

# PAEDIATRIC PATIENT IN PARAMEDICINE

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## INTRODUCTION

Whilst paramedics, emergency medical technicians (EMT) and students manage complex clinical cases as a part of their professional roles, many will find paediatric patients somewhat alarming and confronting. This is likely attributed to a deficiency of paediatric exposure for most crews.

As a result the limiting exposure to paediatric patients, a somewhat deficient assessment is sometimes performed. This short article attempts to simplify this issue by providing two simple paediatric specific assessment tools for use by paramedics and students in the field.

## PAEDIATRIC VITAL SIGNS

Paediatric patients' vital signs vary across age brackets and exhibit rapid physiological changes with overall

low mortality. Paediatrics patients are physiologically different to adults due to the relative size of their body. Prior to the age of eight or nine children's spines are not biomechanically mature and their large heads are heavy, unbalanced and poorly supported, increasing the possibility of head and cervical spine injury. Newborn's brains are about 25% of full adult size and grow to half adult size within the first one to two years of life.

Each stage of a paediatric patient sees changes in anatomy and physiology. The neonate airway consists of a large tongue, long epiglottis, very compliant chest, larynx closer to the head than in older children and adults and a large occiput. Neonates and young children possess thick-walled alveoli totalling 10% of total number found at adulthood. As the child progresses in age the cricoid of the larynx descends, the epiglottis shrinks and becomes firmer, the relative tongue size to oral cavity decreases and the occiput lessens. Until that the paediatric patient's airway develops, they are more

susceptible to acute obstruction of the airway than adults.

Paediatric myocardium and ventricles are less proficient at generating tension during heart contraction which limits stroke volume, causing cardiac output to be dependent on rate. Dehydration is much less tolerated in paediatric patients than adults and hypoglycaemia is more common in neonates than infants and older children. Paediatric patients are less able to regulate their temperature due to poorly developed sweating, shivering and vasoconstrictive mechanisms.

In order to assess a paediatric patient rapidly and accurately in the field it is paramount to know what is considered normal for that patient during the different phases of growth. It is important to determine the magnitude of deviation from the expected norm not only to determine if the values are abnormal, to determine the required extent of care. Integration of these physiological targets (figure one) into treatment will

ensure paramedics provide directed therapy while monitoring and affecting a paediatric patient's needs.

The stages of development can affect the child's behaviour, anatomical development and physical status. Psychosocially, neonates to six-month-old babies are accepting of strangers and not generally upset by separation from their parents. Contrastingly, paediatric patients aged six months to four years can become upset when faced with unfamiliar people and surroundings and if separated from their parents. From the ages of four until 10 patients are upset by the possible disfiguring and painful effects of a surgical procedure. Paediatric patients aged between 10 and 12 have a fear of pain and inability to cope with illness.

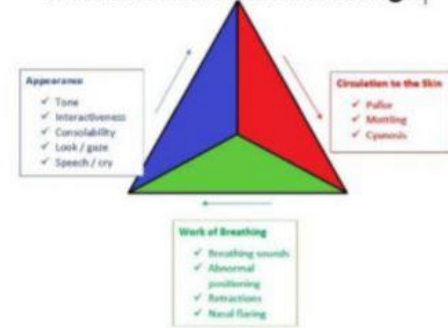
Further consideration to involve the parents or guardians as much as possible is vital when assessing a paediatric patient, though this is not always possible. If done properly this can assist in alleviating fear in both the child and the guardian.

The following table can be used as a quick reference tool for leaders working in the field in relation to what is considered normal vital signs for a paediatric patient (table 1).

## THE PAEDIATRIC ASSESSMENT TRIANGLE (PAT)

Due to the rather challenging nature of assessing paediatrics in the field, the below table can simplify the assessment. The Paediatric Assessment Triangle (PAT) is a rapid assessment tool that has been

## Paediatric Assessment Triangle



incorporated into Paediatric Advanced Life Support courses (PALS), Advanced Paediatric Life Support courses, and the Emergency Nursing Paediatric Course.

The PAT is a simple and swift assessment tool appropriate for emergency paediatric assessment irrespective of the paediatric patient's presentation. The advantages of this tool are simplicity, speed as well as being primarily a visual observation which result in only minor disturbances to the child's mental or physical state.

Remember a great deal of your assessment can be achieved through visual observations alone, and an accurate perfusion status assessment are imperative in your assessment and can be easily achieved by looking, listening and feeling.

## CONCLUSION

A thorough and accurate assessment of a paediatric emergency situation will allow a systematic approach to occur and ensure better planning for the incident response to take place. Never forget your primary survey 'DRSABC' as this forms the foundation to rapidly identify critical problems, the adjuncts described above are designed to support this.

## REFERENCES:

- AGLS (2020). PALS algorithms 2020 (paediatric advanced life support). <https://www.agls-pals-bls.com/algorithms/pals/>
- Dieckmann, R., Brownstein, D. and Gausche Hill, M. (2010). The Paediatric Assessment Triangle. *Paediatric Emergency Care*, 26(4), pp.312-315.
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| Age           | Breaths/min | Beats/ min | Systolic blood pressure | Diastolic blood pressure |
|---------------|-------------|------------|-------------------------|--------------------------|
| Premature     | 40 – 70     | 110 – 170  | 55-75                   | 35 - 45                  |
| 0 – 3 months  | 35 – 55     | 110 – 160  | 65 – 85                 | 45 - 55                  |
| 3 – 6 months  | 30 – 45     | 110 – 160  | 70 – 90                 | 50 - 65                  |
| 6 – 12 months | 22 – 38     | 90 – 160   | 80 – 100                | 55 – 65                  |
| 1 – 3 years   | 22 – 30     | 80 – 150   | 90 – 105                | 55 – 70                  |
| 3 – 6 years   | 20 – 24     | 70 – 120   | 95 – 110                | 60 – 75                  |
| 6 – 12 years  | 16 – 22     | 60 – 110   | 100 – 120               | 60 – 75                  |
| >12 years     | 12 – 20     | 60 – 100   | 110 – 135               | 65 – 85                  |

<https://www.agls-pals-bls.com/algorithms/pals/>

Table1