

Continuous Infusion Medication Safety in a Pediatric Intensive Care Unit

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Background

- Continuous medication infusions ordered without Computerized Physician Order Entry safety mechanisms
 - Increase risk of adverse drug events
 - Is out of scope of nursing practice
 - Contradicts regulatory standards
- The rate of infusions in our Pediatric Intensive Care Unit (PICU) not matching provider orders concerned hospital staff and leaders
- Nursing staff were concerned about their own risk practicing "outside their scope"

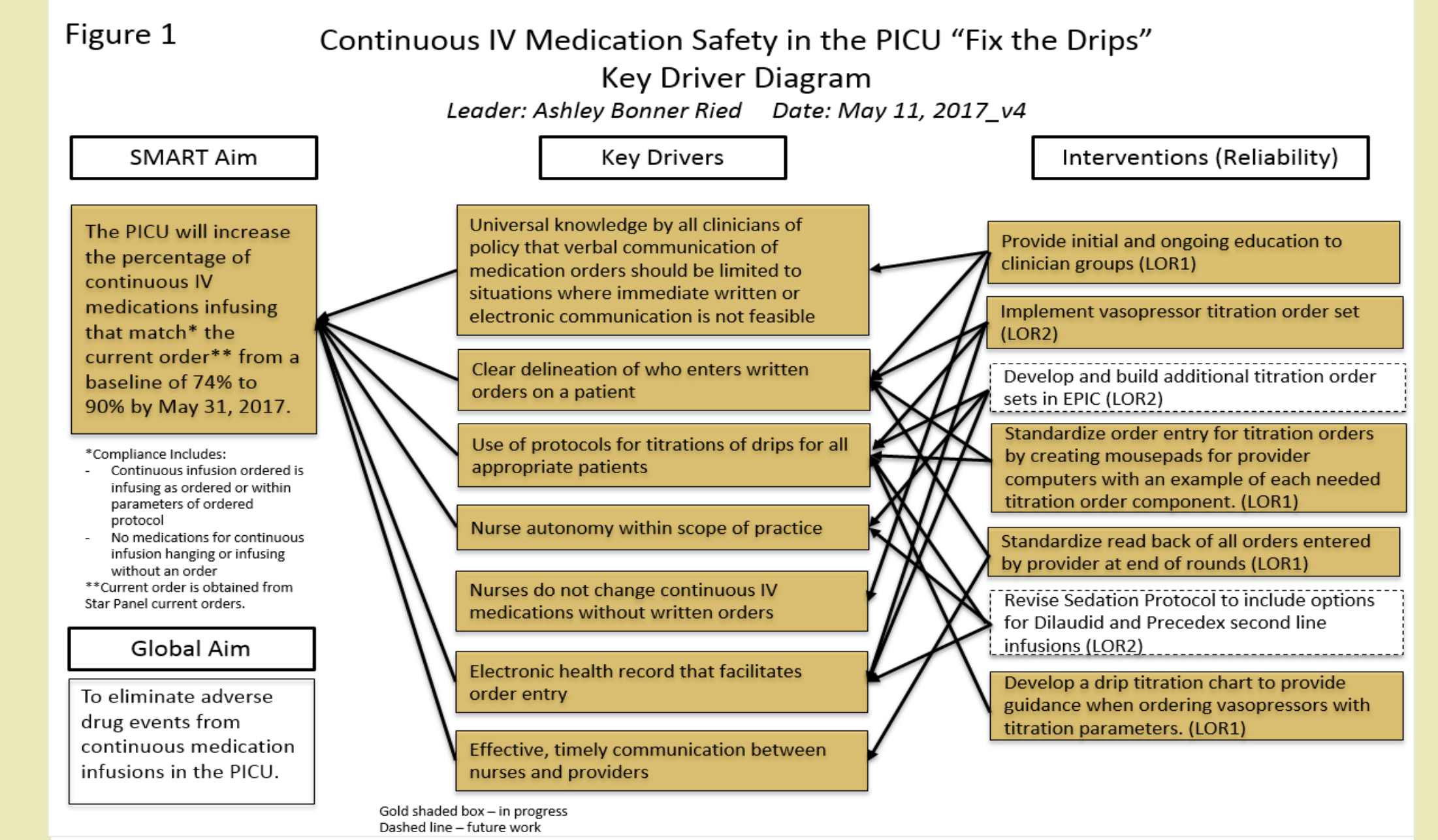
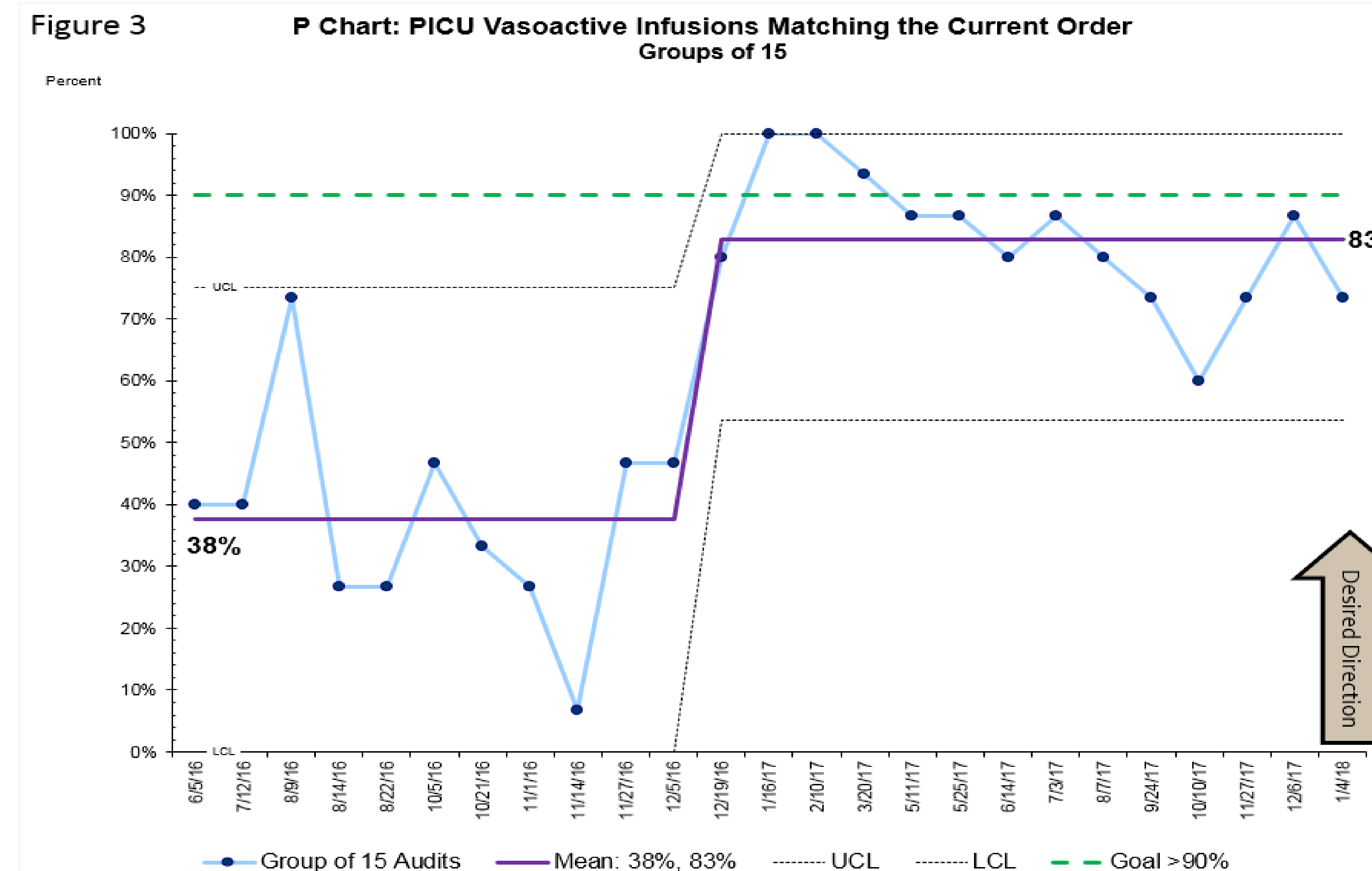
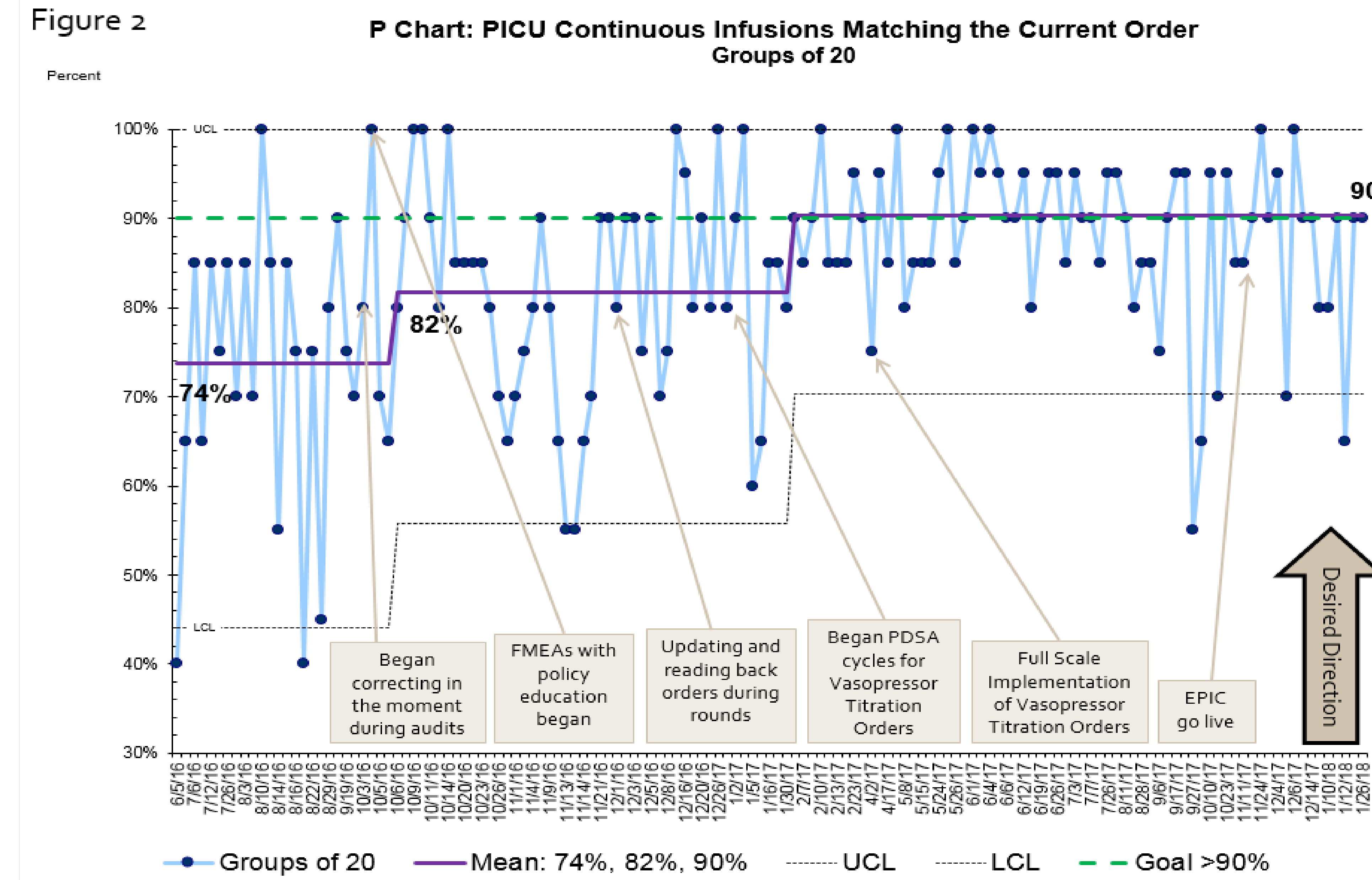
Purpose/Objectives

