

Active Kidney Protection During Lifesaving Contrast-Enhanced Imaging Procedures

Don’t let the kidneys be collateral damage

RenalGuard Therapy®

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Contrast-Associated Acute Kidney Injury (CA-AKI) is a Huge Burden to Hospitals and Patients

Contrast media containing concentrated iodine, used in angiography procedures, is toxic to nephrons. Its viscous nature can obstruct filtration, reduce oxygen delivery to kidney tissues,[3] and take several days to clear from the body,[4] potentially leading to CA-AKI.

Contrast-associated AKI negatively affects hospitals and patients

12%
of patients undergoing in-patient cath-lab procedures get CA-AKI[1]

3.7
days longer average hospital stay[2]

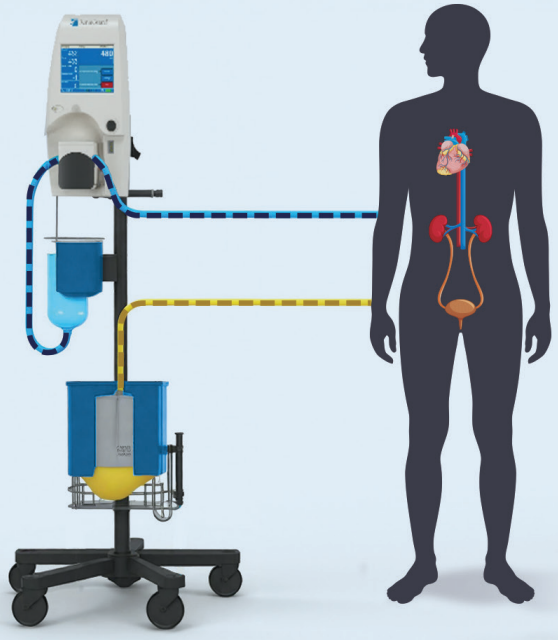
2.5x
higher risk of 30-day in-hospital mortality[1]

50%
higher risk of readmission[1]

RenalGuard: Closing the loop in renal care by automatically balancing the fluids into and out of the kidneys

RenalGuard Therapy's groundbreaking technology autonomously bundles fluid management and therapeutic systems that elegantly integrate into the clinical workflow.

The system is unique in its ability to respond to minute fluctuations in the production and output of urine, automatically adjusting the administration of IV fluids in millilitre increments. The patient is kept hemodynamically stable, preventing over- or under-hydration.



RenalGuard Therapy® is validated in thousands of clinical patients and in multiple clinical studies

RenalGuard has clinically demonstrated:

- **72-87% reduction of AKI** when compared to patients receiving the standard of care[1-5]
- **45% reduction of AKI** when compared to patients receiving the Poseidon Protocol, an aggressive hydration protocol based upon LVEDP[6]



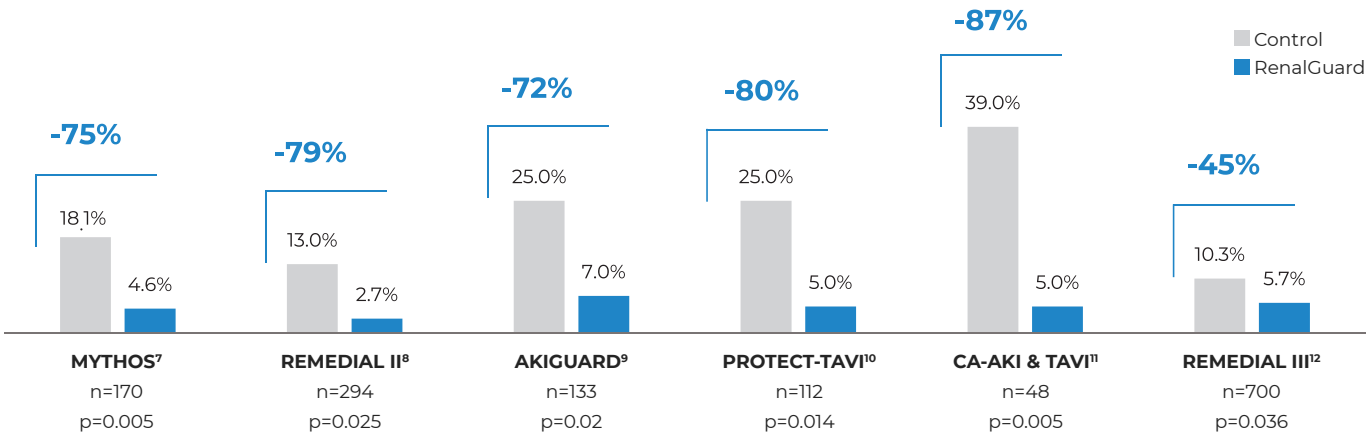
AKI-GUARD Study demonstrated long-term value of RenalGuard in 12-month follow-up[9]

