PROCEDURE	
Oral Maxillofacial and Craniofacial Post-surgical Care	
Scope (Staff):	Clinical Staff
Scope (Area):	PMH (valid for PCH)

This document should be read in conjunction with this DISCLAIMER

Aims

1. To prevent postoperative complications.
2. To recognise early signs and symptoms of complications should a complication occur and implement prompt management.
3. To effectively manage postoperative pain.

Background

Craniofacial and Maxillofacial surgery refers to a range of surgical procedures to treat or correct conditions affecting the bones and/or soft tissues of the face and head. These conditions typically include congenital abnormalities such as cleft lip and palate, Pierre Robin Sequence, craniosynostosis or can be as a result of injury or disease.

Management of children with craniofacial and maxillofacial conditions is multifaceted involving a team of specialists in the child's short term and long term care including for example: craniofacial and maxillofacial surgeons, orthodontists, paediatric-odontists, neurosurgeons, ENT specialists and speech therapists.

Procedures involving the nose, mouth and jaw have significant risk of postoperative swelling and airway compromise. [1-4]

Commonly performed oral craniofacial and maxillofacial surgical procedures performed at PMH include:

- Cleft lip and/or palate repairs
- Alveolar bone graft
- Pharyngoplasty
- ABBE flap/ lip reconstruction
- Maxillary and mandibular osteotomies.

Postoperative Complications

- Airway obstruction
- Bleeding/haemorrhage:
    - primary (within 24 hours of surgery)[5] and
    - secondary (can occur up to 2 weeks post-surgery)
- Pain

Postoperative Complications (Cont.)

- Dehydration and nutritional compromise
- Wound infection

Risk

Delay in recognition of post-operative complications impacting successful patient outcomes and timely discharge from hospital.

Key Points

- Patients at increased risk of postoperative respiratory complications may require a planned admission to PICU or arrangements made for closer ward nurse observation as per CAHS policy 'Patient Special and Clinical Observation Levels' *(pending)*. This must include consultation and agreement with the relevant clinical nurse manager, intensivist, anaesthetist and surgeons.
- Close observation of the patient's respiratory status is essential in the first 24-48 hours for all patients following oral maxillofacial/craniofacial surgery as there is high risk for airway swelling and obstruction.[6] Seek prompt medical review at the earliest signs of complication.[3, 6, 7]
- Effective pain management is essential to:
    - Facilitate an early return to oral intake of fluids and diet and minimises the risk of postoperative dehydration.
    - Reduce distress – excessive crying due to pain can interrupt healing of the surgical wound and increase the risk of a postoperative bleed.
- Patients who have had wiring to the jaw eg. maxillary/mandibular osteotomies must have scissors/wire cutters readily available at the bedside in case of respiratory obstruction.

Postoperative Care

- For postoperative diet and fluids please refer to:

  Appendix 1: Standard Postoperative Diets following Craniofacial Procedures

  Appendix 2: Post-surgical Texture Modified Menu

  Appendix 3 Quick Guide to craniofacial procedures & post-operative care

Steps	Additional Information
1. MAINTAIN AIRWAY **Patient Positioning** • Position the child to promote comfort and drainage of secretions, blood or vomitus e.g. lateral or semi-prone unless otherwise instructed by the treating surgeon.	A pillow may only be used when the child is fully conscious. An absorbent sheet can be used to protect the linen.

Steps	Additional Information
• Elevate the head of the bed to 45^0 for patients who have undergone a pharyngoplasty, alveolar bone grafts or maxillary/mandibular osteotomies.	To assist with oedema control.[2, 3]
Observations: Routine postoperative observations following cleft lip repair only, ABG and ABBE flap unless otherwise clinically indicated.	See Postoperative and Procedural Care (Clinical Practice Manual)

Patients returning to ward areas who have undergone a cleft palate repair, pharyngoplasty or maxillary/ mandibular osteotomy require the following close airway observations:
From arrival in PACU
• Commence continuous pulse oximetry for 24 hours.
• Record ½ hourly for 6 hours: [8]
  ○ Respiratory rate (RR) & effort
  ○ O_2 saturations
  ○ Pulse
  ○ Conscious level
Then if no signs of respiratory distress:
• Document hourly Pulse, RR, SpO_2 overnight until reviewed the following morning or as determined by the surgical team(s) and the patient's clinical status.
• 4 hourly temperature
• BP as clinically indicated
	Patients for admission to PICU post-operatively will have continuous cardiorespiratory monitoring as per PICU protocols.
	Risk of primary bleeding and airway swelling is highest in the immediate postoperative period [5,7, 9]
	Document the monitoring plan in the patients nursing care plan.
	Increase observation frequency if at any time child's condition changes and seek early medical review.[10] Refer to Children's Early Warning Tool (CEWT)
	At a minimum, a baseline post op BP must be obtained and at any time a CEWT is triggered

