

JLA Complex Fractures: Indicative Questions 1-18 and evidence summary

PSP Name	Rank of uncertainty	Uncertainty	Explanatory note	Evidence summary	Evidence	Evidence	True Uncertainty?
Top 10 priorities - Final workshop 08 Jun 2021							
Complex fractures	1	What is the best way to reduce the risk of infection after complex fractures?	Infection may cause significant morbidity and mortality in patients with complex fractures.	<p>All studies referenced in NG37 were of low quality and high risk of bias.</p> <p>There is moderate-certainty evidence that NPWT is not a cost-effective treatment for open fracture wounds.</p> <p>No other relevant trial evidence Cochrane/PUBMED since 2015</p>	<p>Effect of Incisional Negative Pressure Wound Therapy vs Standard Wound Dressing on Deep Surgical Site Infection After Surgery for Lower Limb Fractures Associated With Major Trauma The WHIST Randomized Clinical Trial</p>	<p>NICE Guideline 37 Fractures (complex): assessment and management</p>	Yes
Complex fractures	2	What is the optimal outpatient rehabilitation strategy for patients with complex fractures?	Patients with complex fractures may spend significant amounts of time completing rehabilitation over months or years. This may be very challenging and involve many trips to the rehabilitation facility.	<p>NG37 and NG39 – discuss patient rehabilitation in the context of providing adequate information. They state that this is very important to patients citing the qualitative study listed here.</p> <p>No other relevant trial evidence Cochrane/PUBMED since 2015.</p>	<p>Improving recovery-Learning from patients' experiences after injury: a qualitative study</p>	<p>NICE Guideline 37 Fractures (complex): assessment and management</p> <p>NICE Guideline 39 Major trauma: assessment and initial management</p>	Yes
Complex fractures	3	What psychological support would be useful for patients with complex fractures and when?	Complex fractures may lead to psychological morbidity in multiple ways. Firstly, the index injury may have been psychologically traumatic. Second, scarring and deformity may lead to issues with body image. Third, challenges may relate to changes in function and knock-on effects around work and leisure.	<p>Psychological wellbeing is mentioned in NG37 as a study outcome. The guideline also advises mental health team involvement for patients with psychological or psychiatric risk factors though there is no evidence supplied relating to this.</p> <p>No other relevant trial evidence Cochrane/PUBMED since 2015.</p>	<p>NICE Guideline 37 Fractures (complex): assessment and management</p>	-	Yes
Complex fractures	4	Is it possible to determine which patients will develop complications, arthritis, and poor functional outcomes after complex fractures?	Complex fractures may involve significant complications and there is relatively little recent high-quality evidence to help us prognosticate who will develop complications and how these could be prevented and managed.	<p>Complications are discussed in both NG37 and NG39 as the outcomes of studies that have been reviewed. However, there is no evidence supplied on prediction of complications.</p> <p>Several studies use development of complications as a primary outcome measure when comparing treatments such as operative versus non-operative management of a fracture. However, no studies were found aiming to understand prognosis in these injuries.</p> <p>No other relevant trial evidence Cochrane/PUBMED since 2015.</p>	<p>NICE Guideline 37 Fractures (complex): assessment and management</p>	<p>NICE Guideline 39 Major trauma: assessment and initial management</p>	Yes
Complex fractures	5	What are the options for preventing and treating chronic (long-term) pain after complex fractures?	Pain affects patients at the time of injury and in some cases for the remainder of the patients life. This causes significant morbidity and may reduce quality of life and negatively impact work and leisure.	<p>NG193 has been published (Apr 2021) since the evidence checking process for this JLA PSP was conduct (Oct 2020).</p> <p>Chronic pain related to fractures is not referenced.</p> <p>No other relevant trial evidence Cochrane/PUBMED since 2015.</p>	<p>NICE Guideline 193 Chronic pain (primary and secondary) in over 16s: assessment of all chronic pain and management of chronic primary pain</p>	-	Yes

