KAPPEI

THIRTY-EIGHTH ANNUAL MEETING

Squaw Valley 2008

Western Trauma Association

February 24 - March 1, 2008

Squaw Valley, California

PO Box 3333
Olympic Valley, CA 96146
T: 530.583.6300
F: 530.581.5407
www.squawcreek.com

FFP vs VIIA in
comadin pt's to
correct INR

Can SCO's be
improved? - should it be
2 phase ie vac (neg) to compression
(pos)

OR

SPIRAL - proximally
directed

Carol Schermer -
Interested in Communication Research

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Phil's e-mail / A @ WTA

Spleen observation algorithm - p. 41, ~~53~~

Ben Eisman pioneered concept of algorithms in ~ 70's - ??

CME Event ON-LINE

Begin to look at transfer times and outcomes (ISS)

Google - telemedicine & trauma & pull reprints

experiment in cell phone picture transfer

30 X 15,000 = $450,000

$15,000

Polycom VSX 7000 handheld 50X macro

internet

$1,170,000

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Compare subjective scales (pain/fct)
to objective measurements
in individual pt's

How many invited initially?

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Polycom VSX 7000
+ handheld 50X macro

? e-mail Jeff Saffle re: supplier

$15,000 each

call for evidence re: effectiveness

Med Educ 2006, 40: 759 (or 769)
: American Telemedicine Association

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

WESTERN TRAUMA ASSOCIATION

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

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

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

Gundersen Lutheran Medical Foundation designates this educational activity fo 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

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R. Christie Wray, MD	Historian

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Peter Rhee, MD	2009
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PAST PRESIDENTS

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

The 2009 WESTERN TRAUMA ASSOCIATION Meeting will be held at:

Steamboat Springs, Colorado
February 22 – February 28, 2009

WESTERN TRAUMA FOUNDATION DONORS

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Margaret Knudson
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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 t Annual Meeting of the Association.

Dr. Young received his medical degree from the University of Rochester, N.Y. and Ph.D. in surgery fr University of Minnesota. He completed advanced training in cancer research at Harvard, a fellow 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 gene 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 de 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

EARL G. YOUNG AWARD RECIPIENTS

dent	Institution	Year
ph Schmoker, M.D.	University of Vermont	1991
ph Schmoker, M.D.	University of Vermont	1992
les Mock, M.D.	University of Washington	1993
Travisani, M.D.	University of Vermont	1994
p C. Ridings, M.D.	Medical College of Virginia	1995
d Han, M.D.	Emory University	1996
ton R. Miller, M.D.	Wake Forest University	1997
frey Manley, M.D., PhD.	University of California-San Francisco	1998
es M. Doty, M.D.	Medical College of Virginia	1999
Ciesla, M.D.	Denver Health Medical Center	2000
rdo J. Gonzales, M.D.	Denver Health Medical Center	2001
t C. Brakenridge	Cook County Hospital	2002
ıa J, Osband, M.D.	UMDNJ-New Jersey Medical School	2003
y Lee, M.D.	UMDNJ-New Jersey Medical School	2004
st A. Gonzalez, M.D.	University Of Texas at Houston	2005
ifer M. Watters, M.D.	Oregon Health & Science University	2005
ifer J. Wan, M.D.	University of California-San Francisco	2006
ifer J. Wan, M.D.	University of California-San Francisco	2007

WESTERN TRAUMA ASSOCIATION

IN MEMORIUM

Earl G. Young, MD
February 27, 1989

Gerald S. Gussack
August 25, 1997

Peter Mucha, Jr.
August 9, 2006

"Paint the Ceiling" Lectureship

Jerry Jurkovich, M.D.	1997	Snowbird, Utah
n W. McGill, M.D.	1998	Chateau Lake Louise, Alberta
liam T. Close, M.D.	1999	Crested Butte, Colorado
my Cornell	2000	Squaw Valley, California
ɔff Tabin, M.D.	2001	Big Sky, Montana
ıes H. "Red" Duke, M.D.	2002	Chateau Whistler, British Columbia
ʻid V. Shatz, M.D.	2003	Snowbird, Utah
ıan and Tim Baker	2004	Steamboat Springs, Colorado
ĸ Habel, M.D.	2005	Jackson Hole, Wyoming
lrew Schneider	2006	Big Sky, Montana
est E. Moore, MD	2007	Steamboat Springs, Colorado
nela Kallsen	2008	Squaw Valley, California

WESTERN TRAUMA ASSOCIATION
Schedule of Events
February 24 – March 1, 2008

		Room
Sunday, February 24		
4:00pm – 5:00pm	Nominating Committee	
4:30pm – 7:30pm	Registration	Alpine Foyer
5:00pm – 7:00pm	Welcome Reception	Alpine Ballroom
5:00pm – 7:00pm	Children's Reception	Grand Sierra C/D
7:00pm – 8:00pm	Past President's Meeting	Silver Peak
8:00pm	WTA Foundation Board Meeting	Silver Peak
Monday, February 25		
6:30am – 8:00am	Attendee Breakfast	Grand Sierra C/D
7:00am – 9:00am	Scientific Session	Grand Sierra A/B
7:30am – 9:00am	Friends & Family Breakfast	Cascades
4:00pm – 6:00pm	Scientific Session	Grand Sierra A/B
6:00pm – 7:00pm	Board of Directors Meeting	Silver Peak
Tuesday, February 26		
6:30am – 8:00am	Attendee Breakfast	Grand Sierra C/D
7:00am – 9:00am	Scientific Session	Grand Sierra A/B
7:30am – 9:00am	Friends & Family Breakfast	Cascades
4:00pm – 6:00pm	Scientific Session & Presidential Address	Grand Sierra A/B
6:00pm – 7:00pm	WTA Multi-Center Trials Meeting	Emigrant Peak
Wednesday, February 27		
6:30am – 8:00am	Attendee Breakfast	Grand Sierra C/D
7:00am – 9:00am	Scientific Session	Grand Sierra A/B
7:30am – 9:00am	Friends & Family Breakfast	Cascades
10:00am – 12:00pm	Ski Race	Mountain
12:00pm – 1:30pm	BBQ	Spa Deck
4:00pm – 5:00pm	Scientific Session	Grand Sierra A/B
5:00pm – 6:00pm	Business Meeting	Grand Sierra A/B
5:00pm – 6:00pm	Book Club	Emigrant
Thursday, February 28		
6:30am – 8:00am	Attendee Breakfast	Grand Sierra C/D
7:00am – 9:00am	Scientific Session	Grand Sierra A/B
7:30am – 9:00am	Friends & Family Breakfast	Cascades
4:00pm – 5:00pm	Panel of Experts	Grand Sierra A/B
5:00pm – 6:00pm	"Paint the Ceiling" Lecture	Grand Sierra A/B
6:30pm – 10:00pm	Children's Party	Grand Sierra C/D
7:00pm – 10:00pm	Adult Banquet & Dance	Alpine Ballroom
Friday, February 29		
6:30am – 8:00am	Attendee Breakfast	Grand Sierra C/D
7:00am – 9:00am	Scientific Session	Grand Sierra A/B
7:30am – 9:00am	Friends & Family Breakfast	Cascades
4:00pm – 6:00pm	Scientific Session	Grand Sierra A/B

PROGRAM

ıntific Session 1
ıday AM, February 25, 2008
lerator: James Davis, MD
ation: Grand Sierra A/B

ɛr	Time	Title/Authors	Page
	7:00AM	**Welcome to the 38th Annual Meeting of the WTA** Jim Davis, MD President, WTA 2008	
	7:20 AM	¶ **Alcohol Withdrawal Syndrome in Trauma Patients: A Prospective Cohort Study** B Sharp BS, C Schermer MD MPH, E Omi, MD, T Esposito MD MPH and J Santaniello MD	27
	7:40 AM	¶ **Single Dose Etomidate for Rapid Sequence Intubation Impacts Outcome After Severe Injury** KJ Warner, GJ Jurkovich, EM Bulger	29
	8:00 AM	¶ **Low Protein C Levels are Associated with an Increased Susceptibility to Ventilator-Associated Pneumonia in Trauma Patients** ND Bir, JF Pittet, RH Dotson, K Brohi, P Rahn, RC Mackersie, AH Harken, LD Montana, JP Wiener-Kronish, MJ Cohen	31
	8:20 AM	¶ **The Effects of Drotrecogin Alfa (Activated) on Inflammation and Burn Depth in a Rat Burn Model** T Piester BA, D Meyerholz DVM PhD, K Zamba PhD, J Sokolich MD, A Jaskille MD, T Light MD	33
	8:40 AM	¶ **Proof of Progressive Deepening of Thermal Burn Wounds: From Animal Model to the Clinical Arena** A Jaskille, C Weinand, M Jordan, D Ciesla, J Jeng	35

rl Young Competition

Scientific Session 2
Monday PM, February 25, 2008
Moderator: Carol Schermer, MD
Location: Grand Sierra A/B

¶ Earl Young Competition

ntific Session 3
sday AM, February 26, 2008
lerator: Peggy Knudson, MD
ation: Grand Sierra A/B

er	Time	Title/Authors	Page
	7:00 AM	¶ **Degree of Initial Brain Injury in Young Adults Does Not Correlate with Functional Impairment Recorded by Cognitive Status Examinations** D. Goold, D. Vane	47
	7:20 AM	¶**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	49
	7:40 AM	¶ **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.	51
	8:00 AM	¶ **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.	53
	8:20 AM	**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	55
	8:40 AM	**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	57

ırl Young Competition

Scientific Session 4
Tuesday PM, February 26, 2008
Moderator: Clay Cothren, MD
Location: Grand Sierra A/B

Paper	Time	Title/Authors	Pa
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	59
16	4:20 PM	**Where Do We Go From Here? Utilizing Interim Analysis to Forge Ahead in Violence Prevention** R.A. Dicker, M.D., S. Jaeger, B.S., M.M. Knudson, M.D., R.C. Mackersie, M.D., D.J. Morabito, M.P.H., J. Antezana, M.Texada	61
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*	63
	5:00 PM	**Presidential Address** **"The Rule of Thumb"** James Davis, MD	
	6:00 PM	Multi-Institutional Trials Committee	

¶ Earl Young Competition

ntific Session 5
lnesday AM, February 27, 2008
lerator: Chip Baker, MD
ation: Grand Sierra A/B

er	Time	Title/Authors	Page
	7:00 AM	**Beneficial Effects of Early Stabilization of Thoracic Spine Fractures Depends on Trauma Severity** C Schinkel, MD, PhD TM Frangen, MD, G Muhr, MD, PhD	65
	7:20 AM	**The Demographics of Modern Burn Care. Should Most Burns be Cared for by the Non-Burn Surgeon?** G.Vercruysse, W.Ingram, D.Feliciano	67
	7:40 AM	**Telemedicine Evaluation of Acute Burns is Accurate and Cost-Effective** J Saffle, MD, L Theurer, L Edelman, PhD, S Morris, MD, A Cochran, MD	69
	8:00 AM	**The Reality of Errors in Resuscitation and Haemorrhage Control** M Sugrue, E Caldwell, S D'Amours, P Wyllie, J Crozier, M Parr.	71
	8:20 AM	**Management of Severe Hemorrhage Associated with Maxillofacial Injuries: A Multicenter Perspective** T Cogbill, M.D. representing 9 Western Trauma Association Participating Institutions	73
	8:40 AM	**A Prospective Observation Study of the Optimal Management of Patients with Anterior Abdominal Stab Wounds** W.L. Biffl, 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	75

Scientific Session 6
Wednesday PM, February 27, 2008
Moderator: Tom Thomas, MD
Location: Grand Sierra A/B

Paper	Time	Title/Authors	Pa
	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	
	5:00 PM	Business Meeting	
	5:00 PM	Book Club – Location TBA	

ıntific Session 7
rsday AM, February 28, 2008
lerator: Riyad Karmy-Jones, MD
ation: Grand Sierra A/B

ɛr	Time	Title/Authors	Page
	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	77
	7:20 AM	**Pulmonary Contusion in the CT Era: Much Ado About Nothing?** R Jelsema, K Brasel	79
	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	81
	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	83
	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.	85
	8:40 AM	**Fall From Standing: An Under Appreciated Mechanism of Injury** N Namias, C Glenn, A Marttos, R Manning, M McKenney	87

