Pharmacy Staffing Standards in Paediatric Critical Care

About us

The Neonatal and Paediatric Pharmacy group (NPPG) was formed in 1994, with an aim to improve the care of neonates, infants and children by advancing the personal development of pharmacists and the provision of quality pharmacy services in relation to practice, research & audit, education & training, communication and advice. The NPPG are affiliate partners of the Royal Pharmaceutical Society (RPS) and advise them in areas relating to paediatric and neonatal pharmacy, and also sit as a specialty sub group affiliated to the Royal College of Paediatrics and Child Health (RCPCH).

The Chief Paediatric Pharmacists Group (CPPG) works with NPPG to collectively ensure that the needs of paediatric patients are recognised and accommodated as part of the national pharmacy agenda.

Background

Clinical pharmacy is an integral part of the multidisciplinary paediatric critical care team, optimising medicine use in individual patients, as well as on a unit-wide strategic basis. A pharmacist's in-depth understanding and interpretation of altered and rapidly shifting physiological, pharmacokinetic and pharmacodynamic processes in critical care patients is essential to the safe and effective use of medicines in this patient group[1]. In addition, altered routes of medicine administration in critical care require careful consideration.

Patients in Paediatric Critical Care (PCC) are at high risk from medication errors and preventable adverse drug events. Research suggests a median medication error rate of 14.6 per 100 medication orders and a preventable adverse medication event rate of 21-29 per 1000 patient-days[2]. Increased integration of pharmacists into the PCC Multidisciplinary Team (MDT) and presence on ward rounds is directly associated with a reduction in medication error rates as well as a reduction in episodes of central line access[3]. An American controlled study of medication errors in PICU demonstrated that the presence of a pharmacist on the ward, and attendance at ward rounds, reduced the incidence of serious medication errors from 29/1000 patient days to 6/1000 patient days ($p < 0.01$)[4]. Pharmacists are pivotal to the identification and prevention of potential medication errors in paediatric patients: this is seen both in centres using paper-based medication charts and those using electronic prescribing systems[5]. In Australia (where PCC has a similar organisational structure to the NHS) multidisciplinary teams working in the paediatric inpatient setting consider pharmacists to be an indispensable resource when considering complex medication issues, though it was noted that the lack of "out of hours" expertise is a problem[6].

In addition to a reduction in medication errors, evidence from adult critical care demonstrates that inclusion of pharmacists within the core MDT improves patient outcomes: reducing mortality, lowering critical care length of stay, preventing adverse drug events, identifying problematic drug-drug interactions and reducing costs[7-14]. Routine pharmacist attendance at the multidisciplinary ward round is essential to realising these benefits[15]. Pharmacists working on critical care units with higher staffing resource made more clinically significant interventions than those working on units with lower levels of pharmacist support[16]. It was also noted that experienced, specialist pharmacists made contributions with higher clinical impact than more junior team members[16]

Lord Carter's 2016 report highlighted unwarranted variations in care between different NHS organisations[17]. Pharmacists working in critical care are pivotal to the standardisation of medication use both within and between centres[1]. Variations in clinical pharmacy service provision at weekends and the need to develop seven day services have also been identified as a priority by NHS England[18]. Data from UK Adult Critical Care services indicates that where weekend services were provided, the weekend intervention rate was double that of weekdays and in its absence, contribution rates were significantly higher on Mondays compared to other weekdays.

Staffing Recommendations:

In order to help commissioners and NHS providers ensure the right level of provision, NPPG and CPPG recommend the following standards in relation to pharmacy staffing and pharmacy service provision on Paediatric Critical Care units in the United Kingdom. These recommendations are intended to describe the resource required solely on the Paediatric Critical Care unit within a single centre: additional Pharmacy staff resource is required to support Paediatric Critical Care Transport Services and Operational Delivery Networks where they exist.

1. Clinical Pharmacists are essential practitioners within the critical care MDT and are vital to the routine delivery of medicines optimisation in critical care[19]. Every centre providing Level 2 or 3 care for children must have access to a senior pharmacist practising in paediatric critical care.

2. The lead senior pharmacist time should be funded at Agenda for Change (AFC) Band 8a or equivalent as a minimum. Clinical pharmacist cover can be provided by a Band 7 or equivalent with support from the lead senior pharmacist.

    - The paediatric critical care pharmacist must have sufficient time allocated to fulfil their specialist role. In practice, a team of individuals is usually required to deliver the clinical pharmacy service to the paediatric critical care unit. There should be a minimum of 0.12* whole time equivalent (WTE) pharmacist f**or each funded Level 3 bed and for every two funded Level 2 beds** for a 5 day service (or 0.168* WTE for a 7 day service)[20].
    - This staffing resource is required to allow sufficient "non-patient-facing" time to support the full range of clinical pharmacist activities, including (but not limited to) guideline development, cost efficiency initiatives, multidisciplinary education and training, development and maintenance of electronic prescribing and administration systems, as well as audit and quality improvement work.
    - Where the staffing resource falls short of the recommended level, direct patient care will be prioritised over other activities.
    - A team-based approach helps to ensure service resilience, succession planning and provide the necessary educational and professional support.
    - The specified WTEs include a 20% uplift to allow for maintenance of the service during planned and unplanned leave[20].

3. The pharmacist must attend daily multidisciplinary ward rounds[20].

4. Pharmacists working in Paediatric Critical Care should be encouraged to be active independent prescribers.

5. Alongside pharmacist provision, Paediatric Critical Care units need suitable levels of pharmacy assistant and technician time to ensure access to medicines via the hospital dispensary 7 days a week, with regular stock top ups in accordance with demand, but no less than once a week.

