SKI RELATED SHOULDER INJURIES TREATMENT & PREVENTION

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Direct Catastrophic Injury in Sports

- Catastrophic sports injuries are rare but tragic events.
- Direct (traumatic) catastrophic injury results from participating in the

skills of a sport,

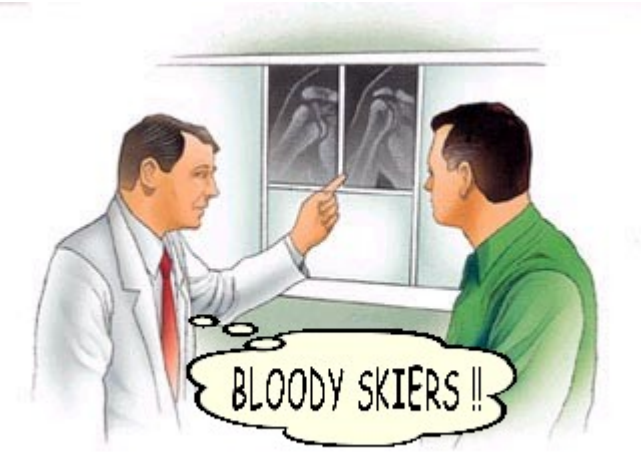
- Indirect (nontraumatic) injury is caused by systemic failure as a result of exertion while

participating in a sport.

Cardiovascular conditions, heat illness, exertional hyponatremia, and dehydration can cause indirect catastrophic injury.

Shoulder injuries

- Shoulder injuries are usually caused by falls or awkward landings;
- they are also common in skiers who specialise in aerial tricks and jumps



Clinical Orthopaedics & Related Research:
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Editorial Comment: PDF Only

Skiing-related Injuries to the Shoulder.

WEAVER, JAMES K. M.D.

Abstract

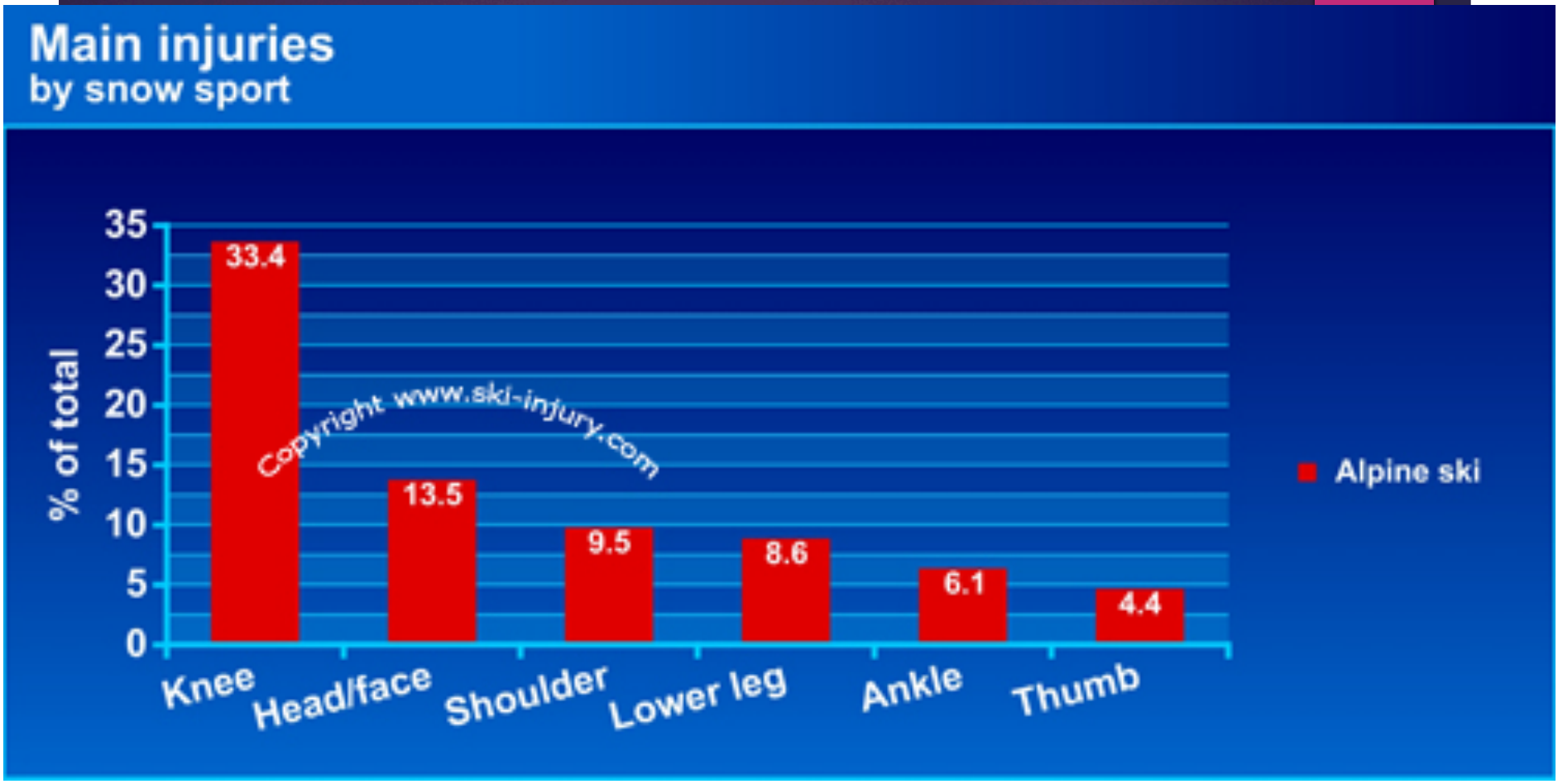
An analysis of 135 consecutive shoulder injuries seen in one clinic during a single ski season revealed anterior dislocation to be the most common ailment, constituting 52% of the total. Rotator cuff tears accounted for 20% of the total, followed by acromioclavicular (AC) separations (18%) and a miscellaneous group of contusions and isolated fractures comprising the other 10%. AH of the shoulder dislocations were anterior, most were primary (81%) and men (83%) were involved more frequently. Twenty-four percent of the dislocations were thought to be equipment related. At follow-up examination three to four years after injury, a significant number (41%) were still symptomatic either from a recurrence (18%) or pain and weakness (23%). Patients with rotator cuff tears tended to be about ten years older than the average skier. Their injuries were usually a result of a fall on ipsilateral arm and were not equipment related. Of the 13 patients responding after a three-year follow-up period, most (10/13) were asymptomatic. There were 24 AC separations. All resulted from a direct fall on the shoulder. Sixty percent were first degree, 22% were second degree, and 18% were third degree. About one-third of the respondents with first and second degree injuries were still having significant pain at three-year follow-up examination. The most frequent isolated fracture was a minimally displaced fracture of the greater tuberosity (only three cases in 135 injuries), but this same fracture occurred in 10% of the shoulder dislocations.

