Lected on normal anatomy

**Cervical Series: medicare series**
- A P,
- APOM
- Neut. Lateral,

**for 5 view** add obliques; (Rt. and Lft.)

**for Davis Series** add flex and ext. views

**Post traumatic** most prevalent reason for flexion and extension

**Neutral Ray Target**
Neutral should include the base of the occiput to C7
with a loss of detail in the transition segment
C7 is hazy due to the musculature
injuries often occur in transition zones

**Repeat the film if need be.**
Need to be able to see pharynx and trachea

**look for**
- hemothoma,
- infection and tumor

**imaging protocols**
CT scan is next
due to availabilty and cost,
still the dominate method with injury

**Seven view Davis series**
accesses mobility and stability.
the lumbar spine napsacks to force displacement to access stabiltiy.
Look at everything. Look at intended observations last

**What’s a quality film?**
- **Anatomy** should be enclosed in the examination
  with the segment above and below;
The transitions of any spinal segment are the danger zones;

  **Must be able to see cortical medullary contrast** - big white line which is the
cortex and white mesh of trabecular bone;
This standard is the legal one.

**Have to be able to see soft tissues.**
If can’t see look under the hot light - variable amplitude light source.

**Failing the hot light test** - film must be repeated.
If you can only see with a hot light - must document

**Trachea is beneath the pharynx (?)**
- C2 - 9 mm is normal,
  - **retrotracheal space**
    up to 22 mm
  - **cervical curve reversed**
    hallmark of anatomy, spasm due to injury

  **Spasm**- can be caused from herniation

**Torticollis**
scoliosis in the coronal plane.
They respond quickly.
You can see a spasm by referral.

**straight cervical curve (loss of lordosis)**
18% of the population has had no trauma,
No c- curve vical curve - body must counterbalance this,
Uses the lumbar spine and the pelvis
this torque prevents your posture from falling too far forward.

**15 degrees when doing the cervical A - P (check this)**
Need to tilt up 15 degrees when doing the A - P,
b/c disks are oriented in this plane

**When the nodes calcify** (common)
don’t know if it is a blood vessel

**vertebral artery calcified**
can’t see the vertebral artery calcified on the plain

**2 things in the A - P**
apex and paraspinal soft tissues

**Pancoast tumor**
Pulmonary origin
it is pathologically bronchiogenic carcinoma 15% are in the apex, causes sympathetic system ablation
**e.g.** no sweating, lip droops, myosis (pupil constricted) assoc. w/ enostosis

**Enostosis** def.
Morbid bony growth developed with in the cavity of a bone or in the internal surface of the bone index

**APOM**
angle of the jaw the gonion should be parallel to the corner of the mouth.

**Dens**
Tip type 1, base type 2, type 3 intrabody,

**Mock lines**
watch out for Mock lines lateral retinal inhibition (brain plays trick on you)

**C1 lateral mass**
should not extend more than 2 mm off to the side if it does suspect fracture.

**C1 burst fractures**
Canal gets bigger thereby sparing the cord.

**Transverse ligament**
most important ligament in the body

**RA** - is a morning problem

**OA** - is a night problem

**Taumatize a joint** - you diminish its proprioceptive capabilities

**Flexion Cervical view**
Tuck the chin kdkdkd
don’t tuck the chin - will only stress C5-C6

**Penny method**
Done in health centers when ever a seven series is ordered the penny method is ordered

**Extension Cervical View** (look up)

**Oblique Cervical Views**
Good to view through the IVF chiropractic adjustment is primarily through the facet
IVFs that you are viewing are 45 degrees off midline,
15 degrees in declination

**Oblique Cervical Views**
45 off midline and 15 down to see the IVFs
**tilt the tube up**
side against the IVF is the side that you will receive
IVF is always pointed down
look up in Yochum

**C1 and C2**
**first 15 degrees of rotation** is at C1 and C2

3 causes of IVF stenosis
degeneration of uncovertbral or apophyseal joint (AP), disc degeneration (Verticle)
congenital stenosis occurs in 5% of patients (?)

**Neuronal Plasticity**
neuroinflammatory insults - can result in the radiculitis

**Pedicles**
should be lined up and on the anterior side of the body

**Pain intensity**
does not match the degree of degeneration

**Lateral Swimmers View**
if you can’t get see C7 on the lateral
look this up for positioning
mets hangs around at transitions
can’t clear a C spine if can’t see C7

pillar
part of the apophyseal joint
is that arc of bone adjacent to the bone
above and below

Right and left pillar views (cervical)
8X10,
FFD 40 inches
bucky grid
patient back flat against bucky
head turned fully to right or left and
slightly flexed.
C.R. through C4 at a 30 - 40 degree
caudal tube tilt.
(Requires 3X the mAs as other cervical
views).
Place marker on side the patient is facing.
2 sets of pillars to look at
Order a Philadelphia collar for the first
day of your clinic opening.

Thoracic Study
A  P
Lateral and
PA chest

Lumbar Spine Series
Routine A - P lumbosacral spot
Lateral Lumbosacral Spot
Right and Left Posterior Oblique
Lateral Lumbar-convexity next to the film
to do this you must look at the AP first

abdominal aneurysm
aorta - deminision is 3.8 cm at the widest
point
Larger indicates aneurysm

ectatic vessel  - vessel enlarged but not
aneurysmal

atherosclerosis  - injury to the intema
and the media

Bifurcation of the common iliacs
around L4
can also become aneurysmal

Annulus
outer posterior fibers are innervated

thoracic cage
limits sagittal motion as compared with
the L1

lumbar lateral spine
allows you to see IVFs

sacral base angle
the sacral base angle is 41.7 + or - 7.7
(In the erect posture)
supine approx. 35

Bisection of L5 vertebral - anterior 1/3
of the sacral plain

Dens wt. Bearing line  - likely to hit the
anterior 2/3 of the sacrum

Bone when stressed  - will proliferate

weight bearing line of the dens
drop weight bearing line of the dens
likely to hit the anterior 2/3 of the
sacrum

Degenerative retrolisthesis  -L3 - L4 is
most common

sacroiliac ligament  - the most powerful
the body

facet tropism
no sensitivity on plain film
can’t be looked for reliably

corticocorticoids
moderate dose steroids -bone reduction
in one year
depresses immune system,

If present with a fever- read handout

Radiology- involves histopahtological
and biochemical components

neurogenic vs. Noneurogenic
Muscle spasms alter the geometry of the
spinal column

pleuripotential fibroblasts
Proliferation of cartilage-comes from
can later form osteophytes
curve reverse in a lumbar spine
go straight in the lumbar spine
doesn’t form the reversal that occurs in the C - spine

instability
radiographic term assoc with measurements ie. disc, etc.

