Liberty Wildlife Medical Services

Medical Services
Training Program

• Section Eight •

Leg Bandaging

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Review on Avian Bandaging

As you have learned, injuries to the avian skeletal system and to the tendons, ligaments, and muscles it supports, often require restriction of movement and stabilization in order to heal properly. Proper bandaging is a crucial component of these treatments.

Again, bandages are used for many purposes:

- To reduce or stop bleeding
- To protect an open area on the body from contamination
- To hold a medication or dressing in place
- To hold padding in place to protect an area from injury
- To hold a splint in place
- To immobilize injuries

In this section we will review common bandage techniques used on the leg and foot, discuss products and supplies, and practice, practice, practice!

Avian Skeletal Review

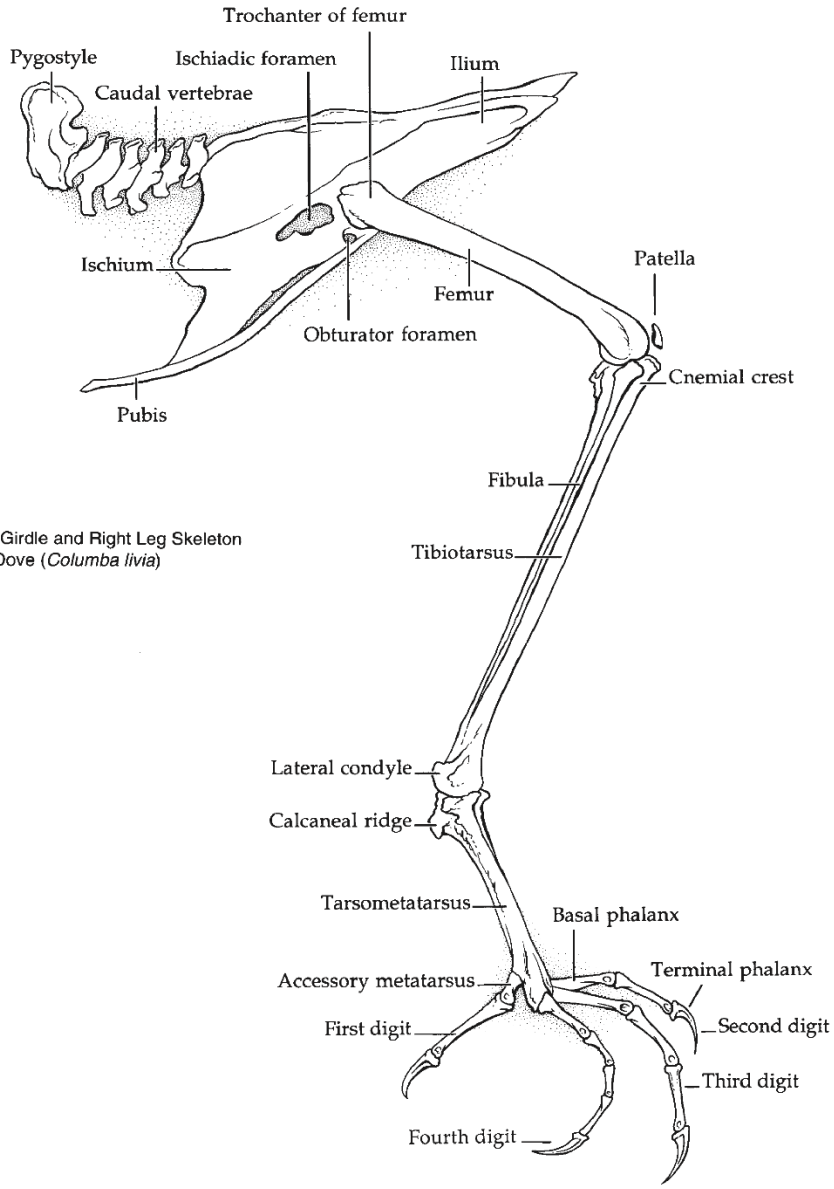
In an earlier session, we divided the avian skeletal system into four sections for the purpose of study: the thoracic limbs (wings), the pelvic limbs (legs), the head, and the torso (thorax, pelvis, and tail).

