

# Prophylactic Passive Peritoneal Drainage Improves Fluid Output in Infants after Congenital Heart Surgery

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## Background

- Infants undergoing congenital heart surgery (CHS) with cardiopulmonary bypass (CPB) are at risk of acute kidney injury (AKI) and fluid overload (FO)
- Peritoneal dialysis after CHS has shown benefits including improved fluid output and ventilatory outcomes
- The Surgical Team at AFCH places a passive peritoneal drain (PPD) during CHS in infants considered higher risk for AKI and FO

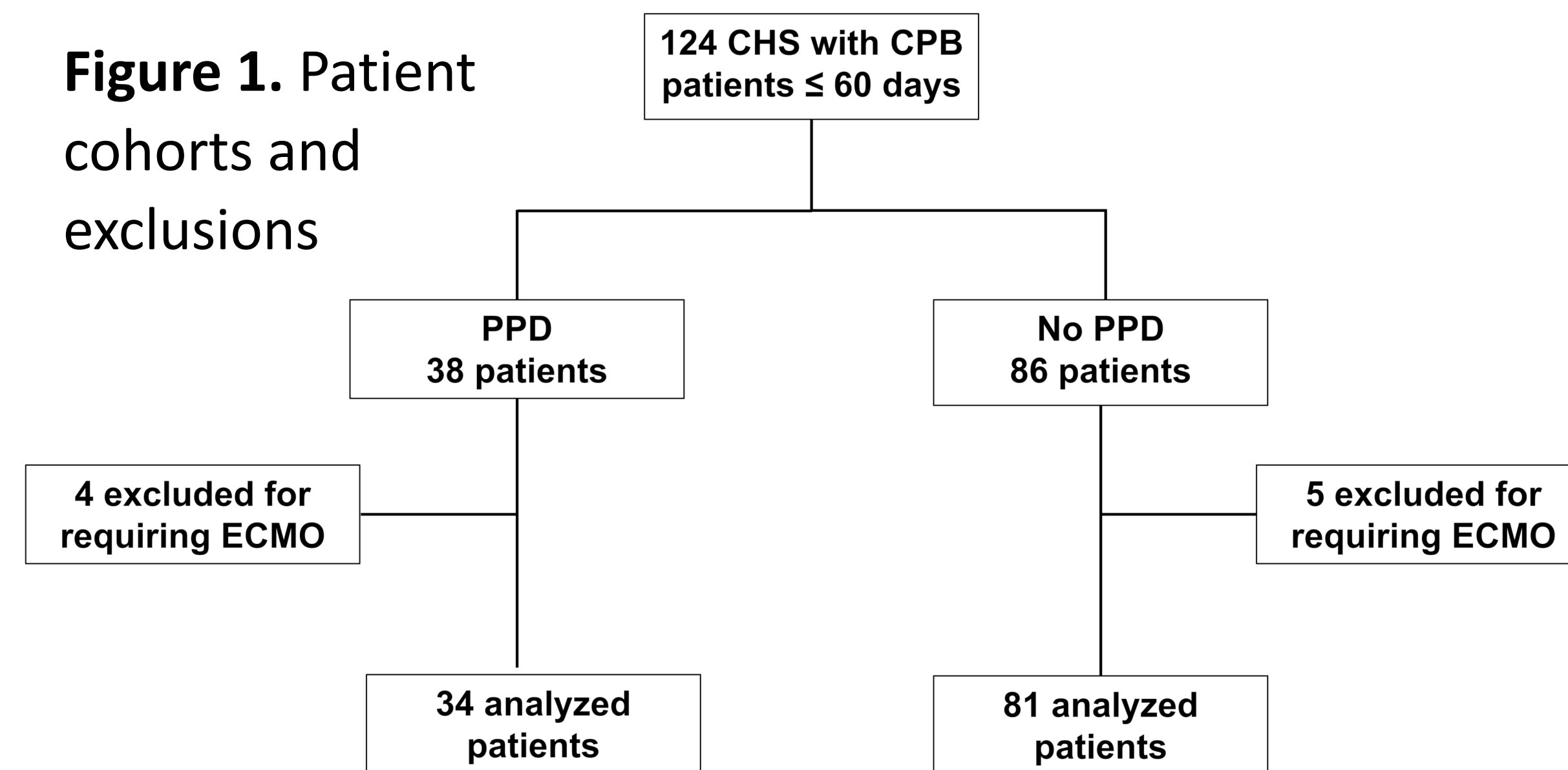
## Hypothesis

- Prophylactic passive peritoneal drain placement improves postoperative fluid output in infants after CHS

