

Case title	Unwell child - SVT		Sim no.	Sim 39P	
Setting	ER	Patient age	12-months	Patient sex	Male
Diagnosis	Initially stable SVT, becoming unstable requiring DC cardioversion		Curriculum code		
Equipment required	<ul style="list-style-type: none"> • Sim-Man (complete Kit) • Defibrillator with training leads • Paediatric Cannulation Set • ECG monitoring 				
Staff required	1x Junior doctor, 1x Senior doctor, 1x Junior nurse, 1x Senior nurse				
Learning objectives	<ol style="list-style-type: none"> 1. Recognise and manage both stable and unstable SVT via APLS guidelines 2. Rapidly estimate Paediatric weight and utilise resources/team members for resuscitation medication dosing. 3. Anticipate deterioration in a patient with compensated shock 4. Demonstrates clear leadership and senior decision making skills 				

INITIAL SETUP

Initial Observations			Arrival route	Arrived with parent	
HR	220	GCS	E 4 V 5 M 6 = 15/15	Carers	None
RR	50			Examination findings: General: Alert, strong cry, pink in colour. ENT: Normal tympanic membranes, mild pharyngeal oedema. CVS: Normal peripheral pulses, no cyanosis. Resp: Equal air entry bilaterally, no added sounds, mild retractions and nasal flaring. Abdomen: Soft non tender	
SpO2	95% on Air	Pupils	Equal		
Systolic BP	82	Temp	37.2		
CRT	2 seconds	Weight	10 Kg		
Glucose	5.5				
Equipment on arrival	None	Additional info	Full term 38 weeks Full immunisation history NKDA No developmental concerns		

Expected progression for simulation technician

Trending over time

For a **Senior team** (at discretion of Lead Facilitator) use the following:

After the **2nd dose of Adenosine** is given make these changes:

- ✓ If stable SVT recognised and treatment given, patient to stay in SVT, become unstable with reduced consciousness and are only responding to painful stimulus observations as follows: HR 240, Systolic BP 70, RR 55, Saturations 94% on Air.
- ✗ If stable SVT not recognised and no medical treatment is given, patient becomes unstable very quickly, with reduced consciousness responding only to pain. Change observations early on to: HR 240, systolic BP 70, RR 55, Saturations 94% on Air.

After **Electrical DC Cardioversion** is attempted make these changes:

- ✓ If candidate(s) gives correct therapy for unstable SVT (synchronised DC cardioversion), patient becomes stable and ECG shows normal sinus rhythm, observations as follows:
HR 100, Systolic BP 95 , RR 25, Saturations 98%.
- ✗ If candidate(s) does not give correct therapy (synchronised DC cardioversion) as above or inappropriate therapy, patient goes into asystole. Team to commence CPR.

Instructions for Facilitator

After vagal manoeuvres and adenosine, at the appropriate dosage for weight of the patient, the patient remains in SVT. The candidate should seek expert advice from the **paediatric cardiologist**.

The patient becomes unresponsive with hemodynamic instability. Following this a **synchronised DC cardioversion** should be performed. If done safely, patient returns to normal sinus rhythm.

Inappropriate or unsafe management results in patient going into asystole.

Instructions for Parent

You are worried about your son, Mark, who has been crying all night and not feeding well today. He has been vomiting prior to hospital arrival (non-bilious, non-bloody). At triage, the nurse had difficulty recording the heart rate but by auscultation it seemed “quite rapid”, and he “feels a bit warm”.

PMH: No past medical history

Drugs and allergies: No regular medications, NKDA

BIND: Normal birth at 38 weeks gestation, fully vaccinated, no concerns with his development

Family history: Nothing significant

Instructions for Senior receiving handover

Simulate phone call

In this scenario the team would be expected to involve appropriate teams with adequate resources to manage the unwell child. This will include the Emergency department doctor and nurse in charge together with the Paediatric intensive care specialists (please refer to local guidance)

Paediatric cardiologists would be expected to be consulted in this case for further management advice.

You would like handover in an SBAR format. If no SBAR format is used please ask to speak to a more senior member of the team.

