

Assessing Compliance and Efficacy of LVEDP Guided Hydration Protocol in Patients Undergoing Coronary Angiography

Mohaned Serdah, MD, Ryan O'Connor, MD, Elizabeth Newman, PA-C, Jeffrey Bruckel, MD

Department of Cardiology, University of Rochester Medical Center, Rochester, NY

Background

- Contrast induced nephropathy is a common complication of contrast exposure, including with coronary angiography¹.
- Defined as an elevation in serum creatinine of more than 25% or 0.5mg/dl from baseline within 48hrs¹.
- Mainstay of therapy is prevention with hydration, but much remains unknown (duration, rate, volume)¹.
- The POSEIDON trial demonstrated significant reduction in CIN with LVEDP guided hydration with normal saline².
- NCDR demonstrates a 14.28% rate of PCI in hospital risk adjusted acute kidney injury at URMCC³.
- The comparison group (1,797 teaching institutions) had a rate of ~7%³.
- Quality improvement initiative started in July, 2021 to address rates of CIN with LVEDP guided hydration protocol guided by the POSEIDON trial⁴.

Objectives

- Assess for LVEDP guided hydration protocol compliance in patients undergoing coronary angiography.
- Assess rates of contrast induced nephropathy pre and post LVEDP guided protocol implementation.

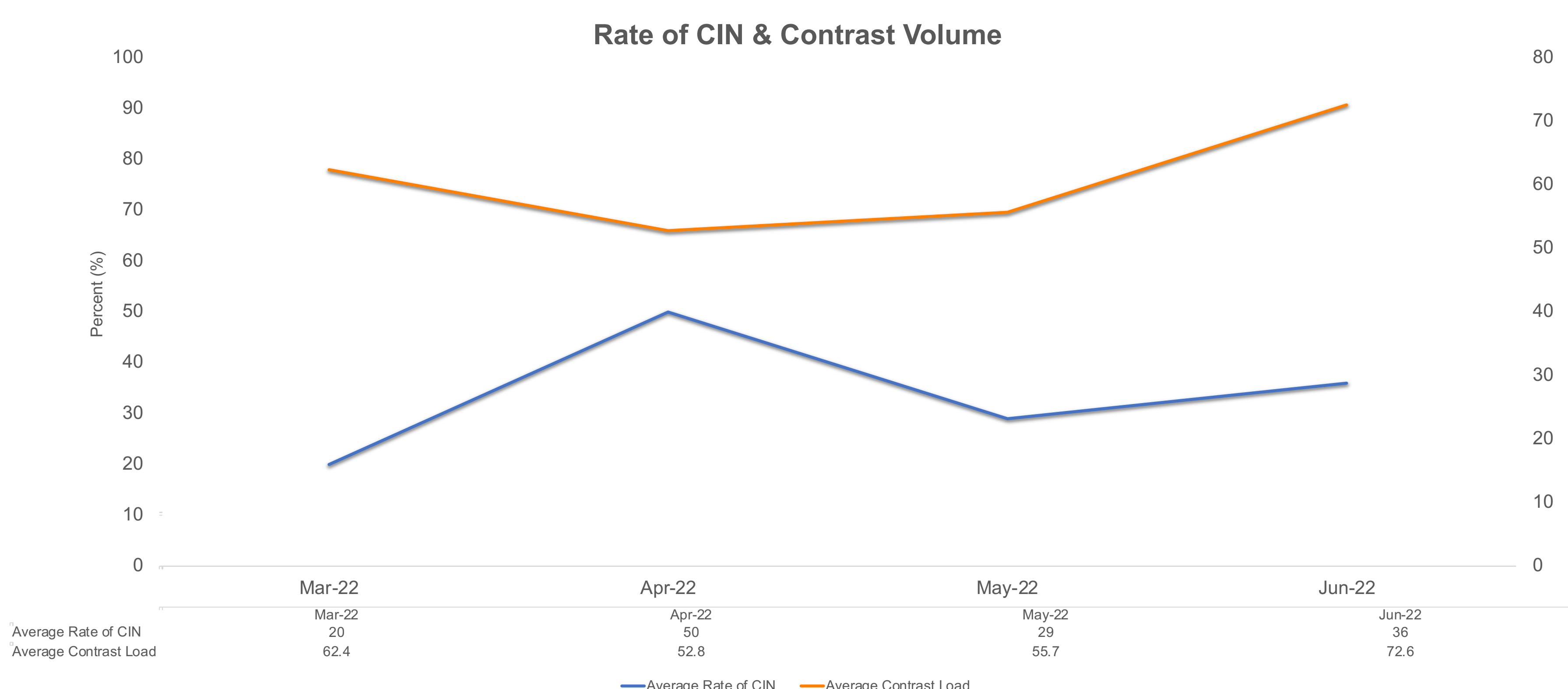
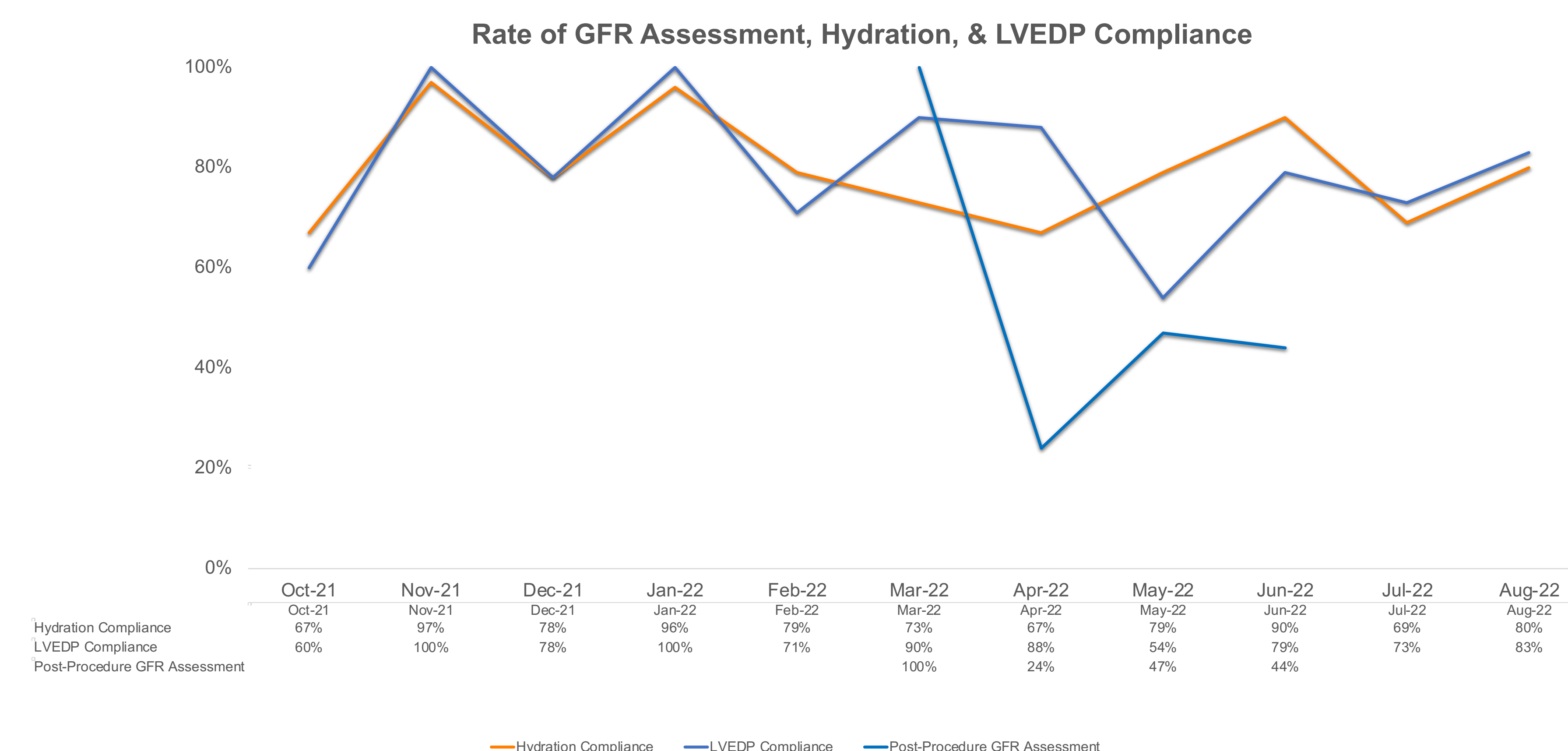
Updated URMCC Guidelines

