Actionable Patient Safety Solutions (APSS) #3E: 
Standardize and safeguard medicine 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:

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Executive summary checklist

Healthcare providers need to safely and quickly deliver medicines 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 medicine 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, and administration

Ensure best patient care

☐ Use the potential of the newest, barcode-enabled, mobile medicine safety tools
☐ Educate staff about and use of a universal checklist for all medicine administration
☐ Follow protocols to create a “mobile 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 EMR
  ☐ Is supplemented with barcode access points that eliminate the need for math or memorization at acute ordering, medicine preparation, and delivery
  ☐ Can be integrated into your systemic response to acute medicine shortages
☐ Use patient stories – in written and video form – to teach and inspire change in your staff
What we know about medicine administration

Medicine 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 medicine administrations, and 1 in every 2 surgeries, resulted in a medication error or an adverse drug event (harm and injury caused by medicine) (Nanji et al., 2016).

Most medical 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 medical 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 care providers (Kaufmann et al., 2012)
- There are 10 times more mathematical errors due to incorrect calculations for children than adults

Preventing medication errors

A standardized system for medicine administration can reduce incorrect calculation errors and miscalculation in the absence of the EHR. There are a variety of approaches to standardize medicine 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 medicine administration. To achieve a goal of zero preventable deaths, leaders need to commit to taking these key actions.

Show leadership’s commitment to standardized medicine 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:
  - Those outlined in the National Quality Forum (NQF) safe practices and an understanding of applicable practices internationally (Meyer et al., 2010)
  - Evidence-based effectiveness to reduce preventable harm and death
  - Generalizable processes to national and international venues, in first and third world settings
  - 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 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 medicine 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 medicine 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 medicine administration log book from the mobile app (drug, dose, time of administration, ROA, and patient) - 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 sync medicine shortages with alternative medicines 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 medicine shortages and alternatives
• Get rid of information silos about medicine 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:

https://patientsafetymovement.org/actionable-solutions/apss-workgroups/technology-vetting/

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<tr>
<th>System or practice</th>
<th>Available technology</th>
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| 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 syncing medicine shortages with compatible alternative medicines  
  • Provide relevant medicine information (weight, drug, drug concentration, ROA, and indication)  
  • Be manufacturer and EHR agnostic  
  • Be a knowledge-based mobile tool for checking medicines and indications  
  • Provide updated information and alerts about medicine shortages  
  • Have free access for all users | • SafeDosePro*  
• Drug Shortages (app by the FDA)  
• RxShortages |

*Company has signed some form of the Open Data Pledge, more information can be found on the Patient Safety Movement Foundation website:

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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References