

Implementing Intravenous Fluid Hydration as Evidence Based Strategy to Reduce the Risk of Contrast Induced Nephropathy

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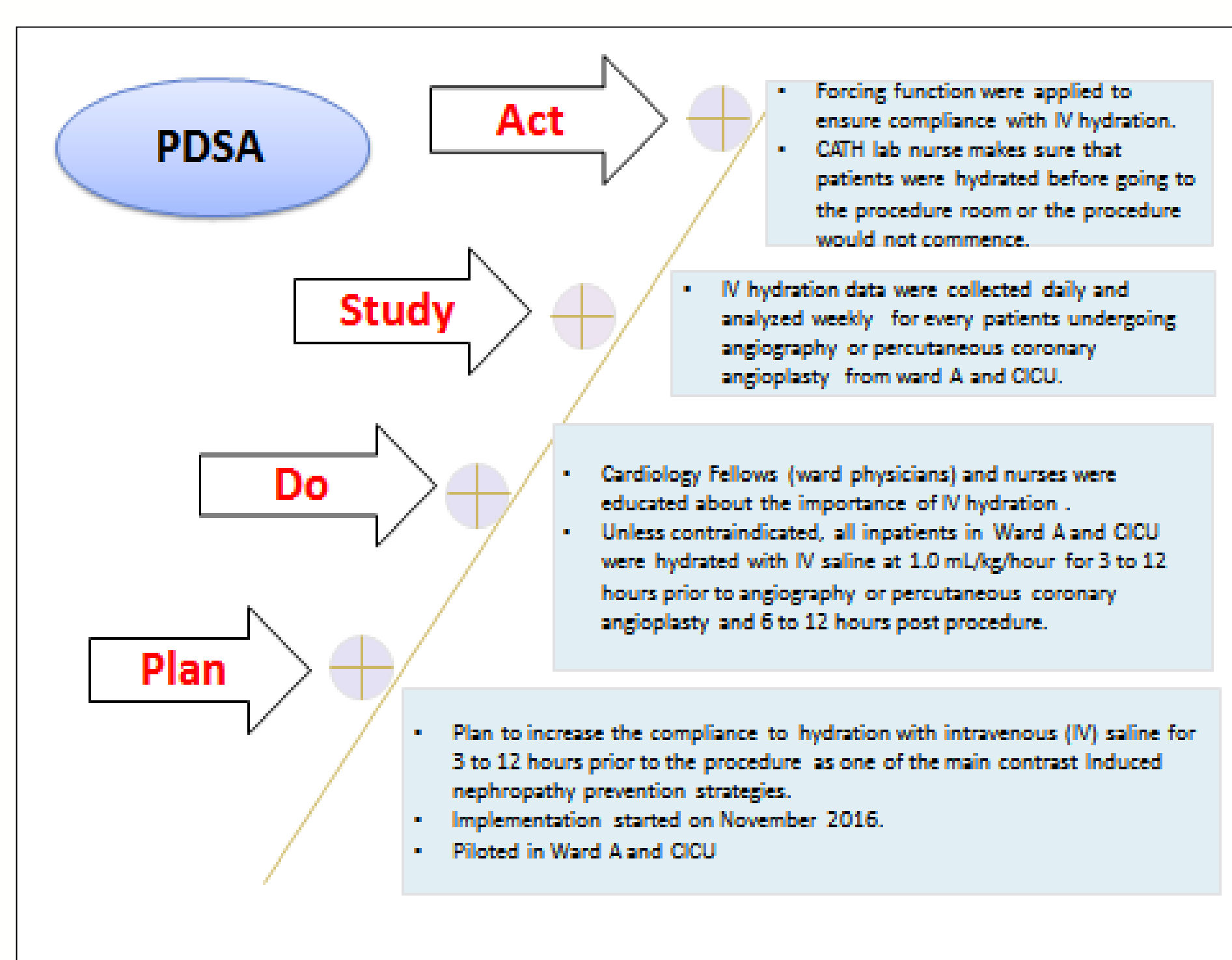
Aim

- To reduce the risk of Contrast Induced Nephropathy (CIN) among patients undergoing Coronary Angiogram and Percutaneous Intervention (PCI) by increasing volume fluid loading with intravenous (IV) saline.

Overview

- CIN remains one of the most serious complication associated with the use of intravascular contrast medium (CM) during angiography or PCI.
- Patients with CIN experience longer hospitalization and higher mortality and morbidity.
- Fluid volume loading is the single most important measure that can be taken prior to intravascular CM administration and this approach is advocated in all recently published studies. Evidence showed that hydration with IV saline is the most effective regimen.