DJD of the spine or vertebral column
see graph on action note pages 7 - 8

subchondral cyst
results from Erosion of cartilage
enough to herniate synovial fluid in the bone

discogenic spondlyosis = spondylosis deformens

? combination today of handwritten, computer and action notes
? not a good note day

Facet Joint imaging
flexion view is the easiest way to evaluate

Know what consitutes the IVF

Entrapment syndrome
3rd component is the central canal
1. lateral recess
2. foraminal enchroachment and
3. Central canal stenosis

recurrent nerve
is nonmyelinated
branch to two levels
when they are stiumulated as stretched as occurs with aging
Sx. = diffuse poorly localized pain

PLL is a very thin ligament
espec at the L5 disc
PLL is mechanically or chemically activated

anchoring ligament at the back wall of the vertebral artery
these patients are more likely to experience protracted pain from

the disc problem
described by Hoffman

nuclear material deep in the disc
antigently unrecog material

posterior annulus - is very vascular and
this nociceptive activation will result in extreme pain

Phosphlipase A2
found in high content and is found in the inflamm pathway

Prostaglandin
notorious in producing pain in the inflamm response

inflammm steps ignite the neuroinflamm
repetitive injury like torsion forces will exert enough changes and patient will experience pain

dozen or so inflammm agents have been found
substance P is an example

Substance P
activated in the spinal cord and
activates processing in the spinal cord
acts as a threshold lowe thalamic and cortical centers interpret these as pain

Allodynia
Def. Pain resulting from non-noxious stimuli to normal skin
Receptors in the spinal cord have had their threshold lowered, pain itself can activate the pain lowering process
start with noxious stimulus particularly to nerve endings
nocipetion activated substance P lowering the threshold for pain

Ephapse
Dictionary def. Point of lateralcontact (other than a synapse) btw. nerve fibers
accross which nerve impulses are conducted directly thru the nerve membranes from one fiber to another

**Ephaptic**
def. Denoting the conduction of the impulse across an ephaps as opposed to the synaps -

Krettner def. short circuit between neurons in the cord
close relationship btw - fibromyalgia and yuppy syndrome

Not only is the disc a source of inflammation the barrier for incoming info can be lowered or raised by either_ pain or proprioception

**Ligaments and bone capsule and skin**
have a receptor that constantly feeds into the DRG and there for can participate in the above process

**herniation**
manipulation does not decrease there herniation

Regarding HVLA- best guess is that the source of the inflamm was degener_facet or an entrapment of a meniscus which causes inflamm
Due to this coinnervation-patient feels it arising from the sciatic nerve This is basis of referred pain - is looked at as a misinterpretation of the brain

**Apophyseal Joint**
capsule is two membranes
inner lining lining is a villous like material cartilage survives from inbibition

way to trigger is physical activity
Inappropriate vector- hits the articular surface in an uneven matter cracks and fibrillation develops and eventually the cartilage falls off - ergonomics

now that the cartilage is gone -so what do we do with patients ?

oral / nutrients for reconstruction of the cartilage possible but / weak

**Meniscoid picture** - in Bogduck

**knee joint**
**fibroadipose structure** known as a knee joint
if hypermobile - primary problem with a meniscoid needs to be mechanically corrected resolve the vectors to allow for the release of the meniscus

stenosis** def.of
Vertebral canal
IVF
Lateral recess (**Nerve root in the lateral recess**)

**neuroinflamm agents**
pain syndromes without compression substance P

Pathomechanics of the spine
because of the avascular way of the nucleus pulposis this substance is designed to fail and its failure is know as

desication - the nucleus just starts to dry
after MRI studies were performed it was found that this desciation already beginning in the teens

Bias distribution - causes annular wear then nucleus pulposis seeps into these cracks
dissect - spreading out the nucleus

disc herniations
rarely seen after the age of 50
60% of the weight bearing through the disc and 40% through the apop. Jt.
nucleus does not change shape during weight bearing argue this squeeze water into the end plate and it moves back during night

patients have pain standing it is due to compression flexion or sitting relieves
extension - tightens the annular margin and bulge along the posterior fibers

instant axis of extension and flexion is the center of the nucleus pulposis
is the key to the whole discussion - the instant axis of extension and flexion is the center of the nucleus pulposis
The scatter plot is less concentrated - now it is centered at the facet joint

Water cross links with the glycoprotein

picture of a discogram - this provokes there pain with injection, serves as an anatomical tool

bulge
first level of discal derangement is bulge describes circumferential exaggeration of the annulus

herniation
the size, shape and location of the herniation has no effect on prognosis
annular fragments rupture and nuclear material escapes
L4 or L5 - most commonly herniated disc usually lean away from side of herniation
This root is lifted
bigger the herniation the more rapid its resolution
Herniations patients can resslove over time
some are asymptomatic

Conus Medullaris - the termination of the cord

Filum terminale - is the end

Root syndrome - produces
lower motor neuron disturbances
reflex
dermatome and
myotome

Radiculomyopathy - hit the cord and the root at the same time
mixed presentation of
upper and lower symptoms

Caudia Equina Syndrome

Massive midline herniation is a problem at L4-5
bladder and bowel symp.input - typical with very large herniations
either unable to urinate or are incontinent
pain is very nonspecific
Pain - back of both thighs and legs
Numbness - saddle distribution
buttocks, back of both thighs, legs, soles of feet
Weakness - paralysis of feet and legs (common)
Reflexes - knee jerk active (L4), ankle jerk (S1) absent
Atrophy - both calves
Neurogenic Involvement - anal sphincter incompetence
bladder sphincter dynamic obstruction
36 hours rough window - beyond this is unmanageable for surgery
Nocieptive Irritant - not only mechanical but also chemical eg. K+, lactic acid
don't have to have trauma
incoming pain messages
nocieption is conducted through C fibers
the other pathway is processed by emotional sensors on the brain
temporal lobe contains a memory of pain (memory)
limbic system the hurt of pain (sensation)
parietal complex is the localization of pain

PAG- is where the opiates hang out - drives alcoholism

Accupunture - affects the descending inhibitory pathway (DIP)

3 of joints in the C spine
intervertebral
apophyseal joints
uncovertebral
are the sites of discogenic spondylosis
discogenic spondylosis
a term reserved for the intervertebral disc

3 Signs of Discogenic Spondlyosis
disc space narrowing
osteophytosis and
sclerosis
(D.O.S.)

**Decreased thickness of the intervertebral disc space** of C5-6
lose the disc space you see rotation of C5 on C6 (above on below)

In **C spine**- if lose disc space-the axis of rotation goes anterior

In **lumbar spine** - if lose disc space - axis of rotation goes posterior

**Discogenic spondylosis**
most common radiographic diagnosis in our practice
segmental, regional and global disturbances due to this
loose the disc space & forces go into the bone and bone
builds up making it more dense on radiographic examination
can cause microfractures

**Endplate flattened**
due to degenerative remodeling from microfractures
patient will maintain complete range of motion
**intersegmental motion** will be abnormal

many times the roof sags (re: endplates)

**Osteophyte**
an example of tissue changes under forces

**Rostral Caudal Subluxation**
First joints don't move then
**ligaments in the zygo joints shorten** - which results in
rostral caudal subluxation
as the disc size diminishes the vert. above comes down
(looks likes the vert. Below is coming up relative to the one above)

**Anterior listhesis**
problem w? degen.of the zygo joints
in the lumbar spine

According to Chuck concentrate on article that he wrote in 1989

**Went on to lecture on**
Osteoarthritis
Discogenic spondylosis
Degeneration of the fibrocartilage in the disc
Apophyseal arthrosis - degeneration of the hyaline cartilage in the facet jts

End plate - (mentioned above) flatten
due to degenerative remodeling from microfractures patient will maintain complete range of motion,
**intersegmental motion** will be abnormal

**Compressive myelopathy**
chronic degeneration of the cord

**Multisegmental degenerative Anterolisthesis**
input out of the Cspine is suppose to go to the vestibular apparatus
Age reduction of conduction velocity
instead taking 10 ms it takes 15 ms
elderly patients loose there conduction velocity

Talked about the article that he gave us yesterday.

