

# Establishment of the Web-based Paediatric Resuscitation Calculator in Department of Paediatrics & Adolescent Medicine in Tuen Mun Hospital, NTWC

Lau WC(1), Yung L(1), Leung SL(1), Cheung ST(1), Young WM(1), Tam HY(1),  
Chu LM(1), Sheh K(2), Kwee Y(2), Chau SC(2), Wong OY(2), Ting YW(2),  
Yeung KY(2), Lam SY(2), Kwong NS(2), Au Yeung KL(3), Law CH(3)

Department of Pharmacy(1),  
Department of Paediatrics & Adolescent Medicine(2),  
Information Technology section(3),  
TMH, NTWC

Presented by:  
**Jenny Lau**

Paediatric Clinical Pharmacist  
Department of Pharmacy  
Tuen Mun Hospital





# Resuscitation calculator

- A program for calculating drug doses for emergency medications → accuracy + timely



## Objectives:

- Web-based program
- With updated drug information
- With increased number of drug items of emergency drugs





# Methodology

- A **multi-disciplinary team** was formed:

- Paediatric intensivists
- Nursing specialist
- Clinical pharmacists
- Information Technology professionals



- The content was updated based on:

- Latest international guidelines
- HA clinical guidelines
- Standard drug references

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Clinical Guidelines on management of prolonged seizures, serial seizures and convulsive status epilepticus in children

Che Kwan Ma, FHKAM (Paed), FHKCP\*, Ada Yung, FHKAM (Paed), FHKCP\*\*, Eric

Kwong, FHKAM (Paed), FHKCP#

Medicine, United Christian Hospital, Hong

Medicine, Queen Mary Hospital, Hong Kong

Medicine, Princess Margaret Hospital, Hong

Medicine, Tuen Mun Hospital, Hong Kong



**PALS**

Vital Signs in Children

Heart Rate (per minute)

Age	Awake Rate	Sleeping Rate
Newborn to 3 months	85 to 205	60 to 160
3 months to 2 years	100 to 190	75 to 160
2 to 10 years	60 to 140	60 to 90
>10 years	60 to 100	50 to 90

Respiratory Rate (breaths/min)\*

Age	Rate
Infant	30 to 60
Toddler	24 to 40
Preschooler	22 to 30
School-aged child	18 to 30
Adolescent	12 to 18

# Results and Outcome

- New version of Resuscitation calculator:
  - **Web-based** computer program
  - With **updated** drug information
  - With **expanded scope** of drugs (i.e. drugs for Resuscitation/Status Epilepticus/Intubation, etc.)

**Resuscitation Data Sheet**

**PATIENT'S PARTICULARS**

Supine Length (cm): 1.5  
Age (yr): 10  
Body Weight (kg): 4.5  
ETT size (for > 1 yr): 12 cm  
ETT length (for > 1 yr): 14 cm

**DRUGS FOR RESUSCITATION**

Adrenaline: 1st dose 1:10,000  
Adrenaline: Sub dose 1:10,000  
Adrenaline: ETT dose 1:1,000

Bicarbonate 4.2%  
Calcium gluconate 10%  
Amiodarone  
50% MgSO<sub>4</sub>

Atropine  
ATP  
Lignocaine

Synch cardioversion: first  
Synch cardioversion: Sub

Defibrillation: first  
Defibrillation: Sub

**DRUGS FOR INTUBATION**

Midazolam: 1.0 mg  
Fentanyl: 20.0 mg  
Rocuronium: 6.0 mg  
Vecuronium: 1.0 mg

**DRUGS FOR CONTINUOUS INFUSION**

Dopamine: 5 to 20 mg/kg/min  
Dobutamine: 5 to 20 mg/kg/min  
Adrenaline: 0.05 - 1 mg/kg/min

Fentanyl: 2 - 4 mcg/kg/hr  
Morphine: 10 - 60 mcg/kg/hr  
Midazolam: 0.2 - 0.3 mg/kg/hr

**Others**

Etomidate: 2.0 mg  
Naloxone: 1.0 mg  
Flumazenil: 50.0 mg  
Diazepam: 2.0 mg

150.0 mg in 50ml NS Rate 1 - 4 ml/hr  
150.0 mg in 50ml NS Rate 1 - 4 ml/hr  
3.0 mg in 50ml NS Rate 0.5 - 1.0 ml/hr  
1.0 mg in 50ml NS Rate 1 - 2 ml/hr  
10.0 mg in 50ml NS Rate 0.5 - 3 ml/hr  
100.0 mg in 50ml NS Rate 1 - 1.5 ml/hr

