Safety Shutdown Meeting

Tuesday, May 16, 2006

CEBAF Center Auditorium

1:30 – 2:30 PM

Welcome	W. Oren 3 min.
Introduction	M. Dallas 5 min.
Shutdown Work List	S. Suhring 5-10 min.
EH&S' Plans for the Downtime We are involved and here's how---	B. May 10 min.
Review Lessons Learned (Internal and External)	C. Ferguson 7 min.
Lifting Demonstration and Guidelines	Dr. Chandler 10 min.
Closing Hazards Refresher	W. Oren 5 min.

Shutdown Work List

Steve Suhring

May 16, 2006

May’06 SAD (Scheduled Accelerator Down)

- **~ 6 weeks long, plus 2 weeks for Recovery**
- **Includes two major holidays:**

  Memorial Day & 4th of July
- **PSS Certification 6/26/06+**
- **Begin Restoration 7/5/06**
- **Halls A&C get beam ~7/19/06**

Major Tasks

- **Injector 500keV rework for PSS Segmentation**
  - Significant time allocated for Inj restoration
- **45MeV dump replacement for PSS**
- **Some penetration stone drops**
- **Facilities PM** (Preventive Maintenance)
- **Emergency Power Loop Test** (Tuesday 6/6/06)
  - Reduced tunnel lighting
  - Work to be limited during 4 hour test

Sun	M	T	W	H	F	Sat
Owl May 14 IOT 1 / 2 Pass test (Wissmann)	15	16 362MeV Hall C Parity quality	17 362MeV Hall C 31MHz transport	18 **Beam OFF 0700** **Machine Rest Access**	19	20
Day 362MeV setup (Spata)	Hall C cryotarget cooldown 362MeV Hall C background studies FEL Crane work FEL instrument air	362MeV Hall C Parity quality **1330** Safety Meeting FEL ¼ CM 25K cryocycle (SRF)	SS PD .	PSS Inj Segmentation Inj vacuum mods Valve checks Rem/Label 500keV elec/air/water lines RF Separator power and LCW tests Tunnel Lights	Disassemble beamline Magnet load measure.	Computer Center Power Outage
Swings 362MeV Hall C match (Benesch/Chao)	362MeV Hall C Background studies FEL ¼ to 20% LL	362MeV Hall C 31MHz transport FEL ¼ cryocycle	? 2L21-2 LLRF high gradient PZT test- Hovater, Hofler, Plaw			
Owl 21	22	23	24 2L03 20% LL	25	26	27
Day	PSS Inj Segmentation ¼ cryo contactor inst Rough inst of beamline Components 45 ILD wire/terminate 0L02 CPS HV mods NAB cooling twr OFF CHL cooling twr Hall B rapid access+ 1300 FEL PSS Cert	Rough align 500 keV VEPCO: Warwick PM Load Shed Hall clean power OFF Unitsub T2 oil leak TS SAB cooling twr OFF 2L03 25K cryocycle	Rough vacuum Install elec/air/water	Leak check Final alignment 45 ILD camac controls VIP HV rework 2L03 4K L-tube & leak test	QA 500keV inst Test components Chicane mag chassis *Geant4 Tutorial Tour?* 2L03 leak test ~1300 2L03 U-tube 2K	**Holiday Weekend**
Swings		2L03 cryocycle (SRF)				
Owl 28	29	30 Pen. stone drop	31	June 1	2	3 Network Outage
Day **Holiday Weekend**	**Lab Holiday**	PSS Inj Segmentation 500keV final checks Rough route air lines Activate DP can 45MeV dump mods Rad survey Rem. elect/air/water Remove Pb bricks ESR cooling twr	JL PD Magnet Verification chassis inst 45MeV prep/vent Remove pneumatic solenoid VEPCO Volt. Reg. PM	Remove 45 dump Install new 45 dump RF Sep resonance test	A3/A4 wire/terminate 45MeV final leak ck Prep shielding Install elec/air/water	
Swings		Begin Hall A cooldown Rt spectrometer arm				

