THIRTY-EIGHTH
ANNUAL MEETING

Squaw Valley 2008
Western Trauma Association

February 24 – March 1, 2008
Squaw Valley, California
FFP vs VITA is

Correct Inv

Can SCO's be
improved? - should it be
2 phase ie vac(-neg) to compen
(pods)
or
SPIRAL - proximal

directed

Carol Schreiner -
Interested in Communicati Research
Phil's email at WTA

Spleen observation algorithm - p. 41, ??

Ben Eisenman pioneered concept of algorithms in 70's - ??

Begin to look at transfer times and outcomes (ISS)

Google telemedicine & trauma & pull reprints

Experiment: cell phone picture transfer

30 x 15,000 = 450,000

$450,000

A distinctive experience provided by Destination Hotels & Resorts.
www.destinationhotels.com
Compare subjective scales (pain, fclt) to objective measurements in individual pts.

How many invited initially?
Polycom VSX 7000

+ handheld 50x macro

$5,000 each

call for evidence re: effectiveness

Med Educ 2000, 40: 759 (co769)

American Telemedicine Association

(double blind) prospective randomized study comparing telemedicine vs telephone communication
eval accuracy, satisfaction, efficiency, etc

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www.destinationhotels.com
WESTERN TRAUMA ASSOCIATION

38TH Annual Meeting
Squaw Valley, California
February 24- March 1 2008

THE WESTERN TRAUMA ASSOCIATION GRATEFULLY ACKNOWLEDGES UNRESTRICTED EDUCATIONAL GRANTS IN SUPPORT OF THE PROGRAM FROM:

KCI

LifeCell

SYNTHES
This activity has been planned and implemented in accordance with the Accreditation Elements and Policies of the Wisconsin Medical Society through joint sponsorship of Gundersen Lutheran Medical Foundation and the Western Trauma Association. The Gundersen Lutheran Medical Foundation is accredited by the Wisconsin Medical Society to provide continuing medical education for physicians.

Gundersen Lutheran Medical Foundation designates this educational activity for a maximum of 14.75 AMA PRA Category I Credit(s).™ Physicians should only claim credit commensurate with the extent of their participation in the activity.
38th Annual Meeting

Squaw Valley, California

2007-2008

ICERS:
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Grace Rozycki, MD
Robert C. Mackersie, MD
M. Gage Ochsner, MD
R. Larry Reed, MD
R. Christie Wray, MD
President
President-Elect
Vice President
Secretary
Treasurer
Historian

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Peter Rhee, MD
Kimberly A. Davis, MD
Soumitra R. Easempati, MD
TERM ENDS:
2008
2008
2009
2009
2010
2010

GRAM COMMITTEE:
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C. Clay Cothren, MD
James Davis, MD
M. Margaret Knudson, MD
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Dennis W. Vane, MD
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Vincent Gracias, MD
Rosemary Kozar, MD
Ram Nirula, MD
Martin Schreiber, MD
Michael West, MD

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Herbert J. Thomas, III, MD
Michael Chang, MD
Roxie M. Albrecht, MD

TI-CENTER TRIALS COMMITTEE:
Krista L. Kaups, MD, Chair
<table>
<thead>
<tr>
<th>President</th>
<th>Year</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert G. Volz, M.D.</td>
<td>1971</td>
<td>Vail</td>
</tr>
<tr>
<td>Robert G. Volz, M.</td>
<td>1972</td>
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</tr>
<tr>
<td>Peter V. Teal, M.D.</td>
<td>1973</td>
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<tr>
<td>William R. Hamsa, M.D.</td>
<td>1974</td>
<td>Aspen</td>
</tr>
<tr>
<td>Arthur M. McGuire, M.D.</td>
<td>1975</td>
<td>Sun Valley</td>
</tr>
<tr>
<td>Lynn Ketchum, M.D.</td>
<td>1976</td>
<td>Snowmass</td>
</tr>
<tr>
<td>Fred C. Chang, M.D.</td>
<td>1977</td>
<td>Park City</td>
</tr>
<tr>
<td>Glen D. Nelson, M.D.</td>
<td>1978</td>
<td>Steamboat</td>
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<tr>
<td>Gerald D. Nelson, M.D.</td>
<td>1979</td>
<td>Snowmass</td>
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<tr>
<td>Kevin G. Ryan, M.D.</td>
<td>1980</td>
<td>Snowbird</td>
</tr>
<tr>
<td>David S. Bradford, M.D.</td>
<td>1981</td>
<td>Jackson Hole</td>
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<tr>
<td>Erick R. Ratzer, M.D.</td>
<td>1982</td>
<td>Vail</td>
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<tr>
<td>William R. Olsen, M.D.</td>
<td>1983</td>
<td>Jackson Hole</td>
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<tr>
<td>Earl G. Young, M.D.</td>
<td>1984</td>
<td>Steamboat</td>
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<tr>
<td>Robert B. Rutherford, M.D.</td>
<td>1985</td>
<td>Snowbird</td>
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<tr>
<td>Rudolph A. Klassen, M.D.</td>
<td>1986</td>
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<tr>
<td>Robert J. Neviaser, M.D.</td>
<td>1987</td>
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<td>Robert C. Edmondson, M.D.</td>
<td>1988</td>
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<td>Ernest E. Moore, M.D.</td>
<td>1989</td>
<td>Snowbird</td>
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<tr>
<td>Stephen W. Carveth, M.D.</td>
<td>1990</td>
<td>Crested Butte</td>
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<tr>
<td>George E. Pierce, M.D.</td>
<td>1991</td>
<td>Jackson Hole</td>
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<tr>
<td>Peter Mucha, Jr., M.D.</td>
<td>1992</td>
<td>Steamboat</td>
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<tr>
<td>David V. Feliciano, M.D.</td>
<td>1993</td>
<td>Snowbird</td>
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<tr>
<td>R. Chris Wray, M.D.</td>
<td>1994</td>
<td>Crested Butte</td>
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<tr>
<td>David Kappel, M.D.</td>
<td>1995</td>
<td>Big Sky</td>
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<tr>
<td>Thomas H. Cogbill, M.D.</td>
<td>1996</td>
<td>Grand Targhee</td>
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<tr>
<td>G. Jerry Jurkovich, M.D.</td>
<td>1997</td>
<td>Snowbird</td>
</tr>
<tr>
<td>James B. Benjamin, M.D.</td>
<td>1998</td>
<td>Lake Louise</td>
</tr>
<tr>
<td>Herbert J. Thomas III, M.D.</td>
<td>1999</td>
<td>Crested Butte</td>
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<tr>
<td>Barry C. Esrig, M.D.</td>
<td>2000</td>
<td>Squaw Valley</td>
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<tr>
<td>Steven R. Shackford, M.D.</td>
<td>2001</td>
<td>Big Sky</td>
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<tr>
<td>James A. Edney, M.D.</td>
<td>2002</td>
<td>Whistler-Blackcomb</td>
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<tr>
<td>J. Scott Millikan, M.D.</td>
<td>2003</td>
<td>Snowbird</td>
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<tr>
<td>Harvey J. Sugerman, M.D.</td>
<td>2004</td>
<td>Steamboat</td>
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<tr>
<td>Scott R. Petersen, M.D.</td>
<td>2005</td>
<td>Jackson Hole</td>
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<tr>
<td>Harold F. Sherman, M.D.</td>
<td>2006</td>
<td>Big Sky</td>
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<tr>
<td>Frederick A. Moore, M.D.</td>
<td>2007</td>
<td>Steamboat Springs</td>
</tr>
<tr>
<td>James Davis, M.D.</td>
<td>2008</td>
<td>Squaw Valley</td>
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</tbody>
</table>

The 2009 WESTERN TRAUMA ASSOCIATION Meeting will be held at:

Steamboat Springs, Colorado
February 22 – February 28, 2009
WESTERN TRAUMA FOUNDATION DONORS
(Current Lifetime Accumulation Status)

COULOUR SOCIETY
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Gregory J. Jurkovich  Guy Lanzi  Ted McAuley
Robert Mackersie  Robert McIntyre  Mark Metzdorff
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Rajan Gupta  Peter Mucha  Gage Ochsner
David Shatz  Daniel Vargo  Michael West

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Soumitra Eeachempati  John Fildes  Warren Gall
Richard Gamelli  Dean Gubler  Michael Hauty
Jay Johannigman  Riyad Karmy-Jones  Margaret Knudson
William Long  Ash Mansour  Nicholas Namias
Leon Pachter  George Pierce  Basil Pruitt
Earl G. Young, M.D.  
(1928-1989)

RESIDENT PAPER COMPETITION

Dr. Earl G. Young of Minneapolis was a founding member of the Western Trauma Association and President. He died of a myocardial infarction, Monday, February 27, 1989, while skiing at Snowbird during Annual Meeting of the Association.

Dr. Young received his medical degree from the University of Rochester, N.Y. and Ph.D. in surgery from University of Minnesota. He completed advanced training in cancer research at Harvard, a fellow in cardiovascular surgery at Baylor University in Houston and studied microvascular surgery at the Unive California–San Diego.

He was a clinical professor of surgery at the University of Minnesota Medical School, and a practicing vascular surgeon at the Park-Nicollet Clinic in Minneapolis from 1960. He was nationally known and was involved in research and education throughout his career. In 1988, one year before his untimely death, he received the Owen H. Wangensteen Award for Academic Excellence from the University of Minnesota Science Center. It was awarded by an unprecedented unanimous vote of all 72 surgical residents.

The Residents Paper competition was begun in 1991 as a tribute to Dr. Young’s memory and his “spirit of love of learning ... and commitment in service to mankind.” The award is given to the best resident presented at the Annual Meeting.

- Dr. John Najarian characterizing Earl at a memorial service in his honor at the University of Minne
<table>
<thead>
<tr>
<th>Dent Name</th>
<th>Institution</th>
<th>Year</th>
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<tbody>
<tr>
<td>ph Schmoker, M.D.</td>
<td>University of Vermont</td>
<td>1991</td>
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<tr>
<td>ph Schmoker, M.D.</td>
<td>University of Vermont</td>
<td>1992</td>
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<tr>
<td>les Mock, M.D.</td>
<td>University of Washington</td>
<td>1993</td>
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<tr>
<td>Travisani, M.D.</td>
<td>University of Vermont</td>
<td>1994</td>
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<td>p C. Ridings, M.D.</td>
<td>Medical College of Virginia</td>
<td>1995</td>
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<tr>
<td>d Han, M.D.</td>
<td>Emory University</td>
<td>1996</td>
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<tr>
<td>ion R. Miller, M.D.</td>
<td>Wake Forest University</td>
<td>1997</td>
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<tr>
<td>frey Manley, M.D., PhD.</td>
<td>University of California-San Francisco</td>
<td>1998</td>
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<tr>
<td>ss M. Doty, M.D.</td>
<td>Medical College of Virginia</td>
<td>1999</td>
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<tr>
<td>Ciesla, M.D.</td>
<td>Denver Health Medical Center</td>
<td>2000</td>
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<td>odo J. Gonzales, M.D.</td>
<td>Denver Health Medical Center</td>
<td>2001</td>
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<td>t C. Brakenridge</td>
<td>Cook County Hospital</td>
<td>2002</td>
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<tr>
<td>a J. Osband, M.D.</td>
<td>UMDNJ-New Jersey Medical School</td>
<td>2003</td>
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<tr>
<td>y Lee, M.D.</td>
<td>UMDNJ-New Jersey Medical School</td>
<td>2004</td>
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<tr>
<td>st A. Gonzalez, M.D.</td>
<td>University of Texas at Houston</td>
<td>2005</td>
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<td>ifer M. Watters, M.D.</td>
<td>Oregon Health &amp; Science University</td>
<td>2005</td>
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<td>ifer J. Wan, M.D.</td>
<td>University of California-San Francisco</td>
<td>2006</td>
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<tr>
<td>ifer J. Wan, M.D.</td>
<td>University of California-San Francisco</td>
<td>2007</td>
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</tbody>
</table>
IN MEMORIUM

Earl G. Young, MD
February 27, 1989

Gerald S. Gussack
August 25, 1997

Peter Mucha, Jr.
August 9, 2006
<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>Jerry Jurkovich, M.D.</td>
<td>1997</td>
<td>Snowbird, Utah</td>
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<tr>
<td>W. McGill, M.D.</td>
<td>1998</td>
<td>Chateau Lake Louise, Alberta</td>
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<tr>
<td>William T. Close, M.D.</td>
<td>1999</td>
<td>Crested Butte, Colorado</td>
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<tr>
<td>my Cornell</td>
<td>2000</td>
<td>Squaw Valley, California</td>
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<tr>
<td>toff Tabin, M.D.</td>
<td>2001</td>
<td>Big Sky, Montana</td>
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<tr>
<td>mes H. &quot;Red&quot; Duke, M.D.</td>
<td>2002</td>
<td>Chateau Whistler, British Columbia</td>
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<td>id V. Shatz, M.D.</td>
<td>2003</td>
<td>Snowbird, Utah</td>
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<tr>
<td>lan and Tim Baker</td>
<td>2004</td>
<td>Steamboat Springs, Colorado</td>
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<tr>
<td>Habel, M.D.</td>
<td>2005</td>
<td>Jackson Hole, Wyoming</td>
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<tr>
<td>rew Schneider</td>
<td>2006</td>
<td>Big Sky, Montana</td>
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<tr>
<td>est E. Moore, MD</td>
<td>2007</td>
<td>Steamboat Springs, Colorado</td>
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<tr>
<td>nela Kalsen</td>
<td>2008</td>
<td>Squaw Valley, California</td>
</tr>
<tr>
<td>Day</td>
<td>Time</td>
<td>Event</td>
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<tr>
<td>Sunday, February 24</td>
<td>4:00pm – 5:00pm</td>
<td>Nominating Committee</td>
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<tr>
<td></td>
<td>4:30pm – 7:30pm</td>
<td>Registration</td>
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<tr>
<td></td>
<td>5:00pm – 7:00pm</td>
<td>Welcome Reception</td>
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<td></td>
<td>7:00pm – 8:00pm</td>
<td>Past President's Meeting</td>
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<td>8:00pm</td>
<td>WTA Foundation Board Meeting</td>
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<tr>
<td>Monday, February 25</td>
<td>6:30am – 8:00am</td>
<td>Attendee Breakfast</td>
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<tr>
<td></td>
<td>7:00am – 9:00am</td>
<td>Scientific Session</td>
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<tr>
<td></td>
<td>7:30am – 9:00am</td>
<td>Friends &amp; Family Breakfast</td>
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<td>4:00pm – 6:00pm</td>
<td>Scientific Session</td>
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<td>6:00pm – 7:00pm</td>
<td>Board of Directors Meeting</td>
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<tr>
<td>Tuesday, February 26</td>
<td>6:30am – 8:00am</td>
<td>Attendee Breakfast</td>
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<td>7:00am – 9:00am</td>
<td>Scientific Session</td>
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<td></td>
<td>7:30am – 9:00am</td>
<td>Friends &amp; Family Breakfast</td>
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<tr>
<td></td>
<td>4:00pm – 6:00pm</td>
<td>Scientific Session &amp; Presidential Address</td>
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<td>6:00pm – 7:00pm</td>
<td>WTA Multi-Center Trials Meeting</td>
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<tr>
<td>Wednesday, February 27</td>
<td>6:30am – 8:00am</td>
<td>Attendee Breakfast</td>
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<td>Scientific Session</td>
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<td>7:30am – 9:00am</td>
<td>Friends &amp; Family Breakfast</td>
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<td></td>
<td>10:00am – 12:00pm</td>
<td>Ski Race</td>
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<td>12:00pm – 1:30pm</td>
<td>BBQ</td>
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<td>4:00pm – 5:00pm</td>
<td>Scientific Session</td>
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<td></td>
<td>5:00pm – 6:00pm</td>
<td>Business Meeting</td>
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<td>5:00pm – 6:00pm</td>
<td>Book Club</td>
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<tr>
<td>Thursday, February 28</td>
<td>6:30am – 8:00am</td>
<td>Attendee Breakfast</td>
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<td>7:00am – 9:00am</td>
<td>Scientific Session</td>
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<td>7:30am – 9:00am</td>
<td>Friends &amp; Family Breakfast</td>
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<tr>
<td></td>
<td>4:00pm – 5:00pm</td>
<td>Panel of Experts</td>
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<td>5:00pm – 6:00pm</td>
<td>&quot;Paint the Ceiling&quot; Lecture</td>
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<td>6:30pm – 10:00pm</td>
<td>Children's Party</td>
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<td>7:00pm – 10:00pm</td>
<td>Adult Banquet &amp; Dance</td>
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<td>Friday, February 29</td>
<td>6:30am – 8:00am</td>
<td>Attendee Breakfast</td>
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<td>Scientific Session</td>
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<tr>
<td></td>
<td>7:30am – 9:00am</td>
<td>Friends &amp; Family Breakfast</td>
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<td></td>
<td>4:00pm – 6:00pm</td>
<td>Scientific Session</td>
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PROGRAM

Western Trauma Association
<table>
<thead>
<tr>
<th>Time</th>
<th>Title/Authors</th>
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<tbody>
<tr>
<td>7:00AM</td>
<td>Welcome to the 38th Annual Meeting of the WTA President, WTA 2008</td>
</tr>
<tr>
<td>7:20 AM</td>
<td>Alcohol Withdrawal Syndrome in Trauma Patients: A Prospective Cohort Study</td>
</tr>
<tr>
<td></td>
<td>B Sharp BS, C Schermer MD MPH, E Omi, MD, T Esposito MD MPH and J Santaniello MD</td>
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<tr>
<td>7:40 AM</td>
<td>Single Dose Etomidate for Rapid Sequence Intubation Impacts Outcome After Severe Injury</td>
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<tr>
<td></td>
<td>KJ Warner, GJ Jurkovich, EM Bulger</td>
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<tr>
<td>8:00 AM</td>
<td>Low Protein C Levels are Associated with an Increased Susceptibility to Ventilator-Associated Pneumonia in Trauma Patients</td>
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<tr>
<td>8:20 AM</td>
<td>The Effects of Drotrecogin Alfa (Activated) on Inflammation and Burn Depth in a Rat Burn Model</td>
</tr>
<tr>
<td></td>
<td>T Piester BA, D Meyerholz DVM PhD, K Zamba PhD, J Sokolich MD, A Jaskille MD, T Light MD</td>
</tr>
<tr>
<td>8:40 AM</td>
<td>Proof of Progressive Deepening of Thermal Burn Wounds: From Animal Model to the Clinical Arena</td>
</tr>
<tr>
<td></td>
<td>A Jaskille, C Weinand, M Jordan, D Ciesla, J Jeng</td>
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Scientific Session 2
Monday PM, February 25, 2008
Moderator: Carol Schermer, MD
Location: Grand Sierra A/B

