

# Uspesifikke Ryggsmarter

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Førstelektor

School of Health Sciences

«Vi vet lite om årsakene til ryggsmarter, som antakelig er forskjellige og komplekse. Når man ikke vet sikkert hva man leter etter, finner man gjerne det man er interessert i.»

«Ingen er tjent med at pasientens korsryggssmerter kompliseres med ømme tær hos terapeuter og forskere»

Guldbrandsen P. Må ryggsmarter gi ømme tær? *Tidsskriftet for Norske Legeforening* 1999; 199: 1574

«Each profession or group presumable has something to offer and surely they all can't be correct. Somehow we need to extract what is common and beneficial from the various groups».

Butler D. *The sensitive nervous system.*  
OPTP 2006



$$\frac{12c^6}{311c_j^6} + \frac{pV_m}{RT} \frac{(1-y)^3 + 0,2871m}{V_m^4 (cx^2) + (ya^2) + \sqrt{672,311c_j^6} + \frac{pV_m}{RT} \frac{(1-y)^3 + 0,2871m}{V_m^4 (cx^2) + (ya^2) + \sqrt{672,311c_j^6}}$$

$$\frac{B_2}{V_m} y^n - 1 + \frac{B_2}{V_m} + \frac{\beta_3}{V_m^2} + \frac{b}{pV_m^2} + 0,2871 \frac{p^4}{V_m^4} \frac{B_2}{V_m} y^n - 1 + \frac{B_2}{V_m} + \frac{\beta_3}{V_m^2} + \frac{b}{pV_m^2} + 0,2871 \frac{p^4}{V_m^4}$$

$$\sum_{m=0}^{\infty} (m^2 + 3n) y^n (cx^2) + (ya^2) + 283,076 = \sum_{m=0}^{\infty} (m^2 + 3n) y^n (cx^2) + (ya^2) + 283,076$$

$$0,2871 \frac{p^4}{V_m^4} + \frac{(x^3 + c^6)}{(c^6 + b^3)} + \sum_{m=0}^{\infty} \left( \frac{B_2}{V_m} + \frac{\beta_3}{V_m^2} \right) y^n + 0,2871 \frac{p^4}{V_m^4} + \frac{(x^3 + c^6)}{(c^6 + b^3)} + \sum_{m=0}^{\infty} \left( \frac{B_2}{V_m} + \frac{\beta_3}{V_m^2} \right)$$

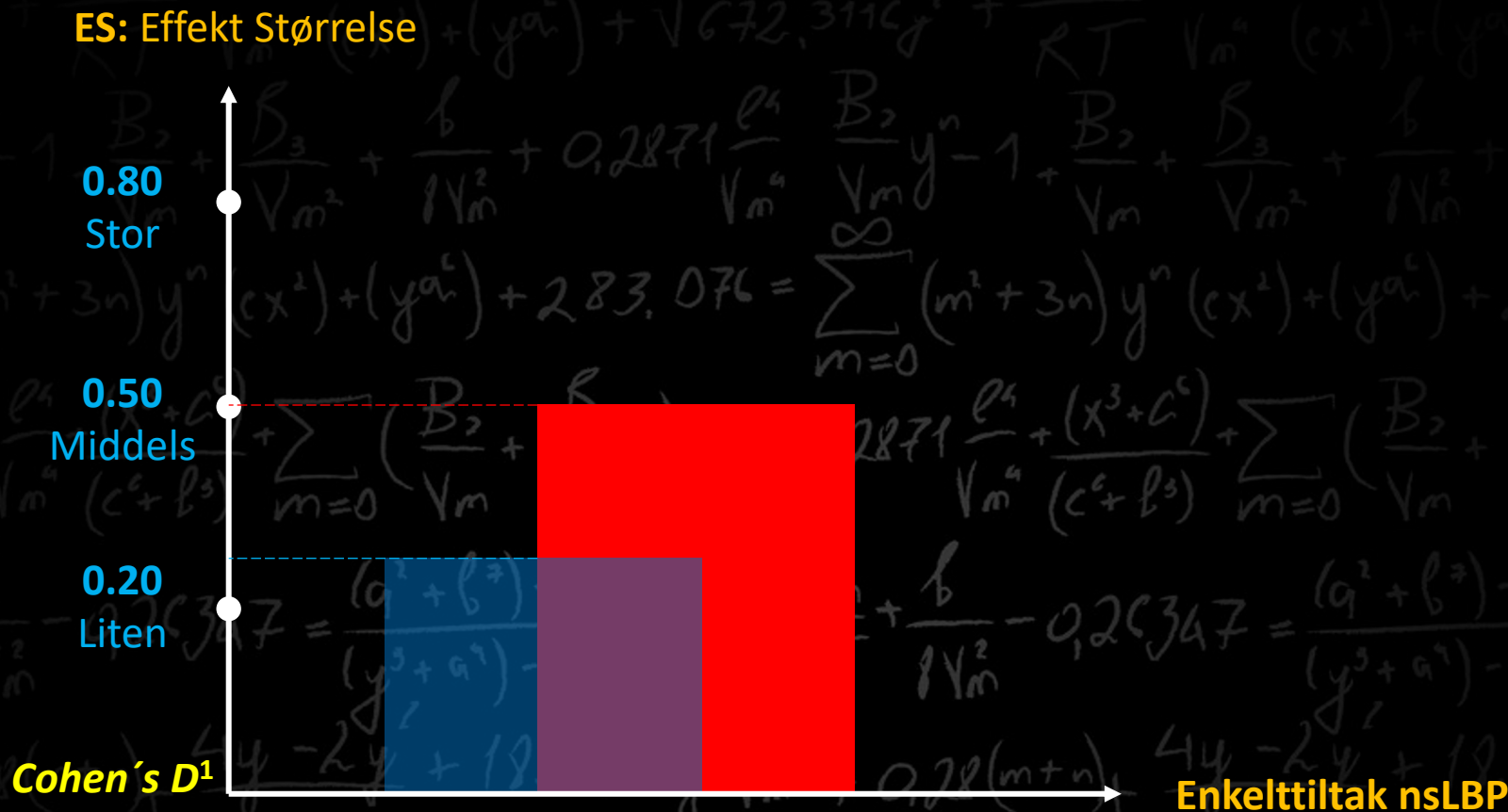
$$\frac{m}{T} + \frac{b}{pV_m} - 0,20347 = \frac{(a^2 + b^3) - (x^3 + c^6)}{(y^3 + a^2) - (c^6 + b^3)} \frac{pV_m}{RT} + \frac{b}{pV_m} - 0,20347 = \frac{(a^2 + b^3) - (x^3 + c^6)}{(y^3 + a^2) - (c^6 + b^3)}$$

$$+ 0,28(m+n) + \frac{44 - 2y}{y} + 18,362 y^3 \frac{1}{V_m^4} + 0,28(m+n) + \frac{44 - 2y}{y} + 18,362 y^3 \frac{1}{V_m^4}$$

$$\frac{12c^6}{311c_j^6} + \frac{pV_m}{RT} \frac{(1-y)^3 + 0,2871m}{V_m^4 (cx^2) + (ya^2) + \sqrt{672,311c_j^6} + \frac{pV_m}{RT} \frac{(1-y)^3 + 0,2871m}{V_m^4 (cx^2) + (ya^2) + \sqrt{672,311c_j^6}}$$

$$\frac{B_2}{V_m} y^n - 1 + \frac{B_2}{V_m} + \frac{\beta_3}{V_m^2} + \frac{b}{pV_m^2} + 0,2871 \frac{p^4}{V_m^4} \frac{B_2}{V_m} y^n - 1 + \frac{B_2}{V_m} + \frac{\beta_3}{V_m^2} + \frac{b}{pV_m^2} + 0,2871 \frac{p^4}{V_m^4}$$

$$\sum_{m=0}^{\infty} (m^2 + 3n) y^n (cx^2) + (ya^2) + 283,076 = \sum_{m=0}^{\infty} (m^2 + 3n) y^n (cx^2) + (ya^2) + 283,076$$



Cohen J. A power primer. *Psychological Bulletin*. July 1992; 112: 1, 56

Keller A, Hayden J, van Tulder M et al. Effect sizes of non-surgical treatment of non-specific low back pain. *Eur Spine J* (2007) 16:1776–1788

Froud R et al. The effect of journal impact factor, reporting conflicts, and reporting funding sources, on standardized effect sizes in back pain trials: a systematic review and meta-regression. *BMC Musculoskeletal Disorders* 16: 370 (2015)

Froud R et al. A Systematic Review of Power, Sample Size, and Reporting of Sample Size Calculations Over Time, in Trials Published Between 1980 and 2012. *Spine* 42(11): E680-E686; 2017



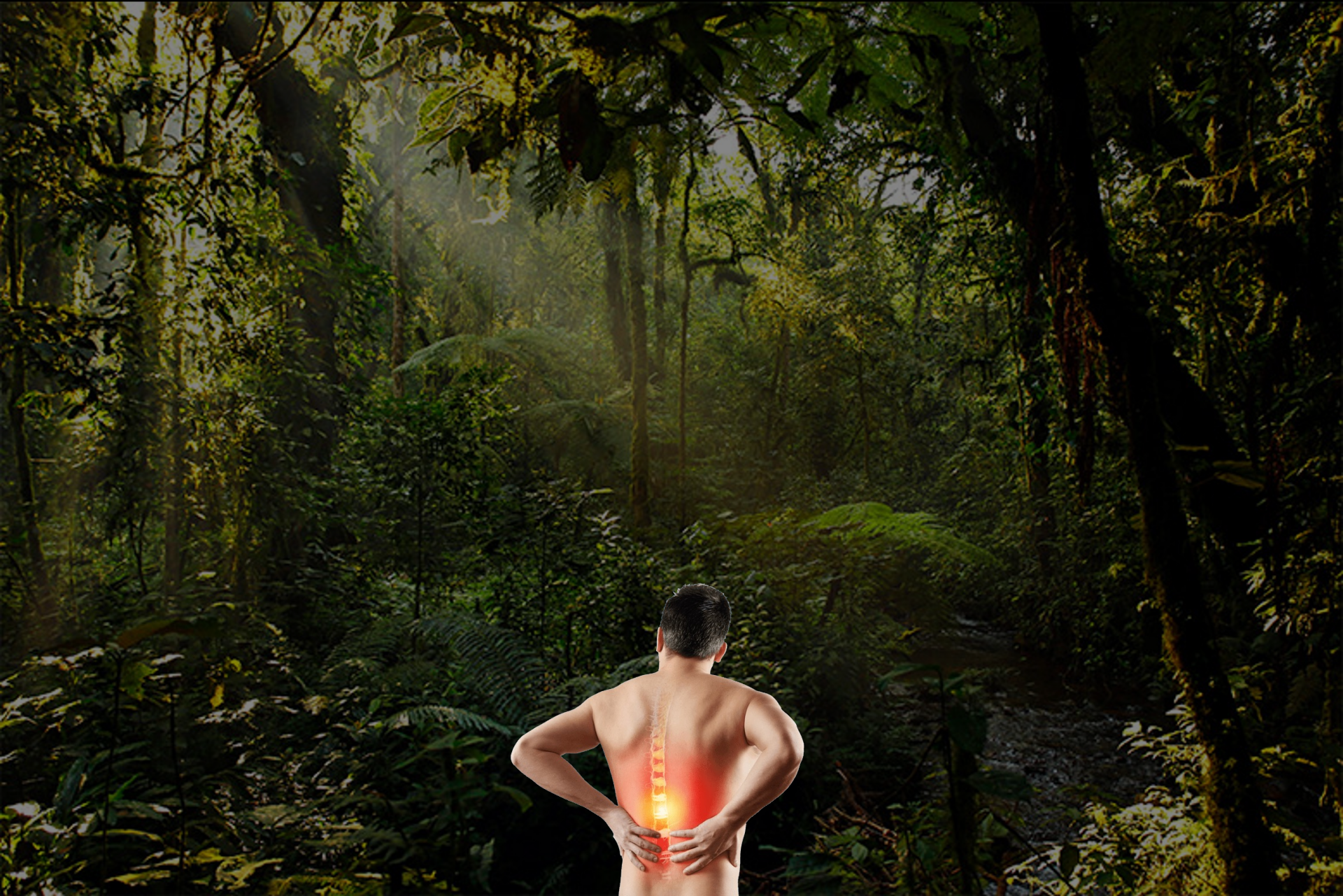
# Del 1: Uspesifikke Ryggmerter



Ett Fugleperspektiv



# Hvordan det føles for pasienten

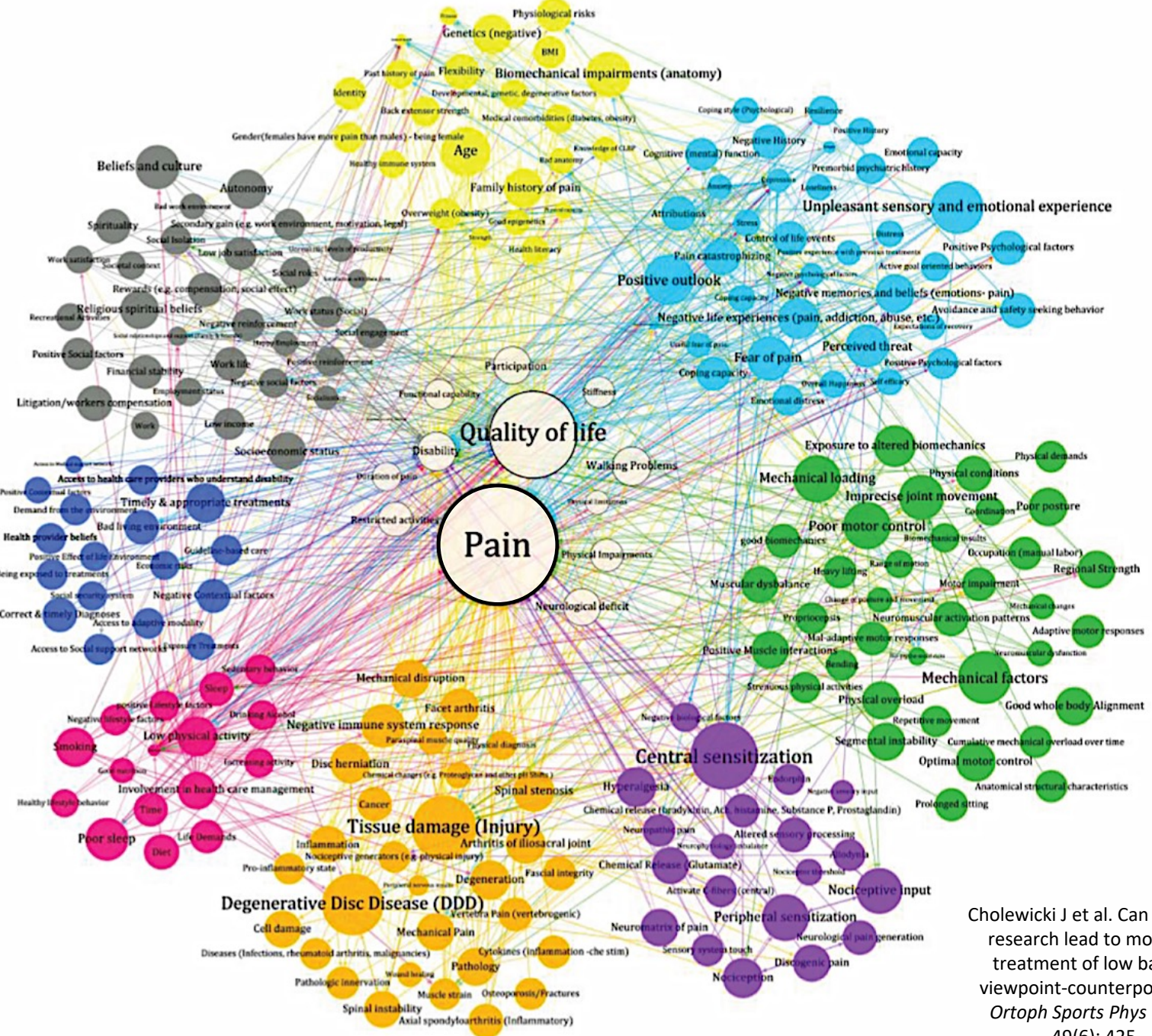


# Hva pasienten ofte tror





# Hva vi som klinikere vet

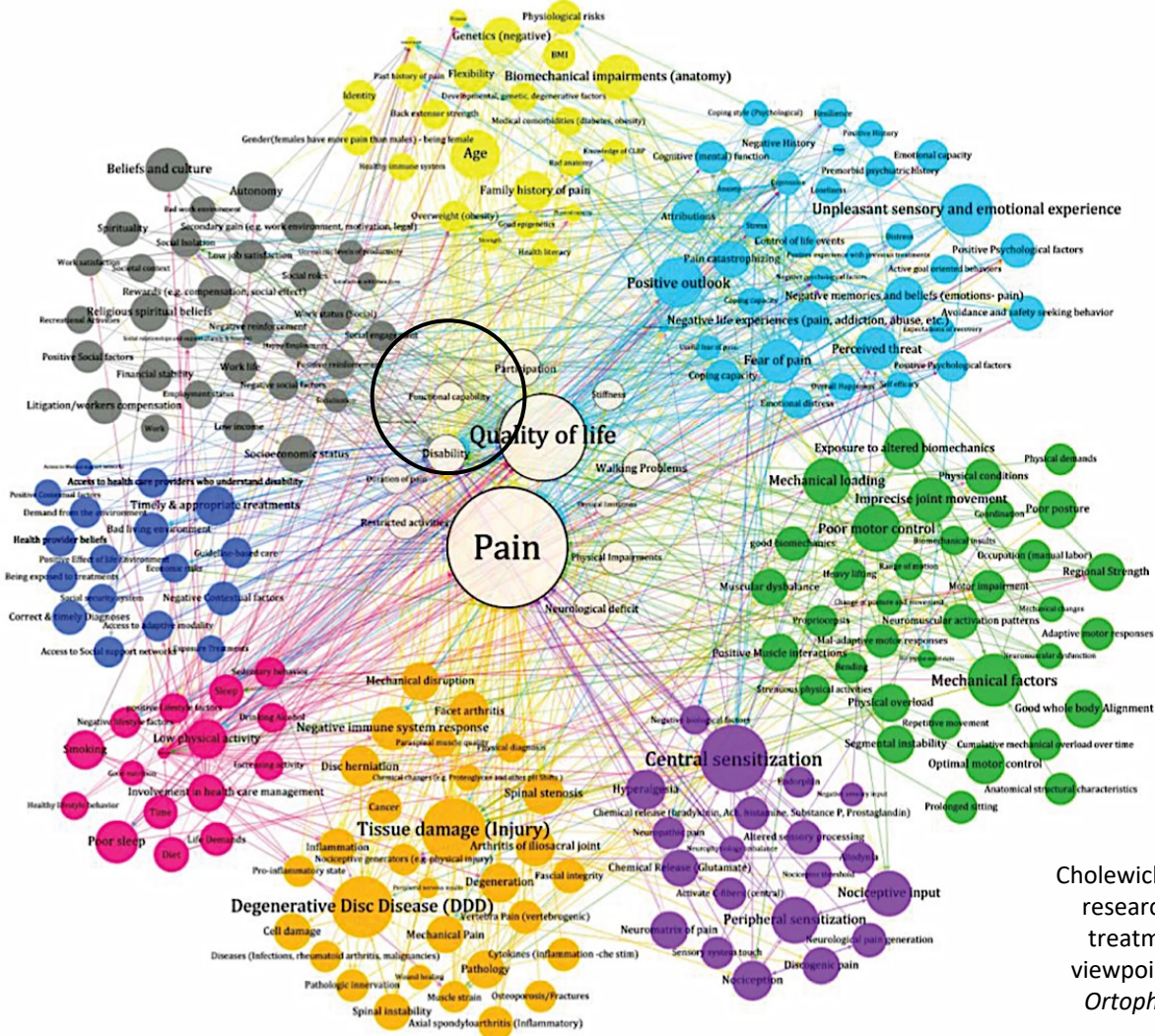


Cholewicki J et al. Can biomechanics research lead to more effective treatment of low back pain? A viewpoint-counterpoint debate. *J Orthop Sports Phys Ther.* 2019; 49(6): 425 - 436



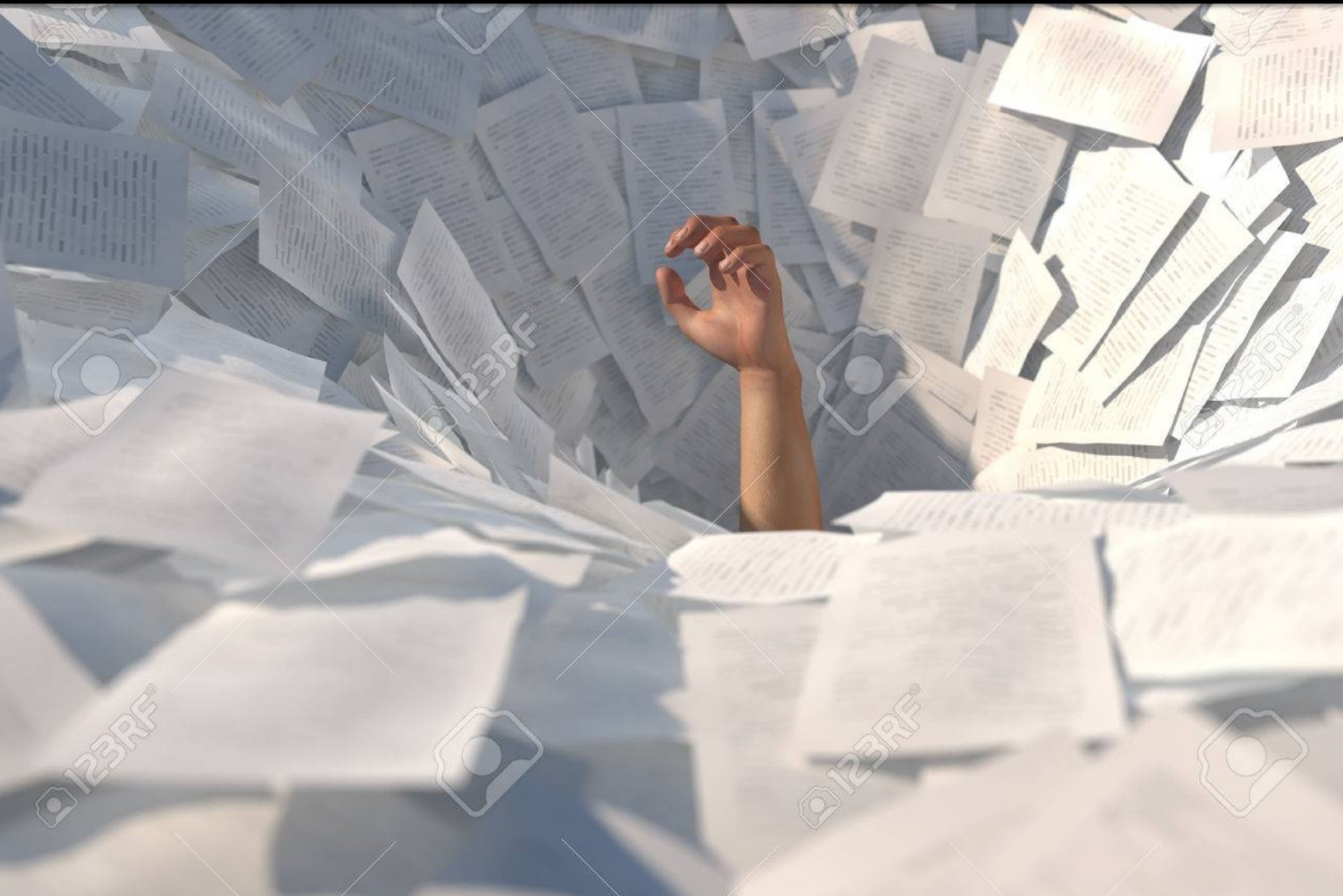
# Hva vi som klinikere vet

- Individual factors
- Psychological factors
- Biomechanical factors
- Nociceptive detection and processing
- Tissue injury or pathology
- Behavioral/lifestyle
- Contextual factors
- Social/work factors



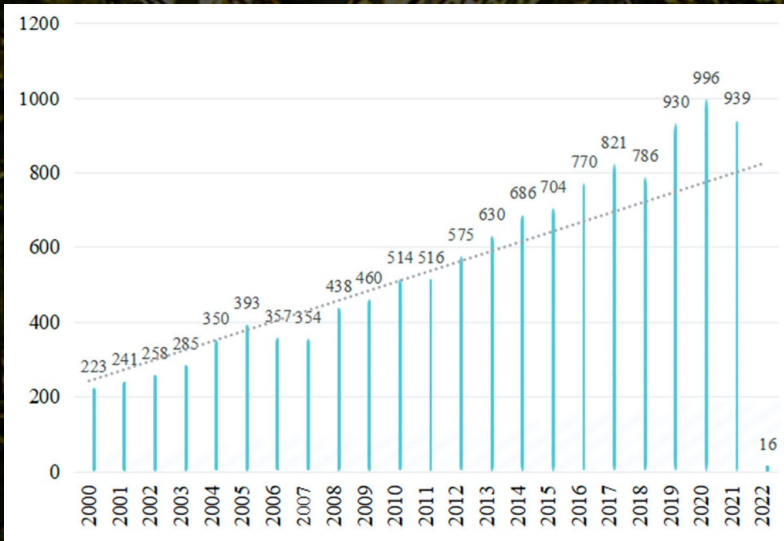
Cholewicki J et al. Can biomechanics research lead to more effective treatment of low back pain? A viewpoint-counterpoint debate. *J Orthop Sports Phys Ther.* 2019; 49(6): 425 - 436

# Hvordan det føles for klinikerer





# Information Overload



Huang F et al. International publication trends in low back pain research: a bibliometric and visualization analysis. *Front. Public Health* 10: 746591, Vol. 10, March 2022

## Hvordan det føles for klinikerer

- <34,000 akademiske og faglige tidsskrifter
- <7 millioner artikler per år

NIH National Library of Medicine  
National Center for Biotechnology Information

PubMed.gov

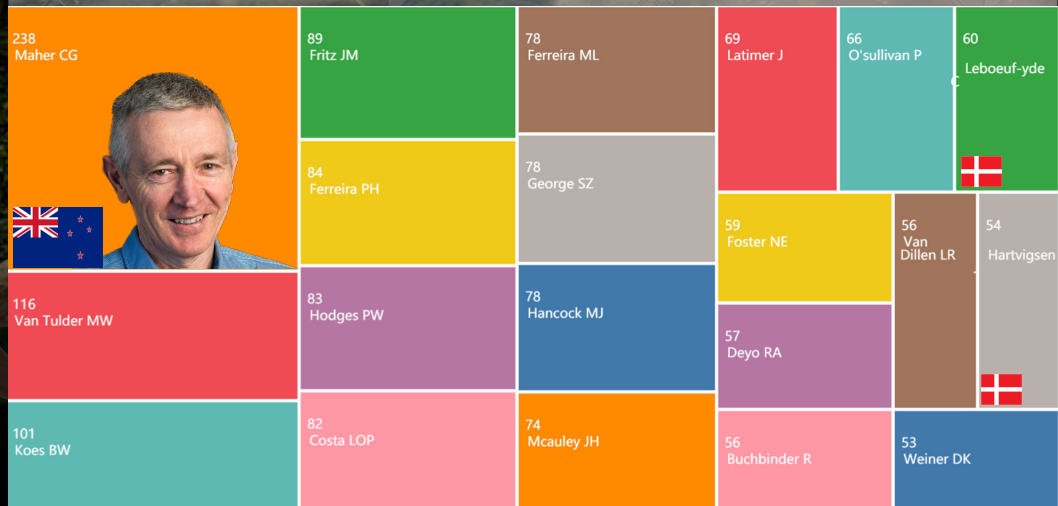
low back pain

46,471 results

RESULTS BY YEAR

1 **Low back pain.**  
Knezevic NN, Candido KD, Vlaeyen JWS, Van Zundert J, Cohen SP.  
Lancet. 2021 Jul 3;398(10294):78-92. doi: 10.1016/S0140-6736(21)00733-9. Epub 2021 Jun 8.  
PMID: 34115979 Review.

**Low back pain** covers a spectrum of different types of pain (eg, nociceptive, neuropathic and nociplastic, or non-specific) that frequently overlap. ...Most treatment options address only single, solitary causes and given the complex nature of low ...





“Low back pain is, in patients aged 30 to 60 years, the most expensive ailment from a socioeconomic viewpoint. . . . At present the etiology is unknown . . . and only symptomatic treatment is available. . . . So far no convincing evidence exists that any type of conservative treatment for the patient with low back pain is superior to nature’s own course. . . .”

“Low back pain is, in patients aged 30 to 60 years, the most expensive ailment from a socioeconomic viewpoint. . . . At present the etiology is unknown . . . and only symptomatic treatment is available. . . . So far no convincing evidence exists that any type of conservative treatment for the patient with low back pain is superior to nature’s own course. . . .”