**T1 and T2**
The mgnitization property is called T1 and T2
The T2 property is the magn relaxation property
T2 is a magnetic interaction of the protons in the tissue itself
impact on body-don’t chop the bones- we bend the bonds -no damage
**fat is white on T1 and T2 on MRI**
water bright on T2 (CSF is almost pure water) therefor
CSF is brightest on T2
fat on T2 gets a little darker as compared to T1

**T2** (if)
Time relaxation - (TR) is less than 1000
Time echo (TE) is greater than 75
TE >75
TR< 1000
therefor CSF bright white (check this)
fat bright white (check this)

GRE - will always tell you that this is a fast scan
(not sure what study this is assoc. w/)

CT - soft tissue window
Fat is black *

By controlling the magnet and the radio waves
you can identify different tissue types

Radio signals - emitted from the patient

Advanced images of CT scan
fat is black on CT
( fat is white on MRI in both T1 and T2)

Nerve root in the lateral recess

Myelogram (showed us)
(saw) extradural defect eg.
osteophyte (stenosis, and herniation due to a degenerative disease)

Intradural but extramedullary-nerve root lesions in the form of neurofibroma and meningoma

2 Intradural Ddx.
neurofibroma and meningoma
(N.M.)

neurofibroma
always in cerebellar pontinr angle
affect cn.s 5,6,7,8
vertigo, nyst, & ataxia
seen on mri
usu. Adult onset except w/ those have neurofibromatosis dz
falx & petrosal area

meningoma
always hyperintense on mri
varied clinical presentation
usu. Adult but not always
falx & petrosal area

Intradural Intramedullary glioma
syrix (fluid cavity)
epididymoma (grows off the filum terminale)

Myelograms- are decreasing in number
done in conjunction with CT( aka ?)
MRI is taking its place

Neurofibromatosis
mesenchymal problem
all have the potential to undergo malignant degeneration

Huge IVF Ddx.
neurofibroma or hemorrhage

T2 normal water bright, fat on T2 gets a little darker as compared to T1
CSF0 - almost pure water
desication - decrease in the normal content of water in the disc
black - right next to the disc - iliac artery
right next to the body
In big vessels MRI acts like an angiogram
Low signal intensity on T1 is cortex - it merges with the low signal of CSF

We don’t have a lateral recess in the spine
The superior facet margins the IVF

How does a 45 degree facet come to angle negatively ?
crunch on a pillar in extension
Over 2/3 of the pillar fractures are missed on plain film
i.e pillar fract. Most frequently missed
see them on obliques
make sure you understand intra and extra dural differentials
Exradural - know differentials (?)

MRI
no matter what the pulse cortical bone = black

Tree foil configuration is replaced by a v shaped pattern
suspect pedicles are too short ( these were my words)
can be totally asymptomatic until the cord is bumped

**Canal stenosis** (ratio method for determination)
if the ratio is not one suspect canal stenosis
procedure: measure anterior to superior on the vertebral body then from the posterior aspect of the vertebral body to the neural arch

**Canal stenosis** (prevalence)
Congenital canal stenosis (more common)
high instance football players

cord elongation
occurs during flexion
about 2 mm in the lower C/S
Japanese first to see

**DISH**
must include 4 segments and synovial component must be normal ie disc space is preserved D1S and PLL ossification associated
**SI joints**
not appreciable on AP spine radiograph degenerative changes result in narrowing

**Trauma and arthritis** - become the same thing after a while

**Ostitis Condensens illi (OCI)**
common in multiparous females (also seen in males) osteoblastic activity away from the margin hip joint incompacitates patients-causes heart and lung dz due to inactivity

55 or 60 yoa people start to cut down activities
**radiographic does not indicate treatment** as far as the hip function does

**medial compartment of the knee**
makes a varus deformity of the leg What s.t. structures would this be? 1.01**Patellar to insertion** patella body should be the same

**patellar alta**
if the patellar tendon measures longer than the patella you probably have patellar alta
patella has the thickest cartilage in the body

**Gave us 2 handouts**
Pathophysiology of stress fracture after fracture there is a healing response bone healing appears on X-rays as an area of sclerosis

**spondyloysis**
most common stress fracture price to pay for the athlete that does doesn’t comply

**Osteoporotic Fracture**
doesn’t call it a fracture because is normal part of the aging process can’t find someone of age with out this problem (check this) Not a normal fracture but at the same time it is Not pathological Known as a universal disease. 32 yof w/ osteoporotic fracture of the hip considered pathological

**Page 3 radiographic evaluation of fractures**
Listing C3 on C4 you list the distal to the proximal if fracture radiates everything distal to this is considered to be fragment

**Angulation - convex or concavely-fracture with 20 degrees of angulation**

**Overriding fragment**
sometimes fracture fragments override ie. where one comes next to the other pediatric population - is no big deal

**Shortening and abnormal rotation of limb**
are strongly specific for pain
more the deformity the higher the poss for fracture or dislocation

**Reduction fracture**
over one half to one third
bones must be pushed together
Complication of healing fracture with cast
got to be immobilized - if reduction
good and stabilization
In a 5-6 wk.s- callus formation (bony growth around a fracture site)

**suspect nonunion**
If calculus not there suspect nonunion
(not healing union)
means the fracture has stabilized and begun to heal

Ribs are never - immobilized- usu. 6- 8 wks to heal but hurt long time

**Clinical significance of a rib fracture**
no problem unless there is a complication like pneumothorax

**What is reontgen evidence?**
on the inside of the cortex is osteal membrane known as the endosteum
on outside the other one is called periosteum
In delayed union or nonunion the fracture line may be unioned

**pseudoarthrosis**
should not be there
results from the nonunion of the fragments

**ways to interrupt fracture healing**
alcoholism
malnutrition

**Bone artrophy**
also known as osteoporosis - immobilization osteopenia (disuse),
prompts calcium and phosphorus under the influence of parathormone

**avasular necrosis**
eg in scaphoid bone fracture due to a fall
on the outstretched hand, ischemia leads to osteonecrosis

**angiogenesis**
new vascular supply

**head of the humerus**
has 3 main blood supplies
effusion in a joint tamponade and end up with deprivation of blood flow and leads to osteonecrosis

area of the impact is undergoing **induration**
(induration def. The process of becoming hard) soft tissue trauma maybe by the end of the 3 or 4 week, can see it on radiography
aka **myosistis ossificans traumatica**

**myosistis ossificans traumatica**
discontinue ultrasound or massage because it causes further bleeding
use the rice method
ideopathic - why these bone cells are out in the soft tissues

