**15. Facial and dental injuries**

**Priorities in management**

Best practice is based on current APLS / ATLS guidelines.

Maxillofacial injuries will often take a lower priority than other potentially life or limb threatening injuries. This is due to the ability to deal with most maxillofacial injuries in a timescale from 24 hours to 7 days without long-term morbidity.

There are a few exceptions to this rule and they are highlighted in the guidelines below.

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| **PURPLE** | Time critical lifesaving intervention needed (or multi system injuries individually needing specialist care)  ED to ED transfer, no speciality permission required |
| **RED** | Time sensitive intervention required. May be able to stay locally if max fax on site.  If being transferred in the context of multi system trauma should only go to paediatric MTC (Leeds / Sheffield) |
| **AMBER** | Delayed treatment required. May be able to stay locally if max fax on site  If being transferred in the context of multi system trauma should only go to paediatric MTC (Leeds / Sheffield)  If isolated injury may be able to go to another Trauma Unit with max fax on site |
| **GREEN** | Non-emergency /elective. May be able to stay locally if max fax on site  If being transferred in the context of multi system trauma should only go to paediatric MTC (Leeds/Sheffield)  If isolated injury may be able to go to another Trauma Unit with max fax on site |

**Location of services and referral pathways for Yorkshire & Humber**

In the child with multiple trauma they will be transferred to the Major Trauma Centre (MTC) according to the usual major trauma pathway (see [Section 3](#Philosophy)). Each MTC will have maxillofacial support available to them.

Some Trauma Units will be able to provide paediatric management in the following circumstances:

* Absence of other injuries which would require immediate transfer to the Paediatric MTC
* Age > 2 years

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| **Major Trauma Centre** | **Centres with maxillofacial resident on call** | | | | | | | |
| Leeds General Infirmary  0113 243 2799  Bleep 1782 | Leeds General Infirmary  0113 243 2799  Bleep 1782 | | Bradford Royal Infirmary  01274542200  Bleep 284 | | | Pinderfields General  01924 213000  01924 542318 (direct)  Bleep 352 | | |
| Sheffield Children’s Hospital  0114 271 1900  07623869543  Bleep 2027 | Royal Hallamshire  0114 271 1900  07623869543  Bleep 2027 | | Barnsley  01226 730 000  Bleep 173 | | Chesterfield 8am to 5pm  01246 277 271  Bleep 861  **Out of hours refer to Sheffield Children’s Hospital** | | | |
| Hull Royal Infirmary  01482 328 541  Bleep 128 | Hull Royal Infirmary  01482 328 541 Bleep 128 | | | York District Hospital  01904631313 Bleep 861  (Harrogate refer to York) | | | | |
| **PENETRATING NECK INJURY** | | | | | | | | |
| **Presentation** | | | **Consideration** | | | | | **Management** |
| **Stable patient**  No airway compromise  Haemodynamically stable  No haematoma  No bruit  No mediastinal widening  No voice changes  No cranial nerve injury | | | Contact vascular surgery and maxillofacial surgery (NB vascular surgery only available in Leeds)  CT angiogram and interventional radiography management of bleeding sites  Tetanus and antibiotics | | | | | Surgery if patient deteriorates or other injury identified on CT scan  Otherwise observe and monitor closely |
| **Unstable patient**  Airway compromise  Haemodynamically unstable  Neck haematoma  Uncontrollable bleeding  Mediastinal widening  Voice changes  Cranial nerve injury | | | Immediate surgical intervention after control of the airway  Tetanus and antibiotics | | | | | Multi-specialty surgical input – paediatric surgery, vascular and/ or maxillofacial surgery |

**Tissue injuries**

The management of soft tissue injuries often involves debridement and closure by the maxillofacial team within 24 to 48 hours unless there is a need to control bleeding.

