

Paediatric Pearls

August 2016

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Previous editions are all available at www.paediatricpearls.co.uk

SEPSIS and the "in-betweeners"

Vital signs from [NICE NG51](#): moderate to high risk criteria in children and young people with sepsis

VITAL SIGNS IN SEPSIS	UNDER 5s			Children aged 5-11 years			Adults and >12 yrs
	Under 1	1-2 years	3-4 years	5 years	6-7 years	8-11 years	Young people >12 yrs
Respiratory rate bpm	50-59	40-49	35-39	24-28	24-26	22-24	21-24
Heart rate bpm	150-159	140-149	130-139	120-129	110-119	104-114	91-130

The under 5s data matches that found in [NICE's fever guideline](#) for the under 5s, data for the older children matches our PEWS cut offs but may be new for some primary care practitioners. We should probably protect ourselves and our young patients by taking note of these vital signs in every encounter with an unwell child. Children who satisfy the criteria for moderate risk AND IN WHOM YOU CAN NEITHER FIND THE CAUSE OF THEIR ILLNESS NOR MANAGE IT IN PRIMARY CARE, should be referred to secondary care. Risk stratification tables and management algorithms both inside and outside hospitals and in the full range of ages are all at <https://www.nice.org.uk/guidance/NG51/resources>.

Most children with high risk criteria for sepsis will look unwell and are fairly straightforward to categorise. They should be referred to secondary care. Well children (low risk criteria band) are also fairly obvious. **But what about the in-betweeners?** The ones where you're not quite sure if they're going to get worse or if you are missing something? There is lots of work going on around markers of severe illness in children and most Emergency Departments in the UK now use a paediatric early warning score (PEWS). NICE's recent sepsis guideline quantifies respiratory and heart rates which might make you tighten the safety net for a certain group of moderate risk children.

[NHS Go](#) is a new app with health information and advice for young people living in London. Includes quite interesting information on puberty, early menopause, suitable breakfasts for people who hate breakfast, body metabolism with some personal stories to maintain the interest. Parents might want to have a read too - sex after the menopause, 5 ways to stop snoring, know your prostate. There's something for everyone!

Cardiac assessment prior to starting medication for Attention Deficit and Hyperactivity Disorder (ADHD)

NICE's guideline on ADHD: diagnosis and management (<https://www.nice.org.uk/guidance/cg72>, publ 2008, updated 2016) says that before starting drug treatment, children and young people with ADHD should have a full pre-treatment assessment, which should include:

- full mental health and social assessment
- full history and physical examination, including:
- assessment of history of exercise syncope, undue breathlessness and other cardiovascular symptoms
- heart rate and blood pressure (plotted on a centile chart)
- height and weight (plotted on a growth chart)
- family history of cardiac disease and examination of the cardiovascular system
- an ECG if there is past medical or family history of serious cardiac disease, a history of sudden death in young family members or abnormal findings on cardiac examination

The main drugs used in ADHD are dexamfetamine, methylphenidate and atomoxetine (see NICE's [technology appraisal](#) TA98 from 2006). They should be initiated by a specialist but may be continued by primary care practitioners. The BNFC advises caution if there is prolongation of the QT interval on ECG or if there is tachycardia or cardiovascular disease. [Click here](#) for information on measuring the QTc; children do not need to be referred to a paediatric cardiology clinic to have an ECG done. Do refer if it's abnormal though.

"The optimum diagnostic procedure is examination of thick and thin blood films by an expert to detect and speciate the malarial parasites. *P. falciparum* and *P. vivax* (depending upon the product) malaria can be diagnosed almost as accurately using rapid diagnostic tests (RDTs) which detect plasmodial antigens. RDTs for other Plasmodium species are not as reliable." Lalloo DG et al. UK malaria treatment guidelines 2016. [Journal of Infection](#) (2016) **72**, 635-649

So, in children with suspected malaria presenting to the ED, do we still need three negative blood films on 3 consecutive days to exclude it?

Dr Tom Waterfield summarises his recent article on this subject (Dyer E, Waterfield T, Eisenhut M. [How to interpret malaria tests](#). Arch Dis Child Educ Pract Ed. 2016 Apr;101(2):96-101. doi: 10.1136/archdischild-2015-309048. Epub 2016 Feb 2) below:

There is only one study exploring the combination of blood films together with RDT's in diagnosing imported malaria and it was in adults (3). Of the 388 cases, 367 (95%) were diagnosed by the initial blood film. Of the 21 that weren't diagnosed on the blood film 19 had RDT's performed. This diagnosed a further 10 leaving only 9 cases (2.3%) not picked up by a single blood film and RDT. Only one case of *P.falciparum* infection was missed and this was in a partially immune individual who had already received an unspecified treatment. The remaining 8 missed cases were *P.vivax* and *P.ovale*.

If we extrapolate from this study, then if a single blood film and RDT are negative a diagnosis of malaria is extremely unlikely. This is especially true in cases of suspected *P.falciparum* in a non-immune patient who has not received any treatment. It is however difficult to extrapolate adult data and draw conclusions relating to children. **So, for the time being, the 2016 UK advice remains that 3 negative films are needed to exclude malaria.**

Tom's full summary and relevant references are on the [Paediatric Pearls blog](#).

Side effects of methylphenidate (eg, ConcertaXL, Equasym XL, Ritalin, Medikinet) and dexamfetamine

- Insomnia
- Nervousness
- Headache
- Decreased appetite
- GI upset
- Tachycardia
- Palpitations
- Hypertension

Patient information leaflet [here](#)

Side effects of atomoxetine (eg, Strattera)

- GI upset
- Decreased appetite
- Nausea and vomiting
- Early morning waking
- Irritability
- Mood swings

Patient information leaflet [here](#)