TRAUMATOLOGIE DU SPORT

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TRAUMATOLOGIE DU SPORT

- Tendon : tendinopathies
- Ligament : entorses et luxations
- Muscle: contusions et lésions musculaires
- Os : fractures

Les tendinopathies

Définition

Tendinopathie: surmenage mécanique entraînant une altération structurelle d'origine micro-traumatique ou inflammatoire d'un tendon

Les topographies

Membre Inférieur

du tendon calcanéen, du tendon patellaire, du fascia lata (Tendinite de l'essuie glace), etc….

Membre Supérieur

épicondylite, tendon du sus-épineux, etc …..

Stades (Blazina)

Stade 1: douleur survenant après l'effort sans répercussion sur l'activité sportive.

Stade 2: douleur en début d'activité disparaissant après échauffement et réapparaissant après l'exercice.

Stade 3: douleur pendant et après l'activité avec altération progressive des performances sportives (repos +++).

Stade 4: douleur permanente, risque maximal de rupture tendineuse.

Facteurs prédisposant

- **Age.**
- **Altération de l'état général.**
- **Echauffement insuffisant**.
- **Variation importante** et inhabituelle en intensité, en durée, ou en qualité d'un effort (microtraumatismes).
- **Troubles de l'axe** (anomalies statiques ou posturales).
- **Manque de souplesse**.
- **Déséquilibre musculaire agoniste/antagoniste**.
- **Technopathies** (anomalies dynamiques et gestuelles).
- **Matériel inadapté** (chaussures, raquette, vélo…).
- **Sous hydratation** (l'élimination des déchets drainés par les liquides corporels (sang), serait perturbée formant des dépôts sur les tendons qui se solidifient et se cristallisent.
- **Mauvaise hygiène de vie** (alcool, manque de sommeil).
- **Troubles dentaires** (foyer infectieux à distance).

Traitement ?

Physiothérapie associée

- Les ondes de choc radiales

-La cryothérapie

- Les Ultrasons

- Traitements locaux anti-inflammatoire

-MTP au glaçon.

-Les hydrojets ?

Kinesithérapie :
Protocole de renforcement Excentrique

Protocole qui favorise la cicatrisation des lésions tendineuses.

Rééducation à trois paramètres :

- L'étirement,
- La charge,
- La vitesse.

Protocole de Stanish

III] Protocole de renforcement Excentrique

Protocole de Stanish

Principes

- Il utilise le mode de contraction excentrique.
- Il provoque des microlésions tendineuses qui relancent secondairement la cicatrisation tendineuse.
- Il permet d'orienter les fibres tendineuses longitudinalement dans la cicatrisation.

Protocole de renforcement Excentrique

Protocole de Stanish

- A poids de corps.
- Vitesse lente, moyenne puis rapide.
- 3 séries de 10 répétitions par séance.
- Etirement statique de 15 à 30 secondes après chaque série.

La douleur permet de contrôler la progression du renforcement :

No pain, no gain ».

- Si douleur pendant les trois séries, le travail est trop important.
- La douleur ne doit apparaître qu'au cours de la dernière série.

Les entorses

ENTORSES DU GENOU

ENTORSE DU LLI (LCM)

Mécanisme traumatique en valgus forcé

EXAMEN

-douleur interne

-pas d'épanchement, mobilités normales

-Test de Lachman négatif

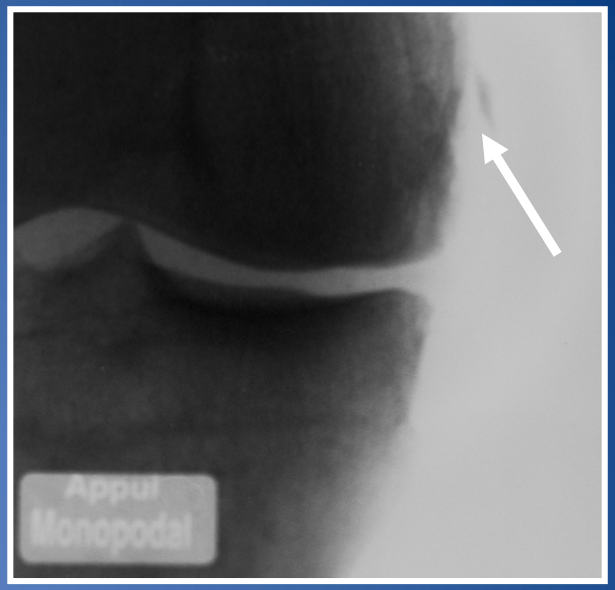
-douleur sur trajet LLI

-**laxité interne** en **flexion +++**

Xr:

-Normales++

-Arrachement osseux fémoral



Traitement:

-AINS, antalgiques

-rééducation +++ (risque de raideur)

- Immobilisation (selon le stade)

RUPTURE DU LCA

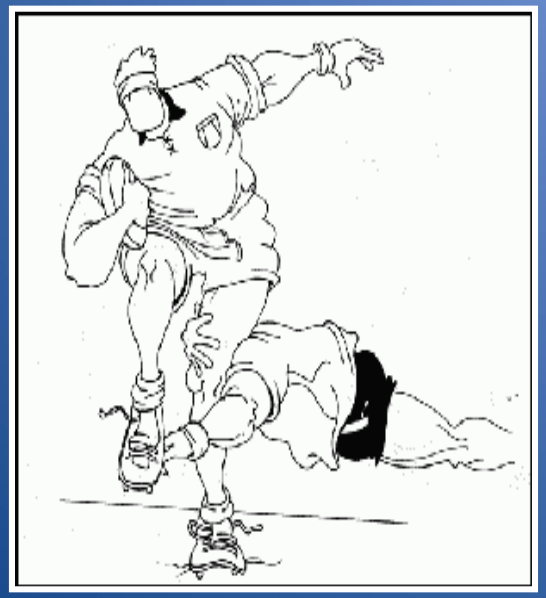
INTERROGATOIRE

Circonstances de l'accident:

-Sport pivot +/-contact (85%)

-AVP,

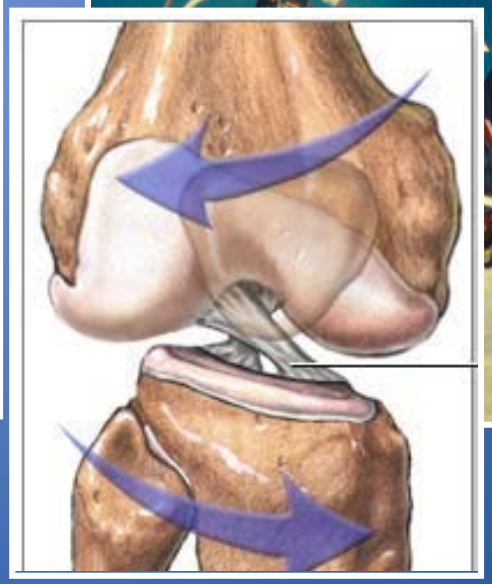
-AT



-**traumatismes appuyés:**

Valgus-flexion-rotation-externe ou varus-flexion-rotation-interne

Enroulement du LCA sur le LCP



Symptômes en phase aigue

-douleur, craquement, dérobement
-épanchement , impotence fonctionnelle et flexum

Symptômes en phase chronique:

- **instabilité +++**
- douleur en cas de lésions méniscale ou chondrale
- épanchement
- blocage

EXAMEN CLINIQUE

Choc rotulien en cas de rupture fraîche ou de lésions associées

- Amplitudes articulaires (flexum++)
- Tests méniscaux

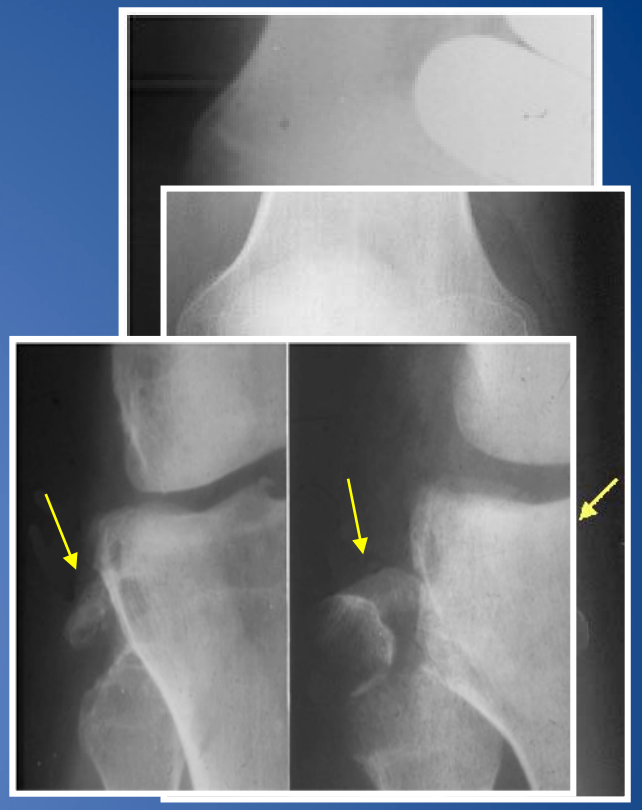
- **Test de Lachmann-Trillat++**
- **Ressaut ++**

- Tiroir antérieur direct, en RE et RI
- Laxité frontale et palpation des ligaments collatéraux

RADIOGRAPHIES

face et profil

-avulsion épine tibiale
-Fracture de Segond
-encoche condyle externe



Diagnostic différentiel:

-fracture plateau tibial
-luxation rotule

Radiographies dynamiques

-**Lachmann:** différentielle > 2mm

-**profil AMP 30° :**

différentielle > 4mm: lésion du PAPI et MI

mesure pente tibiale (> 15° +++)

IRM ++++

Et bilan lésion méniscale ou cartilagineuse

TRAITEMENT

En phase aigue

- ponction: hémarthrose
- antalgiques, AINS
- immobilisation et kinésithérapie

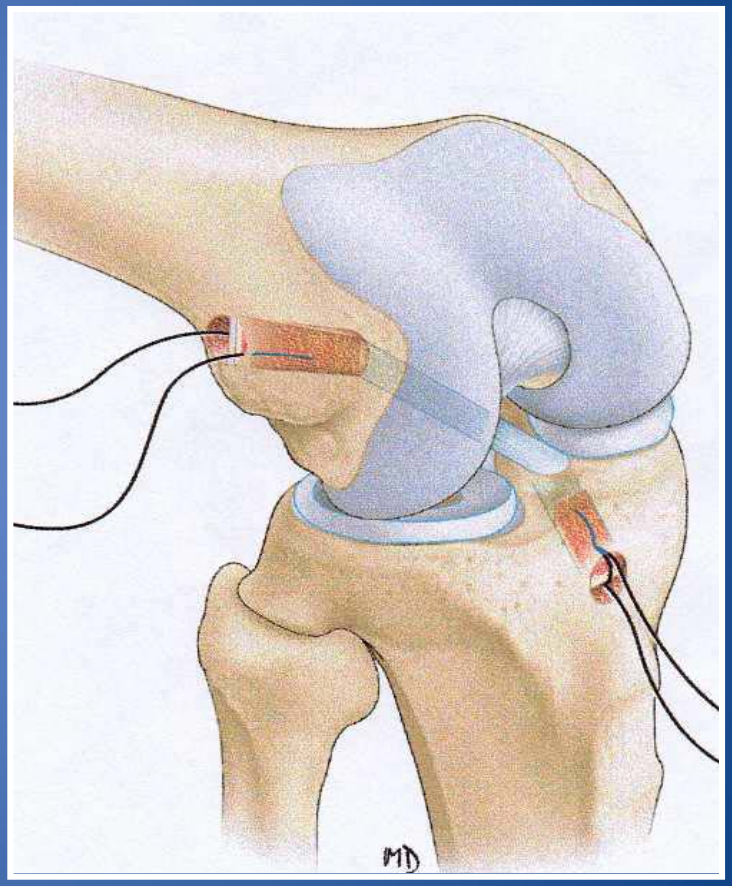
En phase chronique

- **<u>Indications:</u>**

chirurgie si - instable
- jeune
-sportif

- **<u>Greffe du LCA</u>**

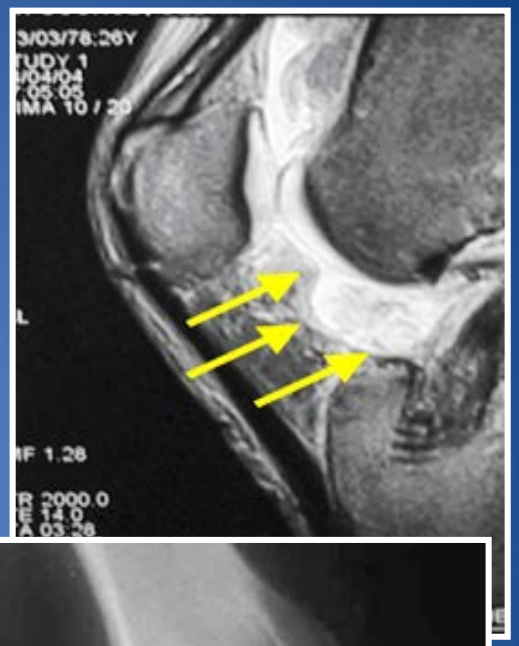
- **<u>Reprise sportive</u>** à 6-8 mois (pivot)



COMPLICATIONS

»cyclop syndrom»

nodule fibreux au pied du LCA responsable de flexum+/-épanchements



Rotule basse

douleurs + limitation flexion

EVOLUTION EN L'ABSENCE DE TRAITEMENT

-instabilité et lésion des freins secondaires

-arthrose (20-30 ans)

