

Challenging the Norm: A Four-Year Journey to Reduce Acute Kidney Injury

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BACKGROUND

- The National Cardiovascular Data Registry (NCDR®) CathPCI Registry® in-hospital risk adjusted acute kidney injury (AKI) rate for 2020 Q4 rolling four quarters (R4Q) was 9.6, less than 25th percentile for all US hospitals.
- Work was done by a multidisciplinary team to reduce the risk standardized AKI rate, resulting in a rate reduction in 2022 Q4 R4Q to 7.8, 50th percentile for all US hospitals.
- Despite the hard work and strategies implemented to reduce AKI, practice drift and lack of culture change led to an upward trend in NCDR AKI rate (9.10 for 2024 Q1).
- National Guidelines for PCI recommend hydration with normal saline (NS) pre- and post-procedure, along with the use of lower contrast volume in high-risk PCI patients.
- NCDR R4Q outlier contrast volume rate for 2024 Q1 was 18.9%.
- The team recognized the need to further influence culture around AKI prevention, along with a new focus on minimizing outlier contrast volume as a strategy to improve AKI rate.

METHODS

Reducing Contrast Volumes

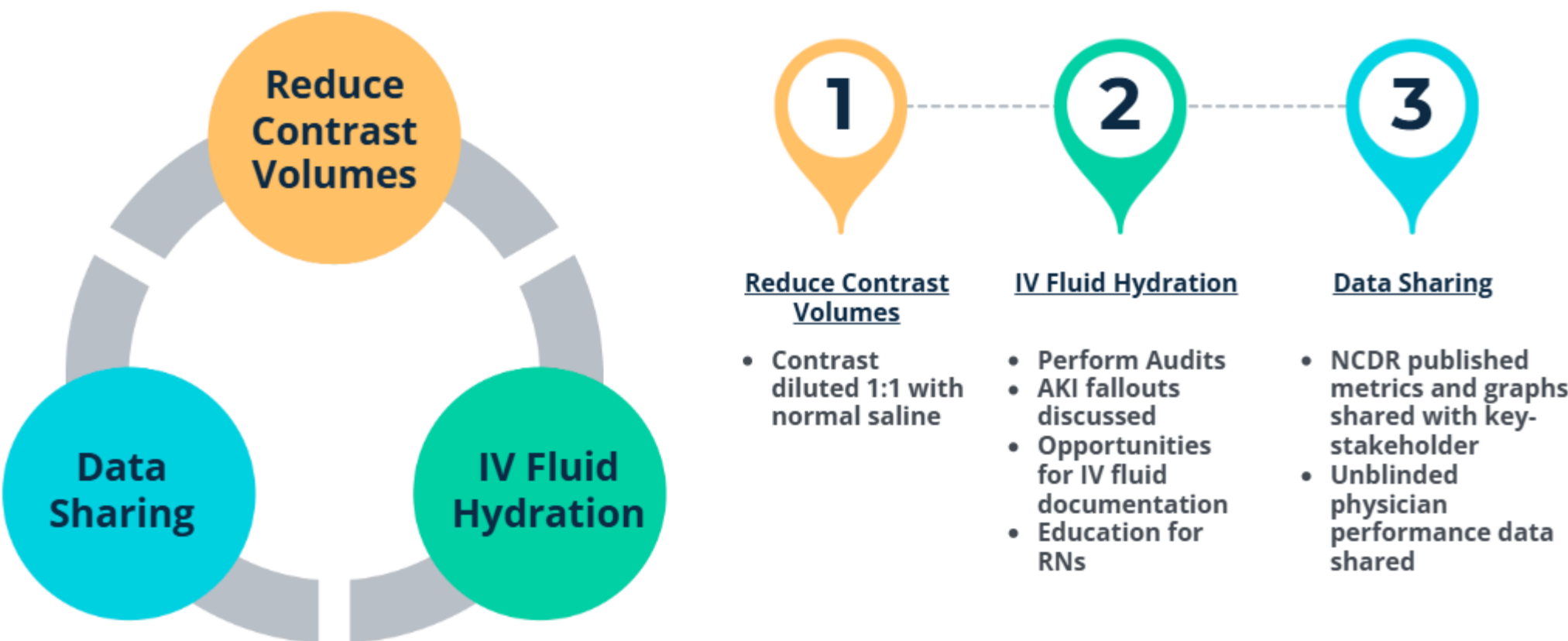
- Multidisciplinary team trialed a test of change to spare contrast by diluting it with normal saline.
- Cath Lab contrast diluted 1:1 with normal saline in the control syringe.