Scientific Session 8
Thursday PM, February 28, 2008
Moderator: David Livingston, MD
Location: Grand Sierra A/B

Paper	Time	Title/Authors	Pa
	4:00 PM	**Panel of Experts** Roxie Albrecht, MD. Gage Ochsner, MD, and Robert Mackersie, MD	
	5:00 PM	**Paint the Ceiling Lecture** **"The Faces of Domestic Violence"** Pamela Kallsen Executive Director Marjaree Mason Center Fresno, California	

ntific Session 9
ay AM, February 29, 2008
lerator: Dennis Vane, MD
ıtion: Grand Sierra A/B

ɛr	Time	Title/Authors	Page
	7:00 AM	**Vancomycin MIC Creep: Impact on Outcomes of Methicillin Resistant *Staphylococcus Aureus* Ventilator Associated Pneumonia** A Malhotra, T Duane, M Aboutanos, K Smalara, G Chenault, C Borchers, N Martin, R Ivatury	89
	7:20 AM	**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?** S Eachempati, L Hydo, J Shou, P Barie	91
	7:40 AM	**Systemic Not Just Mesenteric Lymph Causes Neutrophil Priming Following Hemorrhagic Shock** L Diebel, D Liberati, A Ledgerwood, C Lucas	93
	8:00 AM	**Staff Commitment to Trauma Care Improves Mortality and Length of Stay at a Level I Trauma Center** C. Mains, K. Scarborough, R. Bar-Or, A. Hawkes, J. Huber, D. Bar-Or	95
	8:20 AM	Invited Lecture: David Feliciano, MD **"Oswaldo Borraez's Bag and Beyond: Story of the Open Abdomen"**	

Scientific Session 10
Friday PM, February 29, 2008
Moderator: Christine Cocanour, MD
Location: Grand Sierra A/B

Paper	Time	Title/Authors	Pa
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	97
		CASE REPORTS	
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	99
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, SIzenberg, MD, FACS; and W. B. Long, MD, FACS	10
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.	10
38	5:05 PM	**Inhaled Nitric Oxide in the Management of Patients with Severe Post Traumatic Acute Lung Injury** S. King; R.G. Barton	10
39	5:20 PM	**Equestrian-Associated Urethral Injuries in Women** S Beal JM Galante CS Cocanour	10
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	10

ABSTRACTS

:OHOL 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
)la 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 ive blood alcohol concentration (BAC) are at high risk for the alcohol withdrawal syndrome 'S) 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 itheses of the study were that the risk for alcohol withdrawal would be low and that it could be icted by simple questioning avoiding the need for prophylaxis.

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

ilts: 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 3 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 lop AWS ($p<.05$), but were no more likely to binge drink (66.7% vs 42.5% $p> .05$). endence 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. ementation of a prophylaxis protocol for positive BAC, would have resulted in 88% (n=22/25) AC positive patients receiving unnecessary drugs.

clusion: 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. nts can reliably tell physicians whether they are at risk for AWS. Prophylaxis for positive BAC nts will likely result in substantial overtreatment.

GLE DOSE ETOMIDATE FOR RAPID SEQUENCE INTUBATION IMPACTS ΓCOME AFTER SEVERE INJURY

Warner GJ, Jurkovich EM, Bulger
)orview Medical Center

enter: Keir J. Warner **Senior Sponsor:** Jerry J. Jurkovich

kground: 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 rable hemodynamic profile and rapid onset. However, recent studies demonstrate etomidate eases cortisol levels by inhibiting 11β-hyroxylase for up to 12 hours following a single dose, and lts in non-normal cosyntropin stimulation tests. Elevated cortisol normally occurs with stress, nhibition of this action by etomidate may increase neutrophil margination, which has been /n to be an inciting factor in the development of acute respiratory distress syndrome (ARDS) multiple organ failure syndrome (MOFS). We therefore hypothesized that single dose etomidate inistration for emergent intubation in the severely injured patient would lead to increased rates RDS and MODS.

hods: We analyzed data collected from a prospective trial of prehospital hypertonic saline inistration. This study enrolled adult blunt trauma patients transported directly to our level 1 na center with prehospital SBP <= 90mmHg. Intubated patients were stratified based on iidate use for intubation. Demographic, physiologic, anatomic injury scores, and outcomes were ssed. Multivariate regression was used to assess the relationship between etomidate use and)S/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 ession assessed within the first 24hrs.

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

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

Table Multivariate Effect of Etomidate

Outcomes	OR	95% CI	P-Value
ARDS	3.92	1.26-12.2	0.02
MOFS	3.73	1.22-11.5	0.02

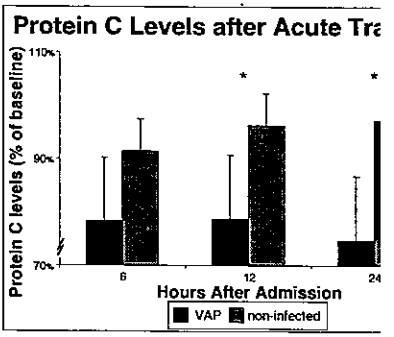
r #3 8:00am, 2/25/08

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 ıer-Kronish, MJ Cohen
ersity of California, San Francisco

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

RODUCTION: Mechanically ventilated trauma patients have a high risk for the development ntilator-associated pneumonia (VAP). We have recently reported that reduced plasma protein 'els early after trauma/shock are associated with coagulopathy and mortality. Furthermore, na 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. ıl 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- ınd 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).



CUSSION: 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 ficantly 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 toprotective effects.
NCLUSION: Critically ill trauma patients have an early activation of the protein C pathway, ciated with a rapid decrease in the plasma levels of this protein and increase in EPCR. Plasma s of protein C return to normal levels within 24 hours in most patients. However, patients who ı to acquire VAP have persistently low plasma levels of protein C in the immediate period after na. Whether protein C could play a pathogenetic role in the host response against nosocomial infection warrants further study.

r #4 8:20am, 2/25/08

: EFFECTS OF DROTRECOGIN ALFA (ACTIVATED) ON INFLAMMATION AND :N DEPTH IN A RAT BURN MODEL

:ster BA, D Meyerholz DVM PhD, K Zamba PhD, J Sokolich MD, A Jaskille MD, T Light MD
ersity of Iowa, Washington Hospital Center, Methodist Dallas Medical Center

enter: Travis Piester **Senior Sponsor:** Barbara Latenser

duction: Traditional treatment of acute burns is prompt fluid resuscitation with Lactated Ringers . In burns, there is an increase in pro-inflammatory mediators which leads to vascular activation he formation of edema. Also, there is a progression of burn depth that continues even after the l thermal injury. This progression is probably mediated by inflammation or hypoperfusion in urned tissue. The inflammatory response, as well as the burn progression, may be limited by ing traditional fluid resuscitation. Burn patients have alterations in the levels of protein C, rombin levels, and various interleukins similar to septic patients. Drotrecogin alfa-activated, a ietic activated protein C, which has reduced mortality in severe sepsis patients, is one candidate nay improve outcomes of burn patients.

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

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

lusion: Burn depth and inflammation were increased with drotrecogin alpha. While our study not designed to delineate a mechanism for this, one explanation is that infusion of exogenous ated protein C (drotrecogin alpha) prior to depletion of endogenous reserves might lead to an ientation of inflammation and disturbances of regional blood flow. Another hypothesis is that lose 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, nt, and timing remain to be determined.

r #5 8:40am, 2/25/08

OF 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

enter: Amin D Jaskille **Senior Sponsor:** David Ciesla

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

ods: For the validation study, 20 male Sprague-Dawley rats were used. Ten 2x2 cm burns were ed in each animal by placing a 500g aluminum branding iron on the animal's torso. Each burn different contact time and these ranged from one to fourteen seconds for a 30% TBSA burn h 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 15 min for 5 hours. Histology slides were evaluated by pathologists blinded to the study. After alidation study, four patients with life threatening burns were scanned with LDI during the 48 of resuscitation.

lts: 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 e burn ($p<0.001$)(more than 10 second contact). Contact burns between 3-9 seconds resulted in ession of the injury ($p<0.0001$). Human study: LDI flux values decreased during the 48hrs of citation, 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 ($p<0.05$).

lusion: Progression of thermal injuries was confirmed using LDI despite maintaining adequate citation. The biggest decrease in perfusion, and thus conversion to a deeper injury seems to in the first four hours. These results are concordant with histology. Additional studies on citation and possible means to disrupt the progress of progression are needed.

r #6 4:00pm, 2/25/08

PROSTHETIC REPAIR OF COMPLEX DUODENAL INJURY IN A PORCINE)EL

ickert MD, JT Perry MD, VY Sohn MD, JA Munaretto MD, MJ Martin MD
igan Army Medical Center

enter: Matthew Eckert, MD **Senior Sponsor:** Matthew Martin, MD

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

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

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

:lusion: Bioprosthetic repair of enteric wall defects, even in proximity to upper intestinal :tions, allows successful recovery of bowel function and injury repair without extensive ɔmic reconstruction. This technique may provide a more conservative approach to the treatment ımplex duodenal injuries after trauma.

r #7 4:20pm, 2/25/08

IOGRAPHIC EMBOLOZATION IS SAFE AND EFFECTIVE THERAPY FOR BLUNT OMINAL SOLID ORGAN INJURY IN CHILDREN

ankoohy K Sartorelli D Vane
ersity of Vermont College of Medicine

enter: Armin Kiankoohy **Senior Sponsor:** Dennis Vane

ctives: 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 lation is limited to one- or -two patient case reports. We reviewed our experience with the use giographic embolization to control hemorrhage in children with bleeding blunt ASO injuries to iate the efficacy and safety of this technique in the pediatric population. We hypothesized that s safe and effective and should be added to the paradigm of treatment of blunt ASO in children.

iods: Data was obtained from the trauma registry and patient charts for children (age < 16 years) underwent AE for hemorrhage from ASO injuries from 2001-2006. All children who underwent)lization were initially selected for nonoperative treatment of their ASO injuries, but had :nce of ongoing hemorrhage. Success of embolization to control bleeding and complications :valuated. 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.

lts: 127 patients with 149 blunt abdominal solid organ injuries (72 spleen, 51 liver, 26 renal) identified during the study period. Two children had splenectomies due to hemodynamic bility. 7 children with bleeding ASO injuries underwent embolization of the following: 2 spleen les IV and V), 2 liver (grades III and IV), and 3 grade IV renal injuries. Three children required 1 transfusions prior to embolization. Mean age was 12.3 + 3.7 years with a mean ISS of 22.4 + Mean length of hospital stay was 12.2 + 2.7 days (range 8-23), with a mean ICU stay of 4.9 + 2 ;e 2-17) days. Embolization was successful in all children and there were no procedure related)lications. Four minor complications occurred; 2 patients had pleural effusions (one requiring nal drainage), 2 patients had transient hypertension after embolization of renal injuries. One who had embolization of a renal injury was later found to have a nephroblastoma in the injured :y and underwent a delayed nephrectomy.

:lusions: Angiographic embolization is an effective and safe technique for controlling)rrhage from blunt abdominal solid organ injuries in select pediatric trauma patients.

ERVATION FOR NON-OPERATIVE MANAGEMENT OF THE SPLEEN: HOW G IS LONG ENOUGH?

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

enter: Victor McCray, M.D. **Senior Sponsor:** James Davis, M.D.

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

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

hods: 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 I: 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.

