THE EFFECT OF PAIN ON SENSORY AND MOTOR CONTROL MECHANISMS IN HEALTHY AND RECURRENT LOW BACK PAIN PATIENTS

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LBP: A GLOBAL BURDEN

- Definitions challenge statistics\(^1\) but LBP often is a **transient** symptom
- **24-87%** LBP patients suffer a **recurrence** within year \(^2\)
- Prevalence of up to **20% of chronicity** has been reported\(^3\)
- The effectiveness of LBP intervention strategies is limited
- **Increased prevalence** of persistent, disabling LBP reported recently\(^4\)
- **Knowledge about transition** from acute to persistent pain is limited\(^5\)
- Higher prevalence of bilateral pain and higher pain intensity persistent LBP\(^6\)

\(^1\) Hoy et al., 2012
\(^2\) Stanton, Latimer, Maher, & Hancock, 2010
\(^3\) Meucci et al., 2015
\(^4\) Freburger et al., 2009
\(^5\) Arendt Nielsen et al 2011, Melloh et al 2011
\(^6\) Chanda et al 2011
There are an awful lot of things going on that need understanding and explanation, but - to put it mildly - the world is a mess.

Madeleine Albright
United States Secretary of State 1996-2001

MOTOR CONTROL ↔ PAIN

- Reaching a goal
- Motor strategies
- Neuromusculoskeletal control
- Planning
- Coordination
- Anticipation
- Adaptation

Larsen 2014 – after Shumway-Cook & Wollacott 2007
SENSORY

PAIN INTENSITY
(MEAN + SEM, N=25 CONTROL/25 R-LBP)

LARSEN, HIRATA & GRAVEN-NIELSEN 2015
LARSEN, HIRATA & GRAVEN-NIELSEN, UNDER PREPARATION
SENSORY
SUPERIMPOSED PERCEIVED EXPERIMENTAL PAIN AREAS
(MEAN + SEM N=19 HEALTHY CONTROLS)

SPATIAL SUMMATION PERIPHERAL SENSITIZATION CENTRAL SENSITIZATION?

LARSEN, HIRATA & GRAVEN-NIELSEN 2017
MOTOR

PAIN-EVOKED MUSCLE ACTIVITY CHANGES AFTER SURFACE PERTURBATION ($\Delta$ RMS EMG (%), N=19 CONTROLS)

BILATERAL VERSUS UNILATERAL PAIN MAY INCREASE TRUNK MUSCLE ACTIVITY

DOMS AGGRAVATES THE EFFECT OF BILATERAL BUT NOT UNILATERAL PAIN REORGANIZATION?

+ REORGANIZATION, DIFFERENTIAL IMPACT OF PAIN DURING GAIT AND STAIR TASKS

LARSEN, HIRATA & GRAVEN-NIELSEN 2016
CONCLUSION

- The sensory and motor impact of pain is influenced by several parameters including spatial summation, local tissue condition and central pain processing mechanisms and their interaction
- The motor impact of pain is influenced by interaction between individual, task-related and acute pain processing mechanisms
  - and recurrent LBP result in manifest changes in the nervous system that may increase pain perception during acute pain response

IMPLICATION

Recurrent low back pain patients should be examined and treated like persistent low back pain patients…. Increase the patients´ knowledge, understanding and tool box to support them to take control