GSR

Institute of Craniomaxillofacial and Facial Plastic Surgery

Pre and Post-Operative Protocol Manual

INDEX

GENERAL PREOPERATIVE & POSTOPERATIVE PROTOCOL

Comprehensive patient management can be divided into three phases as follows:

I. Preoperative Phase

II. Operative Phase

III. Postoperative Phase

I. Preoperative Phase- It includes all the preoperative workup required to diagnose the condition, formulate the treatment plan and preparation for the surgical procedure.

Preoperative phase workup includes:

1. Case History- Take detailed case history of the patient.

2. Physical Examination- Patient's evaluation includes general physical examination and assessment of various body systems like Central Nervous System (CNS), Respiratory System (RS), Cardiovascular System (CVS) etc. It also include evaluation and documentation of vital signs i.e. Temperature (Temp.), Blood Pressure (BP), Pulse Rate (PR), Respiratory Rate (RR), Weight (Wt). In patients with less body weight as compared to normal value for a particular age group, the dose of the drugs must be reduced based on body weight of the patient.

3. Special Investigations- If required for diagnosis.

4. Definitive Diagnosis- Based on the above findings establish definitive diagnosis.

5. Treatment Plan- Formulate the treatment plan. Complete management of a patient may require staged surgeries at different age group. For example, patient

of cleft lip and palate first require management of cleft lip at a particular age group, followed by cleft palate repair after some time.

6. Referal- Decide for any referral if required: For example Pediatric, Internal Medicine, Speech Therapy, Orthodontic, ENT evaluation.

7. Advice Routine Blood Investigations & Viral Markers- Hemoglobin (Hb), Packed Cell Volume (PCV), Blood Grouping & Rhesus Factor (Rh), Red Blood Cells Count (RBCs Count), Total Leucocytes Count (TLC), Differential Leucocytes Count (DLC), Platelet Count (PC), Bleeding Time (BT), Clotting Time (CT), Hepatitis B- Surface Antigen (HB_S-Ag), Human Immunodeficiency Virus I & II (HIV- I, HIV- II).

8. Special Blood Investigations- It may be required in some cases. For example liver functions tests in case of history of chronic alcoholism, blood sugar evaluation in case of history of diabetes.

9. Radiological Examination- Radiograph to be taken depends on the surgical procedure being performed. It not only helps in diagnosis but also in formulating treatment plan.

10. Photographs- Preoperative photographs are essential from record point of view.

11. Specific Requirement- Any specific requirement must be taken into account, for example:

- **For Orthognathic Surgery-** 2 sets of impressions, Study Models, 2 splints each with wire and loops and palatal bar.
- **For Distraction Osteogenesis-** 2 sets of impressions, Study Models, 2 splints each with wire and loops and palatal bar.
- **For Orthognathic Surgery and Distraction Osteogenesis protocol:**
    - Injection Vitamin B12(MEAXON GOLD) (IM) weekly once for 6 weeks
    - Injection Vitamin D (ARACHITOL -6L IU) (IM) once in a year
    - Tab UPRISE D (60,000 IU) weekly once for 6 weeks

- Tab.Irocafe (Iron supplement) once in a day for 60days
- Syp. Zincovit 2tablespoon once in a day for 60 days
- Syp Dexorange 2tablespoon once in a day for 60 days
- Protein supplements (2 scoops with milk) for 30 days
- Protein rich diet

12. Patient's & Parent's Counseling

- Discuss in detail about the patient's problem and the treatment alternatives available to them.
- Inform about the potential complications of the general anesthesia.
- Inform about the potential benefits and complications of the surgical procedure.
- Explain about requirement for additional surgical procedures that may be required based on the surgeon's assessment on OT table. For example, need for auricular grafting during rhinoplasty, need for buccal myomucosal flap during soft palatal repair etc.
- Inform about the general complications which are common to all surgical procedures like swelling, infection, wound dehiscence etc, as well as specific complications related to the particular surgical procedure like fistula formation in palatal repairs.
- Inform about the realistic goals which can be achieved after surgery.
- Emphasize on the need for patient's as well as parent's compliance to get good results.

Note- Patient's & parent's counseling session must be video recorded, and language of conversation should be based on patient's/ parent's understanding.

13. Documentation

- Make a patient's record file and document patient's case history in detail, document about the findings of physical examination; attach blood investigations, radiographs and other records.
- Take consent for both general anesthesia procedure as well as the

surgical procedure in patient's/ parent's language. Consent should be taken from the patient in case the patient is an adult or from the parents if the patient is minor.

- Brief documentation of case history, findings of physical examination, blood investigations, and radiological findings should also be done into the patient's green booklet (which will be given to the patient at the time of discharge).

14. Pre Anesthetic Check (PAC)- PAC is essential for any surgical procedure to be done under local or general anesthesia. Once the patient is physically evaluated by the anesthetist, take clearance for the surgical procedure.

15. Fitness for Surgery- It will be given to the patient after physical examination by the treating surgeon, anesthetists and specialty doctor for example pediatrician in case of children. Once clearance will be given by all the specialists in consideration, the patient can be posted for the surgery.

16. Posting Orders- It should mention about:

- Name, age, sex of the patient.
- Diagnosis and treatment plan.
- Date & time of surgery.
- **Nil per Os (NPO) Or Nothing By Mouth (NBM) Instructions for every patients.**

TABLE 1. SUMMARY OF FASTING RECOMMENDATIONS TO REDUCE THE RISK OF PULMONARY ASPIRATION[35]

Ingested material	*Minimum fasting period (hours)*[a]
Clear liquids[b]	2
Human breastmilk	4
Infant formula	6
Non-human milks[c]	6
Light meal[d]	6

These recommendations apply to healthy patients who are undergoing elective procedures. They are not intended for women in labor. Following the guidelines does not guarantee complete gastric emptying.

[a]The fasting periods noted above apply to all ages.

[b]Examples of clear liquids include water, fruit juices without pulp, carbonated beverages, clear tea, and black coffee.

[c]Because non-human milk is similar to solids in gastric emptying time, the amount ingested must be considered when determining an appropriate fasting period.

[d]A light meal typically consists of toast and clear liquids. Meals that Include fried or fatty foods or meat may prolong gastric emptying time. Both the amount and type of foods ingested must be considered when determining an appropriate fasting period.

- The posting orders should be given to the doctor on duty (night before the day of surgery). It is the responsibility of the doctor on duty to give clear NPO/ NBM instructions to the patient and parents as per the posting orders.
- **Any specific Instruction-** For example, Shampoo hair in case of midface distraction requiring temporal placement of screws, head bath etc.
- Inform operation theatre (OT) staff regarding the patients posted for the surgery one day prior to the surgery.

17. Preoperative Work Up: "Ensure that ..... "

- All the documentations (patient's case record file, routine blood investigations, special investigations, radiological examinations, photographs) are complete.
- Video counseling recorded.
- Consent is taken in written.
- Pre Anesthetic Check (PAC) done
- **Fitness for surgery-** Clearance taken from anesthetist, treating surgeon, pediatrician.
- Surgical armamentarium required is arranged.
- Posting orders given to the doctor on duty.
- OT staff informed.

II. Operative Phase- Operative management of the patient is the responsibility of the anesthetist, anesthesia assistant, treating surgeon, assisting doctElectral and helping OT staff. The basic principle of surgery is to follow strict sterilization protocol throughout the surgery period. Immediately after the completion of the

surgical procedure the documentation regarding the surgical procedure is essential.

1. Duty of Surgeon

- The surgeon must document the surgical notes in the patient's record file.
- Post-operative instructions must be written.
- **Drug Prescription-** Drugs to be given postoperatively must be prescribed in standardized format. It should include the name of the drug, dose, route, frequency and duration of drug administration.
- Counter sign the surgical consumable materials used during surgery.

2. Duty of Anesthetist

- The attending anesthetist must document the complete anesthesia notes in the patient's record file.
- Counter sign the anesthesia consumable materials used during surgery.

3. Duty of OT Staff

- OT staff should enter the operated case record in the OT register. It includes documentation regarding patient's particulars, diagnosis, surgical procedure done, name of the attending anesthetist, treating surgeon and assisting doctElectral.
- OT staff should also record the consumable materials used during the surgery. OT staff must ensure that the consumable form must be counter signed by the chief surgeon and anesthetist.

III. Postoperative Phase- This phase of patient management includes:

A. Intensive Care Unit (ICU) Phase

B. Ward Phase

C. Postoperative Follow up Examination Phase

A. Intensive Care Unit (ICU) Phase

- In this phase the ICU staff must strictly follow the instructions given to them by the treating surgeon. **The routine post surgical instructions are as follows-**

- 100% oxygen administration initially at 3 L/minute & is gradually tapered as per the anesthetist's advice.
- NBM period for 3-4 hours as per anesthetist' advice.
- Start cold clear liquids and maintain adequate fluid intake after NBM period is over.
- Regular monitoring of vital signs and urine output.
- Administer drugs to the patient as per prescription.
- Observe operative site for any active bleeding.
- Shift the patient to ward after 4 hrs if patient is stable and fit.
- **Note-** After procedures done under local anesthesia, the patient can consume cold liquid diet once effect of local anesthesia wears off.

- Inform doctor on duty if the vital signs are not in normal range or any other complication is observed on clinical examination.
- ICU staff should assist the doctor on duty for management of any complication that may occur during ICU phase.
- Ensure safety of the patient and safe transfer of the patient to the wards.

B. Ward Phase

- In this phase the ward nursing staff must strictly follow the instructions provided to them by the treating surgeon. **The routine post surgical instructions are as follows-**

- Maintain adequate fluid intake. Diet of patient should be as per the advice of doctor.

- Regular monitoring of vital signs and urine output..
- Observe operative site for any active bleeding.
- Administer drugs to the patient as per prescription.

➢ Inform doctor on duty if the vital signs are not in normal range or any other complication is observed on clinical examination.

➢ Ward staff should assist the doctor on duty for management of any complication that may occur during patient's stay in wards.

➢ Ensure safety of the patient.

Discharge

- The time of discharge depends on the surgical procedure being performed and the fitness of the patient. The criteria for fitness should be based on the monitoring of the vital signs and clinical examination. For procedure done under local anesthesia the patient can be discharged on the same day if the patient is fit. For procedures done under general anesthesia, the patient can be discharged after 1 or 2 days based on clinical evaluation.
- Discharge summary to be written in the clinical record book (Green Book) and handed over to the patient or attendant at the time of discharge.
- Discharge summary includes documentation regarding procedure performed, name of the chief surgeon, assisting surgeons, date of admission, surgery and discharge. It should also include documentation of the drugs to be taken by the patient at home after discharge. Separate drug prescription must also be handed over to patient on prescription pad. The date and time for follow up examination should be mentioned clearly and must be countersigned by doctor.
- Postoperative instructions must be explained to the patient/ parents verbally and should also be given in printed format in patient's/ parent's language.

- IV cannula/ urinary catheter (if inserted) should be removed at the time of discharge.

C. Postoperative Follow up Examination Phase- Postoperatively, the day of follow up examination depend on the type of surgery being performed. It can be done early if patient noticed any complication related to the surgery.

- This phase of patient management include recall examination of the patient to examine surgical site for recovery.
- To look for any local complication that may occur at home and its early management, for example, wound dehiscence, infection etc.
- To check for patient's compliance regarding postoperative instructions. For example, oral hygiene maintenance after intraoral surgical procedures. If patient/ parents are negligent, then strictly emphasizes on the necessity to follow them to get good results.
- To evaluate patient's recovery after surgical trauma in general.
- To remove sutures (If applicable).
- To remove/ change surgical dressings (if applicable).

Note- Patient's counseling is an important part during follow up examination as these patients often require multiple staged surgeries.

SPECIFIC PROCEDURE RELATED INSTRUCTIONS AND GUIDELINES

CLEFT LIP REPAIR (CHEILOPLASTY)

Please read the general patient management protocol **[Page 3-11]** first followed by procedure related specific guidelines. The specific instructions and guidelines related to cheiloplasty procedure are as follows:

I. Patient's & Parent's Counseling

- Cleft lip repair is an esthetical procedure, it may require revision surgery.
- Always explain regarding the postsurgical scar and tendency for hypertrophic scarring in some patients.
- Explain regarding the possible need for nasal deformity correction (rhinoplasty) in future.
- Cleft lip may be associated with cleft palate or alveolus. Parents must be informed regarding the staged management of these problems at different age groups.
- Inform about the realistic goals which can be achieved after surgery.