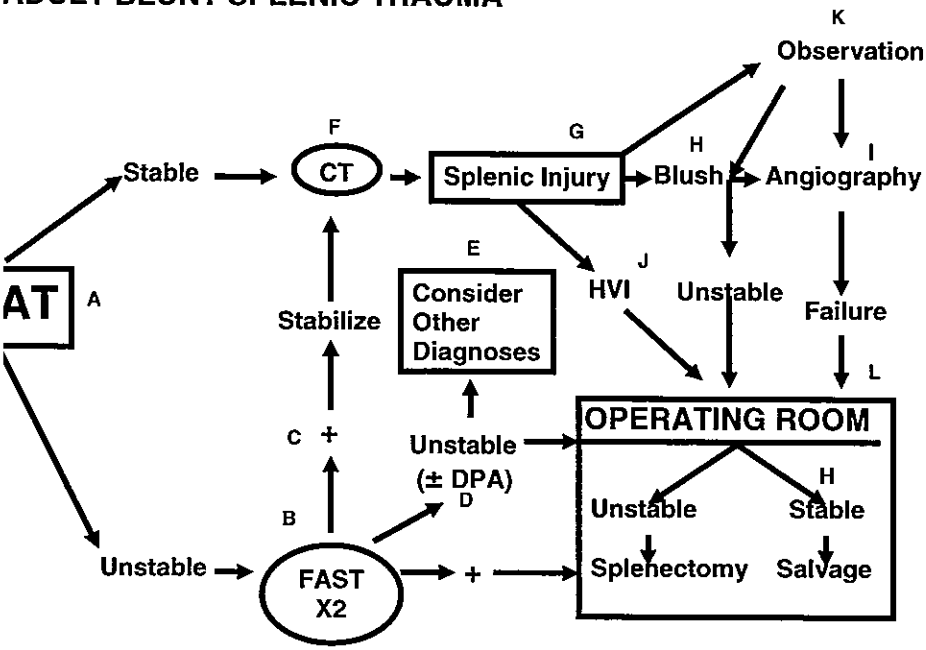
ılts: From 8/2002 through 6/2007, there were 8,192 trauma admissions for blunt trauma, and had splenic injury. Of these, 179 went directly to the OR and 453 were admitted for non-ative management, 18 (4%) failed non-operative management (non-op) and went to the ating room.

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

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 rwent splenectomy.

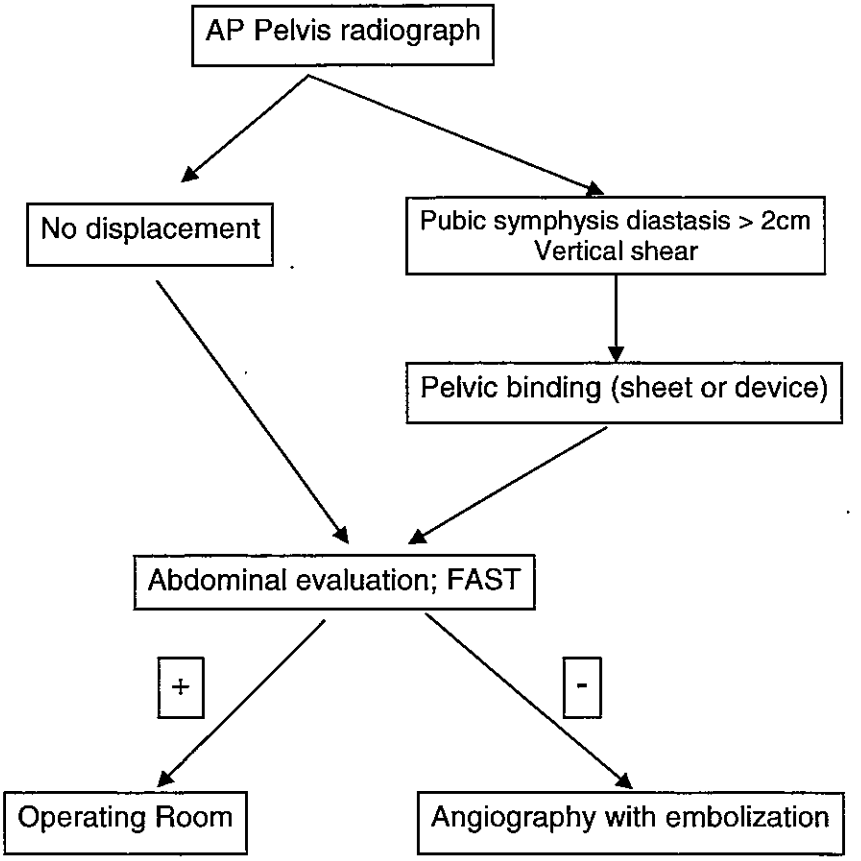
clusions: Non-operative management of splenic injury had a 96% success rate in this study. The elines successfully identified 94% of patients failing non-operative management during the rvation period with the outlier being non-compliant to protocol. These guidelines for rvation are safe and effective.

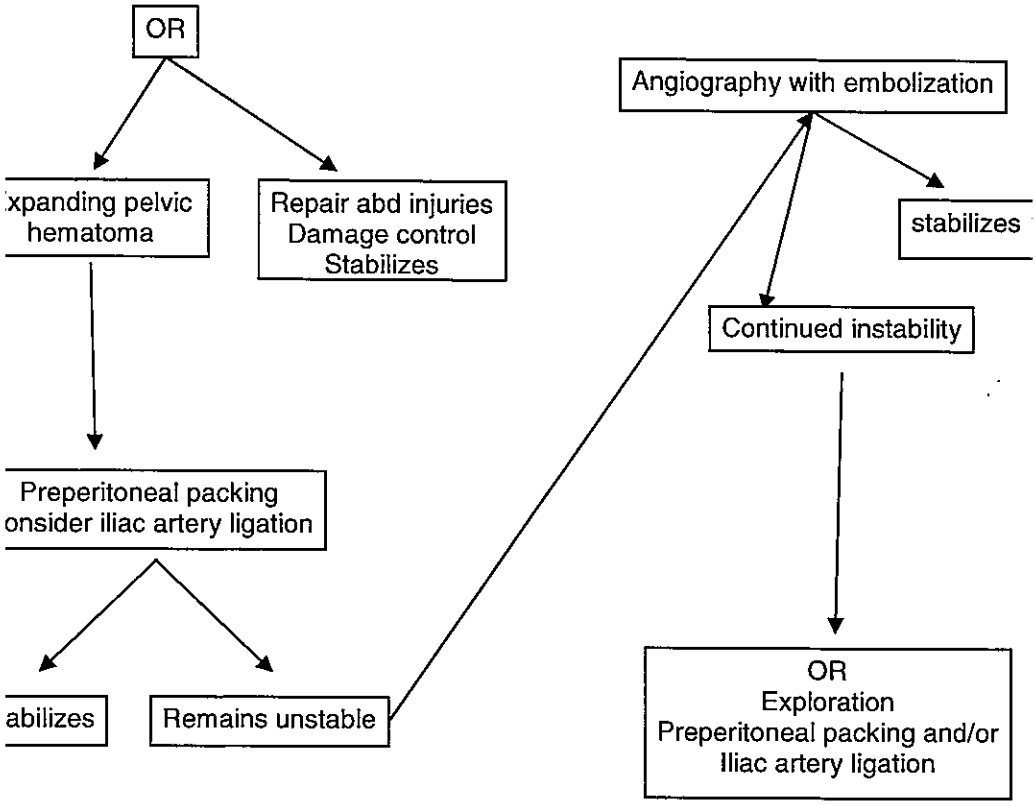
ADULT BLUNT SPLENIC TRAUMA



Pelvic Fracture Algorithm

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




OR
xpanding pelvic hematoma
Repair abd injuries
Damage control
Stabilizes
Preperitoneal packing
onsider iliac artery ligation
abilizes
Remains unstable
Angiography with embolization
stabilizes
Continued instability
OR
Exploration
Preperitoneal packing and/or
Iliac artery ligation

REE OF INITIAL BRAIN INJURY IN YOUNG ADULTS DOES NOT CORRELATE H FUNCTIONAL IMPAIRMENT RECORDED BY COGNITIVE STATUS MINATIONS

)old, D. Vane
ersity of Vermont College of Medicine

:nter: Daniel Goold **Senior Sponsor:** Dennis W. Vane, MD, MBA

)se: The Occupational Therapy Head Injury Mini Screen (OT HIMS)is a screening tool for its admitted with traumatic brain injury (TBI)in the acute care setting. It is a combination of the :ston Orientation and Amnesia Test (GOAT) and the Cognistat (Formally the Neurobehavioral itive Status Examination). Its purpose is identification of cognitive deficits in patients and de 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 /ed for patients admitted with lower GCS.

ods: 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 st to be included. Patients with cognitive deficits were identified using GOAT and.Cognistat as is any known baseline pre existent deficits. Scores were compared with GCS on admission.)mes also included discharge to home or rehab. Hospital deaths were not included.

lts: 609 patients were reviewed and 248 were administered the OT HIMS.83 suffered some irment. The mean GCS for the 248 patients was 13.96 (+/- 2.16). A coefficient of correlation :en GCS and GOAT score of only 0.224 and an R-squared value of 0.050 indicated no lation between these results. Comparing GCS and the presence of impairment identified istat yielded an R-squared value of 0.093, indicating no correlation between these parameters. ng 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 irments on OT HIMS. Of the 248 patients, 12 went to rehab and this was not correlated with

lusions: In this study admission GCS did not predict performance on the OT HIMS after injury s cohort of patients with adequate recovery to take the examination. Cognitive functionality can ipaired after traumatic brain injury of even minimal degree. All patients admitted for TBI d be screened for cognitive deficits prior to discharge. Long term follow-up for this group must rried out for maximal therapy and optimal outcomes.

r #10 7:20 am, 2/26/08

LTITRAUMA DOES NOT INCREASE MORTALITY IN CRITICALLY INJURED IENTS WITH TRAUMATIC BRAIN INJURY

ımpkins, G Bochicchio, M Kilbourne, K Bochicchio, A Conway, T Scalea
sion of Clinical and Outcomes Research, R Adams Cowley Shock Trauma Center

enter: Kimberly Lumpkins **Senior Sponsor:** Thomas Scalea

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

hods: Consecutive patients with TBI admitted to the intensive care unit and surviving at least ours from admission were prospectively followed over an 18 month period. The diagnosis of was confirmed by CT scan. Demographic data were collected including age, gender ıanism of injury, APACHE, ISS, and admission glucose. Isolated TBI was defined as TBI out abdominal, chest, or significant orthopedic injury (long bone fracture, spinal fracture, or c fracture). Univariate analysis was performed using Student's t test, Wilcoxon rank sum test isher's exact test as appropriate. Logistic regression modeling was employed to control for ographic differences.

ılts: 126 patients with TBI were ıated. The average age was 43.5 ± ears and the average ISS was 31.8 0. 92% (N=115) of patients ined blunt trauma. The most mon anatomic pattern of brain y was subarachnoid hemorrhage %, N=81) followed by subdural atoma and contusion (55.6% and 41.3% respectively). Of specific brain injury patterns, only iation 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 ies while 32% (N=40) had isolated TBI. There was no significant difference in age, ISS er, 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 ıivariate analysis ($p = 0.43$). A logistic regression model (table to right) was then developed ıding age, ISS and herniation as variables as well as known predictors of mortality (admission ose level and APACHE score).

	Odds Ratio	95% CI	P value
Age	0.99	0.97-1.02	0.70
ISS	1.04	0.99-1.10	0.11
Herniation	7.77	2.25-26.7	<0.01
APACHE	1.10	1.00-1.20	0.04
Admit Glucose	1.01	0.99-1.20	0.09
Isolated TBI	0.54	0.16-1.83	0.32

clusion: Herniation was the only pattern of brain injury predictive of death. Extracranial injury ıot increase mortality in these multiply injured patients with TBI who did not suffer an acutely l injury.

