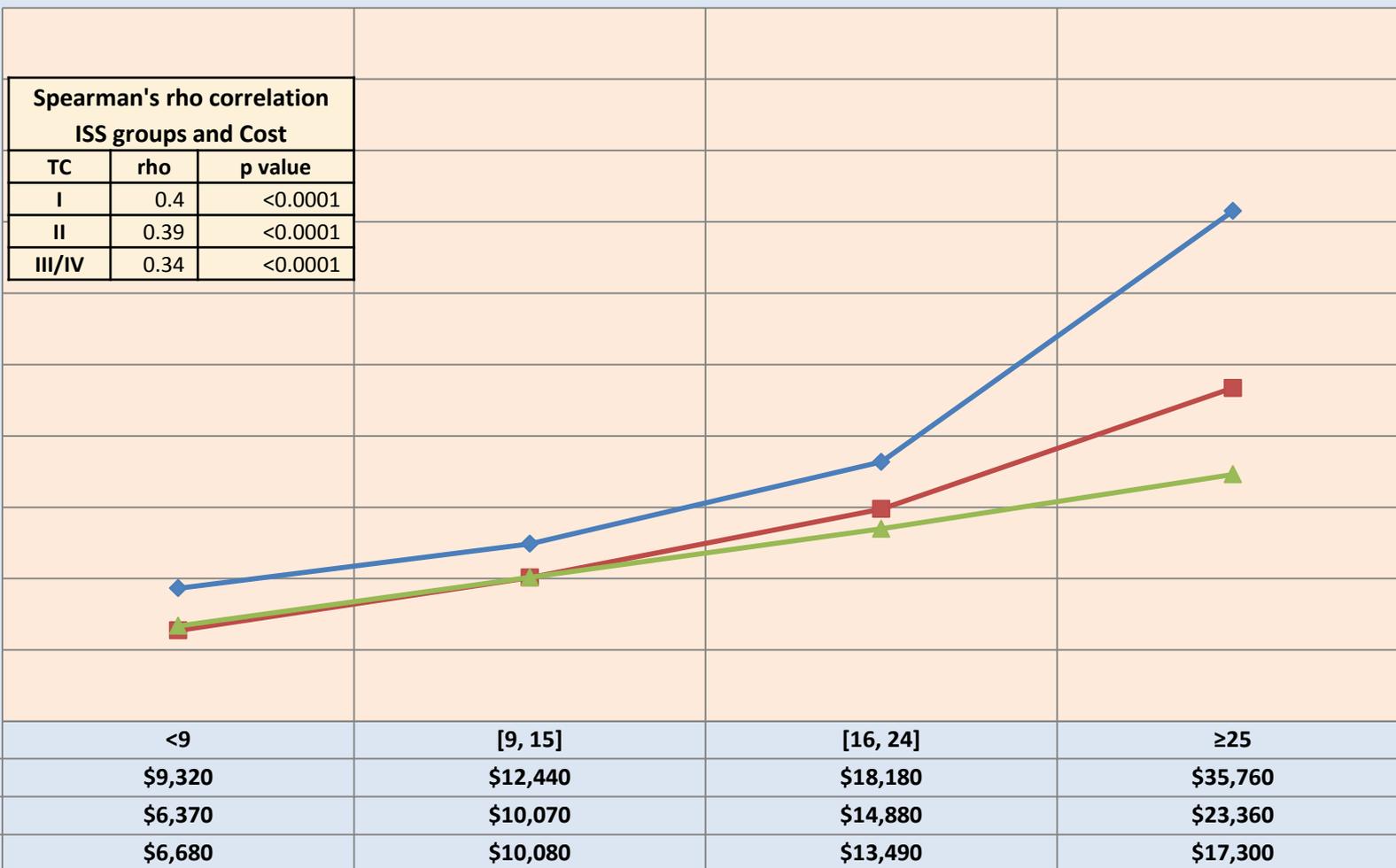
		Charges	Total Est. Cost	Payments	Margin	Level of TC	ISS
ISS<9, LOS 2+	Mean	\$30,056	\$8,827	\$7,646	(\$1,181)	2.37	4.06
"Minor trauma"	Std Dev	\$25,968	\$8,165	\$11,575	\$10,483	0.72	1.52
	Median	\$23,375	\$6,787	\$5,323	(\$550)		
	N	2463					
ISS 9+, LOS 2+	Mean	\$70,942	\$19,404	\$18,467	(\$937)	1.99	14.47
"Major trauma"	Std Dev	\$99,037	\$23,325	\$35,082	\$27,790	0.77	7.95
	Median	\$41,683	\$11,961	\$10,000	(\$1,230)		
	N	2978					
ISS 9-15, LOS 2+	Mean	\$49,829	\$14,340	\$13,398	(\$942)	2.14	10.18
	Std Dev	\$23,963	\$18,395	\$15,516	\$22	0.77	1.75
	Median	\$34,357	\$10,390	\$9,588	(\$817)		
	N	2031					
ISS 16-24, LOS 2+	Mean	\$87,649	\$23,615	\$22,299	(\$1,316)	1.72	18.80
	Std Dev	\$83,502	\$21,883	\$36,987	\$30,253	0.69	2.38
	Median	\$57,937	\$15,698	\$9,339	(\$3,319)		
	N	593					
ISS 25+, LOS 2+	Mean	\$164,092	\$41,407	\$41,132	(\$275)	1.56	31.82
	Std Dev	\$203,284	\$41,621	\$63,885	\$54,967	0.65	8.19
	Median	\$106,468	\$29,792	\$15,896	(\$4,893)		
	N	354					