II. Postoperative Drug Prescription (Drugs to be given in hospital)

1. Injection Taxim (Dilute in 100ml NS give it for about 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
< 2 Months	100 mg/Kg/day	I.V.	B.D.	2 Days
3-6 Months	100 mg/Kg/day	I.V.	B.D.	2 Days
7-8 Months	100 mg/Kg/day	I.V.	B.D.	2 Days
9 Months	100 mg/Kg/day	I.V.	B.D.	2 Days
1 Year	100 mg/Kg/day	I.V.	B.D.	2 Days
2-4 Years	100 mg/Kg/day	I.V.	B.D.	2 Days
5-6 Years	100 mg/Kg/day	I.V.	B.D.	2 Days
7-8 Years	100 mg/Kg/day	I.V.	B.D.	2 Days
9-12 Years	100 mg/Kg/day	I.V.	B.D.	2 Days
≥ 13 Years	100 mg/Kg/day	I.V.	B.D.	2 Days

2. Syrup Ibugesic Plus Or Tablet Brufen

Age	Dose	Route	Frequency	Duration
< 1 Year	10mg/kg/dose	Oral	T.D.S.	2 Days
1-2 Years	10mg/kg/dose	Oral	T.D.S.	2 Days
2-3 Years	10mg/kg/dose	Oral	T.D.S.	2 Days
4-5 Years	10mg/kg/dose	Oral	T.D.S.	2 Days
6-12 Years	10mg/kg/dose	Oral	T.D.S.	2 Days
> 12 Years	10mg/kg/dose	Oral	T.D.S.	2 Days

III. Specific Postoperative Instructions to be Followed During ICU & Ward Phase-

1. Diet- [After Completion of NPO or NBM Period]

- After NPO/ NBM period is over, the infant may be offered a feeding of clear liquid (sugar water, Glucon-D water, ELECTRAL solution). When this is tolerated, they may resume mother's feed or their regular milk formula. The Mead Johnson Cleft lip/palate Nurser with a large cross cut opening (such that there is a steady flow of liquid through the opening when the bottle is held upside down) should be acceptable. A syringe with a short piece of soft rubber tubing can also be used for feeding.
- Hold the child in a semi-sitting position and feed him slowly. Small frequent feedings may be necessary.
- Do not use pacifiers after surgery.
- After each feeding, give your child to drink about 5-15 millilitres of water. Using water will "cleanse" the area and help to remove food that could potentially lead to an infection.

2. Child Positioning

- A child who has had a cleft lip repair should be positioned on their side or back to keep them from rubbing their face in the bed.

- It is important to keep the child from hurting the incision or putting hands or toys in their mouth. Parents should physically restrain child's arms to avoid damage to surgical site.
- It is also important to keep the child from rolling over onto his or her side or stomach, as pressure against the surgical area could cause injury.
- Do not hold the child with their face towards your shoulder. They can bump their nose and harm their incision.

3. Medications

- Administer medications as prescribed by the doctor.

IV. Discharge-

A. Drug Prescription- Medicines to be used at home.

1. Syrup Augmentin/ Tablet Augmentin

Age	Dose	Route	Frequency	Duration
3 Months	40mg/kg/day	Oral	B.D.	5 Days
6 Months	40mg/kg/day	Oral	B.D.	5 Days
9 Months	40mg/kg/day	Oral	B.D.	5 Days
1 Year	40mg/kg/day	Oral	B.D.	5 Days
2 Year	40mg/kg/day	Oral	B.D.	5 Days
3 Years	40mg/kg/day	Oral	B.D.	5 Days
4-5 Years	40mg/kg/day	Oral	B.D.	5 Days
6-12 Years	40mg/kg/day	Oral	B.D.	5 Days
≥ 13 Years	40mg/kg/day	Oral	B.D.	5 Days

2. Syrup Ibugesic Plus Or Tablet Brufen

Age	Dose	Route	Frequency	Duration
< 1 Year	10mg/kg/dose	Oral	T.D.S.	5 Days
1-2 Years	10mg/kg/dose	Oral	T.D.S.	5 Days
2-3 Years	10mg/kg/dose	Oral	T.D.S.	5 Days
4-5 Years	10mg/kg/dose	Oral	T.D.S.	5 Days
6-12 Years	10mg/kg/dose	Oral	T.D.S.	5 Days
> 12 Years	10mg/kg/dose	Oral	T.D.S.	5 Days

3. Syrup Zincovit or Tab. Zincovit

Age	Dose	Route	Frequency	Duration
< 6 Years	5 mL Syrup	Oral	O.D.	60 Days
≥ 6 Years	1 Tablet	Oral	O.D.	60 Days

4. Soframycin Ointment- For topical application over the surgical repaired lip twice daily after the removal of soframycin based pressure dressing; to be continued for 15 days.

B. Directions for Post-Operative Care: Following Cleft Lip Repair

1. Feeding Instructions

- During the first week after surgery, feed the infant **either** with a syringe fitted with special soft tubing, or a special cleft lip feeder (e.g., a Haberman feeder). The goal is to prevent the child from sucking forcefully, and thus protecting the newly repaired lip. Formula and pumped breast milk can both be given in the feeder.
- The child should be fed in a sitting position, fed slowly and carefully, allowing time for burping. Feeding this way is necessary for 2-3 weeks.
- If the child is breastfeeding, he/she may continue to do so at this time.
- Do not use Pacifiers for at least 15 days.
- Older children may drink from a cup.
- Do not use forks, straws, chopsticks, or other utensils that can harm incisions.
- After each feeding, give your child to drink about 5-15 milliliters of water.
- Using water will "cleanse" the area and help to remove food that could potentially lead to an infection.

2. Activity

- Any object your child puts in or around the mouth (including little fingers) can ruin the repair. Therefore, physically restrain the child from putting any object in mouth.

3. Child Positioning

- It is important to avoid damage to the surgical site. Position the child in such a way to avoid pressure against the lip.

4. Oral Hygiene

- Following surgery, the lower teeth may be brushed, and may begin to brush the upper teeth 2 weeks after surgery with a foam or soft bristle toothbrush.
- In case of children in gum pad stage, oral hygiene can be maintained by cleaning the gum pads with gentle wiping with clean wet cloth.

5. Relief of Pain & Discomfort

- You can expect child to have mild to moderate pain for a few days. Give analgesic syrup as prescribed.
- Periods of irritability may be due to the arm restraints or hunger. Tender loving care is recommended. Cuddle and talk to child often. Offer frequent small feedings if necessary.

6. Preventing Infection after Cleft Lip Repair

- Infection is a potential complication of any surgery. Short course of antibiotics is usually prescribed to prevent infection after the surgical procedure. Make sure that medication is given to the child on time, as directed by the physician.

7. Wound Care

- A soframycin based pressure dressing is applied over the suture line. It will become loose over a period of few days and require removal. Carefully remove the dressing without damaging the surgical area.

- It is important to keep the stitches clean and without crusting. The suture line should be cleaned frequently to prevent crust formation and infection. You may use a cotton-tipped applicator and normal saline.
- Clean the suture line as advised and apply soframycin ointment over the wound. A thin layer of ointment will be necessary.
- This will continue 2-3 times a day until the stitches are removed 15 days after surgery.
- Nasal pack if placed should be kept for 15 days or as suggested.

8. Problems to Report to Your Doctor Right Away

- A fever (temperature over 100.4°F).
- Severe pain not relieved by the pain medicine.
- Vomiting and/or diarrhoea.
- Bleeding from and/or any change in the suture line (area of surgery).
- Any direct injury to the repaired lip.
- Drainage from the incision that looks like pus or smells bad.

V. Postoperative Follow up Examination Phase

A. First Review-

- After 15 days for suture removal.
- Nasal pack should be removed if it was inserted during surgery.
- Advice lip massage with **contractubex ointment** twice daily for 6 months.

B. Second Review-

- After 6 months.

PALATOPLASTY PROCEDURES- SINGLE STAGE PALATOPLASTY, ISOLATED SOFT OR HARD PALATOPLASTY, REDO PALATOPLASTY, FISTULA REPAIRS.

Please read the general patient management protocol **[Page 3-11]** first followed by procedure related specific guidelines. The specific instructions and guidelines related to single stage palatoplasty, isolated soft or hard palatoplasty and fistula repair are as follows:

I. Patient's & Parent's Counseling

- Cleft palatal repair have some specific surgery related complications. There are chances of oro-nasal fistula formation requiring further surgical management.
- Recurrent hard palatal fistula repair may require tongue flap and there are associated morbidities related to tongue flap procedures.
- Palatal repairs require frequent follow up speech examinations.
- In case of velopharyngeal incompetence (VPI), Redo palatoplasty may be required to improve speech of the patient
- Explain regarding need of palatal pack in procedures involving hard palate for 5 days and importance of oral hygiene.
- Soft palatoplasty procedures may require use of buccal-myomucosal flap for surgical closure.

II. Postoperative Drug Prescription (Drugs to be given in hospital)

3. Injection Taxim (Dilute in 100ml NS give it for about 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
< 2 Months	100 mg/Kg/day	I.V.	B.D.	2 Days
3-6 Months	100 mg/Kg/day	I.V.	B.D.	2 Days
7-8 Months	100 mg/Kg/day	I.V.	B.D.	2 Days
9 Months	100 mg/Kg/day	I.V.	B.D.	2 Days
1 Year	100 mg/Kg/day	I.V.	B.D.	2 Days
2-4 Years	100 mg/Kg/day	I.V.	B.D.	2 Days

5-6 Years	100 mg/Kg/day	I.V.	B.D.	2 Days
7-8 Years	100 mg/Kg/day	I.V.	B.D.	2 Days
9-12 Years	100 mg/Kg/day	I.V.	B.D.	2 Days
≥ 13 Years	100 mg/Kg/day	I.V.	B.D.	2 Days

1. Syrup Metronidazole or Infusion Metrogyl

Age	Dose	Route	Frequency	Duration
≤ 1 Year	25-30mg/kg/day	Oral	T.D.S.	2 Days
2 Years	25-30mg/kg/day	Oral	T.D.S.	2 Days
3 Years	25-30mg/kg/day	Oral	T.D.S.	2 Days
4 Years	25-30mg/kg/day	Oral	T.D.S.	2 Days
5 Years	25-30mg/kg/day	Oral	T.D.S.	2 Days
6 Years	25-30mg/kg/day	Oral	T.D.S.	2 Days
7-11 Years	25-30mg/kg/day	I.V.	T.D.S.	2 Days
12-13 Years	25-30mg/kg/day	I.V.	T.D.S.	2 Days
≥ 14 Years	25-30mg/kg/day	I.V.	T.D.S.	2 Days

2.Syrup Ibugesic Plus Or Tablet Brufen For Mild Pain

Age	Dose	Route	Frequency	Duration
< 1 Year	10mg/kg/dose	Oral	T.D.S.	2 Days
1-2 Years	10mg/kg/dose	Oral	T.D.S.	2 Days
2-3 Years	10mg/kg/dose	Oral	T.D.S.	2 Days
4-5 Years	10mg/kg/dose	Oral	T.D.S.	2 Days
6-12 Years	10mg/kg/dose	Oral	T.D.S.	2 Days
> 12 Years	10mg/kg/dose	Oral	T.D.S.	2 Days

For Severe Pain Injection Voveran (Under supervision of fellow)

Age	Dose	Route	Frequency	Duration
6-9 Years	1.0 cc of Inj. Voveran	I.M.	B.D.	2 Days
10-13 Years	1.5 cc of Inj. Voveran	I.M.	B.D.	2 Days
14-15 Years	2.0 cc of Inj. Voveran	I.M.	B.D.	2 Days
16-17 Years	2.5 cc of Inj. Voveran	I.M.	B.D.	2 Days
≥18 Years	3.0 cc of Inj. Voveran	I.M.	B.D.	2 Days

3. Syrup Ranitidine Or Injection Ranitidine

Age	Dose	Route	Frequency	Duration
< 1 Year	4-8mg/kg	Oral	B.D.	2 Days
1-2 Years	4-8mg/kg	Oral	B.D.	2 Days
3-4 Years	4-8mg/kg	Oral	B.D.	2 Days
5-6 Years	4-8mg/kg	Oral	B.D.	2 Days
7-11 Years	4-8mg/kg	I.V.	B.D.	2 Days
12-13 Years	4-8mg/kg	I.V.	B.D.	2 Days
≥ 14 Years	4-8mg/kg	I.V.	B.D.	2 Days

III. Postoperative Instructions to be followed During ICU & Ward Phase-

1. Diet- [After Completion of NPO or NBM Period]

- After NBM period is over, the patient may be offered a feeding of clear liquid (sugar water, Glucon-D water, ELECTRAL solution). When this is tolerated, they may resume mother's feed or their regular milk formula. The Mead Johnson Nurser with a large cross cut opening (such that there is a steady flow of liquid through the opening when the bottle is held upside down) should be acceptable. A syringe with a short piece of soft rubber tubingcan also be used for feeding.
- Hold the child in a semi-sitting position and feed him slowly. Small frequent feedings may be necessary.
- Do not use pacifiers after surgery.
- After each feeding, give child to drink about 5-15 milliliters of water. Using water will "cleanse" the area and help to remove food that could potentially lead to an infection.