72%
lower incidence of AKI
(from 25% to 7%)

~80%
fewer hospitalization days
(from 4.9 to 1 day on average)

80%
lower incidence of MACCE
(from 32% to 7%)

Results of 6 published, randomized, controlled clinical trials demonstrating a reduction of CA-AKI



MYTHOS[7]	REMEDIAL II[8]	AKIGUARD[9]	PROTECT-TAVI[10]	CA-AKI & TAVI[11]	REMEDIAL III[12]
n=170	n=294	n=133	n=112	n=48	n=700
p=0.005	p=0.025	p=0.02	p=0.014	p=0.005	p=0.036

1. A. Prasad et. Al. Contemporary Trend of acute kidney injury incidence and incremental cost among us patient undergoing percutaneous coronary procedures Catheter Cardiovasc Interv. Feb. 20, 2020;96:1184-1197.
2. Subramanian S et al. Economic burden of contrast-induced nephropathy: implications for prevention strategies. Journal of Medical Economics. 2007;10(2):119–134.
3. Rear R, et al. Heart 2016;102:638–648. doi:10.1136/heartjnl-2014-306962.
4. G. Deray, Dialysis and iodinated contrast media, International Society of Nephrology, 2006, 69:(S25-29).
5. 2018 European Society of Cardiology guidelines include patient-tailored hydration as an alternative to pre- and post- hydration regimen to prevent CIN.
6. Y. Ben-Haim, S. Banai et. al. Forced Diuresis with Matched Isotonic Intravenous Hydration Prevents Renal Contrast Media Accumulation, J. Clin. Med. 2022, 11, 885.
7. Marenzi et. al. JACC: Cardiovascular Interventions Volume 5, Issue 1, Jan. 2012, Pages 90-97 (MYTHOS).
8. C. Briguori et. al. Circulation, 2011 Sep 13;124(11):1260-9. (REMEDIAL II).
9. Usmiani, Tullio et. al. Journal of Cardiovascular Medicine 17(7):p 530-537, July 2016. | DOI: 10.2459 (AKIGUARD).
10. M. Barbanti et. al. JACC Cardiovasc Interv. Oct. 2015, 8(12):1595-604. doi: 10.1016 (PROTECT-TAVI).
11. G. Visconti, et. al. EuroIntervention, 2016 Apr 8;11(14):e1658-61. doi: 10.4244.(CA-AKI & TAVI).
12. C. Briguori et. al. CCI, Volume 95, Issue 5, July 2019 April 1, 2020, 895-903 (REMEDIAL III).

Offering Active Kidney Protection

~80% fewer hospitalization days

80% lower incidence of MACCE

Fully automated balanced fluid management system

Seamlessly integrates into current workflow



About CardioRenal Systems

CardioRenal Systems is developing and marketing an exciting, clinically proven, and CE-approved solution that has prevented AKI in multiple clinical settings from cardiac surgery to the cath lab. Our solution for reducing contrast-associated AKI and Cardiac Surgery Associated AKI has shown reductions of 62% and 52% respectively.

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RenalGuard Therapy®

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