This section will focus on the avian skeletal system of the pelvic limb and its system of bones and joints.

The Pelvic Limbs

The pelvic limbs are the legs of a bird. They attach to the body at the hip and contain the femur, knee, tibiotarsus, fibula, ankle, tarsometatarsus, and the digits or toes.

- Hip: The head of the femur articulates with the ilium of the pelvis at a cup- shaped structure on the ilium called the acetabulum. This joint is usually located within the trunk of the body.
- Femur: The long proximal bone of the leg is the femur. The femur is located between the hip and the knee.
- Knee: The knee is the *point of articulation* between the femur and tibiotarsus.
- Tibiotarsus/fibula: The tibiotarsus is the long bone that is distal to the femur. It is a fused bone containing the tibia and upper bones of the foot. The fibula is a small bone that runs parallel to the tibiotarsus on the lateral side of the leg.
- Ankle: The ankle is the *point of articulation* between the tibiotarsus and the tarsometatarsus.
- Tarsometatarsus: Distal to the tibiotarsus, the lower bones of the foot are fused and stretched to form the tarsometatarsus.
- Digits: The digits, metatarsals, are the toes of the foot.



Pelvic Girdle and Right Leg Skeleton
Rock Dove (*Columba livia*)

Vocabulary

The following terms help to describe avian anatomy by function or position. Also included are the common bones and joints of the limbs.

Caudal	Toward the tail
Cephalic	Toward the head
Distal	Away from the point of attachment
Dorsal	The top side or back
Lateral	Farther away from the midline
Medial	Closer to the midline
Proximal	Toward the point of attachment
Ventral	Bottom, toward the abdominal side

Can you identify?

- Hip
- Femur
- Knee
- Tibiotarsus
- Fibula
- Ankle
- Tarsometatarsus
- Digits

Equipment and Supplies

- Bandage scissors: Scissors that have one blade flattened at the end to slip under bandages. These were designed for cutting tight bandages without cutting the patient.
- Vet Wrap: Vet wrap is an elastic product that adheres to itself. It is available in many widths and can be cut into very small sections for tiny wraps.
    - The advantage of vet wrap in avian treatments is that it does not stick to feathers. Vet wrap is ideal for many situations; however, caution must be used because if it is applied too tightly, constriction or swelling can result that can irreparably damage tissue or a limb.
- Rolled cotton: Rolled cotton is an excellent material to use for padding areas that require extra protection. It can be used in small amounts to provide a softer wrap or be used in large thick wraps for support such as in the Robert Jones wrap.
- Gauze: Gauze can also be used for padding. It is particularly helpful when bandaging feet.
- Tape: Tape fixes to a surface.
    - *Paper tape* adheres lightly and can be removed with minimal damage to feathers.
    - *Masking tape* is very useful for splinting or for shoes on small birds.
    - *White adhesive tape* sticks firmly in place and does not stretch, but does damage feathers.
    - *Elasticon* is an adhesive tape that stretches. However, caution must be taken when using *Elasticon*. If applied too tight, *Elasticon* can cause swelling that can irreparably damage a limb or the patagium.
    - *Steri-strips* are thin strips of threaded tape. They are very sturdy and can attach to skin or feathers.
- Splints: Splints are commonly used to secure fractures. Simple splints may be made from tongue depressors, wire, swab stems, tape, or custom splinting products such as SAM splint.

Stabilization

Stabilizing your bandage is a necessary step to ensuring its success. Stabilizing can be accomplished in several ways:

- Bone against bone: The bones in the legs or wings adjoining the fracture or trauma site, will act as a splint.
- Bone against body: The body itself will act as a splint, providing additional support.
- Splints: Sometimes external materials are needed to add stiffness to stabilize a site. There are many materials available that can be used as splints. The Schroeder-Thomas and Robert Jones splints are two specific splinting techniques.
- Nesting donut: Support for the animal when it is not standing can provide additional stabilization. A towel wrapped in the shape of a ring can provide a nesting structure that will keep the animals head elevated and limit its attempts at movement.
- Substrate: Substrate is a particular surface below the animal aids in the healing process by providing a stable surface. For example, an animal that has one leg wrapped might find newspaper too slick for one-legged mobility. Softer, firmer, easier to grip, rougher, or smoother are all options for substrate modifications. The one you choose will depend on the condition being treated. The cage flooring is usually sufficient in most cases.
- Cage rest: Just do nothing! Sometimes an animal will hold a limb in the correct position and a wrap can actually un-stabilize the site by tension or even by its weight. This is often the case with very small birds. Not using a wrap but providing complete cage rest may be the best treatment. Some common non-bandaging conditions are fractures of the keel, pelvis, or the pectoral girdle.

Bandaging Techniques

There are many bandaging techniques. Some are standards used for specific situations, but many will be techniques you develop for animals with special needs. A few of the more common bandaging techniques are listed here.

Leg Wraps

A simple bandage is needed to wrap a leg. Pad the leg first to prevent secondary trauma from the wrap. Then, fold the leg up. The lower leg bone will rest against the adjoining one. When you have folded the leg onto itself, wrap it in position. This wrap is used in injuries to the tarsometatarsus and the tibiotarsus. The uninjured bone acts as a splint or stabilizing force.

Leg Wraps w/body wrap

If the femur has been injured you will need to wrap the leg to itself and then wrap it to the body to provide additional stabilization. This usually needs to be accomplished by adding a loop of wrap up and across the ventral thorax and over the opposite shoulder of the bird. Then continue down to the leg and attach.

Ball bandage

Injuries to the foot or toes can be helped by the application of a ball bandage which distributes the pressure evenly across the foot. This bandage can help damaged toes or bumblefoot. A ball bandage is made by placing gauze or other padding material onto the pad of the foot and wrapping in a figure eight pattern in and out of the toes.

Shoes

Birds can have problems with their feet which cause them to maintain a “closed” or clenched foot position. This can be caused from fractures, dislocations, pulled tendons or ligaments, or even from illness. These animals will often need “shoes” to correct the condition. Shoes can be made from tape, cardboard, or other stiff materials. The material is dependent on the type and age of the animal. Shoes can be applied for just a few days or for a much longer period.

Hobbles

Hobbles are used to hold a bird’s leg in a particular position, usually as a corrective measure for splayed legs. Splayed legs overextend from the sides of a bird’s body and must be correctly positioned quickly to avoid permanent dislocation. Hobbles can be effective in just a few days and may need to be in place longer.

Bandaging Considerations

There are many points to consider when deciding whether or not to bandage, what bandage to use, and how to apply it.

Here are some points to remember:

Swelling

Significant swelling can sometimes be found at a fracture site. In this circumstance, it is often preferable to wait and bandage the limb after the swelling has begun to subside, particularly if the animal can hold the limb in a natural position. If the injury is such that waiting is not an option, the bandage should be as loose as possible.

Blood flow

When securing a bandage do not make it too tight. If you have secured a limb, but cut-off the blood supply, the tissue will be damaged or even die. Make your bandages as loose as they can be and yet still be effective.

Mobility

You will have to consider the mobility of the animal. If wrapping both legs seems to be indicated, how will the animal get around? Will it be able to obtain food and water? If an animal has two injured wings should you plan on wrapping both?

Stress

Will the animal be under less stress if it is not restrained by a wrap? This is a real possibility as some birds can experience such a tremendous degree of stress that they may not be able to stand, eat, etc. Remember, severe stress can result in death, so be prepared if your initial treatment plan must change.

Stiffness and Fusion

Another factor to consider is the unplanned result of immobility from a wrap. If an animal has a limb wrapped for an extended period of time, the joints in that area may become stiff or even fused into position. It is important to remove wraps as soon as they have done their job. If movement still needs to be restricted, an animal can be placed in a small enclosure until healing is completed.

Babies

Young animals have special bandaging guidelines. Their growing bones can quickly make a correct bandage into one that is too tight. Bandages on young animals need to be removed and re-applied every three days to ensure that their growth is not compromised.