2. Medications

- Administer medications as prescribed by the doctor.

3. Physical Restraints

- It is important to keep the child from hurting the surgical site by putting hands or toys in their mouth. Parents should physically restrain child's arms to avoid damage to surgical site.

IV. Discharge-

A. Drug Prescription-

1. Syrup Augmentin/ Tablet Augmentin

B. Age	Dose	Route	Frequency	Duration
3 Months	40mg/kg/day	Oral	B.D.	5 Days
6 Months	40mg/kg/day	Oral	B.D.	5 Days
9 Months	40mg/kg/day	Oral	B.D.	5 Days
1 Year	40mg/kg/day	Oral	B.D.	5 Days
2 Year	40mg/kg/day	Oral	B.D.	5 Days
3 Years	40mg/kg/day	Oral	B.D.	5 Days
4-5 Years	40mg/kg/day	Oral	B.D.	5 Days
6-12 Years	40mg/kg/day	Oral	B.D.	5 Days
≥ 13 Years	40mg/kg/day	Oral	B.D.	5 Days

1. Syrup Metronidazole Or Tablet Metronidazole

Age	Dose	Route	Frequency	Duration
≤ 1 Year	25-30mg/kg/day	Oral	T.D.S.	5 Days
2 Years	25-30mg/kg/day	Oral	T.D.S.	5 Days
3 Years	25-30mg/kg/day	Oral	T.D.S.	5 Days
4 Years	25-30mg/kg/day	Oral	T.D.S.	5 Days
5 Years	25-30mg/kg/day	Oral	T.D.S.	5 Days
6 Years	25-30mg/kg/day	Oral	T.D.S.	5 Days
7-11 Years	25-30mg/kg/day	Oral	T.D.S.	5 Days
≥ 12 Years	25-30mg/kg/day	Oral	T.D.S.	5 Days

2. Ibugesic Plus Syrup Or Tablet Brufen

Age	Dose	Route	Frequency	Duration
< 1 Year	10mg/kg/day	Oral	T.D.S.	5 Days
1-2 Years	10mg/kg/day	Oral	T.D.S.	5 Days

2-3 Years	10mg/kg/day	Oral	T.D.S.	5 Days
4-5 Years	10mg/kg/day	Oral	T.D.S.	5 Days
6-12 Years	10mg/kg/day	Oral	T.D.S.	5 Days
> 12 Years	10mg/kg/day	Oral	T.D.S.	5 Days

3. Syrup Ranitidine Or Tablet Ranitidine

Age	Dose	Route	Frequency	Duration
≤ 9 Months	4-8mg/kg/dose	Oral	B.D.	5 Days
1-2 Years	4-8mg/kg/dose	Oral	B.D.	5 Days
3-4 Years	4-8mg/kg/dose	Oral	B.D.	5 Days
5-6 Years	4-8mg/kg/dose	Oral	B.D.	5 Days
7-13 Years	4-8mg/kg/dose	Oral	B.D.	5 Days
≥ 14 Years	4-8mg/kg/dose	Oral	B.D.	5 Days

4. Syrup Zincovit or Tab. Zincovit

Age	Dose	Route	Frequency	Duration
< 6 Years	5 mL Syrup	Oral	O.D.	60 Days
≥ 6 Years	1 Tablet	Oral	O.D.	60 Days

5. Chlorhexidine (0.2%)/ Betadine Mouth Wash - Two to three times a day for 1 Month.

C. Directions for Post-Operative Care Following Palatal Repair Procedures:

1. Feeding Instructions

- Give only **clean, clear and filtered liquids** like jawa (rice water), clear fruit juices, milk alternatively every 1 hour **for 1 month**.
- Use of fibrous diet is strictly prohibited for 1 month.
- Infant can be fed **either** with a syringe fitted with special soft tubing, **or** a special cleft lip feeder (e.g., a Haberman feeder). The goal is to prevent child from sucking forcefully, and thus protect the newly repaired palate. Formula and pumped breast milk can both be given in the feeder.

- Child should be fed in a sitting position, fed slowly and carefully, allowing time for burping. Feeding this way is necessary for 1 month. If breastfeeding, it may be continued at this time.
- Do not use Pacifiers.
- Older children may drink from a cup.
- Do not use forks, straws, chopsticks, or other utensils that can harm their incisions.
- After each feeding, give the child to drink about 5-15 milliliters of water.
- Using water will "cleanse" the area and help to remove food that could potentially lead to an infection.

2. Activity

- Any object that child puts in or around the mouth (including little fingers) can ruin the repair. Therefore, physically restrain the child from putting any object in mouth.

3. Oral Hygiene

- Following surgery, patient can brush the teeth under parent's supervision.
- Make sure to use only a foam or soft bristle toothbrush for oral hygiene.
- Do not traumatize the surgical site during brushing.
- Use of betadine/ chlorhexidine mouth wash three to four times a day is highly beneficial [Use of mouth wash is based on the capability of the patient to do mouth rinses].

4. Relief of Pain & Discomfort

- It is expected from child to have mild to moderate pain for a few days. Give analgesic syrup as prescribed.
- Periods of irritability may be due to the arm restraints or hunger. Tender loving care is recommended. Cuddle and talk to child often. Offer frequent small feedings if necessary.

5. Preventing Infection after Palatal Repair

- Infection is a potential complication of any surgery. Short course of antibiotics is usually prescribed to prevent infection after the surgical procedure. Make sure that the medication to your child on time, as directed by the physician.

6. Problems to Report to Your Doctor Right Away

- A fever (temperature over 100.4°F).
- Severe pain not relieved by the pain medicine.
- Vomiting and/or diarrhea.
- Bleeding from area of surgery.

7. Return to Clinic/ Follow Up Examination

- You will be given an appointment to return to the clinic for a post-operative check when your child is discharged.

V. Postoperative Follow up Examination Phase

A. First Review-

- After 5 days for palatal pack removal for procedures involving hard palate.
- After 15 days if palatal pack is not placed during surgery.

B. Second Review-

- After 1 month.
- Then 6 months and 1 year.

SECONDARY ALVEOLAR BONE GRAFTING (SABG)

Please read the general patient management protocol **[Page 3-11]** first followed by procedure related specific guidelines. The specific instructions and guidelines related to SABG procedure are as follows:

I. Patient's & Parent's Counseling

- Explain the patient regarding need for bone grafting from right iliac region.
- Explain regarding the associated morbidities of iliac crest grafting such as gait disturbance, pain, altered sensation and infection.
- Explain regarding the possible need for orthodontic treatment.

II. Radiological Examination- Orthopantomogram (OPG)

III. Postoperative Drug Prescription (Drugs to be given in hospital)

1. Injection Taxim (Diluted in 100 ml of NS give it over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
7-8 Years	100mg/kg/day	I.V.	B.D.	2 Days
9-12 Years	100mg/kg/day	I.V.	B.D.	2 Days
≥ 13 Years	100mg/kg/day	I.V.	B.D.	2 Days

2. Infusion Metrogyl

Age	Dose	Route	Frequency	Duration
7-11 Years	25-30mg/kg/day	I.V.	T.D.S.	2 Days
12-13 Years	25-30mg/kg/day	I.V.	T.D.S.	2 Days
≥ 14 Years	25-30mg/kg/day	I.V.	T.D.S.	2 Days

1. Injection Lincomycin (Diluted in 100 ml of NS give it over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
< 15 Years	30-60mg/kg/day	I.V./I.M.	B.D.	2 Days
≥ 15 Years	30-60mg/kg/day	I.V./I.M.	B.D.	2 Days

3. Tablet Brufen for Mild Pain

Age	Dose	Route	Frequency	Duration
6-12 Years	200 mg Tablet	Oral	T.D.S.	2 Days
> 12 Years	400 mg Tablet	Oral	T.D.S.	2 Days

For Severe Pain Injection Voveran (under supervision of Fellow)

Age	Dose	Route	Frequency	Duration
6-9 Years	1 mg/kg/dose	I.M.	B.D.	2 Days
10-13 Years	1 mg/kg/dose	I.M.	B.D.	2 Days
14-15 Years	1 mg/kg/dose	I.M.	B.D.	2 Days
16-17 Years	1 mg/kg/dose	I.M.	B.D.	2 Days
≥18 Years	1 mg/kg/dose	I.M.	B.D.	2 Days

4. Injection Ranitidine

Age	Dose	Route	Frequency	Duration
7-11 Years	4-8mg/kg/dose	I.V.	B.D.	2 Days
12-13 Years	4-8mg/kg/dose	I.V.	B.D.	2 Days
≥ 14 Years	4-8mg/kg/dose	I.V.	B.D.	2 Days

IV. Postoperative Instructions to be followed During ICU & Ward Phase- Apart from routine post-surgical instructions, specific surgical procedure related postoperative instructions are as follows:

1. Diet

- After NBM period is over, the patient may be offered a feeding of clear liquid (sugar water, Glucon-D water). When this is tolerated, they may resume normal **soft and liquid diet for 1 month**.

2. Activity

- Patients were encouraged to mobilize on the second post-operative day with support from the assistants or nursing staff.
- Avoid lifting heavy weights, running, climbing stairs, playing outdoor games for 1 month.

3. Medications

- Administer medications as prescribed by the doctor.

V. Discharge-

A. Drug Prescription-

1. Tablet Augmentin

Age	Dose	Route	Frequency	Duration
6-12 Years	375 mg Tab	Oral	B.D.	5 Days
≥ 13 Years	625 mg Tab	Oral	B.D.	5 Days

2. Tablet Metronidazole

Age	Dose	Route	Frequency	Duration
7-11 Years	200 mg Tablet	Oral	T.D.S.	5 Days
≥ 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

3. Capsule Lincomycin

Age	Dose	Route	Frequency	Duration
8-18 Years	250 mg Tablet	Oral	B.D.	5 Days
≥ 19 Years	500 mg Tablet	Oral	B.D.	5 Days

4. Tablet Brufen

Age	Dose	Route	Frequency	Duration
6-12 Years	200 mg Tablet	Oral	T.D.S.	5 Days
> 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

5. Tablet Ranitidine

Age	Dose	Route	Frequency	Duration
7-13 Years	75 mg (½ Tablet)	Oral	B.D.	5 Days
≥ 14 Years	150 mg (1 Tablet)	Oral	B.D.	5 Days

6. Tab. Zincovit

Age	Dose	Route	Frequency	Duration
> 6 Years	1 Tablet	Oral	O.D.	60 Days

7. Chlorhexidine (0.2%)/ Betadine Mouth Wash- Two to three times a day for 1 Month

B. Directions for Post-Operative Care: Following SABG

1. Feeding Instructions

- After surgery, patient should consume soft semisolid diet for one month to avoid pain during mastication. They can resume to normal routine diet slowly after that.

