FOP Injuries in Different Sports
And their Prevention

Dr Sachin Khullar
MBBS MS ortho DNB ortho Dip Sports med FACSEP
Australasian College of Sports and Exercise Medicine
GAMES EXPERIENCE
DISCLAIMER

I currently work as a Sports and Exercise medicine Specialist In Australia

No funding has been received for this presentation

Acknowledgement

Would like to acknowledge SAI and NIS for the opportunity to share my thoughts on this topic

ACSEP
DOCTOR & medical team

WHY SHOULD I LEARN ABOUT FOP INJURY AND PREVENTION. Why do we have the medical team then……

"A Coach Is Someone Who Can Give Correction Without Resentment"

- Coach John Wooden
Establish the extent of the problem
Establish etiology and mechanism
Introduce preventive measure
Assess the effectiveness of the measure

Injury Prevention

Mechelen et al
Athlete injury

2 Basic questions (generally)

1. How big is the injury? (And not what is the injury)
2. When can the athlete return to sport?

Change the Questions to:
What do you do:
- Immediately
- On the side - sideline or medical room (short term)
- In the coming days (long term)

Prevention (TEA)

Training level
Equipment level
Athlete level

ISL
Collapsed Athlete
Runner with Midfoot pain
Apophyseal Injuries
Rower with Chest pain
Wrestler with Skin rash
Parathlete with HTN
CASE 1

22 year old footballer has a head collision with an Opponent
Goes to the ground
Clenches his head

What do you do?:
Immediately
Short term
Long term
Immediate action

- RUN TO THE FIELD ( depending on rules)
- AVPU (Alert, responding to Vocal commands, Responding to Pain, Unresponsive)
- For P, U Initiate DRABC- Cervical spine
- For A, V: Cervical spine and then Assess for Concussion and neurology
Concussion - what it means

- Trauma to head: more than just one contact
  - Head hits the ground
  - Arm hits the head
  - Head clash
  - Ball hitting the head
  - No head contact - rapid head motion
No return to play on the same day

Game day…….
Send to hospital immediately if:

a) Prolonged LOC or deterioration of consciousness
b) Seizures
c) Neurological signs or Spinal cord signs
d) Persistent vomiting or increasing headache post-injury
e) Skull Fracture
f) Risk that assessment can’t be done later on

OR

If you have any doubt....
SHORT TERM and LONG-TERM ACTION

...........Return to play

• Recovery from all symptoms
• Graded rehabilitation—increasing severity of training
• Keep contact training at the last
• No recurrence of symptoms
• Return to Play

COGSPORTS
Early Neuro-vestibular rehab
To help identify concussion in children, adolescents and adults

Visual clues that suggest possible concussion include:

- Headache
- "Pressure in head"
- Balance problems
- Nausea or vomiting
- Drowsiness
- Dizziness
- Blurred vision
- Sensitivity to light
- Sensitivity to noise
- Fatigue or low energy
- Feeling like "in a fog"
- "Don't feel right"
- More emotional
- More irritable
- Sadness
- Nervous or anxious
- Neck pain
- Difficulty concentrating
- Difficulty remembering
- Feeling slowed down
- Feeling like "in a fog"

**STEP 2: OBSERVABLE SIGNS**

Visual clues that suggest possible concussion include:

- Lying motionless on the playing surface
- Slow to get up after a direct or indirect hit to the head
- Disorientation or confusion, or inability to respond appropriately to questions
- Blank or vacant look
- Balance, gait difficulties, motor incoordination, stumbling, slow laboured movements
- Facial injury after head trauma

**STEP 3: SYMPTOMS**

- Headache
- "Pressure in head"
- Balance problems
- Nausea or vomiting
- Drowsiness
- Dizziness
- Blurred vision
- Sensitivity to light
- Sensitivity to noise
- Fatigue or low energy
- Feeling like "in a fog"

**STEP 4: MEMORY ASSESSMENT**

- "What were we at today?"
- "Which half is it now?"
- "Who scored last in this game?"
- "What team did you play last week/game?"
- "Did your team win the last game?"

