


	Nurse Practitioner – Emergency Services CLINICAL PRACTICE GUIDELINE INJURY - KNEE	
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Scope		Outcomes
Nurse Practitioner	<ul style="list-style-type: none"> • Knee injury, pain, swelling or deformity 	Identify patients suitable for NP (Emergency) CPG
Medical Practitioner +/- Nurse Practitioner	<ul style="list-style-type: none"> • Compound # / obvious fracture dislocation/ dislocation • Neurovascular compromise • Locked knee • Dislocated Patella • Multiple injuries • Altered conscious state including effects of drugs / alcohol • History consistent with collapse 	Identify patients not suitable for NP (Emergency) CPG and redirect Mx to usual ED care with NP (Emergency) part of the ED team.
Initial Assessment and Interventions		Outcomes
History	<ul style="list-style-type: none"> • Mechanisms of injuries sustained, • Time of injury • Treatment - given pre hospital • Range of movement / Ability to weight bear • Deformity • Past medical history / medications • Allergies / immunisations • Last food / fluids • Compensable status - MVIT/ WC / DVA / Private Insurance 	Exclusion criteria identified → exit CPG. Referral to EP.
Neurovascular assessment	<ul style="list-style-type: none"> • Colour • Warmth • Movement • Sensation • Capillary refill • Peripheral pulses 	Neurovascular compromise → exit CPG. Referral to EP.
Focused clinical assessment	<ul style="list-style-type: none"> • Knee assessment ^[1, 2] • Ottawa Knee Rules ^[3] – see Appendices. Not validated for use in patients less than 18 years of age. • Patients < 18 yrs of age with tenderness over growth plate require x-ray. 	Determine need for knee x-ray
Pain assessment	<ul style="list-style-type: none"> • Pain scale 	Determine need for and type of analgesia
Analgesia / First Aid	<ul style="list-style-type: none"> • - rest • - ice / immobilisation • - compression • - elevation • Administration of analgesia (see medications) 	Reduction / relief of pain Minimise / prevent swelling
Working diagnosis and Investigations		Outcomes
Imaging	<ul style="list-style-type: none"> • Imaging may not be required if ^[3] <ul style="list-style-type: none"> - patient able to weight bear - no bony or focal tenderness - age > 18 years and <55 years • Knee Ultrasound/CT may be suggested by Orthopedic Unit after assessment, if clinical diagnosis of tendon rupture 	

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Pathology	Not routinely indicated but consider <ul style="list-style-type: none"> • IV access and insert cannula if required • Pre operative investigations may include FBP, U&E, Group and Hold and INR as discussed with admitting medical officer. 	Ongoing assessment of need for intravenous access
Interpretation of results (diagnostic features) and management decisions		Outcomes
Imaging ± clinical features		
No fracture seen and weight bearing. - no effusion Soft tissue injury	<ul style="list-style-type: none"> • NP (Emergency) review with view to discharge • Apply conforming tubular bandage for comfort and support • Crutches for non weight bearing mode for first 24 hours^[1] • Continuing analgesia for the patient to take following discharge from the ED if required or until review • Patient education / health promotion • Follow-up appointment with LMO in 7 days for clinical reassessment and review of formal x-ray report 	Patient discharged with review LMO
Stable Ligamentus injury ^[2] -medial -lateral -anterior cruciate -posterior cruciate -meniscus Effusion or clinical suspicion of injury	<ul style="list-style-type: none"> • NP (Emergency) review with view to discharge • Apply conforming tubular bandage for comfort and support • Apply knee immobilizer splint^[1, 4] • Crutches for non weight bearing mode until return to Orthopedic clinic in 5 – 7 days for reassessment • Continuing analgesia for the patient to take following discharge from the ED if required or until reviewed in clinic • Patient education / health promotion • Follow-up appointment with LMO if required and • Orthopedic clinic appointment made for 5 – 7 days 	Patient discharged with review 1/52 Orthopedic Unit
Unstable Ligamentus injury ^[2]	<ul style="list-style-type: none"> • NP (Emergency) review with advice from Orthopedic Unit • Treatment varies according to acuteness of symptoms and age of patient • Discuss with Orthopedic Unit who may recommended POP or knee immobiliser • Apply knee immobiliser splint or POP • Crutches for non weight bearing mode until return to Orthopedic clinic in 7 days • Continuing analgesia for the patient to take following discharge from the ED if required or until reviewed in clinic • Patient education / health promotion • Follow-up appointment with LMO if required and • Orthopedic clinic appointment made for 7 days • Patient education / health promotion 	Patient discharged with review 1/52 Orthopedic Unit
Fracture undisplaced ^[5] - patella - tibial tubercle	<ul style="list-style-type: none"> • NP (Emergency) review with view to referral to Orthopedic Unit for consultation • Review and maintain adequate analgesia • Discuss with Orthopedic Unit whom may recommended 	Consultation by Orthopedic Unit and Patient discharged with review 2/52 Orthopedic Unit