Sun	M	T	W	H	F	Sat
Owl 4	5	6	7	8	9	10
Day Network Outage CHL IOS Upgrade	PSS Inj Segmentation 45MeV final alignment & HCO Smoke removal fans Crane Certifications	Emergency Loop Test IHA2D00 vent, remove&fiducalize? Install 45MeV shielding *HUGS tour*	PSS controls complete	IHA2D00 inst?	IHA2D00 align? *SULI tour*	
Swing						
Owl 11	12	13	14	15	16	17
Day	PSS functionality tests Interlock checkouts Hall A left spect.cooldn	*Nanofest tour*	SS PD			
Swings						
Owl 18	19	20 Cover penetrations	21	22	23	24
Day	Inj network switch inst Turbo pump PM		Penetration stone: NL17, 20, SL07	Punchlist development Tunnel cleanup	Sftwr hot checkout Tunnel cleanup JL PD	
Swings			1600 PSS Pre-tests	1600 PSS Pre-tests		
Owl 25	26	27	28	29	30 *0700 Inj/NL*	**July 1**
Day	SRF valve checkout *2K operations*	Inj fiber laser #2?		*RECO* Radcon checklists		**Holiday Weekend**
Swing	1500 PSS Cert: Inj /NL	1500 PSS Cert: Inj /NL	1500 PSS Cert: BSY/ SL	1500 PSS Cert: End Stations	1500 PSS Func Tests Inj, NL, SL, BSY,XA&B funct test: Gun,BCMs RF&Mags,HV ON	

Sun	M	T	W	H	F	Sat
Owl **July 2**	3	4	5 *Begin Ops 24/7*	6	7	8
Day **Holiday Weekend**	**Holiday Weekend** **Note:** this is not a sanctioned JLab holiday, but a good opportunity to stretch out a weekend for one day of vacation	**Lab Holiday**	Inj HCO LLRF High Grad tests *PD on duty*	Inj Restore/Commiss. → LLRF High Grad tests Machine HCO	Machine HCO	→
Swing						
Owl 9	10	11	12	13	14	15
Day Inj Restoration →	Halls A&C Temp &RH% sensors		→	Machine Rest. → *EES on site?*	Software beam tests	→
Swing			RF characterization			
Owl 16	17	18	19	20	21	22
Day Beam Studies: → 2 Beam Extraction	→	Parity Checks	Collaborative Checks → Halls A & C	→	Hall A: E05-103 → Commissioning Hall C: E05-108 → 0.362GeV / 80uA/ p	→
Swing						
Owl 23	24	25	26	27	28	29
Day Hall A: E05-103 → Commissioning Hall C: E05-108 → 0.362GeV / 80uA/ p	Hall A: E05-103 → D Photodisintegration 0.362GeV / 10uA / p					→
Swing						

Questions, Comments, Concerns?
8:00 Morning Planning Meetings to continue at MCC.
630-7050 Crew Chief will have the Crew Chief phone
876-7997 PD Phone to be carried by:
Steve Suhring (584-7670) -or-
Jack Ludwig (584-7416)

Lessons Learned from Last Time?

- **Read, understand, and sign the RWP (if you have not already done so).**
- **Pre job planning important: Use ATLis.**
- **Work group toolbox talks help focus attention.**
- **EH&S Group: participation directed toward the work.**
- **Facilities to change tunnel light bulbs first thing.**
- **SRF valve checkout to take place before final lockup.**
- **Early lockup during PSS Certification? Good.**

Important Information

- **8:00 Morning Planning Meetings to continue at MCC.**
- **630-7050 Crew Chief will have the Crew Chief phone.**
- **876-7997 PD Phone to be carried by:**

  Steve Suhring (584-7670) -or-

  Jack Ludwig (584-7416).

- **Questions, Comments, Concerns?**

EH&S' Plans for the Downtime

Bob May

May 16, 2006

January 2006 SAD

- Build on lessons learned (Craig)
- Make good use of safety resources
  - Supervisors
  - Safety Wardens
  - ESH personnel
- Make good use of the ATLis schedule
  - Select tasks with multiple hazards, high hazards, etc.
  - Schedule active work observation

January 2006 SAD

- Work Observation particulars
  - EH&S will temporarily suspend area inspections with Safety Wardens for duration of SAD
  - Since previous SAD, ATLis tasks are copied to EH&S for review
  - Selected ATLis tasks will be updated with a request to conduct work observation
  - ATLis update will include contact information for assigned EH&S reviewer

January 2006 SAD

- Work Observation particulars, cont'd.
- Line manager/supervisors support this effort by:
  - Contacting the EH&S reviewer; let them know when they can go with you to observe work
  - Come prepared with PPE for the task and location of work
  - Discuss results with staff at appropriate time

January 2006 SAD

- Work Observation particulars, cont'd.
- Safety Wardens support this effort by:
  - Joining observation, adding your perspective
- Everyone:
  - If requested, safely stop work and engage in brief discussion about your activities
- Target is 25 to 30 observations during the SAD

January 2006 SAD

- Active work observation will include
  - PPE check
  - Tools and equipment check
  - Working conditions check
  - Review plans for work and current progress
- Active work observation will sometimes include dialogue
  - Discussion about work planning
  - Toolbox safety discussions

January 2006 SAD

- Tips on how to know if the work observation is going well:
  - You have the right PPE
  - You have the right tool for the job
  - Your workplace is organized so that you can safely conduct the planned task(s)
  - Your technical work document (if applicable) is handy – and you read it!
  - The THA information is fresh in your mind from your morning safety toolbox discussion

January 2006 SAD

- Tips on how to know if the work observation is going poorly:
  - The observers greet you by saying, “You have the right to remain silent…”
  - Greg Adams shows up to document conditions in your workplace and a reporter from "60 Minutes" tags along.
  - The observers show up wearing moon suits supplied with a SCBA, and you are working in jeans and tennis shoes.

