Actionable Patient Safety Solutions (APSS) #3E:

Standardize and safeguard medication administration

How to use this guide
This guide gives actions and resources for creating and sustaining safe practices for medicine administration. In it, you'll find:

Patient Safety
M O V E M E N T

Executive summary checklist

Healthcare providers need to safely and quickly deliver medication to their patients. While this is a reasonable and universal expectation, it is also a continuing challenge to healthcare providers. Medication errors, including wrong drug, dose, time, route of administration, or patient, cause serious patient harm and deaths every year. Standardizing and safeguarding medication administration helps create a safety culture, which is a culture that promotes patient safety and quality of care while reducing preventable deaths and harm.

Create an action plan

☐ Create a multidisciplinary team of physicians, nurses, pharmacists, other healthcare providers, and administration

Ensure best patient care

☐ Use the potential of the newest, barcode-enabled, mobile medication safety tools

☐ Educate staff about and use of a universal checklist for all medication administration

☐ Follow protocols to create a "mobile medication medicine safety system" that:

    ☐ Works everywhere within your healthcare facility

    ☐ Works when offline, such as during natural and man-made disasters, military, transport, and remote situations

    ☐ Has basic documentation functionalities that work with existing electronic systems and electronic medical records (EMR)

    ☐ Is supplemented with barcode access points that eliminate the need for math or memorization at acute ordering, medication preparation, and delivery

    ☐ Can be integrated into your systemic response to acute medication shortages

☐ Use patient stories – in written and video form – to teach and inspire change in your staff

What we know about medication administration

Medication administration can lead to medication errors. As mentioned in the Actionable Patient Safety Solutions #3A on "Medication Errors", medication errors are preventable adverse events due to wrong medicine use and are a major cause of death in the United States (Lam et al., 2017). One in 20 surgery-related medication administrations, and one in every two surgeries, resulted in a medication error or an adverse drug event (harm and injury caused by medicine) (Nanji et al., 2016).

Most medication errors result from faulty systems and poorly designed processes, instead of poor practices or incompetent practitioners (Palmieri et al., 2008). Research has found that:

- Children have a higher risk of medication errors than adults because there is no standardized dose for different patient sizes and age
- About 35% of pediatric patients receive the wrong dose from emergency department providers (Kaufmann, Laschat, and Wappler, 2012)
- There are 10 times more mathematical errors due to incorrect calculations for children than adults

Preventing medication errors

A standardized system for medication administration can reduce incorrect calculation errors and miscalculation in the absence of the electronic health record (EHR). There are a variety of approaches to standardize medication administration including:

- Automated infusion and IV injectable technologies
- Checklists
- Predictive algorithms

Leadership plan

Hospital governance, senior administrative leadership, clinical leadership, and safety and risk management leadership need to work collaboratively to standardize medication administration.

To achieve a goal of zero preventable deaths, leaders need to commit to taking these key actions.

Show leadership's commitment to standardized medication administration

- National and international governments, hospital leadership, and emergency response leadership must use a comprehensive approach that applies at all levels of medical sophistication
- Use a process that includes:
  - o Those outlined in the National Quality Forum (NQF) safe practices and an understanding of applicable practices internationally (Meyer et al., 2010)
  - o Evidence-based effectiveness to reduce preventable harm and death
  - o Generalizable processes to national and international venues, in first and third world settings
  - o Reductions in preventable death and disability when applied

Create the infrastructure needed to make changes
- Provide information to assist healthcare professionals when the EHR is not available
- Set measurable quality indicators, benchmarks, and goals
- Provide budget amounts that are matched to available resources
- Get broad implementation across all providers and systems in target areas
- Create a feedback mechanism for continuous quality improvement

Engage staff
- Use patient stories – in written and video form – to teach and inspire change in your staff

Action plan

Ensure accountability
- Create a multidisciplinary team which includes physicians, nurses, pharmacists, respiratory therapists, laboratory personnel, and information technology (IT) personnel

Create protocols and provide staff training
- Create education and training about:
  - A mobile app or platform that can help standardize and safeguard medication administration
  - The capabilities of the app or platform
  - How to use the app or platform in various healthcare settings
- Collaborate with IT to:
  - Integrate a mobile app or platform into the hospital's IT infrastructure
  - Use a synchronous communication pathway for recording medication administration: medication, dose, date, time, route of administration (ROA), and patient
  - If you are a resource-limited community and healthcare center, create a copy of the medication administration log book from the mobile app (drug, dose, time of administration, ROA, and patient) and transfer a hardcopy of the log book into the patient's medical chart
- Create a backup documentation system for when electronic systems are down/offline from the mobile app and related software
  - Review and keep documentation current

Report outcomes inside your organization and share best practices outside your organization
- Collaborate with IT and pharmacy to locally, regionally, nationally, and internationally synchronize medication shortages with alternative medications that have:
  - Similar mechanism of action
  - Compatibilities
  - FDA-approved indications
- Partner with the American Society of Health-System Pharmacists (ASHP), University of Utah medication teams, and international organizations about medication shortages and alternatives

- Get rid of information silos about medication shortage information through the above points

Technology plan

These suggested practices and technologies have shown proven benefit or, in some cases, are the only known technologies for certain tasks. If you know of other options not listed here, please complete the form for the PSMF Technology Vetting Workgroup to consider:

http://patient.sm/2sopQK

System or practice	Available technology
Mobile app platform designed to address medicine and knowledge shortages in serious situations and resource-limited settings (e.g. disaster or remote, third-world triaging clinical circumstance). The mobile app platform should: • Have wireless capability • Work offline • Synchronize the downtime data back into the EHR when the system goes back online • Include basic documentation functionalities, such as time-stamped text logs, that work with existing electronic systems • Be capable of synchronizing medication shortages with compatible alternative medications • Provide relevant medication information (weight, drug, drug concentration, ROA, and indication) • Be manufacturer and EHR agnostic • Be a knowledge-based mobile tool for checking medications and indications • Provide updated information and alerts about medication shortages • Have free access for all users	• Drug Shortages (app by the FDA)

Measuring outcomes

The measure of adverse drug events. See APSS #3A for more information.

Conflicts of interest disclosure

The Patient Safety Movement Foundation partners with as many stakeholders as possible to focus on how to address patient safety challenges. The recommendations in the APSS are developed by workgroups that may include patient safety experts, healthcare technology professionals, hospital leaders, patient advocates, and medical technology industry volunteers. Some of the APSSs recommend technologies that are offered by companies involved in the Patient Safety Movement Foundation. The workgroups have concluded, based on available evidence, that these technologies work to address APSS patient safety issues. Workgroup members are required to disclose any potential conflicts of interest.

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