Secure Bandage

Sometimes we are overly cautious about the wrap being too tight and we tend to make them too loose. This can cause more trauma than the original injury due to damage the animal can cause to itself by thrashing or simply moving around. A simple break can become a compound break overnight.

Efficiency

Be aware of how much wrap is being applied. You don't want your bandage to out-weigh the bird!

Management

The final component to bandaging is to plan for the continued care of your patient. Notes on *care management* should include every step of the process where additional attention will be required.

Some areas to be included are:

- Check Wraps
  - Babies
  - Adults
- Redoing wraps (especially orphans since they grow so fast)
- Monitoring of weight and eating
- Monitoring of general condition
- Monitoring condition of cage
- Noting mental and physical condition
- Noting appropriate social behaviors
- Schedules for physical therapy or other treatment
- Compensate for bandage-caused immobility
- Additional cage rest after wrap is removed
- Medical charting
- After the wrap
  - Wellness checks (ongoing care)
  - Release readiness

Bandaging Techniques Birds

There are many different types of bandages, from very simple to more complex with multiple layers and splinting material

What do bandages do?

- Immobilize the affected area (prevents movement).
- Protect wounds by avoiding contamination and keeping the site clean
- Prevent tissue desiccation (drying out).
- Prevent further trauma, including self-inflicted (some birds may pick and self-mutilate)
- Hold dressings and or splints in place
- Provide localized pressure to reduce swelling
- Hold fractured bones in proper alignment

Major goal of bandages is to provide protection and support to an injured area
Major goal of splinting is to immobilize the joint above and below the fracture

What makes up a bandage?

There are three main layers of a bandage but not every bandage will need all three layers

Primary layer: dressing (such as telfa and furazone ointment) that is in contact with the wound and provides a moist environment, assists with debridement, encourages granulation, and re-epithelialization,

Secondary layer: padding (such as rolled cotton or gauze) for additional support to the area

Tertiary layer: Vet wrap holds the other layers in place, provides pressure to control bleeding. Also keeps bird from picking at under lying layers

Common Bandages used with Birds

- Ball Bandage
- Interdigitating Bandage
- Robert Jones Bandage
- Figure of Eight Bandage & Figure of Eight Body Wrap
- Leg Tape Splint
- Shoes
- Hobbles
- Thomas Shroeder

Which Bandage to Use?

- The type of bandage to use will depend on the injury, size, age and species of bird being treated.
- Young birds will need special attention to growing bones.
- Smaller bird = smaller bandage.

Tips before Beginning

- Before applying any bandage, first implement proper wound management. This means debriding the area and cleaning with chlorhexidine if open wounds are present.
- Have all bandaging materials ready before handling the bird (always try to minimize handling and stress)
- If unsure whether a bone is fractured, err on the side of caution and treat it as though it were.
- Have someone help you with proper restraint.

Select the correct size materials for your patient…

Tips during Bandaging

- If using multiple layers, make sure that the outer layer (Vet Wrap) completely covers the under layers
- Check the limb for correct positioning during the procedure (it's easy to twist things around!)
- Monitor the bird for stress
- Apply bandage snugly but NOT too tight (vet wrap can tighten if it becomes wet)

Tips after Bandaging

- Monitor for any slipping, discharges, discoloration, tightening and swelling

How Long to Leave the Bandage?

- **Adults –** 7 days / **Babies** - 3 days / **Juveniles** - 5 days.
- For babies and juveniles a med card needs to be made indicating to change the wraps every 3 or 5 days depending on the age. For adults no green card is necessary.
- Complications of prolonged and improper bandaging can be joint stiffness, muscle atrophy, damage to flight feathers, and bones healed incorrectly which especially in babies is irreversible.

Ball Bandage

- Used to protect the foot while healing.
- Toe fractures, other soft tissue injuries.