January 2006 SAD

Thank you for your help with this effort!

Lessons Learned

Craig Ferguson

May 16, 2006

January 2006 SAD

- Good work planning
- Good use of daily toolbox meetings
- Good use of supervisors, safety wardens, ESH personnel observing active work
- Good use of the schedule, integration of activities

JLab recent injuries

- Getting to/from work location (broken arm, ladder fall: broken foot, step up)

- Line of fire (broken finger, pipe removal)

DOE wide LL

- Fall (ETTP) – changed condition, changed hazard
- Electrical arc flashes – OR (penetration into live conduit), BNL (failed component, PPE)
- Crushed L3 disc – SNS (preparing for manual lift)

SNS Back Injury

A mechanical technician needed to remove a pump cart from a pallet for work in the vacuum lab March 23, 2006. This is a task that is *infrequently performed*. He enlisted the help of a research mechanic who was working nearby. The cart needed to be moved horizontally from its position on the pallet and deposited on the floor. They *discussed the possibility of using an electric lift that had been used previously for this task, but it was in use in another building at the time*. They also discussed the fact the carts had been *moved manually many times in the past*. As the technician squatted down, preparing to get a grip under the cart, *he lost his balance and sat down hard on the concrete floor*. He reported to medical and was sent offsite where X-rays were taken. On March 23rd, additional X-rays were taken and a *fracture of the L3 area of the spine* was detected.

Unusual posture during an infrequently-performed task led to loss of balance coupled with fact that the lift normally used was not available for the job.

Communication

- Understand the task, hazard, and controls
- Suspend or stop work if in doubt
- Use your supervisor, EH&S staff, Safety Warden

Some LL are Basic

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Resources > Fact Sheets > Manure Pit Gas Hazards

Manure Pit Gas Hazards

A confined-space hazard that often claims multiple lives before anyone realizes there is a danger is manure gas. Manure pits can be oxygen-deficient, toxic and explosive. There are four gases in manure pits that are of primary concern.

Hydrogen Sulfide is a highly toxic gas that is heavier than air. It can cause dizziness, unconsciousness and death. At low concentrations it may smell like rotten eggs, but at higher concentrations it deadens the sense of smell so that no odor can be detected.

Carbon dioxide is an odorless, tasteless gas that is heavier than air. It displaces the oxygen supply in the bloodstream, which can cause unconsciousness and death.

Ammonia is a gas that is lighter than air. It has a pungent smell and can irritate the eyes and respiratory tract. Ammonia also displaces oxygen in the bloodstream.

Methane is also a gas that is lighter than air. The primary hazard of methane gas is that it can create an explosive atmosphere. This gas also displaces oxygen.

- Never enter a manure pit alone.
- Label the manure pit and manure storage areas to warn of the gas hazards.
- Obtain and use monitoring equipment to determine the level of gases present in the manure storage area.
- A self-contained breathing apparatus must be worn when entering a manure storage area and the person wearing it should be trained in its use. A safety harness should also be worn and personnel should be available outside the storage area to monitor the entrant's progress.

Inspection

- Do fences/metal-grill covers restrict pit access?
- Are manure gas warning labels near pit?

Information supplied by the National Safety Council's Agricultural Division.

Related Links

- Agricultural Safety
- Agricultural Safety Fact Sheets

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Questions?