Following all procedures, observe the child throughout and document/report any of the following: • excessive swallowing • visible drooling • bleeding from mouth or nose • Provide gentle suction to sides of cheeks - do not suction directly over the operative site	Refer to Managing Complications below. Use only Y- Suction catheters.

Steps	Additional Information
Continuous pulse-oximetry may be discontinued after 24 hours providing the patient: • is not considered at high risk of respiratory complications • does not have oxygen requirement • has had no signs of respiratory compromise/distress	

Nasopharyngeal Airway (NPA)
• Patients who require a NPA post operatively are usually nursed in PICU and transferred to the ward when stable.
• Patients on the ward with a NPA must be closely supervised at all times and require the following
  ○ Continuous pulse oximetry
  ○ One hourly pulse, respiratory rate/ distress until NPA removed or according to surgeon instruction.
• Maintain patency of NPA with regular suctioning as directed by treating surgeon[2]
• Contact the treating team immediately if the airway becomes dislodged.
• Do not attempt to reinsert unless trained to do so.
• For patients requiring NPA beyond the postoperative period implement parent/carer education as early as possible.
Refer to speech therapy where applicable for assistance with feeding equipment and support.
	NPA is not routine however may be required for children post pharyngeal flap, pharyngoplasty and primary cleft repair and may in some instances be required for several days to weeks.[2]
	
	Apnoea monitoring may be requested for infants by the anaesthetist/treating surgical team.
	
	Do not instil saline into the NPA - Refer to PICU NPA clinical guideline or NICU guideline (adapted NPA)
	
	Contact CNS ENT and/or CNS Respiratory Medicine for support/advice

Steps	Additional Information
2. WOUND/SUTURE LINE CARE	
• Discourage patient from touching suture line. Apply arm splints on patients likely to touch the operative site.	Arm splints are required for a total of 3 weeks following cleft lip/palate repair (available from the orthopaedic/plastics ward).
• No dummies, teats or straws post cleft lip ± palate repair.	
• Offer cooled boiled water after meals, medications and milk feeds (excluding breastmilk).	Breast milk contains antimicrobial properties.
• Perform regular mouth care +/- 0.2% chlorhexidine mouth rinses as instructed which may be prescribed for the following procedures: ○ Alveolar bone graft, ○ Pharyngoplasty, ○ ABBE Flap, ○ Maxillary/ Mandibular osteotomy	Usually 4 times a day (QID) Mouth rinses are commenced 4 days before bone grafting and orthognathic procedures.
Mouth Rinse Procedure: • After tooth brushing (if permitted) rinse mouth out thoroughly with water. • Measure 10mL 0.2% chlorhexidine (approx. 2 capfuls) UNDILUTED. • Rinse for 1 minute (to be timed). • Do not rinse mouth with water or eat/drink for 15 minutes after Chlorhexidine rinse. • Repeat QID (and after tooth brushing) • Continue for 7-14 days following surgery.	Refer to Quick guide below. Toothpaste can deactivate the effect of Chlorhexidine.[11] NB: If patient unable to tolerate full strength dilute 10mL of Chlorhexidine with a maximum of 8mL of water. Time taken for surgical wound to fully heal.[8]
Water Pic: • 20 mL of 0.2% Chlorhexidine may be added to the reservoir on a water pic (aqua jet) when the patient is unable to perform a regular mouth rinse.	NOTE: Water pics/ straws/syringes ONLY allowed for Maxillary/ Mandibular Osteotomy. The water pic is used mainly for the removal of debris.