NSFUSION OF STORED RED BLOOD CELLS RESULTS IN DECREASED TISSUE GENATION 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.
on Health & Science University

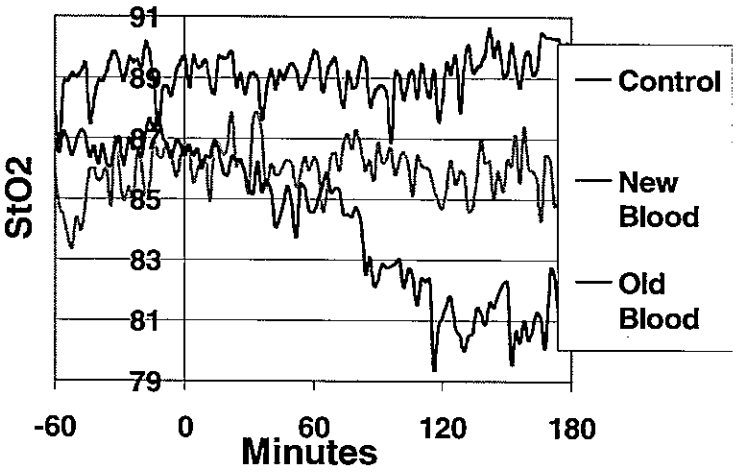
nter: Laszlo Kiraly **Senior Sponsor:** Martin Schreiber

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

thods: Thirty trauma patients in the Intensive Care Unit for whom a blood transfusion had been ed 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 usion, during the transfusion, and four hours after transfusion completion. Tissue oxygen ation (StO2) was recorded every two minutes. The StO2 area under the curve (AUC) over fic time periods was calculated for each patient. A control group of 18 patients, not receiving usions, was also recruited. The transfusion group was divided into two groups by blood age. group received blood that was greater than 21 days until expiration, (New Blood group n=16) ne other received blood less than 21 days until expiration (Old Blood group n=14). A Student's t was used for significance ($p<0.05$).

sults: The baseline AUC did not differ between groups. The Old Blood group demonstrated a ficant decline in StO2 comparing its baseline period to its transfusion period ($p<0.05$). There no similar decline in the control group or the New Blood group. The transfusion period AUC for ld 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 for the different groups. The period of time from -60 to 0 minutes indicates the baseline d. The start of the blood transfusion for the transfusion groups is indicated by minute 0.

nclusions: There is a decrease in peripheral tissue oxygenation in response to stored packed red l cell transfusion. The ase in tissue enation was observed tients receiving blood han 21 days until ation. There was not a ar oxygenation ase in patients ving blood greater than ys until expiration. indicates that factors in d blood may influence eripheral vasculature xygen delivery.



r #12 8:00am, 2/26/08

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

roduction: Trauma induced coagulopathy is associated with an extremely high mortality. We recently shown that survival can be improved by correction of coagulopathy through early, ssive 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 ations. We hereby report the development and testing of such a product.

thods: Plasma separated from fresh porcine blood (n=7) was either stored as FFP, or ilized 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 cted 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.

sults: In-vitro analysis revealed no differences in the coagulation profiles of FFP and FDP le). Lyophilization process did not decrease the levels of measured clotting factors. In the swine l, 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).

ameters	FFP	FDP
sec)	13.3 ± 0.5	13.4 ± 0.3
(sec)	23.1 ± 2.1	26.5 ± 2.7
or II (%)	22.6 ± 2.9	29.3 ± 5.2
or VII (%)	15.4 ± 2.3	21.6 ± 5.5
or IX (%)	229.7 ± 24.6	276 ± 50.9
inogen /dl)	122.5 ± 18	128.4 ± 15.7

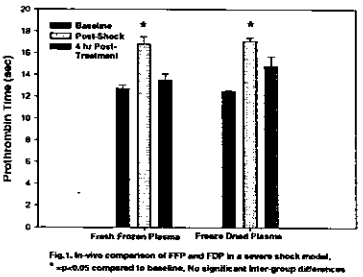


Fig.1. In-vivo comparison of FFP and FDP in a severe shock model.
* =p<0.05 compared to baseline. No significant inter-group differences

e: In-vitro analysis.

presented as mean ± standard error of the mean. Factor levels shown as % of normal human ity levels

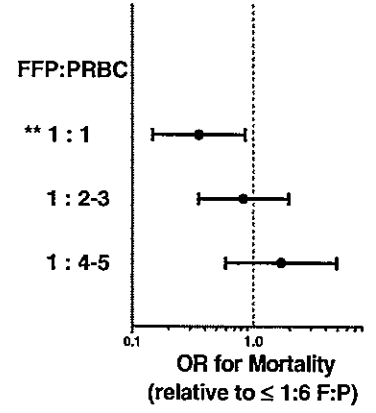
lusion: Plasma can be lyophilized and freeze-dried to create a logistically superior product ıut compromising its hemostatic properties. This product may be suitable for use in austere onments, such as a battlefield, for the treatment of trauma associated coagulopathy.

r #13 8:20am, 2/26/08

:PRBC TRANSFUSION RATIO OF 1:1 IS ASSOCIATED WITH SIGNIFICANT /ER RISK OF MORTALITY FOLLOWING MASSIVE TRANSFUSION

erry, MD,MPH1, J. Ochoa, MD1, S. Gunn, MD1, J. Minei, MD2, J. Cuschieri, MD3, G. efe MD,PhD3, T. Billiar, MD1, A. Peitzman, MD1, R. Maier, MD3, E. Moore, MD4
iversity of Pittsburgh Medical Center, 2 University of Texas Southwestern Medical Center, 3 orview Medical Center,University of Washington, 4 Denver Health Medical Center, University)lorado
enter: Jason L. Sperry MD, MPH **Senior Sponsor:** Ernest E. Moore, MD

ctive: The detrimental effects of coagulopathy, hypothermia and acidosis are well described as ers 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 icterized in a civilian trauma population. **Methods**: Data were obtained from a multi-center)ective cohort study evaluating clinical outcomes in blunt injured adults with hemorrhagic c. Standard operating procedures were employed to minimize variation in clinical management s centers. Patients with isolated tramatic brain injury were excluded. Those patients who red ≥ 8 units PRBCs within the first 12hrs post-injury were analyzed (n=415). Logistic ssion modeling was used to characterize the effects of the F:P ratio transfused on subsequent ality after controlling for differences in injury severity, early shock parameters and /entions, temperature, coagulopathy (INR), resuscitation requirements (crystalloid, platelets,)recipitate) and APACHE II score. **Results**: This cohort of patients were severely injured with a an ISS of 34 [IQR 22,43], with 63% and 16% requiring laparotomy or thoracic operative /ention (within 48hrs post-injury), respectively. Patients who received transfusion products in a :P (n=120) vs. ≤ 1:2 F:P required significantly less blood transfusion at 24hrs (17±11u vs. 7u, p=0.003) with no difference found in presenting coagulopathy (INR: 1.9 vs. 1.7, p=0.10). 'egression model was a good predictor of mortality (AUC =0.87 via ROC curve analysis). A 1:1 vas independently associated with a 64% reduction in the risk of mortality (p=0.002) after olling for important confounders. These significant findings remained even after controlling for evelopment of multiple organ failure (MOF) and nosocomial infection (NI). When the F:P was fied into groups (1:1, 1:2-3, 1:4-5 vs. ≤ 1:6), the odds ratios for mortality demonstrate a dose)nse relationship with a 1:1 F:P ratio remaining statistically significant and protective for ality (**p=0.022, OR=0.35, Figure). When patients who died within 48hrs from injury were)ded, however, the odds ratio for 1:1 F:P became non-ficant (OR 0.85, p=0.723). **Conclusions**: In patients ring ≥ 8 units of PRBC's in the first 12 hours following ficant injury, a 1:1 FFP:PRBC transfusion ratio is :iated with a significant reduction in mortality. This risk :tion is independent of the development of MOF and NI s most relevant to mortality within the first 48hrs. These ts suggest that the mortality associated a FFP:PRBC ratio)ay occur early, possibly secondary to ongoing ulopathy and hemorrhage, and provides justification for)ective trial investigation into the incorporation of a 1:1 PRBC ratio into massive transfusion practice.



r #14 8:40am, 2/26/08

LY ACHIEVEMENT OF A 1:1 RATIO OF FFP:PRBC REDUCES MORTALITY IN IENTS RECEIVING MASSIVE TRANSFUSION

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

enter: Ernest Gonzalez **Senior Sponsor:** Rosemary Kozar

roduction: We previously demonstrated that uncorrected coagulopathy in patients receiving ive transfusion was associated with increased mortality. Based on these findings we emented early goal directed therapy beginning at the time of injury to approach an optimal ma:PRBC ratio of 1:1. The aim of the current study was to evaluate mortality after mentation 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 s). Two resuscitation strategies were compared: 1.) pre 1:1where FFP: PRBC 1:1 was begun ICU admission, 97 patients ending January 2003 vs 2.) post 1:1where 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 lated to mortality. Results were analyzed by student's t-test and chi-square ($p<0.05$).

sults: Patient demographic and emergency department (ED) INR, crystalloid, and 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%.

ible	Pre 1:1	Post 1:1	p value
	39±2	37±1.6	0.44
	29±1	28±1.2	0.53
NR	1.8±0.2	1.62±0.08	0.41
CU Cryst (L)	9±1	7±0.4	0.07
CU PRBC	12±1	15±1.2	0.06
CU FFP	5±0.4	11±1.0	<0.0001
Admit INR	1.6±0.04	1.48±0.03	0.02
ality	30 %	15 %	0.02

Conclusion: In a similar lation of massively transfused injured patients, early goal directed therapy to achieve a ratio of vithin 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 ovement in patient outcomes.

CVP driven

: #15 4:00pm, 2/26/08

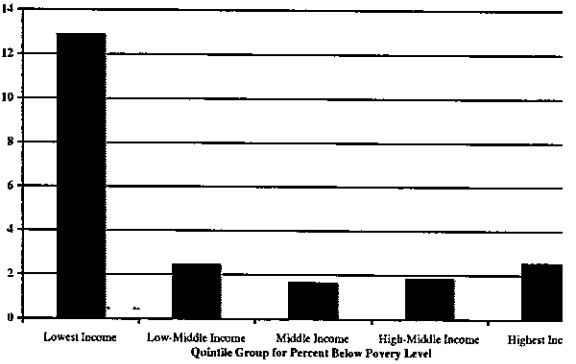
)PULATION-BASED ANALYSIS OF NEIGHBORHOOD SOCIOECONOMIC STATUS INJURY ADMISSION RATES AND IN-HOSPITAL MORTALITY

rzaur, M Croce, L Magnotti, P Fischer, T Fabian
ersity of Tennessee Health Science Center

enter: Ben L. Zarzaur, MD, MPH **Senior Sponsor:** Ben L. Zarzaur, MD, MPH

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

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



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

ES Quintile	Blunt Injury	p-value	Penetrating Injury	p-valu
ghest Income	REF		REF	
gh-Middle Income	1.38 (0.82, 2.34)	0.2308	1.12 (0.30, 4.16)	0.865
iddle Income	0.80 (0.46, 1.40)	0.4332	2.04 (0.58, 7.14)	0.263
w-Middle Income	1.34 (0.84, 2.15)	0.2241	2.89 (0.94, 8.46)	0.064
west Income	0.75 (0.48, 1.17)	0.2029	1.59 (0.54, 4.68)	0.400

nclusion: N-SES is inversely related to injury rates for all mechanisms. However, after risk tment, in-hospital mortality is *not* associated with N-SES level. Neighborhood level injury ntion efforts should be focused on socioeconomically disadvantaged neighborhoods.

: #16 4:20pm, 2/26/08

RE DO WE GO FROM HERE? UTILIZING INTERIM ANALYSIS TO FORGE AHEAD IN ENCE PREVENTION

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rsity of California, San Francisco

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

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

hods: We performed intermediate evaluation on the 18 month-old program. We selected the CDC- mended instrument utilized for unintentional injury prevention programs and applied it to the WP. The equential stages in this methodology are Formative, Process, Impact, and Outcome. To test feasibility of ve used Process Evaluation. To evaluate intermediate goals of risk reduction and early programmatic cy, we used Impact Evaluation.

ults: 435 people met screening criteria at our Level I Trauma Center. The two Case Managers were able ke 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 ed had identified needs and received CM es. 13% refused services. Of the very high risk s receiving full services (N=45), 60% were n American and 30% Latino. CM "dose": In st 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 e who required >6 hours had 2-3 needs. A greater number of identified needs did not correlate with greater me. Importantly, the attrition rate is currently only 4%. The table demonstrates percent success thus far in ling risk reduction resources.

Identified Need	% need met*
Court Advocacy	88%
Driver license	14%
Education	68%
Employment	61%
Housing	50%
Mental Health/Drug Treatment	65%
Vocational Training	67%

* Clients in program ≥ 3 mos

clusions: WP Case Managers served high risk clients by developing trust, credibility and a risk reduction This approach resulted in 6 of 7 major needs being successfully addressed at least 50% of the time with rogram 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 n credibility with municipal stakeholders, who have now agreed to fund a 3rd CM position. Intermediate ation provided a framework in our effort to achieve the ultimate goal of reducing recidivism through ally competent CM and risk factor modification.