Lifting Technique

Smitty Chandler

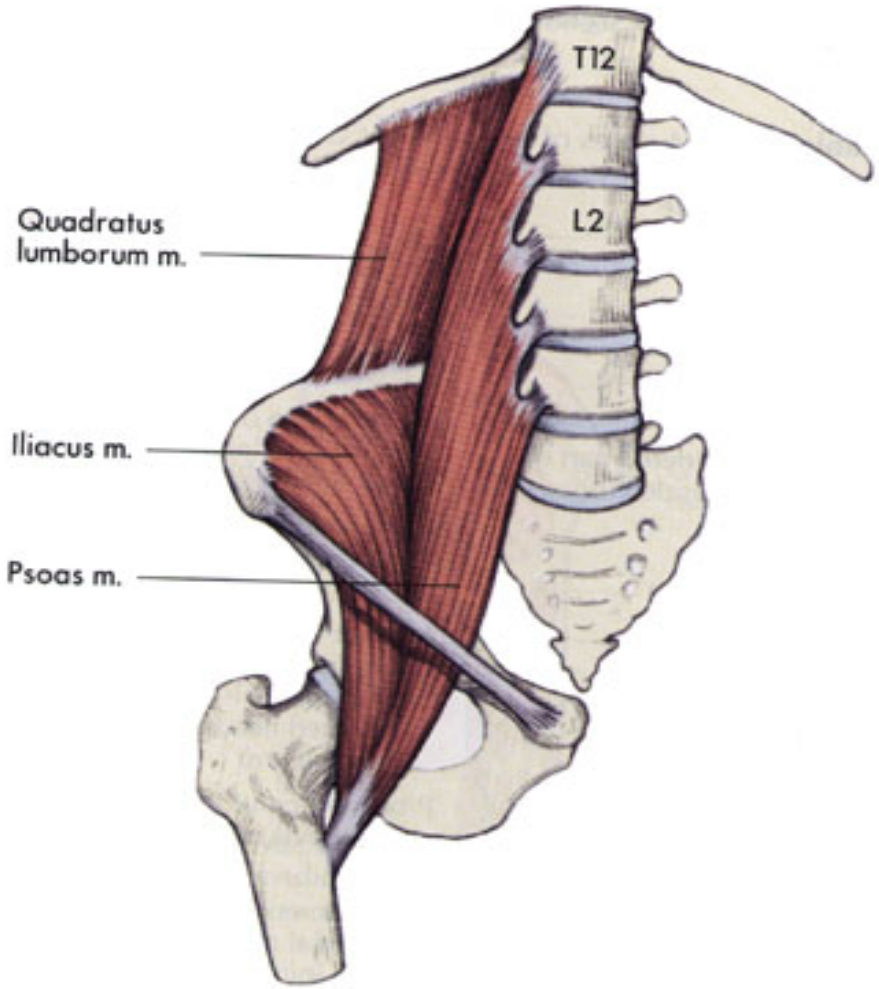
5/06

Lifting Technique

- Insight
  - Anatomy
  - Medical conditions
  - Risk factors
- Proper lifting
  - Principles
  - Specific technique
- Controls
  - Engineering
  - Work practice
  - Administrative

Lifting Technique

- Insight
  - *Anatomy*
  - Medical conditions
