

Trauma and more in the Office: Emergencies *Not* to Miss



Annual Refresher Course
for Family Physicians

Symposium annuel
pour les omnipraticiens

Putting Care at the Core of our Practice.

NOVEMBER 26-28, 2018 HOTEL BONAVENTURE MONTREAL, QC, CANADA

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Disclosure

No animals or humans were injured in the making of this presentation

No company thought it worthwhile to pay us for our thoughts

Menu du Jour

Case study- mechanism of injury

Head

C-spine

Neck

Chest

Abdomen

Orthopedics

Lower extremity

Upper extremity

A few other things

Applause



Case Study

65 male, 3 days post MVC

C/o neck pain, headache, and pain to his leg

Also has some chest pain, he attributes to broken ribs, “but those pills they gave me at emergency, don’t help.”

What is the Nature of the Illness?



With permission: www.totalcarcrashes.com

Does this change your approach?



With permission: www.totalcarcrashes.com



Hôpital Général de Montréal
The Montreal General Hospital

Département de médecine
d'urgence / Department of
Emergency Medicine

Mr Collision -

Cher Dr/Dear Dr:

Date: 18th October, 2009

Votre patient s'est présenté avec:

Your patient presented with: T-bone MVC, rear belted Pax

A l'examen physique:

Pertinent physical findings:

Scalp abrasions, neck tenderness,
C-spine
Chest wall tenderness, hip and knee
Pain/swelling on Left

Investigations:

CT Head (E) ^{oblique} _{read} to collar @ hip + knee @ C-spine
CXR = rib #1's @ (R) X-rays
@ Labs (CBC, SMA, LFT'S, ENR 2, 3)

Diagnostics/ Diagnosis:

rib #1's and soft tissue injuries

Traitements/ Treatment:

Empacet-30, Rest, ice, +/- crutches

Suivi/ Follow-up:

with you per

Merci/Thank you:


Signature du médecin/ Doctor's Signature

Larry
Nom du médecin/ Doctor's name
(Imprimer SVP/ Please print)

Physical Exam



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Basilar Skull Fracture

What is it, why is it important, and can it be missed on CT?



Source: Knoop KJ, Stack LB, Storrow AB, Thurman RJ: *The Atlas of Emergency Medicine, 3rd Edition*: <http://www.accessmedicine.com>
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Basilar Skull Fracture



Basilar Skull Fracture

Associated Injuries:

Injury to the Meninges (CSF leak)

Injury to Cranial Nerves (#3, 7, 8)

Injury to the Carotid Artery

Can be missed on CT (need thin slices and coronal reformatting)



Neck Exam



With permission Trauma.org

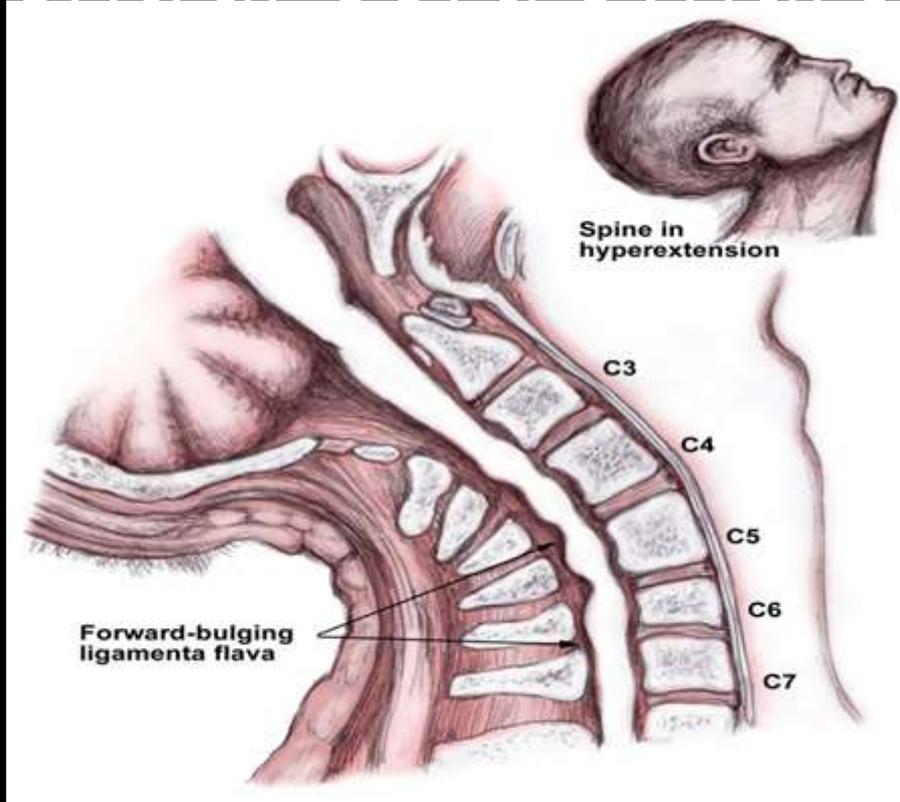
Neck Exam

Delayed neurologic presentations

Central cord syndrome

most frequently seen after spinal injury with acute hyperextension of neck in older patients who have varying degrees of congenital or acquired cervical spine stenosis due to spondylosis

Central Cord Syndrome



-motor deficit more marked in upper than lower limbs and most profound in intrinsic muscles of hands

-extent of sensory deficit varies as does degree of bowel and bladder dysfunction

Soft Tissues of the Neck

What's wrong with this picture?

