Traction frame preparation, IV-type basic frame

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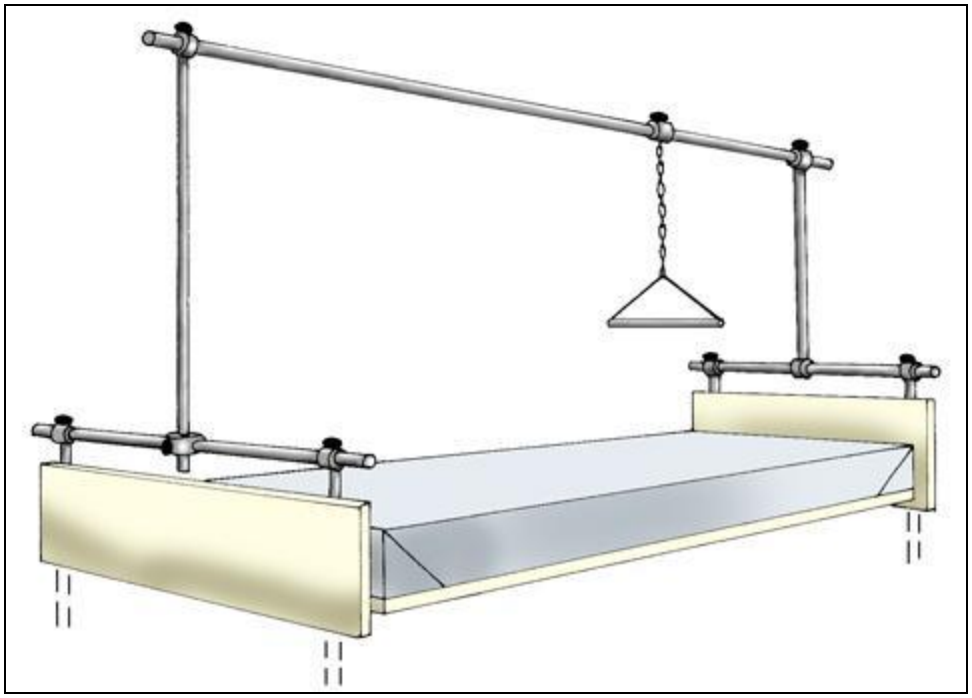
Introduction

An IV-type basic frame is used to set up traction for treatment of an orthopedic injury or condition. (See *IV-type basic traction frame*.) Typically, this type of frame is used for a patient who weighs up to 250 lb (113 kg).[1]

EQUIPMENT

IV-TYPE BASIC TRACTION FRAME

With an IV-type basic traction frame (shown below), IV posts that are placed in IV holders support the horizontal bars across the foot and head of the bed. These horizontal bars then support the two uprights. The frame requires adding another curved double-clamp bar to the frame to support patients who weigh 200 to 250 lb (91 to 113 kg). Without the curved double-clamp bar, the weight limit is 200 lb (91 kg).[1]



Traction exerts a pulling force on a part of the body—usually the spine, pelvis, or long bones of the arms or legs. It can be used to reduce fractures, treat dislocations, correct or prevent deformities,

improve or correct contractures, and decrease muscle spasms. An orthopedist may order skin or skeletal traction, depending on the patient's injury or condition.[2]

When applied directly to the skin (which creates a traction force that transfers indirectly to the bone), skin traction provides a light, temporary, or noncontinuous pulling force.[2] Indications for skin traction include muscle spasm and immobilization before surgery.[3] Contraindications to skin traction include a severe injury with an open wound, an allergy to tape or other skin traction equipment, circulatory disturbances, dermatitis, and varicose veins.[1]

For skeletal traction, an orthopedist inserts a pin or wire through the bone and attaches the traction equipment to the pin or wire to exert a direct, constant, longitudinal pulling force. Indications for skeletal traction include fractures of the tibia, femur, and humerus.[3] Infections, such as osteomyelitis, contraindicate skeletal traction.

Nursing responsibilities for this procedure include setting up the traction frame. The design of the patient's bed usually dictates the type of traction frame to use.

An orthopedic technician, a practitioner, or a nurse with special skills can set up the specific traction. Instructions for setting up the traction unit usually accompany the equipment. After the patient is placed in the ordered type of traction, both the patient and equipment require close monitoring.[3][4] (See the "Traction, care of patient" procedure.)

Equipment

- 27″ (69-cm) double-clamp bar
- 48″ (122-cm) swivel-clamp bar
- 102″ (259-cm) plain bar
- Cross clamp
- Four 4″ (10-cm) IV posts with clamps
- Trapeze with clamp
- Two 36″ (91-cm) plain bars
- Wall bumper or roller
- Optional: IV post adapter brackets, one curved double-clamp bar

Preparation of Equipment

Inspect all equipment and supplies. If a product is expired, is defective, or has compromised integrity, remove it from patient use, label it as expired or defective, and report the expiration or defect as directed by your facility.

Arrange with central supply or the appropriate department to transport the traction equipment on a traction cart to the patient's room.

