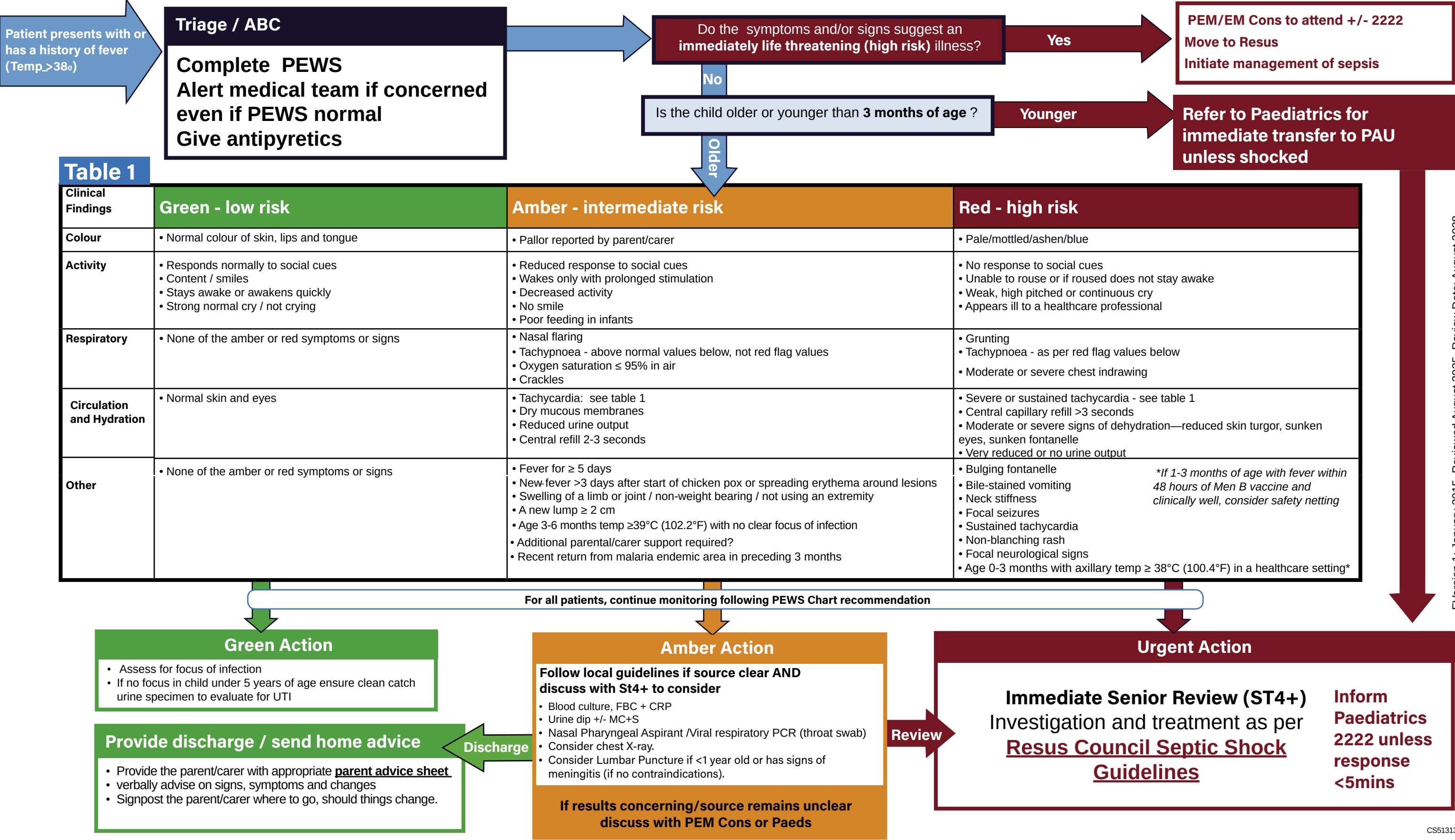




Management - Acute Setting



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Table 1

Normal Paediatric Values (APLS):				
	Respiratory Rate at rest: [b/min]	Red Flag values	Heart Rate [bpm]	Systolic Blood Pressure [mmHg]
<1 year	30 - 40	>60	110 - 160	80 - 90
1 - 2 years	25 - 35	>50	100 - 150	85 - 95
>2 - 5 years	25 - 30	>50	95 - 140	85 - 100
5 - 12 years	20 - 25	>30	80 - 120	90 - 110
>12 years	15 - 20	>25	60 - 100	100 - 120