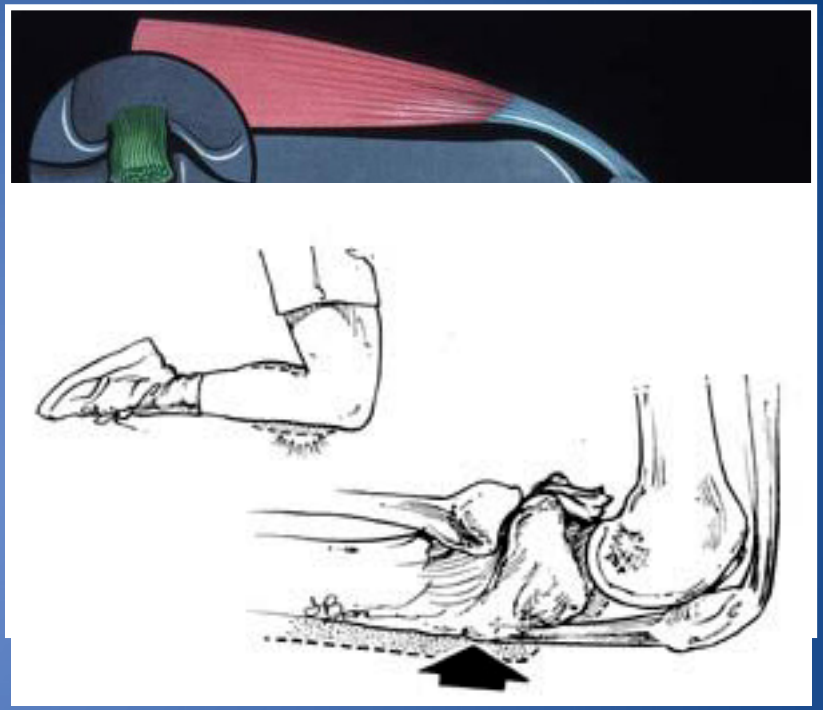
RUPTURE DU LCP

INTERROGATOIRE

Mécanisme initial:

-AVP (syndrome du tableau de bord++)

-sport: chute sur la tubérosité tibiale antérieure



SF au stade chronique

-appréhension dans les escaliers
-instabilité
-douleurs antérieures

EXAMEN CLINIQUE

- Ecchymose sur la tubérosité tibiale antérieure
- **Avalement de la TTA**
- **Tiroir postérieur (TP)**
- Test de Lachman retrouvant un arrêt dur retardé sans ressaut

BILAN RADIOGRAPHIQUE:

standard

-**face, profil:** recherche d'une avulsion osseuse sur la surface retrospinale

-Bartlett: avec mesure de la laxité différentielle++

IRM

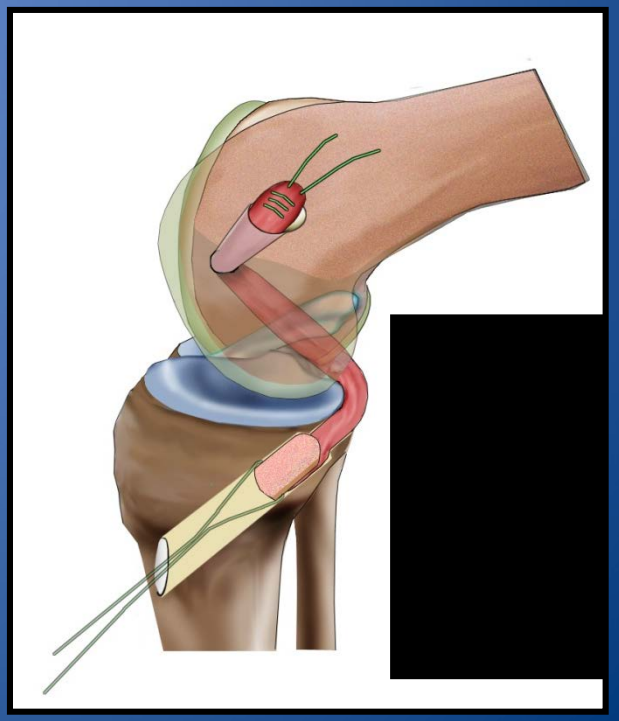
Bilan des lésions associées et confirmation diagnostique

TRAITEMENT

- Bonne tolérance clinique en l'absence de traitement si non sportif

- **Ostéosynthèse** d'une avulsion osseuse

- **Greffe du LCP** (Tendon Rotulien, Tendon Quadricipital, Ischio-Jambiers)



Entorse de cheville

Entorse de cheville

Diagnostic clinique

- Torsion cheville : mécanisme en varus et flexion plantaire le plus souvent
- Complexe ligamentaire externe +++
- Association sous talienne ++
- Association tibio-fibulaire inférieure+
- Association ligamentaire interne +/-
- 3 stades selon lésions ligamentaires

Séquence d'un trauma en varus-équin (inversion)

1. Fx postéro-médial du talo-calcanéen
2. LTFA
3. Fx antéro-latéral du talo-calcanéen
4. LCF
5. LTFP

KATO 1995

Diagnostic clinique

- Les reliefs et points osseux à palper (systématique)

- Les tests cliniques : - tiroir et ballottement astragalien (film)

  - testing des péroniers latéraux (film)

Examen clinique

DIAGNOSTIC

Examen clinique: luxation des fibulaires

Les stades de l'entorse

- Stade 1 : distension du LTFA (fx antérieur)
  pas de laxité clinique
  traitement fonctionnel

- Stade 2 : rupture du LTFA + lésion du LCF
  Laxité clinique (radios systématiques +/- écho)
  svt atteinte sous talienne
  tt orthopédique

- Stade 3 : rupture large du complexe externe (LTFA+LCF+/- LTFP) radios systématiques+ traitement orthopédique ou chirurgical

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Examens complémentaires

- Selon examen clinique ++ (critique des critères d'Ottawa)
- Radios : F + P +RI 20° +/- déroulé de pied
- Echographie +++

CRITERES OTTAWA

-Âge >55 ans
-Marche impossible
-Douleur palpation Mi ou Me
-Douleur palpation base M5

Examens complémentaires

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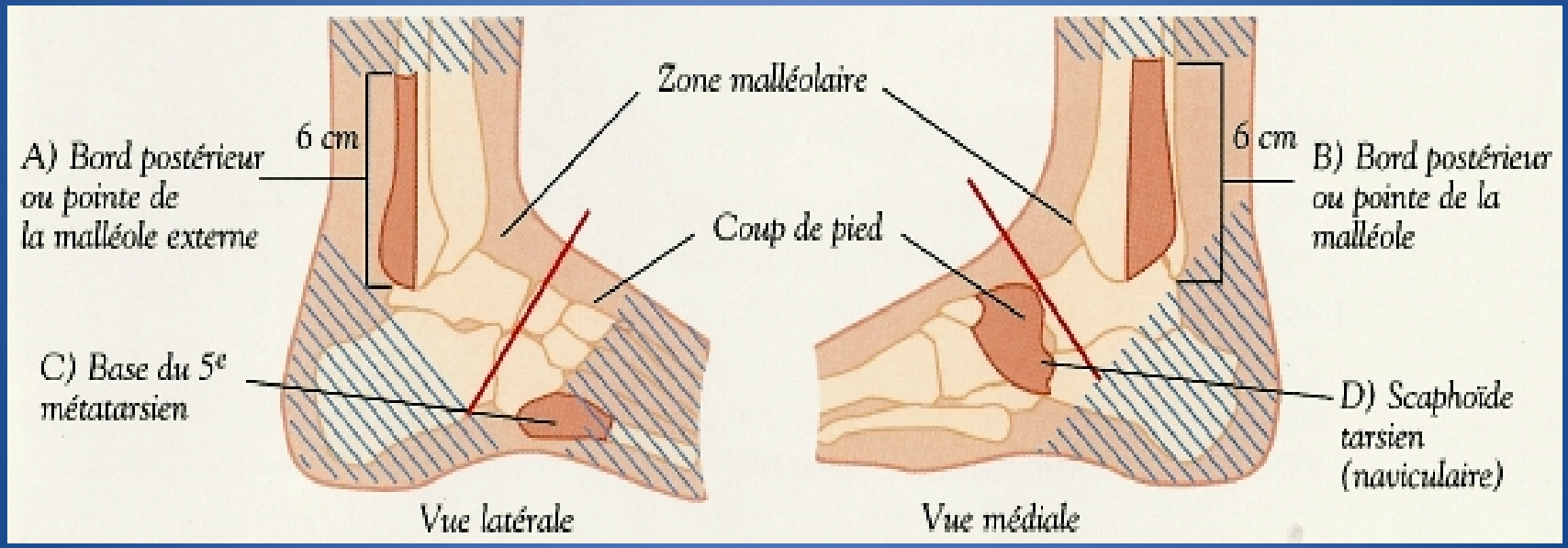
Critères d'Ottawa



Intérêt des radios

LUXATION

COUDE

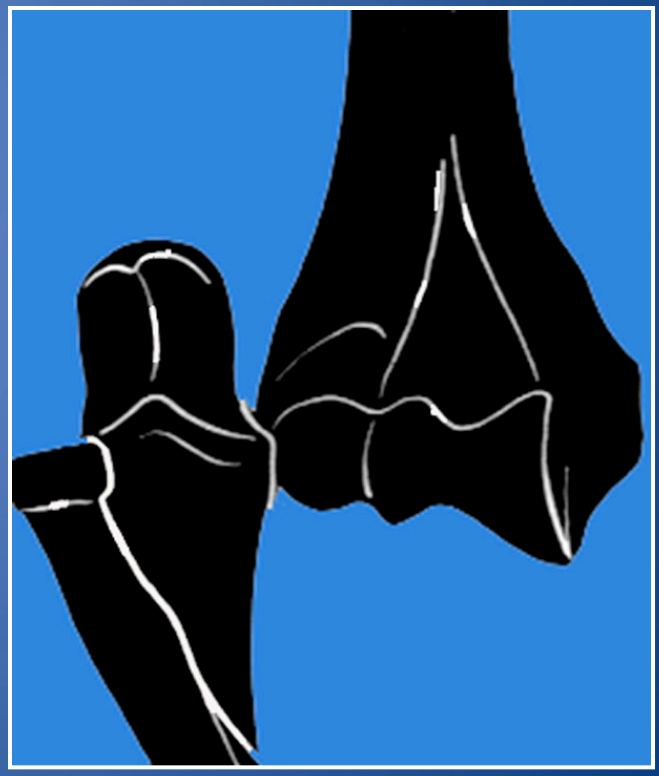
LUXATION DE COUDE

- Plusieurs formes anatomiques:
- Luxation postérieure ++ (la plus fréquente), luxation postéro-externe
- luxation latérale pure (exceptionnelle)

LUXATION DE COUDE
luxation postéro-externe

Chute sur la main (judo ++)

Rupture des ligaments internes



LUXATION DE COUDE
luxation postéro-externe

- Coude volumineux
- Élargissement antéro-postérieur
- L'avant bras paraît plus court
- L'olécrane fait saillie en arrière
- La palette humérale est en avant
- Attitude en flexion et

LUXATION DE COUDE
luxation postéro-externe

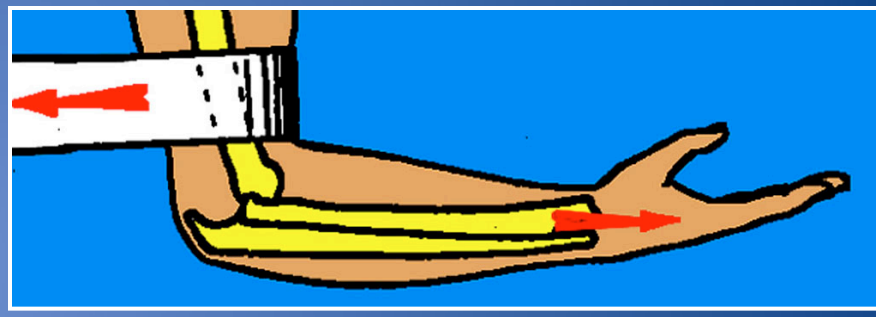
Lésions associées :

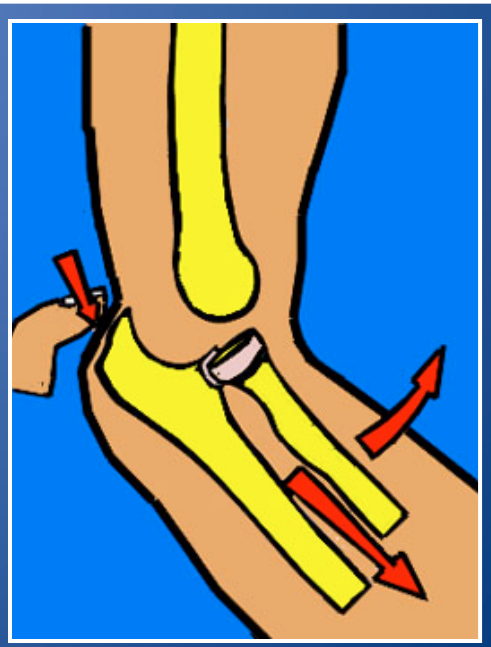
- vasculaire (section artère humérale : pouls, chaleur)
- nerveuse (nerf médian ++)
- osseuse (fracture de l'apophyse coronoide, olécrâne, épicondyle, épitrochlée)

LUXATION DE COUDE
luxation postérieure

- Réduction : Traction sur

l'avant-bras
en flexion du coude
contre-extension sur le bras
± pression sur l'olécrâne





- Immobilisation : gouttière ou plâtre brachio-antebrachio-palmaire (BABP)
- Rx de contrôle (profil +++) : réduction complète

LUXATION DE COUDE
Immobilisation

- Durée d'immobilisation selon le testing post-réduction : testing en valgus et varus,

  Si laxité ou instabilité ++ entre 0 et 30° de flexion : 3 semaines de BABP
- Si bonne stabilité : 10 jours de BABP puis rééducation

LUXATION DE COUDE

- Rééducation très douce, pour récupérer une mobilité normale

- Pas de massage : pour éviter le développement d'ostéome du brachial antérieur

  raideur et ossification visible et palpable

- Les luxations récidivantes sont rares

LUXATION DE COUDE indication chirurgicale en urgence

- Fracture déplacée de l'apophyse coronoide
- Fracture de l'épitrochlée
- Fracture de l'épicondyle

ROTULE

LUXATION DE ROTULE

LUXATION DE ROTULE

- Diagnostic clinique :

Évident si encore luxé

Parfois inaperçu après réduction

- Diagnostic erroné d'entorse du genou (LCA):