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| **SOFT TISSUE INJURY – SPECIAL CONSIDERATIONS ACCORDING TO SITE** | | | | | | | | | |
| **Site** | | **Pitfall** | | | **Immediate Management** | | **Definitive management** | | |
| All sites | | Dirty wound | | | Irrigation, tetanus, antibiotics and dressings | | Debridement, washout and closure | | |
| Scalp | | Haematoma formation | | | Control bleeding and pressure dressing | | Debridement and washout  Monitor haemoglobin | | |
| Ears | | Haematoma | | | Drainage to avoid cartilage collapse | | Compression bandage | | |
| Nose | | Septal haematoma and tissue loss | | | Drain haematoma with needle puncture | | Tissue loss requires secondary reconstruction | | |
| Lips | | Vermillion border scars | | | Irrigation, identify foreign body | | Debridement and closure of wound | | |
| Intra-oral lacerations | | Infection | | | Lacerations < 1.5cm require oral hygiene measures only | | Large wounds require debridement and closure within 72 hours | | |
| Pre-auricular | | Facial nerve and parotid injury | | | Document facial nerve function.  Identify salivary leak | | Exploration of wounds, repair and closure | | |
| Eyelid | | Lacrimal flow damage/underlying damage to the globe | | | Full eye assessment is required | | Repair of eyelid with duct cannulation (Ophthalmology +/- Maxillofacial) | | |
| **HARD TISSUE INJURY** | | | | | | | | | | |
| **Site** | | | **Presentation** | | | **Immediate Management** | | **Definitive Treatment** | | |
| Skull | | | Skull laceration, low GCS, CSF leak, “Panda eyes,” Battles sign, haemotympanum | | | Refer to section on Severe traumatic brain injury **insert hyperlink**  Follow local guidelines for vaccination with CSF leak | | Neurosurgical management | | |
| Orbit - white eye blowout or entrapment (of muscle or fat) | | | Diplopia, bruising around eye, numbness of cheek, vagal symptoms (bradycardia, syncope, nausea, vomiting, hypotension when asked to move affected eye) - can be mistaken for intracranial injury | | | Rule out globe injury  CT orbits with coronal formats (fine cut)  Consider steroids | | Contact oral and maxillofacial surgeon  If no other injuries then EUA and release of entrapment in theatre within 24 hours to reduce risk of persistent diplopia | | |
| Orbit - compartment syndrome or retrobulbar haemorrhage | | | Pain, proptosis, reduced acuity, paraesthesia of cheek, hard / tense globe | | | Lateral canthotomy +/- cantholysis  Mannitol, acetazolamide, steroids | | If no other injuries then EUA and control of bleeding in theatres | | |
| Nose | | | Difficult to assess if swollen  Deviation of nose, septal haematoma, epistaxis | | | Drain septal haematoma, control epistaxis- may need ENT input | | MUA nasal bones when swelling reduces in 48-72 hours | | |
| Orbital floor injury (no entrapment of muscles or fat) | | | Bruising of eye with double vision and often identified on CT scan  Enophthalmos | | | Visual acuity and assess for globe injury | | ORIF of fracture site within 5-7 days | | |
| Zygoma/ midface | | | Flattening of cheekbone complex, double vision, enophthalmos, inability to open mouth, malocclusion due to mobility of maxilla, bruising of palate, epistaxis, numbness of cheek | | | Assess for globe injury and record visual acuity Treat emergency as per orbital injury  Ask patient not to blow nose.  No routine antibiotics | | ORIF fractured bones in 5-7 days | | |
| Complex maxillary fractures require management within 24 hours | | |
| Mandible including  condyles & ramus | | | Bleeding from mouth, inability to bite, malocclusion, numbness of lower lip on one or both sides | | | Treat as open fracture and administer antibiotics (except condyles)  Ensure airway secure in **bilateral** fractures | | ORIF of fracture within 24 hours (can delay treatment if other life threatening injuries present). Condylar fractures rarely require ORIF under age 12 | | |
| **BITE INJURY** | | | | | | | | |
| **Type** | **Consideration** | | | **Management** | | | | |
| Human | Usually dirty  High risk for contamination and transmissible disease | | | Swab wounds, Tetanus / immunization history, consider transmissible diseases, photograph, irrigate  Antibiotics - co-amoxiclav remains first line  Consider non-accidental injury and if suspected refer to paediatrician | | | | |
| Animal | May be clean or dirty  Lower risk for contamination than human bite | | | Swab wounds, Tetanus / immunization history, photograph, irrigate  Antibiotics (Commonest organism from dog bite - Pasteurella species) - co-amoxiclav remains first line  Consider non-accidental injury and if suspected refer to paediatrician | | | | |

**Dental and dentoalveolar trauma – see also tooth avulsion treatment algorithm** [**Appendix 9**](#Appendix9)

Dental trauma should be triaged and managed based on damage to deciduous teeth (baby teeth) or adult teeth which begin to erupt from the age of 6 sequentially replacing baby teeth with their adult counterparts.

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| **Scenario** | **Action** | **Consideration** |
| Acute trauma patient with loose teeth / debris considered to be airway risk | Remove any loose teeth or fractured crowns deemed to compromise airway | Unaccountable teeth- consider CXR to rule out inhalation |
| Avulsed or subluxed/displaced teeth | Follow algorithm – [Appendix 9](#Appendix9) | Contact maxillofacial bleep holder/ SpR on call |

* **Avulsed deciduous (baby) teeth** do not require re-implanting in the acute setting.
* **Avulsed adult teeth** should be re-implanted as quickly as possible (as long as this does not compromise the management of other issues such as the airway management or management of other injuries). This can be performed (ideally within 1 hour of avulsion) by handling the tooth by the crown and sliding the root back into the socket.
* **Dentoalveolar fractures** involve the tooth bearing bone in the mandible and maxilla. Fractured segments will have multiple teeth that move in unison when palpated. These fractures are rare, and should raise suspicion of a fracture of the major bones in the face if mobility is seen.

Following initial management, children should be referred to their dental practitioner or a specialist paediatric dentist at the earliest opportunity for definitive management.

**Appendix 9 - Avulsion of tooth algorithm**