PAEDIATRIC NURSING PRACTICE MANUAL
SECTION 3

GENERAL CARE OF THE SICK CHILD

3.1 MONITORING VITAL SIGNS

3.1.1 GENERAL OBSERVATIONS, INCLUDING RESPIRATORY ASSESSMENT

This document replaces the former 3.1.1 (Temperature), 3.1.2 (Pulse), 3.1.3 (Respirations), 3.1.5 (BP Sphygmomanometer, 3.1.6 (BP DINAMAP) and 7.2.2 (Respiratory Assessment and Observation)

Aims

1. To undertake, document and interpret general observations appropriately.
2. To detect deterioration in the child's condition and instigate timely and appropriate management

Key Points

1. **Any deterioration or other significant changes must be reported immediately to the medical team.**

   Consider a medical review, MET call, CODE Blue as indicated by the patient's clinical condition. (PNPM 4.1 Code Blue (55) and Emergency Resuscitation).
2. Also refer to PNPM 3.1.9 Children's Early Warning Tool.
3. Also refer to PNPM 7.2.1 Oxygen Administration.
4. Pulse and respiration rates will be counted over 60 seconds.[1, 2]
4. As accurate readings are dependent on the correct use of equipment, follow the manufacturer's instructions carefully.

Frequency of observations

1. The frequency of observations should be consistent with the clinical situation of the patient. For the majority of patients in an acute health care facility, observations should be taken at least once per eight hour shift. In some clinical circumstances more frequent or less frequent observations will be appropriate and this should be documented in the patient's notes and/or nursing care plan.[3]
2. Review the frequency of observations daily, and with changes in condition. Document any change.
3. If the child requires acute oxygen therapy, monitor vital signs and oxygen saturations at least hourly.
5. For postoperative monitoring refer to PNPM 8.3.1 Postoperative/Procedural Care and Section 8.4 Care of the Child Related to Specific Procedures.
6. Document medical advice clearly in the patient's progress notes.

Normal Values

1. Normal vital sign parameters do not guarantee a stable physiological status.
2. The rates specified by the CEWT chart are regarded as the bench mark for normal values at Princess Margaret Hospital.

Age (CEWT Chart)	Respiratory Rate	Temperature	Heart Rate	Systolic BP
< 1 year	20-45	35.5-38 °C	100-160	75-120
1-4 years old	15-35	35.5-38 °C	90-140	80-125
5-11 years old	15-30	35.5-38 °C	80-130	85-130
≥ 12 years old	15-25	35.5-38 °C	60-120	90-150

TEMPERATURE

Key Points

1. PMH use digital axilla and/or tympanic thermometers.
2. Mercury thermometers are hazardous and should not be used.[1]
3. Tympanic thermometers [4, 5] are not recommended for use in patients with known ear infections or when excessive ear wax is present.
4. Taking rectal temperatures is not recommended due to possible complications eg. rectal perforation.[1, 4, 6]
5. ***Factors that may affect accurate readings*** [4]

   Localised heating or cooling of a patient

   Extreme environmental temperatures

   Drinking of hot or cold fluids prior to an oral temperature

   Incorrect use of thermometer

6. ***To ensure accurate readings from tympanic thermometers*** [4, 5]

   Readings will vary according to whether or not the ear is exposed to the air and most valid recordings are obtained when the same ear is used for all observations. If patient lying on his/her side, take the temperature from the exposed ear. When feasible to do so use the same ear.

   Correct positioning of the thermometer is vital.

   For children, gently pull the ear lobe down and back and gently position the thermometer at the entrance of the ear canal.

   For older children (>9 years), gently pull the ear up and back and gently position the thermometer at the entrance of the ear canal.

PULSE (HEART RATE)

Key Points

1. An **apical** rate using a stethoscope is preferred in [1]
   - children under two years
   - those with cardiac problems
   - if pulse is irregular on palpation
2. Do not rely on electronic readings. Cross check by undertaking manual pulse/apical rate.

RESPIRATIONS

Key Points

1. The adequacy of breathing is checked in three domains; effort, efficacy and the effect of inadequate respiration.[7] Refer to the table below.
2. When assessing respiratory status, include observations of other clinical signs of respiratory distress or deterioration such as nasal flaring, use of accessory and intercostal muscles, rib recession, tracheal tug, grunting, head bobbing, wheezing, mouth breathing, capillary refill, chest auscultation and /or pulse oximetry readings.[1, 8-10]
3. Consider abdominal movements when assessing respiration rates.[1, 10, 11] Infant's respiratory movements are primarily diaphragmatic. Children < 7 years however may continue to predominately be abdominal breathers.