**Athletes with suspected concussion should:**

- Not be left alone initially (at least for the first 1-2 hours).
- Not drink alcohol.
- Not use recreational/ prescription drugs.
- Not be sent home by themselves. They need to be with a healthcare professional.
- Not drive a motor vehicle until cleared to do so by a healthcare professional.

The CRT5 may be freely copied in its current form for distribution to individuals, teams, groups and organisations. Any revision and any reproduction in a digital form requires approval by the Concussion in Sport Group. It should not be altered in any way, rebranded or sold for commercial gain.


https://www.cdc.gov/headsup/youthsports/training/index.html

HEADS UP to Youth Sports: Coaches
PREVENTION STRATEGIES

EQUIPMENT LEVEL: HELMETS?, MOUTH GUARDS?

ATHLETE LEVEL

- Education

- Concussion Action plan: Remove from play, No return to play on the same day...IF IN DOUBT...SIT THEM OUT

- Neck muscle strength, Balance and proprioception, Landing techniques, avoid impacts
<table>
<thead>
<tr>
<th>Condition</th>
<th>Immediate action</th>
<th>Short term Action</th>
<th>Long term Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athlete with Concussion</td>
<td>ABC, Stop participation Cervical spine assessment Assess if hospital transfer is required</td>
<td>SCAT-5 Neurological Symptomatic recovery Cogsport, ImPACT Neurovestibular rehab</td>
<td>Prevent Post Concussion Syndrome Neuropsychological testing</td>
</tr>
</tbody>
</table>
CASE 2

22 yr old runner reports midfoot pain
Ongoing from few days
Progressively worsening

What do you do?:

Immediately
Short term
Long term
EVALUATION

- Where exactly is the pain
- Special characteristics associated with running, rest and night sleep
- Previous hx
- Medical hx, red flags

RULE OUT NAVICULAR STRESS FRACTURE

- Diet
- Training
- Footwear
- Surface
Important sign: “N-Spot” tenderness
Mechanism of Injury

- Compression force from first metatarsal
- Compression force from second metatarsal
- Zone of maximal shear stress
- Body weight component through talus
Staging of stress Fracture

Figure 105.5 Naricular classification of type I, II, and III described by Saxena (12).
Treatment

CAUTION

PLEASE DON’T TAKE THIS INJURY LIGHTLY

CAN BE CAREER ENDING INJURY
**Training Strategies**

**Training Level**
Training error – repetitive high level or rapid increase training load
- Esp. jumping, push-off, sprinting, cutting

**Equipment Level**
- SHOES
- SURFACE

**Athlete Level**
- Decreased ankle DF
- Stiff subtalar joint
- Short 1st MT plus long 2nd MT (Morton foot)
- Forefoot Varus
- Variable reports regarding foot posture
- Kinetic chain Deficits
<table>
<thead>
<tr>
<th>Condition</th>
<th>Immediate action</th>
<th>Short term Action</th>
<th>Long term Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletes with Concussion</td>
<td>ABC, Stop participation</td>
<td>SCAT-5 Neurological Symptomatic recovery</td>
<td>Prevent Post Concussion Syndrome</td>
</tr>
<tr>
<td></td>
<td>Cervical spine assessment</td>
<td>Neurovestibular rehab</td>
<td>Neuropsychological testing</td>
</tr>
<tr>
<td></td>
<td>Assess if hospital transfer is required</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runner with Midfoot pain</td>
<td>Assessment to rule out Navicular stress fracture N-Spot</td>
<td>Staging of the stress fracture</td>
<td>Rehab and Return to play</td>
</tr>
<tr>
<td></td>
<td>Stop running</td>
<td>Non-operative Rx</td>
<td>Address risk factors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operative Rx</td>
<td></td>
</tr>
</tbody>
</table>
Case 3

12 yr Adolescent with Heel pain
Comes with running
Now pain even on walking and rest
Immediate Action

Where is the pain
Relation of pain to activity
Rest or night pain
Recent training: volume, intensity, recovery
Training surface
Footwear
Red flags: weight loss, night pain, loss of appetite, unusual fatigue
# Differential diagnosis