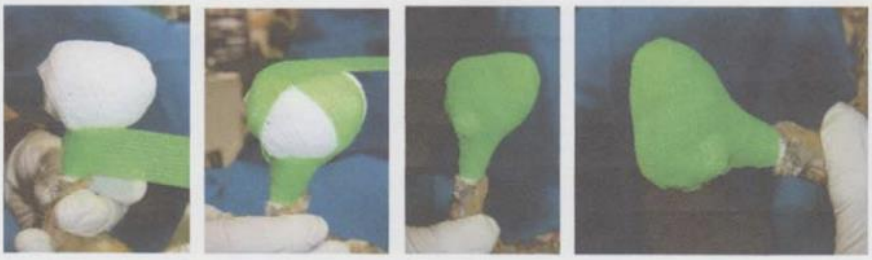
Ball Bandage – Technique

- Clean and debride the wounds first and then apply sterile dressing (such as furazone and telfa)
- Conform the toes around a large stack of gauze sponges
- Wrap with gauze or rolled cotton to provide additional cushioning
- Wrap the foot with vet wrap and anchor around the ankle until a well formed ball is created.

Ball Bandage Tips

- Toes should be in a comfortable grasping position.
- Apply sufficient support around the distal tarsometatarsus (ankle) so that the bird can stand upright.
- Wrap should be secure, not loose or sloppy and not too tight.
- Remember the bird can't perch - must provide food in a manner so that the bird can eat

Ball Bandage



Interdigitating Foot Bandage

- Use when a wound (bumblefoot) needs to be protected on the bottom of the foot yet it's desirable for the bird to perch (bandage leaves the toes exposed while protecting the bottom of the foot).

Interdigitating Foot Bandage – Technique

1. Clean and debride the wounds first and then apply sterile dressing (such as furazone and telfa)Start by loosely wrapping Vet Wrap® around the ankle.
2. Conform the toes around a stack of gauze sponges
3. Using vet wrap pass across the bottom of the foot over the metatarsal pad.
4. Loosely lay the bandage between toes 2 &3 and 3 & 4 just **ONCE** (to avoid bunching and rubbing).
5. Can cross over the metatarsal pad as many times as needed.
6. End by wrapping up around the ankle.
7. MAKE SURE BIRD HAS FULL RANGE OF MOTION IN ALL TOES

Interdigitating Foot Bandage – Tips

- Should NOT be too tight and just lay the bandage between the toes
- Monitor for swelling and coolness which may indicate it's too tight
- Should still have range of motion in toes and be able to perch

Interdigitating Foot Bandage








Robert Jones Bandage

- Limited to simple fractures of the distal tibiotarsus and tarsometatarsus, injuries of the hock joint and soft tissue wounds of this area.
- bulky bandage for immobilization of an extremity
- **Not** for fractures of the femur
- Can be reinforced when necessary with wooden splints (tongue depressors), or aluminum splints

Robert Jones Bandage – Technique

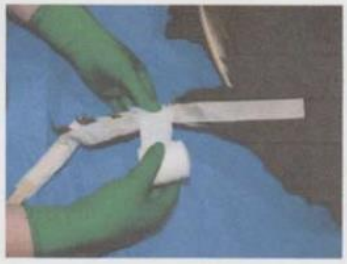
1. Hold the leg in a functional position, slightly flexed.
2. Tape stirrups – long strips of tape on either side of the leg, medial and lateral (inside and outside), with the tape extending several inches beyond the foot
3. 1st layer consists of thick cast padding wrapped from the top of the foot to the most proximal point of the leg (bottom to top).
4. Can use up to 3 layers of padding
5. Leave the toes unbandaged
6. 2nd layer is conforming gauze wrapped fairly tightly around the cast padding.
7. The bandage should be firm and even along the entire length.
8. Can place additional splinting material if necessary.
9. Cover with Vet Wrap®.
10. Tape the stirrups up along either side of the outer layer to help hold it in place

Robert Jones Bandage Tips

- Can be combined with a ball bandage to immobilize the foot if needed
- Make sure the leg is straight (foot facing forward) and that you don't rotate the leg or fracture site while applying the bandage.
- Don't over tighten – if done correctly, the thick underlying layer should prevent this
- Monitor toes for swelling and discoloration.
- Monitor bandage edges for any rubbing along the limb.If there is excessive swelling when the bandage is placed, it may loosen as the swelling decreases and will have to be replaced as needed.

