THIRTY-NINTH ANNUAL MEETING

Crested Butte 2009

Western Trauma Association

February 22 - February 28, 2009

Crested Butte, Colorado

CRESTED BUTTE

CBMR PROPERTIES

Premier Lodging at Crested Butte Mountain Resort

Study possibility
mandible fx's CORIF
: delay
approach
which antibiotic
iv/k vs plates

is activity has been planned and implemented in accordance with the Essential Areas, Elements and Policies of the Wisconsin Medical Society ough the joint sponsorship of Gundersen Lutheran Medical Foundation and the 'estern Trauma Association. The Gundersen Lutheran Medical Foundation is accredited by the Wisconsin Medical Society to provide continuing medical education for physicians.

ndersen Lutheran Medical Foundation designates this educational activity for a ximum of 17.25 *AMA PRA Category I Credit(s).*™ Physicians should only claim credit commensurate with the extent of their participation in the activity.

WESTERN TRAUMA ASSOCIATION

39TH Annual Meeting

Crested Butte, Colorado

February 22- February 28, 2009

Speaker Disclosure Information

Albrecht, Roxie	Nothing to disclose	Kilbourne, M	Other Financial or Mate Support - Hemostasis L Paul, MN
Allison, C	Nothing to disclose	Knudon, P	Nothing to disclose
Amin, PB	Nothing to disclose	Kopelman, TR	Nothing to disclose
Baker, C	Nothing to disclose	Kozar, Rosemary	Nothing to disclose
Ball, CG	Nothing to disclose	Ley, E	Nothing to disclose
Beekley, A	In-Spectra devices provided on-loan for project by Hutchinson Technology	Livingston, David	Nothing to disclose
Berkseth, TJ	Nothing to disclose	Lodermeier, J	Nothing to disclose
Biffl, Walter	Nothing to disclose	Long, J	Nothing to disclose
Borkon, MJ	Nothing to disclose	Magnotti, LJ	Nothing to disclose
Brown, C	Nothing to disclose	Mangram, A	Nothing to disclose
Brundage, Susan	Nothing to disclose	Maxwell, RA	Nothing to disclose
Byrnes, M	Nothing to disclose	McIntyre, Robert	Nothing to disclose
Campbell, Sylvia	Nothing to disclose	Metzdorff, Mark	Nothing to disclose
Cocanour, CS	Nothing to disclose	Moore, FA	Nothing to disclose
Cogbill, Tom	Nothing to disclose	Moore, H	Grant/Research support/Patents - UVM (of Medicine & Dept. of S Fletcher Allen Healthcar
Coimbra, Raul	Nothing to disclose	Morrison, C	
Constantini, TW	Nothing to disclose	Offner, P	Spouse is an employee MediVance which make Arctic Sun device
Cothren, C	Nothing to disclose	Rossi, D	Grant/Research Suppor Claude Worthington Ber Foundation
Crockett, A	Nothing to disclose	Rozycki, Grace	Nothing to disclose
Driggs, A	Nothing to disclose	Sakai, LM	Nothing to disclose
Feliciano, DV	Nothing to disclose	Schermer, CJ	Nothing to disclose
Hauser, Carl	Grant/Research support, NIH/NIGMS; Consultant, Novo Nordisk	Schreiber, Martin	Nothing to disclose
Hindawi, Y		Schuster, KM	Nothing to disclose
Holcomb, JB	Consultant, Hemson/Scientific Advisory Board for Novo Nordisk	Smith, RS	Nothing to disclose
Ingalls, N	Nothing to disclose	Telian, S	Nothing to disclose
Ingraham, A	Nothing to disclose	Thomas, Herbert J.III	Nothing to disclose
Jurkovich, GJ	Nothing to disclose	Vane, Dennis	Nothing to disclose
Karmy-Jones, R	Nothing to disclose	Wahl, GM	Nothing to disclose
Karmy-Jones, S	Nothing to disclose	Warner, E	Nothing to disclose
Kaye, AJ	Nothing to disclose	Wryzykowski, A	Nothing to disclose
		Zumwinkle, LE	Nothing to disclose

39h Annual Meeting
Crested Butte, Colorado
2008-2009

CERS:

Grace S. Rozycki, MD	President
Robert C. Mackersie, MD	President-Elect
M. Gage Ochsner, MD	Vice President
David Livingston, MD	Secretary
R. Lawrence Reed, II, MD	Treasurer
R. Christie Wray, MD	Historian

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Denis Bensard, MD	2009
Peter Rhee, MD	2009
Kimberly A. Davis, MD	2010
Soumitra R. Eachempati, MD	2010
Raul Coimbra, MD	2011
Rosemary A. Kozar, MD	2011

GRAM COMMITTEE:

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C. Clay Cothren, MD	Carol R. Schermer, MD
M. Margaret Knudson, MD	Herbert J. Thomas, III, MD
Riyad C. Karmy-Jones, MD	Dennis W. Vane, MD

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Mitchell Cohen, MD	Raul Coimbra, MD
Kimberly A. Davis, MD	James Davis, MD
Rochelle Dicker, MD	David Feliciano, MD
Larry Gentilello, MD	Enrique Ginzburg, MD
Vincent Gracias, MD	James Haan, MD
John Holcomb, MD	Jay Johannigman, MD
Krista L. Kaups, MD	Rosemary Kozar, MD
Barbara Latenser, MD	David Livingston, MD
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Frederick Moore, MD	Ram Nirula, MD
Scott Peterson, MD	Peter Rhee, MD
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Steve Shackford, MD	Stephen Smith, MD
Dennis Vane, MD	Dan Vargo, MD
Michael West, MD	Chris Wray, MD

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Susan Brundage, MD
Steve Shackford, MD
Herbert J. Thomas, III, MD

TI-CENTER TRIALS COMMITTEE:

Krista L. Kaups, MD, Chair

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
Grace S. Rozycki, M.D.	2009	Crested Butte

The 2010 WESTERN TRAUMA ASSOCIATION Meeting will be held at:

Telluride, Colorado
February 27 – March 7, 2010

WESTERN TRAUMA FOUNDATION DONORS

(Current Lifetime Accumulation Status)

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Dennis Vane

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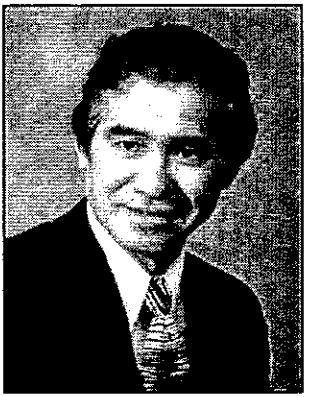
Earl G. Young, M.D.
(1928-1989)



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 Annual Meeting of the Association.

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

He was a clinical professor of surgery at the University of Minnesota Medical School, and a practicing gen 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 Minnesot 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 resider presented at the Annual Meeting.

- Dr. John Najarian characterizing Earl at a memorial service in his honor at the University of Minn

EARL G. YOUNG AWARD RECIPIENTS

ient	Institution	Year
ɔh Schmoker, MD	University of Vermont	1991
ɔh Schmoker, MD	University of Vermont	1992
es Mock, MD	University of Washington	1993
Travisani, MD	University of Vermont	1994
ɔ C. Ridings, MD	Medical College of Virginia	1995
I Han, MD	Emory University	1996
on R. Miller, MD	Wake Forest University	1997
irey Manley, MD, PhD	University of California-San Francisco	1998
ːs M. Doty, MD	Medical College of Virginia	1999
Ciesla, MD	Denver Health Medical Center	2000
do J. Gonzales, MD	Denver Health Medical Center	2001
C. Brakenridge	Cook County Hospital	2002
a J, Osband, MD	UMDNJ-New Jersey Medical School	2003
/ Lee, MD	UMDNJ-New Jersey Medical School	2004
ɜt A. Gonzalez, MD	University 0f Texas at Houston	2005
fer M. Watters, MD	Oregon Health & Science University	2005
fer J. Wan, MD	University of California-San Francisco	2006
fer J. Wan, MD	University of California-San Francisco	2007
J. Warner, MD	University of Washington	2008

WESTERN TRAUMA ASSOCIATION

IN MEMORIUM

Earl G. Young, MD
February 27, 1989

Gerald S. Gussack
August 25, 1997

Peter Mucha, Jr.
August 9, 2006

W. Bishop McGill
October 2007

"Paint the Ceiling" Lectureship

erry Jurkovich, M.D.	1997	Snowbird, Utah
ı W. McGill, M.D.	1998	Chateau Lake Louise, Alberta
am T. Close, M.D.	1999	Crested Butte, Colorado
ny Cornell	2000	Squaw Valley, California
ff Tabin, M.D.	2001	Big Sky, Montana
es H. "Red" Duke, M.D.	2002	Chateau Whistler, British Columbia
id V. Shatz, M.D.	2003	Snowbird, Utah
an and Tim Baker	2004	Steamboat Springs, Colorado
Habel, M.D.	2005	Jackson Hole, Wyoming
rew Schneider	2006	Big Sky, Montana
st E. Moore, MD	2007	Steamboat Springs, Colorado
ıela Kallsen	2008	Squaw Valley, California
ia Campbell, MD	2009	Crested Butte, Colorado

WESTERN TRAUMA ASSOCIATION
Schedule of Events
February 22 – February 28, 2009

		Room
Sunday, February 22		
4:30pm – 7:30pm	Registration	Elko/Floresta Foyer, LMS
5:00pm – 7:00pm	Welcome Reception	Elko/Floresta Room, LMS
5:00pm – 7:00pm	Children's Reception	Alpine Room, LMS
7:00pm – 8:00pm	Past President's Meeting	Al Johnson Boardroom, L
Monday, February 23		
6:30am – 8:00am	Attendee Breakfast	Alpine Room, LMS
7:00am – 9:00am	Scientific Session	Elko/Floresta Room, LMS
7:30am – 9:00am	Friends & Family Breakfast	9380 Prime, Elevation Ho
4:00pm – 6:00pm	Scientific Session	Elko/Floresta Room, LMS
6:00pm – 7:00pm	Board of Directors Meeting	Capitol Room, Elevation
Tuesday, February 24		
6:30am – 8:00am	Attendee Breakfast	Alpine Room, LMS
7:00am – 9:00am	Scientific Session	Elko/Floresta Room, LMS
7:30am – 9:00am	Friends & Family Breakfast	9380 Prime, Elevation Ho
10:00am – 12:00pm	NASTAR Ski Race	Smith Hill
12:00pm – 1:30pm	BBQ	Deck
4:00pm – 6:00pm	Scientific Session & Presidential Address	Elko/Floresta Room, LMS
6:00pm – 7:00pm	WTA Multi-Center Trials Meeting	Elko/Floresta Room, LMS
Wednesday, February 25		
6:30am – 8:00am	Attendee Breakfast	Alpine Room, LMS
7:00am – 9:00am	Scientific Session	Elko/Floresta Room, LMS
7:30am – 9:00am	Friends & Family Breakfast	9380 Prime, Elevation Ho
4:00pm – 5:00pm	"Paint the Ceiling" Lecture	Elko/Floresta Room, LMS
5:00pm – 6:00pm	Business Meeting	Elko/Floresta Room, LMS
5:00pm – 6:00pm	Book Club	Woodstone Grill Alcove, (
Thursday, February 26		
6:30am – 8:00am	Attendee Breakfast	Alpine Room, LMS
7:00am – 9:00am	Scientific Session	Elko/Floresta Room, LMS
7:30am – 9:00am	Friends & Family Breakfast	9380 Prime, Elevation Ho
4:00pm – 5:00pm	Scientific Session	Elko/Floresta Room, LMS
5:00pm – 6:00pm	Panel of Experts	Elko/Floresta Room, LMS
6:30pm – 10:00pm	Children's Party	Alpine Room, LMS
7:00pm – 10:00pm	Adult Banquet & Dance	Elko/Floresta Room, LMS
Friday, February 27		
6:30am – 8:00am	Attendee Breakfast	Alpine Room, LMS
7:00am – 9:00am	Scientific Session	Elko/Floresta Room, LMS
7:30am – 9:00am	Friends & Family Breakfast	9380 Prime, Elevation Ho
4:00pm – 6:00pm	Scientific Session	Elko/Floresta Room, LMS

LMS: Lodge at Mountaineer Square
GL: Grand Lodge

PROGRAM

ntific Session 1
day AM, February 23, 2009
lerator: Grace S. Rozycki, MD
ation: Elko/Floresta Room, Lodge at Mountaineer Square

er	Time	Title/Authors	Page
	7:00AM	**Welcome to the 39th Annual Meeting of the WTA** Grace S. Rozycki, MD President, WTA 2009	
1	7:20 AM	**Facial Trauma: Can We Reduce Variability in Management?** AJ Kaye, AE Kaye, P Kim, V Gracias, S Bartlett, J Serletti	27
2	7:40 AM	¶**Antibiotic Duration and Post Operative Infection Rates in Mandibular Fractures** Y Hindawi, G Oakley, K Lindsay, A Scifres	29
3	8:00 AM	¶ **A Statewide, Multi-Center Analysis of Surgeon's Response Time at Level III Trauma Centers and the Impact on Patient Care: It's All About Commitment** A. Ingraham, MD, J.Riebe, BA CSTR, R.Shukla, PhD, M. M.Knudson, MD, J.Johannigman, MD, and the Ohio Level III Trauma Center Consortium	31
4	8:20 AM	¶ **Traffic Camera Enforcement at High Crash Volume Intersections: Sustained Effects on Driver Behavior** G.M. Wahl, MD; T. Islam, MD, MPH; L. Stukes, MD,MPH; A. Marr, MD; J. Hunt, MD, MPH; C. Baker, MD; N.E. McSwain MD; J. Duchesne, MD	33
5	8:40 AM	¶ **Randomized Double-Blinded Placebo Control Trial Using Lidoderm Patch in Traumatic Rib Fractures** N. Ingalls MD, Z. Horton MD, M. Bettendorf MD, S. Frye MD, C. Rodriguez MD	35

arl Young Competition

Scientific Session 2
Monday PM, February 23, 2009
Moderator: Herbert J. Thomas, III
Location: Elko/Floresta Room, Lodge at Mountaineer Square

Paper	Time	Title/Authors	Pa
6	4:00 PM	**Early and Late Propranolol Dosing Improve Cerebral Perfusion After Traumatic Brain Injury in Vivio** E Ley, J Schenet, R Park, G Dagliyan, D Margolies, A Salim	
7	4:20 PM	**¶ The Transfusion Trigger in Traumatic Brain Injury: Is a Higher Hemoglobin Advantageous?** L.M.Sakai, E.C.Omi, MD, H.H.Ton-That, MD, C.R.Schermer*, MD MPH	
8	4:40 PM	**The Cervicothoracic Seatbelt Sign as an Easily Identifiable Marker for Occult Cervical Vascular Injury: A Prospective Study** A. Wyrzykowski, G. Rozycki, A. Fountain, C. Dente, J. Nicholas, D. Feliciano	
	5:00 PM	**Critical Decisions in Trauma** Moderator: Robert McIntyre **Blunt Cerebrovascular Injury**: Walter Biffl, MD **Liver Injury**: Rosemary A. Kozar, MD	
	6:00 PM	Board of Directors Meeting	

¶ Earl Young Competition

ıntific Session 3
sday AM, February 24, 2008
lerator: C. Clay Cothren, MD
ıation: Elko/Floresta Room, Lodge at Mountaineer Square

ırl Young Competition

Scientific Session 4
Tuesday PM, February 24, 2009
Moderator: Dennis Vane, MD
Location: Elko/Floresta Room, Lodge at Mountaineer Square

Paper	Time	Title/Authors	P
12	4:00 PM	¶ **Blunt Trauma Induced Splenic Blushes are Not Created Equal** LE Zumwinkle BA, CC Cothren MD, EE Moore MD, JL Kashuk MD, JL Johnson MD, WL Biffl MD	
13	4:20 PM	¶ **Long-Term Follow Up of Non-Operative Management for Blunt Splenic Injuries in Children** H.Moore, D. Vane	
14	4:40 PM	¶ **Combined Splenectomy and Left Nephrectomy for Trauma: Have Outcomes Improved Over the Last 30 Years?** CG Ball, DV Feliciano	
15	5:00 PM	**Family abstract: Autism: A Cup Half-Full** S. Karmy-Jones, L. Thomas, PhD, T.N. Karmy-Jones, T.R. Karmy-Jones, R. Karmy-Jones	
	5:05 PM	**Presidential Address** **"The Gift"** Grace S. Rozycki, MD	
	6:00 PM	Multi-Institutional Trials Committee	

¶ Earl Young Competition

ntific Session 5
dnesday AM, February 25, 2009
lerator: Carol R. Schermer, MD
ation: Elko/Floresta Room, Lodge at Mountaineer Square

er	Time	Title/Authors	Page
16	7:00 AM	¶ **Genomic Expression Analysis is Dependent Upon Method of PMN Isolation** E Warner, K Kotz, C Tannahill, R Ungaro, C Lopez, A Cuenca, K Kelly-Scumpia, M Delano, H Baker, L Martin, S Armen, M Toner, L Moldawer	69
17	7:20 AM	¶ **Burns, Inflammation, and Intestinal Injury: Protective Effects of an Anti-Inflammatory Resuscitation Strategy** TW Costantini, MD, CY Peterson, MD, LM Kroll, WH Loomis, BS, JG Putnam, BS, BP Eliceiri, PhD, A Baird, PhD, V Bansal, MD, R Coimbra, MD, PhD	71
18	7:40 AM	¶ **Low Peripheral Leukocyte Apoptosis Levels are Associated with Increased Risk of Infection in Trauma Patients with Hemorrhagic Shock** C Morrison, A Moran, M Carrick	73
19	8:00 AM	**A Trauma Outreach Program Provided by a Level One Trauma Center is an Effective Way to Initiate Peer Review at Referring Hospitals and Foster Process Improvements** M Byrnes, MD; E Irwin, MD; J Chipman, MD; G Beilman, MD; M Thorson, MS; Paul Harrison, MD; K Croston, MD	75
20	8:20 AM	¶ **Operative Intervention for Complete Pancreatic Transection after Blunt Abdominal Trauma in Children: Revisiting an Organ Salvage Technique** MJ Borkon MD, SE Morrow MD, EA Koehler MS, Y Shyr PHD, MA Hilmes MD, RS Miller MD, WW Neblett MD, HN Lovvorn III MD	77
21	8:40 AM	¶ **Shoots and Ladders: A Review of Hunting Related Injuries** A Crockett, P Beery, Y Thomas, D Lindsey, S Stawicki, M Whitmill, S Steinberg, A Jarvis, C Wang, C Cook	79

arl Young Competition

Scientific Session 6
Wednesday PM, February 25, 2009
Moderator: Christine Cocanour, MD
Location: Elko/Floresta Room, Lodge at Mountaineer Square

