

Maintenance care – Allt annat enn rutine

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The Nordic Maintenance Care Program

Important topic

Politically charged

An ambitious idea

A research program



Literature review

No evidence-based definition.

Indications/nature of use?

Chiropractors believe it is useful!

Prevalence?

Efficacy and cost-effectiveness?



Case Management

Axén I, Rosenbaum A, Eklund A, Halasz L, Jørgensen K, Lövgren PW, Lange F, Leboeuf-Yde C.

The Nordic maintenance care program – case management of chiropractic patients with low back pain: a survey of Swedish chiropractors.

Chiropr Osteopat. 2008

Møller LT, Hansen M, Leboeuf-Yde C.

The Nordic Maintenance Care Program—an interview study on the use of maintenance care in a selected group of Danish chiropractors.

Chiropr Osteopat. 2009

Malmqvist S, Leboeuf-Yde C.

The Nordic maintenance care program: case management of chiropractic patients with low back pain—defining the patients suitable for various management strategies.

Chiropr Osteopat. 2009

Case Management

Frequency of Care

Sandnes KF, Bjørnstad C, Leboeuf-Yde C, Hestbaek L.

The Nordic maintenance care program – time intervals between treatments of patients with low back pain: how close and who decides?

Chiropr Osteopat. 2010

Case Management

Axen I, Jensen IB, Eklund A, Halasz L, Jorgensen K, Lange F, et al.
The Nordic maintenance care program: when do chiropractors recommend secondary and tertiary preventive care for low back pain?

Chiropr Osteopat. 2009

Frequency of Care

Hansen SF, S Laursen AL, Jensen TS, Leboeuf-Yde C, Hestbæk L.
The Nordic maintenance care program: what are the indications for maintenance care in patients with low back pain? A survey of the members of the Danish Chiropractors' Association

Chiropr Osteopat. 2010

Indications for care

Axén I, Bodin L.

The Nordic maintenance care program: the clinical use of identified indications for preventive care.

Chiropr Man Therap. 2013

Myburgh C, Brandborg-Olsen D, Albert H, Hestbaek L.

The Nordic maintenance care program: what is maintenance care? Interview based survey of Danish chiropractors. Chiropr Man Therap. 2013



Clinical trial

Eklund A, Axén I, Kongsted A, Lohela-Karlsson M, Leboeuf-Yde C, Jensen I.

Prevention of low back pain: effect, cost-effectiveness, and cost-utility of maintenance care - study protocol for a randomized clinical trial.

Trials. 2014

Eklund A, Jensen I, Lohela-Karlsson M, Hagberg J, Leboeuf-Yde C, Kongsted A, Bodin L, Axén I.

The Nordic Maintenance Care program: Effectiveness of chiropractic maintenance care versus symptom-guided treatment for recurrent and persistent low back pain - A pragmatic randomized controlled trial.

PLoS One. 2018

Clinical trial

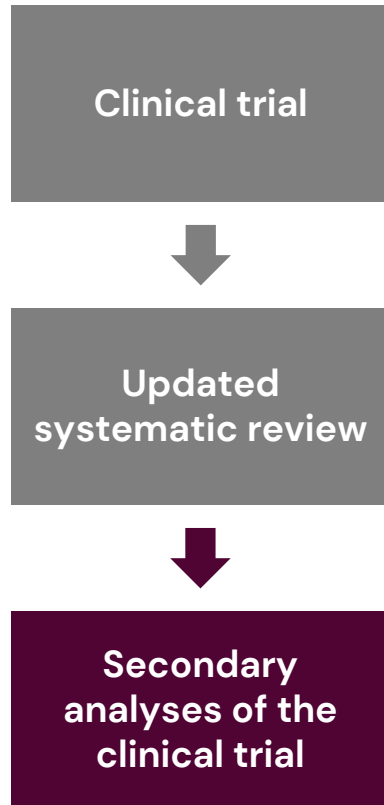


Updated
systematic review

Axén I, Hestbaek L, Leboeuf-Yde C.

Chiropractic maintenance care - what's new? A systematic review of the literature.

