

Department:	Pediatrics		
Document:	Multidisciplinary Policy and Procedure		
Title:	Patient Monitoring in Paediatric Patient		
Applies To:	All Pediatric Staff		
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1. PURPOSE:

- 1.1 To provide individualized nursing care based on the outcome of evaluation.
- 1.2 To determine potential serious life threatening conditions.
- 1.3 To guide management and decision making.

2. DEFINITIONS:

- 2.1 **Patient Monitoring** – is a process of evaluating the progress of patient condition by the use of parameters as applicable to the condition.
- 2.2 **Respirations**: the mechanism of respiration exchanges oxygen and carbon dioxide between cells of the body and the atmosphere. A respiration consists of inhalation and expansion & the pause, which follows.
- 2.3 **Blood Pressure**: It is the force that blood exerts against the walls of the blood vessels.
- 2.4 **Pulse**: is the rhythmic expansion and recoil of elastic artery caused by the ejection of blood from the ventricle. It can be palpated where an artery near the body surface can be pressed against firm substances (e.g. bone).
- 2.5 **Temperature**: it is the difference between the amount of heat produced by the body and amount of heat lost

3. POLICY:

- 3.1 All patients admitted should have continuous observation or measurement of physiological functions and patient parameters. Patients are being monitored through invasive and non – invasive sensors. Patient's monitoring data should be recorded in patient's flow charts.
- 3.2 Nurses carrying out patient monitoring must demonstrate competency with knowledge and skills as determined by the standard specific nursing practice
- 3.3 All equipments used are set with alarms to alert the nurses for emergency situation. All equipment's are calibrated for Periodic Preventive Maintenance (PPM).
- 3.4 Standard precaution must be maintained in the performance of each procedure.

4. PROCEDURE:

- 4.1 Explain the procedure to the patient/ parents to gain cooperation and eliminate fear and anxiety.
- 4.2 Ensure that machines and monitors are in good working condition before connecting to patient.
- 4.3 Attach patient to cardiac monitor for continuous monitoring. Ensure alarm system of the machine is turned 'on' at all times and alarm settings are appropriate on each patient prior to monitoring.
 - 4.3.1 Turn on monitoring alarms at all times. Alarm parameters for the arterial line and heart rate will be set 20% above and below current hemodynamic status.
 - 4.3.2 Set pulse oximeter alarms "on" at all times on maximum alarm volume according to the acceptable oxygen saturation.
 - 4.3.3 When an alarm occurs, always check the patient's condition and never neglect any alarm.
 - 4.3.4 Make sure all alarm condition is corrected.

4.3.5 Check alarm settings each shift before receiving the patient.

4.4 Vital signs monitoring:

- 4.4.1 Record heart rate, respiratory rate and blood pressure and pain hourly. Temperatures which are within normal limits will be recorded every 2 hours.
- 4.4.2 Check blood pressure (BP) every 10 – 15 minutes or as ordered when infusing vasoactive medications.
- 4.4.3 Monitor vital signs when infusing blood products baseline vital signs, 15 minutes after commencement, hourly during blood transfusion, 30 minutes after completion of transfusion and document in Nurses Observation Chart and Nurses Progress Notes.
- 4.4.4 Monitor post – operative vital signs will be recorded on the nurses observation chart for patient who succumbed to operative procedure strictly as follows:
 - 4.4.4.1 Every 5 minutes for 15 minutes.
 - 4.4.4.2 Every 15 minutes for first hour.
 - 4.4.4.3 Every 30 minutes for next hour.
 - 4.4.4.5 Every hour for next 4 hours or until stable.
- 4.4.5 Document on blood pressure monitoring form for patients on close BP monitoring at frequent interval and document readings with which medical intervention had been provided.