<table>
<thead>
<tr>
<th>Paper</th>
<th>Time</th>
<th>Title/Authors</th>
</tr>
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<tbody>
<tr>
<td>6</td>
<td>4:00 PM</td>
<td>(\text{Bioprosthetic Repair of Complex Duodenal Injury in a Porcine Model}) MJ Eckert MD, JT Perry MD, VY Sohn MD, JA Munaretto MD, MJ Martin MD</td>
</tr>
<tr>
<td>7</td>
<td>4:20 PM</td>
<td>(\text{Angiographic Embolization is Safe and Effective Therapy for Blunt Abdominal Solid Organ Injury in Children}) A Kiankooohy K Sartorelli D Vane</td>
</tr>
<tr>
<td>8</td>
<td>4:40 PM</td>
<td>(\text{Observation for Non-Operative Management of the Spleen: How Long is Long Enough?}) V. McCray, J. Davis, D. Lemaster, K. Bhakta</td>
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<td>5:00 PM</td>
<td>(\text{Critical Decisions in Trauma}) Moderator: Robert McIntyre</td>
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<tr>
<td>9</td>
<td>6:00 PM</td>
<td>(\text{Splenic Injury: Frederick Moore, MD Pelvic Injury: James Davis, MD})</td>
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\(\text{Earl Young Competition}\)
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<tr>
<th>Time</th>
<th>Title/Authors</th>
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<td>7:00 AM</td>
<td>Ἐ Degree of Initial Brain Injury in Young Adults Does Not Correlate with Functional Impairment Recorded by Cognitive Status Examinations D. Goold, D. Vane</td>
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<td>7:20 AM</td>
<td>Ἐ Multitrauma Does Not Increase Mortality in Critically Injured Patients with Traumatic Brain Injury K Lumpkins, G Bochicchio, M Kilbourne, K Bochicchio, A Conway, T Scalea</td>
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<td>Ἐ Transfusion of Stored Red Blood Cells Results in Decreased Tissue Oxygenation in Critically Injured Trauma Patients L.N. Kiraly, M.D. M.S. Englehart, M.D. B.H. Tieu, M.D. J.A. Differding, M.S. S.J. Underwood, M.S. G. Singh, M.D. M.A. Schreiber, M.D.</td>
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<td>Ἐ Development and Testing of Freeze Dried Plasma for the Treatment of Trauma Associated Coagulopathy F. Shuja, MD, C. Shults, MD, M. Duggan, DVM, T.H. Fischer, PhD, M.U. Butt, MD, M. Tabbara, MD, deMoya, MD, G. Velmahos, and H.B. Alam, MD</td>
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<td>Ἐ FFP:PRBC Transfusion Ratio of 1:1 is Associated with Significant Lower Risk of Mortality Following Massive Transfusion J. Sperry, MD,MPH, J. Ochoa, MD, S. Gunn, MD, J. Minei, MD, J. Cuschieri, MD, G. O'Keefe MD,PhD, T. Billiar, MD, A. Peitzman, MD, R. Maier, MD, E. Moore, MD</td>
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<td>8:40 AM</td>
<td>Ἐ Early Achievement of a 1:1 Ratio of FFP:PRBC Reduces Mortality in Patients Receiving Massive Transfusion EA Gonzalez, K Jastrow, JB Holcomb, LS Kao, FA Moore, RA Kozar</td>
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**url Young Competition**
Paper | Time | Title/Authors
--- | --- | ---
15 | 4:00 PM | A Population-Based Analysis of Neighborhood Socioeconomic Status and Injury Admission Rates and In-Hospital Mortality
| | | B Zarzaur, M Croce, L Magnotti, P Fischer, T Fabian
16 | 4:20 PM | Where Do We Go From Here? Utilizing Interim Analysis to Forge Ahead in Violence Prevention
17 | 4:40 PM | Title: Close is Dead: The Relationship Between Assailant and Victim is the Primary Determinant of Firearm Injury Lethality in Women
| | | H.E. Finlay-Morreale, B.S.; B.S. Fisher Ph.D.; J. Johannigman M.D*
5:00 PM | Presidential Address
| | “The Rule of Thumb”
| | James Davis, MD
6:00 PM | Multi-Institutional Trials Committee

† Earl Young Competition
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<td>Beneficial Effects of Early Stabilization of Thoracic Spine Fractures Depends on Trauma Severity</td>
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<td>C Schinkel, MD, PhD, TM Frangen, MD, G Muhr, MD, PhD</td>
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<td>7:20 AM</td>
<td>The Demographics of Modern Burn Care. Should Most Burns be Cared for by the Non-Burn Surgeon?</td>
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<td>G. Veredusse, W. Ingram, D. Feliciano</td>
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<td>7:40 AM</td>
<td>Telemedicine Evaluation of Acute Burns is Accurate and Cost-Effective</td>
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<td>J Saffie, MD, L Theurer, L Edelman, PhD, S Morris, MD, A Cochran, MD</td>
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<td>8:00 AM</td>
<td>The Reality of Errors in Resuscitation and Haemorrhage Control</td>
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<td>Management of Severe Hemorrhage Associated with Maxillofacial Injuries: A Multicenter Perspective</td>
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<td>T Cogbill, M.D. representing 9 Western Trauma Association Participating Institutions</td>
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<td>A Prospective Observation Study of the Optimal Management of Patients with Anterior Abdominal Stab Wounds</td>
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<td>W.L. Biffi, MD, C.C. Cothren, MD, K.J. Brasel, MD, K.L. Kaups, MD, R.A. Dicker, MD, J.M. Haan, MD, M.K. Bullard, MD, and the WTA Multicenter Trials Group</td>
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Scientific Session 6  
Wednesday PM, February 27, 2008  
Moderator: Tom Thomas, MD  
Location: Grand Sierra A/B

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<th>Paper</th>
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|       | 4:00 PM| **Point: Counterpoint I**  
Factor VIIa: Pro versus Con  
John Holcombe, MD and Jerry Jurkovich, MD |
|       | 4:30 PM| **Point: Counterpoint II**  
Anticoagulation in Patients with Head Injury: Early versus late  
Alicia Mangram, MD and Kimberly Davis, MD |
<p>|       | 5:00 PM| Business Meeting                                                              |
|       | 5:00 PM| Book Club – Location TBA                                                     |</p>
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| 7:00 AM | **Venous Thromboembolism in a Burn Population—Is It Time to Prevent the Clot?**  
B Potenza MD, J Noordenbos RN, G Lew R Ph, G Danquah MD, M Tenenhaus MD, J Lee MD, V Bansal MD, R Coimbra MD, C Ridgway PA-C, J Mc Sweeney RN |
| 7:20 AM | **Pulmonary Contusion in the CT Era: Much Ado About Nothing?**                |
R Jelsema, K Brasel                                                                 |
| 7:40 AM | **Critical Care in a Combat Support Hospital: Impact of Civilian Patients**  |
C.C. McFarland, MD C.B. Swift, APRN R.M. Perkins, MD S.J. Johnson, MD P.F. Mahoney, MD |
| 8:00 AM | **Teen Traffic Safety Campaign: Competition is the Key**                     |
M. Houston BA, V. Cassabaum RN, S. Matzick BSN RN, T. Rapstine BSN RN, S. Terry BSN RN, P. Uribe BSN RN, J. Harwood PhD, S. Moulton MD |
| 8:20 AM | **Prehospital Hypotension in Blunt Trauma: Identifying the “Crump Factor”**  |
J.F. Bilello, M.D., J.W. Davis, M.D., R.N. Townsend, MD, D. LeMaster RN, L.P. Sue, M.D., K.L. Kaups M.D. |
| 8:40 AM | **Fall From Standing: An Under Appreciated Mechanism of Injury**             |
N Namias, C Glenn, A Marttos, R Manning, M McKenney
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<td><strong>Panel of Experts</strong></td>
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<td>Roxie Albrecht, MD, Gage Ochsner, MD, and</td>
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<td>Robert Mackersie, MD</td>
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<td>5:00 PM</td>
<td><strong>Paint the Ceiling Lecture</strong></td>
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<td>&quot;The Faces of Domestic Violence&quot;</td>
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<td>Pamela Kallsen</td>
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<td>Executive Director</td>
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<td>Marjaree Mason Center</td>
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<td>Fresno, California</td>
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<td>7:00 AM</td>
<td><em><em>Vancomycin MIC Creep: Impact on Outcomes of Methicillin Resistant</em> Staphylococcus Aureus</em> Ventilator Associated Pneumonia**&lt;br&gt;A Malhotra, T Duane, M Aboutanos, K Smalara, G Chenault, C Borchers, N Martin, R Ivatury</td>
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<td>7:20 AM</td>
<td><strong>Does De-Escalation of Antibiotic Therapy for Ventilator-Associated Pneumonia (VAP) Increase the Likelihood of Recurrent Pneumonia (RP) or Mortality in Critically Ill Surgical Patients?</strong>&lt;br&gt;S Eachempati, L Hydo, J Shou, P Barie</td>
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<td>7:40 AM</td>
<td><strong>Systemic Not Just Mesenteric Lymph Causes Neutrophil Priming Following Hemorrhagic Shock</strong>&lt;br&gt;L Diebel, D Liberati, A Ledgerwood, C Lucas</td>
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<td><strong>Staff Commitment to Trauma Care Improves Mortality and Length of Stay at a Level I Trauma Center</strong>&lt;br&gt;C. Mains, K. Scarborough, R. Bar-Or, A. Hawkes, J. Huber, D. Bar-Or</td>
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<td>8:20 AM</td>
<td>Invited Lecture: David Feliciano, MD&lt;br&gt;“Oswaldo Borraez’s Bag and Beyond: Story of the Open Abdomen”</td>
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| 34    | 4:00 PM | A Clustering of Injury Behaviors  
Carol R Schermer MD MPH, Ellen C. Omi MD, Karen Grimley MSW, Pamela Van Auken, RN, John Santaniello MD, Thomas J. Esposito MD |
| 35    | 4:20 PM | Motorcycle versus U.F.O. (Unidentified Feathered Object): A Case Report of a Rare Mechanism for Blunt Carotid Injury  
D Schultz, MD R Georgen, MD |
| 36    | 4:35 PM | Unusual Cervical Spine Injuries in a Rural Patient with Multi-System Trauma: Opportunities for Harm Amidst Conflicting Priorities and Multidisciplinary Followup  
S Hardekopf; FSoldevilla, MD, D Adler, MD; J Krieg, MD; B Bell, DDS, MD; M Smith, MD, SLzenberg, MD, FACS; and W. B. Long, MD, FACS |
| 37    | 4:50 PM | Pneumonectomy: An Effective Salvage Following Devastating Pulmonary Injury  
J. Halonen, M.D., J. O'Connor, M.D., T. Scalea, M.D. |
| 38    | 5:05 PM | Inhaled Nitric Oxide in the Management of Patients with Severe Post Traumatic Acute Lung Injury  
S. King; R.G. Barton |
| 39    | 5:20 PM | Equestrian-Associated Urethral Injuries in Women  
S Beal JM Galante CS Cocanour |
| 40    | 5:35 PM | On the Right of a Guardian to Procure an Abortion for an Incapacitated Trauma Patient: Legal and Ethical Considerations  
C. Bradley, MD, K. Brasel, MD, MPH |
ABSTRACTS
ALCOHOL WITHDRAWAL SYNDROME IN TRAUMA PATIENTS: A PROSPECTIVE IORT STUDY

arp BS, C Schermer MD MPH, E Omi, MD, T Esposito MD MPH and J Santaniello MD
ula University Chicago, Stritch School of Medicine Department of Surgery

enter: Brain Sharp Senior Sponsor: Carol Schermer

duction: Many injured patients consume alcohol. It is often assumed that patients with a
tive blood alcohol concentration (BAC) are at high risk for the alcohol withdrawal syndrome
such that some centers administer prophylaxis to BAC positive patients. The purpose of this
was to determine the risk factors for AWS among trauma patients admitted to the floor. The
theses of the study were that the risk for alcohol withdrawal would be low and that it could be
ected by simple questioning avoiding the need for prophylaxis.

ods: A prospective cohort of trauma patients admitted to the floor was followed for the
opment of AWS during the first 10 days of hospitalization. The Alcohol Use Disorders
ification Test (AUDIT) and questions about alcohol withdrawal history were administered on
first day and the Clinical Institute for Withdrawal of Alcohol Scale (CIWA) was administered

its: 113 patients were followed through discharge or for the first 10 days of hospitalization
age stay 5 days). Three fourths of patients (74.3%, n=84) reported drinking alcohol. Admission
measurement was missed in 21.2% (n=24) leaving 89 patients with a measured BAC, 28%5
of whom were positive. The mean BAC for positive patients was 187.7 mg/dl. No person
denied drinking had a measurable BAC or developed AWS. Among the 84 drinkers, 4 were
ected of developing AWS, which was confirmed in 3 by CIWA (3.6% risk), giving an incidence
of 1.4 episodes per 100 patient days. All 3 patients developing AWS admitted to a history of
symptoms upon stopping drinking (tremulousness, nausea, headache, needing a drink etc.).
all (100%) drank at least 2-3 times per week compared to 36.3% of drinkers who did not
op AWS (p<.05), but were no more likely to binge drink (66.7% vs 42.5% p>.05).

cidence items from the AUDIT were highly associated with AWS risk (66.7% in AWS group vs
% for drinkers not developing AWS, p< .05), but BAC was not predictive of AWS.
mentation of a prophylaxis protocol for positive BAC, would have resulted in 88% (n=22/25)
AC positive patients receiving unnecessary drugs.

lusion: AWS has a low incidence rate among intoxicated trauma patients admitted to the floor.
associated with frequent drinking and is found in patients who report dependence symptoms.
ents can reliably tell physicians whether they are at risk for AWS. Prophylaxis for positive BAC
ents will likely result in substantial overtreatment.
GLE DOSE ETOMIDATE FOR RAPID SEQUENCE INTUBATION IMPACTS COME AFTER SEVERE INJURY

Warner GJ, Jurkovich EM, Bulger
Periview Medical Center

Center: Keir J. Warner
Senior Sponsor: Jerry J. Jurkovich

**Background:** Etomidate is widely used for the rapid sequence induction (RSI) of trauma patients, recently was added to the ATLS recommendations for induction of trauma patients due to its stable hemodynamic profile and rapid onset. However, recent studies demonstrate etomidate causes cortisol levels by inhibiting 11β-hydroxylase for up to 12 hours following a single dose, and its non-normal cosyntropin stimulation tests. Elevated cortisol normally occurs with stress, inhibition of this action by etomidate may increase neutrophil margination, which has been shown to be an inciting factor in the development of acute respiratory distress syndrome (ARDS) and multiple organ failure syndrome (MOFS). We therefore hypothesized that single dose etomidate in intubation for emergent intubation in the severely injured patient would lead to increased rates RDS and MODS.

**Methods:** We analyzed data collected from a prospective trial of prehospital hypertonic saline intubation. This study enrolled adult blunt trauma patients transported directly to our level I trauma center with prehospital SBP ≤ 90mmHg. Intubated patients were stratified based on etomidate use for intubation. Demographic, physiologic, anatomic injury scores, and outcomes were measured. Multivariate regression was used to assess the relationship between etomidate use and HS/MOFS adjusting for severe injury (ISS >25), physiologic derangement (APACHE II >20) massive transfusion (PRBC >10). A small subset of patients (n=9) also had neutrophil CD11b expression assessed within the first 24hrs.

**Results:** Over a two year period 94 patients underwent RSI, 35 received etomidate (37%). There were no significant differences in demographic, physiology, anatomic injury scores, or use of HS between the groups. Stepwise logistic regression demonstrated that etomidate use was an independent predictor of ARDS and MOFS. Additionally, they had increased CD11b expression within the first 24hrs.

**Conclusion:** Single dose etomidate for RSI in severely injured trauma patients is associated with increased neutrophil CD11b expression and increased ARDS and MOFS. Use of etomidate options at risk for inflammatory insults should be cautioned.

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<td>Outcomes</td>
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<td>ARDS</td>
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<td>MOFS</td>
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V PROTEIN C LEVELS ARE ASSOCIATED WITH AN INCREASED
CEPTIBILITY TO VENTILATOR-ASSOCIATED PNEUMONIA IN TRAUMA
IENTS

3ir, JF Pittet, RH Dotson, K Brohi, P Rahn, RC Mackersie, AH Harken, LD Montana, JP
er-Kronish, MJ Cohen
ersity of California, San Francisco

enter: Natasha D. Bir Senior Sponsor: Dr. Robert C. Mackersie

ODUCTION: Mechanically ventilated trauma patients have a high risk for the development_mator-associated pneumonia (VAP). We have recently reported that reduced plasma protein_els early after trauma/shock are associated with coagulopathy and mortality. Furthermore, a patients with tissue injury and shock are at higher risk for the development of VAP.
ECTIVE: We hypothesized that low protein C levels early after trauma are associated with an ased susceptibility to VAP in trauma patients.
THODS: 42 acutely injured, intubated trauma patients were admitted to the critical care unit.
all blood samples were drawn and coagulation factors measured. Ventilator associated monia was diagnosed by presence of bacteria on BAL specimen, bilateral infiltrates on chest x-
nd fever or elevated white blood cell count.
ULTS: Patients in both groups had lower mean protein C s at 6 hours compared to baseline. Non-infected patients’ in C subsequently returned to near-baseline levels, while patients who eventually acquired VAP had significantly r protein C levels at both 12 and 24 hours (12 hours: 79% 6%, p=0.05; 24 hours: 75% vs. 97% p=0.02). (Figure.) ble endothelial protein C receptor (EPCR) levels were lower at 24 hours (82% vs. 99% in the non-infected p, p=0.04).

SSUSSION: The activation of protein C pathway early trauma may protect the vascular endothelium via both its oagulant and cytoprotective effects. However, trauma patients who later developed VAP have icantly lower plasma levels of protein C within 24 hours after injury, suggesting a possible umption of this vitamin K-dependent protein as well as an inhibition of its activation by mmatory mediators. EPCR is involved in the activation of Protein C and is also a mediator of ypoteective effects.

CLUSION: Critically ill trauma patients have an early activation of the protein C pathway,reated with a rapid decrease in the plasma levels of this protein and increase in EPCR. Plasma of protein C return to normal levels within 24 hours in most patients. However, patients who to acquire VAP have persistently low plasma levels of protein C in the immediate period after a. Whether protein C could play a pathogenetic role in the host response against nosocomial infection warrants further study.
EFFECTS OF DROTRECOGIN ALFA (ACTIVATED) ON INFLAMMATION AND DEPTH IN A RAT BURN MODEL

Travis Piester, DVM PhD, K Zamba PhD, J Sokolich MD, A Jaskille MD, T Light MD

Methods: After approval from the Animal Use and Care Committee, and in an approved facility by personnel, thirty-one adult male Sprague-Dawley rats (avg. wt. = 460g) underwent a standardized, second and third degree 30% TBSA burn. Resuscitation with LR at 2ml/kg/%TBSA/24h or experimental (LR plus drotrecogin alpha 24mcg/kg/h) started immediately. At five hours, biopsies of each graded burn were fixed in formalin, and stained with H&E. A blinded pathology team evaluated the slides using a standardized grading system assessing anatomical and histological changes and Mixed Effect Models.

Results: Drotrecogin alpha increased burn depth indicators such as collagen coagulation depth (p<.001), patent vasculature depth (p=0.0054), and follicle cell injury depth (p=0.01). It also used inflammatory markers such as vascular activation (p=0.004) with neutrophil margination (p<.001) and extravasation (p=0.01).

Discussion: Burn depth and inflammation were increased with drotrecogin alpha. While our study was not designed to delineate a mechanism for this, one explanation is that infusion of exogenous protein C (drotrecogin alpha) prior to depletion of endogenous reserves might lead to an enhancement of inflammation and disturbances of regional blood flow. Another hypothesis is that drotrecogin alpha might lead to a paradoxical pro-inflammatory effect. Modification of the inflammatory response to burn remains an intellectually attractive proposal. The ideal drug, int, and timing remain to be determined.
OF PROGRESSIVE DEEPENING OF THERMAL BURN WOUNDS: FROM MAL MODEL TO THE CLINICAL ARENA

Skille, C Weinand, M Jordan, D Ciesla, J Jeng
Center at Washington Hospital Center

Senior Sponsor: David Ciesla

Introduction: Though burn wound deepening after thermal injury is thought to occur, reliable proof is lacking. Serial punch biopsies would confirm the hypothesis, however resulting in ionbal injury. Laser Doppler Imaging (LDI) might be a non-invasive way of documenting this phenomenon. We seek to first validate the use of LDI to assess burn depth compared to histology in an animal model, and then use LDI in humans over the 48 hours of resuscitation following injury.