Implementation

- Verify the practitioner's order. The order should include the type of traction, the amount of weight to apply to provide traction (if applicable), and specific pin-site care (if applicable).
- Perform hand hygiene.[5][6][7][8][9][10]
- Confirm the patient's identity using at least two patient identifiers.[11]
- Provide privacy.[12][13][14][15]

- Explain the procedure to the patient and family (if appropriate) according to their individual communication and learning needs *to increase their understanding, allay their fears, and enhance cooperation.*[16] Emphasize the purpose of traction, the importance of maintaining proper body alignment after traction equipment setup, and proper use of the trapeze for assisting with repositioning.
- Adjust the bed to its lowest position.[1]
- Install IV post adapter brackets for the head and foot of the bed, as needed, according to the manufacturer's instructions.[1]
- Attach one 4” (10-cm) IV post with clamp to each end of both 36” (91-cm) horizontal plain bars.
- Secure an IV post in each IV holder or adapter bracket at the bed corners.
- Use a cross clamp to fasten the 48” (122-cm) vertical swivel-clamp bar to the middle of the horizontal plain bar at the foot of the bed.
- Fasten the 27” (69-cm) vertical double-clamp bar to the middle of the horizontal plain bar at the head of the bed.
- Attach the 102” (259-cm) horizontal plain bar to the tops of the two vertical bars, making sure that the clamp knobs point up.
- Attach the curved double-clamp bar at the foot of the bed, as needed, within the angle of the horizontal and vertical bars *for maximal stability.*[1]
- Using the appropriate clamp, attach the trapeze to the horizontal bar about 2’ (60 cm) from the head of the bed.
- Attach a wall bumper or roller to the vertical bar at the head of the bed *to protect the walls from damage caused by the bed or equipment.*
- Make sure that the traction frame and its components will remain clear of environmental structures and other equipment during operation of bed controls.[1]
- Lock out the necessary bed controls based on the type of traction you applied *to maintain proper traction and body alignment and prevent patient injury.* Follow the bed model manufacturer's instructions.[1]
- Perform hand hygiene.[5][6][7][8][9][10]
- Document the procedure.[17][18][19][20]

Special Considerations

- The patient's body weight, the pull of weights in the opposite direction, or elevation of the bed must provide countertraction *to achieve effective traction.*[2]
- Ensure maintenance of the line of pull at all times.[2][3]
- Ensure that the weights hang freely at all times.[2][3]
- Prevent friction on the traction apparatus.[2]
- When using skin traction, apply ordered weights slowly and carefully *to avoid jerking the affected extremity.* Arrange the weights so that they don't hang over the patient *to avoid injury in case the ropes break.*[2]
- Some practitioners prefer that traction weights hang off the head of the bed versus the foot of the bed *to keep the weights out of visitors' reach and prevent inadvertent bumping by personnel.*[1]
- Communicate any ordered modifications to the traction setup to other personnel, as needed. If possible, take a photo of the setup and place it in the patient's medical record or above the patient's bed *to provide visual verification of how to maintain the traction setup.*[1]
- When applying Buck traction, make sure that the line of pull is always parallel to the bed and not angled downward *to prevent pressure on the heel.* Placing a flat pillow, small foam pad,

or folded blanket under the full length of the calf helps keep the heel off the bed; however, ensure that doing so doesn't alter the line of pull.[1]
- Don't use the traction frame to push, pull, or steer the bed *to avoid weakening or destabilizing the frame.*[1]
- Clean, disinfect, disassemble, and store all traction equipment after each patient use according to the manufacturer's instructions *to prevent the spread of infection.*[1][21][22]

Complications

Complications associated with IV-type basic frame preparation may include:

- patient injury (from improperly assembled or secured equipment).

Documentation

Documentation associated with IV-type basic frame preparation includes:

- date, time, and type of traction setup
- correct assembly and tightening of traction components[1]
- specific modifications (if ordered by the practitioner)
- amount of traction weight used
- confirmation that weights are hanging freely[1]
- teaching provided to the patient and family (if applicable)
  - understanding of that teaching
  - follow-up teaching needed.

This procedure has been reviewed by the Academy of Medical-Surgical Nurses.

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Related Procedures

- Bryant traction management, pediatric
- Cervical traction maintenance, pediatric
- Skeletal traction management, pediatric
- Skin traction management, pediatric
- Traction frame preparation, claw-type frame
- Traction frame preparation, IV-type Balkan frame
- Traction, care of patient

Related UpToDate Patient Teaching Handouts

- Setting a broken bone – ED discharge instructions
- Setting a broken bone in adults

References

(Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions)

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Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions

The following leveling system is adapted from *Evidence-Based practice in nursing & healthcare: A guide to best practice,* Fifth edition, by Bernadette Mazurek Melnyk and Ellen Fineout-Overholt (2023).

Level I	Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials (RCTs)
Level II	Evidence from well-designed single RCTs (experimental)
Level III	Evidence from well-designed nonrandomized controlled trials (quasi-experimental), systematic reviews of a complete body of evidence, and intervention studies using mixed methods
Level IV	Evidence from well-designed case-control and cohort studies (observational)
Level V	Evidence from systematic reviews of qualitative and descriptive studies
Level VI	Evidence from single descriptive and qualitative studies, evidence-based practice implementation, and quality improvement projects
Level VII	Evidence from expert opinion, expert committee reports, and literature reviews

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