**Nachemson AL. The lumbar spine: an orthopaedic challenge. *Spine* 1976;1:10–21**

**Epidemiologiske studier på 1980-tallet viste at den eneste lidelsen som oppstod oftere var forkjølelse (Brayado-Bruno, 2017)**

“Disability due to backache has reached epidemic proportion while heavy physical labor has decreased dramatically”

“...is not due to physical work related factors or to a universal weakening of the locomotor system. Rather, the culprits are (a) the idea that back problems generally improve with rest, and (b) the social - security reaction to this idea with prolonged sick leave and early retirement”

**Editorial. The back pain epidemic. *Acta Orthop Scand* 1989;60:633–634**

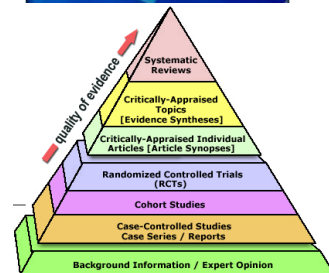
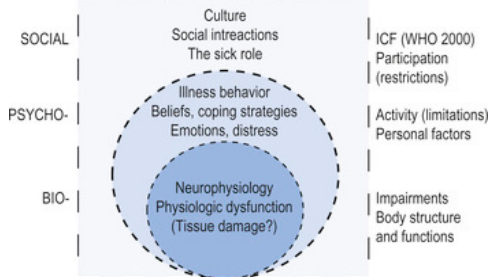
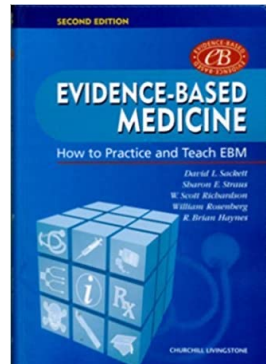
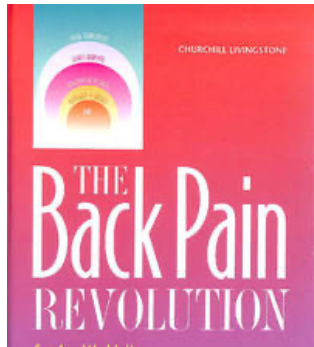


# Epidemiologiske studier på 1980-tallet viste at den eneste lidelsen som oppstod oftere var forkjølelse (Brayado-Bruno, 2017)

“Disability due to backache has reached epidemic proportion while heavy physical labor has decreased dramatically”

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Editorial. The back pain epidemic. *Acta Orthop Scand* 1989;60:633–634

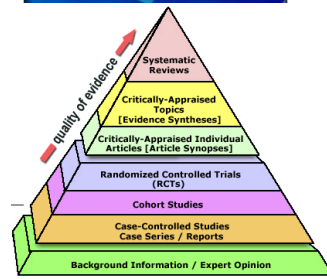
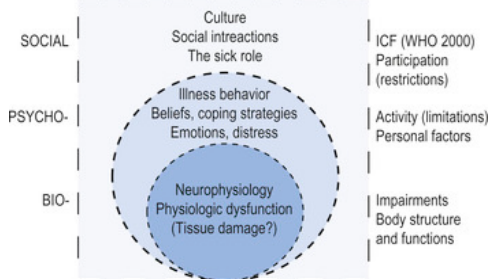
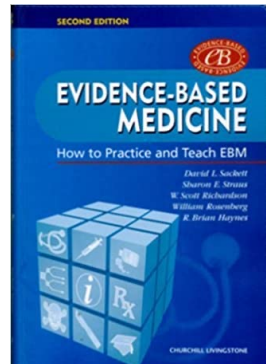
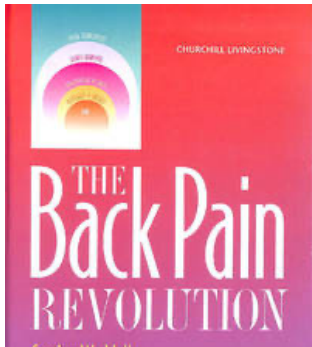
# Kliniker og Forskere med Ryggsmarter som Spesialitet



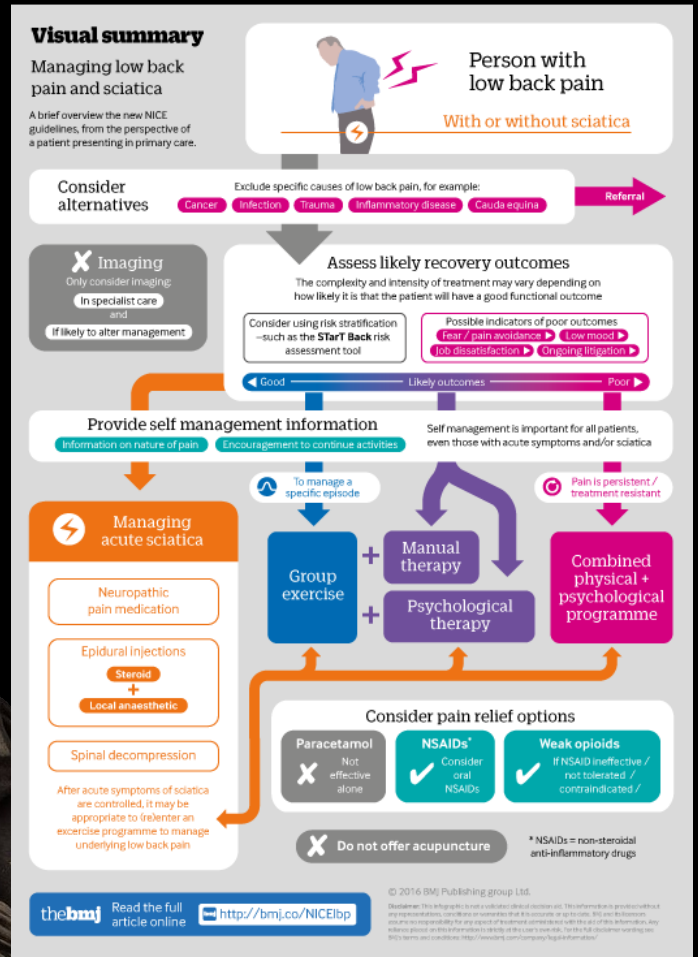
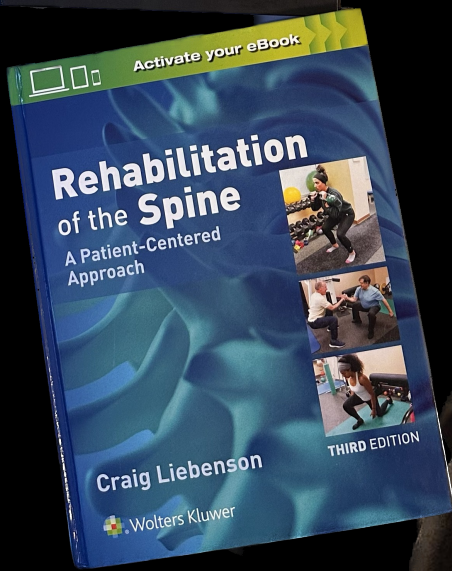
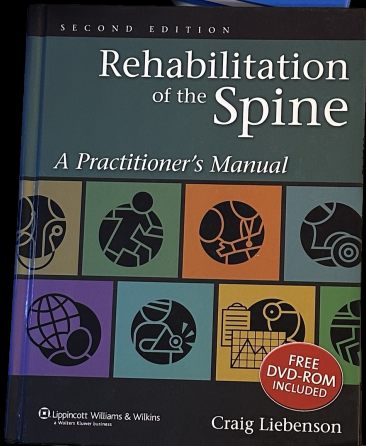
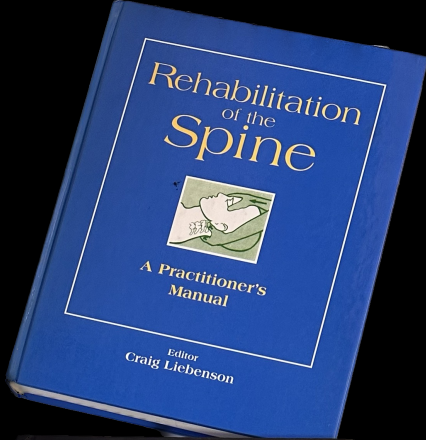
1976



2023







## Lancet Series

The “Magnum Opus” Regarding the Evidence on Low Back Pain

Raymond Ostelo, PhD

## THE LANCET

Volume 392 | Number 10 143 | Pages 187–252 | July 21–27, 2018

www.thelancet.com

2018

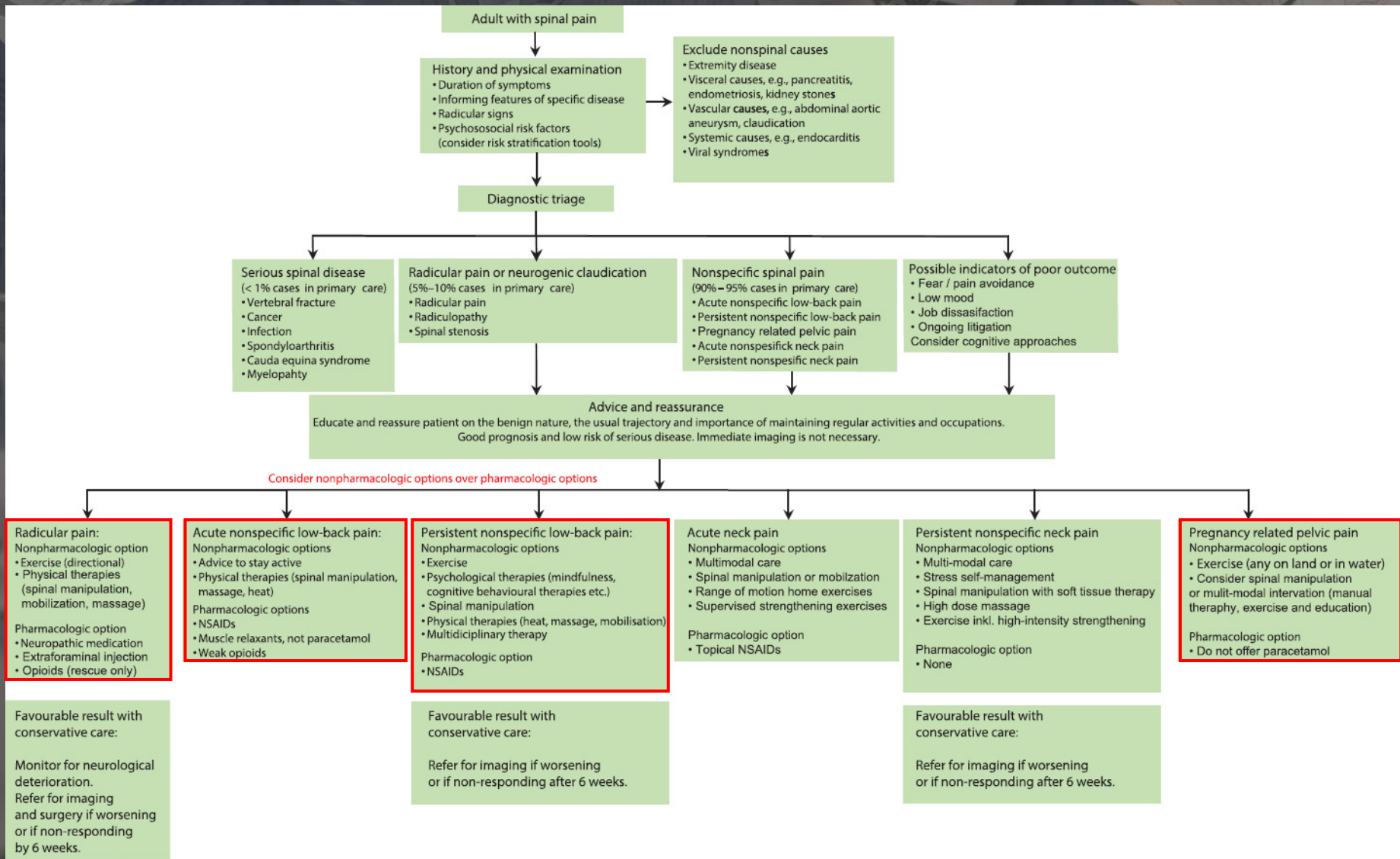


## Box 1 Lessons from the Lancet low back series

- ▶ Low back pain (LBP) is a major global challenge, and back-related disability is increasing.
- ▶ The majority of LBP is not serious and cannot be linked to a specific structure.
- ▶ Most red flags have limited diagnostic accuracy.
- ▶ Imaging use is often inappropriate for non-specific LBP.
- ▶ Non-pharmacological treatments such as advice and activity should be first-line options in the treatment of non-specific LBP.
- ▶ Opioids have small effects, but have substantial risks.
- ▶ Psychosocial factors are important contributors to LBP and associated disability.
- ▶ A systems approach to LBP involving clinical pathway redesign, changes to payment systems and legislation, and integrated health and workplace strategies is needed.
- ▶ Advocate the concept of positive health for LBP—the ability to adapt and to self-manage in the face of social, physical and emotional challenges.
- ▶ Need to change widespread misconceptions about the causes, prognosis and effectiveness of different treatments for LBP.



# Sammenfatning: Kliniske Retningslinjer



«Lower back pain has been the leading cause of years lived with disability since 1990 and remains a significant global public health concern<sup>1</sup>»



**IASP**  
INTERNATIONAL ASSOCIATION  
FOR THE STUDY OF PAIN

<sup>1</sup>Wu A, March L, Zheng X, Huang J, Wang X, Zhao J, Blyth FM, Smith E, Buchbinder R, Hoy D. Global low back pain prevalence and years lived with disability from 1990 to 2017: estimates from the Global Burden of Disease Study 2017. *Ann Trans Med* 2020; 8(6): 299-313

1. LBP er den ledende årsaken globalt til arbeidsuførhet
2. LBP er som regel ikke assosiert med identifiserbare patoanatomiske årsaker
3. Antallet personer med LBP øker med økning i både verdens befolkning og eldrebølgen
4. LBP må ikke resultere i arbeidsuførhet
5. Et BPS rammeverk øker forståelsen for og håndteringen av LBP
6. Kostnader ved LBP er knyttet til bruk av helsetjenester og tapt arbeidsproduktivitet og er i Europa estimert til å ligge opp mot 2% av brutto nasjonalprodukt (BNP)

## Data fra England

- Ledende årsak til arbeidsuførhet
- Kalkulert YLD (*Years Lived in Disability*)
- Fra 1990 til 2010: økning på **12%**

## Global Burden of Disease (GBD):

- Ryggsmerter (Brayado-Bruno, 2017)
- Ledende ikke-dødelige årsak til YLD
- Insidens (forekomst) og prevalens øker
  - Insidens: fra smertefri 25%
  - Prevalens: 75 – 86%



# 1987 Volvo Award in Clinical Sciences A New Clinical Model for the Treatment of Low-Back Pain

GORDON WADDELL, BSc, MD, FRCS

...to alleviate the problem.<sup>124</sup> There is a constant de-  
...research—both in basic sciences  
...perhaps more funda-  
...to low-

Because there is increasing concern about low-back dis-  
ability and its current medical management, this analy-  
attempts to construct a new theoretic framework for the  
ment. Observations of natural history and epidemiol-  
suggest that low-back disability as opposed to pa-  
ing condition, that low-back epidemic, and that the ro-  
a relatively recent Western epidemic must be critically examined  
tradition in that epidemic model of disease is contrasted  
biopsychosocial model of illness to analyze success  
biopsychosocial model of illness in chronic  
failure in low-back disorders. Studies of the weather  
relationship between the biopsychosocial concept  
used as an operational model that explains many  
observations. This model is used to compare re-  
used as an operational model that explains many  
observations. This model is used to compare re-  
used as an operational model that explains many  
observations. This model is used to compare re-

Spine

HEALTH SERVICES RESEARCH

## Twenty-Five Years With the Biopsychosocial Model of Low Back Pain—Is It Time to Celebrate?

A Report From the Twelfth International Forum for Primary Care Research on Low Back Pain

Tamar Pincus, PhD,\* Peter Kent, PhD,† Gert Bronfort, PhD,‡§ Patrick Loisel, PhD,¶||  
Glenn Pransky, MD, MoccH,\*\*\*††† and Jan Hartvigsen, PhD§§§

**Study Design.** An integrated review of current knowledge about the biopsychosocial model of back pain for understanding etiology, prognosis, and interventions, as presented at the plenary sessions of the XII International Forum on LBP Research in Primary Care (Denmark; October 17–19, 2012).

**Objective.** To evaluate the utility of the model in reference to rising rates of back pain-related disability, by identifying (a) the most promising avenues for future research in biological, psychological, and social approaches, (b) promising combinations of all 3 approaches, and (c) obstacles to effective implementation of biopsychosocial-based research and clinical practice.

**Summary of Background Data.** The biopsychosocial model of back pain has become a dominant model in the conceptualization of the etiology and prognosis of back pain, and has led to the development and testing of many interventions. Despite this back pain remains a leading source of disability worldwide.

**Methods.** The review is a synthesis based on the plenary sessions and discussions at the XII International Forum on LBP Research in

Primary Care. The presentations included evidence-based reviews of the current state of knowledge in each of the 3 areas (biological, psychological, and social), identification of obstacles to effective implementation and missed opportunities, and identification of the most promising paths for future research.

**Results.** Although there is good evidence for the role of biological, psychological, and social factors in the etiology and prognosis of back pain, synthesis of the 3 in research and clinical practice has been suboptimal.

**Conclusion.** The utility of the biopsychosocial framework cannot be fully assessed until we truly adopt and apply it in research and clinical practice.

**Key words:** biopsychosocial model, back pain, pain-related disability, return to work, clinical research, clinical practice, international conference.

**Level of Evidence:** N/A  
**Spine 2013;38:2118–2123**

The seminal article by Gordon Waddell<sup>1</sup> on the biopsychosocial model in back pain published by *Spine* marked a fundamental change in the conceptualization of back pain. The model suggests that back pain should be more broadly understood than is possible from a biomedical perspective alone, because for many individuals the main problem lies not with the common and frequently transient experience of pain, but rather in their own and society's perceptions and reactions to pain. Inappropriate reactions may include unnecessary avoidance of physical activity and social interactions, absenteeism from work, and high health care utilization.

The 25th year anniversary of the publication by Waddell was a focus of the Forum for Research in Back Pain in Primary Care XII that was held in Odense, Denmark, October 17–19, 2012. The goal of the Forum is to share the latest concepts, methods, and results of research on low back pain (LBP) diagnosis, evaluation, treatment, and disability prevention. The presentations described here addressed the 3 dimensions of the biopsychosocial model, how it has been applied, and promising areas for research to further develop this

BMJ

BMJ 2014;348:g3725 doi: 10.1136/bmj.g3725 (Published 13 June 2014)

Page 1 of 7

ANALYSIS

ESSAY

## Evidence based medicine: a movement in crisis?

Trisha Greenhalgh and colleagues argue that, although evidence based medicine has had many benefits, it has also had some unintended consequences. They offer a preliminary agenda for the future

SPINE Volume 38, Number 24, pp 2118–2123  
©2013, Lippincott Williams & Wilkins

Jeremy Howick senior research fellow<sup>2</sup>, Neal Maskrey<sup>3</sup>, for the Evidence Based Medicine Society

AB, UK; <sup>3</sup>Centre for Evidence-Based M

Phenomenology and the Cognitive Sciences (2019) 18:637–665  
https://doi.org/10.1007/s11097-019-09624-7

## An enactive approach to pain: beyond the biopsychosocial model

Peter Stilwell<sup>1</sup> · Katherine Harman<sup>2</sup>

Published online: 30 April 2019  
© Springer Nature B.V. 2019, corrected publication 2019

### Abstract

We propose a new conceptualization of pain by incorporating advancements made by phenomenologists and cognitive scientists. The biomedical understanding of pain is problematic as it inaccurately endorses a linear relationship between noxious stimuli and pain, and is often dualist or reductionist. From a Cartesian dualist perspective, pain is to be “in the brain.” The biopsychosocial conceptualization of pain has been adopted to combat these problematic views. However, when considering pain research advanced understanding of perception, the biopsychosocial model is inadequate in many ways. The boundaries between the biological, psychological, and social are artificial, and the model is often applied in a fragmented manner. The model has a limited theoretical foundation, resulting in the perpetuation of dualistic and reductionist beliefs. A new framework may serve to better understand and treat pain. In this paper, we conceptualize pain as a SE process, arguing that it is: *Embodied, Embedded, Enacted, Emotive, and Extended*. This perspective is applied using back pain as an exemplar and we explore potential clinical applications. With enactivism at the core of this approach, pain does not reside in a mysterious immaterial mind, nor is it an entity to be found in the blood, brain, or other bodily tissues. Instead, pain is a relational and emergent process of sense-making through a lived body that is inseparable from the world that we shape and that shapes us.

**Keywords** Biopsychosocial · Phenomenology · Pain · Cognition · Embodied · Enactivism

**D**URING THE PAST DECADE there has been a resurgence of interest in the biopsychosocial model of low back pain. This is reflected in the increasing number of articles published in the field.

From the Orthopaedic Department, Weill Cornell Medical College, New York, NY (Stilwell); Department of Psychology, Clinical, Health, and Social Psychology, Royal Holloway, University of London, England, United Kingdom (Harman); Research Department, Spine Centre of Southern Denmark, Institute of Regional Health Services Research, Hospital Lillebaek, University of Southern Denmark, Middelfart, Denmark (Maskrey); Musculoskeletal Research Program, Northwestern Health Sciences University, Minnesota; §Nordic Institute of Chiropractic and Clinical Biomechanics, Odense, Denmark; ¶Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada; †Canadian Memorial Chiropractic College, Toronto, Ontario, Canada; \*\*Liberty Mutual Research Institute for Safety, Hopkinton, Massachusetts; ††Department of Family Medicine and Community Health, University of Massachusetts Medical School, Worcester, MA; †††Harvard School of Public Health, Boston, MA; and §§Institute of Sports Science and Clinical Biomechanics, University of Southern Denmark, Odense, Denmark.

From the \*Department of Psychology, Clinical, Health, and Social Psychology, Royal Holloway, University of London, England, United Kingdom; †Research Department, Spine Centre of Southern Denmark, Institute of Regional Health Services Research, Hospital Lillebaek, University of Southern Denmark, Middelfart, Denmark; ‡Musculoskeletal Research Program, Northwestern Health Sciences University, Minnesota; §Nordic Institute of Chiropractic and Clinical Biomechanics, Odense, Denmark; ¶Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada; †Canadian Memorial Chiropractic College, Toronto, Ontario, Canada; \*\*Liberty Mutual Research Institute for Safety, Hopkinton, Massachusetts; ††Department of Family Medicine and Community Health, University of Massachusetts Medical School, Worcester, MA; †††Harvard School of Public Health, Boston, MA; and §§Institute of Sports Science and Clinical Biomechanics, University of Southern Denmark, Odense, Denmark.

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DOI: 10.1097/BRS.0b013e3182a8c5d6

2118 www.spinejournal.com

November 2013



# Forskjellige Perspektiver på Ryggsmerter

Cauda Equina Syndrom?  
Fraktur?  
Tumor / Metastase?  
Infeksjon?

Diskogene smerter?  
Prolaps?  
Zygapofyseal ledd?  
Sacroiliacal ledd?  
Muskler?

Upslip?  
Ilium anterior?  
Unilateral sacral fleksjon?  
L4 ERS<sub>VENSTRE</sub>?  
Psoas spasme?

"I believe they're just out of place, or there's something wrong with the actual vertebrae themselves, whether or not they're cracked, I don't know"

"I guess it's always going to be a weak point"

"...it feels like its crumbling. Like my back is crumbling and it can't support me"

"Doing whatever I need to do to strengthen my back so I don't develop chronic back problems"

"It is so sensitive that if I misbehave with my back...then again my back will go rebellious"

"There's always that like I'm going to be like this forever"

Darlow B et al. Easy to harm, hard to heal: patients views about the back. *Spine* 2015 Jun 1;40(11):842-50



# Forskjellige Perspektiver på Ryggsmarter

Cauda Equina Syndrom?  
Fraktur?  
Tumor / Metastase?  
Infeksjon?



Diskogen



Froud et al. BMC Musculoskeletal Disorders 2014, 15:50  
<http://www.biomedcentral.com/1471-2474/15/50>

## RESEARCH ARTICLE

# A systematic review and meta-synthesis of the impact of low back pain on people's lives

Robert Froud<sup>1,6\*</sup>, Sue Patterson<sup>2,3</sup>, Sandra Eldridge<sup>2</sup>, Clive Seale<sup>4</sup>, Tamar Pincus<sup>5</sup>, Dévan Rajendran<sup>6</sup>,  
Christian Fossum<sup>6</sup> and Martin Underwood<sup>1</sup>

Iliu  
Unilatera  
L4 E  
Psoas

"I believe... of place, or  
with the  
whether  
know"  
weak

to do to  
so I don't develop  
back problems"

is so sensitive that if I misbehave  
with my back...then again my back will  
go rebellious"

"There's always that like I'm going to  
be like this forever"

Darlow B et al. Easy to harm, hard to heal: patients views about the back. *Spine* 2015 Jun 1;40(11):842-50

Perspective

## Reconsidering non-specific low back pain: where to from here?

Christopher S. Han, BAppSci (OT), DPT<sup>a,\*</sup>,  
Mark J. Hancock, BAppSci (Phy), MAppSc, PhD<sup>b</sup>,  
Christopher G. Maher, BAppSc (Phy), PhD, DMedSc, FACP, FAAHMS<sup>a</sup>

<sup>a</sup> The Institute for Musculoskeletal Health, The University of Sydney and Sydney Local Health District, PO Box M179, Missenden Rd, NSW 2050, Sydney, Australia

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Received 28 July 2022; revised 2 August 2022; accepted 2 August 2022

«Uspesifikke Ryggmerter»  
Ett begrep mye brukt i både forskning  
og klinisk praksis

Første gang brukte i 1956, og ble  
allerede i 1987 kritisert :  
«Intellektuelt og vitenskapelig  
utilstrekkelig begrep»

# Der er en overvekt av generisk forskning på LBP fremfor årsaker og individualisert behandling<sup>3, 4</sup>

<sup>3</sup>Der eksisterer forskning på individualisert håndtering av pasienter med LBP gjennom subgruppering: men mesteparten har tatt for seg å matche pasienter med behandling basert på prognostiske eller pasient-relaterte mekanismer uten å ta hensyn til årsaker eller mekanismer (Han et al, 2022)

<sup>4</sup>Stratifiseringssystemer (som f.eks STarT Back Tool, McKenzie osv) viste til å begynne med små positive effekter, men en nylig systematisk oversiktsstudie fant at der er utilstrekkelig evidens for å anbefale noen av disse relativt til andre tiltak for nsLBP (Tagliaferri et al, 2022)

Denne forståelsen for nsLBP kan i realiteten ha forhindret relevant forskning på LBP



Perspective

## Reconsidering non-specific low back pain: where to from here?

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Første gang brukte i 1956, og ble  
allerede i 1987 kritisert :  
«Intelleguelt og vitenskapelig  
utilstrekkelig begrep»

### Som begrep fører det ofte med seg en rekke misforståelser:

- At det automatisk fører med seg uspesifikke behandlinger og tiltak for nsLBP<sup>1,2</sup>
- At hverken forskning på, eller kliniske undersøkelser for identifikasjon av spesifikke årsaker eller mekanismer, har noen verdi

<sup>1</sup>Kritiske røster har i moderne tid argumenter mot bruken av begrepet nsLBP nettopp fordi det øker sannsynligheten for uspesifikke behandlinger og tiltak på noe som ikke er en homogen populasjon (Wadell et al, 2005; Peterson et al 2017)

<sup>2</sup>Dette argumentet støttes av at mange retningslinjer for nsLBP anbefaler generelle tilnærminger som trening, manuell behandling og medisinerings, uten å beskrive hvordan man velger mellom de, type trening, dosering osv (Han et al, 2022)

# Studier på Smertegeneratore

- Ett vanlig utsagn er at vi mangler evidens på kliniske tester som kan identifisere smertegeneratore hos pasienter med nsLBP

**Her må vi og erkjenne at lite forskning har vært gjort på det området<sup>2</sup>**

- I en systematisk oversiktsstudie fra 2007<sup>1</sup> fant man kun
  - 28 studier som undersøkte DIV som smertegenerator ved LBP
  - 8 studier som undersøkte ZAL som smertegenerator ved LBP
  - 7 studier som undersøkte SIL som smertegenerator ved LBP

**Mange av disse studiene var av lavere kvalitet, og selv om denne SR er 15 år gammel har nye både eksperimentelle studier og SR vært mangelvare<sup>1, 2</sup>**

<sup>1</sup>Hancock MJ, Maher CG, Latimer J, Spindler MF, McAuley JH, Laslett M, Bogduk N. Systematic review of tests to identify the disc, SIJ or facet joint as the source of low back pain. *Eur Spine J* 2007;16(10):1539-1550

<sup>2</sup>Han CH B, Hancock MJ, Maher CG. Reconsidering non-specific low back pain: Where to from here?, *The Spine Journal* 22; (2022): 1927 - 1930



