Executive Summary Checklist

The ability for healthcare providers to safely and rapidly deliver medications to their patients is a reasonable and universal expectation, but a continuing challenge to healthcare providers. Medication errors, in the forms of wrong drug, dose, time, route of administration, or patient, cause serious patient harm and multiple deaths every year.

- Create a multidisciplinary team comprised of physicians, nurses, pharmacists and administration that uses the unique potential of the newest, barcode-enabled, mobile medication safety tools.
- Implement and educate in the use of a universal checklist for all drug administration[^1].
- Implement protocols to establish a “mobile medication safety system” that achieves the following objectives:
  1. It works everywhere within your healthcare facility, and works when offline (during natural and man-made disasters, military, transport, and remote situations).
  2. It has basic documentation functionalities that work with existing electronic systems and EMR.
  3. It is supplemented with barcode access points that eliminate the need for math or memorization at the critical areas of acute ordering, drug preparation and delivery.
  4. It could be integrated into your systemic response to acute drug shortages.
The Performance Gap

As mentioned in the Actionable Patient Safety Solutions #3A on “Medication Errors”, medication errors are preventable adverse events or effects of care and are a major cause of death in the United States (Lam et al., 2017). One in 20 perioperative medication administrations, and every second operation, resulted in a medication error and/or an adverse drug event (Nanji et al., 2016). Medication errors are a form of medical error and a significant cause of adverse events. The vast majority of medical errors result from faulty systems and poorly designed processes, rather than poor practices or incompetent practitioners (Palmieri et al., 2008). In addition, medical errors are a greater threat to children than adults because there is no standardized dose for different patient sizes and age. Approximately 35% of pediatric patients receive the wrong dose from emergency care providers (Kaufmann et al, 2012).

Tenfold mathematical errors due to incorrect calculations are a much greater threat to children than adults. A variety of approaches are available to reduce these types of errors, including automated infusion and IV injectable technologies, checklists, and predictive algorithms. Due to the high level of incorrect calculation errors and the real-world potential for downtime miscalculation in the absence of the EHR, the availability of a standardized system to reduce the potential for these occurrences would greatly reduce the potential for error.

Closing the performance gap will require hospitals and healthcare systems to commit to action in the form of specific leadership, practice and technology plans.

Leadership Plan

- National and international governments, hospital leadership, and emergency response leadership must close their performance gaps by implementing a comprehensive approach that is applicable at all levels of medical sophistication.
- The process must include those outlined in the National Quality Forum (NQF) safe practices and an understanding of applicable practices internationally (Meyer et al., 2010);
- Demonstrate evidence-based effectiveness and reduction in preventable morbidity and mortality;
- Are generalizable to national and international venues, in first and third world settings;
- Reduce preventable death and disability when implemented;
- Provide information where the EHR is not implemented or in situations where it is not available to provide information that can be used to assist healthcare professionals in the most extreme situations;
- Establish measurable quality indicators, benchmarks, and implementation goals;
- Provide budget allocations that are matched to available resources;
- Obtain broad implementation across all providers and systems in target implementation areas;
- Establish a feedback mechanism to assure continuous improvement.

Practice Plan

- Create a multidisciplinary team which includes physicians, nurses, pharmacists, respiratory therapists, laboratory personnel, and information technology (IT) personnel
- Develop education and training about:
  - a mobile app or platform which can bridge the gap and help standardize and safeguard medication administration,
  - the capabilities of the app or platform, and
  - 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
- Collaborate with IT to implement a synchronous communication pathway for recording the medication administration (medication, dose, date, time, route of administration (ROA), and patient).
- Create a backup documentation system for when electronic systems are down/offline from the mobile app and related software.
- Collaborate with IT and pharmacy to sync the drug shortages with alternative medications that have similar mechanism of action, compatibilities, and FDA-approved indications in a real-time manner for local, regional, national, and international synchronization.
● For resource-limited communities and healthcare centers, collaborate with IT to create a copy of the medication administration log book from the mobile app (drug, dose, time of administration, ROA, and patient). The log book could be transferred into the patient’s medical chart as a hardcopy.

● Collaborate with the American Society of Health-System Pharmacists (ASHP), University of Utah medication teams, and applicable international organizations about drug shortages and alternatives.

● Eliminate information silos regarding drug shortage information by implementing the above-mentioned points.

Technology Plan

Suggested practices and technologies are limited to those proven to show benefit or are the only known technologies with a particular capability. As other options may exist, please send information on any additional technologies, along with appropriate evidence, to info@patientsafetymovement.org.

To be successful in implementing this Actionable Patient Safety Solutions, implement a technology plan using the following systems in local healthcare settings. Other specific strategies will be developed or become apparent as the above are implemented to improve medication administration safety. This action plan will include careful observation of the consequences of each new strategy, leading to additional novel ideas for further improvement in medication administration safety and coordination with key stakeholders in the face of drug shortages.

● A mobile safety system designed to address drug and knowledge shortages in acute situations and resource-limited communities and settings (e.g., disaster or remote, third-world triaging clinical circumstances).

● The system will be designed to be optimized for sharing of open data, in alignment with the Patient Safety Movement’s goals.

● The system will be designed to work with all applicable [AL1] [L12] technology, such as Electronic Health/Medical Record (EHR/EMR) platforms such as EPIC, Allscripts, NextGen, etc.

● It will be manufacturer and EHR agnostic.

● In situations where the technology is available, the mobile app will synchronize the downtime data back into the EHR when the system goes back online.
### System or Practice

**All Settings**

<table>
<thead>
<tr>
<th>Mobile app platform</th>
<th>Available Technology</th>
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<tbody>
<tr>
<td>● Has wireless capability</td>
<td>● SafeDosePro®</td>
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<tr>
<td>● Can work offline</td>
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<tr>
<td>● Includes basic documentation functionalities (inserts time-stamped text logs)</td>
<td></td>
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<tr>
<td>(that work with existing electronic systems)</td>
<td></td>
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<tr>
<td>● Capable of syncing drug shortages with compatible alternative drugs for administration</td>
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<tr>
<td>● Provides relevant drug information (weight, drug, drug concentration, ROA, and indication)</td>
<td></td>
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<tr>
<td>● Manufacturer and EHR agnostic</td>
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<tr>
<td>● Is a knowledge-based mobile tool for checking drugs and indications</td>
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<th>Mobile app platform</th>
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<tr>
<td>● Provides updated information and alerts about drug shortages</td>
<td>● Drug Shortages (app by the FDA)</td>
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<tr>
<td>● Free access for all users</td>
<td>● RxShortages</td>
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Workgroup

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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 APSS recommend technologies offered by companies involved in the Patient Safety Movement Foundation that the workgroups have concluded, based on available evidence, are beneficial in addressing the patient safety issues addressed in the APSS. Workgroup members are required to disclose any potential conflicts of interest.

*This Workgroup member has reported a financial interest in an organization that provides a medical product or technology recommended in the Technology Plan for this APSS.
References