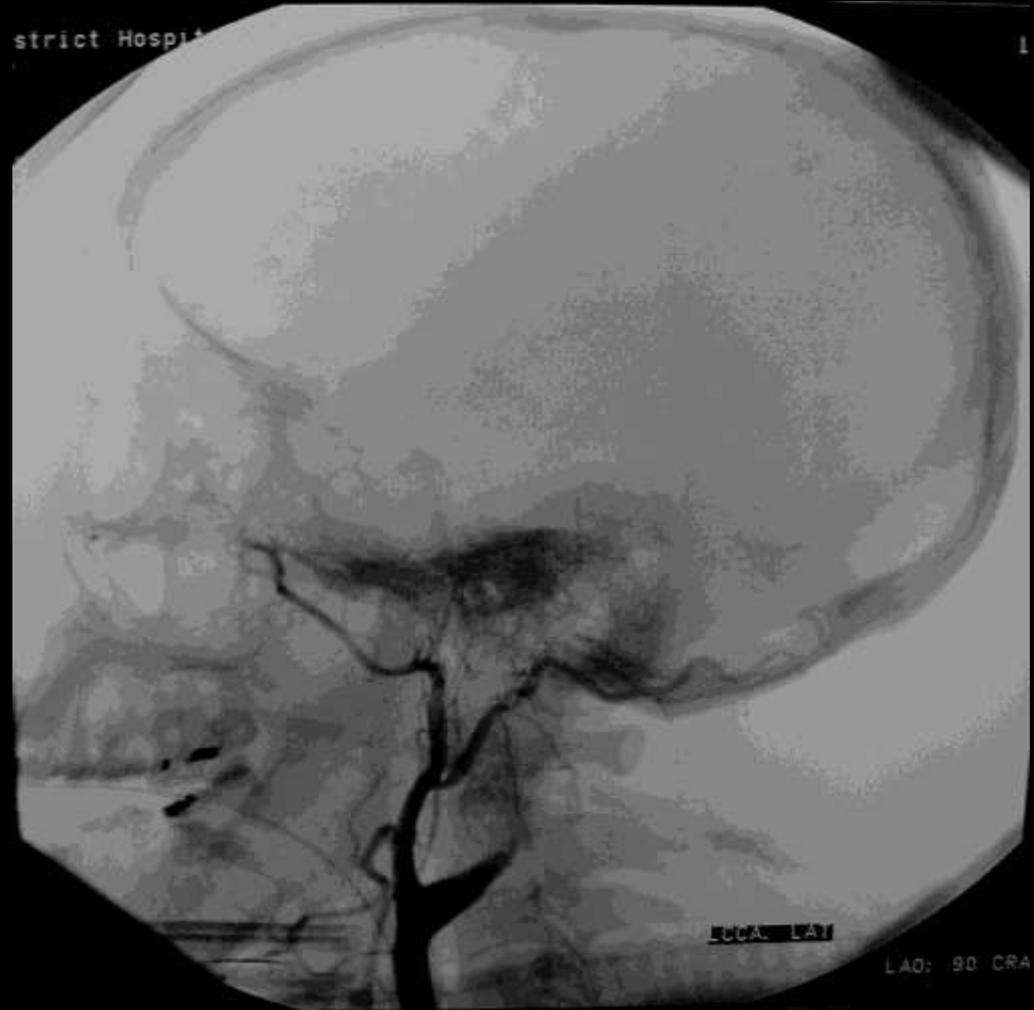


(Photo courtesy of Children's Hospital of Philadelphia)

Carotid Artery Dissection

Risk Factors:

- Chiropractic manipulations
- Sports
- Coughing, sneezing
- Sexual activity
- More intense blunt trauma
 - Falls, strangulations, hangings
 - MVC



[www.aic.cuhk.edu.hk/web8/Hi res/0340 ICA dissection lat.jpg](http://www.aic.cuhk.edu.hk/web8/Hi%20res/0340%20ICA%20dissection%20lat.jpg) (with permission)

Blunt Vascular Injuries

Box 3. High-risk criteria to for blunt cerebrovascular injuries

- Severe hyperextension or flexion and rotation of neck
- Significant soft tissue injury or large hematoma of the anterior neck
- Cervical spine fracture
- Seat belt sign across the neck 
- Massive epistaxis attributable to a carotid-cavernous sinus fistula,
- Bruit or thrill
- Stroke or transient ischemic attack
- Unexplained neurologic abnormalities
- Basilar skull fracture involving the petrous bone

Miller PR, Fabian TC, Croce MA, et al. Screening for blunt cerebrovascular injuries: analysis of diagnostic modalities and outcomes. *Ann Surg* 2002;236:386–95.

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Chest Exam

Rib
fractures,
what's the
big deal?