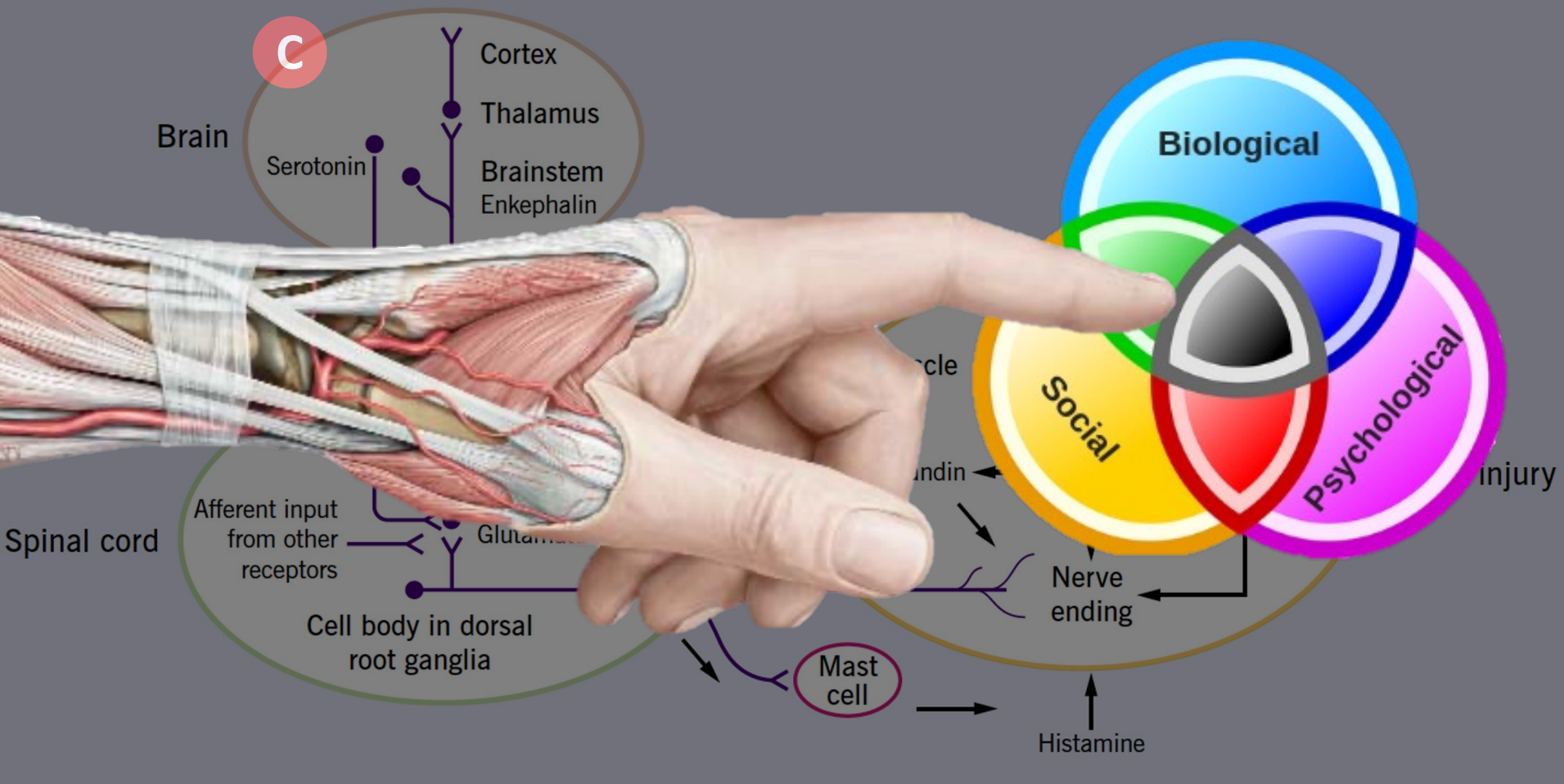
# Del 2: Uspesifikke Ryggmerter



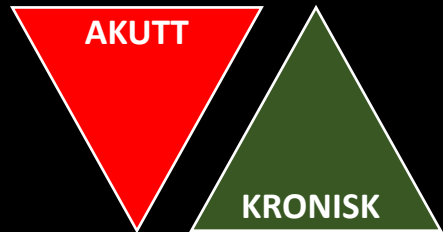
Fra Teori til Praksis



# Patofysiologi Muskel- og Skjelettsmerter

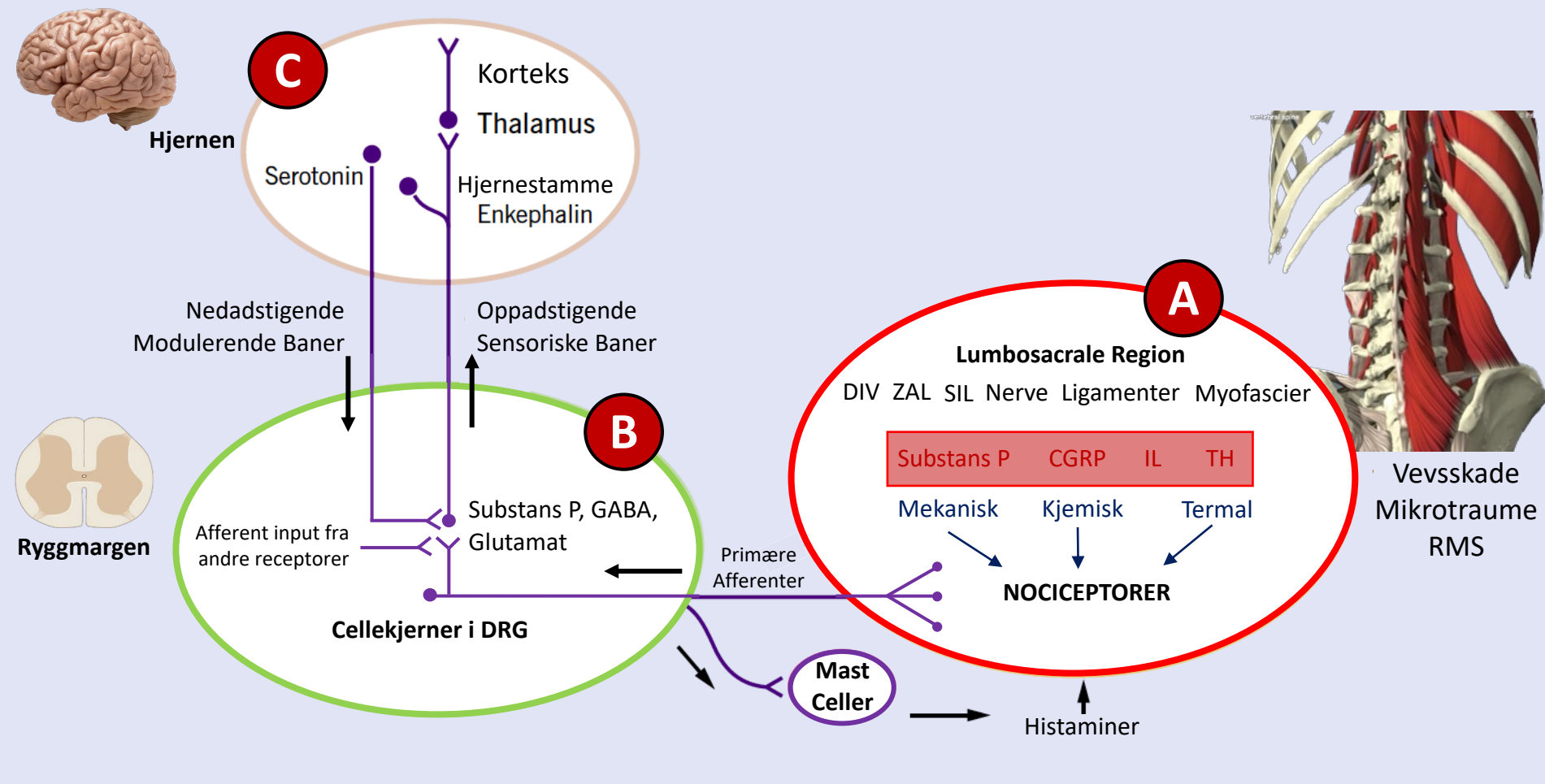


- A. Perifer Sensitivisering
- B. Sentral Sensitivisering
- C. Kognitiv Sensitivisering

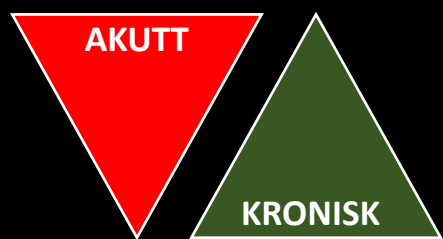


Smerteopplevelsen med sine sensoriske, emosjonelle og affektive komponenter

# Patofysiologi Muskel- og Skjelettsmerter



- A. Perifer Sensitivisering
- B. Sentral Sensitivisering
- C. Kognitiv Sensitivisering



Smerteopplevelsen med sine **sensoriske**, emosjonelle og affektive komponenter



## 2020 Revised Definition of Pain

An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage

- **Sensorisk:** Nocisepsjon
- **Emosjonell:** Opplevelse av smerter
- **Affektiv:** Reaksjon og Adferd

## Pasient presenterer med symptomer i ryggen

### Målrettet Anamnese og Klinisk Undersøkelse:

Varighet på symptomer; Indikatorer på spesifikk patologi eller alvorlig spinal patologi; Tegn og symptomer på radikulære syndromer; Psykososiale risikofaktorer

### Ekkludere ekstra-vertebrale årsaker til symptomene:

Overførte viscerale smerter; Vaskulære årsaker

### DIAGNOSTISK TRIAGE

#### **A** Spesifikk Spinal Patologi (RF):

- <1% av tilfellene i primær HT
- Fraktur; Tumor/Metastasering; infeksjon; CES; Spondylartropatier

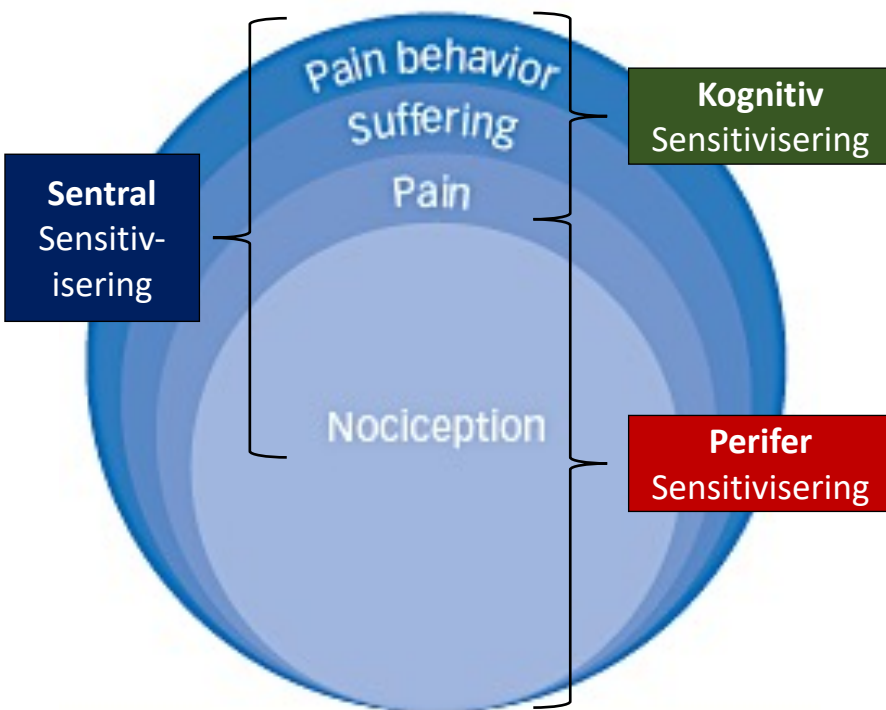
#### **B** Radikulære Syndromer:

- 5-20% av tilfellene i primær HT
- Radikulære Smerter; Radikulopati; Spinal Stenose

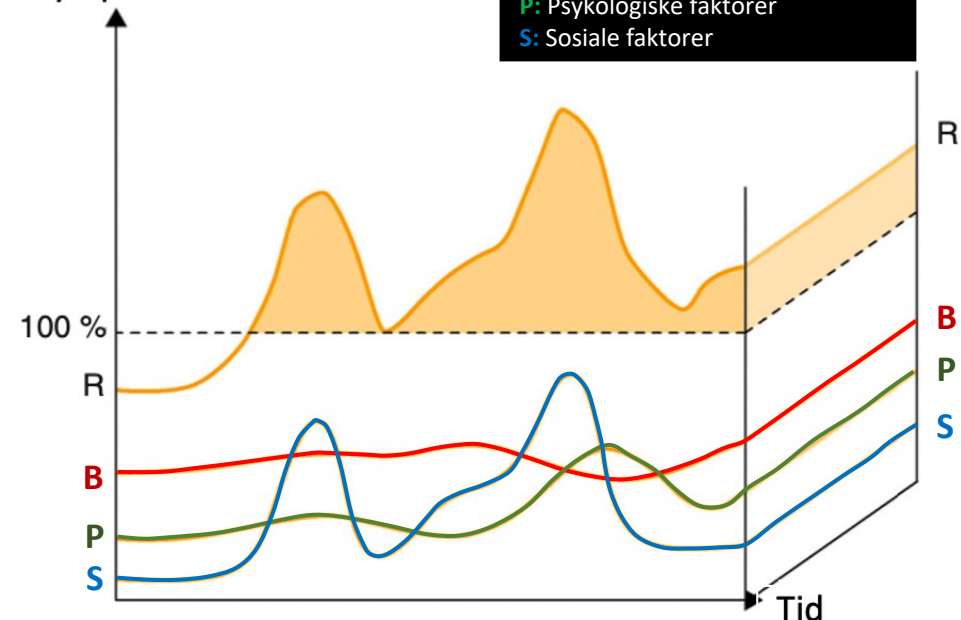
#### **C** Uspesifikke Ryggsmarter:

- 90-95% av tilfellene i primær HT
- Antatte lumbale årsaker til symptomer: ingen tester pålitelig til å stadfeste patoanatomisk årsak

**A**  
**B**  
**C**



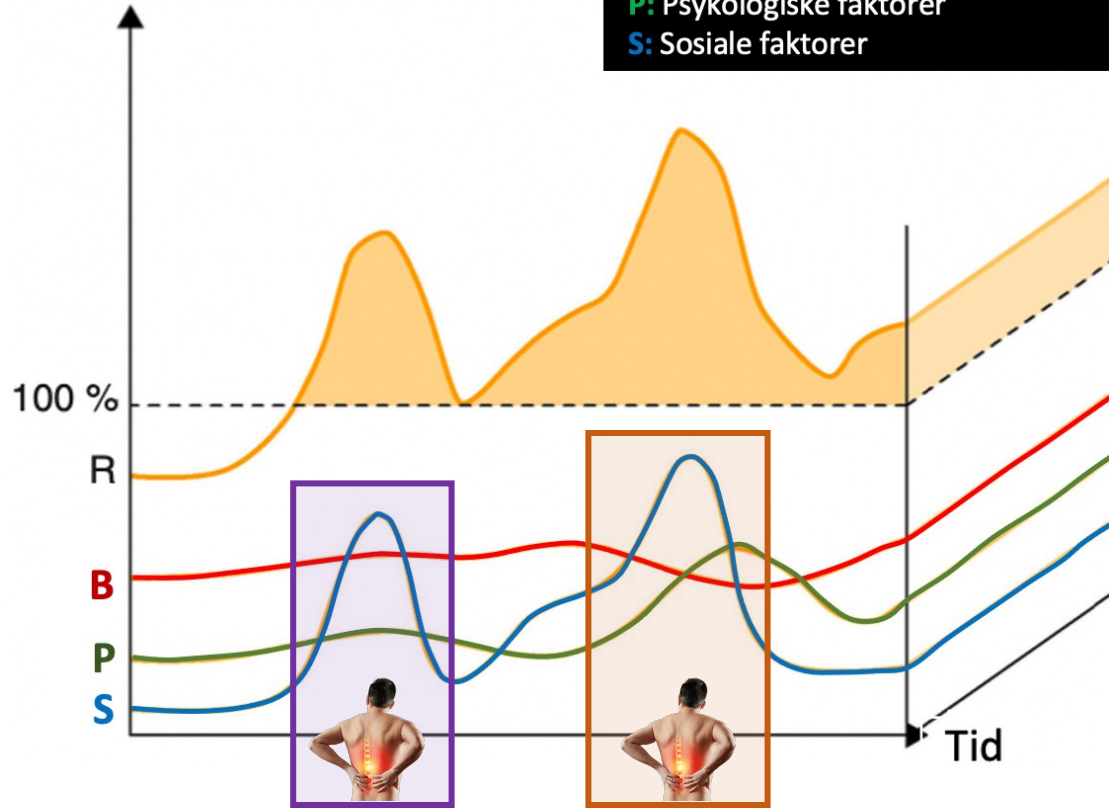
### Opplevelse av symptomer



# BPS påvirkninger ved MSK Smerter er ikke Konstante

Opplevelse av symptomer

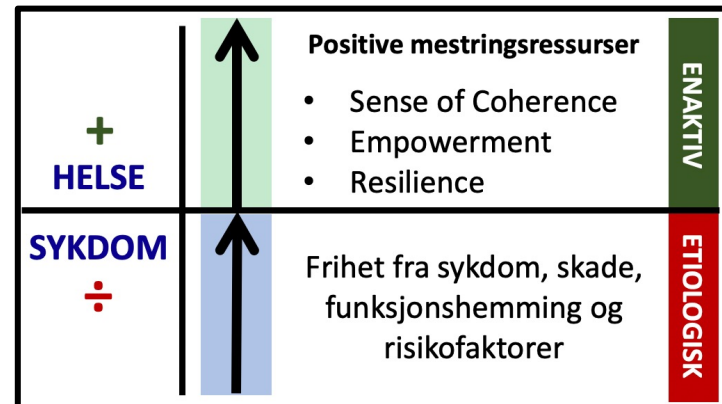
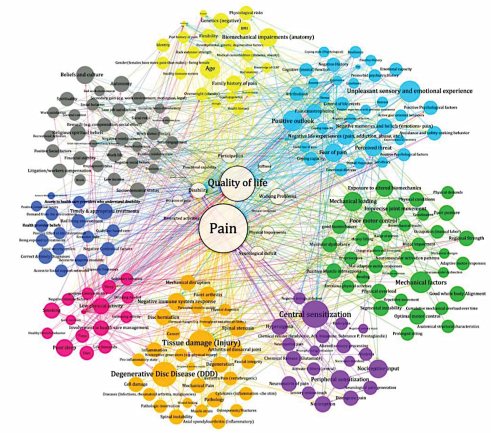
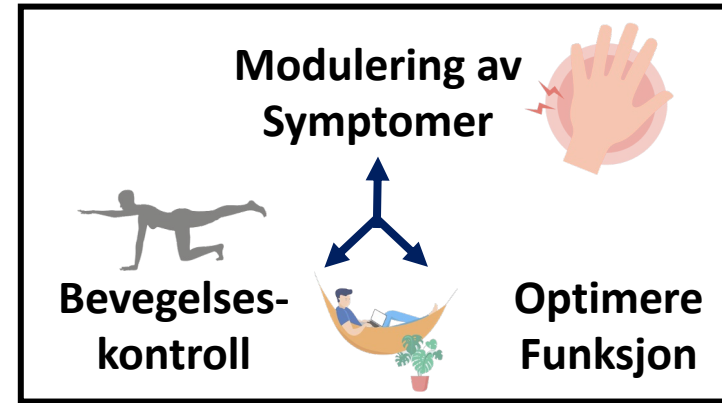
**R:** Resulterende symptomer  
**B:** Biologiske faktorer  
**P:** Psykologiske faktorer  
**S:** Sosiale faktorer



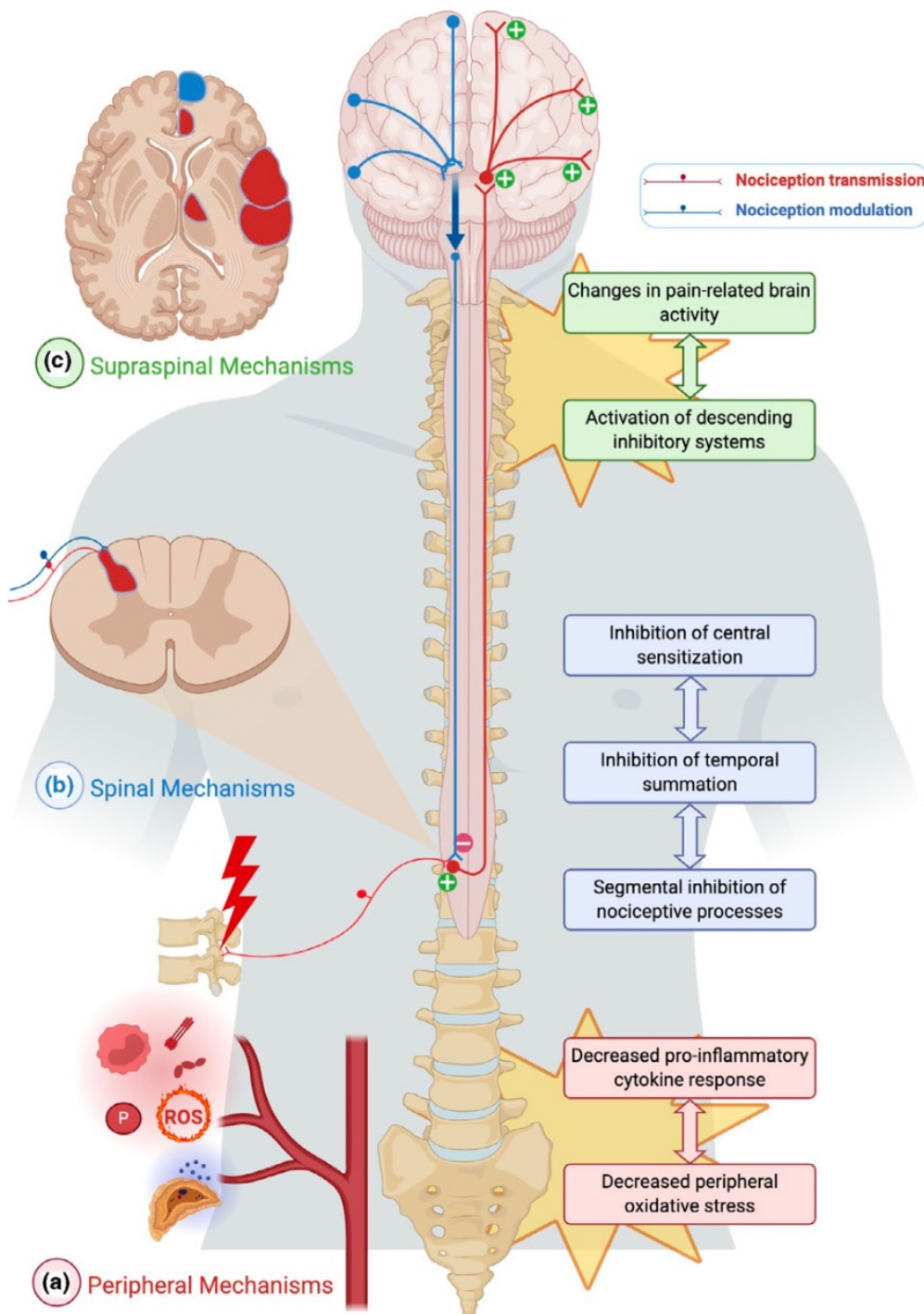
Periode 1



Periode 2



# Smertemekanismer som kan påvirkes av manuelle teknikker



## Supraspinale mekanismer

- Endringer i sentrale nettverk involvert i smerteprosessering
- Aktivering av de nedadstigende smertehemmende banene (DPIS)

## Spinale mekanismer

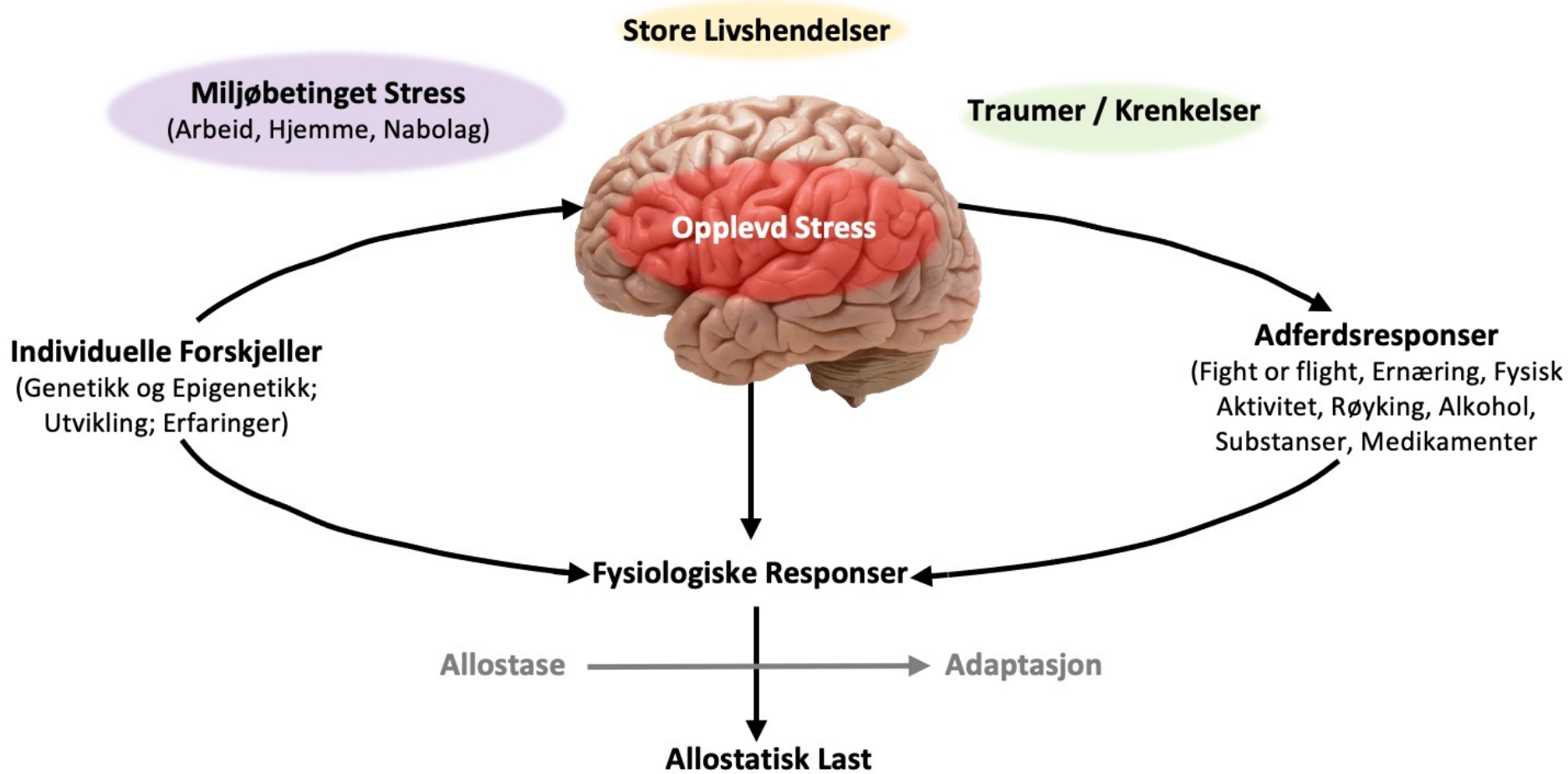
- Inhibisjon av sentral sensitivisering
- Inhibisjon av temporal summering og LTP
- Inhibisjon av nociseptiv signaloverføring (bakre horn)

## Perifere mekanismer

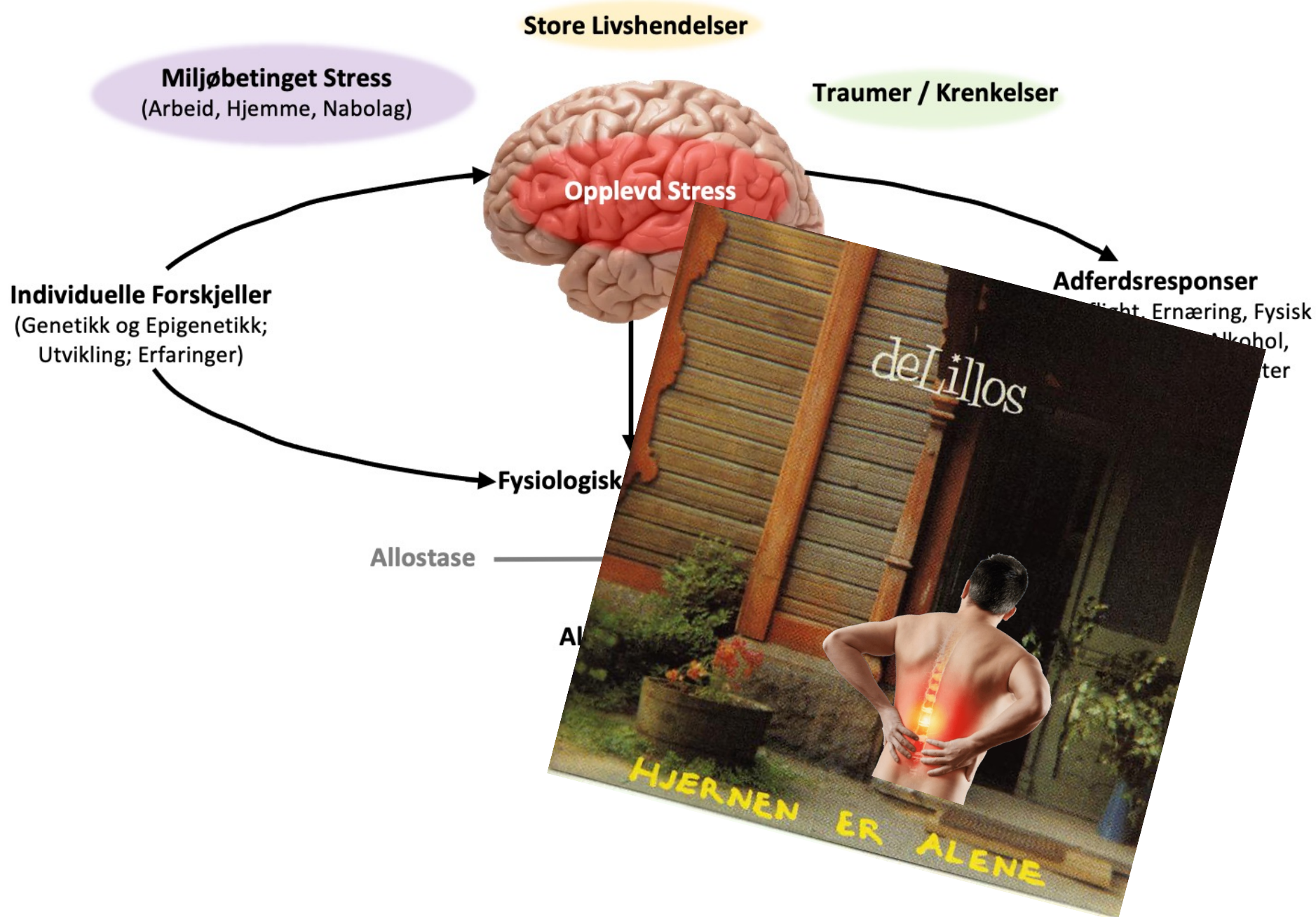
- Dempe den pro-inflammatorisk cytokin responsen og en bedring av det biokjemiske miljøet rundt nociseptorer



