

Whiplash Injury: Facts and Myths

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The Relationship Between Crash Force and Injury

- In general, more crash force increases the probability of injury
 - ▣ At the highest speed changes (>100 kph) everyone dies
 - ▣ At high speeds (50-100 kph) some are killed and many are injured, and a few are ok

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At moderate speeds (16-50 kph) a few are killed and many are injured, and many are ok



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In lower speed crashes (<16 kph speed change), some are hurt and some aren't...



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Fact: Injury presence is not *reliably* predicted by vehicle damage or crash force

- Force of crash and injury probability is like distance of fall and injury probability
 - ▣ People who fall from a 10 story building all have similar injuries
 - ▣ People who fall from a standing position have injuries that vary from none to severe, based on a variety of factors
 - ▣ Crashes are exactly the same
- Reconstructing a lower speed crash is typically meaningless

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Minor Injury



Serious Injury

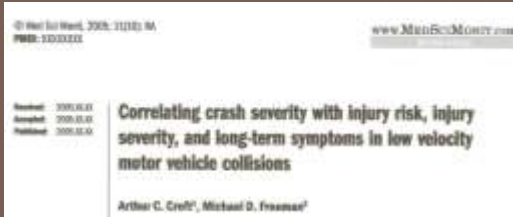


Fatality



No Injury

Fact: It has been demonstrated that injury risk is NOT correlated with vehicle damage



Why do some get hurt in low speed crashes and some don't?

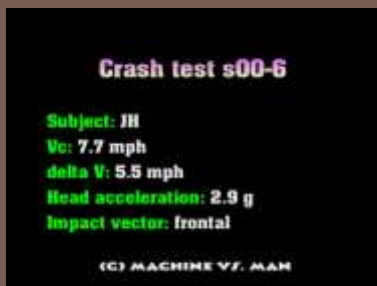
- Established risk factors
 - ▣ Late 3rd to 6th decade
 - ▣ Female
 - ▣ Unaware of impact
 - ▣ Bad seat/ head restraint design
 - ▣ etc.
- What is most important risk factor for injury?



Conclusions: The results of this study suggest that there is no established minimum threshold of significant spine injury. The greatest explanation for injury from traumatic loading of the spine is individual susceptibility to injury, an unpredictable variable.

Fact: The most important risk factor for injury is Not Crash Force!

Myth: If the person in the rear car thinks it was a "tap" then the person in the front is lying



Myth: In Lithuania etc. there is no chronic whiplash because there is no compensation for injury

- The publications that have made these claims were designed to produce the conclusions
- The same is true of similar research from Saskatchewan, Germany, Greece, and others
- It is always the same two or three groups of authors, and almost always funded by insurers

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Myth: There is no objective evidence of pathology in whiplash

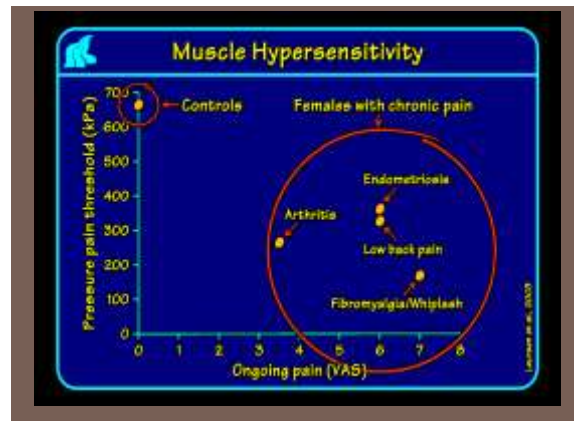
- Corollary: Treating these patients only makes them think they are sick
- Fact: Not a single piece of research has ever established this scandalously unscientific claim beyond innuendo, speculation, and sloppy methods
- The claim is the result of bias and a lack of intellectual honesty
- WNL?

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Whiplash and Central Sensitization

- What if whiplash were proven to result in a derangement of how pain is processed by the brain?
 - Minor trauma will hurt
 - Pain spreads around body
 - Can't sit in one position for long
 - Exercise hurts
- The search for an "injury" would become less important

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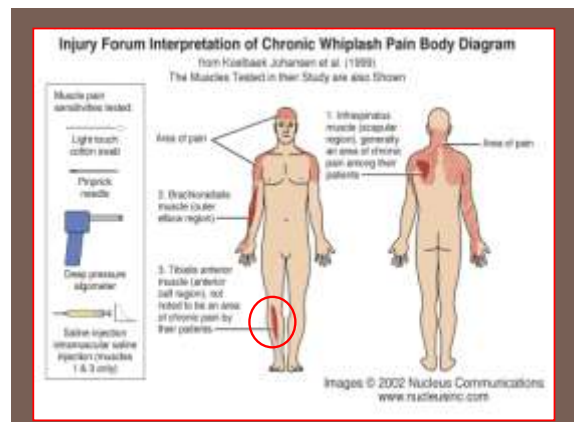


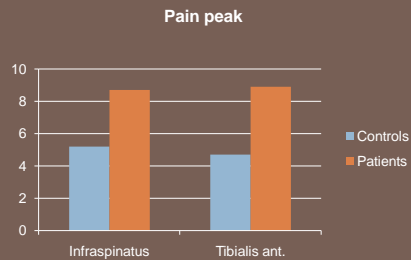
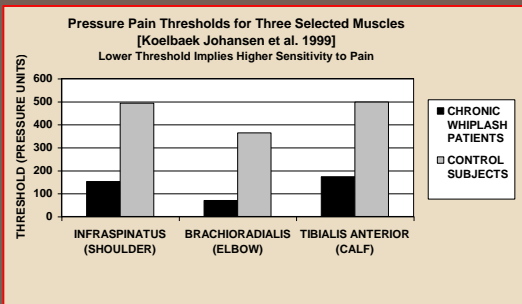
Central Sensitization and Whiplash Study

