

ROLE AND RESPONSIBILITY OF NURSING OFFICERS IN TRACTION

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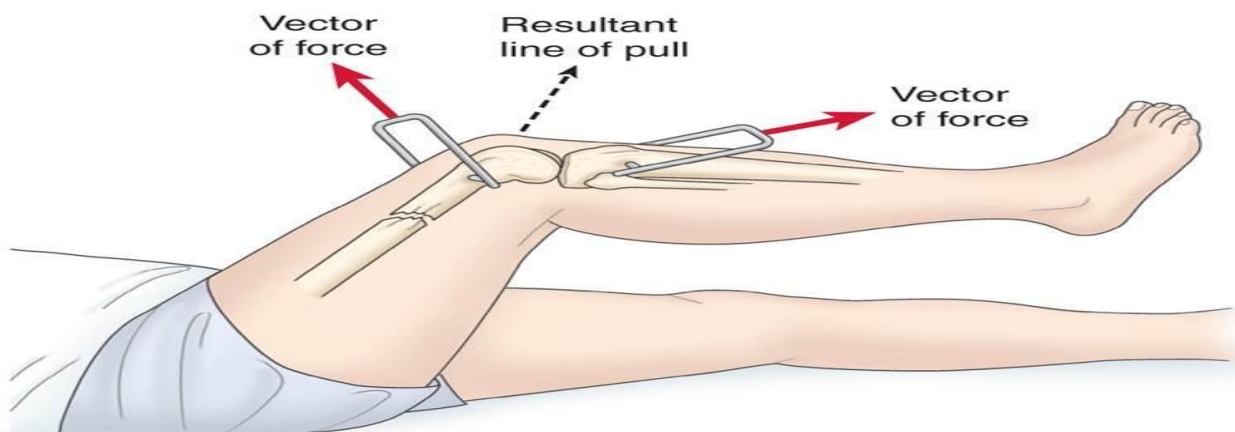
Abstract

Traction is a technique for realigning a broken bone or dislocated part of the body using weights, pulleys, and ropes to gently apply pressure and pull the bone or injured body part back into position. After a fracture, traction can restore the position of a bone during the early stage of healing or temporarily ease the pain while you are waiting for further corrective surgery. There are two main types of traction: skeletal traction and skin traction. A third kind, cervical traction, is used to help stabilize fractures in the neck. Purpose of Traction is to stabilize a fracture or injury and restore tension to the surrounding tissues, muscles, and tendons. Traction can: Stabilize and realign a broken bone or dislocated part of the body (such as the shoulder), help regain the normal position of the bone that's been fractured, stretch the neck to reduce pressure on the spine by realigning the vertebrae, temporarily reduce pain prior to surgery, lessen or eliminate muscle spasms and constricted joint, muscles, and tendons, relieve pressure on nerves, especially spinal nerves and treat bone deformities. The kind of traction used will depend on the location and severity of the broken bone or injury and the amount of force needed.

Keywords: Nurse, Traction, Fixation, Fracture

INTRODUCTION

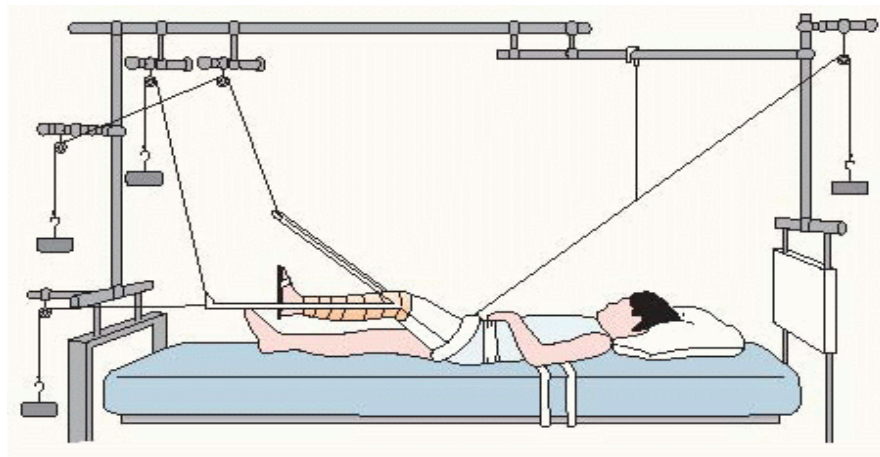
Traction is the application of a pulling force to a part of the body. Traction is used to minimize muscle spasms; to reduce, align, and to immobilize fractures; to reduce deformity; and to increase space between opposing surfaces. Traction must be applied in the correct direction and magnitude to obtain its therapeutic effects. At times, traction needs to be applied in more than one direction to achieve the desired line of pull. When this is done, one of the lines of pull counteracts the other. These lines of pull are known as the vectors of force. The actual resultant pulling force is somewhere between the two lines of pull. The effects of traction are evaluated with x-ray studies, and adjustments are made if necessary.