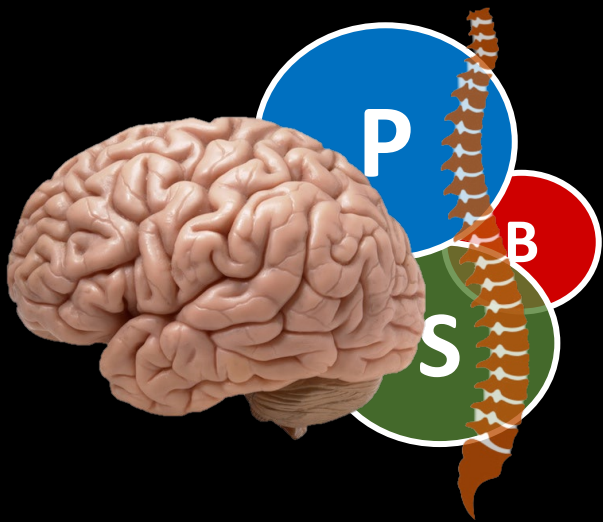




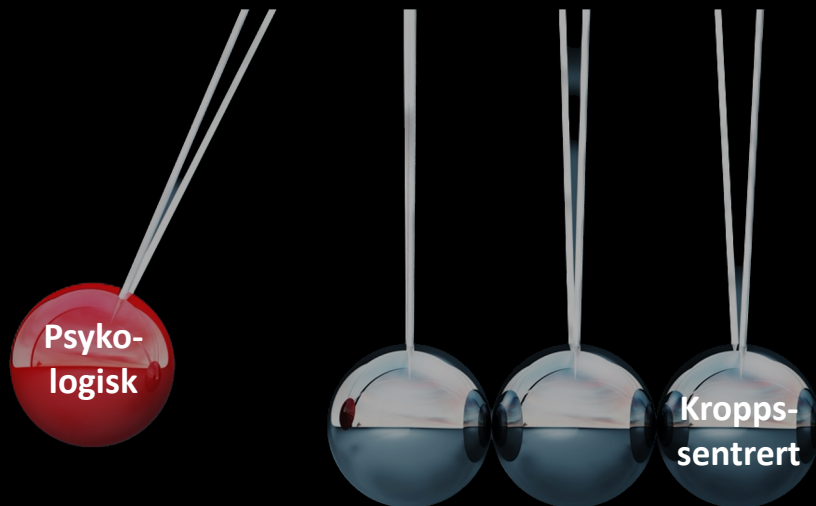




# Bort fra Polarisering: Det å Finne en Balanse

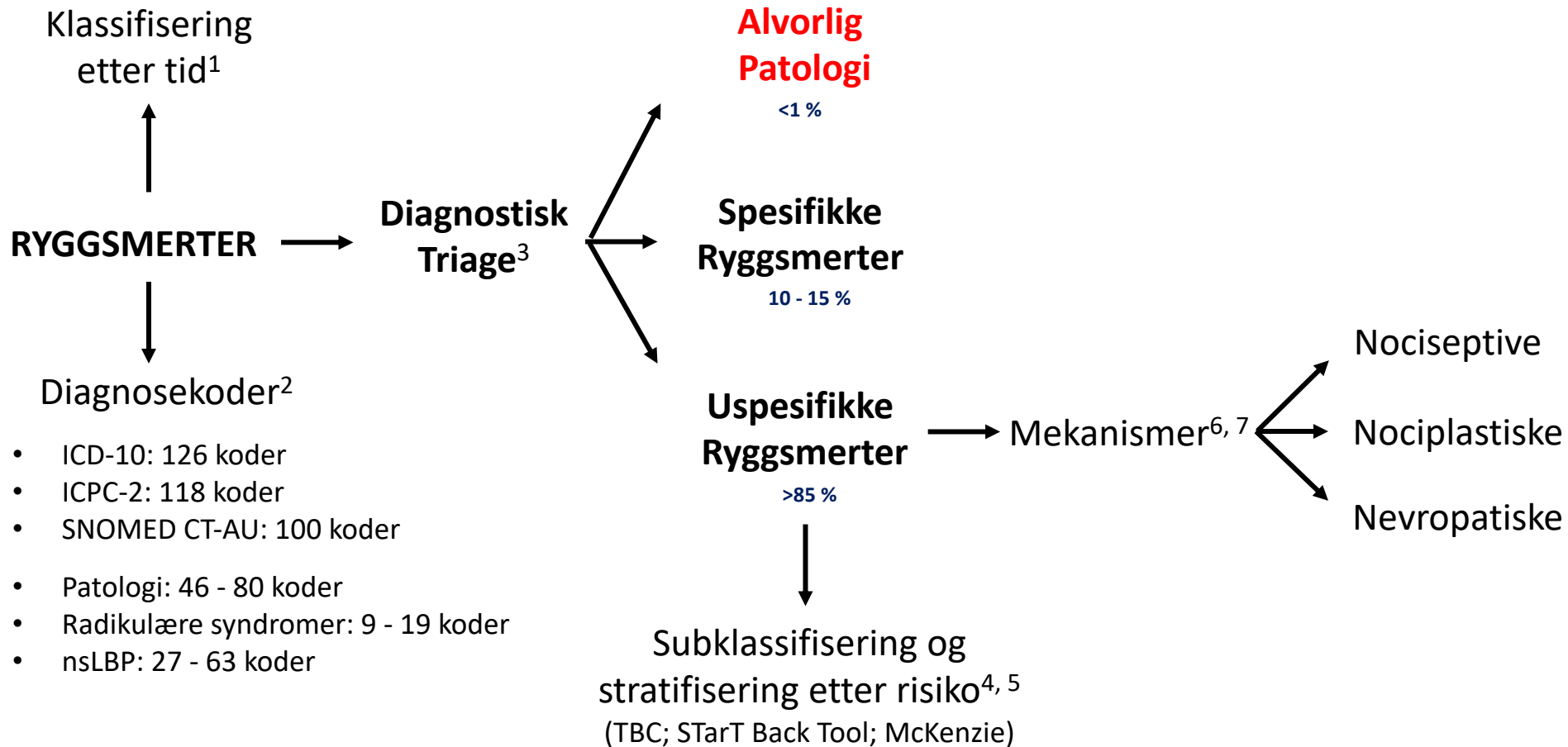


Pendulumet innen muskel- og skjelettbehandling har en tendens til å svinge i den ene eller den andre retning



It is not the tissues....the pain is only in your brain





<sup>1</sup>Kongsted A. What have we learned from ten years of trajectory research in low back pain? *BMC Musculoskeletal Disorders* (2016) 17: 220

<sup>2</sup>Tamrakar M et al. Diagnostic codes for low back pain, nomenclature or noise? A descriptive study of disease classification coding of low back pain. *Int J Rheum Dis.* 2022;25:272–280

<sup>3</sup>Bardin LD et al. Diagnostic triage for low back pain: a practical approach for primary care. *MJA* 206 (6); 3 April 2017

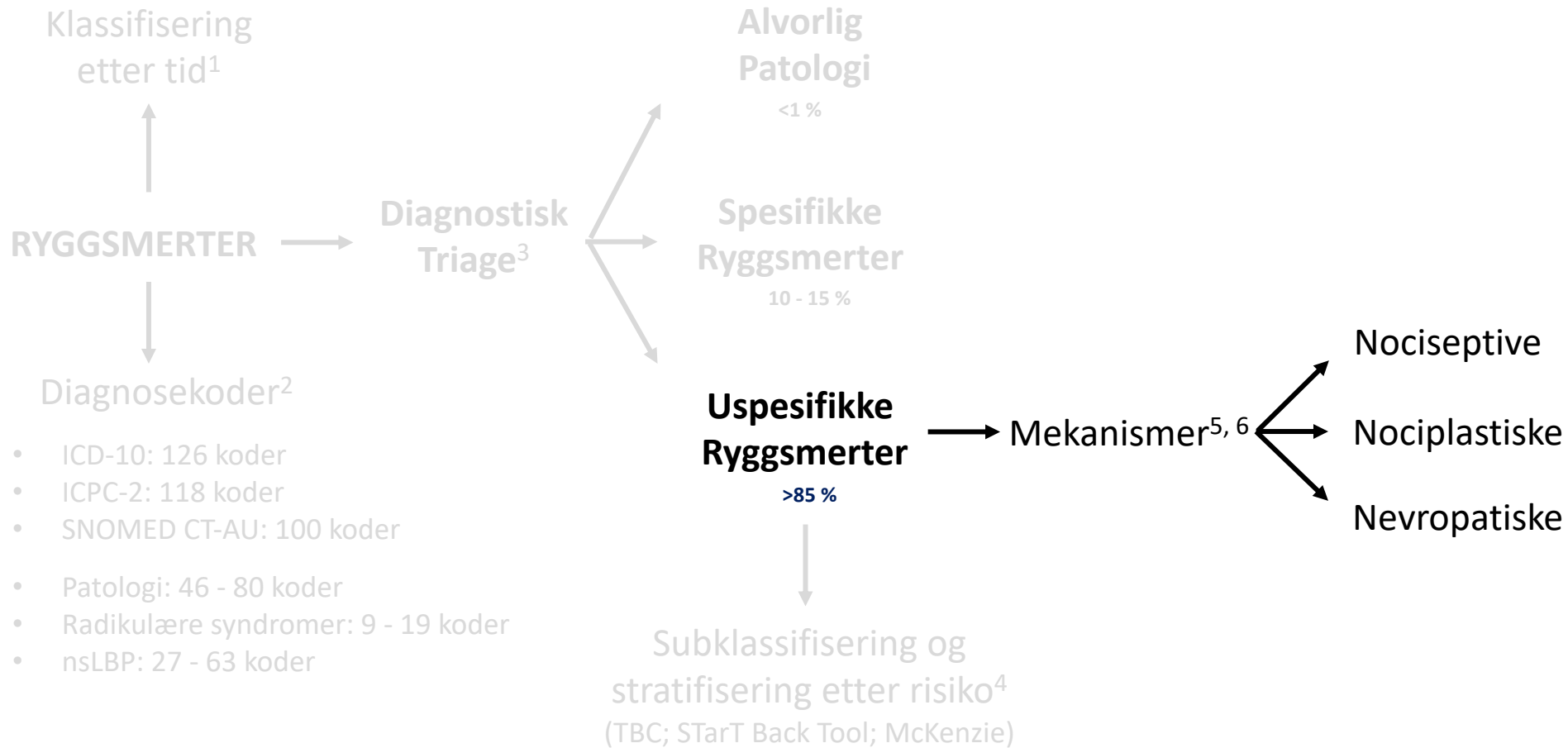
<sup>4</sup>Tagliaferri SD et al. Classification approaches for treating low back pain have small effects that are not clinically meaningful: a systematic review with meta-analysis. *J Orthop Sports Phys Ther* (2022); 52(2): 67 – 84

<sup>5</sup>Hill JC et al. Risk-based stratified primary care for common musculoskeletal pain presentations (STarT MSK): a cluster-randomized, controlled trial. *Lancet Rheumatol* 2022; 4: e591-602

<sup>6</sup>Nijs J et al. Low back pain: Guidelines for the clinical classification of predominant neuropathic, nociceptive, or central sensitization pain. *Pain Physician* 2015; 18: E333-E346

<sup>7</sup>Chimenti RL et al. A mechanism based approach to physical therapist management of pain. *Phys Ther.* 2018;98:302–314





<sup>1</sup>Kongsted A. What have we learned from ten years of trajectory research in low back pain? *BMC Musculoskeletal Disorders* (2016) 17: 220

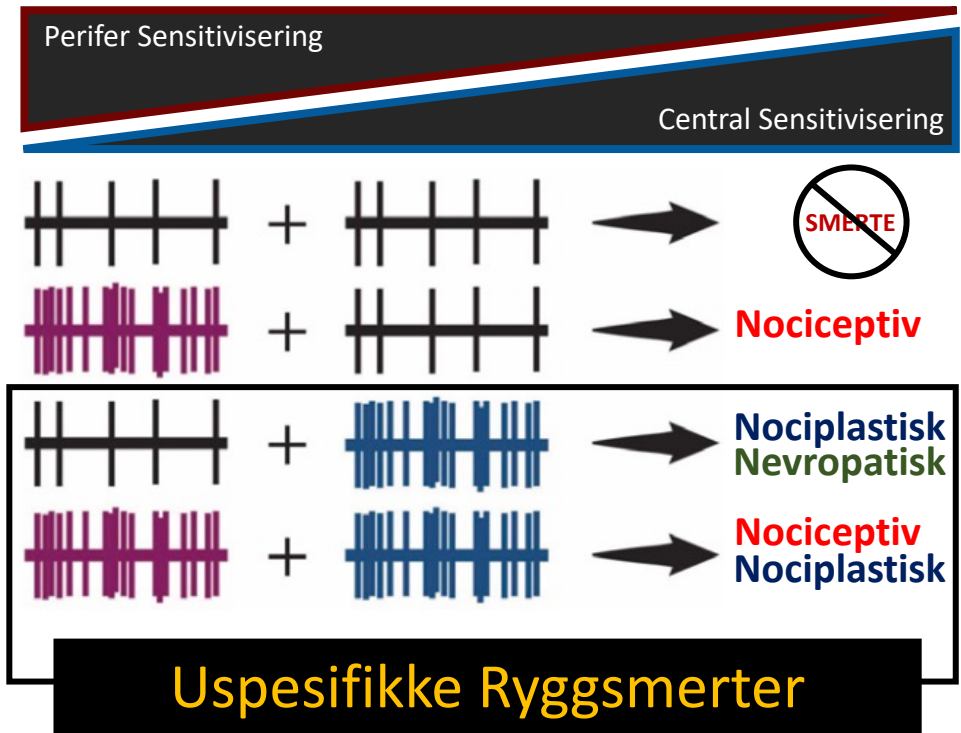
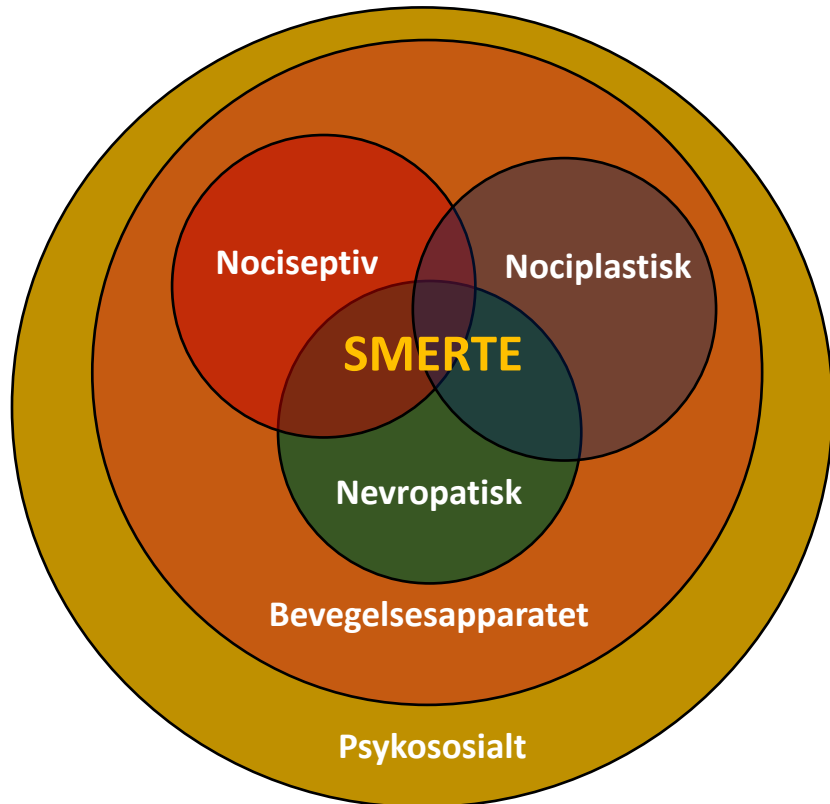
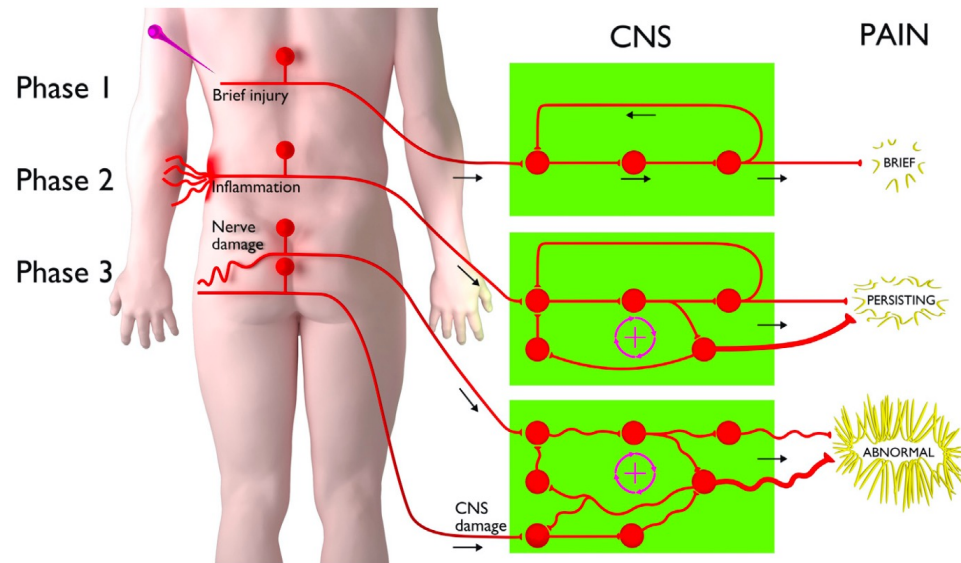
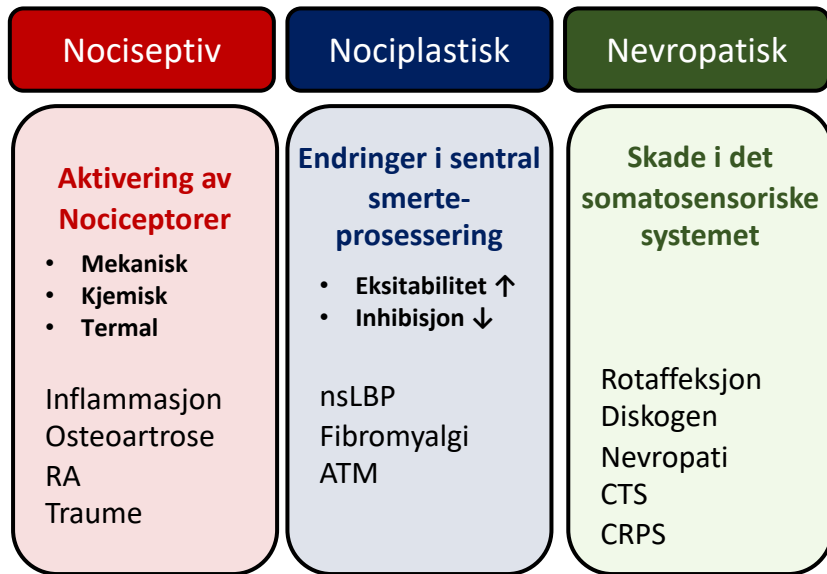
<sup>2</sup>Tamrakar M et al. Diagnostic codes for low back pain, nomenclature or noise? A descriptive study of disease classification coding of low back pain. *Int J Rheum Dis.* 2022;25:272–280

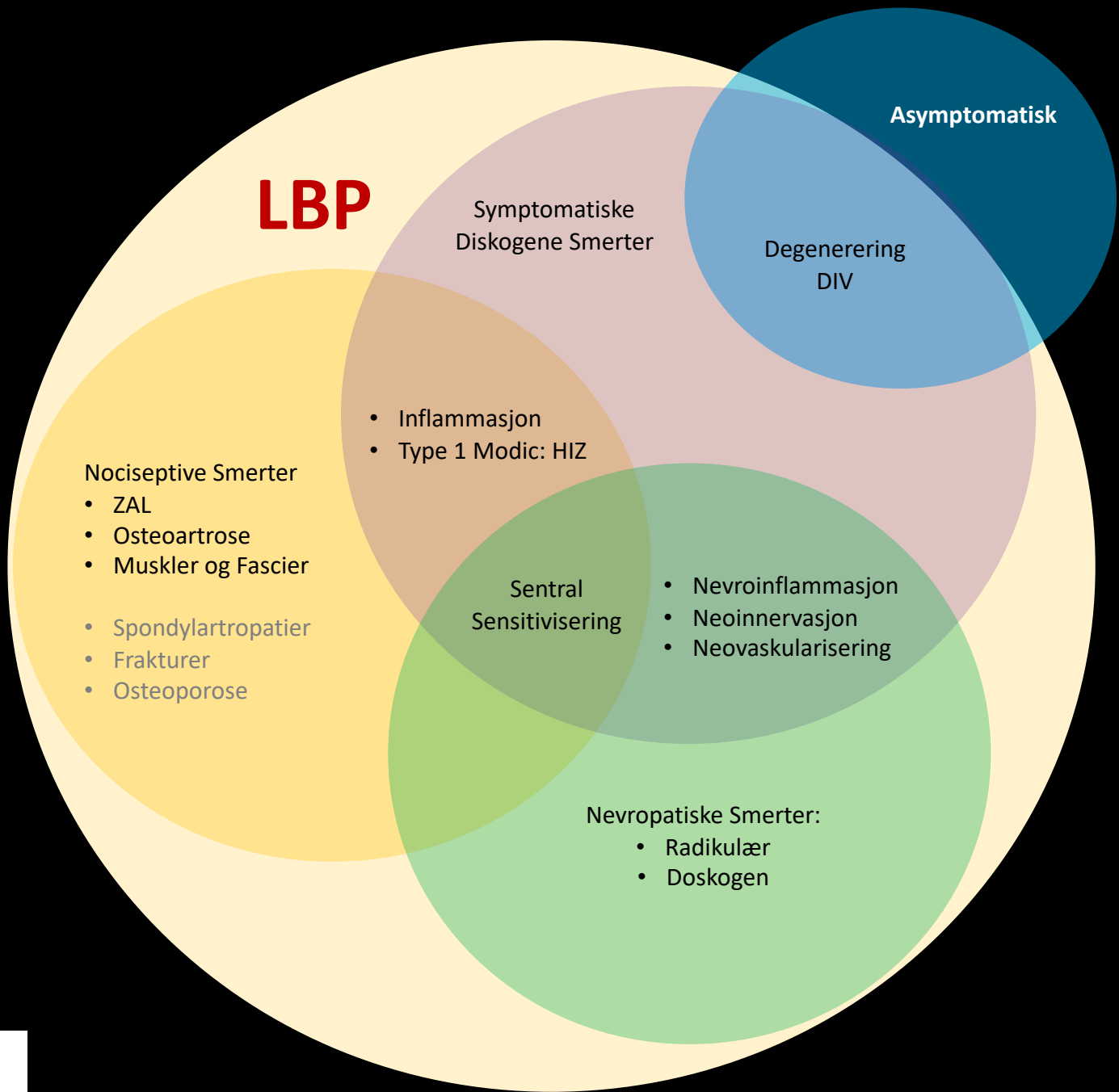
<sup>3</sup>Bardin LD et al. Diagnostic triage for low back pain: a practical approach for primary care. *MJA* 206 (6); 3 April 2017

<sup>4</sup>Tagliaferri SD et al. Classification approaches for treating low back pain have small effects that are not clinically meaningful: a systematic review with meta-analysis. *J Orthop Sports Phys Ther* (2022); 52(2): 67 – 84

<sup>5</sup>Nijs J et al. Low back pain: Guidelines for the clinical classification of predominant neuropathic, nociceptive, or central sensitization pain. *Pain Physician* 2015; 18: E333-E346

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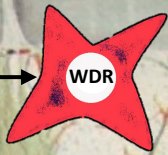


Modifisert etter:  
Isa et al (2023)

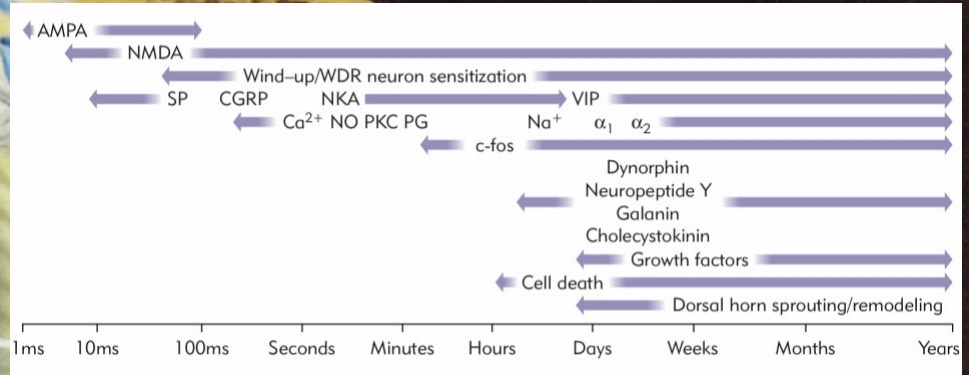


Somatisk  
Visceral  
Kutan

Konvergens

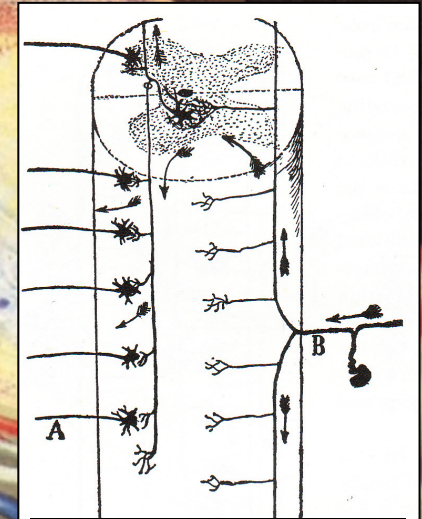


### Kaskade med molekylære hendelser i ryggmargen



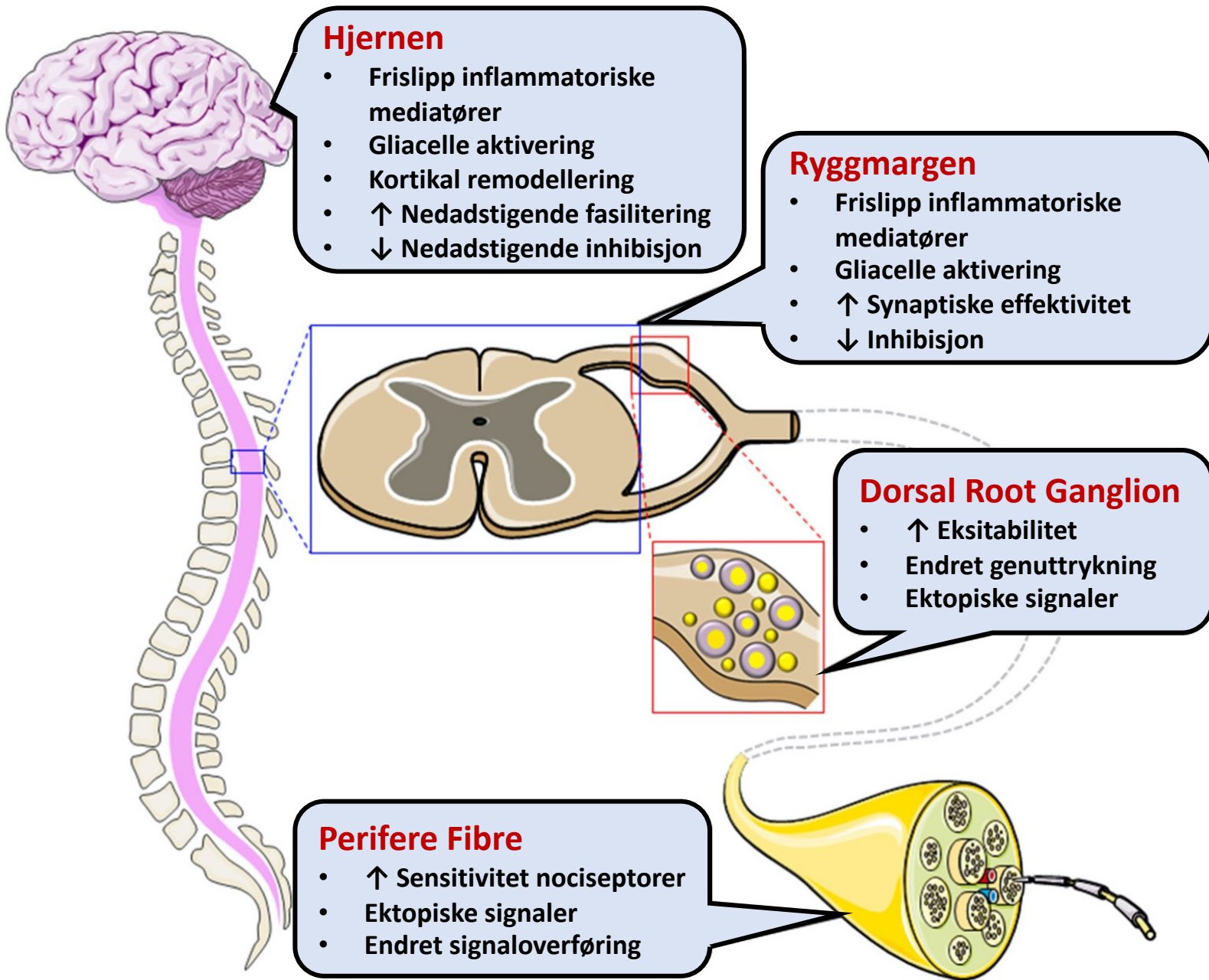
### Sensoriske Cellekerner

- Somatisk
- Visceral



Forgreninger Primære Afferenter (PAN)