Gros genou + hémarthrose

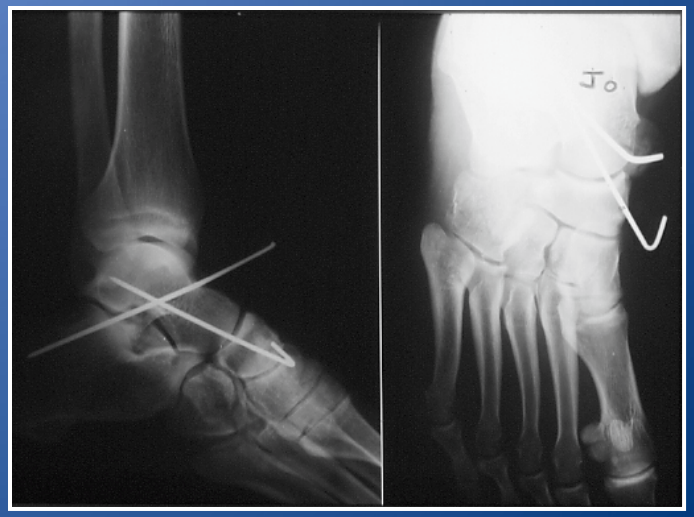
Mais : douleur du versant interne de la rotule, rotule très mobile

LUXATION DE ROTULE

- Radiographie (face + profil + vue axiale): recherche de fracture ostéochondrale, signes d'instabilité rotulienne objective (IRO) tels qu'une dysplasie de trochlée ou une rotule haute
- Immobilisation : attelle en extension à la marche et en flexion au repos + rééducation immédiate (8 jours)

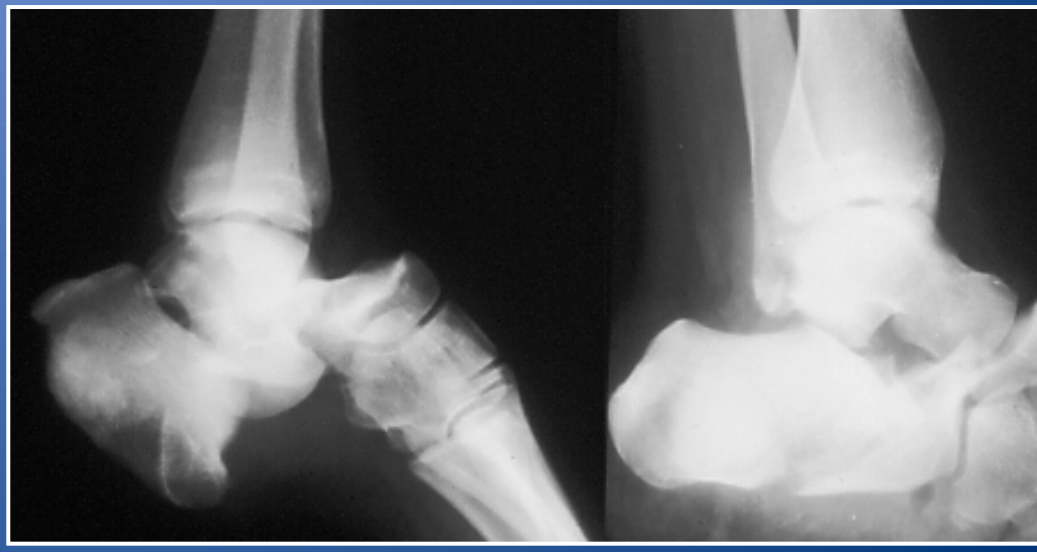
LUXATION SOUS-ASTRAGALIENNE

- Réduction par traction dans l'axe, rapide +++ car œdème précoce
- Difficile sans AG : instable +++
- Immobilisation dans une botte platrée +/- fixation chirurgicale - Pronostic réservé : raideur secondaire



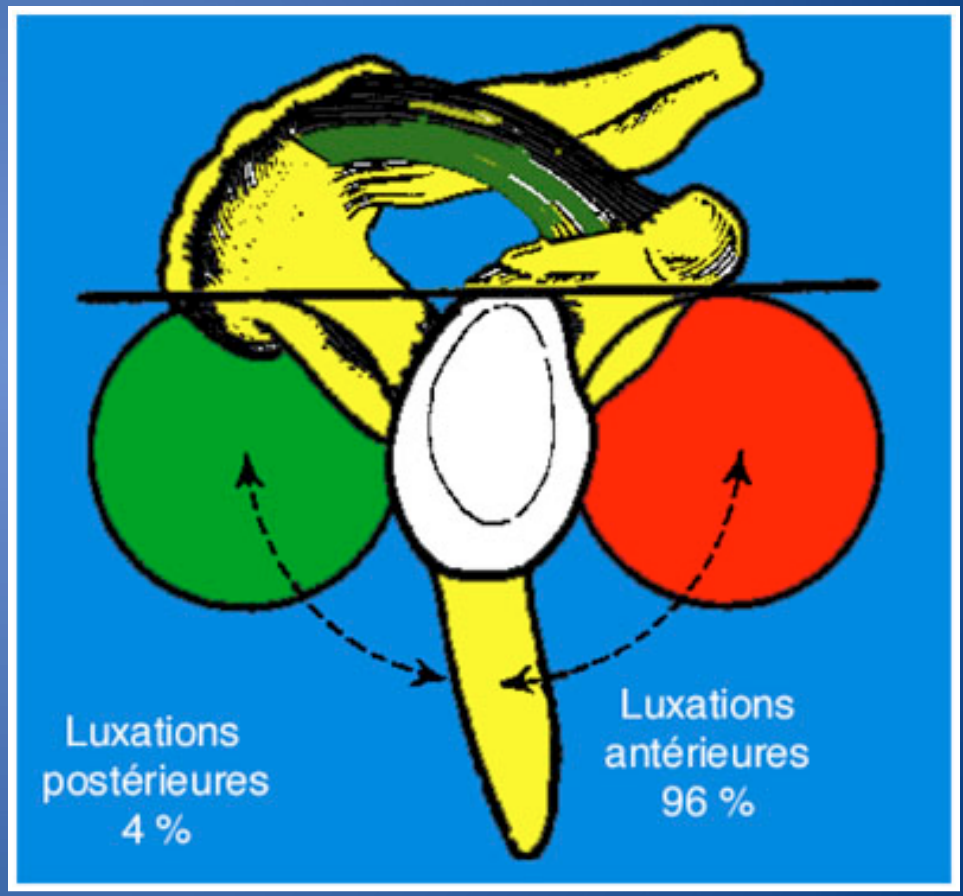
Luxation de l’arrière-pied

- Luxation du médiotarse (Chopart)

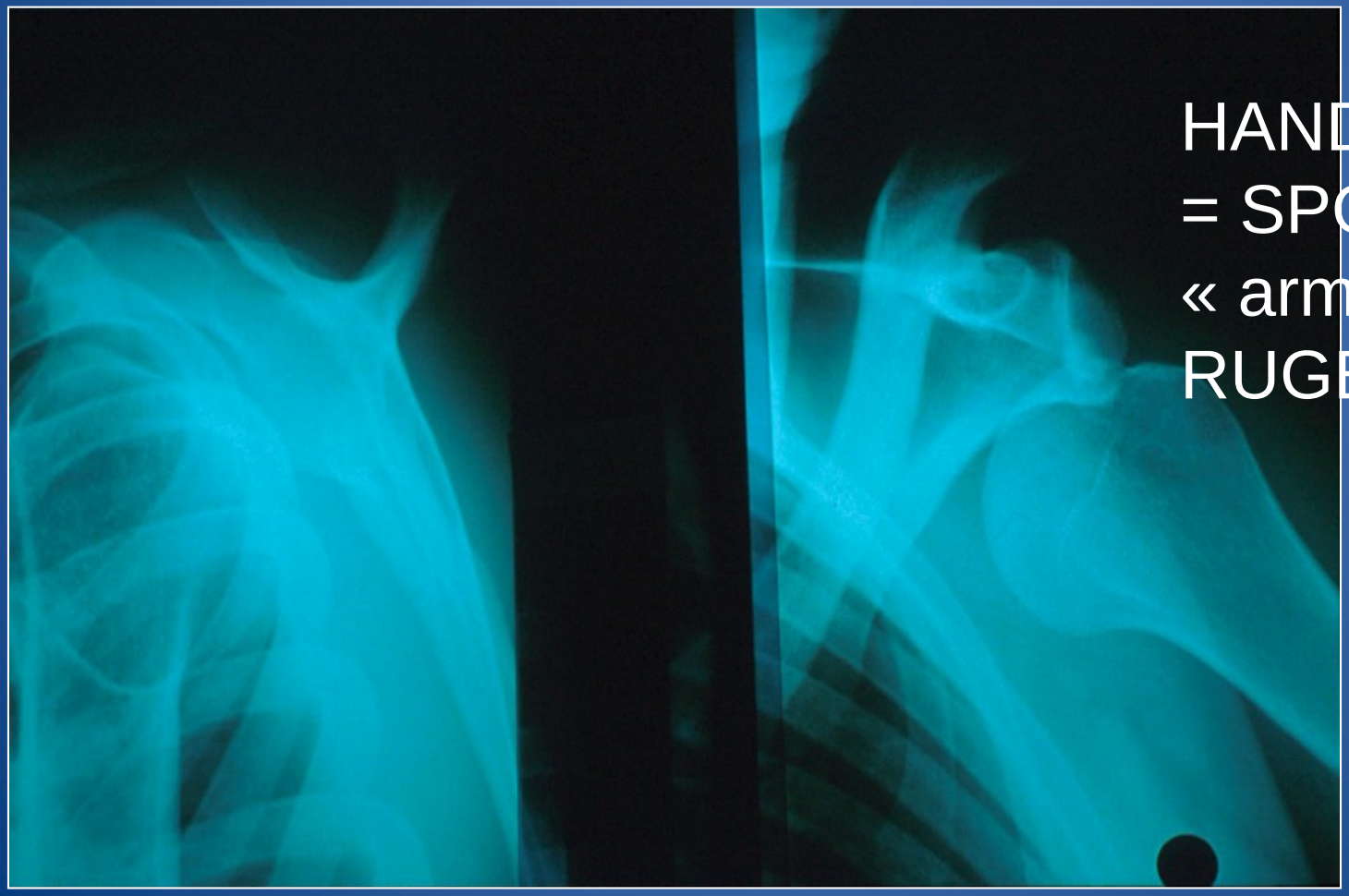


EPAULE

- Luxation antéro-interne
- Luxation inférieure (erecta)
- Luxation postérieure



LUXATION ANTERO-INTERNE



HANDBALL+++
= SPORT EN
« armé contré »
RUGBY,

LUXATION ANTERO-INTERNE
Réduction

- Testing neurologique (avant réduction)
- Plusieurs manœuvres de réduction
- Quelle que soit la manœuvre : toujours en douceur (risque de fracture de glène, trochiter, …)

Traitement immédiat

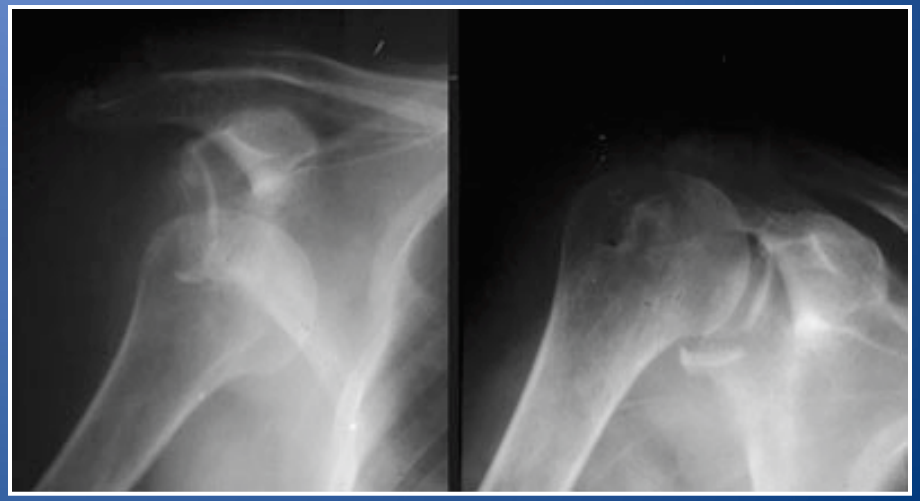
- Immobilisation en Rotation Interne
- Vérifier la sensibilité (plexus brachial)
- Après réduction : tjs faire une Rx de contrôle +++

Analyse des lésions osseuses

Traitement immédiat
analyse de la Rx

- Congruence glèno-humérale
- Fracture de glène (41%):

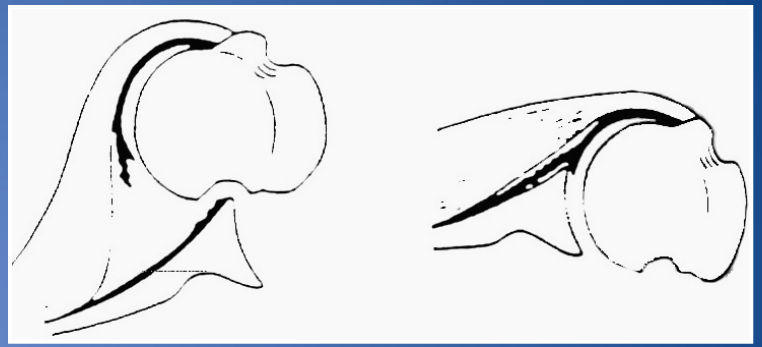
  - fracture du bord antéro-inférieur (compression ou arrachement du LGHI = ligament glèno-huméral inférieur)



