Pediatric intensive care Scenario in India

Sunit Singhi
Professional Bodies:

Indian Academy of Pediatrics (IAP) – Intensive care chapter established in 1998

Indian Society of Critical Care Medicine (ISCCM) - Pediatric section founded in 2000
PICU care in India

- Undoubtedly, these PICUs have been able to establish fairly high standards of care,
- Fulfilled their role in saving lives
- Provided learning opportunities to resident doctors and other staff resulting in improved standards of care outside the PICUs as well.
Indian Scene: Success so far

1989 - Several Neonatal intensive care units, NNF and formal fellowship programs in neonatology

• 1989 first PICU
• 1987- PALS course
• 1994- PALS Group
• 1995- PIC group of IAP
• 1999- first National Conference of PIC
• 2000- ISCCM- Ped Section
• 2012- Indian Journal of PIC

• 2002- PCC certificate course launched
• 2004 No. of PICUs crosses 100 mark
• 2007 NB Fellowship Program
• 2009 DM program
• Curses for Training Pediatricians
• PICU Nursing Training
Pediatric intensive care in India

Professional training:

1. **Basic pediatric intensive care certificate course**
   - since 2000 (1 year training)
   - **22 units** all over India are accredited for training

2. **DNB in pediatric critical care**
   - since 2007 (2 years training)
   - **4 centres**

3. **DM (Fellowship) in pediatric critical care**
   - since 2009 (3 years training)
   - **2 centres**
Critical care research in India – the initiative
Edit Institution

* fields are compulsory.

- Investigational Site Information
- General Information - Hospital
- General Information - Critical Care
- Quality Indicators - Critical Care
- Research

Are you currently involved in any studies on Critical Care?:  
- Yes  
- No

Do you have support staff at your facility to help you with the study?
- a. Sub Investigator:  
  - Yes  
  - No
- b. Study Co-ordinator:  
  - Yes  
  - No
- c. Lab Technician:  
  - Yes  
  - No

Is your staff GCP trained?:  
- Yes  
- No

Do you have a specified room to help with monitoring?:  
- Yes  
- No

Do you have a local lab to conduct the investigations?:  
- Yes  
- No

Do you have a secured storage facility to store study drugs?:  
- Yes  
- No

ICU re-admission rate within 48 hour of transfer:  
- Yes  
- No
Total Institutions / Hospitals: 297

- Southern India: 74 (25%)
- Western India: 93 (31%)
- Central India: 13 (4.4%)
- Eastern India: 20 (6.7%)
- Northern India: 77 (26%)
- North Eastern India: 13 (4.4%)
- Union Territories: 11 (3.7%)
Institutes /Hospitals - Specialty availability

n = 297
Institutes / Hospitals - Facilities availability

n = 297

<table>
<thead>
<tr>
<th>Facility</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulltime Laboratory</td>
<td>89%</td>
</tr>
<tr>
<td>Echo</td>
<td>82%</td>
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<tr>
<td>USG</td>
<td>85%</td>
</tr>
<tr>
<td>CT scan</td>
<td>71%</td>
</tr>
<tr>
<td>MRI</td>
<td>49%</td>
</tr>
<tr>
<td>PET scan</td>
<td>7%</td>
</tr>
<tr>
<td>Microbiology Lab</td>
<td>76%</td>
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<tr>
<td>OT</td>
<td>85%</td>
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<tr>
<td>Hemodialysis</td>
<td>77%</td>
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<tr>
<td>Ambulance services</td>
<td>86%</td>
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<tr>
<td>Cath Lab</td>
<td>50%</td>
</tr>
<tr>
<td>Physiotherapy unit</td>
<td>78%</td>
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</tbody>
</table>
Total No. of PICUs *participated in survey* = 48
PICU details – bed strength

No. of ICU beds  Median (IQR) = 16 (10 – 30)

Middle care beds available in 16 units (33%)

Average no. of middle care beds = 9 (3 – 14)
### PICU details – patients

No. of PICUs participated = 48

<table>
<thead>
<tr>
<th></th>
<th>Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients treated per year</td>
<td>318 (123 – 406)</td>
</tr>
<tr>
<td>No. of patients ventilated per year</td>
<td>131 (50– 171)</td>
</tr>
<tr>
<td>Average mortality rate</td>
<td>15% (7.5% - 31%)</td>
</tr>
</tbody>
</table>
PICU details – Manpower