Principles of effective traction

Whenever traction is applied:

- counter traction must be used to achieve effective traction. Counter traction is the force acting in the opposite direction. Usually, the patient's body weight and bed position adjustments supply the needed counter-traction.
- Traction must be continuous to be effective in reducing and immobilizing fractures.
- Skeletal traction is never interrupted.
- Weights are not removed unless intermittent traction is prescribed.
- The patient must be in good body alignment in the center of the bed when traction is applied.
- Ropes must be unobstructed.
- Weights must hang free and not rest on the bed or floor.



TYPES OF TRACTION

Skin traction

Skin traction is used to control muscle spasms and to immobilize an area before surgery. Skin traction is accomplished by using a weight to pull on traction tape or on a foam boot attached to the skin. The amount of weight applied must not exceed the tolerance of the skin. No more than 2 to 3.5 kg (4.5 to 8 lb.) of traction can be used on an extremity.



Types of skin traction

- Buck's extension traction (applied to the lower leg).
- The cervical head halter (occasionally used to treat neck pain).
- The pelvic belt (sometimes used to treat back pain).

Potential Complications

- Skin breakdown, nerve pressure, and circulatory impairment are complications that may develop as a result of skin traction.
- Skin breakdown results from irritation caused by contact of the skin with the tape or foam and shearing forces. Older adults are at greater risk for this complication because of their sensitive, fragile skin.
- Nerve pressure results from pressure on the peripheral nerves. Foot drop may occur if pressure is applied to the peroneal nerve at the point at which it passes around the neck of the fibula just below the knee.
- Circulatory impairment is manifested by cold skin temperature, decreased peripheral pulses, slow capillary re-fill time, and bluish skin.
- Deep vein thrombosis (DVT), a serious circulatory impairment, is manifested by calf tenderness, swelling, and a positive Homans' sign.

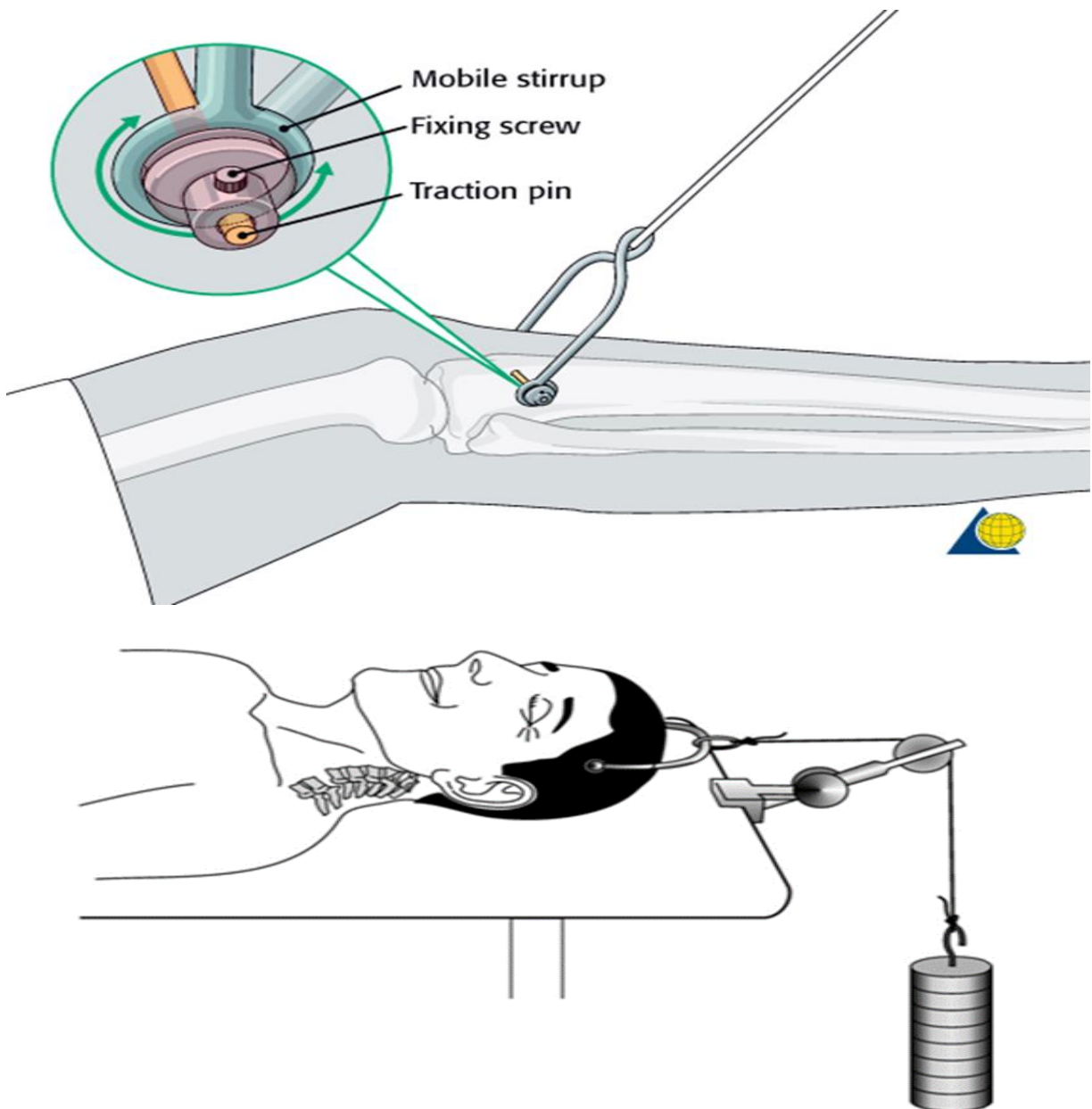
Role and responsibility of Nursing Officer

