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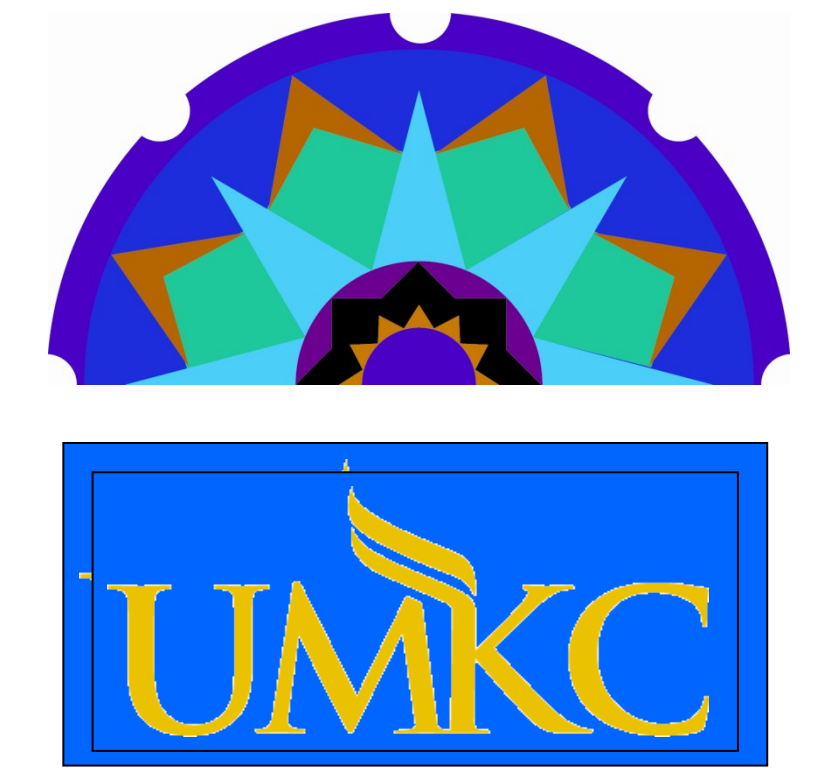
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B-TYPE NATRIURETIC PEPTIDE (BNP): A POTENTIAL BIOMARKER FOR EXTUBATION FAILURE IN INFANTS FOLLOWING CARDIAC SURGERY

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Background: BNP is a hormone released from the cardiac ventricles in response to increased pressure and volume overload¹ and is an important biomarker in heart failure. Following congenital heart surgery, elevated BNP levels correlate with longer duration of mechanical ventilation, low cardiac output syndrome, and increased ICU length of stay²⁻⁴. Mechanical ventilation (MV) has an exaggerated impact on cardiopulmonary interactions in children with myocardial dysfunction, and extubation readiness can be difficult to determine post-operatively following congenital heart surgery.

Hypothesis: An increase in post-extubation BNP levels can predict extubation failure and the need for reintubation within 48 hours.