No. of PICUs participated= 48

Average no. of doctors per ICU = 4 (2 – 11)
Average no. of doctors per shift = 2 (2 – 3)
24 hour physician availability (n) = 44 (91.6%)
Qualification of ICU in charge
   MD – 38 (79%)
   MBBS – 4 (8%)
   Others – 6 (12%)
Average no. of nurses per ICU = 16 (8 – 27)
Average no. of nurses per shift = 6 (2 – 18)
Nurse-patient ratio = 0.8 (0.5 – 2)
Availability of manpower: Total 48 PICUs
PICU details – Materials

Ventilation:

Availability of conventional ventilation = 96%

Average no. of ventilators – 4.6 / unit

Availability of HFOV = 4%
Institutes / Hospitals – Quality indicators

- Institutes / Hospitals measuring quality indicators = 105 (35.4%)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Measuring Institutes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality parameters</td>
<td>83 (27.9%)</td>
<td></td>
</tr>
<tr>
<td>SMR</td>
<td>45 (15.2%)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>27 (9.1%)</td>
<td></td>
</tr>
<tr>
<td>Morbidity parameters</td>
<td>69 (23.2%)</td>
<td></td>
</tr>
<tr>
<td>Iatrogenic pneumothorax</td>
<td>34 (11.4%)</td>
<td></td>
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<tr>
<td>Incidence of ARF</td>
<td>26 (8.8%)</td>
<td></td>
</tr>
<tr>
<td>Decubitus Ulcer</td>
<td>60 (20.2%)</td>
<td></td>
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<tr>
<td>Patient safety parameters</td>
<td>85 (28.6%)</td>
<td></td>
</tr>
<tr>
<td>Patients fall rate</td>
<td>60 (20.2%)</td>
<td></td>
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<tr>
<td>Medication error</td>
<td>77 (25.9%)</td>
<td></td>
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<tr>
<td>Adverse event/error rate</td>
<td>71 (23.9%)</td>
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<tr>
<td>Needle stick injury rate</td>
<td>72 (24.2%)</td>
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<tr>
<td>Re-intubation rate (within 48 hours)</td>
<td>74 (24.9%)</td>
<td></td>
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<tr>
<td>Process Parameters</td>
<td>73 (24.6%)</td>
<td></td>
</tr>
<tr>
<td>Length of stay</td>
<td>61 (20.5%)</td>
<td></td>
</tr>
<tr>
<td>ICU readmission within 24 hrs</td>
<td>57 (19.2%)</td>
<td></td>
</tr>
<tr>
<td>Infection control parameters</td>
<td>93 (31.3%)</td>
<td></td>
</tr>
<tr>
<td>Ventilator associated pneumonia</td>
<td>51 (17.2%)</td>
<td></td>
</tr>
<tr>
<td>Blood infection (CLABSI /UTI)</td>
<td>86 (29%)</td>
<td></td>
</tr>
<tr>
<td>Human Resource parameters</td>
<td>70 (23.6%)</td>
<td></td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>66 (22.2%)</td>
<td></td>
</tr>
<tr>
<td>Overall employee satisfaction</td>
<td>0 (0%)</td>
<td></td>
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</tbody>
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Institutes / Hospitals – Research capacities

• Hospitals currently involved in any studies on critical care – 61 (20.5%)

• Hospitals with Ethics Committee (EC) - 84 (28.3%)
  
  Median (IQR) time for EC approval - 3 (2 – 4) weeks
  
  Median (IQR) fee - 25,000 (11,250 - 45,000) INR

• Equipped with

  Sub-Investigator - 25%
  Study co-ordinator - 24%
  Lab technician - 31%
  Local lab - 43%
  Secure storage facility - 37%
## Institutes / Hospitals – Research capacities

<table>
<thead>
<tr>
<th>Study Type</th>
<th>Count</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Carrying out research in last 5 years</td>
<td>44 (14.8%)</td>
<td></td>
</tr>
<tr>
<td>1 – 4 studies</td>
<td>25 (8.4%)</td>
<td></td>
</tr>
<tr>
<td>5 – 9 studies</td>
<td>8 (2.7%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 10 studies</td>
<td>11 (3.7%)</td>
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<tr>
<th>Journal Type</th>
<th>Count</th>
<th>Percentage</th>
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<tr>
<td>Publications in National journals</td>
<td>36 (12.1%)</td>
<td></td>
</tr>
<tr>
<td>1 – 4 papers</td>
<td>16 (5.4%)</td>
<td></td>
</tr>
<tr>
<td>5 – 9 papers</td>
<td>13 (4.4%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 10 papers</td>
<td>7 (2.3%)</td>
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<th>Percentage</th>
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<tbody>
<tr>
<td>Publications in International journals</td>
<td>31 (10.4%)</td>
<td></td>
</tr>
<tr>
<td>1 – 4 papers</td>
<td>18 (6.1%)</td>
<td></td>
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<td>5 – 9 papers</td>
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<tr>
<td>&gt; 10 papers</td>
<td>5 (1.7%)</td>
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Challenges for PIC care in India

- Transport
- Equipments
- Technology
- Lack of sustainability
- Electricity
- Trained personnel
- Lack of subspecialists expert support,
- Diagnostic facilities (laboratory and radiology),
- And appropriate medications
Intensive Care: What does it mean to a lay person?