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

Finlay-Morreale, B.S.; B.S. Fisher Ph.D.^; J. Johannigman M.D*
ersity of Cincinnati College of Medicine – Division of Critical Care and Trauma * University of nnati College of Criminal Justice^; Cincinnati, OH

enter: Heather Finlay-Morreale **Senior Sponsor:** J. Johannigman M.D

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

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

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

ailant	Total Assaults [%]	Fatal Assaults	Non Fatal	Odds Ratio of Fatality	95% CI	P v
mate partner	39 [34%]	28	11	6.6	2.7 – 16.0	< 0
ily	5 [4%]	4	1	5.4	0.6 – 50.3	0.1
uaintance	16 [14%]	7	9	1.0	0.3 – 2.9	1.0
nger	44 [38%]	7	37	0.1	0.0 – 0.3	< 0
nown	10 [9%]	5	5	1.3	0.3 – 4.6	0.7
al	114	51	63			

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

CLUSION: This study identified a population of women at markedly increased risk of death firearm assault. These are women shot by intimate partners in the home. This is to our ledge the first reporting of the markedly high lethality when intimate partners use a firearm in lts. Because intimate partner firearm violence often results in death, these patients are not ired by the trauma registry. This previously unreported phenomena has critical implications for nce prevention.

r #18 7:00am, 2/27/08

EFICIAL EFFECTS OF EARLY STABILIZATION OF THORACIC SPINE CTURES DEPENDS ON TRAUMA SEVERITY

ıinkel, MD, PhD TM Frangen, MD, G Muhr, MD, PhD
. of Surgery; BG Kliniken Bergmannsheil; Ruhr-University, Bochum, Germany

ɛnter: C Schinkel **Senior Sponsor:** CS Cocanour

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

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

lts: All subgroups were comparable in terms of clinical parameters and demographic data. rely injured patients (ISS > 38) with early stabilization showed a significant decrease in post ıtive 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-); $p<0.05$]. Similar patterns were seen for patients with Frankel A deficits and preoperative lung 'e. Clinical course and outcome for less severely injured patients was not different.

lusions: Our data provide further evidence that early stabilization of spine injuries is safe. It not impair perioperative lung function in severely injured patients and results in reduced ICU ɔverall hospital length of stays in this patient population. These data support previous findings our group where the German Trauma Registry was used to evaluate the impact of timing in 772 ıa patients with severe spine trauma. Further prospective randomized studies are warranted to ɔ these results.

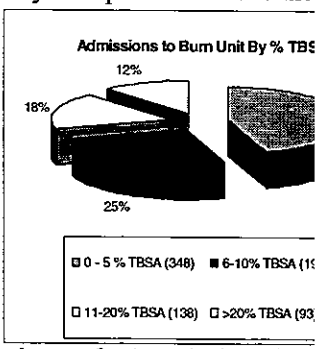
· #19 7:20am, 2/27/08

DEMOGRAPHICS OF MODERN BURN CARE. SHOULD MOST BURNS BE CARED BY THE NON-BURN SURGEON?

rcruysse, W.Ingram, D.Feliciano
'y Univesity School of Medicine

ınter: Gary Vercruysse **Senior Sponsor:** David V. Feliciano

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



ods: We retrospectively reviewed prospectively collected data 76 consecutive patients admitted to an urban tertiary burn center een November, 2005 and July, 2007. Data collected included of admission, distance from scene, mode of transport, age, ance status, burn mechanism, Total Body Surface Area BSA) burned, fraction requiring surgery, and graft size.

lts: Of 776 admissions, 40% were transferred from another ty 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 00.00 per flight. The average distance for helicopter transport was 48 miles (range 12- 238mi.) verage 1 air transfer per week was discharged from the ED after only local wound care and nt education. Patients were relatively equally distributed along a large age range from infants to ly. 87% of our patients were funded. Mechanisms varied, but 96% of all burns were water or e 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.)

lusions: Most small burns do not require surgery but rather pain control, local wound dement, 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 sic skills in burn wound assessment and care. Transferred patients suffer significant economic n not to mention delays in receiving care with multiple workups, and transfer costs. A ıtially huge cost savings could be realized if these patients were cared for by local general or care surgeons educated in basic burn care. As the majority of patients are funded, this system d not be economically burdensome to local facilities or physicians, and could be made more ıble if open lines of communication and a cooperative relationship exist between the nunity hospital and burn center with burn unit consultation on an as needed basis. Major burns d still be transported to a burn unit either directly, or by transfer, and cared for by burn-trained ons.

: #20 7:40am, 2/27/08

EMEDICINE EVALUATION OF ACUTE BURNS IS ACCURATE AND COST-ECTIVE

fle, MD, L Theurer, L Edelman, PhD, S Morris, MD, A Cochran, MD
ersity of Utah Health Center

enter: Jeffrey R. Saffle, MD **Senior Sponsor:** Jeffrey R. Saffle, MD

ckground: The number of US burn centers has declined by over 25% in recent decades. Access rn care is severely limited in rural areas, and referrals to remaining centers often require rce-intensive air transport. Referring physicians' errors in burn size estimates leads to both and undertriage which can be expensive and dangerous. In an effort to improve the priateness of referrals, we utilized telemedicine for evaluation of acute burns in our region.
thods: 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 ng, participants used telemedicine for evaluation of acute burns prior to transport. We ared 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).
sults: 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 red emergency air transport (44.3%), compared to 100% of PRE-TELE patients ($p< 0.05$; Chi-re). Nine other TELE patients later traveled to the burn center by ground; the remaining 30 nts did not require transport. TELE patients tended to have larger median burn sizes (9.0% A versus 6.5%; p=NS) and longer LOS (13.0 days versus 8.0; p=NS) than PRE-TELE patients. size estimates by referring physicians (11.25%TBSA; IQR 13) varied significantly from those rn physicians by either telemedicine (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 size made by either method did not differ statistically. Both providers and patients expressed a level of satisfaction with the telemedicine experience.
nclusions: Acute evaluation of patients with burn injuries can be performed accurately by iedicine on a real time basis. This can reduce under or over-triage for air transport and optimize rce utilization, while extending burn center expertise to many rural communities at little cost, vith high satisfaction

racteristic	PRE-TELE	TELEMED
Patients	28	70
, years	29.9 (34)[1]	30.0 (35)[1]
n size, %TBSA	6.5 (15.3)[1]	4.0 (6.2)[1]
nsport status		
cute aeromedical transport	28 (100%)	31 (44.3%)
elayed (ground) transport	0	9 (12.9%)
ransport not required	0	30 (42.9%)
S inpatients, days	8.0 (24)	13.0 (22)
rtality (percent)	1 (3.6%)	0

ibers are expressed as medians with interquartile ranges in parentheses

·#21 8:00 am, 2/27/08

REALITY OF ERRORS IN RESUSCITATION AND HAEMORRHAGE CONTROL.

grue, E Caldwell, S D'Amours, P Wyllie, J Crozier, M Parr.
na Department, Liverpool Hospital, Sydney Australia

:nter: M Sugrue **Senior Sponsor:** M Sugrue

ground

opriate 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 ontrol of haemorrhage.

ıods

na 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.

lts

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%. :rrors related to poor judgment in 50.9%.delay in treatment in25.8%, poor technique in 9.7% ıthers in 13.6%. Errors related to haemorrhage control in 49.1%, incorrect resuscitation in %, delay or failure to do angioembolisation in 6.0%, lack of damage control in 6.1% and other %. 28 major impact errors occurred in 24 patients. There were 19 thoracotomy related errors 6 ıich were moderate or major impact. Volume resuscitation and haemorrhage control errors of moderate or major impact in 63/163 (22.1%).

:lusions

scitation 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 s have a significant impact on outcome. New strategies in training and performance are required prove outcome.

IAGEMENT OF SEVERE HEMORRHAGE ASSOCIATED WITH MAXILLOFACIAL JRIES: A MULTICENTER PERSPECTIVE

gbill, M.D. representing 9 Western Trauma Association Participating Institutions
lersen Lutheran

enter: Thomas Cogbill, M.D. **Senior Sponsor:** Thomas Cogbill, M.D.

oduction: Airway establishment and control of hemorrhage may be difficult to achieve with ive bleeding from maxillofacial trauma. This study was undertaken to better understand the gement of these challenging injuries in order to develop effective algorithms.
thods: 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 . Only those patients in whom significant bleeding was associated with the maxillofacial es were included. Data collected were demographics, injury measures, physiologic parameters, ods of airway control, hemostatic measures, and outcome.
ults: After exclusions, 90 patients were identified.

	Penetrating (N=30)	Blunt (N=60)	
	35 (15-65)	38.5 (15-89)	N.S.
st B.D.	8 (0-26)	6 (0-30)	N.S.
	17 (9-75)	34 (13-50)	P<0.05
1 24 Hours	5 (3-48)	8 (3-36)	
oembolization	12 (40%)	20 (33%)	
ality	20%	26.7%	

ial airway management was by endotracheal (ET) intubation in 72 (80%) patients. thyrostomy and tracheostomy were emergently placed in 7 (8%) and 5 (6%) patients, ctively. The initial airway was converted to a tracheostomy in the OR within 24 hours in 32 nts 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 s 12 (20%) patients with blunt trauma ($p<0.05$). Although a useful adjunct, anterior and/or rior packing alone controlled bleeding in only 29% of patients. Angioembolization was ssful for definitive control of hemorrhage in 91% of patients with penetrating injuries and 85% tients with blunt trauma.
nclusions: Initial airway control was achieved by ET in the vast majority of patients. Patients penetrating wounds were often taken directly to the OR for airway management and initial pts at hemostasis. Patients with blunt trauma were much more likely to have associated es which affected prioritization of management. Transarterial embolization was successful in olling hemorrhage in 87% of patients in whom it was attempted. Based on this experience, we se treatment algorithms for severe hemorrhage associated with blunt and penetrating llofacial injuries.

#23 8:40am, 2/27/08

OSPECTIVE OBSERVATIONAL MULTICENTER STUDY OF THE OPTIMAL IAGEMENT 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
er Health Medical Center

nter: Walter L. Biffl, MD **Senior Sponsor:** Walter L. Biffl

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

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

lts: 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. atients were further evaluated:

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

tients 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 significant morbidity.

lusions: CT often allows ED DC but also reveals abnormal findings of unclear significance, ing in NT LAP. LWE also allows ED DC frequently (p=NS), but LAP based on LWE/DPL is nonly 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 fficacy of LWE, to determine ED DC potential, followed by SCA, to minimize costs and avoid ive interventions and NT LAPs.

#24 7:00am, 2/28/08

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

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nter: Bruce M Potenza MD **Senior Sponsor:** Bruce M Potenza

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

ods: 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 bility, multiple operations, ventilator dependent, total burn surface area >15%). All were ned weekly by duplex ultrasound for lower extremity VTE as well as upper extremity VTE r 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)

lts: There were 885 patients of which 355 who met entry criteria. 74% were males with a mean \ 32.7%. 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 ial 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.

lusion: 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 ıylaxis. 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. ıylaxis with low molecular weigh 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.

#25 7:20am, 2/28/08

MONARY CONTUSION IN THE CT ERA: MUCH ADO ABOUT NOTHING?

ema, K Brasel
al College of Wisconsin

nter: Rebecca Jelsema **Senior Sponsor:** Karen Brasel

ctive: Pulmonary contusion can lead to severe pulmonary complications, the basis for assigning jury a minimum Abbreviated Injury Score (AIS) of 3. We hypothesized that contusions nt only on chest CT (CCT), with a normal chest radiograph (CXR), were clinically insignificant sulted in substantial increases in Injury Severity Score (ISS). **Methods:** We retrospectively ved imaging studies from all blunt trauma admits to our Level I trauma center in 2006 who ed both a CXR and CCT. We extracted pulmonary complication and demographic nation from the trauma registry and computerized medical records. Diagnosis of pulmonary sion was established according to imaging reports and review of all radiographic studies. nts were allocated into 4 groups by original radiology report: (1) pulmonary contusion on both and CCT; (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 nts were admitted in 2006. 663 patients were evaluated with both imaging studies. 83 had onary contusion identified on both CCT and CXR (group 1, 12.5%), 99 had pulmonary sion identified on CCT, but not CXR (group 2, 14.9%), and 465 patients did not have onary contusion identified on either imaging test (group 3, 70.0%). 16 patients had contusion XR but not CCT. Agreement between original radiology report and blinded review was 96.1%. nal AIS and ISS are reported below as well as resource and complications for both groups.

