

Duperouzel, W. Gray, B. & Santy-Tomlinson, J. (2018). The principles of traction and the application of lower limb skin traction. *International Journal of Orthopaedic and Trauma Nursing*. 29, 54-57.

- This paper provided an overview of the principles of traction and a guidance of the application of skin traction.
- Traction is the application of a pulling force with the purpose of preventing or reducing muscle spasms, immobilising movement of a joint, reducing a fraction to maintain alignment and to elevate a limb to reduce swelling.
- In preparation for application of skin traction all the equipment should be available at the bedside. Full explanation including the rationale for the traction should be given to the patient.
- Prior to the application of skin traction adequate analgesia should be prescribed and administered. A neurovascular assessment on both limbs including checking for pulses should occur and be documented.

Parker, M. & Handoll, P. (2009). Pre-operative traction for fractures of the proximal femur in adults. *The Cochrane Collaboration*, 1-30.

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- 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 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.

<p>Hedin, H., Borgquist, L. & Larsson, S. (2004). A cost analysis of three methods of treating femoral shaft fractures in children. A comparison of traction in hospital, traction in hospital/home and external fixation. <i>Acta Orthopaedic Scand</i>, 75(3), 241-248.</p>	<p>VI</p>	<ul style="list-style-type: none"> - 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. - 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.
<p>Whiteing, N. (2008) Fractures: pathophysiology, treatment and nursing care. <i>Nursing Standard</i>, 17(23), 49-57.</p>	<p>VII</p>	<ul style="list-style-type: none"> - 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. - 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.

<p>Anglen, J. & Choi, I. (2005). Treatment options in paediatric femoral shaft fractures. <i>Journal of Orthopaedic Trauma</i>, 19(10), 724-733.</p>	<p>VII</p>	<ul style="list-style-type: none"> - 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. - 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.
<p>Bailey, J. (2003) Getting a fix on. <i>Nursing</i>, 33(6),59-63.</p>	<p>VII</p>	<ul style="list-style-type: none"> - 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. - 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.
<p>Bone, L., Johnson, K., Weigelt, J. & Scheinberg, R. (1994). Early versus delayed stabilization of femoral fractures</p>	<p>III</p>	<ul style="list-style-type: none"> - 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. - 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.

<p>Anderson, G., Harper, W., Connolly, C., Badham, J. & Goodrich, N. (1994). Preoperative skin traction for the fractures of the proximal</p>	<p>IV</p>	<ul style="list-style-type: none"> - 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. - 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.
<p>Trompeter, A. & Newman, K. (2013). Femoral shaft fractures in adults. <i>Orthopaedic and trauma, 27(5), 322-331</i></p>	<p>VII</p>	<ul style="list-style-type: none"> - 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.