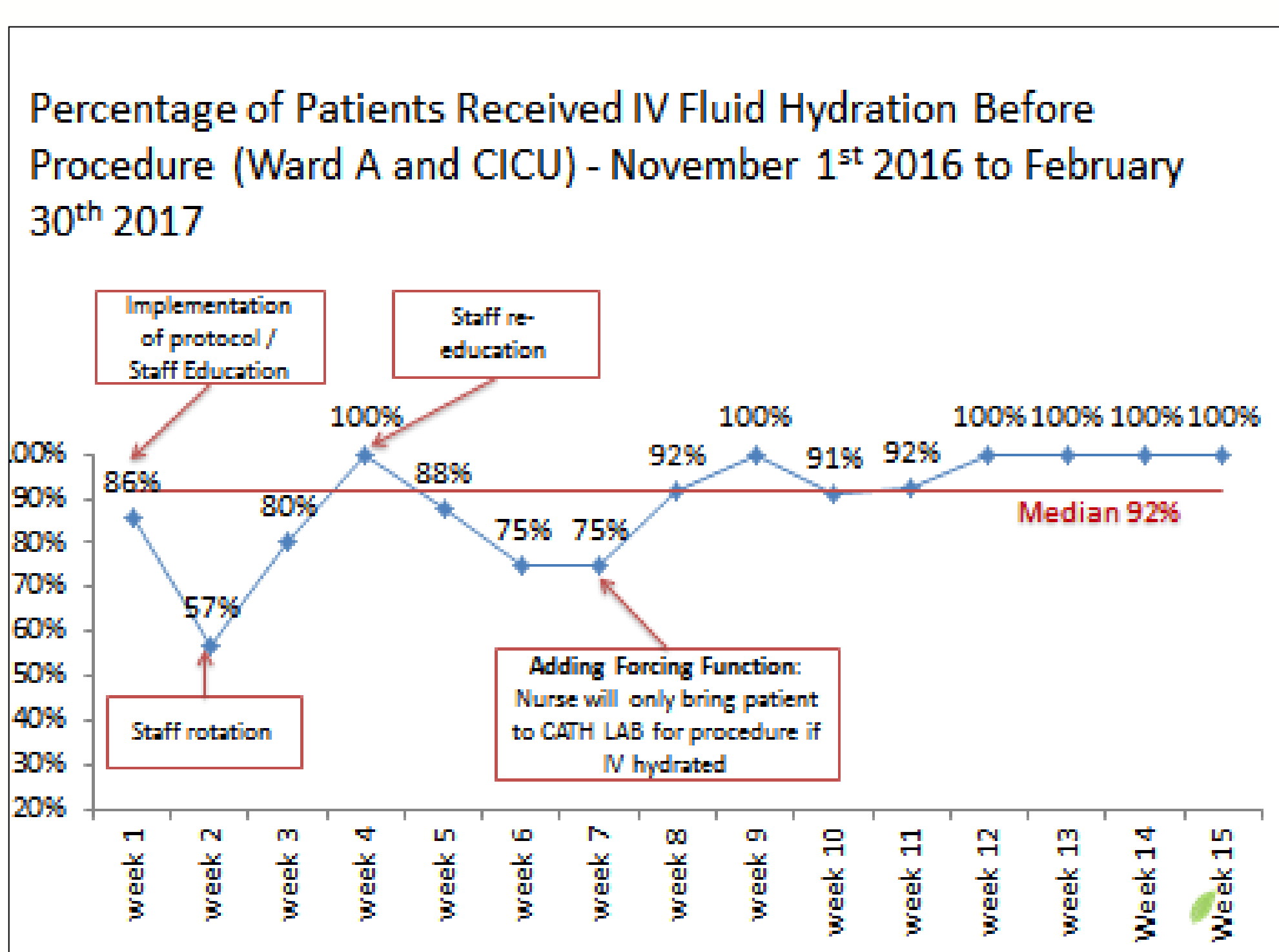
Strategy for Change



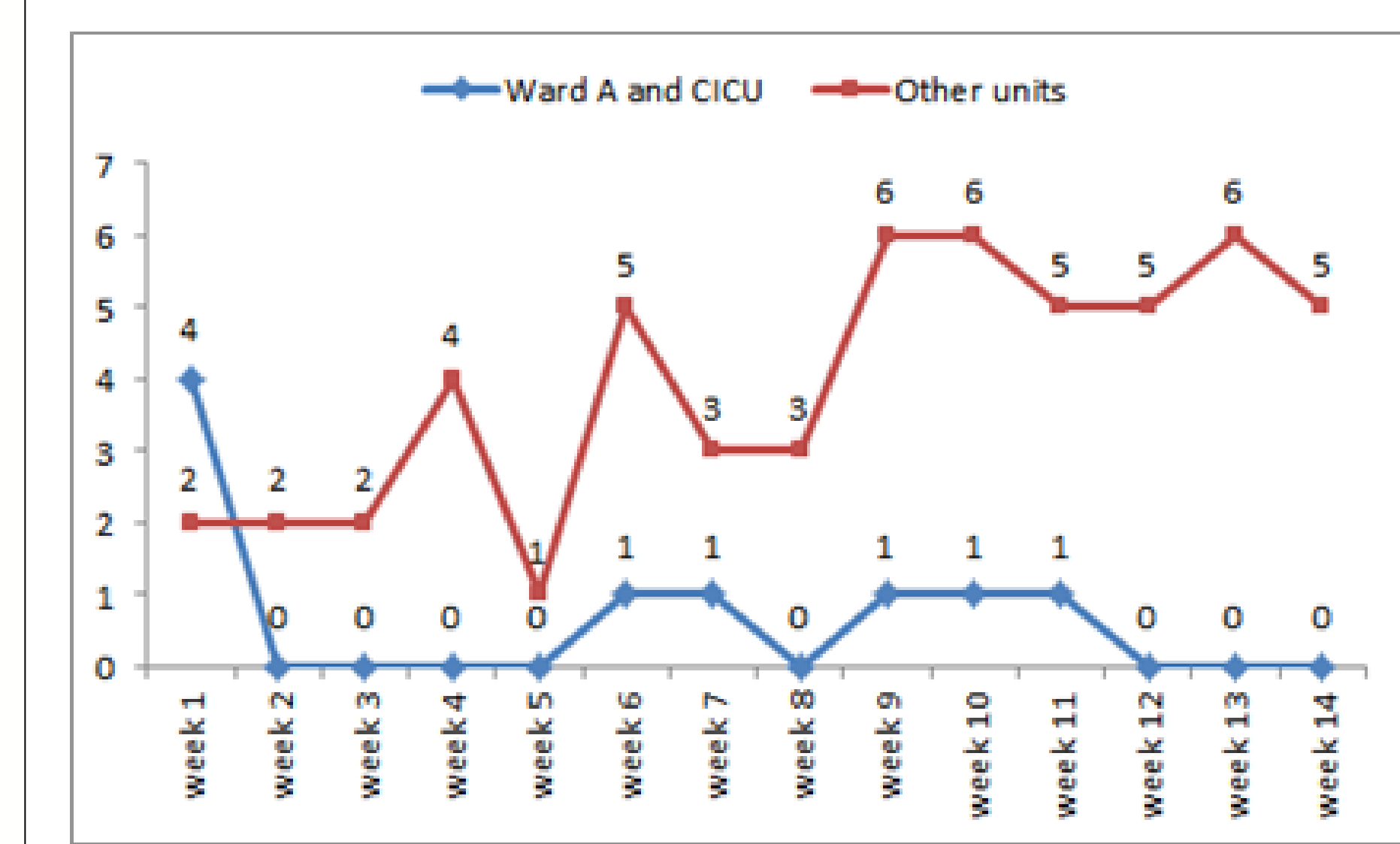
Actions Implemented

- Protocol for Contrast Induced Nephropathy Prevention Strategies was spread among all inpatient units in November 1st 2016.
- Education for caregivers (physicians and nurses) was carried out in ward A and CICU as a pilot study.
- CATH Lab nurse who accompanied the patient from ward A and CICU to the CATH lab collect the data about pre-procedure IV hydration, post-procedure IV hydration and other interventions such as eGFR.
- Drop in pre-procedure IV hydration was noticed during the cardiology fellows rotation after two weeks of implementation.
- Reeducation of the new caregivers was carried on the 3rd week of November.
- A noticeable drop in pre-procedure IV hydration was still observed in the 5th and 6th week of implementation.
- A forcing function was added in the 7th week. CATH lab nurse would transfer the patient from ward A and CICU to the CATH LAB only if hydrated with IV saline before procedure.

Results



Number of Patients with Creatinine Increase \geq 25% Following Coronary Intervention – Ward A and CICU vs. Other Units



- Serum creatinine is a crude indicator of renal disease. An increase of serum creatinine level by more than 25% over a baseline level is an indicator for nephropathy.
- Although there are several factors that may affect serum creatinine level other than IV hydration, data showed that low number of patients with a creatinine increase more than 25% above baseline in Ward A and CICU compared to other Units. This may indicate the effectiveness of the IV hydration strategy.

Conclusion

- Implementation of evidence based IV fluid hydration strategy for reducing the risk of CIN by spreading the knowledge through protocols and staff education followed by adding forcing function was effective in increasing the compliance rate.

Next Step

- Spread the process to all inpatient wards in the Heart Hospital.
- Try to implement the best practice for urgent PCI (primary PCI) cases.
- Monitor other CIN prevention strategies such as reducing the dosage of contrast.

References

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- Bashore TM, Balter S, Barac A, et al. 2012 American College of Cardiology Foundation/Society for Cardiovascular Angiography and Interventions Expert Consensus Document on Cardiac Catheterization Laboratory Standards Update: A Report of the American College of Cardiology Foundation Task Force on Expert Consensus Documents. *J Am Coll Cardiol.* 2012; 59(24):2221-2305.

In Collaboration with