Paper	Time	Title/Authors	Pa
22	4:00 PM	Family abstract: **Cold Steel: Cure for What Ails You Study and Pursuit of the Steelhead Trout** Mark T. Metzdorff, MD	
	4:05 PM	**Paint the Ceiling Lecture** **"The Journey is the Destination"** Dr. Sylvia Campbell	
	5:00 PM	Business Meeting	
	5:00 PM	Book Club – Woodstone Grill Alcove, Grand Lodge	

ntific Session 7
'sday AM, February 26, 2009
erator: R. Stephen Smith, MD
ıtion: Elko/Floresta Room, Lodge at Mountaineer Square

ər	Time	Title/Authors	Page
:3	7:00 AM	**Poloxamer 188 Prolongs Survival of Hypotensive Resuscitation and Decreases Vital Tissue Edema After Full Resuscitation** R.Z. Zhang, MD, PhD, R. Hunter MD, PhD, E Gonzalez MD, FA Moore MD	85
:4	7:20 AM	**Increased Platelet:RBC Ratios are Associated with Improved Survival After Massive Transfusion** Holcomb JB*, Zarzabal LA, Michalek JE, Kozar RA*, Gonzalez EA, Spinella PC, Perkins JG, Wade CE	87
:5	7:40 AM	**Improved Survival after Hemostatic Resuscitation: Does the Emperor Have No Clothes?** L.J. Magnotti, M.D., B.L. Zarzaur, M.D.,MPH, M.A. Croce, M.D., P.E. Fischer, M.D.,MS, R. Williams, M.D., T.C. Fabian, M.D.	89
:6	8:00 AM	**Older Age and Blood Transfusion are Co-Conspirators in the Development of Post Injury Multiple Organ Failure and Subsequent Death** W Biffl, J Johnson, E Moore, C Cothren, J Kashuk, A Banerjee, A Sauaia.	91
	8:20 AM	Invited Basic Science Lecture **"Injury and Intestinal Barrier Dysfunction: Past, Present, and Future"** Dr. Raul Coimbra	93

Scientific Session 8
Thursday PM, February 26, 2009
Moderator: Peggy M. Knudson, MD
Location: Elko/Floresta Room, Lodge at Mountaineer Square

Paper	Time	Title/Authors	P
27	4:00 PM	**A Randomized Prospective Trial of Airway Pressure Release Ventilation and Lung Protective Ventilation in Adult Trauma Patients with Acute Respiratory Failure** RA Maxwell MD, J Waldrop MD, JM Green MD, BW Dart MD, PW Smith MD, PL Lewis RN, D Brooks RT, DE Barker MD	
28	4:20 PM	**Pulmonary Hypertension After Injury is Associated with Left Heart Dysfunction** A.Driggs MD, N.Bir MD, K.Bullard MD	
29	4:40 PM	**Cholesterol Repletion Corrects Effete Neutrophil Signaling after Major Trauma via Lipid Raft Trafficking** C Hauser	
	5:00 PM	**Panel of Experts** Roxie Albrecht, MD. Fred Moore, MD, and David Livingston, MD Moderator: Peggy Knudson	

ıntific Session 9
ay AM, February 27, 2009
lerator: Riyad Karmy-Jones, MD
ıtion: Elko/Floresta Room, Lodge at Mountaineer Square

Scientific Session 10
Friday PM, February 27, 2009
Moderator: Christine Cocanour, MD
Location: Elko/Floresta Room, Lodge at Mountaineer Square

Paper	Time	Title/Authors	P
36	4:00 PM	Family Abstract: **Father and Son: Same Mission, Different Paths** D. V. Feliciano, MD	
		CASE REPORTS	
37	4:05 PM	**Hard Decisions: Conflicts Between Medical Ethics and Medical Rules of Engagement in Current Combat Operations** S Telian, MD; A. Beekley, MD; M. Martin, MD	
38	4:20 PM	**Stab to the Heart and Who's to Blame: You Give Eyeglasses a Bad Name** TJ Berkseth, MD1; NY Patel, MD2; TH Cogbill, MD2	
39	4:35 PM	**Stabbed in the Aorta: Fixing It from the Inside Out** J Lodermeier, J Galante, W Pevec, L Scherer.	
40	4:50 PM	**Non-Invasive Surface Rewarming of Severe Hypothermia is Safe and Feasible** P.J. Offner, MD, MPH	
41	5:05 PM	**Successful Resuscitation and Recovery of a Young College Student Who Sustained Cardiac Arrest, Hypothermic and Hemorrhagic Shock and Multiple Injuries Following Impact from a 400 Pound Boulder on Mount Adams** J G Hill, MD, J Wang, MD, J Chen, MD, J Krieg, MD, R Bracis, MD, R Petrillo, MD, J Long, and W B Long, MD	
42	5:20 PM	**A Major Metropolitan "Field Amputation" Team: A Call to Arms....and Legs** A.J. Mangram M.D., C.F. Sharp M.D., S.A. Clark M.D., M.V. Hegar-Gonzalez M.D., M. Lorenzo M.D. MBA, E.L. Dunn M.D.	

ABSTRACTS

IAL TRAUMA: CAN WE REDUCE VARIABILITY IN MANAGEMENT?

aye, AE Kaye, P Kim, V Gracias, S Bartlett, J Serletti
ersity of Pennsylvania School of Medicine

enter: Adam Kaye, MD **Senior Sponsor:** Vicente Gracias, MD

ɔose: At our institution, maxillofacial trauma is cared for on a rotating basis by three :cal subspecialties: plastic surgery (PRS), otorhinolaryngology (ORL), and oral-llofacial surgery (OMFS). As a result, no formalized interdisciplinary trauma protocols ıe management of facial fractures exist. The goal of this research is to determine the arities and differences in management strategies among surgical subspecialties at our ution with respect to operative timing, operative approaches, perioperative care, and ɔmes. **Methods**: A retrospective review of the trauma database to identify all head and -related trauma patients admitted from 2001 – 2005 was made. 1143 patients were ified with one or more facial bone fractures. A chart review identified patient ɔgraphics and mechanism and patterns of injury. For each of the services fracture agement details including surgical timing, operative approach, antibiotic usage, mission rates, and complications were recorded. **Results**: We review the first 15 ths of our in-depth patient data analysis, representing 5 months of trauma call rage for each service. From Oct '04 to Dec '05 a total of 351 facial fracture patients evaluated and treated (PRS = 115, ORL = 114, OMFS = 122). Patients included 275 s and 76 females aged 15 to 94 years. Mechanisms of injuries included: falls (N=77), trauma assaults (N=80), MVC (N=95), GSW (N=29), pedestrian accidents (N=18), ɔther (N=52). Fractures (either isolated or in combination) included frontal bone 66), orbital (N=629), zygoma (N=319), ethmoid (N=68), nasal (N=606), maxilla 04), and mandible (N=303) injuries. Operative treatment was performed in 97 nts. Although patient injury data was evenly split amongst each service, operative was lower for ORL than for PRS and OMFS. Mandible fracture reductions were the frequent operations (N=37), not including those associated with pan-facial trauma. ıg to operative management was highly variable within and between each group, ing from 0 to 27 days. 19 patients underwent surgeries related to other trauma. 15 nts (16%) who received a tracheostomy and/or gastrostomy tube had either an ative mandible or Le Fort fracture. Antibiotic use data showed a large number of ent drugs being utilized. The most common antibiotics used were clindamycin (43%) multi-drug regimen (30%). 14% of patients were not treated with antibiotics. **clusions**: At our institution PRS, ORL, and OMFS share a near equal number and ty of facial trauma consults on a rotating basis. Our introductory look at the agement of these patients demonstrates numerous strategies related to timing of ative repair, operative approach, and perioperative care for all types of facial fractures. ınding this study to incorporate additional years of patient data will provide for a ɔrehensive review of these patients treatment and their outcomes which will help eate the best combined practices of the three facial trauma services. Ultimately we lefine a multidisciplinary trauma protocol for the future care of maxillofacial trauma ns.

IBIOTIC DURATION AND POST OPERATIVE INFECTION RATES IN IDIBULAR FRACTURES

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t Louis University School of Medicine

ienter: Yonitte Hindawi **Senior Sponsor:** Aaron Scifres

oduction: The optimal duration of systemic antibiotic use following mandibular ure repair remains uncertain. Though surgical site infection is a feared plication after these procedures, excessive antibiotic use can lead to higher s, microbial resistance and antibiotic related complications. We hypothesize prolonged courses of antibiotics after mandibular fracture repair do not reduce ical site infection rates.

erials and Methods: This is a retrospective cohort study of all patients enting to an urban trauma center between December 2001 and July 2006 with ignosis of mandibular fracture. A total of 199 patients were identified. Clinical demographic information collected included patient age, gender, injury severity e, total duration of hospitalization, type of antibiotic therapy, duration of iotic therapy, location of fracture, whether or not the fracture was open or ed, and time from injury to surgery. Statistical analysis was conducted using lents t test, chi squared analysis and Fisher's exact test.

ults: Of the 199 patients studied, 9 (4.5 percent) patients acquired post ative infections. There were no statistical differences among the collected ibles when comparing patients receiving 3 or fewer days of therapy to those iving 7 or more days. Patients receiving shorter duration antibiotics had an tion rate of 4.6 percent, whereas patients who received the longer duration an infection rate of 4.2 percent (RR 0.9, 95% CI 0.15-9.5, p = 0.9).

clusion: Prolonged courses of antibiotics following mandibular fracture repair o reduce the incidence of surgical site infection.

'ATEWIDE, MULTI-CENTER ANALYSIS OF SURGEONS' RESPONSE TIME AT EL III TRAUMA CENTERS AND THE IMPACT ON PATIENT CARE: IT'S ALL UT COMMITMENT

graham, MD, J.Riebe, BA CSTR, R.Shukla, PhD, M. M.Knudson, MD, J.Johannigman, and the Ohio Level III Trauma Center Consortium
ersity of Cincinnati Medical Center

enter: Angela Ingraham, MD **Senior Sponsor:** Jay Johannigman, MD

cground: The American College of Surgeons' Committee on Trauma guidelines ıing the resources needed to provide optimal care for the injured patient has rarely subjected to rigorous scientific investigation regarding their effect on patient ɔmes. The guideline requiring the presence of the surgeon in the emergency room ı 15 minutes of arrival for critically injured patients has recently been extended to 30 tes at Level III trauma centers. The purpose of this study was to evaluate the potential ct of this guideline change on the delivery of care at Level III trauma centers in our . We hypothesized that there would be no measurable difference in the quality of care, ıidity or mortality after enactment of this change in response time.

ıods: Data was collected from the trauma registries of thirteen ACS COT verified Level ıuma centers beginning two years before and ending two years after June 30, 2004, ay the response time was extended to thirty minutes. Statistical analyses were ɔleted comparing the two groups in terms of demographic and clinical characteristics, / severity score, surgeon response time, disposition, length of stay in the emergency .rtment, and mortality.

ılts: A total of 1,076 patients were treated over the four-year period. The cause and of trauma, age, and ISS were similar between the two groups. The surgeon response ; before and after the rule change were 14.7 minutes and 15.5 minutes, respectively. two groups also demonstrated similar lengths of stay in the Emergency Department, ; of transfer to higher level centers, and mortality rates.

clusion: This study represents the largest aggregate analysis of activity and ırmance characteristics at ACS verified Level III trauma centers within a single state ;m. The extension of the surgeon response time from fifteen to thirty minutes did not ;ar to adversely affect the outcomes of trauma patients at the level III trauma centers in ;tate. Furthermore, the surgeon response times were similar before and after the rule ge, demonstrating that the commitment of the general surgeon to being readily able for seriously injured patients remains a critical element in a comprehensive na system.

FFIC CAMERA ENFORCEMENT AT HIGH CRASH VOLUME INTERSECTIONS: TAINED EFFECTS ON DRIVER BEHAVIOR

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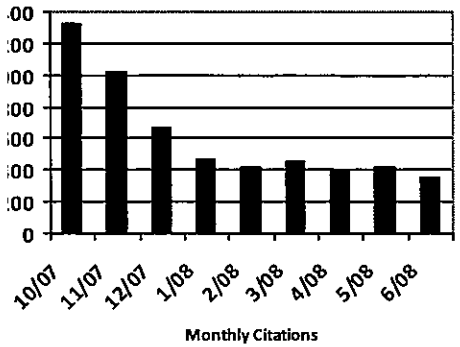
ɔduction: Installation of red light enforcement cameras (RLC) at rsections associated with a high number of traffic accidents are currently se in order to reduce the number of traffic collisions. Primary objective of study was to evaluate the sustained effect of RLC on driver behavior. ondary objective was to evaluate the number of collisions before and r RLC implementation. **Methods**: For the primary objective an eight ıth prospective observational study after installation of RLC was ertaken at the intersection with the highest incidence of traffic accidents ıe state of Louisiana. For the secondary objective collision occurrences e collected ten months pre and post RLC implementation. Mean number itation was calculated by month and statistical significance of trend was ıined from a linear regression model. **Results**: Average number of ion started to drop significantly from October 2007 and continued to) in the subsequent months. In a linear regression model the average ıber of citations dropped from October 2007 to June 2008 from 1018 to 356; $p < 0.001$. Although there was a trend in reduction of collisions from 122 to 97 pre and post RLC, this did not reach statistical significance; $p = 0.18$.



Conclusion: A significant reduction in the number of issued citations occurred as driving behavior was modified, without a significant reduction in number of accidents. Despite the proven benefit of reducing the number of cars entering the intersection during a red light,) do not prevent traffic collisions at monitored intersections. Alternative ıns of injury prevention must be investigated.

IDOMIZED DOUBLE-BLINDED PLACEBO CONTROL TRIAL USING LIDODERM CH IN TRAUMATIC RIB FRACTURES

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ɜenter: N. Ingalls, MD **Senior Sponsor:** M. Ashraf Mansour, MD

ʁODUCTION: The Lidoderm® (5% lidocaine) patch was originally developed to treat related to postherpetic neuralgia. Anecdotal experience at our institution suggests the derm® patch decreases narcotic use in patients with traumatic rib fractures. Pain ıciated with these injuries can be debilitating and lead to increased pulmonary plications and length of hospital stay. A double-blinded placebo control trial was ɜloped to define the patch's efficacy.

ʜHODS: Patients with rib fractures admitted to the trauma service at our Level I trauma er were enrolled and randomized to receive Lidoderm® patch or placebo patch. Fifty- t patients who met the inclusion criteria were enrolled from January 2007 to August 3. Demographic information including gender, age, mechanism of trauma, number of actures, chest tube placement, associated injuries, history of lung disease or smoking ɜ recorded. The patients' narcotic use (IV and oral), non-narcotic pain medication use, age pain score, pulmonary complications, and length of stay were recorded. Our ɹution's IRB approved the study. Statistics used included t-test, Man-Whitney U test, ɜquared test, Fisher's exact test, 2-way ANOVA, and Kruskal-Wallis ANOVA. ificance was assessed at $p<0.05$.

ɜSULTS: Thirty-three subjects received the Lidoderm® patch and 25 received the ɜbo patch. There were no significant differences for age (54.8, 49.7 years, p=0.31), ber of rib fractures (5.3, 4.9, p=0.5), gender (%male 72.7%, 76%, p=0.78), pre-injury disease (9.1%, 20%, p=0.27), smoking history (39.4%, 24%, p=0.22), percent of ɜnt smokers (24.2%, 20%, p=0.7), and need for placement of chest tube (36.4%, 24%, 31), between the Lidoderm® and placebo groups, respectively. Also, each group had ıilar number of patients in the following categories of injury mechanism: motor vehicle ɪdent, motorcycle accident, all-terrain vehicle accident, pedestrian versus auto, fall, and r. There was no difference between the Lidoderm® and placebo group, respectively, regard to: total IV narcotic use (p=0.88), total oral narcotics (p=0.22), total oral non- otic pain mediations (p=0.51), pain score (p=0.39), percentage of patients with ıonary complications (p=0.95), or length of stay (7.8, 6.2 days, p=0.28). Subgroup ysis demonstrated gender differences in length of stay (reduced in men), less non- otic pain medication in patients less than 65 years of age, and less pain (lower pain e) observed in patients who were current smokers.

ɔNCLUSIONS: Lidoderm® patch does not significantly improve pain control of ɪrauma patients with traumatic rib fractures. It may be useful in certain subpopulations ɜverely injured patients. The Lidoderm® patch might be useful in isolated rib fractures equires further study.