Methods: For the validation study, 20 male Sprague-Dawley rats were used. Ten 2x2 cm burns were made in each animal by placing a 500g aluminum branding iron on the animal’s torso. Each burn encompassed all burn depths. Resuscitation followed the Parkland formula. Punch biopsies obtained immediately after injury and at 5 hours and H&E stained. LDI scans were performed every 15 min for 5 hours. Histology slides were evaluated by pathologists blinded to the study. After validation study, four patients with life threatening burns were scanned with LDI during the 48 hours of resuscitation.

Results: Animal model: LDI flux values correlate with burn depth assessed by histology, flux values 180 equate a superficial second degree burn (1-2 second contact) and values under 80 a third degree burn (p<0.001)(more than 10 second contact). Contact burns between 3-9 seconds resulted in resection of the injury (p<0.0001). Human study: LDI flux values decreased during the 48hrs of resuscitation, showing a progressive decrease in perfusion during this time. Subset analysis showed patterns of decreased perfusion, with nadirs at 12hrs (p<0.038) and 24hrs (p<0.05).

Conclusion: Progression of thermal injuries was confirmed using LDI despite maintaining adequate resuscitation. The biggest decrease in perfusion, and thus conversion to a deeper injury seems to occur in the first four hours. These results are concordant with histology. Additional studies on resuscitation and possible means to disrupt the progress of progression are needed.
PROSTHETIC REPAIR OF COMPLEX DUODENAL INJURY IN A PORCINE MODEL

Eckert MD, JT Perry MD, VY Sohn MD, JA Munaretto MD, MJ Martin MD
Ann Arbor Army Medical Center

Enter: Matthew Eckert, MD  Senior Sponsor: Matthew Martin, MD

Introduction: Complex duodenal injury remains a challenging problem for the trauma surgeon. While primary repair of small injuries is often possible, extensive damage requires complex enteric reconstruction and drainage procedures. We sought to determine the efficacy of a bioprosthetic repair for large duodenal wounds in a porcine model.

Methods: A 60% circumferential wall defect in the second portion of the duodenum was created in 4 female Yorkshire swine (38 ± 5 kg). After 30 minutes of peritoneal soilage a bioprosthetic repair using 1.5 mm porcine acellular dermis was performed. Animals were recovered and resumed a normal diet on day three. Repeat abdominal exploration and anastomotic bursting pressure strength was performed at 1, 2, 4 and 6 week intervals. Pathologic analysis of all specimens was performed.

Results: All animals tolerated a normal diet post-operatively, with progressive weight gain and normal bowel function. Upon re-exploration no animal had evidence of duodenal stenosis, proximal obstruction, or intra-abdominal abscess formation. Pathologic analysis demonstrated progressive in-growth of native bowel tissue, with almost complete incorporation at 6 weeks. Mean bursting pressure (202 ± 60 mmHg) occurred at native bowel, not patch repair site, in 3 of 8 animals.

Conclusion: Bioprosthetic repair of enteric wall defects, even in proximity to upper intestinal stenosis, allows successful recovery of bowel function and injury repair without extensive enteric reconstruction. This technique may provide a more conservative approach to the treatment of complex duodenal injuries after trauma.
Angiographic embolization is a safe and effective therapy for blunt abdominal solid organ injury in children.

Author: Armin Kiankoohy
Senior Sponsor: Dennis Vane

Objectives: Angiographic embolization (AE) is an accepted technique for control of hemorrhage in trauma patients with blunt abdominal solid organ (ASO) injuries. Data from the pediatric literature is limited to one- or two-patient case reports. We reviewed our experiences with the use of embolization to control hemorrhage in children with bleeding blunt ASO injuries to evaluate the efficacy and safety of this technique in the pediatric population. We hypothesized that AE is safe and effective and should be added to the paradigm of treatment of blunt ASO in children.

Methods: Data was obtained from the trauma registry and patient charts for children (age < 16 years) who underwent AE for hemorrhage from ASO injuries from 2001-2006. All children who underwent embolization were initially selected for nonoperative treatment of their ASO injuries, but had evidence of ongoing hemorrhage. Success of embolization to control bleeding and complications was evaluated. Data was obtained on site of injury, injury severity score (ISS), grade of abdominal organ injury, length of ICU and overall hospital stay, and complications.

Results: 127 patients with 149 blunt abdominal solid organ injuries (72 spleen, 51 liver, 26 renal) were identified during the study period. Two children had splenectomies due to hemodynamic instability. Seven children with bleeding ASO injuries underwent embolization of the following: 2 spleen lesions (IV and V), 2 liver (grades III and IV), and 3 grade IV renal injuries. Three children required 3 transfusions prior to embolization. Mean age was 12.3 ± 3.7 years with a mean ISS of 22.4 ± 4.6. Mean length of hospital stay was 12.2 ± 2.7 days (range 8-23), with a mean ICU stay of 4.9 ± 2.1 days. Embolization was successful in all children and there were no procedure-related complications. Four minor complications occurred; 2 patients had pleural effusions (one requiring decortication), 2 patients had transient hypertension after embolization of renal injuries. One child who had embolization of a renal injury was later found to have a nephroblastoma in the injured kidney and underwent a delayed nephrectomy.

Conclusions: Angiographic embolization is an effective and safe technique for controlling hemorrhage from blunt abdominal solid organ injuries in select pediatric trauma patients.
SERVATION FOR NON-OPERATIVE MANAGEMENT OF THE SPLEEN: HOW LONG IS LONG ENOUGH?

IcCray, J. Davis, D. Lemaster, K. Bhakta
Community Regional Medical Center, UCSF-Fresno

Enter: Victor McCray, M.D. Senior Sponsor: James Davis, M.D.

Introduction: Non-operative management of splenic injury has become common with success rates seen 88 - 98%. However, there are no specific protocols published in the literature for non-operative observation prior to discharge. Practice management guidelines were adopted for this at trauma center.

Purpose: To determine the safety and effectiveness of the practice management guidelines for observation of patients managed non-operatively for splenic injury.

Methods: A retrospective registry and chart review was conducted of all patients with splenic injury were admitted for non-operative management. Patients with contrast blush on abdominal CT to OR or angiography. The guidelines for observation length included admission with bedrest, at hemoglobins (Hgb) and discharge when Hgb stable.

Le 1: patient admitted. Hgb repeated every 6 hrs for 24 hrs, then discharged if Hgb stable.
Le II, III, and IV: patient admitted, Hgb repeated every 6 hrs for 24 hrs, then every 12 hrs until e. Patient then discharged

collected included age, gender, ISS, grade of splenic injury, length of stay, length of stay for ted splenic injury (by grade), non-operative management failures while in hospital and missions for non-operative failure. Data are expressed as mean ± standard error.

Results: From 8/2002 through 6/2007, there were 8,192 trauma admissions for blunt trauma, and had splenic injury. Of these, 179 went directly to the OR and 453 were admitted for non-active management, 18 (4%) failed non-operative management (non-op) and went to the ating room.

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<th>Grade (n)</th>
<th>Non op success</th>
<th>In-patient failed non-op</th>
<th>Out-patient failed non-op</th>
<th>Isolated spleen (n)</th>
<th>LOS for isolated Spleen</th>
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<tr>
<td>I (53)</td>
<td>53 (100%)</td>
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<td>0</td>
<td>4</td>
<td>2.3 ± .6</td>
</tr>
<tr>
<td>II (206)</td>
<td>204 (99%)</td>
<td>2</td>
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<td>35</td>
<td>1.9 ± .3</td>
</tr>
<tr>
<td>III (146)</td>
<td>136 (93%)</td>
<td>10</td>
<td>1</td>
<td>31</td>
<td>4.5 ± 1.5</td>
</tr>
<tr>
<td>IV (46)</td>
<td>40 (87%)</td>
<td>6</td>
<td>0</td>
<td>7</td>
<td>3 ± .8</td>
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<tr>
<td>V (8)</td>
<td>8 (100%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

patient that failed non-operative management left the hospital against medical advice, failing to ll the protocol requirements for discharge. He returned 8 days later in hemorrhagic shock and went splenectomy.

Conclusions: Non-operative management of splenic injury had a 96% success rate in this study. The guidelines successfully identified 94% of patients failing non-operative management during the rvation period with the outlier being non-compliant to protocol. These guidelines for rvation are safe and effective.
ADULT BLUNT SPLENIC TRAUMA

1. AT
2. Stable → CT
3. CT → Splenic Injury
4. Splenic Injury → Blush → Angiography
5. Angiography → Observation
6. Observation → I
7. Unstable → Failure
8. Failure → L
9. FAST X2
10. Unstable (± DPA) → Unstable
11. Unstable → OPERATING ROOM
12. OPERATING ROOM → Unstable
13. Unstable → Splenectomy
14. Splenectomy → Salvage
15. Stable
16. Consider Other Diagnoses
Pelvic Fracture Algorithm

Pelvic Fracture with Hemodynamic Instability
(BP < 90 systolic, BD ≤ -6, transfusion requirement > 4 u PRBC)

AP Pelvis radiograph

No displacement

Pubic symphysis diastasis > 2cm  
Vertical shear

Pelvic binding (sheet or device)

Abdominal evaluation; FAST

+  
Operating Room

-  
Angiography with embolization
OR

Expanding pelvic hematoma

Preperitoneal packing consider iliac artery ligation

Repair abd injuries
Damage control
Stabilizes

Angiography with embolization

Continued instability

stabilizes

Remains unstable

OR

Exploration
Preperitoneal packing and/or iliac artery ligation
REE OF INITIAL BRAIN INJURY IN YOUNG ADULTS DOES NOT CORRELATE WITH FUNCTIONAL IMPAIRMENT RECORDED BY COGNITIVE STATUS MINATIONS

Goold, D. Vane
University of Vermont College of Medicine

Principal Investigator: Daniel Goold
Senior Sponsor: Dennis W. Vane, MD, MBA

Objective: The Occupational Therapy Head Injury Mini Screen (OT HIMS) is a screening tool for patients admitted with traumatic brain injury (TBI) in the acute care setting. It is a combination of the Glasgow Orientation and Amnesia Test (GOAT) and the Cognistat (Formally the Neurobehavioral Status Examination). Its purpose is identification of cognitive deficits in patients and education for patients on the impact of these deficits on daily living. Our hypothesis for this was that the OT HIMS outcome varies with initial GCS on admission and that this test can be used for patients admitted with lower GCS.

Methods: Data were prospectively collected for all TBI patients (ICD-9-CM codes 800.0-801.99 - 859.9) ages 13-21 over 10 years. Patients had to be awake and functional enough to complete the test to be included. Patients with cognitive deficits were identified using GOAT and Cognistat as is any known baseline pre-existing deficits. Scores were compared with GCS on admission. Patients also included discharge to home or rehab. Hospital deaths were not included.

Results: 609 patients were reviewed and 248 were administered the OT HIMS. 83 suffered some impairment. The mean GCS for the 248 patients was 13.96 (+/- 2.16). A coefficient of correlation between GCS and GOAT score of only 0.224 and an R-squared value of 0.050 indicated no correlation between these results. Comparing GCS and the presence of impairment identified on GCS and GOAT score yielded an R-squared value of 0.093, indicating no correlation between these parameters. Among the patients whose results showed cognitive deficits on OT HIMS, 38.55% had impairments to injury. Interestingly, only 58.18% of patients with deficits prior to injury also demonstrated impairments on OT HIMS. Of the 248 patients, 12 went to rehab and this was not correlated with

Conclusions: In this study admission GCS did not predict performance on the OT HIMS after injury. A cohort of patients with adequate recovery to take the examination. Cognitive functionality can be spared after traumatic brain injury of even minimal degree. All patients admitted for TBI should be screened for cognitive deficits prior to discharge. Long term follow-up for this group must be trialed out for maximal therapy and optimal outcomes.
ULTITRAUMA DOES NOT INCREASE MORTALITY IN CRITICALLY INJURED PATIENTS WITH TRAUMATIC BRAIN INJURY

J. Lumpkins, G Bochicchio, M Kilbourne, K Bochicchio, A Conway, T Scalea
Division of Clinical and Outcomes Research, R Adams Cowley Shock Trauma Center

Researcher: Kimberly Lumpkins  
Senior Sponsor: Thomas Scalea

Background: The degree to which multitrauma impacts outcome in severely injured patients with traumatic brain injury (TBI) remains uncertain. We hypothesize that extracranial injuries may increase the mortality associated with TBI.

Methods: Consecutive patients with TBI admitted to the intensive care unit and surviving at least 24 hours from admission were prospectively followed over an 18 month period. The diagnosis of TBI was confirmed by CT scan. Demographic data were collected including age, gender, mechanism of injury, APACHE, ISS, and admission glucose. Isolated TBI was defined as TBI without abdominal, chest, or significant orthopedic injury (long bone fracture, spinal fracture, or pelvic fracture). Univariate analysis was performed using Student’s t test, Wilcoxon rank sum test, or Fisher’s exact test as appropriate. Logistic regression modeling was employed to control for demographic differences.

Results: 126 patients with TBI were evaluated. The average age was 43.5 ± 17 years and the average ISS was 31.8 ± 11.0. 92% (N=115) of patients sustained blunt trauma. The most common anatomic pattern of brain injury was subarachnoid hemorrhage (36%, N=81) followed by subdural hematoma and contusion (55.6% and 41.3% respectively). Of specific brain injury patterns, only herniation was associated with increased mortality in univariate and multivariate analysis (OR 5.25, CI 1.9-14.9, p=0.002). Sixty eight percent (N=86) of patients had substantial extracranial injuries while 32% (N=40) had isolated TBI. There was no significant difference in age, ISS, or mechanism of injury between these groups (all p > 0.05). Mortality in the multitrauma patients was 18.6% as compared to 15.4% in the isolated TBI patients; this was not significant on univariate analysis (p = 0.43). A logistic regression model (table to right) was then developed including age, ISS and herniation as variables as well as known predictors of mortality (admission base level and APACHE score).

Conclusion: Herniation was the only pattern of brain injury predictive of death. Extracranial injury did not increase mortality in these multiply injured patients with TBI who did not suffer an acute injury.
NSFUSION OF STORED RED BLOOD CELLS RESULTS IN DECREASED TISSUE OXYGENATION IN CRITICALLY INJURED TRAUMA PATIENTS.

Kiraly, M.D. M.S. Englehart, M.D. B.H. Tieu, M.D. J.A. Differding, M.S. S.J. Underwood, G. Singh, M.D. M.A. Schreiber, M.D.

Principal Investigator: Laszlo Kiraly

Senior Sponsor: Martin Schreiber

Objective: To determine the effect of age of blood transfused on tissue oxygenation using Near Infrared Spectroscopy (NIRS).

Methods: Thirty trauma patients in the Intensive Care Unit for whom a blood transfusion had been indicated were recruited. Each patient had a transcutaneous probe placed on the thenar eminence. A device (Hutchinson, Inc.) was used. The probe was left in place for one hour before the transfusion, during the transfusion, and four hours after transfusion completion. Tissue oxygenation (StO2) was recorded every two minutes. The StO2 area under the curve (AUC) over a specific time period was calculated for each patient. A control group of 18 patients, not receiving transfusions, was also recruited. The transfusion group was divided into two groups by blood age group. One group received blood that was greater than 21 days until expiration, (New Blood group n=16) and the other received blood less than 21 days until expiration (Old Blood group n=14). A Student’s t test was used for significance (p<0.05).

Results: The baseline AUC did not differ between groups. The Old Blood group demonstrated a significant decline in StO2 comparing its baseline period to its transfusion period (p<0.05). There was a similar decline in the control group or the New Blood group. The transfusion period AUC for the Old Blood group was lower compared to the control group (p<0.05). The transfusion period for the New Blood group was not different than the control group. The figure reflects the StO2 levels for the different groups. The period of time from -60 to 0 minutes indicates the baseline. The start of the blood transfusion for the transfusion groups is indicated by minute 0.

Conclusions: There is a decrease in peripheral tissue oxygenation in response to stored packed red cell transfusion. The decrease in tissue oxygenation was observed in patients receiving blood greater than 21 days until expiration. There was not a significant decrease in arterial oxygen saturation in patients receiving blood greater than 21 days until expiration. This indicates that factors influencing peripheral vasculature oxygen delivery.
ELOPMENT AND TESTING OF FREEZE DRIED PLASMA FOR THE TREATMENT OF UMA ASSOCIATED COAGULOPATHY

uja, MD, C. Shults, MD, M. Duggan, DVM, T.H. Fischer, PhD, M.U. Butt, MD, M. Tabbara, deMoya, MD, G. Velmahos, and H.B. Alam, MD.
achusetts General Hospital, Boston, MA
enter: Fahad Shuja, MD
Senior Sponsor: Hasan B. Alam, MD

duction: Trauma induced coagulopathy is associated with an extremely high mortality. We recently shown that survival can be improved by correction of coagulopathy through early, ixive infusion of Fresh Frozen Plasma (FFP). However, FFP is a perishable product, and its impractical in challenging environments such as a battlefield. Development of shelf-stable, to use, low volume, lyophilized, Freeze Dried Plasma (FDP) can overcome the logistical iotions. We hereby report the development and testing of such a product.

hods: Plasma separated from fresh porcine blood (n=7) was either stored as FFP, or utilized to produce the FDP. Thawed FFP and reconstituted FDP were matched for pH, erature and osmolarity and subjected to in-vitro analysis, which included measurement of PT, fibrinogen levels, and clotting factors II, VII and IX. To test in-vivo efficacy, swine were ed to polytrauma (femur fracture and grade V liver injury) and severe hemorrhagic shock (blood loss associated with “lethal triad” of coagulopathy, acidosis and hypothermia), and citated with FFP or FDP (n=2/group; plasma volumes equal to the volume of shed blood). ulation profiles (thromboelastography, PT, PTT, INR, fibrinogen) were measured during the iment, and for 4 hours post-treatment.

ults: In-vitro analysis revealed no differences in the coagulation profiles of FFP and FDP e). Lyophilization process did not decrease the levels of measured clotting factors. In the swine e, polytrauma and hemorrhagic shock caused a 50-70% increase in PT (p=0.03), and infusion of and FFP were equally effective in correcting the coagulopathy (Fig.1).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>FFP</th>
<th>FDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>sec</td>
<td>13.3 ± 0.5</td>
<td>13.4 ± 0.3</td>
</tr>
<tr>
<td>sec</td>
<td>23.1 ± 2.1</td>
<td>26.5 ± 2.7</td>
</tr>
<tr>
<td>or II (%)</td>
<td>22.6 ± 2.9</td>
<td>29.3 ± 5.2</td>
</tr>
<tr>
<td>or VII (%)</td>
<td>15.4 ± 2.3</td>
<td>21.6 ± 5.5</td>
</tr>
<tr>
<td>or IX (%)</td>
<td>229.7 ± 24.6</td>
<td>276 ± 50.9</td>
</tr>
<tr>
<td>(dl)</td>
<td>122.5 ± 18</td>
<td>128.4 ± 15.7</td>
</tr>
</tbody>
</table>

\[ H_0 \]

\[ X \]

\[ Y \]

\[ Z \]

\[ A \]

\[ B \]

\[ C \]

\[ D \]

\[ E \]

\[ F \]

\[ G \]

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\[ Z \]

\[ A \]

\[ B \]
PRBC TRANSFUSION RATIO OF 1:1 IS ASSOCIATED WITH SIGNIFICANTLY HIGHER RISK OF MORTALITY FOLLOWING MASSIVE TRANSFUSION

Prunier, MD, MPH, J. Ochoa, MD1, S. Gunn, MD1, J. Minei, MD2, J. Cuscheri, MD3, G. Efe MD, PhD3, T. Billiar, MD1, A. Peitzman, MD1, R. Maier, MD3, E. Moore, MD4
University of Pittsburgh Medical Center, 2 University of Texas Southwestern Medical Center, 3 Ornau Medical Center, University of Washington, 4 Denver Health Medical Center, University of Colorado