With Permission Trauma.org

Chest Surprises

34 ♀, projected from her ATV, bilateral tibial fractures. Died 30 hours after the incident, suddenly, from an asymptomatic injury...what killed her?

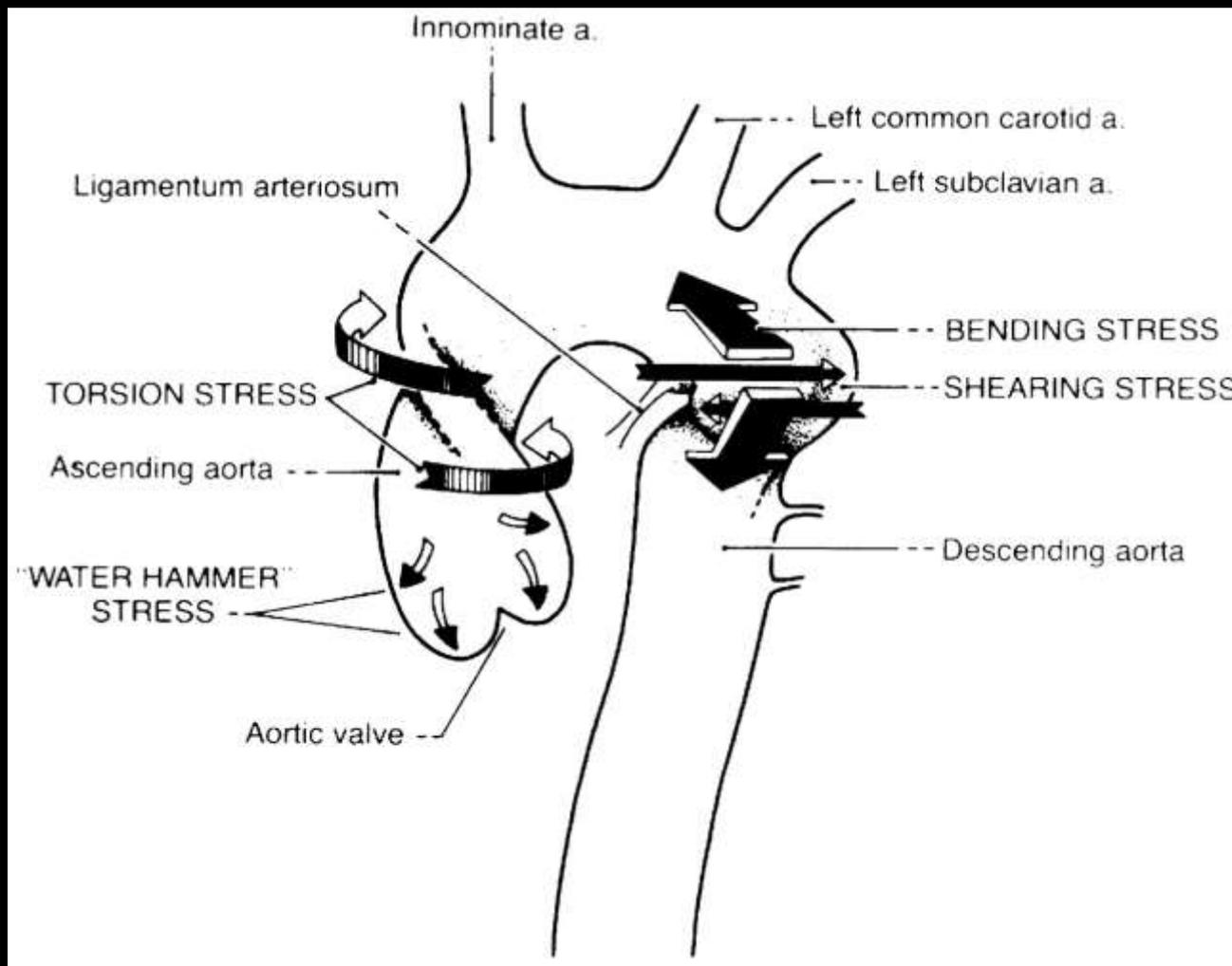


Chest Surprises



With permission: ajronline.org

Demonstration of the putative forces acting through the aorta during blunt traumatic injury



