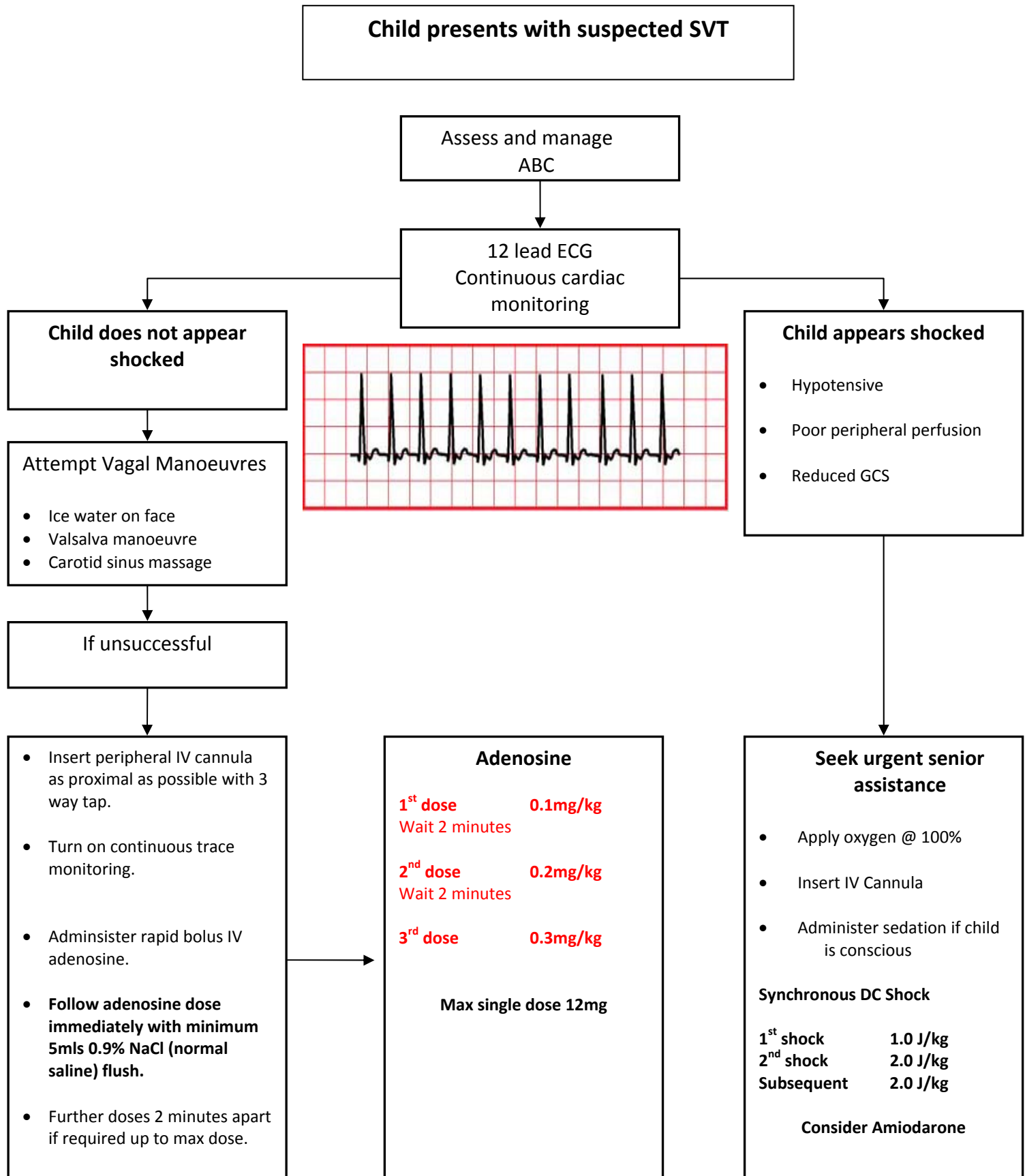


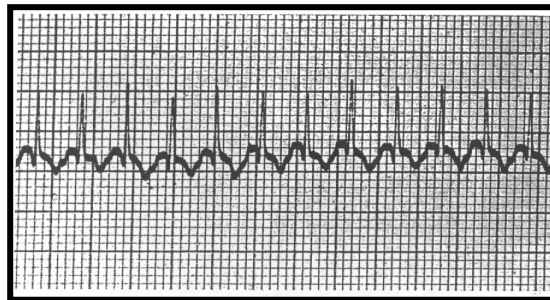
Supraventricular Tachycardia

Management Guidelines
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 Reviewed January 2011
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Supraventricular Tachycardia

- Rapid regular, usually narrow (<0.08 sec) complex tachycardia of 220-320bpm in infants and 150-250bpm in older children.
- P wave usually invisible, or if visible is abnormal in axis and may precede or follow the QRS.
- 90% of paediatric arrhythmias are SVT. 90% of SVT are of re-entrant type.
- Half of patients with SVT will have no underlying heart disease.
- Almost ¼ will have congenital heart disease and ¼ will have Wolf Parkinson White syndrome.
- Consider fever, drug exposure (particularly sympathomimetics).
- SVT may be well tolerated in infants for 12-24 hours, CHF later manifests with irritability, poor perfusion, pallor, poor feeding and then rapid deterioration.
- Note that > 95% of wide complex tachycardias in paediatrics are NOT VT, but SVT with aberrancy, SVT with BBB (in pre-existing congenital heart disease) or a type of accessory pathway re-entrant SVT (see below).
- **Do NOT use verapamil or beta blockers** in infants or children with SVT – cause profound AV block, negative inotropy and sudden death.