2. Oral Hygiene

- Patient should brush the teeth with only a foam or soft bristle toothbrush for oral hygiene.
- Do not traumatize the surgical site during brushing.
- Use of betadine/ chlorhexidine mouth wash three to four times a day is highly beneficial.
- Additionally, warm saline rinses 5-6 times a day can be used for oral hygiene. Warm saline rinses should be used 24 hours after surgery.

3. Activity

- Patients were advised not to strain over the operated area for at least two weeks and avoid any strenuous physical activities (like running, jumping, weight lifting and sports) for minimum of 1-2 months post-operatively.

4. Medications

- Take medications as advised.

VI. Postoperative Follow up Examination Phase

A. First Review-

- After 15 days for iliac crest suture removal.

B. Second Review-

- After 6 months of first review.

RHINOPLASTY WITHOUT GRAFTING

RHINOPLASTY WITH RIB OR AURICULAR GRAFTING

Please read the general patient management protocol **[Page 3-11]** first followed by procedure related specific guidelines. The specific instructions and guidelines related to rhinoplasty procedure are as follows:

I. Patient's & Parent's Counseling

- Rhinoplasty is an esthetic procedure, it may require revision surgery.
- Always explain regarding the postsurgical scar and tendency for hypertrophic scarring in some patients.
- Inform patient regarding the necessity of nasal pack to be retained for 15 days. **[Note: In some cases nasal packing may be required for extended time period.]**
- Possibility of circumorbital swelling that will subside after 2-3 weeks.
- Inform about the realistic goals which can be achieved after surgery. Inform patient that final result of the surgery will be visible after 6-12 months.
- **Problems of Rib Cartilage Grafting-** If rhinoplasty procedure involve harvesting of rib graft, then explain the patient about costchondral grafting procedure and surgical complications like pleural tear, pneumothorax, hemothorax, need for drain, wound dehiscence, graft rejection and infection.
- **Problems of Auricular Cartilage Grafting-** If rhinoplasty procedure involve harvesting of auricular cartilage grafting then, explain regarding the possibility of necrosis at donor site, perforations for which daily dressing need to be done.

II. Postoperative Drug Prescription (Drugs to be given in hospital)

4. Injection Taxim (Dilute in 100ml NS give it for about 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
≥ 14 Years	100mg/kg/dose	I.V.	B.D.	2 Days

1. Infusion Metrogyl

Age	Dose	Route	Frequency	Duration
≥ 14 Years	25-30mg/kg/day	I.V.	T.D.S.	2 Days

2. Injection Lincomycin (Dilute in 100ml NS give it for about 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
≥ 15 Years	600 mg dose	I.V./ I.M.	B.D.	2 Days

3. Tablet Brufen For Mild Pain

Age	Dose	Route	Frequency	Duration
> 12 Years	400 mg Tablet	Oral	T.D.S.	2 Days

For Severe Pain Injection Voveran (Under supervision of fellow)

Age	Dose	Route	Frequency	Duration
14-15 Years	1mg/kg/dose	I.M.	B.D.	2 Days
16-17 Years	1mg/kg/dose	I.M.	B.D.	2 Days
≥18 Years	1mg/kg/dose	I.M.	B.D.	2 Days

4. Injection Ranitidine

Age	Dose	Route	Frequency	Duration
≥ 14 Years	2 cc Infusion	I.V.	B.D.	2 Days

III. Postoperative Instructions to be followed During ICU & Ward Phase-

1. Diet- [After Completion of NPO or NBM Period]

- Start with clear liquids first followed by fruit juices and thereafter semisolid diet as tolerated.
- Drink plenty of fluids following surgery, as dehydration can contribute to nausea.

2. Sleeping:

- It is best to sleep with the head elevated by at least two pillows, both to decrease the amount of swelling and to aid in the resolution of any swelling that does occur.

3. Medications

- Administer medications as prescribed by the doctor.

4. Other Instructions

- It is normal to have some nasal bleeding over the first twelve hours after surgery. It may be necessary to change the gauze drip-pad some times over that period.

IV. Discharge-

A. Drug Prescription-

1. Tablet Augmentin

Age	Dose	Route	Frequency	Duration
≥ 13 Years	625 mg Tab	Oral	B.D.	5 Days

2. Tablet Metronidazole

Age	Dose	Route	Frequency	Duration
≥ 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

3. Tablet Lincomycin

Age	Dose	Route	Frequency	Duration
14-18 Years	250 mg Tablet	Oral	B.D.	5 Days
≥ 19 Years	500 mg Tablet	Oral	B.D.	5 Days

4. Tablet Brufen

Age	Dose	Route	Frequency	Duration
> 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

5. Tablet Ranitidine

Age	Dose	Route	Frequency	Duration
≥ 14 Years	150 mg (1 Tablet)	Oral	B.D.	5 Days

6. Tab. Zincovit

Age	Dose	Route	Frequency	Duration
≥ 14 Years	1 Tablet	Oral	O.D.	60 Days

B. Directions for Post-Operative Care:

1. Sleeping

- During the first week, it is best to sleep with the head elevated by at least two pillows, both to decrease the amount of swelling and to aid in the resolution of any swelling that does occur.

2. Activity

- Limit your activity sharply over the first week following surgery. If you overexert yourself, bleeding or prolonged swelling may result.
- Avoid bending, lifting, pulling, pushing, straining and aerobic activities for 3 weeks.

- Avoid bending over or lifting heavy things for two weeks. Besides aggravating swelling, this can raise blood pressure and increase the chance of hemorrhage.
- Return to regular exercise 3 weeks after surgery. Ease into this, gradually increasing exercise level back to normal by 5-6 weeks from surgery.
- It takes 6 weeks for the nasal bones to fully heal. Slowly resume activity. Swimming is allowed after 6 weeks.
- Contact and semi-contact activities are to be avoided for 4-6 months.

3. Oral Intake

- Drink plenty of fluids following surgery, as dehydration can contribute to nausea.
- Soft and cold diet is recommended for first 24 hrs after surgery. After 24 hrs patient can take soft diet for few days and resume to normal diet as pain subsides.

4. Bathing

- You may bathe below the neck level while the cast/ nasal dressing are in place. These must remain dry.
- You may carefully wash your face with mild soap and clean wash cloth or cotton balls, but make sure the cast/ nasal dressing remains dry. It will be removed after 15 days.

5. Clothing:

- Wear a loose dress, or slacks and a blouse that buttons or zips down the front. You must not wear anything that pulls over the head or face.

6. Pain, Swelling, Bruising, Infection

- Most patients complain more of discomfort from nasal and sinus congestion than from pain. Any pain should be controlled via the prescribed medication.

- Swelling and bruising about the eyes and cheeks is variable. Swelling and bruising maximizes at about two to three days then subsides over the next 5-7 days.
- Do not worry if you have excess swelling around the eyes and cheeks. This will clear and not affect the final result. Bruising may persist a few days longer.
- Infection is also unusual. Fever, localized swelling with redness and tenderness may signify a developing infection and should be reported. Appropriate treatment will be initiated.

7. Skin Changes

- A natural reaction of all types of nasal skin to this surgery is a pronounced increase in nasal oiliness. Even skin that is usually dry will need to be wiped with an astringent on a cotton pad once or twice a day for two weeks or more. Another universal observation is the presence of flaking or peeling of the skin, much like that caused by sunburn. This also abates in about two weeks. Most discoloration is resolved in 7-10 days.

8. Other Common Instructions

- Do not blow your nose or sniff excessively as this will only irritate the healing tissues. If you must sneeze, open your mouth.
- The patient should try to avoid “sniffing“ (forcibly attempting to pull air in through the nose as some people do when they feel their nose is blocked) for the first week following surgery. Sniffing will not relieve the sensation of blockage, but will aggravate the sensation, because suction created on the inside will cause more swelling.
- Avoid rubbing the nostrils or the base of the nose with tissues or a handkerchief. Not only will this aggravate the swelling, but it can cause infection, bleeding or dislodge the cartilage inside the nose.

- Expect your nasal passages to be obstructed by swelling for at least two weeks. A humidifier may help you sleep by allowing you to breathe through your mouth more comfortably.
- It is normal to have some nasal bleeding over the first twelve hours after surgery. It may be necessary to change the gauze drip-pad a dozen or so times over that period.
- It is normal to have a pinkish-reddish discharge from your nose and your throat for the first three to four days. This will gradually subside.
- If you have any profuse nasal bleeding after this time, immediately lie down with you head elevated on 3-4 pillows. Iced wash cloths on the back of the neck and over the eyes may help. Please report back if these measures do not suffice.
- Smoking should be strictly avoided as it interferes with the blood supply to the healing tissues and slows subsequent healing.

9. Sun Exposure:

- It is wise not to sunbathe for the first 6 months after surgery. Sunburn will cause the nose to swell and delay the final result. Walking about between sun and shade or sitting with a hat, is permitted. It is always best to apply a waterproof factor 25 sunblock with both UVA and UVB protection or Use sunscreen with zinc oxide and SPF 20 or greater if you will be in the sun.

10. Wearing Glasses:

- You should not wear glasses for at least one month. If glasses must be worn, taping the central bridge of the glasses to the forehead will allow as little pressure as possible on the nasal bones.

11. Medications

- Take medications as advised.

12. Things to be done after removal of Nasal Splint, nasal pack and dressing

- After nasal packing is removed use nasal saline mist every 1-2 hours while awake for approximately after 5 days of surgery. This prevents dryness and crusting on the inside of the nose.
- Clean your incision with peroxide, and then apply soframycin ointment to the sutures two to three times a day.
- When the cast is removed, the nose will be quite swollen and the nasal tip will be turned up slightly. This will settle down over the next 3-4 days, then more gradually thereafter.

V. Postoperative Follow up Examination Phase

A. First Review-

- After 15 days for removal of nasal steristrips, nasal pack and nasal splints (if used). **[Note:** In some cases nasal pack may be required for extended time period. Therefore, it requires removal of old pack and insertion of new soframycin based nasal pack.**]**
- Sutures in relation to rhinoplasty surgical site are removed after 15 days.
- Sutures in relation to rib grafting site (if applicable) are removed.
- Ear dressing should be removed followed by removal of ear bolsters and sutures in relation to auricular cartilage graft site (if applicable).

B. Second Review-

- After 6 months.

[Note: In some cases requiring nasal pack for extended time period, the second and subsequent reviews should be based on the need for changing of nasal pack. The final review should be after 6 months of the surgical procedure.**]**

DISTRACTION OSTEOGENESIS

Please read the general patient management protocol **[Page 3-11]** first followed by procedure related specific guidelines. The specific instructions and guidelines related to Distraction Osteogenesis are as follows:

I. Patient's & Parent's Counseling

- Explain the patient regarding the distraction osteogenesis surgical procedure.
- Explain regarding the possible complications related to surgical procedure like possibility of inferior alveolar nerve injury in mandibular surgical procedure.
- For midface distraction, patients must be psychologically prepared to wear the external frame and should also be explained the restrictions in activity, and difficulty in sleeping posed by distractor frame in place.
- Explain the need for short term maxilla-mandibular fixation [MMF] during Latency Phase of Distraction Osteogenesis.
- Explain the need for extended period of hospital stay depending on the amount of distraction required.
- Explain the need for frequent follow up visits and possible need for orthodontic treatment for proper alignment of teeth and establishment of stable occlusion.

II. Radiological Examination

- Orthopantomogram (OPG), Lateral Cephalogram to be taken with barium line and maximum intercuspation (Lat. Ceph), Computed Tomogram (CT-Scan) if required.

III. Specific Requirement-

- 2 sets of impressions, Study Models, 2 splints each with wire and loops and palatal bar.