- To ensure effective skin traction, it is important to avoid wrinkling and slipping of the traction bandage and to maintain counter- traction.
- Proper positioning must be maintained to keep the leg in a neutral position.
- To prevent bony fragments from moving against one another, the patient should not turn from side to side; however, the patient may shift position slightly with assistance.
- Monitoring and Managing Potential Complications.
- During the initial assessment, the nurse identifies sensitive, fragile skin (common in older adults).
- The nurse also closely monitors the reaction of the skin in contact with tape or foam to ensure that shearing forces are avoided
- Removes the foam boots to inspect the skin, the ankle, and the Achilles tendon three times a day.
- Palpates the area of the traction tapes daily to detect underlying tenderness.
- Provides back care at least every 2 hours to prevent pressure ulcers.
- Uses special mattress overlays (e.g., air-filled, high-density foam) to minimize the development of skin ulcers.
- Care must be taken to avoid pressure on the peroneal nerve at the point at which it passes around the neck of the fibula just below the knee.
- Pressure at this point can cause foot drop. The nurse questions the patient about sensation and asks the patient to move the toes and foot.
- Dorsiflexion of the foot demonstrates function of the peroneal nerve. Weakness of dorsiflexion or foot movement and in- version of the foot might indicate pressure on the common peroneal nerve.
- Plantar flexion demonstrates function of the tibial nerve.
- Regularly assess sensation and motion.
- Immediately investigate any complaint of burning sensation under the traction bandage or boot.
- Promptly report altered sensation or motor function
- After skin traction is applied, the nurse assesses circulation of the foot or hand within 15 to 30 minutes and then every 1 to 2 hours.
- Peripheral pulses, color, capillary refill, and temperature of the fingers or toes
- Indicators of DVT, including calf tenderness, swelling, and a positive Homans' sign.

- The nurse also encourages the patient to perform active foot exercises every hour when awake.