  - Risk factors
- Proper lifting
  - Principles
  - Specific technique
- Controls
  - Engineering
  - Work practice
  - Administrative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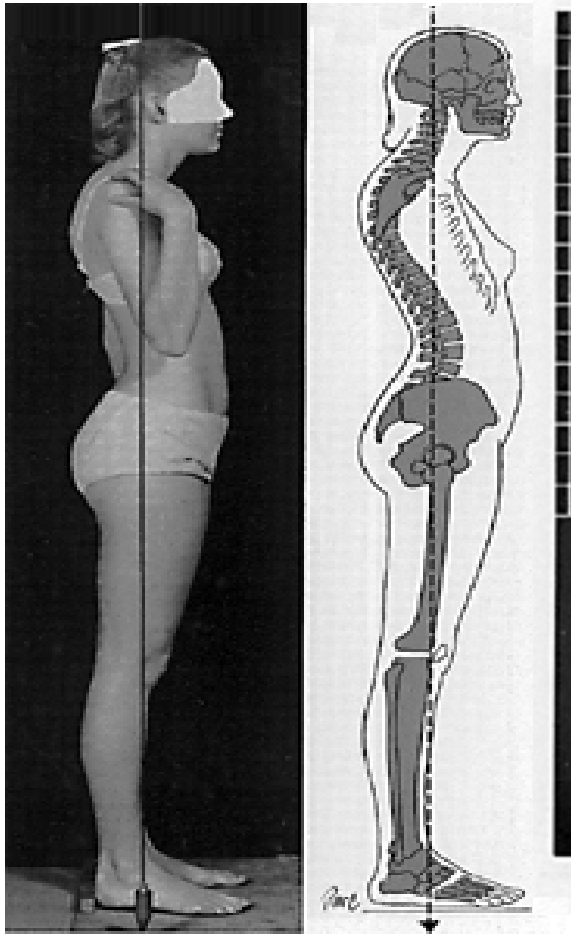
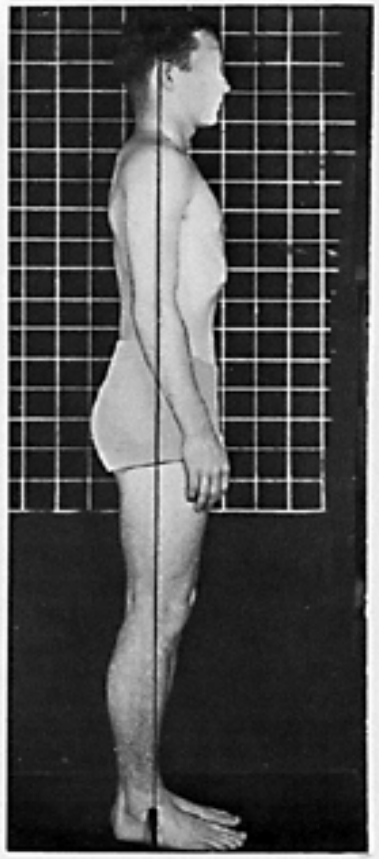
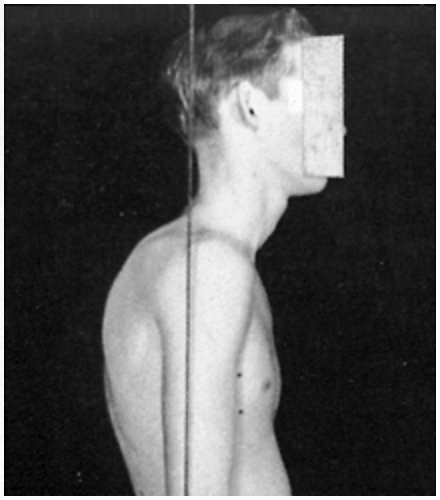
Iliacus m.
Psoas m.



