Acute care: reality vs visions

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Acute care: reality vs visions

- Realities
  - A global summary of quality and safety
- One vision
  - Quality in acute paediatric hospital care
- Positive realities
## Adverse event incidence studies

<table>
<thead>
<tr>
<th>Country</th>
<th>Study</th>
<th>Incidence of adverse events</th>
<th>Deaths</th>
<th>Estimated cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Harvard Medical Practice Study N Eng J Med 1991;324:370-77</td>
<td>3.7%</td>
<td>13.6% of adverse events lead to death</td>
<td>Estimated 100,000 deaths per year</td>
</tr>
<tr>
<td>UK</td>
<td>Retrospective record review BMJ; 322: 517-9</td>
<td>10.8%</td>
<td>One third lead to moderate or greater impairment</td>
<td>1 billion pounds Sterling in additional bed days</td>
</tr>
<tr>
<td>Australia</td>
<td>Quality in Australian Health Care Study Med J Aust 1995;163:458-76</td>
<td>16.6%</td>
<td>50,000 Australians suffer permanent disability and 18,000 die at least in part as a result of their healthcare</td>
<td>4.17 billion dollars per year</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Adverse events in New Zealand Public Hospitals</td>
<td>12.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>Canadian Adverse Events Study</td>
<td>7.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Assessment of 21 hospitals in 7 countries

- Adverse factors in case management of 76% of children
  
<table>
<thead>
<tr>
<th>Adverse factor</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late triage</td>
<td>8</td>
</tr>
<tr>
<td>Assessment</td>
<td>41</td>
</tr>
<tr>
<td>Treatment</td>
<td>61</td>
</tr>
<tr>
<td>Monitoring</td>
<td>30</td>
</tr>
</tbody>
</table>

- The greatest potential for improvement is in rural district hospitals
Quality of hospital care for children in Kazakhstan, Republic of Moldova, and Russia: systematic observational assessment

Trevor Duke, Elia Keshishyan, Aigul Kuttumuratova, Mikael Ostergren, Irina Ryumina, Ekaterina Stas, Mart W Weber, Giorgio Tamburini

Summary
Background Major concerns about the quality of basic hospital care for children have been raised in developing countries, but no formal evaluation applying international standards has been done in the Commonwealth of Independent States.

- Unnecessary hospitalization
- Over-diagnoses
- Poly-pharmacy
- Drug safety
- Equipment safety
- Lack of guidelines
“Perinatal damage to the central nervous system”

Plasma concentrate  
Frusemide  
Acetazolamide  
“Dehydration” therapy  
Glutamic acid  
Vitamin B6, B12, B1  
Pirazitam  
Debazol  
Sidoxin  
Sodium Bromide  
MgSO_4  
“Herbal cocktail”  
Encephabol  
Theophyline  
Complamine  
Trindol  
Nootropil (vasodilator)  
Phenobarbitol  
Electrophoresis
Equipment safety
In some countries half all medical devices are unusable or unsafe
# Oxygen: prevalence of hypoxaemia

<table>
<thead>
<tr>
<th>Study</th>
<th>No. / No. hypoxaemic</th>
<th>Prevalence (%)</th>
<th>CFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usen et al, The Gambia</td>
<td>1072 / 63</td>
<td>5.9 (4.5-7.5)</td>
<td>3.4%</td>
</tr>
<tr>
<td>O’Dempsey et al, The Gambia</td>
<td>1033 / 105</td>
<td>10.2 (8.4-12.7)</td>
<td></td>
</tr>
<tr>
<td>Junge et al, The Gambia</td>
<td>436 / 51</td>
<td>11.7 (8.3-14.2)</td>
<td>11.7%</td>
</tr>
<tr>
<td>Singhi et al, India</td>
<td>828 / 203</td>
<td>24.5 (21.6-27.6)</td>
<td></td>
</tr>
<tr>
<td>Lodha et al, India</td>
<td>109 / 28</td>
<td>25.7 (17.8-34.9)</td>
<td></td>
</tr>
<tr>
<td>Smyth et al, Zambia</td>
<td>158 / 55</td>
<td>35.0 (27.4-42.8)</td>
<td>14.6%</td>
</tr>
<tr>
<td>Basnet et al, Nepal</td>
<td>150 / 58</td>
<td>38.7 (30.8-47.0)</td>
<td></td>
</tr>
<tr>
<td>Reuland et al, Peru</td>
<td>235 / 113</td>
<td>48.1 (41.5-54.7)</td>
<td></td>
</tr>
<tr>
<td>Wandi et al, PNG</td>
<td>578 / 315</td>
<td>54.5 (50.3-58.6)</td>
<td>5.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4599 / 991</strong></td>
<td><strong>21.5%</strong></td>
<td></td>
</tr>
</tbody>
</table>

More than 5 million children present to hospitals world-wide each year with hypoxaemia
Oxygen availability

- PNG
  - 22% of 1300 seriously ill children in 5 hospitals couldn’t access oxygen at admission

- Kenya
  - Only 60% of children prescribed oxygen by a doctor in an ED actually received it

- South Africa
  - 61% of rural health clinics in South Africa had oxygen

Injection safety

- In 2000 contaminated syringes caused 21 million hepatitis B, 2 million hepatitis C and 260,000 HIV infections
PICU in Argentina

- Inadequate interdepartmental organization
- Lack of treatment protocols
- Too few paediatric intensivists
- Inferior equipment
- Lack of qualified technicians
- Lack of training and recognition of paediatric intensive care nurses

