THE CRITICALLY ILL OLDER PERSON WITH:

SEPTIC SHOCK
• Older people carry the burden of sepsis

Epidemiology of severe sepsis in the United States: Analysis of incidence, outcome, and associated costs of care

Derek C. Angus, MD, MPH, FCCM; Walter T. Linde-Zwirble; Jeffrey Lidicker, MA; Gilles Clermont, MD; Joseph Carcillo, MD; Michael R. Pinsky, MD, FCCM

(Crit Care Med 2001; 29:1303–1310)
• Older people carry the burden of sepsis

• Immunosenescence
• Co-morbidity
• Endothelial / mucosal atrophy
• Dependence – hospital, RACF
• Pre-admission functional decline
• Diagnostic challenges
SEPSIS TRIALS IN THE ELDERLY
SEPSIS TRIALS IN THE ELDERLY

142 sepsis trials including adults >65 years
Average cohort age <65 years in 87% trials
Single trial (0.7%) focussed on adults >65
There are few data specifically examining septic shock in the elderly. Most study cohorts are not representative of elderly patients. A small minority of studies conducted age-based subgroup analyses.

<table>
<thead>
<tr>
<th>Aspect of sepsis</th>
<th>Trial</th>
<th>Age</th>
<th>Age-based subgp analysis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Goal-directed therapy</td>
<td>Rivers</td>
<td>64/67</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>ProCESS (USA)</td>
<td>62</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>ARISE (ANZ)</td>
<td>63</td>
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<tr>
<td></td>
<td>ProMISe (UK)</td>
<td>64</td>
<td>Yes</td>
</tr>
<tr>
<td>Antibiotics trial</td>
<td>PHANTASi (pre-hospital ABs)</td>
<td>72</td>
<td>Yes</td>
</tr>
<tr>
<td>Fluid trials</td>
<td>SAFE (saline / 4% albumin)</td>
<td>59</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>VISEP (starch / Ringer's)</td>
<td>64/65</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>6S (starch / Ringer's)</td>
<td>66/67</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>ALBIOS (saline / 20% albumin)</td>
<td>69/70</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>SMART (saline / balanced fluid)</td>
<td>58</td>
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</tr>
<tr>
<td>Vasopressor trials</td>
<td>SOAP II (NA vs DA)</td>
<td>67/68</td>
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</tr>
<tr>
<td></td>
<td>VASST (NA vs NA+AVP)</td>
<td>59/62</td>
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</tr>
<tr>
<td></td>
<td>CATS (NA vs ADR)</td>
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<tr>
<td>MAP target</td>
<td>SEPSISPAM</td>
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<tr>
<td>Corticosteroids</td>
<td>CORTICUS</td>
<td>63</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Adrenal</td>
<td>62/63</td>
<td>No</td>
</tr>
</tbody>
</table>
**SEPTIC SHOCK - TREATMENT**

- Cultures and antibiotics
- Fluids
- Vasopressors
- Corticosteroids
- Disposition decisions – ward vs ICU.
CULTURES + ANTIBIOTICS

- Elderly –
  - higher rates of bacteraemia
  - Gram negatives and multi-drug resistant organisms more likely
  - Specific pathogens e.g. Listeria
  - More likely to have ADR

Blood cultures and informed AB choice therefore vital
CULTURES + ANTIBIOTICS

- Antibiotic treatment ASAP after blood cultures.
- Evidence for narrow time targets doubtful – see:

Prehospital antibiotics in the ambulance for sepsis: a multicentre, open label, randomised trial

RCT with intervention = prehospital CRO for sepsis

CRO @ time = triage – 26 mins
ED AB @ time = triage + 70 mins

Antibiotics 96 mins earlier had no difference on mortality for sepsis, severe sepsis, or shock.
CULTURES + ANTIBIOTICS

- Antibiotic treatment ASAP after blood cultures.
- Evidence for narrow time targets doubtful – see:

  Prehospital antibiotics in the ambulance for sepsis: a multicentre, open label, randomised trial

  Nadia Alam, Erick Oskam, Patricia M Stassen, Pieterem van Exter, Peter M van de Ven, Harm R Haak, Frits Holleman, Arthur van Zanten, Hien van Leeuwen-Nguyen, Victor Bon, Bart A M Duineveld, Rishi S Nannan Panday, Mark H H Kramer, Prabath W B Nanayakkara, on behalf of the PHANTASI Trial Investigators and the ORCA (Onderzoeks Consortium Acute Geneeskunde) Research Consortium the Netherlands

