Improving quality patient care through an evidence-based approach to hemolysis reduction

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Background

- Hemolysis leads to inaccurate test results or no results at all, leading to repeat blood draws, delays in treatment and increased time and costs for patients and staff
- Drawing labs off a peripheral intravenous (PIV) line is a known contributor to hemolysis; however, this is the preferred method of specimen collection in patients with limited venous access, such as breast oncology patients.
  - This preserves vein integrity to safely administer chemotherapy and improve patient satisfaction
- The American Society for Clinical Pathology has established 2% or below as an acceptable benchmark for hemolyzed specimens

Problem Identification

- In one chemotherapy unit labs were routinely drawn off PIVs
- Hemolysis rates were rising and peaked at 4.9%
- Patients needed multiple repeat lab draws and treatment delays
- Other units had gone to a 2- stick method (1 for labs and 1 for the IV) but this unit's population was identified as unique
  - Breast cancer patients had limited extremities available
  - 30% of all Adriamycin prescribed hospital-wide was administered in this unit therefore avoiding multiple same-day venipuncture was needed to minimize risk of extravasation
- The goal was to reduce hemolysis without a process change

Factors increasing hemolysis as identified in the literature

- PIV draws
- Tourniquet time > 1min
- Pneumatic tube delivery
- Puncture before ETOH dries
- Use of site other than antecubital

Interventions

A multi-faceted approach was implemented to reduce hemolysis rates by reinforcing best practices found in the literature

Oct 2016
- Back-to-Basics education for chemo staff on evidence for hemolysis reduction

Nov 2016
- Timers added to chair lamps in all chemo rooms for tourniquet time reinforcement

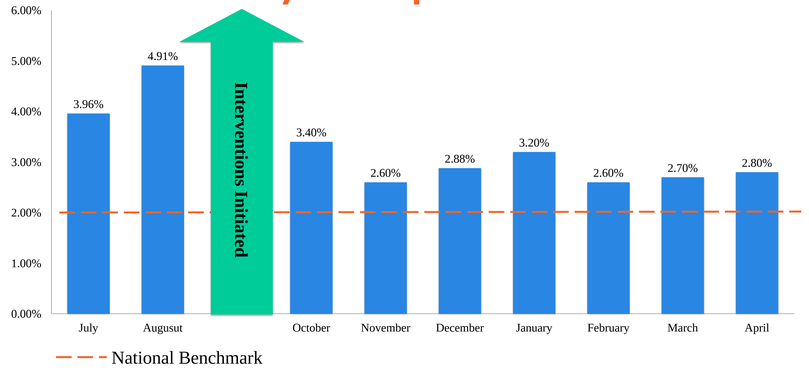
Jan 2016
- Pilot of specimen transport change from pneumatic tube to hand pick up

Feb 2017
- Return to pneumatic tube use and reinforcement of back to basics concepts

Results/Data

- Re-education and timers brought awareness to staff practices, resulting in reduction of hemolysis rates over 2% that was maintained for >6 months
- Pneumatic tube pilot did not show benefit in hemolysis rates; some data suggests this is only a factor over distances longer than 2,000m
- Continuous monitoring and staff reinforcement was needed during initial months
- More than 70% of patients with hemolysis were metastatic versus adjuvant
- On average, 25% of metastatic patients with hemolyzed specimens were patients on research protocols requiring multiple blood draws

Hemolyzed Specimen Rates



Overcoming Challenges

- Use of multiple interventions can avoided a major patient process change, but can be more challenging for staff to adhere to
- Use of a Plan-Do-Study-Act model can be used to test interventions and revise throughout the process
- Rates dropped most and repeatedly when staff was reminded about best practices, demonstrating need for continued monitoring and reinforcement

Nursing Implications

- Reducing hemolysis rates is possible without changing patient process to include multiple needle sticks . This emphasizes the importance of using nursing literature to identify practice drift.
- More discussion is needed with LIPs to increase CVAD placement in metastatic patients who will be receiving indefinite treatment
- These changes can apply to patients beyond breast oncology (e.g. dialysis patients with a fistula, etc) who have challenging venous access