Arm and shoulder injuries comprise **30% to 40%** of all skiing injuries

Source: American College of Sports Medicine

Shoulder injuries (statistics)

	Fracture	Sprain	Joint injury	Bruising
Alpine ski	20.2	21.8	52.9	5
Snowboard	18.4	26.2	52.4	2.9
Skiboard	85.7	14.3	0	0


Main injuries
by snow sport
% of total
35
30
25
20
15
10
5
0
33.4
13.5
9.5
8.6
6.1
4.4
Knee
Head/face
Shoulder
Lower leg
Ankle
Thumb
Alpine ski
Copyright www.ski-injury.com

BEST PREVENTION
STAY AT HOME !!!

BUT SPORTIVES CAN"T

Good advice

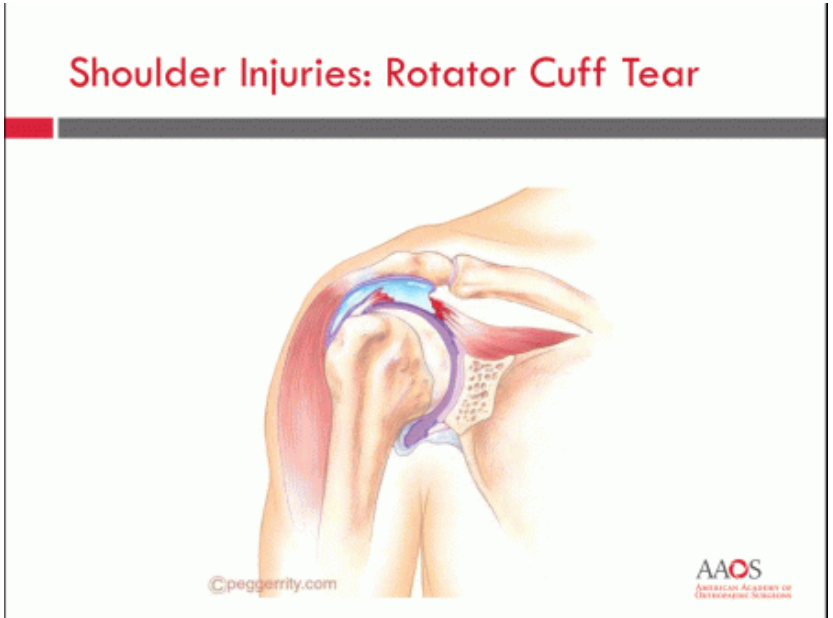
- Improvements to equipment have led to reductions in injury rates
- "Take your time to gain experience on the slopes. Get professional instruction but don't be tempted to try too much too soon, especially if encouraged by more experienced friends

Statistics for shoulder injuries from snow sports

- When looking at acute shoulder dislocations,
- 6.56% were associated with proximal humerus fractures among skiers (compared to 1.7% among snowboarders). Snowboarders who lead with their left foot were more likely to fracture their left humerus (P = .023)
- A paper in 2011 by Ogawa and colleagues (Injury, in press, 2011) reported the overall rate of shoulder dislocation to be 0.0583 per 1000 participant days
- The risk is higher in snowboarders (0.0676 per 1000 participant days) than skiers

Rotator cuff strains

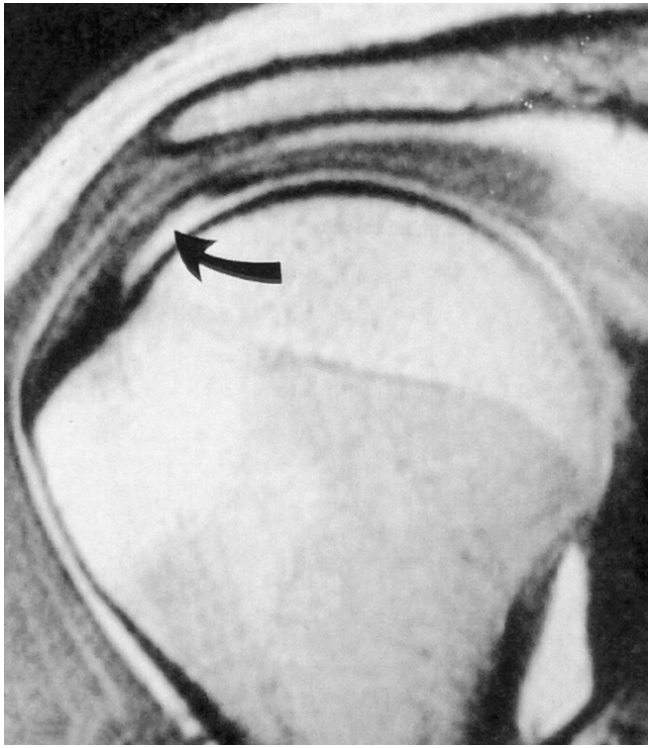
- Rotator cuff strains are the most common cause of pain in the shoulder joint. The rotator cuff is made up of four muscles, which serve to protect and support the shoulder joint



- The most common rotator cuff injury is tendonitis, which occurs when the tendons surrounding the muscles become swollen; this usually results from overuse or an action which requires the tendons to stretch beyond their limits.

Symptoms of rotator cuff strains

- The most common symptom is a sudden onset of pain in the shoulder;
- pain becomes heightened when the arms are raised or the shoulder is moved. Movement in the joint will usually be restricted

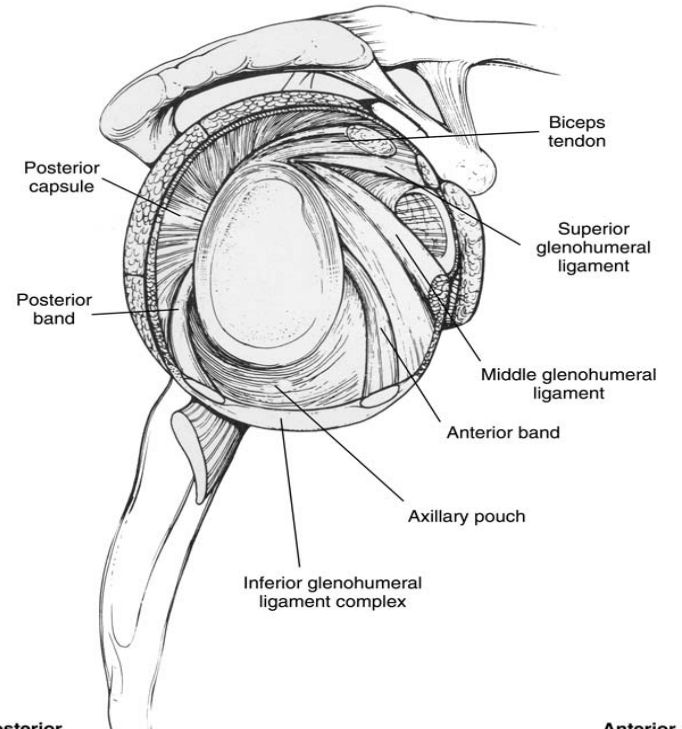


Treating rotator cuff strains

- Rotator cuff strains can usually be treated with rest, ice and a combination of analgesic and anti-inflammatory medications.