Center: Jason L. Sperry MD, MPH
Senior Sponsor: Ernest E. Moore, MD

Objective: The detrimental effects of coagulopathy, hypothermia and acidosis are well described as risk factors for mortality following traumatic hemorrhage. Recent military experience suggests a PRBC ratio (F:P) of 1:1 improves outcome, however, the ratio of F:P has not been adequately characterized in a civilian trauma population. Methods: Data were obtained from a multi-center prospective cohort study evaluating clinical outcomes in blunt injured adults with hemorrhagic shock. Standard operating procedures were employed to minimize variation in clinical management across centers. Patients with isolated traumatic brain injury were excluded. Those patients who received ≥ 8 units PRBC within the first 12 hours post-injury were analyzed (n=415). Logistic regression modeling was used to characterize the effects of the F:P ratio transfused on subsequent mortality after controlling for differences in injury severity, early shock parameters and interventions, temperature, coagulopathy (INR), resuscitation requirements (crystallloid, platelets, precipitate) and APACHE II score. Results: This cohort of patients were severely injured with an ISS of 34 [IQR 22, 43], with 63% and 16% requiring laparotomy or thoracic operative intervention (within 48 hours post-injury), respectively. Patients who received transfusion products in a 1:2 F:P vs. ≤ 1:2 F:P required significantly less blood transfusion at 24 hours (17 ± 11 units vs. 7 units, p = 0.003) with no difference found in presenting coagulopathy (INR: 1.9 vs. 1.7, p = 0.10). In a logistic regression model was a good predictor of mortality (AUC = 0.87 via ROC curve analysis). A 1:1 F:P ratio demonstrated a 64% reduction in the risk of mortality (p = 0.002) after controlling for important confounders. These significant findings remained even after controlling for the development of multiple organ failure (MOF) and nosocomial infection (NI). When the F:P was modeled into groups (1:1, 1:2-3, 1:4-5 vs. ≤ 1:6), the odds ratios for mortality demonstrate a dose-response relationship with a 1:1 F:P ratio remaining statistically significant and protective for mortality (***p = 0.022, OR = 0.35, Figure). When patients who died within 48 hours after injury were excluded, however, the odds ratio for 1:1 F:P became nonsignificant (OR 0.85, p = 0.723). Conclusions: In patients with ≥ 8 units PRBC's in the first 12 hours following significant injury, a 1:1 FFP:PRBC transfusion ratio is associated with a significant reduction in mortality. This risk ratio is independent of the development of MOF and NI and is most relevant to mortality within the first 48 hours. These data suggest that the mortality associated a FFP:PRBC ratio may occur early, possibly secondary to ongoing coagulopathy and hemorrhage, and provides justification for prospective trial investigation into the incorporation of a 1:1 PRBC ratio into massive transfusion practice.
LY ACHIEVEMENT OF A 1:1 RATIO OF FFP:PRBC REDUCES MORTALITY IN
ENTS RECEIVING MASSIVE TRANSFUSION

 Gonzalez, K Jastrow, JB Holcomb, LS Kao, FA Moore, RA Kozar
ersity of Texas-Houston

inter: Ernest Gonzalez Senior Sponsor: Rosemary Kozar

duction: We previously demonstrated that uncorrected coagulopathy in patients receiving
ive transfusion was associated with increased mortality. Based on these findings we
ented early goal directed therapy beginning at the time of injury to approach an optimal
a:PRBC ratio of 1:1. The aim of the current study was to evaluate mortality after
entation of this practice.

thods: Prospectively collected data was retrospectively reviewed on patients meeting criteria
ur standardized shock resuscitation protocol (BP < 90 systolic, base deficit ≥ 6, and the need for
fusion) and receiving massive transfusion (≥ 10 units packed red blood cells, PRBCs, in first 24
). Two resuscitation strategies were compared: 1.) pre 1:1 where FFP: PRBC 1:1 was begun
ICU admission, 97 patients ending January 2003 vs 2.) post 1:1 where FFP:PRBC 1:1 ratio
begun at the time of arrival in the emergency department, 95 patients ending June 2007.
ographic data was collected and transfusion practice compared between populations and
ated to mortality. Results were analyzed by student’s t-test and chi-square (p<0.05).
ults: Patient demographic and emergency department (ED) INR, crystalloid, and
le

<table>
<thead>
<tr>
<th></th>
<th>Pre 1:1</th>
<th>Post 1:1</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR</td>
<td>1.8±0.2</td>
<td>1.62±0.08</td>
<td>0.41</td>
</tr>
<tr>
<td>CU Cryst (L)</td>
<td>9±1</td>
<td>7±0.4</td>
<td>0.07</td>
</tr>
<tr>
<td>CU PRBC</td>
<td>12±1</td>
<td>15±1.2</td>
<td>0.06</td>
</tr>
<tr>
<td>CU FFP</td>
<td>5±0.4</td>
<td>11±1.0</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Admit INR</td>
<td>1.6±0.04</td>
<td>1.48±0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>ality</td>
<td>30 %</td>
<td>15 %</td>
<td>0.02</td>
</tr>
</tbody>
</table>

PRBC requirements were comparable between pre and post 1:1 patients. The implementation
of early FFP resulted in a lower 6 hr (1:2.4 pre vs 1:1.3 post), but
not 24 hr (1:1.2 pre vs 1:1.0 post) FFP:PRBC ratio and was
associated with a significant reduction in mortality from 30%
to 15%.

Conclusion: In a similar
lution of massively transfused injured patients, early goal directed therapy to achieve a ratio of
within the first 6 hrs of injury resulted in a drastic reduction of mortality by 50%. The precise
anism by which early FFP improves outcomes is unclear and warrants investigation. A current
center trial is planned to determine if universal adoption of 1:1 will translate into similar
vement in patient outcomes.
OPULATION-BASED ANALYSIS OF NEIGHBORHOOD SOCIOECONOMIC STATUS INJURY ADMISSION RATES AND IN-HOSPITAL MORTALITY

Aza, M Croce, L Magnotti, P Fischer, T Fabian
iversity of Tennessee Health Science Center

nter: Ben L. Aza, MD, MPH
Senior Sponsor: Ben L. Aza, MD, MPH

oduction: Geocoding methodology makes determining the impact of neighborhood level economic status (N-SES) on disease rates possible. Previous research in diseases other than injury (such as cancer and heart disease) indicates that N-SES has an inverse relationship with disease rates. We hypothesized that N-SES level would be inversely related to injury admission and risk adjusted in-hospital mortality.

ethods: Adults (age ≥ 18) living in the same county as the only designated Level I trauma center county were eligible for the study. Using the trauma registry for 1996 – 2005, addresses of trauma patients were geocoded and matched to one of 216 census tract groups in the county of the trauma center. Each census tract group represents a homogenous neighborhood population of 4000 residents. To determine N-SES level, census groups were divided into quintiles: Lowest Income N-SES to Highest Income N-SES based on the percent of the population living below the poverty level at the time of the 2000 census. Crude injury admission rates were calculated for each N-SES level. Multivariable logistic regression was used to determine if N-SES was associated with in-hospital mortality.

Results: 15927 (70.8% Blunt, 29.2% Penetrating) persons living in the same county as the Level I trauma center were admitted over the study period. Persons living in the lowest income neighborhoods had significantly higher crude injury rate compared to other N-SES levels (p<0.05) (Figure). After risk adjustment, N-SES level was not associated with in-hospital mortality (Table).

<table>
<thead>
<tr>
<th>SES Quintile</th>
<th>Blunt Injury</th>
<th>p-value</th>
<th>Penetrating Injury</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Income</td>
<td>REF</td>
<td></td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>High-Middle Income</td>
<td>1.38 (0.82, 2.34)</td>
<td>0.2308</td>
<td>1.12 (0.30, 4.16)</td>
<td>0.865</td>
</tr>
<tr>
<td>Middle Income</td>
<td>0.80 (0.46, 1.40)</td>
<td>0.4332</td>
<td>2.04 (0.58, 7.14)</td>
<td>0.263</td>
</tr>
<tr>
<td>Low-Middle Income</td>
<td>1.34 (0.84, 2.15)</td>
<td>0.2241</td>
<td>2.89 (0.94, 8.46)</td>
<td>0.064</td>
</tr>
<tr>
<td>Lowest Income</td>
<td>0.75 (0.48, 1.17)</td>
<td>0.2029</td>
<td>1.59 (0.54, 4.68)</td>
<td>0.400</td>
</tr>
</tbody>
</table>

Conclusion: N-SES is inversely related to injury rates for all mechanisms. However, after risk adjustment, in-hospital mortality is not associated with N-SES level. Neighborhood level intervention efforts should be focused on socioeconomically disadvantaged neighborhoods.
DO WE GO FROM HERE? UTILIZING INTERIM ANALYSIS TO FORGE AHEAD IN VIOLENCE PREVENTION

Dicker, M.D., S. Jaeger, B.S., M.M. Knudson, M.D., R.C. Mackersie, M.D., D.J. Morabito, M.P.H., and M. Texada of California, San Francisco

Senior Sponsor: Rochelle A. Dicker, M.D.

nter: Rochelle A. Dicker, M.D.

kground: The recidivism rate after violent injury is between 30-50% nationally. With the ultimate goal of recidivism, we have designed and implemented a hospital-based, case-managed violence prevention program (VPP) uniquely applicable to trauma centers. The Wraparound Project (WP) seizes the “teachable moment” after injury to implement culturally competent Case Management (CM) and shepherd clients through education resources with the help of community and community partners. The purpose of this study was to perform a detailed, dialectic evaluation of this multi-modal VPP. We hypothesized that this evaluation would demonstrate feasibility and early programmatic efficacy. We looked to identify areas of programmatic weakness that, if fixed, could strengthen the project and enhance its effectiveness. Data from this type of analysis is also of interest to community, governmental, and financial stakeholders.

Methods: We performed intermediate evaluation on the 18 month-old program. We selected the CDC-recommended instrument utilized for unintentional injury prevention programs and applied it to the WP. The essential steps in the methodology are Formative, Process, Impact, and Outcome. To test feasibility of use, we used Process Evaluation. To evaluate intermediate goals of risk reduction and early programmatic efficacy, we used Impact Evaluation.

nts: 435 people met screening criteria at our Level I Trauma Center. The two Case Managers were able to contact and screen 73% of gun shot victims, 7% of stab wound victims. Of those not seen, were in the hospital for < 2 days. 54% of those screening had identified needs and received CM services. Of the very high risk of receiving full services (N=45), 60% were of the case. CM “dose”: In the first three weeks of enrollment, 40% of the time managers spent >6 hours/week with the client. of the time they spent 3-6 hours. 17 of 18 who required >6 hours had 2-3 needs. A greater number of identified needs did not correlate with greater contact. Importantly, the attrition rate is currently only 4%. The table demonstrates percent success thus far in reducing risk reduction resources.

Evaluations: WP Case Managers served high risk clients by developing trust, credibility and a risk reduction plan. This approach resulted in 6 of the 7 major needs being successfully addressed at least 50% of the time with program attrition. This extensive interim analysis has led to recognition of the need for a 3rd CM to capture stay patients and augment “high dose” case management. The value of reporting these results has led WP to credibility with municipal stakeholders, who have now agreed to fund a 3rd CM position. Intermediate action provided a framework in our effort to achieve the ultimate goal of reducing recidivism through efficient CM and risk factor modification.

<table>
<thead>
<tr>
<th>Identified Need</th>
<th>% need met*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Court Advocacy</td>
<td>88%</td>
</tr>
<tr>
<td>Driver license</td>
<td>14%</td>
</tr>
<tr>
<td>Education</td>
<td>68%</td>
</tr>
<tr>
<td>Employment</td>
<td>61%</td>
</tr>
<tr>
<td>Housing</td>
<td>50%</td>
</tr>
<tr>
<td>Mental Health/Drug Treatment</td>
<td>65%</td>
</tr>
<tr>
<td>Vocational Training</td>
<td>67%</td>
</tr>
</tbody>
</table>

* Clients in program ≥ 3 mos

61
CLOSE IS DEAD; THE RELATIONSHIP BETWEEN ASSAILANT AND VICTIM: THE PRIMARY DETERMINANT OF FIREARM INJURY LETHALITY IN WOMEN

Finlay-Morreaule, B.S.; B.S. Fisher Ph.D.; J. Johannigman M.D *

University of Cincinnati College of Medicine – Division of Critical Care and Trauma * University of Cincinnati College of Criminal Justice

Presenter: Heather Finlay-Morreaule

Senior Sponsor: J. Johannigman M.D

POSE: To identify circumstances and outcomes of firearm injuries in women and identify key factors associated with death.

HODS: A retrospective review of Trauma Registry and medical records of all female patients aged by assault or firearm injury over age 14 at the University of Cincinnati from 1998–2006. In total, the records of all female deaths due to assault from Hamilton County coroner records from 1998–2006 were reviewed. The relationship between the assailant and victim was determined using medical record. When possible, additional sources of information including court and public records were referenced to corroborate this relationship.

JLTS: A total of 399 assaults were identified. One hundred and fourteen of these assaults were classified as secondary to firearms and occurred in Hamilton County. The table lists assaults and assaults based on relationship to the assailant.

<table>
<thead>
<tr>
<th>Assailant</th>
<th>Total Assaults [ % ]</th>
<th>Fatal Assaults</th>
<th>Non Fatal</th>
<th>Odds Ratio of Fatality</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mate partner</td>
<td>39 [34%]</td>
<td>28</td>
<td>11</td>
<td>6.6</td>
<td>2.7 – 16.0</td>
<td>&lt;0</td>
</tr>
<tr>
<td>Sister</td>
<td>5 [ 4%]</td>
<td>4</td>
<td>1</td>
<td>5.4</td>
<td>0.6 – 50.3</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>aintance</td>
<td>16 [14%]</td>
<td>7</td>
<td>9</td>
<td>1.0</td>
<td>0.3 – 2.9</td>
<td>1.0</td>
</tr>
<tr>
<td>nger</td>
<td>44 [38%]</td>
<td>7</td>
<td>37</td>
<td>0.1</td>
<td>0.0 – 0.3</td>
<td>&lt;0</td>
</tr>
<tr>
<td>nown</td>
<td>10 [ 9%]</td>
<td>5</td>
<td>5</td>
<td>1.3</td>
<td>0.3 – 4.6</td>
<td>0.7</td>
</tr>
</tbody>
</table>

non-fatal firearm injuries and trauma admissions were from assaults by strangers. The most significant factor linked to death from firearm assault was the relationship of the assailant to the victim. Firearm assault by intimate partners demonstrated an odds ratio of fatality of 6.6 (CI 2.7–16.0, P < 0.01). An additional factor associated with increased lethality included the assault occurring in the home, (OR 5.13, CI 2.2–12.2).

CLUSION: This study identified a population of women at markedly increased risk of death from firearm assault. These are women shot by intimate partners in the home. This is to our knowledge the first reporting of the markedly high lethality when intimate partners use a firearm in its. Because intimate partner firearm violence often results in death, these patients are not coded by the trauma registry. This previously unreported phenomena has critical implications for accurate prevention.
EFICIAL EFFECTS OF EARLY STABILIZATION OF THORACIC SPINE INJURIES DEPENDS ON TRAUMA SEVERITY

Schinkel, MD, PhD TM Frangen, MD, G Muhr, MD, PhD

of Surgery; BG Kliniken Bergmannsheil; Ruhr-University, Bochum, Germany

Senior Sponsor: CS Cocanour

Introduction: Proper timing for stabilization of thoracic spine injuries is controversial as multiple trauma and additional lung injuries occur frequently. While early repair of long bone fractures is known to reduce complications, few studies exist that investigate this issue in spine trauma. Early surgery might be beneficial to the clinical course and outcome in this patient population.

Patients and Methods: We retrospectively investigated 160 patients that had stabilization of thoracic and upper lumbar spine fractures. Patients were divided into 2 groups: Spine stabilization within 72 hours (group 1) or stabilization after 72 hours (group 2). Additional subgroups were evaluated based on the impact of the patient’s neurologic status (Frankel Score), Injury Severity (ISS) and operative lung failure.

Results: All subgroups were comparable in terms of clinical parameters and demographic data. Injured patients (ISS > 38) with early stabilization showed a significant decrease in postoperative ventilator days [group 1: 15 d (1-79d) versus group 2: 19 d (4-31 d); p<0.05], ICU stay [16 78d] versus 24 d (7-86d); p<0.05] and overall hospital stay [63 d (14-185d) versus 108d (57-1]); p<0.05]. Similar patterns were seen for patients with Frankel A deficits and preoperative lung failure. Clinical course and outcome for less severely injured patients was not different.

Conclusions: Our data provide further evidence that early stabilization of spine injuries is safe. It does not impair perioperative lung function in severely injured patients and results in reduced ICU and overall hospital length of stays in this patient population. These data support previous findings from our group where the German Trauma Registry was used to evaluate the impact of timing in 772 trauma patients with severe spine trauma. Further prospective randomized studies are warranted to confirm these results.
DEMOGRAPHICS OF MODERN BURN CARE. SHOULD MOST BURNS BE CARED BY THE NON-BURN SURGEON?

Author: Gary Vercruysse  
Senior Sponsor: David V. Feliciano

Introduction and Objectives: 1-2% of all patients seen in the Emergency Department (ED) are admitted for burns. Burn unit referral for all burns regardless of depth or size is still common. We need to characterize our patient population to determine the feasibility and potential economic impact if many of our patients could be managed by non-burn trained care or general surgeons.

Methods: We retrospectively reviewed prospectively collected data on 66 consecutive patients admitted to an urban tertiary burn center from November, 2005 and July, 2007. Data collected included: admission, distance from scene, mode of transport, age, gender, race, burn mechanism, Total Body Surface Area (BSA) burned, fraction requiring surgery, and graft size.

Results: Of 776 admissions, 40% were transferred from another facility after initial care in that facility. 76% of all transfers (51% of all air transfers), and 70% of all unit admissions were for <10% TBSA burns. The average cost of helicopter transport was $300.00 per flight. The average distance for helicopter transport was 48 miles (range 12-238 mi.). Average air transfer per week was discharged from the ED after only local wound care and education. Patients were relatively equally distributed along a large age range from infants to elderly. 87% of our patients were funded. Mechanisms varied, but 96% of all burns were water or flame burns, or scald burns, or flame burns. Of these, only 31% came to surgery, and required an average of m^2 skin graft coverage (the size of four folded 4x4's.)

Conclusions: Most small burns do not require surgery but rather pain control, local wound debridement, assessment, and daily dressing changes. If these burns require surgery, only minimal graft coverage is necessary. Many patients are transferred to tertiary care facilities due to a lack of wound assessment and care. Transferred patients suffer significant economic and non-economic delays in receiving care with multiple workups, and transfer costs. A potential cost savings could be realized if these patients were cared for by local general or burn surgeons educated in basic burn care. As the majority of patients are funded, this system is not economically burdensome to local facilities or physicians, and could be made more efficient if open lines of communication and a cooperative relationship exist between the community hospital and burn center with burn unit consultation on an as needed basis. Major burns still need to be transported to a burn unit either directly, or by transfer, and cared for by burn-trained physicians.
EMEDICINE EVALUATION OF ACUTE BURNS IS ACCURATE AND COST-EFFECTIVE

J. C. Edelman, PhD, S. Morris, MD, A. Cochran, MD
University of Utah Health Center

Background: The number of US burn centers has declined by over 25% in recent decades. Access to care is severely limited in rural areas, and referrals to remaining centers often require time-intensive air transport. Referring physicians' errors in burn size estimates leads to both under and overtriage which can be expensive and dangerous. In an effort to improve the appropriateness of referrals, we utilized telemedicine for evaluation of acute burns in our region.

