

A gap between need and reality - neonatal nursing staff requirements on a German intensive care unit (Supplementary Material)

Supplementary Material, Part 1:

Indicators of quality in structures, processes and results of perinatal centres in Germany.

The QFR directive of the German Federal Joint Commission (G-BA), valid from January 1st, 2014, covers these items. Abbreviations: QM = quality management, iQM = internal QM, EsQS = external quality assurance in hospitals (inpatients), IVH/PVH = intraventricular / periventricular hemorrhagia, ROP = retinopathy of prematurity, NEC = necrotizing enterocolitis, BPD = bronchopulmonary dysplasia, ICP = infantile cerebral palsy.

Structures			Processes	Results
Staff (by department)		Infrastructure	Internal QM	External QM (Published)
Obstetrics	Neonatology	Building	Prevention of nosocomial infection	EsQS / Quality Report
Attending Physician / Trainee: in house	Attending Physician / Trainee: in house	Equipment		Short-term:
Board-certified obstetrician: ≥ 1 in house /on call (hands on)	Board-certified pediatrician: ≥ 1 in house /on call (hands on)	•Incubators	Inter-professional clinical rounds	•Patient volume
		•Respirators		•Survival
		•Monitors	Inter-professional morbidity and mortality conferences	•Damage-free survival, i.e. without – IVH grade 3 or PVH – ROP ≥ stage 3 – NEC ≥ stage 2 – BPD at hospital discharge
Subspecialty in perinatology: ≥ 1 on call (telephone)	Subspecialty in neonatology: ≥ 1 on call (hands-on / telephone)	Diagnostics		
		•X-ray	Physicians and technical assistance:	Long-term:
		•Sonography		
Midwives:	Nurses:	•Echocardiography	Transitional care (inpatients and outpatients)	
≥ 1 in house ≥ 1 on call (hands-on)	in house (defined nurse-to-patient ratio)	•Blood gas analysis		
		Transport	Psychosocial intervention team	
Competence in management	Subspecialty in pediatric intensive care: ≥ 1 in house	Surgery		
	Competence in management			

Source: Bundesministerium für Gesundheit. Bekanntmachung eines Beschlusses des Gemeinsamen Bundesausschusses über eine Änderung der „Vereinbarung über Maßnahmen zur Qualitätssicherung der Versorgung von Früh- und Neugeborenen“ vom 20. Juni 2013. Available at: https://www.bundesanzeiger.de/ebanzwww/contentloader?state.action=genericsearch_loadpublicationpdf&session.sessionid=083efd1dd5f457c14b58d6bcd4762a22&fts_search_list.destHistoryId=94524&fts_search_list.selected=36d664e8a5e06ac2&state.filename=BAZ AT 11.11.2013 B3; accessed November 19th, 2013.

Supplementary Material, Part 2:

Case descriptions used for comparison of British Association of Perinatal Medicine (BAPM) categories of care indicator list versions 2010 and 2011

Case #1

gestational age: 27+3 weeks, birth weight: 1050g (body weight: 935g at 6th day of life); main diagnoses: primary pulmonary hypoplasia, BPD in the course of treatment; process of respiratory support: HFO (plus iNO) → mechanical ventilation → CPAP → oxygen replacement until discharge from ICU; catecholamines 1 day after birth; no surgical procedures; ICU treatment from March 15th to April 23rd.

BAPM indicator list 2010: 14 days in category 1 (mechanical ventilation, then body weight below 1000g and receiving CPAP), 27 days in category 2 until discharge (NCPAP for any part of the day followed by oxygen replacement and body weight below 1500g until discharge);

BAPM indicator list 2011: 13 days in category 1 (mechanical ventilation, then CPAP plus parenteral nutrition), 21 days in category 2 (CPAP plus parenteral nutrition), 7 days in category 3 until discharge (oxygen replacement by nasal cannula).

Case #2

gestational age: 38+0 weeks, birth weight: 2530g; main diagnoses: VACTERL association/esophageal atresia (Vogt IIIB) → surgically treated; respiratory support only during surgery and 4 days thereafter; cardiovascular support for 5 days during anesthesia for surgery and mechanical ventilation; ICU treatment from February 10th to February 18th.

BAPM indicator list 2010: 8 days in category 1 (mechanical ventilation plus one day after withdrawal), 1 day in category 2 until discharge (parenteral nutrition);

BAPM indicator list 2011: 7 days in category 1 (mechanical ventilation), 2 days in category 2 until discharge (parenteral nutrition).

Case #3

gestational age: 26+2 weeks, birth weight: 745g; main diagnoses: RDS, ROP III°, patent ductus arteriosus (surgically closed 14 days after birth); process of respiratory support: mechanical ventilation → CPAP on trial → re-intubation and mechanical ventilation → CPAP → oxygen replacement until discharge from ICU; dopamine one day after surgery; treatment on ICU from November 3rd to January 2nd.

BAPM indicator list 2010: 33 days in category 1 (mechanical ventilation followed by CPAP and body weight below 1000g, then mechanical ventilation followed by CPAP and body weight below 1000g), 25 days in category 2 (CPAP and body weight above 1000g followed

by oxygen replacement and body weight below 1500g), 2 days in category 3 until discharge (baby could not reasonably be expected be looked after at home by its mother);

BAPM indicator list 2011: 39 days in category 1 (mechanical ventilation, then CPAP plus parenteral nutrition followed by mechanical ventilation, then CPAP plus parenteral nutrition), 16 days in category 2 (CPAP), 5 days in category 3 until discharge (oxygen replacement by nasal cannula).