LY AND LATE PROPRANOLOL DOSING IMPROVE CEREBRAL PERFUSION ER TRAUMATIC BRAIN INJURY IN VIVIO

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enter: E Ley **Senior Sponsor:** A Salim

ground: In vivo models of traumatic brain injury (TBI) demonstrate increased cerebral ısion, decreased cerebral hypoxia, reduced cerebral edema and improved neurological very with propranolol treatment. We recently demonstrated that higher doses of ranolol in vivo improved cerebral perfusion compared to lower doses using micro PET ing. The effect of delayed treatment on cerebral perfusion is clinically important; the / between injury and medical evaluation in the real world frequently exceeds the timing l in vivo. The purpose of this study was to determine the effect of early versus late ranolol administration on cerebral perfusion after TBI in vivo.

ıods: Sixteen 12-week old BALB-C mice underwent TBI as previously described. Mice randomized in a blinded fashion to receive intravenous injections of 120µl PBS alone 20µl of PBS with 4mg/kg propranolol (120µg for a 30g mouse) 15 minutes or 60 ıtes after traumatic brain injury. Mice then received intravenous Cu64 and cerebral ısion was imaged by micro PET imaging.

ılts: On micro PET imaging, the normal mouse cerebral perfusion after injection with ebo as measured by standard uptake value (SUV) was 0.71 ± 0.02. After traumatic ı injury and treatment with placebo, SUV was 0.40 ± 0.01 at 15 minutes and 0.26 ± at 60 minutes. With propranolol treatment the SUV was 0.52 ± 0.04 at 15 minutes % of placebo at 15 minutes) and 0.43 ± 0.02 at 60 minutes (165% of placebo at 60 ıtes).

clusion: In a murine model of TBI, cerebral perfusion on micro PET imaging decreased 15 minutes to 60 minutes irregardless of treatment. Propranolol improved cerebral ısion early (15 minutes) and late (60 minutes) compared to treatment with placebo. research indicates that treatment with propranolol after traumatic brain injury improves bral perfusion when administered up to one hour after initial injury.

TRANSFUSION TRIGGER IN TRAUMATIC BRAIN INJURY: IS A HIGHER OGLOBIN ADVANTAGEOUS?

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la University Medical Center

enter: Lauren Sakai **Senior Sponsor:** Carol R. Schermer

ckground: The role of anemia and blood transfusion in traumatic brain injury (TBI) nts has not been well studied. Many neurosurgeons recommend maintaining a oglobin (Hgb) of 10 g/dL, but transfusion in trauma patients has been associated with ased complications. The objective of the study was to examine the impact of the level emia in patients with TBI. The hypothesis was that a Hgb < 9 g/dL would not adversely ct short term outcomes.

thods: Data were collected from a review of medical records. Inclusion criteria were nts with TBI, GCS < 12 at 48 hours, whose initial resuscitation was limited to ≤ 6 units od and survived to discharge. Average low Hgb values were calculated for the first 10 . Patients were stratified into *high* and *low* Hgb groups by their average Hgb ≥ 9 g/dL 9 g/dL, respectively. Baseline demographics and outcome measures during italization were examined.

sults: Eighty-two patients met inclusion criteria. More than 90% of patients had osurgical recommendations to maintain Hgb ≥ 10 g/dl. Males were 79.3% of the lation. The average age of patients was 45.2 years and 49 patients (59.8%) received ast one unit of blood. Subdural hemorrhage was described in 53 (64.6%), rachnoid hemorrhage in 48 (58.5%), epidural hemorrhage in 12 (14.6%), and ventricular hemorrhage in 13 (15.9%) of patients. Fifty-six (69.3%) had intracranial sure monitoring and 19 (23.2%) patients underwent craniotomy/craniectomy. On age, patients in the *low* Hgb stratum (<9 g/dL, n=10) received 4.7 units versus 2.4 units e *high* Hgb stratum (Hgb ≥ 9, n=72; p=.02) but had no difference in pneumonia 40% vs 35% (*high*), p=.74. Admission Hgb, and lowest Hgb were lower in the *low* stratum 02) but, there were no differences in the admission or 48 hour APACHE II scores, arge Hgb, GCS score on admission, GCS at 48 hours, or discharge GCS. There were no differences in tracheostomy status or discharge disposition. Multivariate analysis ed that 48 hour GCS predicted discharge GCS independently of anemia strata.

nclusion: Maintenance of a lower Hgb in TBI patients for the first 10 days of italization did not adversely impact short term outcomes. It is not clear that tenance of a particular Hgb confers any advantage. Given the overwhelming data ast liberal transfusion in the ICU and the lack of human data supporting transfusion to a cular Hgb in TBI patients, we strongly recommend holding off on liberal transfusion more convincing data are elucidated.

Cervicothoracic Seatbelt Sign as an Easily Identifiable Marker for Occult vical Vascular Injury: A Prospective Study

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enter: Amy D. Wyrzykowski **Senior Sponsor:** Grace S. Rozycki

RODUCTION: A missed cervicothoracic injury has potentially devastating equences, but current indications for screening to detect these injuries remain broad. improved technology (32 slice CTA), we sought to determine if the cervicothoracic belt sign (CSS) was a valid marker of occult cervical vascular injury.

THODS: Adult and pediatric patients who sustained a CSS underwent a CTA of the r thorax and neck regions. Demographic data, Injury Severity Score (ISS), Glasgow a Score (GCS), CTA results, treatments and outcomes, especially cerebrovascular dents (CVA) were recorded. Patients were followed throughout hospitalization and -discharge.

ULTS: From 2003 through 2007, 250 patients (age range 4-82, mean 37±13; 97 ale, 153 male) underwent a CTA of the neck following a motor vehicle crash. In 179 nts (72%), a CSS was noted, and 12 (6.7%) occult injuries to the carotid arteries were cted (10 dissections, 2 carotid cavernous fistulae). In 6 patients with CSS, 7 vertebral y injuries were identified. Of these 6, were associated with a cervical spine fracture and was an incidental finding. There was no statistically significant relationship between the ence of a carotid or vertebral vascular injury and either admission GCS or ISS in nts with a CSS. Two patients with carotid injuries who were not candidates for platelet therapy because of associated injuries suffered a CVA, and both died. There no adverse neurologic events in the 167 patients with a restraint sign and a negative . In 71 patients (28%) undergoing CTA for either a basilar skull fracture or a cervical ure, there were no injuries to the cervical carotid artery identified and no adverse ologic events.

ICLUSION: 1. Any patient, who has a CSS, regardless of admission GCS or ISS, ld undergo CTA of the neck to exclude an injury to the carotid artery. 2. The bination of CSS and cervical spine fracture may increase the likelihood of vertebral y injury.

Critical Decisions in Trauma

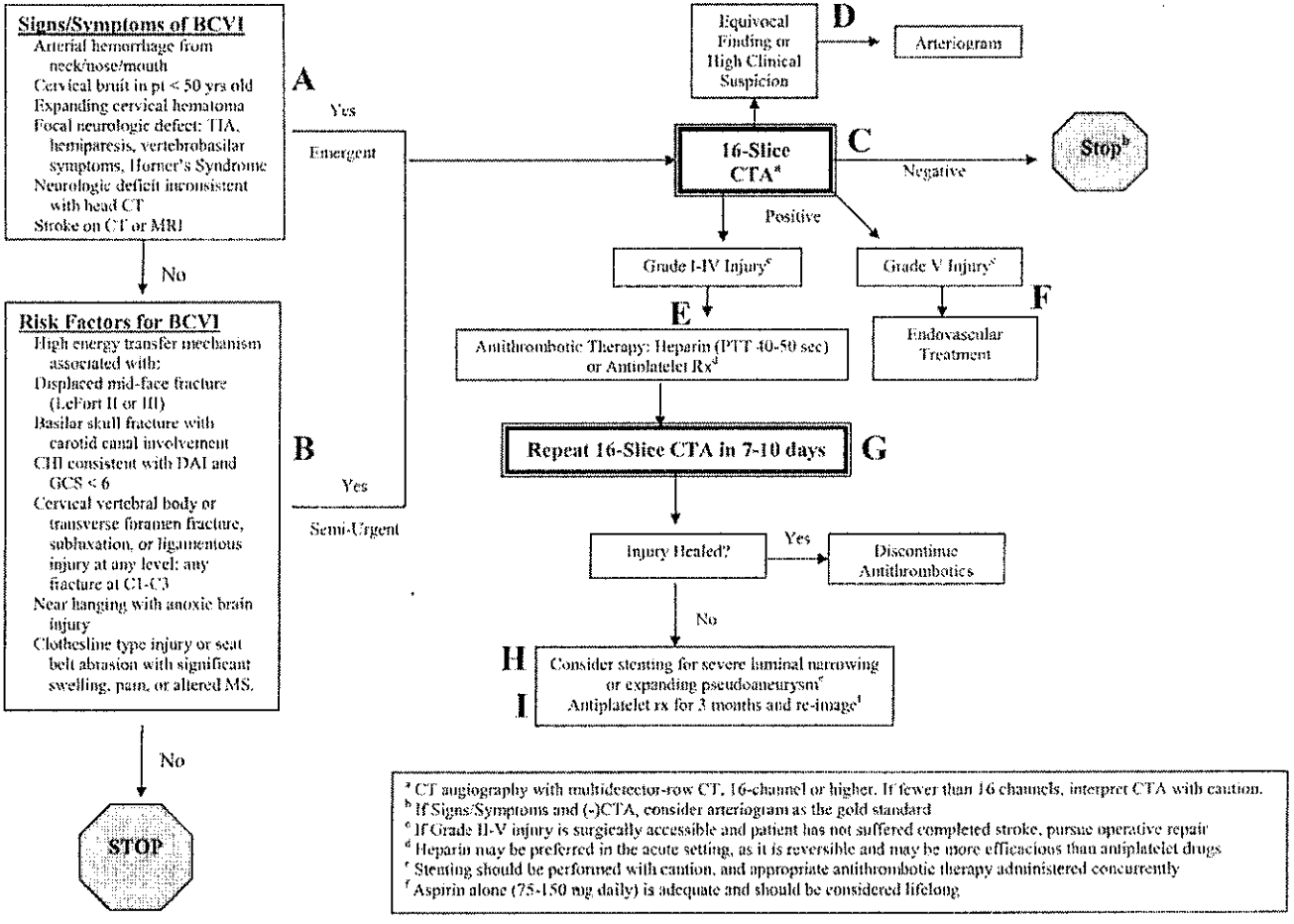
Blunt Cerebrovascular Injury

Walter Biffl, MD

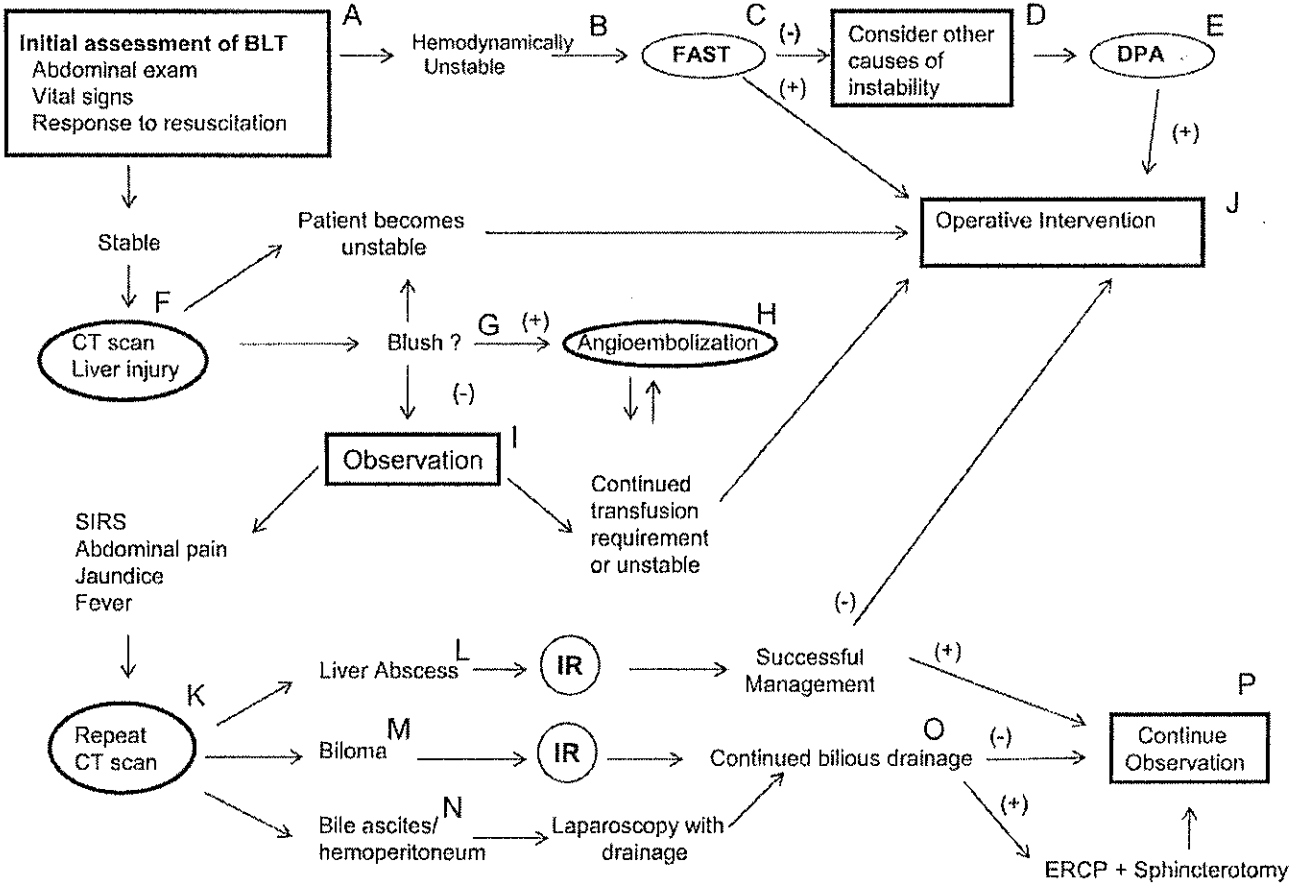
Liver Injury

Rosemary A. Kozar, MD

Diagnosis and Management of Blunt Cerebrovascular Injuries



[a] CT angiography with multidetector-row CT, 16-channel or higher. If fewer than 16 channels, interpret CTA with caution.
[b] If Signs/Symptoms and (-)CTA, consider arteriogram as the gold standard
[c] If Grade II-V injury is surgically accessible and patient has not suffered completed stroke, pursue operative repair
[d] Heparin may be preferred in the acute setting, as it is reversible and may be more efficacious than antiplatelet drugs
[e] Stenting should be performed with caution, and appropriate antithrombotic therapy administered concurrently
[f] Aspirin alone (75-150 mg daily) is adequate and should be considered lifelong


Initial assessment of BLT
Abdominal exam
Vital signs
Response to resuscitation
A
Hemodynamically Unstable
B
FAST
C
(-)
(+)
Consider other causes of instability
D
DPA
E
(+)
Operative Intervention
J
Stable
Patient becomes unstable
F
CT scan Liver injury
Blush ?
G
(+)
Angioembolization
H
(-)
Observation
I
SIRS
Abdominal pain
Jaundice
Fever
Continued transfusion requirement or unstable
(-)
K
Repeat CT scan
Liver Abscess
L
IR
Successful Management
(+)
P
Continue Observation
Biloma
M
IR
Continued bilious drainage
O
(-)
(+)
Bile ascites/ hemoperitoneum
N
Laparoscopy with drainage
ERCP + Sphincterotomy

GENOUS SEX HORMONES MODULATE THE INFLAMMATORY RESPONSE TO OTOXIN

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enter: Carrie E. Allison **Senior Sponsor:** Martin Schreiber

jectives: *In vitro* and animal studies have demonstrated gender dimorphism in sepsis

ile sex conferring protection. In this study, we evaluated whether exogenous sex ones would modulate the human cytokine response to endotoxin stimulation *in vitro* whether baseline hormonal status affects this response. We hypothesized that enous female sex hormones would attenuate the inflammatory response to endotoxin. **thods:** Leukocytes from 30 healthy volunteers were isolated and incubated in cell re overnight with estradiol, progesterone, or testosterone. Sterile E. coli endotoxin then added, and after 6 hours the cytokine response was quantified using ELISA. ects' baseline hormone levels were quantified with ELISA, and linear regression was rmed to determine whether a correlation existed between baseline hormone levels he subsequent cytokine response to endotoxin. $P<0.05$ was considered significant. **sults:** Exogenous estrogen and progesterone amplified the inflammatory response to toxin in women by increasing pro-inflammatory TNF-alpha and decreasing anti-nmatory IL-10. Testosterone produced a similar but attenuated pattern. Men were not ted by exogenous hormones. Baseline estrogen levels in post-menopausal women lated weakly with cytokine response (r^2 0.41-0.62) but did not correlate in any other p.

Alteration of Cytokine Response Due to Exogenous Hormone*

	Pre-Menopausal		Post-Menopausal		Men	
	TNF	IL-10	TNF	IL-10	TNF	IL-10
Estrogen	**1.9****	0.7	**1.8****	**0.5****	1.4	0.8
Progesterone	1.2	**0.6****	**1.6****	**0.5****	1.0	0.7
Testosterone	**1.2****	**0.8****	**1.1****	0.8	1.1	0.8

*Median fold change in cytokine concentration (hormone + endotoxin stimulated cells): (endotoxin stimulated cells) ** p<0.05 Wilcoxon

nclusion: Exogenous estrogen and progesterone amplify the inflammatory response idotoxin in women but not in men. These data do not support the therapeutic use of enous hormones in sepsis and suggest instead that sex hormone antagonism may esent a potential target to decrease the inflammatory response in women with sepsis. line estrogen levels in post-menopausal women also may play a role in their equent response to sepsis.