	Group 1	Group 2
	83	99
ge	36.9	36.8
hest AIS	3.5 +/-0.59	3.2 +/- 0.4
S	23.7 +/- 9.5	21.8 +/- 10.1
entilator days *	2.9+/- 6.9	0.5 +/-1.4
U days *	5.4 +/- 7.5	2.3 +/- 6.1
ospital days *	12.8 +/- 14.0	7.9 +/- 9.6
neumonia *	14 (16.9%)	5 (5.1%)

).05

oup 2, eliminating pulmonary contusion diagnosed only by CCT results in a change in chest f 0.22 +/- 0.42 and an ISS of 12.5 +/- 10.9. These recalculated scores are significantly ent than the AIS and ISS in group 1.

lusion: Pulmonary contusions detected by CCT, but not CXR, are of limited clinical icance. These clinically insignificant pulmonary contusions cause unwarranted increases in oducing inaccurate data that may hinder injury research.

#26 7:40am, 2/28/08

TICAL CARE IN A COMBAT SUPPORT HOSPITAL: IMPACT OF CIVILIAN IENTS

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Combat Support Hospital

nter: Jonathan B. Lundy, MD **Senior Sponsor:** John B. Holcomb, MD

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

standard operating procedure of the ICUs was to log ICU admissions into handwritten oks. The hospital also kept electronic databases, but these could not be interrogated to provide formation we needed for this descriptive study. We therefore conducted a hand search of the dmission logbooks to determine dates of admission and discharge, military status and ality, and injuries. The data was tabulated and expressed in graphs and charts allowing for a iptive representation of the patient population served from which to draw study conclusions and ssion points. In total there were 1383 ICU patients included in this study. Of this ICU patient ation, only 21% were members of the US Military and over 46% were Iraqi civilians. The ning patient population consisted of US and Non-US contractors, Iraqi Military, Security ees, and Coalition members.

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

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

#27 8:00am, 2/28/08

ɴ TRAFFIC SAFETY CAMPAIGN: COMPETITION IS THE KEY

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

nter: M. Houston, BA **Senior Sponsor:** Steve Moulton MD

ɔse: 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 ams to evaluate and promote selt-belt use among teens are needed.

terials and Methods: Seat-belt use among teen drivers and passengers was retrospectively d over a two year period. Next, an educational program aimed at increasing seat-belt use g teens was implemented at five area high schools. Observational studies were conducted as its arrived at school. Resources and incentives were provided to generate peer-to-peer ation. 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 aign was measured by an increase in seat belt usage at participating high schools. .

ults: In 2003, 91 teen drivers and passengers lost their lives on our state's roadways. In 2004, umber increased to 96 victims, of which 33 (34%) were wearing a seat belt and 45 (47%) were d from the vehicle. At the beginning of the safety campaign, average seat-belt use among teen 's was 47% (148/312), versus 40% (143/362) for teen passengers. Post-campaign seat-belt use 3% (230/276) among teen drivers versus 59% (259/435) for teen passengers. Overall use ised by 26%, to an average use rate of 69% (489/711).

ill	School A	School B	School C	School D	School E	Overall Totals
e)	30% 61/203	49% 79/160	48% 63/132	53% 58/109	43% 30/70	43% 291/674
ɔst)	34% 50/149	81% 117/144	81% 120/148	84% 107/127	66% 95/143	69% 489/711
in ie	4% p=0.56	32% p<0.001	33% p<0.001	31% p<0.001	23% p=0.002	26% p<0.001

ıclusions: Social pressure and poor comprehension of the risks of injury were identified as rs to seat-belt usage among teenage high school students. A friendly, *competitive* approach to y discussing and educating teens about these risks led to a 26% increase in seat belt usage g teen drivers and their passengers. Prospective evaluation of motor vehicle-related injuries ıtalities in teens is ongoing, as the campaign expands to meet the demand for this program at area high schools.

#28 8:20 am, 2/28/08

HOSPITAL HYPOTENSION IN BLUNT TRAUMA: IDENTIFYING THE "CRUMP FOR"

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nter: John F. Bilello MD,FACS **Senior Sponsor:** James W. Davis MD,FACS

oduction: The presence of pre-hospital hypotension following blunt trauma as a criterion for a activation is controversial. Base deficit (BD) in blunt trauma $\leq$ -6 correlates with increased dity and mortality.

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

hods: A retrospective chart review was performed on all blunt trauma admissions at a Level I a center from August 2002 through June 2007. Patients who were hypotensive in the field but otensive upon arrival in the emergency department (ED) were included. Patients with continued ension 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 $\leq$ 90 mm Hg. Patients were ied by BD $\leq$ -6 or $\geq$ -5. Statistical analysis was performed using paired t-test, chi-square and ic regression analysis with significance attributed to $p<0.05$.

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

	N	Repeat Hypotension	ISS	IV Fluid (l)	Blood (units)
$\geq$ -5	141	30 %	20	3.1±0.2	1.6±0.4
$\leq$ -6	36	78 %	31	6.6±1.2	5.5±1
alue	-	.0001	.0001	.0001	.0002

rall mortality was 12% (22/177). Patients with a BD$\leq$ -6 had a significantly greater mortality ared to the BD$\geq$ -5 group (22 vs.10%, $p< .05$). Repeat hypotension by itself was the most icant factor in mortality in both BD groups ($p<.001$).

nclusion: Blunt trauma patients with repeat hypotension have significantly greater mortality. nts with transient field hypotension and a BD $\leq$ -6 are more than twice as likely to have repeat ension ("crump"). This study reinforces the need for early arterial blood gases and trauma involvement in the evaluation of these patients. Patients with BD $\leq$ -6 should have early ve monitoring, liberal use of repeat FAST exams and careful resuscitation prior to CT ing. Surgeons should have a low threshold for taking such patients to the operating room.

#29 8:40am, 2/28/08

L FROM STANDING: AN UNDER APPRECIATED MECHANISM OF INJURY

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: Trauma Center/University of Miami

nter: N Namias **Senior Sponsor:** N Namias

jective: To study injuries associated with falls from standing at a Level I Trauma Center.
thods: Retrospective, registry-based cohort study of patients who fell from standing and were
)orted to an urban level 1 trauma center from 1/01/2000 to 12/31/2005.
ults: 738 patients met state trauma criteria and were transported to our Level I trauma center
ı 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
of their fall, 80/98 (82%) over the age of 65. The main cause of death was isolated head
a 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
led concussion/ contusion/ head trauma in 424/ 738(57.45%), limb fractures in125/738
%), and abdominal, chest, or spinal cord trauma in 168/738 (22.8%). 92/738 (12%) patients
ed operations [38/92 (41.3%) neuro, 33/92 (35.8%) ortho, 4/92 (4.3%) laparotomy, and 1/ 92
) vascular]. 19 of the 92 patients who had operations died (21% mortality). The table
ares survivors and non-survivors.

	SBP	GCS	ISS	Trauma Score	LOS	ICU LOS
vived	144	12	10	15	11	3
d	150	9	12	24	10	7

nclusion: Fall from standing position is a potentially serious mechanism of injury. For those
net the physiologic or anatomic criteria for transport to a trauma center, there was a significant
f air transport, hospital and ICU LOS, and mortality (13%), with head injury being the most
ion major injury. As the population ages, prevention efforts will be critical.

#30 7:00am, 2/29/08

COMYCIN MIC CREEP: IMPACT ON OUTCOMES OF METHICILLIN RESISTANT 'HYLOCOCCUS AUREUS VENTILATOR ASSOCIATED PNEUMONIA

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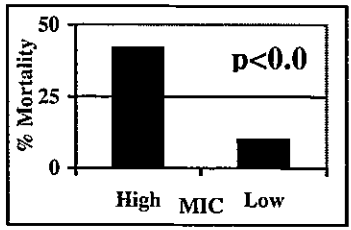
:al College of Virgina, Virginia Commonwealth University

nter: Ajai K Malhotra **Senior Sponsor:** Ajai K Malhotra

ground: The minimal inhibitory concentration (MIC) of Vancomycin, against Vancomycin *ive*-Methicillin ***resistant*** Staphylococcus aureus (VS-MRSA), has been steadily increasing. erns have been raised about the efficacy of Vancomycin in treating VS-MRSA. The current evaluates outcomes of patients with ventilator associated pneumonia (VAP) caused by VS-A treated with Vancomycin, and compares outcomes of patients infected with high MIC VS-A (MIC >0.5μgm/ml) to those infected with low MIC (MIC≤0.5μgm/ml) VS-MSRA.
ods: 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 ho-alveolar lavage (BAL) showing $>10^5$CFU of VS-MRSA/ml of BAL fluid. The Vancomycin of all VS-MRSA isolates was obtained from a microbiology database. A chart review was rmed to obtain outcomes in terms of mortality, ventilator, ICU and hospital lengths of stay. nts with VAP caused by high MIC (MIC >0.5μgm/ml) VS-MRSA were compared to patients VAP caused by low MIC (MIC≤0.5μgm/ml) VS-MRSA. Significance was set at $p<0.05$.
lts: Over the 69 month study period ending August 2007, 48 patients were identified with 61 des of VAP caused by VS-MRSA. 29 patients had 35 episodes of VAP with low MIC VS-A and 19 patients had 26 episodes of VAP caused by high MIC VS-MRSA (Table). Trauma nts had a lower incidence of high MIC VS-MRSA when compared to non-trauma patients 05). 4/29 (14%) of low MIC group developed recurrent infection with VS-MRSA as compared 9 (32%) of the high MIC group.

vice ients)	Age (years)	Sex (M:F)	MIC	
			High	Low
uma (22)	49±4	16:6	4	18
gery (13)	59±3	6:7	7	6
n (7)	42±6	3:4	3	4
er (6)	61±8	4:2	5	1

shown as Mean ± Standard error of Mean



lity of high MIC VS-MRSA VAP patients (8/19 – 42%) treated with Vancomycin was icantly higher than mortality of VAP patients with low MIC VS-MRSA (3/29 – 10%) similarly d ($p<0.05$) (Fig.). The ventilator, ICU and hospital lengths of stay were similar.
lusions: Vancomycin therapy is less effective in treating VAP caused by high MIC VS-MRSA. itions should consider treating VAP caused by high MIC VS-MRSA with alternatives. The :al Institute of Laboratory Standards (CLSI) should consider lowering the breakpoint of ivity of Vancomycin for MRSA.

#31 7:20am, 2/29/08

S DE-ESCALATION OF ANTIBIOTIC THERAPY FOR VENTILATOR-)CIATED PNEUMONIA (VAP) INCREASE THE LIKELIHOOD OF RECURRENT JMONIA (RP)OR MORTALITY IN CRITICALLY ILL SURGICAL PATIENTS?

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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 hesized that DT for VAP was not associated with an increased rate of RP or mortality in a t of critically ill surgical patients.

ods: All SICU patients from 1/05 to 5/07 with VAP diagnosed by quantitative bronchoalveolar e with a positive threshold of 10,000 cfu/mL were identified. Data collected included age, r, APACHE III (A3), type of bacterial or other pathogen, antibiotics used for initial and final y, mortality, RP, and appropriateness of initial therapy (AIT). Patients were designated as ing 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. $P < 0.05$.

ts: 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 t differ between patients receiving DT (27.3%) and those who did not receive DT (35.1%). ll mortality was 37% (55% predicted by A3 norms) and did not differ between those receiving 3.8%) 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%). tic 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 demonstrates that appropriate initial antibiotic therapy remains vital in the successful treatment ilator-associated pneumonia.

#32 7:40 am, 2/29/08

'EMIC NOT JUST MESENTERIC LYMPH CAUSES NEUTROPHIL PRIMING LOWING HEMMORRHAGIC SHOCK

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:e State University

nter: 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 ple 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, stulated that systemic lymph after hemorrhagic shock would exhibit PMN priming and this tudied *in vitro*.

ods: Lymph was collected at intervals from the hind limb of dogs subjected to sham or HS and lloid 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 (O_2^-) generation (nanomoles/mg protein), and elastase release (%) after the addition of fMLP ol). PMN's with buffer served as control.

ts: (N = 4, mean ± SD)

	CD11b (MFI)	O_2^-	Elastase (%)
ol	114.4±4.0	6.8±0.2	8.7±0.4
-Sham	138.8±3.0*	5.9±0.6	5.2±0.3*
-Shock	283.8±3.7*#	9.4±0.6*#	13.2±0.3*#
-Resuscitation	269.8±4.7*#	8.3±0.3*#	11.6±0.4*#

).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.

