THIRTY-SIXTH ANNUAL MEETING

Big Sky 2006

Western Trauma Association

February 26 - March 3, 2006

Big Sky, Montana

WESTERN TRAUMA ASSOCIATION

36TH Annual Meeting
Big Sky, Montana
February 26 - March 3, 2006

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36th Annual Meeting
Big Sky, Monatana

2005-2006

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Harold F. Sherman	2006	Big Sky

The 2007 WESTERN TRAUMA ASSOCIATION Meeting will be at:

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

RESIDENT PAPER COMPETITION

:arl G. Young of Minneapolis was a founding member of the Western Trauma Association and its 14th dent. He died of a myocardial infarction, Monday, February 27, 1989, while skiing at Snowbird during the 19th al Meeting of the Association.

'oung received his medical degree from the University of Rochester, N.Y. and Ph.D. in surgery from the ersity of Minnesota. He completed advanced training in cancer research at Harvard, a fellowship in ovascular surgery at Baylor University in Houston and studied microvascular surgery at the University of ornia–San Diego.

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

Residents Paper competition was begun in 1991 as a tribute to Dr. Young's memory and his "spirit of inquiry, of learning ... and commitment in service to mankind."* The award is given to the best resident paper ented at the Annual Meeting.

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

EARL G. YOUNG AWARD RECIPIENTS

Resident	Institution	Year
Joseph Schmoker, M.D.	University of Vermont	1991
Joseph Schmoker, M.D.	University of Vermont	1992
Charles Mock, M.D.	University of Washington	1993
Gino Travisani, M.D.	University of Vermont	1994
Phillip C. Ridings, M.D.	Medical College of Virginia	1995
David Han, M.D.	Emory University	1996
Preston R. Miller, M.D.	Wake Forest University	1997
Geoffrey Manley, M.D., PhD.	UC – San Francisco	1998
James M. Doty, M.D.	Medical College of Virginia	1999
D.J. Ciesla, M.D.	Denver Health Medical Center	2000
Ricardo J. Gonzales, M.D.	Denver Health Medical Center	2001
Scott C. Brakenridge	Cook County Hospital	2002
Adena J, Osband, M.D.	UMDNJ-New Jersey Medical School	2003
Cindy Lee, M.D.	UMDNJ-New Jersey Medical School	2004
Earnest A. Gonzalez, M.D.	University 0f Texas at Houston	2005
Jennifer M. Watters, M.D.	Oregon Health & Science University	2005

WESTERN TRAUMA ASSOCIATION

IN MEMORIUM

Earl G. Young, MD
February 27, 1989

Gerald S. Gussack
August 25, 1997

"Paint the Ceiling" Lectureship

G. Jerry Jurkovich, M.D.	1997	Snowbird, Utah
John W. McGill, M.D.	1998	Chateau Lake Louise, Alberta
William T. Close, M.D.	1999	Crested Butte, Colorado
Jimmy Cornell	2000	Squaw Valley, California
Geoff Tabin, M.D.	2001	Big Sky, Montana
James H. "Red" Duke, M.D.	2002	Chateau Whistler, British Columbia
David V. Shatz, M.D.	2003	Snowbird, Utah
Susan and Tim Baker	2004	Steamboat Springs, Colorado
Alex Habel, M.D.	2005	Jackson Hole, Wyoming
Andrew Schneider	2006	Big Sky, Montana

WESTERN TRAUMA ASSOCIATION
Schedule of Events
February 26 – March 3, 2006

lay		Room
)m (24 hours)	WTA Office	Lake (Conference Center)
)m – 5:00pm	Nominating Committee	Canyon (Conference Center)
)m – 7:30pm	Registration	Summit Lobby (Summit)
)m – 7:00pm	Welcome Reception	Talus Room (Summit)
)m – 7:00pm	Children's Reception	TBD
)m	Past President's Meeting	Canyon (Conference Center)
)m	WTA Foundation Board Meeting	Canyon (Cdhl68690onference Center)
day – Friday		
ours)	WTA Office	Lake (Conference Center)
)m – 8:00am	Attendee Breakfast	Outside Jefferson Ballroom (Conf Ctr)
)m – 9:00am	Scientific Sessions	Jefferson Ballroom (Conference Ctr)
)m – 9:00am	Friends & Family Breakfast	TBD
)m – 6:00pm	Scientific Sessions	Jefferson Ballroom (Conference Ctr)
day		
)m – 7:00pm	Board of Directors Meeting	Canyon (Conference Center)
day		
)am – 12:00pm	Ski Race	Mountain
)pm – 1:30pm	BBQ Outside	HDR
)m	WTA Multi-Center Trial Meeting	Gibbon (Conference Center)
nesday		
)m – 6:00pm	Business Meeting	Jefferson Ballroom (Conference Ctr)
)m – 6:00pm	Book Club	To Be Announced
sday		
)m – 7:30pm	Cocktails outside Dinner	Madison & Jefferson Ballroom (Conf Ctr)
)m – 10:30pm	Children's Party	Lake/Canyon (Conference Center)
)m – 10:30pm	Adult Banquet & Dance	Madison & Jefferson Ballroom (Conf Ctr)

PROGRAM

Scientific Session 1

Monday AM, February 27, 2006
Moderator: Harold Sherman, MD
Location: Jefferson Ballroom (Conference Ctr)

Paper	Time	Title/Authors	Pa
1	7:20 AM	¶Testing Of Modified Hemostats In A Swine Model Of Lethal Groin Injury N. Ahuja, MD, T.A. Ostomel, MS, G.A. Stucky, PhD, E. Gonzales, MD, Z. Chen, MD, PhD, P. Rhee, MD, G. Velmahos, MD, M. deMoya, MD, H.B. Alam, MD	26
2	7:40 AM	¶The Effect Of An Institutional Pathway On TBI Resuscitation With 7.5% Hypertonic Saline J.L. Pascual MD, PhD, E. Maloney CRNP, P.M. Reilly MD, M.K. Keutmann BA, S. Stein MD, P.D. Leroux, MD, V.H. Gracias MD	28
3	8:00 AM	¶Mental Illness Increases The Risk Of Unintentional Injury And Recidivism JJ, Wan M.D.; L, Khaw M.S.; DJ, Morabito R.N., M.P.H; MM, Knudson M.D.; RA, Dicker M.D.	30
4	8:20 AM	¶Waiting For The Patient To "Sober Up": Effect Of Alcohol Intoxication On Glasgow Coma Scale In Brain Injured Patients J. Sperry, M.D., L. Gentilello, M.D., J. Minei, M.D., R. Diaz-Arrastia M.D., S. Shafi, M.D.	32
5	8:40 AM	¶The Anterolateral Thigh Flap (ALT) Is A Highly Effective Technique In Complex Lower Extremity Trauma J Park MD, E Rodriguez MD, G Bochicchio MD,MPH, R Bluebond-Langer MD, and T Scalea MD.	34

¶ Earl Young Competition

entific Session 2
nday PM, February 27, 2006
derator: David Shatz, MD
cation: Jefferson Ballroom (Conference Ctr)

ber	Time	Title/Authors	Page
	4:00 PM	¶ Intentional Burning: In The Heat Of The Argument B Tibbs MD, WL Ingram MD, DV Feliciano MD, CJ Dente MD	36
	4:20 PM	¶ Acute Lower Extremity Compartment Syndrome (ALECS) Screening In Critically Ill Trauma Patients R. Kosir, S. Todd, J. Selby, C. Cocanour, R. Kozar, G. Vercruysse, E. Gonzalez, N. Ware, F. Moore	38
	4:40 PM	¶ Definitive Establishment Of Airway Control Is Critical For Optimal Outcome In Lower Cervical Spinal Cord Injury V.J. Hassid, M.A. Schinco, J.J. Tepas, A.J. Kerwin, M.M. Griffen, S. Khetarpal, T.L. Murphy, E.R. Frykberg,	40
	5:00 PM	¶ Strategies For Recruitment Into A Comprehensive Fall Prevention Program: If We Build It, Will They Really Come? J,Shandro MD MPH; DA,Spain MD; E,Corman MRA; RA,Dicker MD	42
	5:20 PM	¶Fighting Ali: The Effects Of Hypertonic Saline And Pentoxifylline In An Animal Model Of Hemorrhagic Shock J. Deree MD, J.O. Martins PharmD, J. Putnam BS, A. Leedom BS, B. Lamon BS, T. deCampos MD, D.B. Hoyt MD, R. Coimbra MD, PhD	44
	5:40 PM	¶ Increased Insulin Requirements Are Associated With Pneumonia After Severe Injury R Martin, J Smith, J Hoth, P Miller, J Meredith, M Chang	46
	6:00 PM	Board of Directors Meeting	

arl Young Competition

Scientific Session 3
Tuesday AM, February 28, 2006
Moderator: Andy Michaels, MD
Location: Jefferson Ballroom (Conference Ctr)

¶ Earl Young Competition

entific Session 4
esday PM, February 28, 2006
derator: Brent King , MD
cation: Jefferson Ballroom (Conference Ctr)

ber	Time	Title/Authors	Page
	4:00 PM	Etomidate Use In Trauma Patients: Useful Adjunct Or Dangerous Drug? K.L.Kaups, M.D	60
	4:20 PM	Trauma Center Financial Crisis Precipitated By Repeal Of No Fault Auto Insurance C. Mains, MD; P. Offner, MD; R. Madayag, MD; G. Pinson, MD; F. Seale, MD; E. Pulido, MD	62
	4:40 PM	Prone Ventilation In Trauma/Surgical Patients With ALI/ARDS - Is It Beneficial? J Davis MD, E Moore MD, D Lemaster MSN, J Bilello MD, R Townsend MD	64
	5:00 PM	**Presidential Address** **"No More Mr. Knife Guy"** Harold F. Sherman, MD	
	6:00 PM	Multi-Institutional Trials Committee	

Scientific Session 5
Wednesday AM, March 1, 2006
Moderator: Krista Kaups, MD
Location: Jefferson Ballroom (Conference Ctr)

ientific Session 6
ednesday PM, March 1, 2006
oderator: R. Larry Reed, MD
ıcation: Jefferson Ballroom (Conference Ctr)

per	Time	Title/Authors	Page
	4:00 PM	An Unexpected Effect Of Enhance Border Security; Falls Frfom The International Border Fence B Potenza, K Hodgekiss-Harlow, D Hoyt, R Coimbra, P. Friedlund and D Fortlage	74
	4:20 PM	Our Bloody Devices: Incidence Of Instrument Contamination M. deMoya, M.D. K. Inaba, M.D. D. Shatz, M.D.	76
	4:40 PM	The Impact Of The Consolidation And Corporatization Of Gang Activity On Gun Violence R Lavery, MA, A Mohr, MD, M Passannante, PhD, D Livingston, MD	78
	5:00 PM	Business Meeting	
	5:00 PM	Ladies Book Club – Location TBA	

Scientific Session 7
Thursday AM, March 2, 2006
Moderator: Fred Moore, MD
Location: Jefferson Ballroom (Conference Ctr)

Paper	Time	Title/Authors
	7:00 AM	**Invited Lecture - "The Nation's Medical Preparedness: will you know what to do?"** Jeffrey W. Runge, MD FACEP Chief Medical Officer United States Department of Homeland Security
27	8:00 AM	Pre-Hospital Tourniquet Use In Operation Iraqi Freedom: Effect On Hemorrhage Control And Outcomes A Beekley, J Sebesta, L Blackbourne, J Holcomb
28	8:20 AM	The Usage And Availability Of Blood Products In Multiple Casualty Incidents: The Experience Of A Level 1 Trauma Center In Israel D.Soffer MD, J.Klausner MD, D. Bar-Zohar MD, O.Szold MD, C.I. Schulman MD, MSPH, P.Halpern MD, A.Shimonov RN, M.Hareuveni PhD, O.Ben-Tal MD.
29	8:40 AM	Fresh Frozen Plasma Should Be Given Earlier To Patients Who Require Massive Transfusion E, Gonzalez, F, Moore, J, Holcomb, C, Miller, R, Kozar, S, Todd, C, Cocanour, B, McKinley

ıtific Session 8
sday PM, March 2, 2006
tion: Jefferson Ballroom (Conference Ctr)

r	Time	Title/Authors	Page
	4:00 PM	**Panel of Experts** Jerry Jurkovich, MD Fred Moore, MD Jim Davis, MD	88
	5:00 PM	**Paint the Ceiling Lecture** **"The doctor made me do it."** Andrew Schneider Author and Investigative Reporter	

Scientific Session 9
Friday AM, March 3, 2006
Moderator: Kim Davis, MD
Location: Jefferson Ballroom (Conference Ctr)

Paper	Time	Title/Authors
30	7:00 AM	Trauma Care In The Jungles Of Ecuador: Where There Is No ATLS S.Z. Aboutanos, M.D.; M.B. Aboutanos, M.D., M.P.H.; E.B. Rodas, M.D.; F.E. Mora, M.D.; L.G. Wolfe; T.M. Duane, M.D.; A.K. Malhotra, M.D.; R.R. Ivatury, M.D.
31	7:20 AM	NTDB Outcomes Expose AIS Severity Score Inconsistencies R. Reed, S. Eachempati, F. Luchette, T. Esposito, J. Fildes, P. Barie, R. Gamelli
32	7:40 AM	Tachycardia: Is It Truly A Vital Sign? R. Nirula, C. Guse, L. Gentilello, K. Brasel
33	8:00 AM	Obesity Increases The Risk Of Postinjury Organ Dysfunction But Not Death In High Risk Trauma Patients DJ Ciesla MD, EE Moore MD, JL Johnson MD, JM Burch MD, CC Cothren MD, A Sauaia PhD
34	8:20 AM	Six Days Versus Six Weeks Of Systemic Antibiotics In The Treatment Of Adult Osteomyelitis G. Cierney III, MD J.T. Mader, MD, K.E.Zorn, RN
35	8:40 AM	L-Arginine Infusion Improves Survival Without Generating INOS In Swine Subjected To Sequential Shock And Abdominal Compartment Syndrome H Yoshihara, MD, AK Malhotra, MD, C Blochers, BS, M Mangino, PhD, HJ Sugerman, MD, RR Ivatury, MD

ıtific Session 10
ıy PM, March 3, 2006
erator: David Livingston, MD
tion: Jefferson Ballroom (Conference Ctr)

ABSTRACTS

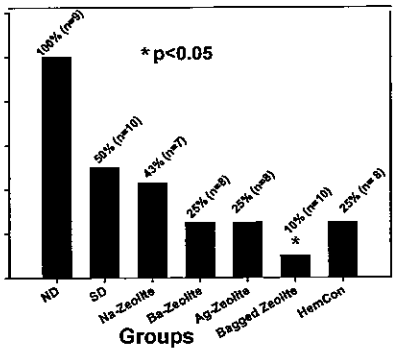
TING OF MODIFIED HEMOSTATS IN A SWINE MODEL OF LETHAL GROIN JRY

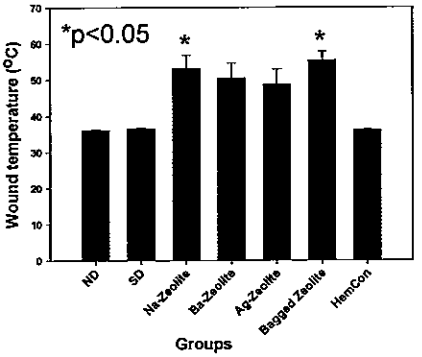
huja, MD, T.A. Ostomel, MS, G.A. Stucky, PhD, E. Gonzales, MD, Z. Chen, MD, PhD, P. , MD, G. Velmahos, MD, M. deMoya, MD, H.B. Alam, MD.
ormed Services University, Bethesda, MD and Massachusetts General Hospital, Boston, MA

enter: Naresh Ahuja, MD Senior Sponsor: Hasan B. Alam, MD

iave previously identified a granular zeolite hemostat (ZH) as an effective agent for control of e bleeding, and it is currently being used by the US troops in the battlefield. ZH causes an ermic reaction on application, which theoretically can be decreased by altering its chemical osition or changing its physical properties. However, the effect of these on the hemostatic acy is unknown. We tested modified zeolites and a chitosan hemostat against controls in a swine el of battlefield injury.

hods: A complex groin injury was created in 60 swine (40-55 kg). This included semi-ection of the proximal thigh, and complete division of the femoral artery and vein. After 3 ites, the animals were assigned to: 1) no dressing (ND), 2) standard dressing (SD), 3-5) SD+ ically modified ZHs, where Ca was substituted with Na, Ba, or Ag respectively, 6) SD+ ically modified ZH, where "beads" were packaged in a fabric bag, 7) SD+ chitosan based ostat (HemCon). Resuscitation was started 15 minutes after application of dressing (500 ml 0f etastarch over 30 min). Survival for 180 minutes was the primary endpoint for this study. In ion, blood loss, wound temperatures, and histological tissue damage were recorded. (Data nted as means ± SEM, *p<0.05 vs. ND).