A ABROGATES INFLAMMATORY RESPONSES AND IMPROVES RTALITY FOLLOWING PSEUDOMONAS PNEUMONIA

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enter: Parth Amin, M.D. **Senior Sponsor:** Lawrence Diebel, M.D.

roduction: Post-traumatic pneumonia (Pn) and other infectious complications are ced by enteral nutritional support. Proposed mechanism(s) for this include preservation ucosal integrity and immune function. Secretory immunoglobulin A (SIgA) is the iple antibody at respiratory and other mucosal sites. Its concentration in mucosal etions is influenced by route of nutrition and insults common to the trauma patient. has anti-inflammatory effects which may protect against exaggerated inflammatory onses following infection. . SIgA is transported to mucosal surfaces via a specific mmunoglobulin receptor (pIgR). PIgR knockout (KO) mice, which do not have SIgA in osal secretions but are otherwise immunologically intact, were used to study the rtance of SIgA in respiratory secretions following bacterial pneumonia.

thods: *Pseudomonas aeruginosa* ($9x10^7$) was administered intratracheally to pIgR-KO nventional mice. Mortality was noted at 72 hours. Surviving animals were sacrificed blood, lung and bronchoalveolar lavage (BAL) fluid samples were obtained and yzed for myeloperoxidase (MPO), cytokine and IgG levels.

sults: (mean±SD)

	Conventional-Sham (N=6)	Conventional + Pn (N=10)	pIgR-KO + Pn (N=10)
od TNF (pg/ml)	8.0±1.0	19.1±0.5*	20.3±3.9*
od IL-6 (pg/ml)	3.2±0.7	16.8±1.5*	35.5±4.3*#
g MPO (µg/ml)	5.9±2.1	10.6±2.3*	22.8±2.6*#
_ TNF (pg/ml)	4.2±3.7	16.6±1.7*	30.6±6.4*#
_ IL-6 (pg/ml)	3.9±1.0	12.9±1.2*	28.6±6.7*#
_ IgG (ng/ml)	135.7±4.1	129.3±8.2	159.4±6.6#

< 0.001 vs. Conventional , #p < 0.001 vs. Conventional + Pn

ality rates were 13% vs. 36% for Conventional + Pn vs. pIgR-KO + Pn mice, ectively (p< 0.005).

nclusions: SIgA deficiency led to increased mortality and an exaggerated local and emic inflammatory response to *Pseudomonas* pneumonia. This study supports clinical ts to preserve mucosal immunity in the trauma patient. Monitoring SIgA levels in osal secretions may predict infection risk and subsequent outcome.

ONIC DISCONTINUITY AFTER DAMAGE CONTROL LAPAROTOMY: WHAT T?

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:opa Medical Center

enter: Patrick J. O'Neill **Senior Sponsor:** Richard Miller

duction: Damage control laparotomy (DCL) represents a crucial advance in trauma :itation practice. For patients who are left in colonic discontinuity after DCL, questions still in regarding what constitutes the best surgical option. The purpose of this study was to compare ıts undergoing colonic resections and immediate anastomosis (IA) with those undergoing DCL lelayed anastomosis (DA) or delayed ostomy (DO) to determine potential risk factors for the opment of bowel-related complications.

ods: Following expedited IRB approval, a retrospective review was performed at an urban Level ıma center of patients with destructive colonic injuries requiring resection who presented over a ear time period. Patients were stratified into non-DCL with IA, DCL with DA or DCL with DO ıtion. Patient demographics, injury scoring and colon-related complications were collected. 'sis was performed to identify the factors associated with an increased risk of anastomotic ge in the face of DCL colon resection. Statistical significance was calculated for each variable the student's t-test for independent means. For proportions, a Chi-square test with Yates' ction for continuity was applied. All p-values reported are two tailed.

lts: Over the study period, 35 patients met inclusion criteria. Demographic data revealed ıts undergoing DCL with DA and DO to have statistically increased injury severity score (ISS), minal trauma index (ATI), and transfusion of packed red blood cells (PRBC) when compared to ı all groups, there were no significant differences in either the rate of abscess formation or colon- :d mortality; however, there was a significantly higher anastomotic leak rate in the DA group.

	ISS	ATI	PRBC (units)	Abscess Rate (%)	Anastomotic Leak Rate (%)	Colon-Related Mortality (%)
n=17)	13.4	24.2	0.9	29	6	0
(n=8)	25.0*	36.7*	6.9*	25	62.5*	11
n=10	29.6*	33.0*	17.1*	30	N/A	0

<0.05 in relation to IA; N/A= not applicable)

ıriate analysis of previously described risk factors for anastomotic leak (i.e., ISS > 25, ATI > 25, ransfusion > 4 units PRBC) failed to reveal any statistical significance in this patient population. dition, the inability to close the abdomen at the time of anastomosis was not identified as a risk r in the development of anastomotic complications. Of note, the average time to diagnosis of an :omotic leak was 7.0 days.

:lusion: Our study indicates that patients undergoing DA after DCL have a significantly higher ıf anastomotic complications but not colon-related mortality versus those patients undergoing IA. a creation should therefore be strongly considered in patients left in colonic discontinuity after until risk factors for anastomotic leak may be better defined.

NT : COUNTERPOINT I

COLOSTOMY VS PRIMARY REPAIR AFTER DAMAGE CONTROL SURGERY

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Stanford University

Martin Schreiber, MD
Oregon Health Science University

NT : COUNTERPOINT II

ACUTE CARE SURGERY:

AL OR IMAGINED THREAT TO THE GENERAL SURGEON

Tom Cogbill, MD
Gunderson Lutheran

G. Jerry Jurkovich, MD
Harborview Medical Center

NT TRAUMA INDUCED SPLENIC BLUSHES ARE NOT CREATED EQUAL

umwinkle BA, CC Cothren MD, EE Moore MD, JL Kashuk MD, JL Johnson MD, WL MD
ver Health Medical Center

enter: Lucy Zumwinkle **Senior Sponsor:** C. Clay Cothren, MD

cground: Currently, evidence of contrast extravasation on computed tomography (CT) is regarded as an indication for angioembolization or operation. In our recent rience, patients transferred from other institutions for angioembolization have often ved the "blush" upon repeat imaging at our hospital. We *hypothesized* that not all ıic blushes require intervention and that patients may be selectively observed based ı physiologic status.

ıods: During a 10 year period, all patients transferred with blunt splenic injuries and ence of active contrast extravasation on initial postinjury CT scan were evaluated. nts undergoing intervention (angioembolization or splenectomy) were compared to e managed without intervention.

ılts: During the study period, 241 patients with splenic injuries were transferred from ıtside hospital, of which 16 had a contrast blush on CT imaging. The majority (88%) of nts were men with a mean age of 35 ± 5 and mean ISS of 26 ± 3. Eight (50%) of e patients were managed without angioembolization or operation. There was a ficant difference in admission heart rate and decline in hematocrit following transfer in nts undergoing intervention, but not in injury grade:

	Injury Grade	Age	SBP	HR	Decline in Hct after transfer
Nonoperative Management (N=8)	3.5 ± 0.3	30.9 ± 4.7	115 ± 6	83 ± 6	1.0 ± 0.3
Intervention (N=8)	3.9 ± 0.2	38.5 ± 8.2	125 ± 10	106 ± 9*	5.3 ± 2.0*

*= systolic blood pressure; HR = heart rate; Hct = hematocrit *p-value < 0.05*

e 8 patients managed with observation, 3 underwent repeat imaging immediately after fer; CT scan revealed the blush had resolved. In the intervention group, 4 patients ongoing extravasation on repeat imaging an underwent intervention, 2 patients rwent empiric embolization, and 2 patients underwent immediate splenectomy for al indices.

clusions: For blunt splenic trauma, evidence of contrast extravasation on initial CT ing is not an absolute indication for intervention. A period of close observation and at imaging may be considered and could avoid costly, invasive interventions and their ciated sequelae.

G-TERM FOLLOW UP OF NON-OPERATIVE MANAGEMENT FOR BLUNT ENIC INJURIES IN CHILDREN

oore, D. Vane
inal Glennon Children's Medical Center, Saint Louis University and University of ıont College of Medicine

enter: H. Moore **Senior Sponsor:** Dennis Vane

ose: Debate no longer involves the initial effectiveness of non-operative care of ıic injuries in children but revolves around safe recovery time and long term ɔlications. To date no long term follow up for non-operative management of these ren has been carried out. The purpose of this study was to asses the safety of the ıcols used by our institution for blunt splenic injury and evaluate long term outcomes ıildren managed in this fashion.
ɔthesis: Present protocols are safe and effective and no significant long term ɔlications arise in children undergoing our non operative management algorithm.
ıods: From 1993 to 2008 153 children (age 1-17yrs, mean=12) with blunt splenic es were admitted. Patients were contacted by telephone and answered a standardized tionnaire. Medical records were reviewed to validate injury grade, hospital stay, and ɔlications.
ılts: 80 patients were contacted (52%). 16 were excluded (8 Splenectomies, 3 atose, 2 Language issues and 3 whose medical records were not available). Follow-up ɜ remaining cohort ranged from 5 to 165 months post discharge (mean 74). There 9 grade I, 9 grade II, 22 grade III, 20 grade IV, and 3 grade V injuries. The most non mechanism of injury was from MVC's (14) followed by falls (11), ATV crashes snow related (14), misc. recreation (13). All children were seen in follow-up 2 wks discharge. Two were readmitted for spleen specific complications. Neither required ional medical treatment. (CT diagnosed cyst and residual hematoma) Radiographic ing showed both abnormalities resolved after 6 months. 8 patients reported ɔlications: 5 immunologic (asthma, rashes, and increased frequency of minor ıess), 1 fatigue, 2 occasional abdominal pain, and 2 psychiatric related to fear of ıring their spleen. One patient with a grade V splenic injury, and a salvaged spleen, ted major medical complications resulting in multiple hospitalizations for infections (no splenectomy sepsis and Spleen intact on follow-up). 3 sustained second blunt splenic es. One reported a pale complexion, however, all had successful non-operative ıgement of their second injury with no long term complications.
ɔlusions: Long term follow-up indicates that non-operative management of blunt ıic injuries is safe and without long term morbidity or mortality. Patients report some ɜs after injury but none out of proportion from occurrence in non-injured populations. ındary splenic injury appears also to be safely managed with non-operative ıgement.

IBINED SPLENECTOMY AND LEFT NEPHRECTOMY FOR TRAUMA: HAVE 'COMES IMPROVED OVER THE LAST 30 YEARS?

3all, DV Feliciano
ry University; Grady Memorial Hospital

ıenter: Chad G. Ball **Senior Sponsor:** David V. Feliciano

‹ground: Injury to the spleen or kidney is associated with an individual mortality rate oaching 23%-26%. When the magnitude of the injury mandates simultaneous ıectomy and left nephrectomy, mortality rates greater than 40-45% have been rted. The goals of this study were to: 1) document current morbidity and mortality in ıts with combined injuries, and 2) compare these outcomes to those from the era eding "damage control" trauma operations in shock patients.

ıods: A retrospective chart review of all injured patients who underwent a concurrent ıectomy and left nephrectomy at Grady Memorial Hospital (GMH) (Atlanta) from 1995)07 was performed. The results were then compared to patients with similar injuries were treated at Ben Taub (BT) General Hospital (Houston) from 1978 to 1987.

ılts: Concurrent splenectomy and left nephrectomy after trauma was performed in 48 ıts at BT and in 30 patients at GMH during the defined time periods. Patient ographics were similar in both groups (male = 94% and 80%; mean age = 31 and 29 s; p>0.05). More patients at GMH had a blunt mechanism of injury (34% vs. 12%; 05). The pattern of associated injuries was the same in both series, but more ciated injuries occurred at GMH (4.1 vs. 2.0/ patient; p<0.05). Postoperative olications occurred in 81% of patients in both series. In both groups, 33% of patients ving beyond 5 days of injury developed a left subphrenic abscess. The mortality rates)% (BT) and 53% (GMH) were similar as well, and were most commonly due to ctory hemorrhagic shock within 24 hours (84% (BT) and 56% (GMH); p<0.05).

clusions: Despite advances in operative management ("damage control") and ɔperative critical care over the past 30 years, the complication rate, incidence of left ıhrenic abscesses, and mortality rate are unchanged when a modern group of patients H) is compared to another series (BT) treated 20 years earlier. The combination of ' blood loss from organs receiving 15% of the circulating volume/minute, presence of ciated injuries, and failure of current damage control techniques, contribute to the ıanged morbidity/mortality of these combined injuries.

ISM: A CUP HALF FULL?

ɜrmy-Jones, L. Thomas, PhD, T.N. Karmy-Jones, T.R. Karmy-Jones, R. Karmy-Jones
ıy-Jones Household

ɜenter: Riyad Karmy-Jones **Senior Sponsor:** Riyad Karmy-Jones

ɜm is a spectrum of disorders defined behaviorally. Incidence of classic autism is now 0, but in some geographical areas the incidence is as high as 1/82. Common features de: isolating and perseverating on parts of a whole object (spinning wheels on a toy rotating blades of a fan, etc.); atypical repetitive and dysfunctional body movements ɔing, spinning, etc); difficulty with language (syntax or expressive); difficulty making ɔontact; difficulties navigating social situations; difficulty seeing situations from different ɜs of view (theory of mind). Many children have associated disorders including ıres, severe motor delays, and/or cognitive delays. Often children on the spectrum difficulty processing sensory input. The etiology is not clearly defined, but there is a ıg genetic component. There may be environmental triggers, which may differ for ɜent children. Classically, there are two patterns; children who appear to have a normal development who begin to regress and those who have a pattern of delay from birth. nosis can be difficult, prevention is unknown and treatment and prognosis uncertain. tment and diagnosis has been hindered by designation as a psychiatric disorder, which ɜ medical coverage to 60 hours a year. The primary treatment method, Applied ıvioral Analysis (ABA) requires that every step of socialization, adaptive care and ıing be broken down into simple steps, taught in a hierarchical fashion, and idualized to each child. Treatment must include home, therapy and school and ires integration of both developmental and social skills. Unfortunately, the volume of ren has precluded any reliable measure of support outside of the home, and the after osts can range from 40-100K/annum to the family. Our own personal experiences resulted in significant job and family changes. Many of these changes have been ive. Our daughters have benefited from their exposure both to children of differing ies as well as from what we have learned in teaching techniques. Although our son's e is uncertain, there has been significant progress such that far from being utionalized we can now see him as an independent young man with his own ɜssed hopes and ambitions. Although he has faced prejudice, fear, and frustration, ıll as we have taken a team approach and grown as a family.

Presidential Address

"The Gift"

Grace S. Rozycki, MD

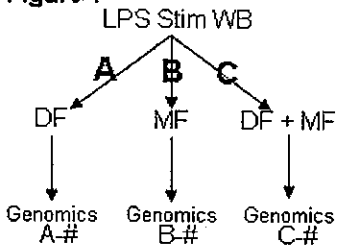
OMIC EXPRESSION ANALYSIS IS DEPENDENT UPON METHOD OF PMN .ATION

arner, K. Kotz, C. Tannahill, R. Ungaro, C. Lopez, A. Cuenca, K. Kelly-Scumpia, M. no, H. Baker, L. Martin, S. Armen, M. Toner, L. Moldawer
ersity of Florida

enter: Elizabeth A Warner **Senior Sponsor:** Larry C. Martin.

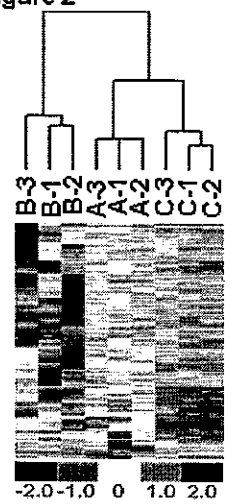
ground: Contemporary trauma research involves gene expression profiling to predict nt outcomes and identify patients who may benefit from targeted therapies. The ctive ability of expression analysis can be dramatically reduced by artifacts introduced g cell isolation. We compared the current gold standard method for isolating ophils (PMNs) from whole blood (WB), Dextran-l (DF) gradients, to a novel microfluidic (MF) nique that isolates PMNs by capturing CD66b+

Figure 1



ods: WB from three healthy volunteers was lated ex vivo with LPS for 2 hours as a model of toxemia. Following stimulation, PMNs were ted by either: A) DF gradient, B) MF, or C) DF ent followed by MF (Fig 1). RNA was extracted gene expression was inferred using Affymetrix 3A GeneChips™ with statistical analysis using p and BRB ArrayTools software.

Figure 2



lts: An unsupervised analysis (CoV 0.5) and rchal clustering revealed 2318 probes that divided amples into two broad categories based on the ence of DF processing. Thus, samples that were sed to DF had a similar gene expression pattern dless of whether they were further enriched by A supervised analysis (Fig 2) identified 239 probe significantly different among the three groups (F-p<0.001) while maintaining the same overarching er pattern into 2 distinct categories: groups A and les clustered together while group B samples ered separately.

ussion: These findings suggest that DF essing alters gene expression patterns and ars to suppress apparent in vivo gene expression. ugh expression profiling is a powerful diagnostic the current findings suggest that the genomic results are highly dependent upon the rtical methods used to isolate PMNs.

C

NS, INFLAMMATION, AND INTESTINAL INJURY: PROTECTIVE EFFECTS OF AN I-INFLAMMATORY RESUSCITATION STRATEGY

Costantini, M.D. C.Y. Peterson, M.D. L.M. Kroll W.H. Loomis, BS J.G. Putnam, BS B.P iri, Ph.D. A. Baird, Ph.D. V. Bansal, M.D. R. Coimbra, M.D., Ph.D.
ersity of California, San Diego School of Medicine

enter: T.W. Costantini, M.D. **Senior Sponsor:** R. Coimbra, M.D., Ph.D.