4.5 Invasive measurements: Hemodynamic monitoring.

- 4.5.1 Select monitoring kits that are simple with minimal length of transparent, non – compliant, high pressure tubing. Stopcock should have Luer connections for system integrity and be transparent to facilitate locating air bubbles.
- 4.5.2 Remove all air during set up, especially near the transducer. Air bubbles are often hidden at the connection between the pressure tubing and the transducer dome or at stopcocks.
- 4.5.3 Minimize the potential for clot formation at the catheter tip by using a continuous flush device with heparinized flush (1 unit of heparin per 1 ml solution).
- 4.5.4 Eliminate kinks in the catheter and pressure tubing.
- 4.5.5 Establish zero (atmospheric) pressure baseline and electrical calibration. Zero baseline, electrical calibration and dynamic response should be validated at least once each shift, when the waveform seems damped or distorted, or when the measurement result will lead to significant therapeutic change.
- 4.5.6 Documentation of arterial lines/ central venous pressure monitoring must be done hourly and must be clearly documented whether which hemodynamic parameter used.

4.6 SPO₂ monitoring:

- 4.6.1 Continuously monitor and document hourly. Episodes of desaturation must be documented in between particular time lapse in the patient monitoring sheet.
- 4.6.2 Assure that device is detecting an adequate pulse through good quality strength of plethysmograph waveform or pulse amplitude strength.
- 4.6.3 Explore before results are documented and reported when disparity exists between SPO₂ and the clinical presentation of the patient.

4.7 Monitoring Carbon dioxide:

- 4.7.1 Prepare necessary equipment's. Decide which method on the module to be utilized:
 - 4.7.1.1 Mainstream measurement uses a CO₂ sensor attached to an airway adapter directly inserted into the patient's breathing system.
 - 4.7.1.2 Connect the necessary sensor to patient's monitor.
 - 4.7.1.3 Perform a zero calibration. When performing a zero calibration, disconnect the transducer from the patient's airway.
 - 4.7.1.4 Make sure there is no leakages in the airway then start the measurement.
 - 4.7.1.5 Always position the sensor with the adaptor in an upright position to avoid collection of fluids on the windows of the adaptor as these will obstruct the analysis.
- 4.7.2 Side stream/ micro stream measurement samples, expired patient gas at a constant sample flow from the patient's airway and analyse it with a CO₂ sensor.
 - 4.7.2.1 Connect the necessary sensor with a water trap component.

- 4.7.2.2 After start up' procedure is finished, 'warm up' to reach the operating temperature. Do not perform CO₂ measurements during warm up, the measurement may be compromised.
- 4.7.2.3 Perform CO₂ measurements when 'warm up' is finished.
- 4.7.2.4 Drain the collected water when it reaches a certain amount to avoid blocking the airway. The water trap collects water drops condensed in the sampling line and therefore prevents them from entering the device.
- 4.7.3 Document end tidal CO₂ value, fraction of inspired oxygen.

4.8 Intake and output (I and O).

- 4.8.1 Measure intake and output in millimetre (ml) metric system.
 - 4.8.1.1 All of the following must be recorded as fluid intake.
 - 4.8.1.1.1 Oral fluids/ foods that are tend to become fluid at room temperature.
 - 4.8.1.1.2 Tube Feedings
 - 4.8.1.1.3 Parenteral Fluids
 - 4.8.1.1.4 Intravenous Medications
 - 4.8.1.1.5 Blood Transfusions
 - 4.8.1.1.6 Arterial and Central Venous Catheter Flushes
 - 4.8.1.1.7 Catheter or Tube Irrigants
 - 4.8.1.2 All of the following must be measure as output:
 - 4.8.1.2.1 Vomits and Feces
 - 4.8.1.2.2 Urinary Output
 - 4.8.1.2.3 Gastric Drain and Aspiration
 - 4.8.1.2.4 Intestinal Drainage
 - 4.8.1.2.5 Intercoastal Chest Drainage
 - 4.8.1.2.6 Wound Drainage and Fistulas
- 4.8.2 Aspirate the stomach contents. Either continuous or intermittent aspiration as ordered by physician.
 - 4.8.2.1 For intermittent gastric feeding, aspirate the gastric residual every 4 – 6 hours.
 - 4.8.2.2 For continuous gastric feeding, verify physician's order whether to interrupt feeding and frequency of aspiration.
 - 4.8.2.3 Record the amount and characteristics of the gastric residual. Hold and notify the physician if residual gastric contents exceed 20% from the amount of intermittent tube feeding.
- 4.8.3 Urinary output monitoring:
 - 4.8.3.1 Drain and record hourly urine output for patients on close output monitoring. Monitor trends of urine output.
 - 4.8.3.2 Compute urine output in ml/kg/hr. inform physician if output is < 1 ml/ kg/hr or >5ml/kg/hr.
 - 4.8.3.3 Weigh soaked diaper then subtract with same kind dry (unsoiled) diaper in milligram then record as millimetre.
- 4.8.4 Record intake and output hourly, every shift, 24 hour total will be done at 0700H and fluid balance must be determined and shall be written in red ink pen as positive or negative.

