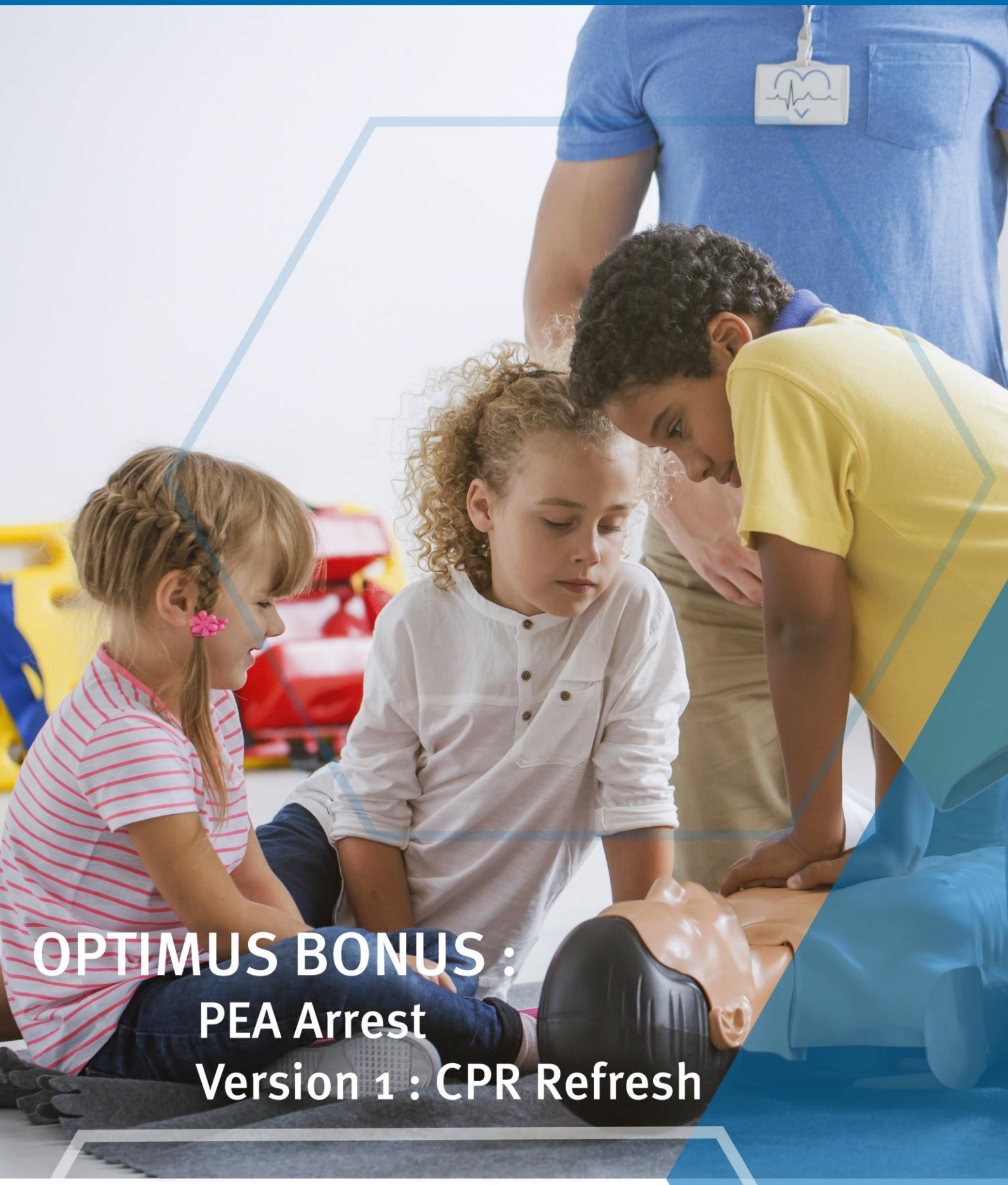


OPTIMUS BONUS :
PEA Arrest
Version 1 : CPR Refresh

Queensland Government

OPTIMUS BONUS: PEA Arrest Version 1 (CPR Refresh)

Published by the State of Queensland (Queensland Health), July 2019

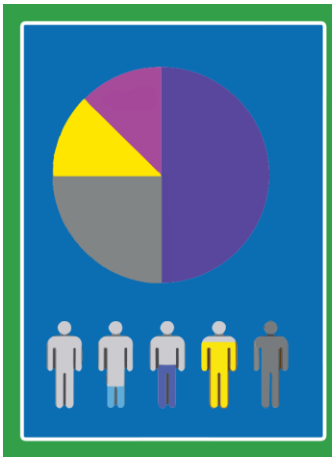
For more information contact:

Simulation Training Optimising Resuscitation for Kids (STORK) Unit, Queensland Children's Hospital, 501 Stanley St, South Brisbane QLD 4101, stork@health.qld.gov.au

Contents of this educational package:

Simulation

Refresh ALS algorithm
Equipment check for paediatric arrest
Use of services for advice & transfer



Infographic

For sharing in the weeks before or after your simulation via email or in poster format.

Further Reading

Podcasts and Blog Posts
Online Videos
Journal Articles

Fill out our online survey!