“I HATE TO TELL YOU THIS, BUT THAT SHOULD BE INTENSIVE CARE.”

“I don’t know how to tell you this, but I think it should be INTENSIVE CARE UNIT.”
Excessive Economic Burden

☐ Govt contribute to only 20% of health care spending, most is paid out of pocket
☐ Families continue spending out of duty, hope to buy a miracle, social pressure
☐ When care gets prolonged, costs multiply, patient not improving, should parents / family be left penniless to save a child who unlikely to have intact survival.
  eg. severe brain injury.
☐ Is it ethical to have economically ruined family because of admission to ICU, when outcome is dubious?

Cost effectiveness and cost benefit are the major considerations
ICUs are no income source for the hospital.

Substantial part of costs for drugs, laboratory tests, and ICU procedures must be covered by the patients or their relatives. In India, 78% of health care costs must still be paid by patients or their relatives. (Parikh & Dilip 1999, JISCCM)

Substantially limits public accessibility to hospitals and in particular to ICUs.

To avoid a tragic scenario with a bankrupt family mourning over their dead family member, therapies often remain inadequate.
Challenges for PIC care in India

- Transport
- Equipments
- Technology
- Lack of sustainability
- Electricity

- Trained personnel
- Lack of subspecialists expert support,
- Diagnostic facilities (laboratory and radiology),
- And appropriate medications
Physicians’ Frustration

Non availability of

• Emergency medical system

• Transport system- Long distances and high transportation costs, Travel may take days, inadequate monitoring,

• Emergency care

• PIC units
  – Equipments
  – Technology
Where are ICUs and ICU beds?

- Many district and regional hospitals have units where severely ill patients can be separately cared for but major ICU are only in large hospitals or urban or metropolitan areas.
- Striking differences in the quality of medical care between rural and urban areas.
- Patients who would be urgently admitted to an ICU in industrialized countries do not have access to an ICU.
- In rural areas, critically ill patients are often treated on regular wards.

ICU beds rarely cover more than 2-3% of all hospital beds compared with 10% in industrialized countries.
Pediatric critical care services — next step

- Provision of Intensive care services through Pediatricians with the available resources in the communities
- Increased demand for intensive care
- Share the vision of Pediatric Intensive care with Pediatricians and training and teaching of principles and practice
What should we do: 4-tier system!

- Providing low-technology and low-cost interventions
- Establishing a 4-tier system by utilizing the existing network.
  - Primary health centers, community health centers, district hospitals and medical colleges
  - Build sustainable system
  - Rationing the resource allocation/ the intensive care units
Pediatric Fundamental Critical care Course, Delhi, 2012
Area to be addressed

• Setting up Formal Training of PICU nurses, and Resp therapists
• Effective triage protocols
• Transport systems
  - Ground (and Air)
• Emergency Medical System
  – In hospital and Network
• Consensus Guidelines to benchmark levels of Care
• Follow up after PICU care
Specific areas of intervention to advance quality of care in the PICU

• IOM `s 6 aims
  – Safety- Error reduction
  – Effectiveness
  – Equity
  – Timeliness
  – Patient -centeredness
  – Efficiency

Integrating the Institute of Medicine's six quality aims into pediatric critical care: Relevance and applications

Anthony D. Sionlis, MD, MPH; Murray M. Pollack, MD, MBA

Our Current Challenges and Future Directions

• Deliver timely and accessible, patient-centred care, which is safe, appropriate and evidenced-based care
• Ensure a responsive, flexible service system, Support the integration of intensive care services with the continuum of care
• Ensure the supply of an appropriately-trained and flexible workforce
• Ensure efficient and appropriate utilization of intensive care resources
• Utilize information technology and data management solutions
• Support continuous improvement, collaboration, innovation and research
• This future directions framework should focus on paediatric intensive care services in regional and rural public hospitals
SAVE THE DATE

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www.picc2016.com