ılts: Application of bagged ZH decreased the mortality from 100-10% ($p<0.05$), whereas the Ba Ag substituted zeolites, and HemCon were associated with a mortality rate of 25%. Ionic titution of zeolite decreased the in-vivo temperature peak by 5-10°C. In contrast to our previous /, no histological tissue damage was noted in this experiment.

clusions: The use of zeolite hemostat can control hemorrhage and dramatically reduce mortality a lethal groin wound. Modifications of zeolite hemostat can decrease the exothermic reaction gh to prevent tissue damage.

NOTES

EFFECT OF AN INSTITUTIONAL PATHWAY ON TBI RESUSCITATION WITH HYPERTONIC SALINE

Pascual MD, PhD, E. Maloney CRNP, P.M. Reilly MD, M.K. Keutmann BA, S. Stein MD, P.D. ux, MD, V.H. Gracias MD
ersity of Pennsylvania, Philadelphia, PA

enter: Jose L. Pascual Senior Sponsor: Vicente H. Gracias

TRODUCTION: Resuscitation of traumatic shock with hypertonic saline (HTS) is known to t in beneficial hemodynamic and immunomodulatory effects. Recently, HTS resuscitation has shown to decrease intracranial pressure (ICP) in some head injury studies. Scant animal data s which has evaluated brain tissue oxygenation ($PbtO_2$) following HTS administration. To date no human studies have evaluated direct $PbtO_2$ in head injury victims following HTS administration and no correlation with changes in intracranial pressure (ICP) and cerebral perfusion pressure (CPP) have been demonstrated.

Fig 1

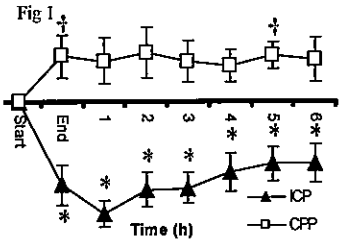
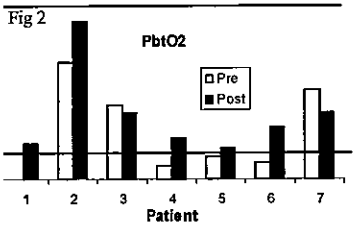


Fig 2



HYPOTHESIS: We postulated that administration of HTS in hypotensive head injured patients would lower ICP and increase CPP while raising $PbtO_2$ above hypoxic levels (>20mmHg)

METHODS: 8 consecutive head injured patients were administered 250cc of 7.5% NaCl solution over 30 minutes if they fulfilled strict institutional clinical pathway criteria including: a mean arterial pressure (MAP) $\leq$ 80mmHg, a GCS $\leq$ 8, an ICP $\geq$ 20 and serum $[Na^+] < 155$ mEq/L. All patients deemed eligible underwent placement of a Licox© intracerebral monitor as well as a pulmonary artery catheter if not already in place. Repeated administrations were not performed within 6 hours of initial infusion. At the start of infusion as well as at its completion and hourly for 6 hours, the following data was collected: , MAP, cardiac index, CPP, ICP, and $PbtO_2$. Vasopressor requirements, serum $[Na^+]$ and GCS also recorded. ANOVA with Bonferroni correction was used for statistical analysis. IRB oval was obtained for this review.

ESULTS: Figure 1: data presented as percent change (%Δ) from the start of HTS infusion rt') over time for a measured parameter (ICP [n=8], CPP [n=8]) 'End'=end of infusion. Figure nly patients 4, 5, 6 had a pre-infusion $PbtO_2 < 20$mmHg, and all their post-infusion $PbtO_2$ rose n hypoxic levels. *$p<0.01$ vs. start ICP, †$p<0.05$ vs. start CPP.

SCUSSION: HTS infusion in brain injured patients results in a significant and sustained ction of ICP, and CPP elevation is similarly durable. Tissue oxygenation tends to improve with infusion in patients with hypoxic brain tissue.

Hypoxia ≠ Hypotension

NTAL ILLNESS INCREASES THE RISK OF UNINTENTIONAL INJURY AND :IDIVISM

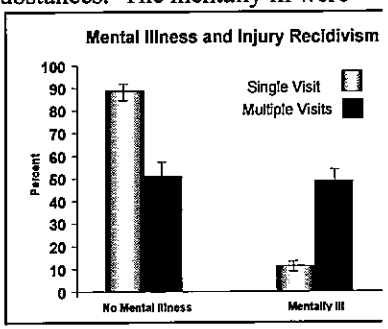
Van M.D.; L, Khaw M.S.; DJ, Morabito R.N., M.P.H; MM, Knudson M.D.; RA, Dicker M.D.
/ersity of California, San Francisco, CA

enter: Jennifer J. Wan, M.D. Senior Sponsor: Rochelle A. Dicker, M.D.

ıckground: 12% of Americans are diagnosed and treated for mental illness annually. ıtionships between mental illness and intentional injury have been well identified. Pre-existing tal illness increases the risk of developing post-traumatic stress disorder. Previous studies have ribed potential high-risk features for injury in the mentally ill such as decreased focus, attention pain sensitivity. However, *unintentional* injury among mentally ill adults has not been well acterized. The purpose of this study was to identify relationships between Axis I and II hiatric diagnoses and unintentional injury. We hypothesized that the mentally ill have distinct rns of injury mechanisms, and that psychiatric illness is a risk factor for increased rates of tentional injury and injury recidivism.

ethods: In this retrospective review, trauma registry data and medical records were used to tify patients admitted with blunt injuries at a Level I trauma center in 2004. Data collected ıded mechanism of injury, mental health diagnoses, substance abuse history, and number of at injury events. The proportion of mentally ill patients hospitalized for unintentional injury was pared to local and national data. Chi square analysis was used to compare rates of individual hanisms between the mentally ill and other patients with unintentional injury. Specific mental ss diagnoses and their relationship to mechanism of injury were also examined. Odds ratios for y recidivism and mental illness were calculated.

sults: Of the 965 patients admitted for blunt injury, there were 810 unintentional injuries, 17% hom were mentally ill. 58% of this population also abused substances. The mentally ill were ificantly more likely to fall and to be hit by cars and less y to be in a motor vehicle crash ($p<0.001$), even when ıunting for substance abuse. Specific mental illnesses e closely related to specific mechanisms of injury. For nple, among schizophrenics, 63% fell and 31% were hit ars compared to 32% and 23% respectively among those were not mentally ill. The mentally ill are nearly 8 times e likely to have more than one hospital visit for injury).001) (see figure).



ɔnclusions: The mentally ill had a different pattern of tentional injury from those without mental illness and they were more likely to be injury livists. This increased risk of unintentional injury has implications for establishing and aining appropriate mental health treatment as a modality of injury prevention. Future public y and public health funding agendas should consider the burden of injury in this population n budgeting for mental health care.

Face to face survey 4000

NOTES

31% have characteristics
12% carry dx

er #4 8:20 AM, 2/27/2006

ITING FOR THE PATIENT TO "SOBER UP": EFFECT OF ALCOHOL TOXICATION ON GLASGOW COMA SCALE IN BRAIN INJURED PATIENTS

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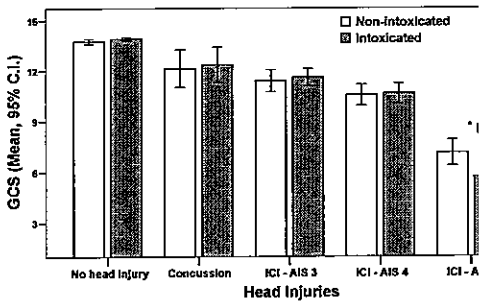
senter: Jason L Sperry M.D. Senior Sponsor: Larry Gentilello M.D.

jective: Between 35%-50% of traumatic brain injury (TBI) patients are under the influence of hol. Level of consciousness may be reduced by alcohol intoxication, limiting the ability of the sgow Coma Scale (GCS) to accurately assess severity of TBI in intoxicated patients. We othesized that alcohol intoxication significantly depresses GCS in TBI patients, and should be n into account in order to avoid overly aggressive monitoring and therapeutic interventions.

thods: Retrospective analysis of a large, urban level I trauma center registry (1995-2004) was ertaken. The study population consisted of all blunt injured TBI patients tested for blood alcoho centration (BAC) upon presentation (n=1203). Patients were divided into two groups: Intoxicate an BAC 180±92 mg/dl, n=629) and Non-intoxicated (BAC=0, n=574). TBI was classified using)-9 codes as concussion alone (ICD-9 850, n=89) and intracranial injury (ICI, ICD-9 851-854, 114). Severity of ICI was further classified using the Abbreviated Injury Score (AIS). Mean S was compared between the Intoxicated and the Non-intoxicated groups for each type of TBI. ddition, subgroups of patients who were either endotracheally intubated or hypotensive upon val (systolic blood pressure < 90 mm Hg) were analyzed separately to rule out their potential founding effects on GCS. Finally, to assess for a threshold effect, severely intoxicated patients AC > 250 mg/dl, mean±SD 310±54, n=117) were compared to non-intoxicated patients for each e of TBI.

ults: Intoxicated and Non-intoxicated TBI ents were clinically similar in age (34±12 vs. 18 years), systolic blood pressure (131±29 vs. ±33 mm Hg), and overall injury severity (ISS 11 vs. 22±12). Alcohol intoxication had little ct on GCS, with less than a single point erence in all types of TBI, except the most erely injured (AIS 5 injuries, GCS difference points). These results were not altered by otracheal intubation, systemic hypotension or ere intoxication.



nclusion: Alcohol intoxication does not result in clinically significant changes in GCS in blunt I patients. Hence, alterations in GCS in TBI should not be attributed to alcohol intoxication, as ng so might result in inappropriate delays in monitoring and therapeutic interventions.

NOTES

E ANTEROLATERAL THIGH FLAP (ALT) IS A HIGHLY EFFECTIVE TECHNIQUE COMPLEX LOWER EXTREMITY TRAUMA

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enter: Julie Park, MD Senior Sponsor: Thomas Scalea, MD

kground: Complex soft tissue/extremity injury often requires the recruitment of fresh tissues g microsurgery for reconstruction. The anterolateral thigh (ALT) flap's long pedicle and ɔtability in supporting a variety of tissues (muscle, fascia, soft tissue) make it a valuable tool for ːosurgical reconstruction in these challenging patients. There are few reports evaluating the ːacy of the ALT flap in trauma patients. Our objective was to evaluate the utility of the ALT flap ˈeconstruction in the traumatically injured patient.

hods: Prospective data were collected on all patients who underwent ALT harvest with ɔnstruction over a 3 ½ year period at a Level 1 trauma center. Demographics including age, ler, Injury Severity Score (ISS), mechanism of injury, and size of reconstruction (length x width were collected. ALT flap success was graded as successful, partially successful, or failure as per ːt clinical guidelines.

ults: Sixty-six patients underwent 70 ALT flap harvests over the study period. The majority of ɛnts were male (77%) and were admitted due to blunt mechanism of injury (75%). The mean was 37 ± 13 years with a mean ISS of 17.9 ± 8. Recipient areas of reconstruction were lominantly lower extremity 80% (n=56). Others sites included were head and neck (11%), upper emity (6%), and abdominal wall (3%). The overall mean flap size was 20.8 x 8.5 cm. In the case ɔwer extremity limb salvage, 66% of the flaps were harvested from the ipsilateral side of injury. most common type of fractures in the study population were tibia (n= 36) followed by fibula (n= calcaneus (n=5), metatarsal (n= 3) and femur (n=2). Total flap success rate was 91.4%, with 4 l flap failures (5.7%) and 2 partial flap failures (2.9%).

ıclusion: Trauma patients pose complex reconstructive challenges. The ALT is an effective flap ɪrauma reconstruction, particularly in lower extremity salvage. We have shown that the ALT can be performed successfully in the traumatically injured patient even when harvested from the lateral lower extremity.

NOTES

ENTIONAL BURNING: IN THE HEAT OF THE ARGUMENT

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enter: Brian Tibbs MD Senior Sponsor: David V Feliciano MD

ɔjectives: Assault by burning is a relatively underreported cause of thermal injury among all age ps. We attempted to categorize the epidemiologic factors and outcome of victims of intentional ing not associated with child abuse.
thods: Retrospective review of 2882 consecutive patients admitted to an urban tertiary burn er between April, 1997, and August, 2005. Data collected included age, gender, Total Body ace Area (%TBSA) burned, depth and type of burn, patient relationship to assailant, associated ies, Injury Severity Score (ISS), length of stay (LOS) and patient outcome.
sults: Of 2882 admissions, 80 (2.8%) patients (70% male, mean age 36.6 ± 15.1 years) ıined intentional burns. Mean %TBSA burn of all intentionally burned patients was 17.9% ge 1-100%). Etiology was flame in 38 patients, scald in 28 patients, contact in 7 patients, nical in 6 patients and electrical in one patient. Mean %TBSA burned in those patients was , 10.5%, 5.2%, 6% and 3%, respectively. Assailant was known to the victim in 44 cases (55%), in 24 of 80 (30%) cases, the assailant was an intimate partner. In 7 (8.7%) other cases the ilant was a family member, while one patient sustained his injury as a result of terrorism. 44 ents had 2nd degree burns, 33 had 3rd degree and 3 had 4th degree. Additional injuries were ıined in 17 patients (21.3%) and were generally minor. Overall ISS was 10.4 with non-burn ISS aging 4.2. Outcome data are listed in the table. All patients who died sustained flame burns of ter than 50%.

ıtient Outcome Data

	Male (n)	Female (n)	Age (Mean)	LOS (Days)	%TBSA Burned	Mortality
All	56	24	36.6	14	17.9%	7 of 80 (8.7%)
Associated Injuries	12	5	39.1*	13*	21.2%*	3 of 17 (17.6%)*
'ithout Associated Injuries	44	19	36*	15*	17%*	4 of 63 (6.3%)*

not significant

clusions: (1) Intentional burn injuries are not only a result of child abuse. (2) Flame burn is the t common type of intentional thermal injury and accounted for the largest burns and all ıalities. (3) Associated injuries occur in a minority of patients and are generally minor.

NOTES

UTE LOWER EXTREMITY COMPARTMENT SYNDROME (ALECS) SCREENING IN TICALLY ILL TRAUMA PATIENTS

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enter: Roman Kosir, MD Senior Sponsor: Christine S. Cocanour, MD

LECS is a devastating complication that often presents silently in critically ill trauma patients
use the physical exam (PE) is unreliable. Therefore, we developed a protocol to screen high-
patients.

ethods: This prospective observational study included all shock trauma intensive care unit
ICU) patients who met specific high-risk criteria including: pulmonary artery catheter (PAC)-
cted shock resuscitation, open or closed tibial shaft fracture, major vascular injury below the
ic bifurcation, abdominal compartment syndrome, or pelvic/lower extremity crush injury.
ents were screened upon admission and every 4 hours thereafter for the first 48 hours of
ission. Screening included PE and anterior/deep posterior calf compartment pressure
surements when PE was concerning or not reliable. A positive screening, defined as a delta P <
mmHg (where delta P is the difference between the diastolic blood pressure and the compartment
sure), mandated a four-compartment fasciotomy. Data are presented as mean ± standard
iation.

esults: Over 6 months ending July 2005, there were 2,582 admissions to our Level I Trauma
ter. Four hundred and twenty-eight of these were admitted to the STICU, of which 45 (11%)
one or more of our inclusion criteria. Patient age was 38.0 ± 16.6 years, 76 % were male and the
ry severity score was 29.0 ± 12.0. Eighty-seven percent of those that met inclusion criteria had a
t mechanism of injury, with the most common cause being motor vehicle collision (51%).
nty-six (58%) patients had one inclusion criterion, 11 (24%) two, 6 (13%) three, and 2 (4%)
. ALECS occurred in 9 patients (20% of screened patients and 2% of STICU admits). The
nostic delta P was 20.6 ± 3.7 mmHg. The time from STICU admission to the development of
CS was 8.9 ± 5.0 hours (range 3-18 hours). The findings at fasciotomy were all consistent with
partment syndrome (muscle bulging without necrosis).
ie most frequent inclusion criterion was PAC-directed shock resuscitation in 27 (60%) patients.
(22%) of these patients developed ALECS. This subset of patients was in severe shock with a
deficit of 14.7 ± 5.1 and a lactate of 14.7 ± 4.3. The total fluid requirements in these patients fo
first 24 hours of admission were 42.2 ± 21.8 L (crystalloids: 23.0 ± 12.9 L and blood products:
± 13.4 L). A total of 11 (24%) screened patients died, including 6 (67%) who developed
CS. In PAC-directed shock resuscitation patients, the mortality rate was 83%. None of the non-
ened patients developed ALECS and 6% died.

onclusions: We developed a sensitive screening protocol for the early detection of ALECS.
ed on these results we have shortened the screening period to 24 hours. Future plans include re-
uating the modified protocol and identifying better predictors for the development of ALECS.

