Pre-hospital medicine: How far have we come?

Origins of battlefield triage - France, Percy & Lamy Bandoliers kept bandage rolls under their tall uniform hats 1967 - Prehospital ambulance for cardiac events in Northern Ireland. 1st year 312 patients transported with no deaths despite in-transit cardiac arrests.

Prehospital medicine no longer separated from in-hospital medicine. Now dictating in-hospital outcomes.

True prehospital medical & surgical care, esp military medicine, but also civilian. eg, prehospital ECMO, REBOA.

RescuePod

Training in PHARM

True Goal = improving patient outcome

Training: Self Team Others

<u>Self</u>

Not spoon fed Train self - Reading literature - FOAMed, but not simply accepting on faith; not to check veracity for self

Visualization self-training Mike Lauria's "Beat The Stress Fool"

Maintain fluid cognition - keep challenging your brain Don't keep doing the same things with the same people - learn from variety of patients and colleagues Educational gold in the debrief - seek actively

<u>Team</u>

"Train how we fight" Fidelity - Not simply mannequin, but environment, equipment and interactions

Cadaver lab is essential for procedures

Others

Must have credibility to do this!

Goal is not to impress but to educate

Passion

PHARM dogmalysis

Brohi definition "process of cherry picking to suit opinion that is divergent from common practice"

Acute crush injury

- HyperK

Evidence base for actual existence is very thin. Extrapolated from WWII article 1941 describing victims pinned down by fallen wall for hours, NOT guy trapped in car for an hour

- ECG rarely identifies it accurately. Poor sensitivity.

- Touniquets no preventitive role
- HCO3

Little evidence to support benefit. Some evidence of harm (pro arrythmic)

Current recommendations



Spine immobilisation

Beginning to see rational guidelines, but still lots to learn and validate

Scoop & run V Stay & play

False dichotomy: not a mutually exclusive choice ... Depends upon patient context and geography

Reid: "This argument is not a debate, it is BS"

Head injury does not cause hypotension

Rare, but it can

- kids
- scalp lacerations



Stress in EMS

Key items

-Recognition that we can't fix everything. But we need to feel that we have done everything that we could and to the best of our ability

- the fear still happens, but can be channelled to be useful

- Call things what they are. Sometimes we are angry or upset. Call it out rather than trying to mute it. Support person needs to understand context of individual to be truely supportive, otherwise risk worsening situation. Open offer of help, not forced involvement.

- Everyone reacts differently. Look out for warning signs, eg 1000-yard stare.

- Eliminate stigma - OK for girls to cry, but not guys?! Tough guy approach. Sissy.

- Lots of time spent taking care of *other* people. Need to be aware of own needs and reactions.

Bleeding in trauma

Aiming to shorten time lapse to full chain of survival

Shared mental model

Blood product or no fluid. Composition and ratios yet to be defined & validated. Role of REBOA - Concerns re competency & skill maintenance: G Grier - if you believe a procedure creates beneficial outcomes then may need to just start doing it in order to get it off ground (but need to be ready to back stance with supporting evidence)

Need further research into metabolic response to massive hge, which may lead



to endless debate over role of cytokine etc manipulation in the prehosp environment.

Ketamine in PHARM

V good for non-critical interventions, eg field fracture reduction Useful in critically ill interventions, but need to understand context and pitfalls and dose to physiology

IV, IM

<u>Ketamine EBM</u> Fine in TBI - plenty of evidence. Minimises secondary injury from hypotension. Good in agitated pt, suicidal pt Useful in fitting patient Useful in asthma/COPD Useful in neonatal and paeds - sepsis, cardiomyopathy

<u>Pitfalls</u>

Apnoea in higher doses, esp v sick pts, but likely to be needing vent support anyway

Increases BP but not necessarily flow (perfusion) due to myocardial depressant effect. Therefore not great post ROSC - increased myocardial O2 demand with reduced supply.

Hypertensive emergencies - use something else

5-10% get increased salivation. May be relavent in critical airway management.

Consider sialogogue. Warn team/relatives of ketamine appearance

CRM

Cognitive bandwith - physical resource that can be rapidly saturated. Need coping mechanisms



Prioritise

Resuscitate, differentiate, communicate (adapted from Joe Novac's aviate, navigate, communicate)

<u>Manage the stress</u> Stress innoculation Contextual training Cognitive pff-loading, eg checklists, Browselow tape, kit dump sheet "Beat The Stress Fool"

<u>Share</u> Leadership - delegate right task to right person at right time Communication - no doubt about influence - clear, concise, closed loop Shared mental model

Pre hospital RSI

DASHH-IA NODESAT GAMUT

Life, limb and sight saving procedures (for non surgeon)

Essentially compartment syndromes

These skill can be acquired by anyone

Skill maintenance may be trickier, but can be managed with proper training approach

Need context & environmental fidelity training

Lateral canthotomy Finger thoracostomy Field amputation Emergency thoracotomy Escarotomy Resuscitative hysterotomy (formerly perimortem C-section) - chance to save 2 lives Skull trephination (decompressive craniotomy)

Need to have considered not only the procedure, but also post procedure actions and next steps.

Important consideration: PTSD potential of doing these procedures on the one-off or occasional proceduralist (Ashley Liebig's)



Decompressive craniotomy



Needle decompression



Resus hysterotomy



Preparing for rare procedures

Thoughts for motorsport application

Use of Pause & Reflect scenario rather than testing a crew in front of audience on training day to ensure critical teaching points are made and include whole group rather than just team under focus.

Low-fi mannequin but high fidelity (realistic) equipment, environment and context.

Focus on decision making over skills

Dealing with cognitive stress load

Working with unknown team members and unknown skill base

Call and check procedure checklist (SydneyHEMS site provides checklists for free use)

Pre-procedure 30 second drill aims to ensure everything is in place and barriers identified before starting the intervention in order to minimise risk of stuffing it up.

<u>Procedures</u> Life, limb and vision saving with focus on blunt trauma injuries



ATACC training manual - http://www.atacc.co.uk/e-learning/