Steps	Additional Information

3. HYDRATION & NUTRITION
• Maintain an accurate fluid balance record - document all vomiting and ooze and describe contents.
• Report to the treating surgeon if old or new blood clots observed.
• Encourage diet with patient prior to discharge refer to:
  ○ Standard Postoperative Diets following Oral Maxillofacial or Craniofacial Procedures
  ○ Post-Surgical Texture Modified Menu
• Refer to dietitian if patient requires nourishing fluids on discharge.
	Swallowing promotes healing and helps prevent secondary haemorrhage.
	See (Appendix 1)
	See (Appendix 2)
	Requires ordering by Dietitian

• Maintain patent IV access for at least 24 hours • Depending on procedure, IV access may be needed for IVABs as per ChAMP surgical prophylaxis guidelines.	IV access is necessary for emergency management in the event of a postoperative haemorrhage especially in the primary risk period
4. PAIN MANAGEMENT • Perform and document regular pain assessments using an appropriate tool as per APS Pain Service & Management Protocol. • Administer regular prescribed analgesia and monitor effects. Tablets are permitted only if patient is able to swallow whole with water.[12] • Liaise with acute pain service/ anaesthetic registrar if pain is not well controlled.	Effective pain management will promote fluid/dietary intake and therefore allow for planned discharge. Excessive crying and distress due to pain can interrupt suture line healing and increase the risk of a post- operative bleed therefore regular analgesia is important in the post-operative period.
• Implement discharge education early and provide child/carer with verbal and written discharge advice.	Provide relevant Health Facts sheets to parents (refer to Useful Resources).

Managing Complications

Airway Obstruction

Steps	Additional Information
Call for medical review assistance if any of the following signs: • Visible or suspected airway obstruction • Restlessness and agitation • Change in vital signs and increased CEWT score • Initiate MET/Code Blue as clinically indicated.	**Increasing oxygen requirements for a child with a history of OSA and apparent airway obstruction is a significant concern. Initiate MET call or PICU review.** Refer to Oxygen Therapy Guidelines. Refer to Clinical Deterioration Response MET Call and Code Blue procedures.
• Maintain airway support: • Reposition child/sit child up at 45^0 • Gentle suction into cheeks if obstruction present • Administer Oxygen via Hudson mask • **Inform treating surgeon immediately**.	Use only Y- suction catheters. Never suction over operative site ie. suture line.

Haemorrhage

Steps	Additional Information
Inform the treating surgeon immediately if the child develops any of the following: • Significant bleeding • Drowsiness • Pallor and clamminess • Excessive swallowing	If possible, keep blood/ ooze for treating surgeon to review.
• Re-commence continuous observation until reviewed or transferred to theatre/PICU. • Apply adrenaline (1:1000) soaked gauze to suture line only if instructed to do so by the treating surgeon.[12]	Ensure theatre coordinator is informed of the potential for returning to theatre.

Steps	Additional Information
• Remain with the patient at all times. • Reassure the child/carer and assist the child to remain calm.	
• Prepare the child for theatre.	

Related internal policies, procedures and guidelines
Postoperative/ Procedural Care
Children's Early Warning Tool
Clinical Deterioration Response: MET Call and Code Blue for ongoing management.
Acute Pain Service Protocols
Oxygen Administration

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11. Farah CS, McIntosh L, McCullough MJ, . Mouthwashes. Autstralian Prescriber, [Internet]. 2009; 32:[162-4 pp.]. Available from: http://www.australianprescriber.com/magazine/32/6/162/4/.

12. Watts G [Consultant Plastic Surgeon], Adrenaline use on craniofacial wound site. [Personal Communication]. Princess Margaret Hospital; 2015.

13. Dietitians Association of Australia, The Speech Pathology Association of Australia, Texture-modified foods and thickened fluids as used for individuals with dysphagia: Australian standardised labels and definitions. Nutrition & Dietetics. 2007;64:S53-S76

Useful resources (including related forms)
Care following Repair of Cleft Lip and/ or Cleft Palate (Health Facts)
Care following Mandibular/ Maxillary Surgery (Health Facts)
Care following Pharyngoplasty (Health Facts)
Nursing Practice standard for Maxillofacial Procedures, Fiona Stanley Hospital

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APPENDIX 1: Standard Postoperative Diets following Oral Maxillofacial Craniofacial Procedures

Aims

1. Meals provided will be of an appropriate texture and meet the patients' energy and nutrient requirements.
2. To provide a standardised meal ordering system for patients who have undergone the following maxillofacial or craniofacial surgery.