IV. Postoperative Drug Prescription

2. Injection Taxim (Diluted in 100 ml of NS give it over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
≥ 13 Years	1000 mg	I.V.	B.D.	3 Days

1. Infusion Metrogyl

Age	Dose	Route	Frequency	Duration
≥ 14 Years	100 cc Infusion	I.V.	T.D.S.	3 Days

3. Injection Lincomycin (Diluted in 100 ml of NS give it over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
≥ 15 Years	600 mg dose of injection	I.V.	B.D.	3 Days

2. Tablet Brufen For Mild Pain

Age	Dose	Route	Frequency	Duration
> 12 Years	400 mg Tablet	Oral	T.D.S.	3 Days

For Severe Pain Injection Voveran (UNDER SUPERVISION OF FELLOW)

Age	Dose	Route	Frequency	Duration
14-15 Years	1mg/kg/dose	I.M.	B.D.	2 Days
16-17 Years	1mg/kg/dose	I.M.	B.D.	2 Days
≥18 Years	1mg/kg/dose	I.M.	B.D.	2 Days

3. Injection Ranitidine

Age	Dose	Route	Frequency	Duration
≥ 14 Years	4-8mg/kg/dose	I.V.	B.D.	3 Days

4. Injection Dexamethasone

Dose	Route	Frequency	Duration
8 mg	I.V./I.M	OD	Operative Day
4mg-2mg-2mg	I.V./I.M	TID	1st Postoperative Day
2mg-2mg	I.V./I.M	BD	2nd Postoperative Day
2mg	I.V./I.M	OD	3rd Postoperative Day

V. Postoperative Instructions to be Followed During ICU & Ward Phase- Apart from routine post-surgical instructions, specific surgical procedure related postoperative instructions are as follows:

1. Diet- [After Completion of NPO or NBM Period]

- After NBM period is over, the patient may be offered a feeding of clear liquid (sugar water, Glucon-D water). When this is tolerated, they may resume cold liquid diet.

2. Ice Application

- During the day and evening of surgery, cold moist compresses are used continuously over the eyes to minimize swelling and control bruising. Puffiness and bruising can occur but if present usually regresses quickly over the next few days. There are several techniques for icing which are effective. The one glove technique is preferred, but the frozen pea method, or cool compress methods are acceptable as well.

3. Activity

- Patients were encouraged to mobilize on the second post-operative day with support from the assistants or nursing staff.

4. Medications

- Administer medications as prescribed by the doctor.

5. Other Instructions

- Distraction device to be activated on 5th postoperative day **[After completion of Latency Period].**
- Normal physical activity to be continued after 24 hrs.
- Change betadine packs every 24 hrs at RED pin sites at temporal area.
- Daily shampoo/ betadine wash to be done.
- Maintain wound at bilateral ala site.
- Periodic radiographs with barium line to be taken.
- Periodic photographs, occlusal/ profile etc.
- Elastic/ wire IMF as deemed appropriate.
- Periodic review with orthodontists.
- After Distractor removal (1 month for external distractor), wash bilateral pin sites with betadine.

VI. Discharge-

A. Drug Prescription-

1. Tablet Augmentin

Age	Dose	Route	Frequency	Duration
≥ 13 Years	625 mg Tab	Oral	B.D.	5 Days

2. Tablet Metronidazole

Age	Dose	Route	Frequency	Duration
≥ 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

3. Capsule Lincomycin

Age	Dose	Route	Frequency	Duration
14-18 Years	250 mg capsule	Oral	B.D.	5 Days
≥ 19 Years	500 mg capsule	Oral	B.D.	5 Days

4. Tablet Brufen

Age	Dose	Route	Frequency	Duration
> 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

5. Tablet Ranitidine

Age	Dose	Route	Frequency	Duration
≥ 14 Years	150 mg (1 Tablet)	Oral	B.D.	5 Days

6. Tab. Zincovit

Age	Dose	Route	Frequency	Duration
≥ 6 Years	1 Tablet	Oral	O.D.	60 Days

7. Chlorhexidine (0.2%) Mouth Wash Two to three times a day for 1 Month.

B. Directions for Post-Operative Care:

1. Feeding Instructions

- Patient can consume only liquid with the maxillomandibular fixation in place.
- As normal dietary intake is reduced, patient should be encouraged to consume plenty of liquid or semisolid at frequent intervals.
- After the initial consolidation period is over, the Maxillo-mandibular Fixation [MMF] is released, and patient can start soft semisolid diet till the distractor removal and final consolidation phase (6-8 weeks) of distraction osteogenesis.

2. Oral Hygiene

- Patient should brush the teeth with only a foam or soft bristle toothbrush for oral hygiene.
- Do not traumatize the surgical site during brushing.

- Use of betadine/ chlorhexidine mouth wash three to four times a day is highly beneficial.
- Additionally, warm saline rinses can be used for oral hygiene.
- Gently swish the mouth with plain water after every meal.

3. Activity

- Patient can perform routine day to day life activity after 2 days but should avoid strenuous activity at least for 4-6 weeks.

4. Medications

- Take medications as advised.

VII. Postoperative Follow up Examination Phase

A. First Review-

- For those patients staying nearby: report daily for distraction.
- For those patients staying far away: To be discharged after completion of distraction.

B. Second Review-

- After 6 month.

ORTHOGNATHIC SURGERY

Please read the general patient management protocol **[Page 3-11]** first followed by procedure related specific guidelines. The specific instructions and guidelines related to Orthognathic Surgery are as follows:

I. Patient's & Parent's Counseling

- Explain the patient regarding the orthognathic surgical procedure.
- Explain regarding the possible complications related to surgical procedure like possibility of inferior alveolar nerve injury in mandibular orthognathic surgery.
- Always explain that, although internal fixation is applied across the osteotomy sites, maxillo-mandibular fixation [MMF] is required for a period of 15-20 weeks.
- Explain that need may arise for removal of internal fixation device in future in case of infection or if it became loose.
- Explain the need for frequent follow up visits and possible need for orthodontic treatment for proper alignment of teeth and establishment of stable occlusion.
- Need may arise to take bone graft from anterior ilium. Explain regarding the associated morbidities of iliac crest grafting such as gait disturbance, pain, altered sensation and infection.

II. Radiological Examination

- Orthopantomogram (OPG), Lateral Cephalogram to be taken with barium line and maximum intercuspation (Lat. Ceph), Computed Tomogram (CT-Scan) if required

III. Specific Requirement

- 2 sets of impressions, Study Models, 2 splints each with wire and loops and palatal bar.

IV. Preoperative Workup- Check availability of orthodontic heavy gauge wires with hook solders, plating kit to be used.

V. Postoperative Drug Prescription

1. Injection Taxim (Diluted in 100 ml of NS give it over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
≥ 13 Years	1000 mg	I.V.	B.D.	3 Days

2. Infusion Metrogyl

Age	Dose	Route	Frequency	Duration
≥ 14 Years	100 cc Infusion	I.V.	T.D.S.	3 Days

4. Injection Lincomycin (Diluted in 100 ml of NS give it over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
≥ 15 Years	600 mg dose of injection	I.V.	B.D.	3 Days

3. Tablet Brufen For Mild Pain

Age	Dose	Route	Frequency	Duration
> 12 Years	400 mg Tablet	Oral	T.D.S.	3 Days

For Severe Pain Injection Voveran (under supervision of fellow)

Age	Dose	Route	Frequency	Duration
14-15 Years	1mg/kg/day	I.M.	B.D.	2 Days

16-17 Years	1mg/kg/day	I.M.	B.D.	2 Days
≥18 Years	1mg/kg/day	I.M.	B.D.	2 Days

4. Injection Ranitidine

Age	Dose	Route	Frequency	Duration
≥ 14 Years	2.0 cc Infusion	I.V.	B.D.	3 Days

5. Injection Dexamethasone

Dose	Route	Frequency	Duration
8 mg	I.V./I.M	OD	Operative Day
4mg-2mg-2mg	I.V./I.M	TID	1st Postoperative Day
2mg-2mg	I.V./I.M	BD	2nd Postoperative Day
2mg	I.V./I.M	OD	3rd Postoperative Day

VI. Postoperative Instructions to be followed During ICU & Ward Phase-

1. Diet- [After Completion of NPO or NBM Period]

- After NBM period is over, the patient may be offered a feeding of clear liquid (sugar water, Glucon-D water). When this is tolerated, they may consume liquid diet.
- Start with clear liquids first followed by fruit juices and thereafter semisolid diet as tolerated.
- Drink plenty of fluids following surgery, as dehydration can contribute to nausea.

2. Ice Application

- During the day and evening of surgery, cold moist compresses are used continuously over the eyes to minimize swelling and control bruising. Puffiness and bruising can occur but if present usually regresses quickly over the next few days. There are several techniques for icing which are effective. The one glove technique is preferred, but the frozen pea method, or cool compress methods are acceptable as well.

3. Activity

- Patients were encouraged to mobilize on the second post-operative day with support from the assistants or nursing staff.

4. Medications

- Administer medications as prescribed by the doctor.

VII. Discharge-

A. Drug Prescription-

1. Tablet Augmentin

Age	Dose	Route	Frequency	Duration
≥ 13 Years	625 mg Tab	Oral	B.D.	5 Days

2. Tablet Metronidazole

Age	Dose	Route	Frequency	Duration
≥ 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

3. Tablet Lincomycin

Age	Dose	Route	Frequency	Duration
14-18 Years	250 mg Tablet	Oral	B.D.	5 Days
≥ 19 Years	500 mg Tablet	Oral	B.D.	5 Days

4. Tablet Brufen

Age	Dose	Route	Frequency	Duration
> 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

5. Tablet Ranitidine

Age	Dose	Route	Frequency	Duration
≥ 14 Years	150 mg (1 Tablet)	Oral	B.D.	5 Days

6. Tab. Zincovit

Age	Dose	Route	Frequency	Duration
≥ 6 Years	1 Tablet	Oral	O.D.	60 Days

7. Chlorhexidine (0.2%) Mouth Wash Two to three times a day for 1 Month.

B. Directions for Post-Operative Care: Following ORIF

1. Feeding Instructions

- Patient can consume only liquid diet with the maxillomandibular fixation in place.
- As normal dietary intake is reduced patient should be encouraged to consume plenty of liquid or semisolid at frequent intervals.

2. Oral Hygiene

- Patient should brush the teeth with only a foam or soft bristle toothbrush for oral hygiene.
- Do not traumatize the surgical site during brushing.
- Use of betadine/ chlorhexidine mouth wash three to four times a day is highly beneficial.
- Additionally, warm saline rinses can be used for oral hygiene.
- Gently swish the mouth with plain water after every meal.

3. Activity

- Patient can perform routine day to day life activity after 2 days but should avoid strenuous activity at least for 4 weeks.

4. Medications

- Take medications as advised.

VIII. Postoperative Follow up Examination Phase

A. First Review-

- After 7 days for suture & pressure dressing removal.

B. Second Review-

- After 1 month.

Next review at 6 months and 1 year respectively.

TMJ ANKYLOSIS SURGERY- INTERPOSITIONAL ARTHROPLASTY

Please read the general patient management protocol **[Page 3-11]** first followed by procedure related specific guidelines. The specific instructions and guidelines related to TMJ Ankylosis surgery are as follows:

I. Patient's & Parent's Counseling

- Explain the patient regarding the TMJ ankylosis surgical procedure.
- Explain regarding the possible complications related to surgical procedure and explain regarding possibility of facial nerve injury.
- Explain the importance of postoperative physiotherapy and the possibility of increased incidence of reankylosis in case of failure of patient to perform active physiotherapy.
- Explain the need for frequent follow up visits to evaluate the postoperative mouth opening.