Methods: We created a telemedicine network linking our burn center to the emergency rooms of hospitals located 298 - 350 air miles away. After providing telemedicine equipment and support, participants used telemedicine for evaluation of acute burns prior to transport. We record telemedicine referrals from these facilities during the period July, 2005-Aug, 2006 (E) to those during a two-year period prior to instituting telemedicine (PRE-TELE).

Results: 70 acute burn TELE consults occurred, compared to 28 PRE-TELE referrals (Table). Groups did not differ in age or median burn size. However, only 31 of the TELE patients received emergency air transport (44.3%), compared to 100% of PRE-TELE patients (p<0.05; Chi-square). Nine other TELE patients later traveled to the burn center by ground; the remaining 30 did not require transport. TELE patients tended to have larger median burn sizes (9.0% vs 6.5%; p=NS) and longer LOS (13.0 days versus 8.0; p=NS) than PRE-TELE patients. Burn size estimates by referring physicians (11.25% TBSA; IQR 13) varied significantly from those made by the TELE physicians (8.25% TBSA; IQR 10.7) or direct visualization (7.25% SA; IQR 10.9; both p<0.05 Wilcoxon Signed Ranks Test), while burn physicians’ estimates of burn size made by either method did not differ statistically. Both providers and patients expressed a high level of satisfaction with the telemedicine experience.

Conclusions: Acute evaluation of patients with burn injuries can be performed accurately by telemedicine on a real time basis. This can reduce under or overtriage for air transport and optimize resource utilization, while extending burn center expertise to many rural communities at little cost, with high satisfaction.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>PRE-TELE</th>
<th>TELEMED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td>Age years</td>
<td>29.9 (34)</td>
<td>30.0 (35)</td>
</tr>
<tr>
<td>Burn size, %TBSA</td>
<td>6.5 (15.3)</td>
<td>4.0 (6.2)</td>
</tr>
<tr>
<td>Air transport status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute aeromedical transport</td>
<td>28 (100%)</td>
<td>31 (44.3%)</td>
</tr>
<tr>
<td>Delayed (ground) transport</td>
<td>0</td>
<td>9 (12.9%)</td>
</tr>
<tr>
<td>Transport not required</td>
<td>0</td>
<td>30 (42.9%)</td>
</tr>
<tr>
<td>Days inpatients, days</td>
<td>8.0 (24)</td>
<td>13.0 (22)</td>
</tr>
<tr>
<td>Mortality (percent)</td>
<td>1 (3.6%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Numbers are expressed as medians with interquartile ranges in parentheses.
REALITY OF ERRORS IN RESUSCITATION AND HAEMORRHAGE CONTROL.

gre, E Caldwell, S D’Amours, P Wyllie, J Crozier, M Parr.
a Department, Liverpool Hospital, Sydney Australia

enter: M Sugrue
Senior Sponsor: M Sugrue

ground
opiate and timely arrest of haemorrhage is crucial to optimizing trauma outcomes. This study ates trauma patients dying at a Level 1 trauma centre to determine the adequacy of resuscitation control of haemorrhage.

ods
a deaths at a Level 1 trauma centre between 1996 and 2003 were reviewed by a disciplinary death review panel. Errors relating to volume resuscitation and haemorrhage ol were classified according to their location, nature, impact, outcome and whether the deaths avoidable or non-avoidable.

Its
een 1996 and 2003, there were 17,157 trauma admissions, including 307 trauma deaths with errors in all aspects of care. There were 267/1063 (25.1%) of errors in 151 patients related to ne resuscitation and haemorrhage control. The mean patient age was 47.7 years ± 24.8 years, ISS 38.1± 19.6. Errors occurred in ER in 59.9%, the OR in 20.2% and other areas in 19.9%.
errors related to poor judgment in 50.9%.delay in treatment in25.8%, poor technique in 9.7% others in 13.6%. Errors related to haemorrhage control in 49.1%, incorrect resuscitation in t, delay or failure to do angioembolisation in 6.0%, lack of damage control in 6.1% and other 3%. 28 major impact errors occurred in 24 patients. There were 19 thoracotomy related errors 6 hich were moderate or major impact. Volume resuscitation and haemorrhage control errors of moderate or major impact in 63/163 (22.1%).

usions
escitation and haemorrhage control related errors are common in trauma patient who die. They most frequently in the ER and mostly relate to failure in timely haemorrhage control. These have a significant impact on outcome. New strategies in training and performance are required prove outcome.
MANAGEMENT OF SEVERE HEMORRHAGE ASSOCIATED WITH MAXILLOFACIAL INJURIES: A MULTICENTER PERSPECTIVE

Cogbill, M.D. representing 9 Western Trauma Association Participating Institutions

Center: Thomas Cogbill, M.D.  Senior Sponsor: Thomas Cogbill, M.D.

roduction: Airway establishment and control of hemorrhage may be difficult to achieve with live bleeding from maxillofacial trauma. This study was undertaken to better understand the gement of these challenging injuries in order to develop effective algorithms.

hods: Trauma registries for 9 WTA participating institutions were queried from Jan 1, 1999 gh Dec 31, 2005 for injuries with AIS face ≥ 3 and ≥ 3 units of blood transfused within 24 hours. Only those patients in whom significant bleeding was associated with the maxillofacial areas were included. Data collected were demographics, injury measures, physiologic parameters, odds of airway control, hemostatic measures, and outcome.

results: After exclusions, 90 patients were identified.

<table>
<thead>
<tr>
<th>Penetrating (N=30)</th>
<th>Blunt (N=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 (15-65)</td>
<td>38.5 (15-89)</td>
</tr>
<tr>
<td>8 (0-26)</td>
<td>6 (0-30)</td>
</tr>
<tr>
<td>17 (9-75)</td>
<td>34 (13-50)</td>
</tr>
<tr>
<td>12 (3-48)</td>
<td>8 (3-36)</td>
</tr>
<tr>
<td>12 (40%)</td>
<td>20 (33%)</td>
</tr>
<tr>
<td>20%</td>
<td>26.7%</td>
</tr>
</tbody>
</table>

Penetrating airway management was by endotracheal (ET) intubation in 72 (80%) patients. Thyrotracheostomy and tracheostomy were emergently placed in 7 (8%) and 5 (6%) patients, respectively. The initial airway was converted to a tracheostomy in the OR within 24 hours in 32 patients for a total of 37 (41%) patients requiring tracheostomy. There were 17 (57%) patients with rating wounds taken directly to the OR for airway control and initial efforts at hemostasis of 12 (20%) patients with blunt trauma (p<0.05). Although a useful adjunct, anterior and/or posterior packing alone controlled bleeding in only 29% of patients. Angioembolization was useful for definitive control of hemorrhage in 91% of patients with penetrating injuries and 85% of patients with blunt trauma.

conclusions: Initial airway control was achieved by ET in the vast majority of patients. Patients with penetrating wounds were often taken directly to the OR for airway management and initial efforts at hemostasis. Patients with blunt trauma were much more likely to have associated injuries which affected prioritization of management. Transarterial embolization was successful in controlling hemorrhage in 87% of patients in whom it was attempted. Based on this experience, we use treatment algorithms for severe hemorrhage associated with blunt and penetrating maxillofacial injuries.
OSPECTIVE OBSERVATIONAL MULTICENTER STUDY OF THE OPTIMAL AGEEMENT OF PATIENTS WITH ANTERIOR ABDOMINAL STAB WOUNDS

Biffl, MD, C.C. Cothren, MD, K.J. Brasel, MD, K.L. Kaups, MD, R.A. Dicker, MD, J.M. MD, M.K. Bullard, MD, and the WTA Multicenter Trials Group

Senior Sponsor: Walter L. Biffl

Optimal management of stable patients with anterior abdominal stab wounds (AASWs) remains under debate. The goal is to identify and treat injuries in a safe, cost-effective manner. Commonly included local wound exploration (LWE)/diagnostic peritoneal lavage (DPL); serial clinical examinations (SCA); and CT imaging (CT). The purpose of this multicenter study was to evaluate the clinical course of patients managed by various strategies, to determine whether nontherapeutic laparotomy (NT LAP), emergency department discharge (ED DC), or complication rates differ.

Methods: A multicenter, IRB-approved study enrolled patients with AASWs. Management was determined by surgeon/institutional protocols and was not dictated by the study. Data on the presentation, evaluation, and clinical course were recorded prospectively. Therapeutic benefit of was determined by surgeon. Charges were provided by each institution.

Results: 308 patients (90% male, age 35 +/- 3) were enrolled at 10 centers. 78 (25%) had immediate for evisceration (27), shock (24), peritonitis (13) or other reasons (14); 16% were NT LAPs. Patients were further evaluated:

<table>
<thead>
<tr>
<th>Test</th>
<th>Pts (n)</th>
<th>ED DC</th>
<th>LAP</th>
<th>NT LAP</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>112</td>
<td>21 (19%)</td>
<td>27</td>
<td>9 (33%)</td>
<td>$2000</td>
</tr>
<tr>
<td>E/DPL</td>
<td>101</td>
<td>29 (29%)</td>
<td>37</td>
<td>17 (46%)</td>
<td>$4450</td>
</tr>
<tr>
<td>SCA</td>
<td>17</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>$750</td>
</tr>
</tbody>
</table>

Patients were taken for LAP after LWE, without DPL; 13 (59%) of these were NT. Mean LOS NT LAP was 3.4 +/- 0.6 days. Delayed LAP did not differ among groups and was not associated with significant morbidity.

Conclusions: CT often allows ED DC but also reveals abnormal findings of unclear significance, leading to NT LAP. LWE also allows ED DC frequently (p=NS), but LAP based on LWE/DPL is non-NT. SCA does not allow ED DC but minimizes NT LAP rates. The three primary gies appear safe, although SCA was infrequently performed in this series. Imaging and invasive g are expensive and do not obviate the need for admission. A prospective study should address the efficacy of LWE, to determine ED DC potential, followed by SCA, to minimize costs and avoidive interventions and NT LAPs.

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OUS THROMBOEMBOLISM IN A BURN POPULATION-IS IT TIME TO PREVENT CLOT?

Enza MD, J Noordenbos RN, G Lew R Ph, G Danquah MD, M Tenenhaus MD, J Lee MD, V)
1 MD, R Coimbra MD, C Ridgway PA-C, J Mc Sweeney RN
University of California San Diego

Senior Sponsor: Bruce M Potenza

Introduction: The incidence of venous thromboembolism in a burn population has yet to be defined. ller or not this is a real or perceived problem for this population is still controversial. We mined the incidence of VTE in patients admitted to a regional burn center.

Methods: This was a prospective analysis to determine the incidence and prophylaxis for VTE on a service. Patients were included from 2004-06 who were at "high risk" for VTE (defined by inability, multiple operations, ventilator dependent, total burn surface area >15%). All were ed weekly by duplex ultrasound for lower extremity VTE as well as upper extremity VTE x only if CVP catheter was present). Determination of VTE present or absent was recorded. ype of VTE prophylaxis also recorded. Comparison of VTE rates by location, catheter presence ype of prophylaxis determined. (sub Q heparin 5000 units Q 12 hours or low molecular weight in on a weight based dosing-enoxaparin 30 mg sub Q BID)

Results: There were 885 patients of which 355 who met entry criteria. 74% were males with a mean \\n32.7%. There were 34 VTE determined for an incidence rate of 9.7%. 87% of VTE were ptomatic. There were 18 VTE found denovo (no CVP catheter in the vein. The remaining 16 were found in the presence of a CVP catheter in the vein. 85% of all catheters were in the avian vein location. Leading sites of VTE were femoral vein (n=16), subclavian vein (11)and jugular vein (7). The presence of a catheter increased the rate of VTE by 2 fold in the avian vein, 4 fold in the femoral vein and 8 fold in the internal jugular vein. The longer the ter was in place the higher the incidence of VTE, but it was non-linear. The rates of VTE by od of prophylaxis were sub Q heparin 11.5% and low molecular weight heparin 4.9%. The rate TE was 50% higher in the sub Q heparin group compared to low molecular weight heparin.

Discussion: The rate of VTE in a burn population is an important problem in the burn population. population is at risk for VTE similar to major trauma and SICU patients and need appropriate prophylaxis. Despite prophylaxis, patients at high risk develop VTE and in the presence of an elling catheter have a 4 fold increase in VTE rates compared to non catheterized veins. 

Prophylaxis with low molecular weight heparin decreases the rate of VTE by 50%. Careful catheter choice of catheter and catheter site; 1) subclavian 2) internal jugular and 3) femoral vein only ast resort; will decrease the risk of VTE.
MONOARY CONTUSION IN THE CT ERA: MUCH ADO ABOUT NOTHING?

Jelsema, K Brasel

University of Wisconsin

Project: Rebecca Jelsema  Senior Sponsor: Karen Brasel

Abstract: Pulmonary contusion can lead to severe pulmonary complications, the basis for assigning injury a minimum Abbreviated Injury Score (AIS) of 3. We hypothesized that contusions not only on chest CT (CCT), with a normal chest radiograph (CXR), were clinically insignificant and resulted in substantial increases in Injury Severity Score (ISS). Methods: We retrospectively reviewed imaging studies from all blunt trauma admits to our Level 1 trauma center in 2006 who had both a CXR and CCT. We extracted pulmonary complication and demographic data from the trauma registry and computerized medical records. Diagnosis of pulmonary contusion was established according to imaging reports and review of all radiographic studies. Patients were allocated into 4 groups by original radiology report: (1) pulmonary contusion on both CCT and CXR; (2) pulmonary contusion on CCT, but not CXR; (3) pulmonary contusion on neither nor CCT, and (4) pulmonary contusion on CXR but not CCT. Results: 1252 blunt trauma patients were admitted in 2006. 663 patients were evaluated with both imaging studies. 83 had pulmonary contusion identified on both CCT and CXR (group 1, 12.5%), 99 had pulmonary contusion identified on CCT, but not CXR (group 2, 14.9%), and 465 patients did not have pulmonary contusion identified on either imaging test (group 3, 70.0%). 16 patients had contusion on CXR but not CCT. Agreement between original radiology report and blinded review was 96.1%. Median AIS and ISS are reported below as well as resource and complications for both groups.

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS</td>
<td></td>
</tr>
<tr>
<td>3.5 +/-0.59</td>
<td>3.2 +/- 0.4</td>
</tr>
<tr>
<td>Chest AIS</td>
<td></td>
</tr>
<tr>
<td>23.7 +/- 9.5</td>
<td>21.8 +/- 10.1</td>
</tr>
<tr>
<td>Ventilator days</td>
<td></td>
</tr>
<tr>
<td>2.9 +/- 6.9</td>
<td>0.5 +/- 1.4</td>
</tr>
<tr>
<td>ICU days</td>
<td></td>
</tr>
<tr>
<td>5.4 +/- 7.5</td>
<td>2.3 +/- 6.1</td>
</tr>
<tr>
<td>Hospital days</td>
<td></td>
</tr>
<tr>
<td>12.8 +/- 14.0</td>
<td>7.9 +/- 9.6</td>
</tr>
</tbody>
</table>

Conclusion: Pulmonary contusions detected by CCT, but not CXR, are of limited clinical significance. These clinically insignificant pulmonary contusions cause unwarranted increases in producing inaccurate data that may hinder injury research.
TICAL CARE IN A COMBAT SUPPORT HOSPITAL: IMPACT OF CIVILIAN INCIDENTS

McFarland, MD C.B. Swift, APRN R.M. Perkins, MD S.J. Johnson, MD P.F. Mahoney, MD Combat Support Hospital

Center: Jonathan B. Lundy, MD Senior Sponsor: John B. Holcomb, MD

As far as we know the first article to describe the experience of a military Combat Support Hospital (CSH) providing intensive care in a combat zone for over the course of almost a year. We describe the hospital's mission and facilities, and focus on the patients, relating to their status (military/civilian/detainee and as Iraqi/US/third nation), their injuries and illnesses, and their situation. Our hope is to provide a glimpse of the challenges that anyone providing sustained intensive care in a war-torn country will face.

The standard operating procedure of the ICUs was to log ICU admissions into handwritten books. The hospital also kept electronic databases, but these could not be interrogated to provide a comprehensive picture of the patient population served from which to draw study conclusions and make rational decisions. The data was tabulated and expressed in graphs and charts allowing for a descriptive representation of the patient population served from which to draw study conclusions and make rational decisions. In total there were 1383 ICU patients included in this study. Of this ICU patient population, only 21% were members of the US Military and over 46% were Iraqi civilians. The patient population consisted of US and Non-US contractors, Iraqi Military, Security Forces, and Coalition members.

There were several groups of patients that had a major impact on our experience. First, the single volume of penetrating trauma caused by small arms and increasingly by explosive devices caused the most numerically significant burden on our workload. The mechanism of injury varied widely by patient population. Overall, 38% of all trauma-related injuries seen at our CSH were due to injury from explosives and only 5% from gunshot wounds. Secondly, burn patients were a very resource-intensive group, and we often expended large amounts of supplies and energy in caring for them. Lastly, pediatric patients posed a challenge due to the need for redundant equipment in pediatrics. Significant to note of our largest patient population, Iraqi Civilians, 13% of their ICU admissions were related to medical reasons and 87% were related to trauma.

In a well resourced and constructed facility, our CSH was able to provide a high standard of care in a good clinical environment. The hospital treated patients outside the expected patient population and subgroups of these (such as severe burns) were very resource-intensive. National patients had to stay longer in the ICU compared to coalition casualties as they were not easily evacuated out of the country. The average length of stay for Iraqi civilians was 33 days, whereas for US Military the average length of stay was 1.6 days. The retrospective analysis of our experience with such a diverse patient population highlights the many challenges we faced and what implications those challenges have on future deployments. This study and similar ones could be used by military planners when considering how deployed intensive care facilities could be adapted to care for civilian patients.
#27

8:00am, 2/28/08

TRAFFIC SAFETY CAMPAIGN: COMPETITION IS THE KEY

Houston BA, V. Cassaboom RN, S. Matzick BSN RN, T. Rapstine BSN RN, S. Terry BSN RN, be BSN RN, J. Harwood PhD, S. Moulton MD

Children's Hospital and the Mile-High Regional Emergency and Trauma Advisory Council RETAC

INTER: M. Houston, BA

SENIOR SPONSOR: Steve Moulton MD

Objective: Motor vehicle crashes are the leading cause of death among teenagers due to higher crash (per mile driven, compared to all other age groups) and low seat belt use rates. Educational aims to evaluate and promote seat belt use among teens are needed.

Materials and Methods: Seat belt use among teen drivers and passengers was retrospectively observed over a two year period. Next, an educational program aimed at increasing seat belt use among teens was implemented at five area high schools. Observational studies were conducted as they arrived at school. Resources and incentives were provided to generate peer-to-peer competition. Schools competed against one another to see which could achieve the highest seat belt rate over a seven week period. Observational studies were repeated and success of the safety sign was measured by an increase in seat belt usage at participating high schools.

Results: In 2003, 91 teen drivers and passengers lost their lives on our state's roadways. In 2004, 142 were killed, 96 of which 33 (34%) were wearing a seat belt and 45 (47%) were not. At the beginning of the safety campaign, average seat belt use among teens was 47% (148/312), versus 40% (143/362) for teen passengers. Post-campaign seat belt use was 3% (230/276) among teen drivers versus 59% (259/435) for teen passengers. Overall use increased by 26%, to an average use rate of 69% (489/711).