**DDX. for bone growing in soft tissue**
mets or sports injury postinjury

**stress fracture**
produces bone in bone

**Fat embolism** - if fracture a big bone eg. fracture of the femur
marrow comes out into circulation
can get caught in the pulmonary artery

**open fracture**
handout on “Healing of Bone, Tendon and Ligament”

**Hemotoma**
first phase of the healing process
if you don’t clot or form hemotoma you don’t have the adequate framework to heal it (watch out for anticooag. Q.ustion)

**Hemotoma becomes organized**
means that the fracture gap has started to decalcify

**Repair phase** - see interdigitating fragment
many people argue that reorganization is over and that over attempts to repair ie,
excessive proliferation of cells to repair
which this is one concern of bone repair

Vascular supply brings in the
fibroblasts
cartilage cells make cartilage and the
fibroblast is pleuripotent
can make the matrix for bone cells
makes of osteoid and chondroid matrix
they stay as fibroblasts to produce
collagen

this is the reference in C for of
Mesenchymal in origin
Letter E - this invasion is known as
callus - underline the term
now get immature form of stabilizing
tissue

Next page letter H -
massive callus and now at the repairative
phase
the remodeling phase
Increase activity in a fracture on x-ray
for about 2 years in an extremity

Osteoblastic activity is stress mediated
it is a pisoelectric phenomenon put
strain on bone and it will produce an
electrical potential

either osteoclasts or osteoblasts -
depends on concave or convex bump
Polarity of the fields mediate the activity
of the neighboring cells
Biopotentials or strain potentials -
Fukada and Yasuda, Becker; concept of
the body as a conductor

PMFs or DC current
activates the forces recognized by the
above Researchers

Twelve Significant Signs of Trauma

Abnormal Soft Tissues:
a. Widened retropharyngeal space 7-9
b. Widened retrotracheal space to an
outside limit of 22
c. Displacement of prevertebral fat stripe
d. Tracheal deviation and laryngeal
dislocation

7 - 9mm at C2 is significant of
dislocation
respiratory problems result from this

fat stripe - anterior to vertebral
called the fat stripe
very hard to see

If a and b abnormal then c abnormal

Blood like water will not stay in one place
If it can find away to move it will
If stay a long time it will eventually put a
whole in them

Tracheal Deviation Case: athlete struck
in trachea⇒hemotoma
be very aware of tracheal deviation and
related respiratory problems

Entabation Tube (ET) tube has to be
placed until the hemotoma has resolved
- called etubation

ET is not the same as ventilation

Abnormal Vertebral Alignment:
a. Loss of Lordosis
b. Acute kyphotic hyperangulation
c. widened interspinous space
d. torticollis
e. Rotation of vertebral bodies

Just say the curve is increased or
decreased or reversed
the abnormal finding in misalignment is
an abnormal ligament

torticollis
is the equivalent of scoliosis in the C
spine,
is an involuntary response

rotation of vertebral bodies
best stated as isolated vertebral rotation

segmental rotation of a vertebral body -
can't rotate in isolation
must alter the segments above and
below
continued segmental rotation will lead to
rotatory dislocation (check)
Abnormal Joints:
a. Abnormal middle atlantoaxial joints
b. 
c. widening of the apop. jts

the first 15 degrees of rotation are C1, 2

Abnormal middle atlantoaxial joints
The physiological conseq - is the fastest way to get input into the brain
the fastest way to disrupt this is in reference to the transverse ligament
RA is most common source- never consider this without radiography to confirm stability
20 % of Down’s Kids will have this

abnormal IVD
refers to disc and disc space specifically widening of the IVD
The target of that particular mechanic we can predict the possible outcomes

What would happen with extension and rotation of the articular surface?

Looked at slides - The trachea is always below the cartilage

Bursting comminuted fracture
can cause bleeding due to an automobile accident

following radiographic examination by a chiro the person was sent to the hospital by ambulance

Fat on T2 gets a little darker (check this seems to conflict w/ above)

Longest syrinx ever reported was 22 segments

Pulse rate of CSF- is the cardiac pulse rate

only accept 3 mm above and below
if greater tornuchal first, then interspinous and then flavum

Rust Sign
Do not flex a rust sign

hard collar and transport

Gradel Interspinous Pain on flexion
put the neck in flexion and when palpate find tenderness

Grade II - hyperflexion - increased interspinous space

*(check this section carefully)*
three hyperflexion - with nuchal injury and flaval injury

steep angulation
the limiting translation injury is 3.5 unstable configuration - greater than 11 hard collar this person and transport unstable - what is holding the head on without any movement spontaneously dislocate

fatalities have been reported with no movement

spine boards are used to transport
assume a spinal injury - until proven otherwise

w/o tx. → is progressive kyphosis

eventually become goose neck

HVLA adjusting contraindication

Untreated neck → fatality or perm disability

muscle tone resists unstable configuration until it is no longer sufficient

more than 2 is from a segment above to below is abnormal

never ever move a neck until you have done a neutral lateral

C2 and 3 facets angle downward

unlike the rest of the Cspine acute anterior herniation - when the ALL rips of the annular fibers which are delicate - the real problem is sympathetic chain ablation
due to the fact they run up along the margin

goiterous mass enlargement
can cause the trachea to deviate

rotation is to the convexity

AP open mouth exam. Pt. cannot rotate to one side ie.
cock Robin appearence

Atlantoaxial dislocation
may present as non resolving torticollis
can lead to destabilization of the atlantooccipital joint

**other etiology for torticollis**
a form of distonia
neuro - disorder
infantile form of torticollis

**If see an IVF AP film**
then the vertebrae has rotated a bunch
to allow this
this pt. has a wrung c- spine & an IVF is looking at you

**apophyseal joint arthrosis**
could cause an anteriolisthesis

**Bowties sign (?)**
dislocation (Goes w/apop. Artrosis. I think)

**locked facet**
zero range of motion active or passive
think dislocation
this is a surgical reduction,
is an unstable segment and its management will be stabilization

**atlantodental interval**
5 mm in adults
3 mm in children
more important is the spinolaminar alignment

**Grade III** - spinous widened & jt space uncovers
this is an unstable neck,
stay partically intact but they pull apart the capsule has been compromised

**Grade IV** and dislocation
occur unilaterally or bilaterally
may occur with rotation and flexion
forward projection of the angulation should not exceed 11 degree angle
11 degrees is a very steep angle
3.5 mm of translation - in order for it to advance 3 mm on the line above there must be a dural compression

**RULE OF THREE**
the cord is 7 mm in diameter

the DENS is approx 7 mm from front to back
leaving 7 mm of space 3.5 in front and 3.5 behind
a 6 mm ADI guarantees that the patient will have cord compression
the compensatory system of the cord is asymptomatic

The odds of only 1 injury from a motor vehicle is 1out of 3
the average number of injuries is 2.3

This was all on a table on an overhead.