<table>
<thead>
<tr>
<th>Causes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Local causes</td>
<td>Calcaneal Apophysitis, Achilles tendinopathy, Ankle sprain, planter fascitis, tarsal Coalition, Bursitis, TP apophysitis</td>
</tr>
<tr>
<td>Referred/systemic causes</td>
<td>RA, JRA, ref from spine</td>
</tr>
<tr>
<td>Red flags</td>
<td>Infection, osteomyelitis, Bony tumour</td>
</tr>
</tbody>
</table>
Features to suggest Calcaneal Apophysitis- Sever’s disease

- Posterior inferior heel pain
- Almost no pain when waking up
- Activity related increase in pain and stiffness—may limp
- Tenderness at the insertion of the Achilles tendon
- Limited ankle dorsiflexion
- Hard surfaces and poor-quality or worn-out athletic shoes

Sports Involved:
Running and Impact-ballistic
<table>
<thead>
<tr>
<th>Short term action</th>
<th>Long term action</th>
</tr>
</thead>
<tbody>
<tr>
<td>• “POLICE”</td>
<td>Biomechanical correction</td>
</tr>
<tr>
<td>• Rest from aggravating activities</td>
<td>Adjust training loads</td>
</tr>
<tr>
<td>• Anti-inflammatory medication</td>
<td>Footwear and taping</td>
</tr>
<tr>
<td>• Heel lift</td>
<td>Patient and parent education</td>
</tr>
<tr>
<td>• Ice</td>
<td>- Growth spurts</td>
</tr>
<tr>
<td>• Local ointments</td>
<td>Reassurance</td>
</tr>
<tr>
<td>• Padded heel counter</td>
<td>Imaging if any doubt</td>
</tr>
<tr>
<td>• Supportive shoes</td>
<td></td>
</tr>
</tbody>
</table>
Growth centers
<table>
<thead>
<tr>
<th>Condition</th>
<th>Immediate action</th>
<th>Short term Action</th>
<th>Long term Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletes with Concussion</td>
<td>ABC, Stop participation Cervical spine assessment Assess if hospital transfer is required</td>
<td>SCAT-5 Neurological Symptomatic recovery Neurovestibular rehab</td>
<td>Prevent Post Concussion Syndrome Neuropsychological testing</td>
</tr>
<tr>
<td>Runner with Midfoot pain</td>
<td>Assessment to rule out Navicular stress fracture N-Spot Stop running</td>
<td>Staging of the stress fracture Non-operative Rx Operative Rx</td>
<td>Rehab and Return to play Address risk factors</td>
</tr>
<tr>
<td>Adolescent with heel pain</td>
<td>Assessment POLICE</td>
<td>Intial treatment Activity modification</td>
<td>Biomechanical correction Training loads Education</td>
</tr>
</tbody>
</table>
CASE 4
Rower with Chest pain
Rower with chest pain

• 23 yr
• Participating in camp
• High volume (200 km / 3 days)
• High intensity
• Rough water
Immediate Action

- No history of chest wall pain or stress fracture
- Developed right chest pain during row
- Stopped immediately
- Gentle row back to shed
Assessment

- Night pain
- Pain with ADLs
- Pain with deep inspiration
- Cough
- Sit up
- Push up
- Thoracic spring
INVESTIGATION

RIB STRESS FRACTURE
INVESTIGATION--- CT SCAN
RISK FACTORS

• Intrinsic risks
  - Low BMI
  - RED-S
  - Biomechanics
  - Thoracic mobility
  - Kinetic Chain
  - Medical causes

• Extrinsic risks
  - Training volume and intensity
  - Environmental
  - Equipment: Oar type, shaft length, boat size, experience of crew
BIOMECHANICS

Serratus Anterior Muscle

External Oblique Muscles
Rib Stress Injury: Guidelines for Diagnosis and Management

Definition: Rib stress injury is the development of pain due to bone oedema caused by overload along the bone shaft.