<table>
<thead>
<tr>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
<th>School E</th>
<th>Overall Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>e</td>
<td>30%</td>
<td>49%</td>
<td>48%</td>
<td>53%</td>
<td>43%</td>
</tr>
<tr>
<td>61/203</td>
<td>79/160</td>
<td>63/132</td>
<td>58/109</td>
<td>30/70</td>
<td>291/674</td>
</tr>
</tbody>
</table>

Post        | 34%      | 81%      | 81%      | 84%      | 66%            |
| 50/149    | 117/144  | 120/148  | 107/127  | 95/143   | 489/711        |

Inclusion  | 4%       | 32%      | 33%      | 31%      | 23%            |
| p=0.56    | p<0.001  | p<0.001  | p<0.001  | p=0.002  | 26%            |

p<0.001

Conclusions: Social pressure and poor comprehension of the risks of injury were identified as reasons to seat belt usage among teenage high school students. A friendly, competitive approach to discussing and educating teens about these risks led to a 26% increase in seat belt usage by teen drivers and their passengers. Prospective evaluation of motor vehicle-related injuries in teens is ongoing, as the campaign expands to meet the demand for this program at area high schools.
HOSPITAL HYPOTENSION IN BLUNT TRAUMA: IDENTIFYING THE "CRUMP FOR"

Bilello, M.D., J.W. Davis, M.D., R.N. Townsend, MD, D. LeMaster RN, L.P. Sue, M.D., Taups M.D.

University of California San Francisco-Fresno Campus

Inter: John F. Bilello MD,FACS

Senior Sponsor: James W. Davis MD,FACS

Introduction: The presence of pre-hospital hypotension following blunt trauma as a criterion for a activation is controversial. Base deficit (BD) in blunt trauma ≤ -6 correlates with increased mortality. 

Hypothesis: The purpose of this study is to see whether hypotension in the field from blunt trauma, associated with an admission BD ≤ -6, correlates with future bouts of unexpected hypotension, "crumping", during evaluation as well as increased morbidity and mortality.

Methods: A retrospective chart review was performed on all blunt trauma admissions at a Level I center from August 2002 through June 2007. Patients who were hypotensive in the field but tensive upon arrival in the emergency department (ED) were included. Patients with continued tensive upon admission to the ED were excluded. Age, gender, ISS, arterial blood gas analysis, s of adjunctive studies (FAST, CT), IV fluids, blood transfusions, and the presence of repeat of hypotension were noted. Hypotension was defined as a SBP ≤ 90 mm Hg. Patients were t by BD ≤ -6 or ≥ -5. Statistical analysis was performed using paired t-test, chi-square and regression analysis with significance attributed to p<0.05.

Results: Over the 5 year period, 231 blunt trauma patients had hypotension in the field with normotension on admission to the ED. Of these, 177 patients had BD data recorded.

<table>
<thead>
<tr>
<th>N</th>
<th>Repeat Hypotension</th>
<th>ISS</th>
<th>IV Fluid (l)</th>
<th>Blood (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ -5</td>
<td>141</td>
<td>30%</td>
<td>20</td>
<td>3.1±0.2</td>
</tr>
<tr>
<td>≤ -6</td>
<td>36</td>
<td>78%</td>
<td>31</td>
<td>6.6±1.2</td>
</tr>
</tbody>
</table>

Overall mortality was 12% (22/177). Patients with a BD≤ -6 had a significantly greater mortality rate than the BD≥ -5 group (22 vs. 10%, p<.05). Repeat hypotension by itself was the most significant factor in mortality in both BD groups (p<.001).

Discussion: Blunt trauma patients with repeat hypotension have significantly greater mortality. Patients with transient field hypotension and a BD ≤ -6 are more than twice as likely to have repeat tensive ("crumping"). This study reinforces the need for early arterial blood gases and trauma involvement in the evaluation of these patients. Patients with BD ≤ -6 should have early monitoring, liberal use of repeat FAST exams and careful resuscitation prior to CT imaging. Surgeons should have a low threshold for taking such patients to the operating room.
FROM STANDING: AN UNDER APPRECIATED MECHANISM OF INJURY

Niamas, C; Glenn, A; Marttos, R; Manning, M; McKenney, M

Location: Trauma Center/University of Miami

Object: To study injuries associated with falls from standing at a Level I Trauma Center.

Methods: Retrospective, registry-based cohort study of patients who fell from standing and were transported to our Level I trauma center for a mechanism of fall from standing. 341/738 (46%) were transported by helicopter. 38(60%) were male. The mean age was 56 years with 324/738 (44%) over age 65. A total of 38 (69%) required admission, with 156/738 (21%) going to the ICU. 98/738 (13%) died as a result of their fall, 80/98 (82%) over the age of 65. The main cause of death was isolated head trauma in 63/98 (64%), followed by head trauma associated with other injuries in 18/98 (18.4%), abdominal trauma and or chest trauma in 12/98 (12.5%). Injuries in patients who survived included concussion, contusion, head trauma in 424/738 (57.45%), limb fractures in 125/738 (17%), and abdominal, chest, or spinal cord trauma in 168/738 (22.8%). 92/738 (12%) patients had operations [38/92 (41.3%) neuro, 33/92 (35.8%) ortho, 4/92 (4.3%) laparotomy, and 1/92 (1%) vascular]. 19 of the 92 patients who had operations died (21% mortality). The table below shows survivors and non-survivors.

<table>
<thead>
<tr>
<th>SBP</th>
<th>GCS</th>
<th>ISS</th>
<th>Trauma Score</th>
<th>LOS</th>
<th>ICU LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>144</td>
<td>12</td>
<td>10</td>
<td>15</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>150</td>
<td>9</td>
<td>12</td>
<td>24</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>

Conclusion: Fall from standing position is a potentially serious mechanism of injury. For those who die, the physiologic or anatomic criteria for transport to a trauma center, there was a significant difference in transport, hospital and ICU LOS, and mortality (13%), with head injury being the most common major injury. As the population ages, prevention efforts will be critical.
COMYCIN MIC CREEP: IMPACT ON OUTCOMES OF METHICILLIN RESISTANT HYLOCOCCUS AUREUS VENTILATOR ASSOCIATED PNEUMONIA

Ihotra, T Duane, M Aboutanos, K Smalar, G Chenault, C Borchers, N Martin, R Ivatury

School of Virginia, Virginia Commonwealth University

Senior Sponsor: Ajai K Malhotra

Background: The minimal inhibitory concentration (MIC) of Vancomycin, against Vancomycin sensitive-Methicillin resistant Staphylococcus aureus (VS-MRSA), has been steadily increasing. Concerns have been raised about the efficacy of Vancomycin in treating VS-MRSA. The current study evaluated outcomes of patients with ventilator associated pneumonia (VAP) caused by VS-MRSA treated with Vancomycin, and compares outcomes of patients infected with high MIC VS-MRSA (MIC > 0.5 μg/ml) to those infected with low MIC (MIC ≤ 0.5 μg/ml) VS-MRSA.

Methods: All patients treated for VS-MRSA VAP in our mixed trauma/surgery ICU and burn ICU identified from a prospective VAP database. Pneumonia was diagnosed by bronchoscopic BAL showing > 10^5 CFU of VS-MRSA/ml of BAL fluid. The Vancomycin susceptibility of all VS-MRSA isolates was obtained from a microbiology database. A chart review was performed to obtain outcomes in terms of mortality, ventilator, ICU and hospital lengths of stay. The clinical presentation of patients with VAP caused by high MIC (MIC > 0.5 μg/ml) VS-MRSA were compared to patients with VAP caused by low MIC (MIC ≤ 0.5 μg/ml) VS-MRSA. Significance was set at p < 0.05.

Results: Over the 69 month study period ending August 2007, 48 patients were identified with 61 episodes of VAP caused by VS-MRSA. 29 patients had 35 episodes of VAP with low MIC VS-MRSA and 19 patients had 26 episodes of VAP caused by high MIC VS-MRSA (Table). Trauma patients had a lower incidence of high MIC VS-MRSA when compared to non-trauma patients (p = 0.05). 4/29 (14%) of low MIC group developed recurrent infection with VS-MRSA as compared to 9/32% (p = 0.05) of the high MIC group.

<table>
<thead>
<tr>
<th>Patients</th>
<th>Age (years)</th>
<th>Sex (M:F)</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uma (22)</td>
<td>49±4</td>
<td>16:6</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>Gery (13)</td>
<td>59±3</td>
<td>6:7</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>N (7)</td>
<td>42±6</td>
<td>3:4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Er (6)</td>
<td>61±8</td>
<td>4:2</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Shown as Mean ± Standard error of Mean

Mortality of high MIC VS-MRSA VAP patients (8/19 = 42%) treated with Vancomycin was significantly higher than mortality of VAP patients with low MIC VS-MRSA (3/29 = 10%) similarly (p < 0.05) (Fig.). The ventilator, ICU and hospital lengths of stay were similar.

Conclusions: Vancomycin therapy is less effective in treating VAP caused by high MIC VS-MRSA. Institutions should consider treating VAP caused by high MIC VS-MRSA with alternatives. The Clinical Institute of Laboratory Standards (CLSI) should consider lowering the breakpoint of vancomycin for MRSA.
3 DE-ESCALATION OF ANTIBIOTIC THERAPY FOR VENTILATOR-
OCCLUDED PNEUMONIA (VAP) INCREASE THE LIKELIHOOD OF RECURRENT 
MONIA (RP) OR MORTALITY IN CRITICALLY ILL SURGICAL PATIENTS?

S Eachempati, L Hydo, J Shou, P Baric
Medical College of Cornell University

nter: S Eachempati Senior Sponsor: S Eachempati

tive: VAP is a leading cause of mortality in critically ill patients. Whereas previous studies
shown that de-escalation therapy of antibiotics (DT) may decrease costs and the development
istant pathogens, minimal data have shown its effect on other patient outcomes. We
esized that DT for VAP was not associated with an increased rate of RP or mortality in a
of critically ill surgical patients.

ds: All SICU patients from 1/05 to 5/07 with VAP diagnosed by quantitative bronchoalveolar
x with a positive threshold of 10,000 cfu/mL were identified. Data collected included age,
, APACHE III (A3), type of bacterial or other pathogen, antibiotics used for initial and final
ly, mortality, RP, and appropriateness of initial therapy (AIT). Patients were designated as
ving AIT, DT, and/or escalation of antibiotic therapy (ET) based on microbiology for their
Statistics: ANOVA, chi-square; binary logistic regression for mortality and RP was
med. P < 0.05.

nts: 138 of 1596 SICU patients developed VAP during the study period (8.7%). For VAP
its, the mean APACHE III was 82.7 with a mean age of 63.8 years. The RP rate was 30% and
ded DT (27.3%) and those who did not receive DT (35.1%).
ill mortality was 37% (55% predicted by A3 norms) and did not differ between those receiving
.8%) or not (42.1%). The most common pathogens for primary VAP were MRSA (14%), E.
.1%), and P. aeruginosa (9%) whereas P. aeruginosa was the most pathogen in RP. The AIT
VAP was 93%. DT occurred in 55% of patients with AIT whereas 8% of VAP patients
ed ET. The most commonly used initial antibiotic choice was
mycin/piperacillin/tazobactam (16%) and for final choice was piperacillin/tazobactam (20%).
etic regression demonstrated no specific parameter correlated with development of RP. Higher
.03, 1.01-1.05] was associated with mortality while lack of RP [0.31, 0.12-0.80], and AIT
ed mortality [0.024, 0.007-0.221]. Age, gender, individual pathogen, individual antibiotic
en and the use of DT had no effect on mortality.

usions: De-escalation therapy did not lead to recurrent pneumonia or increased mortality in
its with VAP. Due to its acknowledged benefits and lack of demonstrable risks, de-escalation
y should be employed whenever possible in critically ill patients with VAP. Additionally, our
states that appropriate initial antibiotic therapy remains vital in the successful treatment
ulator-associated pneumonia.
EMIC NOT JUST MESENTERIC LYMPH CAUSES NEUTROPHIL PRIMING LOWING HEMMORRHAGIC SHOCK

bel, D Liberati, A Ledgerwood, C Lucas
e State University

inter: Larry N. Diebel, MD Senior Sponsor: Larry N. Diebel MD

luction: Inflammatory mediators present in post-shock mesenteric lymph have been causally l to systemic polymorphonuclear cell (PMN) priming resulting in acute lung injury (ALI) and e organ failure. Earlier human and animal studies demonstrated ALI after lower limb nia/reperfusion (I/R) injury. As hemorrhagic shock (HS) is in essence a systemic I/R insult, tulated that systemic lymph after hemorrhagic shock would exhibit PMN priming and this studied in vitro.

cks: Lymph was collected at intervals from the hind limb of dogs subjected to sham or HS and olid resuscitation. Human PMN's isolated from heparinized blood of normal volunteers were ated with either buffer, sham lymph, or lymph after 120 minutes of shock or resuscitation. priming was indexed by CD11b expression (mean fluorescence intensity, MFI), superoxide (O2-) generation (nanomoles/mg protein), and elastase release (%) after the addition of fMLP ol). PMN's with buffer served as control.

<table>
<thead>
<tr>
<th></th>
<th>CD11b (MFI)</th>
<th>O2^-</th>
<th>Elastase (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sham</td>
<td>114.4±4.0</td>
<td>6.8±0.2</td>
<td>8.7±0.4</td>
</tr>
<tr>
<td>Shock</td>
<td>138.8±3.0*</td>
<td>5.9±0.6</td>
<td>5.2±0.3*</td>
</tr>
<tr>
<td>Resuscitation</td>
<td>283.8±3.7*#</td>
<td>9.4±0.6*#</td>
<td>13.2±0.3*#</td>
</tr>
<tr>
<td></td>
<td>269.8±4.7*#</td>
<td>8.3±0.3*#</td>
<td>11.6±0.4*#</td>
</tr>
</tbody>
</table>

0.05 vs. Control, *p < 0.001 vs. PMN-Sham

Usions: Exposure with systemic lymph following HS resulted in PMN priming. These results on the unique properties attributed to post HS lymph from the splanchnic bed in causing PMN ng and ALI following shock. The causal agent(s) for these effects are unclear.
IF COMMITMENT TO TRAUMA CARE IMPROVES MORTALITY AND LENGTH OF STAY AT A LEVEL I TRAUMA CENTER

Authors: K. Scarborough, R. Bar-Or, A. Hawkes, J. Huber, D. Bar-Or
Institution: St. Anthony Central Hospital and Swedish Medical Center

Senior Sponsor: Charles Mains

ABSTRACT: Optimizing human resources at trauma facilities may increase efficiency and quality of care. The purpose of this study was to assess whether staffing changes within the same level I trauma center (St. Anthony Central Hospital, ‘SAH’) improved mortality and shortened hospital and intensive care unit (ICU) length of stay for trauma patients.

METHODS: Mortality, hospital length of stay (LOS) and ICU LOS were evaluated during three periods: In-house general surgery resident presence (“Group 1”), after the implementation of a trauma service with dedicated in-house trauma surgeons (“Group 2”), and the addition of trauma service physician assistants (PA’s) to the core trauma service (“Group 3”). Logistic regression and chi-square tests were used for mortality, and multiple linear regression and non-parametric tests were used for LOS outcomes.

RESULTS: Adult trauma patients from the trauma registry at SAH were included in the analysis (n=297). There were fewer transfers-in during the Group 2 period, a higher percent of patients with systolic blood pressure (<90 mm Hg) during the Group 1 period, and more severely injured patients (ISS > 15) for Group 3 than Groups 2 and 1, all of which were adjusted for. After adjustment, the introduction of dedicated PA’s (Group 3) resulted in significantly decreased mortality in overall population and patients with severe injuries (ISS > 15) compared to the preceding Group 1 period (Table 1). Dedicated PA presence also resulted in significantly reduced hospital LOS and ICU LOS for the overall population. The presence of in-house trauma surgeons significantly decreased ICU LOS compared to Group 1; however, the reduction in mortality did not reach statistical significance.

CONCLUSION: The presence of in-house trauma surgeons and dedicated trauma service PA’s improves management and outcome of critically injured trauma patients within a level I trauma center.

<table>
<thead>
<tr>
<th>Group</th>
<th>Adjusted and unadjusted mortalities by group, stratified by injury severity score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted Mortality (%)</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
</tr>
<tr>
<td>1</td>
<td>3.82 (243)</td>
</tr>
<tr>
<td>2</td>
<td>3.76 (248)</td>
</tr>
<tr>
<td>3</td>
<td>3.18 (74)</td>
</tr>
</tbody>
</table>

**Adjusted for: Injury severity score, age, systolic blood pressure, transfer status**

Values are calculated compared to reference group 1.
USTERING OF INJURY BEHAVIORS

R Schermer MD MPH, Ellen C. Omi MD, Karen Grimley MSW, Pamela Van Auken, RN, Santaniello MD, Thomas J. Esposito MD
a University Chicago, Department of Surgery

nter: Carol R. Schermer MD Senior Sponsor: Carol R. Schermer MD

ground: Alcohol is a well known risk factor for injury. A number of other behaviors are also associated with injury risk. We hypothesized that problem drinking would be associated with other risk behaviors, thereby delineating a need for behavioral interventions in addition to alcohol.

ods: A consecutive sample of trauma patients was interviewed for drinking and risky behaviors including seatbelt use, helmet use, and driving behaviors. The alcohol use disorders identification (AUDIT) was used to screen for problem drinking and risky behavior questions were taken from validated questionnaires. Behaviors were ranked on a Likert scale ranging from a low to a high mood of the behavior or assessed the frequency of behavior in the past 30 days. An AUDIT of 8 or more was considered problem drinking. Problem and non-problem drinkers were compared on behavior risk items. A p-value of less than .05 was considered significant.

ts: 118 patients (mean age 35.7 years, 73.7% male,) were interviewed. Risky drinkers were likely to drive after consuming alcohol, drive more than 20 mph over the limit, tailgate, weave in and out of traffic, and make angry gestures at other drivers (all p< .05). Problem drinkers were likely to wear motorcycle or bicycle helmets. However, problem drinkers were no more or less likely to talk on the cell phone while driving, to use seatbelts, or use turn signals. Problem drinkers also in more motor vehicle crashes in their lifetime than non-problem drinkers (average 2.92 vs 1.24) and in more in which they were the party at fault (1.0 vs .43, p=.006).

usions: Factors other than alcohol increase injury risk in problem drinkers. Injury prevention programs performing alcohol interventions should consider including behavioral interventions along with alcohol reduction strategies.
ORCYCLE VERSUS U.F.O. (UNIDENTIFIED FEATHERED OBJECT); A CASE REPORT OF A RARE MECHANISM FOR BLUNT CAROTID INJURY

David J. Schultz, MD
Senior Sponsor: Karen Brasel, MD

A 22-year-old male was the unhelmeted driver of a motorcycle traveling at highway speeds when he struck in the anterior right neck by an unknown type of bird. He was able to bring the cycle to a stop without collision. He was awake and alert, but had an enlarging hematoma of the right neck. Rapid sequence intubation to protect his airway was unsuccessfully attempted at the hospital. A Combitube was placed and he was transported to the trauma center dynamically normal.

Angiography revealed a large right neck hematoma as well as a disruption of the right common carotid artery just proximal to the bifurcation with active extravasation. He was brought emergently for a tracheostomy was performed followed by a right neck exploration. A pseudoaneurysm contained by the facial vein was encountered. Proximal and distal control was achieved and the patient was anticoagulated. The injured segment of common carotid artery was excised and repaired with a 6mm Hemashield interposition graft. A percutaneous endoscopic tracheostomy tube was also placed.