NOTES

FINITIVE ESTABLISHMENT OF AIRWAY CONTROL IS CRITICAL FOR OPTIMAL TCOME IN LOWER CERVICAL SPINAL CORD INJURY

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versity of Florida, Health Science Center, Jacksonville, FL

enter: Victor J. Hassid, M.D. Senior Sponsor: Kimberly Davis, M.D.

ackground: Respiratory complications can inevitably undermine outcome from low cervica al cord injury (LSCI). Most devastating of these is catastrophic loss of airway control (CLA) s study sought to determine the incidence and effect of catastrophic airway loss and to define th d for elective intubation with subsequent tracheostomy (TRACH) to prevent potentially fata comes.

ethods: A database of 54,838 consecutive patients (pts) treated in a Level I trauma cente veen January 1988 and December 2004 was queried to identify pts with LSCI (C5-TI) withou ed head injury. Pts were then stratified as complete (CSCI) or incomplete (ISCI) groups. Age ry severity, need for airway intervention, and mortality were analyzed for each group usin ier's exact test, accepting $p<0.05$ as significant.

esults: One hundred and eighty six pts met inclusion criteria. The majority of LSCI wer plete (58%). Overall, 127 (68%) LSCI pts required intubation, 88 (69%) required TRACH an died (15% of study population). Within each group there was no difference in age or injur erity as measured by ISS.

	Intubation No. (%)	Trach No. (%)	Mortality No. (%)	CLA No. (%)
SCI (n=108)	Y 97(91)*	73 (75)	16 (17)	0
	N 11 (9)*	0	10 (91)	6
SCI (n=78)	Y 30 (38)	15 (50)	1 (1.3)	0
	N 48 (62)	0	0	0

0.0001, CLA in CSCI intubated vs non-intubated

11 CSCI pts for whom intubation was not considered, 4 were at family's request for withdrawa are. Six of the remaining 7 resulted in fatal catastrophic airway loss. One patient survived t harge to rehabilitation. Pts with ISCI required intubation less frequently (38%), however 50% o e required TRACH for intractable pulmonary failure.

onclusions: These data indicate that regardless of completeness of LSCI, immediate, thoroug luation for respiratory failure is necessary. Early definitive airway management and long ter ACH for CSCI is critical for survival. For pts with ISCI, respiratory failure should prompt timel ACH.

NOTES

ɪATEGIES FOR RECRUITMENT INTO A COMPREHENSIVE FALL PREVENTION)GRAM: IF WE BUILD IT, WILL THEY REALLY COME?

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enter: Jamie Shandro, MD Senior Sponsor: Rochelle A. Dicker, MD

ıckground: More than 1/3 of adults >65 suffer a fall each year and half of those are expected to ıgain within a year, facing significant morbidity and mortality. Studies have identified ɪifiable risk factors for falls, and there is evidence that prevention is effective. However, specific ıitment strategies for prevention programs in Level I trauma centers have not been evaluated. purpose of this study is to evaluate recruitment strategies and outline implementation challenges solutions. We hypothesize that we have developed effective recruitment strategies for our multi- ıl fall prevention program.

hods: Participants were recruited into "Farewell to Falls" from 12/04 - 8/05 at our Level I ma center. Eligibility criteria included: >65 years, independent living, and a fall not resulting in)italization. Recruitment modalities included: 1) EMS dispatched 911 calls for "fall" *not* lting in ED transport, 2) ED referrals via nurses and web-based pager notification system for 5yo fall", 3) awareness campaign targeting a primary care center (PCC), 4) exposure in l media leading to self-referral. Data were ɔcted on demographics of referrals and enrolled ɔnts, and source of referral. X^2 and T-test yses were performed.

Referral source	*# ref*	*# enrolled (%)*
EMS	13	9 (69%)
ED	21	9 (43%)*
PCC	21	18 (86%)
Self-referred	13	13 (100%)*

Table 1. Patients referred and enrolled by source. *X^2 significantly different from expected result. p=0.015

ɔsults: Through the ED notification system, 142 enrollment criteria, but only 21 (15%) were ɪred. Of the 68 total patients referred, 47 were ılled (69%). Enrollment rates differed significantly by referral source (Table 1). There was no ɪificant difference in gender or age between referrals that were enrolled and referrals that were ɔnrolled. Overall reasons for not enrolling in the program included inappropriate referral (38%), esponse after many calls to home (24%), or patients and families feeling they do not need ices and home visits from our Occupational Therapists (38%). 75% of those enrolled had ɪiple falls within the prior year. The attrition rate was 6%.

ɔnclusions: Level I trauma centers are dedicated to injury prevention programs. Pivotal to the ibility of prevention programs is access to and willing participation of the target population. Our ıitment strategies were successful in enrolling referred patients but should be modified to ure more potential participants. Source of referral had a significant effect on rate of enrollment; ɪreferral after media coverage was very effective given the inherent motivation to participate. referral and enrollment rates were low. Future strategies should include a dedicated responder to ɔr capture the large eligible populations seen in the ED and by EMS. Methods should include ıe calls to eligible patients after ED discharge. The high rate of enrollment from PCC referrals be attributed to trust of the participants in their providers. Preliminarily, the program is uring a high risk population of fall recidivists and has a favorable rate of retention.

NOTES

er #10 5:20 PM,
/2006

HTING ALI: THE EFFECTS OF HYPERTONIC SALINE AND PENTOXIFYLLINE IN ANIMAL MODEL OF HEMORRHAGIC SHOCK

eree MD, J.O. Martins PharmD, J. Putnam BS, A. Leedom BS, B. Lamon BS, T. deCampos MD
. Hoyt MD, R. Coimbra MD, PhD
versity of California at San Diego

enter: Jessica Deree M.D. Senior Sponsor: Raul Coimbra M.D., Ph.D.

he relationship between hemorrhagic shock, the duration of ischemia, and the development of e lung injury (ALI) has been well established. Strong evidence suggests that the current shock iscitation regimen with Ringer's lactate (RL) potentiates neutrophil activation and is associated i increased inflammation and acute lung injury (ALI). We have recently shown that HSPTX, a el resuscitation strategy that combines low volume hypertonic saline (HS) with pentoxifylline X), both carrying significant anti-inflammatory properties, attenuates hemorrhagic shock-iced acute lung injury when compared to conventional RL resuscitation. Because the neutrophil s a major role in the post-shock inflammatory response and tissue injury, we investigated the cts of HSPTX on neutrophil functions that participate in the development of ALI.
rat model of controlled hemorrhagic shock was used. By withdrawing blood from the femoral ry, the mean arterial pressure was maintained at 35 mmHg for one hour. Animals were then iscitated with RL (32 ml/kg, equal salt load) or HSPTX (4 ml/kg 7.5% NaCl + PTX 25 mg/kg). A m group (no shock, no resuscitation) was also used as control. At 24 h after resuscitation animals e sacrificed and bronchoalveolar lavage fluid (BALF) and lungs were obtained. IL-8 was isure in BALF by ELISA. MMP-2 and MMP-9, proteolytic enzymes involved in the elopment of ALI and considered markers of neutrophil activation and degranulation were isured by zymography in BALF and lung tissue. Expression of HO-1, an inducible enzyme ased in conditions of oxidative stress was assessed by western blot and immune staining of lung ie.
SPTX resuscitation led to a 62% decrease in IL-8 levels compared to RL ($p<0.001$). BALF IP-2 expression was attenuated by 23% in HSPTX-treated animals ($p<0.05$) compared to their counterparts. Similarly, MMP-2 and MMP-9 expression in the lung tissue were attenuated by % and 76% respectively ($p<0.001$), in HSPTX-treated animals. Lung HO-1 expression was reased by 34% in HSPTX-treated animals when compared to RL ($p<0.01$), indicating attenuated lative injury in that treatment group. Lung HO-1 immune staining localized the expression of -1 mainly to neutrophils and alveolar macrophages.
ollectively, we demonstrated that HSPTX, a novel resuscitation strategy, attenuated acute lung ry when compared to RL by downregulating neutrophil activation, pro-inflammatory mediator duction, and HO-1 expression.

NOTES

:r #11 5:40 PM,
/2006

REASED INSULIN REQUIREMENTS ARE ASSOCIATED WITH PNEUMONIA 'ER SEVERE INJURY

artin, J Smith, J Hoth, P Miller, J Meredith, M Chang
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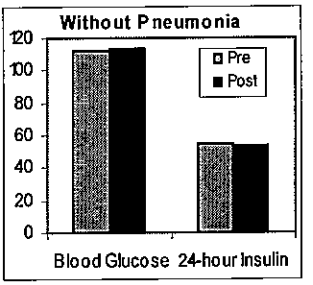
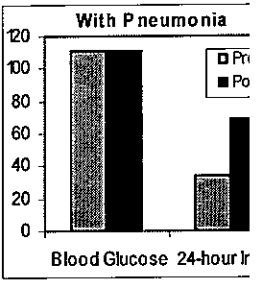
enter: Robert S. Martin, MD Senior Sponsor: Michael C. Chang, MD

oduction: Hyperglycemia after severe injury has been associated with an increased risk of :tion and death. The merits of strict glycemic control in the ICU have recently been recognized. /ing amounts of insulin by infusion are required to maintain blood glucose levels within normal ts. Little is known about how insulin requirements are affected by the presence of infection, :fore, the purpose of this study was to characterize this relationship.

hods: Medical records of all intubated, injured patients admitted to the ICU over a one year od of time were reviewed. Patients were included if they were managed with an insulin infusion they had a single bronchoalveolar lavage (BAL) culture performed for presumed pneumonia /een 48 hours and 6 days. Mean hourly and 24-hour insulin requirements were compared before after BAL and related to the presence or absence of pneumonia.

ults: Between January 1, 2004 and December 31, 2004, 62 patients met inclusion criteria. :nts with pneumonia (50) demonstrated a significant increase in hourly and 24-hour insulin iirements from before to after BAL ($p<0.0001$) which was not seen in patients without umonia (12) (See Figures). The :rence between pre- and post-BAL 24- · insulin requirements was 36.7 units in :nts with pneumonia versus -5.3 units ıose without ($p=0.035$). A 2 unit :ase in 24-hour insulin requirement · the pre-BAL level demonstrated an % positive predictive value for umonia.





clusions: Increased insulin requirements are associated with the presence of pneumonia and represent a valuable tool for earlier recognition.

NOTES

er #12 7:00 AM,
3/2006

CULT PNEUMOTHORAX: TO TREAT OR NOT TO TREAT

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senter: C. Seaver, MD Senior Sponsor: Dave Shatz, MD

jectives: The Optx is defined as a pneumothorax not identified on plain chest x-ray but detected a ct-scan. The overall reported incidence is about 5-8% of all trauma patients. We conducted a ar review of our Optx incidence and asked if an objective score could guide the practitioner with decision to place a thoracostomy tube (TT) or observe these patients.

thods: This is a retrospective review of all trauma patients in a level 1 university trauma center r the period of 5 years. The patients were identified by a query of all pneumothoraces in our ma registry. Those x-ray results were then reviewed to identify those who had Optxs. We then ospectively scored 50 of the Optx by taking the largest perpendicular distance in mm from the st wall of the largest air pocket. We then added 10 or 20 to this if the Optx was either rior/posterior or lateral, respectively.

ults: A total number of 21,193 trauma patients were evaluated with 1295 patients with umothoraces (6.1%) were identified. Of the 1295 patients with pneumothoraces there were 379 x identified (29.5%). The overall incidence of Optx was 1.8%. 95.7% occurred after blunt ma. 222 (59%) of the Optx had TT and of the remaining 157 without TT, 27 (17%) were on itive pressure ventilation. The average score was 28.5 overall. The average score for those with 's was 34. The average score for those without TT's was 21. PPV for need of CT if score > 30 78% and NPV if score <20 needing a TT was 70%. Area under ROC curve was 0.72 which wa nificant with $p<.007$

nclusions: The management of these Optx is not standardized and further study leading to a e objective classification may assist the surgeon's decision-making. The application of a scoring em may also decrease unnecessary insertion of TT and is currently being prospectively validated

NOTES

er #13 7:20 AM,
3/2006

JSCLE MICRODIALYSIS IN ACUTE TRAUMA PATIENTS: VISUALIZATION OF JLTI-DIMENSIONAL COMPLEX METABOLIC STATES USING BIOINFORMATIC USTER ANALYSIS

chell J. Cohen, MD, Geoffrey T. Manley, MD, PhD, Jennifer J Wan, MD, Danagra Ikossi, MD, rco Sorani, MS, Diane Morabito, RN, MPH, Donghong Yan, PhD, Campbell Stewart, BA, Linda aw, MS, M. Margaret Knudson, MD, UCSF, San Francisco, CA

senter: Mitchell Jay Cohen MD Senior Sponsor: M. Margaret Knudson MD

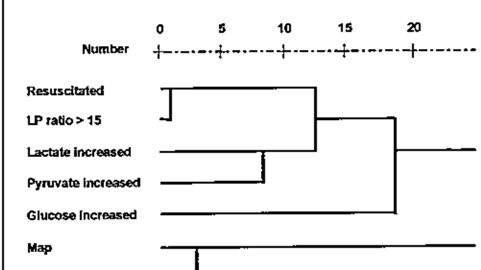
TRODUCTION: Tissue microdialysis measures levels of glucose, lactate, and pyruvate in the acellular fluid of specific organ beds. Microdialysis has been used extensively in exercise siology and traumatic brain injury to reflect both global and local metabolic states. Analysis of h throughput data in the ICU is increasingly difficult due to the large size and complexity of data . Self-organizing cluster analysis is a bioinformatics tool for mapping associations within high iensional data that would otherwise be too complex to visualize.

BJECTIVES: We hypothesized that microdialysis of the deltoid muscle in critically injured ients would provide insight into cellular metabolism during differing states of resuscitation. This ly was designed to examine the relationship between muscle metabolites (lactate, pyruvate, cose) and both standard (MAP, BD, HR, serum lactate), and a new physiologic measure of iscitation (PmO_2).

IETHODS: In this prospective observational study, microdialysis probes were inserted into the oid muscle of critically injured intubated patients upon admission to the ICU. Dialysate samples e collected at 1 hour intervals and analyzed the following day. Physiologic data were collected tinuously using a multimodal bioinformatics system. Resuscitation was defined as MAP $\geq$ 70 Hg and heart rate $\leq$ 110 bpm. A lactate pyruvate ratio of < 15 was considered nl.

ESULTS: 865 microdialysis samples were lyzed from 19 critically injured patients. scle lactate measurements were positively related with HR ($p < 0.0001$) and inversely related with MAP, BD and PmO_2 ($p <$ 05). Using a hierarchical cluster analysis, we ived the dendrogram seen in Figure 1. scle tissue LP ratio, lactate and pyruvate e found to cluster with resuscitation state. surprisingly, at a higher order, this cluster also associated with increased muscle cose. HR and MAP formed another cluster which was associated at the highest order with muscle abolic measures.

Figure 1 Hierarchical Cluster Analysis



ONCLUSION: We have shown, for the first time, the feasibility and potential utility of muscle rodialysis in acute trauma patients. We have identified a significant correlation between muscle abolites and standard measures of resuscitation. We also demonstrate that cluster analysis is a verful tool for visualizing high density physiologic and microdialysis data that may provide new ght into these complex relationships during various states of resuscitation.

