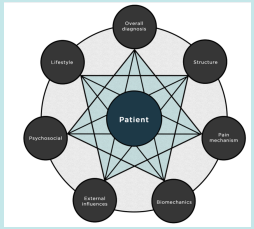
Spine Congress

24th - 25th March 2017
Helnan Marselis Hotel, Aarhus, Denmark

Danish Musculoskeletal Physiotherapy Association
Celebrating 50th anniversary



Framework for Clinical Reasoning

Flemming Enoch Specialist physioterapist, MR, Dip Mpt,

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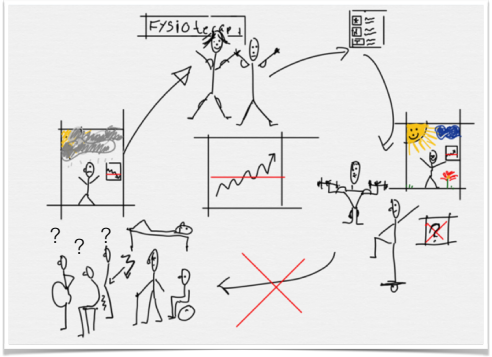
Start with the end in mind

My lecture aims to offer clinicians a simple guidance in diagnosing an treating the patient in a broder context.

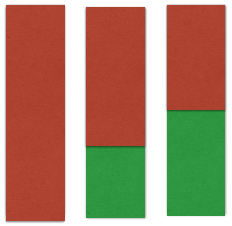
The job that needs to be done



The smallest worthwhile effect…..

If participants were told that they would improve **30% with no treatment**

Average, people with chronic low back pain would need to experience an additional **20% improvement in pain and disability** compared with no treatment to perceive that the effect of physical therapy was worthwhile, that is, an **overall 50% change.**



Ferreira et al 2013

The questions that need to be answered

Is it something serious?

How long does it take?

What's wrong with me?

What can you do about it?

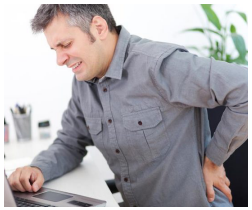
What should I do about it?

Introducing Lars

- He is 55 year old, self employed and has a history of recurrent backpain for at least 20 years. Referred from the doctor with nonspecific low back pain.
- This time the back pain has been there for 6 weeks. When the pain is worst, it spreads down the leg to the knee (left)
- Worse prolong standing, turning in bed at night, slow walking, from sit to stand, golf (aggravates at hole 10) Driving range 10 min., stopped running
- Better sitting, lying down, bicycling ok, massage
- X-ray shows facet arthrosis discuss degeneration at L3, 4, 5.
- He is not sick from work. Normally he does not have worrying thoughts about his back pain, but this time it is too much in his leg and he is anxious about it. He says he does not trust his back.
- **Lifestyle.**
- Generel health is good, he takes blood pressure reducing medicine and simple painkillers when worst. He would like to loose + 5 kgs
- Many late hours, work and business meetings, not always the most healthy food, sleep is disturbed from pain and sometimes he has difficulties getting back to sleep, he is a nonsmoker

The challenge

- There are many ways to get “the job” done
- But when we define “the job” by our speciality and “area of interest” We/the patient can easily get stock
- It shows in research and it shows in clinical practise.



- Our patients may be given a choice but not the choice they need. O´Connell et al. 2015

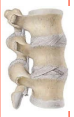
In research

*“The disappointing results of clinical research are commonly explained by the **failure of researchers to adequately attend to sub-grouping** of the chronic non-specific low back pain population. Current approaches may be ineffective and clinicians and researchers may need to radically rethink the nature of the problem and how it should best be managed”.*

Wand - O´Connell 2008

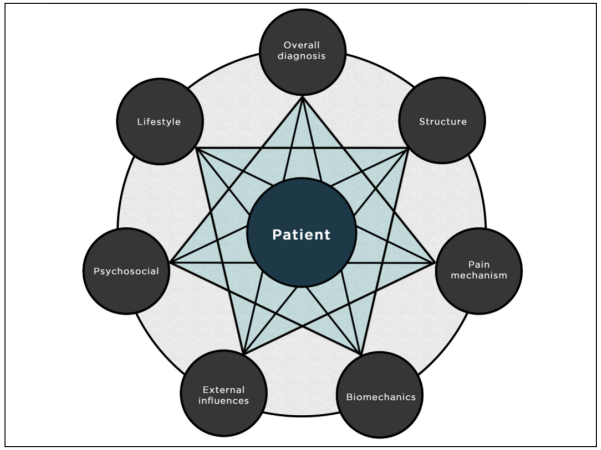
The physiotherapeutic diagnosis has many factores