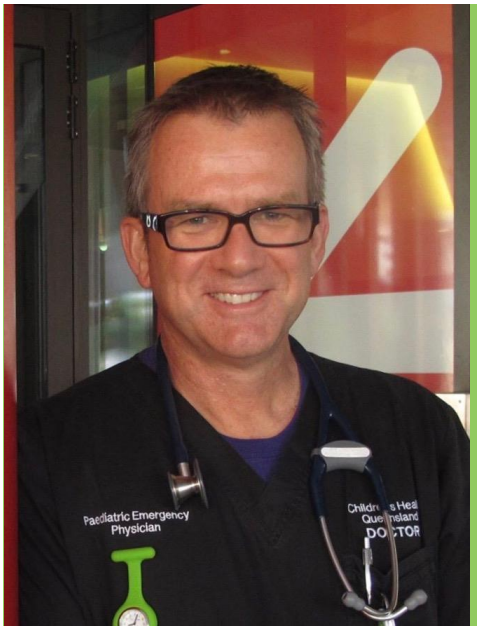
Scan the QR code with your phone camera

Scan me

Simulation

Introduction by Associate Professor Jason Acworth

Director of Paediatric Emergency Medicine, Queensland Children's Hospital
Medical Lead, Children's Health Queensland Rapid Response System
President & Chair of National Board, APLS Australia
Paediatric Representative, Australian Resuscitation Council



Jason Acworth is the Director of Paediatric Emergency Medicine at the Queensland Children's Hospital. He has been a Paediatric Emergency Physician for 20 years completing Fellowship training in both Brisbane and at the Hospital for Sick Children in Toronto. Jason has a long held passion for resuscitation education. He has been an APLS instructor for over 20 years and is the current National President of APLS Australia. He was the Chair of Training at St John Ambulance Queensland for 5 years and President of First Aid Services for 10 years. He currently serves on the Australian Resuscitation Council as a paediatric representative and Deputy Convenor of the Paediatric Life Support Committee.

Jason established the CHQ STORK Statewide Simulation Service in 2013 and co-developed the RMDPP course (the forerunner to the OPTIMUS program) in that same year. He loves simulation teaching so much that he completed a Graduate Certificate in Health Care Simulation in 2016 and says that he enjoys working with plastic kids almost as much as the real ones.

"Out of hospital cardiac arrest (OHCA) is, thankfully, rare in children. In the Aus-ROC Australian and New Zealand OHCA Registry, fewer than 500 (2.5%) of the 19722 OHCA case recorded in 2015 occurred in children.

The majority of paediatric OHCAs (~70%) occur in younger children (<8years) with >20% occurring in infants. Most (88%) OHCAs in kids occur in the family home. In 90% of paediatric OHCA the first monitored rhythm is asystole or PEA (non-shockable) but in teenage patients up to 1/3 may have a first monitored rhythm of VT or VF.

Unfortunately, only around 1 in 12 children suffering OHCA survive to hospital discharge (as opposed to 1 in 8 adults) and only ¾ of these survive with a favourable neurological outcome. Children with VT/VF are 6 times more likely to survive with a good neurological outcome.

High quality CPR is the cornerstone of resuscitation. Bystander CPR in the pre-hospital setting is associated with improved outcomes. Once a patient makes it into hospital, we use advanced equipment, agreed algorithms & systems of care, and slick teamwork to give these kids the best chance at a good survival. If we manage to get return of spontaneous circulation (ROSC) the focus instantly changes to post-arrest care and maximising neurological outcome.

As clinicians, we also need to recognise that paediatric cardiac arrest is a highly emotive event – for the family, for our teams, and for us as individuals. As a father of 2 boys, I remember every single paediatric cardiac arrest I have managed.

I am very passionate about educating our resuscitators (community, pre-hospital & hospital) and improving systems of care to help improve outcomes from paediatric cardiac arrest. I hope this BONUS simulation contributes to that improvement."

Section I: Scenario Demographics

Scenario Title:	BONUS – PEA Arrest (Version One : CPR Refresh)
Date of Development:	July 2019
Target Learning Group:	Multidisciplinary Teams that look after Paediatric Patients

Section II: Scenario Developers

Scenario Developers:	Dr Sonia Twigg, Dr Ben Symon, Dr Ben Lawton, Louise Dodson, Tricia Pilotto, Dr Carolina Ardila Sarmiento
Reviewed by:	Dr Jason Acworth

Section III: Equipment and Staffing

Scenario Cast	
Patient:	☐ Mannequin suitable for CPR rehearsal
Clinical Expert:	Consultant in Retrieval or ED or PICU. Gives helpful advice over the phone using ABCDE structure. They can be called for advice at any time during the scenario.
Confederate 1:	Airway paramedic. Ventilating using Bag Valve Mask to give breaths via LMA.
Confederate 2:	CPR paramedic. Doing good CPR as they arrive until team takes over. Once freed from duties, one paramedic gives good handover using IMISTAMBO format.

Required Monitors		
☐ ECG Leads/Wires	☐ Pulse Oximeter	☐ Capnography
☐ NIBP Cuff	☐ Defibrillator Pads	

Required Equipment		
☐Gloves	☐ IV Bags/Lines	☐ ET Tubes
☐ Stethoscope	☐ IV Push Medications	☐ LMA
☐ Defibrillator	☐ Bag Valve Mask	☐ Ventilator with test lung attached
☐ Intraosseous Set-up	☐ Laryngoscope	☐ Other: tapes to secure ETT

Moulage

Intraosseous R tibia (with drainage bag attached to leg).

LMA insitu and taped.

2x IVC with drainage bag attached – one in each cubital fossa with “No IV” sticker. Can be taken off when Voice in Ceiling confirms IV access attempt successful.

