BACKGROUND
It is often the most junior member of the hospital team who is first asked to see the “casualty patient” with possible maxillofacial bony injuries. There is a requirement to make an immediate assessment and to commence the management of the patient. The general principles of fracture management for facial fractures involve reduction, immobilisation and fixation.

AETIOLOGY OF FACIAL INJURIES
Facial injuries result mainly from fights, sporting injuries, falls and road traffic accidents. Alcoholic intake is a common finding in these categories of patients. The aetiology of the injury may have clinical significance. eg. road traffic accidents often involve litigation, fights may involve the police.

Early management of patients with maxillofacial trauma involves:

A - Airway.
B - Bleeding.
C - Cranium – CNS, CSF, cervical spine, chest.
D - Diplopia, dentures, dentition, drugs.
E - Eyes, ears.
F - Facial lacerations, fractures, foreign bodies.
G - Genitourinary and other injuries, gunshot wounds.
H - History.
I - Infection.

DIFFERENTIAL DIAGNOSIS
Patients with maxillofacial bony trauma fall into those with:
(1) Fractures of the mandible and who rarely have serious injuries to other parts.
(2) Fractures of the middle or upper third facial skeleton, commonly because of severe trauma (particularly road accidents), who are more likely therefore to have their life threatened because of associated:
   (a) Airway obstruction.
   (b) Bleeding
   (c) Head injury.
   (d) Serious trauma to other parts, particularly chest injuries, ruptured viscera, eye injuries, fractures of the cervical or lumbar spine, and fractures of long bones.

Immediately life threatening injuries take priority
Ensure the airway is open and the patient is breathing high flow oxygen (via reservoir bag) if necessary. Insert 1-2 wide bore venous cannulae. Give fluids and blood as appropriate. Ensure all manoeuvres are carried out with due regard to the possibility of an unstable C. spine injury. Check GCS and pupils. Expose the patient as far as necessary and begin secondary survey.
Remember: PATTERN
P – Posture
A – Airway
T – Tongue traction.
T – Tubes/tracheotomy.
E – Examination
R – Reassurance of patient.
N – Notification of specialists, eg Maxillofacial Surgeons or Neurosurgeons.

HISTORY
Remember the AMPLE history:
Allergies
Medications
Past medical history.
Last meal.
‘Environment’ ie. the circumstances of the incident.

CLINICAL EXAMINATION
This should consist of a general physical examination of all the major systems. In addition, a specific examination of the injured site(s) is mandatory. Accurate records of the history and examination at the time the patient is first seen are extremely important in preparing future medical reports required for any subsequent litigation.

CLINICAL FINDINGS WITH MANDIBULAR FRACTURES
(a) History of trauma to mandible.
(b) Pain
(c) Swelling
(d) Bruising, especially sublingually.
(e) Bleeding – usually intraorally.
(f) Mobility of fragments (and possible crepitus).
(g) Deranged dental occlusion (= bite).
(h) Paraesthesia/anaesthesia of nerves involved in the site – usually lower lip and chin skin anaesthesia.

FRACTURES OF THE MIDDLE THIRD OF THE FACIAL SKELETON
(a) History of severe trauma to the face, usually in a backward and downward direction (often a road traffic accident).
(b) Swelling of the upper lip and massive swelling of the face (ballooning) in more severe fractures (panda facies).
(c) Pain
(d) Bleeding (usually from the nose); haematoma – bilateral black eyes common; buccal sulcus introraorally also affected.
(e) Mobility – sometimes gross (floating face).
(f) Posterior gagging of dental occlusion and lengthening of the face with anterior open bite (inability to bring the front incisor teeth together).
(g) Percussion of teeth may elicit a “cracked pot” sound.
(h) Subconjunctival ecchymosis.
(i) Anaesthesia of the infraorbital nerves.
(j) Double vision/restricted eye movements.
(k) Cerebrospinal rhinorrhoea – leakage of CSF through the nose (or into the naso-pharynx).
(l) Bruising in the region of the greater palatine foramen at the posterolateral area of the hard palate.

