Evidence Table

Parker, M. & Handoll, P. (2009). Pre-operative traction for fractures of the proximal femur in adults. *The Cochrane Collaboration,* 1-30.	I	- This paper is a systematic review of ten randomised trials involving 1546 adult patients with fractures of the femur. Nine of the trials compared traction with no traction and one compared skeletal traction with skin traction. The studies assessed; degree of pain, analgesia use, ease of fracture reduction, length of surgery, intra-operative blood loss, incidence of pressure areas, thromboembolic complications, length of hospital stay, mortality, incidence of fracture non-union, patient satisfaction and incidence of avascular necrosis. - The main advantage of traction identified from the collection of studies includes; traction will reduce pain at the fracture site and assist in reduction of the fracture therefore making the operation easier. - It was identified by all studies that the average time in traction was 24 hours. - The ten studies used a range of pain measurement scales and there was no significant difference found in the use of different scales. - The study by Ghnaimat 2005 had a small population of children and noted no difference in management and pain in this population. - The study by Finsen, 1998 identified that there was significantly more pain noted with skeletal traction (P=0.3). - Six of the studies reported on pressure sores noting that it is an adverse event of traction making a recommendation that turning of the patient regularly should occur to prevent. - Four of the studies that reported that in relation to pressure areas; taking the skin traction once per nursing shift will aid pressure area devloepment. - It was identified by Billsten, 1996 who studied 78 hospitals that half of the hospitals routinely apply skin traction to all femur fractures. Brink 2005 found that the application of pre-operative skin traction was standard practice in 20% of trauma hospitals for the reduction of pain - The systematic review provides the strongest type of evidence available. The review includes a large population with a large number of hospitals being utilised. Due to the large study size and number of hospitals the evidence can easily be applied to the broader population. - The review of the ten studies identified that there were different assessment tools used making it hard to ensure that pain is measured the same at each hospital. The studies were majority adult based making the application to the paediatric population hard, although one study did report that a small population of their study included some paediatrics and there was no difference in management in this population group as principles for traction were the same. The studies identified that some of the data was collected over longer periods of time and there was incomplete data obtained, therefore some data may be missed.

Hedin, H., Borgquist, L. & Larsson, S. (2004). A cost analysis of three methods of treating femoral shaft fractures in children. A comparsion of traction in hospital, traction in hospital/home and external fixation. *Acta Orthopaedic Scand, 75(3),* 241-248.	VI	- It has been identified by many previous studies that femoral fractures are common in children this study completed a cost analysis comparing the treatment options for femoral shaft fractures in 128 children aged 3-15 at three hospitals over a three year period. Prior to this study there was no evidence on what treatment option is best and the cost of the various treatments varied. The cost of treatment was determined by the number of days spent in traction, 24 hours spent in traction indicated a 48 hour hospital stay. - The study identified that there were three options available for the management of paediatric femur fractures; theatre immediately for fixation or hip spica, skin traction for 24 hours then theatre and skin traction for 4-6 weeks until the fracture is repaired. - In hospital skin traction until fracture heals had a large cost to hospital hence recommendation for skin traction for 24 hours and then application of a hip spica or internal fixation was recommended. - It was identified that taking the patient straight to theatre had higher intraoperatively complications due to swelling. - Delays in theatre increased the cost to hospital due to longer hospital stay. - The study identified that patients should be transported to theatre in traction to reduce pain and maintain alignment. - Complications identified from skin traction included pressure areas and joint contractures, strict pressure area care would minimise this. The longer the patient is in traction the worse pressure areas became if not managed correctly. - In current literature there are minimal studies completed on the paediatric population, therefore studies completed on paediatrics provide evidence that can easily be applied to this population. This study has made the application to the paediatric population easy and therefore provided a large amount of current evidence for this clinical practice guideline. - This retrospective study collected data from past therefore the data may not be reliable and also be missing parts. The study was done on children aged 3-15 missing those under three years of age which make up a large proportion of paediatric patients requiring skin traction. The study was completed on three hospitals and included 128 children, sample size and hospital numbers are small making the application to the wider population harder. Complications of skin traction were identified but failed to mention prevention techniques.

Whiteing, N. (2008) Fractures: pathophysiology, treatment and nursing care. *Nursing Standard, 17(23),* 49-57.	VII	- This article identified that fractures are common among childhood and adult life and that many nurses will care for these patients. The article aimed to discuss fracture classification and assessment, treatment, complications and nursing care of these patients. - The paper identified that an xray confirming the fracture should be confirmed by an orthopaedic registrar and traction recommendation made by them. - It was identified that monitoring of haemodynamic status is essential to detect any complications; tissues must be well perfused to receive oxygen and nutrients for healing. If haemodynamic status is compromised, irreversible tissue damage may occur. Neurovascular assessment should be carried out regularly. - Assessment of pain is essential to ensure that the correct analgesic is prescribed and administered. - Non pharmalogical management such as positioning, distraction and massage benefits patients. - Traction will not occur if the system is not nursed correctly; Traction system must be checked during every shift to ensure traction and counter traction are maintained and that the cords and pulleys are in good working order. Weights should hang freely. - Skin traction should be removed at least daily for limb washing and skin inspection and Pressure area care is essential two hourly. - The paper provided vast knowledge of skin traction nursing management and complications to the reader. The layout was clear and easy to read making including pictures. The paper was targeted to nurses and provided evidence on the nursing management of skin traction patients, therefore providing strong evidence for nursing care for this guideline. - This paper was a recommendation by an expert, and not a study however it does make reference to studies indicating that it is evidence based. Evidence that is recommendation based was used in the development of this guideline due to minimal studies available in the past ten years as well as minimal studies being done on paediatrics. The majority of literature on this topic is very old and evidence in the past ten years are adult based. This paper is focused on all patients in traction not specific to paediatrics but as mentioned before the principles of traction management for paediatrics and adults are the same. It was identified that neurovascular assessment is a nursing priority but there was no recommendation on how often to assess neurovascular observations.