Chest wall pain

Diagnostic features for rib stress injury (and clinical markers*)

- **History**
  - Insidious sudden onset or crescendo pain over a few days or weeks
  - Pain on deep breathing
  - Pain on pushing/pulling doors
  - Difficulty rolling over in bed or sitting up from a lying position
  - Unable to sleep on affected side
  - Possible cough/sneezing pain

- **Examination**
  - Tenderness commonly mid axillary line of chest wall
  - Rib 5-8 in particular
  - Tender spot over oedema and sometimes palpable callous
  - Axillary/compression of ribs/ribs (AP & lateral)
  - Pain with press up or resisted serratus anterior testing
  - Pain on initiating trunk flexion (sit up position including oblique bias)

Severity of injury

- **Mild**
  - VAS score 2-3/10
  - Rib pain towards end of activity
  - Can row through it
  - Tightness or soreness
  - Rib tenderness
  - Compression test may be negative
  - Pain only when characteristically rib cage without pain
  - Often not all clinical markers present

- **Moderate**
  - VAS score 4-6/10
  - Rib pain on movements
  - Unable to complete training/tracing
  - Tender on palpation and compression test positive
  - Most clinical markers will be present

- **Severe**
  - VAS score 7-10/10
  - Rib pain at rest
  - Pain on deep inspiration/coughing
  - Pain on simple movements/tracing
  - Unable to train or race
  - Compression test positive
  - All clinical markers likely to be present

Investigations:

- Usually CLINICAL DIAGNOSIS

Management

**Stage 1**

- Offload rib – stop all rowing mechanics both in a boat and on the ergo
- Initiate pain free cross training
- Analgesia for comfort but not NSAIDS as impede recovery
- Consider taping for comfort
- Soft tissue work helpful to alleviate symptoms of protective mechanism
- Ultrasound/Laser treatment may shorten recovery period if available but not essential
- Gradual return to activity ensuring load kept low and under supervision
- Ensure resolution of all clinical markers
- Time frame 3-6 weeks

**Stage 2**

- biomechanical assessment by physiotherapists and coach
- Improvement of thoracic mobility and maintenance of mobility as load increases
- Assess rowing technique and correct to reduce areas of overload if possible
- Consider all intrinsic and extrinsic risk factors (see overload)
- Consider implementing prevention program

See overload for intrinsic and extrinsic risk factors for rib stress injury

*The GB Rowing Team is the High Performance Arm of British Rowing
Prevention Strategies

TRAINING LEVEL

• Training loads- volume and Intensity sweeps or scull
• Technique: Drive phase (catch, mid rive, finish) and recovery phase (feathering)
• Environmental
• Land based training

EQUIPMENT LEVEL

• Weight and Size of Equipment

ATHLETE LEVEL

• Biomechanical issues
• Kinetic chain
• Warm-up and land-based training (Ergometers)
MOBILISE

Warm Up Essentials

1. Start your warm up with 5-10 minutes of cardiovascular exercise, then perform a minimum of three mobility exercises before getting on the water.

WHOLE BODY MOBILITY

SPINE MOBILITY

ACTIVATE

Warm Up Essentials

2. Perform a minimum of three activation exercises before getting on the water.

POSTERIOR CHAIN

SCAPULAR STABILISERS

STRETCH

Stretching Essentials

4. Perform a minimum of 3 stretches after exercise.

- Hold for at least 30 seconds.
- Aim for 4 repeats each set.

HAMSTRINGS

FOREARMS

CALF

LUMBAR SPINE

LATS & PECS

PATTERN

Warm Up Essentials

3. Posture is important for both optimal force transfer and injury minimisation.

Maintain a neutral posture with movement.

Transition a neutral posture into the first and into the boat.

Identify a neutral posture.

Remember to complete some exercises from all 3 Warm Up Essentials sections before getting on the water... and follow the Stretching Essentials after exercise to optimise your flexibility before your next session.
Key messages

• Significant lost time among elite rowers
• Stop immediately if Rower develop chest wall pain
• Pain poorly localised
• Early diagnosis does not necessarily save the athlete from cortical fracture
• Bone scan is more sensitive than the USS
<table>
<thead>
<tr>
<th>Condition</th>
<th>Immediate action</th>
<th>Short term Action</th>
<th>Long term Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athlete with Concussion</td>
<td>ABC, Stop participation Cervical spine assessment Assess if hospital transfer is required</td>
<td>SCAT-5 Neurological Symptomatic recovery Neurovestibular rehab</td>
<td>Prevent Post Concussion Syndrome Neuropsychological testing</td>
</tr>
<tr>
<td>Runner with Midfoot pain</td>
<td>Assessment to rule out Navicular stress fracture N-Spot Stop running</td>
<td>Staging of the stress fracture Non-operative Rx Operative Rx</td>
<td>Rehab and Return to play Address risk factors</td>
</tr>
<tr>
<td>Adolescent with heel pain</td>
<td>Assessment POLICE</td>
<td>Intial treatment Activity modification</td>
<td>Biomechanical correction Training loads Education</td>
</tr>
<tr>
<td>Rower with Chest pain</td>
<td>Stop activity Initial assessment Bone scan/CT Staging of the stress #</td>
<td>Healing of the fracture</td>
<td>Correct biomechanics</td>
</tr>
</tbody>
</table>
Case 5