- Narrow time to antibiotic targets will have consequences – poor (no?) cultures and poor AB choice.
FLUIDS - VOLUME

- SSC guidelines: 30 mL/kg crystalloid, then bolus to targets
- Controversy regarding volume in sepsis
- Elderly more prone to side effects from excess volume – is ventilation an option?
FLUIDS - TYPE

- Starch associated with renal dysfunction and mortality
- Hyperchloraemia associated with renal dysfunction and mortality

**ORIGINAL ARTICLE**

*Hydroxyethyl Starch 130/0.42 versus Ringer’s Acetate in Severe Sepsis*


**ORIGINAL ARTICLE**

*Balanced Crystalloids versus Saline in Critically Ill Adults*


**ORIGINAL ARTICLE**

*Intensive Insulin Therapy and Pentastarch Resuscitation in Severe Sepsis*

ALBIOS provides some evidence for albumin
FLUID SUMMARY

- Err on side of less rather than more volume, titrate
- Avoid starch
- Avoid hyperchloreaemia – consider balanced fluids rather than reflex saline
- Consider albumin – eg 20% albumin 100mL/hr X 3-4, +/- aim [ALB] >30 daily
- (Blood – transfusion trigger in elderly sepsis is anybody’s guess)
VASOPRESSORS

• **Noradrenaline** established 1st line vasopressor, however unproven benefit.
• Consider NA trial via sturdy PIVC or venous vygon catheter

• **Arginine vasopressin (AVP)** may have role – reduces NA requirements, constant dose.
• **Terlipressin** – long-acting (intermittent dose) selective V1 > V2 agonist
• **Selepressin** – highly selective V1 agonist, early trials promising.
STEROIDS

- Hydrocortisone 50mg q6h – for presumed adrenal insufficiency (arguably more common in elderly)
- Annane, CORTICUS conflicting. Luckily we have ADRENAL (2018):

  3800 patients with septic shock requiring invasive ventilation
  Mortality – no difference
  **However** faster shock resolution, shorter ICU and hospital LOS

**Adjunctive Glucocorticoid Therapy in Patients with Septic Shock**
SOURCE CONTROL

• Removal of infected foreign bodies – IDC, pacemaker, PIVC, CVAD
• Percutaneous drainage of collections: cholecystostomy, nephrostomy, ICC for empyema etc.
• Spinal anaesthesia may be an option
DISPOSITION

• Should I advocate for my elderly patient with septic shock to be admitted to ICU / retrieved?
• How can ward-based care be optimised?
DISPOSITION

• Should I advocate for my elderly patient with septic shock to be admitted to ICU / retrieved?

- Heavily dependent
- Poor quality of life, unaware
- Non-urinary sepsis
- Substantial co-morbidity
- Respiratory failure with underlying lung disease
- Declines ICU
- ‘Not determined to benefit’*

Consider benefits of ward-based care**
Older adults can expect the following after an emergency department intubation:

- 65 to 74 years old: 31% survive and return home, 40% survive and discharge to nursing home, 29% die in the hospital
- 75 to 79 years old: 23% survive and return home, 43% survive and discharge to nursing home, 34% die in the hospital
- 80 to 84 years old: 19% survive and return home, 41% survive and discharge to nursing home, 40% die in the hospital
- 85 to 90 years old: 15% survive and return home, 42% survive and discharge to nursing home, 43% die in the hospital
- >90 years old: 14% survive and return home, 36% survive and discharge to nursing home, 50% die in the hospital

**DISPOSITION**

- Should I advocate for my elderly patient with septic shock to be admitted to ICU / retrieved?

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<th>Good quality of life</th>
<th>Urosepsis</th>
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RBWH
Most ED patients hospitalised with septic shock are aged >65
Mortality increases linearly with age from (approx.) age 40
ICU admission rates drop sharply after age 70
SEPTIC SHOCK IN THE ELDERLY

- Conventional approach warranted – antibiotics, fluids, vasopressors, source control
- Key discussions regarding ICU admission.
- There are advantages to ward-based care, which may be optimised.