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Critical Care Pharmacists: Improving Care by Increasing Access to Medication Expertise

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Critical care pharmacists: Improving care by increasing access to medication expertise

Not every critically ill patient receives direct patient care from a critical care pharmacist (1). This absence of critical care pharmacists has direct ramifications on medication safety, patient-centered outcomes, and healthcare costs. A dedicated, pharmacotherapeutic expert is a requirement for high-quality care of critically ill patients. Their absence decreases healthcare safety and quality (2). During a typical stay in an intensive care unit (ICU), a patient is prescribed more than 20, often high-risk, medications. It has been estimated that every one of the 5 million Americans cared for in an ICU will suffer from more than one medication error per day (2). Medication errors in the form of adverse drug events can double the risk of dying in the ICU, and the annual cost of treating adverse drug events across the United States exceeds $1.5 billion (3, 4).

Improving medication safety through critical care pharmacists saves lives (5). In a recent meta-analysis, Lee and colleagues observed that pharmacists attending multiprofessional rounds in the ICU were associated with reductions in adverse drug events (by 74%), mortality (by 22%), and length of ICU stay (by 1.33 d) (5, 6). Moreover, pharmacists are a cost-effective resource with as much as a 25-to-1 return on investment. Even with this compelling evidence and endorsement by multiprofessional guidelines that pharmacists are essential members of the ICU team, a pharmacist attending rounds occurs in only 70% of ICUs (1). This is especially notable, given that higher workload of pharmacists has been associated with reduced quality of care and longer lengths of stay in the ICU (7).

Both low supply and low demand have produced this gap (1). There are only 3,600 board-certified critical care pharmacists available to provide care to the 100,000 ICU beds in the United States (for reference, there are approximately 20,000 intensivists and 512,000 critical care nurses). Every year, qualified trainees interested in critical care pharmacy residency training go unmatched, because there are only 171 accredited residency programs. Even with more programs increasing supply, the demand has remained low: Position justification has remained challenging, with most critical care pharmacist positions limited to weekday, daytime coverage (1). Pharmacists only attend multidisciplinary rounds on weekends in 15% of institutions, and 24 × 7 × 365 clinical pharmacist coverage is exceedingly rare. Many critically ill patients go without a critical care pharmacist during their entire ICU stay, often because of these barriers of institutional approval of full-time positions.

Improving this gap in a complex healthcare system requires a multiprofessional approach to increase demand and supply. First steps are for hospital leadership to survey how many ICU rounding teams regularly have a pharmacist, as the most robust evidence for improvement in patient-centered outcomes supports pharmacists as core members of rounding teams (8). These effects are most pronounced on the addition of the first pharmacist to a team currently without one (8). Additionally, supporting the means to increase access to pharmacist services through institutional privileging (e.g., pharmacy-driven protocols and guidelines) may expand the reach of existing personnel resources. Pharmacists also serve as key drivers of quality improvement initiatives, and individuals involved in patient safety and healthcare quality initiatives are recommended to survey their teams for pharmacist membership (8). Staffing decisions must incorporate time for this indirect patient care role as well as provide more seamless coverage.
of direct patient care (e.g., designated float pharmacist positions to cover for holiday and sick leave to minimize the workload burden of cross-coverage, additional positions so that a single pharmacist is not providing care to patients from multiple rounding teams).

This increased demand will require an increase in supply. The relative lack of training programs is a limiting factor. Multiple studies have shown economic benefit for pharmacy residency training programs, including decreases in length of hospitalization, direct cost savings, and cost avoidance (9, 10). Medicare Pass-Through funding supports these programs. These discussions with hospital administrators are immediately actionable, as robust evidence supports this quality improvement initiative. Table 1 provides a toolkit of actionable steps and key resources to support these efforts.

Identifying the optimal patient:pharmacist ratio in the ICU remains a key question. Although evidence has been established for physician and nursing workload ratios that are associated with safe and high-quality care (as well as reduced healthcare professional burnout), limited research has been conducted for pharmacists. Expert opinion has placed this ratio around 1:15, but evidence suggests that critical care pharmacists often take care of significantly more than this number (11). Evaluating the workload of existing critical care pharmacists, including the extent of cross-coverage and the presence of

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Table 1. Toolkit for increasing critical care pharmacy services

### Actionable Steps

1. Identify multiprofessional rounding teams caring for critically ill patients that do not currently have a critical care pharmacist present on rounds.
2. Explore how institutional privileging through protocols can improve access to pharmacist services.
3. Survey existing patient safety and healthcare-quality teams to identify those that do not currently have pharmacist membership.
4. Investigate resources and potential to expand critical care pharmacy residency training programs (through Medicare Pass-Through funding, organizational grants, etc.).
5. Evaluate and document existing workload of critical care pharmacists, with a focus on number of patients care for per shift and rate of cross-coverage.

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**Definition of abbreviations:** 95% CI = 95% confidence interval; ICU = intensive care unit; OR = odds ratio.
evening and weekend clinical services is another actionable step for ICUs that do have daytime, weekday clinical pharmacy services. Dynamic, patient-specific, predictive models embedded within the electronic health record would inform this ratio and future position justification but remain in development.

An evidence-based, data-driven approach by a united healthcare team is required to meet ICU patient needs for critical care pharmacists. The evidence is clear that critical care pharmacists enhance both patient outcomes and the value of healthcare services. We must begin closing the gap between evidence and practice to realize the full benefits from this member of the multiprofessional team.

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