

## SHORT REPORT

# The Livingston Paediatric Dose Calculator

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The Livingston Paediatric Dose Calculator is presented and its use explained. It may be of benefit in emergency departments that do not regularly see large numbers of children requiring drug treatment.

Paediatric dose calculators are not a new concept. Many are available for use in the paediatric intensive care setting, having been designed by anaesthetists and intensivists in order to aid what are often sometimes complicated calculations.<sup>1</sup> There is some evidence that use of a computerised calculator reduces prescribing error rates,<sup>2</sup> and may be significantly faster than manual paper based calculation.<sup>3</sup> The paediatric anaesthesia

departments at both The Royal Aberdeen Children's Hospital (<http://www.abdn.ac.uk/~ans087/trustwebsite/PICU.xls>) and The Royal Hospital for Sick Children, Edinburgh (<http://www.snprs.scot.nhs.uk/Paediatric%20Drug%20Dose%20Calculator.xls>) have developed excellent free on-line paediatric drug calculators; there are also numerous commercially available programmes, although many of these are US-based and therefore not useful in a UK setting.

While dose calculators are extremely useful for children requiring resuscitation and intensive care treatment, they may also benefit patients presenting to emergency departments (EDs) requiring treatment for conditions such as asthma or seizures, or requiring analgesia for orthopaedic injuries. A search of the medical literature and of Google revealed only one

Paediatric Drug and Infusion Calculator - St Johns Hospital, Livingston.				Actual weight / kgs					
For use in children over the age of 1 month				OR Age in years		5			
PUT IN ACTUAL WEIGHT OR AGE, CLEAR OTHER BOX, THEN CLICK HERE				Weight to be used		18.0		kg	
4	Electrical Cardioversion	Indication	Joules	Calculated Joules					
5	Biphasic or Monophasic	VF or Pulseless VT (Cardiac arrest)	4	Joules/kg all shocks	100	Joules			
6	Monophasic / Biphasic	Synchronous Cardioversion	0.5	Joules/kg first dose	10	Joules			
7	Monophasic / Biphasic	Synchronous Cardioversion	1	Joules/kg second dose	20	Joules			
8	Monophasic / Biphasic	Synchronous Cardioversion	2	Joules/kg third dose	50	Joules			
9	ETT tube	Only calculates if age entered		Estimated internal diameter	5 1/2	mm			
10	ETT tube	Only calculates if age entered		Estimated length	13	cm			
11	Resuscitation Fluid Bolus	Shock	20	ml/kg	360	ml			
12	Maintenance Fluid Requirement	4mls/kg/hr for first 10kg, 2mls/kg/hr for second 10kg, 1mls/kg/hr thereafter			56	mls/hr			
13	Suction catheter size				8	French			
14	Resuscitation Drugs	Dilution	Recommended dose per kg	Actual dose					
15	Adrenaline 1:10,000 IV bolus	none	0.01	mg/kg	1.8	mls	0.18	mg	
16	Atropine (600mcgs/ml)	none (600mcgs/mls)	0.02	mg/kg (maximum 600mcg)	0.6	mls	0.36	mg	
17	Atropine (minijet = 100mcgs/ml)	none (100mcgs/mls)	0.02	mg/kg (maximum 600mcg)	3.6	mls	0.36	mg	
18	Calcium Chloride (10%=minijet)	bolus in emergency else dilute in NS or SD	0.25	mls/kg (max 4.5mmols=6.6mls)	4.5	mls			
19	Sodium bicarbonate (8.4%)	Resuscitation or metabolic acidosis	1	ml/kg (eq to 1 mmol/kg of 8.4%)	18	mls			
20	Amiodarone	IV loading dose	5	mg/kg (max 300mg)	90	mg			
21	Haloxone (minijet = 400mcgs/ml)	no reconstitution required (400mcgs/ml)	0.01	mg/kg	0.45	ml	0.18	mg	
22	Glucose / Dextrose (10%)	no reconstitution required	5	mls/kg	90	mls			
23	Adrenaline infusion	0.3 mg/kg (=0.3 mls/kg of 1:1000) in 50mls NS	0.1	micrograms/kg/minute	1	ml/hour			
24	Iloradrenaline infusion	0.3 mg/kg (=0.3 mls/kg of 1:1000) in 50mls NS	0.1	micrograms/kg/minute	1	ml/hour			
25	Analgesics	Dilution	Recommended dose per kg	Actual dose					
26	Morphine (10mg/ml)	9mls VFI + 1mls morphine	0.1	mg/kg	1.8	ml	1.8	mg	
27	Intranasal Diamorphine	Dilute with saline to volume of 0.2mls	0.1	mg/kg	0.2	ml	1.8	mg	
28	Paracetamol - ORAL	Initial dose 20mg/kg, Max 90mg/kg per day	20	mg/kg	360	mg			
29	Ibuprofen	Max: 20 mg/kg/day up to 2.4 g/day	5	mg/kg	90	mg			
30	Volatol PR or ORAL		1	mg/kg	18	mg			

Figure 1 Screenshot from the Livingston Paediatric Dose Calculator.

calculator specifically designed for use in UK EDs. This was not solely for use in the paediatric population and is not freely available.<sup>3</sup> It was for this reason that the Livingston Paediatric Dose Calculator was developed.

The calculator, developed as a Microsoft Excel document, is available on a computer in our ED's resuscitation room at St John's Hospital. The programme is accessed either via the desktop or via the ED guidelines on the hospital's intranet site. On opening the file, a screen similar to that shown in fig 1 appears. The user enters either the patient's age or weight if it is known, and then clicks on the large grey box on the left of the screen at which point 72 instant calculations are performed and the results displayed. The calculator is able to aid resuscitation, analgesic, fluid and antibiotic administration, rapid sequence induction, and the treatment of cardiac conditions, seizures, anaphylaxis, asthma and many other paediatric conditions.

If enough warning and information is available from the ambulance service of an imminent admission, then the age of the child can be entered into the calculator and a sheet can be printed out immediately, with all drug doses for reference. Once the child arrives, then either an age or an actual weight can be entered into the calculator to improve accuracy. The calculator can also be used online. As with all such calculators it is vital that the drug dose is double checked by a second person before medication is administered. The calculator is freely available for use via EMJ online at <http://emj.bmj.com/supplemental>.

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Royal North Shore Emergency Department in Sydney, New South Wales, Australia.



The Livingston Paediatric Dose Calculator is available online at <http://emj.bmj.com/supplemental>

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