II. Postoperative Drug Prescription

5. Injection Taxim (Diluted in 100 ml of NS give it over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
7-8 Years	100mg/kg/day	I.V.	B.D.	3 Days
9-12 Years	100mg/kg/day	I.V.	B.D.	3 Days
≥ 13 Years	100mg/kg/day	I.V.	B.D.	3 Days

1. Infusion Metrogyl

Age	Dose	Route	Frequency	Duration
7-11 Years	25-30mg/dose/day	I.V.	T.D.S.	3 Days
12-13 Years	25-30mg/dose/day	I.V.	T.D.S.	3 Days
≥ 14 Years	25-30mg/dose/day	I.V.	T.D.S.	3 Days

6. Injection Lincomycin(Diluted in 100 ml of NS give it over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
< 15 Years	300 mg dose of injection lynx diluted in NS	I.V.	B.D.	3 Days
≥ 15 Years	600 mg dose of injection lynx diluted in NS	I.V.	B.D.	3 Days

2. Tablet Brufen for Mild Pain

Age	Dose	Route	Frequency	Duration
6-12 Years	200 mg Tablet	Oral	T.D.S.	3 Days
> 12 Years	400 mg Tablet	Oral	T.D.S.	3 Days

For Severe Pain Injection Voveran (under supervision of fellow)

Age	Dose	Route	Frequency	Duration
6-9 Years	1mg/kg/day	I.M.	B.D.	2 Days
10-13 Years	1mg/kg/day	I.M.	B.D.	2 Days
14-15 Years	1mg/kg/day	I.M.	B.D.	2 Days
16-17 Years	1mg/kg/day	I.M.	B.D.	2 Days
≥18 Years	1mg/kg/day	I.M.	B.D.	2 Days

3. Injection Ranitidine

Age	Dose	Route	Frequency	Duration
7-11 Years	4-8mg/kg	I.V.	B.D.	3 Days
12-13 Years	4-8mg/kg	I.V.	B.D.	3 Days
≥ 14 Years	4-8mg/kg	I.V.	B.D.	3 Days

4. Injection Dexamethasone

Dose	Route	Frequency	Duration
8 mg	I.V.	T.D.S.	Operative Day
8 mg	I.V.	B.D.	1st Postoperative Day
4 mg	I.V.	B.D.	2nd Postoperative Day

- **And tapered so on.**

III. Postoperative Instructions to be followed During ICU & Ward Phase- Apart from routine post-surgical instructions, specific surgical procedure related postoperative instructions are as follows:

1. Diet- [After Completion of NPO or NBM Period]

- After NPO/ NBM period is over, the patient may be offered a feeding of clear liquid (sugar water, Glucon-D water, coconut water). When this is tolerated, they may resume cold liquid or semisolid diet.

2. Medications

- Administer medications as prescribed by the doctor.

IV. Discharge-

A. Drug Prescription-

1. Tablet Augmentin

Age	Dose	Route	Frequency	Duration
6-12 Years	375 mg Tab	Oral	B.D.	5 Days
≥ 13 Years	625 mg Tab	Oral	B.D.	5 Days

2. Tablet Metronidazole

Age	Dose	Route	Frequency	Duration
7-11 Years	200 mg Tablet	Oral	T.D.S.	5 Days
≥ 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

3. Capsule Lincomycin

Age	Dose	Route	Frequency	Duration
8-18 Years	250 mg capsule	Oral	B.D.	5 Days
≥ 19 Years	500 mg capsule	Oral	B.D.	5 Days

4. Tablet Brufen

Age	Dose	Route	Frequency	Duration
6-12 Years	200 mg Tablet	Oral	T.D.S.	5 Days
> 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

5. Tablet Ranitidine

Age	Dose	Route	Frequency	Duration
7-13 Years	75 mg (½ Tablet)	Oral	B.D.	5 Days
≥ 14 Years	150 mg (1 Tablet)	Oral	B.D.	5 Days

6. Tab. Zincovit

Age	Dose	Route	Frequency	Duration
≥ 6 Years	1 Tablet	Oral	O.D.	60 Days

B. Directions for Post-Operative Care:

1. Feeding Instructions

- Patient can consume only liquid or semisolid diet for approximately 1 week depending on the pain in TMJ area during mastication. They can resume to normal routine diet slowly over a period of few days once pain subsides.

2. Oral Hygiene- [Applicable if coronoidectomy is performed from intraoral side]

- Patient should brush the teeth with only a foam or soft bristle toothbrush for oral hygiene.
- Do not traumatize the surgical site during brushing.
- Use of betadine/ chlorhexidine mouth wash three to four times a day is highly beneficial.
- Additionally, warm saline rinses can be used for oral hygiene.
- Gently swish the mouth with plain water after every meal.

3. Activity

- Patient can perform routine day to day life activity after discharge but should avoid strenuous activity.
- Patient should perform active physiotherapy of the jaw as the pain over the surgical area decreases over a period of time.
- Start with gentle mouth opening exercises first followed by lateral excursions and protrusive movements. Gradually increase the range of motion as the pain over TMJ area decreases.

4. Medications

- Take medications as advised.

V. Postoperative Follow up Examination Phase

A. First Review-

- After 7 days for suture & pressure dressing removal.

B. Second Review-

- After 1 month.

Next review after 6 months and 1 year respectively.

TRAUMA- OPEN REDUCTION & INTERNAL FIXATION (ORIF)

Please read the general patient management protocol **[Page 3-11]** first followed by procedure related specific guidelines. The specific instructions and guidelines related to trauma management by open reduction and internal fixation (ORIF) are as follows:

I. Patient's & Parent's Counseling

- Explain the patient regarding the surgical procedure for management of fracture.
- Explain regarding the possible complications related to open reduction and internal fixation procedure.
- Explain that need may arise for removal of internal fixation device in future in case of infection or if it become loose.
- Always explain that, although internal fixation is applied across the fracture line, need may arise for maxillo-mandibular fixation [MMF] with wire or elastics for a period of 4-6 weeks.

II. Radiological Examination- Radiograph depending on the type of fracture

III. Postoperative Drug Prescription

7. Injection Taxim (Diluted in 100 ml of NS give it over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
7-8 Years	100mg/kg/dose	I.V.	B.D.	2 Days
9-12 Years	100mg/kg/dose	I.V.	B.D.	2 Days
≥ 13 Years	100mg/kg/dose	I.V.	B.D.	2 Days

8. Infusion Metrogyl

Age	Dose	Route	Frequency	Duration
7-11 Years	25-30mg/kg/dose	I.V.	T.D.S.	2 Days
12-13 Years	25-30mg/kg/dose	I.V.	T.D.S.	2 Days
≥ 14 Years	25-30mg/kg/dose	I.V.	T.D.S.	2 Days

9. Injection Lincomycin (diluted in 100 ml of NS over 30 to 45 mins)

Age	Dose	Route	Frequency	Duration
< 15 Years	30-60 mg/kg/day	I.V.	B.D.	2 Days
≥ 15 Years	30-60 mg/kg/day	I.V.	B.D.	2 Days

10. Tablet Brufen For Mild Pain

Age	Dose	Route	Frequency	Duration
6-12 Years	200 mg Tablet	Oral	T.D.S.	2 Days
> 12 Years	400 mg Tablet	Oral	T.D.S.	2 Days

For Severe Pain Injection Voveran (under supervision of fellow)

Age	Dose	Route	Frequency	Duration
6-9 Years	1mg/kg /day	I.M.	B.D.	2 Days
10-13 Years	1mg/kg /day	I.M.	B.D.	2 Days
14-15 Years	1mg/kg/ day	I.M.	B.D.	2 Days
16-17 Years	1mg/kg/ day	I.M.	B.D.	2 Days
≥18 Years	1mg/kg/ day	I.M.	B.D.	2 Days

11. Injection Ranitidine

Age	Dose	Route	Frequency	Duration
7-11 Years	4-8mg/kg	I.V.	B.D.	2 Days
12-13 Years	4-8mg/kg	I.V.	B.D.	2 Days
≥ 14 Years	4-8mg/kg	I.V.	B.D.	2 Days

IV. Postoperative Instructions to be Followed During ICU & Ward Phase- Apart from routine post surgical instructions, specific surgical procedure related postoperative instructions are as follows:

1. Diet- [After Completion of NPO or NBM Period]

- After NPO/ NBM period is over, the patient may be offered a feeding of clear liquid (sugar water, Glucon-D water). When this istolerated, they may resume cold liquid diet.

2. Medications

- Administer medications as prescribed by the doctor.

V. Discharge-

A. Drug Prescription-

1. Tablet Augmentin

Age	Dose	Route	Frequency	Duration
6-12 Years	375 mg Tab	Oral	B.D.	5 Days
≥ 13 Years	625 mg Tab	Oral	B.D.	5 Days

2. Tablet Metronidazole

Age	Dose	Route	Frequency	Duration
7-11 Years	200 mg Tablet	Oral	T.D.S.	5 Days
≥ 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

3. Capsule Lincomycin

Age	Dose	Route	Frequency	Duration
8-18 Years	250 mg capsule	Oral	B.D.	5 Days
≥ 19 Years	500 mg capsule	Oral	B.D.	5 Days

4. Tablet Brufen

Age	Dose	Route	Frequency	Duration
6-12 Years	200 mg Tablet	Oral	T.D.S.	5 Days
> 12 Years	400 mg Tablet	Oral	T.D.S.	5 Days

5. Tablet Ranitidine

Age	Dose	Route	Frequency	Duration
7-13 Years	75 mg (½ Tablet)	Oral	B.D.	5 Days
≥ 14 Years	150 mg (1 Tablet)	Oral	B.D.	5 Days

6. Tab. Zincovit

Age	Dose	Route	Frequency	Duration
> 6 Years	1 Tablet	Oral	O.D.	60 Days

7. Chlorhexidine (0.2%) Mouth Wash Two to three times a day for 1 Month.

B. Directions for Post-Operative Care: Following ORIF

1. Feeding Instructions

- For first week postoperatively, patient should consume liquid diet to avoid pain during mastication. After one week patient can start taking semisolid diet and can resume to normal routine diet gradually over a period of time as pain on mastication subsides. The patient can consume only liquid diet if maxillomandibular fixation is continued postoperatively.
- As normal dietary intake is reduced patient should be encouraged to consume plenty of liquid or semisolid at frequent intervals.

2. Oral Hygiene

- Patient should brush the teeth with only a foam or soft bristle toothbrush for oral hygiene.
- Do not traumatize the surgical site during brushing.
- Use of betadine/ chlorhexidine mouth wash three to four times a day is highly beneficial.
- Additionally, warm saline rinses can be used for oral hygiene.
- Gently swish the mouth with plain water after every meal.

3. Activity

- Patient can perform routine day to day life activity after 2 days but should avoid strenuous activity at least for 4 weeks.

4. Medications

- Take medications as advised.

VI. Postoperative Follow up Examination Phase

A. First Review-

- After 7 days for suture & pressure dressing removal.

B. Second Review-

- After 1 month.

Next review 6 months later.

AVERAGE HEIGHT AND WEIGHT OF INDIAN CHILDREN

AGE	WEIGHT (Kg)	HEIGHT (Cm)
Birth	3.0	50.5
3 months	6.0	61.1
6 months	7.5	67.8
9 months	9.0	72.3
1 year	10.0	76.1
2 years	12.0	85.6
3 years	14.5	94.9
4 years	16.5	102.9
5 years	18.5	109.9
6 years	20.0	116.1
7 years	23.0	121.7
8 years	25.0	127.0
9 years	28.0	132.2
10 years	31.0	137.5
11 years	32.0	140.0
12 years	37.0	147.0
13 years	40.0	153.0
14 years	47.0	160.0
15 years	52.5	166.0
16 years	58.0	171.0
17 years	62.0	175.0
18 years	65.0	177.0

Routinely Used Drug Dose Calculation-

Based On Body Weight of the Patient

1. Injection Taxim

Usual Adult Dose- 1 gram B.D. By I.M. or Slow I.V. Infusion Route.