6. Ward-based Pharmacy Technicians can provide a valuable supportive role, assisting with activities such as medicines reconciliation, medicines management and expenditure reporting. This can release more time for medicines optimisation activities by clinical pharmacists and support nursing staff with medication ordering and stock management. A 10-bedded paediatric critical care unit should have ward based technician support to a level of 0.2 WTE as a minimum.

** See Appendix 1 for details of the rationale for these values.*

Qualifications and Competencies:

The Royal Pharmaceutical Society (RPS) has published competency frameworks for both foundation[21] and advanced level[22] practice. The foundation framework covers the initial post-registration years of practice: the competencies are typically attained via a 2-3 year Agenda for Change (AFC) Band 6 non-specialist pharmacist role. The Advanced Practice Framework (APF) describes three levels of advanced practice: Advanced Stage I, Advanced Stage II and Mastery.

Relevant specialist competencies are set out by the RPS Faculty and the NPPG in the Neonatal and Paediatric Care Expert Professional Practice Curriculum[23]:

Specialist pharmacists practising in Paediatric Critical Care must be able to demonstrate competency at least to the level of Advanced Stage II (but ideally at or working towards Mastery).

The Faculty of the RPS provides an independent recognition process for the credentialing of an individual's stage of practice. To date, participation is voluntary and it remains the responsibility of Chief Pharmacists (or equivalent) to ensure that pharmacists are competent for their role.

Pharmacists working within Paediatric Critical Care should develop their knowledge in line with the APF[22] and relevant sections of the NPPG / RPS Neonates and Paediatric Expert Professional Practice curriculum[23].

General Pharmaceutical Council (GPhC) revalidation requires pharmacists to demonstrate ongoing minimum competence to maintain registration through continuing professional development, including peer discussion, though this is not designed to identify and annotate advanced practice.

Pharmacists practising in paediatrics should be members of the NPPG (http://www.nppg.org.uk) to enable shared working, and peer support for lone paediatric pharmacists.

Pharmacist roles in providing professional support to Paediatric Critical Care teams:

When resourced to the staffing levels stated on Page 2, the following support should be provided, drawing on other pharmacist colleagues (such as those working in procurement and finance, Medicines Information and Medicines Safety) as required:

- Development and maintenance of medication-related guidelines.
- Review of all clinical guidelines mentioning use of medication.
- Education and training of members of the Paediatric Critical Care and wider Pharmacy teams.
- Contingency planning for drug shortages
- Introducing new medicinal products and associated formulary requests.
- Advice on high cost/high risk/restricted medications
- Advice and co-ordination of parenteral nutrition
- Cost saving measures
- Quality improvement and audit
- Review of medication errors.
- Governance and methods of managing medication-related errors, including attendance at relevant Governance meetings.
- Prescribing (where the pharmacist is a qualified independent prescriber)
- Day to day support for transport teams (note that strategic support for transport services and Paediatric Critical Care Networks should be funded separately).
- Support for advancing technologies designed to support safer prescribing and administration, including the maintenance of Smart Pump drug libraries and ensuring that electronic prescribing systems are suitable for use within Paediatric Critical Care. Additional resource and pharmacist time may be required to facilitate the implementation and maintenance of systems.
- Pharmacy staff should be aware of the local paediatric critical care unit research strategy and have the opportunity to develop skills to promote, support, and deliver research. Additional funded time is likely to be necessary to facilitate significant pharmacist-led research.

Where the recommended staffing levels are not met, it will not be possible to provide all of the support listed above. In this circumstance, the priority will be direct patient-facing clinical activity.

Professional support for pharmacists:

A paediatric pharmacist in a district general hospital is likely to be a lone worker, as is a paediatric critical care pharmacist working in a small unit. As such peer support, often from outside of the individual's own organisation, is critical to ensuring competency.

Support from other pharmacists practising in critical care should be available through professional bodies e.g. NPPG or the Paediatric Critical Care Society, or via a paediatric critical care network.

Critical care pharmacists should undergo an independent, recognised process to verify competence level. Senior specialist critical care pharmacist support should, preferably, be provided within the organisation but may be provided from a critical care network or on a regional basis.

Consultant Paediatric Critical Care Pharmacists are also available in some centres and provide expert pharmacy knowledge and leadership in neonatal practice, education and research. Development of network pharmacist posts should utilise the availability and skills of these Consultant Pharmacists.

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Appendix 1: Rationale for Recommended Pharmacist Staffing Whole Time Equivalents (WTEs)

The GPICS standards published by the Faculty of Intensive Care Medicine (https://www.ficm.ac.uk/sites/default/files/gpics-v2.pdf) recommend:

- A pharmacist staffing level of 0.1 WTE for each Level 3 bed and for every two Level 2 beds to deliver a 5-day service.
- A further uplift of 20% on these values to allow for maintenance of the service during planned and unplanned leave.

Overall, for a **5 day** service, this equates to:

WTE x 1.2 (for leave)

= 0.12 WTE.

The **daily** requirement (inclusive of the 20% uplift to cover leave) is therefore:

0.12 WTE ÷ 5 days

= 0.024 WTE.

The **7-day** requirement (inclusive of the 20% uplift to cover leave) is therefore:

0.024 WTE per day x 7 days

= 0.168 WTE.

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