Shoulder dislocation

- The shoulder joint is more susceptible to dislocation than other joints



- Commonly, shoulder dislocations occur as a result of high speed impact or a fall which results in landing in an awkward position

Acute Management of Shoulder Dislocations

- Acute dislocations should be reduced in a timely manner to avoid muscular spasm and neurovascular compromise
- while ensuring gentle and technically

sound closed reduction

Shoulder Injuries: Dislocation

Normal

Dislocated

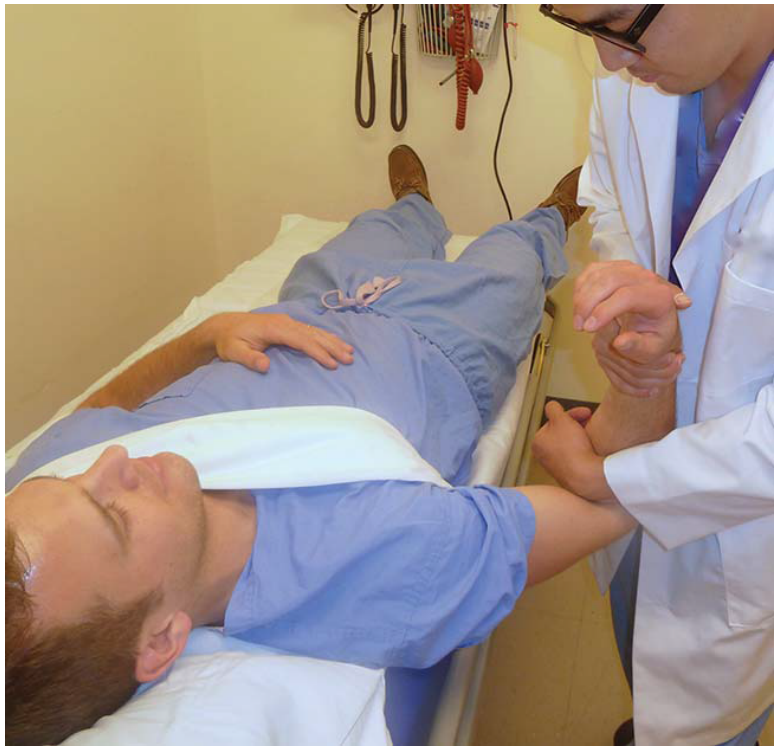
.CLOSED REDUCTION ,SHOULDER Dx

the chair technique for reduction of an anterior shoulder dislocation. The patient
initially sits with the affected arm hanging over a chair back and then stands while the physician holds the arm. The patient reduces the shoulder using his own power.

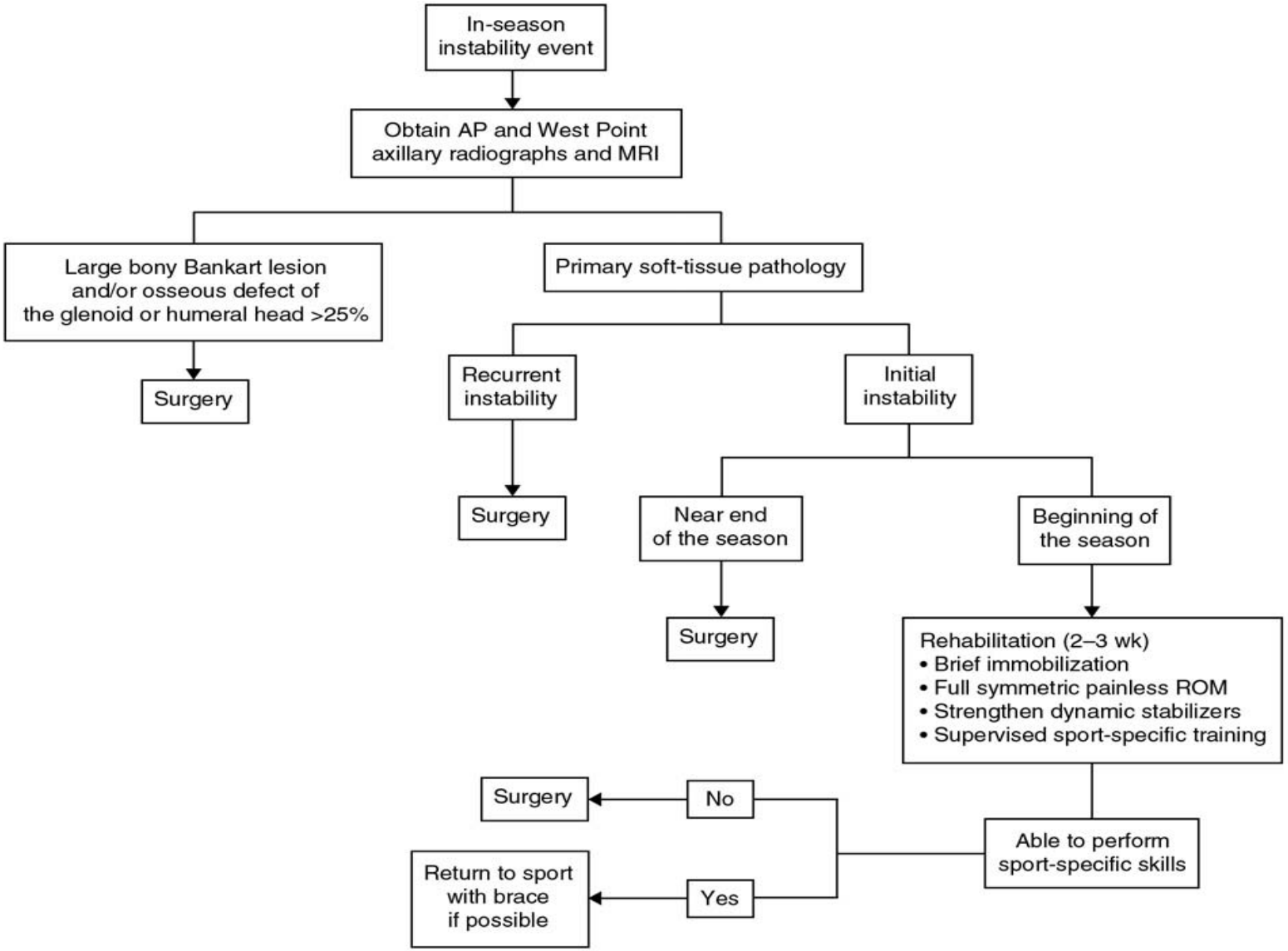
Stimson technique

for reducing
anterior shoulder dislocation. With the patient in the prone position, weights are hung from the wrist or elbow.