Wrestler with Skin rash

Primary Herpes Gladiatorum
Herpes Gladiatorum (HG)

Term coined by Selling and Kibrick (1964)
Due to Herpes Simplex virus Type-1
Numerous outbreaks since first diagnosed in 1960’s – Selling (1964), Wheeler (1965), Porter (1965), Dyke (1965) and Belongia (1991)

Prevalence in wrestlers:
- 2.6-29% High School
- 7.6-12.8% Collegiate
- 20-40% Division I

Location
- 73% on Head and Face
- 42% on Extremities
- 28% on Trunk

- Appear 3-8 days after contact
- Primarily at locations of ‘Lock-up’ position
- Only from skin-to-skin contact
- No association with mats

Location of lesions from 57 wrestlers with Primary Herpes Gladiatorum

Prevalence in wrestlers:
Symptoms:

- Painful Vesicles with red base
- Malaise
- Pharyngitis
- Fever
- Lasts 10-14 days

Herpes Gladiatorum: Primary HG: Note grouped vesicles on forehead and along jawline. Usual reoccurrences last 3-5 days. Less signs and symptoms than primary outbreak. Brought on by stress, i.e. weight cutting, abrading or rubbing facial skin, sun exposure, suppressed cell-mediated immunity.
TREATMENT

REMOVE ATHLETE FROM PLAY
CANNOT PLAY TILL ALL VESCICLE GET DRY and no NEW VESCICLES in 48 HRS
CANNOT COVER THE RASH AND PLAY
CAN SPREAD TO OTHER ATHLETES
ANTI VIRAL DRUGS
CONSIDER TREATING OTHER TEAM MEMBERS
EQUIPMENT AND PERSONAL HYGIENE

PREVENTION

Personal Hygiene
Equipment Hygiene
Avoid overtraining and Fatigue
General conditioning
Consider treatment for the whole team

MYTHS

Not Sexually Transmitted
It can occurs even if you wash the mat
Its different from Herpes- cold sore
Its different from other skin infections which are more common in athletes
<table>
<thead>
<tr>
<th>Condition</th>
<th>Immediate action</th>
<th>Short term Action</th>
<th>Long term Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athlete with Concussion</td>
<td>ABC, Stop participation  Cervical spine assessment  Assess if hospital transfer is required</td>
<td>SCAT-5 Neurological Symptomatic recovery  Neurovestibular rehab</td>
<td>Prevent Post Concussion Syndrome Neuropsychological testing</td>
</tr>
<tr>
<td>Runner with Midfoot pain</td>
<td>Assessment to rule out Navicular stress fracture  N-Spot  Stop running</td>
<td>Staging of the stress fracture  Non-operative Rx  Operative Rx</td>
<td>Rehab and Return to play  Address risk factors</td>
</tr>
<tr>
<td>Adolescent with heel pain</td>
<td>Assessment POLICE</td>
<td>Initial treatment  Activity modification</td>
<td>Biomechanical correction  Training loads  Education</td>
</tr>
<tr>
<td>Rower with Chest pain</td>
<td>Stop activity  Initial assessment  Bone scan/CT  Staging of the stress #</td>
<td>Healing of the fracture</td>
<td>Correct biomechanics</td>
</tr>
<tr>
<td>Wrestler with skin rash</td>
<td>Assessment  Differentiate form other infection  Stop participation</td>
<td>Wait for healing of the lesions  Anti-viral  Team assessment</td>
<td>Personal and Equipment hygiene  Education  Prevention of recurrence</td>
</tr>
</tbody>
</table>
Case 6
Parathlete with hypertension
Spinal cord Injury
wheelchair racing athlete