Garcia PC. Crit Care Med 1993;9 Suppl:S409-S410
Visions

An unrealized *minimal* vision
UN Convention of the Rights of the Child: *article 26*

- All children have the right to the highest attainable standard of health, and access to care and medicines when they are sick.
- States Parties shall take appropriate measures…
  - (a) To diminish infant and child mortality;
  - (b) To ensure the provision of necessary medical assistance and health care to all children with emphasis on the development of primary health care;
  - (c) To combat disease and malnutrition
  - (f) To develop preventive health care, guidance for parents and family planning education and services.
Visions

A vision for quality & safety
Defining quality
Schneider A, Bull WHO 2006;84:259

- Effective
- Efficient
- Accessible
- Timely
- Acceptable
- Evidence-based
- Safe
- Client focused
Factors determining quality of hospital care

**Physical facilities**
- Buildings
- Maintenance

**Clinical guidelines**
- Training strategies
- Process of updating
- Evidence-base

**Supportive technology**
- Oxygen, IV fluids, nutrition
- Equipment procurement and maintenance

**Drugs**
- Procurement and distribution
- Rational use and safety

**QI strategies**
- Auditing, use of HIS
- Assessment instruments
- Certification

**Community**
- Demand & care seeking
- Interaction with primary health
- Communication and referral
- Transport and access

**Human resources**
- Training & accreditation
- Rostering, supervision
- Staff retention initiatives
- Supportive milieu for staff
- CPD

**Child friendly facilities**
- Family friendly care
- Information and advice
- Education and play
- Cultural appropriateness

**Financing**
- No barrier to access
- Insurance schemes
- Incentives
Global Alliance for Patient Safety
WHO, Geneva October 2005

• “Clean Care is Safer Care”
  – Blood safety
  – Injection practices and immunization
  – Water, basic sanitation and waste management
  – Clinical procedures
  – Hand hygiene
Realities

Some *positive* realities from the field
Acute care delivery

• Developing countries
  – ETAT: Emergency Triage, Assessment and Treatment
  – Oxygen systems
  – Standardized clinical guidelines
  – Respiratory support

• Transitional countries
  – Experience with PICU
Improved triage and emergency care for children reduces inpatient mortality in a resource-constrained setting
Elizabeth Molyneux, a Shafique Ahmad, b & Ann Robertson c

Fig. 2. Monthly admissions and case-fatality rates for children aged less than 5 years, Queen Elizabeth Hospital, Blantyre, Malawi, 2000–03. Triage introduced in 2001

Bull World Health Organ 2006; 84(314):319
Oxygen systems

- Pulse oximetry
- Oxygen concentrators
- Back-up cylinder
- Continuous power supply
- Oxygen tubing and delivery mechanism
- Protocols for use of oxygen
- Training and supervision
- Maintenance and spare parts
- Follow-up
Impact of better provision of oxygen in pneumonia

- **Standard treatment**
  1. Oxygen if cyanosed or severe respiratory distress
  2. Discharge when antibiotics completed and no cyanosis
- **Intervention:** protocol for rationing O₂ based on pulse oximetry
  1. SpO₂ <85%
  2. Daily trial off oxygen
  3. No discharge until SpO₂ >90%

<table>
<thead>
<tr>
<th>Time period</th>
<th>No patients</th>
<th>Deaths</th>
<th>Case fatality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre oxygen protocol: 1997</td>
<td>258</td>
<td>26</td>
<td>10.0</td>
</tr>
<tr>
<td>Post oxygen protocol: 1998-2001</td>
<td>1116</td>
<td>65</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Int J Tuberc Lung Dis 2001; 5:511-519
Oxygen systems

• PNG
  – Concentrators less than half the cost of oxygen cylinders
  – More reliable source of oxygen

• Malawi

• Mongolia
Standardized clinical guidelines

- Severe malnutrition
- Neonatal care
# Respiratory support

An Evaluation of Bubble-CPAP in a Neonatal Unit in a Developing Country: Effective Respiratory Support That Can Be Applied By Nurses

*by Lanieta Koyamaibole, Joseph Kado, Josaia D. Qovu, Samantha Colquhoun, and Trever Duke*

<table>
<thead>
<tr>
<th></th>
<th>Prior to bubble-CPAP (n=1106)</th>
<th>After introduction of bubble-CPAP (n=1382)</th>
<th>RR / P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for mechanical ventilation</td>
<td>113 (10.2%)</td>
<td>70 (5.1%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Deaths</td>
<td>79 (7.1%)</td>
<td>74 (5.4%)</td>
<td>RR: 0.75 (0.55-1.02 p=0.065)</td>
</tr>
</tbody>
</table>

Bubble-CPAP <15% the cost of mechanical ventilators

Improving quality in PICU

• In Malaysia, introduction of 24-hour staffing by critical care physicians reduced the case-mix adjusted mortality.

• Nosocomial sepsis

• Need more models of PICU in transitional economies
Improvements in acute care

• Prioritize
  – Basic to complex
  – Equity and Epidemiology

• Innovate
  – Appropriate technology

• Systems not hardware
A broader vision

Hospitals are not just mechanical structures to deliver technical interventions the way the post-office delivers a letter.

Hospitals are core social institutions; the way people are treated has the potential to worsen, or to mitigate, the effect of poverty and social disadvantage on health and development.

Freedman L. Achieving the MDGs. Development 2005; 48: 19-24