Procedures/Abbreviations*:*

Type of Procedure	Abbreviation
Cleft Lip Repair	CLR
Cleft Palate Repair	CPR
Cleft Lip Repair with Primary Rhinoplasty + Repair of Anterior Palate	CPR + CLR
Alveolar Bone Graft	ABG
Pharyngoplasty	Pharyn
Mandibular & Maxillary Osteotomies +/- expansion	MO
ABBE Flap	ABBE

Coordinators' Role*:*

On the morning of patient admission/day of surgery the coordinator will ring the Diet Kitchen (ext 8382) and state the patients:

- Full name
- Age
- Type of surgical procedure child is undergoing

If the Diet Kitchen is unavailable, leave a message and they will return the call to confirm the meal order.

On the *Meal Order List*, simply tick breakfast, lunch and dinner as usual and which diet the patient is now tolerating ie. clear fluids, nourishing fluids, tasty puree or soft (where applicable). In the comments section write the abbreviation for the appropriate procedure ie. "CLR".

Occasionally the surgery time will be rescheduled. If this occurs, the shift coordinator will contact the Diet Kitchen and notify them of appropriate changes to the patients' meals.

Diet Kitchen's Role

- Write the above information on the order sheet in the kitchen, and fill in the appropriate upgrades for the procedure each child is having, for breakfast, lunch and dinner.
- Return any missed calls to confirm the patient and the meal order.

Food Services Assistant Role

- Prepare the appropriately textured meals each day.
- Place meals on the child's tray for transfer to the ward.

Contact the WARD Dietitian if:

- A child has allergies.
- Avoids certain foods for religious or cultural reasons.
- A child is not tolerating the standard diet upgrades, or
- Any problems arise.

Please be aware that there are two versions of the Texture C diet:

- For patients 4 months- 10months, they will be given the Texture C- ABC diet.
- This diet is milk and egg free.
- Patients older than 10 months will receive the Texture C- Tasty Puree diet.

Day	CPR + CLR **(Diet Only if >4/12)**	**CLR (Diet only if >4/12)**	CPR **(Diet Only if >4/12)**	**ABG**	**Pharyngoplasty**	**MO**	**ABBE**
Postoperative (Day of Surgery)	EBM / Infant Formula (On ward)	EBM / Infant Formula (On ward)	EBM / Infant Formula (On ward)	Clear Fluids	Clear Fluids	Clear Fluids	Clear Fluids
Day 1 Post-op	EBM / Infant Formula **OR** Nourishing Fluids **OR** Tasty Puree/ ABC	EBM / Infant Formula **OR** Nourishing Fluids **OR** Tasty Puree/ ABC	EBM / Infant Formula **OR** Nourishing Fluids **OR** Tasty Puree/ ABC	Nourishing fluids **OR** Tasty Puree	Nourishing fluids **OR** Tasty Puree	Nourishing fluids **OR** Tasty Puree **OR** Soft Diet	Nourishing fluids **OR** Tasty Puree
IMPORTANT NOTE: **GRADUALLY TITRATE DIET UP ACCORDING TO WHAT EACH INDIVIDUAL PATIENT CAN TOLERATE. REMEMBER TO PRACTICE AND TEACH REGULAR MOUTH CARE**							

EBM = Expressed Breast Milk

Appendix 2: PMH Post-Surgical Texture Modified Menu [13]

	Clear Fluids	Nourishing Fluids	Puree (Texture C)	Soft
Description	Fluids that liquefy at room temperature. All liquids containing fat are excluded	Full fluids including milk and soy-based products that can easily pass through a straw	Smooth, lump-free food that holds its shape	Naturally soft foods or foods that are cooked and cut to make the texture soft. Little chewing or biting required.
Allowed	Water, apple juice, soft drink, other pulp-free fruit juice (strained), fat free clear soups, broths, clear jelly Commercial high-energy, fat-free, milk free nutritional supplements as prescribed by Dietitian	Strained meat and vegetable soup, strained fine porridge or thin semolina, strained fruit juice. Milk, soy milk (calcium enriched), yoghurt (no lumps), thin custard, low joule jelly, ice-cream, lemonade, nutritional supplements as prescribed by Dietitian	Any food with smooth and lump free texture Moist and cohesive enough to hold its shape on a spoon. Food can be moulded, layered or piped.	Any soft food that can be chewed but not necessarily bitten. Minimal cutting required – easily broken up with fork. Food should be moist or served with a sauce or gravy to increase moisture content.
Not Allowed	Cream soups, ice cream, milk, prune juice, juice with pulp, jelly with added fruit, liquids containing fat.	Lollies, yogurt with lumps, unblended soups.	Foods that are not of the specified texture.	Foods that are not of the specified texture