Data for ISS Groups- All Patients with LOS ≥ 2 days

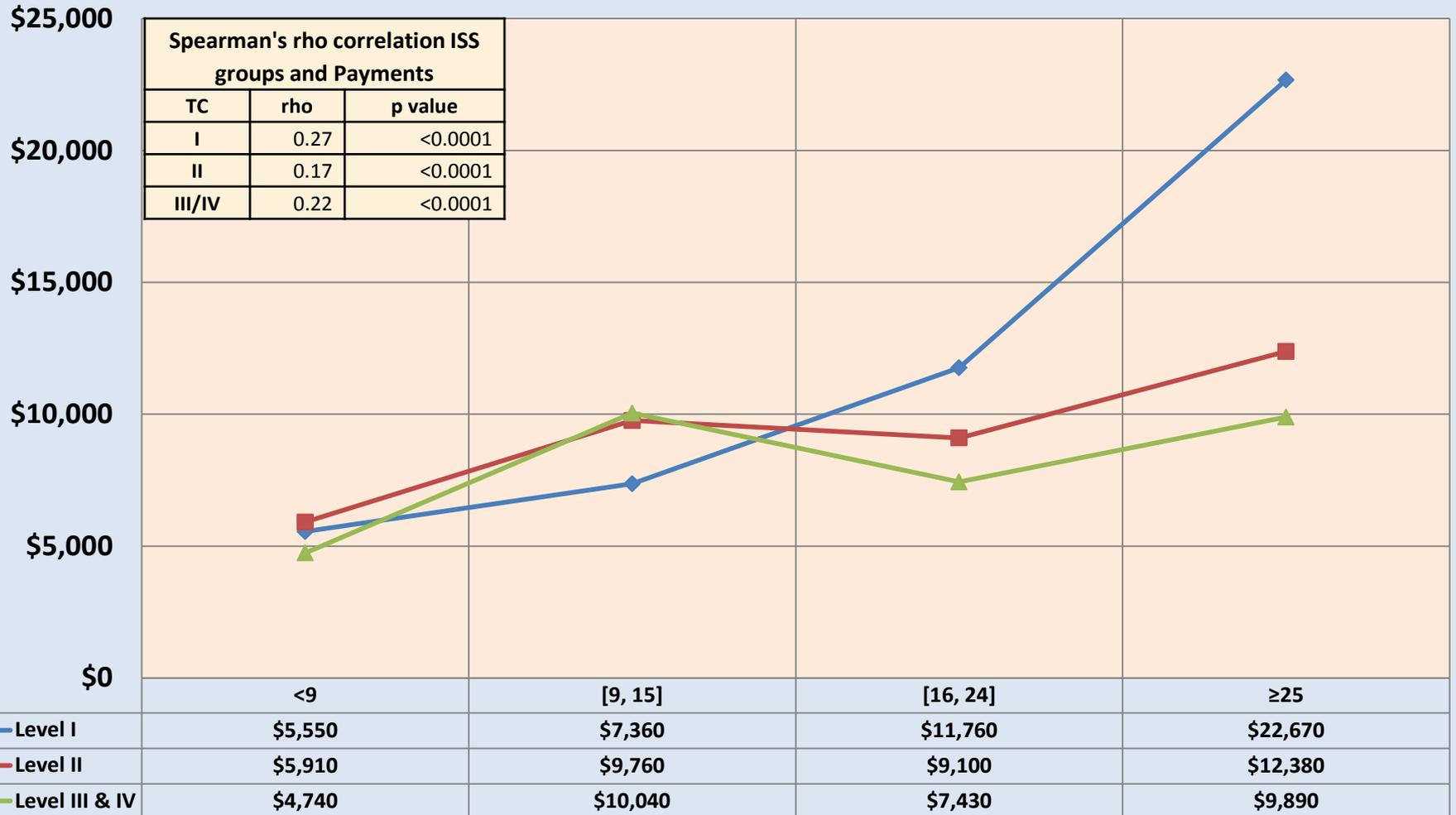
		Level of TC	ISS	LOS	ICU Days	Vent Days	Age	Male %	Mortality %
ISS<9, LOS 2+	Mean	2.37	4.06	4.79	0.58	0.19	58.29	46.1%	1.0%
"Minor trauma"	Std Dev	0.72	1.52	3.61	1.68	1.22	22.17		
	Median								
	N	2463							
ISS 9+, LOS 2+	Mean	1.99	14.47	8.44	3.56	1.98	52.92	60.2%	2.8%
"Major trauma"	Std Dev	0.77	7.95	9.52	6.92	6.27	21.87		
	Median								
	N	2978							
ISS 9-15, LOS 2+	Mean	2.14	10.18	6.43	1.74	0.66	55.6	55.1%	1.4%
	Std Dev	0.77	1.75	6.06	3.82	2.74	21.8		
	Median								
	N	2031							
ISS 16-24, LOS 2+	Mean	1.72	18.80	10.11	4.80	2.48	47.34	71.5%	1.9%
	Std Dev	0.69	2.38	8.07	5.95	4.77	20.53		
	Median								
	N	593							
ISS 25+, LOS 2+	Mean	1.56	31.82	17.12	9.81	7.54	47.11	70.3%	11.9%
	Std Dev	0.65	8.19	18.43	12.67	13.36	21.76		
	Median								
	N	354							

Median Cost by Level of TC and ISS Groups LOS 2+ days

\$50,000
\$45,000
\$40,000
\$35,000
\$30,000
\$25,000
\$20,000
\$15,000
\$10,000
\$5,000
\$0