Skeletal Traction

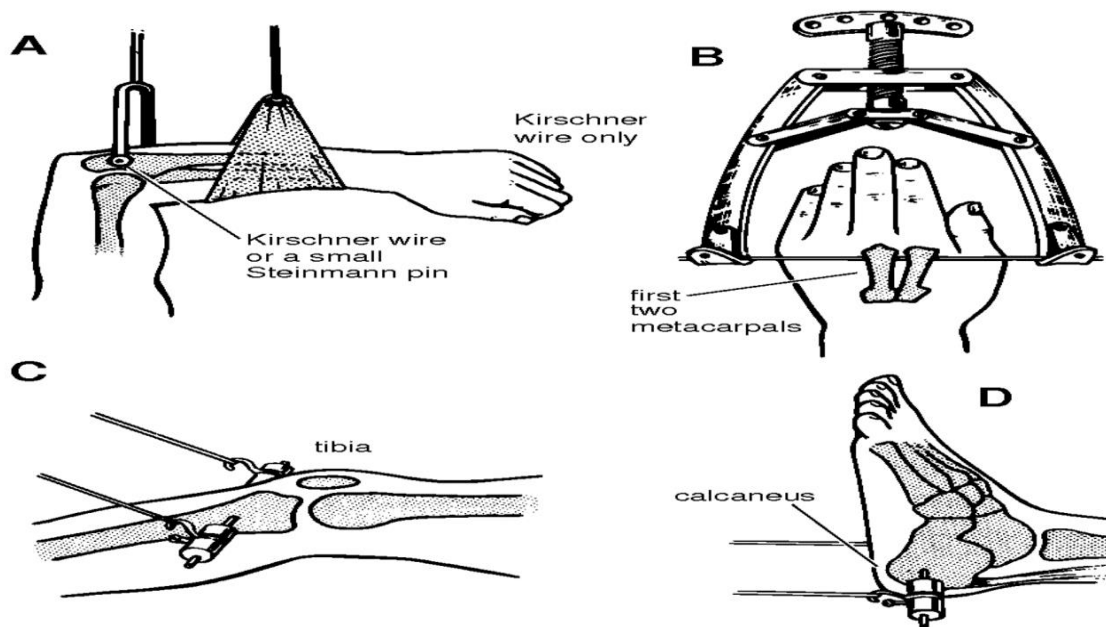
Skeletal traction is applied directly to the bone. This method of traction is used occasionally to treat fractures of the femur, the tibia, and the cervical spine. The traction is applied directly to the bone by use of a metal pin or wire (e.g., Steinmann pin, Kirschner wire) that is inserted through the bone distal to the fracture, avoiding nerves, blood vessels, muscles, tendons, and joints. Tongs applied to the head (e.g., Gardner-Wells or Vinke tongs) are fixed in the skull to apply traction that immobilizes cervical fractures.



How Skeletal Traction Is Applied

The orthopedic surgeon applies skeletal traction, using surgical asepsis. The insertion site is prepared with a surgical scrub agent such as povidone-iodine solution. A local anesthetic is administered at the insertion site and periosteum. The surgeon makes a small skin incision and drills the sterile pin or wire through the bone. After insertion, the pin or wire is attached to the traction bow or caliper. The ends of the wire are covered with corks or tape to prevent injury to the patient or caregivers. The weights are attached to the pin or wire bow by a rope-and-pulley system that exerts the appropriate amount and direction of pull for effective traction. Skeletal traction frequently uses 7 to 12 kg (15 to 25 lb) to achieve the therapeutic effect. The weights applied initially must overcome the shortening spasms of the affected muscles. As the muscles relax, the traction weight is reduced to prevent fracture dislocation and to promote healing.

SITES FOR SKELETAL TRACTION



Role and responsibility of Nursing Officer

- When skeletal traction is used, the nurse checks the apparatus to see that: the ropes are in the wheel grooves of the pulleys, that the ropes are not frayed, that the weights hang free, and that the knots in the rope are tied securely.
- The nurse also evaluates the patient's position, because slipping down in bed results in ineffective traction.
- The patient's elbows frequently become sore, and nerve injury may occur if the patient repositions by pushing on the elbows. In addition, patients frequently push on the heel of the unaffected leg when they raise themselves. This digging of the heel into the mattress may injure the tissues. Therefore, the nurse should protect the elbows and heels and inspect them for pressure areas.
- To encourage movement without using the elbows or heel, the nurse can suspend a trapeze overhead within easy reach of the patient. This apparatus helps the patient to move about in bed and to move on and off the bedpan.