Anglen, J. & Choi, I. (2005). Treatment options in paediatric femoral shaft fractures. *Journal of Orthopaedic Trauma, 19(10),* 724-733.	VII	- This paper identified that the management of fractured femurs in the paediatric population there are different options available for different aged children. Generally the option is the choice of the orthopaedic surgeon. - The paper identified that the management of femoral fractures in paediatrics poses some potential concerns due to immature vascular patterns and future growth. It was reported that studies of younger children younger than walking age 80% were due to child abuse. - It was identified that femur fractures should be managed in traction pre operatively however pressure areas are a common risk of traction. It was also reported that the diagnosis of child abuse must not be missed. - This paper is specific to the management of paediatrics being one of the few papers available on fracture management specific to paediatrics. The article was written in 2005 providing current evidence to be applied to the clinical practice guideline. - The paper is an article on expert opinion making reference to studies throughout. The paper focused on post traction management and included a small section specific to skin traction. There is a need for further research in this area to provide a stronger evidence based practice for this topic.
Bailey, J. (2003) Getting a fix on. *Nursing, 33(6),*59-63.	VII	- A case study of a 78 year old with a fracture that identified that previous management of the fracture included staying in hospital for 8-10 weeks while the injury healed. In this case study the individual was placed in skin traction for 24-48 hours with pain relief. - The author identified that the management of fractures was designed to keep the patient more mobile and discharge from hospital quickly. It was also identified that skin traction limits movement and reduces the fracture to help decrease pain and swelling around the fraction site. - It was identified by the author that the use of opioids and muscle relaxants ensures that pain relief is managed correctly. The article reported that prior to theatre should be reviewed by the medical doctor to ensure that swelling is not excessive - The article was easy to read identifying primary nursing goals of nursing patient in traction. The article was developed in 2003 providing the reader with relatively current evidence to be applied to their practice. - This paper was based on a 78 year old patient making the application to the paediatric population difficult. The article provided expert opinion with minimal reference to relevant literature and evidence.

Bone, L., Johnson, K., Weigelt, J. & Scheinberg, R. (1994). Early versus delayed stabilization of femoral fractures	III	- A prospective randomised study on 178 adults comparing early versus delayed stabilisation of fractures with exclusion criteria of hip fractures and older than 65. - Patients with a delay in theatre were put into skin traction. - The study identified that delay in theatre indicated larger hospital costs as well as an association between a large bone fracture and respiratory insufficiency in adults. - The study reported that skin traction lead to pressure areas which needs to managed by nursing staff including; pressure area care and taking down the bandages. - There are limited studies available on the use of skin traction therefore one strength of this paper is that a study has been completed providing relatively strong evidence. - This paper is hard to apply to the Paediatric population due to being based on the adult population. Further research is needed in the Paediatric population on skin traction. The study has a small sample size and completed in one hospital making the application to the wider population harder. This paper was developed in 1994 which is older research, but due to the lack of research available it was used to provide more evidence for this clinical practice guideline.
Anderson, G., Harper, W., Connolly, C., Badham, J. & Goodrich, N. (1994). Preoperative skin traction for the fractures of the proximal	IV	- This paper is based on a randomised trial study on 252 patients from 1 hospital waiting surgery for a fractured femur. The study was completed on patients in Hamilton Russell skin traction. The study assessed pain, analgesia requirement, ease of operation and pressure areas in two groups of patients; traction and no traction. Exclusion criteria - The study identified that some surgeons believe that the use of traction pre operatively improves the position of the fracture. - It was also identified that skin may have reaction to bandages and tapes as well as develop pressure areas. - The study identified that there was no benefit from the application of skin traction in the operation. The use of tight bandages incurves potential risk to arterial supply and venous drainage; therefore neurovascular observations should be completed. The management of pressure areas can be more difficult in traction therefore strict four hourly pressure area cares should be maintained. - This paper is based on a different type of skin traction with similar principles and can be applied to the management of skin traction. There are minimal studies available on skin traction; this study provides evidence based practice which can be applied to this clinical guideline. - The study is based on adult population making the application to the paediatric population hard. The sample size is small and was completed in one hospital making the application to the wider population harder. This study was completed in 1994, this makes it hard to apply to current practice, and however there is minimal current evidence available.

Trompeter, A. & Newman, K. (2013). Femoral shaft fractures in adults. *Orthoapedic and trauma, 27(5),* 322-331	VII	- This review focuses on femoral fractures in adults. The author reported that fractures can be a major source of blood loss and should be splinted to minimise haemorrhage. - It is recommended that skin traction be applied prior to going to theatre in patients with fractured femurs. The author recommends that skin traction should be removed regularly to prevent pressure areas as well as adequate pain relief oral or intravenous should be charted as well as a regional femoral nerve block consideration. - The article is based on an adult population however as mentioned earlier application to the Paediatric stream is easily made due to the same principles. There is a lack of literature available on this topic, this article was written in 2013 which is recent and provides the reader with current evidence. This article is an expert opinion with some recommendation to evidence from other studies.