Photograph demonstrating the traction-countertraction reduction technique



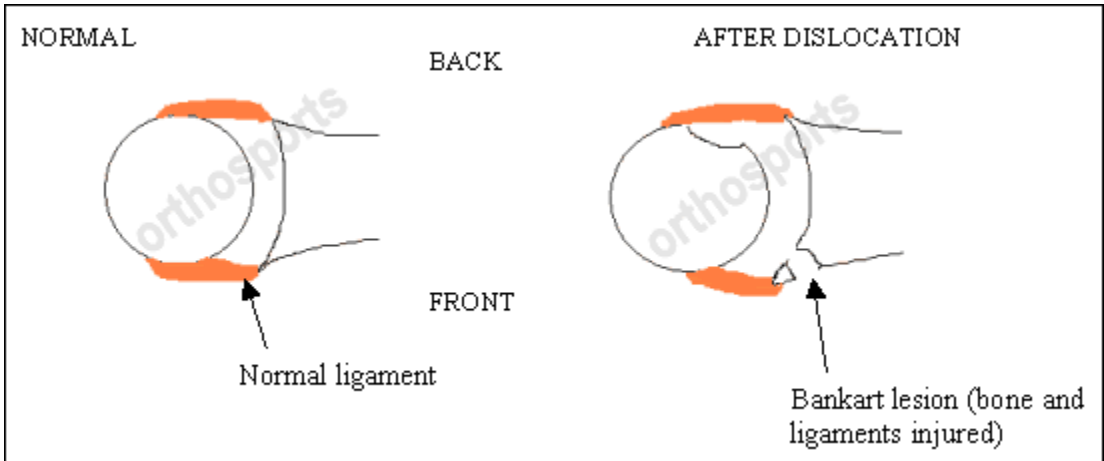
the Fast, Reliable, and Safe (FARES)
technique. While the clinician maintains traction, short, vertical, oscillating movements (orange
arrow) are performed during gradual abduction and external rotation of the
arm (blue arrow). Note there is no
sheet across the torso to provide countertraction.


In-season instability event
Obtain AP and West Point axillary radiographs and MRI
Large bony Bankart lesion and/or osseous defect of the glenoid or humeral head >25%
Surgery
Primary soft-tissue pathology
Recurrent instability
Surgery
Initial instability
Near end of the season
Surgery
Beginning of the season
Rehabilitation (2–3 wk)
• Brief immobilization
• Full symmetric painless ROM
• Strengthen dynamic stabilizers
• Supervised sport-specific training
Able to perform sport-specific skills
No
Surgery
Yes
Return to sport with brace if possible

Preferred Treatment

- We recommend early surgical stabilization for patients with large bony Bankart lesions or significant glenoid or humeral bone loss.
- Athletes with an axilliary nerve lesion or rotator cuff pathology are also offered surgery

- Nonsurgical treatment Our rehabilitation protocol
- consists of simple sling use, gentle ROM exercises, and cryotherapy to regain comfort during the first week postinjury.



IMMOBILIZATION?

Nonsurgical treatment Our rehabilitation protocol

- Unfortunately, once you have dislocated your shoulder once, there is something in the order of a 85% risk that the shoulder will re-dislocate at some point in the future

RETURN TO SPORT

- When ROM and strength are similar to those of the contralateral side, sport specific drills are initiated and return to play with a brace is considered.
- Typically, the time frame for return

  to play is 3 weeks,

- motion-restricting braces may be helpful in preventing recurrence

Photograph of a patient wearing a motion-limiting brace that limits overhead motion

ng

brace.
Similar to the motion limiting brace, this brace limits motion but is somewhat less restrictive

Posterior Shoulder Dislocation and Reduction Maneuver

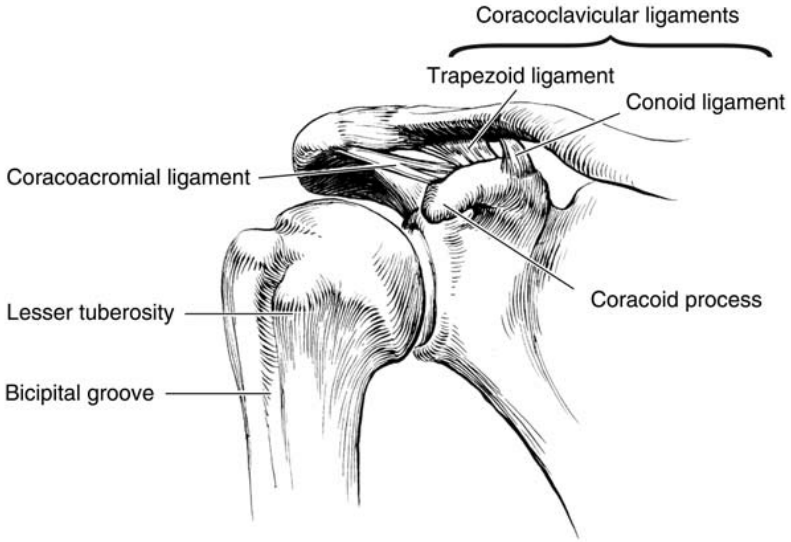
- Posterior dislocations comprise , 3% of dislocations

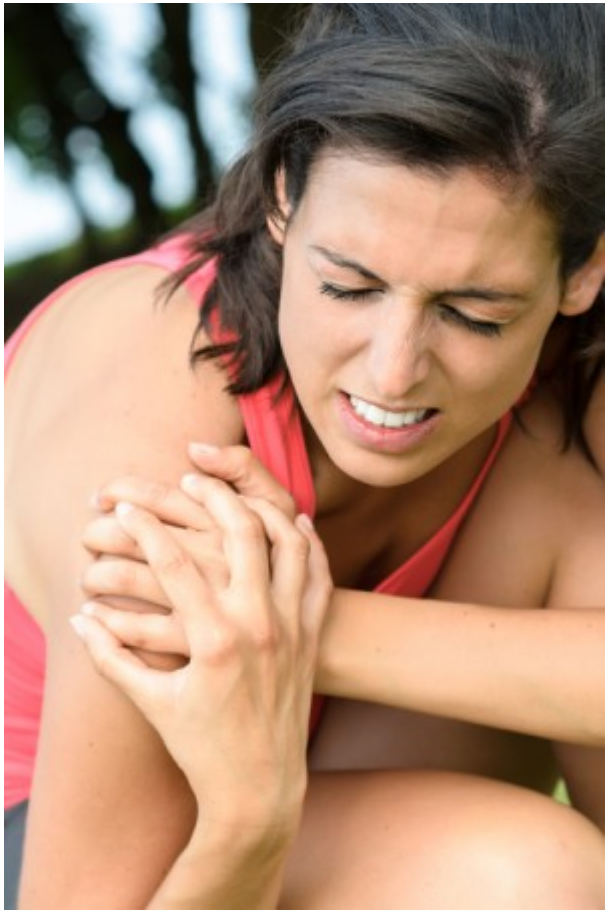
  often unrecognized or incorrectly recognized; therefore, careful examination

  is required.