#33 8:00am, 2/29/08

'F COMMITMENT TO TRAUMA CARE IMPROVES MORTALITY AND LENGTH OF ' AT A LEVEL I TRAUMA CENTER

iins, K. Scarborough, R. Bar-Or, A. Hawkes, J. Huber, D. Bar-Or
ıa Services, St. Anthony Central Hospital and Swedish Medical Center

nter: Charles Mains **Senior Sponsor:** Charles Mains

IECTIVE: Optimizing human resources at trauma facilities may increase efficiency and quality e. The purpose of this study was to assess whether staffing changes within the same level I a center (St. Anthony Central Hospital, 'SAH') improved mortality and shortened hospital and ive care unit (ICU) length of stay for trauma patients.
THODS: Mortality, hospital length of stay (LOS) and ICU LOS were evaluated during three ıeriods: In-house general surgery resident presence ("Group 1"), after the implementation of a rauma service with dedicated in-house trauma surgeons ("Group 2"), and the addition of ıted trauma service physician assistants (PA's) to the core trauma service ("Group 3"). tic regression and chi-square tests were used for mortality, and multiple linear regression and xon non-parametric tests were used for LOS outcomes.
SULTS: Adult trauma patients from the trauma registry at SAH were included in the analysis ,297). There were fewer transfers-in during the group 2 period, a higher percent of patients ow systolic blood pressure (<90 mm Hg) during the group 1 period, and more severely injured ıts (ISS > 15) for group 3 than groups 2 and 1, all of which were adjusted for. After ıment, the introduction of dedicated PA's (group 3) resulted in significantly decreased mortality ɜ overall population and patients with severe injuries (ISS> 15) compared to the preceding ls (table 1). Dedicated PA presence also resulted in significantly reduced hospital LOS and .OS for the overall population. The presence of in-house trauma surgeons significantly ısed ICU LOS compared to group 1; however, the reduction in mortality did not reach ical significance.
)NCLUSION: The presence of in-house trauma surgeons and dedicated trauma service PA's ves management and outcome of critically injured trauma patients within a level I trauma

1 Adjusted and unadjusted mortalities by group, stratified by injury severity score

	Unadjusted Mortality (%)		*Adjusted Mortality (%)			
	Overall	ISS 16 -75	Overall	p value**	ISS 16 -75	p value**
) 1	3.82 (243)	14.83 (192)	3.82	NA	14.83	NA
) 2	3.76 (248)	12.21 (200)	3.64	0.64	10.98	0.31
) 3	3.18 (74)	9.73 (62)	2.64	0.01	6.54	0.01

ɜted for: Injury severity score, age, systolic blood pressure, transfer status
lues are calculated compared to reference group 1

#34 4:00 pm, 2/29/08

USTERING OF INJURY BEHAVIORS

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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 iated with injury risk. We hypothesized that problem drinking would be associated with other isk 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 ling 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 ited questionnaires. Behaviors were ranked on a Likert scale ranging from a low to a high iood 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 ared 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 l out of traffic, and make angry gestures at other drivers (all $p < .05$). Problem drinkers were kely to wear motorcycle or bicycle helmets. However, problem drinkers were no more or less 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 =.019) 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 ams performing alcohol interventions should consider including behavioral interventions along lcohol reduction strategies.

#35 4:20pm, 2/29/08

ORCYCLE VERSUS U.F.O. (UNIDENTIFIED FEATHERED OBJECT); A CASE)RT OF A RARE MECHANISM FOR BLUNT CAROTID INJURY

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ı Clark Medical Center

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

year-old male was the unhelmeted driver of a motorcycle traveling at highway speeds when he ıruck 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 ght neck. Rapid sequence intubation to protect his airway was unsuccessfully attempted at the ng hospital. A Combitube was placed and he was transported to the trauma center ıynamically normal.

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

mained neurologically intact and was weaned from the ventilator on postoperative day #1. He tolerating a liquid diet, and was discharged home on postoperative day #7. His tracheostomy ownsized and eventually removed on postoperative day #23 as well as his gastrostomy tube.

carotid injury from a bird strike has not been described before in the literature.

#36 4:35pm, 2/29/08

SUAL CERVICAL SPINE INJURIES IN A RURAL PATIENT WITH MULTI-'EM TRAUMA: OPPORTUNITIES FOR HARM AMIDST CONFLICTING ›RITIES AND MULTIDISCIPLINARY FOLLOWUP

dekopf; 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 loFacial Surgery (Portland, Oregon), and from the Emergency Medicine Department at Mercy tal (Roseburg, Oregon)

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

is case report describes some of the unique aspects of rural trauma involving a 16-year-old e 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 ing injuries: closed head injury, fracture/dislocations of the first and second cervical vertebrae 2 odontoid) with lateral translocation of c2 over c3 without neurological injury, right nothorax, grade 5 liver lacerations, grade 2 splenic injury, complex pelvic and facial fractures, rrhagic shock from blood loss, hypothermia, and coagulopathy.
iere were multiple opportunities to cause harm and delay in management of this patient with es not commonly seen by rural prehospital personnel and level 3 rural trauma centers. We le a time motion analysis of her initial care to definitive care at a level 1 ACSCOT verified a center, 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 ed or described in the neurosurgical, orthopedical, or trauma literature (fig. 1, 2, &3), and the gement thereof.

#37 4:50pm, 2/29/08

JMONECTOMY: AN EFFECTIVE SALVAGE FOLLOWING DEVASTATING ⁄IONARY INJURY

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

nter: Jill Halonen, M.D. **Senior Sponsor:** Thomas M. Scalea, M.D.

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

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

ts: Six patients were identified. The mean age was 27.8 years, four sustained penetrating a and two blunt trauma. Mean ISS was 26 and RTS was 4.6. Mean admission SBP, lactate and ɜre 94 mmHg, 9.9 mmol/L and 6.94 respectively. Mean time to operation was 47 minutes. Two ıts presented in arrest; one requiring emergent thoracotomy and one treated by tube ›ostomy. The decision to perform pneumonectomy was made when no lesser procedure would e. Mean EBL was 6.9 liters and mean intra-op TX was 14.5 units of prbcs, and 13.8 units of All six developed pulmonary hypertension, requiring vasoactive medications and lung ›tive ventilation. Three required prone ventilation, one oscillating ventilation, continuous renal ɜement in three and extracorporeal membrane oxygenation (ECMO) in two. Transesophageal ardiography was used to guide therapy for pulmonary hypertension and volume management ɜ. Three patients died (50%); two of refractory right heart failure within the first 24 hours and f multiple organ failure on the ninth post-operative day. Mean length of stay in the survivors 1 days. All survivors were neurologically intact, and none required mechanical ventilation at ne of discharge. Both ECMO patients survived.

usion: The need for pneumonectomy following trauma is rare. Patients undergoing ıonectomy who present in extremis require significant intra and postoperative support, but ⁄al is 50%.

LED NITRIC OXIDE IN THE MANAGEMENT OF PATIENTS WITH SEVERE TRAUMATIC ACUTE LUNG INJURY

ıg; R.G. Barton
rsity of Utah

nter: Sarah King **Senior Sponsor:** Richard Barton

oduction: Inhaled nitric oxide (NO) has been used in the management of ARDS and for ɔerative pulmonary hypertension. We describe the use of NO in trauma patients with severe, diately life threatening, acute lung injury, hypoxemia, and pulmonary hypertension.
hods: With IRB approval, we conducted a retrospective chart review of four patients with diately life threatening acute lung injury secondary to shock, pulmonary contusion, or fatty li syndrome that were treated with NO. All patients had diffuse infiltrates on chest x-ray, ɔnsion despite volume resuscitation, hypoxemia requiring high levels of PEEP and $Fi0_2$, and ɔnary hypertension. All patients were receiving continuous infusions of epinephrine and one to support blood pressure and cardiac output. Inhaled NO (20-40 ppm) was started for table hypoxemia and suspected right ventricular failure related to pulmonary hypertension and PEEP.
lts: The effects of NO on hemodynamic parameters and oxygenation are shown below.

neters	Pre-Nitric Oxide	Nitric Oxide 1 Hr	Nitric Oxide 8 Hr	Nitric Oxide 24 Hr
ınge g)	99 ± 12 / 47 ± 4.3	110 ± 22 / 65 ± 7.2	103 ± 4.7 / 59 ± 8.1	114 ± 30 / 70 ± 8.6
/min/m^2)	3.7 ± 0.8	3.7 ± 0.31	3.2 ± 0.35	3.2 ± 0.37
mmHg)	24 ± 0.75	16 ± 3.7	22 ± 3.1	16 ± 1.4
(mmHg)	25 ± 1.6	17 ± 3.0	22 ± 3.5	19 ± 3.8
mmHg)	57 ± 7.6 / 32 ± 7.0	47 ± 8.1 / 25 ± 3.1	47 ± 7.0 / 27 ± 2.9	43.5 ± 1.9 / 24 ± 2.5
·cm-^{5})	227 ± 67	196 ± 12	155 ± 38	193 ± 74
·cm-^{5})	593 ± 65	810 ± 190	632 ± 19	764 ± 135
mmHg)	60 ± 12	72 ± 18	82 ± 12	92 ± 26
(cm	21 ± 2.1	19 ± 1.5	18 ± 2.4	16 ± 2.4
$Fi0_2$	62 ± 13	83 ± 14	139 ± 23	184 ± 52

ɔresented as mean ±SEM
lusion: In critically injured trauma patients with severe acute lung injury, inhaled NO reduced ɔnary artery pressures and was associated with an increase in systemic blood pressure, tting the weaning of vasoactive drug infusions. Further, inhaled NO improved oxygenation and ed reductions in PEEP and $Fi0_2$. Inhaled NO may be useful for patients with intractable ɛemia and right ventricular failure due to traumatic acute lung injury.

#39 5:20pm, 2/29/08

ESTRIAN-ASSOCIATED URETHRAL INJURIES IN WOMEN

l JM Galante CS Cocanour
avis Medical Center

nter: Shannon Beal **Senior Sponsor:** Christine Cocanour

trian 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 iel injuries. Female urethral injuries are exceedingly rare with only two equestrian-associated al injuries reported in the last 10 years. This case report details two female patients with trian-associated urethral injuries.

1 JM 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)lacement 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 gram and rectal exam were normal. She was taken to the OR within a few hours of injury for ial fixation of her pelvis, repair of a traumatic hernia that was discovered intraoperatively, /ed by vaginal exam under anesthesia. A sagittal laceration extended ventrally to the urethra, gh the urethra posteriorly, and into the anterior vaginal wall. A cystoscopy demonstrated no ice 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 it's post operative course was complicated by a wound cellulitis, and an infected pelvic :oma with failed pelvic fixation secondary to infected hardware. She underwent drainage, lement, placement of antibiotic beads, and external pelvic stabilization.

2 SR 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)lood exuding from her vagina. Abdominal CT scan showed a large amount of free fluid ut solid organ injury. She underwent bilateral iliac artery embolization, and then ex lap where raperitoneal bladder rupture was identified. Vaginal exam revealed a large laceration to the :um anterior to the vagina and urethra extending into the space of Retzius. The pubic rami 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 ibia. The posterior urethra was intact. It was repaired over a foley catheter. The ureters were lated with 5-French feeding tubes, which were then brought out through bilateral cystotomies irough the skin. A suprapubic catheter was placed. The dome of the bladder was repaired. ubic symphysis was plated. The perineum was repaired by reattaching the clitoris and crura. /as returned to the OR a few days later for reduction and percutaneous screw fixation of her n. The patient was later transferred to her contracted hospital for physical therapy.

lusion Female urethral injuries are rare, but should be considered in the patient with trian-associated pelvic fractures, especially those presenting with blood in the vagina.