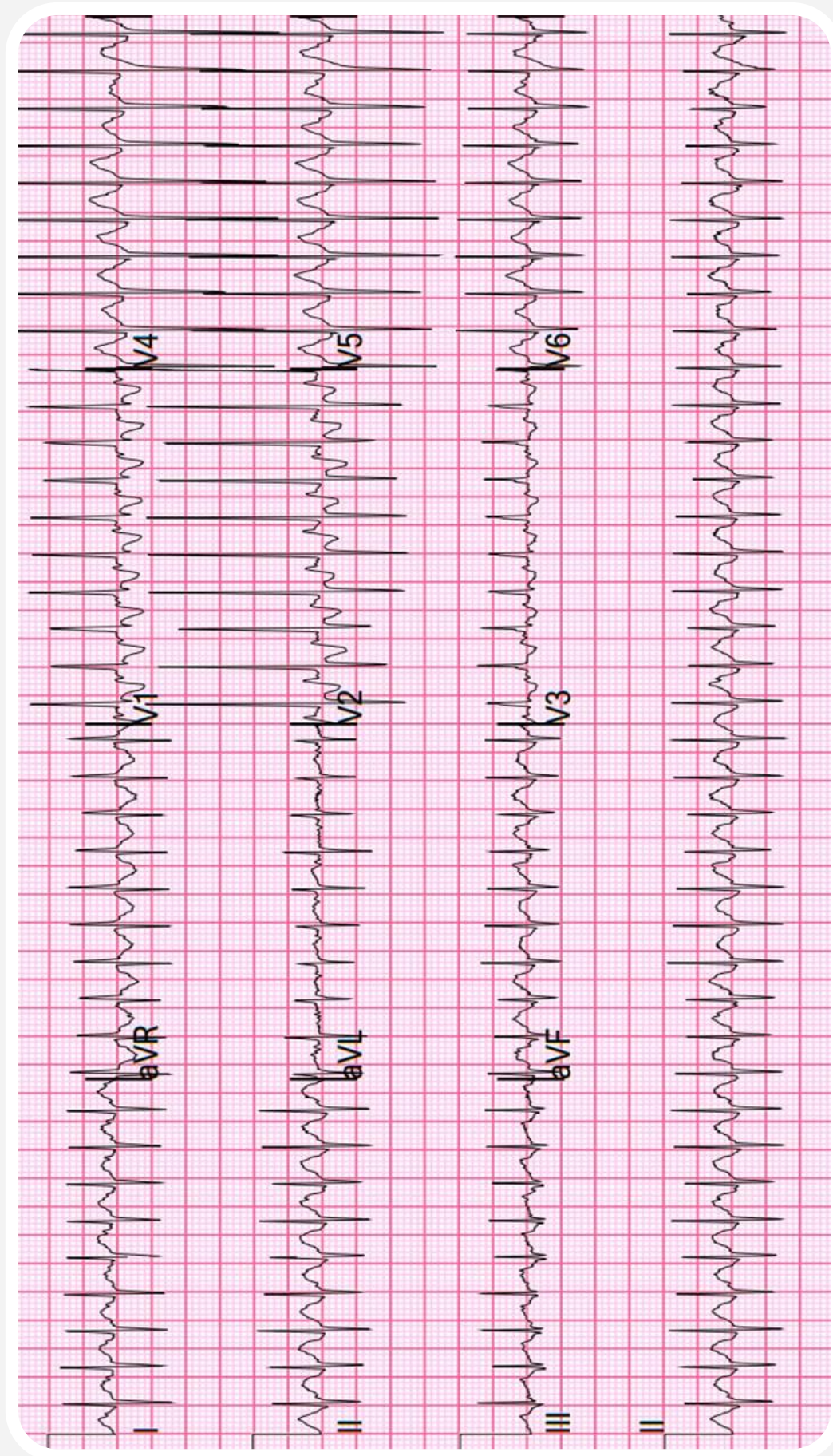
Capillary Blood Gas (CBG)

Provide if requested

Gas Type	Capillary (on air)	Reference range
pH	7.21	7.35 → 7.45
pO ₂	8.5 (--)	10 → 14
pCO ₂	4.9 (-)	4.5 → 6
HCO ₃	18	22 → 26
BE	-6.5	-2 → 2
Na	136	135 → 145
K	3.5	3.5 → 5.5
Ca	1.30	1.1 → 1.35
Cl	100	98 → 106
Glu	5.4	4 → 6
Lactate	6.0 (++)	0.4 → 0.8
Hb	125	115 → 178