Richens D. et al.; Eur J Cardiothorac Surg 2002;21:288-293

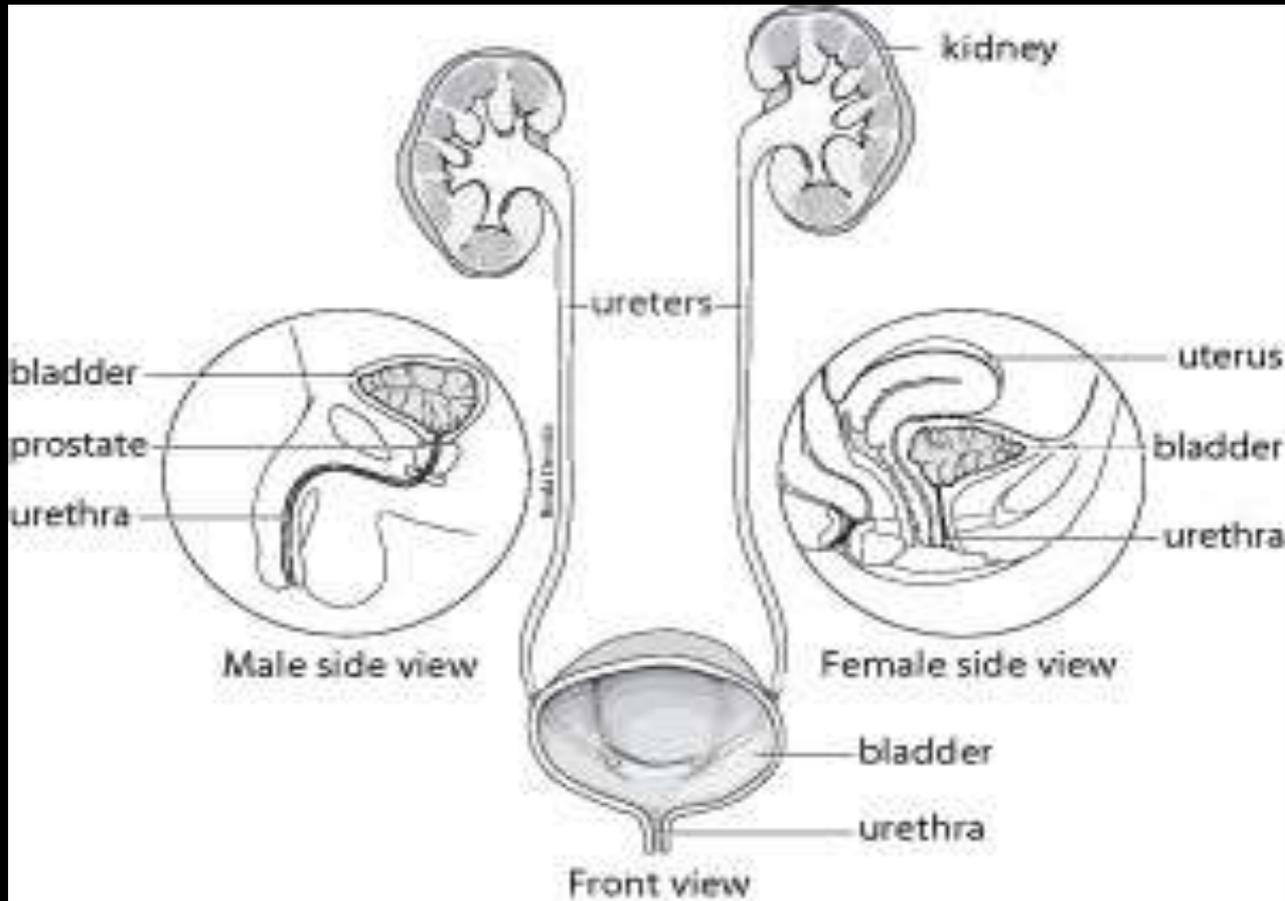
The Abdomen

The abdomen is akin to the black box; we are never entirely sure what lies inside.

There are several injuries that can be missed in the initial trauma workup, depending on what type of imaging was performed.

Abdomen

Microscopic hematuria-when and why do trauma docs ignore it?



Microscopic hematuria

How does one injure a kidney?