Appendix 3: Quick Guide to Oral Maxillofacial and Craniofacial Procedures Post-Surgical Care

Aims	CLEFT LIP REPAIR ONLY & Primary Rhinoplasty	PALATE REPAIR ± Cleft Lip repair	ALVEOLAR BONE GRAFT	PHARYNGOPLASTY	ABBE FLAP	MAXILLARY / MANDIBULAR OSTEOTOMY
Maintain Effective Airway Clearance	• Routine post op obs Nurse laterally • Gentle suction to sides of cheeks PRN • Nasal drops 4/24 if stents in situ	• Close airway observations* • Nurse laterally • Gentle suction to sides of cheeks PRN • Nasal drops 4/24 if stents in situ	• Routine post op obs • Gentle suction to sides of cheeks PRN • Nurse at 45°	• Close airway observation * • Gentle suctioning to sides of cheeks PRN • Nurse at 45°	• Routine post op obs • Nurse laterally • Gentle suction to sides of cheeks PRN • Reduce anxiety	• Close airway observation * • Gentle suction to sides of cheeks • Nurse at 45° • Scissors or wire cutters above bed if bands or wiring in situ
	*Close Airway Observations: For 6 /24 post op: ½ hrly Respiratory Assessment; O2 sats; Pulse, LOC; Continuous pulse-oximetry for 24/24 4/24 Temp; ±4/24 BP Observe for: excessive swallowing, drooling, bleeding from mouth/nose – inform surgeon immediately.					
Maintain Hydration & Nutrition	• **IVT** • EBM/Formula post-op • Day 1- titrate diet up (according to each individual's tolerance) to pureed feeds for 2/52 (consider age) • Pigeon bottle	• **IVT** • EBM/Formula post-op • Day 1- titrate up diet (according to each individual's tolerance) to pureed feeds for 3/52 (consider age) • Pigeon bottle	• **IVT** • PO Clear fluids post-op • Day 1- titrate up diet (according to each individual's tolerance) to pureed diet for 2/52 • Post 2/52, increase to soft diet until follow- up (consider age)	• IVT • PO clear fluids post-op • Day 1- titrate up diet (according to each individual's tolerance) to pureed diet for 3/52.	• **IVT** • PO clear fluids post-op • Day 1- Pureed diet until suture line separated.	• **IVT** • PO clear fluids post-op • Day 1- titrate up diet (according to each individual's tolerance) from nourishing fluids to pureed to soft diet until follow-up appointment. • The titration process will usually occur over a 1 week period.
Promote Comfort	**Pain Assessment** as per Acute Pain Service Pain Assessment and Management Protocol					
Maintain Suture Line Integrity	• No dummies/teats • Cool boiled water after all meals except breast milk • Suture care 4/24 & PRN • Arm splint 4/24 cares when awake • ROS Day 5 post op • Sedation & consent required	• No dummies/teats • Cool boiled water after all meals except breast milk • Suture care 4/24 & PRN • Arm splint 4/24 cares when awake • ROS Day 5 post op • Sedation & consent required	• Open cup, no straws • Cool boiled water after all meals • Mouth care 4/24 & PRN • Clean lower teeth on day 2 • BD Chlorhexidine mouthwashes for 7/7	• Open cup, no straws • Cooled boiled water after all meals • Discourage talking • BD Chlorhexidine mouthwashes for 7/7	• Suture line care 4/24 & PRN • Chlorhexidine mouth washes BD • Cooled boiled water after all meals • Mixing cannula, straws, syringes for food/fluid • ROS Day 5 post op • Separation of suture line 2/52 post-op (GA)	• Mouth care 4/24 & PRN • Water Pic TDS with Chlorhexidine mouthwash • Cool boiled water after all meals • Mixing cannula, straws, syringes for food/fluid • Pinsite cares if single vector distractor in situ
Maintain Skin Integrity	**As per CAHS Guideline: Pressure Injury Prevention and Management**					
Prepare for Discharge	**As per Discharge Advice Sheets** **Implement patient/carer education early, where applicable**					