- SMART AIM: The MCJCHV PICU will increase the percentage of continuous IV medications infusing that match the current order from a baseline of 74% to 90% by May 31, 2017
- GLOBAL AIM: Eliminate adverse drug events from continuous IV medication infusions in the PICU.

Methods

- Failure Modes Effects Analysis (FMEA) included PICU nurses, pediatric residents, PICU Fellows and Attendings
 - Over 100 unique failure modes were identified
- A Key Driver Diagram (Fig. 1) was created using the failures identified in the FMEA to frame the improvement work
- 1st Plan-Do-Study-Act (PDSA) cycle involved the ordering providers entering and reading back all orders while on daily rounds
- A Pareto chart of failures identified vasoactive medications as the largest category of non-compliance, leading to a second PDSA implementing a vasoactive titration order set.
 - Rapid cycle testing and feedback allowed the team to revise and address concerns before full order set implementation.
- Statistical process control was used to measure the percentage of continuous medication infusions, vasoactive infusions, and sedative/narcotic/paralytic infusions matching the provider order displayed in separate p-charts using established rules to differentiate special versus common cause

Results



Results

- 431 baseline observational audits revealed a mean compliance of 74% that increased to 90% after 12 months, which continues to be sustained after 3 additional months (Fig. 2)
- Subset analysis of vasoactive medications showed an improvement from 38% to 83% mean compliance (Fig. 3)
- Further subset analysis of the sedative/narcotic/paralytic infusions revealed an increase from the 84% to 93% mean compliance which has been sustained for a year.

Conclusions

- Formation of an engaged, interdisciplinary team meeting on a weekly basis was crucial to success.
 - The team learned to incorporate QI methodologies to drive progress
- Challenges included:
 - Manual auditing processes
 - Staffing availability
 - Higher acuity census
 - Fewer IT resources available while building content for transition to new electronic medical record (EMR)
- Ensuring continuous medications have matching provider orders uses proven safety mechanisms, ensures nurses provide care within their scope of practice, and reduces adverse drug events.
- Spread will occur to the Cardiac ICU
- Project used to develop guidelines for medication orders in the new EMR (EPIC)