:ground: Intestinal barrier breakdown following severe burn can lead to intestinal nmation which may act as the source of the systemic inflammatory response. In vitro tinal cell studies have shown that mitogen-activated protein kinase (MAPK) signaling a role in regulating barrier function. Pentoxifylline (PTX), a non-specific phodiesterase inhibitor, has been shown to inhibit MAPK inflammatory signaling. We previously observed that PTX attenuates burn-induced intestinal permeability and junction breakdown. We hypothesize that PTX may prevent burn-induced intestinal er injury by preventing activation of p38 MAPK and extracellular-regulated kinase :).

ods: Male balb/c mice underwent 30% total body surface area (TBSA) full thickness n burn. Immediately following burn, animals received an intraperitoneal injection of (12.5mg/kg) in normal saline (NS) or NS alone. Distal ileum was harvested at multiple points following burn. Intestinal injury was assessed by histology and by intestinal IL-6 s using ELISA. Intestinal abstracts were obtained to analyze phosphorylated p38 K, p38 MAPK, phosphorylated ERK, and ERK by immunoblotting.

ılts: Increased phosphorylation of intestinal p38 MAPK and ERK is seen at 2 hours ving severe burn. Treatment with PTX attenuated the burn-induced phosphorylation of MAPK (12-fold vs. 3-fold increase over sham, p=0.01) and decreased phosphorylation RK (9-fold vs. 3-fold increase over sham, p<0.01) at 2 hours. Phosphorylation of p38 K and ERK remained lower in PTX treated animals at 24 hours. Animals given PTX had decreased histologic intestinal injury and decreased intestinal IL-6 levels (121.8 l vs. 55.0 pg/ml, p<0.005) compared with animals given NS alone.

:lusion: PTX prevents the burn-induced phosphorylation of p38 MAPK and ERK. This provide insight into the mechanism by which PTX modulates intestinal permeability subsequent intestinal inflammation. Therefore, PTX may be a beneficial inomodulatory adjunct to resuscitation fluid following severe injury.

ʻ PERIPHERAL LEUKOCYTE APOPTOSIS LEVELS ARE ASSOCIATED WITH ꟻEASED RISK OF INFECTION IN TRAUMA PATIENTS WITH HEMORRHAGIC CK

orrison, A. Moran, M. Carrick
ɔr College of Medicine
enter: C. Anne Morrison **Senior Sponsor:** Ernest A. Gonzalez

roduction: Previous studies have been conflicting with regards to the effects of ıheral leukocyte apoptosis on clinical outcomes in hemorrhagic and septic shock. No es have examined the correlation between peripheral leukocyte apoptosis and ɔmes in trauma patients following resuscitation from hemorrhagic shock in-vivo.
thods: Pre-operative, post-operative, and 24-hour venous samples were drawn from auma patients requiring emergent laparotomy or thoracotomy. All patients were in ɔrrhagic shock and were resuscitated intra-operatively. Leukocyte apoptosis was sured pre-operatively, post-operatively and at 24 hours via nucleosome ELISA, and nt records were examined for 30-day mortality, organ failure and infection rates.
sults: Patients who developed infection had significantly lower post-operative ɜosome levels than those who did not develop any infections (17.7 mu/mg protein ɹs 49.7 mu/mg protein, p<0.01). This trend persisted when analyzing by specific type ection and by organ failure, although these differences did not reach statistical ficance. There were no statistically significant correlations between nucleosome levels survival.
nclusions: In patients with hemorrhagic shock, post-operative leukocyte apoptosis is ıtively correlated with development of subsequent infection. Previous research has ᴧn that high levels of apoptosis in circulating neutrophils following shock may have a ective effect by preventing neutrophil migration and limiting release of harmful oxygen als in the tissues. Thus neutrophil apoptosis may render tissues less susceptible to ꞁ and subsequent infection. Our findings support this hypothesis and suggest that ased levels of apoptosis in the immediate post-operative period are associated with ɔved outcome, particularly with regards to infection.

	Not Present			Present			
	n	Mean Nucleosome Level (mu/mg protein)	SD	n	Mean Nucleosome Level (mu/mg protein)	SD	p-va
ꞁ Infection	9	49.7	38.1	14	17.7	15.4	0.0C
spiratory ction	13	37.3	36.8	10	21.1	16.9	0.21
und Infection	18	30.8	33.6	5	28.2	16.7	0.8E
ıary Tract ction	19	33.0	32.3	4	17.1	14.6	0.3
lominal Abscess	16	34.7	34.3	7	19.9	16.0	0.2S
sis	18	34.5	32.6	5	14.7	13.0	0.2C
tiple Infections	14	37.2	35.7	9	19.4	15.9	0.17
an Failure	18	35.9	40.1	9	25.5	17.5	0.4E

e 1: Post-operative nucleosome levels (mu/mg protein) in peripheral leukocytes, by ɔme

IAUMA OUTREACH PROGRAM PROVIDED BY A LEVEL ONE TRAUMA CENTER N EFFECTIVE WAY TO INITIATE PEER REVIEW AT REFERRING HOSPITALS FOSTER PROCESS IMPROVEMENTS

/rnes, MD; E Irwin, MD; J Chipman, MD; G Beilman, MD; M Thorson, MS; Paul ison, MD; K Croston, MD
ı Memorial Medical Center and University of Minnesota

enter: Matthew Byrnes, MD **Senior Sponsor:** Paul Harrison, MD

roduction: The initial care of critically injured patients has profound effects upon ate outcomes. The "golden hour" of trauma care is often provided by rural hospitals to definitive transfer. There are, however, no standardized methods for providing ational feedback to these hospitals for purposes of performance improvement.

pothesis: We hypothesized that an outreach program would stimulate peer review identify systematic deficiencies in the care of injured patients.

thods: We developed a quality improvement program aimed at providing educational ɔack to hospitals that refer patients to our American College of Surgeons-verified level trauma center. We travelled to each referral center to provide feedback on the initial ment and ultimate outcome of patients that were transferred to us. These feedback ions were presented in the format of case presentations and case discussions. inuous data was analyzed with t-tests and categorical data was analyzed with chi- re tests.

sults: The outreach program was presented at each hospital every three to six ths. Nine hospitals were included in our program. We received 334 patients in transfer these hospitals during the study period. The mortality rate of patients treated before after institution of the program was similar (5.7% vs. 3.8%, p=0.41). Only 14% of itals had a formal peer review program that focused on trauma patients prior to tion of our program. This increased hospitals to 100% of hospitals after institution of rogram ($p<0.05$). 85% of hospitals felt the care of injured patients was improved as a t of the program. 85% of hospitals developed process improvement initiatives as t of the program. Insertion of two large bore intravenous catheters was more common the program was initiated. Additionally, formal radiologic reporting time was reduced)%.

nclusions: A formal outreach program can stimulate peer review at rural hospitals, de continuing education in the care of injured patients, and foster process ɔvements at referring hospitals.

RATIVE INTERVENTION FOR COMPLETE PANCREATIC TRANSECTION AFTER NT ABDOMINAL TRAUMA IN CHILDREN: REVISITING AN ORGAN SALVAGE HNIQUE

Borkon M.D., S.E. Morrow M.D., E.A. Koehler M.S., Y. Shyr PH.D., M.A. Hilmes M.D., Miller M.D., W.W. Neblett M.D., H.N. Lovvorn III M.D.
lerbilt Medical Center

enter: Matthew J. Borkon, M.D. **Senior Sponsor:** Richard S. Miller, M.D.

:ground

plete pancreatic transection (CPT) in children is commonly managed with distal reatectomy (DP), which may require concomitant splenectomy. Alternatively, sewing of the proximal pancreatic stump, with Roux-en-Y pancreaticojejunostomy 'J) to drain internally the distal pancreas, may be performed to preserve glandular e and the spleen. The purpose of this study was to review our experience using either edure in the management of children sustaining CPT.

iods

IRB approval, we reviewed retrospectively the records of all children who were tted to our institution during the last 15 years and were confirmed by computed graphy (CT) and operation to have CPT after blunt mechanisms. Summary statistics of ographic data were performed to describe children receiving either DP or RYPJ. Time bles were analyzed using the Kaplan-Meier method and log-rank test. A Cox ortional hazards model was used to control for demographical differences between ery populations.

ılts

occurred in 29 children: 15 had DP (6 splenectomy), 10 RYPJ (1 splenectomy), 3 jastrostomy, and 1 external drain only. RYPJ children, compared to DP, were younger v. 12.2 years, $p<0.001$), had higher ISS (22.5 v. 19.8, $p<0.001$) and sustained more e IV pancreatic injuries (70% v. 13%, $p<0.009$). Time to full enteral feeds was not tically different between procedures ($p=0.1022$). However, when comparing children ıg the same age, ISS, and pancreatic injury grade, DP children were 3.11 times ter to reach full enteral feeds ($p<0.034$); nevertheless, procedure type did not affect h of stay or drain duration. Postoperative complications were not different between ery groups ($p=0.667$). Pancreatic volumes distal to the transection measured 52% J and 57% DP ($p<0.001$).

clusions

e management of children sustaining CPT, DP affords a slightly earlier return to full al feeds. RYPJ appears otherwise equivalent to DP and may preserve significant reatic glandular tissue.

r #21 8:40 am, 2/25/09

OTS AND LADDERS: A REVIEW OF HUNTING RELATED INJURIES.

ɔckett, P Beery, Y Thomas, D Lindsey, S Stawicki, M Whitmill, S Steinberg, A Jarvis, C ɡ, C Cook
Ohio State University and Grant Medical Centers

enter: Andrew Crockett **Senior Sponsor:** Charles Cook

ODUCTION: Hunting is a popular outdoor activity throughout the United States. Despite mentation of hunter's safety courses and use of high visibility clothing, hunting related injuries n a source of morbidity and mortality amongst outdoor enthusiasts. Although the prevailing ɔtype is that most hunting injuries are gunshot wounds inflicted by drunk hunting buddies (AKA Cheney" type injuries), our experience led us to hypothesize that falls comprise a significant rtion of hunting related injuries.

HODS: Trauma databases of two ACS Level 1 trauma centers in our city were queried for all ıg related injuries from Jan. 98 – Dec. 07, and data were acquired from chart reviews.

ILTS: One hundred thirty patients were identified with hunting related injuries, 90% of whom male (mean age 41.0 yrs, range 17-76). Median injury severity score was 9 (range 1-31). 50% ıries were from falls, 92.8% of which were falls from tree-stands. Gunshot wounds accounted for ⅓, ATV crashes represented 7.7% of injuries, and only 1.5% of injuries were considered to be nflicted (1 bite, 1 goring). Of records including species hunted, 76.5% were hunting deer, 8.8% / and 8.8% mushrooms. Very few were hunting snakes (2.9%) or squirrels (2.9%). Alcohol was ed in only 6.2%, and drugs of abuse in 9.5%. Amongst gunshot victims with an identified er, 57.6% were self-inflicted (~17% of all injuries), while 42.4% were shot by another hunter % of all injuries). Of patients with fall injuries, 50.0% had spine fractures, 42.9% lower extremity res, 10.7% upper extremity fractures and 14.3% had closed head injuries. Operative ention was required for 67.9% of these injuries, and 14.3% had permanent neurological deficits aplegic, 1 quadriplegic). Disposition for surviving patients was 85.8% discharged home, 6.3% facilities, 5.5% nursing homes, and 2.4% transferred to acute care hospitals. Overall mortality injuries was only 2.3%.

CLUSIONS: Counter to prevailing beliefs, in our geographic area falls are the most common anism of hunting related injury requiring admission to a Level 1 trauma center. The vast ity of these falls are sustained by deer-hunters using tree-stands. Significant numbers of those ing admission to trauma centers required surgical care including orthopedic and neurosurgical entions with rehabilitation follow-up. Gunshot wounds occurred far less frequently than falls, ere nearly evenly split between self-inflicted injuries and those sustained from another hunter. ɜ other trauma mechanisms, alcohol appears to play a much less frequent role in hunting related ıa, and may relate to the early hour in which hunting typically occurs. While all hunters in our ı are required to pass a hunter's safety course prior to being licensed, these courses focus y on hunting regulations and firearm safety, with sparse coverage of situational dangers iiated with tree-stands. Broadening the scope of hunter's education to include tree-stand safety ıll prevention might decrease the incidence hunting related injuries in our area.

#22 4:00 pm, 2/25/09

) STEEL: CURE FOR WHAT AILS YOU STUDY AND PURSUIT OF THE LHEAD TROUT

:tzdorff, M. D.
)vascular Surgical, PLLC

:nter: Mark T. Metzdorff, MD **Senior Sponsor:** Mark T. Metzdorff, MD

Surgery can be a stressful practice, and surgeons find relief from stress in varying This presentation will describe one man's journey toward serenity in pursuit of one West's most magnificent species: *Onchorynchis mykiss,* the steelhead trout, vise known simply as *the steelhead.* The incredible anadromous life cycle of the ead, like all salmonid species, involves time in both fresh and salt water and a tion of thousands of miles from their natal stream, to the ocean and back again. : fish overcome tremendous obstacles, both natural and manmade, to fulfill their y to reproduce; a destiny which is ever more endangered as old threats persist and ıreats emerge. As an indicator species of ecosystem health, steelhead have drawn e scientific study which has shed light on their life cycle and on the factors which ıce them at each stage of their existence. The urgent threat of fish farming as :ed in the near-shore saltwater where salmonids migrate is the latest manmade rophe of unforeseen consequences to affect the species. As the steelhead and n runs decline in the states, provinces and communities where steelhead are found, ıments have gained a new appreciation of the impact of recreational fishing on their mies. Although the challenges are many, there are opportunities for improvement ıyone who appreciates wild creatures and their habitats, even non-anglers, can pate in.

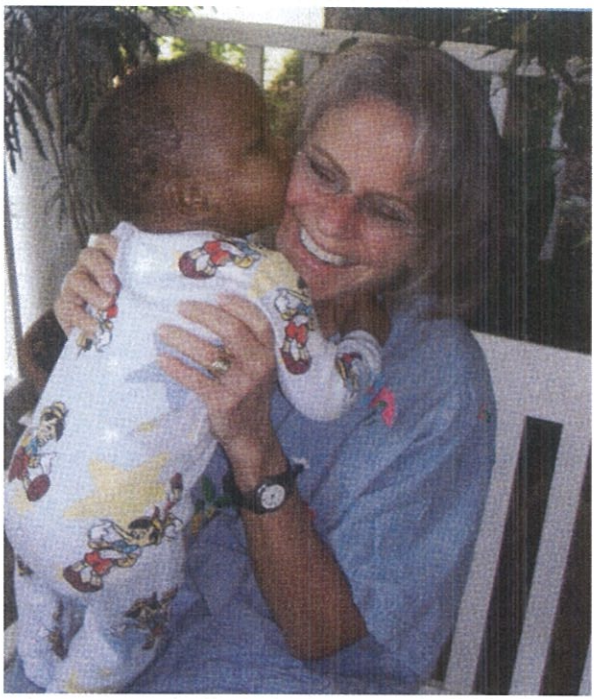
The appeal of angling for these fish ("steelheading") will be apparent from the ıtation. Steelhead are found in the wildest, most beautiful areas of the Pacific Northwest, along with other rare, beautiful and endangered species. Steelheading is a solitary activity which requires skill, patience, persistence, and tolerance for adverse conditions. The sport has a rich literary tradition that nurtures its practitioners in the off-season. The rewards of the pursuit go far beyond the mere act of catching, and releasing, a trophy. The act of angling for these fish gives ample opportunity for reflection, for appreciation of the profoundly beautiful environment in which it is practiced, and for camaraderie with anglers both contemporary and long gone. Like many avocations favored by individuals in stressful occupations, steelheading allows one the opportunity to lose himself in the pursuit, to meet and hopefully overcome the challenges inherent in the sport, to recharge his batteries and return to the daily grind a rested, person.

Paint the Ceiling Lecture

997, Dr. Gregory "Jerry" Jurkovich delivered his Presidential Address entitled t the Ceiling: Reflections on Illness". This was a personal account of his battle h non-Hodgkin's lymphoma. His deep insights were shared from a patient's ›ective, even that of a stained ceiling that he observed while lying on his back. proposed that future WTA Scientific Programs have some time "dedicated to our patients and to the Art of Medicine".

"The Journey is the Destination"

Dr. Sylvia Campbell



OXAMER 188 PROLONGS SURVIVAL OF HYPOTENSIVE RESUSCITATION AND REASES VITAL TISSUE EDEMA AFTER FULL RESUSCITATION

Zhang, MD, PhD, R. Hunter MD, PhD, E Gonzalez MD, FA Moore MD.
Methodist Hospital and University of Texas Houston Medical School

enter: Frederick A. Moore **Senior Sponsor:** Frederick A. Moore

duction: Damage control resuscitation (DCR) prolongs survival so that patients with severe ling live long enough to undergo hemorrhage control. Hypotensive resuscitation is a DCR ıct to limit ongoing bleeding but may result in deleterious gut ischemia/reperfusion (I/R) with full ;citation which sets the stage for acute lung injury (ALI) and the abdominal compartment ome (ACS). In our gut I/R ALI model, Poloxamer (P) 188 (a nonionic, block copolymer ctant) was quite protective. We, therefore, hypothesized that P188 would likewise be protective ıodel of hypotensive resuscitation of lethal hemorrhagic shock.

ıods: Previously instrumented, unanesthetized rats (n=8 per group) were observed (sham) or l (6 groups) over 15 minutes to a mean arterial pressure (MAP) of 30 mmHg and this was :ained for 30 min. Two bleed groups had hypotensive resuscitation with Hextend (Hex) or Hex + g/ml P188 to maintain a MAP of 60 mm Hg and observed until death. The remained four bleed ›s had the same hypotensive resuscitation (2 Hex and 2 Hex-P188) maintained for 40 min, then ull resuscitation with lactated Ringers (LR) or LR + 20 mg/ml P188 respectively to a MAP of 80 g. One treatment group each was then observed for survival to 24 hr. The remaining two groups injected with Evan's Blue dye and then sacrificed at 5 hrs. Tissues were harvested for mination % H_20 content (wet - dry weight/wet weight) and Evan's Blue extravasation (quantitated ectroscopic absorption). Data are expressed as mean ± SEM. Differences were compared by n-Breslow, $P<0.05$ was considered significant.

