

# *Backpacks*



*...created from a presentation designed by Harvey Lerner...*

## Excessively Heavy Backpacks May Contribute to:

- Spinal injury
- Poor posture
- Muscle strain and fatigue
- Numbness/tingling in the arms
- Back, neck, shoulder pain



### *Notes:*

Spinal compression, hamper ability of discs to absorb shock, improper alignment (disrupts natural curves of the spine when leaning forward to compensate for excessive weight or twisting when using one strap).

Arching back, rounding shoulders, leaning forward or to one side (when one strap used).

## *Study Results*

- 55% of children in 5th-8th grade carried backpacks weighing more than 15% of their body weight.
- 1/3 of children reported back pain that resulted in their visiting a doctor, missing school, or refraining from physical activity.

### *Source:*

Girls and younger students carried proportionally heavier packs because they are smaller. Simmons College Graduate Program in PT, Shelley Goodgold, Associate Professor of PT.

345 children, written questionnaires, student reports, weighing of children and their packs

## *Optimal Backpack Weight*

- No more than 10-20% of child's total body weight  
(American Academy of Pediatrics)
- No more than 15% of child's total body weight  
(American Academy of Orthopedic Surgeons)



## *Optimal Backpack Design*

- Padded back
- Waist belt
- Straps that are wide, padded, contoured
- Compression straps
- Lightweight
- Reflective material
- Positive and negative aspects of rolling backpacks

### *Notes:*

Proper size for the child; Padded back reduces pressure on the back and prevents sharp objects from digging in; Waist belt distributes some of the weight to the pelvis; Shoulder straps under the arms to allow free movement of arms; Narrow straps can impair circulation and impinge on superficial nerves; Compression straps compress and stabilize contents; Bottom of pack should rest in lumbar curve and not sag down to the buttocks; Lands' End Collegiate, Collegiate Junior.

Wheeled packs must have correctly sized handle to prevent poor posture; may need to be carried up stairs; may not fit in a locker; may not roll in the snow; should have sufficiently large wheels to prevent toppling.

## *Proper Wearing*

- Wear both straps
- Tighten straps
- Pack should rest 2 inches above waist

### *Notes:*

This results in weight being borne by some of the strongest muscles in the body – back and abdominals (strong and built for endurance).

Wear both straps (even better than one large strap across the body) to more evenly distribute weight.



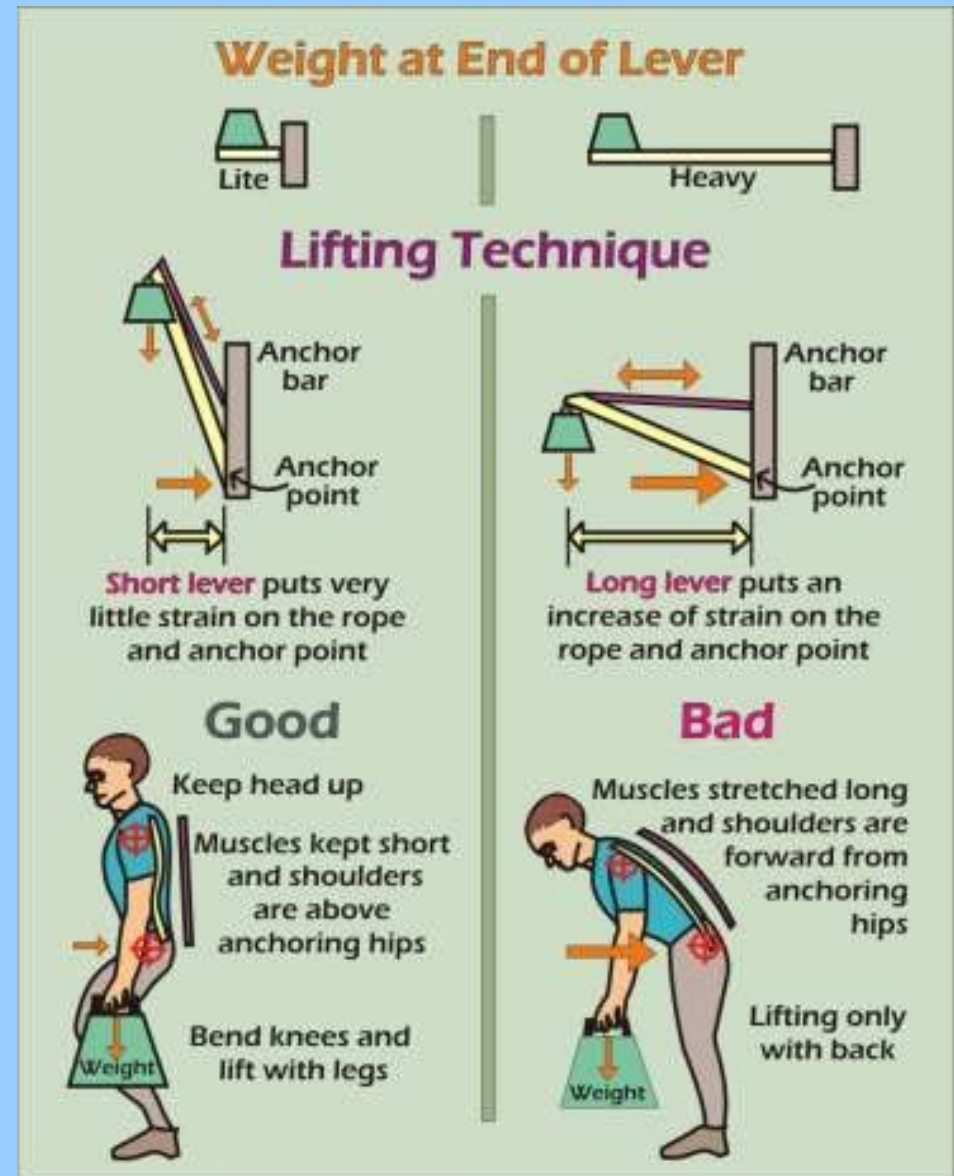
## *Proper Packing*

- Keep weight close to body
- Heaviest objects closest to back
- Distribute load



## *Proper Lifting and Body Mechanics*

- Stand up straight
- Don't slouch
- Don't lean forward
- Bend knees when lifting
- Lift with load close to body





## *Strategies for Decreasing Weight of Backpack Contents*

- Books on CD
- Books on-line
- Increased use of lockers
- Adult monitoring
- One class set of books for each grade



## *Strategies for Implementing Solutions*

- Hastings Education Foundation
- Involve stakeholders

Students: articles in student newspaper, poster contest, slogan contest, foster sense of ownership, solicit and use their ideas.

Parents: distribute fact sheets (written by students), increase awareness and oversight of what students carry in their backpacks.

Teachers: incorporate into science, math, health curriculum; discuss social dynamics to promote student involvement.