C2 and C6 - area has the most injury

**Rules**
likely to have more than 1 injury
most likely 2 and 6
the vertebral arch is the one most often hit
most are extension injuries

**Clay Shovels fracture** - Avulsion of the spinous process of C7

**What fracture in the vertebral end plate?**
avulsion and compression

**compress the vertebral body**
Flexion & extension (check) if then in flexion
when neck goes into flexion violently decelerating
what part of the spine undergoes ddkdkd as a rule posterior tensile, and compress thing in front like vertebral arteries

**opposite in the opposite**

**PLL more likely injured** - in flexion

**patterns of dens fractures**
tip
base
and into the body

Locked facet is a dislocated spine

**ALL can be injured** -in extension
target of injury based on mechanism

arch
most likely If multiple energies
site of injuries is usu C6 & 7

differential in the ROM is responsible
every time you see changes in the plane
of biomechanics
start to see osteophytes at T12
The transitional forces change quickly

Degenerative disease
how often do you get C7, you have to
have this, fractures hide here

Of the vertebral arch fractures number 1
in prevalence
most common target zone is 2 and 6

The arch has the highest likelihood

Most commonly injured is facet (this is
the part of the arch that breaks most
often)

Jumping facet means dislocation

Most likely to see hyperflexion at C5
and 6

Spinous on flexion is greater than 2 -
indicates damage to the ligaments

See dislocation as a soft tissue injury
- may have death as a outcome very
serious

Grade III facet unstable
that is greater than 3.5 mm with 11
degrees being the angle

Soft tissue complications of
musculoskeletal injury
See Table 9.9

He will submit 3 questions from the
lecture today
one from the neck
one from the pelvis or knee or shoulder
This is all in Yochum page 681 or 684 he is now to sure

Lateral cervical is the first thing we take

look at:
retropharyngeal interspace - C4 to 5 - 20
is allowable and the retrotracheal space -
larger than 20 blood, pus or cells (check
these)

asymmetrical tearing that can be
viewed on the AP lower cervical
set belts can make

Wide interspinous space - the interval
is the one above and the one below
greater than a 2 mm variance

Abnormal joints
best see differences btw flexion and
extension
may want to stop the exam

widened intervertebral disk
In the adult the endplate stays with the
body during a shearing injury

Bookend fracture of the pelvis
usually have to separate one or both SI
joints
intrapelvis hemorrhage is the most
common complication due to laceration
of a blood vessel, there can also be
bladder complications usually do to
bony injury, laceration at the rectum

Knee injuries
simple to biomechanical injuries
medial joint instability

Salter Harris Fracture of the Knee
MRI - is very sensitive to edema, very
bright on T1 and T2 weighted images

MRI has taken over imaging of the
knee
Irregular signal intensity within the
proximal tibia is indicative of a tear of the
anterior tubercle with tearing of
trabecular bone
Facet uncapping or facet perching
demonstrated in a flexion view dkdkdkk
in T1 if you see bright white this is
indicative of cord bruising and hemotoma
complication this could resolve,
common sequele to cord trauma is a syrinx spinal canal is really in the cord in trauma this has been know to herniate they an get a shaw pattern

**MRI** is great for determining a syrinx

One out of 100 people end up with headaches for life due to sensitivity to the contrast agent

Diastasis of a suture skull fracture complications headaches due to pressure from hemotoma, you would want to order a T2 weighted MRI

Why does the humerus go superior =

**Wednesday, October 30, 1996**

you do not view sydesmophytes in degenerative processes know the difference between the syndesmophyte and osteophyte

The disc space is affected in DISH, by definition the SI joint must be okay but some patients do not read the testbook

The only way to tip a dens is fracture it now the different types of dens fractures the tilt should not be more than 3 advise CT definite if it is 5

If base is fractured type I, most common at 65% look up type III

Reformation or reformatting is the process of lifting up a view and placing it by itself

You fracture bones before you take out the transverse ligament

The more the listhesis the more likely the injury

**Thursday, October 31, 1996**

study trauma it is the core of the exam

Table 4 “Fingerprints” of vertebral injury

1. **Flexion**
   1. compression, fragmentation, burst vertebral bodies
   2. Teardrop fracture
   3. Wide interspinous spaces
   4. anterolittheses
   5. locked facets
   6. narrow disc space this is acute

Would you expect disc herniation to anterior or posterior in flexion injuries

**posterio**

II. **Extension**

1. Wide disc space
   2. triangular avulsion fracture- can occur in flexion or extension
   3. retrolisthesis water seed example- if extend enough it will drive the dislocation posterior question wording

4. neural arch fracture-50% this is the most common fracture of C1

antrolisthesis with normal interspinous space and spinolaminar line done through a neural arch fracture or unilateral facetal dislocation

III. **Shear**

1. Lateral distraction - distraction means you have torn enough to have a grade III -the facets can be next to one another
   2. lateral dislocation -Transverse process fractures

IV. **Rotational**

1. Rotation
   2. Dislocation

Facet/ pillar fractures the neck cannot sustain rotational forces

most victims of air crashes are killed by facet dislocation due to abrupt impact

patients who have cervical spine injury pillar angles should be at 45 degrees look up a pillar vie

Locked Facet, dislocation grade III dislocation - facetal unilateral
In an acute setting the cord bleeds very easily.

Next slide multilevel congenital stenosis the person doesn’t have a lamina, no spinolaminar junction
Called **Congenital Spinal Canal Stenosis**

**Achondroplasia**
The cord in this patient is always compressed - ever since birth
Discussion went to achondroplasia no extension moves with these patients
never be able to determine this w/a clinical exam alone
not that the lamina is not there but it is too short.

**Rugby and Football players**
this was reported early on in Rugby and Football players
5% of general population and up to 30% in these individuals
this cord looked like the oscar miar wenor sausage
cortex is very dense crystal & water doesn’t move around well

Next slide **high signal intensity in the cord**
**Chordoma** - nothing to do with the cord
t is a tumor of the nucleas pulposis
this slide was hemorrhage or contusion
in a week her leg stopped working, how do you determine the difference from a syrinx

**Chordoma vs. Syrinx DDX**
typically a cervical spinal injury flexion and extension
syrinx can develop 18 to twenty months after the injury

**Contusion** is only edema in the cord sense
occurs almost instantly
which has a better prognosis -contusion or hemorrhage - the bigger the loss of blood to cord or brain the greater the injury
would know something 48 hours

the bigger the herniation -the faster they usually resolve-

**If neural signs are unrelently worsening**
there is zero prognosis and the outcome of the case
know there is a herniation and there is a soft tissue case
more complex requires higher frequency of care

**Friday, November 01, 1996**

Criteria for joint injury
secondary ossification centers are not present in a 10 year old
understand pseudosubluxation of childhood

The base of C2 can still be fractured while it is cartilaginous
Because of the high range of motion in the children in the upper C/S they get hurt

**AAP Recommendations**
Down’s Syndrome
If atlantodental interspace is 4.5 no sports and if the they have neurological signs this is even worse

Role of radiography in ruling out instability
it is not very sensitive
Fusion - interwire stabilization is not always effective
any patient undergoing HVLA should have same studies

Angiogram - showed us a digitally subtracted angiogram
This is the normal caliber of the vertebral artery
segmental narrowing of the vertebral artery atherosclerosis, dissecting aneurysm, or spasm
The cord has a period of 72 hours
This vessel recovers without complication
The sooner the patient is treated with thrombogenics the better the outcome
omen under 40 with hypertension and on birth control are in danger of having a problem especially those who are dizzy