ılts: The hypotensive resuscitation alone Hex group compared to hypotensive alone Hex + P188 › required more fluid to maintain MAP till death (11.17 ± 1.37 vs 4.72 ±0.81 ml/kg/hr, $p<0.05$) and much sooner (288 ± 37 vs 598 ± 100 min, $p<0.05$). One (12.5%) full resuscitation Hex/LR rat ved 24 hours compared to 4 (50%) full resuscitation Hex/LR + P188 ($p<0.05$) rats. Full ;citation Hex/LR rats compared to full resuscitation Hex/LR + P188 rats who were sacrificed at 5 ; required more fluid during full resuscitation (35.5± 6.6 vs 13.8 ± 3.32 ml/kg/hr, $p<0.05$), had ased vascular permeability as quantitated by Evan Blue extravasation into the lung (sham = 89.7 1 vs Hex/LR = 261.5 ± 49.5 vs Hex/LR + P188 = 133.6 ± 28.0 ug Evans Blue/100 g tissue, p< and ileum (58.8 ±9.6 vs 122.5 ± 26.0 vs 60.5 ± 15.2, $p<0.05$) which corresponded to ased tissue water in the lung (sham = 78.16 ± 0.22 % vs Hex/LR = 80.78 ± 0.77 % vs Hex/LR + = 78.85 ± 0.32%, $p<0.05$) , and ileum (74.88± 0.48% vs 77.82 ± 0.84% vs 75.14 ± 1.02%,)5).

:lusion: Poloxamer 188 prolonged survival and decreased fluid requirements in a model of :ensive resuscitation of lethal hemorrhagic shock. With full resuscitation, more Poloxamer 188 :d rats survived and they had less tissue edema in the lungs and the gut. Poloxamer 188 may be ıportant adjunct in DCR of patients with severe bleeding by prolonging survival of hypotensive ;citation and decreasing the incidence of ALI and ACS in those who survive long enough to rgo effective hemorrhage control followed by successful full resuscitation.

REASED PLATELET:RBC RATIOS ARE ASSOCIATED WITH IMPROVED VIVAL AFTER MASSIVE TRANSFUSION

omb JB*, Zarzabal LA, Michalek JE, Kozar RA*, Gonzalez EA, Spinella PC, ins JG, Wade CE
ersity of Texas Health Science Center-Houston

enter: John B Holcomb **Senior Sponsor:** John B Holcomb

roduction: Several recent military and civilian trauma studies demonstrate improved outcomes are associated with early and increased use of plasma d resuscitation strategies. However, outcomes associated with platelet sfusions are poorly characterized. We hypothesized that increased let:RBC ratios would decrease hemorrhagic death and improve survival after sive transfusion.

thods: A transfusion database of patients transported from the scene to 22 1 Trauma Centers over 12 months in 2005-2006 was reviewed. Two patients within 30 minutes of arrival and were excluded from analysis. Massive sfusion (MT) was defined as receiving ≥ 10 RBC units within 24 hours of ission. Admission and outcome data associated with average low (1:20), ium (1:2.5) and high (1:1) platelet:RBC ratios were examined.

sults: Six hundred forty five patients received MT. Admission vital signs, INR, perature, pH, GCS, ISS and age were similar between groups. Patients were rely injured, with a mean (± SD) ISS of 33 ± 16 and received 22 ± 15 RBC . Increased platelet ratios were associated with improved survival at 6 hours, ours and 30 days ($p<0.001$). Median time to death increased (Low: 7 days, : 30 days, $p<0.001$), while truncal hemorrhage as a cause of death decreased : 67%, High: 47%, $p<0.001$). Although MOF mortality increased (Low: 7%, : 27%, $p<0.05$), 30 day survival improved (Low: 53%, High: 75%, $p<0.001$).

nclusion: Similar to recently presented military data, transfusion of let:RBC in a ratio of 1:1 is associated with improved early and late survival, eased hemorrhagic death and a concomitant increase in MOF related ality. Based on this large retrospective study, increased and early use of lets may be justified.

ROVED SURVIVAL AFTER HEMOSTATIC RESUSCITATION: DOES THE EROR HAVE NO CLOTHES?

Magnotti, M.D., B.L. Zarzaur, M.D.,MPH, M.A. Croce, M.D., P.E. Fischer, M.D.,MS, R. ıms, M.D., T.C. Fabian, M.D.
ersity of Tennessee Health Science Center
enter: Louis J. Magnotti, M.D. **Senior Sponsor:** Ben L. Zarzaur, M.D, MPH

ht of recently published and presented data, controversy surrounds the apparent 30-survival benefit of patients achieving a fresh frozen plasma (FFP):red cell (PRBC) ratio least 1:2 in the face of massive transfusions (MT) (≥10 units of PRBC within 24 hours mission). We hypothesized that initial studies suffer from survival bias since they do onsider early deaths secondary to uncontrolled exsanguinating hemorrhage. To help ve this controversy, we evaluated the temporal relationship (at 6 hour intervals) een blood product administration and mortality in civilian trauma patients receiving MT.

y Design: Patients requiring MT over a 22-month period were identified from the scitation registry of a level I trauma center. Shock severity at admission as well as g of shock-trauma admission, blood product administration and death were rmined. Patients were divided into **hi** and **lo** ratio groups (≥1:2 and <1:2 FFP:PRBC, ectively) and compared. Kaplan Meier analysis and log-rank test was used to examine our survival.

ılts: 103 patients (63% blunt) were identified (66 **hi**, 37 **lo**). Those patients who ved a **hi** ratio in 24 hours had improved survival (Fig 1). However, severity of shock less in the **hi** group (BE: -8.0 vs. -11.2, p=0.028; LA: 6.3 vs. 8.4, p=0.03). 75 patients ved MT within 6 hours. Of these, 29 received a **hi** ratio in 6 hours. Again, severity of k was less in the **hi** ratio group (BE: -7.6 vs. -12.7, p=0.008; LA: 6.7 vs. 9.4, p=0.02). hese patients, 6 hour mortality was less in the **hi** group (10% vs. 48%, p<0.002). After unting for early deaths, groups were similar from 6 to 24 hours (Fig 2).

Figure 1

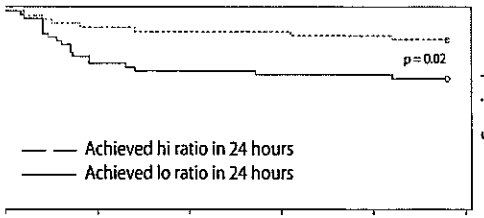
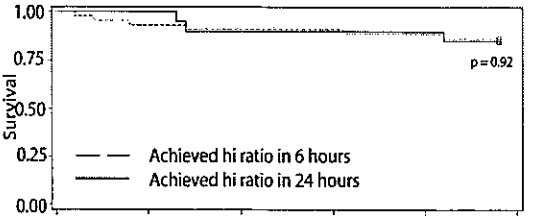


Figure 2



clusions: Improved survival was observed in patients receiving a higher plasma ratio the first 24 hours. However, temporal analysis of mortality using shorter time periods ıours) revealed those who achieve early **hi** ratio are in less shock and less likely to die from uncontrolled hemorrhage compared to those who never achieve a **hi** ratio. Thus, roposed survival advantage of **hi** ratio may be due to selection of those not likely to ı the first place; that is, patients die *with* a **lo** ratio not because of a **lo** ratio.

r #26 8:00 am, 2/26/09

ER AGE AND BLOOD TRANSFUSION ARE CO-CONSPIRATORS IN THE ELOPMENT OF POSTINJURY MULTIPLE ORGAN FAILURE AND SUBSEQUENT TH

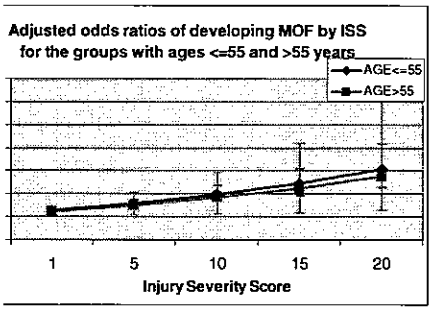
'fl, J Johnson, E Moore, C Cothren, J Kashuk, A Banerjee, A Sauaia
er Health Medical Center

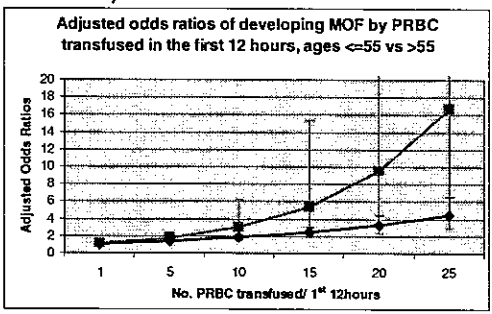
enter: Walter L Biffl **Senior Sponsor:** Walter L Biffl

is an independent predictor of postinjury morbidity and mortality. Blood fusion is a critical risk factor for postinjury multiple organ failure (MOF), the r cause of late mortality following trauma. The age/transfusion interaction as it es to MOF has not been examined. The purpose of this study was to acterize the relationship between age, transfusion, and postinjury MOF.

ods: 1415 high-risk patients, excluding isolated head injured patients, were lled in a Level I Trauma Center's prospective database over a 13-year period. ple logistic regression evaluated the association between age, other risk rs, and MOF.

lts: 346 (24%) patients developed MOF; 98 (28%) died. The incidence of began to rise at age 45 (35% for age ≥45, vs 20% for age <45, p<.0001) and ality increased after age 55 (44% for age ≥55, vs 23% for age <55, p=.0005). timing (early vs. late), pattern of organ dysfunction, and incidence of tious and non-infectious complications were no different across age strata. effect of injury severity on MOF was independent of age (left figure). However, isk conferred by early blood transfusion was exacerbated by age (p=0.01) t figure; age ≥55, squares; <55, diamonds)





clusions: Age becomes a risk factor for postinjury MOF at 45 years. Blood transfusion profound adverse effect among older (age >55) patients. These data support current nmendations for a restrictive transfusion strategy (eg, target hemoglobin >7 g/dL) ng all trauma patients, irrespective of age and medical comorbidities.

Founders' Basic Science Lectureship

Throughout the years, the Western Trauma Association has matured as an mic society while maintaining the cherished elements of friendship, collegiality and . In honor of this unique spirit, a founding member has generously provided the idea ıost of the financial support for an annual *Founders' Basic Science Lectureship*. The se of this Lecture is to further enhance the educational value of our Scientific Meeting e to the area of basic science research. This Lecture reflects the vision and ıtion of our founding members and will hold a prominent place in all future programs.

ıjury and Intestinal Barrier Dysfunction: Past, Present, and Future"

Raul Coimbra, MD, PhD

NDOMIZED PROSPECTIVE TRIAL OF AIRWAY PRESSURE RELEASE TILATION AND LUNG PROTECTIVE VENTILAION IN ADULT TRAUMA PATIENTS H ACUTE RESPIRATORY FAILURE

laxwell MD, J Waldrop MD, JM Green MD, BW Dart MD, PW Smith MD, PL Lewis RN, ooks RT, DE Barker MD
ersity of Tennessee, Chattanooga

enter: Robert A. Maxwell **Senior Sponsor:** Robert A. Maxwell

rpose: Airway Pressure Release Ventilation (APRV) is a relatively new form echanical ventilation which has demonstrated potential benefits in trauma nts. We therefore sought to compare relevant safety outcomes of this modality e recommendations of the ARDS Network.
thods: Patients admitted following traumatic injury requiring mechanical ilation were randomized under a 72 hr waiver of consent to a respiratory ocol for APRV or lung protective ventilation (CONVEN). Data were collected rding demographics, ISS, oxygenation, ventilation, airway pressure, failure of ality (Failure), tracheostomy (Trach), pneumonia (VAPS), vent days, length of (LOS), pneumothorax (PTX) and mortality (Mort).
sults: 63 patients were enrolled during the 16 month study period beginning 2004 with 31 being assigned to APRV and 32 being assigned to CONVEN. 74 ere males, 56% smoked, 98% had a blunt mechanism, with a mean age ±15.0 yrs, ISS 29.5± 8.2, GCS 6.3±4.6, Lung Injury Score 1.73±1.22 without rences between groups. Mean APACHE2 was worse for APRV patients ±5.35 than CONVEN 16.9±7.17 with a p-value = .027. Outcome variables are ayed as means ± SD or rates per group in the following table:

	Vent Days	ICU LOS	PTX	VAPS	Trach	Failure	Mort
V	10.49±7.23	16.47±12.83	0	1.00±.86	61.3%	12.9%	6.45%
VEN	8.00±4.01	14.18±13.26	3.1%	.56±.67	65.6%	15.6%	6.25%

e were no statistical differences between groups.

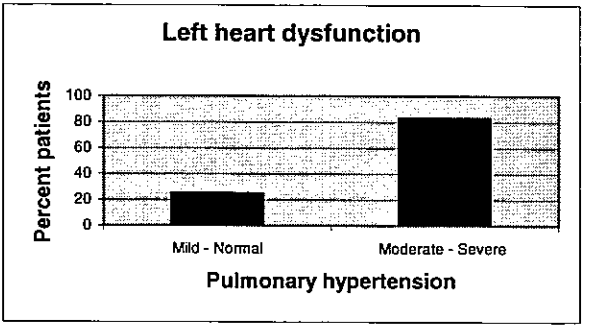
nclusion: For patients sustaining significant trauma requiring mechanical ilation for greater than 72 hrs, APRV appears to have a similar safety profile as ung protective strategy put forward by the ARDS Network. Slight trends for V patients to have increased vent days, ICU LOS and VAPS may be explained itial worse physiologic derangement demonstrated by higher APACHE2 es.

MONARY HYPERTENSION AFTER INJURY IS ASSOCIATED WITH LEFT HEART FUNCTION

ggs MD, N.Bir MD, K.Bullard MD
ERSITY OF CALIFORNIA, SAN FRANCISCO - EAST BAY

enter: A. Driggs **Senior Sponsor:** K. Bullard

kground: Pulmonary hypertension can manifest acutely in injured patients. Hypoxia een implicated as the cause of pulmonary vasoconstriction, however not all hypoxic nts have increased pulmonary artery pressures. The purpose of this study is to mine the association between pulmonary hypertension, hypoxia, and left heart nction in critically injured patients.
othesis: Pulmonary hypertension after injury is secondary to left heart dysfunction not to hypoxia.
thods: Over 24 months, 113 patients admitted to the surgical intensive care unit of a urban trauma center underwent transthoracic echocardiograms with color flow doppler termine endpoints of resuscitation. Pulmonary hypertension was estimated from D flow measurements by a board certified cardiologist. Moderate pulmonary tension was defined as a pulmonary artery pressure 45-75 mmHg and severe onary hypertension was defined as > 75mmHg. Degree of hypoxemia at time of cardiogram and left icular dysfunction was l for each patient.
sults: 41 out of 113 nts were found to have rate to severe pulmonary / hypertension. 83% of patients had left heart nction, in the form of rate to severe concentric trophy (diastolic nction), wall motion rmality, decreased on fraction (systolic dysfunction), or aortic stenosis (outflow obstruction). Only 25% of nts with mild to normal pulmonary hypertension showed signs of left ventricular nction. Median PaO2 for the two groups at time of echocardiography, were not icantly different.



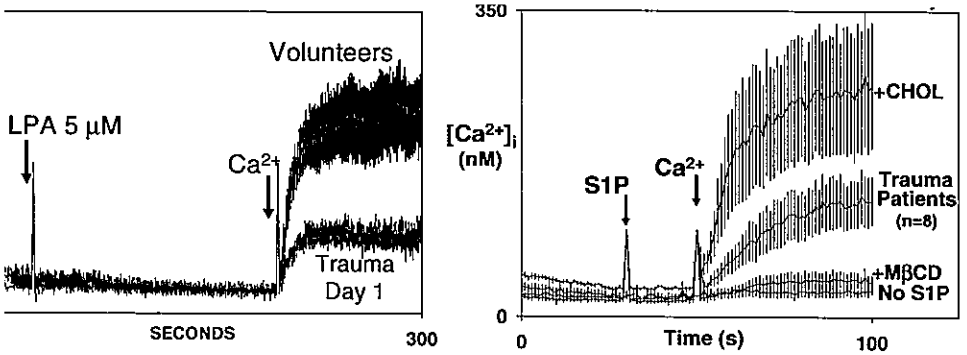
cussion: Patients with left heart dysfunction are at an increased risk for pulmonary tension that may contribute to prolonged ventilation following injury.
cardiography can identify patients at risk for pulmonary hypertension and these nts can then be targeted with cardioprotective strategies such as prudent fluid citation and inotropic support. Selective pulmonary vasodilators may offer additional ns for patients with severe pulmonary hypertension. Serial echocardiograms can to monitor progress with resuscitation strategies in these complex patients.