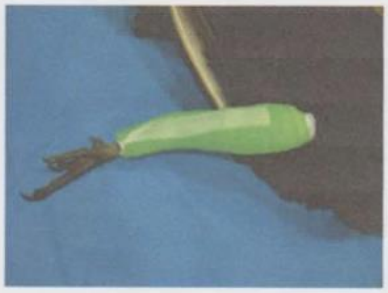
Robert Jones Bandage









Leg Tape Splint

- Used for tibiotarsus and tarsometatarsus fractures in small birds (roughly less than 150gm).
- Best with mid shaft tibiotarsal fractures.
- Can be used for fractures of the digits.
- Not for femoral fractures

Leg Tape Splint Tips

- Don't include the foot in the bandage (other than the stirrup).
- Use GREAT caution when removing the bandage

Leg Tape Splint – Technique

1. Hold the leg in a functional position, slightly flexed so that the bird is able to perch.
2. Overlapping strips (3-4 layers) of tape are placed on the inner (medial) and outer (lateral) aspect of the leg.
3. The tape must extend the joint above and below the fracture site.
4. A splint can be included passing longitudinally down the lateral tarsometatarsus to aid in ambulation and maintain the foot in a normal position.
5. Can cover with vet wrap



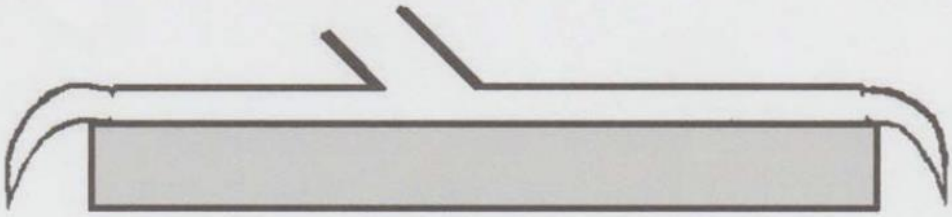


Shoes

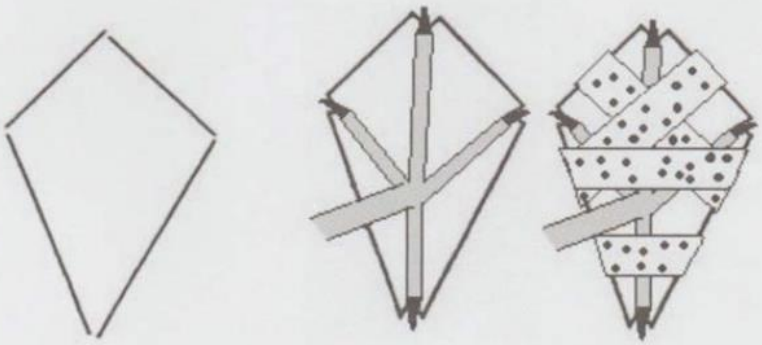
What do shoes do?
Shoes are used quite often and can be quickly custom made for the individual bird. They can be used to correct broken toes, toes curled into odd positions, and holding the foot in a fist.
Shoes can be applied to only one foot or both

How long do they stay on?
For adult birds remove the shoe in 1 week. If the problem is still evident, reapply shoe for another week. For babies remove the shoe in 3 days. If the problem is still evident, reapply shoe for another 3 days. For juvenile birds remove the shoe in 5 days. If the problem is still evident, reapply shoe for another 3 days. .

Materials: Use styrafoam as the foundation of the shoe. Cut the styrafoam in a kite pattern based on the size of the bird's toenails The nail should have enough clearance to drape over the edge of the shoe without twisting the toe sideways from hitting the ground



Use tape to attach shoe making sure to apply in between toes to keep toes separate and in place. Then apply vet wrap over foot and slightly up ankle. For small birds be careful not to make wrapping too heavy. (for very young birds the tape alone may be enough)



Hobbles For Splay Leg

What is Splay Leg?
splay-leg is a leg problem in young birds. It occurs when abnormal lateral forces on the legs and feet causes the long bones (femurs) and sockets of the upper leg (acetabula) to distort and bend outward or sideways. Both legs are usually affected.