- Closed reduction is often difficult and may require sedation.
- It should be attempted only within 3 weeks of the injury
- Forward flexes the shoulder to 90 then adducts and internally rotates the arm to disengage the humeral head from the glenoid rim
- Finally, external rotation can be attempted

Acromioclavicular Joint Injuries: Diagnosis and Management

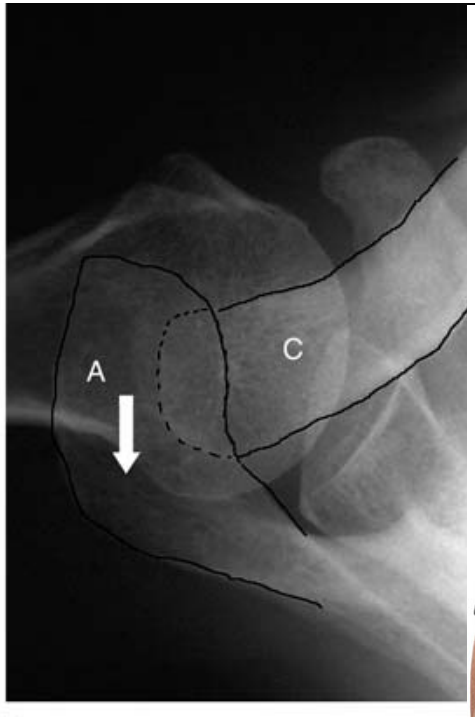




Nonsurgical

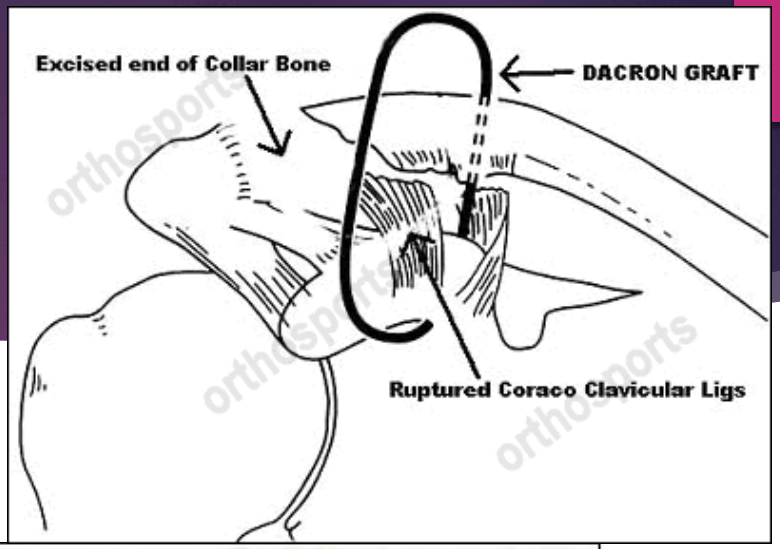
Nonsurgical treatment is uniformly recommended for type I and type II injuries