# Sentrale og Perifere Mekanismer som bidrar til Nevropatiske Smerter





- Zygapofyseal Ledd (ZAL)
- Myofascier og Ligamenter
- Diskogen
- Art. Sacroiliaca

**Vevskade  
Inflamasjon**

**Perifer Sensitivisering og  
hyperalgesisk priming**

**Ektopisk fyring fra  
sensoriske fibre**

**Skade på Sensoriske Fibre**

**Spinal Sensitivisering**

**Aktivering av det thalamokortikale  
systemet (smerten blir bevist)**

**Aktivering av amygdala (frykt)**

**Atrofi av «smerteområder»**

**Kortikal reorganisasjon**

**Endringer i hjernestammen:**

- Redusert nedadstigende inhibisjon
- Økt nedadstigende fasilitering

- Diskogen
- Nerverot



- Kliniske retningslinjer: prevalens ved LBP på cirka 5 %
- Litteraturen sier at 16-55% av pasienter med LBP kan ha nevropatiske komponenter



**NEVROPATISK**

**NOCISEPTIV**

Smerte beskrevet som brennende, elektrisk sjokk og / eller skytende ned i beinet

Smerte beskrevet som kriblende eller ubehagelig unormal følelse (dysestesi)

Smerte beskrevet som intermitterende

Smerte med andre neurologiske symptomer

Rapporter om spontane smerter og / eller paroksysmale smerter

Tydelig, mekanisk smertekarakter med forverrende og forbedrende faktorer

Analgiske holdninger, posisjoner eller bevegelsesmønstre

Historie med nerve-skade, patologi eller mekanisk påvirkning i området til nerverot eller annet nervalt vev

Smerte lokalisert til område med dysfunksjon (med eller uten refererte smerter)

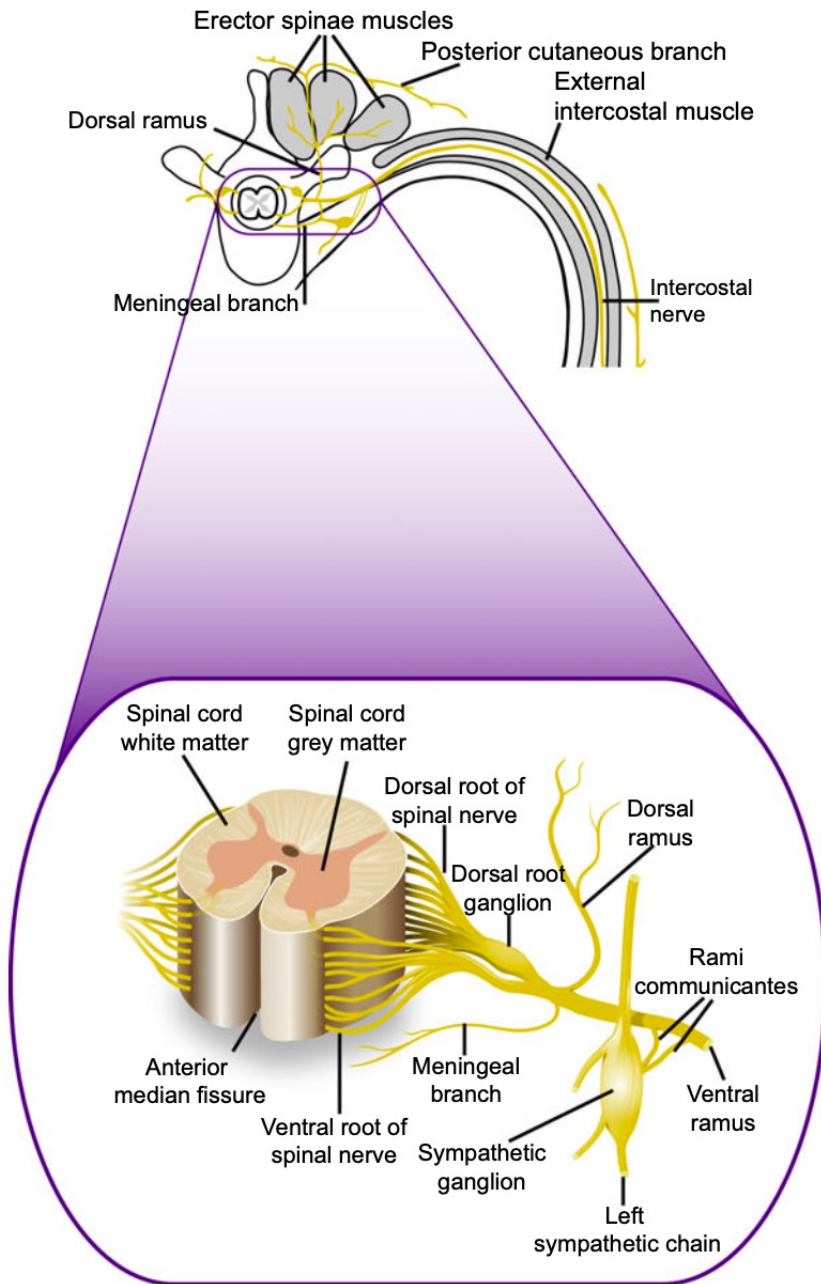
Ofte forbigående eller går over med forventet tilhelningstid av skadet vev



«Uspesifikk» betyr ikke at man ikke skal prøve å forstå mekanismer og smertegeneratorer



Hva vet vi om antatte smertegeneratorer?



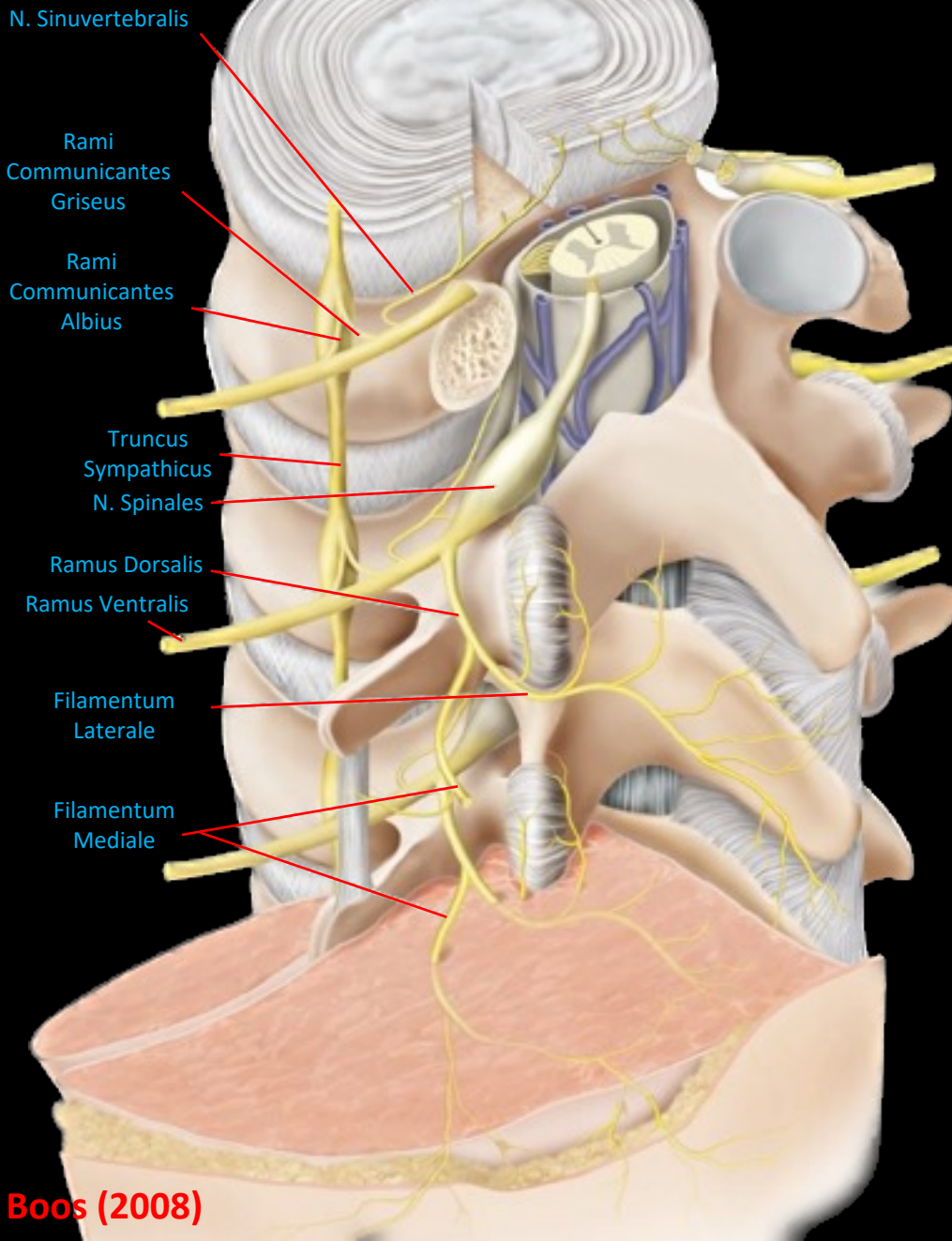
# Innervasjon Columna og Bekkenringen

ANATOMISKE STRUKTURER	Nociseptiv					Sympatisk		
	CGRP	SP	NADPH-D/NOS	NaN/SN52	Free Endings	TH	NPY	DBH
Annulus Fibrosus	+	+		+	+	+		
Vertebrale Endplate	+	+		+	+			
Ligamenter: LLA og LLP	+	+	+	+	+	+	+	+
Kapsel Zygapofyseal Ledd	+	+	+	+	+	+	+	
ZAL og Synoviale Folder	+	+		+	+	+	+	+
Ligamentum Flavum			+					
Art. Costovertebrale		+		+	+		Ja	
Art. Sacroiliacale	+	+				+		
Lig. Sacroiliacale Post og Interossea	+	+						

Tabell satt sammen fra: [Groen et al \(1990, 2012\)](#); [Böhni et al \(2015\)](#), [Szadek et al \(2008, 2010\)](#) og [Steinke et al \(2022\)](#)

**CGRP** = Calcitonin Gene-Related Peptides; **SP** = Substans P; **NOS** = Nitric Oxide; **TH** = Tyrosinhydroxylase; **NPY** = Neuropeptide Y; **DBH** = Dopamin-β-Hydroxylase

# Innervasjon Lumbal Regionen



- **Zygapofyseal Ledd**
  - Multisegmentell fra Ramus Dorsalis
- **Discus Intervertebralis**
  - Posterior Anulus F: N. Sinuvertebralis
  - Lateral/Anterior AF: Grå Rami Communicantes
- Paravertebrale muskler
  - Ramus dorsalis
- Paravertebral Kutan
  - Ramus Dorsalis



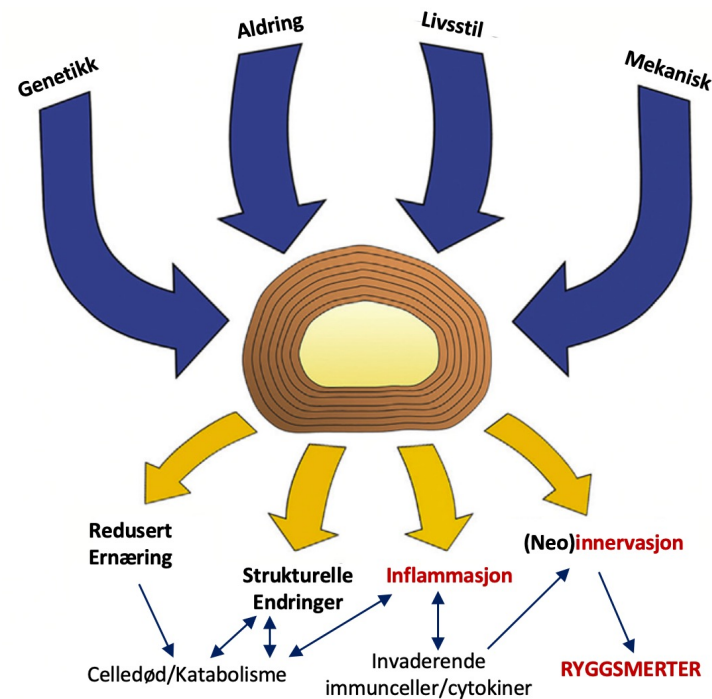
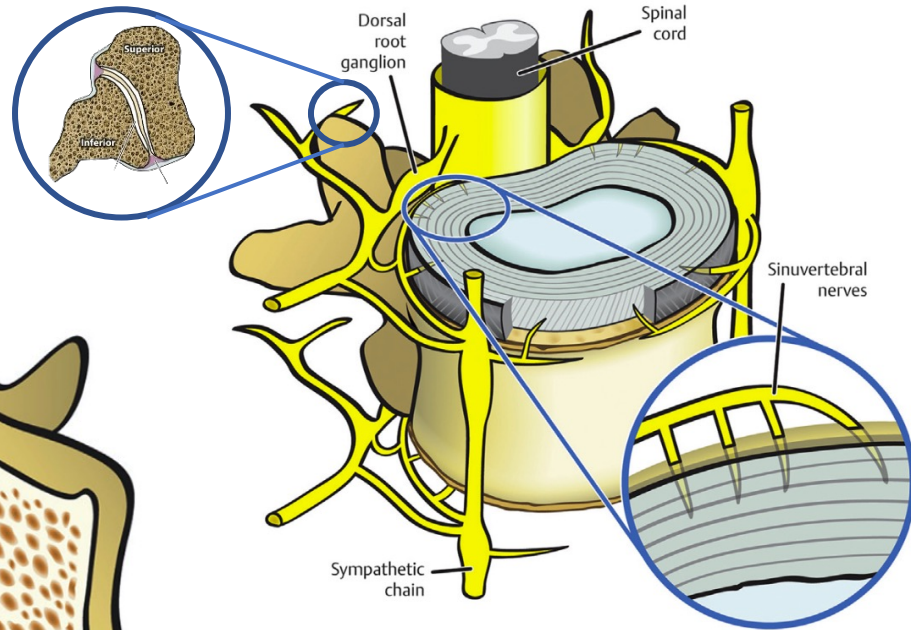
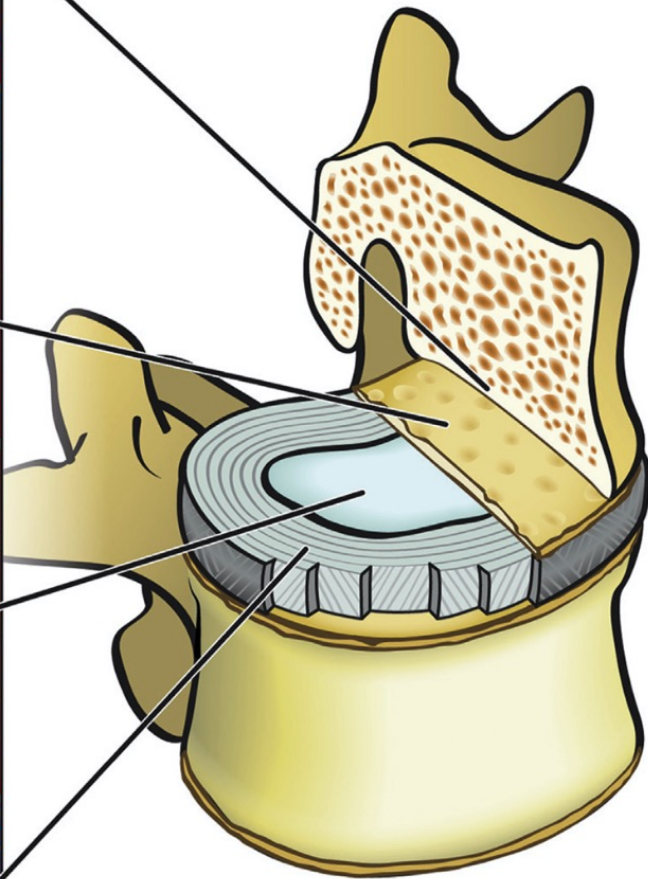
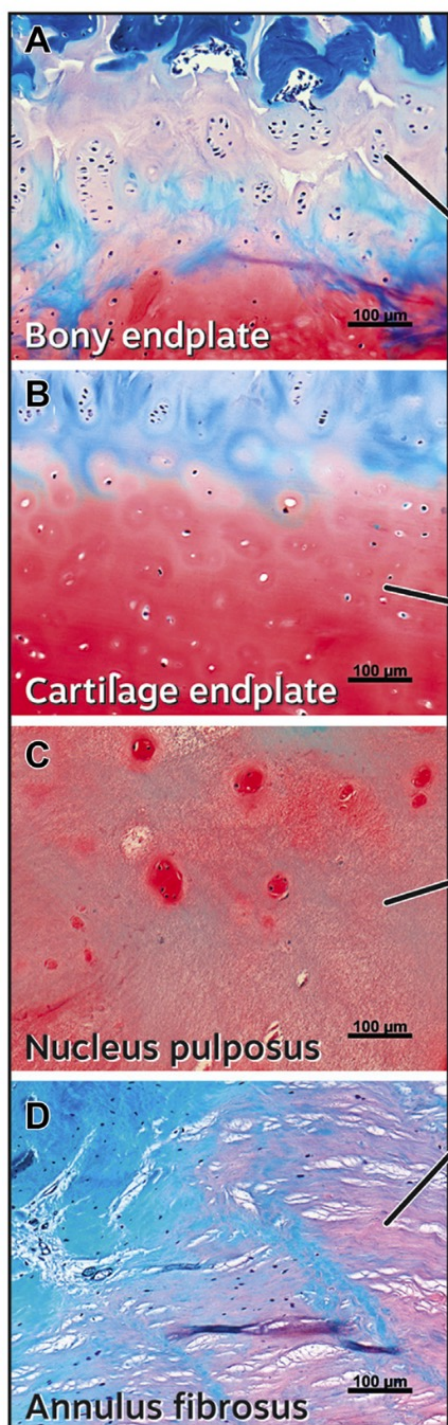
- **Nociceptive Rygg smerter**
  - Diskogene smerter: IDD
  - Zygapofyseal Ledd
  - Sacroiliacal Ledd
- **Somatisk Overførte Smerter**
  - Zygapofyseal Ledd («Pseudoradikulær»)
    - Paravertebral kutan distribusjon
    - Sklerotom
  - Sacroiliacal Ledd («Pseudoradikulær»)
  - Myofascielle strukturer
  - Bindevev (Fasciotom)
- **Radikulære Smerter**
  - Nerverot: Prolaps eller Lateral Stenose
    - Dermatom
    - Sklerotom
- **Radikulopati**
  - Sensoriske, motoriske, refleksutfall
- **Perifer Nevropati**
  - Nn. Clunei Superiore og Mediale

## Prevalens

### Basert på diagnostisk triage

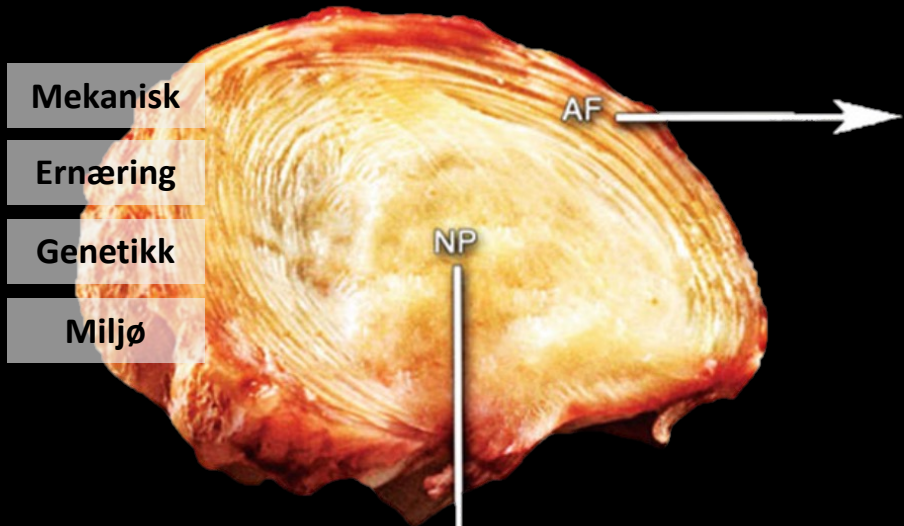
- Alvorlig Patologi: **<1%**
  - Fraktur: **81% (9/1172)**
  - Cauda Equina Syndrom
  - Tumor / Metastaser
  - Spinal infeksjon: **0.001%**
- Spesifikke Rygg smerter: **10 – 15%**
  - Nerverot: **2 – 10%** (av total)
  - Spondylartropatier: **<1.4%**
- Uspesifikke Rygg smerter: **85 – 90%**
  - Diskogene smerter: **39%**
  - Lumbale ZAL: **15 – 40%**
  - Sacroiliacal Ledd: **6 – 21%**
  - Myofasciell: \_\_\_\_\_%

Schwarzer et al (1994, 1995); Deyo et al (1994); Manchikaniti et al (1999), Govind et al (2004); Boos (2008); Bogduk (1995, 2009); Henschel et al (2009)

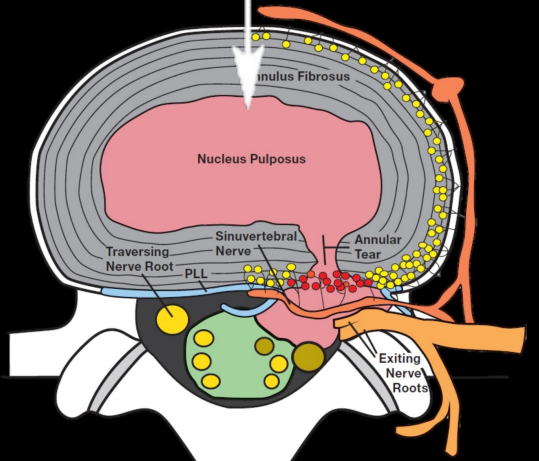


Kirnz S et al. Fundamentals of Intervertebral disc degeneration. *World Neurosurg.* (2022) 157:264-273



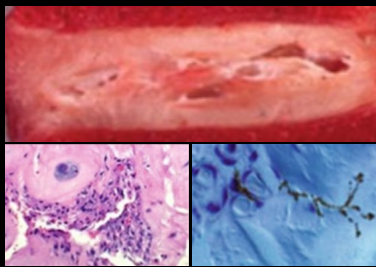


- Mekanisk
- Ernæring
- Genetikk
- Miljø



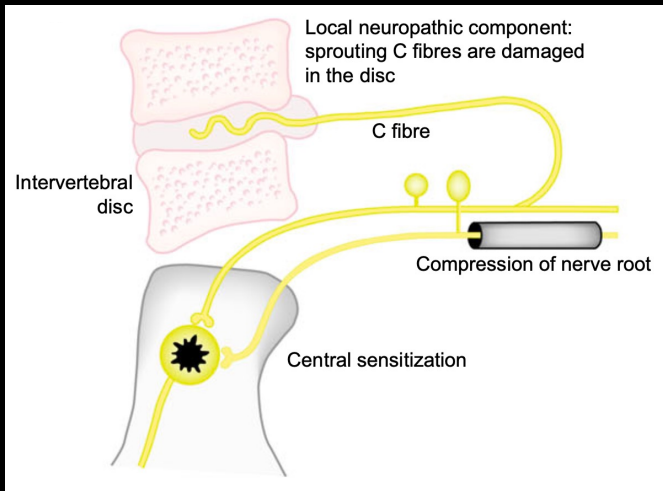
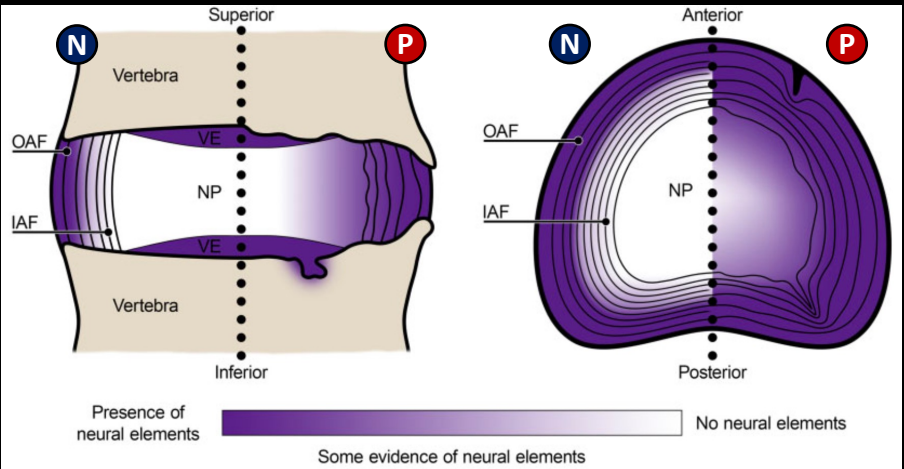
**Radikulopati**      **Radikulære Smerter**

Degenerering



Neovaskularisering  
Neoinnervasjon

- N. Sinuvertebralis**
- Aksiale ryggmerter
- SNS: Grå Rami Communicantes**
- T12, L1 og L2: Ramus Ventralis
  - Lyskesmerter; Nedre Abdomen
  - T12, L1 og L2: Ramus Dorsalis



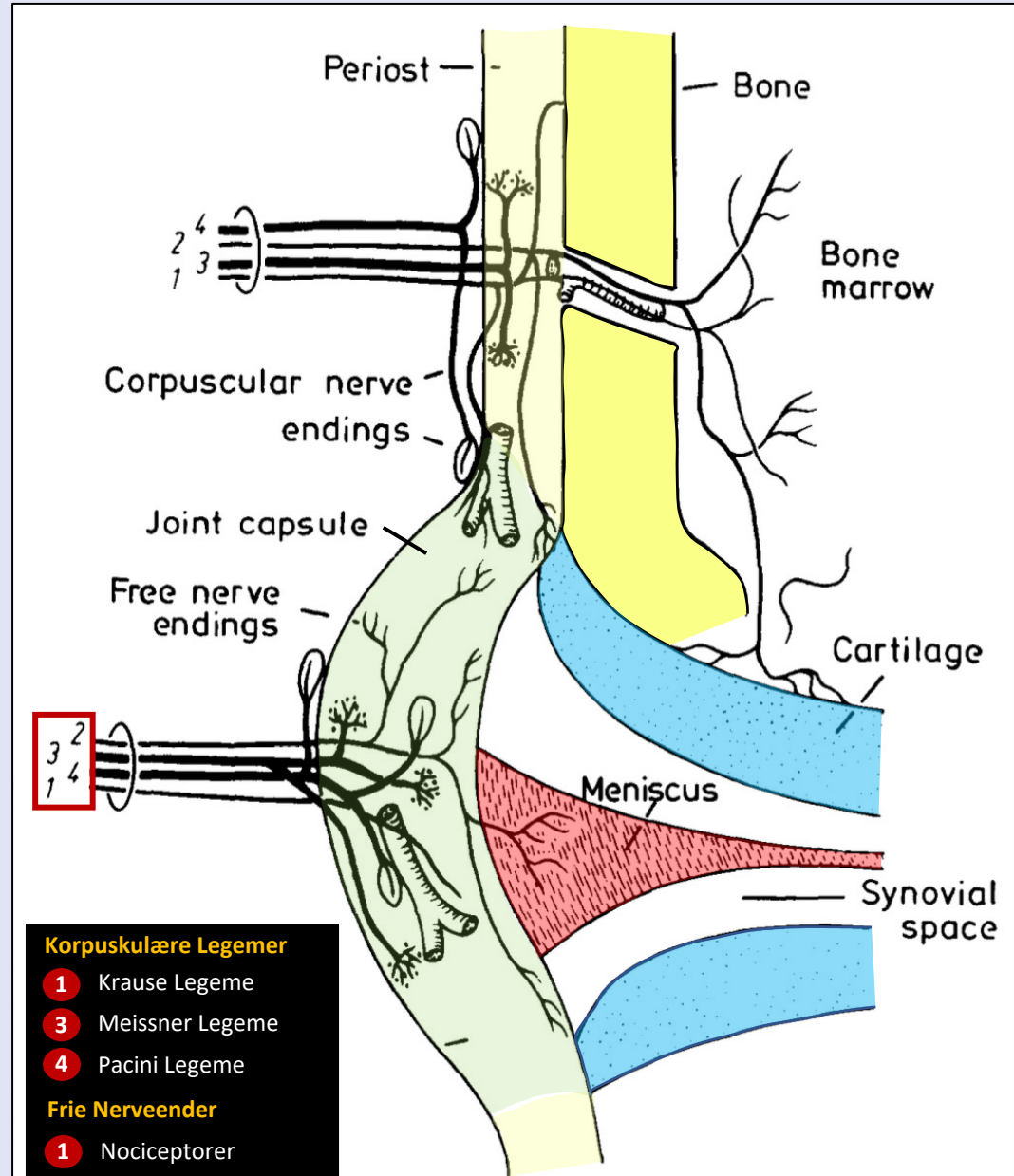
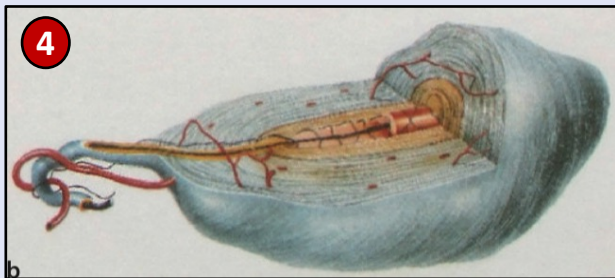
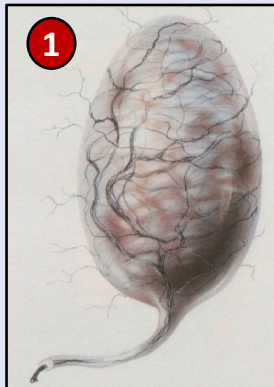
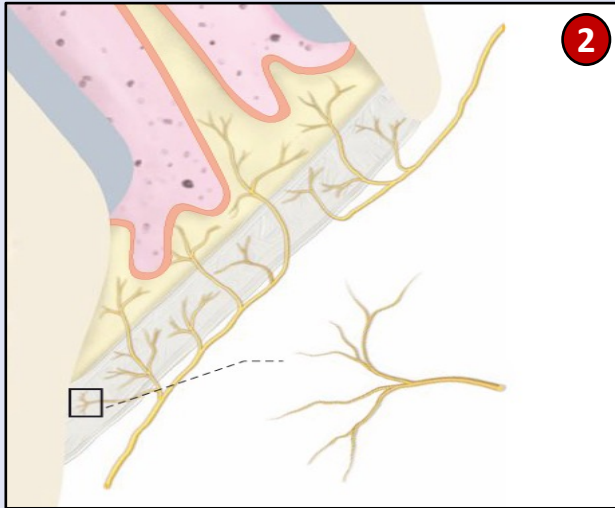
**Nevropatisk Smerte**  
**DIV Kompleks**