Complex fractures	6	What is important to patients recovering from complex fractures?		Not mentioned in NICE guidelines specifically. No other relevant trial evidence Cochrane/PUBMED since 2015.	Nil	-	Yes
Complex fractures	7	What additional care and support is helpful for patients being discharged from hospital after a complex fracture?	Patients with complex fractures receive supportive care from a multidisciplinary team that may be dispersed across different service organisations.	Not mentioned in NICE guidelines specifically. No other relevant trial evidence Cochrane/PUBMED since 2015.	Nil	-	Yes
Complex fractures	8	When is it better to replace, fix or fuse fractures around the ankle, knee or acetabulum (hip socket)?	Joint replacement, fixation with metalwork, and fusion with screws are all methods of treating fractures around joints. It is not well understood which injury pattern at each joint may benefit from each intervention. Furthermore, it is not known which patients may benefit from each.	No specific NICE guidance exists on this question. A Cochrane review and several randomised controlled trials have been conducted to answer specific questions that fall under this uncertainty. Further studies are ongoing, none are likely to answer the question entirely.	The Ankle Injury Management (AIM) Trial	Effect of Locking Plate Fixation vs Intramedullary Nail Fixation on 6-Month Disability Among Adults With Displaced Fracture of the Distal Tibia The UK FixDT Randomized Clinical Trial	Yes
			-	-	Cochrane Review: Interventions for treating fractures of the distal femur in adults	Fractures of the posterior wall of the acetabulum: Treatment using internal fixation of two parallel reconstruction plates Trial	-
			-	-	Single versus double column fixation in transverse fractures of the acetabulum: A randomised controlled trial	AceFIT – a study comparing three methods of treatment of acetabular fractures (a type of hip fracture) in older patients; surgical fixation versus surgical fixation and hip replacement versus non-surgical treatment	-
Complex fractures	9	Can peer support (from other patients) be used to help patients with complex fractures?	-	Not mentioned in NICE guidelines specifically. No other relevant trial evidence Cochrane/PUBMED since 2015.	Nil	-	Yes
Complex fractures	10	Can patients be provided with expected recovery times for functional recovery and return to life roles after complex fractures?	The rehabilitation journey after complex fractures can be very long and demanding for patients. There is frequently concern relating to returning to work, caring responsibilities, and leisure.	Not mentioned in NICE guidelines specifically. No other relevant trial evidence Cochrane/PUBMED since 2015.	Nil	-	Yes