  - éculement

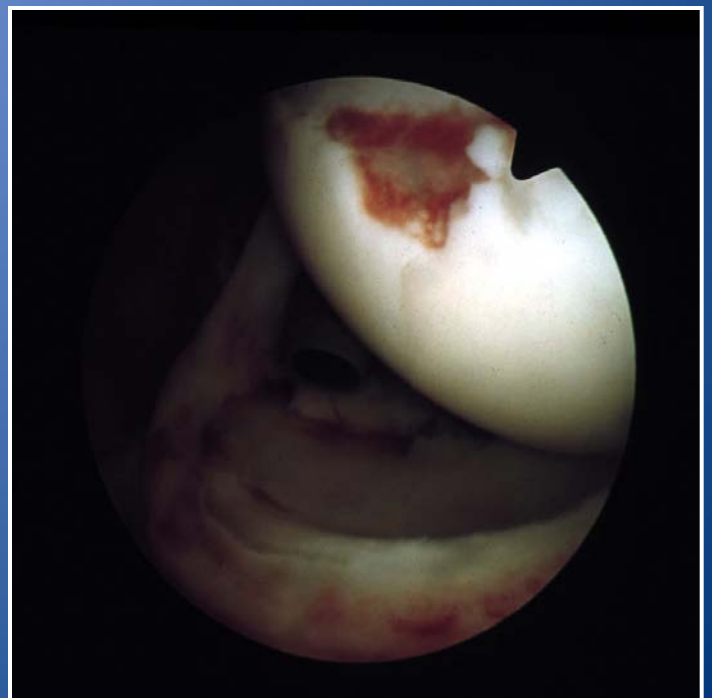
Traitement immédiat analyse de la Rx

- Fracture de glène :si fracture supérieure à 30% de la surface : indication chirurgicale



- encoche humérale (66%)

(Malgaigne = Hill-Sachs)



Traitement immédiat analyse de la Rx

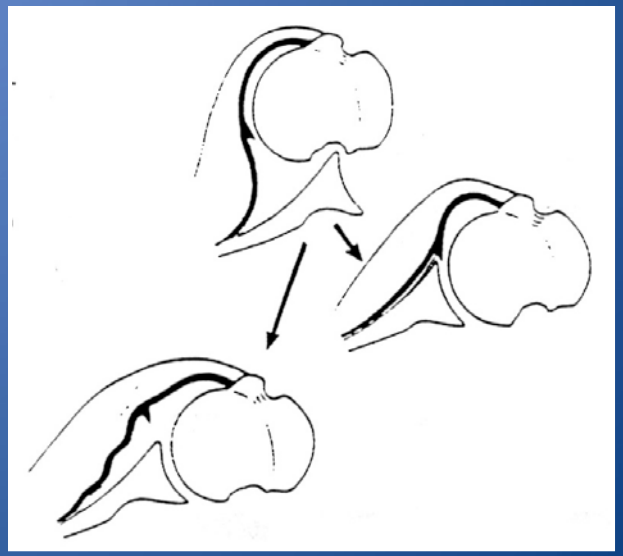
- fracture du trochiter

- fracture de la coracoïde

Lésions anatomiques

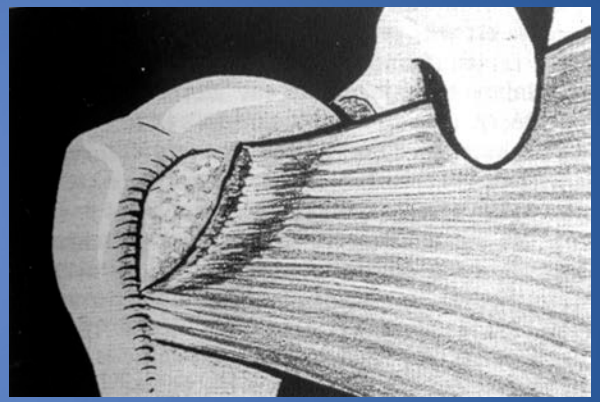
- Lésions osseuses
- Lésions ligamentaires

  - lésion de Bankart (94%) : désinsertion du bourrelet et du LGHI



Lésions tendineuses de la coiffe des rotateurs

- Rupture du Sous-Scapulaire (SS) avec luxation TLB



- Lésion du Sus-Epineux

(SE), Sous-epineux

Conduite à tenir après immobilisation

- Traitement chirurgical en urgence si : fracture déplacée du trochiter (réinsertion chirurgicale), fracture de plus de 30% et déplacée de la glène)
- Durée d'immobilisation : en fonction de l'âge :

- Moins de 30 ans : risque de récidive +++
- Plus de 40 ans : risque de rupture de coiffe associée +++

Facteur de récidive

- Age +++

Environ si < 20 ans : 50% de risque de récidive dans les 2 ans

- Importance du traumatisme
- Lésions anatomiques
- Pratique sportive

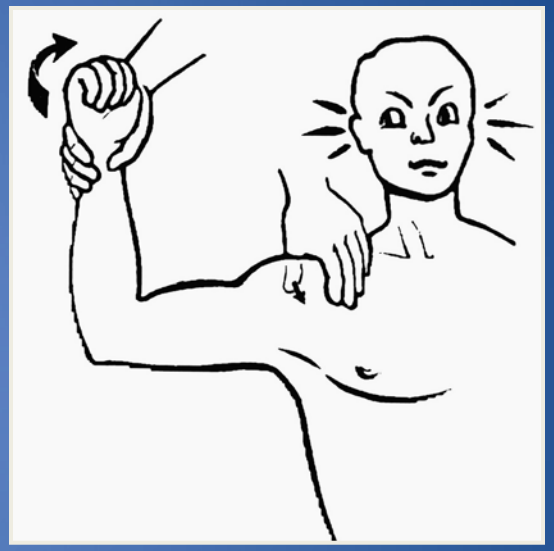
Pas de preuv

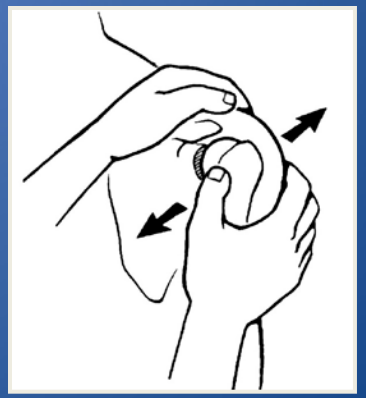
DUREE D'IMMOBILISATION

- Moins de 20 ans : 6 semaines
- Entre 20 et 35- 40 ans : 4 semaines
- Plus de 40 ans : 15 jours

Instabilité antérieure chronique

- Examen clinique (comparatif)
- test de l'appréhension ou signe de l'armé, fulcrum test
- Tiroir antérieur
- Sulcus test (hyperlaxité inférieure)
- Relocation test (test de recentrage)





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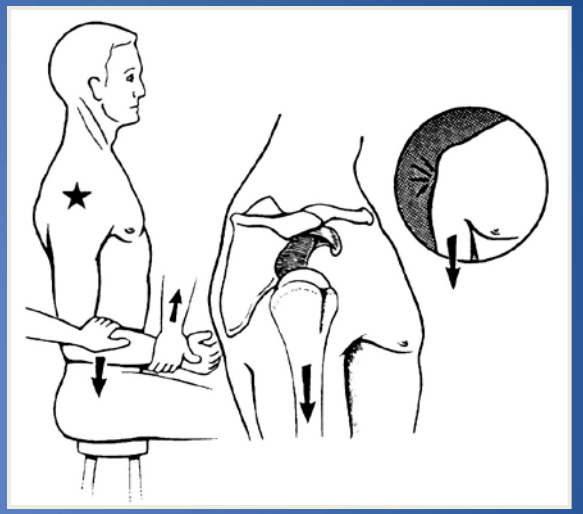

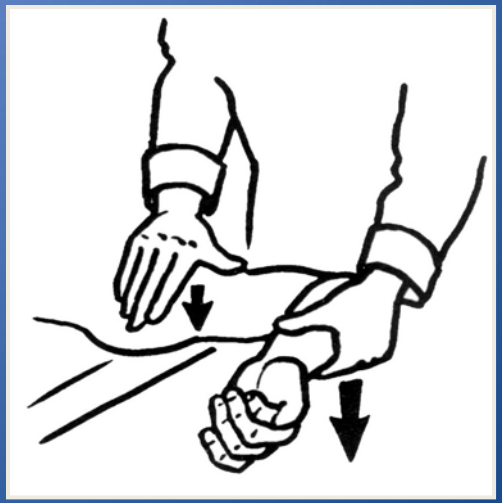

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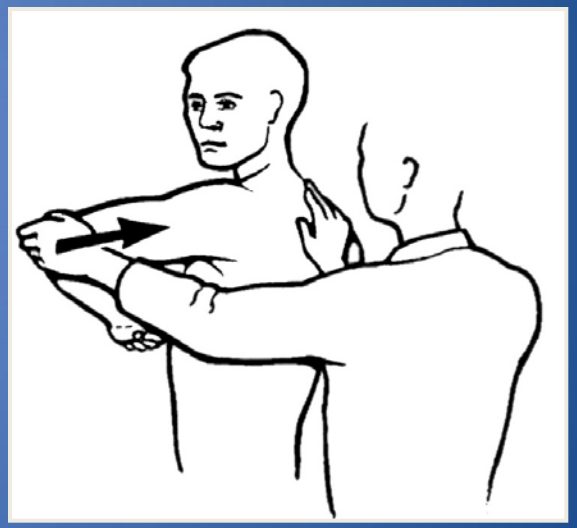
  - Sulcus test (hyperlaxité inférieure)
  - Relocation test (test de recentrage)
- Test d'appréhension postérieure



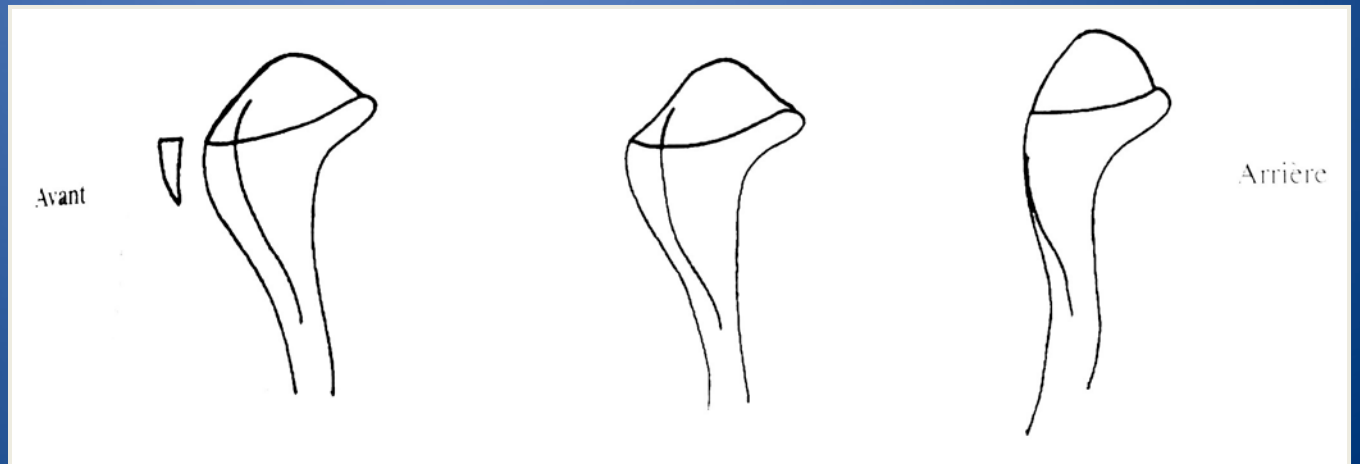
Instabilité antérieure chronique bilan radiologique

- Radiographie de face (3 rotations) :

Fracture glène, encoche

- Radiographie de profil : incidence de bernageau

Analyse de la glène +++ (fracture, aspect en pan coupé)



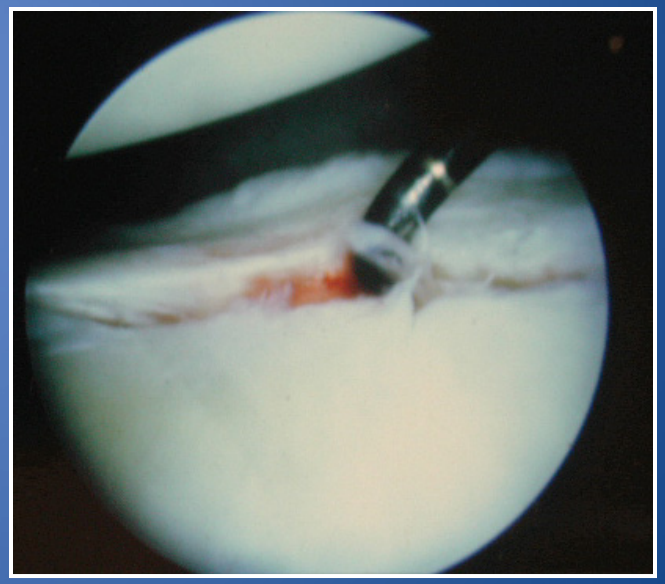
Instabilité antérieure chronique

- Radiographie
  - face 3 rotations
  - Profil de Bernageau : analyse de la glène
- Arthroscanner : non systématique : si doute diagnostique

  Analyse lésion du bourrelet, bilan radio négatif

Traitement chirurgical

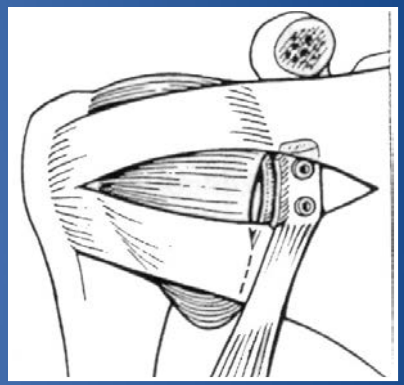
- Butée antérieure
- Traitement arthroscopique : Bankart sous arthro
- Capsulorraphie

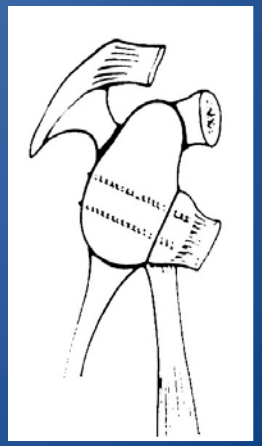


Traitement chirurgical

- Butée antérieure de la coracoïde

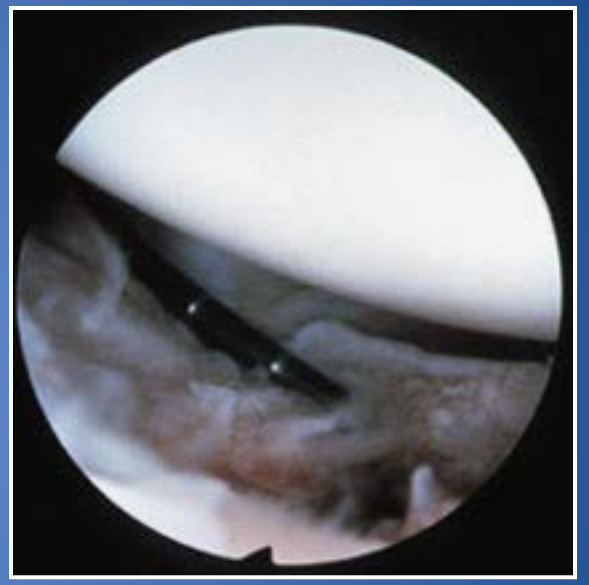
  (intervention de Latarjet-Patte)