NOTES

ıer #14 7:40 AM,
8/2006

)MPLICATIONS ASSOCIATED WITH SMALL BOWEL RESECTIONS:)NCURRENT INJURIES ARE MORE RELEVANT TO MORBIDITY THAN METHOD ' GASTROINTESTINAL ANASTOMOSIS

3rundage, MD, MPH, N. Kirilcuk, MD, D. Livingston, MD, S. Brakenridge, MD, K. Nagy, MD, Davis, MD, R. Friese, MD, C. Cothren, MD, Z. Sifri, MD, S. Ross, MD, R. Albrecht, MD, J. rray, MD, D. Spain, MD; Stanford Univ and the WTA Multicenter Trial Committee
senter: Susan I. Brundage, MD Senior Sponsor: Susan I. Brundage, MD

ckground: The preferred method of bowel anastomosis; sutured versus stapled, is at the :retion of the operating surgeon. Retrospective studies have called into question the appropriate l safe method of constructing gastrointestinal anastomoses in trauma patients. The purpose of this dy was to prospectively collect data and analyze clinical outcomes associated with repairs of ıred small bowel in the trauma patient. We hypothesized that stapled repairs would have a higher : of intra-abdominal complications compared to sutured anastomoses.

thods: Nine Level I trauma centers participated in this prospective multicenter study to ascertain complication rates associated with the two cohorts; stapled versus sutured anastomoses. lusion criteria were: a documented small bowel anastomosis, survival > 48 hours post injury, and : > 15. Enterotomies repaired without formal resection and anastomosis were excluded. Data were lected including demographics, intra-abdominal abscess formation, anastomotic leak, erocutaneous fistula, associated injuries, and mortality. IRB approval was obtained from all :itutions. Restrictions regarding IRB safety concerns and consent issues prohibited accomplishing ndomized controlled trial. Data was analyzed by STATA software.

sults: Over a 4 year period, 136 patients were enrolled in the study. The mean age was 30±11 rs, the majority were male (90%), and sustained penetrating rather than blunt trauma (77% vs. %). Ninety-seven patients had isolated small bowel anastomoses, 39 patients had concomitant on resections. The intra-abdominal complication rate associated with isolated small bowel injury s 12/97(12.4%). The complication rate with concurrent small and large bowel resection was 39(41%). (p=0.007) Complications by stapled vs. sutured cohorts follow:

	Small Bowel Resections (n=97)		Small Bowel & Colon Resections (n=39	
orbidity	STAPLED (n=73)	SUTURED (n=24)	STAPLED (n=28)	SUTURED (n=1
Leaks	1 (1.4%)	0 (0%)	3 (11%)	1 (9%)
)scesses	5 (6.8%)	4 (17%)	5 (18%)	2 (18%)
istulas	1 (1.3%)	1 (4%)	3 (8%)	0 (0%)

'a-abdominal complications were not significantly associated with either method of anastomotic ıstruction. Complications associated with isolated small bowel resection were due to other injurie l hypotension. The mortality rate was 2% (3 deaths; mean age 48±10) one attributed to abdomina sis in a patient with four stapled anastomoses. The two other deaths were secondary to brain ıry and multiple organ dysfunction not associated with bowel injury.

nclusion: To date, no other prospective study has examined the appropriateness of using a staple sus a sutured method of small bowel anastomosis in the trauma population. We found that relatec ılts rather than anastomotic construction were responsible for most complications. Although ıtively morbid with high intra-abdominal complication rates, deaths are rarely attributed to bowel ıry. Surgeons should be comfortable chosing their preferred type of repair.

NOTES

er #15 8:00 AM,
3/2006

EE PERITONEAL FLUID (FF)WITHOUT SOLID ORGAN INJURY ON MPUTERIZED TOMOGRAPHY (CT) FOLLOWING BLUNT TRAUMA: EDICTORS OF THERAPEUTIC LAPAROTOMY (TL)

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), and M. Rotondo, MD
t Carolina University, Greenville, NC

senter: Eric Toschlog, MD Senior Sponsor: Carol Schermer, MD

nagement of blunt trauma patients with FF without solid organ injury on abdominopelvic CT is troversial. The study purpose was to identify variables predictive of TL.

adult blunt trauma patients with unexplained FF on CT underwent laparotomy (2001-5). spectively collected variables and operative reports were reviewed. Operations were deemed TL consensus of 7 trauma surgeons. A single radiologist retrospectively reviewed CTs, grading FF egion (pelvis, gutter, Morrison's), Houndsfield units (HFU) and volume (minimal/moderate). TL cohort was compared to non-therapeutic (NTL) using ANOVA, Chi square, and uni- and tivariate regression (significance $p<0.05$).

arotomy was performed on 102 consecutive patients. Abdominal injuries (158) were noted in 76 ents (75%). Injuries were primarily gastrointestinal (GI)(50%), mesenteric (33%), or occult soli an (11%). The TL rate was 53% (n=54). TL was comprised primarily of GI (57%), mesenteric %), solid organ (13%), and bladder or diaphragm (9%) repair/resection. ANOVA and Chi square aled 9 variables significantly associated with TL (Table1).

	HFU Pelvis	HFU Mean	TND	Shock	Min. Fluid	HFU <20	1/3	3/3	SS
TL	37±12	38±10	61%	20%	38%	4%	15%	67%	31%
NTL	20±13	23±15	29%	6%	83%	48%	48%	20%	12%

ans±SD, TND=tender, Shock=hypotension + tachycardic in ED, Min.=minimal =1 of 3 regions with fluid, 3/3=all 3 regions with fluid, SS=seatbelt sign.

-and multivariate regression pared significant variables to 4 (Table 2).

	Volume=moderate	Tenderness	Fluid in region >1	HFU Pelvis
p value	0.006	0.007	0.04	0.001
OR	6.9	7.0	5.1	3.7

prediction accuracy from the multivariate model was 88% for TL, 82% for NTL.

versal laparotomy in this population leads to a high NTL rate, and patients must be vidualized. Predictors of TL include increasing pelvic HFU, FF in more than one region, lerness, and increasing FF volume. Retrospective application of the regression model reduced L to 18%. The model predicts a 96% TL rate for patients with pelvic HFU > 30, moderate fluid one region, and tenderness on examination.

NOTES

er #16 8:20 AM,
3/2006

)LATED THORACOLUMBAR TRANSVERSE PROCESS FRACTURES: CALL YSICAL THERAPY, NOT SPINE

omnick PA-C, R Lavery MS, MICP, DH Livingston MD, CJ Hauser MD
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enter: Adena Homnick, MS, PA-C Senior Sponsor: Carl J. Hauser MD

ackground: As CT scanning of the chest, abdomen and pelvis (CT-CAP) has become more ine in evaluating high-energy blunt torso trauma, thoracolumbar spine transverse process tures (TVPFx) have been diagnosed with increased frequency. It is widely believed that TVPFx often associated with mechanically significant structural lesions of the vertebral column, ssitating formal spine consultation and maintenance of patients on log-roll precautions pending ne clearance'. With recent increases in the frequency of diagnosis however, our perception has ome that although TVPFx are painful markers of significant torso trauma, they are intrinsically ign and seldom associated with major spine trauma. We therefore reviewed our experience in gnosis and management of TVPFx.

ethods: We performed a retrospective review of the trauma registry of a large Level I trauma er over 4 years from 2001-2004. We identified 360 patients with TVPFx. Patients were aged 16- and were 74% male and 26% female. Patients who died in the first 48 hours (3%) were excluded n study. Of the remaining patients, another 15% were noted to have had associated, potentially hanically significant thoracolumbar spine injuries seen on initial screening CT-CAP. These ents were also excluded from further study.

esults: The remaining 82% of patients were found to have sustained 2.1 ± 0.2 (Mean ± SE) PFx. These patients spent 27 ± 4 hours on log-roll and waited 3.5 ± 0.6 days to be started on sical therapy. Nonetheless, no patient with an isolated TVPFx on the initial CT-CAP was found ave a significant spine injury that required specific therapy. Optional corsets and braces were n recommended "for comfort."

onclusions: TVPFx are common injuries that are diagnosed with increased frequency when CT- P is used to evaluate torso trauma. More than 50% of patients have multiple TVPFx. Isolated PFx require aggressive pain management and benefit by early mobilization. Also, TVPFx are ed markers for major torso trauma, and about 15% will be associated with mechanically ificant spine injuries. Nonetheless, in the vast majority of patients where no associated structural ons of the vertebral column are seen on an adequate screening CT-CAP, no further study of the PFx is needed. Under these conditions, dedicated consultation with a 'spine service' may waste ce and valuable resources. Moreover, unnecessarily detailed investigation of the spine will often l to prolonged periods on log-roll precautions and to delays in patient mobilization by siotherapy. This will be a special concern in the large subgroup of these patients who have ciated chest and orthopedic injuries, and in whom delays in mobilization due to concerns for the PFx may be frankly deleterious to overall management of the patient.

NOTES

ıer #17 8:40 AM,
8/2006

ı% FASCIAL APPROXIMATION WITH SEQUENTIAL ABDOMINAL CLOSURE IN E OPEN ABDOMEN

Cothren, EE Moore, JL Johnson, JB Moore, DJ Ciesla, JM Burch
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senter: C. Clay Cothren, MD Senior Sponsor: C. Clay Cothren, MD

ckground: Multiple techniques have been introduced to obtain fascial closure for the open lomen. Vacuum-assisted closure has reduced but not eliminated the use of either split-thickness ı grafts to cover the exposed bowel or mesh (prosthetic or biologic) approximation of the fascia. hypothesized that a modification of the vacuum-assisted technique that provided constant fascial sion would achieve a higher rate of primary fascial closure, hence obviating the morbidity of the n abdomen and cost of either complex abdominal reconstruction or biologic mesh insertion.

thods: The technique proposed by Miller et al. was modified to employ the VAC white sponges over the bowel. The fascia is placed under moderate tension over the white sponges with #1-PDS ıres, and the black sponge is placed on top of this with an occlusive dressing in the standard ıion. Patients are returned to the operating room for sequential fascial closure and replacement of sponge sandwich every two days, with a resulting decrease in the fascial defect. Patients lergoing this technique for persistent open abdomens since its introduction in 1/05 at our level I ıma center were reviewed.

sults: Eleven patients underwent sequential abdominal closure during the study period: 7 due to ıage control surgery (6 trauma and 1 general surgery) and 4 due to secondary abdominal ıpartment syndrome (2 trauma, 1 pancreatitis, 1 ruptured AAA) . The majority were men (73%) h a mean age of 41.6 ± 5.8 years. Average time to closure was 7 days (range 4-12) and average ıber of laparotomies to closure was 4.5 (range 3-8). Patients undergoing post-injury DCS had an rage of 3 (range 1-5) intraabdominal injuries and 2.6 (range 1-5) additional injuries. All patients ined primary fascial closure.

nclusions: We propose a modification of the previously described vacuum-assisted closure ınique that achieves 100% fascial approximation in our limited experience. Further application l refinement of this technique may abolish the need for delayed, complex reconstructive lominal wall procedures for the open abdomen.

NOTES

ıer #18 4:00 PM,
3/2006

OMIDATE USE IN TRAUMA PATIENTS: USEFUL ADJUNCT OR DANGEROUS UG?

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senter: Krista L. Kaups, M.D. Senior Sponsor: Krista L. Kaups, M.D.

urpose: Etomidate (ETOM) is frequently use to facilitate intubation for trauma patients. ETOM lso known to cause adrenal suppression (AS), lasting up to 24 hours after administration. We ıothesized that AS has prolonged deleterious effects and may worsen outcomes in critically ıred patients.

lethods: Critically injured patients, admitted to a Level I Trauma Center, from 8/04 to 6/05, wh random cortisol (CORT) levels drawn within 48 hrs of admission were included. Data collected luded age, sex, mechanism of injury (MOI), AIS and ISS, P_s. ETOM use, CORT level, ıotension (HYPO), pressor use (PRESS) and outcomes were recorded. Patients who died within hours were excluded.

esults: 102 patients were included; mean age was 40 yrs and ISS was 30. Most patients were le (69%) and had blunt injury (86%). Patients who received ETOM (ETOM+) were not different MOI, age, AIS-head or chest, or ISS from those who did not (ETOM-). CORT was less in the OM + group (16.1 vs. 20.2, $p < .02$). P_s was greater in the ETOM + group (0.71 vs. 0.56, t-test,))5), yet this group had more complications and worse outcomes (death or discharge to ECF).

	N	HYPO	PRESS	ECF/DEATH
ETOM-	33	8	9	9
ETOM+	69	33*	30*	19*

$P < .02, \chi^2$

onclusions: ETOM use is associated with continued complications and may contribute to poor comes in critically injured patients. Although the AS due to ETOM is believed to last only 24 ırs, the effects persisted throughout the hospitalization.

NOTES

ier #19 4:20 PM,
8/2006

AUMA CENTER FINANCIAL CRISIS PRECIPITATED BY REPEAL OF NO FAULT TO INSURANCE

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senter: Charles W. Mains, MD **Senior Sponsor:** Charles W. Mains, MD

ackground: In 2003 the Colorado State Legislature repealed a 30 year old no fault insurance resulting in loss of a mandatory $50,000 acute care, $50,000 rehabilitation and $30,000 lost ges benefit for drivers ($130,000 total). Loss of revenue to providers potentially threatens the ncial stability of Trauma Centers, EMS services and physicians.

bjective: Evaluate the financial impact of the change from No Fault to Tort Auto Insurance on tims, hospitals, pre-hospital providers and physicians.

lethods: In 2005, the Trauma Care Preservation Coalition assisted by the Colorado Hospital sociation conducted surveys of 63 hospitals and 23 pre-hospital providers. A detailed financial lysis was conducted on 20,650 inpatients (2001-3rd quarter 2004). A separate survey of 14 uma centers examined trending analysis for 121,616 hospital visits (2002-2004). The Regional uma Advisory Council commissioned studies from an insurance consultant who analyzed the act to motorists and from an economist who analyzed the impact to the State Trauma system. sicians and consumers were also surveyed.

esults: 2001-2004 trend analyses of cost shifts and revenue losses showed a 42% reduction in o insurance reimbursement. Medicaid increased 124.7%, Medicare increased 171.9%, no pay reased 400.4%. Auto insurance reimbursement schedules cover the cost of care. No pay, dicaid and Medicare covers only a fraction or none of the cost of care. Projected Colorado uma Center reduction in revenue is $80,000,000 for 2005. Pre-hospital services average time to lection increased from 50 days for 2001-2003 to 108 days for 2004. Physicians surveyed erienced similar reduction in overall revenue and increased accounts receivable aging. One thir victims, those injured in single car crashes, are not entitled to benefits. Legally at fault drivers have no benefit. Those who are injured by the average at fault driver may recover no more tha),000 and the time to recovery may be years. Public opinion favors auto insurance coverage for dical expenses.

onclusion: With the shift to Tort Auto Insurance, Colorado consumers lost $130,000 in persona tection benefits, with little or no reduction in premiums. The State Trauma System lost a major rce of funding creating unprecedented declines in reimbursement for the providers of care. This es a fundamental question: Should auto insurance pay the cost of medical care to the victims of tor vehicle crashes?

NOTES

ıer #20 4:40 PM,
8/2006

ONE VENTILATION IN TRAUMA/SURGICAL PATIENTS WITH ALI/ARDS - IS IT NEFICIAL?

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senter: J Davis MD Senior Sponsor: J Davis MD

rpose: to compare the effectiveness of supine versus prone kinetic therapy in mechanically ıtilated trauma/surgical patients with acute lung injury (ALI) and adult respiratory distress drome (ARDS).

thods: Retrospective review of all patients with ALI/ARDS that were placed on either a supine to-rest) or a prone (roto-rone) oscillating bed. Data obtained includes age, CVP, chest_AIS, ISS,)2/FiO2 ratio, FiO2 requirement, days on bed, ventilator days, mortality, and pulmonary related rtality. Data are expressed as mean ± SEM, with significance at $p < 0.05$.

sults: From 03/01/2004 through 08/31/2005, 2715 trauma patients were admitted and 37 met lusion criteria with 26 supine and 11 prone.

ategory (n)	PaO_2/FiO_2 entry	FiO_2 entry	PaO_2/FiO_2 day 5	FiO_2 Day 5	Bed Days
upine (26)	166 ± 18	.63 ± .05	185 ± 17	.44 ± .02	6.9 ± 1
rone (11)	163 ± 10	.57 ± .03	238 ± 13	.40 ± .01	5.6 ± .5
value	.92	.48	.03	.16	.43

ere was no difference between the groups for age, CVP, ISS, chest_AIS, ventilator days or length stay. There were 9 deaths (4 pulmonary related) in the supine group and no deaths in the prone up ($p < 0.04, X^2$).

nclusions: ALI/ARDS patients that were prone positioned had greater improvement in)2/FiO2 ratio, lower mortality and less pulmonary related mortality than supine positioned ients. The use of a prone-oscillating bed is advantageous for trauma and surgery patients with LI/ARDS.

