FRACTURE REDUCTION IN THE EMERGENCY DEPARTMENT - CHW

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- The purpose of this guideline is to:
  - Standardise the process by which fractures are reduced at the Children's Hospital at Westmead in the Emergency Department.
  - Ensure that patients with fractures that require reduction are treated appropriately and with the highest quality care whilst minimising the need to make a trip to the Operating Theatre when possible.
- Fracture reduction is undertaken in the Emergency Department under sedation with nitrous oxide/oxygen mix and intranasal fentanyl for pain relief.
- It is used:
  - for specific types of closed fractures
  - when adequate sedation and analgesia are anticipated with this method
  - when appropriately trained and experienced staff are available
  - for children who can cooperate with the procedure.
- The Image Intensifier may be used to obtain post reduction views if a radiographer is available.
- The patient is admitted to EMU with Emergency consultant as AMO 1 and Orthopaedics as AMO 2.
- If these criteria are not met the fracture is treated under general anaesthetic in the Operating Theatre.
- Related policies:
  - Paediatric Procedural Sedation

Approved by:	SCHN Policy, Procedure and guideline Committee	
Date Effective:	1st April 2020	**Review Period**: 3 years
Team Leader:	Medical Director	**Area/Dept**: Emergency Department CHW

Date of Publishing: 17 March 2020 12:22 PM Date of Printing: 17 March 2020

- Intranasal Fentanyl: Administration in ED Guideline
- Pain Management CHW

CHANGE SUMMARY

- Due for mandatory review

READ ACKNOWLEDGEMENT

- Read Acknowledgment required for participating staff in the Emergency Department, Orthopaedic Department and Medical Imaging Department

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This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Introduction

Children with fractures commonly present to the Emergency Department. Some do not need reduction and can be splinted and sent home. Some need to be reduced in the operating theatre. Carefully selected cases can be reduced under nitrous oxide/oxygen mix and intranasal fentanyl in the Emergency Department. This reduces the time in hospital for the child and family and frees up the operating time for other cases needing reduction. However, if the cases are poorly selected, the procedure may fail, resulting in increased distress for the child and family and staff involved.

This procedure takes place in a Plaster or Procedure room or the Resuscitation Area and can be used for patients in the Fast Track, Subacute Cubicle Area and Acute Observation Area of the Emergency Department. The patient is admitted as an EMU patent with ED as AMO1 and Orthopaedics as AMO2. The Orthopaedic registrar is responsible for the procedure and can supervise another JMO, e.g. an SRMO. The procedure can take place so long as it can be completed before 2200hrs. After this time it is more appropriate to arrange for the fracture to be reduced under general anaesthetic. This should be arranged as a Day Stay the following day if possible.

The image intensifier Mini C Arm is available in the plaster room during and after reduction. This is only used by the Radiographer and its use depends on availability of the radiographer. If they are not available the patient is sent to Medical Imaging Department for a post reduction film.

Orthopaedic Registrar's Responsibilities

The Orthopaedic Registrar

- Assess the child and reviews the Xrays
- Explains the procedure to the child and parent and obtains informed written consent.
- Documents the procedure in the patient's notes.
- Carries out the procedure or supervises directly

The Orthopaedic Registrar is responsible for confirming the fracture is appropriate for reduction under nitrous oxide & intranasal fentanyl and for performing the procedure.

Closed reductions in the Emergency Department can be performed by senior Orthopaedic Registrars and Fellows.

Fractures deemed acceptable for this procedure include:

- displaced distal radius/ulna fractures
- displaced both bone forearm fractures
- minimally displaced tibial fractures
- hinged minimally displaced humeral supracondylar fractures

Fractures that should NOT be managed using this procedure include:

- off ended distal radius fractures
- both bone forearm fractures with 100% translation (i.e. no cortex preserved to hinge on)
- Monteggia and Galeazzi fractures, which require fluoroscopic evaluation after reduction
- displaced humeral supracondylar fractures
- multiple fractures (other than both bones forearm)
- hand fractures
- elbow, knee and complicated shoulder dislocations
- any fracture which has a high likelihood of requiring a percutaneous or open operation to obtain or maintain reduction.

Emergency Dept. Medical and Nursing Staff Responsibilities

The Emergency Department medical staff or Nurse Practitioner are responsible for arranging the procedure, arranging EMU admission (ED AMO 1 and Orthopaedics as AMO2), informing the family, arranging radiographer support and X-rays as needed. Refer to: Intranasal Fentanyl: Administration in ED Guideline and Pain Management CHW .

Patient:

The child needs to be assessed for appropriateness for conscious sedation with intranasal fentanyl and nitrous oxide/oxygen,

This includes:

- not severely unwell, no complex medical problem, over 1 year of age
- fasting for two hours for food and fluid given urgency of procedure
- no parenteral narcotics in the past one hour
- cooperative enough to take the mask for nitrous oxide/oxygen delivery
- no contraindications to intranasal fentanyl
- Admitted to EMU with ED as AMO 1 and Orthopaedics as AMO 2

Staffing:

Check availability of:

- **Proceduralist** –Orthopaedic Registrar or Fellow
- **Assistant** -Staff member from the Emergency Department who is not involved in the sedation is arranged to assist with the fracture reduction and plaster application.
- **Sedationist** - The sedation is given by a dedicated staff member not involved in the orthopaedic procedure. This person is responsible for ensuring adequate sedation and pain relief. This is usually a nursing staff member accredited in administration of nitrous oxide/oxygen

Image Intensifier Mini C Arm use:

- Powerchart Order placed as 'Fluoroscopy Any Part' for use of image intensifier.
- **Radiographer** – contact on 51245. In hours (weekday 8-4pm) 30 minutes notice is required, after hours 1 hour notice is required.
  - check Powerchart order received
  - discuss timing of sedation and procedure
  - establish if radiographer is available
  - confirm time of procedure

Time of Procedure:

Once the time of the procedure is negotiated ensure it is known to:

- patient and family
- orthopaedic team
- radiographer
- ED nursing and medical staff

Medication - Intranasal Fentanyl is ordered in the electronic medical record and obtained before procedure starts

Time Out

STOP and confirm the following before commencing the procedure

- Introduction of proceduralist, assistant, seditionist to each other
- Patient identification
- Procedure verification - procedure + site/side + match with consent
- Patient position
- Essential imaging reviewed
- Allergy/adverse reaction
- Fentanyl administered 10 minutes before nitrous oxide/oxygen sedation
- Radiographer availability confirmed for use of image intensifier
- Anticipated critical events and reasons to stop procedure

Procedure

- The Orthopaedic team explain the procedure to the child and parent and obtains and documents informed written consent for the procedure. The Orthopaedic team documents the procedure in the patient's notes.
- Sedationist moves the child and parent to the plaster room and applies oxygen saturation monitoring. Baseline pulse, respiratory rate and sedation score are recorded on the 'Procedural Sedation Form (M16B)' which acts as an assessment, prescription and observation chart: Procedural Sedation Checklist
- Give the intranasal fentanyl using the mucosal atomiser device. It is prescribed by the Emergency Dept. Doctor or accredited Nurse Practitioner and administered by the Emergency Dept. Registered Nurse. Dose and preparation are detailed in the guideline Intranasal Fentanyl: Administration in ED
- Intranasal fentanyl must be given 10 minutes prior to commencing nitrous oxide/oxygen sedation
- Nitrous oxide/oxygen sedation is administered by a Registered Nurse or Registrar who is accredited or Emergency Consultant / Fellow
- Start the nitrous oxide sedation at a 50% oxygen/50% nitrous oxide mixture and then rapidly increase to a 30% oxygen/70% nitrous oxide mixture
- Remain at a 30% oxygen/70% nitrous oxide mixture for 5 minutes prior to the beginning of the reduction to allow maximum effect
- Once the child is adequately sedated, the assistant escorts the parents from the plaster room to an appropriate waiting area. This is because the procedure may be distressing to the parents and also due to the limited physical space in the plaster room.
- The Orthopaedic Registrar then performs the reduction.
- Position of the reduction is confirmed using image intensifier under radiographer control if available.
- The child is placed in a full above elbow plaster for upper extremity cases and moulded appropriately. Backslabs may be used at the Orthopaedic Registrar's discretion. For lower extremity fractures, the patient will often be placed in a backslab.
- Nitrous oxide sedation must continue at a 30% oxygen/ 70% nitrous oxide mixture until the Orthopaedic Registrar has completed the moulding of the plaster.
- ALL upper extremity casts need to be bivalved (cast split on both sides) by the Orthopaedic Registrar with the plaster saw before the patient leaves the Emergency Department, to allow for swelling.

Recovery

- After ceasing the nitrous oxide/oxygen mixture the child breathes oxygen for a minimum of 3 minutes, or as long as it takes for the child to return to their normal level of awareness.
- Once the child has returned to their normal level of awareness, the parent is ushered back in to the plaster room by the assistant.
- A full set of observations is checked - pulse rate, respiratory rate, saturation and sedation score recorded on the 'Procedural Sedation Form (M16B)'
- Once awake and responding, the child is moved to the chairs outside the plaster room or to their bed in the Acute Observation Area.
- Once recovered (minimum 30 mins), the patient is sent to Radiology for a post reduction X-ray if needed. Care must be taken and the child should not walk to Radiology as the child may lack coordination initially.
- Circulation and neurological observations are taken hourly until discharge (minimum 2 hours).
- Check the child can tolerate oral fluids before discharge.
- The Orthopaedic Registrar reviews the post-reduction x-ray, prior to the patient being discharged.
- Any concern should prompt clinical review by Emergency Registrar for post sedation issues or Orthopaedic Registrar for fracture related issues.
- Under NO circumstances should the Orthopaedic Registrar attempt a second reduction under conscious sedation in the Emergency Department. If the patient requires a re-manipulation than this must be performed in the Operating Theatre.

Reasons to stop the procedure

At any time during the sedation and reduction, if any member of the medical / nursing staff feels that the child is:

- not tolerating the sedation, or
- the reduction is too painful or difficult

then the team is advised to:

- stop the procedure
- place the child in a comfortable splint and
- make appropriate arrangements for the Operating Theatre to complete the reduction.

Follow -up

- All patients return for follow up with a repeat x-ray ordered in one week's time, in the appropriate Orthopaedic Consultant clinic.
- Patients are given a plaster care card / fact sheet and clear instructions on elevation of the limb and cast care prior to discharge.
- Parents are advised that if the post reduction x-ray shows an inadequate reduction the child will require a trip to the Operating Theatre to re-manipulate the fracture under general anaesthesia.
- Also, parents are advised that there is always a chance that the reduced fracture can re-displace and this will be assessed at the one week follow-up. Should the fracture need to be re-manipulated at the one week follow-up, the reduction will be done in the Operating Theatre under general anaesthesia.

Concerns or Questions

For concerns and question at the time of presentation contact the Emergency Consultant or Fellow on Extension 52454 or the Orthopaedic Registrar or Consultant on call. For concerns regarding the process contact the Head of Department of Emergency, Orthopaedics or Chief Radiographer.