Approximate Timing

Set-Up:	15 mins	Prebrief:	15 mins	Scenario:	20 min	Debriefing:	20 min

Section IV: Curriculum

Learning Goals & Objectives – Post arrest version	
Educational Goal:	• Paediatric ALS refresher
Skills Rehearsal:	• CPR • Ventilating via LMA during CPR • Appropriate consideration of use of defibrillator in non-shockable rhythm
Systems Assessment:	• Appropriate escalation of care for a child in arrest • Physical equipment for paediatric cardiac arrest • Presence of guidelines and cognitive aids in department

Case Summary: Brief Summary of Case Progression and Major Events

A toddler had a PEA arrest after drowning in the bath. He was discovered within 5 minutes, effective CPR given by parent and ALS commenced by ambulance paramedics when they arrived 10 mins after discovery. CPR is ongoing. An LMA and an IO has been inserted. They are about to arrive in ED at 25 minutes post arrest. The availability and timing of paediatric and retrieval services available for your hospital should reflect your locally available services.

A note from the developer

This Simulation has been written in two Versions :

- Version 1 : PEA Arrest (CPR Refresh)
- Version 2 : PEA Arrest (Post Arrest Cares)

Version 1 (this package) is designed to focus on providing a CPR skills refresher for your staff but also to provide a systems check on your clinical environment for appropriate paediatric resources and equipment related to Paediatric Arrest.

In Version 2 the emphasis of the simulation is instead on considering post arrest cares, the patient arrives post arrest. We have often found that post arrest care is an under-rehearsed skill compared to BLS competencies.

If you have extensive time for your simulation, you may wish to combine the two packages into one session to cover all of those learning objectives. If you wish to combine it, simply skip the handover section of Version 2.

Our recommendation would be to run the two separately to allow time to discuss all of the learning objectives of each case.

Section V: Scenario Progression

A. Clinical Vignette: To Read Aloud at Beginning of Case

Phone rings.

"Hi, this is Ambulance Comms. A paramedic crew is a few minutes away with a 20 month old boy who has drowned in the bath – found within 5 minutes. Weight 12kg. The crew arrived 10 minutes after he was found. CPR is ongoing - PEA rhythm - IO placed and 1 dose of adrenaline given. An LMA has been inserted. They will be there in 5 minutes."

Paramedic handover for State 2. IMISTAMBO format

I: "Hi I am the critical care paramedic called to the scene. CPR is ongoing. Can your team take over?"

When relieved from doing CPR, paramedic hands over to whole team or to team leader as preferred by the team.

I: "This is Toby, a 20 month old boy. His mother says he weighs 12kg."

M: "Toby drowned in the bath at his home very close to the hospital. His mother went to check on the dinner cooking and when she came back in less than 5 minutes, he was lifeless in the bath."

I: "She pulled him out, started CPR and her partner called the ambulance."

T: "When the critical care paramedic team arrived 10 minutes later, she was doing effective CPR. Our team started ALS, noted a PEA rhythm, inserted an IO, inserted an LMA and transported to hospital. He has received 3 arrest doses each of 120 micrograms of adrenaline. It is about 25 minutes post arrest.

Going through a quick ABCD.

A: Toby has an LMA insitu – taped.

B: He is currently being bagged with no difficulty. No SaO2 trace.

C: He has an IO in his right tibia. CPR is ongoing. If still in PEA we are due for adrenaline at the next rhythm check.

D: He has been GCS 3 throughout. BSL was 4.1.

AMBO: Toby has no allergies, no medical problems, has been well recently and his immunisations are up to date. His parents are on the way and should arrive in about 15 minutes."

Scenario States

State 1: Preparation phase

Patient State	Patient Status	Learner Actions, Modifiers & Triggers to Move to Next State	
Pre arrival	Patient en route via ambulance Initial phone call to team informing of arrival (as per handover card)	☐ Anticipate and plan for child in cardiac arrest, including : ☐ Call for resuscitation team and appropriate senior staff. ☐ Allocate roles, consider CPR coach. ☐ Team leader gives prebrief. ☐ Prepare equipment and optimize space including IV equipment, defibrillation machine and ventilator. ☐ Prepare medications and fluids for child of 12kg.	Triggers 5 minutes or all tasks completed.

State 2: Paramedic Handover and CPR Continuity

Rhythm: CPR Artefact when CPR ongoing, PEA (NSR at 150) at rhythm check **HR:** no trace **BP:** none **Cap refill** >5s **RR:** bagging rate **O_2 SAT**: no trace **T:** 35.5 **AVPU** = U **GCS** 3 **BSL** 4.1	PEA Arrest Paramedic provides handover as per script	Learner Actions ☐ Facilitate handover ☐ Establish effective continuous CPR cycles including : ☐ Airway : Check patient is ventilating via LMA – chest rise and fall, misting in the LMA, ETCO2 trace ☐ Breathing : Bag patient at 10-12 breaths per minute. Ensure oxygen at 15L/min. No need to pause CPR to give breaths. ☐ Circulation: Continue effective CPR at 100-120 per min, 1/3 depth of chest ☐ Change defib pads and monitoring over to hospital equipment as needed. ☐ Adrenaline as per ALS algorithm ☐ Rhythm check as per ALS algorithm – Remains in PEA. ☐ Diagnostic Assessment of Arrest Cause : Team considers 4Hs and 4Ts - concludes hypoxia is likely cause of arrest.	Modifiers • If inadequate CPR then ET CO2 is 5. • If effective CPR then ETCO2 is 25. Triggers • Change defib pads and monitoring over to hospital equipment as needed. • **Continue cycles of CPR and rhythm checks for the length of time you deem necessary for your team to have rehearsed.** ○ At this point, confirm ROSC occurs. ROSC is indicated by rise in ETCO2 to 32 and return of pulse. Then move to next state.