Poor Posture



Good Posture



How to Condition Your Back

- If in doubt, obtain medical advice
- Pelvic tilts
- Yoga
- Posture

Lifting Technique

- Insight
  - Anatomy
  - ***Medical conditions***
  - Risk factors
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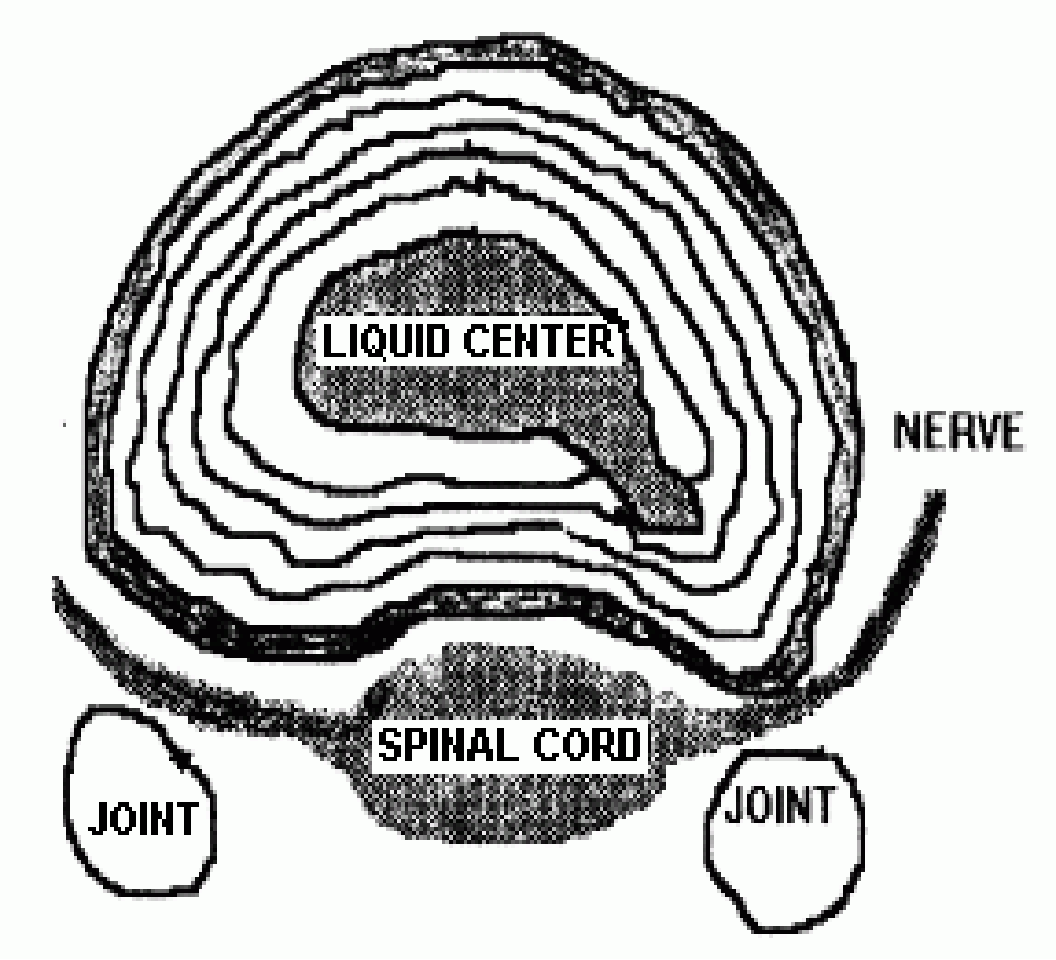
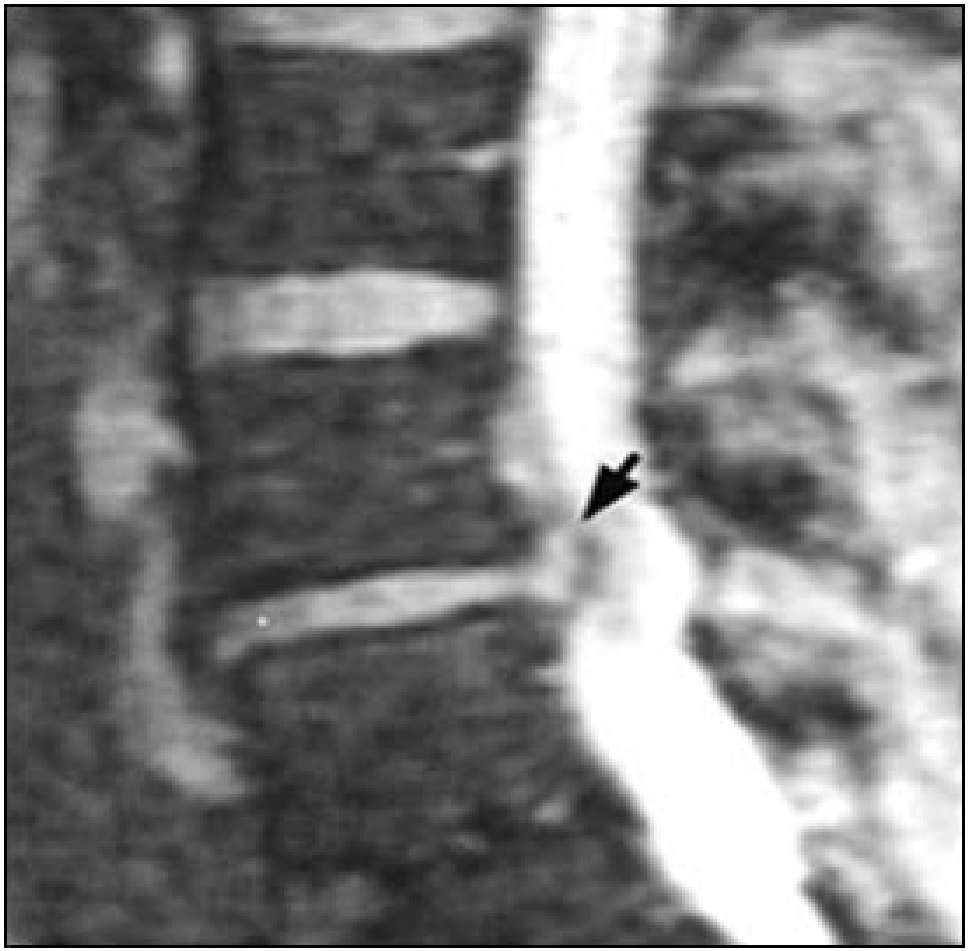
What Causes Back Pain?

- Muscle tightness and/or inflammation
- Pressure on a nerve from
  - Muscle spasm (cause and effect)
  - Arthritic bone spurs (degenerative joint disease, osteoarthritis)
  - Ruptured disc
  - Micro fractures of the annulus fibrosis (degenerative disc disease)