Septic shock and sepsis-associated organ dysfunction in children

RECOGNITION

Assess with ABCDE approach

A, B assessment

- Airway, RR, work of breathing, oxygen saturations, breath sounds, recognition respiratory distress/failure.
- Open airway and start high-flow oxygen via non-rebreather mask with reservoir or BMV as appropriate.

C assessment

- HR, CRT, BP, peripheral and central perfusion, rhythm recognition; recognition circulatory failure/shock.
- Establish IV/IO access (take blood cultures, full blood count, blood glucose, urea and electrolytes, lactate*, blood gas and other bloods as indicated**) and give fluid resuscitation as below.

D assessment

- AVPU score; recognition of altered mental status secondary to poor perfusion.

E assessment

- Rash, temperature (high or low).

Sepsis is diagnosed if there is evidence of infection as cause of the acute illness (suspected or proven) plus at least two of the following: core temperature $< 36^{\circ}\text{C}$ or $> 38.5^{\circ}\text{C}$; white cell count elevated or depressed for age; inappropriate tachycardia; altered mental state; reduced peripheral perfusion.

10–15 MIN

Initial resuscitation

- If no signs fluid overload (hepatomegaly, crackles at lung bases) then give 10 mL kg^{-1} balanced crystalloids*** IV bolus over 5–10 min and re-assess after each bolus up to $40\text{--}60\text{ mL kg}^{-1}$ or until perfusion improved.
- Therapeutic end points: CRT $< 2\text{ s}$; normal BP for age; $\text{UO} > 1\text{ mL kg}^{-1}\text{ h}^{-1}$, normal pulses, normal mental state.
- Watch for signs of fluid overload; if present stop bolus therapy and start inotropic support.
- Correct hypoglycaemia and hypocalcaemia.
- Start broad-spectrum antibiotics; seek and aggressively control any infection source.
- Call for more senior help and an anaesthetist urgently; call PICU for bed +/- PICU transfer team.
- If mechanical ventilation is required, then cardiovascular instability during intubation is less likely after appropriate cardiovascular resuscitation.

15–60 MIN

Fluid refractory shock?

Start IV/IO inotrope infusion; central (preferable) or peripheral IV (clinical signs unreliable at differentiating 'warm' and 'cold' shock in children).

Adrenaline $0.05\text{--}0.3\text{ mcg kg}^{-1}\text{ min}^{-1}$ (use more dilute infusion if peripheral)

and/or

Noradrenaline via central IV or IO, starting infusion rate $0.05\text{ mcg kg}^{-1}\text{ min}^{-1}$

Titrate inotropes upwards according to clinical response and haemodynamic effects using haemodynamic monitoring (where possible)****

Use ketamine +/- atropine IV/IO/IM to gain central access and airway if needed.

Fluid and catecholamine-resistant shock?

Further management as per Paediatric Intensive Care/retrieval service advice.

Warm shock – high cardiac output with low systemic vascular resistance.

Cold shock – low cardiac output with high systemic vascular resistance.

Fluid in mL kg^{-1} should be dosed for ideal body weight (max bolus 500 mL)

* lactate measurements are useful if available as they have prognostic ability if measured serially.

** Other bloods that may be indicated: coagulation studies, liver function tests, magnesium levels or any others indicated by the child's clinical picture.

*** Balanced (buffered) fluids are used in preference to 0.9% sodium chloride, but if not available, 0.9% sodium chloride should be used.

**** These are starting dose ranges for these inotropes, and increases may be necessary but should be guided by

PICU retrieval team/senior clinicians. Choice of inotropes is dictated by clinician preference, response to treatment and monitored parameters, and again decisions should be made in conjunction with PICU teams.