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Number, unit mortality and acute hospital mortality of ventilated admissions with a PF ratio <150 to critical care units in England, Wales and Northern Ireland, 2012

Questions

What were the number, unit mortality and acute hospital mortality of ventilated admissions with a PF ratio <150 to adult, general critical care units in England, Wales and Northern Ireland participating in the Case Mix Programme (CMP) from 1 January 2012 to 31 December 2012?

Background to the ICNARC Case Mix Programme

The Intensive Care National Audit & Research Centre (ICNARC) was established in 1994 on a two-year (1994-1995), pump-priming grant from the Department of Health (England) and Welsh Health Common Services Authority (Wales), ICNARC became an independent Registered Charity in July, 1994 (Registered Charity Number: 1039417).

ICNARC's aim is to foster improvements in the organisation and practice of adult critical care (intensive and high dependency care) to improve patient care and outcomes. Towards achieving part of this aim, ICNARC coordinates a national, comparative audit of patient outcomes from adult, critical care units in England, Wales and Northern Ireland known as the CMP. Currently, 95% of adult, general critical care units in England, Wales and Northern Ireland are participating in the CMP.

The CMP is a voluntary, performance assessment programme using high quality clinical data to facilitate local quality improvement through routine feedback of comparative outcomes and key quality indicators to clinicians/managers in adult critical care units.

The CMP recruits predominantly adult, general critical care units. Adult, general critical care units are defined as either standalone intensive care units (ICUs) or combined intensive care/high dependency units (ICU/HDUs). Participation in the CMP is entirely voluntary.

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Statistical Research Assistant
Source: Case Mix Programme Database
27 September 2013

CMP specified data are recorded prospectively and abstracted retrospectively by trained data collectors according to precise rules and definitions - set out in the ICNARC Case Mix Programme Dataset Specification. Data collectors from each unit are trained prior to commencing data collection with retraining of existing staff, or training of new staff, also available. CMP training courses are held at least four times per year.

CMP specified data are collected on consecutive admissions to each participating critical care unit and are submitted to ICNARC quarterly. Data are validated locally, on data entry, and then undergo extensive central validation, for completeness, illogicalities and inconsistencies, with data validation reports returned to units for correction and/or confirmation. The validation process is repeated until all queries have been resolved and then the data are incorporated into the CMP Database (CMPD).

Participating units receive comparative data analysis reports on outcomes and key quality indicators, in which they can identify their own unit data and compare with all units participating in the CMP. In addition, staff at units can interrogate the CMPD by submitting analysis requests which are provided free-of-charge.

Data collected for the CMP include alphanumeric unit/admission identifiers, demographics (e.g. age, sex, ethnicity), case mix (e.g. acute severity, comorbidity, surgical status, reason for admission), outcome (e.g. unit/acute hospital survival) and activity (e.g. unit/acute hospital length of stay) for each admission to each critical care unit.

Available data for report

133,266 admissions to 203 critical care units
1 January 2012 – 31 December 2012

Selection of Cases

All admissions to adult, general critical care units (i.e. excluding admissions to specialist critical care units or standalone high dependency units) in England, Wales and Northern Ireland that were participating in the CMP from 1 January 2012 to 31 December 2012.

Definitions for variables included

P/F ratio was calculated using the PaO_2 from arterial blood gas with lowest PaO_2 recorded in the first 24 hours, divided by the FiO_2 associated with the lowest PaO_2 recorded in the first 24 hours.

An admission was identified as receiving ventilator support in the first 24 hours if they were mechanically ventilated at admission or within the first 24 hours in ICU.

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An admission was identified as receiving ventilatory support during their ICU stay if the number of calendar days of advanced respiratory support (recorded for the CCMDS) was at least 1. One calendar day of advanced respiratory support was considered to be advanced respiratory support at any point in a calendar day (00:00 to 23:59) with any part-days considered as total calendar days. Please refer to Appendix A for a full definition.

Critical care unit mortality was defined as the status at discharge from the critical care unit.

Acute hospital mortality was defined as the status at ultimate discharge from acute hospital, wherever.

Results

Table 1: Number, unit mortality and acute hospital mortality of ventilated admissions with a PF ratio <150 to intensive care units in England, Wales and Northern Ireland participating in the CMP, 2012

	1 January 2012 – 31 December 2012
Number of admissions ventilated at admission or within first 24 hours with a PF ratio <150 within first 24 hours (%) [N]	16,741 (12.6) [133,266]
- Critical care unit mortality, deaths (%) [N]	6,810 (40.7) [16,741]
- Acute hospital mortality*, deaths (%) [N]	7,687 (48.8) [15,750]
Number of admissions ventilated at some point during their unit stay with a PF ratio <150 within the first 24 hours (%) [N]	18,512 (13.9) [133,266]
- Critical care unit mortality, deaths (%) [N]	7,551 (40.8) [18,512]
- Acute hospital mortality*, deaths (%) [N]	8,481 (48.9) [17,358]

N: number of admissions; SD: standard deviation; IQR: interquartile range.
*Excluding readmissions to the critical care unit

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Acknowledgement

Please acknowledge the source of these data in all future presentations (oral and/or written), as follows:

“These data derive from the Case Mix Programme Database. The Case Mix Programme is the national, comparative audit of patient outcomes from adult critical care coordinated by the Intensive Care National Audit & Research Centre (ICNARC). These analyses are based on data for 133,266 admissions to 203 adult, general critical care units based in NHS hospitals geographically spread across England, Wales and Northern Ireland. For more information on the representativeness and quality of these data, please contact ICNARC.”