**Cerviogenic dizziness**
look for the risk factors in young not old people
T/S compression fractions can occur in flexion
severe cord injury can result from thoracic spine fracture
*Scheuermann’s Disease* anterior vertebral wedging of 5 degrees of more between three contiguous bodies in worst case scenario it produces a permanent kyphosis
increased growth hormone defective
Your posture and your additudes are linked
you see schmorl’s hernations this is the most common herniation it goes through the growth plate
If you knock off a piece of cartilage can be termed a limbus former piece of cartilage that looks like a fracture it matures next to a schmorl’s node
hyperextend the T/S they have to use isometric exercises
55 degrees of angulation consider a brace they are developing a point in the T spine
every day cases of schermann’s doesn’t warrant this
Rib fractures hang around the flank Ap compression or blunt injury, if a blow strikes from the lateral aspect you can develop a pneumothorax
Typically impact fractures are the ones you have to worry about decreased breath sounds and laborous breathing
lung field density in a pneumothorax white line representing the pleura, so a pneumo will produce a visceral pleural line outside which can have hair impact blows to the chest falls down steps, will give rise to abdominal pain
laceration of spleen and liver avulsive types are less likely to do that
*Afternoon Hours*
Gastritis biopsy using an endoscope to guide us in this is the way to have a defin dx
Only 15% of the patients with helicobacter gastritis go on to produce peptic ulcer disease

The H2 inhibitors do not work accept for symptomatic
Cytomegalovirus increasing cause of gastritis includes HIV poplutation
burns develop high incidence of burns Patients with significant portions of the body burns develop gastritis in very high percentages the percentage has to be over 15% he thinks
normal tissue, or irritation to normal tissues
3 types of acute gastritis action notes page 21
signs and symptoms of gastritis these 2 conditions are more likely to produce a positive hemoccult
if they vomit might see bright red anorexia appetite suppressed
Give them food that is easy to digest both foods that won’t delay gastric emptying no fat soup whole vegetable stalk
Chronic Gastritis fibrotic replacement
3 main categories mucosal layer is thick, areas of hemorrhagic tissue showing through gastric atrophy strinking of the whole stomach complications end stage fibrosis 10% higher incidence of gastric carcinoma patients with achlorohydria key component to developing pernicious anemia
first start with chronic gastritis with fibrotic replacement eventually leads to pernicious anemia Chronic gastritis tend to be less symptomatic than acute We generally have a bleak prognosis in alcoholic patient may get to rock bottom
Giant Hypertrophic Gastritis (Menetrier’s Ds)
Hills and valleys thicker hills and smaller valleys Radiographic appearance much more serious

*Tuesday, November 05, 1996*
He always asks something on the flow chart
**CG plate number 4473**

Roughly 2 years you have to translate after the fracture, most cases halt after bone maturation, this does not mean that they cannot become unstable.

The reason they go into nonunion is that they are asymptomatic if we catch them we can brace them and they will heal like any other fracture.

The spondylo date has nothing to do with automobile accident these happened back when they were a kid.

Before the union separates too far one in twenty people have this problem, we can have a tremendous savings.

If the spine is unstable it will go back into traction.

Loading you can see instability.

**Thursday, November 07, 1996**

3 arches exist across the wrist joint look up

3 the distal aspect of the proximal row

3rd proximal aspect of the distal row

Pisiform can be broken in martial arts, can undergo necrosis.

Commest fracture of hand is the scaphoid, most common dislocation is the lunate.

The hand and the wrist joint is the second most common radiograph in the US, the chest film is the most common.

Sclerosis with a fracture line is called nonunion.

TFCC need an MRI to visualize this, it is a little cushion or meniscus.

Osteonecrosis fragment with large is collapsing, this is known as SLAC (scapholunate advanced collapse).

The capitate moves proximal with every flexion of the wrist like a battering ram of a particular ligament I did not catch the name.

Negative ulnar variance what happens with ulnar positive variance raises risk for degenerative changes of TFCC.

These complications all arise from mechanical impact of ulnar deviation.

TFCC triangular fibrocartilage complex.

TFCC is stabilizer of the ulnar side.

1.2 mm radiographic dx creates a big problem for carpal bones and TFCC.

Bayonnet weapon which is a cutting edge is is a congenital variation or due to posttraumatic injury.

Major joint injuries of the wrist carpal action with injury.

Dorsal Perilunate Dislocation clinical pearl 10 days to surgically help these people or the problem is permanent.

We want collinear alignment.

Must remember the three arches.

When the arches are broken you need consultation right away.

There is a ten day window for dx of the wrist.

**Friday, November 08, 1996**

Three lines of mensuration that apply to injury, can’t leave wrist pain undiagnosed.

Detection or the sensitivity dkkdkd.

MRI or CT two camps on this issue.

Bone scan very safe dose comparable to a 5 view lumbar series on old screen.

Osteoblastic activity increases metabolism and blood flow this is why it is hot on the bone scan.

What is the agent used technecium 99.

How does the isotope tag itself no one knows.

In carpal tunnel syndrome you would expect the thenar to be smaller due to atrophy.

If you put a manometer spike on flexion and extension.

A hypoxia in a nerve triggers inflammatory biproducts.

A root inflammm syndrome may produce a double crush syndrome.

What ligament stabilizes the thumb.

The ulnar collateral ligament.

The number one ambulatory fracture is that of a phalanx.

Showed a picture of a fracture dislocation.

More than 10 degrees of articular fracture ortho consultation.

Cartilage disruption is the basis for delayed osteoarthritis.

Showed us a picture of a salter harris fracture I.
The most common fracture in the 4-10 age range in the radius is a torus fracture; it is a significant fracture. Torus is a type of impaction injury. Carpal injury is spared when the radius fractures. RSD due to a nonunion collar's fracture.

Eponym named after Sudeck. Sudeck's atrophy for RSD. The repetitive microtrauma avulsion of the medial epicondyl epiphysis. If joint doesn't fit properly uneven wear and tear. This joint can't ever be normal.

Tuesday, November 12, 1996
Talked about skull radiography. Most of the time on the internal table skull or the membrane the membrane is going to move the bleeding pressure is 120 mm of mercury brain is moveable jelly. Stroke is a parenchymal problem. The malignancies that go to the skull go to the femur think blastic and lytic of the femur. Infection or neoplasm may effect the skull. Both Paget's and Fibrous Dysplasia likes the face. Osteoporosis Circumscripta the headaches come from the first stage of Paget's. Bone turn over is abnormally high. Type of dementia assoc with Paget's. Next Phase is blastic or mixed phase. The third phase is the cotton wool appearance occurs around the pelvis also. Problem is basilar invagination.

Basilar invagination is the point of the hard palate taken back to the opisthion. The posterior arch of C1 is occipitalization nonsegmentation of the C1 arch. Occipitalization often has the anomaly assoc with it of basilar invagination. Towne Projection is the forth projection in the Skull series the best view of the foramen magnum. This patient only has half of a foramen magnum due to foramen magnum stenosis. Consider MRI if the patient has invagination to see what degree of compression exists. 11 mm of basilar invagination. Alkaline phosphate would be active in this disorder. Poorly fuzzy margin is characteristic of cortical bone. Shoed radiographs women had breast cancer, 60% have a skull mets, headache pain. What metastatic carcinoma sites are lytic rather than blastic lung, colon, kidney and thyroid, breast is mixed. Nasopharyngeal carcinoma is common in pipe smokers.