Indicative questions 11-18 discussed at final workshop 08 Jun 2021

Complex fractures	11	When is it safe to start weight-bearing and joint movement after a complex fracture?	For some types of fracture surgeons may decide to restrict movement and weight-bearing after surgical fixation to reduced a perceived risk of impairment of healing. However, this may result in longer patient stays in hospital, dependence on care services, and muscle loss leading to poor patient outcome.	NG37 and 39 mention weight-bearing in terms of an outcome from studies they have reviewed. However, these guidelines offer no specific advice. The WAX Weightbearing in Ankle Fractures trial will report in 2022 but will not entirely answer this question in the context of complex fractures. No other relevant trial evidence Cochrane/PUBMED since 2015.	NICE Guideline 37 Fractures (complex): assessment and management	NICE Guideline 39 Major trauma: assessment and initial management	Yes
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Complex fractures	12	What information would be helpful to give to patients sustaining complex fractures and how would this be best delivered?	Information may be given to patients with injuries may vary in terms of timing, content, and media used.	NG37 reported that the qualitative evidence was generally good quality and gives detailed guidance on important information to give to patients with complex fractures. NG39 makes a brief mention of leaflets on complications such as compartment syndrome though does not link this with specific evidence. No other relevant trial evidence Cochrane/PUBMED since 2015.	NICE Guideline 37 Fractures (complex): assessment and management	NICE Guideline 39 Major trauma: assessment and initial management	Yes
			-	-	Impact of Psychoeducational Video on Adjustment to Open Fracture Randomised Controlled Trial (ongoing)	-	-
Complex fractures	13	In patients with multiple injuries, which fractures need fixing and when?	Relatively little is known about which injuries are best treated with early vs late fixation and how patient and injury factors influence this.	NICE offer no specific guidance on this uncertainty. A randomised controlled trial has been conducted looking at this question in femoral shaft fractures in multiply injured patients. More broadly this question remains an uncertainty. No other relevant trial evidence Cochrane/PUBMED since 2015.	Randomized, controlled, two-arm, interventional, multicenter study on risk-adapted damage control orthopedic surgery of femur shaft fractures in multiple-trauma patients	-	Yes
Complex fractures	14	What is the best way to predict which fracture-associated nerve injuries will recover without treatment?	Patients with complex fractures may sustain injuries to various nerves resulting in sensory loss to the skin, weakness of muscles, and altered joint position sense. There are various ways in which nerve injuries can be treated including watchful waiting, active rehabilitation, and surgical repair	NG37 describes the importance of documentation in the management of patients with nerve injuries but offers no specific guidance on treatment or prognosis. No other relevant trial evidence Cochrane/PUBMED since 2015.	NICE Guideline 37 Fractures (complex): assessment and management	-	Yes
Complex fractures	15	How can we assess and improve bone health after complex fractures to promote healing and prevent future fractures?	Bone health depends on hormonal, nutritional, and mechanical factors. Patients and clinicians were interested in questions relating to better understanding these factors and potential targets for treatment in the context of complex fractures.	Several studies have been carried out on calorific and other supplementation in fractures generally, but not specifically complex fractures. No other relevant trial evidence Cochrane/PUBMED since 2015.	-	-	Yes
Complex fractures	16	What is the best strategy for preventing blood clots after complex fractures?	Patients with complex fractures are at an increased risk of venous thrombo-embolism (VTE) (ie blood clots) whereby blood clots may form at peripheral sites and move in the circulation to block blood flow. In some cases, this may result in cardiac arrest and death.	NG89 includes a review of 15 studies, 13 of which were randomised controlled trials. Where pharmacological or mechanical prophylaxis was compared with no prophylaxis, there were better outcomes in the group receiving an intervention. The NICE committee considered that the evidence sufficiently supported the use of Low Molecular Weight Heparin and Fondaparinux. The listed randomised controlled trial supports use of aspirin alone, however NICE committee felt inadequate evidence on bleeding risk and therefore this was listed as a research recommendation. There was a lack of evidence evaluating Direct Oral Anticoagulants in this review population. A 2020 Randomised Controlled Trial linked here by Haac et al. found no evidence of superiority between Low Molecular Weight Heparin or Aspirin for VTE prevention in fracture patients. Non-pharmaceutical method of VTE prophylaxis exist and include patient hydration, early mobilisation, and compression stockings.	NICE Guideline 89 Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism	Aspirin versus low-molecular-weight heparin for venous thromboembolism prophylaxis in orthopaedic trauma patients: A patient-centered randomized controlled trial	Yes

Complex fractures	17	What is the best bone defect reconstruction option in the acute treatment of complex fractures?	Complex fractures may result in bone defects whereby a region of bone is destroyed or must be excised by the treating surgeon as it has lost its blood supply. Several treatment options exist for these situations such as fixation with new morphology, cadaveric bone graft, autologous bone graft, or bone free flaps.	NG37 examined the evidence for staging and treating Pilon fractures. Evidence for all outcomes included in the review was very imprecise. Overall, the NICE committee felt the Low quality of the evidence underlined the need for research in this area.	NICE Guideline 37 Fractures (complex): assessment and management	An International, Multicenter, Prospective Registry on Post-traumatic Long Bones Defects (registry data)	Yes
			-	-	Enhancement of Bone Regeneration and Healing in the Extremities by the Use of Autologous BonoFill-II (single group assignment trial in non-complex fractures)	-	
Complex fractures	18	Should metalwork routinely be removed after surgery and when?	Complex fractures may be treated using internal fixation with nails, plates, and screws. This metalwork may be left in situ forever or removed after a period of time. Some patients report problems with plates and screws close to the skin, ligaments, or tendons in areas such as the outside of the ankle.	No relevant guideline or trial evidence.	Nil	-	Yes