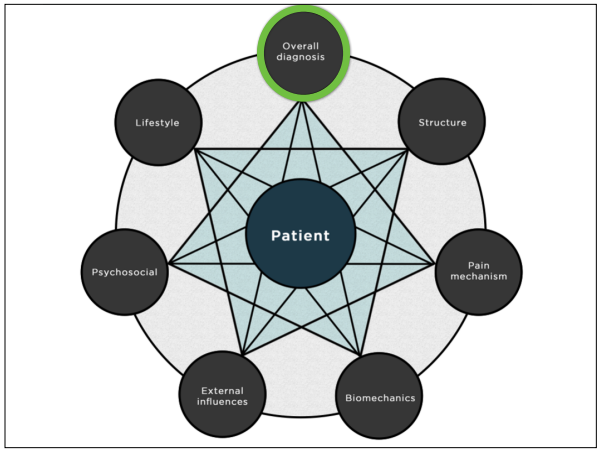
Overall diagnosis | Structure | Pain mechanism | Biomechanics | External influences | Psycho-social | Lifestyle




Enoch 2005, 2010



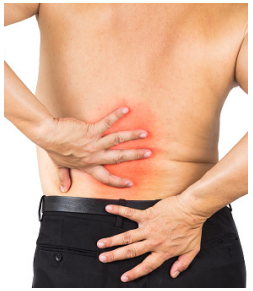


Lars Assessment 1

- Pain on extension gets worse with repeated reps
- Extension rotation is worse
- Flexion is stiff, but when repeated in sitting it gets better
- Return from flexion is worse
- Neurological assesment ia.

Overall diagnosis

- Serverity
- Pattern
- Duration
- Risk of chronicity/need for intervention



Ref.Hill JC, Dunn KM,et al Eur J Pain 2010 L.Morsø, Ph.d. 2013 Quebec Task Force,Kent P, Keating J:2004, Foster NE et al 2011, A. Kongsted et al 2013,

Quebec Task Force Classification

Figur 3. Quebec Task Force klassifikation baseret på smerteudbredelse, varighed og jobsituation.

Kategori 1				Kategori 2				Kategori 3				Kategori 4			
Lændesmerter				Lændesmerter + udstråling over knæ				Lændesmerter + udstråling under knæ				Lændesmerter + udstråling og neurologiske tegn			
≤ 7 dg.		> 7 dg. < 7 uger		> 7 uger		≤ 7 dg.		> 7 dg. < 7 uger		> 7 uger		≤ 7 dg.		> 7 dg. < 7 uger		> 7 uger	
+ arb.	- arb.	+ arb.	- arb.	+ arb.	- arb.	+ arb.	- arb.	+ arb.	- arb.	+ arb.	- arb.	+ arb.	- arb.	+ arb.	- arb.	+ arb.	- arb.

Figur 4. Quebec Task Force klassifikation baseret på diagnoser

Kategori 5	Kategori 6	Kategori 7	Kategori 8	Kategori 9		Kategori 10		Kategori 11
Formodet rodpåvirkning	Bekræftet rodpåvirkning	Bekræftet spinalstenose	Post-kirurgi 1 – 6 mdr.	Post kirurgi > 6 mdr.		Kronisk smerte-syndrom		Andet – fx metastaser, viscerale smerter, fraktur mv.
				Symptom-fri	Sympto-matisk	+ arb.	- arb.	