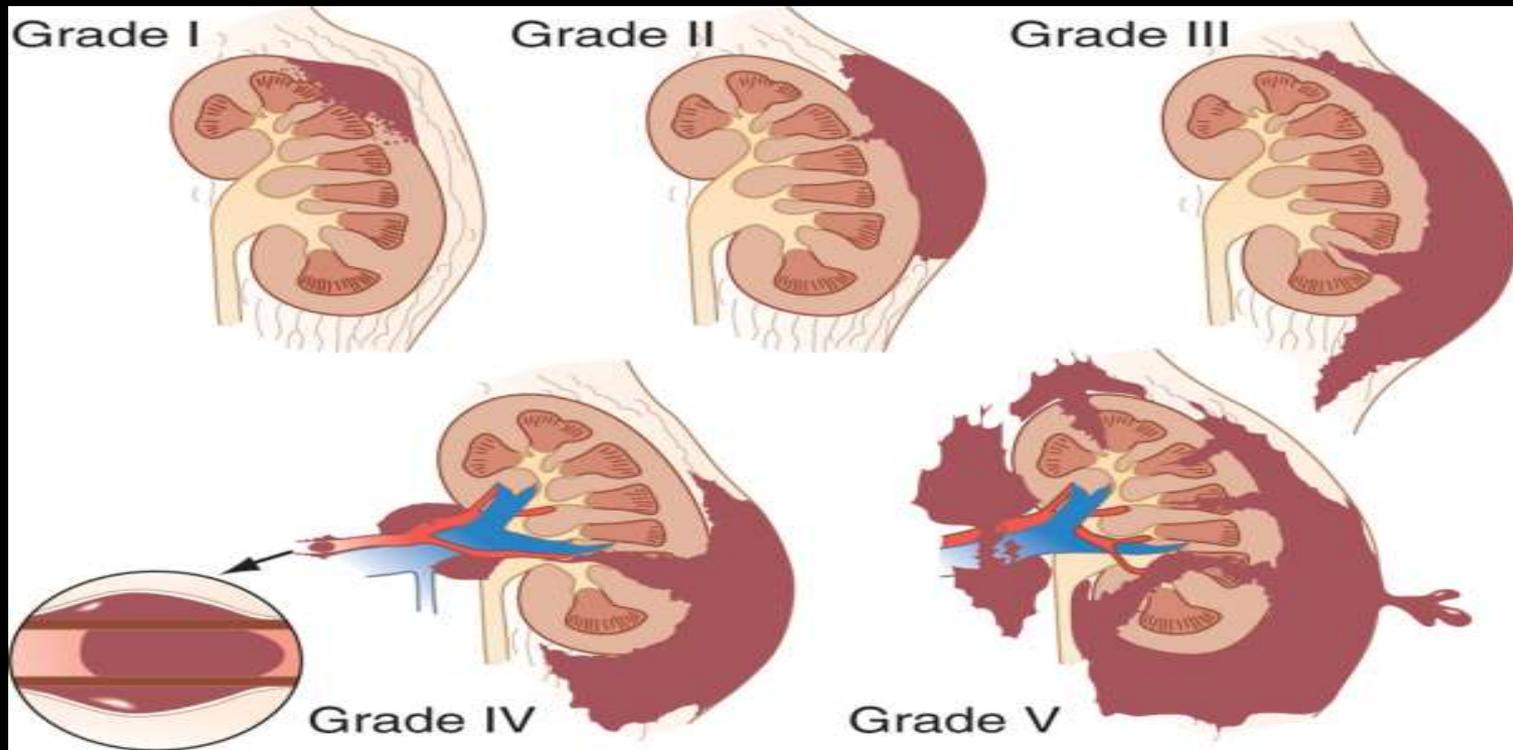


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Microscopic hematuria when do renal injuries require treatment?



Classification of renal injuries by grade (based on the organ injury scale of the American Association for the Surgery of Trauma). (From McAninch JW, Santucci RA: *Genitourinary trauma*. In Walsh PC, Retik AB, Vaughan ED Jr, et al [eds]: *Campbell's Urology*, 8th ed. Philadelphia, Elsevier, 2002, p 3709.)

Microscopic hematuria
why do we send them back to their MD?



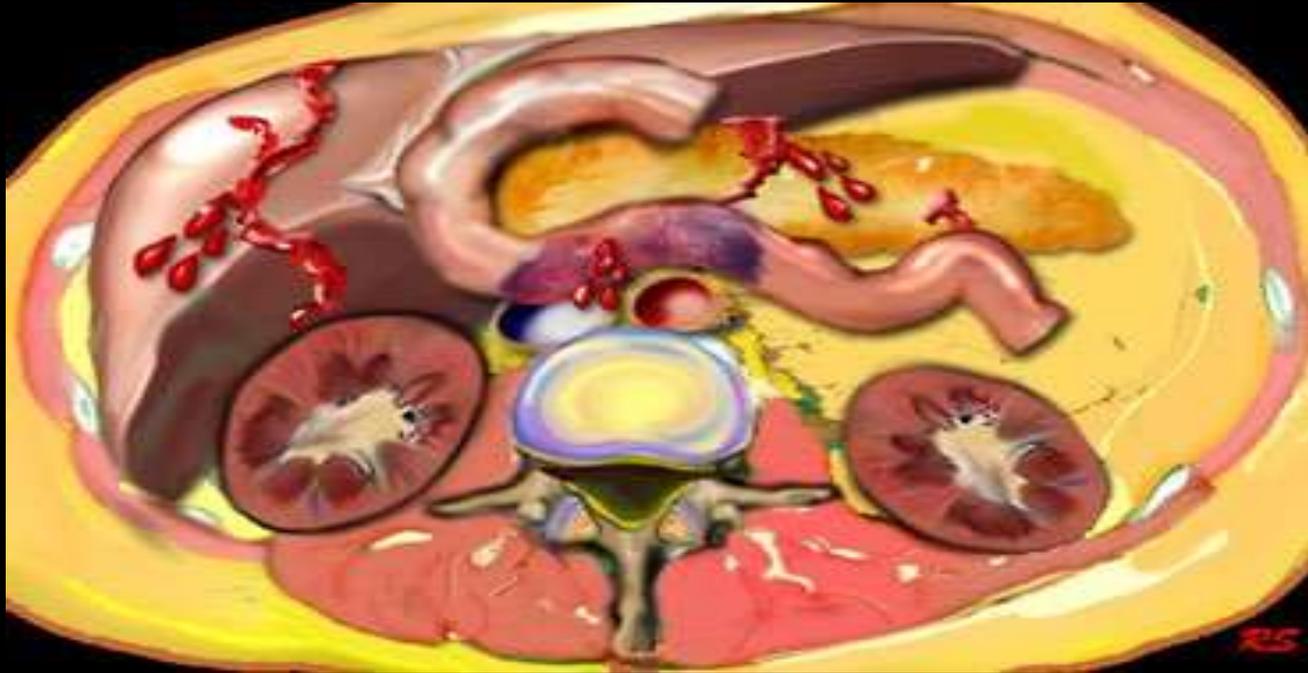
Handlebar Injuries

What gets injured?