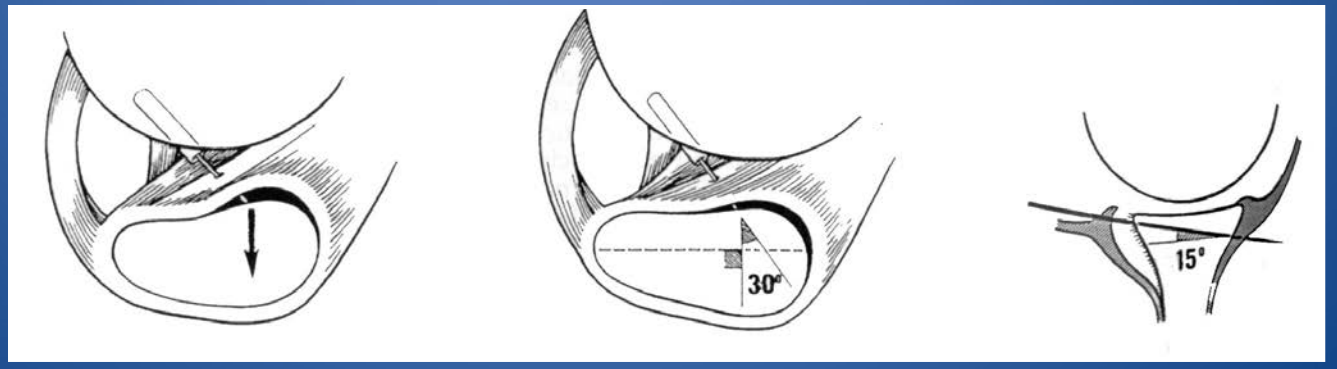




Traitement chirurgical

- Traitement arthroscopique : Bankart sous arthro





Les lésions musculaires

Lésion du grand pectoral

INSPECTION
Examen torse nu :

- Hématome
- Interrogatoire

Clinique

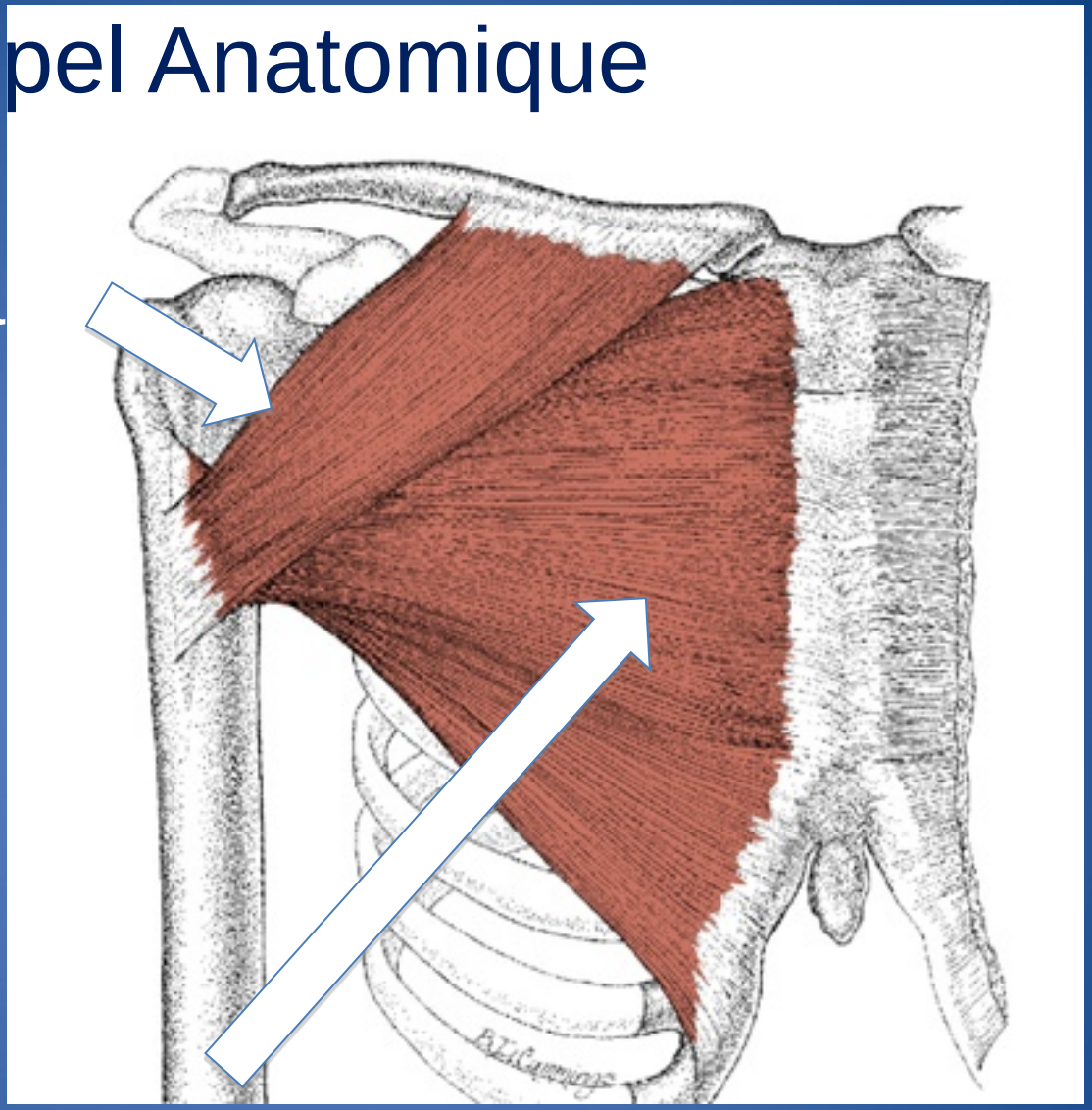
- Douleurs brutale
- Sensation de « crac »
- Torse et épaule
- Œdème puis ecchymose
- Coup de hache: dépression
- Palpation d'une déhiscence

Faiblesse en contraction contrariée

Développé couché impossible

Rappel Anatomique

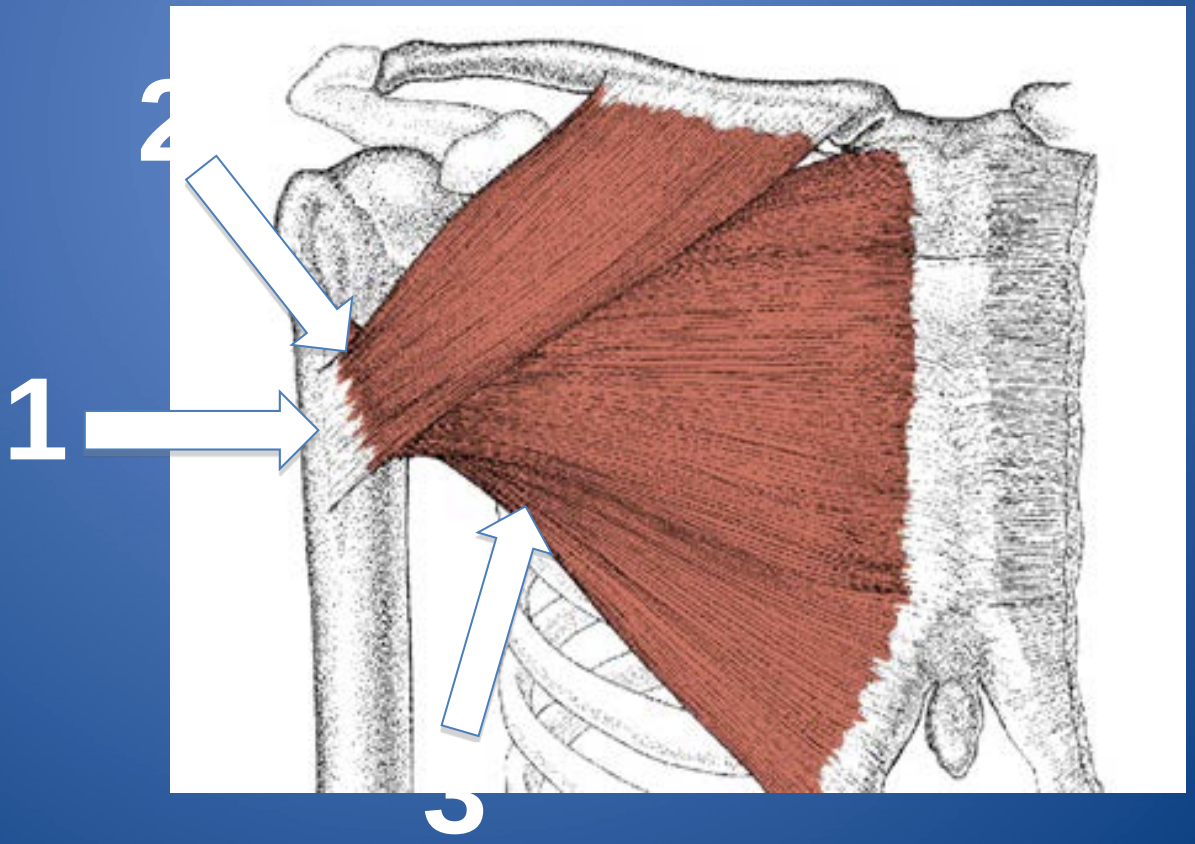
Chef Clavicula



Chef Sternal

Classification

- Type 1: Avulsion insertion osseuse du tendon
- Type 2: Rupture jonction tendino-musculaire
- Type 3: Rupture du corps musculaire



Circonstances sportives

- Muscu: développé couché bench press
- Rugby (mêlée ou maul écroulé, abduction rétropulsion forcée)
- Lutte
- Foot américain (Blocking)

Examen clinique

Ecchymose

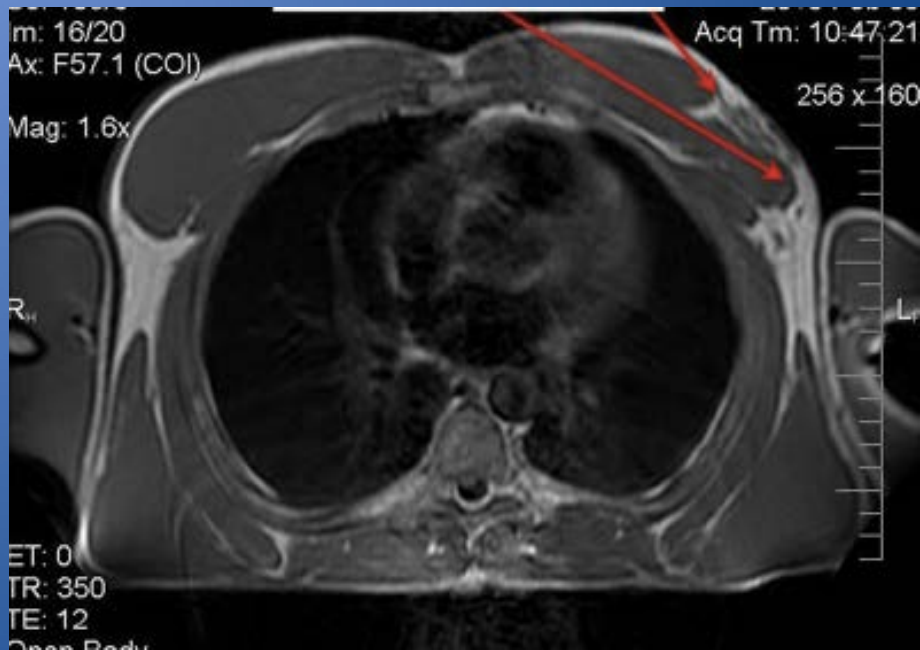
Rétraction

- Coup de hache

- Contraction contrariée

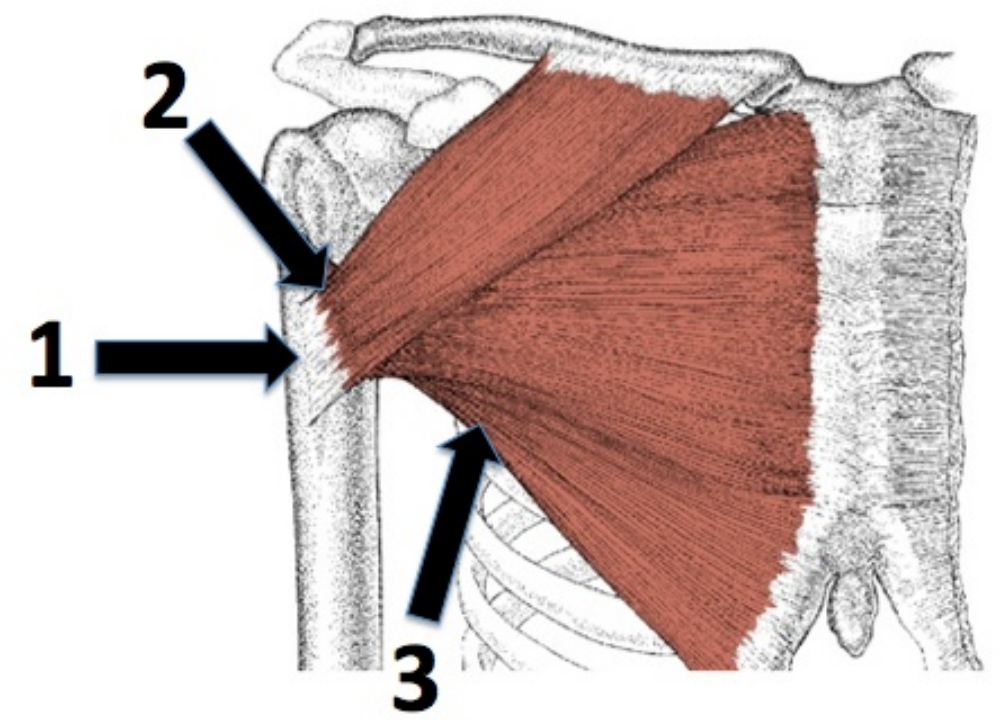
Diagnostic

- Radio
  - Avulsion osseuse rare
  - Asymétrie ombre grand pec
  - Echographie +++
- IRM++
  - Hypersignal T2
  - Avulsion et rétraction
  - Siège de la lésion



Indications

- Stade 1 et 2: Réparation chirurgicale
- Stade 3: Traitement médical de déchirure musculaire

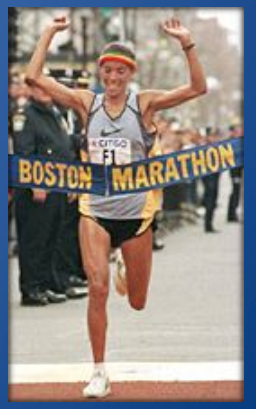


Prévention

- Echauffement
- Étirement,
- Contrôle du mouvement en développé-couché
- Contrôle de la charge
- Ne pas trop écarter les mains
- Ne pas descendre la barre trop bas

Background female athlete

- Before the 1970s, girls were discouraged from participating in sports
- Not until 1950s that distances of greater than 200 meters for women introduced into Olympic games
- First women's Olympic marathon in 1984



The 11+

- Randomized controlled trial
  - 1892 girls aged 14-16 yrs
  - 2007 football season

Soligard et al. BMJ 337 (2486): 449, 2008

Introduction

- Millions of girls participate in organized sports on all levels
- Number of female soccer player is increasing +++
- Professional teams of women
  - Basketball
  - Football

What do we know (already) ?