Spitzer WO et al. 1987 (figur from Kjær et al 2010)

The Keele STarT Back Screening Tool

Patient name: Lars Date: _____

Thinking about the **last 2 weeks** tick your response to the following questions:

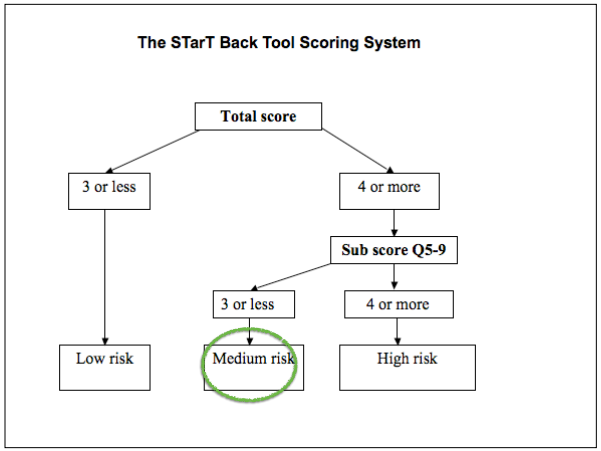
		Disagree 0	Agree 1
1	My back pain has **spread down my leg(s)** at some time in the last 2 weeks	☐	☑
2	I have had pain in the **shoulder** or **neck** at some time in the last 2 weeks	☑	☐
3	I have only **walked short distances** because of my back pain	☐	☑
4	In the last 2 weeks, I have **dressed more slowly** than usual because of back pain	☑	☐
5	It's not really safe for a person with a condition like mine to be physically active	☑	☐
6	**Worrying thoughts** have been going through my mind a lot of the time	☑	☐
7	I feel that **my back pain is terrible** and **it's never going to get any better**	☑	☐
8	In general I have **not enjoyed** all the things I used to enjoy	☐	☑

9. Overall, how **bothersome** has your back pain been in the **last 2 weeks**?

Not at all 0	Slightly 0	Moderately 0	Very much 1	Extremely 1
☐	☐	☐	☑	☐

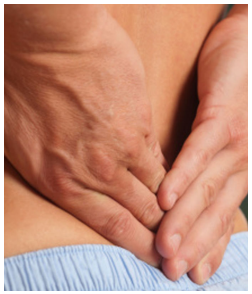
Total score (all 9): 4 **Sub Score (Q5-9):** 2

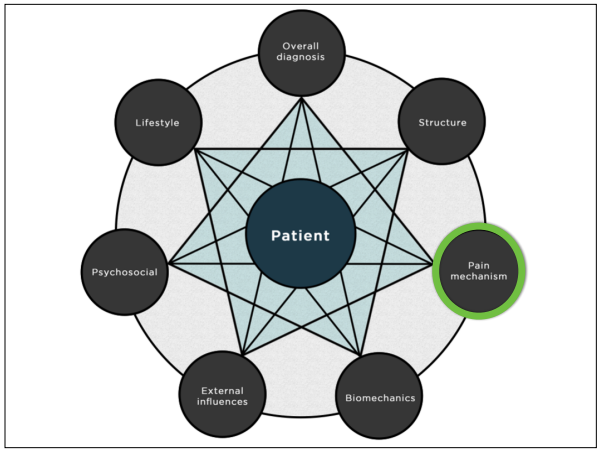
Hill JC, et al. 2011



Lars´ overall diagnosis

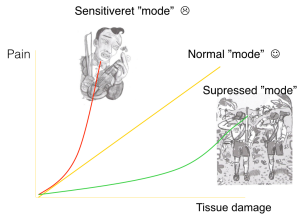
- QFT 2 - longlasting - medium risk of chronicity - recurrent - Low back pain problem.





Pain mechanisme

- Is the pain adaptive or maladaptive
- Nociceptive
- Perifer neurogen
- Central pain mechanisme



Pain Mechanisme

Nociceptive pain

Clear, proportionate mechanical/anatomical nature to aggravating and easing factors' and 'Clear, consistent and proportionate mechanical/anatomical pattern of pain reproduction on movement/mechanical testing of target tissues' ranked as the 'subjective' and 'clinical examination' criteria most strongly suggestive of a dominance of 'nociceptive' pain mechanisms.

Peripheral neuropathic pain

Pain variously described as burning, shooting, sharp, **aching or electric-shock-like' and** 'Pain/symptom provocation with mechanical/movement tests that move/load/compress neural tissue' and those deemed most suggestive of dominant 'central' pain mechanisms were; 'Disproportionate, non-mechanical, unpredictable pattern of pain provocation in response to multiple/non-specific aggravating/easing factors' and 'Disproportionate, inconsistent, non-mechanical/non-anatomical pattern of pain provocation in response to movement/mechanical testing'.

