Administration of vasopressor infusions in critical care units in a low resource setting
Critical care provision varies globally and reflects the healthcare services they support.

In resource-limited settings balancing scarce workforce, resources, and competing demands for funding for healthcare services is a significant challenge and will determine critical care services and practices.

World Bank Definitions:

- Low Income Country (LIC)
- Low Middle Income Country (LMIC)
Vasopressors use in critical care

- The World Health Organization (WHO) (2017) essential medicines list includes epinephrine (adrenaline) as essential and dopamine as a complimentary provision.

Aims & Objectives:

**Aims:**
- To appraise the existing evidence relating to the management of a vasopressor infusion in a critical care unit in a resource-limited setting.

**Objectives of this study:**
- To review and appraise the current evidence and highlight best practice relating to the management of a vasopressor infusion in a critical care unit in a low resource setting.
Design methods

- Both qualitative and quantitative research
- Multiple systematic searches of the Cumulative Index of Nursing and Allied Health Literature (CINAHL) and Medline, between 2008 and 2018 were identified.
- Supplementary search methods including reference lists, expert discussions and hand searching websites and journals completed the search.
- An inclusion and exclusion criteria guided the screening of papers.
- Last search conducted in February 2019.
Results

- 259 papers
- 30 papers met the inclusion criteria and analysed.
  - (29 Quantitative, 1 Qualitative)
- Themes included:
  - Professional issues relating to the administration of vasopressors;
  - Access to equipment and medications
  - Experience of staff
  - Nursing considerations.

<table>
<thead>
<tr>
<th>Region</th>
<th>Number</th>
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<tbody>
<tr>
<td>Africa</td>
<td>9</td>
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<tr>
<td>South East Asia Region</td>
<td>8</td>
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<tr>
<td>Combination of regions</td>
<td>4</td>
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<td>Region of the Americas</td>
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<td>Western Pacific Region</td>
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<td>Eastern Mediterranean Region</td>
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Professional Issues relating to Administration of vasopressors

- Use of protocols for treatment

- Initiation of vasopressors therapy in emergency departments

- Delays in starting treatment & impact on outcome
  - Uganda (Kwizera et al, 2016)
  - China (Xiaowu et al 2014)
  - Asia (Bouchard et al. 2015)
Professional Issues

- Ethical considerations
- ‘Pushing the boundaries of critical care practice’
- Withholding of Treatment
  - Phua et al (2016)
Access to Critical Care & Equipment

- De Wulf et al (2015) Region of Haiti
  - No critical care services were available in the region.

- Baelani et al (2011) 307 African self-reported questionnaires:
  - 73.8% had access to an intensive care unit (P <0.001)

- Sierra Leone (Langer et al. (2018))
- Uganda (Dunser et al. 2017)
- DR Congo (Baelani et al. 2012)
- Africa (Baelani et al. 2011)
- Mongolia (Bataar et al. 2010)
- Brazil (Oliveira et al. 2008)
- Haiti (De Wulf et al. 2015)
Access to Equipment

Leligdowicz et al (2017)

<table>
<thead>
<tr>
<th>Resource</th>
<th>Ghana</th>
<th>Nigeria</th>
<th>DR Congo</th>
<th>Rwanda</th>
<th>Zambia</th>
<th>Malawi</th>
<th>Zimbabwe</th>
<th>Nepal</th>
<th>Cambodia</th>
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<tbody>
<tr>
<td>Intravenous vasopressors</td>
<td>Often</td>
<td>Always</td>
<td>Rarely</td>
<td>Always</td>
<td>Often</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Always</td>
<td>Sometimes</td>
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<tr>
<td>Infusion pumps</td>
<td>Always</td>
<td>Always</td>
<td>Never</td>
<td>Always</td>
<td>Sometimes</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Often</td>
</tr>
<tr>
<td>Arterial catheters</td>
<td>Sometimes</td>
<td>Never</td>
<td>Never</td>
<td>Never</td>
<td>Never</td>
<td>Never</td>
<td>Rarely</td>
<td>Often</td>
<td>Rarely</td>
</tr>
<tr>
<td>Central venous catheters</td>
<td>Often</td>
<td>Always</td>
<td>Rarely</td>
<td>Always</td>
<td>Rarely</td>
<td>Never</td>
<td>Often</td>
<td>Always</td>
<td>Sometimes</td>
</tr>
</tbody>
</table>
Access to equipment

- Haniffa & DeSilva (2014) survey of 99 critical care services in Sri Lanka:
  - 100% of units had access to basic infrastructure (e.g. continuous supply of electricity) and basic monitoring and infusion pumps.

Experience of staff

- Haniffa & DeSilva (2014) survey of critical care services in Sri Lanka:
  - 87.9% of respondents reported providing 1:1 nurse to patient ratio, however, 11.4% of nurses had received formal intensive care training.

  - Shortage of critical care doctors and nurses, clinicians from other specialities and the wards may be managing patients.
Experience of Staff

- Oliveira et al (2008) paediatric sepsis care in Brazil found:
  - Lack of recognition of early shock
  - Non-following treatment protocols.

- Santhanam et al (2009) India
  - 66% of respondents did not feel comfortable titrating inotropes in the ED
  - 92 (78%) felt central venous access and 78 (67%) arterial pressure monitoring were unimportant in the management of refractory shock
  - 92 (78%) had never inserted a central venous catheter
  - 90 (76%) had never inserted an arterial line
Nursing Considerations

- Case-mix (Riviello et al. 2016)
  - Average Age 34 (25-47 years)
  - 72.8% patients required endotracheal intubation for respiratory failure
  - Within 24 hours of admission:
    - 42.2% diagnosis of sepsis, 33% severe sepsis and 20.8% septic shock
    - Surgical intervention 69.3%
- Complications of administration of vasopressors via a peripheral line (Medlej et al. 2018)
- Follow up post Critical Care Discharge
  - Patients readmitted to critical care during same hospitalization associated with increased risk of in-hospital death (Ponzoni et al. 2017).
Limitations

- All studies were medical – critical care not recognised as a speciality
- Country & regional variations
- Clinically selected patients – not representative of critically ill patients in hospital.
- Lack of critical care facilities
- Focus on resources not healthcare professionals skills
- Small sample size
- Lack of documentation / records
- Lack of appropriate consensus guidelines
- Limited access to the internet
- Influence of expatriate staff which may have impacted on care
- Set in tertiary hospitals – not representative of all hospitals
- Delays in getting to hospital may have influenced outcomes
- Ethics approval not clear in some studies
- Hand searching
- Not all studies published in English.
Conclusion

- Delivery of critical care in low resource setting is complex
- Realities of data collection burden versus delivery of healthcare services
- Development of consensus guidelines difficult due to variations in resources and provision of critical care services.
- Best practice guidelines,
  - Joined up approach in terms of procurement of equipment and medications, sufficient HR, education and evidence
  - Development of a guideline focusing on core standards and building to ‘full availability of staff and resources.
  - Based on healthcare professionals working in critical care, emergency departments, operating theatres and wards.
  - Impact of lack of access to continuing professional development opportunities and internet
- Requirement for further research.
Questions?