**FRACTURES OF THE ZYGOMA – CLINICAL FINDINGS**
(a) Flattening of the cheek due to depression of the zygomatic complex – may be masked by oedema.
(b) Right-sided cheek and facial swelling and bruising.
(c) Subconjunctival ecchymosis, especially laterally, with no clear posterior scleral margin.
(d) Nerve damage – infraorbital, zygomatico-facial or zygomatico-temporal anaesthesia/paraesthesia.
(e) Interference with mandibular movements and limited jaw opening.
(f) Diplopia and restricted eye movements.
(g) Enophthalmos or exophthalmos.
(h) Step deformities on the orbital rim. Pain on palpation.
(i) Sometimes as the zygoma is driven in, the maxilla is "sprung" down, without being fractured, and there may be a temporary gagging of the occlusion in the molar area on the fractured side.

**CLINICAL FINDINGS IN ISOLATED ORBITAL WALL FRACTURES**
(a) Periorbital ecchymosis.
(b) Subconjunctival haemorrhage.
(c) Diplopia
(d) Limitation of eye movement, especially in upward gaze.
(e) Globe retraction on upward gaze.
(f) Enophthalmos
(g) Surgical emphysema of eyelids.
(h) Paraesthesia/anaesthesia within distribution of infraorbital nerve.

**ASSESS FOR THE POSSIBILITY OF RETROBULBAR HAEMORRHAGE**
Fractures of the orbital walls may be accompanied by subperiosteal haemorrhage and, if the periorbita is damaged, this may extend into the conjunctiva. Haemorrhage posterior to the orbital septum may be present after soft tissue or bony injury. Haemorrhage within the muscle cone may have more serious consequences. Retrobulbar haemorrhage may rarely occur either as a result of a zygomatic fracture and, if the haemorrhage causes sufficient rise in pressure within the intraconal space, it produces the classical signs of pain, proptosis, a dilating pupil, ophthalmoplegia and decreasing visual acuity. Blindness may follow in the absence of decompression, and is thought to be caused by ischaemia of a critical zone of the optic nerve head following occlusion or spasm of the short posterior ciliary arteries. This is an eye saving diagnosis. If time allows, with the support of medical treatment, a CT scan should be obtained in order to determine the site of the haemorrhage and to facilitate a possible urgent decompression following discussion with the On Call Maxillofacial Surgical Team. Medical treatment involves:
(1) Mannitol 20%, 2g/kg iv over 5 minutes.
(2) Dexamethasone, 8mg iv.
(3) Acetazolamide, 500mg iv and then 1,000mg orally over 24 hours.
(4) Surgical decompression remains the most certain option.

All patients with maxillofacial bony injuries of the orbital areas, with ocular signs and symptoms, require review not only by the Maxillofacial Surgeons but also by the Ophthalmic Surgeons, either at St Helens Hospital or, following any transfer to the University Hospital Aintree, such an opinion may be obtained at that hospital following review or admission.

INVESTIGATIONS
The definitive diagnosis of facial fractures largely depends on good radiographs. If the patient is unconscious, restless or drunk, definitive radiographs may be best obtained at a later date.

Radiographs recommended for maxillofacial injuries:
Mandibular – panoramic (OPG), posteroanterior view of the mandible or reverse Townes for possible mandibular condylar/temporomandibular joint fractures. If OPG is unavailable, bilateral lateral oblique views of the mandible.

Middle third and zygomatic fractures – initial single view 15° occipitomental radiograph.

Zygomatic arch – submentovertical view (exposed for zygomatic arches, not base of skull).

Orbital wall/floor fractures - ? additional specialised imaging with orbital CT scanning.

INITIAL TREATMENT
At this point sufficient information should have been obtained to enable you to gauge:
(1) The severity of the injury.
(2) Whether other medical/surgical teams need to be involved.
(3) Whether the patient requires hospital admission or requires to be transferred to the Regional Centre for Maxillofacial Surgery at the University Hospital Aintree.
(4) What investigations are required?

If any doubt exists on any of these points, contact can be made with the Oral and Maxillofacial Outpatients at Whiston Hospital or the On Call Team in the Regional Centre for Maxillofacial Surgery at the University Hospital Aintree.
MONITORING, REFERRAL AND DISPOSAL
Discussion regarding the management and further review and treatment of patients with maxillofacial injuries can be obtained, during the day, from the Outpatient Oral and Maxillofacial Department at Whiston Hospital (K2) – telephone number 1429, or, if unavailable or at night, from the On Call Team of the Regional Centre for Maxillofacial Surgery at the University Hospital Aintree – telephone number 0151 525 5980 (ask for the Maxillofacial Surgeon on call) or, if the patient is under the age of 16, via the Alder Hey Switchboard – telephone number 0151 228 4811.