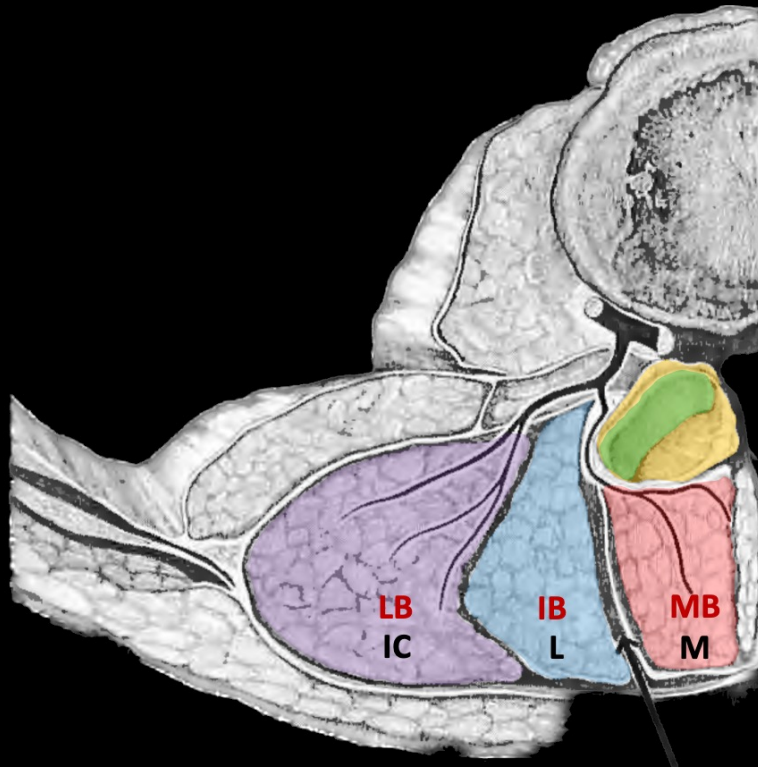
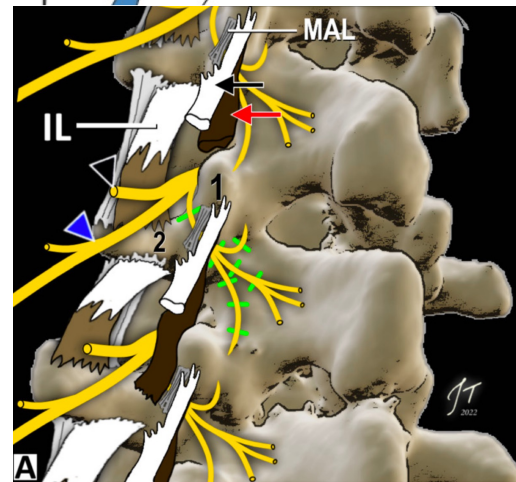
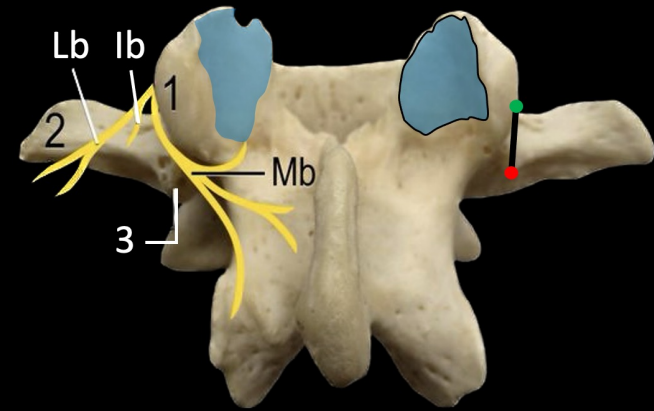
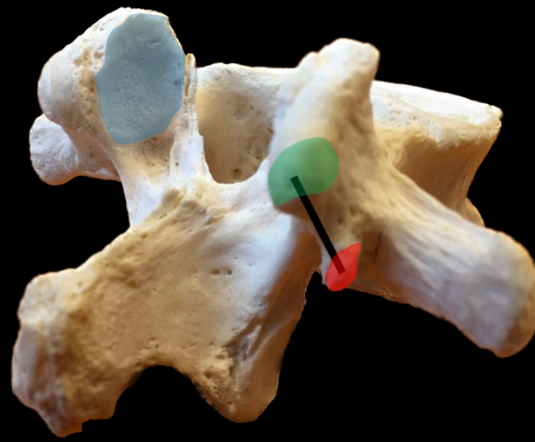
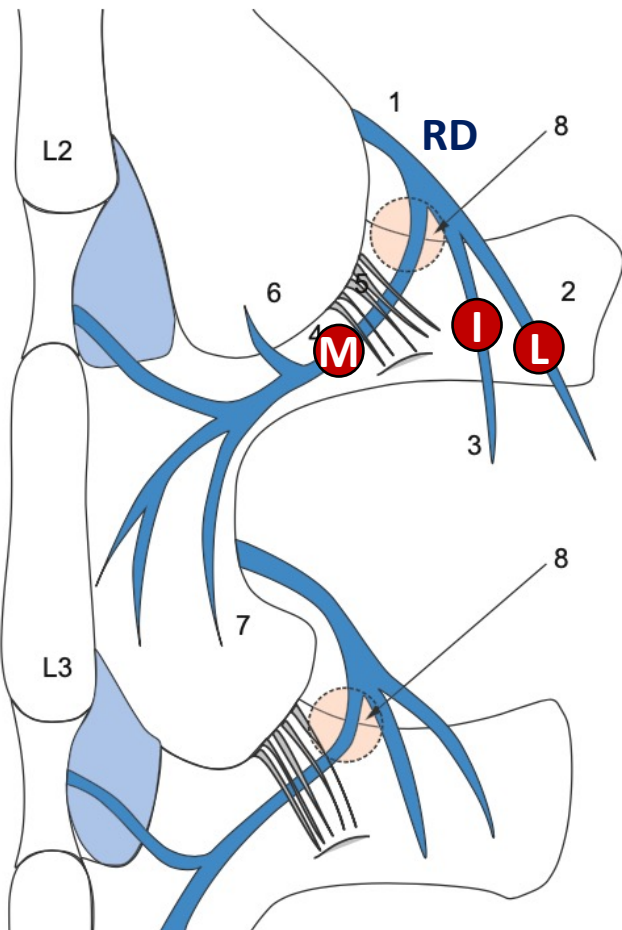
# Zygapofyseal Ledd og Reseptorer

Wyke (1985); Zimmerman (1989); Nix (2017); Hildebrandt (2019)

## Ledd Reseptorer (I – IV)



- Korpuskulære Legemer**
- 1 Krause Legeme
  - 3 Meissner Legeme
  - 4 Pacini Legeme
- Frie Nerveender**
- 1 Nociceptorer

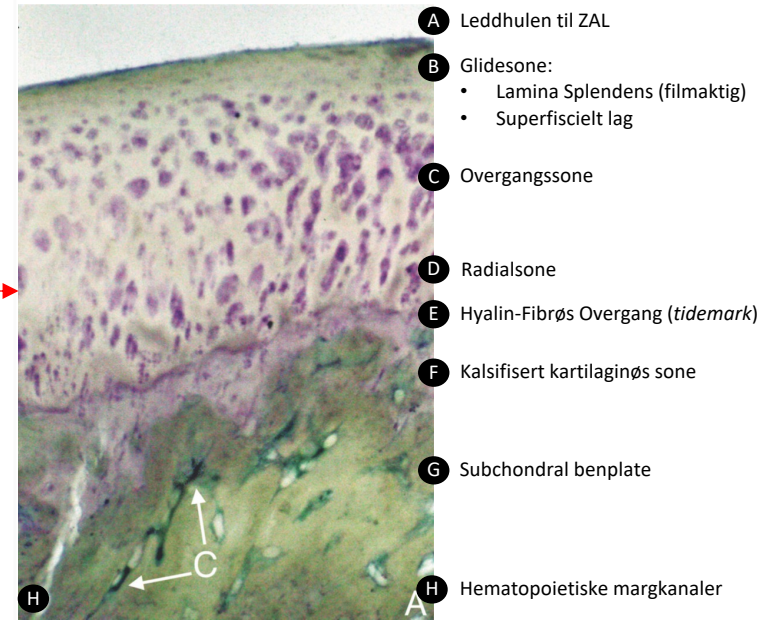
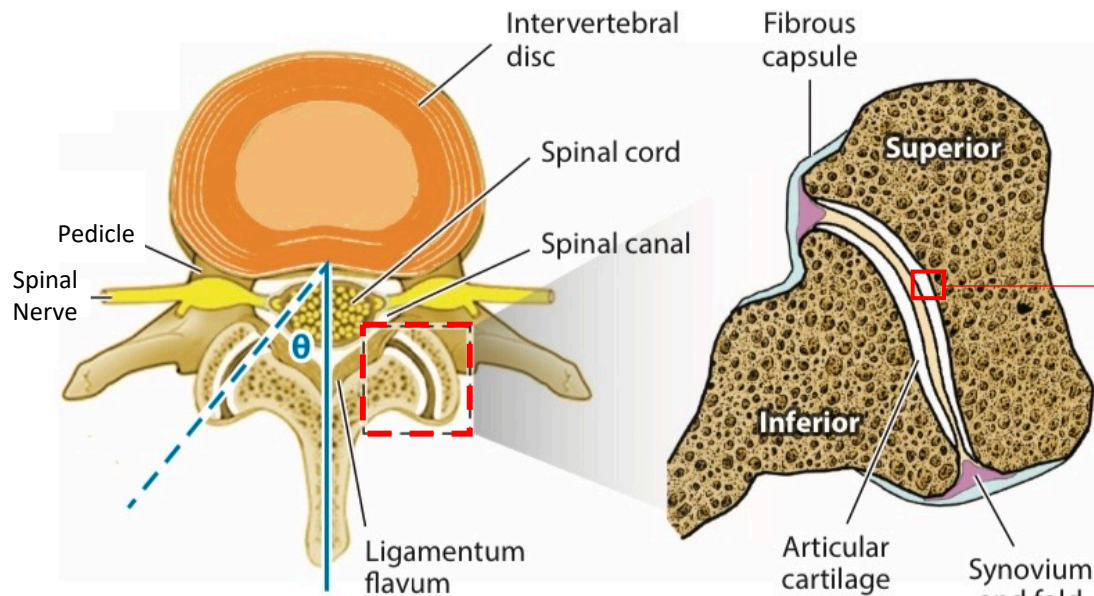


Ramus dorsalis har 3 grener og ikke 2 slik ofte antatt:

- Mediale gren
  - ZAL Komplekset
  - Multifidus
  - Intertransversari
  - Kutan
- Intemediale gren
  - Longissimus
- Laterale gren
  - Iliocostalis
  - Kutan



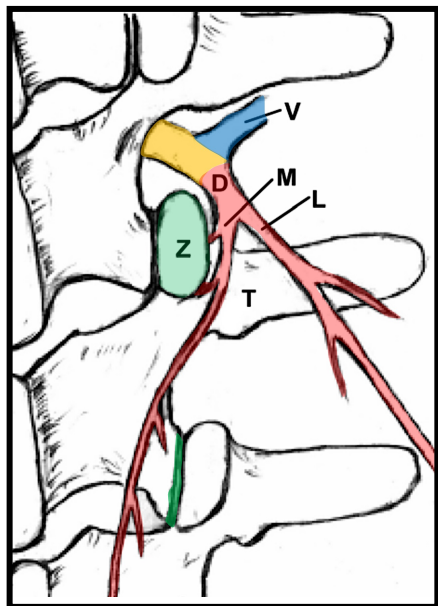
# Lumbale Zygapofyseale Ledd



## Til tross forskning er der mye som er uavklart

- Multisegmentell innervasjon gjennom ramus dorsalis
- Innervasjon gjennom N. Sinuvertebralis også beskrevet
- Innervasjon gjennom sympatiske fibre også beskrevet
- ZAL kapsel og ligamenter beskrives som å ha en rik nociseptiv og autonom innervasjon

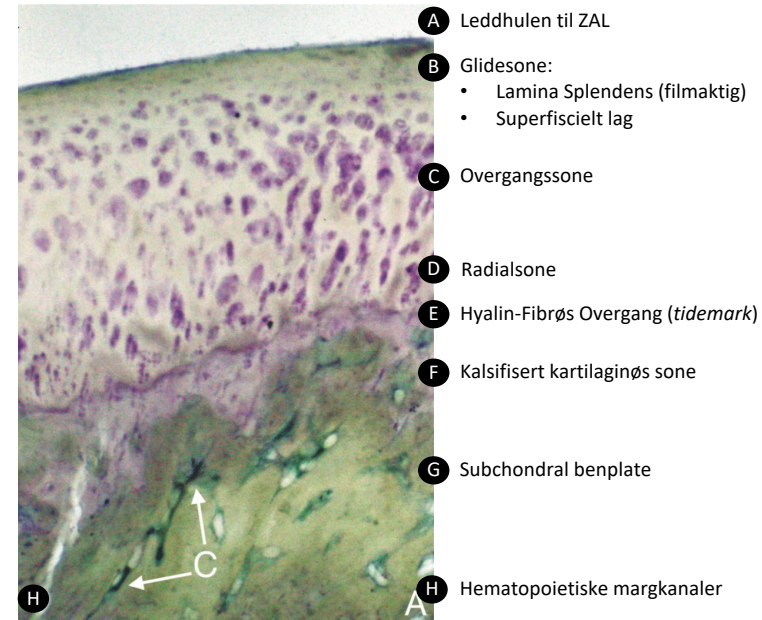
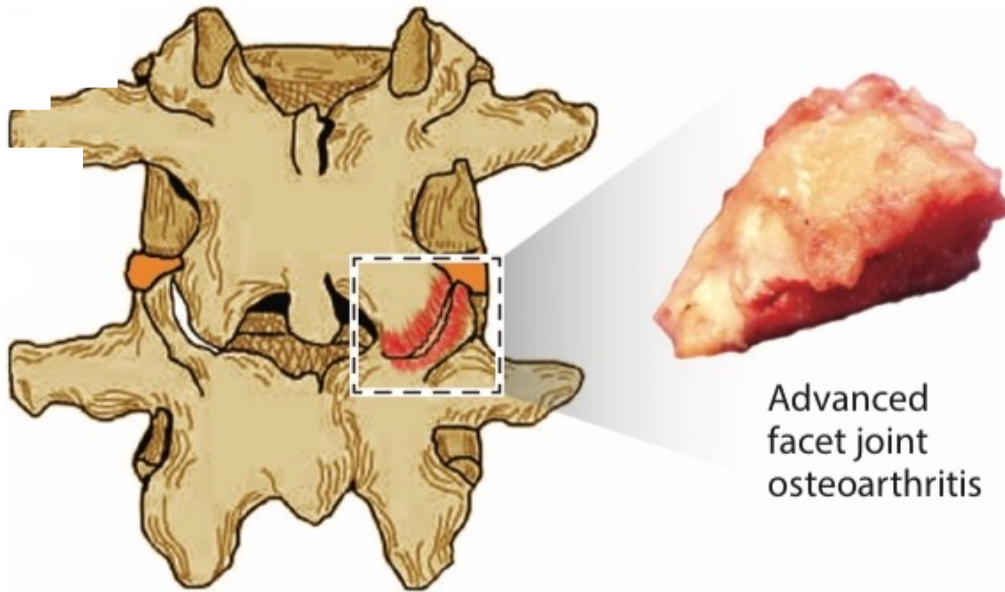
Pedersen et al (1956); Bogduk (1982, 2006); Suseki et al (1997); Steinke et al (2009, 2016); Shuang et al (2015); Kozera et al (2016); Ohlmaker (2015); Inoue et al (2019); Kapetanakis et al (2020)





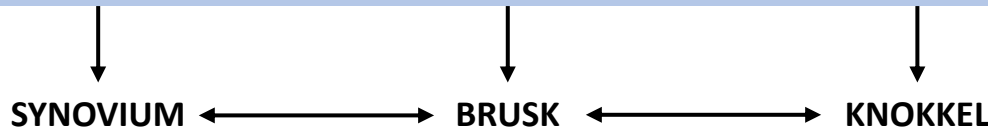
# Lumbale Zygapofyseale Ledd

Eitner et al (2017); O'Leary et al (2018)



## OA Risikofaktorer:

Traume, mekanisk overbelastning, alder, overvekt, metabolske syndromer, genetisk predisposisjon, kjønn



**Frislepp av cytokiner / mediatører / MMPs/ ADAMTSs**

## OA Strukturelle Endringer:

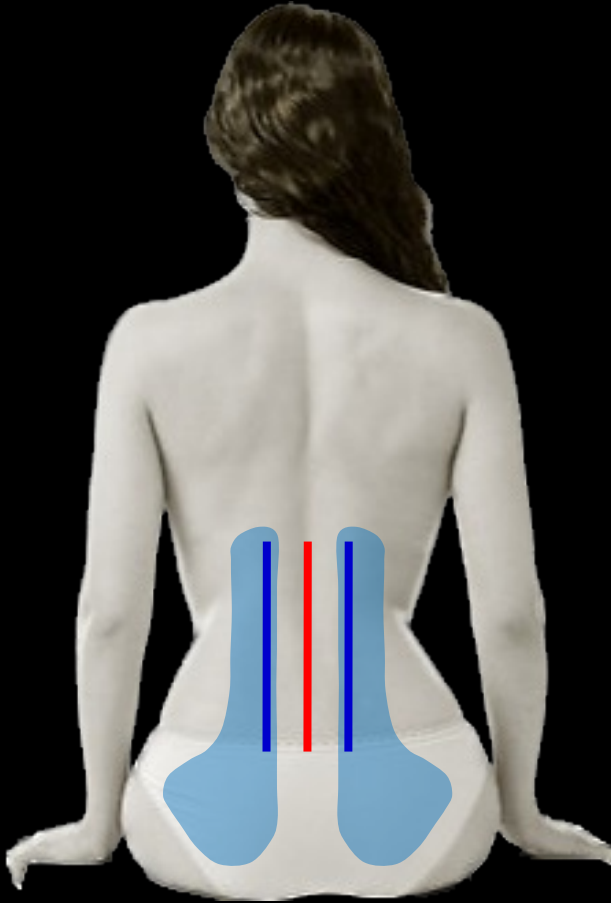
Synovitt; Angiogenese; Nerveskade / Innvekst; Degenerering av bruskmatriks; Apoptose chondrocytter; Sklerose; Osteofytter; Benmarg

## Mulig Utfall:

- Bruskskade og fortynning
- Subchondral knokkelsklerosering
- Synoviale og subchondrale cyster
- Osteofytter og hypertrofi
- Smerter

O'Leary S et al. Facet joints of the spine: structure-function relationships, problems and treatments, and potential for regeneration. *Annu. Rev. Biomed. Eng.* 2018; 20: 145-170

# Smertemønstre: Diskogene og ZAL



DePalma MJ et al. Does the location of low back pain predict its source? *PM R* 2011; 3: 33 – 39, 2011

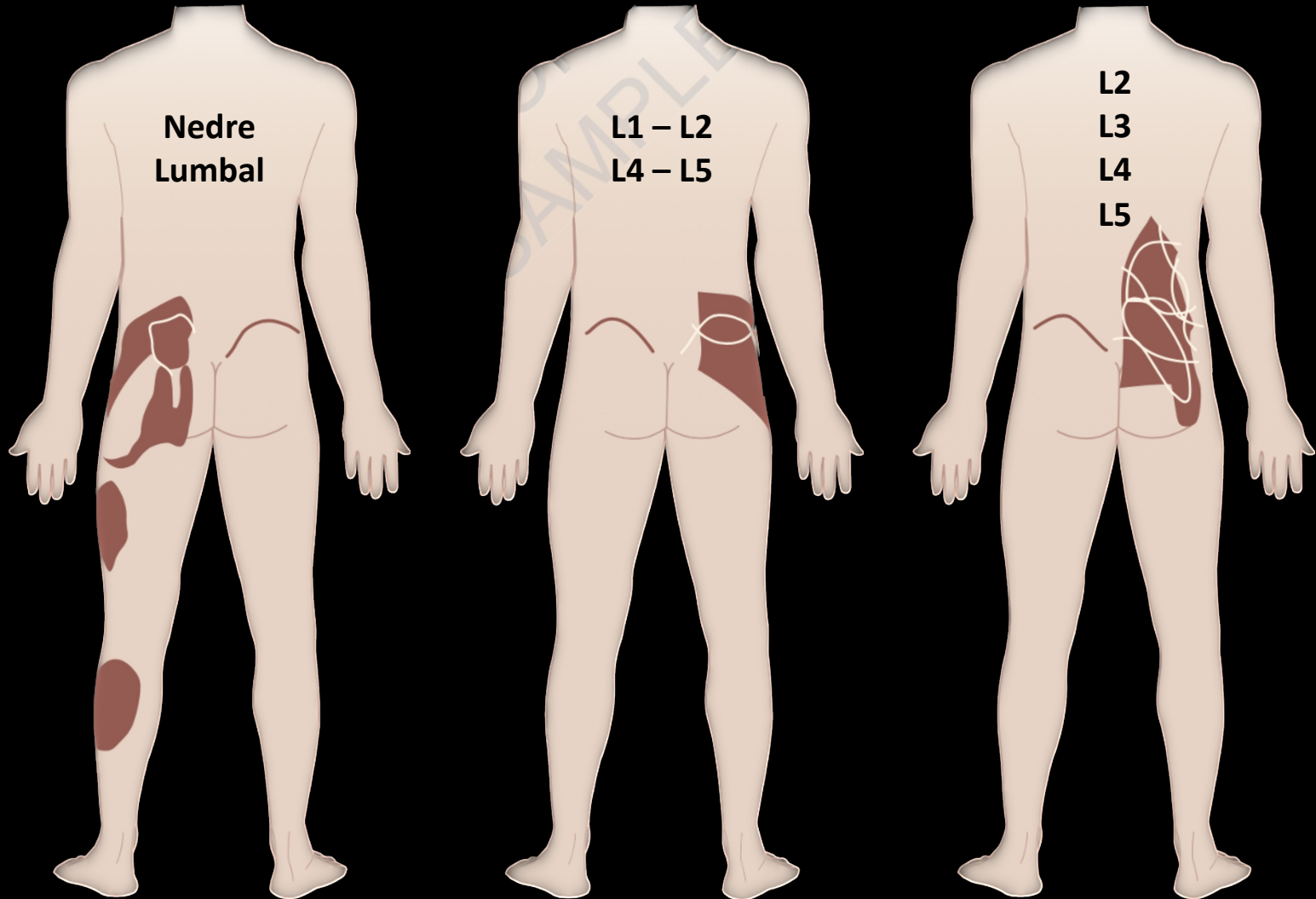
Den studien så på den prediktive verdien av smertelokalisasjon i forhold til strukturer som potensielt forårsaket den:

- N = 170, Snitt 54.4 år, LBP varighet 12 måneder
- Provokativ diskografi, ZAL og SI Leddblokader
- Diskogene (IDD), Lumbale ZAL og SI Ledd smerter
- Kalkulerte sensitivitet, spesifisitet, positiv og negativ prediktiv verdi, diagnostisk nøyaktighet og LR +/-

Smerter mediant over Proc. Spinosi:  
IDD og reduserer sannsynligheten for ZAL og SIL som smertegenerator

Isolerte paramediane smerter:  
økt sannsynlighet for ZAL og SIL som årsak til smerten

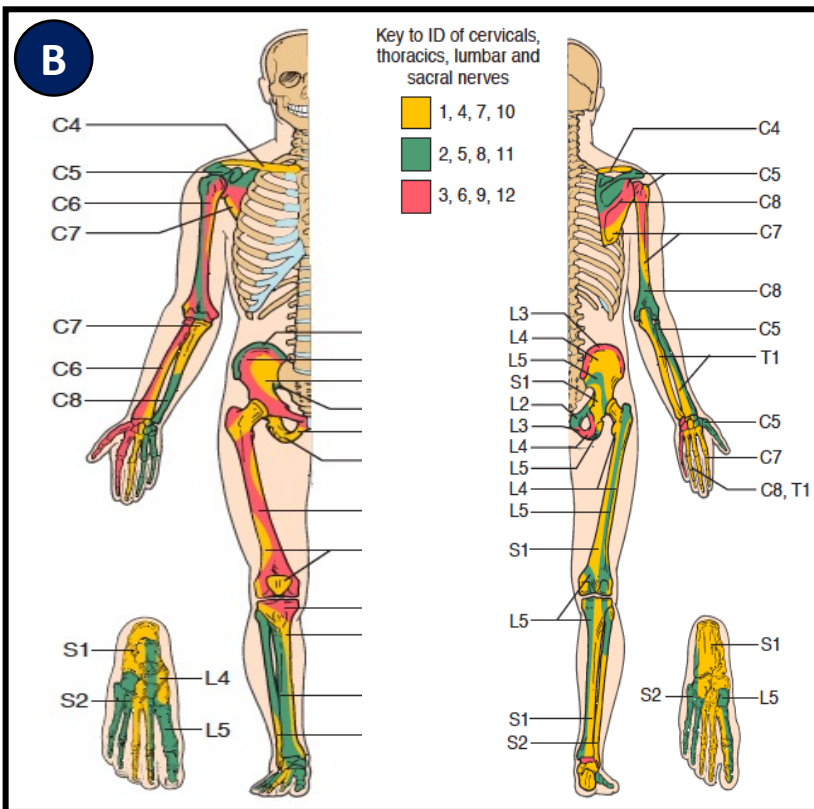
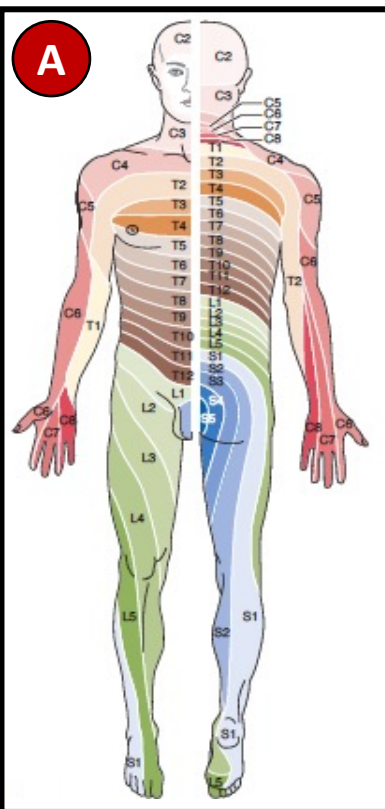
# Smertemønstre Lumbale ZAL





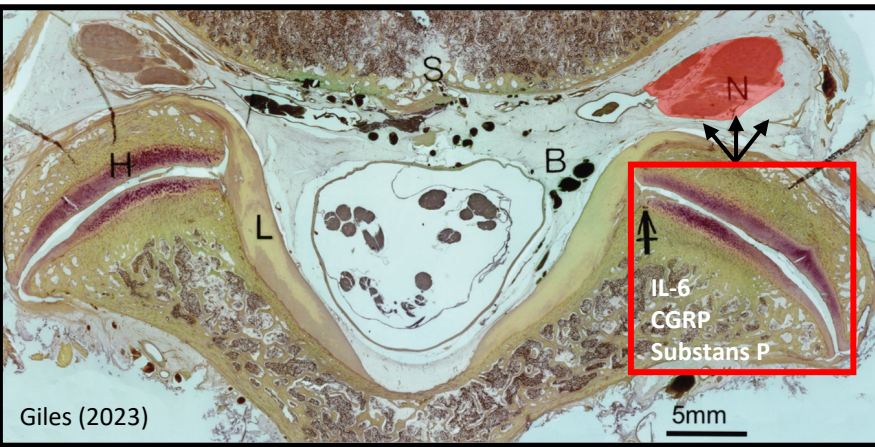


# Kan ZAL gi andre smertemønstre?



## Sklerotom

- Fra det paraksiale mesoderm som dermatom og myotom
- Segmentell innervasjon av knokler (fra en nerverot)
- Først brukt som mekanisme for refererte smerter i 1944
  - Inman V, Saunders J. 1944. Referred pain from skeletal structures. *J Nerv Ment Dis* 99:660–667
- Fortsatt mye uavklart
  - Ivanusic JJ. The evidence for the spinal segmental innervation of bone. *Clinical Anatomy* 20: 956-960 (2007)



Giles (2023)