Shoed another radiograph person had headaches lots of blastic disease these are very painful, prostate cancer was the primary. What are the lucencies those are vessels meningeal middle meningeal impressions on the inner table of the skull, this is a normal radiographic finding. Prognathic mandible the jaw is way in under bit, the mandible with reference to the maxilla is disperic.
The brow is very puldgy one of the few disorders that increases the joint space
Osteoarthtitis haunts the acromegalic
The pit gland has overgrown and the sella is large 14 by 17 mm this is the max for normal
The sella is very sensitive to pressure two things intracranial pressure increase of any kind, or a pit tumor
May occur inside the pit or from a pulse outside
Sellar enlargement or sellar erosion may occur from sites distal
When the CS is performed always take a look at the sella, once a year we will pick up a sella tumor

Tuesday, November 19, 1996
Skull 409 87
pages 1151 and 78
5 sequence soft tissues, skeleton, central shadow, hila and lung fields
soft tissues refers to structures on and not in the chest
region of soft tissue in the cervical spine
everything around both sides of the patient comes into scrutiny
Calcifications are seen in the neck Axilla calification nodes calcify due to old infection
soft tissue nodes around the chest and not in the chest
Sometimes after carbonated soft drinks can elevate the left hemidiaphram
Carbonation is in the fundus of the soft
by definition there will be torque in the spine of a scoliotic
Each of the ribs are examined in succession
every time you do a search pattern you will superimpose the ribs on them
Mediastinum cavity is broken down 3 compartments the anterior media is from the retrosternal space to the pericardium every thing btw the sternum and the heart most fat, vessels and nodes, arteries and nerves in this compartment, middle mediastinum back to the anterior one third of the column remaining two thirds constitutes the posterior mediastinum

middle mediastinum heart, great vessels, esophagus, pulmonary vessels
Look up the structures of the mediastinum
Right side of the heart is right atrium
The right ventrical is really the right side of the heart that ventrical drains into the pulmonary trunk or pulmonary conus showed us branches of these arteries
The left pulmonary artery is higher than the right if right higher than the left it is assumed to be the result of atelectasis pulling the vessels upward
Blood has the same density of water or the heart on a CAT scan the densities are very different
The eye can appreciate 32 shades of grey
The computer can separate out 2000 shades
The ascending aorta gets blood from the left ventricle which receives its blood from an artery or vein peculiar aspect of the dkdk
L4 into the common iliacs this is the order of the aortic posticiotn and then it goes to the aorta as we age all of these relationships change without evidence dkdkd, increase in BP is compensatory for a decrease in stroke volume
Tortuosuty the aorta on the ascending side will acutally swing out before it comes through this is not an aneurysm this is an aging change where the aorta is attempting to straighten like a hose see this on all people depending on there hx
The older the patient gets the more prominent it becomes
The mediastinum should be one half btw 50 55% is the width of the heart shadow in an adult
This pump beats 2 billion in a life time like any muscle in the body it must be conditioned it has extreme benefits for cardiac function the blood supply to the heart comes off the aortic sinus this is due to failure of perfusion this is the basis of the leading cause of death in the US
every 20 seconds some drops dead of a heart attack
collaterals grow and keep the person out of trouble until they become disease
E stress good news can be a source of problems must get control of the persons life styles
Starving myocardium under the strain hypertrophy until these patients enter cardiac decompensation arises by enlarge from reversilbe events
Cardiac failure without sufficient multiorgan failure
Clavicel the more asymmetry the ribs are in an oblique position and the ribs are rotated.
Wednesday, November 20, 1996
Continued with the chest x ray search sequence
Second phase is skeletal
Third central shadow
Forth is the hilum
Hilum vessels and nodes, the most common cause of death due to cancer in the US is bronchogenic carcinoma
One of the many phases of bronchogenic carcinoma 15% occur in the apex
2 3 cm soft tissue density is located in the lung field, is always an anomalous finding
If nodes lumped together it is called hilar adenopathy
Metastatic disease may produce hilar adenopathy
Bilateral adenopathy is typically infectious in origin
Bilateral hilar adenopathy of equal size and peritracheal these are structures seen on a T spine exam
This is the 1,2,3 sign, indicative of sarcoid look this up
Bilateral asymmetrical lymphoma is in the differential
The presence of sarcoid the enzyme renin angiotensin ACE is elevated in sacroid, but many patients go to biopsy
Hilum gets a lot of attention
If patient has a dense hilum and it is not adenopathic what's left vascular disorder like pulmonary hypertension causes increase size of the vessels
COPD above is a common finding
The alveolar walls degenerate the capillaries in the interstitial walls degenerate
COPD is hard on the heart
Smoking causes a depression of the bodies anti inflann mechanisms
protein distuction follows in the wake of protein destruction, the heart gets large on this side and will eventually spread to the other side
What is the most common cause of acute kdkd pulmonary emolism the patient has a few hours and then dead they look like they are having heart attacks kills 40,000 people a year
look up the definition of cor pulmonale
The parietal and visceral plura move with breathing
fluid is something similiar to synovial fluid
In the 5 phase we need to cover the entire plural surface along the edges of the ribs and scan across and look at density the density leaves the chest wall
Consolidated Lung the density should be semetrical
the Horizontal fissure is seen in the anterior rib, it is the only fissure seen in t dkkddkdkdkd
If it elevates it becomes visible because fluid raises it up ateletasis keys on the horizontal fissure not seen on the image
When we look on the search look for abnormal decrease look for the presence of a soft tissue density metastatic disease pulmonary, third is granulamatous disease typically histomplasmosis
the above is the differnetial for a solid pulmonary nodule anywhere in the lung
Pulmonary mass is greater than 3 cm bronchiogenic carcinoma, metastasis and infection this is the big brother of a pulmonary nodule
Threats from the heart arrhymia, the vasculature to the heart and the valves and muscle to the heart these are
the problems we will all some day face with the heart

Mammography this examination is the only means by which breast cancer may be palpation skills best skills at this is a gynecologist palpation is still 2 years behind dx by radiography by congressional law these can be performed on demand that is mammograms use to be doctor had to sign a slip but no more
If this trend is maintained breast cancer may be a normal finding
High mass and low kvp on mammography to produce high contrast to the breast tissue
Order of 28 branches in most people from the first branch in the lung asthma blocks a massive volume of lung, tumor tends to block the segmental bronchus right middle lobe 2 segments typically under the 20 25 year mark
The wastes in our environment vessels on a chest film are from pulmonary artery can't see coronary arteries on radiographs without a contrast agent.