Central pain

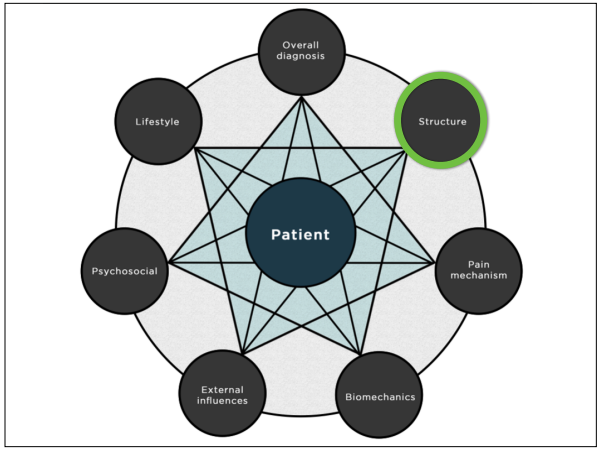
including patient reports suggesting **diffuse geographies of pain,** distortions in the stimulus-response relationship **associated with aggravating/easing factors and clinical tests,** spontaneous and paroxysmal pain and pain states with seemingly strong associations to emotional disturbances and maladaptive cognitions. A number of additional criteria were suggested including a history of failed interventions and diffuse/non-anatomic areas of pain and tenderness on palpation.

Smart et al 2010

Diagnosis Pain Mechanisme for Lars

Nociceptive pain.

Clear, proportionate mechanical/anatomical nature to aggravating and easing factors



Structure related to symptoms

"The high prestige diagnosis"

Structure related to symptoms

- Disc
- Adherent nerve root
- Nerve root entrapment
- Nerve root compression
- Spinal stenosis
- Zygapophysial joint
- Sacroiliac joint
- Myofascial pain
- Adverse neural tension

Petersen et al 2003 Kongsted et al 2010 Allegri 2016

Lars Assessment 2

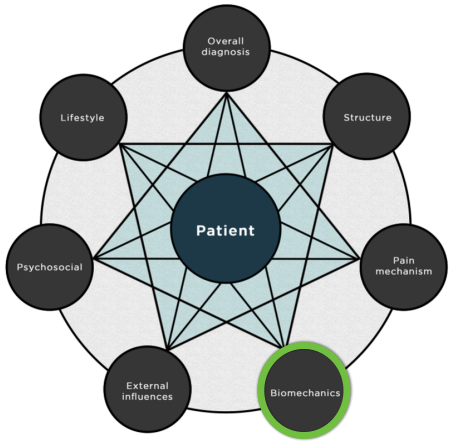
- Nerve tensiontest ia.
- SIJ provocation test ia
- Neurological assessment ia.
- Repeated movement did not reduce leg or back pain.
- Palpation P/A L4,L5 gave recognizable pain.

Diagnosis structure for Lars

L4, L5 facet joint "irritation"

- *Low back pain with or without referred pain with dominant symptoms above the gluteal fold in which the principal source of nociceptor receptor activity is assumed to be a zygapophysial joint.*

Petersen T et al 2003



Biomechanical

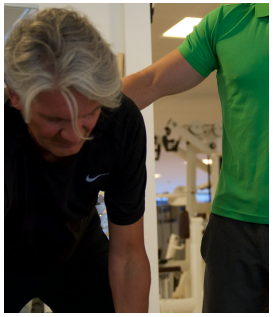
Is the patients posture and functional movement adaptive or maladaptive?

and

Can it explain the the patient's pain.

then

The patient has a biomechanics diagnosis



Sahrmann 2002, Van Dillen et al 1998, 2005, Richardson CA 1999, O*Sullivan 2005, Dankart 2006, Fersum.K et al., 2013 Hibbs 2008

CONCENSUS 2013

1. *THE SPINE IS CONTROLLED BY A INTERPLAY OF MANY MUSCLES - NO SINGLE MUSCLE IS MOST INPORTANT*
2. *CHANGING THE MANNER IN WHICH A PATIENT CONTROLS THE SPINE AND PELVIS IS LIKELY TO BE BENEFICIAL IN THE MANAGEMENT OF BACK PAIN*
3. *MOTOR CONTROL OF THE SPINE CAN BE CHANGED WITH TREATMENT/EXERCISE*
4. *TREATMENT REQUIRES PROGRESSION TO ENHANCED EXECUTION OF ACTIVITIES OF DAILY LIVING*

