

### Sepsis in a heartbeat: Never ignore persistent tachycardia

A two and a half year old child presented to the Emergency Department (ED) at a rural hospital with fever, vomiting, and flu like symptoms. Observations on arrival included respiratory rate 58 (Yellow Zone); SpO2 100% on room air; heart rate 178 (Red Zone); and temp 37.3°C.

The child was assessed by a medical officer (MO) who noted the child to have a “flat” affect, and, following examination, thought the child had a viral infection. The MO presented the case to a senior consultant, however, the consultant did not review the patient.

The child’s respiratory rate and heart rate remained in the Yellow and Red Zones respectively for the next 4 hours at which point the child was discharged home, with advice to return if there were further concerns.

The following day the child returned to the ED via ambulance following a self-resolving seizure. Observations on arrival included heart rate 180; respiratory rate 60; SpO2 95% on room air; capillary refill time=5 sec; blood pressure 78/48 and a petechial rash on the child’s upper limbs.

A provisional diagnosis of meningococcal sepsis was made and IV antibiotics and fluid bolus were administered and the child was transferred to a specialist paediatric facility via NETS.

In reviewing all NSW paediatric RCAs from 2015-2016 involved late recognition of deterioration, there were seven cases of missed sepsis identified.

Paediatric Watch – lessons from the frontline: Sepsis in a heartbeat: Never ignore persistent tachycardia July 2017, © Clinical Excellence Commission. SHPN (CEC) 170354

Sepsis is one of the leading causes of death in children, with mortality rates as high as 8% -10%. The majority of these deaths are considered to be preventable. Recent literature has highlighted that early sepsis identification with targeted sepsis management may in fact reduce mortality to as low as 1-3%.

There were a number of similarities in each of these seven NSW RCAs. They included diagnostic error, loss of situational awareness, and failure to activate the [Clinical Excellence Commission’s paediatric sepsis pathway](#) despite the child fitting the criteria on the pathway.

One consistent theme was clearly evident in all seven cases. All seven patients had **persistent tachycardia**.

In each of these cases, staff did not react to this vital clue which could have led them to recognise a sick child and investigate further.

Persistent tachycardia remains one of our most valuable tools in identifying sepsis in infants and children. Babies and young children increase their heart rate to improve cardiac output; unlike adults who also have capacity to change their stroke volume.

It is not uncommon for children who are unwell to be tachycardic, particularly when they are febrile. Infants and children who remain tachycardic, even when their temperature subsides, should be reassessed to exclude sepsis as a cause of their illness.

Persistent tachycardia is a valuable trigger for clinicians to consider, “could this be sepsis?”, and to escalate care as per the paediatric sepsis pathway.

All seven patients involved in the missed sepsis cases had risk factors, signs and symptoms to activate the paediatric sepsis pathway either on arrival or early in their presentation. However, the sepsis pathway was not activated in any of the cases.

Once a patient is placed on the sepsis pathway and reviewed by a senior clinician, diagnostic tools including a lactate, base excess or procalcitonin level are useful to assist clinicians in the ongoing management of the patient.

The aim for patients with presumed sepsis is administration of appropriate antibiotics and IV fluids within an hour of activating the paediatric sepsis pathway.

### Lessons learnt:

- Do not ignore, or dismiss an unexplained persistent tachycardia.
- For any undifferentiated patient with persistent tachycardia, always consider “could this be sepsis?”
- Never discharge a patient home or transfer a patient to the ward with a heart rate in the Red Zone.

*“Patients do not suddenly deteriorate- clinicians suddenly notice”*

Associate Professor Patrick Brady, Cincinnati Children’s Hospital

#### References

Kissoon N. Sepsis Guideline Implementation: Benefits, Pitfalls and Possible Solutions. Critical Care Medicine. 14; 18 (7)

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[Clinical Excellence Commission – Paediatric Quality Program](#)

The Paediatric Patient Safety Program works across a range of areas to improve the quality and safety of health care for children and young people in NSW.