## Methods

- Retrospective review data of all patients under 60 days undergoing CHS with CPB
- Multivariable analysis for inputs with between-group p values of  $\leq 0.1$  (table 1)

**Figure 1.** Patient cohorts and exclusions



## Results

**Table 1.** Preoperative and operative demographics

	PPD (n=34) n (SD or % Sample)	No PPD (n=81) n (SD or % Sample)	P-Value
Female sex	12 (35%)	34 (42%)	0.539
Premature birth (<36 weeks)	4 (12%)	18 (22%)	0.298
Known syndrome/chromosome disorder	8 (24%)	19 (24%)	1
Low birth weight (< 2kg)	2 (6%)	8 (10%)	0.721
Presence of delayed chest closure	25 (74%)	18 (22%)	<0.001
Cross clamp time (minutes)	82.62 (29.91)	72.59 (34.22)	0.141
Preoperative creatinine	0.50 (0.17)	0.44 (0.14)	0.114
Weight at surgery (kg)	3.20 (0.53)	3.42 (0.77)	0.09
Age at surgery (days)	10.56 (12.64)	16.49 (15.85)	0.037
Bypass time (minutes)	185.62 (46.23)	152.74 (45.27)	0.001
STAT Category 1	1 (3%)	2 (2%)	<0.001
STAT Category 2	2 (6%)	13 (16%)	
STAT Category 3	6 (18%)	15 (19%)	
STAT Category 4	12 (35%)	47 (58%)	
STAT Category 5	13 (38%)	4 (5%)	

**No** direct complications of PPD placement were observed, including bowel perforation, drain malfunction, or peritonitis

**Table 2.** Vasoactive-Inotropic Score (VIS), Vent Hours, LOS

	PPD (n=38) Mean (SD)	No PPD (n=84) Mean (SD)	Effect Estimate (OR if binary)	95% CI	P-Value
POD 0 Max VIS	12.6 (5.3)	9.0 (5.1)	1.3	[-1.0, 3.7]	0.3
POD 1 Max VIS	15.8 (9.8)	9.1 (5.1)	4.5	[1.2, 7.8]	0.009
POD 2 Max VIS	10.8 (5.7)	6.8 (3.6)	2.7	[0.9, 4.6]	0.005
Post-op hours on ventilator	141 (69)	88 (57)	4.3	[-22.3, 31.0]	0.8
Post-op length of stay (days)	25.0 (15.5)	19.0 (11.6)	-2.9	[-8.3, 2.5]	0.8

In multivariable modeling, PPD use accounted for

**49**  
mL/kg

increased total output over POD 1-5 (p=0.04).

**3.4**  
mg/kg

decreased total furosemide over POD 1-5 (p<0.001)

**Table 3.** AKI and Fluid Balance

	PPD (n=38) % or Mean (SD)	No PPD (n=84) % or Mean (SD)	Effect Estimate (OR if binary)	95% CI	P-Value
KDIGO Stage 1 AKI	58.8%	30.9%	OR = 2.0	[0.7, 5.7]	0.2
KDIGO Stage 2 AKI	23.5%	4.9%	OR = 4.0	[0.9, 18.2]	0.07
First Day Net Negative Fluid Balance	2.1 (1.0)	2.0 (0.8)	0.1	[-0.3, 0.5]	0.6

## Conclusions

- Maximum daily VIS was higher in PPD patients, including on POD 0. This likely signifies a higher-risk patient cohort even after multivariable adjustment for identified pre/intra-operative risk factors
- LOS, dynamic respiratory compliance, & hours on vent were not significantly different in the higher-risk PPD cohort

Prophylactic passive peritoneal drainage is associated with increased postoperative total fluid output despite reduced diuretic exposure in infants after CHS.

In retrospective comparison across broad and divergent groups of PPD and non-PPD patients, endpoint benefit was not demonstrated