State 3: Return of Spontaneous Circulation			
Rhythm: NSR **HR:** 150 **BP:** 60/40 **Cap refill** 4s **RR:** bagging rate **O_2 SAT**: 91% LMA **ETCO2**: 35 **T:** 35.5 **AVPU** = P **GCS** 8 (E1 M5 V2) Eyes closed Localises to pain. Moans to pain. **BSL** 4.4	ROSC	Learner Actions : ☐ Consideration of Escalation of Care and Post Arrest Cares ☐ Attach cardiac and pulse ox monitoring. ☐ Cycle BPs at least every 5 mins. ☐ ABCDE assessment to reassess patient. ☐ Airway: check still ventilating with LMA. Consider airway plan. Should LMA be removed if patient moaning? ☐ Breathing: auscultate, organize for chest xray. ☐ Circulation: IVC placed and bloods taken, Fluid bolus given. Consider adrenaline infusion. ☐ Disability: BSL requested - aim for normoglycemia 4.4-10 ☐ Exposure: Temperature taken. ☐ Contact Retrieval Services or PICU for transfer and advice.	Modifiers If fluid bolus given, BP rises to 70/45. If team does not contact retrieval services or PICU then Retrieval Coordinator should call in and say the Ambulance Service had advised them there was a child there who had had an arrest and they wondered if the team would like their help. Close simulation once handover of patient received.

A note from the developer

If you wish to continue this case to rehearse post arrest cares, continue to Optimus BONUS : PEA Arrest Version 2, and skip the handover section.

Section VII: Debriefing Guide

Objectives	
Educational Goal:	• Paediatric ALS refresher
Skills Rehearsal:	• CPR • Ventilating via LMA during CPR • Appropriate consideration of use of defibrillator in non-shockable rhythm
Systems Assessment:	• Appropriate escalation of care for a child in arrest • Physical equipment for paediatric cardiac arrest • Presence of guidelines and cognitive aids in department

Sample Questions for Debriefing

Acknowledge that paediatric cardiac arrest is an emotive event.

- Thank participants for engaging with the sim. Remind participants that clinical event debriefing might be useful after such an event.

I'd like to explore how our department is equipped to treat paediatric cardiac arrest :

- Was the equipment appropriate?
- What should be changed?
- What cognitive aids do we have in ED about Paediatric Cardiac Arrest?
    - How could we more effectively use them when treating real patients?

I'd like to talk about ensuring effective CPR in an Arrest :

- How does your team facilitate effective ambulance handover when CPR is in progress?
- Have you considered assigning a CPR coach during real arrests?
- When do you charge the defibrillator in a PEA arrest?

Can we explore ventilation strategies in an arrested paediatric patient?

- Can anyone explain the difference in delivering breaths between using an LMA and a BMV?
- What factors influenced your decision making around intubation?

I'd like to reflect on caring for this patient after ROSC in our department :

- What will be disposition for this patient after ROSC?
- How do you organise retrieval or transfer to PICU within your service?

Key Moments

Preparing for arrival of patient in arrest.

Ambulance handover.

Quality of CPR :

- Rate and depth of compressions
- Staff rotation on 2 minutely cycles
- Minimisation of hands-off time at rhythm check

Following ALS algorithm in arrest.

Using an ABCDE approach to reassess after ROSC.

Communicating with the retrieval team and PICU.

Ask participants to complete our survey!