Hodges, McGill, Hides 2013

Neural and Muscular Factors Associated with Motor Impairment in Neck Pain

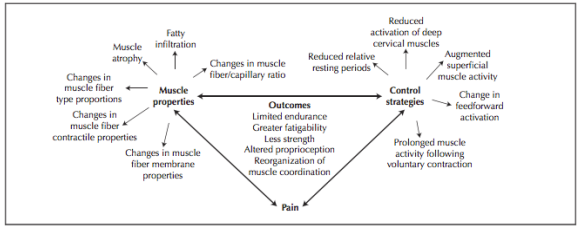


Figure 1. Inter-relationships between pain, altered control strategies, and peripheral changes of the cervical muscles.

Falla ; Ferino 2007

Motor control exercise

MCE probably provides **better improvements** in pain, function and global impression of recovery than minimal intervention at all follow-up periods.

MCE may provide **slightly better improvements** than exercise and electrophysical agents for pain, disability, global impression of recovery and the physical component of quality of life in the short and intermediate term.

There is probably **little or no difference between MCE and manual therapy** for all outcomes and follow-up periods. Little or no difference is observed between MCE and other forms of exercise.

Given the minimal evidence that MCE is superior to other forms of exercise, the choice of exercise for chronic LBP should probably depend on patient or therapist preferences, therapist training, costs and safety.

Cochrane, Saragiotto et al. 2016

An update of stabilisation exercises for low back pain: a systematic review with meta-analysis

Benjamin E Smith[1*], **Chris Littlewood**[2] and **Stephen May**[3]

Meta-analysis showed significant benefit for stabilisation exercises versus any alternative treatment or control for long term pain and disability

but

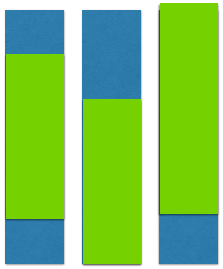
Conclusion

There is strong evidence stabilisation exercises are not more effective than any other form of active exercise in the long term. The low levels of heterogeneity and large number of high methodological quality of available studies, at long term follow-up, strengthen our current findings, and further research is unlikely to considerably alter this conclusion.

Benjamin E Smith et al 2014

At the impairment level

- Does the patient have movement or control impairment
- Does the patient have a low load, a high load problem or both



	Low load stabilisering
Akbari 2008	Instruction of isometric abdominal drawing in manoeuvre, in 4 point kneeling, supine, sitting and standing.
Costa 2009	tailored exercises aimed at multifidus and transversus abdominis muscles.
Critchley 2007	Tailored to assessment findings and progressed within participants' ability, working on transversus abdominis and lumbar multifidus muscle training followed by group exercises that challenged
Ferreira 2007	Each patient was trained in contraction of transversus abdominis and multifidus muscles in isolation, by a physical therapist
Franca 2012	Exercises focused on transversus abdominis and multifidus using the abdominal drawing in manoeuvre. Exercises in 4 point kneeling, crook lying, prone and in upright positions.
Gladwell	6 x 1 hour Pilates class a week. Plus 2 x 30 minute sessions at home a week. Exercises involved initial teaching of recruitment of transversus abdominis, progressing onto recruitment
Inani 2013	Teaching of isometric contraction of transversus abdominis and multifidus.
Javadian	Stabilization exercises included isometric contraction of deep muscles of the lumbar spine in supine, bridging, kneeling, sitting and standing. Progressed onto Swiss ball and wobble board.
Kumar 2010	20 sessions of one on one dynamic muscular stabilization exercise. Isometric abdominal drawing in manoeuvre in crook lying, progressing onto contraction
Macedo 2012 Javadian 2012 [43]	tailored exercises aimed at multifidus and transversus abdominis muscles
Marshall 2013	The teaching of the isometric abdominal drawing in manoeuvre, with biofeedback pressure transducer under lumbar spine.
Moon 2013	All exercises were performed with the abdominal drawing in manoeuvre and included crook lying, knee lifts, leg slides, straight leg raises, plank, 4 point kneeling
Rasmussen-Barr 2009	reatment included instruction on deep muscles of lumbar spine and isometric contraction of transversus abdominis with and multifidus
Rhee 2012	Exercise involved abdominal drawing in manoeuvre in 5 different positions: prone, prone with leg and arm lifts, 4 point kneeling leg and arm lifts, crook lying mini sit ups, crook lying mini twist sit ups.
Sung 2013	Exercise involved abdominal drawing in manoeuvre in 5 different positions
Wang 2012	Control of neutral spine alignment in sitting, prone, bridging, leg lifts, double