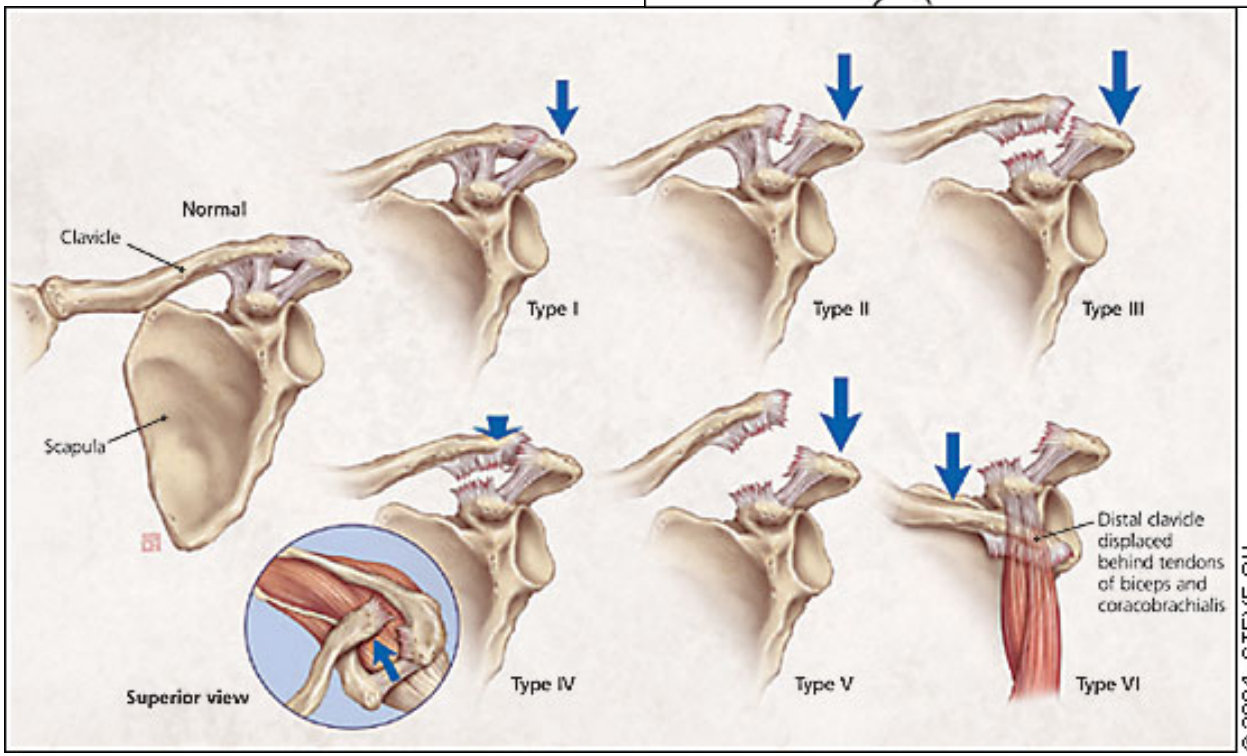
A



B

SURGICAL Tx

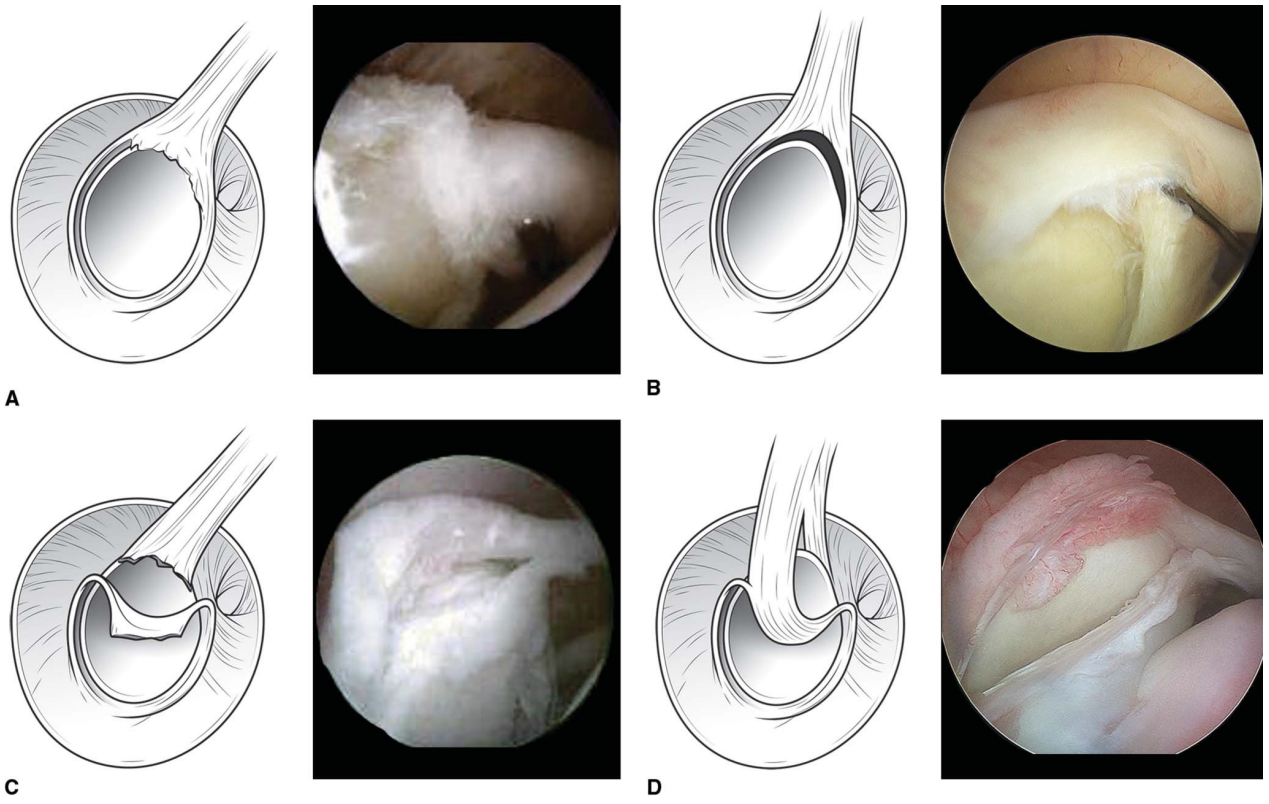

Excised end of Collar Bone
DACRON GRAFT
Ruptured Coraco Clavicular Ligs
orthosports
orthosports
orthosports


Normal
Clavicle
Scapula
Type I
Type II
Type III
Type IV
Superior view
Type V
Distal clavicle displaced behind tendons of biceps and coracobrachialis
Type VI
© 2004 STEVE OH

SLAP LESION

- SLAP tears are a detachment of the superior glenoid labrum from anterior to posterior with or without involvement of the anchor of the long head of the biceps tendon

Slap lesion types



Management of SLAP lesion Repair

- In general, outcomes of SLAP repair are good, with reported success

  rates ranging from71 to 97%,

- Other authors have noted poor results following SLAP repair.
- In a retrospective

  review of the medical

  records of 39 patients

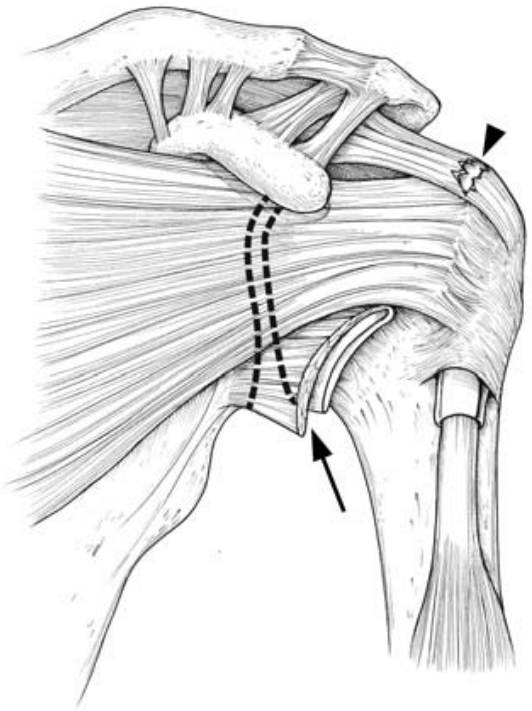
  (40 shoulders)

  with pain, stiffness, or mechanical symptoms after SLAP repair

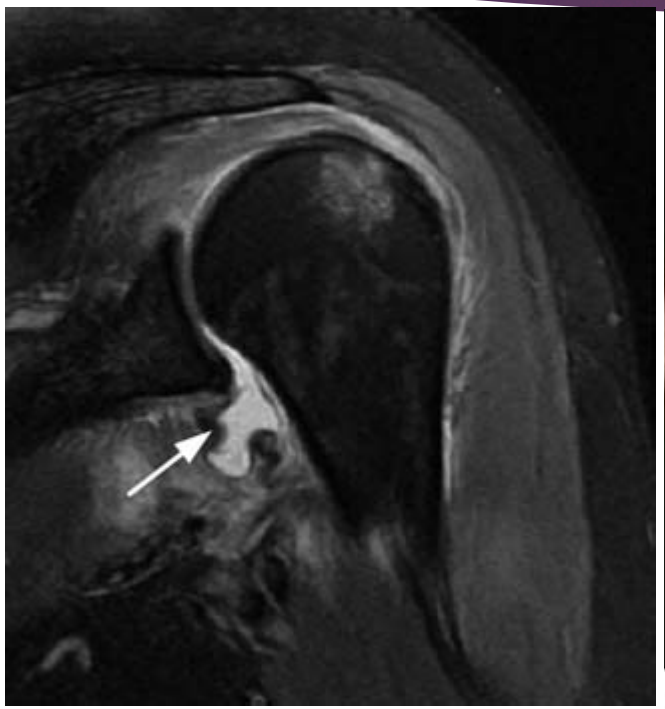
Humeral Avulsion of Glenohumeral Ligaments