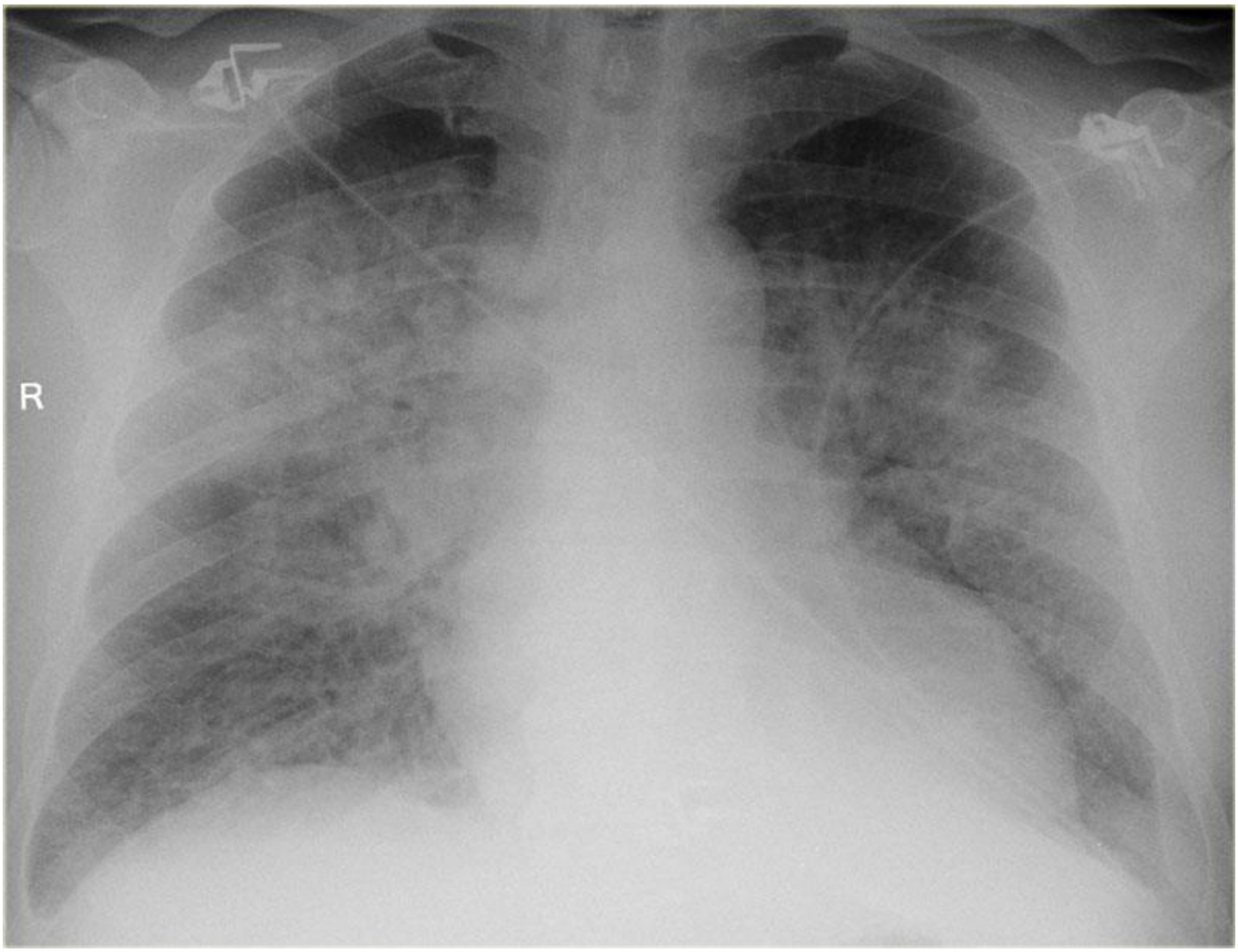
Just show them this QR code for their phone for a quick 5 minute survey.