Thursday, November 21, 1996
The left pulmonary artery chest film from perspective sksksk
Spent alot of time on the vessels around the heart and lungs not sure if they are the arteries of the heart
They branch until they are small capillaries around the vein carries it back to the left atrial appendage
Subclavian artery occultus just proximal to take off that is high grade stenosis of the subclavian artery, comes down the basilar and then to the vertebral artery backwards and supplies the rest of the subclavian this is known as the subclavian steel
Look up Steele Phenomenon
Pelvic Pain when walking discomfort and dizziness
Posterior left side, and anterior is right side
Ecocardiography is ultrasound of the heart extreme percision can be viewed in real time uncoordinated movements can be a big problem

Filling of the right side space right behind the sternum
SVC draining into the right side
Angina ecocardiography to assess damage to the wall, and angiocardiography to look at the vessels to the heart
LAD called the Widow Maker
Many times the first symptom is MI often stress related and triggered Early Monday Morning is the greatest chance of having a heart attack stress is thought to produce emobi when arrives at the LAD you have heart attack occlusive changes may be spasm and embolism can differentiate the two the patient has serious vascular disease
By the time the patient has occultus they are 75 percent occluded
Colateralization can be improved with exercise the patients should be evaluated with a stress test before a rehab program
Rib Notching why would it notch due to pulsatile hydodynamic pressure from a vessel, with beating due pressure erosion
Erosions that are saucer like due to high pressure in the system due to coarctation of the aorta
Like the aorta in or at the arch congenitally, backs up into the intercostal system it takes years to do this
Azygous of AZ this lobe arises when the AZ arises in the lung causing an invagination in the lung the AZ lobe is an example of an anomaly always cuts down in the right apex comes from when goes down the lung rather than the mediastinum
Nothing significant the lung is just anomalous
There are 1 segments on the left side
Right 4 upper and 4 lower
Phase of the search pattern take heart widest on the left and right cardiac ratio if greater than 50%

Second Hour
How is the chest studies in the mediastinum CT with a contrast agent
What else can do this to a hemidiaphragm atelestasis can draw a
diaphragm up it never depresses it always pulls up
Pulls structures toward the side of atelectasis cancer until proven otherwise in a forty year old and older it is cancer until proven otherwise infection or spasm can elevate a hemidiaphragm mass underneath pulls it up unilateral diaphragm
Look through the heart shadow Fibrous tissue and calcification old inflammation or an old process Atelectasis means there is incomplete inflation of the lung, because of obstruction of a bronchus Scar form of atelectasis the air distal to the obstruction will eventually be absorbed, in that circumstance the alveoli collapse resulting in the displacement of structures The direct sign is fissural displacement these are referred to as direct sign know the difference btw direct and indirect atelectasis Atelectasis is the leading cause of death due to cancer that is bronchiogenic carcinoma most common manifestation is atelectasis
13 % prognosis for central bronchiogenic carcinoma
Tuesday, November 26, 1996
What is the worry with atelectasis trachea and mediastinum is not where it should be The basis for atelectasis is obstruction of a bronchiole pathway What is signifiance of bronchiogenic carcinoma Tracheal displacement a hemidiaphragm and the fissure
If this were a C spine examination trachea deviation instead of aeration this would raise consideration for a chest examination Contrast is an important component to determine vascular from nonvascular Infection more chronic is tuberculosis may go months with out diagnosis and treatment AN opaque line vein of azygous circulation this represents the fissure, a little lobe all of its own
Eventually calcific densities represent granulamatous infection common in the region The absence of a boarder or failure silohhette sign failure or absence of a boarder when air is replaced in substitution of the air Sil sign loss of a boarder contiguous with a pulmonary infiltrate This is one of the most important signs in skeletal radiology Failure to identify a boarder is a sil sign What does the arrow indicate diaphragm The disparity of the diaphragm from one side to another should not be more than one interspinous space Diagnostic pneumopertioneum air was insuflated into the diaphragm Pulmonary mass greater than 3 cm carcinoma, metastasis or abscess Massive infiltration of the alveolar airspace by tumor In order for clavicle to be lifted up this is the apical lordotic position by angulation of the tube or by posture of the patient easier to just move the tube Anytime a shoulder series or Ts spine series demonstrates ddkdk PA and lateral chest should be obtained if you are sure it is there then do chest series 15% of the time bronchiogenic carcinom hides in the lung apices If cartilage calcifies it will look more pronounced and it is an incidental finding costochondritis does not have a radiographic finding The non smoker has a worse prognosis, because the doctor usually does not think it is significant Solitary bronchiogenic carcinoma, met carcinoma, non calcified granuloma this would be the best news About 30 % survival rate 5 phase lung search sequence calcium is the major differentiating feature btw kdkdkdk There is a way to quantify the doubling time of a lesion the presence of an old radiograph magic number is
2 years greater than 2 years is outside the hxs of a growing malignancy
1 year interval is not enough time
If only one X-ray you need a CT and a consultation
something on the chest can appear as if it is in the chest something like chewing gum
Mets that go to the chest reproductive, prostate testicle ovary uterus breast cancer, and lung mets to lung
Mets to the lung is what kills children with osteogenic carcinoma
The right hemidiaphragm phrenic nerve irritation only a part of the diaphragm has a bump as a result of pressure in the peritoneal cavity, you know it is congenital when on the lateral it is anterior elevation, it has no clinical significance need to determine if it is moving the phrenic nerve may be impaired
COPD flattens the diaphragm the lung has too much air and forces the diaphragm downwards

**Tuesday, December 03, 1996**
Dr. Golden came in to lecture today. This lecture has 3 parts chest radiograph pitfalls
Atelectasis is one of his favorite things
Next slide calcification of the azygous vein
Next slide large radiopaque mass in the lung, hard to tell if right hemidiaphragm or mass, the most definitive dx is intraperitoneal gas filling, if it doesn’t fill on one side this indicates may by tumor, in this case it was bronchiogenic carcinoma
this was a review of Kettner’s stuff
Today’s new stuff
Next slide hyperinflation tends to give you a black lung, if take picture with COPD and you think they are over penetrated, this slide was tissue on one side a breast was removed and the other intact side it was giving the look of an infiltrative process
Next slide solitary pulmonary nodule and abscess are cousins ?????
Turned out to be a left nipple, as the tissue density increases it appears on the film, if overlying a rib it can look just like mets.
A great inspiratory effort will tend to elongate the heart and it will twist, this slide of a nipple
next slide overlap of the same structure, blood pus or cells tumor, this was a subpulmonic effusion it layers out in the bottom portion of the lungs, gives you a false floor for the lung field, this turned out to be a hernia, you would want to take them for flouscopy to observe there breathing can actually see diaphragmatic motion
diagnostic for hernia of abdominal contents superiority this can be due to phrenic nerve paralysis we will have paradoxical motion of the diaphragm, if balloons upward and is easily seen with the radiograph
mediastinal mass could take out part of the phrenic nerve
right diaphragm is usually 1 intercostal space higher, if 2 or 3 take and inspiratory and expiratory reserve to look for change
next slide if done well a good lordotic has the clavicle above the apices, this might be a aneurysm of one of the great vessels
great location is a subclavicular location solid pulmonary nodule three basic bumps of the left heary shadow aortic nobe, atrial and ventrical

**Wednesday, December 04, 1996**
systemic hypertension causes widening and uncoiling of the aorta
scoliosis the ribs are wider on the convex side and closer together on the concave side