Intravenous (IV) Fluid Hydration

- Audits performed to assess the use of CV order sets and IV fluid administration.
- All audit results and real-time AKI fallouts were shared at monthly procedure workgroup meetings.
- Identified opportunities for improved order set usage and nursing documentation of IV fluids pre- and post-procedure were shared at Cath Lab and physician meetings.
- Education provided to pre- and post-procedural RNs on IV fluid documentation for procedural patients.

Data Sharing

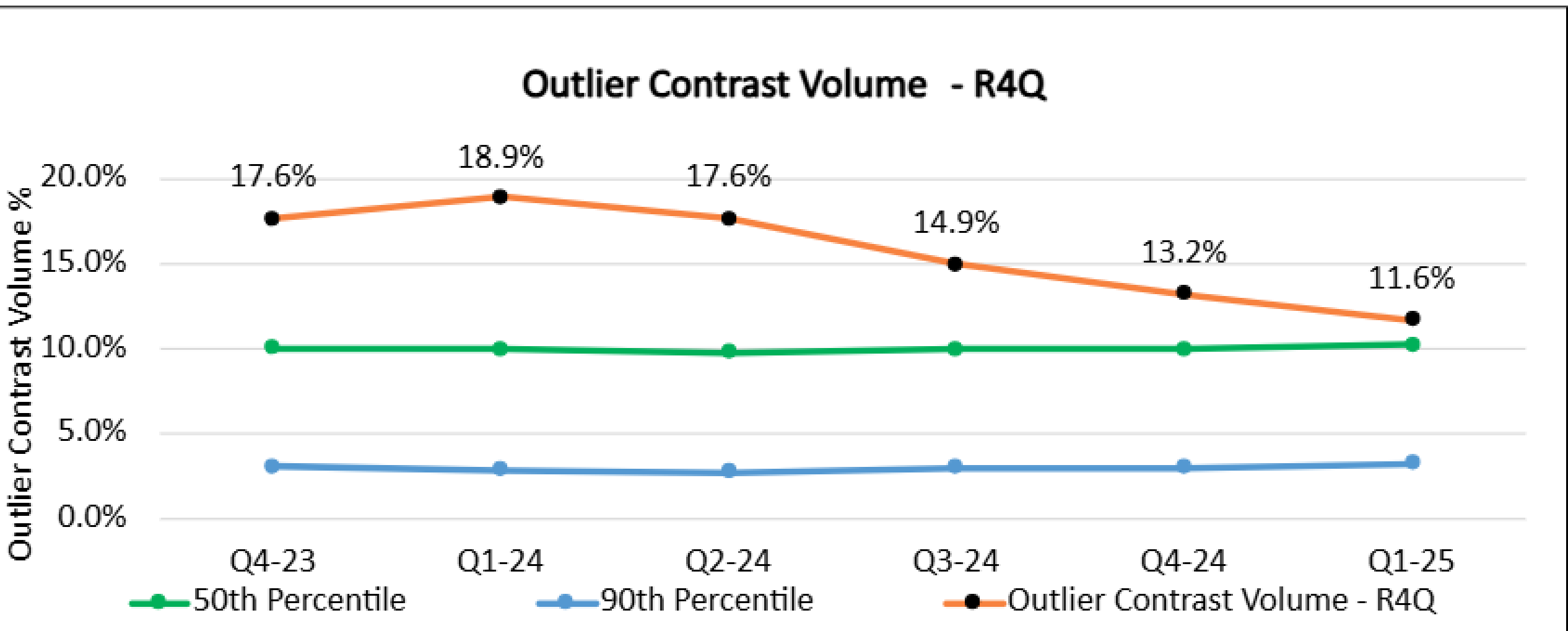
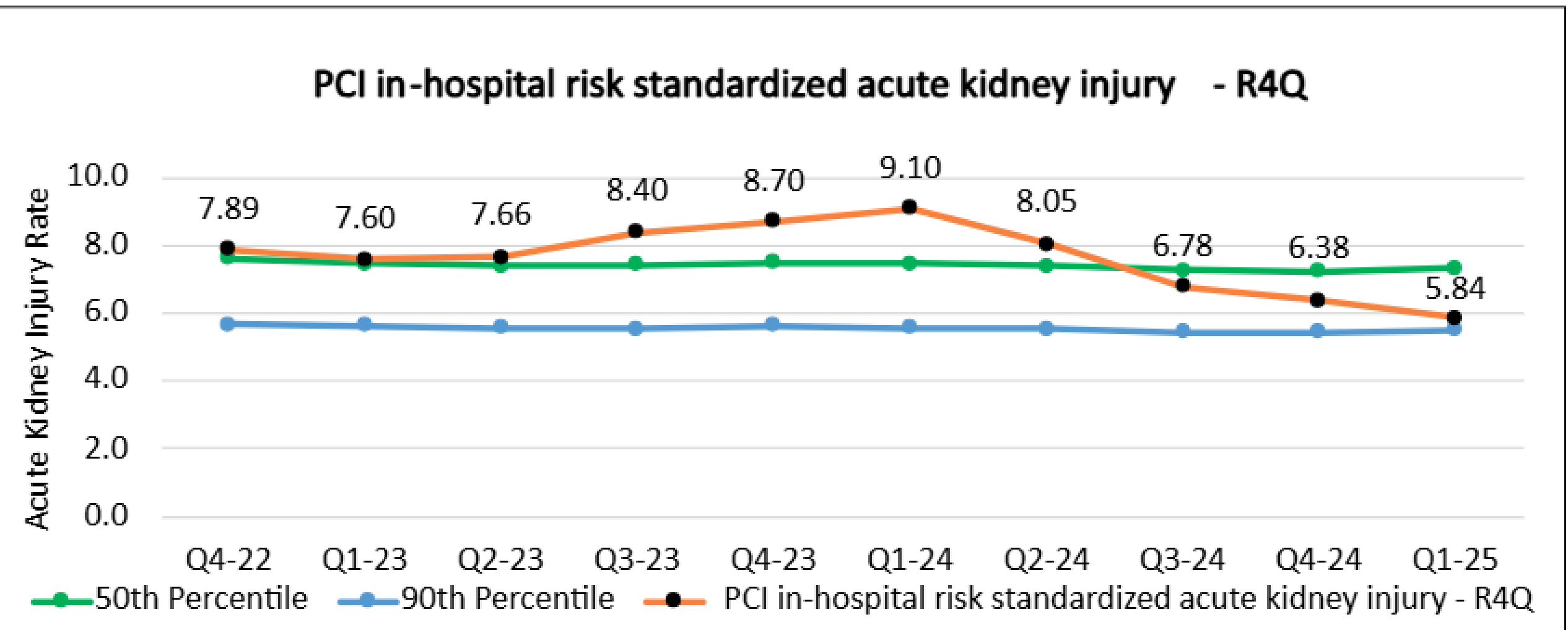
- Data collection and sharing of unblinded data was shown to drive performance improvement.
- Data included:
 - NCDR published metrics (AKI and Outlier Contrast).
 - Internal real-time data for IV fluid hydration and contrast dosage.
 - Graphs showing pre-, intra-, and post-procedure fluids for all AKIs, along with contrast volume trends.
 - Unblinded physician comparison graphs of observed versus expected AKI ratio to highlight physician variance.