Lars Assessment 3

- Posture: ant tilt
- Extension reverse from flexion
- Extension from sit to stand
- Pain in trunk rotation ease with neutral Lx (golf movement)
- Positive test prone knee-flexion, prone hip extension (restriction) Tx extension Leg cycle - low and high load.
- Myofaciel restriction back extensors, hipflexors.
- Articular restriction Tx extension and hip extension

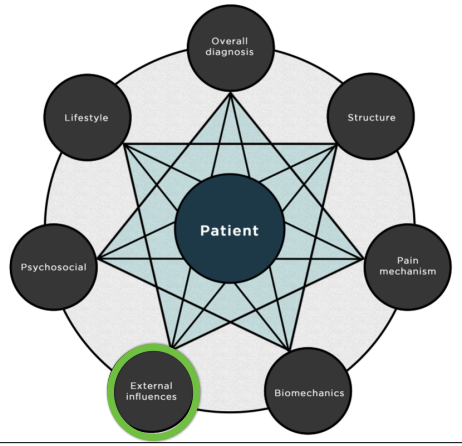
Diagnosis Biomechanical

- **Control impairment**
  - Direction specific
    - Flex
    - Extension
    - Rotation Lateral Flex.
    - A combination of two or more
  - Local
  - Low load, High load, High speed
- **Movement impairment**
  - Direction specific
    - Flexion
    - Extension
    - Rotation/lat flex.

Sahrmann 2002, Vandillen et al 1998, 2005, Richardson 1999, O´Sullivan 2005, Dankeart 2006, Fersum 2013, Enoch 2004, 2011

Biomechanical diagnosis for Lars

- **Control impairment** in extension/rotation low and high load
- **Movement impairment** in Lx fleksion and hip extension



External factors

Vibrations affecting the whole body, **physically hard work**, **frequently twisting or bending**, **standing up**, and concentration demands proved to be **risk factors for the occurrence of low back pain**, even after controlling for age, sex, educational level, and duration of employment in a specific occupation.

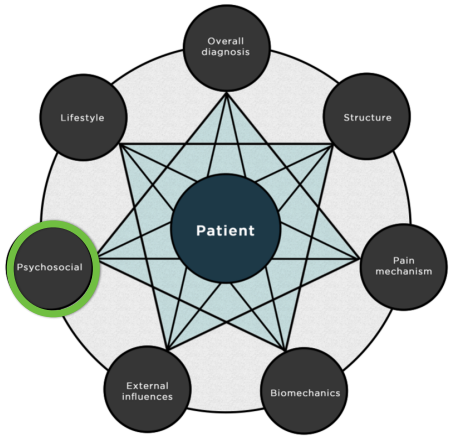
Leboeuf-Yde C1 ET. 1997, Y Xu, E Bach, E Orhede 1997

External factors

- Repetition/time
- Load/position
- Restitution

Factors related to Lars´ back problem

- Activity related to extension and rotation -
- Obs Golf repeated drives with poor technique on the driving range



Psycho social

Psychosocial factors are at least as important as biomedical factors in the onset, maintenance and treatment of chronic low back pain Leboeuf-Yde 2004

According to recent epidemiological literature, evidence for significant positive associations between psychosocial factors at work and LBP and consequences of LBP is lacking. Hartigvisen et al 2004

Few independent psychosocial risk factors have been demonstrated to exist. Raymond et al 20111

Physiotherapist-delivered cognitive-behavioural interventions are effective for low back pain Hall 2016

Psycho social

Cognitive-behavioral intervention

Reduce fear of movement and pain-related disability such as pacing, goal setting, problem-solving, relaxation, and challenging unhelpful thoughts relevant to LBP Hall et al 2016