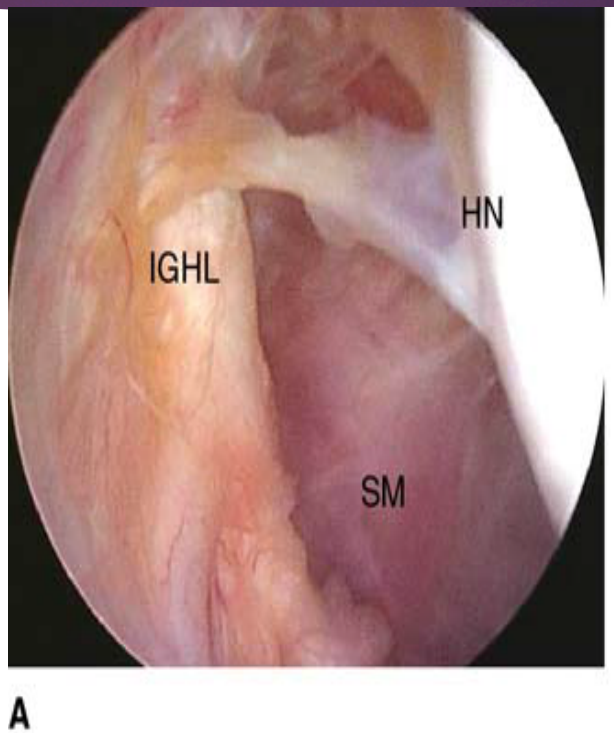
- (HAGL) is an

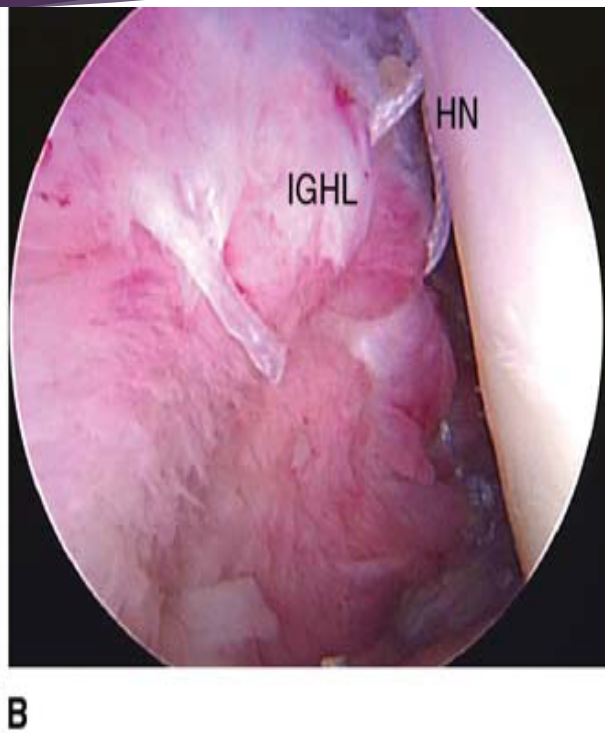
  increasingly recognized cause of recurrent shoulder instability
- Most HAGL lesions require surgical repair



HAGL LESION Tx







Arthroscopic image demonstrating repair of
the HAGL lesion using suture anchors.
The IGHL was reduced to the HN

Cold Exposure

- In cold conditions, the homeostatic response is one of peripheral vasoconstriction in an effort to limit the amount of warm blood being circulated to the periphery, where stored

  heat is dissipated into the surrounding

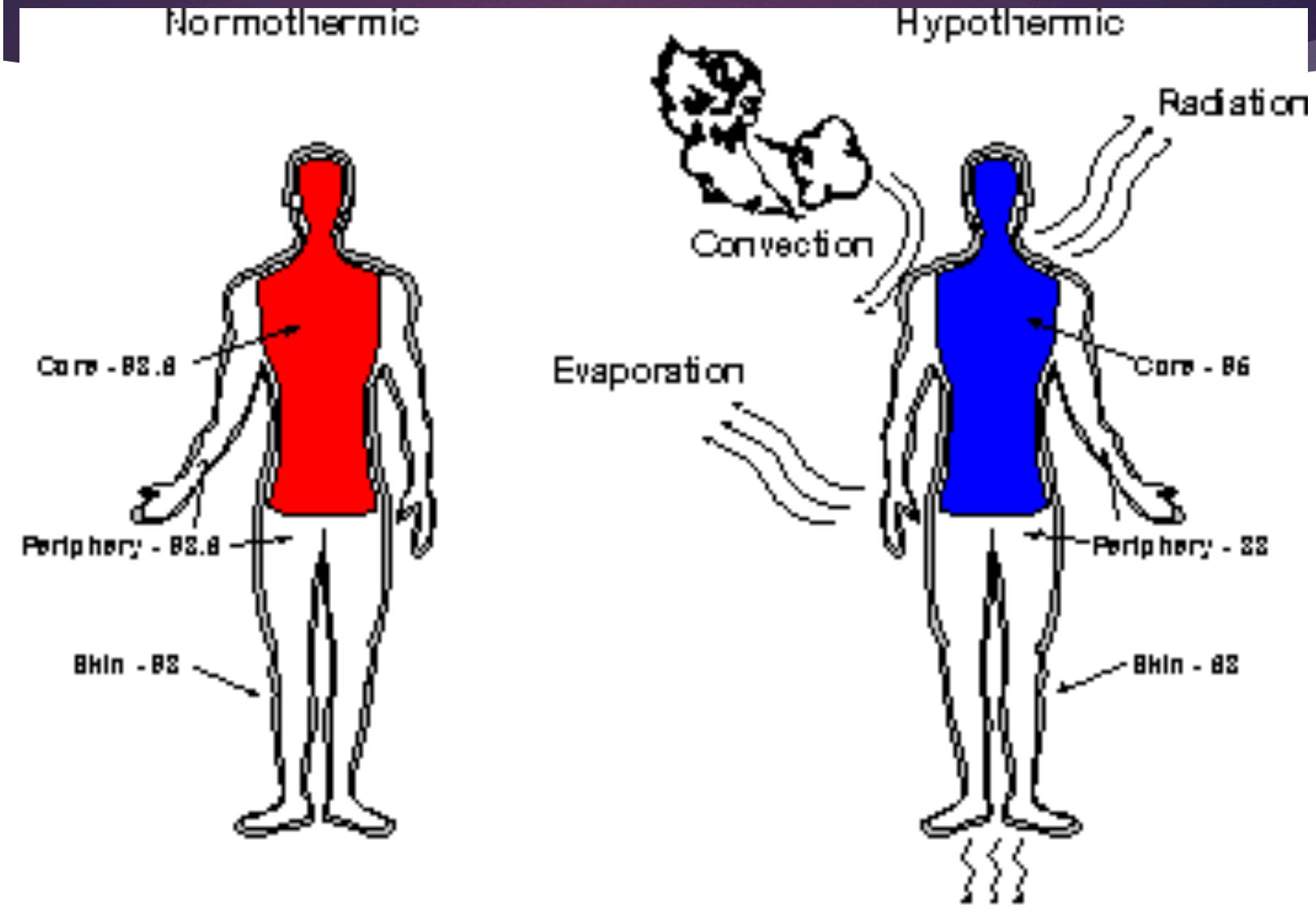
  environment

- If this is not sufficient

  to maintain core body temperature,

- the body increases its metabolic rate with the initiation of shivering

HYPOTHERMI

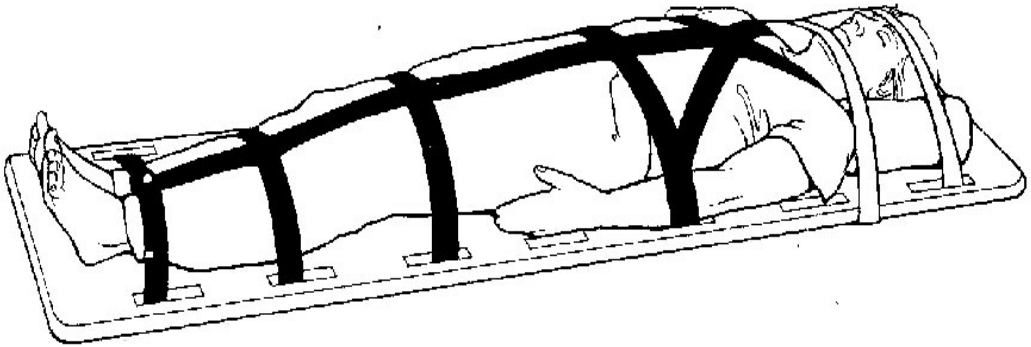

Normothermic
Core - 98.6
Periphery - 92.6
Skin - 92
Hypothermic
Radiation
Convection
Evaporation
Core - 86
Periphery - 82
Skin - 82