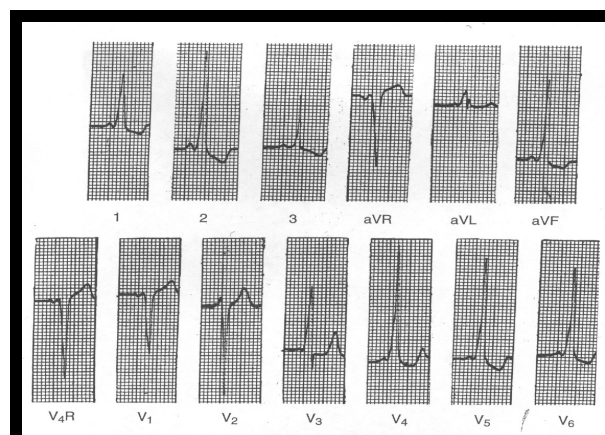


Types of supraventricular tachycardia

Supraventricular tachycardia includes main two types:

1. Majority of SVT (90%): **Re-entrant SVT** (or Reciprocating SVT or PAT - paroxysmal atrial tachycardia)

- HR does not vary substantially in re-entrant tachycardia.
- Typically begins and ends abruptly.
- The ECG findings will vary according to the type of bypass tract (anatomic or functional) and the direction of the impulse flow through the AV node (atrium to ventricle, or visa versa).
- **Wolf Parkinson White syndrome** is characterised by the occurrence of SVT plus specific ECG findings in sinus rhythm. The characteristic pre-excitation is evidenced by a short PR interval and widened QRS with a slurred upstroke or delta wave. It is caused by earlier ventricular excitation occurring via the accessory pathway than have occurred via the normal AV node alone. With the onset of SVT, conduction reverses (becomes V to A) in the accessory pathway as part of the circular rhythm.



- Any type of AV block is incompatible with re-entrant tachycardia that involves the AV node – therefore **adenosine** (transiently blocks AV conduction) works well.
- Several atrial rhythms; atrial flutter, atrial fibrillation and sinoatrial node re-entry tachycardia are also considered subgroups of re-entrant SVT. These do not respond to adenosine but the transient slowing of the ventricular rate may unmask the atrial activity and therefore underlying cause of the SVT. A running rhythm strip is therefore imperative.

2. Automatic SVT: an abnormal or accelerated normal automaticity.

- Usually accelerate ('warm up') and decelerate ('cool down') gradually.
- Includes:
 - **Sinus tachycardia:** enhanced automatic rhythm. Rate varies with physiological state.
 - **Atrial Tachycardia:** non-reciprocating or ectopic atrial tachycardia – rapid firing of a single focus in the atria. Slower heart rate (130-160). Rare. Usually constant rather than paroxysmal.
 - **Junctional Ectopic Tachycardia:** difficult to treat, usually occurs in setting of post extensive atrial surgery. Rapid firing of a single focus in the AV node. Slower rhythm – 120-200bpm.

Management of SVT

A 12 lead ECG in SVT and post conversion is essential. Essential to monitor with a rhythm strip during manoeuvres ie in SVT and post conversion – allows later assessment of underlying rhythm in unclear cases.

If reversion to sinus rhythm occurs but is not sustained, there is little to be gained by persisting with that manoeuvre/drug.

1. Acute treatment: aims to induce AV nodal slowing

• **Vagal manoeuvres:**

- Infants: ice plus water in bag placed on face for up to 10 seconds – often effective
- Older children: carotid sinus massage, valsalva manoeuvre (30 –60 seconds), deep inspiration/cough/gag reflex, headstand.

• **Adenosine:**

- Half life: <1.5 seconds: transient AV nodal block as well as sinus node block, negative chronotrope, ionotrope. Side effects: flushing, nausea, dyspnea, bronchospasm are short lived. If not sustained in sinus rhythm – call cardiologist.

Dose: Refer to the flowchart.

• **Cardioversion:**

Be very wary of cardioverting an 'unstable' child in a SVT in ED who remains conscious to the point of requiring sedation or anaesthesia – a cardiologist and ICU consultant are required as rapid deterioration of the 'SVT-stressed' myocardium may occur with anaesthesia.

If shock is present, synchronous DC shock is indicated (monophasic). Refer to the flowchart for joules/kg.

2. Chronic treatment – conducted as an inpatient; either medical or surgical/catheter pathway ablation.