7:00 AM,

:VELOPMENT AND TESTING OF PORTABLE PUMP FOR THE INDUCTION OF :OFOUND HYPOTHERMIA IN A SWINE MODEL OF LETHAL VASCULAR INJURIE

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:senter: Hasan B. Alam, MD Senior Sponsor: Hasan B. Alam, MD

pid induction of a profound hypothermic state (suspended animation) can maintain viability of y organs during repair of lethal injuries. Conventional cardiopulmonary bypass equipment (rolle mp) used to induce and reverse hypothermia is bulky, requires standard electricity, and is not nsportable. Development of small, portable, battery operated, disposable, rotary pump can :ilitate induction and maintenance of hypothermia (during transport). In this experiment, a rtable prototype pump was tested and its performance was compared with the regular roller pump a swine model of lethal vascular injuries.

ethods: Uncontrolled lethal hemorrhage was induced in 16 swine (80-120 lbs) by creating an ilia ery and vein injury. After 30 minutes of pulseless shock, descending thoracic aorta was lacerated rough an Emergency Department thoracotomy approach, a catheter was placed in the aorta and ld organ preservation solution was infused to rapidly (2°C/min) induce hypothermia (10°C) for 6(nutes. The performance of prototype pump was initially tested in a non-survival experiment (four imals). Then, 12 animals were cooled either with (n=6/group): 1) conventional roller pump, or 2) all prototype pump. The injuries were repaired during hypothermic arrest and the animals were warmed (0.5°C/min). Whole blood was infused during resuscitation on cardiopulmonary bypass. rviving animals were closely monitored for three weeks for post-operative complications, ırologic deficits, and organ dysfunction.

sults: The flow rates and the time needed to induce and reverse profound hypothermia were no ferent between the prototype and the conventional roller pumps. Three-week survival rates were % in both groups. Only a transient increase in liver enzymes, and makers of cellular injury eatine kinase, lactate dehydrogenase) was noted (no difference between groups), with no long- m organ dysfunction.

nclusions: In this large animal model of lethal vascular injuries, a portable, battery operated, posable, rotary pump performed as well as the conventional roller pump. The logistical vantages of this system make it an attractive choice for inducing hypothermia in emergency partments, austere settings (e.g. battlefield hospitals), and for maintaining hypothermia during nsport.

NOTES

/HOLE BLOOD LEUKOCYTE MAPK ACTIVATION DIFFERENTIATES ICU ATIENTS WITH SIRS AND SEPSIS

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'esenter: Michael A West, MD, PhD Senior Sponsor: Michael A West MD, PhD

We sought to determine whether leukocytes from ICU pts have altered ERK and p38 kinase :tivation and specifically if septic pts manifest changes of endotoxin (LPS) tolerance. In vitro 'etreatment of monocytes (Mono) with LPS induces LPS tolerance with impaired cytokine release ıd inhibition of ERK and p38 activation after LPS rechallenge.

[ethods: Heparinized whole blood from 21 surgical ICU pts and 16 normal controls was incubate 5 min ±10 ng/ml LPS at 37°C. Mono and neutrophil (PMN) diphospho (active) ERK and p38 nase activation were determined using flow cytometry with monoclonal antibodies to. Results are :pressed as mean ± SEM of basal and "delta" (Δ) % positive cells [Δ = LPS stimulated – Basal]. atistics by Chi-square.

Patient Group:		Normal	Post Op	Sepsis	SIRS
Mono	Basal	36±6%	24±14%	25±12%	45±7%
	Δ	22±3%#	8±7% *	3±5% *	17±6%#
PMN	Basal	13±6%	3±3% *	5±4% *	43±15% *
	Δ	3±3%	2±2%	-2±3%	3±5%
Mono	Basal	2±2%	18±12% *	18±16% *	7±4%
	Δ	72±3%#	42±15%#	29±14%*#	58±6%#
PMN	Basal	2±1%	1±2%	8±12%	1±2%
	Δ	71±7%#	12±8% *	3±3% *	40±13%*#

* $p < 0.05$ versus Normal, # $p < 0.05$ vs basal

esults: Basal ERK was seen in Mono from all groups, but Δ only increased with in normal and RS pts. No basal Mono or PMN p38 was seen in normal, but LPS significantly activated p38 in ıth cells. Mono from pts with sepsis, but not SIRS had impaired ERK activation. Both PMN and ono from pts with SIRS had low basal but high LPS-stimulated p38, whereas p38 activation was ıpaired in pts with sepsis.

onclusion: Alterations in MAPK activation are seen in ICU pts. Leukocytes of septic pts, but not ose with SIRS, showed characteristics of LPS tolerance. Leukocyte ERK and p38kinase activatio ay be useful to identify ICU subgroups.

NOTES

per #23 7:40 AM,
)1/2006

IE ELDERLY TRAUMA PATIENT: AN INVESTMENT FOR THE FUTURE?

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ody School of Medicine at East Carolina University, Greenville, NC

esenter: Mark A. Newell, M.D. ***Senior Sponsor:** Carol Schermer, M.D.

troduction: The cost of care in elderly trauma patients (OLD) has been shown to be high mpared to younger patients (YNG), but the association between age and reimbursement relative t st is less clear. As the elderly population continues to increase, the number of geriatric trauma tients requiring care will similarly soar. An unfavorable financial margin for these patients could ve devastating financial implications for trauma centers in the future. The purpose of this study is to explore the relationship between direct cost and reimbursement for both YNG and OLD tients.

ethods: NTRACS was queried to capture consecutive patients admitted to a Level I university uma center between Jan 2002 to Dec 2004. YNG (18-64 yrs) were compared to OLD (≥65 yrs) demographics, mechanism of injury, injury severity (ISS), length of stay (LOS in days), mplications, and mortality. Data obtained from the hospital cost accounting system included yer source, direct costs (DC), total payment (TP) and contribution margin (CM = TP – DC). rtually all patients were reimbursed based on fixed DRG payment. Comparisons between groups re performed using ANOVA. Significance was set at $*p \leq 0.05$.

sults: The results noted below are expressed as mean ± standard deviation.

	Age (yrs)	ISS	LOS	ICULOS	Mort (%)	DC ($)	TP ($)	CM ($
NG =3470	36 ± 13	13.3 ± 10.9	7.3 ± 11.5	2.1 ± 5.8	4.7	9,962 ± 16,766	16,539 ± 30,889	6,576 22,33
LD =641	*76± 7	*14.9 ± 10.8	*8.8 ± 11.7	*3.1 ± 6.9	*17.0	10,741 ± 15,114	*20,021 ± 29,756	*9,28 ± 19,78

e mean time to death was 5.5 days for YNG vs. *8.3 days for OLD and the complication rate wa gher for OLD (54%) vs. YNG (34%) yet, no difference in DC was noted. Moreover, Medicare 4.1%, mean CM = $7,944) and Commercial (41.7%, mean CM = $10,097) comprised the majorit payment sources for OLD. For YNG, Medicaid (24.2%, mean CM = $4,659) and Managed Car 5.8%, mean CM =$15,263) comprised the majority, however, Self Pay (23.5%, mean CM = -,021) contributed a significant loss.

nclusions: In this study of primarily fixed DRG payment patients, DC was not the driving facto overall CM. Moreover, LOS, mortality and complications had little effect on DC. TP as termined by payer mix appears to be critical to the effect on CM. We believe that without nificant change in the rate of Medicaid reimbursement and additional strategies to remedy the f-pay problem, young trauma patients will continue to represent the dominant financial strain on uma centers. We speculate that our aging population may represent a shift towards a more ancially favorable patient cohort in the future, not the financial burden that one might expect.

NOTES

Invited Lecture

"Endovascular Surgery: A Top Priority in the Development of Acute Care Surgery"

Timothy C. Fabian, MD
Professor and Chairman of Surgery
University of Tennessee Center for the Health Sciences, Memphis, Tennessee,

NOTES

UNEXPECTED EFFECT OF ENHANCE BORDER SECURITY; FALLS FRFOM THE ERNATIONAL BORDER FENCE

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;enter: Bruce Potenza, MD **Senior Sponsor:** Bruce Potenza, MD

ective: Homeland security has become a national focus with safe and secure borders a high rity. The international border fence parallels the southern most boundaries between the U.S. and :ico. We designed this study to quantify the type, severity and incidence of trauma sustained by viduals while climbing this fence.

hods: Analysis of trauma (falls) from the border fence was conducted utilizing a trauma center stry and chart review (1987-2000). Demographic characteristics, time of injury, patterns of :y, therapy, length of stay and hospital charges were examined.

ults: 73 injured patients were treated at a level one trauma center. 96% were admitted after the e was heightened There were 38 males and 32 females with a combined mean age of 32 ½ years. / 3 patients had significant comorbid disease and 3 tested positive for alcohol. Overall, there ; 5 patients with closed head injuries (4 mild, 1 fatal). There were 3 patients with relatively mild acic injuries (rib fractures, hemo and pneumothoraces. Only 1 patient sustained significant)minal trauma (AAST Grade 2 liver/splenic injuries). The only operative procedure done on this ip was a craniotomy for evacuation of intracranial bleeding. Orthopedic injuries requiring a .er level of care was the leading reason for admission (93%). Despite a mean Injury Severity :e of 8.6; the orthopedic injuries were complex, multiple and frequently open. 92% of the :nts suffered extremity fractures and 24% spinal column injuries. Lower extremity fractures the ing site of orthopedic injury (67 patients). In total there were 120 operative orthopedic :edures. The entire cohort of injured border fence trauma patients utilized 550 hospital days and :rated charges of 3.8 million dollars. Only three patients were funded whereas 70 were neither red nor covered by any county medical assistance.

:clusion: The change in the border fence characteristics has an unanticipated result of increasing matic falls from the fence. Injuries are predominantly orthopedic, yet require specialized surgical for their complexity. These patients represent a significant resource and financial burden to onal medical resources. Health care institutions in these boundary areas are presently ıldering the burden for care of these individual. This problem is a direct complication of the re secure national boundary policy" and should be recognized as an additional cost for homeland ırity.

NOTES

:r #25 4:20 PM,
/2006

? BLOODY DEVICES: INCIDENCE OF INSTRUMENT CONTAMINATION

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enter: M. deMoya Senior Sponsor: D. Shatz

oduction: Medical devices such as, stethoscopes and non-disposable pulse oximetry probes ı come in contact with bodily fluids from patients. Studies have shown almost a 50% incidence ıthologic bacteria on devices such as stethoscopes and pagers. The incidence of blood on ical devices has not been tested. Our hypothesis is that medical devices harbor blood that may ɔe grossly apparent.

hods: Using a commercially available reduced phenolphthalein test kit, with high sensitivity specificity for blood, medical devices were tested. A total of 200 devices were tested. These ces were tested among a distribution of ER/trauma personnel, ICU nurses, and Paramedics.

ılts: Of the 200 devices tested, 48 were paramedic, 48 ER/Trauma, and 104 ICU personnel. ɔd was present in 24/200(12%). The incidence among each sample of personnel was 18, 8, and respectively for paramedics, ER/Trauma and ICU personnel. There were no signs of gross blood ıese devices. 100% of the devices were routinely cleaned using alcohol. The frequency of ıing ranged from after each patient to every shift. The 25 pulse oximetry probes tested had a ı incidence of blood contamination.

:ussion: The incidence of non-gross blood noted on medical devices in this small survey onstrated a rather high incidence of contamination. The much higher incidence of blood present ıe pulse oximetry probe was particularly alarming. Techniques of reducing this contamination e from closer scrutiny of routine inter-patient cleaning to the use of disposable covers for ıoscopes, pulse oximetry probes or other devices in contact with patients.

NOTES

E IMPACT OF THE CONSOLIDATION AND CORPORATIZATION OF GANG TIVITY ON GUN VIOLENCE

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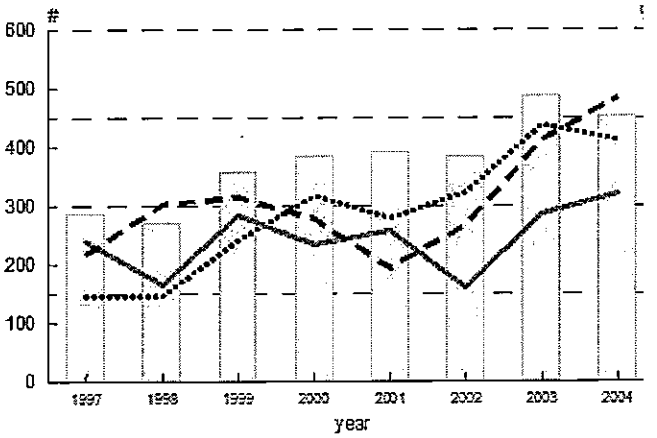
enter: Robert F Lavery, MA Senior Sponsor: David H Livingston, MD

fter a decline in violence and the overall crime rate at the end of the nineties, we noted a rise in shot wounds (GSW) coming to our trauma center. In addition, there was a major shift in gang cture and a dramatic increase in gang related drug activity. The purpose of this study was to uate the impact of these issues on injury severity and patient outcome.

ETHODS: Retrospective analysis of GSW injuries from 1/97-12/04 for GSW injuries. iographics, location and number of wounds (through/through, entrance/exit or where a "bullet " is documented are counted as one wound), AIS body region and severity score, ISS, and tality. Means and 95% confidence intervals (CI_{95}) are noted.

ESULTS: Total GSWs have increased 50% (figure, grey bar) as well as the number of wounds patient from 1.48 (CI_{95} 1.35-1.62) 997 to 1.73 (CI_{95} 1.61-1.86) in 4. More patients are arriving with cal and extremity wounds. The entage of patients with ≥3 nds (dotted line) and injuries to ≥ S defined body regions (dashed) doubled from 1997 to 2004. n ISS is also significantly higher, ((CI_{95} 11.6-14.1) in 1997 to 15.3 $_5$ 14.2-16.5) in 2004. While there a slight increase in mortality id line), the percent of patients ving DOA or dying within 1 hour from just under 50% in 1997 to 67% in 2004.



ONCLUSIONS: Gun violence injury severity increased markedly and paralleled the changes in gang structure and related drug e from a local "neighborhood guilds" to a corporate ***franchise-like*** business model (data from the ex County Gang Violence Task Force). Strategies to decrease gun violence needs to be targeted angs and related activity and primary prevention in keeping young people away from gangs bined with increasing economic opportunities remains the only long term solution.

NOTES

Invited Lecture
"The Nation's Medical Preparedness: will you know what to do?"

Jeffrey W. Runge, MD FACEP
Chief Medical Officer
United States Department of Homeland Security

NOTES

Paper #27 8:00 AM, 3/02/2006

E-HOSPITAL TOURNIQUET USE IN OPERATION IRAQI FREEDOM: EFFECT ON MORRHAGE CONTROL AND OUTCOMES

eekley, J Sebesta, L Blackbourne, J Holcomb
digan Army Medical Center, Tacoma, WA

senter: Alec C. Beekley, MD Senior Sponsor: Matthew J. Martin, M.D.

kground: Anecdotal data and early analysis of those killed in action during Operation Iraqi edom reveals casualties who died from exsanguination from isolated compressible extremity norrhage.

pothesis: We hypothesized that pre-hospital tourniquet use decreased hemorrhage from extremity uries and saved lives. We further hypothesized that pre-hospital tourniquet use was not associated h an increase in adverse limb outcomes. Methods: This is an IRB-approved, retrospective review he 31st Combat Support Hospital database, which contains 3,460 patients treated from January 04 to December 2004. Inclusion criteria were any patient with a traumatic amputation, any patient h a major extremity vascular injury, and any patient with documented presence of a pre-hospital rniquet. Patients with other severe system injury were excluded. 33 data points were collected for h patient.

sults: 166 patients met inclusion criteria, of which 67 had pre-hospital tourniquets and 99 did not er 95% of injuries were caused by penetrating trauma. Statistically significant differences were ed in the numbers of patients with arm injuries (16.2% TK vs. 31.6% No TK), injuries requiring cular reconstruction (29.9% TK vs. 52.5% No TK), traumatic amputations (41.8% TK vs. 26.3% TK), and in those patients with adequate bleeding control on arrival with ISS > 15 (65% TK vs. % No TK). The average tourniquet time was 70 minutes (range 5 - 210 minutes). There was no istically significant difference in secondary amputation rate (4(6.0%) TK vs. 6(6.1%) No TK); or rtality with (3 (4.4%) TK vs. 4 (4.1%) No TK). Analysis of the injuries in the 7 patients who died ealed that 4 of these deaths were potentially preventable with adequate tourniquet placement.

nclusions: Pre-hospital tourniquet use was associated with improved hemorrhage control. hough this data set does not show an improvement in survival, it is biased towards those patients viving to reach the combat support hospital. No adverse outcomes (secondary amputations or rologic deficits) related to tourniquet use were noted. Full analysis of those casualties who died n compressible extremity hemorrhage is expected to show that pre-hospital tourniquet use fers a survival benefit.

