Lifting & Back Pain

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Did he eat sprouts?
Back Pain, is it a problem?

Global burden of disease:

1. Low back pain
2. Depression
3. Neck pain
6. Other MSK problems
17,000 workers followed for 3 years
Back Pain
Seeking Care
Not seeking Care

(Vingard 2002)
Can structure explain persistent pain?

MRI findings without back pain
Disc degeneration - 91%
Disc height loss - 56%
Disc bulges - 64%
Disc protrusion – 32%
Annular tears – 38%

"muscle imbalance"  (Gubler 2010)
"muscle timing"  (Vasseljen 2012)
Varied and normal on pain and pain free

(McCullough 2012)
Putting it together; pain is complex

- Genetics
- Life stages
- System changes
- Back pain

Cognitive

Emotional

Social

Physical

Lifestyle

Behavioral response to pain

(O’Sullivan 2016)
Genetics
Epigenetics

Vulnerable life stages
(Coenen 2016)
System changes, or tissues sensitivity

A measure is PPT

Similar mechanisms: HPA axis, immune health and inflammation.

(Auvinen 2010, Paananen 2010)
Putting it together; pain is complex

cognitive  emotional  social  physical  lifestyle  (O’Sullivan 2016)

Life stages  System changes  Back pain

Behavioral response to pain

genetics
Putting it together; pain is complex

- genetics
- Life stages
- System changes
- Back pain

Behavioral response to pain

- cognitive
- emotional
- social
- physical
- lifestyle

(O’Sullivan 2016)
Lifting

Meta analysis: Cumulative back loads are predictive of LBP
Lifting: to bend or not to bend

Models: McGill, Callaghan, Wade, Adams, Dolan

Models often in-vitro animal modeling

Overview:

Repetitive flexion/ext can lead to disc failure

Fast rapid flexion can lead to disc injury

End range flexion, increased strain passive structures

But, neutral is not protective in models (Veres 2010, Gooyers 2015)

Benefits of more neutral spine tend to be disc related: how big a problem is disc herniation? Around 2%. Have we got bigger fish to fry?
Models are not consistent (Kingma 2010)

Non of the techniques clearly superior
Based on: peak shear, flexion, compression
Fatigue: Engaging in physical activity when feeling fatigued increased risk of back pain

Steffens 2015
Pain V No Pain

Those with persistent back pain lift differently

- Slower
- Less flexion
- More muscle co-activation

(Ferguson 2004, Marras 2001, Rudy 2003, Slaboda 2008)

More pain related fear, less flexion
(Thomas 2008)

Pain related fear less flexion,
more muscle EMG,
less FRR (Geisser 2004)
Relevance of spinal models in back pain population

Often theoretical models
Done in-vitro or with pain free subjects
How common injuries with persistent pain?

Fail to take into account:

Back pain complex
Structure does not explain back pain
Protective behaviors, what drives them and there loading effects
OK, how do you teach people to lift.

Those pain free/ never had significant back pain.

Opinion, not FACT:

Light

Not bothered.
Not even that bothered with repeated
Low load flex.

Really Heavy

Get the weight in close
Mid range back flex
Mid rage hip, knee
Efficient muscle system
But, avoid end of range flex
Be aware: fatigue, stress, sleep
Chronic v acute workload,
Pre-existing fitness,
Those who have pain/ persistent pain.

Not a recipe, needs individual assessment……. But that may not help you…So,

Often they are: stiff, tense, don’t and are reluctant to flex guarded, overactive in muscles, breath hold, associate lifting with damage. Often part of protective strategy is overuse of back extensors (thoracic especially)

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<thead>
<tr>
<th>Light</th>
<th>Really Heavy</th>
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<tbody>
<tr>
<td>Identify any big cognitive barriers</td>
<td>Often do not attempt; but,</td>
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<tr>
<td>Relaxation (abd), breathing and often flex of the spine (TSp++)</td>
<td>Identify any big cognitive barriers</td>
</tr>
<tr>
<td>Use of leg muscles</td>
<td>Relaxation, breathing and often flex of the spine (TSp++)</td>
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<tr>
<td>Use of leg muscles as power generator</td>
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5 areas of associated with poor outcome, do not facilitate: vulnerability; pain = damage; activity & back pain; prognosis; Psychological influences.
References

- Kingma, I., Faber, G.S. and van Dieen, J.H., 2010. How to lift a box that is too large to fit between the knees. Ergonomics, 53(10), pp.1228-1238.