PROCEDURE	ADDITIONAL INFORMATION
Airway [3] Assess patency of the airway *Look* for chest and/or abdominal movement, symmetry and recession. *Listen* for breath sounds. *Feel* for expired air	Consider repositioning the patient to ensure optimal lung expansion and airway patency.
Effort of Breathing Assess the respiratory rate [7] Observe for; recession, stridor, wheeze, grunting, accessory muscle use, nasal flaring, gasping, [7] tracheal tug, mouth breathing and/or head bobbing.	The degree of increase in the effort allows clinical assessment of the severity of the respiratory disease. **Important** An increased effort of breathing does not occur in three circumstances; [7] • exhaustion (with imminent respiratory arrest) • central respiratory depression • neuromuscular disease

PROCEDURE	ADDITIONAL INFORMATION
Auscultate the chest Identify the presence of normal, abnormal or additional breath sounds. The nature of the sounds, location, duration and phase (inspiratory or expiratory) should be noted.[9]	Sounds can be referred from the upper respiratory tract when mucus is present in the nose or throat.
Efficacy of breathing Observe; chest expansion (abdominal excursion in infants).[7] Listen for breath sounds.[7]	Are they reduced or absent? Is there symmetry on auscultation? Is there decreased air entry?
Monitor oxygen saturations, hourly or as condition indicates. For postoperative care of a child following surgery on the airway refer to PNPM 8.4.1.	**Continuous pulse oximetry monitoring when:** 1. Ordered by medical team. 2. Oxygen >50%. 3. Respiratory deterioration/distress. 4. If patient experiencing apnoeas/bradycardia. 5. When weaning oxygen levels or for 4 hours with air trial. Refer to PNPM 3.1.8 for guidance on use of a pulse oximeter.
Effects of respiratory failure on other physiology.[7] Assess heart rate.	Tachycardia or Apnoea +/- Bradycardia are indicators of respiratory deterioration.
Note skin colour.	Pallor is associated with the early stages of hypoxia.[8] Capillary refill >3 seconds. Peripheral and/or central cyanosis is a late sign of hypoxia.[6]
Note changes of behaviour or level of consciousness.[6, 7]	

PROCEDURE	ADDITIONAL INFORMATION
Obtain blood gases as required. **Note:** For blood sampling procedures refer to PNPM Section 5: Specimen Collection	Medical staff may request for a venous or arterial blood gas to be taken. The results provide a valuable indication of the child's acid base balance, oxygenation and ventilation status. For online learning - Arterial Blood Gas Interpretation for Nurses click here
Secretions Document on general observation chart if saline drops/suction required. Document on general observation chart amount, colour and consistency of secretions.	

BLOOD PRESSURE MONITORING

Key Points

1. Where possible remove any tight or restrictive clothing.[12]
2. Avoid limbs that equipment is attached to - eg. IV cannula, PICC/CVC lines, pulse oximetry probes.[13]
3. The arm is preferable, but the calf may be used.[1, 13] The thigh is the least preferred site.[13]
4. If used, the arm should be supported and positioned at heart level.[1, 12-15]
5. Incorrect cuff size and fitting can lead to inaccurate readings.[16] The cuff should cover 80% of the chosen limbs circumference [1, 12-15] and position the centre of the leads over the artery.[10, 13]
6. Re-check any marked differences in the blood pressure readings.
7. Artefact from patient caused (ie. crying) or nurse caused (ie. leaning on cuff or tubing) are potential sources of inaccuracy.[1, 4, 13, 16]

Manual Blood Pressure

8. In children, as the cuff is deflated;
   - Systolic pressure is when the first tapping sounds are heard (1st Korotkoff sound) [10, 12]
   - Diastolic pressure is when the sounds disappear (5th Korotkoff sound) [4, 10, 12]
   - Sometimes the sounds may not disappear before the manometer reaches 0mm Hg. In this situation the 4th Korotkoff sound, indicated by the muffling of sound is considered the diastolic reading.[10, 12]

Automated Blood Pressure

9. The reading obtained is dependent on correct use of the automated blood pressure machine. Follow the manufacturer's instructions.

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