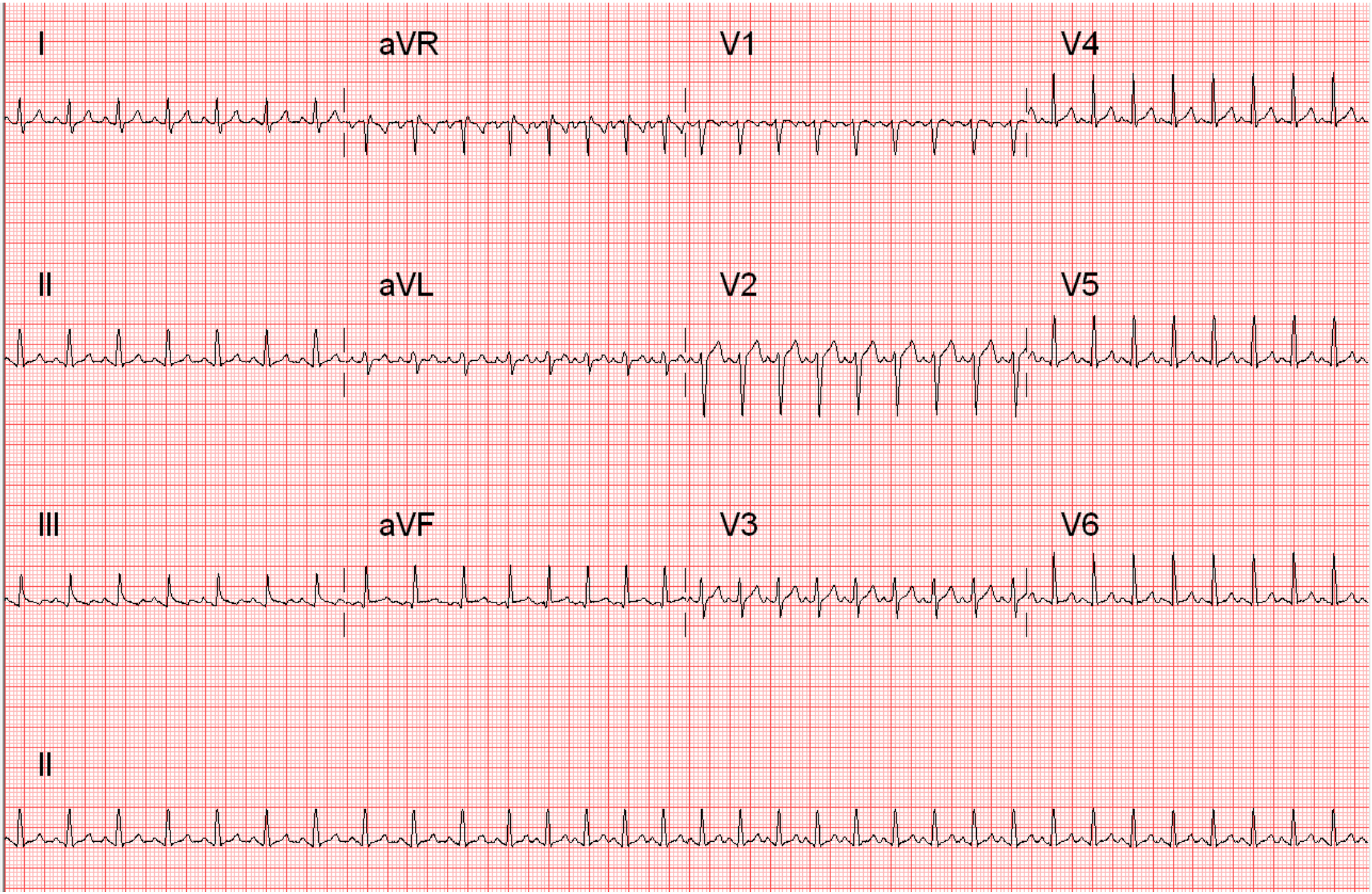
Scan me

Section VI: Supporting Documents, Laboratory Results, & Multimedia

Venous Gas

VBG	Results	Units	Normal Range
pH	6.9		**7.32 – 7.42**
pCO2	60	mmHg	**41 - 51**
pO2	60	mmHg	**25 - 40**
O2 Saturations	95%	%	**40 - 70**
Bicarb	13	mmol/L	**22 - 33**
BE		mmol/L	**-3 - +3**
HCT			**0.3 - 0.42**
Hb	110	g/L	**105 - 135**
Na+	135	mmol/L	**135 - 145**
K+	5.5	mmol/L	**3.2 - 4.5**
Ca++ (ionised)	1.2	mmol/L	**1.15 – 1.35**
Glucose	4.4	mmol/L	**3.0 – 7.8**
Lactate	5.0	mmol/L	**0.7 – 2.5**


R


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II

Flowchart for Management of
PAEDIATRIC CARDIOPULMONARY RESUSCITATION

CPR
15 compressions : 2 breaths
Minimise interruptions
Attach monitor
Assess rhythm

SHOCKABLE

Pulseless Ventricular Tachycardia

Ventricular Fibrillation

DC shock 4 J/kg (max. 200J)

2 min CPR Assess rhythm

IO / IV access

DC shock 4 J/kg (max. 200J)

Followed immediately by
IV/IO Adrenaline
10 micrograms/kg (max. 1mg)
0.1 mL/kg of 1:10,000

2 min CPR Assess rhythm

Secure airway: ETT / LMA

DC shock 4 J/kg (max. 200J)

IV/IO Amiodarone
5 mg/kg (max. 300mg)

2 min CPR Assess rhythm

DC shock 4 J/kg (max. 200J)

IV/IO Adrenaline
10 micrograms/kg (max. 1mg)

2 min CPR Assess rhythm

DC shock 4 J/kg
(max. 200J)

2 min CPR Assess rhythm

DC shock 4 J/kg
(max. 200J)

IV/IO Adrenaline
10 micrograms/kg
(max. 1mg)

2 min CPR Assess rhythm

NON SHOCKABLE

Asystole

PEA

IO / IV access

IV / IO Adrenaline
Immediately
10 micrograms/kg (max. 1mg)
0.1 mL/kg of 1:10,000
Then every 4 mins
i.e. every 2nd loop

Assess cardiac rhythm every 2 minutes
If rhythm organised → check pulse

Secure airway
ETT / LMA
Assess End tidal CO_2
NB: End tidal CO_2 will be low in Cardiac Arrest

IO / IV fluids

1. **Select Energy**
4 J/kg (max. 200J) for all shocks

2. **Press CHARGE**
Continue CPR while charging

3.
- Ask everyone to stand clear
- Reassess rhythm and absence of pulse
- Press **SHOCK**
- Immediately resume CPR for 2 min

Consider and Correct Reversible Causes

4H's
- Hypoxia
- Hypovolaemia
- Hypo / Hyperthermia
- Hypo / Hyperkalaemia

4T's
- Tamponade (cardiac)
- Tension Pneumothorax
- Toxins / poisons / drugs
- Thrombosis – pulmonary / coronary

Consider IV Na Bicarbonate 8.4% 1mL/kg in cases of:
- Severe metabolic acidosis
- Hyperkalaemia

Adapted from: Australian Resuscitation Council Guideline 12.2, 5 Protocols for Paediatric Advanced Life Support December 2010 & ILCOR Guidelines – "Paediatric Basic and Advanced Life Support" in Resuscitation (2010).

Queensland Government

Flowcharts for Management of Paediatric –

Ventricular Tachycardia (with a pulse)

Ventricular Tachycardia
NB: If no pulse
- Commence CPR
  15 compressions : 2 breaths
- Continue as cardiac arrest

SHOCK PRESENT
Attach monitor
Assess rhythm

YES → **Synchronous DC shock 1 J/kg (max. 200J)**
→ **Synchronous DC shock 2 J/kg (max. 200J)**
→ **Consider anti-arrhythmic** e.g. IV Amiodarone 5 mg/kg over 30 min (max. 300mg)
→ **Synchronous DC shock 2 J/kg (max. 200J)**

NO → **Establish large bore proximal IV access**
→ **IV / IO Amiodarone** 5 mg/kg over 30 min (max. 300mg)
→ **Consider**
- Wide-QRS tachycardia in stable children may be treated as SVT
- Synchronous DC shock 1 J/kg (max. 200J)