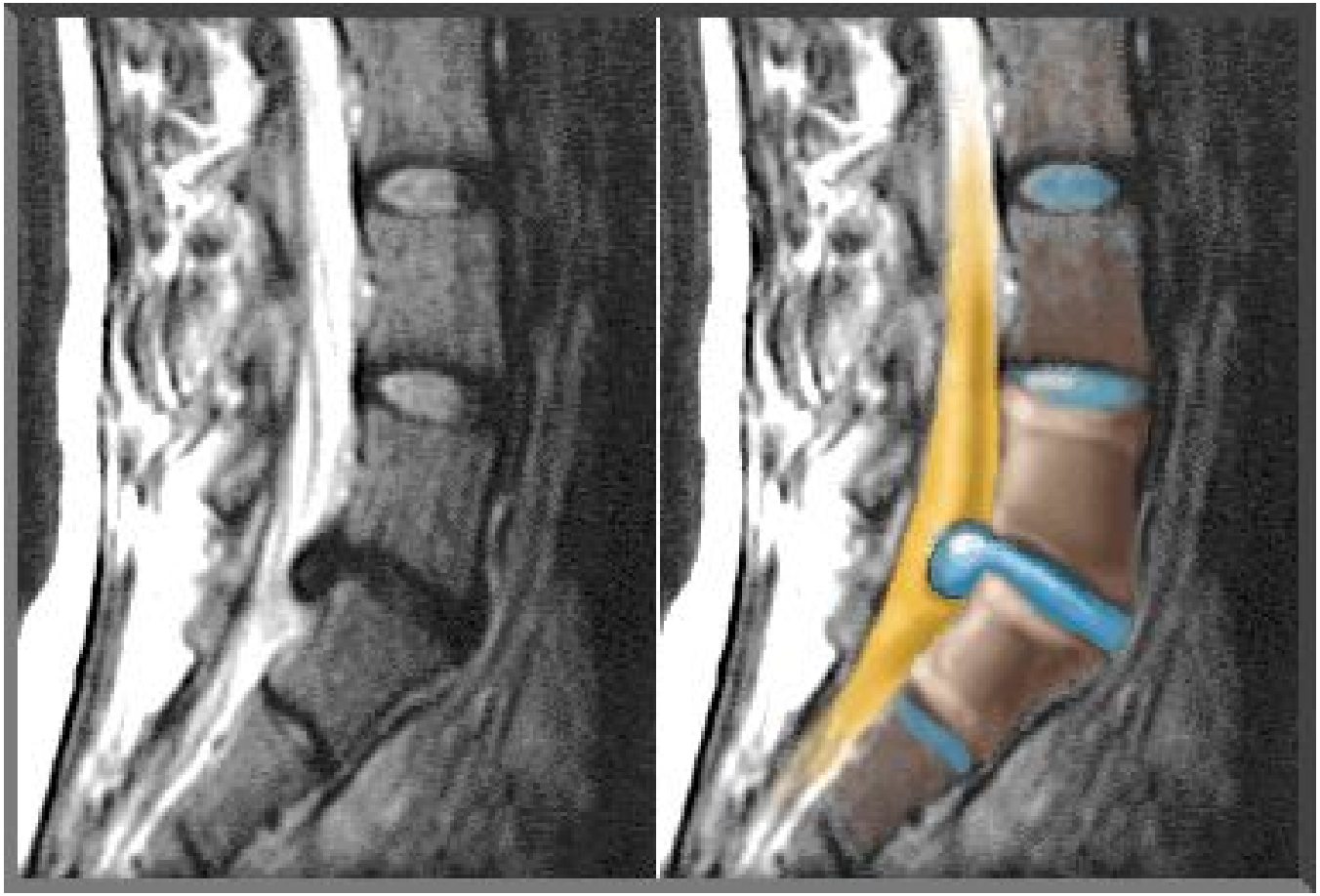
DJD and DDD


LIQUID CENTER
NERVE
SPINAL CORD
JOINT
JOINT

Ruptured Disc



Ruptured Disc



Lifting Technique

- Insight
  - Anatomy
  - Medical conditions
  - ***Risk factors***
- Proper lifting
  - Principles
  - Specific technique
- Controls
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Risk Factors for Back Pain

- Signs on physical exam
- Past history
- Smoking
- Driving
- Deconditioning of abs and psoas
- Over nutrition
- Sedentary work
- Strenuous work

What if You Are Predisposed

- Tell Smitty
- Be especially careful in work motions
- Habituate to cautious routine motions
- Restrict work episodically
  - If you feel anything other than normal
  - If you need meds
- Restrict work permanently

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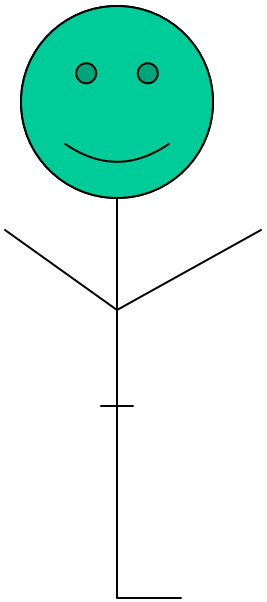
General Principles

- Minimize weight lifted
- Minimize bending and twisting
- Minimize frequency of lifts