E USAGE AND AVAILABILITY OF BLOOD PRODUCTS IN MULTIPLE CASUALTY ⊐IDENTS: THE EXPERIENCE OF A LEVEL 1 TRAUMA CENTER IN ISRAEL.

ɔoffer MD, J.Klausner MD, D. Bar-Zohar MD, O.Szold MD, C.I. Schulman MD, MSPH, [alpern MD, A.Shimonov RN, M.Hareuveni PhD, O.Ben-Tal MD.
ɜ Yitzhak Rabin Trauma Center.Tel – Aviv Sourasky Medical Center. Sackler Scool of Medicine ıversity of Tel – Aviv, Israel.

senter: Dror Soffer M.D. Senior Sponsor: David V. Shatz, M.D.

ckground: The issue of blood products utilization and blood bank preparedness in the setting of ltiple casualty incidences (MCI) has not been elucidated yet, and thus guidelines regarding these ects of MCI management are not established. Since blood transfusions are conman in trauma ıms it is only logic to assume that multiple casualty incidents will be associated with an ıonential rise demand for transfusions, which will pose a greater burden on the blood banking abilities. Therefore, the objectives of the current study were to describe the pattern of blood ducts administration during MCI, trying to determine whether a special preparedness is needed a level I Trauma Center blood bank in the setting of such events.

thods: A retrospective study evaluating data from all relevant information regarding 19 ısecutive terrorist attacks that took place in the city of Tel-Aviv between January 1997 and ɔruary 2005. Data was retrieved from chart review and from the Blood bank and emergency ıartment's computerized MCI registry programs.

sults: 320 packed red blood cell (PRBC) units were transfused altogether, with an average of 8±34.7 units per incident. Half of the PRBCs supplied in all MCIs were administered in the ing of massive transfusion (>10XPRBC) to 5.7% of the patients. In total, 230 blood samples e sent for type and cross match. The ratios of transfused PRBC units per evacuated and admitted ients –packed cell per patient index (PPI) - were 0.55±0.96 and 1.0±1.5, respectively. The PPI d significantly when there were over 25 evacuated victims (p=0.030). The most frequent major od group transfused was O+ (40% of all transfused PRBCs) with an average of 6.7±12.8 units pe ident, followed by type A+ and O-. Neither AB- nor A- units were transfused. The average nber of non-typed and non-screened units of blood transfused was 4.56 ± 12.8 (range0-50) units incident. Half (51%) of the blood units were supplied during the first two hours post admission.

nclusions: Blood bank operations must be coordinated with the other medical teams dealing with ICI. Timely information flow to the blood bank regarding the incidents relevant data and ılication of PPI might help in the initial estimation of the need for blood products.

NOTES

ESH FROZEN PLASMA SHOULD BE GIVEN EARLIER TO PATIENTS WHO QUIRE MASSIVE TRANSFUSION

Gonzalez, F, Moore, J, Holcomb, C, Miller, R, Kozar, S, Todd, C, Cocanour, B, McKinley
iversity of Texas Health Science Center at Houston, Houston, TX
senter: Ernest A. Gonzalez, M.D. Senior Sponsor: Frederick A. Moore, M.D

ur massive transfusion (MT) protocol directs 6 units (U) of packed red blood cells (PRBC) be en before fresh frozen plasma (FFP). Thereafter, FFP is to be given at a ratio of 1U FFP:1 U BC. Hirshberg et al (*J Trauma* 2003) challenged this traditional approach of initially withholdin ? and concluded that FFP should be given concurrently with the 1st U of PRBC when the surgeon icipates severe hemorrhage. To ascertain whether our standard of care MT protocol should be nged, we retrospectively reviewed prospectively collected data from shock resuscitation patients. ta was compared using a one-way ANOVA to detect change with time and was expressed as an ± SEM ($P < 0.05$ significance). Over 51 months, 91 torso trauma patients (brain injured luded) undergoing operative interventions received a MT (≥ 10 U PRBC in 24 hrs). 61% were le, 73% blunt trauma, ISS was 29 ± 1 and initial base deficit (BD) was 10 ± 1 mEq/L. All lerwent emergent hemorrhage control interventions and pre ICU resuscitation (Lactated Ringer 9 L, FFP 5 ± 0.4 U, PRBC 11 ± 1 U). Resuscitation variables and cumulative (cum) volumes pre J and during ICU resuscitation were:

Variables	ICU admit	4hr ICU	8hr ICU	12hr ICU
T (°C)	35.4 ± 0.1 a	37.0 ± 0.1 b	37.5 ± 0.1 c	37.3 ± 0.1 c
BD (mEq/L)	6.6 ± 0.5 a	4.8 ± 0.5 b	2.7 ± 0.5 c	2.4 ± 0.5 c
pH	7.29 ± 0.01 a	7.31 ± 0.01 a	7.35 ± 0.01 b	7.35 ± 0.01 b
INR	1.58 ± 0.02 a	1.45 ± 0.02 a	1.38 ± 0.02 a	1.36 ± 0.01 a
PTT (sec)	59.9 ± 2.9 a	44.3 ± 2.7 b	39.2 ± 2.8 b	37.5 ± 2.8 b
Plt count kcell/mm^3)	94.6 ± 7.1 a	90.8 ± 6.5 a	103.9 ± 6.5 a	92.3 ± 6.9 a
Fibrinogen (mg/dl)	146.6 ± 10.0 a	193.4 ± 9.2 a	234.3 ± 9.5 a	260.2 ± 9.9 a
LR (cum L)	9 ± 1	12 ± 1	14 ± 1	16± 1
PRBC (cum U)	11 ± 1	15 ± 1	16 ± 1	17 ± 1
FFP (cum U)	5 ± 0.4	6 ± 1	8 ± 1	11± 1
Means with different letters are significantly different ($P < 0.05$)				

Upon ICU arrival, INR was notably elevated. Consistent with our MT protocol, FFP had been hheld until after 6U PRBC and MT patients received a 1U FFP:2U PRBC ratio. MT patients re mildly hypothermic and acidotic. However, these factors corrected quickly with ICU uscitation. In contrast, initial INR of our MT patients were elevated and were not corrected by standard protocol. As a result, MT patients required ongoing PRBC transfusions (6 ± 1 U over 12 ICU hr). Based on our data, recent literature, and expert opinion, we have changed our MT tocol to direct an immediate early transfusion ratio of 1 U FFP:1 U PRBC.

NOTES

Paper #30 7:00 AM, 3/03/2006

AUMA CARE IN THE JUNGLES OF ECUADOR: WHERE THERE IS NO ATLS

Aboutanos, M.D.; M.B. Aboutanos, M.D., M.P.H.; E.B. Rodas, M.D.; F.E. Mora, M.D.; L.G. lfe; T.M. Duane, M.D.; A.K. Malhotra, M.D.; R.R. Ivatury, M.D.
ginia Commonwealth University Medical Center, Richmond, VA

enter: Sharline Aboutanos, MD Senior Sponsor: Michael Aboutanos, MD, MPH

ackground: The Advanced Trauma Life Support (ATLS) course is not available or affordable to l areas in low income countries. A trauma continuing education course was created to educate sicians of rural hospitals in the jungles of Ecuador.

ethods: A basic trauma care course was designed based on local resources and location of injury: mentary health posts in the jungle (RHP), rural hospitals (RH) and definitive referral centers C). Course effectiveness was evaluated by comparison of pre- and post-course test scores. A tiple choice questionnaire (MCQ) was given. Comparison to previous test scores was also ormed. Paired student t-test was used for statistical analysis. An objective structured clinical nination (OSCE), based on the course design, was administered.

esults: Twenty-six rural physicians participated in the course. Mean test scores significantly roved from pretest to posttest (72% to 79%, p=0.032). Knowledge deficiencies in prehospital , extremity injury care, and patient evaluation adjuncts improved from 23% to 87%, 23% to % and 31% to 100%, respectively. Post-course test results showed improvements in all major gories tested. Twelve of the 26 participants were repeat test-takers from a course provided 2 s prior. These participants showed improved pretest scores compared to their highest previous score (76.8% vs. 68.5%, p = 0.0496). Compared to first time test takers, these participants ved improved pretest (68.4% vs. 76.8%) and post-test (76% vs. 81%) scores. Twenty-five of the hysicians participated in the OSCE with a pass rate of 77%. OSCE identified various strengths deficiencies based on patient location and available resources. In RHP, management was quate for hemorrhage control (65%), immobilization (77%), and early transfer to RH (92%). ospital communication was inadequate (53%). RH management was adequate for primary uation (60%) and resuscitation (74%) but poor in secondary patient evaluation (53%), adjuncts %), and transfer to DRC (11%). OSCE scores differed from MCQ test results.

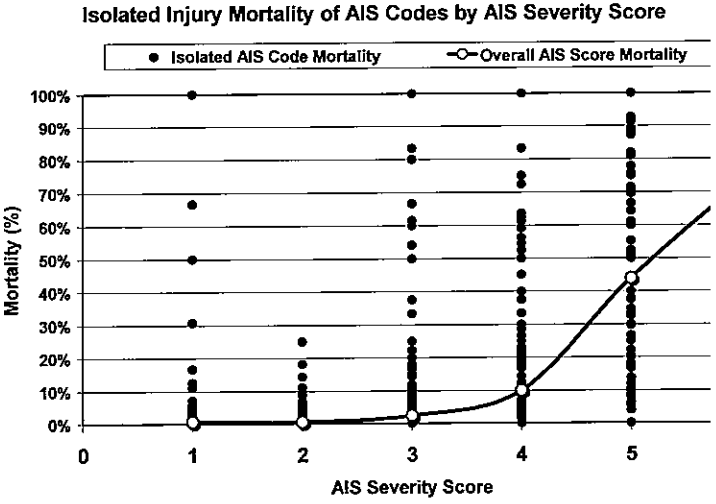
iscussion: Where there is no ATLS, a tailored trauma course and evaluation can be effective in cating local providers. A well designed competency evaluation (MCQ and OSCE) is helpful in tifying deficient local aspects of trauma care. This course design and evaluation methods can e as a model for continuing trauma care education in developing countries.

DB OUTCOMES EXPOSE AIS SEVERITY SCORE INCONSISTENCIES

Reed, S. Eachempati, F. Luchette, T. Esposito, J. Fildes, P. Barie, R. Gamelli
ɔartments of Surgery, Loyola University Medical Center, Maywood, IL, University of Nevada
ıool of Medicine, Las Vegas, NV and Weill Cornell Medical College, New York, NY

ɜsenter: R. Lawrence Reed, II, M.D. **Senior Sponsor:** R. Lawrence Reed, II, M.D.

roduction: Trauma outcomes are commonly classified according to the Injury Severity Score S), which is derived from the severity score of the Abbreviated Injury Scale (AIS), ranging from › 6. For the ISS to be a precise injury grading scheme, different injuries with similar severity res should portend identical mortalities. We sought to determine whether the actual mortality ɜs observed in the National Trauma Data Bank® (NTDB) were equivalent for patients with ɛrent AIS codes (describing the nature of the injury) but with similar AIS severity scores.
thods: The NTDB database (version 4.0) was imported into SQL Server as a relational set of ɛd tables. Distinct trauma episodes were linked between tables using a key field (INC_KEY). ɛries were constructed to extract the tallies from the database using Structured Query Language)L). Patients with isolated injuries were evaluated for their AIS Code, AIS Severity Score, and come.
ɜults: The NTDB contains a total of 1,130,093 trauma incidents. There are 276,784 patients wit y a single AIS Code orded. The mortality ɜs of patients with lated injuries correlated itively with their AIS ɛrity Score ($p < 0.0001$). wever, there is a wide ge of mortality rates ong AIS Codes at each ɛrity Score. Absolute ges (i.e., from 0% to)%) exist for the mortality ɜs of every AIS Severity ɔre except AIS=2.



nclusion: AIS Severity ɔres were established itrarily. The recent ilability of NTDB data v demonstrate great parity with respect to mortality for identical AIS scores. Data-driven recalibration of AIS ɛrity Score should provide greater precision of mortality risk assessment.

NOTES

CHYCARDIA: IS IT TRULY A VITAL SIGN?

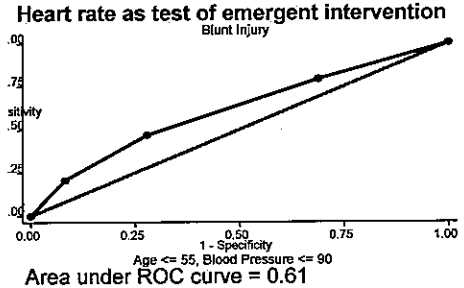
Nirula, C. Guse, L. Gentilello, K. Brasel
dical College of Wisconsin, Madison, WI

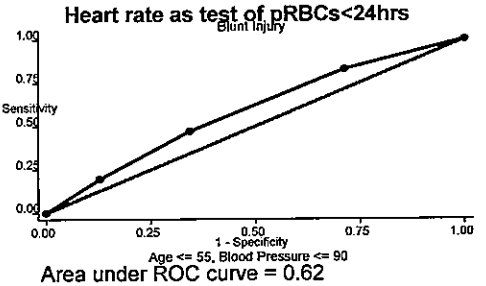
senter: Karen Brasel, MD Senior Sponsor: Ram Nirula, MD

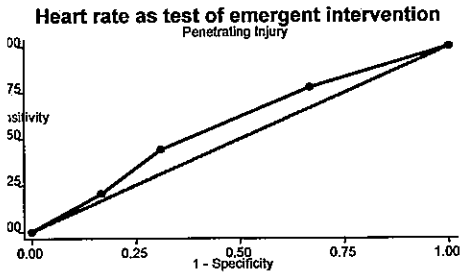
ckground: Tachycardia has been utilized as a physical sign of hypovolemic shock among the ıred for decades without evidence to support the use of tachycardia as a predictor of injury or ıificant hypovolemia. Several studies show tachycardia is absent among penetrating trauma tims. We sought to determine if admission heart rate is a valid predictor of hemodynamically ıificant injuries.

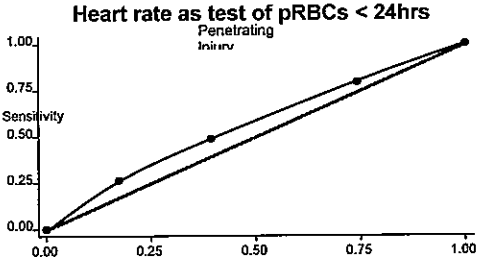
thods: Level one trauma registry data from 1998 to 2004 was analyzed with logistic regression letermine if heart rate was associated with need for emergent intervention for bleeding ɔarotomy, thoracotomy or angiography), need for pRBCs in the first 24 hrs, or severe injury S>25) in blunt or penetrating trauma.

sults: A total of 11,017 patients were analyzed. Heart rate was neither sensitive nor specific in ermining the need for emergent intervention, pRBCs in the first 24 hours or severe injury. This s not altered by the presence of hypotension.









nclusions: Heart rate is not a useful physical finding in determining the need for emergency ɛrventions for hemorrhage. Clinicians should not feel at ease if patients are not tachycardic nor ɔuld they feel that tachycardia necessitates emergent interventions.

NOTES

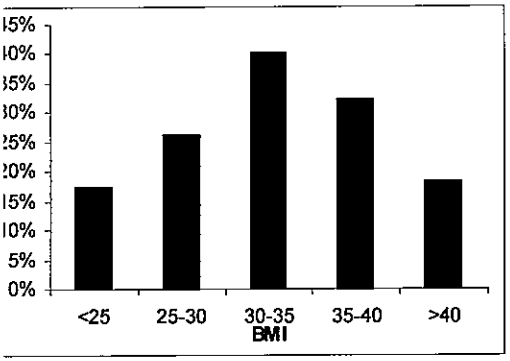
ESITY INCREASES THE RISK OF POSTINJURY ORGAN DYSFUNCTION BUT NOT ATH IN HIGH RISK TRAUMA PATIENTS

Ciesla MD, EE Moore MD, JL Johnson MD, JM Burch MD, CC Cothren MD, A Sauaia PhD
nver Health Medical Center and University of Colorado School of Medicine, Denver, CO

senter: David J Ciesla, MD Senior Sponsor: David J Ciesla, MD

ckground: The incidence of obesity and morbid obesity has increased dramatically in the recent t. Previous reports have demonstrated an association between obesity and increased risk of tinjury death. However, the relationship between obesity and postinjury organ dysfunction is lefined. We hypothesized that obesity is associated with postinjury organ dysfunction and an reased risk of multiple organ failure.

thods: Data were prospectively collected severely injured patients admitted to the ICU within 4 irs of injury over six years. Deaths within 48 hours and isolated head injuries were excluded. DS was defined using the American- European consensus definition. Organ dysfunction was ined using the Denver MOF scale. Univariate and multivariate analyses were performed using linear or logistic regression where appropriate, <.05 was significant.