→ **Call Cardiologist**

Use sedation where possible prior to cardioversion

1 Press SYNC
Confirm recognition of QRS complex – R waves are marked with a triangle.

2 Select Energy
For the first shock 1 J/kg is used

3 Press CHARGE
Confirm correct joules are available

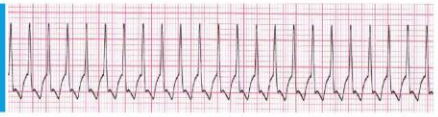
4 Press SHOCK
Ask everyone to stand clear.
Confirm:
- All clear
- Correct joules
- SYNC mode on & R waves marked
- Rhythm

Press and hold SHOCK button to deliver the shock

NB: Select SYNC
for each repeat synchronised shock

Supraventricular Tachycardia

Supraventricular Tachycardia
- P waves absent or abnormal
- HR not variable
- Infants: Rate >220/min
- Children: Rate >200/min



Attempt vagal manoeuvres (no delays)
→ **Establish large bore proximal IV access**
→ **Is the defibrillator immediately available?**

Yes → **Synchronous DC shock 1 J/kg (max. 200J)**
→ **Synchronous DC shock 2 J/kg (max. 200J)**
→ **Consider anti-arrhythmic** e.g. IV Amiodarone 5 mg/kg over 20 min (max. 300mg)
→ **Synchronous DC shock 2 J/kg (max. 200J)**

SHOCK PRESENT
Attach monitor
Assess rhythm

YES → **Call Cardiologist**

NO → **Vagal manoeuvres**
- Infant / young child: Apply ice to face
- Older child: Valsalva manoeuvre (i.e. blow through a narrow straw or syringe, ask the child to cough) / Carotid massage

→ **Adenosine 100 micrograms/kg (max. dose 6mg)**
2 minutes
→ **Adenosine 200 micrograms/kg (max. dose 12mg)**
2 minutes
→ **Adenosine 300 micrograms/kg (max. dose 12mg)**
→ **Call Cardiologist**

Use sedation where possible prior to cardioversion

1 Press SYNC
Confirm recognition of QRS complex – R waves are marked with a triangle.

2 Select Energy
For the first shock 1 J/kg is used

3 Press CHARGE
Confirm correct joules are available

4 Press SHOCK
Ask everyone to stand clear.
Confirm:
- All clear
- Correct joules
- SYNC mode on & R waves marked
- Rhythm

Press and hold SHOCK button to deliver the shock

NB: Select SYNC
for each repeat synchronised shock

Bradycardia

Bradycardia Causes
- Commonly hypoxia – preterminal sign
- Raised ICP
- Poisoning / toxicological causes
- Vagal stimulation

Treat hypoxia and shock
IV / IO access | Maintain airway
→ **IV/IO Adrenaline** 10 micrograms/kg 0.1 mL/kg of 1:10,000 (max. 1mg)
→ **Continue to Monitor Notify PICU Consultant & Cardiologist**
→ **Consider Pacing Adrenaline Infusion**
→ Provide sedation and analgesia

SHOCK PRESENT
Attach monitor
Assess rhythm

YES → ***HR <60 bpm and poor perfusion – commence CPR***

NO →
- **Continue to Monitor**
- **Consult with PICU Consultant & Cardiologist**
- **Consider cause (vagal over stimulation)**
  - **IV/IO Atropine 20 micrograms/kg**
    Min. dose 100mcg
    Max. dose 600mcg

Press PACER

Press RATE
(60 - 100 bpm)

Press CURRENT
Start at 100mA & ↓ after capture achieved
Confirm mechanical capture by checking pulse / clinical improvement

Adapted from: Protocols for Paediatric Advanced Life Support December 2010 & ILCOR Guidelines – 'Defibrillation and Advanced Life Support' in Resuscitation (2010).

Queensland Government

Resources for CPR Refresh Simulation

ANZCOR
Paediatric Cardiorespiratory Arrest Flowchart

Online Video : APLS PAC 2018
What's New in Paediatric Resuscitation?
Dr Jason Acworth

DRSABCD Demonstration Video
OPTIMUS CORE

Blog Post : The CPR Coach
A Paradigm Shift in Resuscitation Teams

Curriculum

This package is designed for **individuals** to refresh and retain the following skills learned in previous OPTIMUS courses as well as add new knowledge on Paediatric Sepsis.

OPTIMUS CORE	OPTIMUS PRIME	OPTIMUS BONUS
Intravenous access	Assessing a critically unwell child	Refresh ALS
Fluid prescription & rapid administration	Securing an endotracheal tube	Care of the patient post-arrest
Paediatric Basic Life Support	Setting a Ventilator	Communicating with other services
Escalation of care	Fluids in shock	Organising for transfer
Adrenaline prescription and administration in cardiac arrest	Inotrope prescription and administration	

This package is designed to offer your **department** a systems level check regarding:

Access to paediatric resources on: • ALS training • Caring for a child after the arrest • Securing an endotracheal tube in a child	☐ ☐ ☐
Equipment Check: • Use of infusion pumps for administering adrenaline • Use of the ventilator	☐ ☐
Departmental Protocols for: • Intubation/ airway checklist • Organising retrieval or transfer • Preparing for retrieval – use of a checklist.	☐ ☐ ☐

If you would like any assistance obtaining access or advice for any of the above issues, please contact stork@health.qld.gov.au

About the Creators :

Dr Sonia Twigg : Primary Author
@LankyTwig
FACEM, MBBS, BA, BSc
Fellow, STORK (Simulation Training Optimising Resuscitation for Kids)
Queensland Children's Hospital

Dr Sonia from STORK is an emergency physician doing subspecialty training in Paediatric Emergency Medicine and works at the Queensland Children's Hospital as a fellow in the emergency department and for the STORK simulation team.
She is part of the ALIEM faculty incubator program for 2019-2020 and facilitated the 2019 Health Workforce Queensland workshops for GPs on Paediatric Emergency Medicine. Sonia is interested in critical care, medical education and ultrasound. She is passionate about fun, creativity and innovation in education.