Cognitive-behavioral intervention

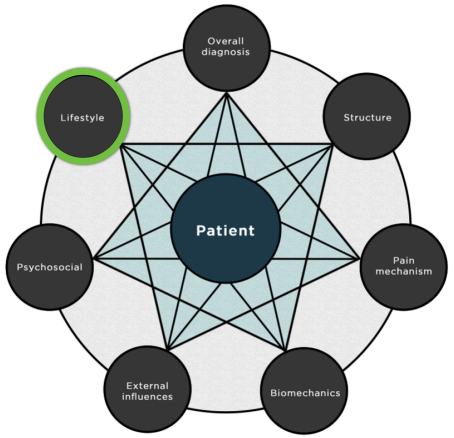
CB interventions yield **long-term improvements in pain, disability and quality of life** in comparison to no treatment and other guideline-based active treatments for patients with LBP of any duration and of any age. Richmond 2015

The classification-based cognitive functional therapy produced **superior outcomes** for non-specific chronic low back pain compared with traditional manual therapy and exercise. Fersum et al 2012

Patient satisfaction[b] [*n* (%)]	MT-EX					CB-CFT					
	1	2	3	4	5	1	2	3	4	5	
3 months[3]	28 (68.3)	6 (14.6)	5 (12.2)	0	2 (5.9)	48 (94.1)	1 (2.0)	2 (3.9)	0	0	z = 3.21 **
12 months[3]	18 (46.2)	8 (20.5)	9 (23.1)	3 (7.7)	1 (2.5)	46 (95.8)	1 (2.1)	1 (2.1)	0	0	z = 5.18 ***

Diagnosis Psycosocial

- Lars has some concerns about his back.
- He needs more knowledge about low back pain and needs to gain more confidence in his back



Lifestyle

- Active
- Education
- Diet
- Stimulants
  - Smoke
  - Alcohol
  - Sweets
- Sleeppattern

- Non-smoking, no risk consumption of alcohol, recommended level of leisure physical activity and recommended consumption of fruit and vegetables.

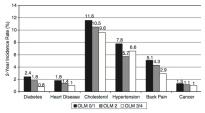
Lifestyle

Individuals with low back pain often experienced a **lower physical activity during leisure time,** and they were also more likely to have been **smokers,** have had **higher body mass** index,… than people without low back pain.

Björck-van Dijken 2008

Healthy lifestyle behaviour

- Healthy lifestyle behaviour seems to decrease the risk of developing long duration troublesome low back pain among women
- LBP decreased by 35% with one healthy lifestyle factor and by 52% with all four healthy lifestyle factors.
- "Optimal lifestyle" decreased the 2-year risk of chronic LBP by 66% compared to employees with an unhealthy lifestyle.
- **40% of all deaths and nearly 80% of chronic diseases related to lifestyle factors**



OML Optimal Life style matrix

Bohman T 2014, Pronk et al 2009

Sleep

Consistent evidence found that **CLBP was associated with greater sleep disturbance;**

Insufficient sleep quantity or quality was an independent risk factor for NP and LBP among girls

Kelly et al 2011

Deep Sleep 20% + REM sleep 25% = 45%

Diet

Dietary approaches leading to maintenance of normal body weight can prevent LBP, and its chronicity. Reduction of body weight through nutrition intervention reduces chronic low back pain Silisteanu et al 2015

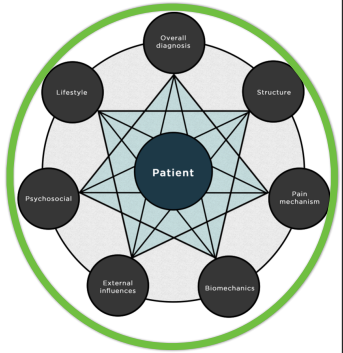
Being overweight or obese in early adulthood as well as during the life increases the risk of radiating LBP Frilander 2015

Factors related to Lars' back problem

- Lifestyle -
  - Increased blodpressure
  - Disturbed sleep
  - Active - but not enough high intensity
  - Maybe he needs special diet, to reduce high blodpressure

Diagnosis Lars

- QTF 2 - longlasting - medium risk for chronicity - recurrent -
- L4, L5 facet joint "irritation" Low back pain problem.
- Control problem in extension/ rotation low and high load
- Movement impair in Lx fleksion and hip extension
- He does not trust in his back
- Few lifestyle issues (sleep, diet, high intensity training)