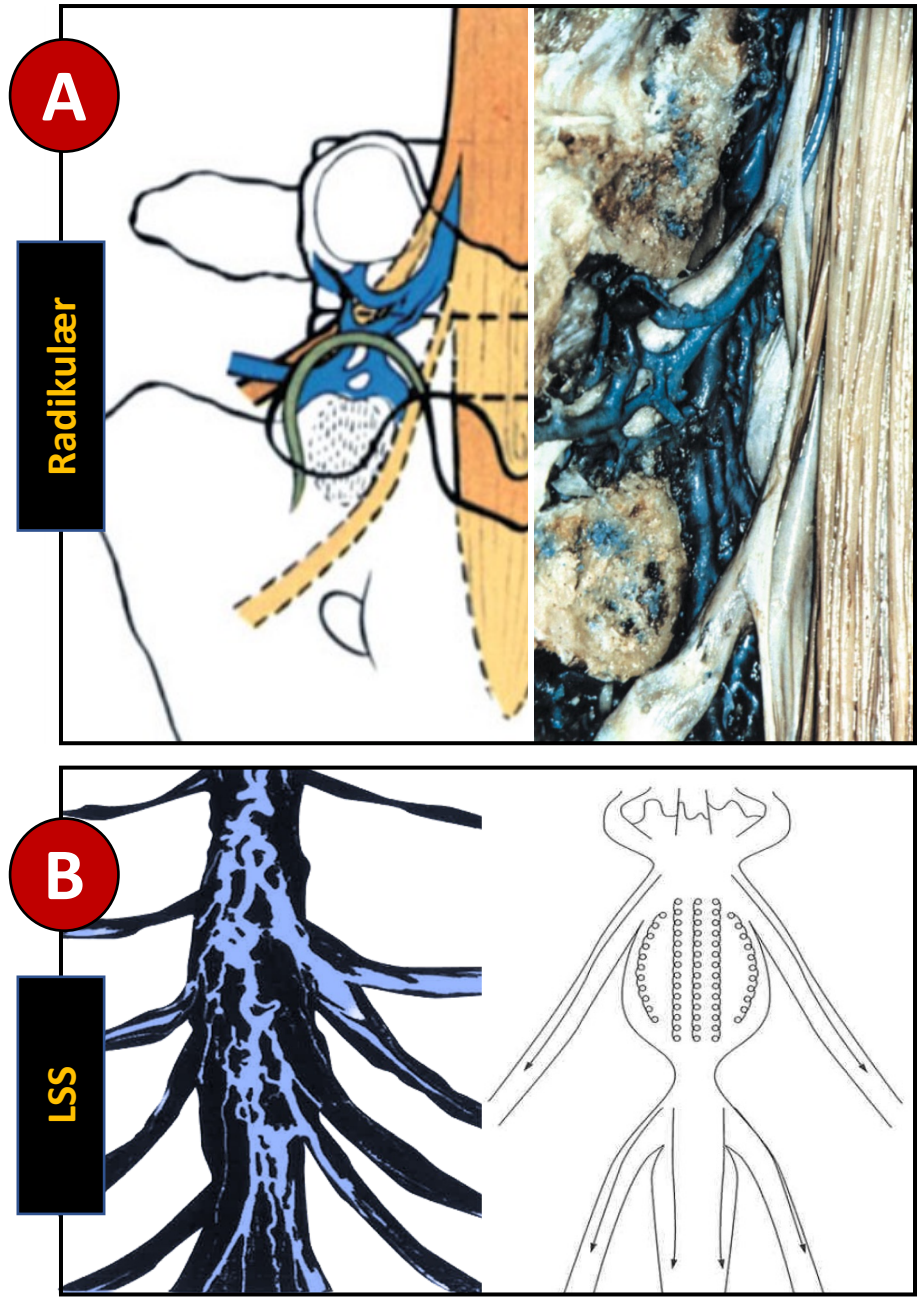
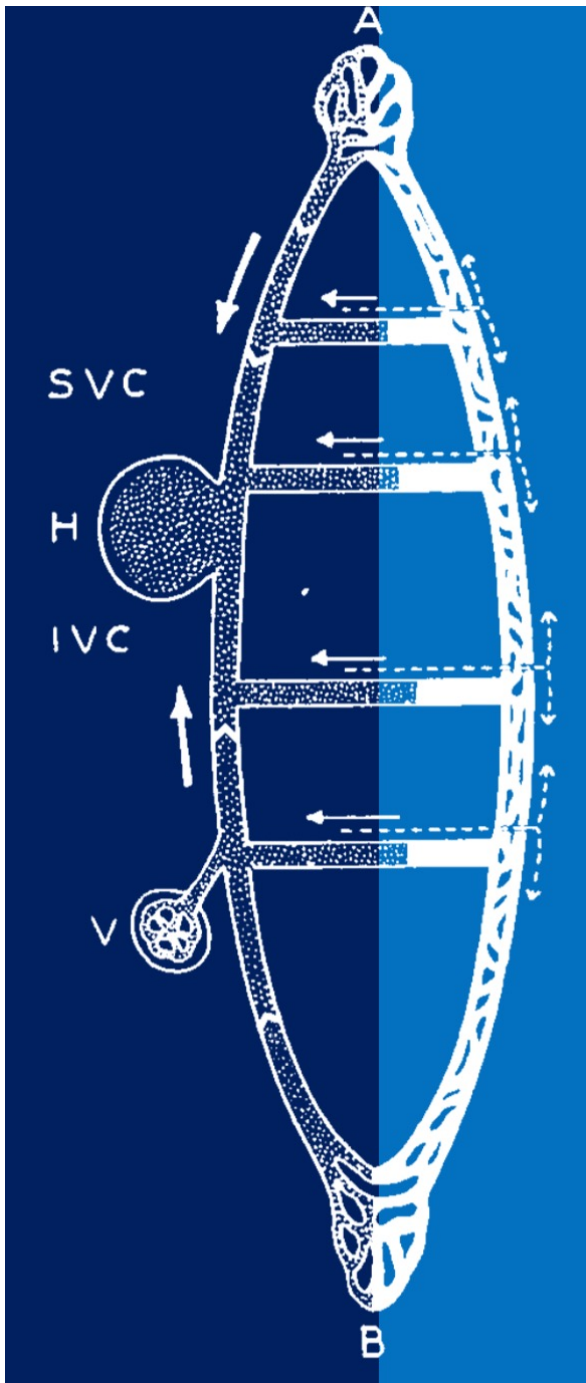
## Entesopati

- Inflammasjon kollagene fester knyttet til ZAL komplekset kan muligens gi sklerotomsmerter

## Inflammasjon ZAL

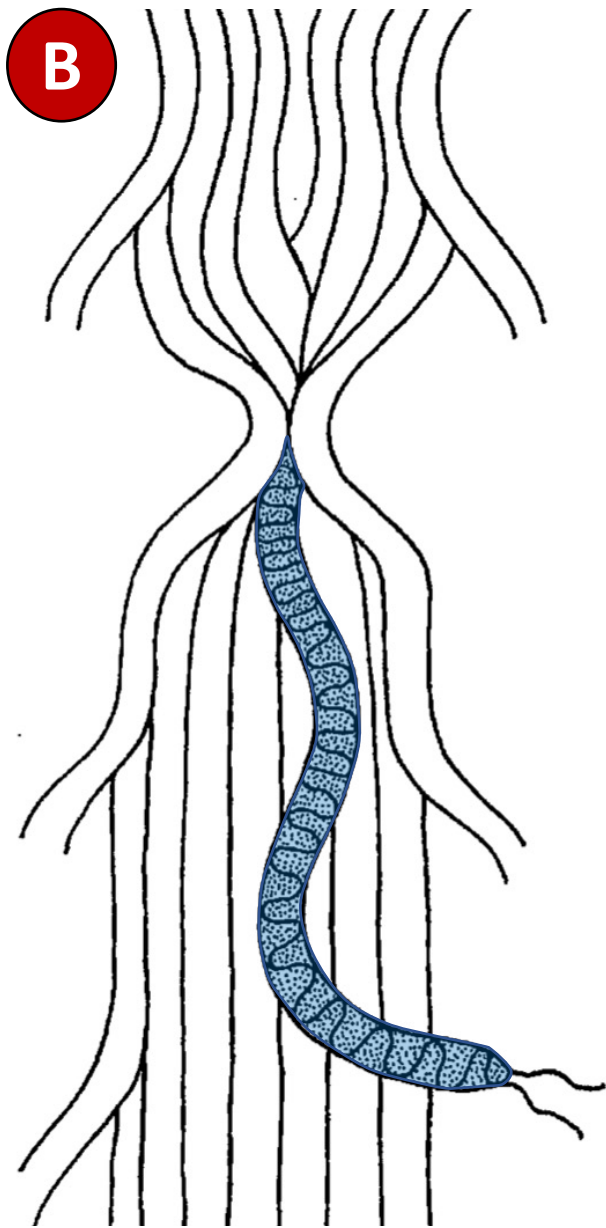
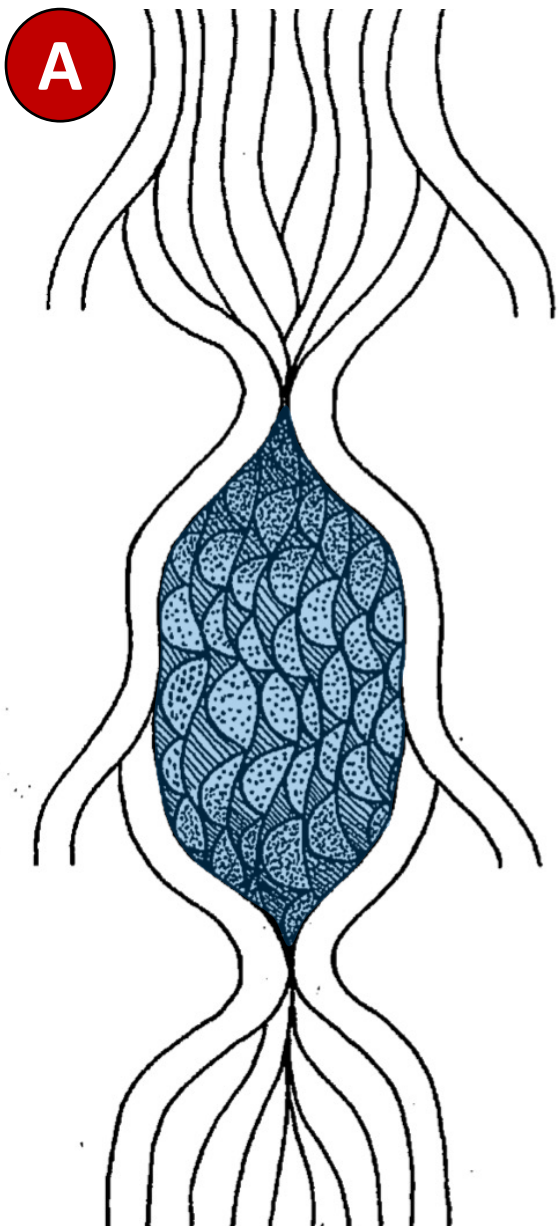
- Inflammasjon i ZAL komplekset kan diffundere og spre seg til omliggende nervestrukturer som mulig opphav til radikulære sypntomer

Cox (1999); Rachlin (2002); Tachihara et al (2007); Jerosch et al (2014);



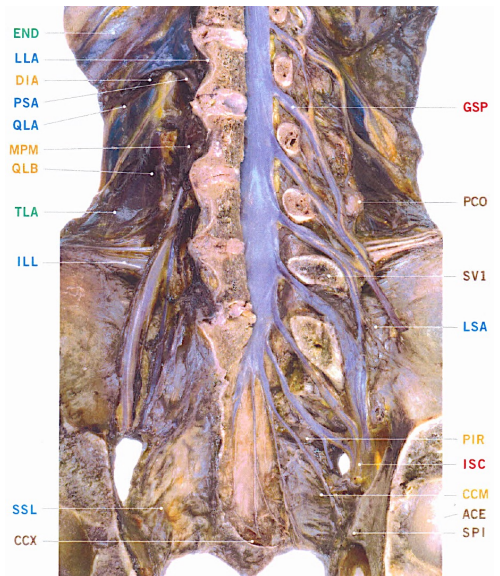
Corck (1983); Parker (2005); Krämer et al (2014)





**A. Lumbal spinal stenose: to nivåer**  
**B. Lumbal spinal stenose: enkeltnivå**

**Venøse Staseringer**



Steinke H. Atlas of human fascial topography. Leipzig: Leipziger Universitätsverlag 2018

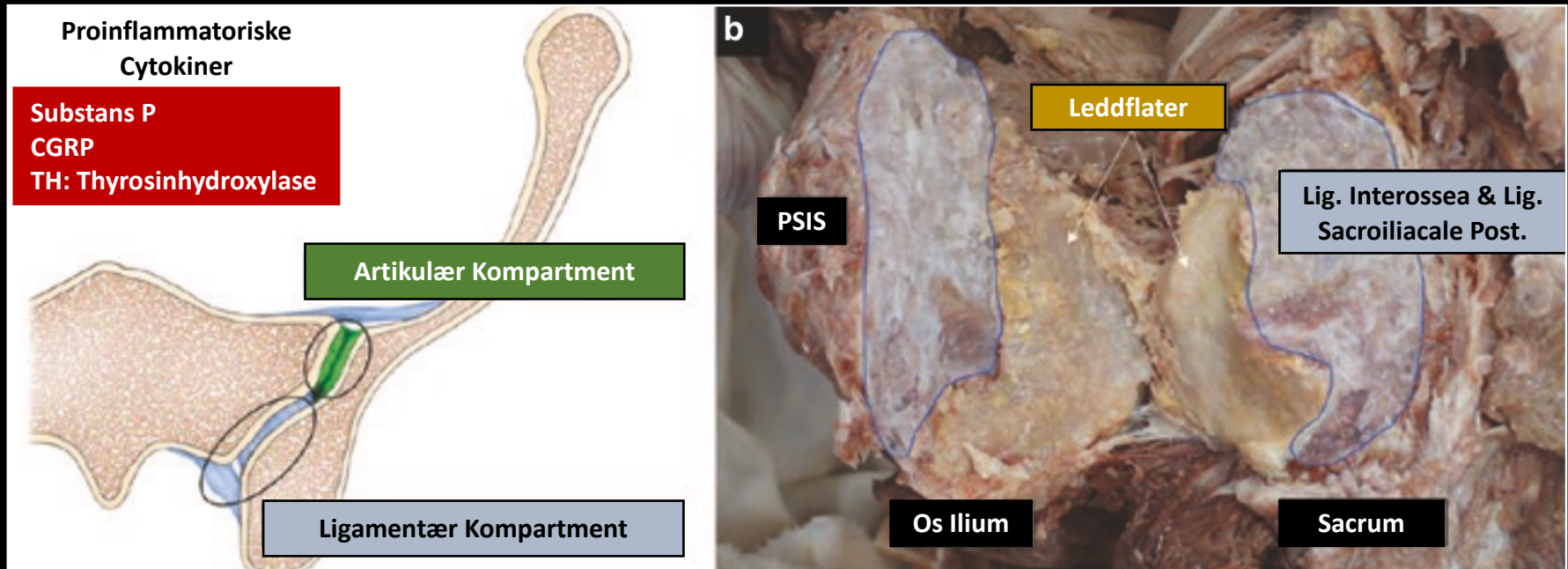
Ohlmer K, Rydevik B. Single- versus double-level nerve root compression. An experimental study on the porcine cauda equina with analysis of nerve impulse conduction properties. *Clin Orthop.* 1992; (279): 35 – 39

Porter RW, Ward D. Cauda equina dysfunction. The significance of two-level pathology. *Spine* 1992; 17(1): 9 – 15

Sato K et al. Clinical analysis of two-level compression of the cauda equina and nerve roots in lumbar spinal canal stenosis. *Spine* 1997; 22(16)\_ 1898 – 1903

Morris CE (Ed). *Low back syndromes: integrated clinical management.* New York: McGraw-Hill 2006

# Art. Sacroiliacale som Smertegenerator

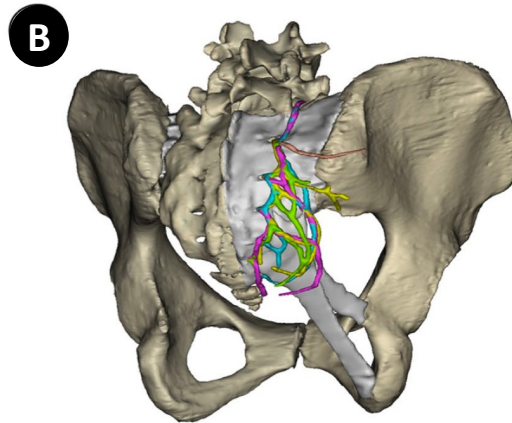
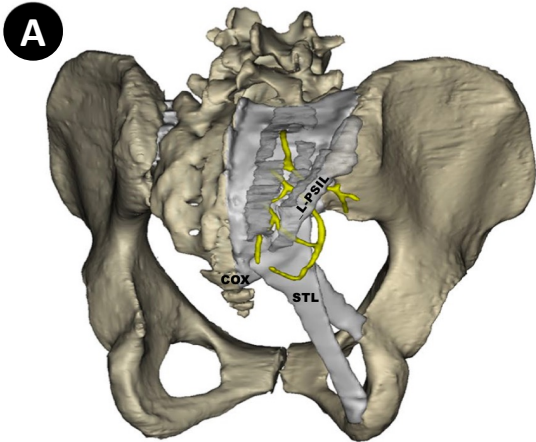


- Innervasjon av ledd og leddnære strukturer forholdsvis godt beskrevet
- Økt fokus på spesifikke strukturer og smertemekanismer
- Anteriore og posteriore spredningsruter for inflammatoriske mediatører fra leddkomplekset til leddnære nervale strukturer godt beskrevet
- Fortsatt stor diagnostisk usikkerhet

Anterior SI	L3	L4	L5	S1	S2	N. Glutealis Sup.	Plexus Sacralis
Solonen (1957)							
Ikeda (1991)							
Szadek (2008)							
Cox (2017)							

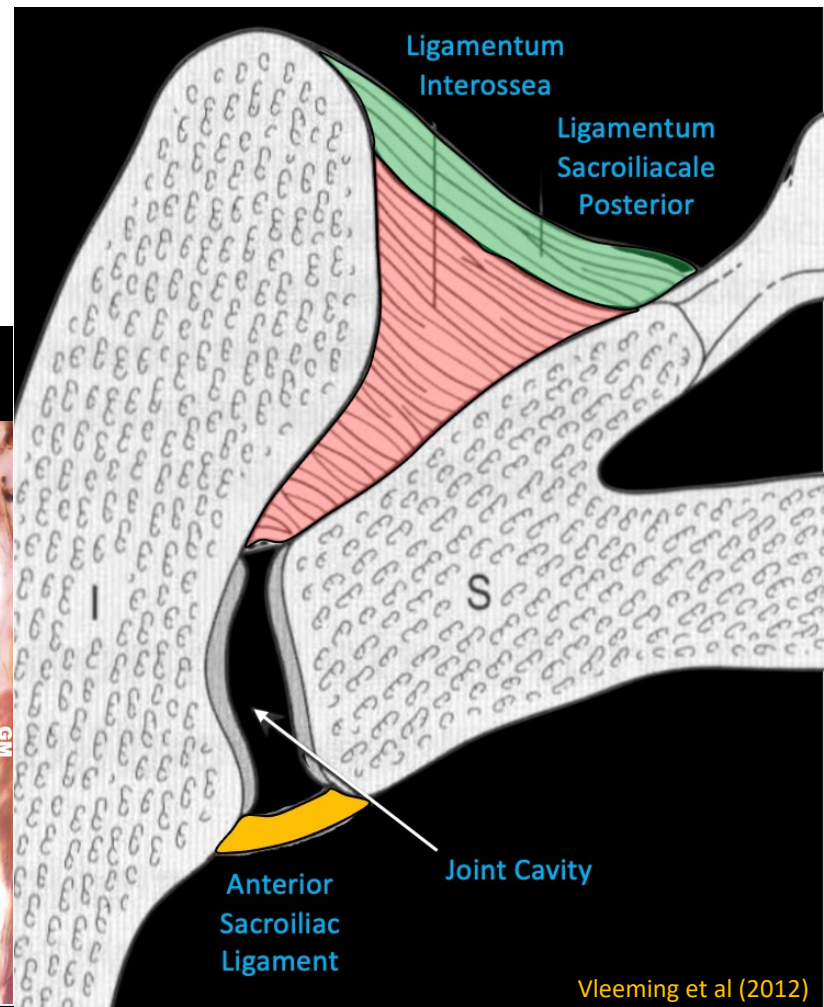
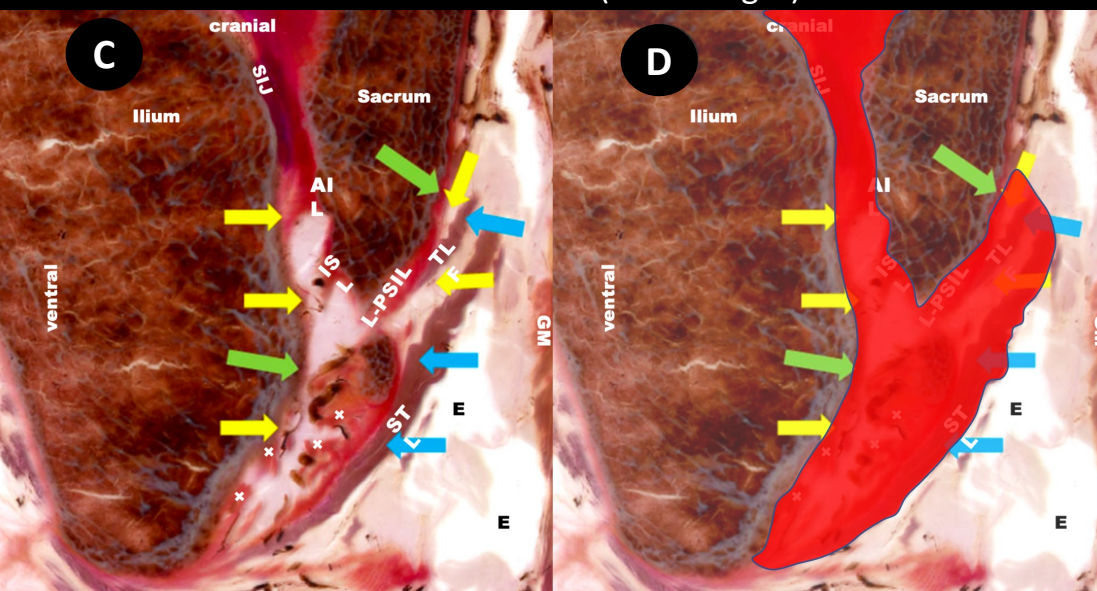
Posterior SI	N. Glutealis Sup.	L5	S1	S2	S3	S4
Horwitz (1939)						
Solonen (1957)						
Bradley et al (1974)						
Ikeda (1991)						
Grob et al (1995)						
Fortin et al (1999)						
Yin et al (2003)						
McGrath og Zhang (2005)						
Cox og Fortin (2014)						
Roberts et al (2014)						





Steinke H et al. Sacroiliac innervation.  
European Spine Journal 27 August 2022

**Ekstravasasjon** av veske fra SIL til de posteriore ligamentære og fascielle strukturer (bilde C og D)



Vleeming et al (2012)

### PBSN: Posteriore Grene Nn. Sacrales

RC L5/S1	RC S1/S2	RC S2/S3	RCS3/S4	RCS4/S5	RC S5/Cocc
Passerer Lig. Iliolumbale og <b>Lig. Interossea</b>	Inferior for SIPS <b>Ventral for LSIP-L</b> Loop til STL	<b>Medial for LSIP-L</b> Loop til STL Nivå L5 til Cocc.	<b>Ventral for LSIP-L</b>	Krysser med mangfoldige RC forgreninger	Forløper langsmed Coccygeus

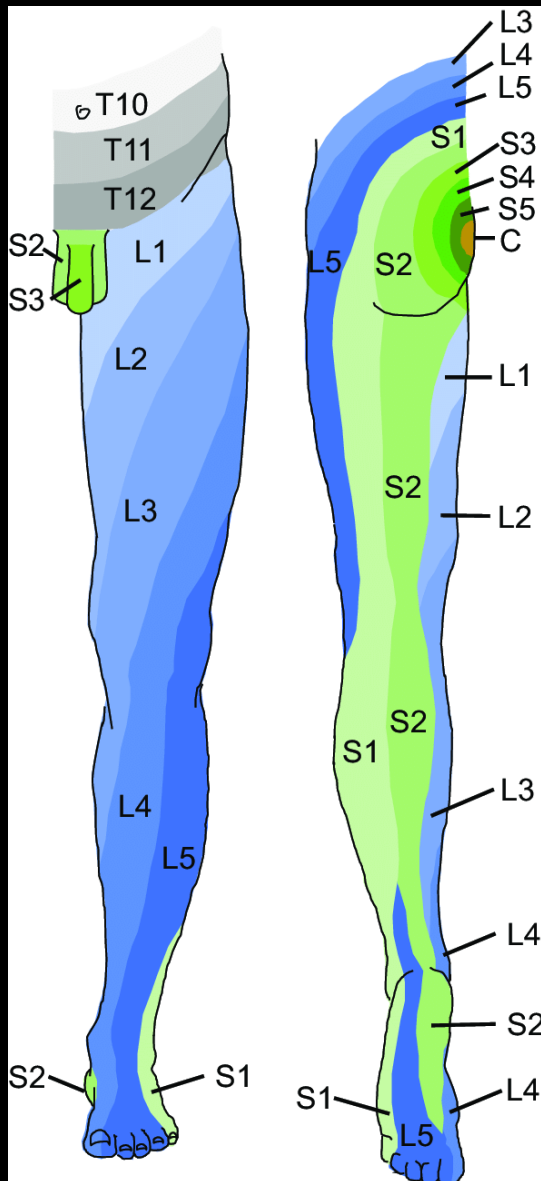
**A**

«Klassiske Smertemønstre» fra SI-Ledd



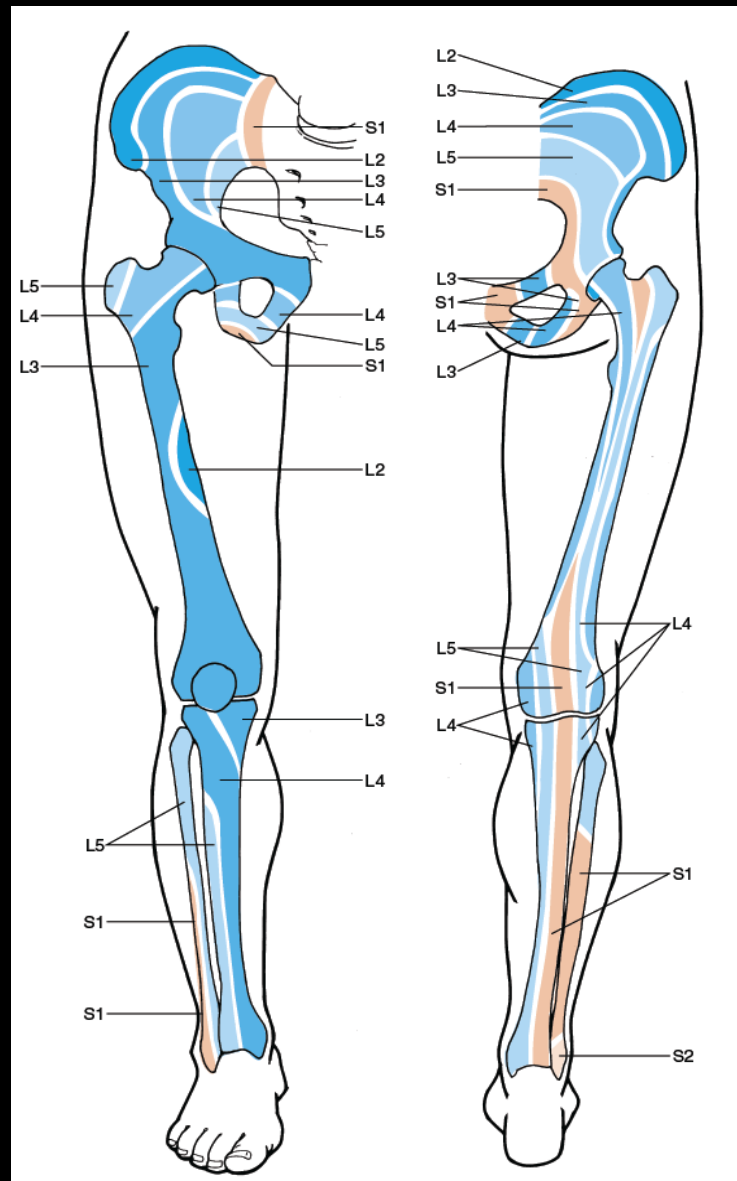
**B**

«Isjiasdistribusjon»