- Information on professional female players is limited.
- Studies on amateur and youth females have identified injury rates :

  1.5 -7 in pratice (per 1000 players hours)

  9.1-24 in game
- 4 times higher risk in acl injury than males ….

What do we know (already) ?

- 1991 : study in elite female soccer players (n=41)
  80% sustained a injury mostly at the lower limb (88%)
  50% of the injury : knee or ankle.
- Major injuries (N = 12) : knee ligament or meniscal tears (58%)
- Overuse injuries : 28% of all injuries

- In 91, conclusion was :
  female elite soccer players sustain a high incidence of injury ….

Am J Sports Med1991 Jul-Aug;19(4)
*Engström B et al, **Soccer injuries among elite female players.***

What do we know ?
Which injury ?

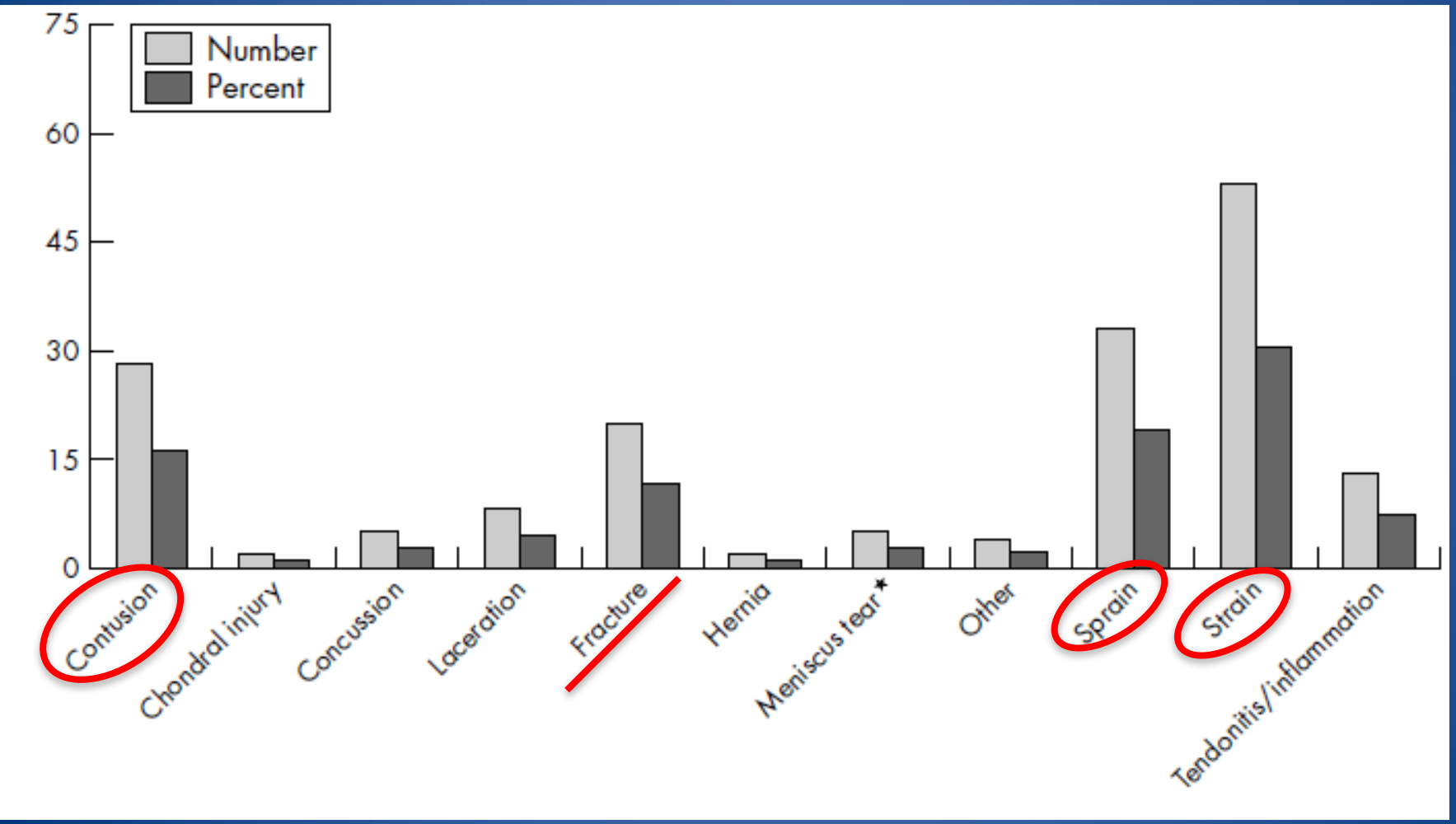
- Data from WUSA (Women's united soccer association)

Injuries in women's professional soccer

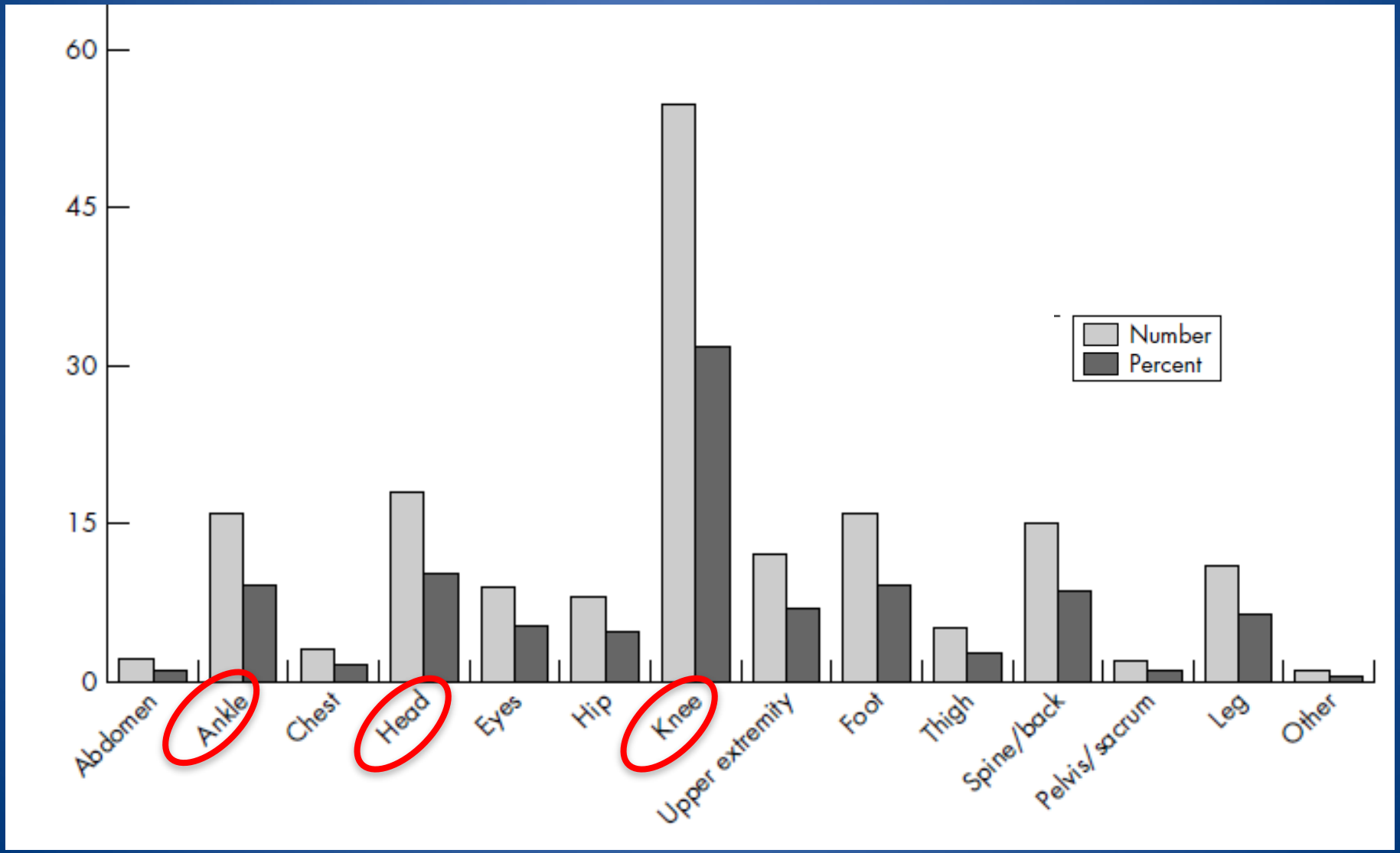
E Giza, K Mithöfer, L Farrell, B Zarins, T Gill

Br J Sports Med 2005;39:212–216.

Epidemiology , which injury ?

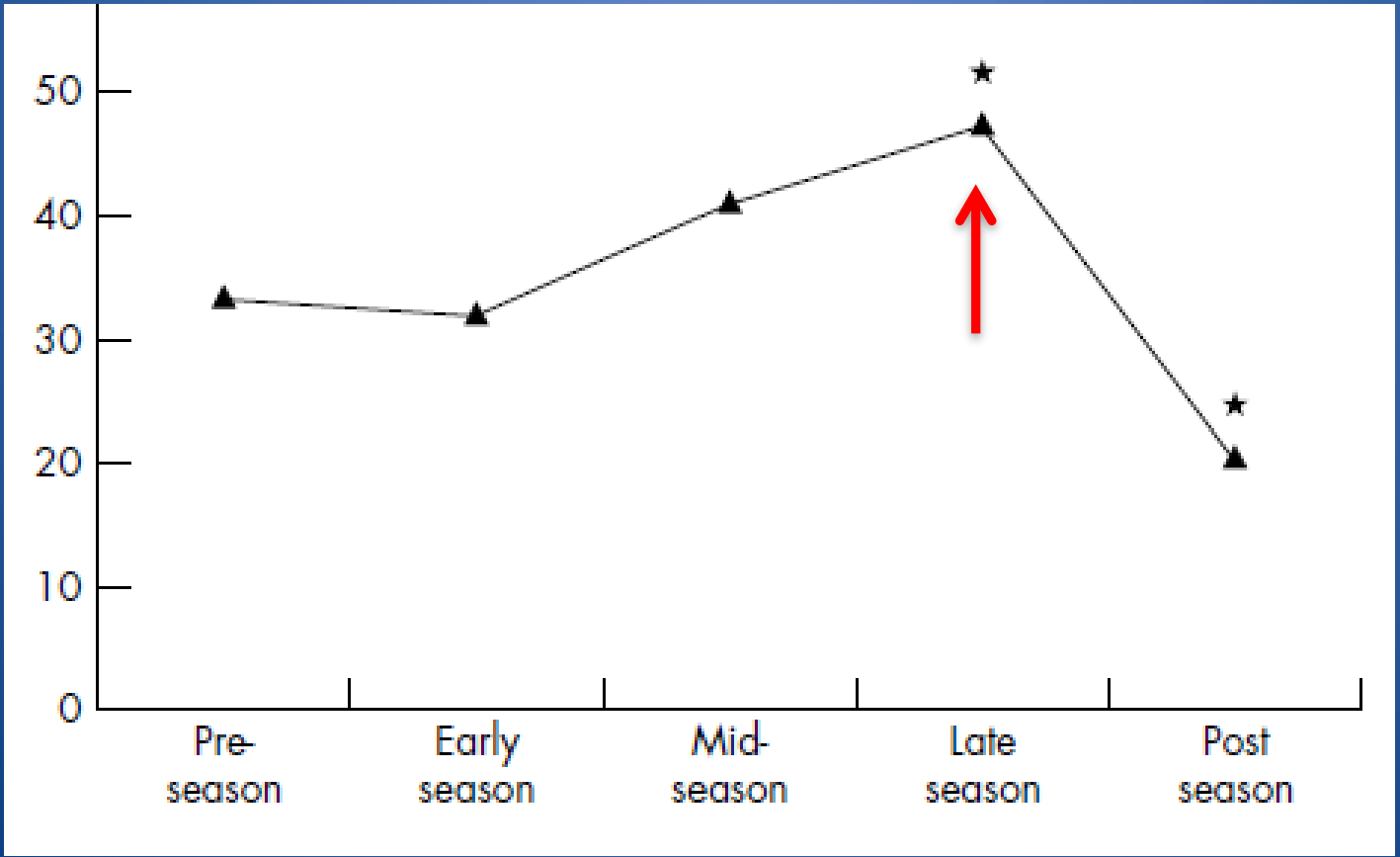


Location of injury?