Dr Ben Symon : Consultant Supervisor, Infographics and Editor
@symon_ben
RACP PEM, MBBS, BAnim
Simulation Consultant and Paediatric Emergency Physician
Queensland Children's Hospital and The Prince Charles Hospital

Dr Symon is a PEM Physician and Simulation enthusiast with a passion for translating clinical and educational research to front line health care workers. He is co-producer of the podcast 'Simulcast' and facilitates the Simulcast Online Journal Club, an online journal club for simulation educators throughout the world. He is faculty on the APLS Educational Skills Development Course and has recently been invited to join as international faculty for the Master Debriefer Course by the Debriefing Academy. His original degree in Animation has proved surprisingly useful in his career in medical education.

About the BONUS Project :

The OPTIMUS BONUS project is a bank of useful scenarios that are open access and available for free use. It has been designed by the Simulation Training Optimising Resuscitation for Kids team for Children's Health Queensland.

We aim to use the packages to provide :

- Spaced repetition to reinforce learning objectives from CORE and PRIME
- Connections to high quality, up to date paediatric resources for health professionals
- Quality and Safety checks for local hospitals regarding paediatric clinical guidelines, resources and equipment

The scenarios have been designed in response to :

- Paediatric coronial investigations in Queensland, Australia.
- Clinical skills issues revealed through In Situ Translational simulations in hospitals throughout Queensland.
- Quality and Safety Initiatives

About STORK

In 2014, Children's Health Queensland funded the 'Simulation Training Optimising Resuscitation for Kids' service. STORK is a paediatric education team focused on improving healthcare outcomes for children throughout the state.

STORK has developed a number of courses aimed at different phases of paediatric critical care :

- CORE is a course for first responders to a paediatric emergency, and teaches recognition of the deteriorating patient, Children's Early Warning Tools, and resuscitation competencies.
- PRIME is a course for mid phase responders who look after unwell patients while waiting for retrieval or escalation to an Intensive Care. It aims at contextualising Seizure Management, Intubation and Inotrope Administration within host hospital's real clinical environments in order for healthcare teams to generate their own practice improvement strategies as well as link peripheral hospitals with high quality resources.
- BONUS was proposed as a solution to skill and knowledge decay after these courses are run.

If you would like to know more information about STORK or acquire copies of our resources, please contact us at stork@health.qld.gov.au .

Resources to email to participants

- ANZCOR Paediatric Cardiorespiratory Arrest Flowchart Jan 2016. Available at: https://resus.org.au/guidelines/flowcharts-3/
- *What's new in paediatric resuscitation? – Jason Acworth | PAC 2018*. [online] Vimeo. (2019). Available at: https://vimeo.com/347664671
- DRSABCD Demonstration Video. Optimus CORE eLearning. Children's Health Queensland 2019. Available at: https://vimeo.com/296133916
- Cheng, A. (2019). *The CPR Coach – A Paradigm Shift in Resuscitation Teams for Cardiac Arrest Management - CanadiEM*. [online] CanadiEM. Available at: https://canadiem.org/the-cpr-coach-a-paradigm-shift-in-resuscitation-teams-for-cardiac-arrest-management/

References

This educational package has been reviewed by content experts and a Statewide Steering Group Review on behalf of Children's Health Queensland.

1. Kurz et al, Thermoregulate, autoregulate and ventilate; Brain directed critical care for paediatric cardiac arrest. Current Opinion in Pediatrics, 2017, 29 (3): 259-265.
2. ANZCOR guideline 12.7; Management after return of spontaneous circulation (ROSC), Jan 2016. Available at: https://resus.org.au/guidelines/
3. Children's Health Queensland Retrieval Service CHQRS referring hospital checklist. Available through Optimus Prime eLearning, iLearn https://ilearn.health.qld.gov.au/d2l/login
4. CHQ HHS Guideline: Nursing Care of the Intubated/Ventilated patient. Available through Optimus Prime eLearning, iLearn https://ilearn.health.qld.gov.au/d2l/login
5. Reid, C, Post arrest hypothermia in children did not improve outcomes. May 2015. Available at: http://resus.me/post-arrest-hypothermia-in-children-did-not-improve-outcome/
6. Kneyber et al, Recommendations for mechanical ventilation of critically ill children from the paediatric mechanical ventilation consensus conference (PEMVECC), Intensive Care Medicine 2017, 43 (12): 1764-1780
7. Twigg S, Basic Ventilation in Children, Children's Health Queensland, 2019, Available at: https://vimeo.com/355257586
8. The Simulation Template has been adapted from the template from emsimcases.com, available at : https://emsimcases.com/template/

Images (ECGs, CXRs, etc.)
Cremers S, Bradshaw J and Herfkens F, Chest X-ray- Heart Failure in Radiology Assistant, 2010. Available at: http://www.radiologyassistant.nl/en/p4c132f36513d4/chest-x-ray-heart-failure.html
Case courtesy of Dr Jan Frank Gerstenmaier, <a href= https://radiopaedia.org/">Radiopaedia.org</a From the case rID: 24685