With permission: fushnchups.co.nz/category/mountain-biking

Handlebar Injuries



Duodenal injuries (mural hematomas, perforation), pancreatic injuries

Both easily missed on CT, and biochemistry

With permission: Dr. Simon Robben and www.radiologyassistant.nl

Abdominal Imaging

this patient had a normal ultrasound
what did they miss?

these hematomas have names... what are they?

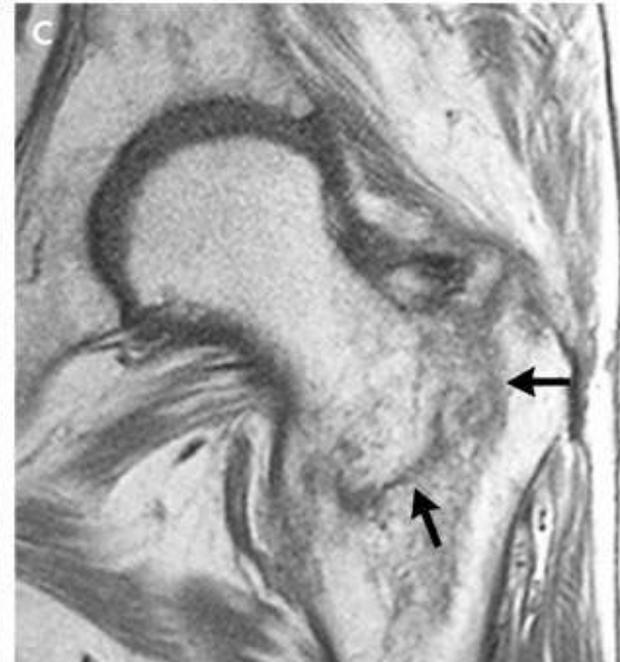
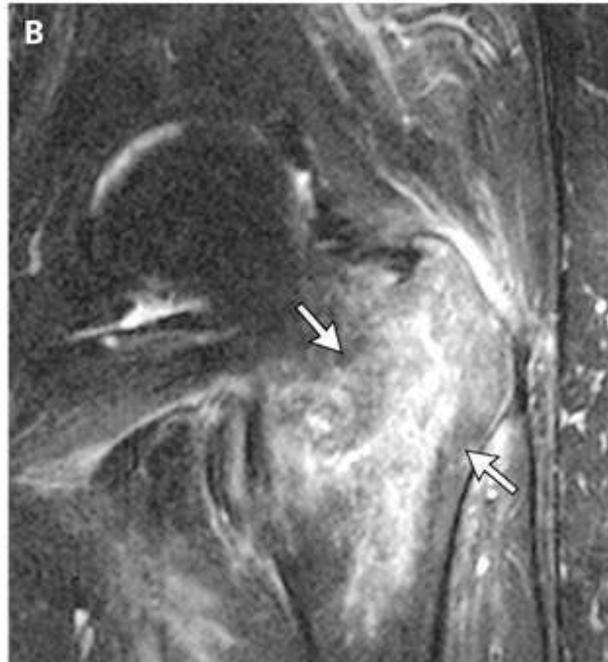


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Orthopedic Trauma

The hip

what are the chances of missing a hip fracture on plain radiographs?





1 month



3 months



13 months

*With permission: Dr. Ferco Berger, Milko de Jonge, Robin Smithuis and Mario Maas,
and www.radiologyassistant.nl*

Orthopedic Trauma

The Knee

what is the sensitivity of plain knee x-rays?



With permission: Dr. David Rubin, Robin Smithuis and www.radiologyassistant.nl

Orthopedic Trauma

The knee



c

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The take home message here is that any patient with persistent knee pain needs further imaging

Orthopedic Trauma

The Knee

What is the Second Fracture?



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Segond Fracture

Appears very innocent on x-ray but associated with ...

