Better Medicine

In

Bad Places.

Optimizing Trauma Outcomes in Austere, Humanitarian and Disaster Settings

Sean G. Smith
Flight Nurse-Paramedic
MSc Forensics (cand.)
Faculty / Moderator:

NO CONFLICTS

Sean G. Smith, BSN
Flight RN-Paramedic
CNPT, FP-C, TP-C, CCRN-K, CCRN (CMC), CFRN, CEN, CPEN, etc
(lab rat, bouncer, nuclear engineering student, super secret squirrel, lab rat...ICU/Flight/ED/ Ebola(WHO)/50+ Medical Missions/ NASA (PRN), etc...)

MSc Forensics (cand.)
Haiti, Guyana, Nepal

criticalcareprofessionals@gmail.com

All Rights Reserved, Sean G. Smith. Please Credit.
Agenda:

We are going to FLY! ..... BUT!
Be a CLINICIAN....NOT a Technician and

....

ALWAYS ask........ WHY   !!!!!!!!
4 y/o Engineer.... PERFUSION / CPP!
Education is Not The Learning of Facts

It’s Rather The Training of The Mind To Think
WHEN IT COMES TO EDUCATION
THE MOST IMPORTANT THING IS APPETITE
“IF EVERYONE IS THINKING ALIKE, THEN SOMEBODY ISN’T THINKING.”

- GENERAL GEORGE S. PATTON
(1885-1945)
Begin With The End In Mind...
Failing to Plan Is Planning to Fail.
Trees vs Forest: Specific Skillset Vs. Big Picture Mission Planning
<table>
<thead>
<tr>
<th><strong>Category</strong></th>
<th><strong>Characteristics</strong></th>
<th><strong>Body Part Affected</strong></th>
<th><strong>Types of Injuries</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary</strong></td>
<td>Unique to HE, results from the impact of the overpressurization wave with body surfaces. Gas filled structures are most susceptible - lungs, GI tract, and middle ear</td>
<td></td>
<td>- Blast lung (pulmonary barotrauma) - TM rupture and middle ear damage - Abdominal hemorrhage and perforation - Globe (eye) rupture - Concussion (TBI without physical signs of head injury)</td>
</tr>
<tr>
<td><strong>Secondary</strong></td>
<td>Results from flying debris and bomb fragments</td>
<td>Any body part may be affected</td>
<td>- Penetrating ballistic (fragmentation) or blunt injuries - Eye penetration (can be occult)</td>
</tr>
<tr>
<td><strong>Tertiary</strong></td>
<td>Results from individuals being thrown by the blast wind</td>
<td>Any body part may be affected</td>
<td>- Fracture and traumatic amputation - Closed and open brain injury</td>
</tr>
<tr>
<td><strong>Quaternary</strong></td>
<td>- All explosion-related injuries, illnesses, or diseases not due to primary, secondary, or tertiary mechanisms. - Includes exacerbation or complications of existing conditions.</td>
<td>Any body part may be affected</td>
<td>- Burns (flash, partial, and full thickness) - Crush injuries - Closed and open brain injury - Asthma, COPD, or other breathing problems from dust, smoke, or toxic fumes - Angina - Hyperglycemia, hypertension</td>
</tr>
</tbody>
</table>
Stopping the Bleed and Stabilizing: Tourniquets, Tranexamic acid (TXA), AbNormal Saline, Physiologic Fluids,
Stopping the Bleed:
1. STOP BLEED!
2. Replace What was lost… Whole blood, but what about supply?
Tourniquets: Direct Pressure Done Right. \( P = \frac{F}{A} \), FlipFlop vs Spike Heel...ET vs Whole Hand.
Pearls: Envenomation
Crotalidae/Viperidae
Symptomatic Management
Calm, Cro-Fab Do NOT Compartmentalize! (no tourniquet!)
Antivenom: Anaphylaxis: Monitor for and Tx accordingly.
What about Elapidae? PPPPPP!
Know BEFORE you go!
THE CONDOM TAMPONADE

Inflate Condom with water till no further bleeding is occurring (usually about 300-500 mls)

Apply clamp to keep water within Condom after inflation

UTERUS

Condom

String

Foleys Catheter

Giving set

Water/NS

syringe

OR

Clean water
Tranexamic acid (TXA): CRASH, (Lancet) MATTERS, WOMAN, etc.

https://www.jems.com/2018/01/01/is-txa-a-lifesaving-drug-that-s-too-cheap-to-bother-using/
How is it given?6-7

Loading dose bolus:

TXA 1 GRAM + NORMAL SALINE 100 ml given over 10 minutes

Followed by intravenous infusion:

TXA 1 GRAM + NORMAL SALINE 250 ml given over 8 hours

This information sheet is provided for informational purposes only. ENA is not providing medical advice. The instructions and information provided herein is not intended to replace judgment of a medical practitioner or healthcare provider based on clinical circumstances of a particular patient. The information included herein reflects current knowledge at the time of publication and is subject to change without notice as advances emerge and recommendations change. ENA makes no warranty, guarantee or other representation, express or implied, with respect to the validity or sufficiency of any information provided and assumes no liability for any injury arising out of or related to use of or reliance on information contained herein.
Replace What Was Lost: AbNormal Saline, Physiologic Fluids. NUMEROUS Trials. (SMART) Consider Unseen Endpoints (AKI, etc)
Stopping the Bleed and Stabilizing: Freeze Dried Plasma, Transfusions, TRALI, TRIM, and more…
Freeze Dried Plasma,
France, Israel, SOF, THOR, etc...
Get Smart:
TCC/TECC
PFC, etc.
TNCC, ATLS, etc.

are good, but derivative.

Stay Dynamic.
CBC: O2 Delivery Rules of

<table>
<thead>
<tr>
<th>Cell Type</th>
<th>Normal Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBCs</td>
<td>5</td>
</tr>
<tr>
<td>Hgb</td>
<td>15</td>
</tr>
<tr>
<td>HCT</td>
<td>45</td>
</tr>
</tbody>
</table>

1. Immune Reaction/Sensitization
2. Infection (Bacterial/Viral)
3. Iatrogenic Coagulopathies: Pede Tubs/POC
   • Pressure
   • Hemodilution
   • Ca2+ chelation
4. K+
5. TRALI, TACO, TRIM, etc

All Rights Reserved, Sean G. Smith. Please Credit.
The Trauma Triad of Death.

Figure 1. The triad of death

- Coagulopathy
- Hypothermia
- Acidosis

- Decreased coagulation
- Decreased heart performance
- Increased lactic acid in blood
- Severe blood loss
Field Amputations: Pray for the Best, plan for the worst. Life before Limb.
Fight The Pain...
Multimodal
Locals, Regionals
POCUS
MARAA
Know Before You Go: PPMPPP
How are you going to get it In?
Alternate Routes:
IntraOsseus
IM
IN
Pressure Bags. "real" and improvised.
Know Before You Go: PPPPPP

Rx: NaHCO3, Thiopental, etc

Needle Decompression/ Chest Tubes…

Pulse Oximeters and etCO2 as ICU monitors, Etc…
What would you think if I told you that you really only needed to remember Just TWO concepts For Shock?

1. PERFORUSION is ALWAYS the RIGHT answer! (followed by Situational Awareness)

   CPP = MAP - ICP

2. CO = HR x SV

   (every variable we have discussed essentially comes down to SV: Warm, Pink, Sweet: Electrolytes, acidosis, temperature, glucose.)
Transport, Trauma Surgery, and Training: Triage, Transport, Telemedicine, and Therapy. Building Capacity and Trauma Systems Where There Are None...
Transport, Trauma Surgery, and Training: Triage: SMART, ESI, etc
Transport, Trauma Surgery, and Training: Transport: Israel, etc.
Telemedicine: Devices, Apps…
Power/ BANDWIDTH!
Training / Consult
PeriOperative
EMS
Training: Self and Others: PTC, CALS, HomeGrown/Bespoke
EG: Burns-Breaks-Bleeds-Babies
Training:
Helping Health Workers Learn
A book of methods, aids, and ideas for instructors at the village level.

David Werner and Bill Bower
Training: Self and Others
Training:
Point of Care Ultrasound (POCUS). E-FAST, Regionals, Training for Locals. Many advantages over other imaging modalities. Good ROI.
Medical Records, Follow Up:

Open MRS
Follow Up, Prosthetics, Physical /Occupational Therapy
Psycho-Social Considerations for both Patient and Provider. WHO (Pre/Peri), CISD(peri/post), etc.
Stress Management

CISD: Critical Incident Stress Debriefing. Small group of those exposed to same traumatic event. Occurs 24-72 hours after.

CISM: Critical Incident Stress Management (Bigger Picture). Mitigates negative mental and physical health sequelae from traumatic events. (pediatric code, aircrew fatalities, etc.) Individual counseling may be needed.
Stress Management

CISD: Critical Incident Stress Debriefing.

Small group of those exposed to same traumatic event.

Occurs 24 - 72 hours after.
Stress Management
CISD: Critical Incident Stress Debriefing.

1. Assess (audit) the impact
2. Identify immediate issues
3. Defusing
4. Predict events and reactions
5. "Systematic Review" Look for maladaptive behaviors or responses to the crisis or trauma;
6. "Closure"
7. Debriefing /"re-entry" process.

All Rights Reserved. Copyright 2019. Sean G. Smith.
Conclusion/Contact

1. E-Mail
2. Social Media
3. Save The Date.

11-14 May 2021
Tokyo, Japan
Questions, Comments, Concerns

Again, Thank You.... Thank You Very Much....!
criticalcareprofessionals@gmail.com