Results: Data was collected on 716 patients the mean±SD age and ISS were 39±17 and 31±11 respectively, blunt mechanism was observed in 572 (80%) patients and 57 (8%) died. Heart, lung, kidney and liver dysfunction were observed in 208 (29%), 573 (80%), 74 (10%), and 193 (27%) patients respectively. ARDS an MOF were observed in 24 (31%) and 179 (25% of patients respectively. The incidence of MOF was significantly higher in patients with BMI = 25-40 compared to patients with BMI ≤ 2 (figure). BMI > 25 was independently associated with an increased risk of lung heart, liver and renal dysfunction and the number of organs with dysfunction after adjusting for age, ISS and blood transfuse during resuscitation. BMI > 30 was independently associated with an increase risk of acute lung injury, ARDS and MOF but not death after adjusting for age, ISS and blood transfusion during resuscitation

	Point estimate	Odds Ratio (95% CI)	p
ercept	-2.052		
e >	0.718	2.050 (1.323, 3.178)	0.001
> 25	0.578	1.783 (1.155, 2.751)	0.009
C > 6	0.877	2.405 (1.629, 3.551)	<0.001
II >	0.592	1.808 (1.208, 2.706)	0.004

Conclusion: Obesity is a significant risk tor for the development of postinjury organ dysfunction and multiple organ failure. In this high population, obese patients are not at increased risk of death compared to normal patients.

NOTES

DAYS VERSUS SIX WEEKS OF SYSTEMIC ANTIBIOTICS IN THE TREATMENT ADULT OSTEOMYELITIS

Cierney III, MD J.T. Mader, MD, K.E.Zorn, RN
it Joseph's Hospital; Atlanta, GA, University Of Texas Medical Branch; Galveston, TX

senter: George Cierny III, MD Senior Sponsor: George Cierny III, MD

s study was designed to test the hypothesis that six weeks of parenteral antibiotics are required in cessful treatment of chronic osteomyelitis.

m 1981 to 1994, 914 adult patients with osteomyelitis sequentially entered our prospective tment protocols. The surgical team, Clinical Staging System, surgical algorithms, antibiotic ction and follow up remained constant throughout the study. Two year outcomes were recorded all groups.

lowing a thorough debridement, three antibiotic regimens were implemented.

OUP 1 (1981-1986): 269 patients received six consecutive weeks of parenteral antibiotics.

OUP II (1986-1991): 361 patients received one to six weeks of parenteral antibiotics based on th nical Stage of their disease and reconstruction criteria.

OUP III (1991-1994): 284 patients received one to two weeks of either parenteral or enteral/oral coverage based only on the physiologic classification of the host.

sults: The distribution of clinical stages, anatomic sites, patient gender, pathogens and deadspace nagement options remained constant throughout the study. There were no statistical differences in cess rates for the three groups: 93%, 94% and 97%, respectively. Complications decreased with e due to the refinement of our treatment strategies.

nclusions: When an osteomyelitis treatment protocol creates wounds that are live, clean and nageable, six-weeks of parenteral antibiotics are not necessary to maximize outcomes. In this ing, short term coverage is both safe and cost-effective.

per #35 8:40 AM, 3/03/2006

ARGININE INFUSION IMPROVES SURVIVAL WITHOUT GENERATING INOS IN VINE SUBJECTED TO SEQUENTIAL SHOCK AND ABDOMINAL COMPARTMENT NDROME

Yoshihara, MD, AK Malhotra, MD, C Blochers, BS, M Mangino, PhD, HJ Sugerman, MD, RR itury, MD,; Medical College of Virginia, Richmond, VA

esenter: Hideaki Yoshihara, MD Senior Sponsor: Ajai K Malhotra, MD

jectives: The current study evaluates the effect of L-Arginine infusion on 1) survival and 2) patic inducible Nitric Oxide Synthase (iNOS) activity, in our clinically relevant large animal – ine – model of sequential hemorrhagic shock-resuscitation and abdominal compartment syndrom CS).

ethods: On day1 anesthetized and ventilated swine were randomized to experimental (Exp) – L-ginine (500mg/Kg IV) – or control (Con) groups. After splenectomy animals were bled (35% od volume) over 80min. and resuscitated (lactated Ringer's=4X shed blood) over 120min. ACS s created by intra-peritoneal saline to raise intra-abdominal pressure to 25mmHg for 80 min. imals were observed for 120min., then replaced in cage. Survivors were euthanized on day2. modynamics, perfusion indices and 24hour survival were recorded. 6 Tru-cut liver biopsies (5 on /1, and 1 on day2) were analyzed for presence of iNOS activity (presence of nitrotyrosine – foot

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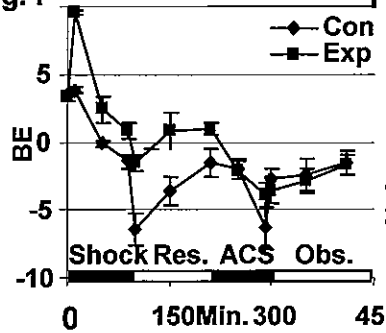


Fig. II

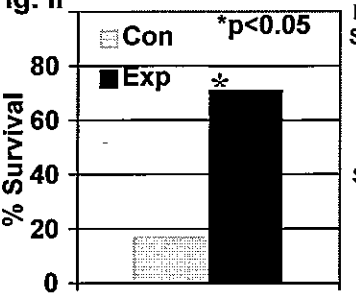
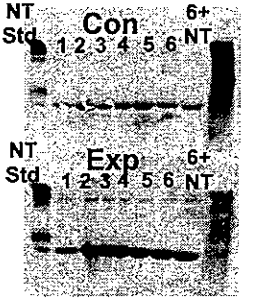


Fig. III



nt of iNOS activity) by immuno-blotting.

sults: Of 19 animals utilized, 1 died during preparation and 18 were randomized (Exp-7: Con-11 modynamic parameters (filling pressures, cardiac output, systemic and pulmonary pressures) and fusion indices (lactate, base excess (Fig. I), gastric mucosal pH) were similar in the 2 groups. 5/7 %) Exp and 2/11 (18%) Con animals survived ($p<0.05$ – Fig. II). There was no difference in otyrosine protein detected between the groups in any of the liver samples (Fig. III).

nclusions: In our clinically relevant large animal – swine – model of sequential hemorrhagic ck-resuscitation and ACS, L-Arginine infusion improved survival, ***without adversely affecting nodynamics***. This survival benefit seems to be unrelated to iNOS activity, and ***maybe*** due to re ecNOS generated NO. The exact mechanism for the observed survival benefit however, shoul elucidated with further experiments.

ORES OF WRATH: A CASE OF DISSEMINATED MUCORMYCOSIS POST-TRAUMA

Raghunathan, BS, D. Brandon Williams, MD, Natalie N. Kirilcuk, MD, MS, Susan I. Brundage,). MPH; Stanford University, Stanford, CA

ɔsenter: Amritha Raghunathan BS Senior Sponsor: Susan I. Brundage, MD

ckground: Post-traumatic invasive fungal infections are obscure and predominantly fatal. We ort survival after post-traumatic disseminated pulmonary and intra-abdominal mucormycosis.
se Report: A 38 year-old man was brought to the emergency department after being ejected ing a high-speed, head-on collision between his 18-wheeler and an oncoming truck. Evaluation ealed hypotension despite resuscitation, bilateral hemothoraces drained by chest tubes, equivocal ST and negative diagnostic peritoneal aspiration. Secondary to multiple pelvic fractures, bilatera ɔogastric arteries were embolized. Abdominal compartment syndrome developed, leading to ɔmpressive laparotomy and repair of a gastric perforation. Respiratory cultures done due to ɛrmittent fevers showed Aspergillus and Mucor on hospital days (HD) 3 & 4. In this nunocompetent patient without leukocytosis, the results were attributed to contamination and ifungal agents were not initiated. After two further abdominal washouts, the abdomen was closed HD 7. Broncheoalveolar lavage on HD 8 confirmed mucor and amphotericin B was started. Ches revealed fungal disease with multiple pulmonary nodules.
Secondary to increased leukocytosis and incisional erythema on HD 9, the abdomen was re-ɔlored with findings of angioinvasion and necrosis of the mesentery representing intra-abdominal cor. On HD 13, sepsis ensued with end-organ dysfunction including ARDS, renal failure, and a rubin of 37. Pressors, CVVH, dialysis and activated protein C were initiated. Itraconazole was led as a second anti-fungal, and discontinued when the patient was stable, the abdominal lesions ɔroved, and repeat chest CT scan showed no fungal infection. Repeat washout revealed an rmingly indurated and erythematous appendix. After resection, pathology showed a normal lume h soft tissue necrosis. Itraconazole was restarted on the basis of subsequent laparotomies showed alating invasive fungal infection in the mesentery of the sigmoid colon. Amphotericin B washes re utilized. With combination therapy, the appearance of the bowel and mesentery substantially ɔroved. After 33 days of amphotericin B, 12 days of itraconazole, and 11 laparotomies, the patier s discharged home with no end organ sequelae.
nclusion: Mucormycosis is traditionally associated with severe immunocompromise. However; V, hepatitis and diabetes tests were negative in this patient. While hospital contamination was ısidered, infection control found no source. The patient had multiple risk factors for community-ɹuired mucormycosis including intubation in an agricultural setting and occupational contact with ting vegetables. Aggressive therapy with multiple antifungal agents was likely the key to his vival. Combination treatment with amphotericin and itraconazole was crucial. Further surgical ɔridement of the abdomen was considered, however, the patient responded to antifungal drugs. trauma and critical care continues to evolve and increasing numbers of patients in extremis vive, surgeons can expect a greater incidence of complex fungal infections. Early diagnosis and ɡressive combination treatment based on anatomic evidence of disease and good clinical judgmen essential to achieve optimal outcomes.

GHT UPPER QUADRANT EXENTERATION FOR CRUSH INJURY: A CASE REPORT

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ɔsenter: Casey J. Thomas, D.O. Senior Sponsor: Thomas M. Scalea, M.D.

ɔ was a 23 year-old Hispanic male who was struck in the upper abdomen and chest with a 4000-
und 'wrecking-ball' while working at a construction site. He was initially stable with a Glascow
ma Scale of 14 then his mental status quickly deteriorated and he required intubation.
' demonstrated a grade-5 liver laceration, a grade-3 splenic laceration, a laceration of the uncinat
ɔcess of the pancreas, and a duodenal injury as well as large hemoperitonium and retroperitoneal
natoma. He was resuscitated with blood products, placed on veno-venous bypass and taken to
ɡiography for preoperative embolization. Visceral angiography showed a large filling defect
thin the liver parenchyma, but no active hemorrhage from the arterial system.

ploratory laparotomy revealed the liver laceration was actually a grade-6 injury with complete
ılsion of the left lobe of the liver and near complete avulsion of the right lobe from the
rohepatic vena cava and portal vein. A total hepatectomy via a thoracoabdominal approach with
al vascular isolation on veno-venous bypass was performed. The vena cava was reconstructed
ng a 20mm synthetic graft and an end to side portacaval shunt was created. The patient underwer
ɔancreaticoduodenectomy for a full thickness duodenal injury of portions 1,2, and 3 as well as a
ıcomitant pancreatic transection. A subtotal gastrectomy was also done secondary to major
vascularization of the stomach. Total estimated blood loss was 22 liters with replacement of 24
its of blood, 27 units of fresh frozen plasma, 4 liters of cell saver blood, 5 packs of platelets and
00 cc's of crystalloid.

e patient was supported on hepatic dialysis using a 25% albumin dialysate. Multiple staged
erations were performed to control bleeding and reconnect the patient's gastrointestinal tract.
ɔproximately 72 hours later the patient underwent orthotopic liver transplant.
ɔ survived one week post liver transplant. On his 7th post-operative day he was noted to have
ateral fixed and dilated pupils. The patient was sent for a cerebral perfusion scan. He was found t
ve no cerebral blood flow and was pronounced dead on hospital day 10.

is case represents surgery at the extreme. Even in the face of severe poly-trauma, total
ɔatectomy with liver transplant can be performed successfully. The outcome of this case may hav
fered with earlier donor availability. Liver procurement and transplant is a viable option for
ɪients with hepatic injuries that are beyond repair.

NOTES

per #38 4:40 PM, 3/03/2006

ROTALIDAE BITE TO THE FACE (WHY YOU DON'T LET THE SNAKE KISS FIRST)

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troduction: Approximately 8,000 cases of venomous snakebites are reported annually in the US ulting in 10-15 deaths. The rare fatalities from rattlesnake envenomation are believed to result m direct intravascular envenomation, anaphylaxis, or bites to the head and neck causing airway mpromise. This case illustrates two unique aspects of rattlesnake bites. First, local tissue reactior ociated with a snake bite to the face can cause rapid airway compromise. Second, it illustrates th ractory nature of coagulopathy following envenomation.

se Report: An intoxicated 50 year old Caucasian male sustained a rattlesnake bite to his upper after attempting to "kiss the snake good-bye". He was treated at a community hospital with 6 ls of Crotalidae polyvalent immune Fab (ovine) (CroFab) and urgently intubated secondary to nificant facial edema and airway compromise. On arrival to our facility, his physical exam vealed significant facial edema, bloody oropharyngeal secretions and a 3 cm necrotic appearing a on the upper lip with two puncture sites lateral to the philtrum. He had a severe coagulopathy th protime > 100 s (PT), partial thromboplastin time > 150 s (PTT), fibrin split products > 20, rinogen < 15, and platelets 257,000. He received 6 additional vials of CroFab, 12 units of FFP d 2 units of cryoprecipitate over the first 36 hours to correct his initial coagulopathy. The patient ntinued to clinically deteriorate. He required increased ventilatory support and had a deterioratin ntal status. He received 6 more vials of CroFab. The patient had 2 more recurrences of agulopathy that responded to FFP and vitamin K. As he clinically improved and had no signs of eding, he received no further blood products. By hospital day 16, his coagulation profile returne normal. After 11 days of ventilatory support, 18 vials of CroFab, 16 days of hospitalization, and atment of multiple recurrent coagulopathies, the patient was discharged home. His lip wound ntinues to improve and has required no surgical intervention.

scussion: Local effects and coagulopathic recurrences are well-documented events following ivenom administration. Management of recurrent coagulopathy is controversial. Our patient's agulation profile remained abnormal for over 2 weeks following injury. We stopped giving FFP d cryoprecipitate when hemorrhage risk decreased.

nclusion: Snake envenomation remains a serious physiological insult that requires close clinical d laboratory monitoring in an ICU setting. Early airway protection, circulatory support, ivenom therapy, and selective treatment of recurrent coagulopathy are the cornerstones of nagement.

ıPTIVE TIGER ATTACK: CASE REPORT AND REVIEW OF THE LITERATURE

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ıy: Tiger attacks may occur anywhere, due to an increasing number of these feral animals kept in icensed "private zoos" or as pets. This poses a public health risk and makes knowledge of the ultant injuries and their treatment desirable.

w: Case report of an attack on a Minnesota woman by a privately owned Siberian tiger.

38 year old woman was attacked by a 700 lb Siberian tiger owned by her boyfriend while cleanin animal's cage. She was first bitten on the neck and then suffered mangling of the lower remities before the animal was controlled. Injuries included cervical laceration/crush injury with fracture, vertebral and external carotid artery occlusion, multiple lacerations, and a comminuted ɜn left tibia-fibula fracture with severe soft tissue loss. She underwent multiple surgical ɔcedures, and required physical rehabilitation as well as psychiatric care and grief counseling for emotional trauma she suffered when the animals were subsequently destroyed.