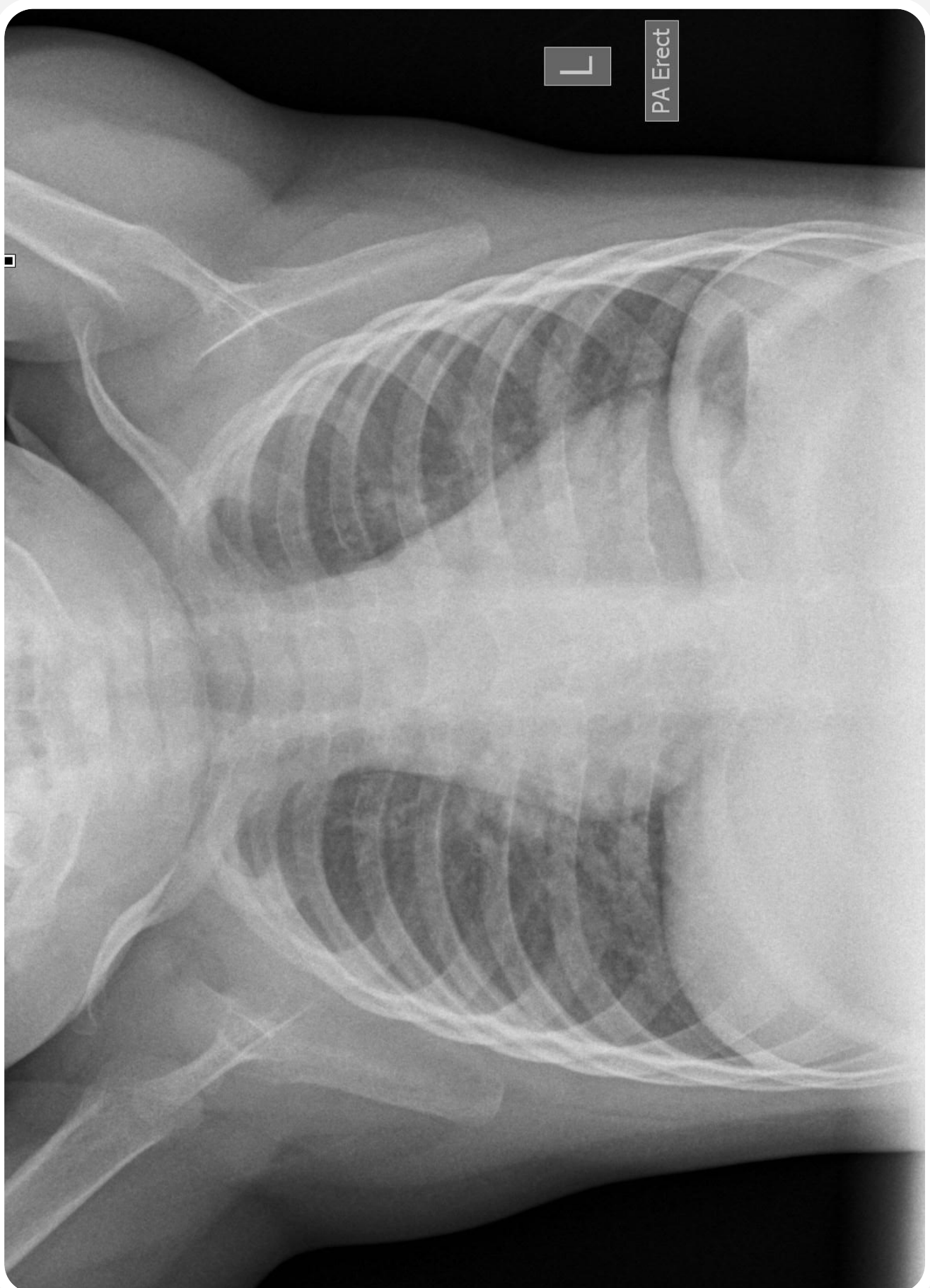
ECG

Provide if requested

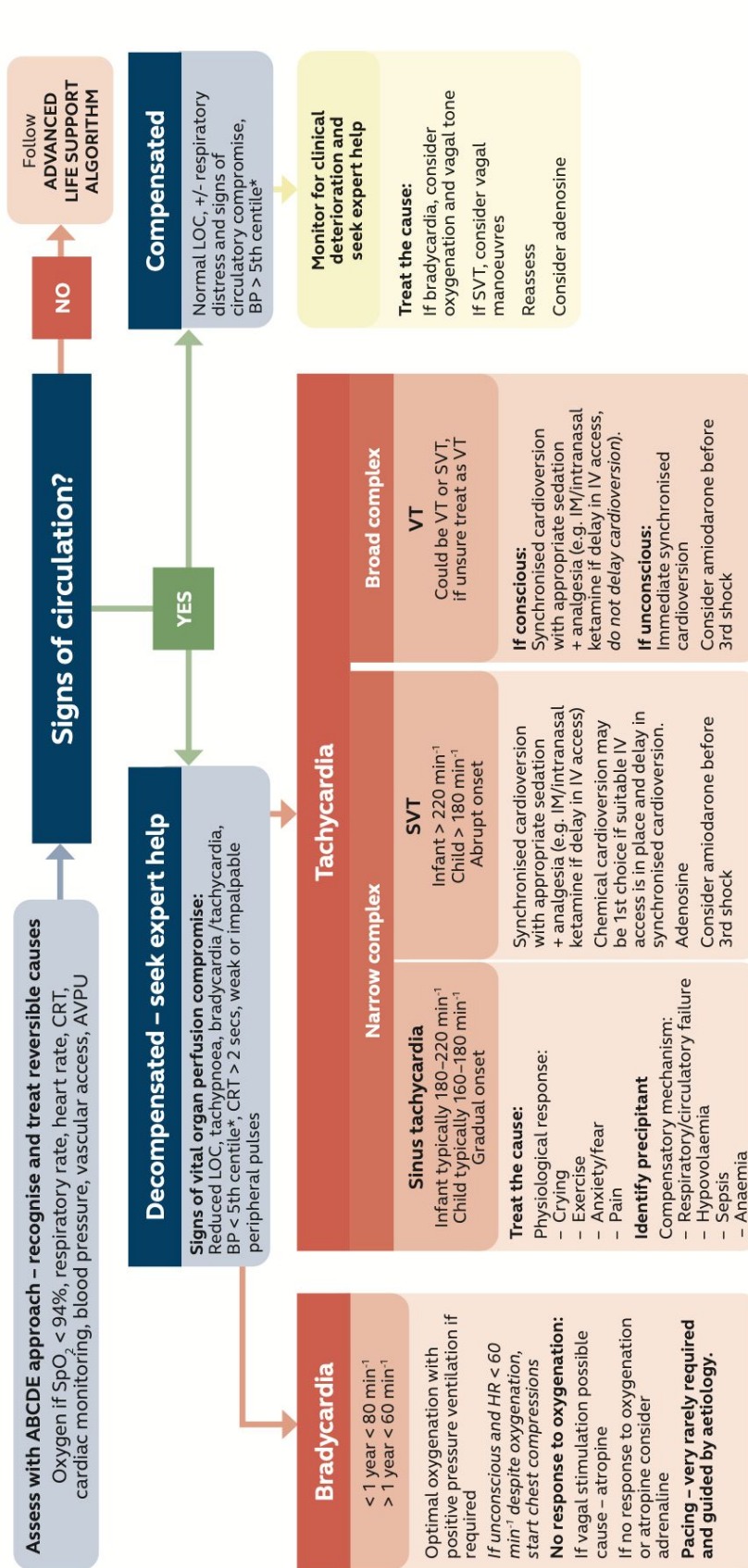


Chest X-ray

Provide if requested



Paediatric cardiac arrhythmias



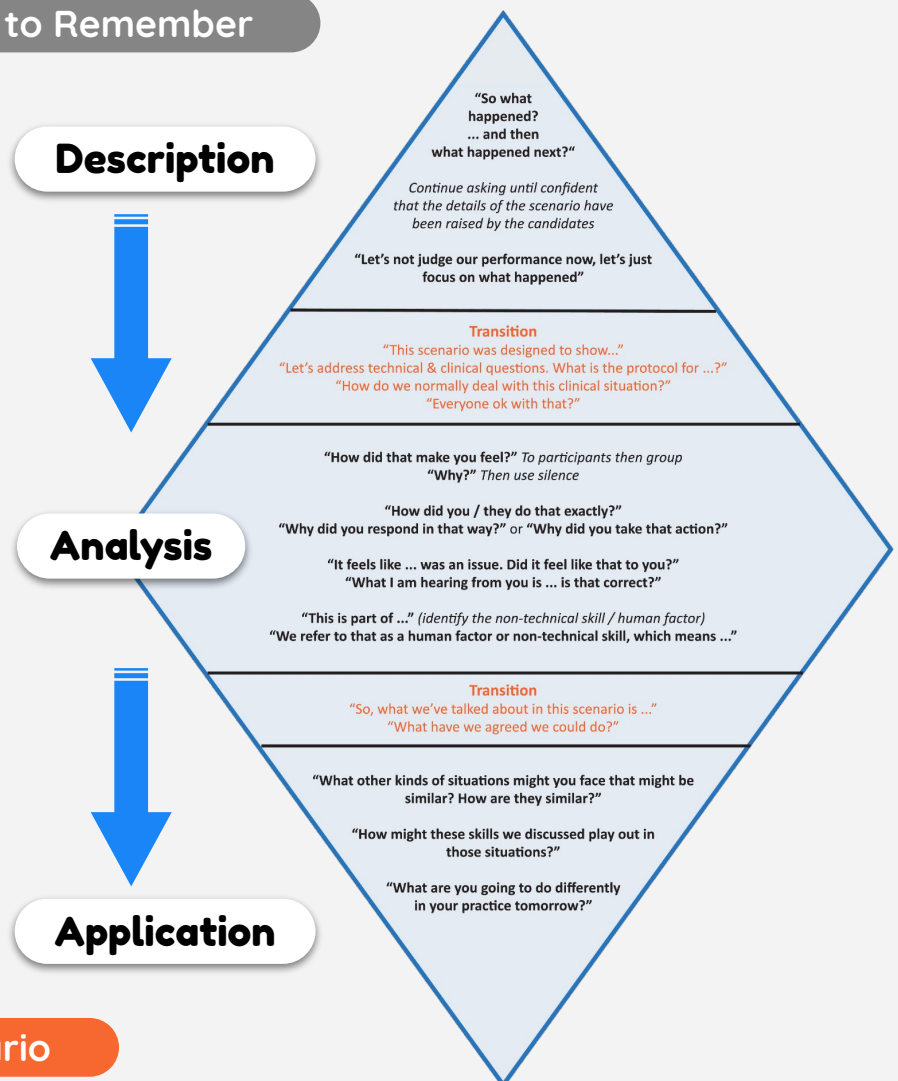
Drug	Atropine	Adrenaline	Adenosine	Amiodarone	Synchronised cardioversion	Magnesium
Treatment	Up to 11 years: 20 mcg kg ⁻¹ . 12–17 years: 300–600 mcg, larger doses may be used in emergency.	For bradycardia: 10 mcg kg ⁻¹ repeat if necessary.	Up to 1 year: 150 mcg kg ⁻¹ , increase 50–100 mcg kg ⁻¹ every 1–2 min. Maximum single dose: Neonates 300 mcg kg ⁻¹ , Infants 500 mcg kg ⁻¹ . 1–11 years: 100 mcg kg ⁻¹ , increase 50–100 mcg kg ⁻¹ every 1–2 min. Maximum single dose: 500 mcg kg ⁻¹ (max. 12 mg) 12–17 years: 3 mg IV, if required increase to 6 mg after 1–2 min, then 12 mg after 1–2 min	5 mg kg ⁻¹ – by SLOW IV infusion (> 20 min) before 3rd cardioversion in discussion with