The Long Arm Cast
Range of Motion Limited

The long arm cast is applied to limit dorsi-flexion, extension and rotation at the wrist and flexion and extension at the elbow. It can be applied with the wrist in pronation, supination or neutral or any degree of forearm rotation as prescribed by the doctor. The angle of flexion at the elbow can be varied but the long arm cast is usually applied with the elbow at 90 degrees of flexion.

Distal radius fractures

What is the injury?

The most common fracture of the distal end of the radius is known as the Colles fracture. This fracture is located just proximal to the wrist joint and it is usually the result of a fall on the outstretched hand. It may extend into the joint or remain outside of it. In most instances a closed reduction is the treatment of choice, except in those instances where there is severe intra-articular comminution that cannot be adequately improved by manipulation methods. In those instances where the radio-ulnar joint is dislocated, particularly if the fracture is intraarticular, external fixation or plate stabilization is usually the preferred treatment option. Closed reduction, in instances where the radio-ulnar joint is dislocated, a redislocation is likely to occur.

What are you trying to accomplish?

The initial cast is intended to provide comfort to the patient and to relieve the acute symptoms of the injury. The attempt is to gently immobilize the elbow and wrist joints and limit motion of the carpal-metacarpal joints, but allow motion of the metacarpal-phalangeal, proximal and distal phalangeal joints. The cast should be well padded for comfort.

Supplies needed
2 or 3 inch stockinet
2, 3 or 4 inch padding
2, 3 or 4 inch casting tape
Bucket
Scissors

Exit Evaluation
1. Check circulation and neuro functions
2. Check for sharp ridges around the thumb
3. Check patient comfort and general firmness of cast
4. Check for cast rubbing at the chest wall
How do you accomplish this?
List of materials and tools: see gray box
List of records: X-rays showing the position of the bone fragments.

Positioning of the patient for reduction:
The patient should have the thumb placed in a Chinese finger trap or other traction apparatus and a weight of X lbs (Y Kg) placed on the arm to reduce the fracture.
If no reduction is necessary, the patient can be casted in a comfortable sitting position.

Experience and clinical research has convinced us that Colles fractures are best stabilized in a position of relaxed supination, rather than in the traditional position of pronation. We have extensively documented that the relaxed position of supination allows for better reading of radiographs; reduces significantly the incidence of loss of reduction; and leads to an ultimate greater degree of motion of the wrist. This is due to the fact that the only muscle capable of recreating the typical Colles deformity of radial shortening and dorsal angulation is the brachioradialis. This muscle functions best when the wrist is in pronation.

This pattern suggests that the stability of the distal radio-ulnar joint is the single most important prognostic feature in Colles fractures. Functional bracing should be reserved to those fractures with intact radio-ulnar joints and especially for the ones where the distal radial fracture is not intra-articular and comminuted.

Typical fractures requiring long arm casts

Colles
Green Stick
Olecranon
1. Stockinet is applied to the affected arm. A “gumby” may be used. (see chapter 3) Be sure the stockinet reaches well into the axilla. Cut openings at the olecranon and the anterior aspect of the elbow. Additional holes can be cut to loosen the stockinet.

2. Apply padding as you normally would. Try to flex the elbow to 95 degrees before you apply padding around the elbow. This will relieve any pressure over the cubital area as you adjust the flexion of the elbow to 90 degrees later in the casting process. Do not over-pad the elbow.

3. Padding should be applied with even pressure around the arm as discussed in earlier chapter 3. By limiting extra padding around the elbow you will be preventing pistonning within the cast which can cause skin breakdown at the elbow and discomfort at the fracture site.

4. This is the relaxed supination position that is both comfortable to the patient and maintains good alignment after reduction in certain distal radius fractures.

5. After you apply the short arm segment of the cast to within 1 inch of the elbow bend, reduce the flexion at the elbow to 90 degrees. This allows for a small void under the padding at the cubital area.

6. Start your second roll at mid forearm. Cover the elbow well and proceed to the proximal cast line. Start your third roll at the proximal cast line and continue to the wrist. Make sure you have 4 layers of casting tape at the proximal cast line to be able to hold a mold.
The proximal cast on the medial (axilla) side should be molded flat to prevent rubbing against the chest wall and help prevent rotation within the cast. A counter mold can be made around the triceps. By slightly stretching or “cinching” the casting tape at the proximal end of the cast, a slightly tighter fit will be achieved that will counter atrophy changes and maintain a better and more comfortable fit.

The above picture shows the patient “lean” that can be used to help roll casting tape around the medial side of the upper arm in a tender patient without abducting the arm forcefully. Make sure the patient is well balanced before asking them to lean. A stool and/or grab bar can help.

The cast to the left has been applied in relaxed supination. Recent studies by the authors indicates that this is the preferred position to hold reductions of the radius where pronation might cause recurrence of the deformity.

Notice the “gumby” thumb. Application of the gumby provides extra padding around the thumb while preventing the patient from removing padding from under the cast. The instructions for the gumby are found in chapter 3.

The long arm cast should allow for full flexion of the fingers at the distal end and reach above the belly of the biceps at the proximal end.

The final degree of flexion at the elbow, the ulna or radial deviation of the wrist, the degree of palmer or dorsi-flexion at the wrist are all decided by the nature or severity of the fracture and prescribed by the physician.