Hypothermia

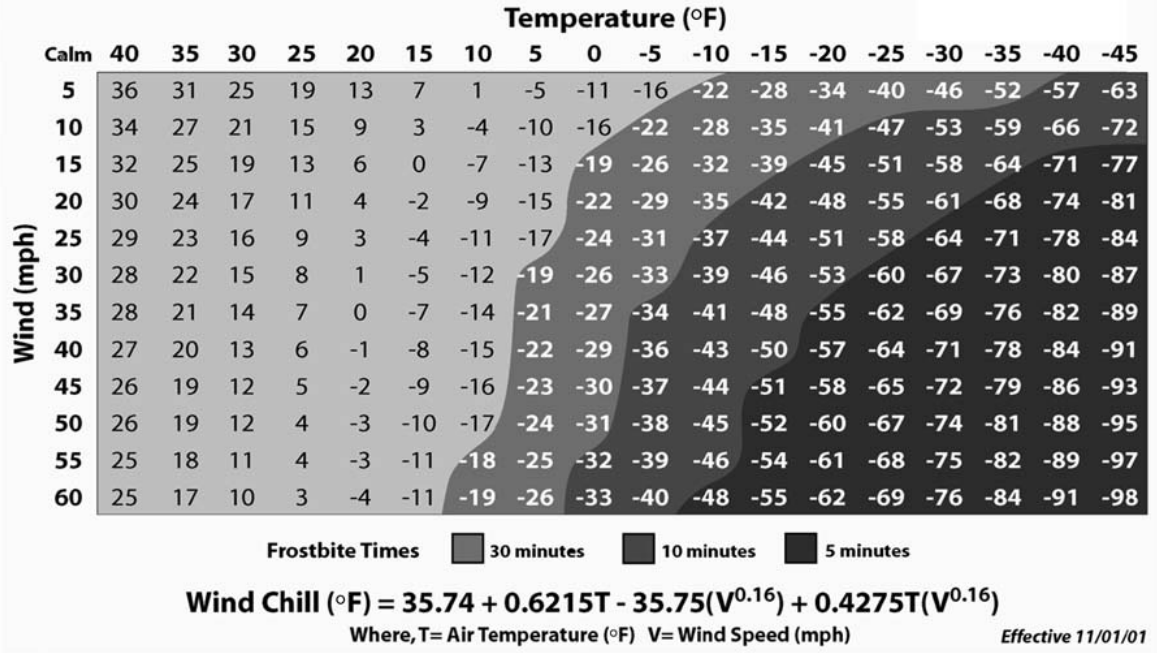
- Hypothermia is defined as a core body

  temperature of <35°C (<95°F).

- **Signs and Symptoms**
- vigorous shivering,
- increased blood pressure,
- fine motor skill impairment, lethargy, apathy,
- and mild amnesia.



Wind chill chart demonstrating the estimated time for the development of frostbite at given wind speeds and ambient temperatures.



Temperature (°F)

Wind (mph)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes; 10 minutes; 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

Management

- Prevention

  is the best strategy for cold induced injuries, with a focus on the

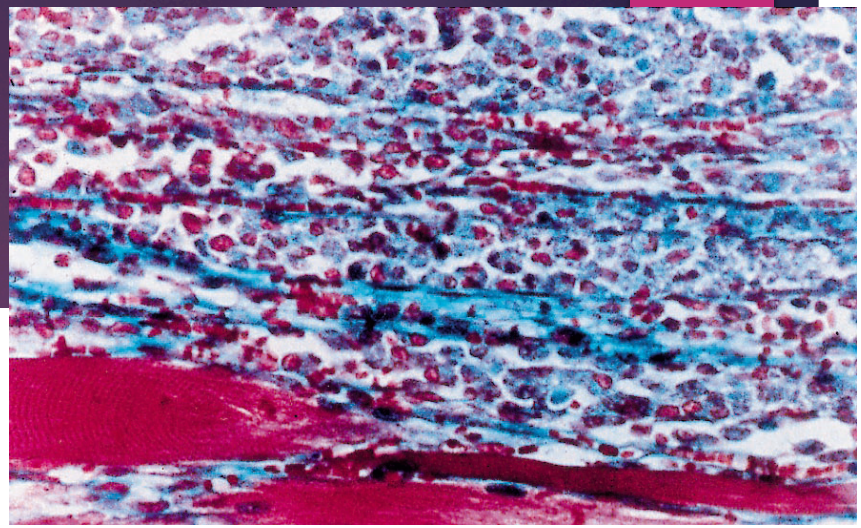
  education of athletes

- Clothing can play a major role in preventing such injuries
- Multiple layers are best.

Muscle Contusion Injuries: Current Treatment Options

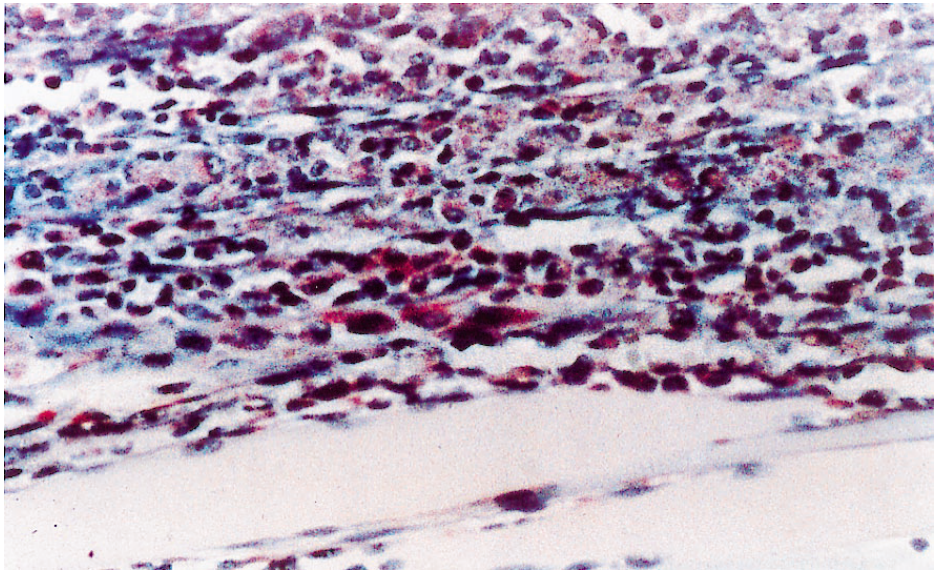
- *Muscle contusion is second only to strain as the leading cause of morbidity from*
- *sports-related injuries*

- The healing process is a delicate balance between the formation of scar tissue by fibroblasts and the regeneration
- of normal muscle by migrating myoblasts.



- **A, Histologic sections at day 2 after injury (original magnification ×200). Top, Trichrome stain shows intense inflammatory response**

with phagocytosis. Intact basement membranes are seen as thin lines stained blue.



Treatment

- **Operative Treatment**
- Many surgeons have

  reported their anecdotal sense that in the presence of hematoma and a palpable defect in the muscle belly,

  it is difficult to suture the muscle together

- However, recent animal studies

  have provided increasing evidence that in the setting of a contusion injury that causes a spatial defect in the muscle belly, suturing with large absorbable sutures through

  the thick substance of the muscle does decrease the distance between the lacerated edges, allowing faster healing

MERCI