Pediatric Dose- 100 mg/ Kg Body Weight/ Day in two divided doses

2. Metronidazole

Usual Adult Dose- 400 mg T.D.S. By Oral or 7.5 mg/ Kg Body Weight T.D.S. By Slow I.V. Infusion Route

Pediatric Dose- 30-50 mg/ Kg Body Weight/ Day in three divided doses

3. Lincomycin

Usual Adult Dose: 500 mg B.D. or T.D.S. by Oral or 600mg by I.M. or Slow I.V. Infusion Route

Pediatric Dose [>1 month of age]:

10 mg/ Kg Body Weight B.D or T.D.S. By Oral or 10 mg/ Kg Body Weight/ Day in three divided doses By Slow I.V. Infusion Route

3. Tablet Augmentin or Syrup Augmentin

Usual Adult Dose- 625 mg B.D. By Oral Route

Pediatric Dose- 40 mg/ Kg Body Weight/ Day in two divided doses By Oral Route

Patient with > 40 Kg Body Weight- The dose is same as adult dose

4. Ranitidine

Usual Adult Dose [Including Patient > 16 Years of Age]-

150 mg B.D. By Oral Route or 4-8 mg/Kg B.D. or T.D.S. By I.V. Route

Pediatric Dose- [Patient < 16 Years of Age]

Orally- 4-8 mg/ Kg Body Weight/ Day in two divided doses

Intravenously- 4-8 mg/ Kg Body Weight/ Day in three divided doses

5. Brufen

Usual Adult Dose- 400 mg T.D.S. By Oral Route

Pediatric Dose- 10 mg/ Kg Body Weight/ Dose T.D.S by Oral Route

6. Ibugesic Plus Syrup

< 1 Year- Dose is 50 mg- 2.5 mL Syrup T.D.S.

1-2 Years- Dose is 75 mg- 3.5 mL Syrup T.D.S.

2-3 Years- Dose is 100 mg- 5.0 mL Syrup T.D.S.

4-5 Years- Dose is 150 mg- 7.5 mL Syrup T.D.S.

7. Ketorolac [0.2- 0.5 mg/ Kg Body Weight I.M./ I.V. 6 Hourly]

8. Morphine- [0.1 mg/ Kg Body Weight I.M. Stat]

9. Ondansetron

Usual Adult Dose- 0.15 mg I.V.

Pediatric Dose- 0.15 mg/ Kg Body Weight I.V.

Patient with > 40 Kg Body Weight- The dose is same as adult dose

MANAGEMENT OF POSTOPERATIVE COMPLICATIONS

I. Thrombophlebitis- [Inflammation of the vein]

History- Predisposing factor for thrombophlebitis is the intravenous administration of irritating drugs prone to cause thrombophlebitis like diazepam or prolonged use of i.v. cannulas for > 48 hrs.

Clinical Examination- Reveal inflammation and redness of skin overlying the vein. The involved vein is firm and tender on palpation.

Diagnosis- It is based on history and clinical examination.

Prevention- Avoid use of irritating drugs if possible. If i.v. line is required for prolonged time period, then place the i.v. cannula at other site after 48 hrs.

Definitive Management-

- Remove the involved cannula.
- Gently massage the cannula site.
- Advise the patient to perform frequent movement of the involved hand.
- Advise hot fomentation over the cannula site.
- Ointment Thrombophob (Thromboprin) to be applied topically 2-3 times a day till inflammation resolved.

II. Nausea & Vomiting- Postoperative nausea and vomiting is quite common after surgical procedures under general anesthesia. The nausea and vomiting are not only unpleasant but can also prove dangerous in sedated patients or patients with depressed cough reflex.

Aspiration of the vomitus is a fatal complication. There are variable causes of nausea and vomiting, requiring different management.

The management is as follows:

1. Use of Emetic Drugs- Use of anesthetic agents like Nitrous oxide, halothane, ether etc and some preanesthetic medications like opioids enhances the incidence of postoperative nausea and vomiting. If possible use anesthetics with lesser incidence of nausea and vomiting. This may not be feasible in all cases and therefore require definitive management with the use of drugs as follows:

- Check if vomitus has food particles or gastric content. If patient is spitting food particles out, just reassurance is required. If vomitus contain gastric contents then after two episodes of vomiting give:
- **Injection Ondansetron**

Age	Dose	Route	Frequency
3 Months- 1 Year	0.15mg/kg/dose	I.V.	Stat
2-4 Years	0.15mg/kg/dose	I.V.	Stat
5-7 Years	0.15mg/kg/dose	I.V.	Stat
8 Years	0.15mg/kg/dose	I.V.	Stat
9-11 Years	0.15mg/kg/dose	I.V.	Stat
12 Years	0.15mg/kg/dose	I.V.	Stat
≥ 13 Years	0.15mg/kg/dose	I.V.	Stat

- Syp Vomikind 5mL SOS to children if episodes of vomiting continues.

2. Gastric Distension- It is due to ingestion of air and blood. Blood is gastric irritant inducing nausea and vomiting. It can be managed by gastric decompression using nasogastric tube.

3. Pain- Pain increases the incidence of nausea and vomiting. Effectively manage the pain using analgesic drugs.

4. Induced Gag Reflex By

Oropharyngeal airway- Patient with intact gag reflex may not be able to tolerate oropharyngeal airway. If use of airway in post-operative period is mandatory for airway maintenance, use nasopharyngeal airway.

Palatal Pack- In case of cleft palate surgery check for palatal pack impinging on the soft palate causing gag reflex. In case of loose pack, remove the pack to avoid constant irritation.

ZOE Pack- In case of bone graft surgery, check for ZOE pack causing gag reflex. In case of ZOE specks in the posterior area, remove the pack particles.

5. Ambulatory Nausea- Patients requiring opioid analgesics for pain management feel nauseated during ambulation. So, these patients should avoid early ambulation and remain seated on their beds.

6. Other Causes- Use of carbonated beverages or drinks with preservatives. Advice the parents and adult patients to avoid using stored liquids and diet with preservatives. Encourage fresh and natural liquids.

Additional Management- Frequent vomiting can lead to significant fluid and electrolyte loss, therefore, require additional management to avoid dehydration and hypovolemia. All these patients should be monitored well for adequate fluid intake. Apart from daily fluid requirement, add the amount of fluid loss in vomiting. Frequent episodes of vomiting must be managed with use of antiemetic drugs as described earlier.

III. Dehydration

- Check if the dehydration is chronic by physical examination of the patient. Check for the skin texture, whether the skin is turbid or not, general health of the patient.

Table 1. Degree of Fluid Deficit & Clinical Symptoms Associated with Dehydration

	Mild Dehydration	Moderate Dehydration	Severe Dehydration
Weight Loss Older child Infant	 3% (30 ml/kg) 5% (50 ml/kg)	 6% (60 ml/kg) 10% (100 ml/kg)	 9% (90 ml/kg) 15% (150 ml/kg)
Heart rate	Normal	Mildly increased	Marked tachycardia
Distal pulses	Normal	Slightly diminished	Weak, thready
Capillary refill	Normal	Approx. 2 seconds	>3 seconds
Urine output	Normal	Decreased	Anuria
Fontanelle	Flat	Soft	Sunken
Eyes	Normal	Normal	Sunken
Tearing	Normal	Diminished	Absent
Mucosa	Normal	Dry	Parched

Adapted from Gunn VL, Nechyba C. The Harriet Lane Handbook, 16th edition. 2002.

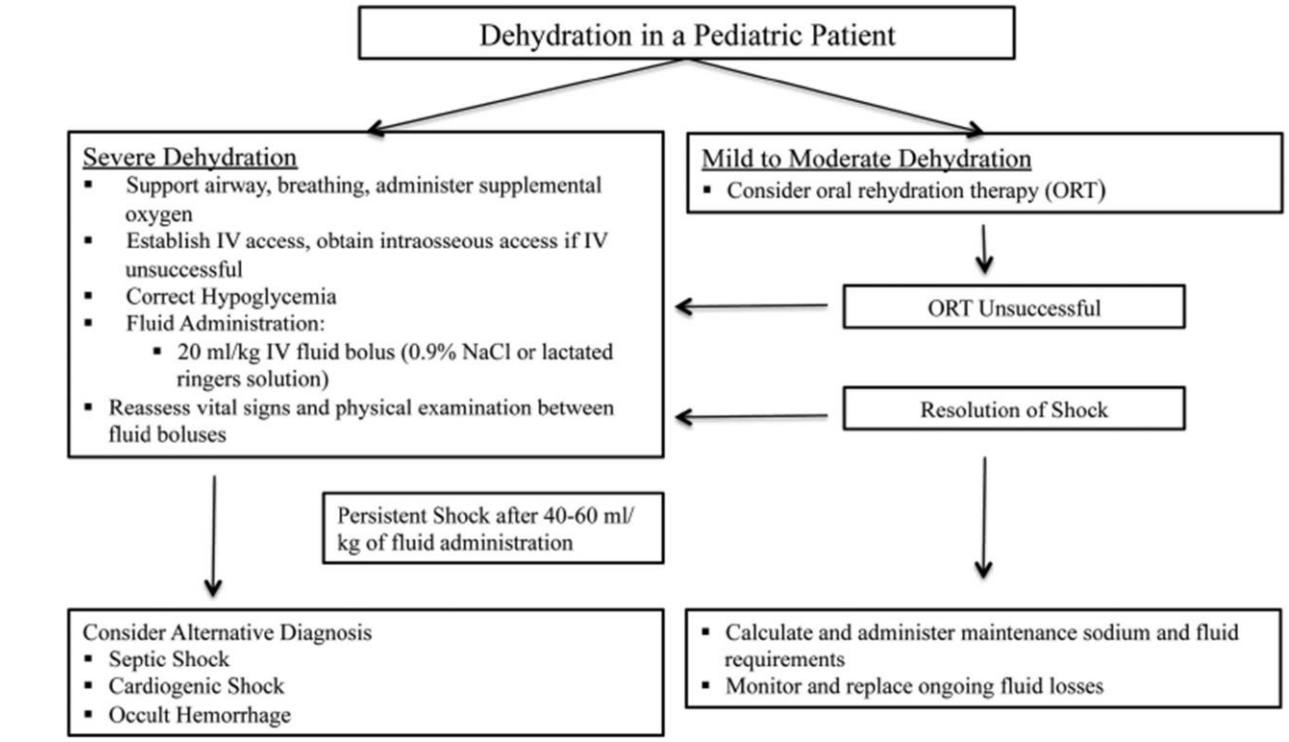
- The amount of the fluid to be given is calculated by adding daily fluid requirement + Amount of fluid lost in vomiting or diarrhea + Amount of anticipated loss.
- The daily fluid requirement of the patient is calculated by 4-2-1 Rule:

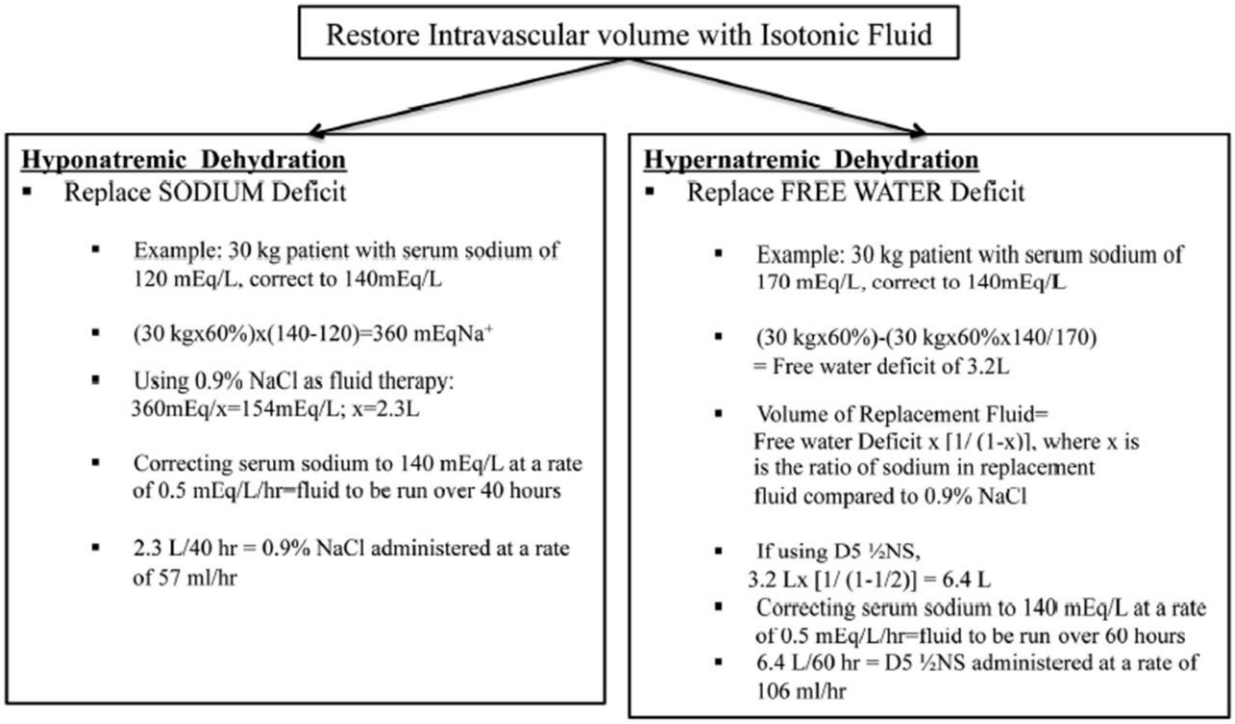
Table 1: Hourly (4/2/1 rule) and daily maintenance fluids according to child's weight

Weight (kg)	Hourly fluid requirements	Daily fluid requirements
<10	4 ml/kg	100 ml/kg
10–20	40 ml+2 ml/kg Above 10 kg	1000 ml+50 ml/kg Above 10 kg
>20	60 ml+1 ml/kg Above 20 kg	1500 ml+25 ml/kg Above 20 kg

- For Mild to moderate dehydration start with Electral solution.
- In case of failure of Electral therapy like deterioration of patient, continuous vomiting, patient refuses or unable to take by mouth, I.V. Solutions are required.