The questions need to be answered

- **Is it something serious?**
- *No not at all. In my assessment I have not found anything you need to worry about*
- **How long does it take?**
- *Within 6-8 weeks you will be much better. But you had it for a long time, so you need to do your rehabilitation for a long time. I would think 6 month would get you in good shape*
- **What's wrong with me?**
- *You have some irritated facet joints in your lower back and the way you move stress the joints, especially when you move into extension and rotation. The muscles that need to stabilize your back is not working optimally. Your abdominal strength is not good enough together with your poor golf technique it will hurt your back.*
- *Also you are a little stiff in your hips and thorax, which affects the way you move.*
- **What should you (the Physio) do about it?**
- I will try to teach you some alternative ways to move with less or no pain, and I will give you some exercises for control and some other ways to mobilize the stiff areas. You wake up several times at night. Thats not good. We also need to look into that. It may affect your restitution. Finally you have some lifestyle issues with your blood pressure. Later in your rehabilitation we should address that if your are interested.
- **What should you do about it?**
- *You need to stay away from the driving range for some time and you should only play 9 holes of golf. You need to do your exercise, some at home and some at a class at the clinic.*

- *Do you want me to write it down for you and send it together with home exercise program?*

Clinical take home message1

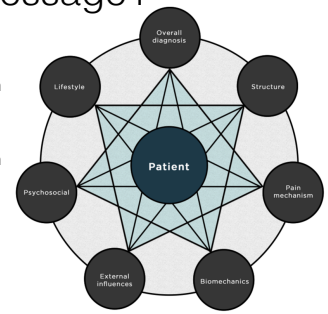
There is no such thing as
None specific low back pain

only

None specific low back pain assessment

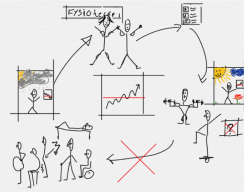
and

None specific treatment



The job that needs to be done

- Help getting a patient from one physical/mental state they don't like to be in - to another state they like better
- And
- Give the patient tools to stay in that state and if he/she wants to, move further towards a better/healthier life.



What is good physiotherapy

- We have a clear idea
- But how about our patients?

	MT-EX					CB-CFT					
Patient satisfaction[2] [n (%)]	1	2	3	4	5	1	2	3	4	5	
3 months[3]	28 (68.3)	6 (14.6)	5 (12.2)	0	2 (5.9)	48 (94.1)	1 (2.0)	2 (3.9)	0	0	$z = 3.21^{**}$
12 months[3]	18 (46.2)	8 (20.5)	9 (23.1)	3 (7.7)	1 (2.5)	46 (95.8)	1 (2.1)	1 (2.1)	0	0	$z = 5.18^{***}$

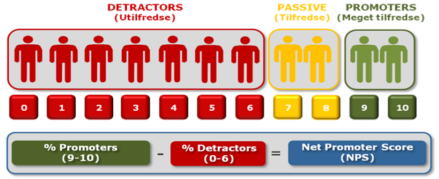
Fersum et al 2012

Good Physiotherapy Take home message 2

- Good physiotherapy is what gives meaning to the patient to a degree that the patient would recommend you to a friend or a colleague.

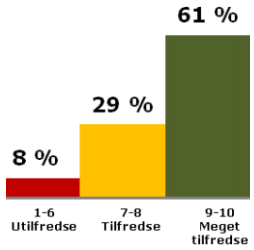
Net promotor score

- How likely is it that you would recommend our clinic to a friend or colleague?



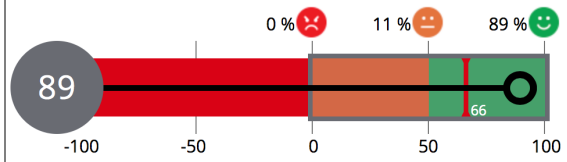
Net promotor score

- How likely is it that the patient would take other services from us if we advice it.



Temkin group benchmark survey 2015

What it takes



Not so happy

- It (the treatment) did not make a difference
- Did not feel they were being heard
- There was a lack in the following up - the physio never called back.
- The physiotherapist did not seem prepared.

What it takes!

- **The patient needs to feel an improvement - (no pain)**
- Empathy
- Commitment
- Feeling of being the center
- Feeling of being heard
- “Taken in the hand”
- Helped the whole way around