Chiropr Man Therap 2019



Eklund A, Jensen I, Leboeuf-Yde C, Kongsted A, Jonsson M, Lövgren P, Petersen-Klingberg J, Calvert C, Axén I. **The Nordic Maintenance Care Program: Does psychological profile modify the treatment effect of a preventive manual therapy intervention? A secondary analysis of a pragmatic randomized controlled trial.** PLoS One. 2019

Eklund A, Hagberg J, Jensen I, Leboeuf-Yde C, Kongsted A, Lövgren P, Jonsson M, Petersen-Klingberg J, Calvert C, Axén I.

The Nordic maintenance care program: maintenance care reduces the number of days with pain in acute episodes and increases the length of pain free periods for dysfunctional patients with recurrent and persistent low back pain – a secondary analysis of a pragmatic randomized controlled trial. Chiropr Man Therap. 2020

Clinical trial



Updated
systematic review



Secondary
analyses of the
clinical trial



Patient
experiences

Hjertstrand H, Palmgren P, Axén I; Eklund A

The Nordic maintenance care program: patient experience of maintenance care – a qualitative study.

Chiropr Man Therap. 2021

Clinical trial



Updated
systematic review



Secondary
analyses of the
clinical trial



Patient
experiences



Clinical
instrument

Eklund A, Palmgren P, Jakobson U, Axén I

**Development and Evaluation of the MAINTAIN Instrument,
Selecting Patients Suitable for Secondary or Tertiary Preventive
Manual Care – The Nordic Maintenance Care Program.**

Chiropr Man Therap 30, 15 (2022). <https://doi.org/10.1186/s12998-022-00424-6>

Describing MC

$$a^0 = 1 [a^0]$$

$$\arcsin(z)$$

$$x_{n+1} =$$

Prevalence

22% (Asking Chiropractors to estimate)

28 and **35%** (Asking Chiropractors to review a typical clinic day)

26 and **41%** (Observing and counting)

1/3 of all visits are dedicated to MC



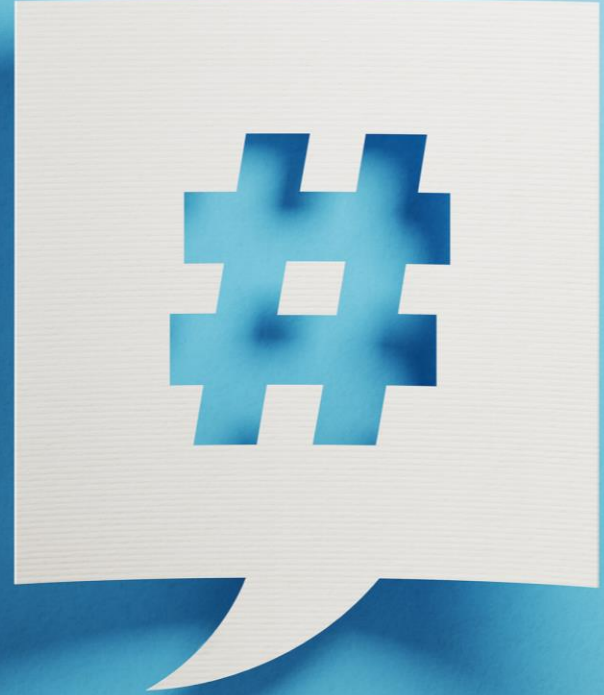
Content of care?

Manipulation (97%)

Exercise (96%)

Nutrition (93%)

Life-style (84%)