#40 5:35pm, 2/29/08

HE RIGHT OF A GUARDIAN TO PROCURE AN ABORTION FOR AN PACITATED TRAUMA PATIENT: LEGAL AND ETHICAL CONSIDERATIONS

idley, MD, K. Brasel, MD, MPH
:al College of Wisconsin

ground: Advanced trauma life support (ATLS) addresses the care of the pregnant patient by mphasizing 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 quent management. Both legal and ethical issues may come into question. Case law has uently addressed the role of a guardian in making decisions about the fetus, with conflicting s. **Case:** A 21 year-old unrestrained passenger was involved in a high-speed frontal motor e crash. She was intubated in the trauma bay, in hypovolemic shock, with a GCS of 6. After itation full radiographic evaluation revealed diffuse intraparenchymal cerebral hemorrhages, fracture, and an intrauterine pregnancy. An intracranial pressure monitor documented low ranial pressures, and was discontinued on hospital day 3. She then underwent early ostomy and percutaneous gastrostomy. During her 5-week hospital stay, she had ventilator ated pneumonia, septicemia, and episodes of neuro-storming with autonomic instability. Her eventually stabilized at 5. Near the end of her hospital course, obstetric ultrasound estimated stational age of the fetus at 14 weeks. The patient's father, her closest living relative, sought guardianship. Concurrently, he expressed wishes to have the pregnancy terminated. **ssion:** Case law has addressed this specific scenario less than 10 times. Some states have ed the guardian to terminate a pregnancy, although Florida statutes prohibit guardians from nting to an abortion without judicial review. Other states have case law supporting ntment of a separate guardian ad-litem for the fetus, who may make decisions counter to those ated by the maternal guardian. Our jurisdiction does not specifically address these issues in es or case law. Since our statutes neither uphold nor deny a guardian the right to seek an on for their ward, the law is effectively silent, rendering any such petition susceptible to legal ny. 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 atient's best interests. This autonomy of the patient is upheld through her guardian's voice, gh it is not limitless. It is tempered to some degree by its companion principles of icence, non-maleficence, and justice. The right of a guardian to seek a course of action that is r advantageous nor detrimental, if not medically necessary, is determined by weighing the four ples 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 sues that can arise during subsequent care, which may not be limited to medical decisions. posed with the complicated question of whether a pregnancy can be terminated for an acitated trauma patient, the applicable legal and ethical intricacies require thorough inspection onsultation with appropriate experts.

BY-LAWS

BYLAWS OF THE
WESTERN TRAUMA ASSOCIATION

ARTICLE I
Name, Objectives, Organization, and Jurisdiction

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

ION 2: Objectives, Core Value and Mission Statement
ectives to promote the exchange of educational and scientific information and principles, at the st level, in the diagnosis and management of traumatic conditions and to advance the science rt of medicine.

e value:
uing education by participation in a diverse, multi-disciplinary scientific program with the goal of ving the care of injured patients.

sion Statement:
/estern Trauma Association is committed to the improvement of trauma care through research, tion, sharing of clinical experiences and the development of physicians of all specialties who volved in the care of trauma patients.

ION 3: Organization
s 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
rritory in which this Association shall act will be the United States of America. It shall not be ained, however, from holding its annual meetings at any designated site.

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

ARTICLE II
Membership

ION 1: Membership Limitation
ership shall be limited 125 active members. No single specialty shall comprise more than 40% 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 ar 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 a exempt from all membership requirements, including the payment of dues. They shal 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 significa contribution 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 supp (sponsorship) from a member of the Association. They must also submit an abstract f 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, s 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
n 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
e 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
cretary of the Association to each and every member at his address as it last appears on the
s 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
e-mail) 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 Pas President, program committee chairman and six members-at-large shall constitute th of Directors.

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

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

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

Section 2: Annual Meetings

A. The annual meeting of the Board of Directors shall be held during and in the same ge location as the annual meeting of the Association, but at least one day in advance of 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 propos discussion and/or vote by any Board member.

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

SECTION 3: Special Meetings

A. Special meetings of the Board of Directors may be held at any time and place upon th of the President, or a majority of the Board providing ten days prior written notice sha given to each Director, stating the time, place and purpose of the special meeting. N of special meetings shall be mailed to the Directors by the Secretary of the Associatic 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 conferen telephone call including a quorum of Members of the Board. The same rules for notifi 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 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 iation shall be controlled by, or under the authority of, the Board of Directors.

on 6: Ex-officio Members of Board of Directors.
resident of the Western Trauma Foundation for Education and Research, Chairman of the am Committee, Chair of the Multicenter Trials Committee and the Historian shall be ex-officio bers 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 al meeting. The amount of the registration fee shall be determined by the President, in ltation with the Treasurer, and notice thereof shall be sent to the membership along with the n notice 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 urer of the Association for each fiscal year, beginning with the first new fiscal year after election mbership. The Treasurer shall notify each member of his/her dues obligation during the first er 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 iation of membership.

ION 3: Assessments
-thirds majority vote of the Board of Directors of the Association can institute a special sment 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 purposes designed to achieve the exchange of ideas and principles pertaining to the diagnosis anagement of traumatic injuries and conditions. Notice of any special assessment of the bership 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
quirements for retention of membership including payment of dues and attendance at meetings e waived by a vote of the majority of the Board of Directors upon petition. Eligibility for such rs shall include induction into the Armed Forces of the United States on a temporary basis, cal 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 prese 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 Associati 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 v 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 re the matter voted upon by such Member.

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

SECTION 4: Amendments
As to the Articles of Incorporation, consolidation or dissolution of the Association shall be pass 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 qu 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 appointec 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 quor

SECTION 2: Terms and Vacancies
The President, President-Elect, and Vice-President shall hold office for one (1) year. The Sec 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 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/h death, resignation or inability to perform the duties subsequently described in Article VIII, Sect an officer cannot complete his/her term, his/her successor shall be chosen by the Board of Dir by special meeting to fill the vacancy for the unexpired term of the office. No officer shall serve 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 Board of Directors present at any meeting for that purpose.

ION 4: Resignation
fficer may resign at any time by giving written notice to the Board of Directors and receiving
ıpproval.

ARTICLE VIII
Duties and Authority of Officers

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

ION 2: President-Elect
resident-elect shall plan and organize the next annual meeting and assume whatever
nsibilities the president or Board of Directors shall assign.

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

ION 4: Secretary
ecretary shall
eep the minutes of all meetings of the association and the Board of Directors
e responsible for applications for membership, elections and terminations of members and
ıunications to the membership, especially those whose membership is in jeopardy because of
ons of the bylaws.
laintain the Membership database, with the help of the Treasurer.
ecord the reports from the other officers and committees and any bylaw changes.
laintain copies of all corporate documents, including contracts, except for those that specifically
to financial matters.
repare a report for the membership at the annual business meeting and for the Board of
ors at each of their annual meetings.

ION 5: Treasurer
easurer 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 registratio process at the annual meeting.

SECTION 6. Historian

The Historian should maintain and safeguard the archives of the Association. The Historian sh an ex-officio member of the Board of Directors. In case of a vacancy by reason of death, resig or inability to fulfill the responsibilities of the office, the vacancy may be filled by the Board of D until the next annual meeting of the members. The historian shall keep a continuous account history of the Association for the use of the membership. This shall include significant informa concerning each annual meeting, including the site of the meeting, recipients of honors, invitec 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 meeti Each five years the historian shall prepare the history of the Association from the time of the la recorded history to be part of the archives of the Association. Memorabilia of the Association retained by the Historian.

ARTICLE IX
Committees

SECTION 1: Nominating Committee

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

SECTION 2: Program Committee

The Program Committee shall consist of a Chairman, appointed by the President, and a Comr including at least one General Surgeon, one Orthopedic Surgeon, another specialist (if availab as many other members as the Program Chairman and President deem necessary to a maxim ten (10) members. The Chair and the President will appoint the committee members. The Pres 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 Commit 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 secretary shall present to the Board of Directors at its annual meeting, a list of candidates whc satisfied the requirements for membership. Upon approval of the Board of Directors, this grou 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 ava and as many other members as the Chairman and President deem necessary and appropriate Chairman of the Program Committee shall serve as an ex-officio member of the committee. Th Chairman of the Publications Committee will be appointed by the President and serve a two (2 term. The other members, selected from the membership, will be appointed by the President i 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 choosir

will be submitted to The Journal of Trauma. The Chairman will serve as the liaison to The al of Trauma. Should the Chairman not be an Editorial Consultant to The Journal of Trauma, ıairman will consult with a member of the Editorial Board of The Journal of Trauma designated : President.

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

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

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

ARTICLE X
Conduct and Order of Business

'ION 1: Business Sessions of the Members
shall be an annual business meeting of the members during the annual meeting. It shall be ded by a meeting of the Board of Directors also held during the annual meeting of the ;iation.

'ION 2: Order of Business
'resident shall set the agenda and where possible should follow Robert's Rules of Order.

ARTICLE XI
Indemnification

ɔn 1. Definitions. For purposes of this Article:

The terms "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 or 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 na defendant or respondent in a proceeding.

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

E. When used with respect to a director, the phrase "official capacity" shall mean the off director in the Association, and, when used with respect to a person other than a dire shall mean the office in the Association held by the officer or the employment, fiducia agency relationship undertaken by the employee or agent on behalf of the Associatio in neither case shall include service for any foreign or domestic Association or for an 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 amou 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 Associatio the conduct was in the best interests of the Association, and, in all other cases, that the condu at least 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 director or officer was adjudged liable to the Association; or
(ii) in connection with any other proceeding charging improper personal benefit to the di officer, whether or not involving action in that person's official capacity, in which the officer or is ultimately adjudged liable on the basis that the director or officer improperly received perso benefit.

Indemnification under this Section 2 in connection with a proceeding brought by or in the right Association shall be limited to reasonable expenses incurred in connection with the proceedin termination of any action, suit, or proceeding by judgment, order, settlement, or conviction or u plea of solo contender or its equivalent shall not of itself be determinative that the person did r 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 me 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 connectic 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 b Association only as authorized in each specific case upon a determination that indemnificatior

ɔr or officer is permissible under the circumstances because such person met the applicable ɪrd 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.

ssociation may pay for or reimburse the reasonable expenses (including attorneys, fees) ɔd by a director or officer who is a party to proceeding in advance of the final disposition of the ɔding 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.

event that the Association indemnifies, or advances the expenses of, a director or officer in ɪance 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.

ssociation 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.

oard of Directors may exercise the Association's power to purchase and maintain insurance ɪing without limitation insurance for legal expenses and costs incurred in connection with ɪing any claim, proceeding, or lawsuit) on behalf of any person who is or was a director, officer, yee, fiduciary, agent or was serving as a director, officer, partner, member, trustee, employee, ɪry 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 th 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 procedures to which one indemnified may be entitled under the Articles of Incorporation, any b agreement, resolution of disinterested directors, or otherwise, both as to action in such persor official capacity and as to action in another capacity while holding such office, and shall contin a person who has ceased to be a director or officer, and shall inure to the benefit of such pers 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 Associatio give written notice of the indemnification in advance to the voting members with or before the of the next voting members' meeting. If the next voting member action is taken without a mee 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 about to enter into any business transaction directly or indirectly with himself, any member of person's family, or any entity in which he has any legal, equitable or fiduciary interest or positi including without limitation as a director, officer, shareholder, partner, beneficiary or trustee, s 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 wi such person's knowledge that bear on the advisability of such transaction from the standpoint 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 b with such person present to provide information and answer any questions.

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

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

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

Section 2. Loans to Directors and Officers Prohibited.

ıns shall be made by the Association to any of its directors or officers. Any director or officer ssents to or participates in the making of any such loan shall be liable to the Association for the ıt of such loan until it is repaid.

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

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

any director may, from time to time, be reimbursed for such director's actual and reasonable ses 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 vhom the Association has received contributions previously made to support its activities to the such distributions represent no more than a return of all or a part of the contributor's ɔutions.

ARTICLE XIII
Amendments

Bylaws may be amended at any annual meeting of the Association provided that a notice ; the purpose of each proposed amendment and the reason therefore, and a copy of the sed amendment is sent to every member in good standing not less than thirty (30) days prior to te of the meeting at which the proposed amendment is to be voted upon. It shall require a two- vote of a quorum of the membership present at the meeting to amend a Bylaw.

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