He remained neurologically intact and was weaned from the ventilator on postoperative day #1. He tolerated a liquid diet, and was discharged home on postoperative day #7. His tracheostomy was downsized and eventually removed on postoperative day #23 as well as his gastrostomy tube. This carotid injury from a bird strike has not been described before in the literature.
SUAL CERVICAL SPINE INJURIES IN A RURAL PATIENT WITH MULTIPLE TRAUMA: OPPORTUNITIES FOR HARM AMIDST CONFLICTING PRIORITIES AND MULTIDISCIPLINARY FOLLOWUP

dekof, FSoldevilla, MD, D Adler, MD; J Krieg, MD; B Bell, DDS, MD; M Smith, MD, berg, MD, FACS; and W. B. Long, MD, FACS

y Emanuel Trauma Program, and the Divisions of Neurosurgery, Orthopedic Surgery, Oral and Facial Surgery (Portland, Oregon), and from the Emergency Medicine Department at Mercy Hospital (Roseburg, Oregon)

nter: Savanna Hardekof Senior Sponsor: William B. Long, M.D.

is case report describes some of the unique aspects of rural trauma involving a 16-year-old high school student involved in a motor vehicle that rolled 40ft down an embankment. After on from the driver’s seat, the car rolled over her. She sustained life threatening and potentially injuries: closed head injury, fracture/dislocations of the first and second cervical vertebrae (C2 odontoid) with lateral translocation of C2 over C3 without neurological injury, right rib fracture, grade 5 liver lacerations, grade 2 splenic injury, complex pelvic and facial fractures, hemorrhagic shock from blood loss, hypothermia, and coagulopathy.

ere were multiple opportunities to cause harm and delay in management of this patient with as not commonly seen by rural prehospital personnel and level 3 rural trauma centers. We e a time motion analysis of her initial care to definitive care at a level 1 ACSCOT verified enter, highlighting opportunities for improvement and further education and training.

e also highlight the subsequent attention to detail in post hospital discharge follow-up of some se complex injuries, leading to detection and non-operative treatment of an asymptomatic a, development of gallstone pancreatitis and subsequent laparoscopic cholecystectomy, ibular reconstruction for malocclusion and tracheostomy scar revision.

ve also report a hitherto unrecorded lateral cervical spine dislocation, which is not currently xi or described in the neurosurgical, orthopedical, or trauma literature (fig. 1, 2, &3), and the gement thereof.
Pneumonectomy: An Effective Salvage Following Devastating Pulmonary Injury

Jonen, M.D., J. O'Connor, M.D., T. Scalea, M.D.

Ironer: Jill Halonen, M.D. 
Senior Sponsor: Thomas M. Scalea, M.D.

Introduction: Blunt or penetrating trauma necessitating pneumonectomy is exceedingly rare. In patients in extremis who require pneumonectomy, the combination of respiratory insufficiency, right heart failure and depth of shock results in mortality approaching 100%.

Methods: Retrospective review of trauma registry data from January 2003 to June 2007 for patients undergoing pneumonectomy. Data collected included: demographics, admission systolic blood pressure (SBP), time to thoracotomy, intra-operative blood loss (EBL), transfusion (TX), critical care management, complications and mortality.

Results: Six patients were identified. The mean age was 27.8 years, four sustained penetrating trauma and two blunt trauma. Mean ISS was 26 and RTS was 4.6. Mean admission SBP, lactate and heart rate were 94 mmHg, 9.9 mmol/L and 6.94 respectively. Mean time to operation was 47 minutes. Two patients presented in arrest; one requiring emergent thoracotomy and one treated by tube thoracostomy. The decision to perform pneumonectomy was made when no lesser procedure would work. Mean EBL was 6.9 liters and mean intra-op TX was 14.5 units of platelets and 13.8 units of whole blood.

All six developed pulmonary hypertension, requiring vasoactive medications and lung protective ventilation. Three required prone ventilation, one oscillating ventilation, continuous renal replacement therapy in three and extracorporeal membrane oxygenation (ECMO) in two. Transesophageal echocardiography was used to guide therapy for pulmonary hypertension and volume management. Three patients died (50%); two of refractory right heart failure within the first 24 hours and one of multiple organ failure on the ninth post-operative day. Mean length of stay in the survivors was 11 days. All survivors were neurologically intact, and none required mechanical ventilation at the time of discharge. Both ECMO patients survived.

Discussion: The need for pneumonectomy following trauma is rare. Patients undergoing pneumonectomy who present in extremis require significant intra and postoperative support, but survival is 50%.
NITRIC OXIDE IN THE MANAGEMENT OF PATIENTS WITH SEVERE TRAUMATIC ACUTE LUNG INJURY

R.G. Barton
University of Utah

Principal Investigator: Sarah King
Senior Sponsor: Richard Barton

Inhalation: Inhalation of nitric oxide (NO) has been used in the management of ARDS and for the treatment of pulmonary hypertension. We describe the use of NO in trauma patients with severe, acute life threatening, acute lung injury, hypoxemia, and pulmonary hypertension.

Methods: With IRB approval, we conducted a retrospective chart review of four patients with acute life threatening acute lung injury secondary to shock, pulmonary contusion, or fatty liver syndrome that were treated with NO. All patients had diffuse infiltrates on chest x-ray, evidence of hemodynamic instability, hypoxemia requiring high levels of PEEP and FiO2, and pulmonary hypertension. All patients were receiving continuous infusions of epinephrine and norepinephrine to support blood pressure and cardiac output. Inhaled NO (20-40 ppm) was started for intractable hypoxemia and suspected right ventricular failure related to pulmonary hypertension and high PEEP.

Table: The effects of NO on hemodynamic parameters and oxygenation are shown below.

<table>
<thead>
<tr>
<th>Nitric Oxide Parameter</th>
<th>Pre-Nitric Oxide</th>
<th>Nitric Oxide 1 Hr</th>
<th>Nitric Oxide 8 Hr</th>
<th>Nitric Oxide 24 Hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (min/m²)</td>
<td>99 ± 12 / 47 ± 4.3</td>
<td>110 ± 22 / 65 ± 7.2</td>
<td>103 ± 4.7 / 59 ± 8.1</td>
<td>114 ± 30 / 70 ± 8.6</td>
</tr>
<tr>
<td>ppmHg</td>
<td>24 ± 0.75</td>
<td>16 ± 3.7</td>
<td>22 ± 3.1</td>
<td>16 ± 1.4</td>
</tr>
<tr>
<td>mmHg (mmHg)</td>
<td>25 ± 1.6</td>
<td>17 ± 3.0</td>
<td>22 ± 3.5</td>
<td>19 ± 3.8</td>
</tr>
<tr>
<td>mmHg (mmHg)</td>
<td>57 ± 7.6 / 32 ± 7.0</td>
<td>47 ± 8.1 / 25 ± 3.1</td>
<td>47 ± 7.0 / 27 ± 2.9</td>
<td>43.5 ± 1.9 / 24 ± 2.5</td>
</tr>
<tr>
<td>cm⁻²</td>
<td>227 ± 67</td>
<td>196 ± 12</td>
<td>155 ± 38</td>
<td>193 ± 74</td>
</tr>
<tr>
<td>cm⁻²</td>
<td>593 ± 65</td>
<td>810 ± 190</td>
<td>632 ± 19</td>
<td>764 ± 135</td>
</tr>
<tr>
<td>cmHg</td>
<td>60 ± 12</td>
<td>72 ± 18</td>
<td>82 ± 12</td>
<td>92 ± 26</td>
</tr>
<tr>
<td>cm</td>
<td>21 ± 2.1</td>
<td>19 ± 1.5</td>
<td>18 ± 2.4</td>
<td>16 ± 2.4</td>
</tr>
</tbody>
</table>

Presented as mean ± SEM

Conclusion: In critically injured trauma patients with severe acute lung injury, inhaled NO reduced pulmonary artery pressures and was associated with an increase in systemic blood pressure, permitting the weaning of vasoactive drug infusions. Further, inhaled NO improved oxygenation and reduced reductions in PEEP and FiO2. Inhaled NO may be useful for patients with intractable hypoxemia and right ventricular failure due to traumatic acute lung injury.
Equestrian-associated urethral injuries in women

I. J. M. Galante, C.S. Cocanour

Medical Center

INTER: Shannon Beal  SENIOR SPONSOR: Christine Cocanour

Equestrian accidents account for over 2,300 admissions per year with most injuries being head and extremity fractures. Urethral injuries are rare and are almost always seen in males related to pelvic fractures. Female urethral injuries are exceedingly rare with only two equestrian-associated injuries reported in the last 10 years. This case report details two female patients with equestrian-associated urethral injuries.

1. J.M. is a 66 year old woman bucked off her horse and landed straddling the saddle horn, falling to the ground. She had an unstable pelvic fracture. Pericatheter bleeding was found along the course of a foley catheter. Generalized perineal swelling and blood at the vaginal vault in sence of hematuria was seen. An anterior vaginal laceration was repaired in the ED. A CT and rectal exam were normal. She was taken to the OR within a few hours of injury for pelvic fixation of her pelvis, repair of a traumatic hernia that was discovered intraoperatorically, and by vaginal exam under anesthesia. A sagittal laceration extended ventrally to the urethra, through the urethra posteriorly, and into the anterior vaginal wall. A cystoscopy demonstrated no evidence of bladder injury, but did reveal an anterior and posterior tear of the urethra from the is to the verge of the bladder neck. The urethra was reconstructed around a 20 Fr foley. The post operative course was complicated by a wound cellulitis, and an infected pelvic abscess with failed pelvic fixation secondary to infected hardware. She underwent drainage, debridement, placement of antibiotic beads, and external pelvic stabilization.

2. S.R. is a 28 year old woman thrown from her horse during a jump. The horse also fell and on top of her. She had an unstable open book pelvic fracture and swelling of her mons pubis blood exuding from her vagina. Abdominal CT scan showed a large amount of free fluid without solid organ injury. She underwent bilateral iliac artery embolization, and then lap where raperitoneal bladder rupture was identified. Vaginal exam revealed a large laceration to the spin anterior to the vagina and urethra extending into the space of Retzius. The pubic rami were visible through this laceration. The vagina was intact. Further evaluation revealed a laceration anterior bladder neck and a complete anterior disruption of the urethra from the clitoral bodies of the clitoris and crura. It was repaired over a foley catheter. The ureters were lated with 5-French feeding tubes, which were then brought out through bilateral cystotomies through the skin. A suprapubic catheter was placed. The dome of the bladder was repaired. The pubic symphysis was plated. The perineum was repaired by reattaching the clitoris and crura. The patient was later transferred to her contracted hospital for physical therapy.

Conclusion: Female urethral injuries are rare, but should be considered in the patient with equestrian-associated pelvic fractures, especially those presenting with blood in the vagina.
HE RIGHT OF A GUARDIAN TO PROCURE AN ABORTION FOR AN PACITATED TRAUMA PATIENT: LEGAL AND ETHICAL CONSIDERATIONS

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Ground: Advanced trauma life support (ATLS) addresses the care of the pregnant patient by emphasizing the treatment of the mother, on whose health the survival of the fetus depends. Both survive a severe maternal traumatic brain injury, there is much less guidance about maternal management. Both legal and ethical issues may come into question. Case law has directly addressed the role of a guardian in making decisions about the fetus, with conflicting views. Case: A 21 year-old unrestrained passenger was involved in a high-speed frontal motor vehicle crash. She was intubated in the trauma bay, in hypovolemic shock, with a GCS of 6. After a full radiographic evaluation revealed diffuse intraparenchymal cerebral hemorrhages, fracture, and an intrauterine pregnancy. An intracranial pressure monitor documented low intracranial pressures, and was discontinued on hospital day 3. She then underwent emergency cesarean section and percutaneous gastrostomy. During her 5-week hospital stay, she had ventilator associated pneumonia, sepsis, and episodes of hypotension with autonomic instability. Her eventually stabilized at 5. Near the end of her hospital course, obstetric ultrasound estimated gestational age of the fetus at 14 weeks. The patient’s father, her closest living relative, sought the guardian. Concurrently, he expressed wishes to have the pregnancy terminated. Discussion: Case law has addressed this specific scenario less than 10 times. Some states have the guardian to terminate a pregnancy, although Florida statutes prohibit guardians from doing so without judicial review. Other states have case law supporting the appointment of a separate guardian ad litem for the fetus, who may make decisions counter to those made by the maternal guardian. Our jurisdiction does not specifically address these issues in any or case law. Since our statutes neither uphold nor deny a guardian the right to seek an order for their ward, the law is effectively silent, rendering any such petition susceptible to legal challenges. Addressing the ethical issues requires examination of the role of a guardian, normally to make decisions by utilizing either substituted judgment or establishing what would be in the patient’s best interests. This autonomy of the patient is upheld through her guardian’s voice, although it is not limitless. It is tempered to some degree by its companion principles of beneficence, non-maleficence, and justice. The right of a guardian to seek a course of action that is advantageous or detrimental, if not medically necessary, is determined by weighing the four cases in concert. The ethically equitable position strives to maximize consideration of each, in this case, suggested maintenance of the pregnancy. Conclusion: ATLS guidelines govern management of the pregnant trauma patient. It is important for trauma surgeons to be aware of potential issues that can arise during subsequent care, which may not be limited to medical decisions. Proposed with the complicated question of whether a pregnancy can be terminated for an acutely trauma patient, the applicable legal and ethical intricacies require thorough inspection and consultation with appropriate experts.
BY-LAWS
BYLAWS OF THE
WESTERN TRAUMA ASSOCIATION

ARTICLE I
Name, Objectives, Organization, and Jurisdiction

ION 1: Name
The name of this organization is the Western Trauma Association, henceforth referred to as the Association.

ION 2: Objectives, Core Values and Mission Statement
The objectives of the Association are to promote the exchange of educational and scientific information and principles, at the state level, in the diagnosis and management of traumatic conditions and to advance the science of medicine.

The core values are:
- Using education by participation in a diverse, multi-disciplinary scientific program with the goal of improving the care of injured patients.

The mission statement:
The Western Trauma Association is committed to the improvement of trauma care through research, education, sharing of clinical experiences and the development of physicians of all specialties involved in the care of trauma patients.

ION 3: Organization
The Association is a non-profit membership corporation entity, duly incorporated on the 25th day of January 1971, and by virtue of the provisions of the laws of the State of Colorado. The Association received determination of its 501(c)(3) status in October 2002.

ION 4: Jurisdiction and Territory
The territory in which this Association shall act will be the United States of America. It shall not be limited, however, from holding its annual meetings at any designated site.

ION 5: Governing Board
Meetings of the Association shall be conducted by the Board of Directors.

ARTICLE II
Membership

ION 1: Membership Limitation
Membership shall be limited to 125 active members. No single specialty shall comprise more than 40% of the total membership of 125.

ION 2: Membership and Qualifications
Active members shall be limited to Doctors of Medicine or Doctors of Osteopathy who are Board Certified in their particular medical specialty and are under the age of 55 years. The Board of Directors is hereby given discretionary powers to interpret if foreign physicians who apply for membership have credentials comparable to Board Certification. Active status is conferred by a two-thirds vote of the Board of Directors. Active members have the right to vote on any business presented to the organization during the business meeting, serve on, or chair any committee and be elected to any elected position within the organization.
B. Associate members include qualified members of other (non-M.D.) health care discip
with a special interest or expertise in trauma. Approval of a majority of the Board of D
is required. Associate members must satisfy the same requirements for election to or
retention of membership as active members. Associate members may not vote, serve
committees or hold office.

C. Senior membership is automatically conferred on all members in good standing upon
reaching the age of 55, assuming the member is in good standing. A senior member
all voting privileges and rights of active members, and must pay dues annually but is
from attendance requirements. The senior member is not counted as part of a given
specialty's membership quota or membership total.

D. Retired membership: Members in good standing who retire from practice are, upon
notification of the Secretary and/or Treasurer, entitled to continued membership, but are
exempt from all membership requirements, including the payment of dues. They shall
have the right to vote and their membership shall not be counted towards specialty or
membership quotas. The change to “retired status” is voluntary.

E. Emeritus membership: Senior members of the Association who have made a significan
cortribution to the organization may be awarded Emeritus membership by a majority
the Board of Directors.

F. Candidates for membership must submit a completed application and a letter of suppp
(sponsorship) from a member of the Association. They must also submit an abstract
consideration by the Program Committee. A prospective member must attend a mee
within three (3) years prior to the meeting in which he/she is voted on for membership.

SECTION 3: Membership Retention
To retain membership in the Association, each member must comply with the following:

A) Be a physician in good standing before his or her professional specialty board.

B) Attend at least one out of every three consecutive meetings of the Association.

C) Agree to be responsible for annual membership dues and any assessments as set by
Board of Directors at a special meeting or the annual meeting. He/she must remain c
in the payment of dues and assessments.

D) Maintain behavior befitting a physician by adhering to the code of ethical and moral
standards as described by either the American College of Surgeons or the American
Medical Association.

SECTION 4: Termination of Membership

A) Membership can be terminated for a violation of one or more of the items set forth in
II, Section 3 of the Bylaws of the Association by a vote of two-thirds of the Board of
Directors.

B) Any member may resign by filing a written resignation with the Secretary; however, a
resignation shall not relieve the member so resigning of the obligation to pay any due
other charges accrued and unpaid.
ARTICLE III
Meetings

ION 1: Annual Meetings
shall be an annual meeting of the membership of the Association held in some suitable location
on by the President-elect and approved by a majority vote of the Board of Directors and the
ership. Funds shall be made available for the conduct of the scientific program at the annual
ng.

ION 2: Special Meetings
al meetings of the Association may be called by the Board of Directors or two-thirds of the
ers in good standing, entitled to vote. The location for a special meeting of the Association
be chosen by the Board of Directors.

ION 3: Notice
of the time and place of the annual or special meetings of the Association shall be mailed by
ry of the Association to each and every member at his address as it last appears on the
ds of the Association with postage thereon prepaid. Notice shall be deemed delivered when
ited in the United States Mail, so addressed to the respective member. Notification by electronic
ail) may be substituted for regular mail.

ION 4: Quorum
ct to provisions of Article VI, Section 3, one-fourth of the membership present at any meeting of
ssociation shall constitute a quorum.
ARTICLE IV
Board of Directors, Meetings, and Responsibilities

SECTION 1: Composition
A. The President, President-elect, Vice-President, Secretary, Treasurer, immediate Past President, program committee chairman and six members-at-large shall constitute the Board of Directors.

B. The President of the Association shall serve as Chairman of the Board of Directors. The Chair of the Multicenter Trials Committee, the Historian and the President of the West Trauma Foundation for Education and Research shall serve as ex-officio members of the Board of Directors. The ex-officio members shall not have any vote on matters before the board.

C. At each annual meeting, two members of the Association in good standing named by the Nominating Committee and elected by the membership, shall replace the two outgoing members-at-large of the Board unless the membership should, by majority vote, elect to retain the then existing at-large Directors.

D. The tenure of elected members of the Board of Directors shall be for no more than three years unless such member shall be elected to a position as an officer in the Association.

Section 2: Annual Meetings
A. The annual meeting of the Board of Directors shall be held during and in the same geographic location as the annual meeting of the Association, but at least one day in advance of the annual general business meeting. The agenda will be determined by the President of the Association who will preside at the meeting. Additional agenda items may be proposed for discussion and/or vote by any Board member.

B. Unless otherwise determined by a majority vote of the Directors, all meetings of the Board shall be considered executive sessions and, thus, closed to all but Board Members and invited guests.

SECTION 3: Special Meetings
A. Special meetings of the Board of Directors may be held at any time and place upon the President’s request or a majority of the Board providing ten days prior written notice shall be given to each Director, stating the time, place and purpose of the special meeting. Notices of special meetings shall be mailed to the Directors by the Secretary of the Association in the same form and manner as provided above for mailing notices of meetings for the membership of the Association.

B. In lieu of special meetings, the Board of Directors may conduct business by conference telephone call including a quorum of Members of the Board. The same rules for notice of special meetings shall apply to conference calls.

SECTION 4: Quorum
A majority of the Board of Directors shall constitute a quorum. (No member of the Board may act by proxy.)
ION 5: Powers
ct only to the limitations of the provisions of the Colorado Nonprofit Corporation Act, all
rate powers shall be exercised by or under the authority of, and the affairs and activities of the
ation shall be controlled by, or under the authority of, the Board of Directors.