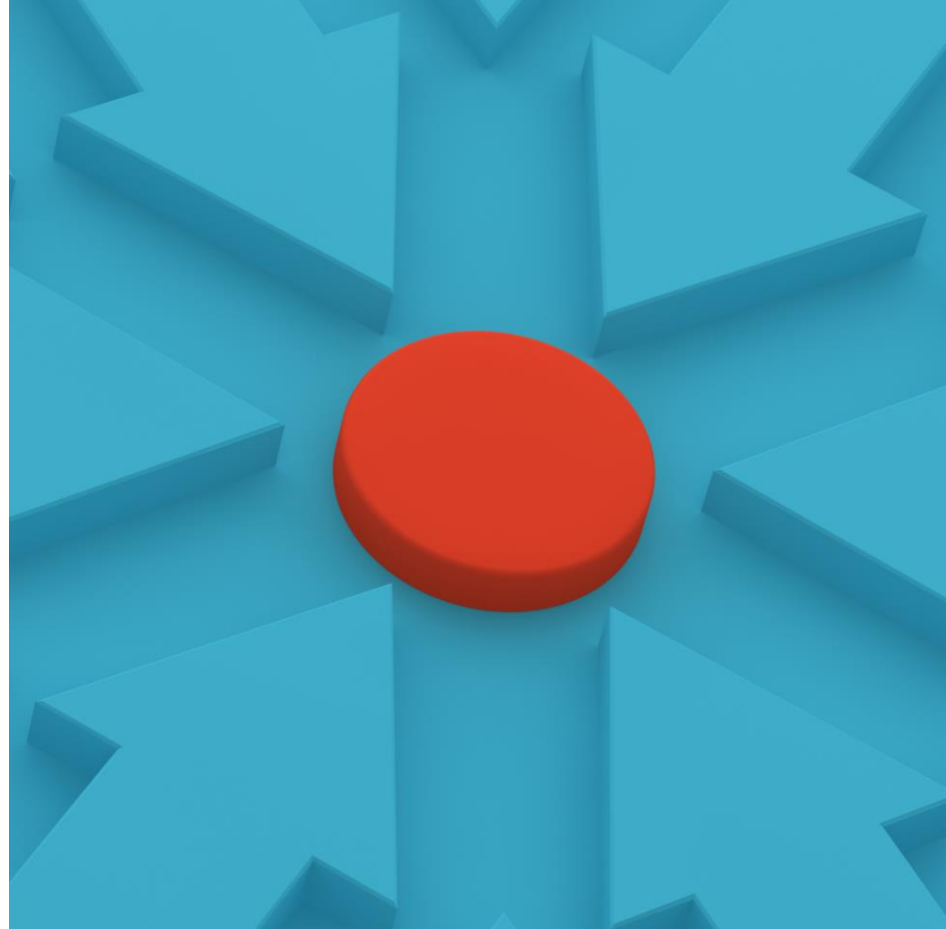


Why Patients Choose MC?

Prevent recurrent pain

Keep optimal function

Stay pain free



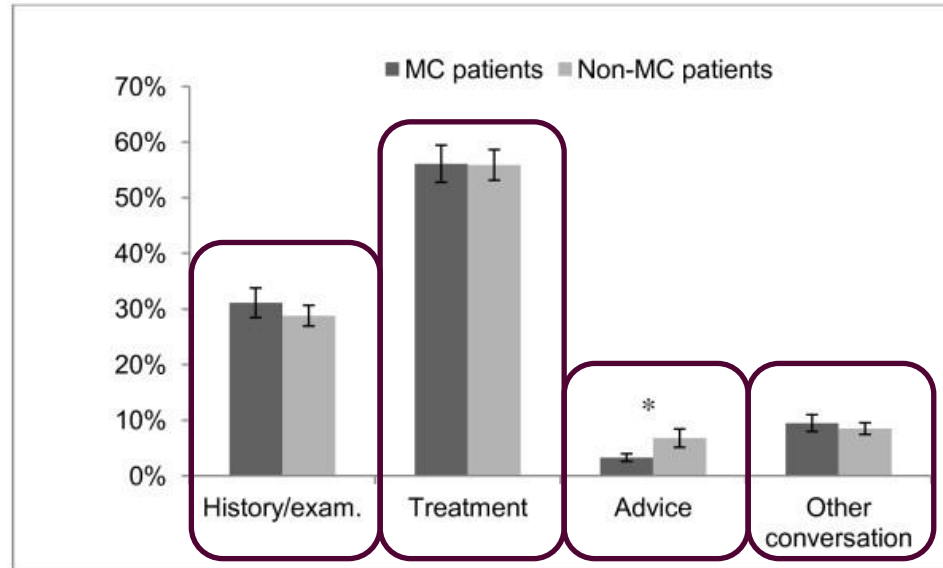
What Actually happens During the Consultation?

Patient reported:

- Discussed health problem (92%)
- Passive treatment (88%)
- Examination (66%)
- Manual muscular treatment (51%)
- Ergonomic/life-style advice (20%)
- Discussion of other health problems (17 %)
- Exercise (10%)



Proportion of time spent on components during consultation



Bringsli et al. Chiropractic & Manual Therapies. 2012.

How often?

An interval between 2 weeks and 3 months is usual

2 months is the norm

Outliers

- Very frequent
- Never



A photograph of a server room with rows of server racks. The racks are filled with equipment, and many small lights are visible, some glowing green and others white. The room is dimly lit, with the primary light source being the equipment itself. A large, semi-transparent circular overlay is centered over the image, containing the text "Clinical Reasoning" in a white, sans-serif font.