RESULTS

The NCDR R4Q CathPCI 2025 Q1 Outcome and Safety metrics showed significant improvement:

- AKI rate improved to **5.84** (2025 Q1) from **9.65** (2020 Q4), better than 75th percentile for US hospitals (6.35).
- Outlier contrast volume rate improved to **11.6%** (2025 Q4) from **17.6%** (2023 Q4), less than 50th percentile for all US hospitals.
- A focus on multidisciplinary team communication resulted in culture change, with Cath Lab staff feeling more empowered to speak up. With this, an improved procedural Time Out was initiated with announcement of 75% max contrast dose (MCD) and when 75% of MCD was reached.



VALUE PROPOSITION

- AKI is a known complication for the over 1 million patients undergoing PCI annually in the United States.
- Patient PCI risk profiles have increased due to clinical instability, anemia, diabetes, and chronic kidney disease.²
- Average AKI hospitalization cost is \$38,000.⁴
- Associated AKI incremental length of stay is 3.6 days.⁴
- Physician adoption of AKI prevention strategies ranges from 0-30%.⁴
- Patients with complex coronary artery disease and a high number of risk factors can benefit from reduced contrast volume during PCI, which reduces length of stay, leading to inpatient stay cost savings.³

CONCLUSION

This project was successful due to:

- Test of change trial to dilute contrast 1:1 with normal saline in the control syringe.
- Audits of previously revised CV order set and IV fluid administration.
- Real-time data collection (AKI fall outs and outlier contrast volume).
- Data sharing of unblinded data with key stakeholders .
- Focused RN education around IV fluid hydration documentation for procedural patients.
- Consistent work by a Multidisciplinary Procedural Workgroup with a common goal to improve patient outcomes and reduce harm to patients.

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DISCLOSURES

Author's have no disclosures.