Anterior Cruciate ligament tear

Medial and lateral menisci injury

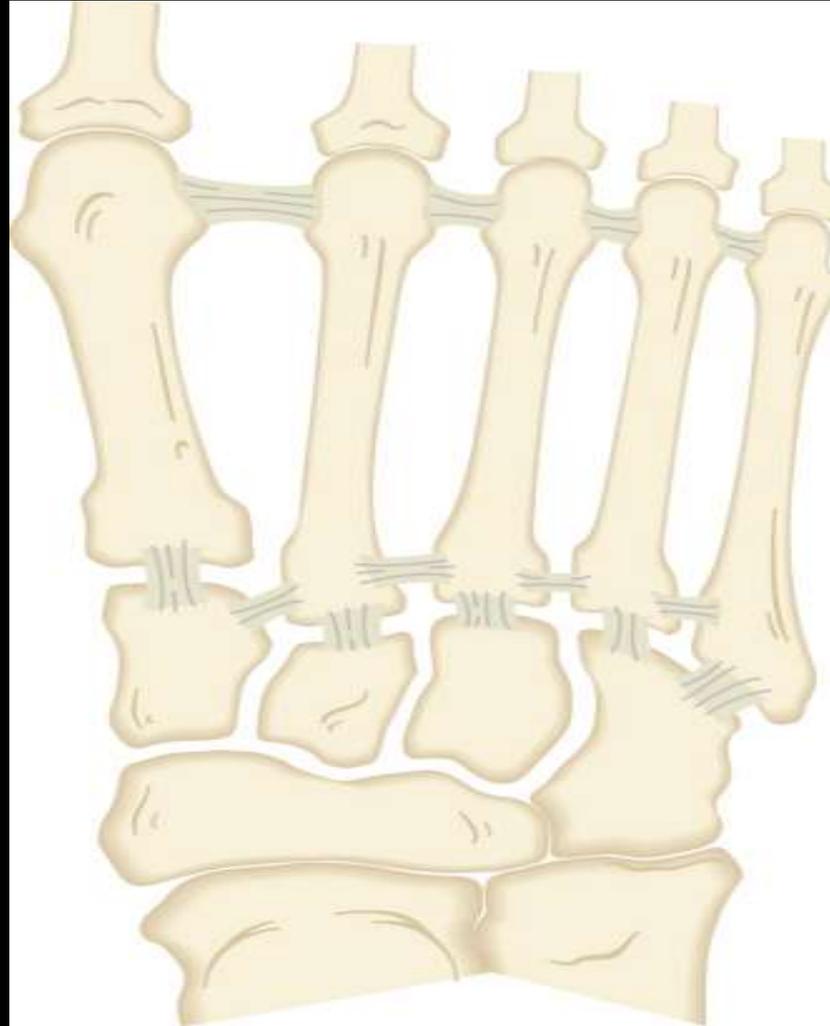
Avulsion fracture of fibular head

What's broken?



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Lisfranc's Joint



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Lisfranc's Injury

Suspect it with:

- widening of 1st or 2nd metatarsal spaces
- any fracture around the Lisfranc joint
- fracture of 2nd metatarsal base “fleck sign”
- cuboid fractures
- cuneiform fractures



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Wrist Injuries



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Scaphoid Fractures

When do we suspect it clinically?

How do you test for it, clinically and on X-ray?

If X-rays are normal, how do you proceed?



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Thumb Injury

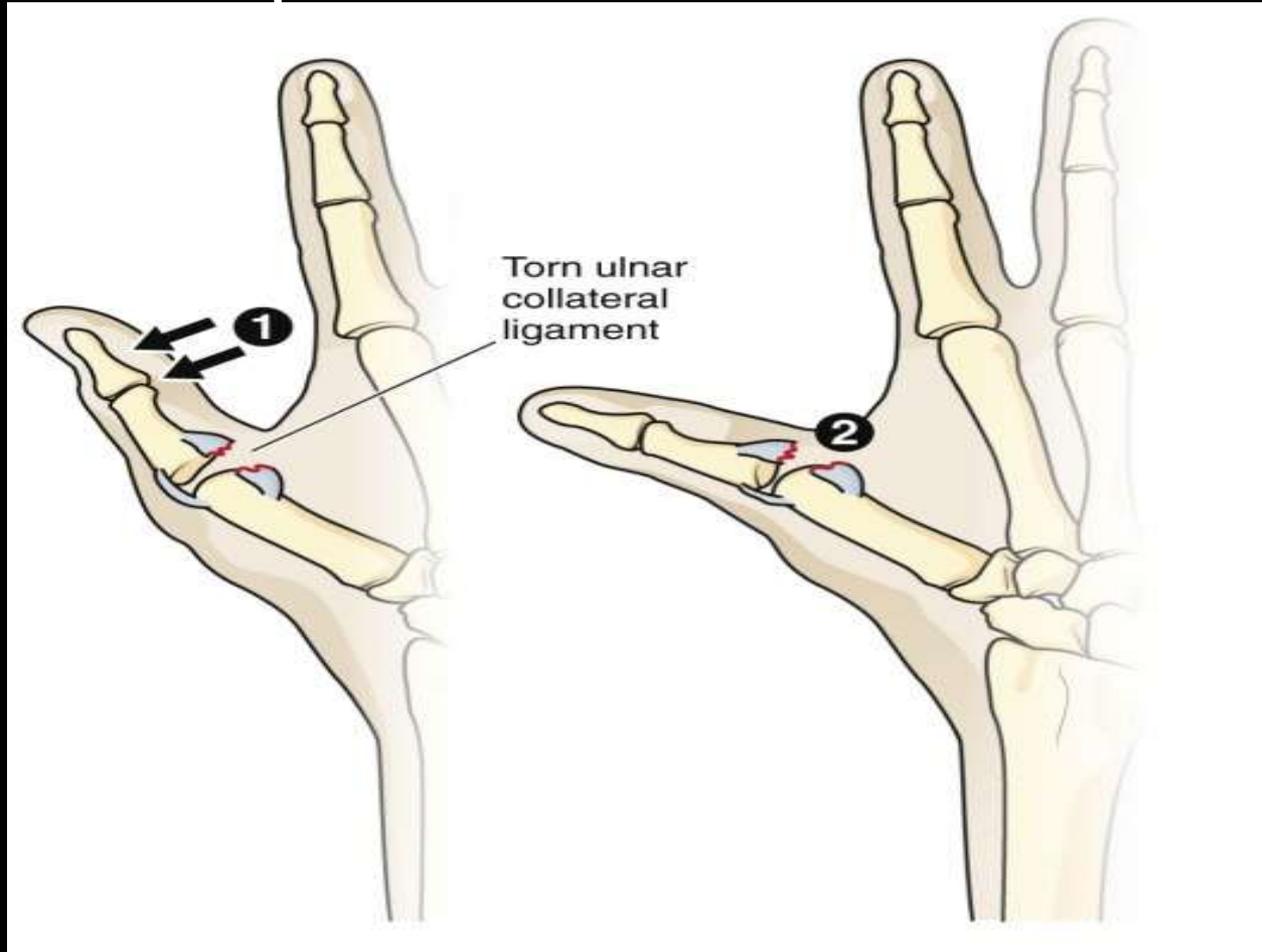
24 male, bar fight, “missed” the other guy’s face
c/o thumb pain