LESTEROL REPLETION CORRECTS EFFETE NEUTROPHIL SIGNALING AFTER OR TRAUMA VIA LIPID RAFT TRAFFICKING

user
Israel Deaxoness Medical Center and Harvard Medical School

enter: C Hauser **Senior Sponsor:** C Hauser

ckground: PMN are dysfunctional in the post-injury period, predisposing to sepsis. underlying mechanisms are poorly understood, but Ca^{2+} influx in response to G-protein led receptor (GPCR) activation is critical for PMN function. GPCR mobilize Ca^{2+} via pid (LyL) second messengers. Lipid rafts are composed of LyL and cholesterol)L) but plasma CHO levels are suppressed in trauma and critical illness.
thods: We prospectively, serially studied PMN Ca^{2+} mobilization in major trauma nts (ISS>25) and their matched controls to the LyL sphingosine 1-phosphate (S1P), igosyl phosphorylcholine (SPPC) and lysophosphatidic acid (LPA) using Fura-2AM. dependence of signaling on raft trafficking was assessed by response to M□CD. All onses were assessed with and without CHOLL supplementation.
sults: PMN Ca^{2+} entry responses to all the LyL are profoundly suppressed by injury. ression begins on Day 1, peaks on Day 3 and returns toward normal at Day 7. CHOL lementation restored normal and even supra-normal Ca^{2+} influx. Destruction of rafts M□CD abolished all Ca^{2+} responses to the LyL.



PMN responses (n=8) to LPA are suppressed immediately after trauma. **Right:** na patients show suppression (>50%) of response to 5□M S1P on Day 3. M□CD shes Ca^{2+} entry response to S1P but CHOL restores it to above normal.
nclusions: LyL as a class are potent PMN activators that probably function by asing Ca^{2+} entry through channels that traffic to forming lipid rafts. PMN become edly refractory to LyL in the week after trauma but their responses can be restored by L. These findings suggest micro-nutrient dependent alterations in lipid raft composition signaling function contribute to PMN dysfunction after injury. The same principles might sed in modulating PMN function after injury and in critical illness.

PANEL OF EXPERTS

Moderator: Margaret "Peggy" Knudson

Roxie Albrecht, MD

Frederick A. Moore, MD

David Livingston, MD

:S THE RTTDC© (RURAL TRAUMA TEAM DEVELOPMENT COURSE©))RTEN THE INTERVAL FROM TRAUMA PATIENT ARRIVAL TO DECISION TRANSFER?

appel, D. Rossi, E. Polack, T. Avtgis, M. Martin
t Virginia University Hospitals

enter: Daniel C. Rossi, DO **Senior Sponsor:** David A. Kappel, MD

KGROUND: The Rural Trauma Team Development Course© (RTTDC©) was loped by the ad hoc Rural Trauma Committee of the American College of jeons Committee on Trauma to address the increased mortality of the rural na patient. In the course, multiple potential delays are identified and essed including delay in the decision to transfer to an appropriate level of care. effectiveness of the RTTDC© in shortening the interval from patient arrival to sion to transfer and the effect on the transfer process of communication ing emphasizing team building is the focus of this study.

HOD: Rural Level III and Level IV trauma centers (N = 18), participating in the trauma registry were enrolled in a multi-institutional three month longitudinal y of transferred trauma patients. Time of arrival, time of decision to transfer, sporting ambulance arrival time, number of receiving facilities contacted, time ceptance by receiving facility, and number of transporting units contacted data points collected. Results were compared for institutions having hosted DC© versus those institutions not yet exposed to the course. Eighteen ties submitted data. Three facilities were excluded for incomplete data. lities without RTTDC© experience submitted 191 patients. RTTDC© trained ties provided data on 117 patients and of those, two facilities had experienced munication training in the RTTDC© and submitted 36 of the 117 patients.

ULTS: One - Way Analyses Of Variance (ANOVA's) were conducted. ults indicated that RTTDC© training including communication training, resulted statistically significantly shorter ($p < .05$) time for decision to transfer. sferring squad arrival time was also significantly reduced ($p < .01$). The ber of transferring squads contacted was also reduced ($p = .01$). No rences were observed among the trauma facilities and the number of receiving ties contacted, ($p = .69$) or in the time required to find an accepting facility ($p =$

ICLUSION: The RTTDC© with the embedded communication module ficantly reduces delays in the transfer process of the rural trauma patient.

SAFETY OF HYPERTONIC SALINE SOLUTION FOR RESUSCITATION IN UMA

ıith V,Choudhry S,Helmer
M-Wichita, Carilion Clinic

enter: R.Stephen Smith **Senior Sponsor:** R.Stephen Smith

ground : The optimal fluid for resuscitation of injured remains controversial. The standard fluid suscitation remains isotonic crystalloid solution. Mounting experimental and clinical evidence ɔrts the use of hypertonic saline solutions (HTS) in resuscitation. However, there continues to be ɜrn regarding the efficacy and safety of HTS. Herein, we report our initial experience with HTS citation in the trauma setting.
ods : After obtaining IRB approval, a retrospective review of seriously injured (ISS>15) patients ted to an ACS verified Level 1 trauma center between 01/2006 and 01/2008 was performed. nts received either HTS, normal saline (NS) or Ringers lactate (RL) during initial resuscitation. hoice of initial resuscitation fluid was determined by the attending trauma surgeon. The severity ury was determined by ISS, initial Glasgow Coma Scale score (GCS), and the calculated survival ıbility. The safety of HTS was determined by evidence of adverse outcomes (coagulopathy, ılogic dysfunction, cardiac dysfunction, renal failure, phlebitis) associated with HTS ıistration. The efficacy of HTS was determined by comparing the primary outcome of all-cause ıy mortality between the two groups. Secondary outcomes included CHF, respiratory failure, ion, ICU length of stay (LOS), and overall hospital LOS. A subgroup analysis (n=105) was rmed in patients with traumatic brain injury (TBI).
lts : A total of 324 patients met study criteria. Of these, 183 received HTS. Patients that ved HTS were more severely injured. The mean ISS of the HTS group was higher than for the ıic resuscitation group (29.2 vs. 28.0; p = 0.02). The initial GCS was significantly lower in the group than in the standard group (5.3 vs. 7.0; p = 0.0008). The calculated survival probability ɔwer in the HTS group (45.4% vs. 52.2%; p= 0.12). Patients with HTS required longer periods of anical ventilation and ICU care and were more likely to develop nosocomial infections. There ıo difference in the number of transfusions given to the HTS and standard groups (7.2 vs. 6.6; p 4). There was no significant difference in the INR, PTT, or fresh frozen plasma (FFP) ements of the two groups (1.3 vs. 1.5 with p = 0.94, 35.0 vs. 47.5 with p = 0.67, and 5.1 vs. 4.3, 821). There were 2 episodes each of paralysis and paraparesis and 1 episode of dysarthria, all standard therapy group. The incidence of arrhythmias (6.0% vs. 11.4%; p = 0.11) and renal ɜ (9.3% vs. 10.6%; p = 0.71) were lower in the HTS group. The 30-day all-cause mortality was in the HTS group (33.3% vs. 36.8%; p = 0.56). In patients with TBI, 61 patients with TBI ved HTS and 44 patients received isotonic fluids. The initial GCS was lower (3.9 vs. 5.0, p = 5), the ISS was higher (29.3 vs. 28.0, p = 0.28), and the survival probability was lower (36.3% 2.2%, p = 0.32) in the HTS group. However, the 30-day mortality was lower in the HTS group % vs. 40.9%, p = 0.21). There was no increase in adverse outcomes in the HTS group when ared to the standard group.
lusions : The administration of HTS during resuscitation is safe. There were no adverse events ɔiated with HTS resuscitation. There was a trend towards a lower incidence of coagulopathy, ımias, and renal failure in the HTS group, although, this did not reach statistical significance. The group was more severely injured, as indicated by the ISS, initial GCS, and calculated survival ıbility. Thirty day survival was higher in the HTS group, although not statistically significant. In BI subgroup analysis, patients who received HTS were more severely injured, but showed a towards improved survival.

r #32 7:40 am, 2/27/09

SPECTIVE STUDY OF CONTINUOUS NON-INVASIVE TISSUE OXIMETRY IN THE LY EVALUATION OF THE COMBAT CASUALTY

ekley, M Martin, T Nelson, K Grathwohl, M Griffith, G Beilman, J Holcomb
gan Army Medical Center

enter: Alec C. Beekley **Senior Sponsor:** Matthew J. Martin

duction: Near-Infrared Spectroscopy (NIRS) has been previously evaluated in tensive trauma patients and found useful for predicting MODS and death. We thesized that (NIRS)-derived tissue oxygenation (StO2) could assist in identifying perfusion in combat casualties arriving to a combat support hospital and predict need e-saving interventions (LSI) and blood transfusion.

ods: We performed an IRB-approved, prospective observational trial at a single U.S. combat support hospital in Iraq from August to December 2007. Arriving casualties StO2 (Inspectra 650TM, Hutchinson Technology, Inc) recorded for a 43 second to 54 te period on arrival, using a sensor applied to the thenar eminence or a pre-designated native site if both hands were injured. Minimum (StO2 min) over the entire monitoring d and 2 minute averaged StO2 and Tissue Hemoglobin Index (THI) readings at the ining of the file were used as endpoints. Outcomes measured were requirement for aving interventions (LSI), any blood transfusion, massive transfusion (≥10 units in 24 s), and early mortality. Univariate and multivariate logistic regression modeling was to estimate the area under the receiver operating characteristic curve (AUC) for dual or combinations of variables using a stepwise backward elimination technique.

lts: We enrolled 147 combat casualties. 72 (49%) required an LSI, 42 (29%) a blood fusion, and 10 (7%) a massive transfusion. On multivariate logistic regression analysis e whole study group, SBP, INR, Tissue Hemoglobin Index (THI), and hematocrit cted blood transfusion with an AUC of 0.90 (0.84, 0.96). When just the group with SBP (n = 133, mean SBP 131) were analyzed, independent predictors of patients requiring l transfusion on logistic regression analysis were StO2 min (OR 1.35) and hematocrit 2.66).

clusions: Previous studies demonstrated that StO2 differentiates patients with severe perfusion from normal patients and predicted the development of MODS and death in tensive trauma patients. We demonstrated that NIRS-derived StO2 obtained on arrival cts the need for blood transfusion in combat casualties who initially appear to be dynamically stable (SBP > 90). Further study of this technology for use in the scitation of trauma patients is warranted.

SELESS ELECTRICAL ACTIVITY, THE FOCUSED ABDOMINAL SONOGRAM FOR UMA, AND CARDIAC CONTRACTILE ACTIVITY AS PREDICTORS OF SURVIVAL ER TRAUMA

Schuster MD, R Lofthouse RN, LJ Kaplan MD, DC Johnson MD, FY Lui MD, LM Maerz A Maung MD, KA Davis MD
on of Trauma, Surgical Critical Care, and Surgical Emergencies; Yale University ol of Medicine

enter: Kevin M. Schuster, MD**Senior Sponsor:** Kimberly A. Davis MD

duction: Pulseless electrical activity (PEA) secondary to both blunt and penetrating ıa is associated with minimal survival. There may however be a difference in survival een patients who maintain organized cardiac contractile activity and those who do not. ɔericardial view of the focused abdominal sonography for trauma (p-FAST) has the y to differentiate between these two groups of patients and may assist in the decision rminate ongoing resuscitation.

ıods: A retrospective chart review was performed for all patients presenting to an ı level I trauma center from 1/2006 through 8/2008 who had no pulse or were severely tensive. The charts were reviewed for the presence of PEA on arrival or the lopment of PEA while in the emergency department. Additional data abstracted ded the patient outcome, the p-FAST findings, and mechanism of injury. All available ded FAST exams were also re-reviewed by a blinded ultrasound trained physician to rm documented findings.

ılts: Over the study period 22 patients presented with PEA and 2 developed PEA g initial resuscitation. All patients had cardiac ultrasound evaluation. Contractile ac activity was present in 6 patients with PEA on presentation and immediately after ioration to PEA in the 2 patients developing PEA in the emergency department. Four nts had a penetrating mechanism and 20 were due to a blunt mechanism. Two ions were present on exam, one after blunt trauma and one after penetrating cardiac treated with emergency department thoracotomy. All but one patient died in the gency department (96% early mortality). The sole survivor had presented in PEA with ıized cardiac contractile activity on ultrasound and had a tension pneumothorax ed with tube thoracostomy. This patient was admitted to the ICU before dying on ital day 6 as a result of severe closed head injury.

clusion: The presence of PEA at any time during initial resuscitation is a grave ıostic indicator. p-FAST is a useful test to identify contractile cardiac activity. P-FAST identify those patients with some potential for survival who may benefit from ongoing scitative efforts.

OSTATIC FOAM FOR FIRST RESPONDERS IN THE TREATMENT OF SEVERE ACAVITARY NON-COMPRESSIBLE HEMORRHAGE

lbourne, MD K. Keledjian, MD G. Falus, PhD B. Ginevan, BS T. Scalea, MD G. icchio, MD, MPH
ɜr Reed Army Medical Center R Adams Cowley Shock Trauma Center

enter: Michael Kilbourne MD **Senior Sponsor:** Grant Bochicchio MD, MPH

KGROUND: Severe intracavitary hemorrhage is the cause of most early trauma ıs. The objective of this study was to evaluate the ability of a novel hemostatic foam ⁼oam®) to control bleeding from lethal intraabdominal vascular injuries when delivered :losed cavity rodent model.
HODS: Anesthetized rats (250-300 g) underwent femoral vein and arterial ulation, followed by midline laparotomy. After gaining proximal and distal control of ıfrarenal aorta with vascular clamps, the aorta was pierced twice with a 25 gauge le on both sides of the vessel. A 16 gauge needle was inserted intraperitoneally in ght lower quadrant remote from the aortic injury. At time 0, the vascular clamps were sed, free bleeding ensued for 4 seconds. Animals were randomized into five groups ɔeive either ClotFoam® (CF) formula 1, CF formula 2, CF formula 3, standard chitosan sealant (CLS), or no treatment. Animals were infused with lactated Ringer's to tain mean arterial pressure at about 70-80% of initial MAP (if possible). Animals were rved for 30 minutes. In one subset of animals, the abdomen was fully closed with ɔs during free bleeding. Animals in this subset underwent closed cavity application of nostatic agent. Total blood loss (TBL), mean arterial pressure (MAP), and survival recorded. A second subset of animals underwent open cavity agent application after ɔleeding. In this subset, bleeding time (BT) was recorded.
JLTS: None of the non-treated animals survived for the 30 minute duration of the ' (mean survival time 13 ± 3 min). Only 20% of the animals in the CLS group survived n survival time 22 ± 4 min). All animals in the three CF groups survived the entire ion of the study.

come	CF 1	CF 2	CF 3	CLS	No Treatment
al blood loss)	5.2 ± 0.5*	5.7 ± 1.4*	3.8 ± 1.2**	7.9 ± 0.9	10.3 ± 0.3
uscitation P (mmHg)	73 ± 22**	70 ± 8**	81 ± 6**	48 ± 5	27 ± 3
eding time (s)	12.2 ± 6**	16.0 ± 2.0*	10.8 ± 4.1**	21 ± 2.9	48.7 ± 4.9

: 0.01; * $p < 0.05$ (all p values relative to CLS)
CLUSION: Hemostatic ClotFoam® demonstrates the ability to effectively stop ɔrrhage from a lethal intraabdominal aortic injury in a rodent model, even when applied ıon-directed closed cavity manner. This hemostatic agent has the potential use for esponders in the field to treat non-compressible severe intracavitary hemorrhage.

r #35 8:40 am, 2/27/09

RIERS TO OBTAINING FAMILY CONSENT FOR POTENTIAL ORGAN DONORS

)wn, K Hejl, B Coopwood
ersity Medical Center at Brackenridge & University of Texas Medical Branch – Austin

enter: Carlos V.R. Brown, MD **Senior Sponsor:** Carlos V.R. Brown, MD

duction: Our country suffers from a chronic shortage of organ donors, and the list of duals in desperate need of a life-saving organ transplants is growing every year. ly consent represents the most important limiting factor for successful donation. We thesize that specific barriers to obtaining family consent can be identified and)ved upon in order to increase organ donation consent rates. The specific purpose of tudy was to compare families who declined organ donation to those who granted ent in an attempt to identify barriers to family consent for successful donation.
ods: We performed a four-year (2004-2007) retrospective study of potential organ rs covered by our regional organ procurement organization (OPO). Variables collected ded age, gender, race, cause of brain death (trauma vs. medical) of the potential organ r and elapsed time from declaration of brain death to family approach by OPO. ntial organ donors whose family declined organ donation (DECLINE group) were)ared to potential organ donors whose family consented to organ donation (CONSENT)). Groups were compared using univariate and multivariate analysis.
lts: There were a total of 827 potential organ donors during the four-year period within)PO region. Overall, 471 (57%) families consented to organ donation, while 356 (43%) ned. While there was no difference in male gender between the DECLINE and SENT groups (59% vs. 53%, $p = 0.12$), the DECLINE group had more medical brain is (73% vs. 58%, $p < 0.001$), more potential donors > 50 years of age (43% vs. 34%, p 01), as well as more potential organ donors of Hispanic (67% vs. 43%, $p < 0.001$) and an-American (10% vs. 4%, $p < 0.001$) descent. In addition, time from declaration of death to family approach by OPO was longer for the DECLINE group (350 minutes 59 minutes, $p = 0.03$). Logistic regression identified three independent risk factors for e of consent for organ donation:

	Odds Ratio	p-value
African-American Potential Donor	**1.8**	**.041**
Medical Brain Death	**1.6**	**.004**
Potential Donor > 50 years old	**1.4**	**.050**

lusion: Several barriers exist to family consent for successful organ donation. Family bers of minority populations, medical brain deaths, and older potential donors more decline consent for organ donation. Family education and resource utilization towards specific populations of potential organ donors may help to improve organ donation ent rates. Additionally, delayed family approach by OPO appears to be associated with eased consent rates. System improvements to expedite family approach by OPO may ise lead to improved consent rates.

r #36 4:00 pm, 2/27/09

IER AND SON: SAME MISSION, DIFFERENT PATHS

Feliciano, M.D.
y University School of Medicine

enter: D. V. Feliciano, M.D. **Senior Sponsor:** D. V. Feliciano, M.D.