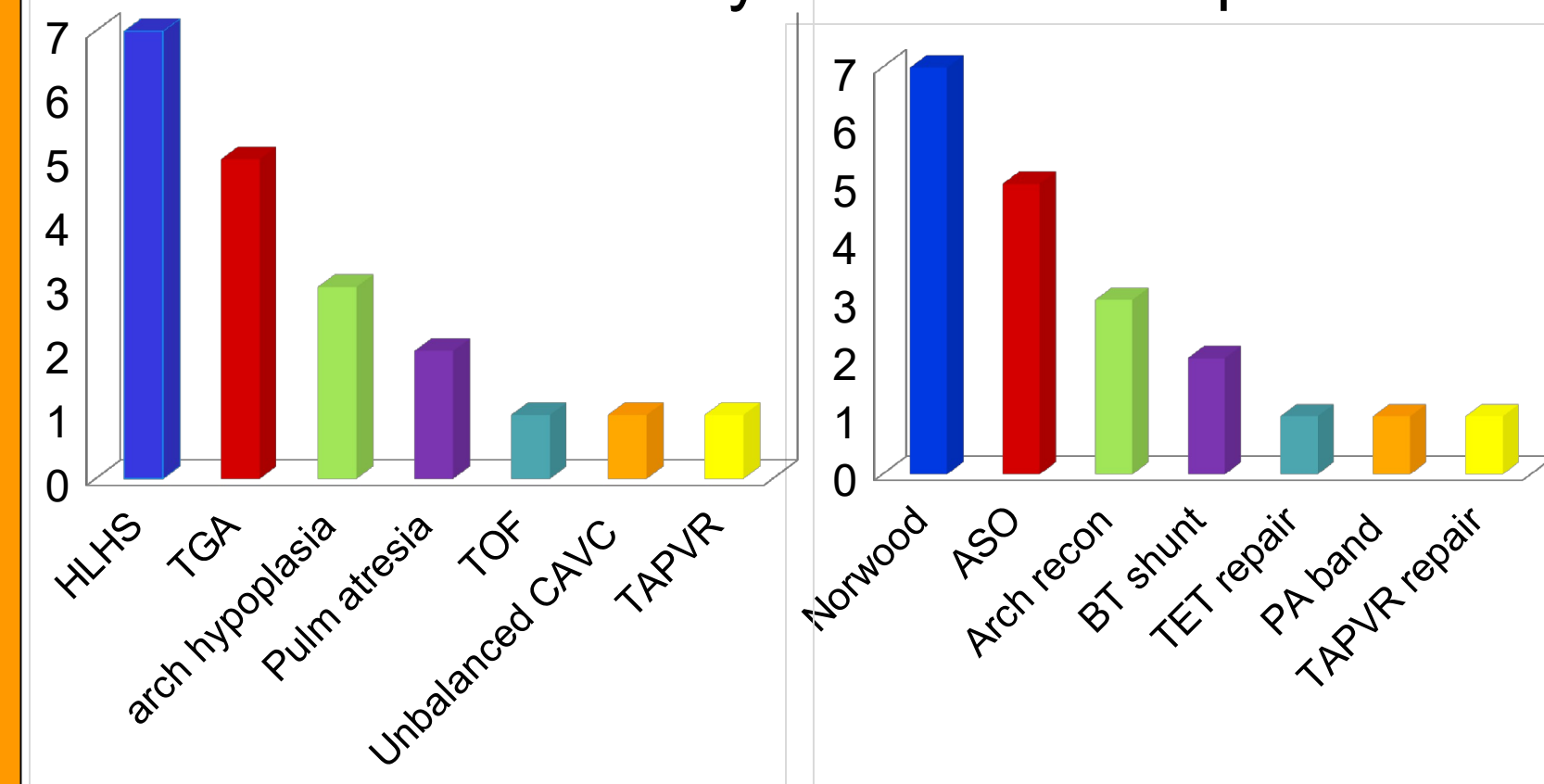
Methods:

Design: prospective, observational, blinded pilot

Participants: Infants ≤ 30 days of age with RACHS-1⁵ score ≥3 admitted to the PICU following congenital heart surgery