Exam notes swelling/tenderness 1st MCP

X-ray normal

What has to be checked next?

Gamekeeper's Thumb



Another Bar Fight...

25 male, pain, swelling, mild erythema and decreased ROM at 2nd MCP

You note what looks like a superficial laceration over the knuckle.



Closed Fist Injury

“fight bites”

Patients often deny a history of punching

Importance of suspecting injury... early on it will appear extremely innocuous

Extensor tendon is inoculated with oral bacteria

This can seed the underlying joint when the hand is relaxed from it's clenched position

A few other things you don't want to miss – perhaps you know

1. Headache -- not just a migraine
2. Chest pain -- not costochondritis, not even an MI
3. Abdominal pain -- not "gas" or constipation, not even a AAA.
4. Dizziness -- Not just benign vertigo
5. Loss of consciousness -- not just a faint
6. Back pain -- not just "entorse lombaire"



Headache Red Flags

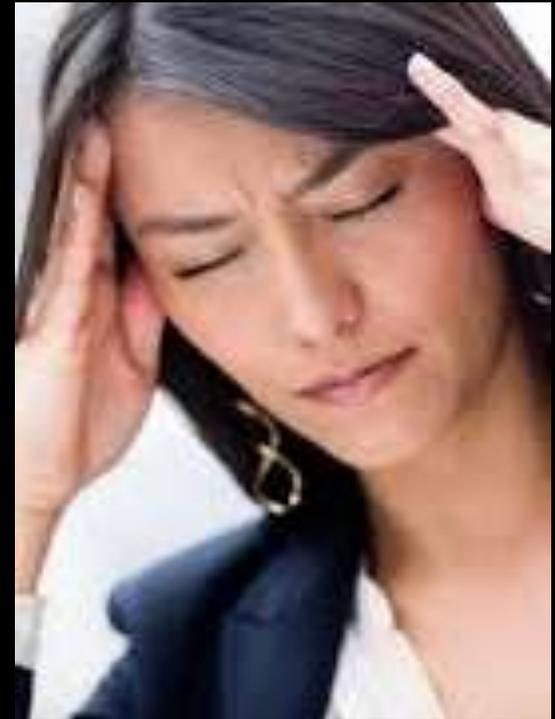
Starting after 50

Sudden onset

Systemic illness

Focal neurological signs

Head trauma



Chest Pain Red Flags



Exertional

Sudden onset

Dyspnoea

Haemoptysis

Significant unintentional weight loss

New-onset dyspepsia if aged >55 years

History of leg swelling, long-haul flights
or any recent periods of immobility

Abdominal Pain Red Flags

Sudden onset

Haematemesis

Unexplained weight loss

Change in bowel habit

Unexplained PV bleeding

Shortness of breath

Dysphagia

Pre-syncopal symptoms

Haematuria

Fever

Persistent unexplained vomiting

Testicular pain



Dizziness (vertigo) Red Flags

Headache

Ataxia

Loss of consciousness

Focal neurologic deficit

Severe, continuous symptoms
for >1 hour



Loss of Consciousness Red Flags

No prodrome

Preceding chest pain

Preceding dyspnoea

Preceding headaches

Preceding palpitations

Preceding abdominal pain

Associated weakness of arm,
face or leg

Associated with exercise or
posture

Blood loss



Back Pain Red Flags



Signs and symptoms of cauda equina or cord compression

Immunosuppression

Trauma

History of cancer

Nocturnal pain

Systemic upset – weight loss, fevers, night sweats

Thoracic pain

Abnormal gait

Summary

My main goal in this presentation was to show how mechanism of trauma can predict patterns of injury.

By paying attention to the details of the trauma, our imaging threshold changes, and we can pick up injuries that would otherwise be missed, avoiding devastating results for our patients.

And don't forget to consider the most dangerous cause of that headache, chest pain, abdominal pain, back pain, dizziness, and loss of consciousness.

Thank You