The cause of this condition is a nesting area or nesting container, which is too slick for the young bird to grasp well. Not having enough shredded bedding or bedding of the wrong kind within the nest also causes this condition. Another common cause is too rapid a growth rate in overfed, hand-reared birds.

Baby birds that are in the process of developing splay-leg are look like skaters whose legs slide outward from the midline.

The older the bird, the harder splay–leg is to correct. This is because the bones of older nestlings and adults are more calcified and rigid and less adaptable to change

All birds with splay leg need to be treated as soon as the problem is noticed. This goes for minor deviations as well as major ones.

Treatment

1. Make sure legs are in proper alignment and spread in natural position
2. Apply vet wrap at Tarsomatatarsus
3. Remove after 3 -5 days depending on age of the bird

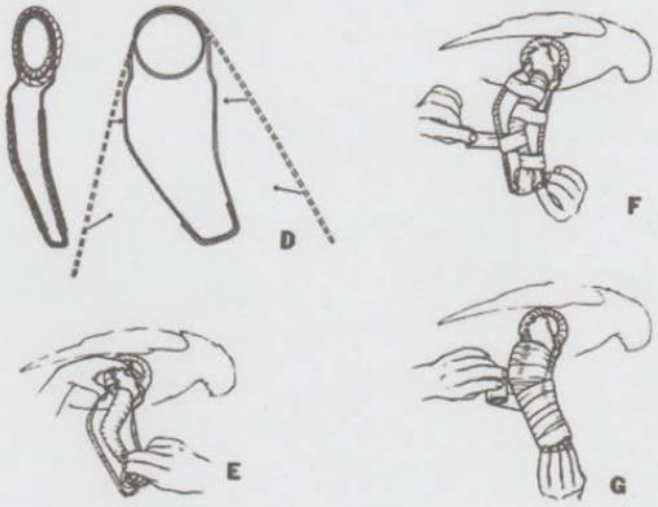
Thomas-Schroeder splints

When to Use?

The Schroeder-Thomas splint can be used to immobilize distal femoral or tibial fractures. It's also used for immobilization of joints distal to and including the knee. Thomas-Schroeder splints are intended for medium to large birds.

What is it?

The Schroeder-Thomas splint is a traction device. The splint is designed so that soft bandages are used as slings to properly position and help align and immobilize parts of the skeleton. It's made of aluminum rods and a padded ring. The limb is suspended and traction applied to the joints proximal and distal to the fracture site by wrapping with padded bandages.



Thomas-Schroeder Splint Technique

- The ring positions at the top of the leg so the splint is parallel to the long axis of the leg. The leg should be positioned with some flexion at the hock joint.
- The splint should be slighter longer than the partially flexed leg and extended toes.
- The leg is lightly bandaged with gauze and tape is suspended within the splint by alternating strips of tape placed cranially and caudally with the toes extended to the end of splint.
- The splinted leg is covered with bandaging material.
- The bird should be provided with a low perch so the splinted leg can hang below

Medical Services Workshop
MS8 Bandaging Lab

- Leg wraps
    - Tarsometatarsus
    - Ankle
    - Tibiotarsus
    - Toes and digits
- Leg wraps with body wraps
    - Tibiotarsus
    - Femur
    - Hip
- Adding splints
- Hobbles
- Shoes

Medical Services Practice Worksheet

Section Eight: Leg Bandaging

1. Name five conditions which might require bandaging.
    a.
    b.
    c.
    d.
    e.
2. How would you bandage a closed fracture of the proximal femur?
3. How would you bandage a closed fracture of the distal tarsometatarsus?
4. How would you bandage a closed fracture of the proximal tarsometatarsus?
5. How would you bandage a closed fracture of the distal femur?
6. When should you use a splint?
7. How would you bandage a closed fracture of the tibiatarsus?
8. Under what circumstances would you provide shoes? How would you make and apply them?
9. Name two concerns you should have when using vet wrap:
    a.
    b.
10. Why do you check wraps on a young bird? How often should you check?
11. What is your favorite bandage of the leg?
12. You have now completed Section Eight on Leg Bandaging. What was the most interesting part of this section?