Time of injury ?

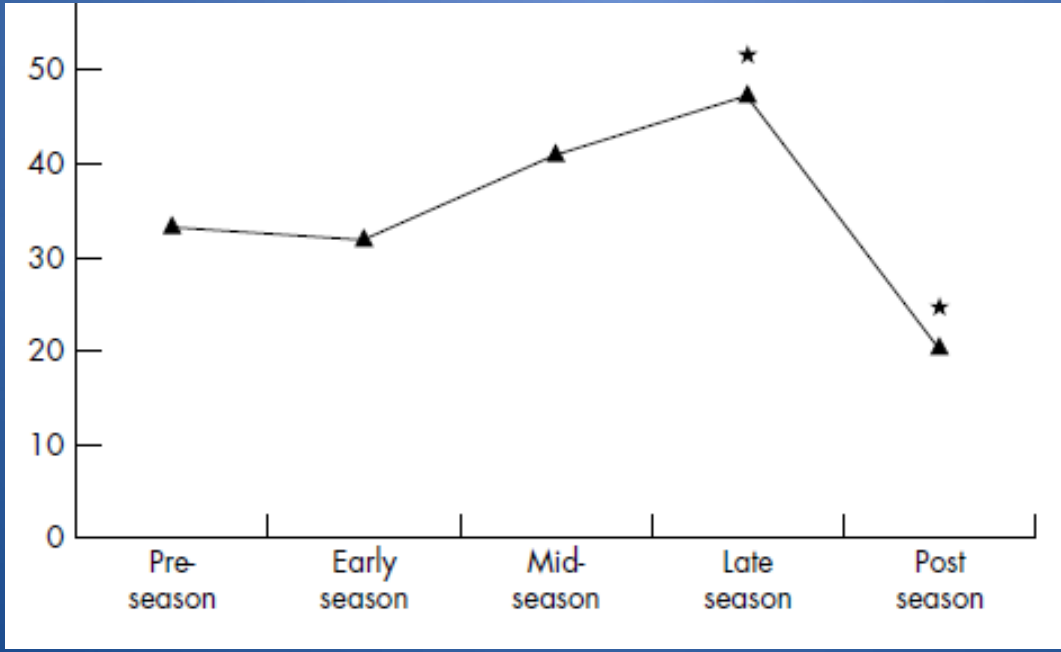
- Relationship of time of season with injury occurence



Time of injury ?

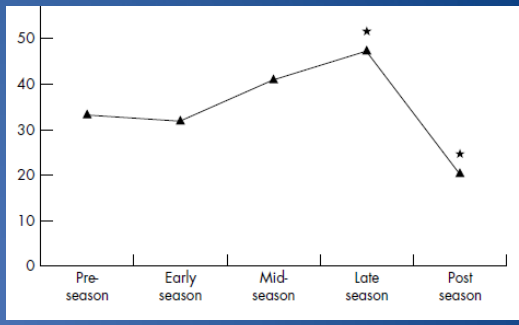
Increase in injuries during the end of the seasons ?

- deconditionning
- increase in play intensity (tournament, play-off)



Women's soccer injuries

Data from the NCAA (National Collegiate Athletic Association) 2012



- The overall rate of injuries 7.3 per 1,000 athlete exposures (games and practices combined)
- Surgery : only performed for 2.4% of the women's soccer injuries.
- greater injury rate (9.1 per 1,000 athlete) : preseason

data occurred in the NCAA between the 2004/05 and 2008/09 seasons.

Women's soccer injuries

Data from the NCAA2012

- Higher rate of ACL injuries but … only 0.7% of all women's soccer injuries > men
- Much higher rate of concussions men's soccer at the NCAA level

girls' soccer is one of the top sports for concussion incidence In NCAA women's soccer

Women's soccer injuries
Data from the NCAA2012

- high rate of concussions
- heading the balls the sixth most common activity at the time of injury
- female athletes should learn proper heading and landing techniques …..

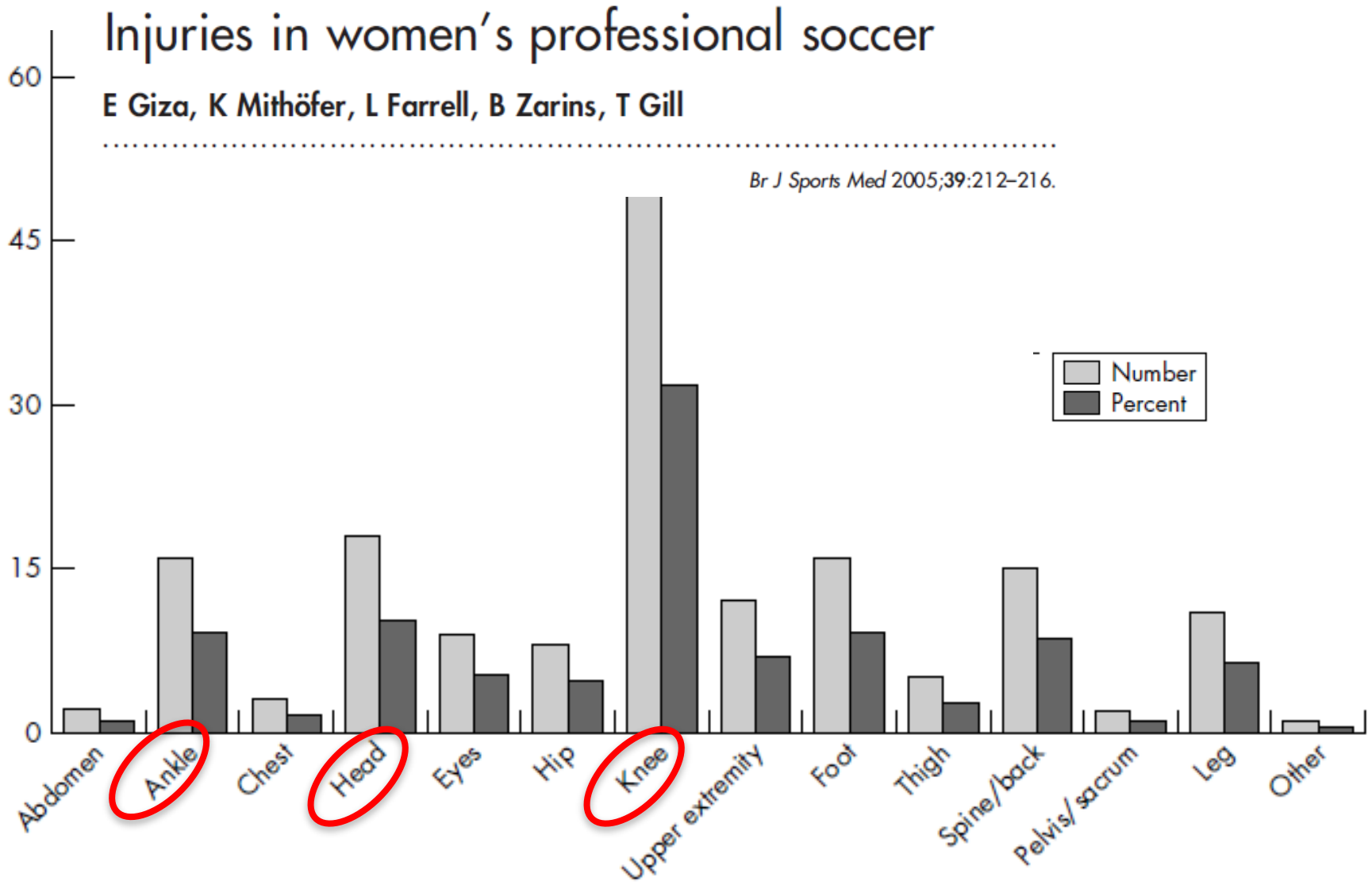
  avoid head-to-head contact or contact with the head to the ground or goalpost

  minimize the risk for traumatic brain injury

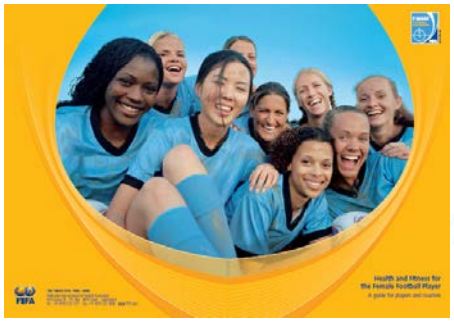
Women's soccer injuries
Data from the NCAA2012

Injury Percentage Breakdown

- Concussions: 9.2%
- Head, face and neck: 13.3%
- Upper limb: 5.6%
- Torso and pelvis: 12.3%
- Lower limb: **65.3%**


Injuries in women's professional soccer
E Giza, K Mithöfer, L Farrell, B Zarins, T Gill
Br J Sports Med 2005;39:212–216.
60
45
30
15
0
Number
Percent
Abdomen
Ankle
Chest
Head
Eyes
Hip
Knee
Upper extremity
Foot
Thigh
Spine/back
Pelvis/sacrum
Leg
Other

Concussions (9.2%)



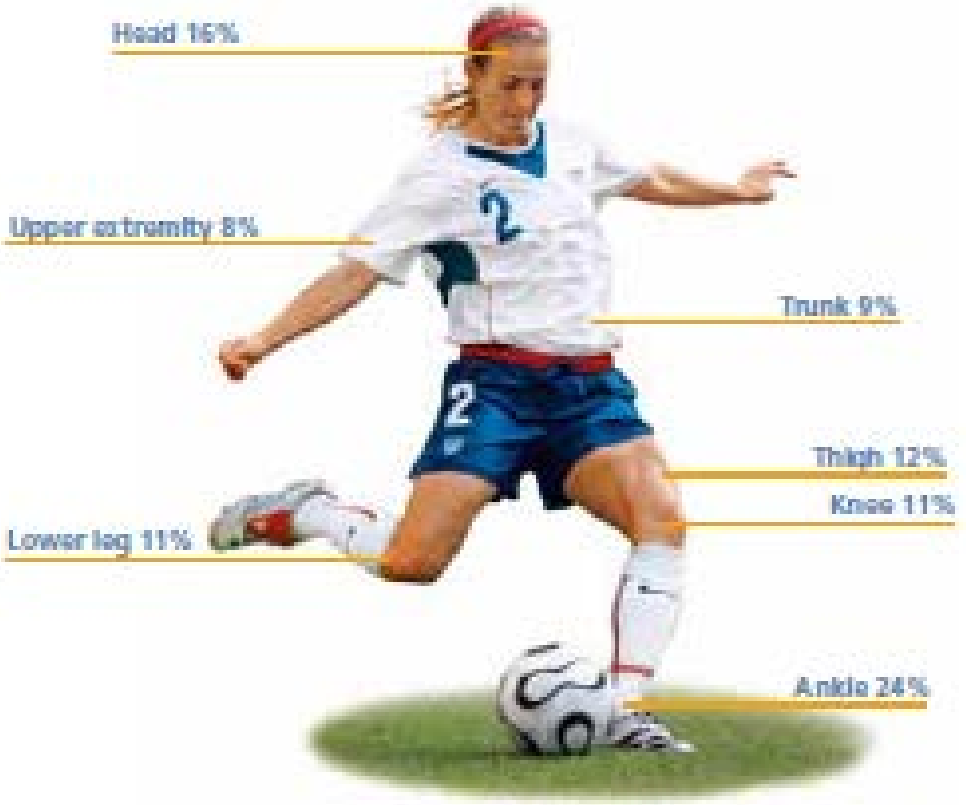
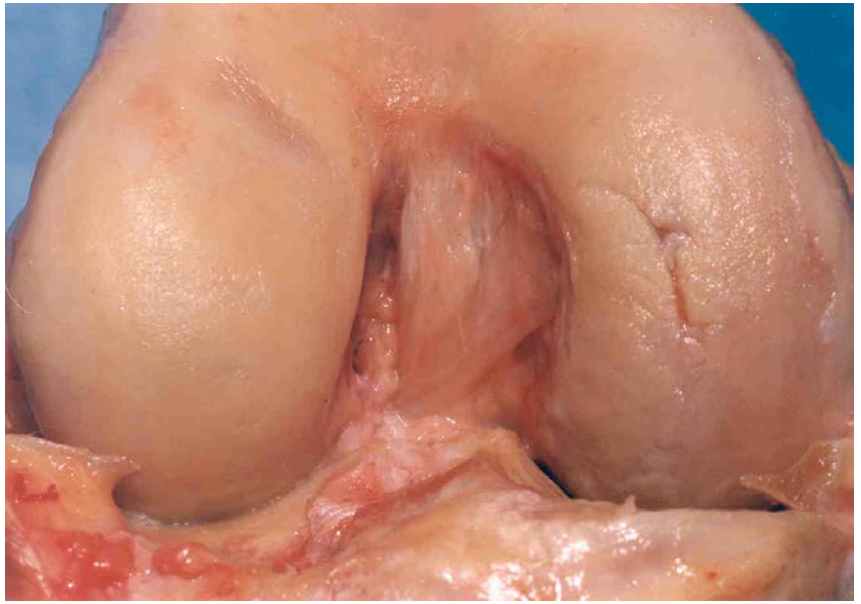


Figure 1: Location of injuries in female football players (FIFA tournaments)

J Athl Train. 2011 Jan-Feb;46(1):
Sex differences in concussion symptoms of high school athletes.
Frommer LJ et al.

Am J Sports Med.2013 Apr;41(4):742-8
Comparison of hamstring strain injury rates between male and female intercollegiate soccer athletes. Cross KM et al.