paediatric cardiologist/expert	With appropriate sedation + analgesia (e.g. IM/intranasal Ketamine if delay in IV access + airway management) – IV access attempts must not delay cardioversion 1st shock: 1 J kg ⁻¹ 2nd shock: 2 J kg ⁻¹ , consider up to 4 J kg ⁻¹	25–50 mg kg ⁻¹ Maximum per dose 2 g to be given over 10–15 min, may be repeated once if necessary, in Torsades de pointes VT
						*Systolic BP 5th centile mmHg
						1 month 50
						1 year 70
						5 years 75
						10 years 80

Debrief Diamond: Key Phrases to Remember

Debriefing is the most important element in providing effective learning in simulation-based medical education reviews.

The debrief diamond (pictured) allows a standardised approach with a focus on non-technical skills as well as clinical elements, with a clear translation to modifying practice.

We recommend using this DAA (Description, Analysis, Application) approach in the debrief.



Debrief specific for THIS scenario

Non-Technical Skills:

1. Was the Team Leader Role well defined?
2. Were other roles allocated and followed? (e.g. Were names used? Stickers used?)
3. Did the team communicate well? Use of closed-loop communication?
4. Did the team communicate well and sensitively with the parent explaining the clinical course and expected disposition?
5. Did the team leader give clear instructions?
6. Did team members prioritise tasks effectively?

Technical Skills:

1. Safe and effective A-E assessment of patient, correctly recognising SVT as diagnosis
2. Initiating correct medical management (adenosine challenge)
3. Identifies deterioration to unstable SVT and performs a safe DC cardioversion.
4. Escalates to appropriate senior clinicians using a precise and informative SBAR handover
5. If ALS algorithm started, safe ALS management and Post ROSC care