Why You Should Minimize Bending

Torque = Force x Lever Arm

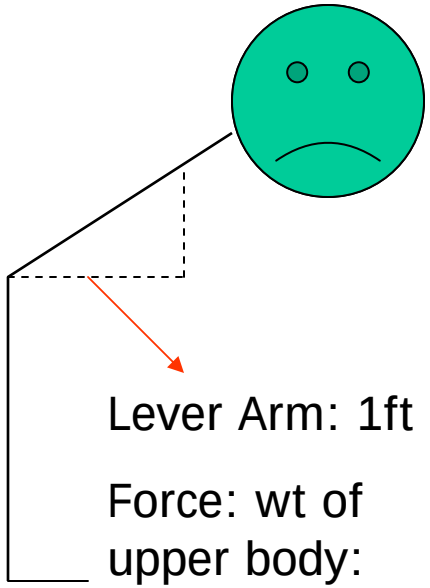
T=100lbs x 0 lbs
= 0 ft-lbs



Lever Arm: 0ft

Force: wt of upper body: 100lbs

T = 100lbs x 1ft
= 100 ft-lbs



Lever Arm: 1ft

Force: wt of upper body: 100lbs

How to Minimize Torque

- Minimize force
  - Lift less weight
    - Get help
    - Lift fewer items at a time
- Minimize lever arm
  - Bend less
    - Use legs instead of waist
    - Bring load as close as possible to your body
    - Raise initial and terminal position of load

How Much Weight is OK?

- It depends on
  - Past history
  - Size
  - Strength
  - How you feel
  - Structure of the load
- For young, healthy, strong person, I recommend 50 lbs max
- For all, the less weight lifted and the less frequently, the better

Lifting Technique

- Insight
  - Anatomy
  - Medical conditions
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Proper Lifting Steps

- Lighten the load
- Raise the load: Ideal load height to start the lift is stomach level
- Face the load
- Place the load next to your body
- Pretighten the rectus abdominis and psoas muscles
- Lift
- Rotate body with feet to achieve terminal position
  - Never rotate torso
  - Never laterally flex
- End lift at stomach level if possible

Lifting Technique

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  - Engineering
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Controls

- Engineering controls
  - Lifting devices, excellent carts
  - Not back belts
- Work practice controls
  - Lifting limits, e.g., 50 pounds
- Administrative controls
  - Job rotation
  - Prompt, liberal reporting of symptoms
  - Employee education
  - Enforcement

Friendly Advice

- Think about safety before you act
- Don’t do regular duty if you feel irregular
- Use proper lifting technique

Thank You!

CLOSING

"Hazards Refresher"

W. Oren

Safety Shutdown Meeting
Tuesday, May 16, 2006
CEBAF Center Auditorium
1:30 – 2:30 PM

Potential Hazards

- Hazardous chemicals: MSDS and PPE
- Vacuum, pressure, or explosive hazard
- Inhalation of dusts, mists, fumes
- Exposure to excessive heat, excessive noise
- Elevated work or egress issues
- Non-mechanical materials handling; lifting or sharp edges
- Power tools, extension cords, hand tools
- Use of mechanical lift devices: lift tailgate, fork trucks, hoists, or cranes
- Electrical hazards
- Cryogenic hazards
- Radiation hazards
- Lock/Tag/Try
- Permits or specialized training
- Waste disposal or environmental issues
- Other considerations

What Do We Do Now?

- ✓ Do your ATLis tasks with hazard analysis
- ✓ Hold your daily Safety Toolbox meetings

  - Safety minute
    - Ladder Safety (Handout)
  - Read over hazards checklist (Handout)
  - Remember your daily housekeeping
  - Debrief yesterday's work

What do we do now? (cont.)

- ✓ Be sure everyone has the correct training
  - Operators
  - Contractors

What do we do now? (cont'd.)

- **REMEMBER: If it doesn't feel right**

,

regroup, change plans if necessary and <u>then</u> move on.

- But if an accident occurs…….

Responding to Emergencies

Accidents resulting in work related injury:

- If life threatening, call 911, stay on the line for instructions. Security is aware of location and time of call
- If non-life threatening/first aide, notify your supervisor & proceed to Medical Services
- Contact EH&S On-call (810-0812) for further reporting if the accident has resulted in:
    - **Electrical shock (even mild electrical shock)**
    - **Extremity or back strain/sprain/injury**
    - **Chemical exposure to (inhalation or contact)**
    - **Overexposure to or contamination by ionizing radiation**
    - **Lacerations that might require stitches**

Responding to Emergencies, cont'd.

- Off Hours Response:
  - Same as normal hours except:
    - Notify supervisor and medical <u>as soon as reasonable</u>
  - Follow the instruction in the "blue brochure" found at first aid boxes
    - Go to the nearest emergency medical facility for treatment
    - Tell them that you work at JLab and the injury is work related
    - Make arrangements for follow-up at JLab Panel Physician

Responding to Emergencies, cont'd.

- Accidents resulting in <u>equipment damage</u>
  - If imminent threat of fire or spill of hazardous chemicals, <u>call 911</u>

  - If something less serious breaks with wide implications call the control room at x7045 or <u>Crew Chief at 630-7050</u>. **Don't tamper** with following systems unless authorized:
    - Radiation Monitors
    - Personnel Safety System
    - ODH System

Questions?