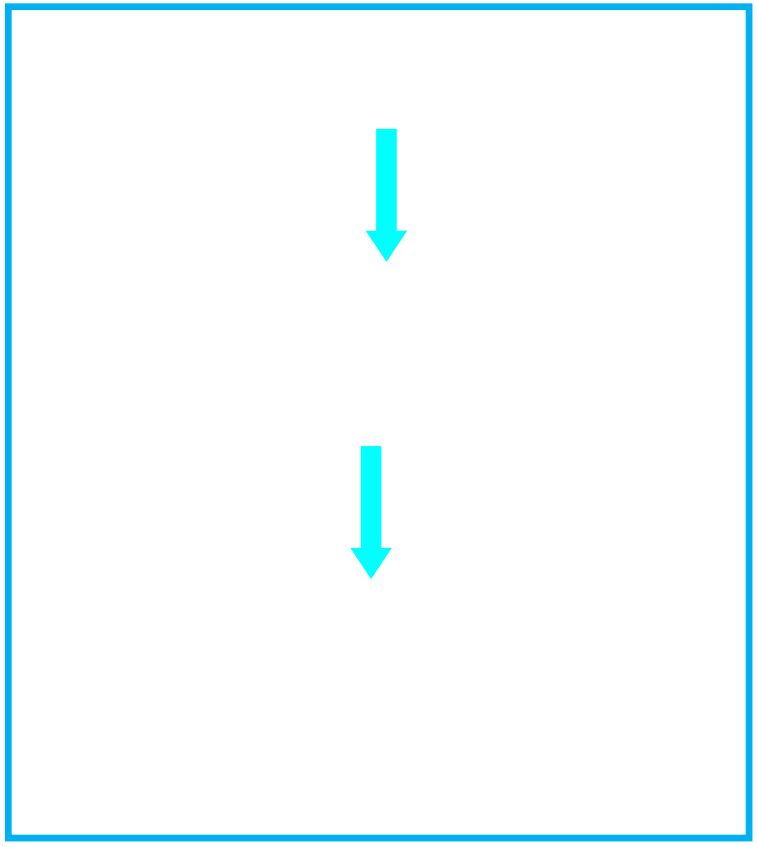

FETTIG
6

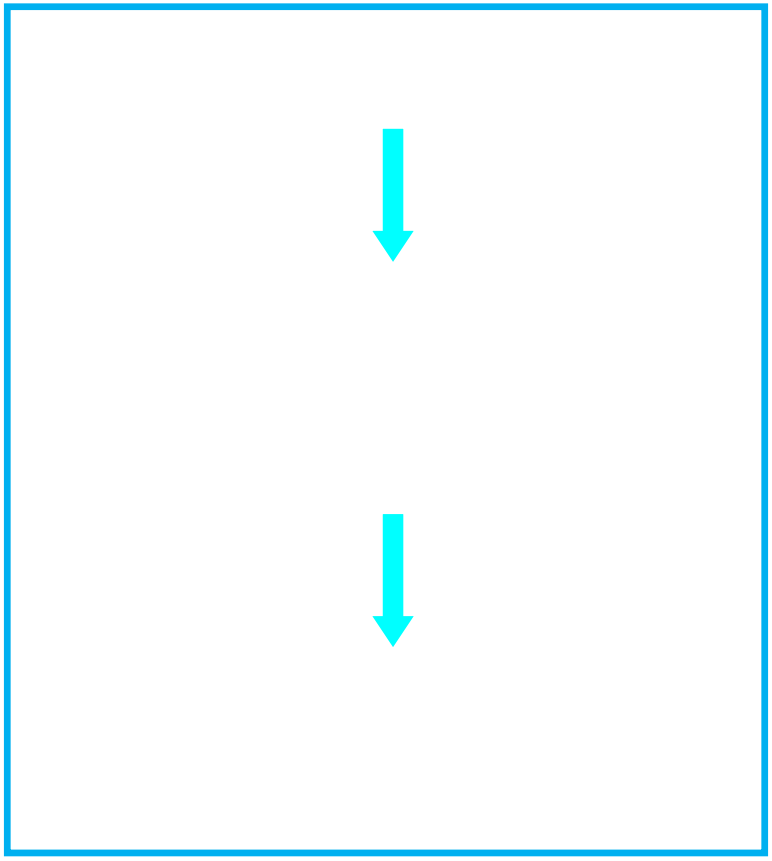


- Souryal and all. *Intercondylar notch size and anterior cruciate ligament injuries in athletes : a prospective study* – Am J Sports Med 1993
- Laprade and all. *Femoral intercondylar notch stenosis and correlation to anterior cruciate ligaments injuries : a prospective study.* Am J Sports Med 1994

Am J Sports Med.2011 Oct;39(10):2175-80.
Prospective correlation between serum relaxin concentration and anterior cruciate ligament tears among elite collegiate female athletes.
Dragoo JL et al

Jansen P er al (2012). Mental rotation in male soccer players. PLoS One, **7**(10)
Jordan K et al (2002). Women and men exhibit different cortical activation patterns during mental rotation tasks. Neuropsychologia, **40**(13), 2397-2408.





Differences Between Sexes in Lower Extremity Alignment and Muscle Activation During Soccer Kick, Brophy et al.*JBJS Am. 2010; 92:2050-2058*

Differences Between Sexes in Lower Extremity Alignment and Muscle Activation During Soccer Kick, Brophy et al.*JBJS Am. 2010; 92:2050-2058*

For ACL reconstruction ?

The 11+

PART 1 RUNNING EXERCISES · 8 MINUTES

PART 2 STRENGTH · PLYOMETRICS · BALANCE · 10 MINUTES

PART 3 RUNNING EXERCISES · 2 MINUTES

Oslo Sports Trauma
RESEARCH CENTER

F-MARC
FOOTBALL FOR HEALTH
FIFA

BMJ

RESEARCH

Comprehensive warm-up programme to prevent injuries in young female footballers: cluster randomised controlled trial

Torbjørn Soligard, PhD student,[1] Grethe Myklebust, associate professor,[1] Kathrin Steffen, research fellow,[1] Ingar Holme, professor,[1] Holly Silvers, physical therapist,[2] Mario Bizzini, physical therapist,[3] Astrid Junge, associate professor,[3] Jiri Dvorak, professor,[3] Roald Bahr, professor,[1] Thor Einar Andersen, associate professor[1]

emales

F-MARC
FOOTBALL FOR HEALTH
FIFA

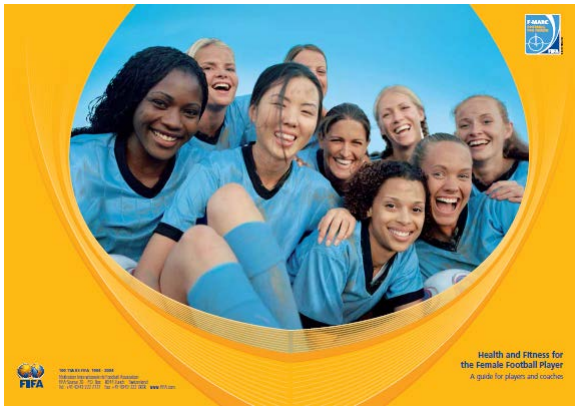
Health and Fitness for the Female Football Player

A guide for players and coaches

– Running

strength plyometric

balance



1A. Jog line to line (cone to cone)

Elapsed time	0–30 seconds
Purpose	To ensure a good running technique. Keep your hip/knee/ankle in straight alignment without your knee caving in or your feet whipping out to the side.
Instructions	Complete a slow jog from the near to the far sideline.

1B. Shuttle run (side to side)

Elapsed time	30–60 seconds
Purpose	To engage your hip muscles at the inner and outer thigh. This exercise will increase speed. Carefully avoid inward caving of the knee joint.
Instructions	Start in an athletic stance with a slight bend at the knee. Leading with the right foot, sidestep, pushing off with the left foot (back leg). When you drive off with the back leg, be sure your hip/knee/ankle are in a straight line. Switch sides halfway across.

1C. Backward running

Elapsed time	1–1.5 minutes
Purpose	To continue your warm-up and engage your hip extensors/hamstrings. Make sure you land on your toes. Watch for locking of your knee joint. As you bring your foot back, make sure you maintain a slight bend to your knee.
Instructions	Run backwards from sideline to sideline. Land on your toes without snapping the knee back. Stay on your toes and keep the knees slightly bent at all times.

2. Stretching

It is important to warm-up prior to stretching – never stretch a cold muscle. By doing the exercises outlined here, you can improve and maintain your range of motion, reduce stiffness in your joints, reduce post-exercise soreness, reduce the risk of injury and improve your overall mobility and performance.

- Do a large muscle warm-up such as brisk walking for five to ten minutes before stretching.
- Do not bounce or jerk when you stretch. Gently stretch to a point of tension and hold.
- Hold the stretch for 30 seconds. Concentrate on lengthening the muscles when you are stretching.
- Breathe normally. Do not hold your breath.

2A. Calf stretch (30 seconds x 2 repetitions)

Elapsed time	1.5–2.5 minutes
Purpose	To stretch the calf muscle of your lower leg
Instructions	Stand leading with your right leg. Bend forward at the waist and place your hands on the ground (V formation). Keep your right knee slightly bent and your left leg straight. Make sure your left foot is flat on the ground. Do not bounce during the stretch. Hold for 30 seconds. Switch sides and repeat.

2B. Quadriceps stretch (30 seconds x 2 repetitions)

Elapsed time	2.5–3.5 minutes
Purpose	To stretch the quadriceps muscle of the front of your thigh
Instructions	Place your left hand on your partner's left shoulder. Reach back with your right hand and take hold of the front of your right ankle. Bring your heel to the buttock. Make sure your knee is pointing down towards the ground. Keep your right leg close to your left. Do not allow your knee to wing out to the side and do not bend at the waist. Hold for 30 seconds and switch sides.

2C. Hamstring stretch (30 seconds x 2 repetitions)

Elapsed time	3.5–4.5 minutes
Purpose	To stretch the hamstring muscles of the back of your thigh
Instructions	Sit on the ground with your right leg extended out in front of you. Bend your left knee and rest the bottom of your foot on your right inner thigh. With a straight back, try to bring your chest toward your right knee. Do not curve your back. If you can, reach down towards your toes and pull them up toward your head. Do not bounce. Hold for 30 seconds and repeat with the other leg.

2D. Inner thigh stretch (30 seconds x 3 repetitions)

Elapsed time	4.5–5.5 minutes
Purpose	To elongate the muscles of your inner thigh (adduction)
Instructions	Remain seated on the ground. Spread you legs evenly apart. Slowly lower yourself to the centre with a straight back. You need to feel a stretch in the inner thigh. Now reach towards the right with the right arm. Bring your left arm over your head and stretch over to the right. Hold the stretch and repeat on the opposite side.


10
91
RIDA

Head injuries and how to avoid them

The most common head injury in sport is a contusion of the head, which may vary widely in severity. Many head injuries in football are the result of unsuitable playing techniques and can be reduced by employing proper skills, ensuring good medical care and enforcing safety through the Laws of the Game.

For both men and women, the most frequent injury in football is a contusion to the lower leg. But one injury is particularly troubling, not just in football, but in all contact sports and that is an injury to the head. Numerous injuries are possible such as contusions (bruises) and abrasions, dental injuries, eye injuries (e.g. detached retina), lacerations (cuts), fractures and concussions. The injury that gets everyone's attention is concussion. Why? Because concussion has the potential to have long-term consequences affecting memory, concentration, planning, problem solving and more.

What is concussion?

Concussion is the temporary loss of normal brain function as a result of an injury. A player does not need to have lost consciousness to suffer concussion. The player may be confused or unaware of the time, date or place for a while after the injury. Other typical symptoms are headache, dizziness, nausea, unsteadiness/loss of balance. This a brain injury that may result in a bad headache or unconsciousness.

Head injuries are predictable. They usually occur near the halfway line when players are competing for headers, goal kicks, long passes etc. They can also happen, though much less frequently, in the penalty area when many players compete for crosses or corner kicks. Head injuries are spread out fairly evenly across female strikers, midfielders, and defenders. Goalkeepers have unique challenges when coming out to an onrushing striker or working around the goalposts.

The majority of injuries are due to head-head, head-elbow, head-ground contact or when the head impacts another hard object like the foot, knee, post or even some object near the touchline. Generally, head injuries to women happen from head-head contact; for men, it is head-elbow contact. This is why the FIFA Medical Assessment and Research Centre (F-MARC) has recommended changing the laws to the International Football Association Board (IFAB) and sanctioning every elbow blow with a red card.

Concussion can occur if the ball hits you when you are unprepared for the contact. However, purposeful heading carries little risk of concussive injury. Nevertheless, heading is a complex task. It involves skill, courage, timing and decision-making. In preparing to head the ball, you tighten your neck muscles that fix the head to the trunk giving you a large mass to overcome the mass of the ball. Then you have to time your actions according to the velocity and direction of the ball while you are running (forwards, sideways or backwards) or jumping (off one or both feet) while trying to decide what the opponent will do and then direct the ball to a specific location. All this is done in a split second. There are players who are skilled headers who seek out every chance to head the ball and there are players who rarely head the ball.

Injuries to the head are not uncommon. If we add up all the recorded head injuries, we see that between 4% and 20% of all injuries in football are to the head. Around half of all injuries to the head are common contusions and/or abrasion injuries. In men, the next most common head injury is a laceration, but in women, the next most common injury is concussion. For men, concussion is the fourth most common type of head injury. In some studies, the concussion injury rate for women is nearly 2.5 times higher than the rate for men. Why? Women seem to have some differences in how they execute some tasks relating to impact that may relate to how well they can handle impact to the head. There are two major points in concussion that everyone associated with football needs to be aware of: recognition that an injury has occurred and when to allow a player to return to play.

"I had a severe concussion when I got kicked in the head a few years ago. I couldn't play for six months, and that was difficult, but I knew I needed to take a break for the future of my career. The doctors told me not to do too much of anything, so I didn't. When I came back, it took a while for me to get back into shape."

Lori Chalupny, 23, midfielder, US women's national team

The first concern is recognising that an injury has occurred. The common perception is that one needs to lose consciousness to have sustained concussion but this is not true. Medical definitions of concussion state that there has been a 'rapid onset of short-lived impairment of neurological function'. Impact, not always to the head, can lead to this impairment. So, if you see two players knock heads and one bends over, holds her head and is oblivious to the game around her, the chances are that she has suffered 'short-lived impairment of neurological function'.

When in doubt, keep them out

It is important to recognise that an injury has occurred so the player can be removed from play and assessed. While there are many recommendations regarding when to allow a player to return to play, the safest decision is to keep them out of play until a medical professional says they can return. Most coaches and players are not in a position to make such a decision on the field, so

CONCLUSION