2 hours before the race—
red flushed face and headache
Autonomic dysreflexia - T6 and above injury

- Pounding **headache** (caused by the elevation in blood pressure)
- **Sweating above the level of injury**
- Restlessness
- **Flushed (reddened) face**
- Red blotches on the skin above level of spinal injury
- Cold, clammy skin below level of spinal injury

**Examination:**
- Sharp elevation of blood pressure
- Bradycardia

- Pressure sores
- Distended bladder, blocked catheter
- Constipation, faecal impaction
Video- Disclaimer

From You tube in the Public domain
Source is identifiable on the video and only for Educational use.
Incidence of Boosting in athletes with high-level spinal cord injury participating in different sports

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheelchair athletics</td>
<td>18.2</td>
<td>81.8</td>
</tr>
<tr>
<td>Long distance events</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Throwing events</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Wheelchair basketball</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Quad rugby</td>
<td>17.2</td>
<td>82.8</td>
</tr>
</tbody>
</table>
Autonomic Dysreflexia and Boosting: Non-pharmacological doping in disability sport

Management:
Remove the patient from competition
Sit the patient up
Examine for the common causes - bowel and bladder
- Insert a catheter if one is not in use
Anti-hypertensive if systolic blood pressure >150mmHg
(Nifedipine 10mg rapid release or GTN)- Rule out VIAGRA
Avoid beta blockers - may cause peripheral vasoconstriction resulting in prolonged hypertension
Low threshold to transfer to hospital

If BP >180 mm Systolic, retest after few minutes
- If still high: Athlete is disqualified
- No sanctions, but IPC Ethical committee
- Disqualification is to prevent serious injury
  Including death of the athlete
Prevention Strategies

TRAINING LEVEL
- Education: recognize symptoms early
- rewards and Punishment

EQUIPMENT
- Wheel chairs
- no sharp areas
- padding

ATHLETE LEVEL
- Bowel and bladder management
- Avoid constipation
- Regular catheterization (avoid bladder distension)
- Monitor for UTI’s
- Avoid pressure areas
- Self monitoring of blood pressure
<table>
<thead>
<tr>
<th>Condition</th>
<th>Immediate action</th>
<th>Short term Action</th>
<th>Long term Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athlete with Concussion</td>
<td>ABC, Stop participation Cervical spine assessment Assess if hospital transfer is required</td>
<td>SCAT-5 Neurological Symptomatic recovery Neurovestibular rehab</td>
<td>Prevent Post Concussion Syndrome Neuropsychological testing</td>
</tr>
<tr>
<td>Runner with Midfoot pain</td>
<td>Assessment to rule out Navicular stress fracture N-Spot Stop running</td>
<td>Staging of the stress fracture Non-operative Rx Operative Rx</td>
<td>Rehab and Return to play Address risk factors</td>
</tr>
<tr>
<td>Adolescent with heel pain</td>
<td>Assessment POLICE</td>
<td>Initial treatment Activity modification</td>
<td>Biomechanical correction Training loads Education</td>
</tr>
<tr>
<td>Rower with Chest pain</td>
<td>Stop activity Initial assessment Bone scan/CT Staging of the stress #</td>
<td>Healing of the fracture</td>
<td>Correct biomechanics</td>
</tr>
<tr>
<td>Wrestler with skin rash</td>
<td>Assessment Differentiate form other infection Stop participation</td>
<td>Wait for healing of the lesions Anti-viral Team assessment</td>
<td>Personal and Equipment hygiene Education Prevention of recurrence</td>
</tr>
<tr>
<td>Parathlete with HTN</td>
<td>Sit upright Remove causative factor GTN/Nifedipine</td>
<td>Follow-up Ethical concerns</td>
<td>Education Removal of risk factors</td>
</tr>
</tbody>
</table>
References


11. Preventing spread of herpes Gladiotorum infection. Minnesota Department of health Infection control: Fact sheet
12. Herpes Gladiotorum Position Statement and Guidelines NFSHA- Sports Advisor Committee
THANK YOU

Questions?

wcsachin@yahoo.com  @wcsachin  sachinkhullar