

## Quality Improvement: Emergency Department Arterial Blood Gas Turn Around

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**Problem:** Arterial blood gases (ABG) effectively manage critically ill patients in the emergency department (ED). As patient volume and acuity increased, turn-around time (TAT) from the laboratory also increased.

**Evidence:** Baseline TAT was greater than 30 minutes. Lengthy TAT increased time to therapeutic intervention, delayed transport to an intensive care unit, and took the therapist away from the bedside to follow-up with the laboratory, all of which could worsen the patient's condition. Causes of prolonged TAT included improper specimen labeling; lost, destroyed or clotted samples; and waiting for carriers. In addition, the sample needed to make two stops through the pneumatic tube system.

**Strategy:** Prolonged TAT was discussed with laboratory personnel. Interventions included a laboratory supervisor carrying a pager specifically for ED problems ED and placing requisitions on purple paper to identify a "stat" specimen. Turn around time was monitored for an additional three months with no change. Comparative models were evaluated with a cost analysis.

**Practice change:** The decision was made to decentralize the process to the ED with the purchase of an analyzer, a moderately-complex point-of-care test. Components of the process set-up included instrument/method validation studies, competency testing, staff training, and written technical procedures.

**Evaluation:** Outcomes were measured by calculating the difference between draw time and result time on all samples for five months.

**Results:** Data revealed average TAT of 3 minutes; an 89% decrease. All variables associated with the sample leaving the department to be analyzed were eliminated. Of the first 664 samples there were 10 critical values not reported to the physician. Addition of a physician pick list as a mandatory field eliminated this problem for future samples.

**Recommendations:** Decentralizing an ABG machine dramatically decreased TAT and improved quality of care and patient safety by expediting time to therapeutic intervention, improving throughput, and allowing timely disposition.

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