ɜcussion: While rare in the United States, large cat attacks continue to occur, and may involve ɔtive animals. For patients surviving the initial attack, wound superinfection may result from a ıe variety of bacteria including *Pasteurella multocida*, common staphylococci, streptococci, and ım-negative bacteria as well as less common microorganisms such as *Pasteurella tularensis*, *ɔkettsia* species, and *Yersinia pestis*. Rabies may also be transmitted. The details of our case, as ll as others where such animals are kept as performing animals or in illegal or unregulated private ɔs highlights the fact that these animals remain fierce and dangerous predators with a high degree unpredictability regardless of the degree of domestication assumed by the humans caring for ım, even if the animals have been raised from infancy. Indeed, in our case and others, owners ıcked by their "pets" vehemently argued that the animal did nothing wrong and that the attack wa sunderstood by others.

mmary: Large cats held in captivity maintain a degree of their feral nature regardless of how tame ɜy may appear to be; patterns of injury follow the predator's modus operandi in the wild. ɜctious complications are frequent, and may be caused by unusual organisms. Disabling injuries ıl post traumatic stress syndrome are common in survivors, and rehabilitation and psychiatric care ɜy be necessary for optimal recovery. As some still erroneously believe that such animals may be ɜly domesticated, consideration should be given to more stringent regulation.

NOTES

EUMOTHORAX BY CATFISH

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senter: Reanna C. Adams, M.D. Senior Sponsor: Gage Ochsner, M.D.

TRODUCTION

:erations and puncture wounds to the hands and feet have been oft-reported as sequelae of ıdling catfish. To our knowledge, however, this is the only reported case of pneumothorax caused assault with a catfish.

SE REPORT

welve year-old male was transferred to our Level One Trauma facility for management of a :umothorax after an assault. He stated that he had been playing by a stream with an acquaintance, l an unknown male threw a catfish at his back. He went home, complaining of some back pain l increasing shortness of breath. He was taken to the Emergency Department by his mother, wher hest xray was evaluated by the physician and thought to display evidence of a possible right :umothorax. On review of the xray after transfer, it was confirmed to show an apical :umothorax, stable in comparison with xray at our hospital. On examination, the patient was note ɔe thin, and there was evidence of a small puncture to the right flank at the level of T10. This was n to be hemostatic, and the patient's FAST examination was within normal limits with no 'aabdominal fluid seen. Vital signs were stable, and the patient was asymptomatic at this point. ven his earlier complaints of flank pain with shortness of breath and the location of his wound h evidence of intrathoracic penetration, a CT of the abdomen and pelvis extending through the ver lung fields was conducted to rule out intraabdominal or retroperitoneal injury. This showed a derate anterior right pneumothorax and small posterior pulmonary contusion without 'aabdominal injury. These injuries were managed conservatively, and the patient was discharged ne approximately thirty-six hours after the initial injury with a resolving pneumothorax on serial :st xrays.

BY-LAWS

BYLAWS OF THE
WESTERN TRAUMA ASSOCIATION

ARTICLE I
Name, Objectives, Organization, and Jurisdiction

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

SECTION 2: Objectives, Core Value and Mission Statement
1) Objectives to promote the exchange of educational and scientific information and principles,
highest level, in the diagnosis and management of traumatic conditions and to advance the sci
and art of medicine.

2) Core value:
Continuing education by participation in a diverse, multi-disciplinary scientific program with the
improving the care of injured patients.

3) Mission Statement:
The Western Trauma Association is committed to the improvement of trauma care through res
education, sharing of clinical experiences and the development of physicians of all specialties
are involved in the care of trauma patients.

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

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

SECTION 5: Governing Board
The affairs of the Association shall be conducted by the Board of Directors.

ARTICLE II
Membership

SECTION 1: Membership Limitation
Membership shall be limited 125 active members. No single specialty shall comprise more tha
of this total membership of 125.

SECTION 2: Membership and Qualifications
A. Active members shall be limited to Doctors of Medicine or Doctors of Osteopathy whc
Board Certified in their particular medical specialty and are under the age of 55 years
Board of Directors is hereby given discretionary powers to interpret if foreign physicia
apply for membership have credentials comparable to Board Certification. Active sta
conferred by a two-thirds vote of the Board of Directors. Active members have the rig
vote on any business presented to the organization during the business meeting, ser
or chair any committee and be elected to any elected position within the organization

Associate members include qualified members of other (non-M.D.) health care disciplines with a special interest or expertise in trauma. Approval of a majority of the Board of Directo is required. Associate members must satisfy the same requirements for election to and retention of membership as active members. Associate members may not vote, serve on committees or hold office.

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

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

Emeritus membership: Senior members of the Association who have made a significant contribution to the organization may be awarded Emeritus membership by a majority vote c the Board of Directors.

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

CTION 3: Membership Retention

retain membership in the Association, each member must comply with the following:

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

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

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

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.

CTION 4: Termination of Membership

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

Any member may resign by filing a written resignation with the Secretary; however, such resignation shall not relieve the member so resigning of the obligation to pay any dues or other charges accrued and unpaid.

ARTICLE III
Meetings

SECTION 1: Annual Meetings
There shall be an annual meeting of the membership of the Association held in some suitable lo chosen by the President-elect and approved by a majority vote of the Board of Directors and th membership. Funds shall be made available for the conduct of the scientific program at the an meeting.

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

SECTION 3: Notice
Notice of the time and place of the annual or special meetings of the Association shall be maile the secretary of the Association to each and every member at his address as it last appears on records of the Association with postage thereon prepaid. Notice shall be deemed delivered wh deposited in the United States Mail, so addressed to the respective member. Notification by ele mail (e-mail) may be substituted for regular mail.

SECTION 4: Quorum
Subject to provisions of Article VI, Section 3, one-fourth of the membership present at any mee the Association shall constitute a quorum.

ARTICLE IV
Board of Directors, Meetings, and Responsibilities

CTION 1: Composition

The President, President-elect, Vice- President, Secretary, Treasurer, immediate Past President, program committee chairman and six members-at-large shall constitute the Boar of Directors.

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

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

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

ction 2: Annual Meetings

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

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

CTION 3: Special Meetings

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

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

CTION 4: Quorum

najority of the Board of Directors shall constitute a quorum. (No member of the Board may vote b oxy.)

SECTION 5: Powers
Subject only to the limitations of the provisions of the Colorado Nonprofit Corporation Act, all corporate powers shall be exercised by or under the authority of, and the affairs and activities o Association shall be controlled by, or under the authority of, the Board of Directors.

Section 6: Ex-officio Members of Board of Directors.
The President of the Western Trauma Foundation for Education and Research, Chairman of th Program Committee, Chair of the Multicenter Trials Committee and the Historian shall be ex-off members of the Board of Directors and may participate in any meeting of the Board of Director

ARTICLE V
Registration, Fees, Dues, and Assessments

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

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

SECTION 3: Assessments
A two-thirds majority vote of the Board of Directors of the Association can institute a special assessment of the general membership. Special assessments can be voted by the Board of Directors only for the promotion of scientific programs at the annual meetings, research papers other purposes designed to achieve the exchange of ideas and principles pertaining to the diag and management of traumatic injuries and conditions. Notice of any special assessment of the membership so voted by the Board of Directors shall be sent, by either regular or electronic ma all active and senior members at the last address on record with the Association, postage pre-p

SECTION 4: Waiver of Dues and Responsibilities
All requirements for retention of membership including payment of dues and attendance at mee may be waived by a vote of the majority of the Board of Directors upon petition. Eligibility for su waivers shall include induction into the Armed Forces of the United States on a temporary basi physical disability, or other reasons that would place unreasonable hardship, physical disability other reason upon the petitioner.

ARTICLE VI
Voting

SECTION 1: Voting Rights
Each active member or senior member in good standing shall be entitled to one vote on each n submitted to a vote of the membership.

SECTION 2: Majority

najority of the votes entitled to be cast on a matter at a meeting at which a quorum is present sha deemed necessary for the adoption of such matters unless otherwise noted in the Bylaws.

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

In person.

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

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

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

CTION 5: Elections
ctions and all other matters raised to a vote of the membership cannot be held unless a quorum sent and shall be by majority vote.

ARTICLE VII
Officers

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

CTION 2: Terms and Vacancies
e President, President-Elect, and Vice-President shall hold office for one (1) year. The Secretary d Treasurer shall each hold office for the term of three years. All elected officers, except the easurer, shall be automatically inaugurated at the close of the annual meeting at which they are cted. The newly elected treasurer shall assume the responsibilities of his/her office at the ginning of the next fiscal year following his/her election. The Historian shall serve until his/her ath, resignation or inability to perform the duties subsequently described in Article VIII, Section 6. officer cannot complete his/her term, his/her successor shall be chosen by the Board of Director special meeting to fill the vacancy for the unexpired term of the office. No officer shall serve more n one term.

CTION 3: Removal
y officer may be removed, with or without cause, by a vote of a majority of the members of the ard of Directors present at any meeting for that purpose.

SECTION 4: Resignation
Any officer may resign at any time by giving written notice to the Board of Directors and receivi
their approval.

ARTICLE VIII
Duties and Authority of Officers

SECTION 1: President
The President shall preside at all meetings of the members and shall serve as ex-officio memb
all committees. The president shall be Chairman of the Board of Directors and shall serve as t
liaison to the American Association for the Surgery of Trauma.

SECTION 2: President-Elect
The president-elect shall plan and organize the next annual meeting and assume whatever
responsibilities the president or Board of Directors shall assign.

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

SECTION 4: Secretary
The secretary shall
1) Keep the minutes of all meetings of the association and the Board of Directors
2) Be responsible for applications for membership, elections and terminations of members ar
communications to the membership, especially those whose membership is in jeopardy becau
violations of the bylaws.
3) Maintain the Membership database, with the help of the Treasurer.
4) Record the reports from the other officers and committees and any bylaw changes.
5) Maintain copies of all corporate documents, including contracts, except for those that spec
relate to financial matters.
6) Prepare a report for the membership at the annual business meeting and for the Board of
Directors at each of their annual meetings.

SECTION 5: Treasurer
The treasurer shall:
1) Keep the books of account of the Association.
2) Have custody of, and be responsible for all funds, securities, financial documents, an
properties of the Association and shall deposit all such funds in the name of the Asso
in such banks or other depositories as shall be approved by the Board of Directors.
3) Assist the Secretary in keeping the roster of the membership that is current and accu
4) 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/sh
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.
5) Manage all accounts receivable and payable, including such expenses as may be inc
in the name of the Association.
6) Send to all active and associate members a statement of dues in the first quarter of th
year, and make all necessary efforts to collect those dues.
7) Serve on the Website Committee and prepare the website annually for the meeting
registration process.

Prepare registration packets, including name badges,-and other items, for all those attendin the annual meeting.
Organize, with assistance from the other Officers and Board Members, the registration process at the annual meeting.

CTION 6. Historian
Historian should maintain and safeguard the archives of the Association. The Historian shall be ex-officio member of the Board of Directors. In case of a vacancy by reason of death, resignatior nability to fulfill the responsibilities of the office, the vacancy may be filled by the Board of Director l the next annual meeting of the members. The historian shall keep a continuous account of the ory of the Association for the use of the membership. This shall include significant information cerning each annual meeting, including the site of the meeting, recipients of honors, invited urers, highlights of the scientific program, and important actions arising from the Business eting. The historian shall also record significant action of the Board of Directors at its meeting. h five years the historian shall prepare the history of the Association from the time of the last orded history to be part of the archives of the Association. Memorabilia of the Association shall b lined by the Historian.

ARTICLE IX
Committees

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

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

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

CTION 4: Publications Committee
Publications Committee will consist of a Chairman and a Committee including at least one neral Surgeon, one Orthopedic Surgeon, one Plastic Surgeon and another specialist (if available) l as many other members as the Chairman and President deem necessary and appropriate. The airman of the Program Committee shall serve as an ex-officio member of the committee. The airman of the Publications Committee will be appointed by the President and serve a two (2) year n. The other members, selected from the membership, will be appointed by the President in sultation with the Chairman, annually. This committee will be responsible for reviewing all nuscripts submitted in association with presentations at the annual meeting and for choosing thos

which will be submitted to The Journal of Trauma. The Chairman will serve as the liaison to Th Journal of Trauma. Should the Chairman not be an Editorial Consultant to The Journal of Trau the Chairman will consult with a member of the Editorial Board of The Journal of Trauma desig by the President.

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

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

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

ARTICLE X
Conduct and Order of Business

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

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

ARTICLE XI
Indemnification

Section 1. Definitions. For purposes of this Article:

A. The terms "director or officer" shall include a person who, while serving as a director c officer of the Association, is or was serving at the request of the Association as a dire officer, partner, member, manager, trustee, employee, fiduciary or agent of another fo 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.

B. The term "proceeding" shall mean any threatened, pending, or completed action, suit, proceeding, whether civil, criminal, administrative, or investigative, whether formal or informal, any appeal in such an action, suit, or proceeding, and any inquiry or investig that could lead to such an action, suit, or proceeding.

The term "party" includes an individual who is, was, or is threatened to be made a named defendant or respondent in a proceeding.

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

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

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

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

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

in connection with a proceeding brought by or in the right of the Association in which the ector or officer was adjudged liable to the Association; or
in connection with any other proceeding charging improper personal benefit to the director cer, whether or not involving action in that person's official capacity, in which the officer or direct ıltimately adjudged liable on the basis that the director or officer improperly received personal ıefit.

lemnification under this Section 2 in connection with a proceeding brought by or in the right of the sociation shall be limited to reasonable expenses incurred in connection with the proceeding. Th mination of any action, suit, or proceeding by judgment, order, settlement, or conviction or upon a a of solo contender or its equivalent shall not of itself be determinative that the person did not me standard of conduct set forth in this Section 2.

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

ction 4 Determination of Right to Indemnification.
y indemnification under Section 2 of this Article (unless ordered by a court) shall be made by the sociation only as authorized in each specific case upon a determination that indemnification of th

director or officer is permissible under the circumstances because such person met the applica standard 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 dire who at the time of the vote are not, were not, and are not threatened to b made parties to the proceeding; or

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

Section 5. Advance Payment of Expenses; Undertaking to Repay.

The Association may pay for or reimburse the reasonable expenses (including attorneys, fees) incurred by a director or officer who is a party to proceeding in advance of the final disposition proceeding if:

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

(ii) the director or officer furnishes the Association with a written undertaking, ex 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 d 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 fact known to such body would not preclude indemnification.

Section 6. Reports to Members.

In the event that the Association indemnifies, or advances the expenses of, a director or officer accordance with this Article in connection with a proceeding by or on behalf of the Association, report of that fact shall be made in writing to the member with or before the delivery of the notic the next meeting of the members.

Section 7. Other Employees and Agents.

The Association shall indemnify such other employees and agents of the Association to the sa extent and in the same manner as is provided above in Section 2 with respect to directors and officers, by adopting a resolution by a majority of the members of the Board of Directors specifi identifying by name or by position the employees or agents entitled to indemnification.

Section 8. Insurance.

The Board of Directors may exercise the Association's power to purchase and maintain insura (including without limitation insurance for legal expenses and costs incurred in connection with defending any claim, proceeding, or lawsuit) on behalf of any person who is or was a director, employee, fiduciary, agent or was serving as a director, officer, partner, member, trustee, empl fiduciary of another domestic or foreign corporation, nonprofit corporation against any liability asserted against the person or incurred by the person in any such capacity or arising out of the

son's status as such, whether or not the Association would have the power to indemnify that son against such liability under the provisions of this Article.

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

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

ARTICLE XII
Conflicts Of Interest, Loans And Private Inurement

ction 1. Conflicts of Interest.
ny person who is a director or officer of the Association is aware that the Association may or is out to enter into any business transaction directly or indirectly with himself, any member of such son's family, or any entity in which he has any legal, equitable or fiduciary interest or position, luding without limitation as a director, officer, shareholder, partner, beneficiary or trustee, such son shall:

immediately inform those charged with approving the transaction on behalf of the sociation of such person's interest or position;

aid the persons charged with making the decision by disclosing any material facts within ch person's knowledge that bear on the advisability of such transaction from the standpoint of the sociation; and

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

ting on such transaction shall be conducted as follows:

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

The interested office or director shall withdraw from the meeting.

Discussion of the matter outside of the presence of the interested officer or director shall b d by the Board.

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

ction 2. Loans to Directors and Officers Prohibited.

No loans shall be made by the Association to any of its directors or officers. Any director or offi who assents to or participates in the making of any such loan shall be liable to the Association amount of such loan until it is repaid.

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

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

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

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

ARTICLE XIII
Amendments

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

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Paint the Ceiling Lecture

"The doctor made me do it."

Andrew Schneider
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