- For Severe dehydration immediately start with I.V. Solutions.





- Check if the dehydration is chronic by physical examination of the patient. Check for the skin texture, whether the skin is turbid or not, general health of the patient.

IV. Diarrhea

- Administer fluids to correct the fluid imbalance.
- Prefer oral rehydration therapy using ELECTRAL solution or ELECTRAL powder.
- Use probiotics and Zinc tablets.
- Use of antibiotics is usually not recommended.
- Diarrhea leads to loss of body fluids. If patient become dehydrated then it require management of dehydration as already described.

V. Bleeding- Reactionary postoperative bleeding is usually due to slippage of ligatures due to rise in blood pressure. Bleeding must be managed timely to avoid development of hypovolemic shock.

- If patient is still sedated and is not fully awake, position the patient in lateral position to avoid aspiration of the blood.
- Clean the bleeding site by suctioning the area to explore the bleeding point.
- In case of minor ooze, apply pressure with the gauze soaked in cold sterile water or normal saline. Usually pressure application for 5 minutes is sufficient to arrest hemorrhage.
- In case of continuous bleeding, check for opened sutures, if possible, suture the area of bleeding.
- Pressure packs impregnated with local hemostatic agents like 4.8 % tranexamic acid applied to the area of bleeding assist in hemostasis. After

hemostasis is achieved, the patient can use 4.8% tranexamic acid mouth wash postoperatively starting 24 hours after surgery.

- In case of troublesome active bleeding hemostatic agents may be used systemically like Injection Tranexamic acid. Dose of tranexamic acid in 10mg/ Kg Body weight I.V. For more troublesome bleeding the I.V. dose can be repeated three to four times a day. After control of hemorrhage tranexamic acid can be given by oral route [10mg/ Kg Body weight T.D.S. for 5-7 days].
- Vitamin K injections in case of altered bleeding and clotting profile.

VI. Fever

- Advise lukewarm water tepid sponging.
- In case the patient has more than 1 episode of fever, note the frequency and pattern of occurrence of fever.
- In case fever continues for more than 24 hours and follows a particular pattern, immediately consult the pediatrician and conduct necessary investigations as advised.
- Make sure the patient is being fed well and diet given is hygienic.
- Avoid infusion of intravenous fluids in case patient has fever with chills.
- **For patients running fever of the range of 99-101 degree F**
- Syp Crocin 5.0mL QID for patients aged between 0-3 years.
- Syp Crocin 7.5 mL QID for patients aged between 4-6 years.
- Tab. Crocin 250 mg QID for patients aged between 7-13 years.
- Tab. Crocin 500 mg QID for patients aged ≥ 14 years.
- **For patients running fever of the range of 102-103 degree F**
- Syp Crocin 5.0mL QID for patients aged between 0-3 years.
- Syp Crocin 7.5 mL QID for patients aged between 4-6 years.

- Injection Paracetamol 1.0 mL for patients aged between 7-13 years.
- Injection Paracetamol 2.0 mL for patients aged ≥ 14 years
- Suppositories/Rectal 15mg/kg body weight

VII. Gastritis

- Stop tablet or injectable metronidazole and observe.
- **Syrup Ranitidine Or Tablet Ranitidine**

Age	Dose	Route	Frequency	Duration
≤ 9 Months	1.0 mL Syrup	Oral	B.D.	5 Days
1-2 Years	1.5 mL Syrup	Oral	B.D.	5 Days
3-4 Years	2.0 mL Syrup	Oral	B.D.	5 Days
5-6 Years	2.5 mL Syrup	Oral	B.D.	5 Days
7-13 Years	75 mg (½ Tablet)	Oral	B.D.	5 Days
≥ 14 Years	150 mg (1 Tablet)	Oral	B.D.	5 Days

VIII. Pain

- Pain in postoperative period depend on the amount of surgical trauma. If patient's pain is not in accordance with surgical trauma, then it requires further evaluation and management.
- Look for site of pain (like operative site), its nature (dull or sharp shooting), duration (since how many hours), intensity (mild or severe), and radiation to adjacent structures or not, aggravating factor and relieving factor.
- Check whether the analgesic dose has not been missed.
- The NSAIDs dose and frequency can be increased within therapeutic limits. Use injectable NSAID as an alternative.
- **For Severe Pain Injection Ketorolac [Ketanov]**

Age	Dose	Route	Frequency	Duration
< 3 Years	0.25 cc of Inj. Ketorolac	I.M./ I.V.	T.D.S.	1 Day
4-8 Years	0.50 cc of Inj. Ketorolac	I.M./ I.V.	T.D.S.	1 Day
9-12 Years	0.75 cc of Inj. Ketorolac	I.M./ I.V.	T.D.S.	1 Day
≥ 13 Years	1.00 cc of Inj. Ketorolac	I.M./ I.V.	T.D.S.	1 Day

- **Or Injection Voveran (under supervision of fellow)**

Age	Dose	Route	Frequency	Duration
6-9 Years	1mg/kg/dose	I.M.	B.D.	1 Days
10-13 Years	1mg/kg/dose	I.M.	B.D.	1 Days
14-15 Years	1mg/kg/dose	I.M.	B.D.	1 Days
16-17 Years	1mg/kg/dose	I.M.	B.D.	1 Days
≥18 Years	1mg/kg/dose	I.M.	B.D.	1 Days

- For more severe pain opioid analgesics can be used instead of NSAIDs. In case of increased pain, Inj. Morphine 0.1 mg/ Kg Body Weight I.M. can be given stat to the patients.
- Differentially diagnose between surgical trauma induced inflammatory pain from pain due to infection. Infection can lead to much severe pain and is often associated with more severe sign of inflammation, may be accompanied by exudation of pus and systemic signs of toxemia like fever, anorexia, malaise etc. Definitive management of infection requires local wound management and use of systemic antibiotic therapy.
- In case of infection as the cause of severe pain, check for the antibiotics being given, if needed change the antibiotics to manage the infection.

IX. Facial Swelling

- Certain amount of postsurgical swelling is normally present post-operatively and increases over a period of 48-72 hrs and then start resolving over a period of few days. For majority of the surgeries like cleft lip, cleft palate, rhinoplasty procedures no specific management is required.
- Some surgical procedures with increased surgical trauma (like orthognathic surgeries, distraction surgeries) with considerable post-

operative facial swelling and edema require definitive management (use of steroid as anti-inflammatory agent).

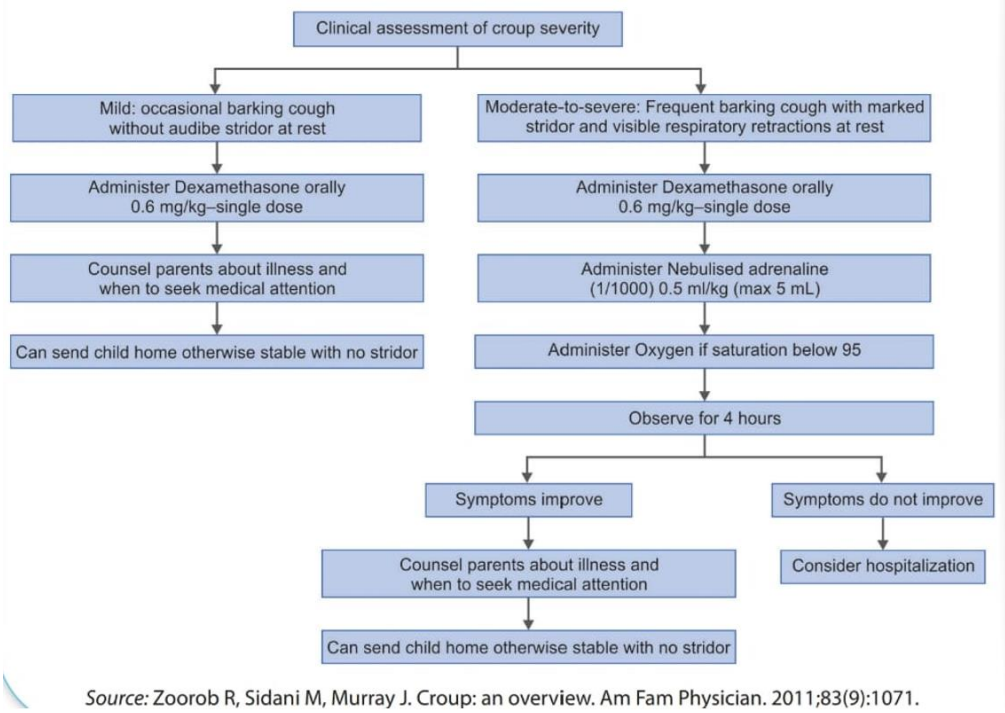
- Ensure pressure dressing with dynaplast is present over the surgical area.
- Head up position of the bed in the postoperative period minimize facial edema due to antigravity positioning.
- During sleeping hours, patient can use two or three pillows as tolerated to maintain head up position.
- Apart from this the patient should use cold compression ice packs for a period of 20-30 minutes per hour for first 24 hours after surgery. Cold compresses help by decreasing vascularity to the area, decrease inflammation, pain and swelling.
- Use of Steroids as Anti-inflammatory agent. Inj. Dexona 8 mg/day adults.
- All doses to be tapered over the 3 postoperative days.
- Differentially diagnose between surgical trauma induced inflammatory swelling from that due to infection (cellulitis). Infection can lead to much severe swelling and is often associated with more severe sign of inflammation, may be accompanied by exudation of pus and systemic signs of toxemia like fever, anorexia, malaise etc. Definitive management of infection requires local wound management and use of systemic antibiotic therapy.

X. Nerve Weakness

- Some surgical procedures may lead to nerve injury due to close approximation of the nerves to the surgical sites. For example- In TMJ surgeries- facial nerve, Mandibular fracture management and mandibular orthognathic surgeries- inferior alveolar nerve and mental nerves are at risk.

- **Postoperatively-** Patient should be frequently evaluated to rule out nerve injury.
- Majority of the times the injury is due to traction or compression of the nerve during surgery leading to localized intraneural inflammatory edema leading to increase in intraneural pressure and conduction block. This can be managed by use cold compression ice packs for a period of 20-30 minutes per hour for first 24 hours after surgery. Cold compresses help by decreasing vascularity to the area, decrease inflammation, and edema.
- Use of Steroids as Anti-inflammatory agent- Tablet methylprednisolne 10 mg B.D. for 5 days reduces inflammation and edema. The recovery is usually complete and occur within few days.
- For more significant trauma to the nerve, the recovery is often incomplete and delayed requiring weeks to months. If there are no signs of recovery in initial post-operative days consider considerable nerve injury and start tablet methylcobalamine 1500 mcg for at least three months. Recall the patient frequently to monitor the recovery.

XI.Stridor



Source: Zoorob R, Sidani M, Murray J. Croup: an overview. Am Fam Physician. 2011;83(9):1071.