4.9 Body weight monitoring:

- 4.9.1 Weigh all patients during admission and frequency of weighing will be as per Physician's order. Weight will be recorded on the initial assessment form and on flow sheet.
- 4.9.2 Obtain accurate weight measurements in a calibrated scale before each use.
- 4.9.3 Compare previous body weight with the current obtained weight and document 'increase', 'decrease' 'the same' and document accordingly.

4.10 Blood Gases:

- 4.10.1 Blood gases are helpful in determining the adequacy of respiratory function oxygenation and ventilation as well as acid-base balance' Blood gases can be formed from arterial venous or capillary specimens.
- 4.10.2 Frequency of blood gas evaluation and re-evaluation is based on specific physician's order.

- 4.10.3 Blood gases are repeated within one hour of a ventilator change for acute admissions or unstable patients and to evaluate respiratory status following spontaneous breathing trials.
- 4.10.4 PRN blood gases are repeated for evidence of respiratory distress, to evaluate or monitor acid-base disturbances.
- 4.11 ECG: Patients have three electrodes placed: the right arm / right chest, left arm / left chest, and left lower abdomen / left leg. The monitor can be adjusted to visualize either leads I, II, or III. For patients that are having active arrhythmias, a 12-lead ECG must be acquired to fully evaluate the abnormal rhythm. Multiple hours of patient's vitals and ECG recordings are accessible from the Wall mounted cardiac monitor.
 - 4.12 Check frequently for proper placement of an airway.
 - 4.13 Check patient's response to mechanical ventilator settings.
 - 4.14 Monitor blood gases analysis as per Physician's order.
 - 4.15 Monitor blood investigations as per Physician's order and according to pediatric protocol.
 - 4.16 Write nursing care plan according to identified patient's problem through nursing process approach.
 - 4.17 Document in the nurses notes and forms the patient condition, all the treatment given and nursing care rendered and patient's tolerance to procedure.

5. MATERIAL AND EQUIPMENT:

- 5.1 Cardiac Monitor
- 5.2 Pulse Oximeter
- 5.3 Stethoscope
- 5.4 Thermometer
- 5.5 CVP Monitoring Equipment
- 5.6 Blood Tubes
- 5.7 Resuscitation Equipment
- 5.8 Arterial Line Equipment
- 5.9 Weighing Scale
- 5.10 Heparinized Syringe
- 5.11 Nasogastric Tube
- 5.12 CO₂ Detector

6. RESPONSIBILITIES:

- 6.1 Paediatric Nurses

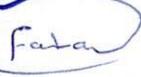
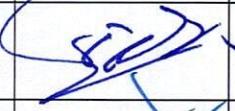
7. APPENDICES:

- 7.1 Nurses Progress Notes

8. REFERENCES:

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- 8.4 Kingdom of Saudi Arabia, Ministry of Health, Qatifah cluster, PICU protocol in Qatifah central Hospital, 2024

9. APPROVALS:

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