

## Improving Use of Peri-operative Therapeutic Heparin Infusions on a Paediatric Cardiology Ward

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### Introduction:

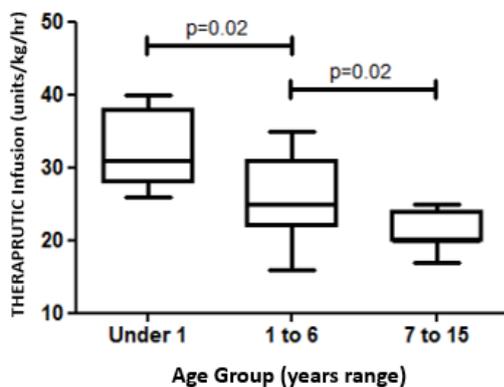
Heparin infusions are commonly used to minimise the risk of thromboembolic events in paediatric cardiology patients. Evidence for infusion rates and target ranges for monitoring are however largely extrapolated from adult data. Given differences in drug clearance and clotting factor expression, the paediatric population is very different. Where paediatric-specific evidence exists, it is largely from a non-cardiology PICU population. Furthermore, evidence arbitrarily distinguishes patients above and below one year old. These age ranges persist within current ACCP guidelines.

### Methods:

Retrospective observational study of heparin infusion dosing in patients on a general paediatric cardiology ward, at a surgical centre, over a one year period. All inpatients between 0-16 years old, who received a heparin infusion, were included. The patient cohort was generated from an electronic prescribing system, on which timings of dose changes were also recorded. Correlation was made against pathology results for both APTT and anti-Xa levels. Demographic data was collected from patient records. Statistics were analysed using STATA.

### Results:

Thirty-six patients had 243 blood tests to monitor heparin infusions. Current guidelines were followed in all cases. No bleeding, thromboembolic events, or adverse reactions were recorded. The most common indication was post-operative prophylaxis for fenestrated-TCPC (n=7). Median delay till achieving therapeutic dosing was 26 hours (range 0-115 hours). This was longer for patients following PICU step-down, at 32 hours (0-115 hours). Inverse correlation was demonstrated between age and therapeutic infusion rate ( $r=-0.59$ ). Significant differences were seen between under-1, 1 to 6 and over-6 year age groups ( $p=0.02$ , figure). Increasing initial heparin dose for a '1 to 6 year' group from 20 to 24 units/kilogram/hour would reduce time till therapeutic dosing by 10 (0-30.5) hours per patient.



### Conclusions:

Evidence underlying heparin dosing is very limited in paediatric cardiology ward patients. Demographic-based dosing relies upon data using arbitrary age boundaries. We demonstrate that patients currently experience significant delays before achieving accepted therapeutic targets. This may increase risk of thromboembolic events, and certainly increases the burden of blood tests. Modifying the current guideline, to increase initial infusion rates for an intermediate age group, may reduce this risk exposure.