- Whiplash group
 - 11 Patients with chronic pain after whiplash injury
- Control group
 - 11 Healthy volunteers

Koelbaek et al.
Pain 1999

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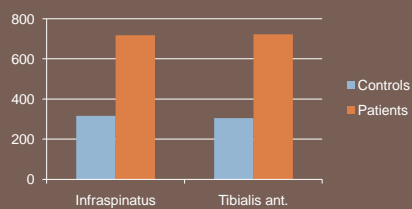




$P=0.01$

Koelbaek et al, Pain 1999

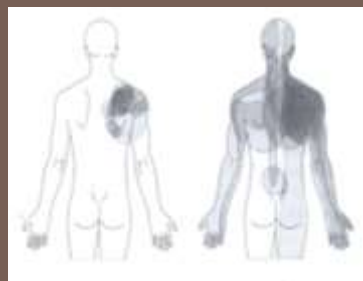
Pain duration (s)



$P=0.01$

Koelbaek et al, Pain 1999

Controls Patients



Koelbaek et al, Pain 1999

Controls Patients



Koelbaek et al, Pain 1999

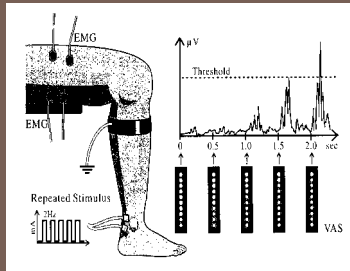
Whiplash, FMS, and central sensitization study

Three groups:

- 27 patients with chronic pain after whiplash injury
- 22 patients with fibromyalgia
- 29 healthy control subjects

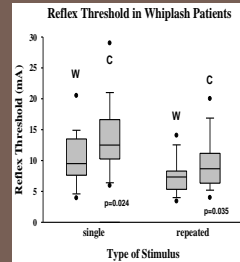
Banic et al, Pain 2004

Methods

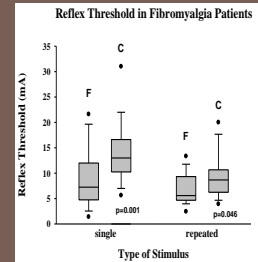


Lars Arendt-Nielsen

Results



W = Whiplash Group
C = Control Group



F = Fibromyalgia Group
C = Control Group

Banic et al, Pain 2004

whiplash injury and fibromyalgia display spinal cord hyperexcitability that is similar

Banic et al, Pain 2004

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New radical treatments for whiplash...

- Recent research has demonstrated that upper cervical (transverse ligament, alar ligament) instability is associated with whiplash injury
- A surgeon in Germany has done over 1000 operations on such patients

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What is the injury?

- There are a lot of patients with the same instability who don't need surgery
- If you fuse C4 and up nothing can move
- Has the problem been repaired or is the patient just prevented from doing anything painful?

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Åke Nystrom

- Plastic surgeon in Nebraska (UNMC)
 - ▣ he has treated more than 700 patients with chronic spine pain, mostly whiplash related
 - >250 Swedes
 - ▣ All patients have had virtually every kind of treatment possible
 - ▣ Has an 85% documented success rate
 - ▣ What does he do?

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Typical Patient Characteristics



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Very Restricted ROM



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Chronic intrusive pain for more than 6 years



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Often with suicidal ideation or attempts



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Typically photophobic



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Always with TPs in the upper traps



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- First the patient is examined for upper trap TPs
- They are marked on the skin
- They are then injected with lidocaine

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It's a painful procedure...



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The results are dramatic (but short lived)

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The permanent solution?

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First the patient is anesthetized and then the upper trap is exposed



The patient is then awakened and ask to indicate where the trigger points hurt most



The trigger points are then removed



1 Day Post-op





What is the common link between whiplash and FMS?

- Chronic whiplash can develop into FMS
- FMS is associated with Chiari
- Is chronic whiplash associated with Chiari?
- Current study
 - 300 chronic whiplash upright MRI
 - 300 non-trauma neck pain upright MRI
 - 300 chronic whiplash recumbent MRI
 - 300 non-trauma neck pain recumbent MRI

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Chiari Malformation



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Non-trauma upright



Whiplash upright

Current Results

- Upright whiplash group
 - 49% prevalence of Chiari
- Upright non-trauma group
 - 8% prevalence of Chiari
 - Compare to ~3% in general pop'n
- Recumbent whiplash
 - ~30% prevalence of Chiari
- Recumbent non-trauma
 - ?

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- If these results are consistent, then:
 - Chiari is related to chronic whiplash
 - Whiplash trauma may result in injury to the ligaments that support the brain
 - This means that chronic whiplash may become an "objectifiable" injury to the brain

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What to do for these patients

- Not sure, but...
 - Typically not a surgical solution
 - Proprioceptor input (manual therapy, chiro) may be important
 - The trapezius may be a key to treatment
 - New medications for FMS?

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What can the patient do?

- Education is most important
 - Legislators and regulators need to know that whiplash injury is not a complaint that goes away when you get money
- Doctors must learn to diagnose injuries
 - No such thing as "chronic whiplash," chronic sprain, or WNL
- Doctors need to document signs of central sensitization (PPT)
- Expose insurance company doctors who use junk science to deny injury while lining their pockets

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Write to me

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