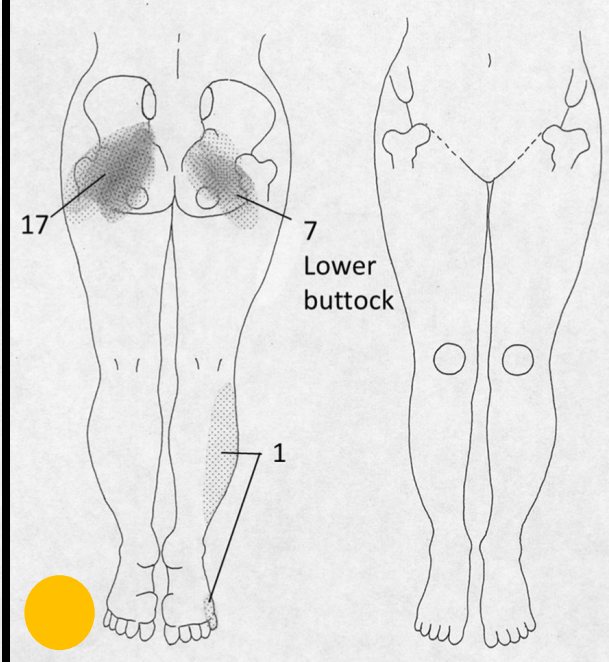
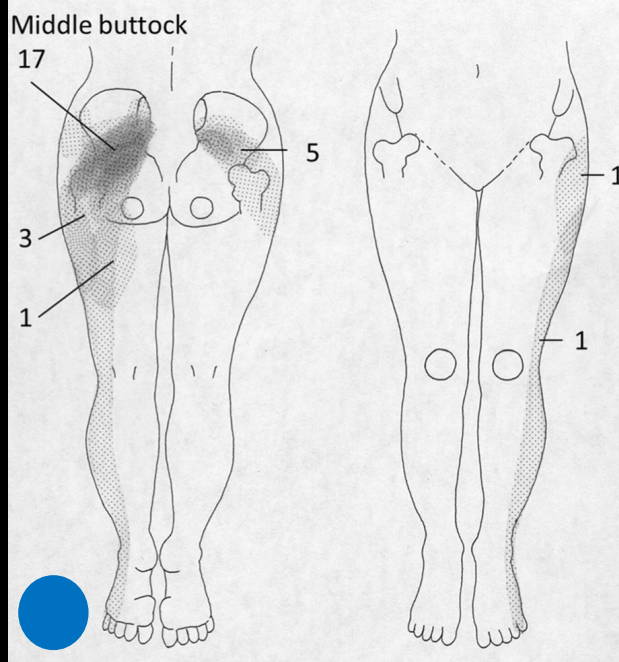
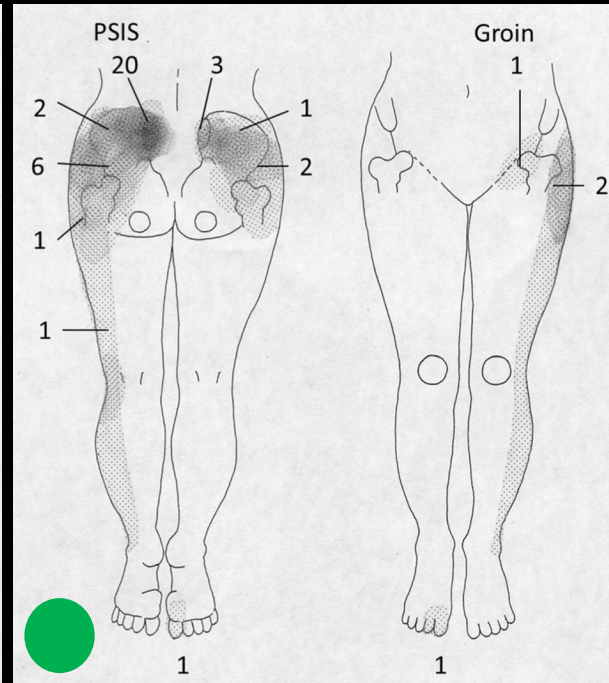
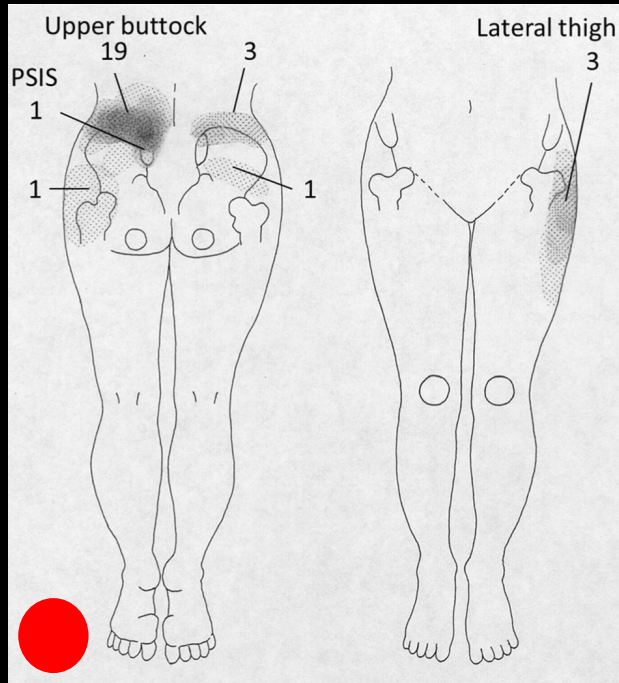
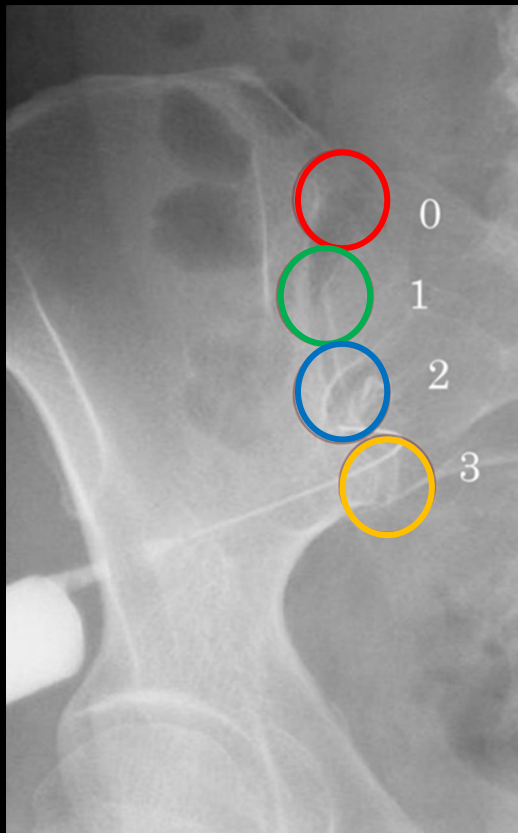


**C**

Sklerotomer  
(noen bruker begrepet «Osteotomer»)



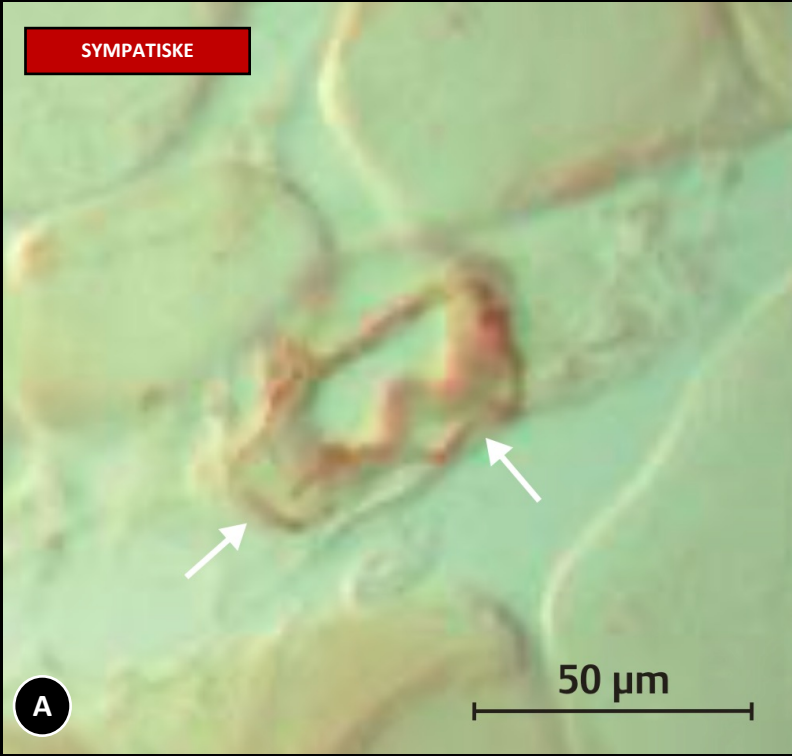
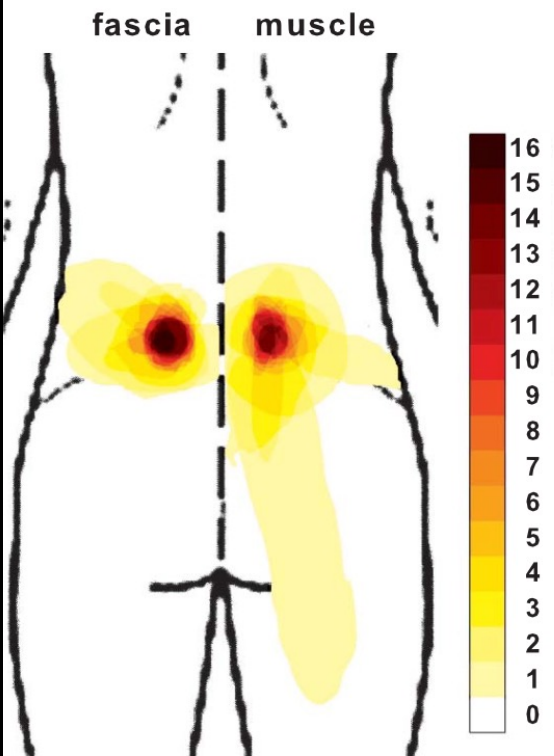




Bemerkning: Alle fire seksjonene kunne forårsake lyskesmerter når de ble stimulert

Kurosawa D et al. Referred pain location depends on the affected section of the sacroiliac joint. *Eur J Spine* (2015) 24: 521-527



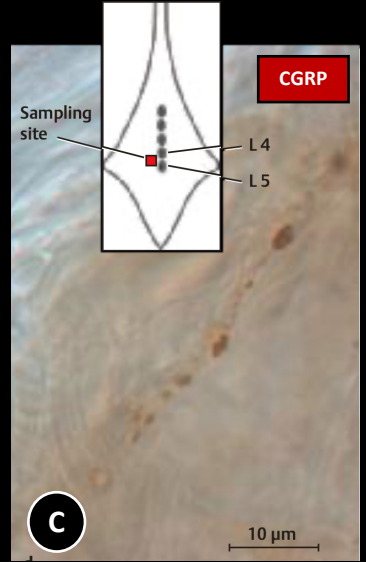


Schilder A, Hoheisel U, Magerl W et al (2014). Sensory findings after stimulation of the thoracolumbar fascia with hypertonic saline suggest its contribution to low back pain. *Pain* 155: 222-231

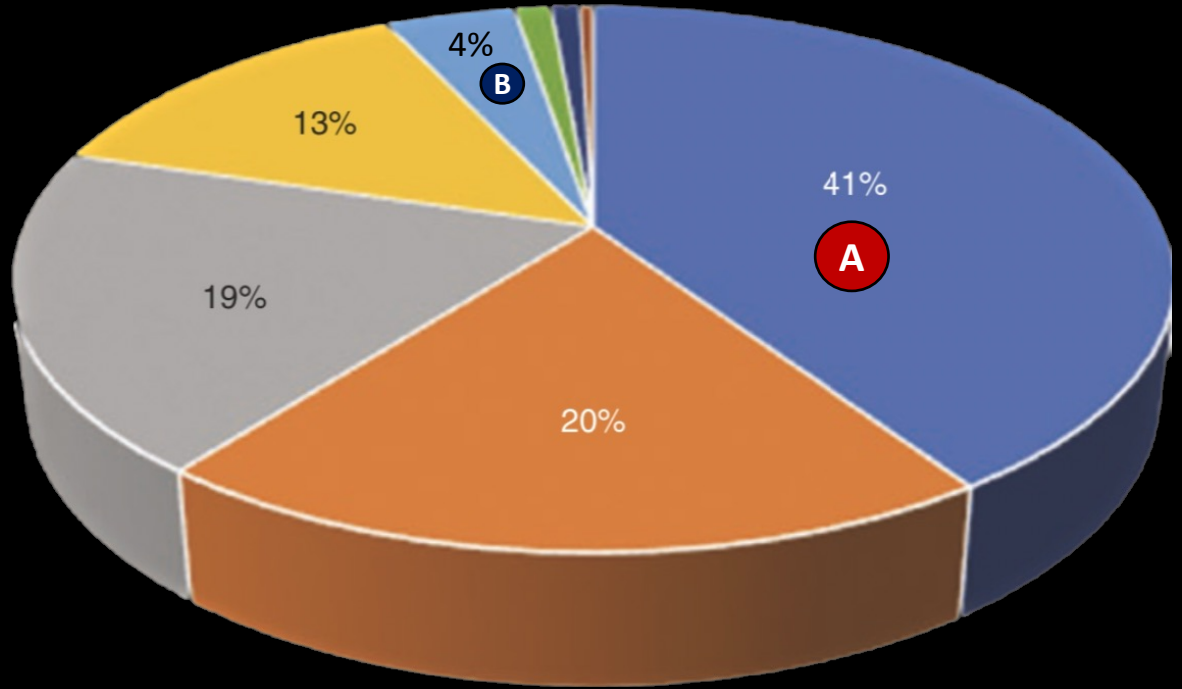
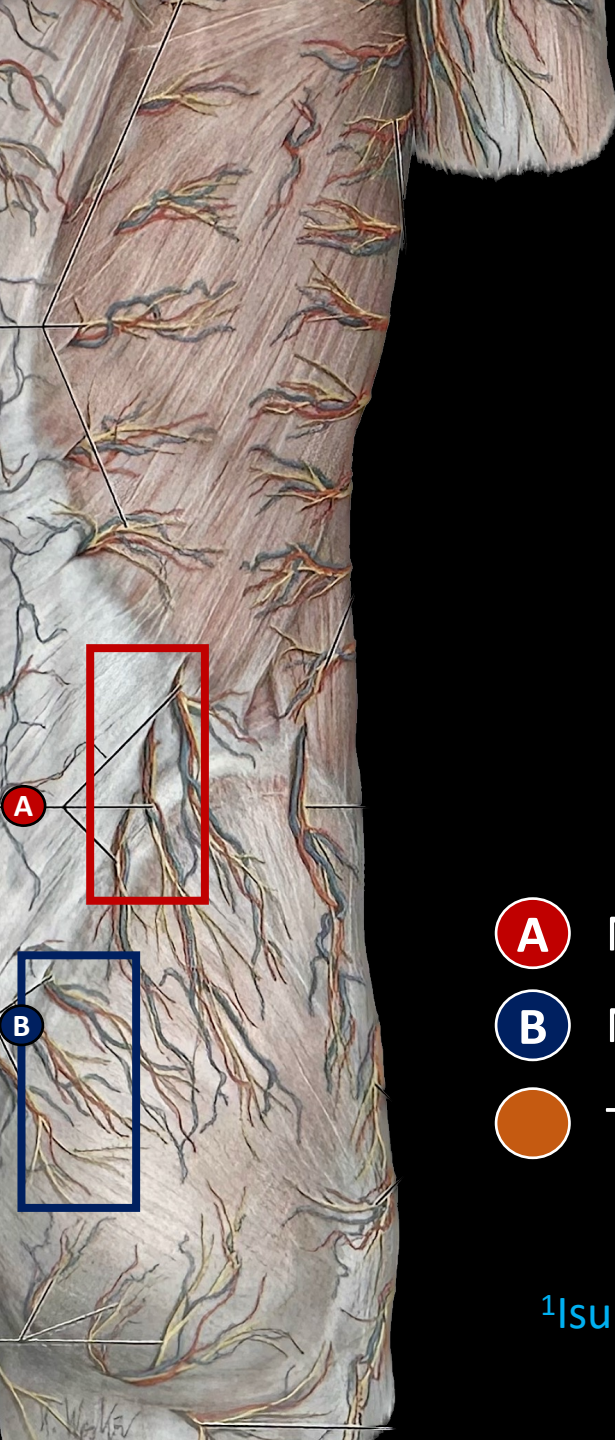
Schilder A, Magerl W, Hoheisel U et al (2016). Electrical high-frequency stimulation of the human thoracolumbar fascia evokes long-term potentiation-like pain amplification. *Pain* 157:2309-2317

Tesarz J, Hoheisel U, Wiedenhöfer B, Mense S. 2011. Sensory Innervation of the Thoracolumbar Fascia in Rats and Humans. *Neuroscience* 194: 302- 308.

**Mense S. Muskeln, Faszien und Schmerz. Stuttgart: Thieme Verlag 2021**



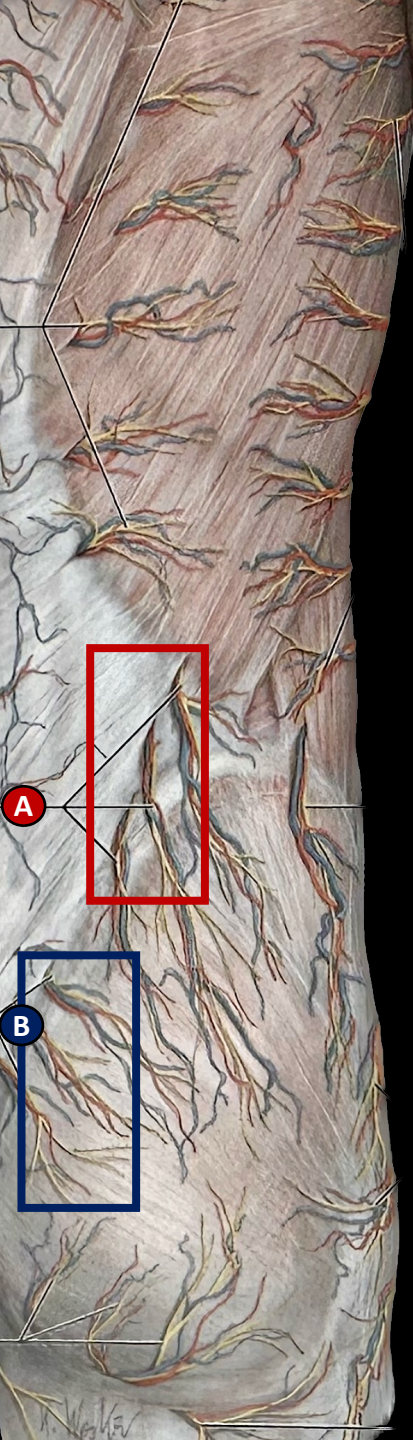
# Kirurgi for perifer nevropati: 1276 pasienter<sup>1</sup>



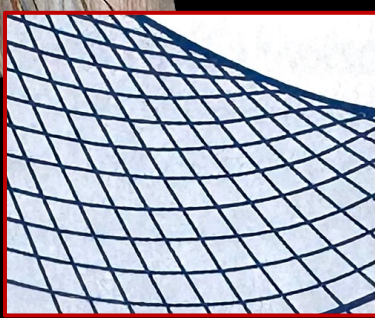
- A** Nn. Clunealis Superior
- B** Nn. Clunealis Medialis
- Tarsal Tunnell Syndrom
- Gluteus Med. Dekompresjon
- N. Peroneus Communis

<sup>1</sup>Isu T, Kyongson K. *Entrapment neuropathy of the lumbar spine and lower limbs*. Singapore: Springer Nature 2021

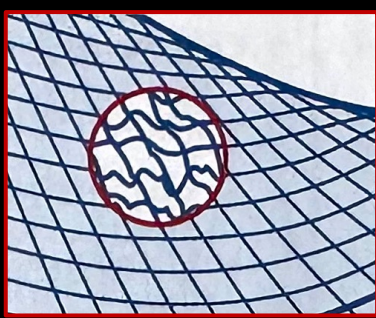




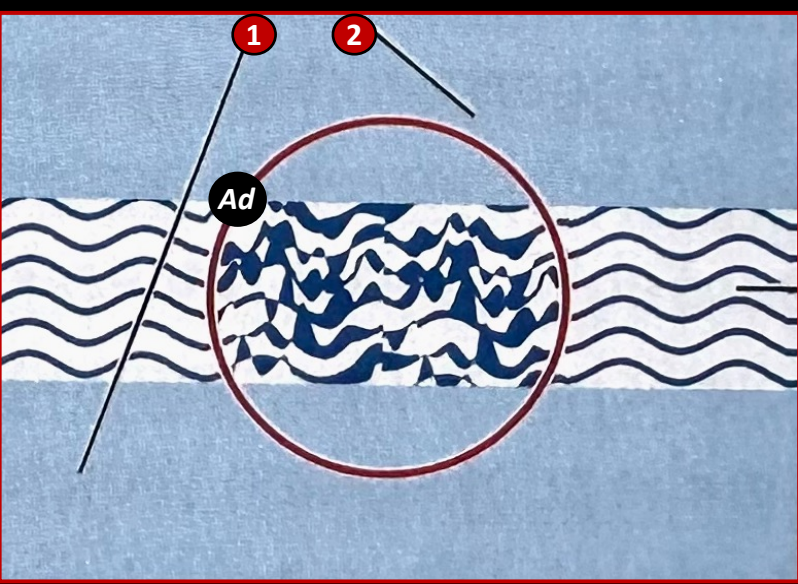
Normal



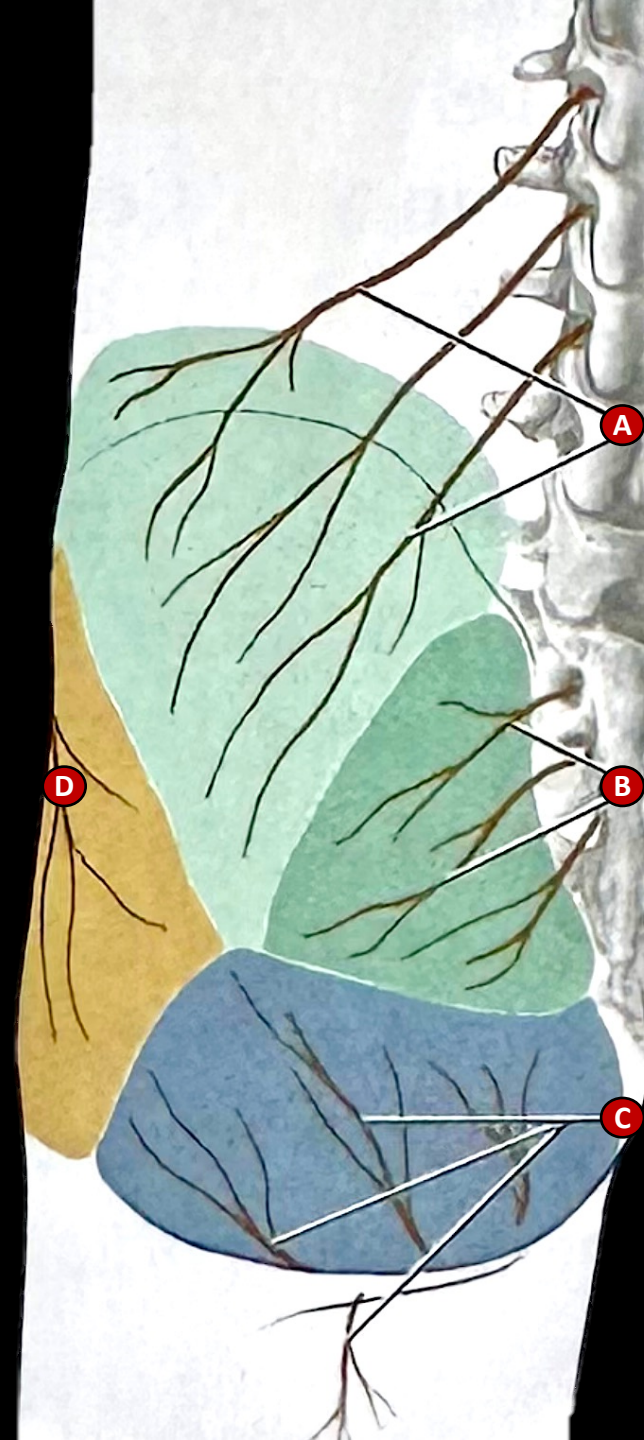
Patologisk



Ad = Adhesjon mellom lag 1 og 2



- A** Nn. Clunealis Superior
- B** Nn. Clunealis Medialis
- C** Nn. Clunealis Inferior
- D** N. Cutaneous Femoris Lateralis



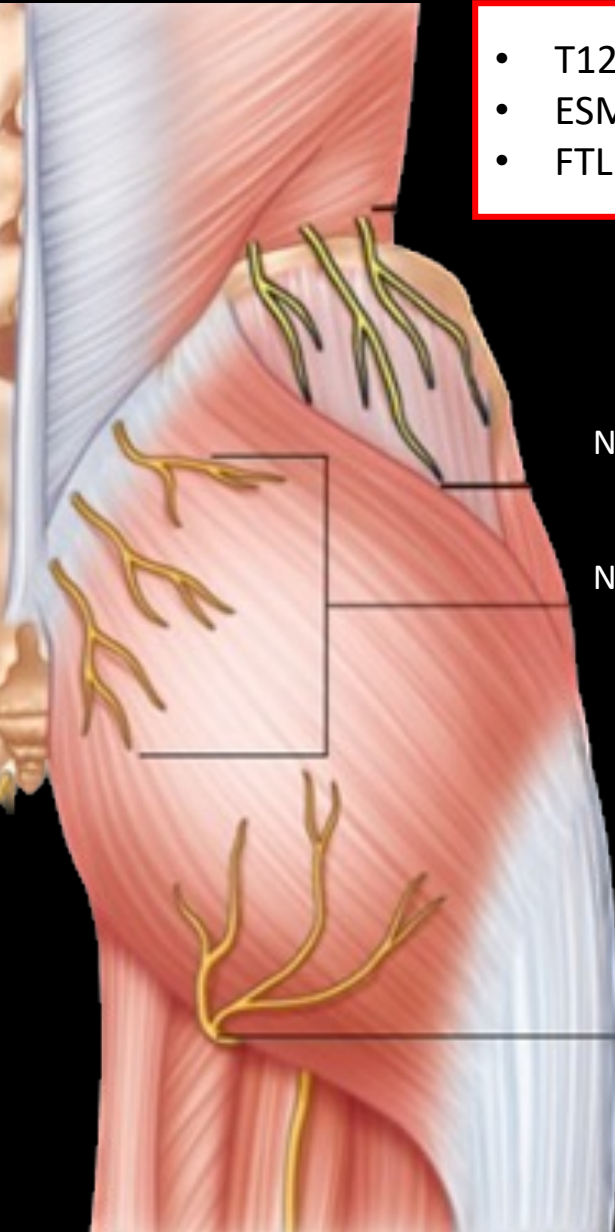


# Clunealis Entrapment (SCN, MCM, ICN): Klinisk Relevans

- T12 – L1 (Maigne)
- ESM og QL muskler
- FTL og Crista Iliaca

- Lig. Sacroiliacale Posteriore og Art. Sacroiliacale

- Glut Max og Hamstrings
- Piriformis og spina ischiadica



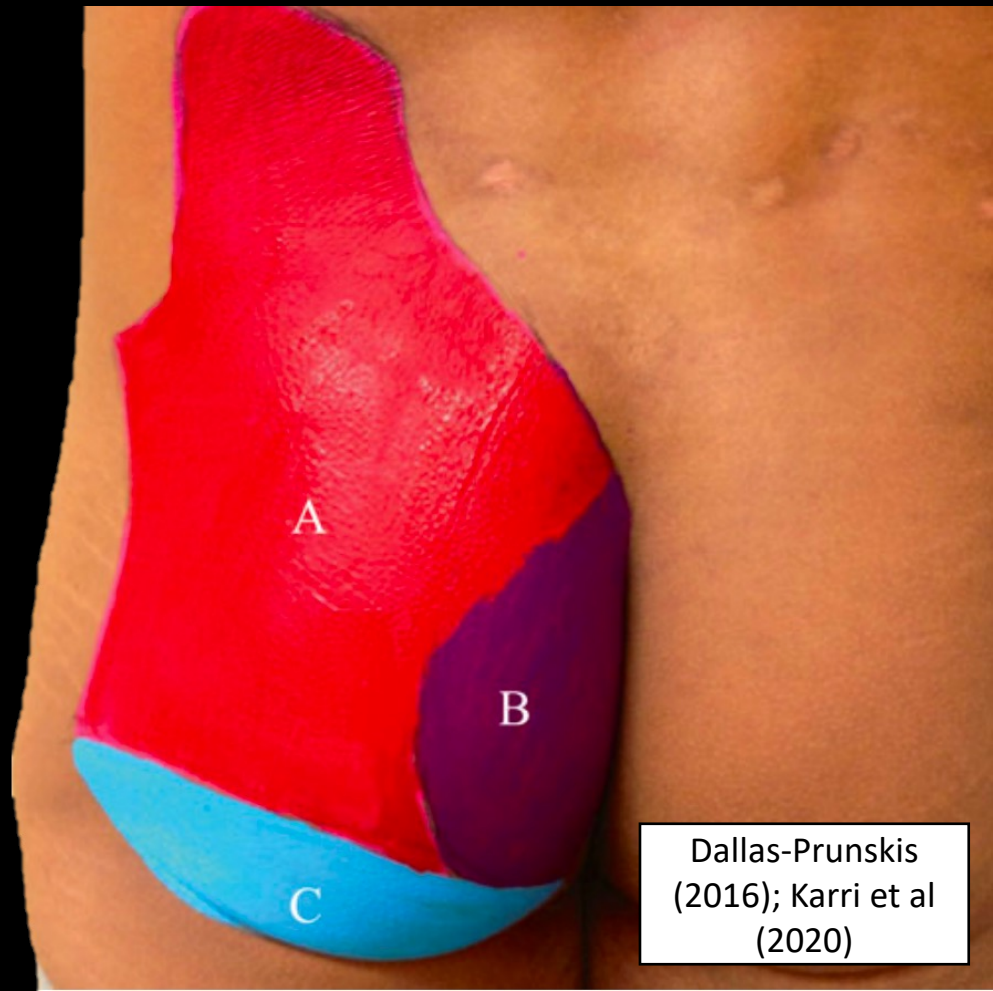
N. Clunealis Superior



N. Clunealis Medius



N. Clunealis Inferior



Dallas-Prunskis (2016); Karri et al (2020)