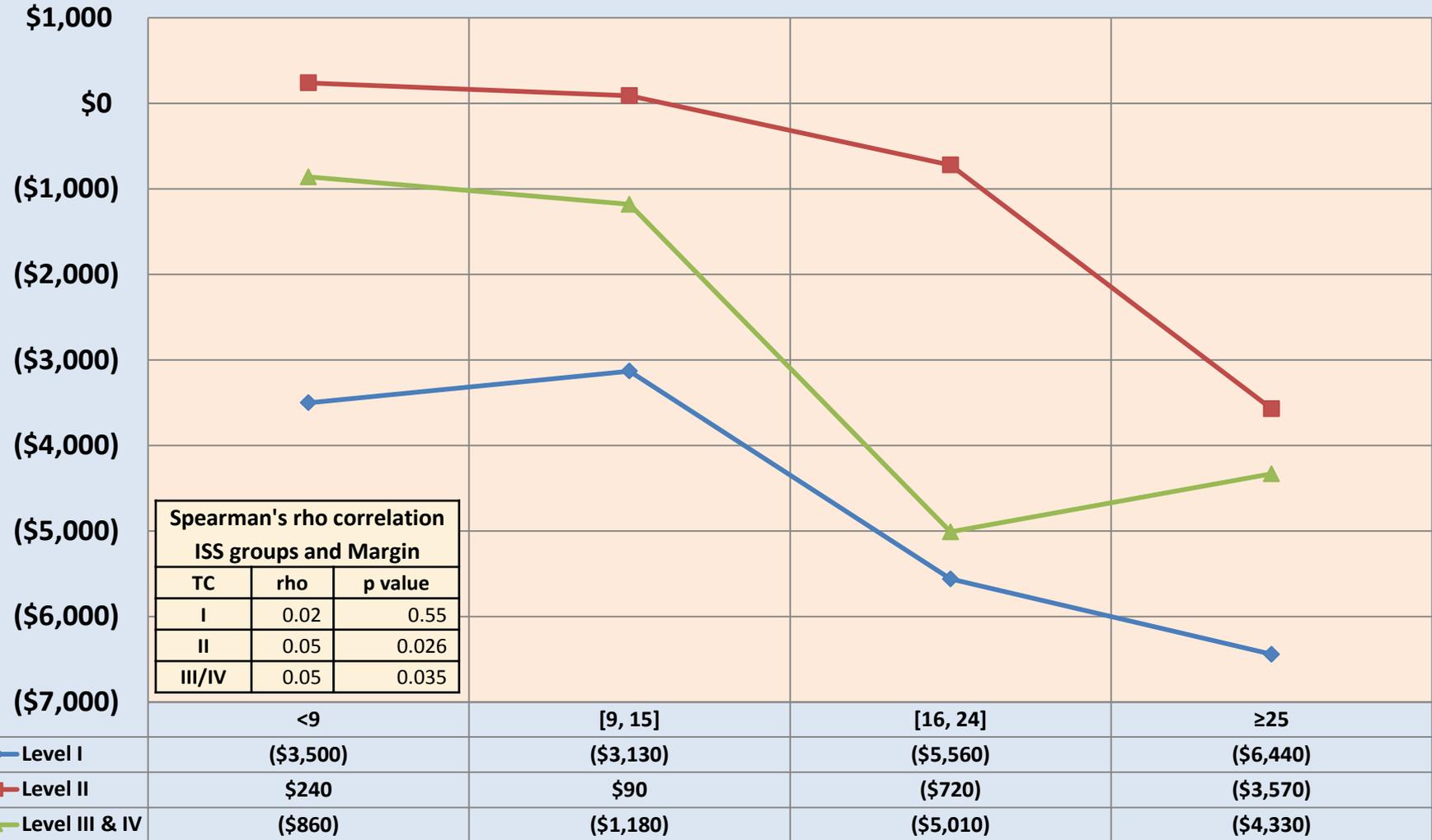
Median Payments by Level of TC and ISS Groups LOS 2+ days



Spearman's rho correlation ISS groups and Payments		
TC	rho	p value
I	0.27	<0.0001
II	0.17	<0.0001
III/IV	0.22	<0.0001

	<9	[9, 15]	[16, 24]	≥25
Level I	\$5,550	\$7,360	\$11,760	\$22,670
Level II	\$5,910	\$9,760	\$9,100	\$12,380
Level III & IV	\$4,740	\$10,040	\$7,430	\$9,890

Median Margin by Level of TC and ISS Groups LOS 2+ days



Conclusions

- * Estimated cost rose with increasing levels of ISS, LOS, ICU and ventilator days, especially for patients with LOS ≥ 2 , ISS 9+
- * Level I TC had the highest cost, due primarily to severity of trauma in their patient population
- * Net Margin was negative in most cases but didn't relate to level of TC or severity of trauma
- * Verification & response costs were higher in Level I and II TCs
- * Trauma activation fee payment would have great impact on profitability of trauma service line

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Thank you