Case #4

gestational age: 26+1 weeks, birth weight: 805g; main diagnoses: amnion infection syndrome, patent ductus arteriosus (closed with ibuprofen), BPD in the course of treatment; process of respiratory support: mechanical ventilation → CPAP on trial → re-intubation and mechanical ventilation → CPAP → oxygen replacement until discharge from ICU; treatment on ICU from October 21st to January 11th;

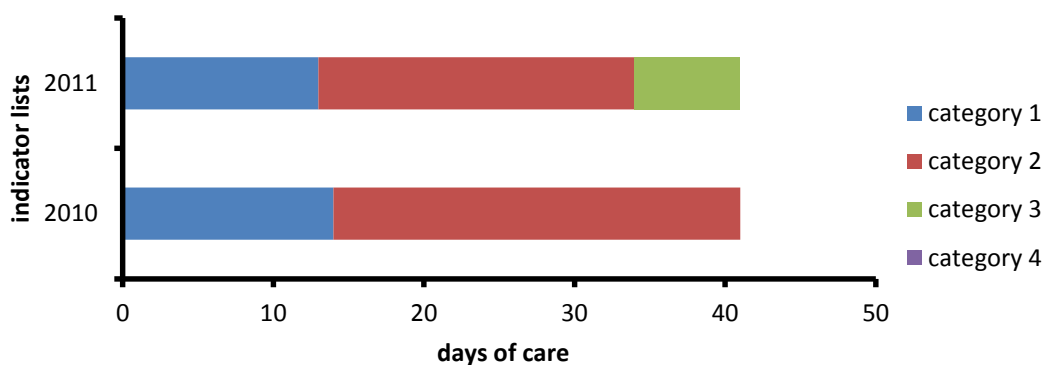
BAPM indicator list 2010: 34 days in category 1 (mechanical ventilation, then CPAP and body weight below 1000g followed by mechanical ventilation, then CPAP and body weight below 1000g), 41 days in category 2 (CPAP and body weight above 1000g), 8 days in category 3 until discharge (baby could not reasonably be expected be looked after at home by its mother);

BAPM indicator list 2011: 34 days in category 1 (mechanical ventilation, then CPAP plus parenteral nutrition followed by mechanical ventilation, then CPAP plus parenteral nutrition), 41 days in category 2 (CPAP but no parenteral nutrition), 8 days in category 3 until discharge (oxygen replacement by nasal cannula).

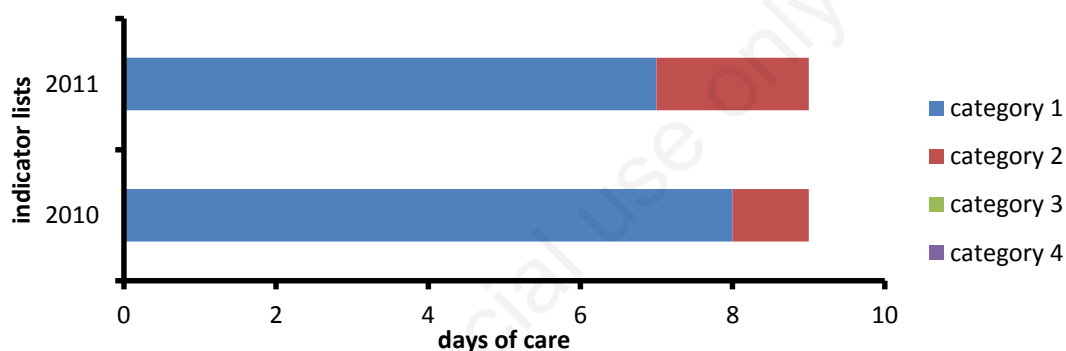
Abbreviations: BPD = bronchopulmonary dysplasia, CPAP = continuous positive airway pressure, NCPAP = nasal CPAP, HFO = high frequency oscillation, iNO = inspiratory nitrous oxide, ICU = intensive care unit, RDS = respiratory distress syndrome, ROP = retinopathy of prematurity, VACTERL = **V**ertebral anomalia, **A**nal atresia, **C**ardiac defects, **T**racheoesophageal fistula and/or **E**sophageal atresia, **R**enal anomalies and **L**imb defects.

Figure: Comparative analysis of 4 patients described above assessed using both the British Association of Perinatal Medicine (BAPM) 2010 and 2011 indicator lists.

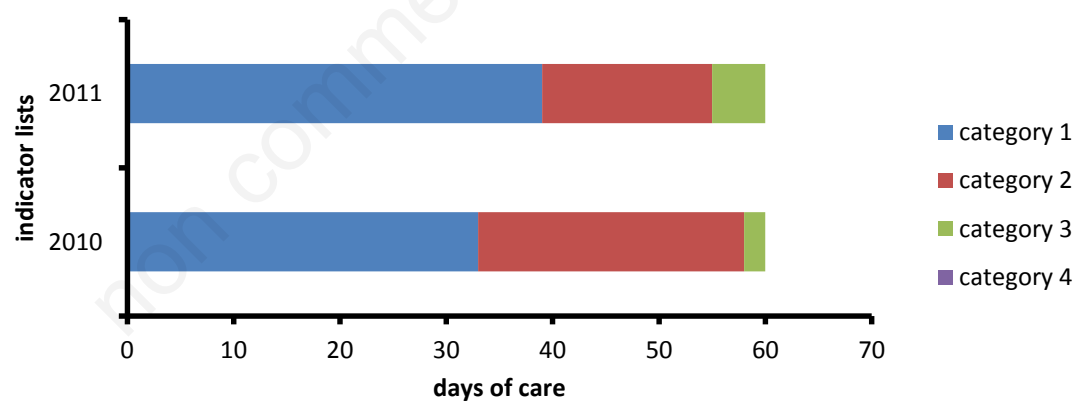
#1



#2



#3



#4