ION 6: Ex-officio Members of Board of Directors.
resident of the Western Trauma Foundation for Education and Research, Chairman of the
m Committee, Chair of the Multicenter Trials Committee and the Historian shall be ex-officio
ers of the Board of Directors and may participate in any meeting of the Board of Directors.

ARTICLE V
Registration, Fees, Dues, and Assessments

ION 1: Registration Fees
tration fees for annual meetings shall be paid and used to defray the cost of the functions of the
ll meeting. The amount of the registration fee shall be determined by the President, in
ation with the Treasurer, and notice thereof shall be sent to the membership along with the
ice of the annual meeting.

ION 2: Dues
of the Association shall be set by the Board of Directors. Each member shall pay dues to the
er of the Association for each fiscal year, beginning with the first new fiscal year after election
ership. The Treasurer shall notify each member of his/her dues obligation during the first
r of the fiscal year by regular or electronic mail. This notification shall follow the rules for
ation of the annual meeting. Associate members shall be required to pay the same dues
ed of active members. Failure to pay dues for three (3) years shall be considered cause for
ation of membership.

ION 3: Assessments
-thirds majority vote of the Board of Directors of the Association can institute a special
ment of the general membership. Special assessments can be voted by the Board of
ors only for the promotion of scientific programs at the annual meetings, research papers or
poses designed to achieve the exchange of ideas and principles pertaining to the diagnosis
agement of traumatic injuries and conditions. Notice of any special assessment of the
ership so voted by the Board of Directors shall be sent, by either regular or electronic mail, to
ive and senior members at the last address on record with the Association, postage pre-paid.

ION 4: Waiver of Dues and Responsibilities
uirements for retention of membership including payment of dues and attendance at meetings
waived by a vote of the majority of the Board of Directors upon petition. Eligibility for such
s shall include induction into the Armed Forces of the United States on a temporary basis,
al disability, or other reasons that would place unreasonable hardship, physical disability, or
reason upon the petitioner.

ARTICLE VI
Voting

ION 1: Voting Rights
active member or senior member in good standing shall be entitled to one vote on each matter
itted to a vote of the membership.

ION 2: Majority
A majority of the votes entitled to be cast on a matter at a meeting at which a quorum is present shall be deemed necessary for the adoption of such matters unless otherwise noted in the Bylaws.

SECTION 3: Manner of Voting
Each member of the Association is entitled to vote in one of three following manners:

1) In person.

2) With respect to matters described in any notice of meeting, by written instruction or ballot, delivered by United States Mail, postage pre-paid, addressed to the secretary of the Association at the Association's registered office or such other address as specified in any notice of meeting, postmarked and received on or before the date of the meeting of the membership where the vote is to be taken. A member who has voted by such written instruction or ballot shall be counted for purposes of determining whether quorum of members is present at a meeting, but only with respect to the matter voted upon by such Member.

3) By proxy duly executed in writing by the member or his authorized attorney-in-fact. No voting member in attendance at a meeting shall hold or vote more than one duly executed proxy for another member.

SECTION 4: Amendments
As to the Articles of Incorporation, consolidation or dissolution of the Association shall be passed in the event of a two-thirds vote of the members in good standing.

SECTION 5: Elections
Elections and all other matters raised to a vote of the membership cannot be held unless a quorum is present and shall be by majority vote.

ARTICLE VII
Officers

SECTION 1: Officers
The officers of the Association shall consist of the President, President-Elect, Vice-President, Secretary, Treasurer, Historian, and such other officers as from time to time may be appointed by the Board of Directors. The President, President-Elect, Vice-President, Secretary, Historian, and Treasurer shall be elected at the annual meeting of the members by simple majority of a quorum.

SECTION 2: Terms and Vacancies
The President, President-Elect, and Vice-President shall hold office for one (1) year. The Secretary and Treasurer shall each hold office for the term of three years. All elected officers, except the Treasurer, shall be automatically inaugurated at the close of the annual meeting at which they are elected. The newly elected treasurer shall assume the responsibilities of his/her office at the beginning of the next fiscal year following his/her election. The Historian shall serve until his/her death, resignation or inability to perform the duties subsequently described in Article VIII. Section ten officer cannot complete his/her term, his/her successor shall be chosen by the Board of Directors by special meeting to fill the vacancy for the unexpired term of the office. No officer shall serve for more than one term.

SECTION 3: Removal
Any officer may be removed, with or without cause, by a vote of a majority of the members of the Board of Directors present at any meeting for that purpose.
ARTICLE VIII
Duties and Authority of Officers

ION 1: President
The President shall preside at all meetings of the members and shall serve as ex-officio member of all committees. The President shall be Chairman of the Board of Directors and shall serve as the representative of the Association at the American Association for the Surgery of Trauma.

ION 2: President-Elect
The President-Elect shall be selected by the Board of Directors and shall serve as the Vice President in the absence of the President. The President-Elect shall serve as Chair of the Website Committee and perform such other duties as requested by the President or the Board of Directors.

ION 3: Vice President
The Vice President shall preside at all business meetings in the absence of the President. The Vice President shall serve as Chair of the Website Committee and perform such other duties as requested by the President or the Board of Directors.

ION 4: Secretary
The Secretary shall:
- Keep the minutes of all meetings of the Association and the Board of Directors.
- Be responsible for applications for membership, elections and terminations of members and communications to the membership, especially those whose membership is in jeopardy because of non-payment.
- Maintain the Membership database, with the help of the Treasurer.
- Record the reports from the other officers and committees and any bylaw changes.
- Maintain copies of all corporate documents, including contracts, except for those that specifically relate to financial matters.
- Prepare a report for the membership at the annual business meeting and for the Board of Directors at each of their annual meetings.

ION 5: Treasurer
The Treasurer shall:
- Keep the books of account of the Association.
- Have custody of, and be responsible for all funds, securities, financial documents, and other properties of the Association and shall deposit all such funds in the name of the Association in such banks or other depositories as shall be approved by the Board of Directors.
- Assist the Secretary in keeping the roster of the membership that is current and accurate.
- Engage a certified public accountant, approved by the President, to prepare such tax documents as are required by law and file said documents in a timely manner. He/she will require said certified public accountant to audit the books of the Association upon the request of the Board of Directors and present the report of that audit to the Board.
- Manage all accounts receivable and payable, including such expenses as may be incurred in the name of the Association.
- Send to all active and associate members a statement of dues in the first quarter of the fiscal year, and make all necessary efforts to collect those dues.
- Serve on the Website Committee and prepare the website annually for the meeting registration process.
8) Prepare registration packets, including name badges, and other items, for all those at the annual meeting.
9) Organize, with assistance from the other Officers and Board Members, the registration process at the annual meeting.

SECTION 6: Historian
The Historian shall maintain and safeguard the archives of the Association. The Historian shall be an ex-officio member of the Board of Directors. In case of a vacancy by reason of death, resignation, or inability to fulfill the responsibilities of the office, the vacancy may be filled by the Board of Directors until the next annual meeting of the members. The Historian shall keep a complete and continuous account of the history of the Association for the use of the membership. This shall include significant information concerning each annual meeting, including the site of the meeting, recipients of honors, invited lecturers, highlights of the scientific program, and important actions arising from the Business Meeting. The Historian shall also record significant action of the Board of Directors at its meetings. Each five years the Historian shall prepare the history of the Association from the time of the last recorded history to be part of the archives of the Association. Memorabilia of the Association shall be retained by the Historian.

ARTICLE IX
Committees

SECTION 1: Nominating Committee
The Nominating Committee shall be composed of three (3) members of the Association appointed by the President. These individuals should represent General Surgery, Orthopedic Surgery, and specialty. The Chairman of this Committee shall be the immediate Past President. This committee shall submit a slate of nominees for the various offices of the Association to the annual meeting.

SECTION 2: Program Committee
The Program Committee shall consist of a Chairman, appointed by the President, and a Committee including at least one General Surgeon, one Orthopedic Surgeon, another specialist (if available) as many other members as the Program Chairman and President deem necessary to a maximum of ten (10) members. The Chair and the President will appoint the committee members. The President and the Chairman of the Publications Committee shall serve as ex-officio members. The Chair will serve a two-year term and is an ex-officio member of the Board of Directors. This Committee shall be responsible for the organization and conduct of the program at the annual meeting.

SECTION 3: Membership Committee
The Secretary of the Association shall serve as Chairman of the Membership Committee. The committees shall present to the Board of Directors at its annual meeting, a list of candidates who satisfied the requirements for membership. Upon approval of the Board of Directors, this group be then presented to the membership for its approval as previously outlined.

SECTION 4: Publications Committee
The Publications Committee will consist of a Chairman and a Committee including at least one General Surgeon, one Orthopedic Surgeon, one Plastic Surgeon and another specialist (if available) as many other members as the Chairman and President deem necessary and appropriate. The Chairman of the Program Committee shall serve as an ex-officio member of the committee. The Chairman of the Publications Committee will be appointed by the President and serve a term of two years. The other members, selected from the membership, will be appointed by the President in consultation with the Chairman, annually. This committee will be responsible for reviewing all manuscripts submitted in association with presentations at the annual meeting and for choosing...
will be submitted to The Journal of Trauma. The Chairman will serve as the liaison to The Journal of Trauma. Should the Chairman not be an Editorial Consultant to The Journal of Trauma, the Chairman will consult with a member of the Editorial Board of The Journal of Trauma designated by President.

5: Multicenter Trials Committee
Multicenter trials committee shall consist of a Chairman and other interested members of the Association. This Committee will be responsible for coordinating and reviewing all the multicenter trials conducted under the aegis of the Association. The Chairman will be appointed by the President to a (2) year term. The Chairman will report to the President and board of directors, and at the annual business meeting and serve as an ex-officio member of the Board of Directors.

6: Website Committee
Website Committee shall consist of a Chairman and four (4) members. The Vice President shall serve as the Chairman of the Committee. The Treasurer will serve as a member. The two other members, selected from among the Association membership, will be appointed by the Vice President to a (2) year term. The Committee will be responsible for development and maintenance of the Association’s Website.

7: Other Committees
Ad hoc committees may be established by the Board of Directors. The creation of additional committees, proposed by the Board of Directors, requires the approval of a majority of members in good standing.

ARTICLE X
Conduct and Order of Business

1: Business Sessions of the Members
There shall be an annual business meeting of the members during the annual meeting. It shall be preceded by a meeting of the Board of Directors also held during the annual meeting of the Association.

2: Order of Business
The President shall set the agenda and where possible should follow Robert’s Rules of Order.

ARTICLE XI
Indemnification

1: Definitions. For purposes of this Article:

The term “director or officer” shall include a person who, while serving as a director or officer of the Association, is or was serving at the request of the Association as a director, officer, partner, member, manager, trustee, employee, fiduciary or agent of another foreign or domestic Association. The term “director or officer” shall also include the estate of personal representative of a director or officer, unless the context otherwise requires.

The term “proceeding” shall mean any threatened, pending, or completed action, suit, or proceeding, whether civil, criminal, administrative, or investigative, whether formal or informal, any appeal in such an action, suit, or proceeding, and any inquiry or investigation that could lead to such an action, suit, or proceeding.
C. The term "party" includes an individual who is, was, or is threatened to be made a defendant or respondent in a proceeding.

D. The term "liability" shall mean any obligation to pay a judgment, settlement, penalty, or reasonable expense incurred with respect to a proceeding.

E. When used with respect to a director, the phrase "official capacity" shall mean the office of director in the Association, and, when used with respect to a person other than a director, shall mean the office in the Association held by the officer or the employment, fiduciary agency relationship undertaken by the employee or agent on behalf of the Association in neither case shall include service for any foreign or domestic Association or for any person.

Section 2 General Provisions.
The Association shall indemnify any person who is or was a party or is threatened to be made to any proceeding by reason of the fact that such person is or was a director or officer of the Association, against expenses (including attorneys' fees), liability, judgments, fines, and amounts paid in settlement actually and reasonably incurred by such person in connection with such proceeding if such person:

(i) acted in good faith;
(ii) reasonably believed, in the case of conduct in an official capacity with the Association, that the conduct was in the best interests of the Association, and, in all other cases, that the conduct was not opposed to the best interests of the Association; and
(iii) with respect to any criminal proceeding, had no reasonable cause to believe that the conduct was unlawful.

However, no person shall be entitled to indemnification under this Section 2 either:

(i) in connection with a proceeding brought by or in the right of the Association in which the director or officer was adjudged liable to the Association; or
(ii) in connection with any other proceeding charging improper personal benefit to the director, officer, whether or not involving action in that person's official capacity, in which the director or officer is ultimately adjudged liable on the basis that the director or officer improperly received personal benefit.

Indemnification under this Section 2 in connection with a proceeding brought by or in the right of the Association shall be limited to reasonable expenses incurred in connection with the proceeding or termination of any action, suit, or proceeding by judgment, order, settlement, or conviction or plea of guilty or its equivalent shall not of itself be determinative that the person did not meet the standard of conduct set forth in this Section 2.

Section 3 Successful Defense on the Merits: Expenses.
To the extent that a director or officer of the Association has been wholly successful on the merits in the defense of any proceeding to which he was a party, such person shall be indemnified against reasonable expenses (including attorneys' fees) actually and reasonably incurred in connection with such proceeding.

Section 4 Determination of Right to Indemnification.
Any indemnification under Section 2 of this Article (unless ordered by a court) shall be made by the Association only as authorized in each specific case upon a determination that indemnification
r or officer is permissible under the circumstances because such person met the applicable
urd of conduct set forth in Section 2. Such determination shall be made:

(i) by the Board of Directors by a majority vote of a quorum of disinterested directors
who at the time of the vote are not, were not, and are not threatened to be
made parties to the proceeding; or

(ii) if such a quorum of the Board of Directors cannot be obtained, or even if such a
quorum is obtained, but such quorum so directs, then by independent legal
counsel selected by the Board of Directors in accordance with the preceding
procedures, or by the voting members (other than the voting members who are
directors and are, at the time, seeking indemnification). Authorization of
indemnification and evaluation as to the reasonableness of expenses shall be
made in the same manner as the determination that indemnification is
permissible, except that, if the determination that indemnification is permissible
is made by independent legal counsel, authorization of indemnification and
evaluation of legal expenses shall be made by the body that selected such
counsel.

n 5. Advance Payment of Expenses; Undertaking to Repay.
association may pay or reimburse the reasonable expenses (including attorneys, fees)
exd by a director or officer who is a party to proceeding in advance of the final disposition of the
eding if:

(i) the director or officer furnishes the Association a written affirmation of the director’s
or officer’s good faith belief that the person has met the standard of conduct set
forth in Section 2;

(ii) the director or officer furnishes the Association with a written undertaking, executed
personally or on the director’s or officer’s behalf, to repay the advance if it is
determined that the person did not meet the standard of conduct set forth in
Section 2, which undertaking shall be an unlimited general obligation of the director
or officer but which need not be secured and which may be accepted without
reference to financial ability to make repayment; and

(iii) a determination is made by the body authorizing indemnification that the facts then
known to such body would not preclude indemnification.

n 6. Reports to Members.
ent that the Association indemnifies, or advances the expenses of, a director or officer in
ance with this Article in connection with a proceeding by or on behalf of the Association, a
of that fact shall be made in writing to the member with or before the delivery of the notice of
xt meeting of the members.

n 7. Other Employees and Agents.
association shall indemnify such other employees and agents of the Association to the same
and in the same manner as is provided above in Section 2 with respect to directors and
s, by adopting a resolution by a majority of the members of the Board of Directors specifically
ying by name or by position the employees or agents entitled to indemnification.

n 8. Insurance.
card of Directors may exercise the Association’s power to purchase and maintain insurance
ling without limitation insurance for legal expenses and costs incurred in connection with
ing any claim, proceeding, or lawsuit) on behalf of any person who is or was a director, officer,
see, fiduciary, agent or was serving as a director, officer, partner, member, trustee, employee,
y of another domestic or foreign corporation, nonprofit corporation against any liability
ed against the person or incurred by the person in any such capacity or arising out of the
person's status as such, whether or not the Association would have the power to indemnify the person against such liability under the provisions of this Article.

Section 9. Nonexclusivity of Article.
The indemnification provided by this Article shall not be deemed exclusive of any other rights to which a person may be entitled under the Articles of Incorporation, any bylaw, resolution of disinterested directors, or otherwise, both as to action in such person's official capacity and as to action in another capacity while holding such office, and shall continue a person who has ceased to be a director or officer, and shall inure to the benefit of such person's heirs, executors, and administrators.

Section 10. Notice to Voting Members of Indemnification.
If the Association indemnifies or advances expenses to a director or an officer, the Association shall give written notice of the indemnification in advance to the voting members with or before the time of the next voting members' meeting. If the next voting member action is taken without a meeting, such notice shall be given to the voting members at or before the time the first voting member writing consenting to such action.

ARTICLE XII
Conflicts Of Interest, Loans And Private Inurement

Section 1. Conflicts of Interest.
If any person who is a director or officer of the Association is aware that the Association may be about to enter into any business transaction directly or indirectly with himself, any member of his or her immediate family, or any entity in which he has any legal, equitable or fiduciary interest or position, including without limitation as a director, officer, shareholder, partner, beneficiary or trustee, such person shall:

(a) immediately inform those charged with approving the transaction on behalf of the Association of such person's interest or position;

(b) aid the persons charged with making the decision by disclosing any material facts with which such person's knowledge that bear on the advisability of such transaction from the standpoint of the Association; and

(c) not be entitled to vote on the decision to enter into such transaction.

Voting on such transaction shall be conducted as follows:

(i) Discussion of the matter, with the interested officer or director, shall be held by the board with such person present to provide information and answer any questions.

(ii) The interested officer or director shall withdraw from the meeting.

(iii) Discussion of the matter outside of the presence of the interested officer or director shall be held by the Board.

(iv) The remaining members of the Board shall vote. Such voting shall be by written ballot. Such ballots shall not reflect the name or identity of the person voting.

Section 2. Loans to Directors and Officers Prohibited.
Ins shall be made by the Association to any of its directors or officers. Any director or officer who consents to or participates in the making of any such loan shall be liable to the Association for the entire amount until it is repaid.

n 3. No Private Inurement. The Association is not organized for profit and is to be operated exclusively for the promotion of social welfare in accordance with the purposes stated in the Association's articles of incorporation. The net earnings of the Association shall be devoted exclusively to charitable and educational purposes and not inure to the benefit of any private individual. No director or person from whom the Association may receive any property or funds shall receive or shall be entitled to receive any salary or profit from the operation thereof, and in no event shall any part of the funds or assets of the Association be paid as salary or compensation to, or distributed to, or inure to the benefit of any person other than the board of directors; provided, however, that:

reasonable compensation may be paid to any director while acting as an agent, contractor, employee of the Association for services rendered in effecting one or more of the purposes of the Association;

any director may, from time to time, be reimbursed for such director's actual and reasonable expenses incurred in connection with the administration of the affairs of the Association; and

the Association may, by resolution of the board of directors, make distributions to persons whom the Association has received contributions previously made to support its activities to the extent that such distributions represent no more than a return of all or a part of the contributor's contributions.

ARTICLE XIII
Amendments

Bylaws may be amended at any annual meeting of the Association provided that a notice of the purpose of each proposed amendment and the reason therefore, and a copy of the proposed amendment is sent to every member in good standing not less than thirty (30) days prior to the meeting at which the proposed amendment is to be voted upon. It shall require a two-thirds vote of a quorum of the membership present at the meeting to amend a Bylaw.
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Please supply any needed corrections directly to the secretary's office by e-mail (preferably) care of Dr. Ochsner’s administrative assistant, Ms. Janice Bentley bentlja1@memorialhealth.com or to Dr. Ochsner’s office by any other means