Pre & post operative care for children

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Objectives

- At the end of session, student will be able to:
  - Identify pre operative, intra operative & post operative care of children
  - Explain Care immediately after surgery
  - Know complication prevention

Outline

- Preoperative care
- Intra operative care
- Post operative care
- Immediate care after surgery
- Prevention of complication
- Common post operative complications

Care before, during and after surgery

- Good surgical care neither begins nor ends with the procedure.
- In most instances, it is the preparation for surgery, the anesthetic and the postoperative care that ensure a good outcome.

Preoperative care

- Both the child and the parents should be prepared for the procedure and must consent.
- Explain why the procedure is needed, the anticipated outcome and the potential risks and benefits.
- Ensure that the child is medically fit for an operation: Correct any fluid deficit and resuscitate as appropriate before an emergency procedure (IV bolus of normal saline, 10–20 ml/kg, repeated as needed).

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- Restoration of urine output implies adequate volume resuscitation.
- **Correct anemia.**
- Severe anemia interferes with oxygen transport. As a consequence, the heart must pump more blood.
- Surgery may cause blood loss, and the anesthetic may affect oxygen transport in the blood. Ideally, the child’s Hgb should be checked to ensure that it is normal for the age and population.
- Reserve blood transfusions for situations in which anemia must be corrected quickly, e.g. emergency surgery.
- In children undergoing elective surgery, correct anemia with oral medications.

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- Check that the child is in the best nutritional state possible. Good nutrition is needed to heal wounds.
- Check that the child has an empty stomach before a general anesthetic.
- **Infants < 12 months:** the child should be given no solids orally for 8 h, no formula for 6 h, no clear liquids for 4 h or no breast milk for 4 h before the operation. If prolonged periods of fasting are anticipated (> 6 h), give IV fluids that contain glucose.

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- Preoperative laboratory screening is generally not essential; however, carry out the following if possible:
- **Infants < 6 months:** check Hgb :
- **Children 6 months to 12 years:** minor surgery (e.g. hernia repair): no investigations; major surgery: check Hgb, group and cross-match blood for possible transfusion.
- Other investigations may be indicated after full clinical examination of the child.

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- Preoperative antibiotics should be given for: Infected and contaminated cases (e.g. those requiring bowel or bladder surgery).
- ✓ **Bowel:** give ampicillin (25–50 mg/kg IM or IV four times a day), gentamicin (7.5 mg/kg IM or IV once a day) and metronidazole (10 mg/ kg three times a day) before and for 3–5 days after the operation.
- ✓ **Urinary tract:** give ampicillin (50 mg/kg IM or IV four times a day) and gentamicin (7.5 mg/kg IM or IV once a day) before and for 3–5 days after the operation.

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- Children at risk for endocarditis (children with congenital heart disease or valvular heart disease) undergoing dental, oral, respiratory or esophageal procedures: Give amoxicillin at 50 mg/kg orally before the operation or, if the child is unable to take oral medications, ampicillin at 50 mg/kg IV within 30 min of surgery.
- For major surgery, give premedication to allay anxiety.

Intra operative care

- Successful procedures require teamwork and careful planning.
- The operating room staff should function as a team, including surgeons, anesthesia staff, nurses, scrub technicians and others.
- Ensure that essential supplies are readily available before the start of the operation.

Post operative care

- Prevent hypothermia in the operating room by maintaining a temperature > 28 °C when operating on an infant or small child, and cover the exposed parts of the child.
- Use warmed fluids (but not too hot).
- Avoid long procedures (> 1 h) unless the child can be kept warm.
- Monitor the child’s temperature as frequently as possible and at completion of the operation. Preferably use a low-reading thermometer.

Hypoglycemia

- Infants and children are at risk for hypoglycemia because of their limited ability to use fat and protein to synthesize glucose.
- Use glucose infusions during anesthesia to help maintain the blood sugar level. For most pediatric operations, other than minor ones, give Ringer’s lactate or normal saline with 5% glucose at a rate of 5 ml/kg per h, in addition to replacing the measured fluid losses.
- Check blood glucose regularly, as the signs of hypoglycemia might be masked by anesthesia.

Blood loss

- Children have smaller blood volumes than adults, so even small amounts of blood loss can be life-threatening, especially if the child is already anemic.
- Measure blood loss during operations as accurately as possible.
- Consider blood transfusion if the blood loss exceeds 10% of blood volume.
- Have blood available in the operating room if blood loss is anticipated.

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- Blood volume of children by age and ml/kg of body weight:-
  - Neonate 85–90
  - Children 80
  - Adults 70
- Communicate to the family the outcome of the operation, any problems encountered during the procedure and the expected postoperative course.