- Specific pressure points are assessed for redness and skin breakdown. Areas that are particularly vulnerable to pressure caused by traction apparatus applied to the lower extremity include the ischial tuberosity, popliteal space, Achilles tendon, and heel.
- If the patient is not permitted to turn on one side or the other, the nurse must make a special effort to provide back care and to keep the bed dry and free of crumbs and wrinkles. A pressure-relieving air-filled or high-density foam mattress overlay may reduce the risk of pressure ulcer.
- The nurse assesses the neurovascular status of the immobilized extremity at least every hour initially and then every 4 hours.
- The nurse instructs the patient to report any changes in sensation or movement immediately so that they can be promptly evaluated.
- DVT is a significant risk for the immobilized patient. The nurse encourages the patient to do active flexion-extension ankle exercises and isometric contraction of the calf muscles (calf-pumping exercises) 10 times an hour while awake to decrease venous stasis.
- In addition, elastic stockings, compression devices, and anticoagulant therapy may be prescribed to help prevent thrombus formation.
- Prompt recognition of a developing neurovascular problem is essential so that corrective measures can be instituted promptly.
- Patient exercises, within the therapeutic limits of the traction, assist in maintaining muscle strength and tone and in promoting circulation.
- Active exercises include pulling up on the trapeze, flexing and extending the feet, and range-of-motion and weight-resistance exercises for noninvolved joints.
- Isometric exercises of the immobilized extremity (quadriceps-setting and gluteal-setting exercises) are important for maintaining strength in major ambulatory muscles.
- Without exercise, the patient will lose muscle mass and strength, and rehabilitation will be greatly prolonged.
- The nurse examines the patient's skin frequently for evidence of pressure or friction, paying special attention to bony prominences.
- It is helpful to reposition the patient frequently and to use protective devices (e.g., elbow protectors) to relieve pressure.
- If the risk of skin breakdown is high, as in a patient with multiple trauma or a debilitated elderly patient, use of a specialized bed is considered to prevent skin breakdown.
- If a pressure ulcer develops, the nurse consults with the physician and the wound care nurse specialist.
- The nurse auscultates the patient's lungs every 4 to 8 hours to determine respiratory status and teaches the patient deep-breathing and coughing exercises to aid in fully expanding the lungs and moving pulmonary secretions.
- If the patient history and baseline assessment indicate that the patient is at high risk for development of respiratory complications, specific therapies (e.g., incentive spirometer) may be indicated. If a respiratory problem develops, prompt institution of prescribed therapy is needed.
- Reduced gastrointestinal motility results in constipation and anorexia.
- To improve the patient's appetite, the nurse identifies and includes the patient's food preferences, as appropriate, within the prescribed therapeutic diet.
- Incomplete emptying of the bladder related to positioning in bed can result in urinary stasis and infection.
- In addition, the patient may find use of the bedpan uncomfortable and may limit fluids to minimize the frequency of urination.

- The nurse monitors the fluid intake and the character of the urine.
- The nurse teaches the patient to consume adequate amounts of fluid and to void every 3 to 4 hours.
- If the patient exhibits sign or symptoms of urinary tract infection, the nurse notifies the physician.
- The nurse teaches the patient to perform ankle and foot exercises within the limits of the traction therapy every 1 to 2 hours when awake to prevent DVT, which may result from venous stasis.
- The patient is encouraged to drink fluids to prevent dehydration and associated hem concentration, which contribute to stasis.
- The nurse monitors the patient for signs of DVT, including calf tenderness, warmth, redness, swelling (increased calf circumference), and a positive Homans' sign (discomfort in the calf when the foot is forcibly dorsi flexed).
- The nurse promptly reports findings to the physician for definitive evaluation and therapy.

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REFERENCES

1. AdibHajbaghery M, Moradi T. Quality of care for patients with traction in shahidbeheshti hospital in 2012. Arch Trauma Res. 2013 Aug;2(2):85-90. doi:10.5812/atr.9127. Epub 2013 Aug 1. PubMed PMID:24396800; PubMed Central PMCID: PMC3876554.
2. Altaman G.B. Delmer's Fundamental and Advanced Nursing Skills. 2nd ed. Thomson Learning Publication; 2004; 1381-1395p.
3. Ivan Mwebaza, Godfrey Katende, Sara Groves, and Joyce Nankumbi, "Nurses' Knowledge, Practices, and Barriers in Care of Patients with Pressure Ulcers in a Ugandan Teaching Hospital," Nursing Research and Practice, vol. 2014, Article ID 973602, 6 pages, 2014. <https://doi.org/10.1155/2014/973602>.
4. Shirley Teng KY, Norazliah S. Surgical Patients' Satisfaction of Nursing Care at the Orthopedic Wards in Hospital Universiti Sains Malaysia (HUSM). Health and the Environment Journal. 2012; 3-1.
5. Tosun et al. Preoperative Skin Traction in Adults With Hip Fracture: Evidence-Based Practice. 2013; <http://hdl.handle.net/10755/335466>.
6. J Kuzma. A Comparison of Skin vs. Skeletal Traction in the Management of Childhood Humeral Supracondylar Fractures: Randomized Clinical Trial, the Internet Journal of Orthopedic Surgery. 2014; 22-1.
7. Ami Hommel, Marie-Louise Kock, Jeanette Persson, and Elisabeth Werntoft. "The Patient's View of Nursing Care after Hip Fracture". 2012; ISRN Nursing, vol., Article ID 863291, 6 pages.
8. Maher, Ann Butler, Meehan, Anita J., Hertz, Karen, Hommel, Ami, MacDonald, Valerie, O'Sullivan, Mary P., Specht, Kirsten, Taylor, Anita. International Journal of Orthopaedic and Trauma Nursing. 2012; Volume 16, Issue 4, 177 - 194.