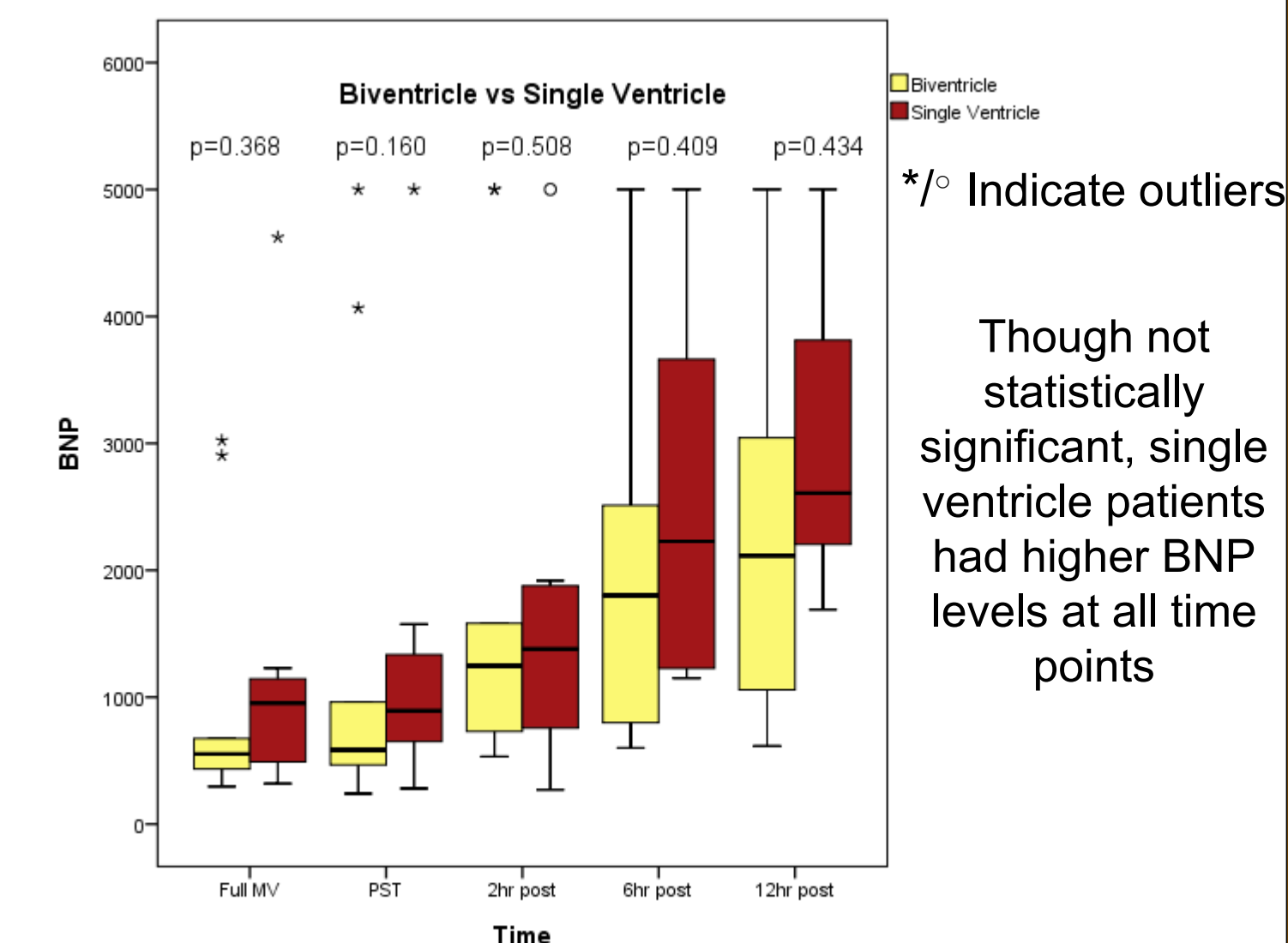
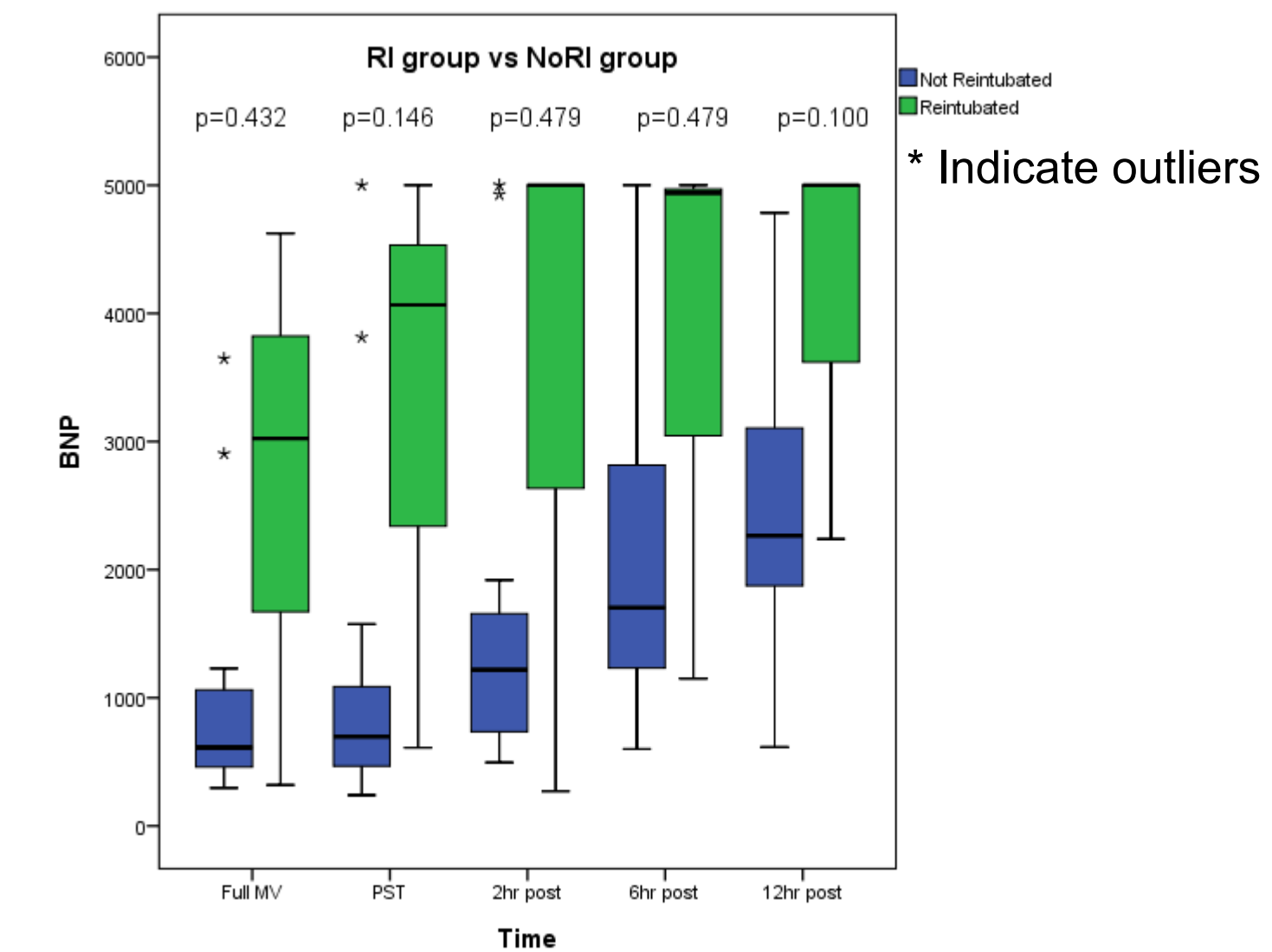
Measurements: BNP levels were obtained on full MV just prior to weaning per standardized weaning protocol, one hour following a pressure support trial (PST), and at 2, 6, and 12 hours following extubation

Results: Data analyzed on first 20 patients



	RI group BNP (pg/mL)	NoRI group BNP (pg/mL)	p value
Full MV	3023 (319-4624)	611 (296-3647)	0.432
PST	4066 (611-5001)	712 (291-3814)	0.146
2hr post	5001 (270-5001)	1326 (548-4928)	0.479
6hr post	4940 (1150-5001)	2191 (600-5001)	0.479
12hr post	5001 (2239-5001)	2265 (615-4785)	0.100

Median BNP levels were compared using Mann Whitney test
3 required reintubation (RI group), 17 did not (NoRI group)



Conclusions:

1. Patients who failed extubation had a trend towards higher BNP levels compared to those who did not fail extubation
2. BNP levels increased in all patients with MV weaning and following extubation
3. Single ventricle patients had higher BNP levels compared to biventricular patients

Speculations:

4. BNP may be an important biomarker in predicting extubation failure
5. MV weaning causes more cardiac stress than what is clinically appreciated
6. Serial BNP levels may be useful to determine extubation readiness and guide the use of peri-extubation inotropic support

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