- Patients with renal insufficiency (GFR <60 ml/min) and 1 additional risk factor receive pre and post-angiography hydration⁴.
- Risk factors include:
 - Diabetes Mellitus
 - Congestive Heart Failure (LVEF <40%, Class III/IV)
 - Hypertension
 - Age > 75 years old
- Exclusion Criteria:
 - Pre-angiography: Emergent procedures
 - Post-angiography: Decompensated HF, ESRD on HD, Severe valvular disease

URMC Protocol

Timing	LVEDP Guided Hydration	Duration
Pre-procedure	3cc/kg/hr	1 hour
Post-procedure	<13mmHg: 5cc/kg/hr 13-18mmHg: 3cc/kg/hr >18mmHg: 1.5cc/kg/hr No LVEDP: 3cc/kg/hr	4 hours

Results



Conclusions

- LVEDP guided hydration protocol has been fully implemented in the Department of Cardiology at URMCC.
- There is a high rate of compliance with the correct hydration protocol (mean 80%), but there remains room for improvement.
 - Recent development of hydration order set.
 - Inclusion of protocol in safety data sheet.
 - Continued education during monthly department safety meetings.
 - Standardized documentation of exclusion criteria.
- Rates of CIN remain above the national average (22.19% during 2022Q1), and remain an area of focus for the department³.
- Elevated rates likely influenced by:
 - Patient population and degree of illness.
 - Undermeasurement of post procedure renal function.
 - Variable degree of hydration implementation.
- It is too early to infer whether LVEDP guided hydration will reduce rates of CIN as demonstrated by the POSEIDON trial.

Limitations

- Contrast load is patient and case dependent (PCI vs diagnostic).
- A significant number of patients do not have post-angiography renal function assessment within 48-72 hrs.
- Variable degree of implementation as illustrated by rates of compliance.
- Sample size with protocol parameters likely limits accurate assessment.

References

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