In February, 2008, I received an email from Air Force Major Raymond Fang was on the General and Trauma Surgery Service at the U. S. Army Landstuhl onal Medical Center near Frankfurt, Germany. He commented that he had an American Red Cross volunteer helping out in the intensive care unit. The nteer's name tag had my surname. After discussion with my son Douglas who that volunteer, Dr. Fang's email said "your son made it over here, when are coming?"

Doug is a former Lieutenant in the U.S. Navy (Special Warfare) who has nteered at Landstuhl, at Brooke Army Medical Center, and has accompanied oled young veterans on skiing vacations. He is a veteran, a patriot, and red me to join the AAST/ACS Senior Visiting Trauma Surgeon Program based ndstuhl Regional Medical Center.

The experiences at Landstuhl have been well-described by numerous or surgeons. The "wounded warrior network", despite the distances involved, is tive in moving soldiers from Iraq or Afghanistan to Landstuhl for secondary IED's create devastating wounds outside of the soldier's body armor, and of the patients I helped care for had severely injured or amputated mities. Operative debridements took hours because of the need to remove aminated fragments of the IED and burned muscle and to repair and cover ed bones, joints, and tendons.

While Doug and I took different paths to Landstuhl to help the wounded, we returned with similar impressions - our soldiers are heroes, they receive state e art care for their devastating wounds, and it was a privilege to participate as unteer at Landstuhl Regional Medical Center.

r #37 4:05 pm, 2/27/09

) DECISIONS: CONFLICTS BETWEEN MEDICAL ETHICS AND MEDICAL RULES NGAGEMENT IN CURRENT COMBAT OPERATIONS

ian, MD; A. Beekley, MD; M. Martin, MD.
gan Army Medical Center

enter: Simon Telian, MD. **Senior Sponsor:** Matthew Martin, MD

KGROUND: Surgeons are on the forefront of dealing with casualties from the many itions that comprise the Global War on Terrorism (GWOT). In select cases, medical urgical decisions may be impacted by operational conditions and local policies, known e medical rules of engagement (MROE). Many of these policies and judgments are by non-clinical personnel without the input of surgeons, and can result in the creation nificant ethical dilemmas.

HODS: The authors have the perspective of being deployed for a collective 60 months q and Afghanistan, being assigned to 8 Combat Support Hospitals and 6 Forward cal Teams under 6 different Medical Brigades. Case reports of conflicts between cal ethics and MROE were collected and analyzed for common themes. Select cases asizing these conflicts and potential resolutions will be presented.

JLTS: Conflicts between medical ethics and MROE were classified into four ories: 1) denying access to needed care due to operational or logistic concerns, 2) nating aggressive care due to real or expected limitations of personnel/supplies, 3) tant care provided to patients with survivable injuries or illness (dual standards of , and 4) transfer of patients to local facilities with inadequate ability to provide care. ples of cases highlighting each category will be presented and the impact of these cts on patient outcomes will be discussed.

CLUSIONS: Medical care in combat operations must take into account multiple tional factors, limitations, and policies which can come into conflict with medical l principles. It is imperative that clinicians take an active role in the formation and mentation of the MROE to ensure the ethical decisions regarding patient care are ced with operational goals.

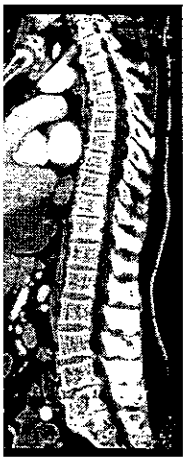
r #38 4:20 pm, 2/27/09

3 TO THE HEART AND WHO'S TO BLAME: YOU GIVE EYEGLASSES A BAD E

erkseth, MD1; NY Patel, MD2; TH Cogbill, MD2
artment of Medical Education, Gundersen Lutheran Medical Foundation and
artment of General & Vascular Surgery, Gundersen Lutheran Health System

enter: Timothy J. Berkseth, MD **Senior Sponsor:** Nirav Y. Patel, MD

cground: A 55-year-old man reportedly rolled out of bed and fell onto the le of his eyeglasses, which impaled him in the anterior chest. He experienced ssociated hemodynamic or respiratory compromise, and he had a sinus m without ectopy. He was alert and oriented, GCS 15. A thin metallic object protruding from his anterior chest just left of midline and cephalad to the id. Breath sounds were clear bilaterally, and cardiovascular examination igs were normal. No JVD was appreciated. There was no external orrhage. Lateral chest radiograph demonstrated a linear metallic structure igh the sternum and into the cardiac silhouette. CT scan confirmed penetration e right ventricle to a depth of 15-16 mm, with associated moderate pericardial ion. He was taken to the operating room, where a subxiphoid pericardial ow was performed with evacuation of approximately 100 cc of bloody fluid. penetrating object was removed under direct vision with no resultant orrhage, and a 24-French Blake drain was placed into the pericardial cavity. patient's postoperative course was unremarkable. The drain was removed and atient discharged on POD#2.



r #39 4:35 pm, 2/27/09

3BED IN THE AORTA: FIXING IT FROM THE INSIDE OUT

lermeier, J Galante, W Pevec, L Scherer
'avis Medical Center

enter: Jeffrey Lodermeier **Senior Sponsor:** Christine Cocanour

year old man was transferred to our Level 1 Trauma center for management of a stab d to the back. He arrived lying face down on the gurney with the knife still protruding his back and imaging that confirmed the knife tip in the thoracic aorta just above the of the diaphragm. He was hemodynamically stable throughout his initial hospital ;e and during transfer. The patient had a prior left thoracotomy and exploratory otomy both for previous penetrating trauma. Given his hemodynamic stability and the idity associated with an open approach to the aorta at this level, particularly given his ous surgical history, an endovascular approach was chosen.

ler to place the patient supine, he was positioned on two angiography tables placed oy side, with the knife between them. The trauma surgeons were scrubbed and ared to provide immediate open control of the injury if the patient developed odynamic instability.

n-table arteriogram confirmed blush from the distal thoracic aorta at the level of the blade. Through a right groin approach, an aortic endograft was positioned at the site ury. Just prior to deployment of the endograft, the knife was removed and the aorta d with the endograft. Completion arteriogram confirmed resolution of the blush from orta and followup CT Angiogram confirmed no leak and a small hematoma at the site horacic spine fracture (where the knife had lodged). The patient tolerated the edure well and was discharged home on post-operative day four. He has undergone v-up CT Scan confirming excellent endograft position and absence of doaneurysm.

ussion:

c endograft use in trauma has been largely limited to blunt thoracic aortic injury. More ntly, reports of endograft repair for penetrating trauma have become available. Most of e reports have involved the treatment of pseudoaneurysms. This is the first case report strate use of the endovascular approach while the injuring object is still impaled. vascular repair of penetrating injuries, especially the aorta, is a feasible alternative presented with complex exposure and a stable patient.

case demonstrates an alternative to open repair for penetrating vascular injury to the - fixing it from the "inside out".

r #40 4:50 pm, 2/27/09

-INVASIVE SURFACE REWARMING OF SEVERE HYPOTHERMIA IS SAFE AND ɜIBLE

ːk J. Offner MD MPH
thony Central Hospital

ɜnter: Patrick J. Offner MD MPH **Senior Sponsor:** Patrick J. Offner MD MPH

ckground: Hypothermia remains a significant problem in severely injured nts and contributes to excess mortality. Recent unavailability of tubing ɾred for continuous arteriovenous core rewarming, as well as the introduction ɯer devices for temperature management, led us to more frequent use of e external rewarming. The **purpose** of this study was to critically evaluate our experience with the Arctic Sun for active external rewarming of severely thermic patients.

thods: Patients with moderate to severe hypothermia recently admitted to our l trauma center were rewarmed with the Arctic Sun. The Arctic Sun is a water-d device that uses unique energy transfer pads to allow efficient, non-invasive ce rewarming. The pads are placed on the patient's torso, arms and legs to adequate contact surface area for efficient rewarming. Adjunctive measures ded maintenance of a warm ambient temperature, infusion of warmed IV fluids ɹse of warm, humidified oxygen for mechanically-ventilated patients. Patients monitored closely for cardiac dysrhythmias and for core temperature drop during the rewarming process. Time required to reach safe core body ɜerature was recorded.

sults: During the winter of 2007, four patients presented with moderate to re hypothermia and were rewarmed with the Arctic Sun. The ages ranged 21 to 48 years, with a mean of 34 years. 3 patients were male and one was le. Three were severely intoxicated while the remaining had been using ine and benzodiazepines. The initial core body temperatures were 34, 30, 29 26° C. Three of the patients were hemodynamically stable whereas one ɜnted with atrial fibrillation and mild hypotension. This responded to volume nistration and low-dose dopamine. All were rewarmed with the Arctic Sun and ɳed 35° C within 4 hours. There were no instances of cardiac disturbance or temperature afterdrop noted during the rewarming process.

nclusions: Active external rewarming of severely hypothermic patients is ble and safe using the Arctic Sun. Advantages include lack of invasiveness ɜase of use. Further study is warranted to confirm these findings.

r #41 5:05 pm, 2/27/09

CESSFUL RESUSCITATION AND RECOVERY OF A YOUNG COLLEGE STUDENT SUSTAINED CARDIAC ARREST, HYPOTHERMIC AND HEMORRHAGIC SHOCK MULTIPLE INJURIES FOLLOWING IMPACT FROM A 400 POUND BOULDER ON NT ADAMS

lill, MD, J Wang, MD, J Chen, MD, J Krieg, MD, R Bracis, MD, R Petrillo, MD, J Long, V B Long, MD
cy Emanuel Trauma Program, Portland, Oregon

enter: Julia Long **Senior Sponsor:** William Long MD

vors of cardiac arrest from blunt trauma are rare. Most survivors are injured in urban onments where the resources of a level 1 trauma center are immediately available. vors of cardiac arrest from extreme environmental hypothermia are well documented. vors of cardiac arrest from blunt trauma occurring in wilderness areas are extremely

year old college sophomore was glissading down Mt. Adams when a tumbling 400 d boulder struck her on the back and left pelvis, propelling her 40 feet down the ıtain to land face down in snow.

aeromedical helicopters are not equipped to do high mountain rescues. The lengthy nse for a military medical helicopter to deploy and pick up this patient with an ISS 66 .002) took over 4 hours. By the time she arrived at a level 1 trauma center, she had no of life, no EKG tracing, no CO2 production.

rauma surgeon on call that day was a cardiac surgeon familiar with rewarming and rting the heart techniques from experience with profoundly hypothermic patients from acific NW wilderness areas. Direct to operating room resuscitation, median otomy, open heart massage, chest and abdominal cavity irrigations with warm saline, ive transfusion, correction of acid base imbalances and coagulopathies, epicardial g led to a successful reanimation of the patient's circulatory, respiratory and renal ion.

ensuing multiple organ failures (6) led to a 3-month ICU stay, multiple operations ding drainage of abscesses and debridement of contused/ infarcted left gluteus les and hemodialysis. The patient regained mobility, cognitive, renal, and enteral ion, allowing us to repatriate her to another level 1 trauma center close to her home for c surgery and rehabilitation.

patient subsequently graduated from college and resumed winter sports activities.

case raises the question once again; does hypothermia reduce the impact of rrhagic shock

r #42 5:20 pm, 2/27/09

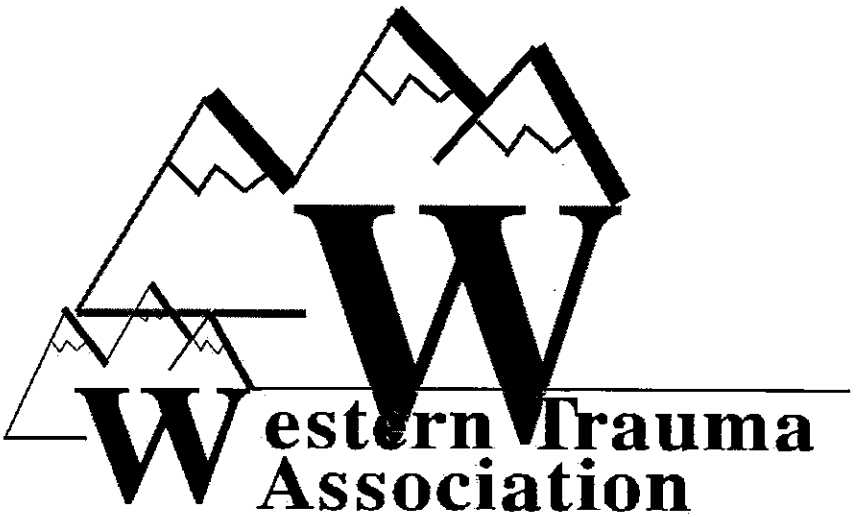
IJOR METROPOLOITAN "FIELD AMPUTATION" TEAM: A CALL TO ARMS...AND 3

Mangram M.D., C.F. Sharp M.D., S.A. Clark M.D., M.V. Hegar-Gonzalez M.D., M. ızo M.D. MBA, E.L. Dunn M.D.
odist Dallas Medical Center

enter: Alicia Mangram M.D. **Senior Sponsor:** Alicia Mangram M.D.

ckground: As early as 1979, suggestions were made to establish utation teams and protocols in major metropolitan areas. It was recognized preplanning on such calls would be valuable to carrying out rescues of that re. Since then, questionnaires and collegial conversations reveal the ence of such teams remains the exception in our nation's cities.
thods: Our team was formed in 1984 after an EMS request for a surgeon to rm an amputation on a person who had become entrapped with both arms in dustrial candy press was made. In its current form, the team consists of an ding trauma surgeon, a resident surgeon, a registered nurse, and a pilot, all ital based. Equipment is limited to medications for sedation and pain control, units of un-crossmatched blood, and a pre-bundled duffle bag of bandages, a el, various saws, and hemostats. Transportation to the scene is provided by elicopter based at our Level II Trauma Center.
sults: Since its inception, the team has been activated three to four times ear, resulting in nine amputation rescues. Three of these cases, presented , are from an unusually busy five weeks during the spring of 2008. The first involves a tree shredding device, the second an industrial auger, and the , a forklift and a steel toed boot. In these cases the utilization of the utation team resulted in successful patient rescues and outcomes.
nclusion: A field amputation team can be an integral part of any EMS em, filling an infrequently used but helpful adjunct to emergency care.

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 a retention of membership as active members. Associate members may not vote, serv committees or hold office.

C. Senior membership is automatically conferred on all members in good standing upor reaching the age of 55, assuming the member is in good standing. A senior membe 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 exempt from all membership requirements, including the payment of dues. They sha have the right to vote and their membership shall not be counted towards specialty o membership quotas. The change to "retired status" is voluntary.

E. Emeritus membership: Senior members of the Association who have made a signific 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 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 membershi

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 b 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
ls 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
sociation 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 o 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 outgoir members-at-large of the Board unless the membership should, by majority vote, elec 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 Associat

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 E 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 t 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.

n 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
ers of the Board of Directors and may participate in any meeting of the Board of Directors.

ARTICLE V
Registration, Fees, Dues, and Assessments

ION 1: Registration Fees
tration fees for annual meetings shall be paid and used to defray the cost of the functions of the
l 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
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
r of the fiscal year by regular or electronic mail. This notification shall follow the rules for
ation of the annual meeting. Associate members shall be required to pay the same dues
ed of active members. Failure to pay dues for three (3) years shall be considered cause for
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
ership so voted by the Board of Directors shall be sent, by either regular or electronic mail, to
ive and senior members at the last address on record with the Association, postage pre-paid.

ION 4: Waiver of Dues and Responsibilities
uirements for retention of membership including payment of dues and attendance at meetings
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,
al disability, or other reasons that would place unreasonable hardship, physical disability, or
reason upon the petitioner.

ARTICLE VI
Voting

ION 1: Voting Rights
active member or senior member in good standing shall be entitled to one vote on each matter
tted 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 voti 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 appointed 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 a the annual meeting.
9) Organize, with assistance from the other Officers and Board Members, the registratic process at the annual meeting.

SECTION 6. Historian
The Historian should maintain and safeguard the archives of the Association. The Historian s an ex-officio member of the Board of Directors. In case of a vacancy by reason of death, resi 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, invite 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 meet Each five years the historian shall prepare the history of the Association from the time of the l 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 comr shall submit a slate of nominees for the various offices of the Association to the annual meetir 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 availat as many other members as the Program Chairman and President deem necessary to a maxin ten (10) members. The Chair and the President will appoint the committee members. The Pre and the Chairman of the Publications Committee shall serve as ex-officio members. The Chai 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 wh 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 on 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 appropriat Chairman of the Program Committee shall serve as an ex-officio member of the committee. T 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 choosi

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, airman will consult with a member of the Editorial Board of The Journal of Trauma designated President.

n 5: Multicenter Trials Committee
ulticenters 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 cted 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 ss meeting and serve as an ex-officio member of the Board of Directors.

n 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 ers, 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.

n 7: Other Committees
ad hoc committees may be established by the Board of Directors. The creation of additional ng committees, proposed by the Board of Directors, requires the approval of a majority of ers 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

n 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, 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 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 connectio 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

›r or officer is permissible under the circumstances because such person met the applicable ırd 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.

ın 5. Advance Payment of Expenses; Undertaking to Repay.
ssociation may pay for or reimburse the reasonable expenses (including attorneys, fees) ɜd by a director or officer who is a party to proceeding in advance of the final disposition of the ɜding 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.

ın 6. Reports to Members.
event that the Association indemnifies, or advances the expenses of, a director or officer in ıdance 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.

ın 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.

ın 8. Insurance.
oard of Directors may exercise the Association's power to purchase and maintain insurance ding without limitation insurance for legal expenses and costs incurred in connection with ding 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, ıry of another domestic or foreign corporation, nonprofit corporation against any liability ɜd 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 l 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 contir 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.

n 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 gs 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 er 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 ı 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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