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Taken from the Case Mix Programme Data Collection Manual, Version 3.1.

Respiratory support days

Fields: Basic respiratory support days
Advanced respiratory support days

Number of data items: Two
Units of measurement: Calendar days

Definition for collection:

- a calendar day is defined as any complete calendar day (00:00-23:59) or part thereof e.g. a patient admitted on 1 January 2006 at 23:45 and discharged on 3 January 2006 at 00:10 would be recorded as having received three calendar days of care
- specifies the number of calendar days during which the admission received any basic or advanced respiratory support whilst on your unit
- record 1, 2, 3 etc for one, two, three etc calendar days; record 998 for 998 or more calendar days; record 999 for support occurring but number of days not known
- Advanced Respiratory - indicated by one or more of the following (see diagram):
    - admissions receiving invasive mechanical ventilatory support applied via a trans-laryngeal tube or applied via a tracheostomy
    - admissions receiving BiPAP (bilevel positive airway pressure) applied via a trans-laryngeal tracheal tube or applied via a tracheostomy
    - admissions receiving CPAP (continuous positive airway pressure) via a trans-laryngeal tracheal tube

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Source: Case Mix Programme Database

- admissions receiving extracorporeal respiratory support
- admissions receiving mask/hood CPAP or mask/hood BiPAP is not considered advanced respiratory support

- Basic Respiratory - indicated by one or more of the following (see diagram):
  - admissions receiving more than 50% oxygen delivered by a face mask (except those receiving short-term increases in FiO_2, e.g. during transfer, for physiotherapy, etc.
  - admissions receiving close observation due to the potential for acute deterioration to the point of requiring advanced respiratory monitoring and support e.g. severely compromised airway, deteriorating respiratory muscle function, etc.
  - admissions receiving physiotherapy or suction to clear secretions, at least two hourly, either via a tracheostomy, a minitracheostomy or in the absence of an artificial airway
  - admissions recently (i.e. within 24 hours) extubated after a period of intubation
  - admissions recently (i.e. within 24 hours) extubated after a period (i.e. more than 24 hours) of mechanical ventilation via an endotracheal tube
  - admissions receiving mask/hood CPAP or mask/hood BiPAP or non-invasive ventilation
  - admissions receiving CPAP via a tracheostomy
  - admissions intubated to protect their airway but receiving no ventilatory support and who are otherwise stable.

- Note: If advanced and basic respiratory monitoring and support occur simultaneously, then only advanced respiratory monitoring and support should be recorded.

- The following diagram may aid categorisation to advanced or basic respiratory support

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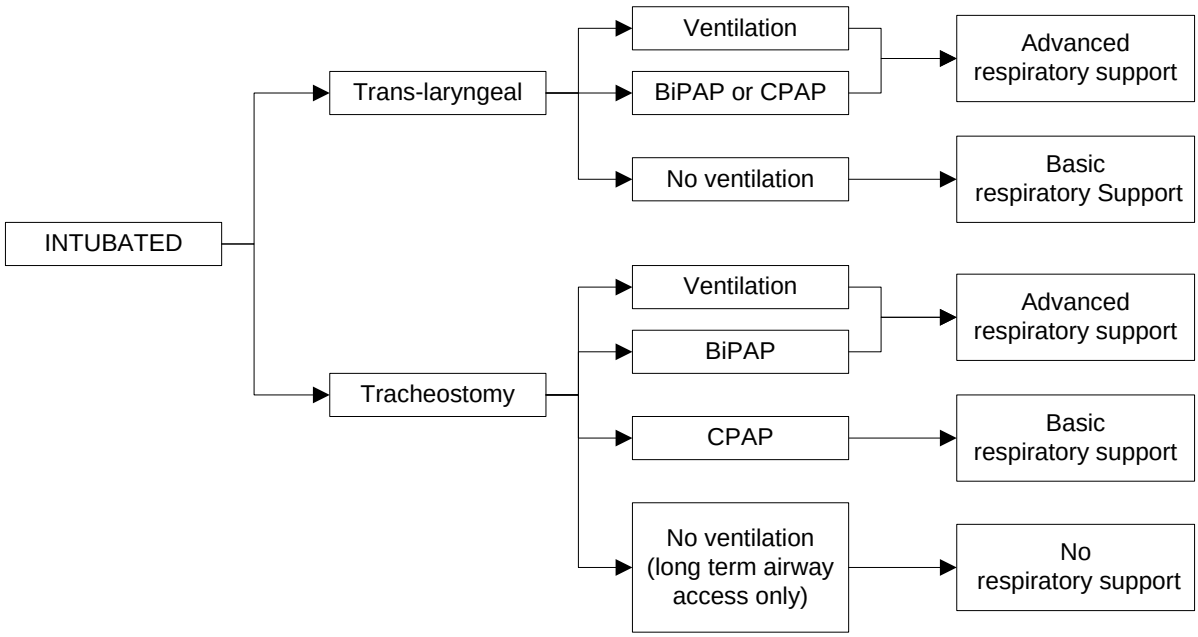

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