**Resuscitation Data Sheet for PICU**  
(Only suitable for use between 1 month to 18 years)

**PATIENT'S PARTICULARS**

Supine Length (cm): 5 years  
Age: age in (months) = age in (months) / 12  
Gender: M  
Dosing Body Weight (kg): 20 kg  
(Choose body wt. not to used for calculation if correct)  
Estimated Body Weight (kg): 20 kg

ETT size (internal diameter: mm): 5 mm  
ETT length (internal diameter: mm): 4.5 mm  
ETT length (oral lip): 14.5 cm  
ETT length (nasal): 17.5 cm

**Drugs for Resuscitation**

Drug	Route of Administration	Dose	Remarks
Adenosine Triphosphate (ATP)	IV/IO	2nd dose: 8 mg	
Adrenaline 1:10,000 (0.1 mg/ml)	IV/IO	2 ml	May repeat every 3 - 5 min
Adrenaline 1:1,000 (1 mg/ml)	ET	2 ml	Follow with, or dilute in NS 1-5 ml based on patient size, and follow with 3 ventilations
Adrenaline 1:1,000 (1 mg/ml)	IM/SC	0.2 ml	Repeat every 5 - 20 min IM route is preferred for anaphylaxis Severe reaction may require IV adrenaline in continuous infusion
(For Anaphylaxis)			
Amiodarone	IV/IO	100 mg	May repeat dose twice up to total dose of: 300 mg

**Electrical Therapy for Resuscitation**

Drug	Route of Administration	Dose	Remarks
Electrical	First: 10 - 20 joules Second: 40 joules		
Electrical	First: 40 joules Second: 80 joules Subsequent: 80 - 150 joules		

**Overall**

Route of Administration	Dose	Remarks
IV	20 mg	
IV	40 - 120 mg	
IV	0.2 mg	May repeat at 1 min intervals to a maximum cumulative dose of: 1 mg

# New features are added: to enhance Medication Safety



- Maximum dose and concentration bounding
- Out-of-range body weight pop up reminder
- Tall-man lettering and zebra-colour

Printed By: \_\_\_\_\_ Date: 30/Mar/2017

**Weight Entered:**  
> 97 percentile or < 3 percentile  
Do you want to proceed?



**Resuscitation Data Sheet for PICU** ver.1.1-170002A

*(Only suitable for use between 1 month to 18 years)*

Supine Length (cm)		5 years(s)
Age: age in (years) or age in (months) / 12		M
Gender		20 kg
Dosing Body Weight (kg)		
<i>(Growth chart wt. will be used for calculation if entered)</i>		
Estimated Body Weight (kg)		

ETT size (internal diameter: mm)	Uncuffed:	5 mm
	Cuffed:	4.5 mm
ETT length of insertion (cm)	Oral air:	14.5 cm
	Nasal:	17.5 cm

Printed By: \_\_\_\_\_ Date: 30/Mar/2017

Remarks: Please refer to PICU IV guideline for proper dilution and administration method.

Disclaimer: All Data generated by this program are for reference only.  
Adjustment should be made for individual situation, especially for body weight > 50kg  
The calculation is based on the body weight entered on the date of printing  
Please regenerate a new resuscitation data sheet when there is a change in body weight

**Drugs for Resuscitation**

Drug	Route of Administration	Dose	Remarks
Adenosine Triphosphate (ATP)	IV/IO	Initial dose: 2 mg Second dose: 4 mg	
Adrenaline 1:10,000 (0.1 mg/ml)	IV/IO	2 ml	May repeat every 3 - 5 mins
Adrenaline 1:1,000 (1 mg/ml)	ET	2 ml	May repeat every 3 - 5 mins Follow with, or dilute in NS 1-5 ml based on patient size, and follow with 5 ventilations
Adrenaline 1:1,000 (1 mg/ml)	IM/SC	0.2 ml	Repeat every 5 - 20 mins IM route is preferred for anaphylaxis Severe reaction may require IV adrenaline in continuous infusion
<i>[For Anaphylaxis]</i>			
Amiodarone	IV/IO	100 mg	May repeat dose twice up to total dose of: 300 mg
Atropine	IV/IO	0.4 mg	Child: may repeat dose once, max total dose 1mg Adolescent: may repeat dose once, max total dose 3mg