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	<ul style="list-style-type: none"> • knee immobiliser splint or POP • Apply POP or Knee immobilizer splint • Crutches for non weight bearing mode until return to Orthopedic clinic in 7 days ^[5] • Continuing analgesia for the patient to take following discharge from the ED if required or until reviewed in clinic • Follow-up appointment with LMO if required and • Orthopedic clinic appointment made for 7 days • Patient education / health promotion 	
Fracture displaced <ul style="list-style-type: none"> - Femur - patella - tibial tubercle - tibial table 	<ul style="list-style-type: none"> • NP (Emergency) review with referral to Orthopedic Unit for admission and operative repair^[5] • Maintain RICE, review and maintain adequate analgesia • Monitor neurovascular perfusion of limb • Maintain nil orally until review • Patient education re admission • IV fluids as per medications 	Patient Assessment by Orthopedic Unit for admission
Associated care	<ul style="list-style-type: none"> • Consider ECG / CXR for patients who require surgical intervention • Consider IV fluids for patients who require fasting for surgical intervention 	
Acute Referral	<ul style="list-style-type: none"> • Consider referral to • +/- physiotherapy • +/- interpreter • +/- allied health etc. 	
Patient discharge education		Outcomes
When to return	<ul style="list-style-type: none"> • Verbal instructions from NP (Emergency) • ED written patient information 	Ensure patient understands problem, treatment, follow up and is safe for discharge home
Follow up appointments	<ul style="list-style-type: none"> • Verbal instructions from NP (Emergency) • Written instructions for LMO/Fracture clinic 	Ensure patient understands problem, treatment, follow up and is safe for discharge home
Medication instructions	<ul style="list-style-type: none"> • Verbal instructions from NP (Emergency) • Contact Pharmacist to provide medication education for patient when available. Written information as per Hospital Pharmacy on medications dispensed. 	Ensure patient understands problem, treatment, follow up and is safe for discharge home
POP care	<ul style="list-style-type: none"> • Verbal instructions from NP (Emergency) • Appointment for Plaster check in 24 - 48hrs with LMO • ED written patient information 	Ensure patient understands problem, treatment, follow up and is safe for discharge home
Safety assessment i.e. crutches	<ul style="list-style-type: none"> • Appropriate fitting of crutches and ambulation instructions. • Patients > 60 yrs of age, consider referrals 	Ensure patient understands problem, treatment, follow up and is safe for discharge home

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Other Referrals	<ul style="list-style-type: none"> Referrals may be made for specific patient problems or as required to <ul style="list-style-type: none"> - social work - physiotherapy - drug and alcohol counsellor - aboriginal liaison officer 	Ensure patient understands problem, treatment, follow up and is safe for discharge home
Certificates	<ul style="list-style-type: none"> Absence from work certificates WC certificate Certificate of attendance 	Appropriate documentation completed
Letters	<ul style="list-style-type: none"> Local medical officer letter 	Ensures continuity of care and referral to health care team
Medications		Outcomes
All medication will be stored, labelled and dispensed in accordance with hospital policy and relevant legislation ^[6]		
Simple analgesia ^[7] S2 Mild pain	Paracetamol 500mg: 1 or 2 tablets 4-6/24, not to exceed 8 tablets in 24 hrs. Children: 15 mg/kg 4 hourly up to 4 times a day. Not to exceed 4 doses in 24 hours Painstop Day: 0.6 - 0.8 MLS/KG ^[8]	Patients given analgesia appropriate to allergies, current medications and past medical history. Analgesia requirements determined by ongoing assessment of pain and adequate analgesia Provided.
S4 ^[7] Moderate	ADD to paracetamol if still in pain Naproxen 500 mg initially then 250 mg 6 – 8 hourly Children; Ibuprofen: 10 mg/kg 3-4 times daily to maximum of 600 mg in 24 hours ^[9] If NSAIDS contraindicated, Tramadol Adults and Children > 12 years Contraindicated in epilepsy, SSRI use Caution in the Elderly – Maximum 300 mg daily Oral: 50-100mg QID, maximum 400mg over 24 hours OR Intravenous: 50-100mg QID, maximum 600mg over 24 hours	Patients with excessive pain or pain unrelieved by analgesia need review by EP.
Narcotic Analgesia ^[7] S8 Severe Reassess	ADD to paracetamol + NSAID if still in pain Currently NPs require Medical Prescription for Schedule 8 medication Oxycodone: Adults only; Oral: 5mg every 4 hours OR Morphine Adults; Intramuscular/intravenous: 2.5mg then incremental doses to a maximum total dose of 10mg (given over period of 30 minutes) Children; IM – 0.2 mg/kg IV: 0.1- 0.2 mg/kg/dose given in titrated doses: IF PAIN NOT CONTROLLED WITH ALL 3 AGENTS, REFER TO ED CONSULTANT	

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Anti-emetic ^[7] PRN S4	Metoclopramide hydrochloride: Oral/IM/IV:10-20mg 8/24 Prochlorperazine: Oral 5-10mg 8-12/24 IM deep 12.5 mg 8/24 Not in Children < 16 years of age.	
Intravenous fluids S4	Adults: 0.9% Sodium Chloride Intravenous fluid: 5-10ml flush of Intravenous cannula 6/24 or Infusion at 8-12hrly titrated to patients requirements. Children: Discuss with ED Consultant.	

Clinical audit evaluation strategies		
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Unexpected representation	Emergency Department attendance register and NP (Emergency) clinical log	
Missed problem	Emergency Department x-ray review	

References		
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Authorship and endorsement		
(This Guideline has been developed in collaboration with the JHC ENP CPG Review Committee)		

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Key to terms	Appendices
CPG- Clinical Practice Guideline DVA- Department of Veteran Affairs EP- Emergency Physician LMO- Local Medical Officer MVIT – Motor Vehicle Insurance trust NP (Emergency) - Nurse Practitioner – Emergency Services OP- Outpatients PS- Pain Score	Ottawa Knee Rules

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S1-S4- Schedule of the drug administration act WC- Work cover	
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Ottawa Knee Rules^[10] For Knee Injury Radiography

A knee x-ray series is only required for knee injury patients with any of these findings:

1. age 55 or older
OR
2. isolated tenderness of patella (no bone tenderness of knee other than patella)
OR
3. tenderness of head of fibula
OR
4. inability to flex to 90 degrees
OR
5. inability to bear weight both immediately and in the emergency department for 4 steps (unable to transfer weight twice onto each lower limb regardless of limping)