Immediately after surgery

- Ensure that the child recovers safely from the anesthesia.
- The patient should be kept on the ward or recovery area where she or he can be adequately monitored, with clear orders to:- monitor the airway, breathing and circulation
- Observe vital signs: temperature, pulse, respiratory rate and blood pressure (with the correct size of cuff. Observations should be made more often if there is a change from a normal to an abnormal value.

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- Monitor oxygen saturation (normal > 94%) after a general anesthesia. Give oxygen if required.
- Observe the patient closely until the effect of the anesthetic has worn off.
- Normal pulse rate and blood pressure in children
- **Age (years), pulse rate(average) & systolic BP(mmhg)**

✓ 0-1	100-160	>60
✓ 1-3	90-150	>70
✓ 3-6	80-140	>75

Fluid management

- Postoperatively, children commonly require more than maintenance fluid. Children who have undergone abdominal operations typically require 150% of baseline requirements and even larger amounts if peritonitis is present.
- The preferred iv fluids are ringer’s lactate with 5% glucose, normal saline with 5% glucose or half-normal saline with 5% glucose.

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- Note that normal saline and Ringer’s lactate do not contain glucose and are therefore a risk in hypoglycemia; large amounts of 5% glucose contain no sodium and can produce hyponatremia and cerebral edema. Monitor fluid status closely.
- Record inputs and outputs (IV fluids, nasogastric drainage, vomit, urine drain outputs) every 4–6 h. Urine output is the most sensitive indicator of fluid status in a child:
- Normal urine output: infants, 1–2 ml/kg per h; children, 1 ml/kg per h.

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- If urinary retention is suspected, pass a urinary catheter.
- This also allows hourly measurements of urine output, which can be valuable for severely ill children.
- Suspect urinary retention if the bladder is palpable or the child is unable to void urine.

Pain control

- Have a plan for postoperative pain management.
- Mild pain Give paracetamol (10–15 mg/kg every 4–6 h) by mouth or rectally. Oral paracetamol can be given several hours before the operation or rectally at the completion of surgery.
- Severe pain Give IV narcotic analgesics (IM injections are painful) – Morphine sulfate, 0.05–0.1 mg/kg IV every 2–4 h.

Nutrition

- Many surgical conditions increase caloric needs or prevent adequate nutritional intake. Many children with surgical problems present in a debilitated state. Poor nutrition adversely affects their response to injury and delays wound healing.
- Feed children as soon as possible after surgery.
- Provide a high-calorie diet containing adequate protein and vitamin supplements.
- Consider feeding by nasogastric tube for

Prevention of complications

- Encourage early mobilization: deep breathing and coughing – active daily exercise
- Move joints passively – muscular strengthening – provide walking aids, such as canes, crutches and walkers, with instructions for their use
- Prevent skin breakdown and pressure sores: Turn the patient frequently.
- Keep urine and faeces off skin.

Common postoperative problems

- Tachycardia (raised pulse rate) may be caused by pain, hypovolaemia, anaemia, fever, hypoglycemia or infection.
- ✓ Examine the child: Review the child's pre-operative and intra-operative care.
- ✓ Monitor the response to pain medication, boluses of IV fluids, oxygen and IV transfusions, when appropriate.
- Bradycardia in a child should be considered a sign of hypoxia until proven otherwise.

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- Fever May be due to tissue injury, wound infection, pneumonia, internal abscess, urinary tract infection (from indwelling catheters), phlebitis (from an IV catheter site) or other concomitant infection (e.g. malaria).
- Low urine output may be due to hypovolaemia, urinary retention or renal failure; usually due to inadequate fluid resuscitation.

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- ✓ Examine the child: Review the child’s fluid record; If hypovolaemia is suspected, give normal saline (10–20 ml/kg) and repeat once (total highest safe level, 40 ml/kg; watch closely after first 20 ml/ kg for circulatory fluid overload), as needed.
- ✓ If urinary retention is suspected (the child is uncomfortable and has a full bladder on physical examination), pass a urinary catheter.

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- **Wound abscess**
- ✓ If there is pus or fluid, open and drain the wound. Remove infected skin or subcutaneous sutures, and debride the wound. Do not remove facial sutures.
- ✓ If there is an abscess without cellulites, antibiotics are not required: Place a damp, sterile normal saline dressing in the wound, and change the dressing every 24 h.
- ✓ If the infection is superficial and does not involve deep tissues, monitor for development of an abscess and give antibiotics: Give ampicillin (25–50 mg/kg IM

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- ✓ If the infection is deep, involves muscles and is causing necrosis (necrotizing fasciitis), give antibiotics until necrotic tissue has been removed and the patient is fever-free for 48 h. Give ampicillin (25–50 mg/kg IM or IV four times a day) plus gentamicin (7.5 mg/kg IM or IV once a day) and metronidazole (10 mg/kg three times a day).

BE HOLISTIC IN CARE!!!