Clinical Reasoning

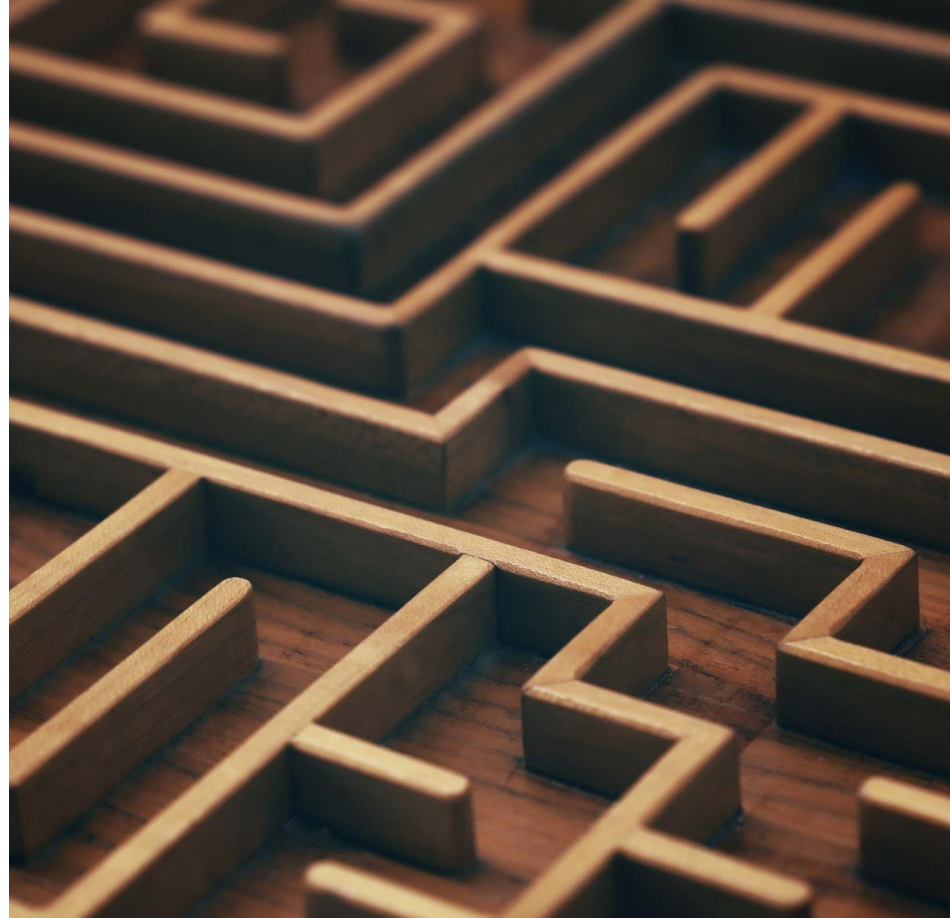
A Logical Strategy!

Uncomplicated patients are treated for a short time

Difficult cases are referred out

Recurrent cases are treated with MC

Similar across the Nordic countries

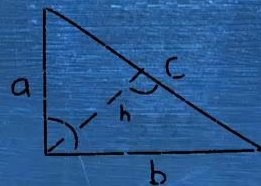


Effectiveness



$$\left(\frac{a}{b}\right)^n = \left(\frac{b}{a}\right)^n = b^n$$

$$a^2 + b^2 = c^2$$



$$74 \quad 9 + \sqrt{5}$$

Method

Randomized controlled trial

12-month follow-up period

Two treatment arms

- Maintenance Care (Intervention)
- Symptom guided treatment (control)



Outcome Measures

Number of days with activity limiting
(bothersome) LBP

Weekly measurements

SMS-track

Secondary outcomes



Data Collection

35 clinicians

2033 patients screened

328 patients eligible

- Control: 162 patients
- MC: 166 patients

319 patients analyzed (7 dropouts, 2 excluded)

16 692 SMS sent at 98.9% response-rate



Total number of days with LBP (52 weeks)

MC group had **13 fewer days** with activity limiting LBP

MC group had **2 more treatments**

At an additional number of treatments MC is effective



A large pile of yellow smiley face emojis, with a dark circular overlay on the left side containing the text "Sub-groups".

Sub-groups

Psychological sub-groups

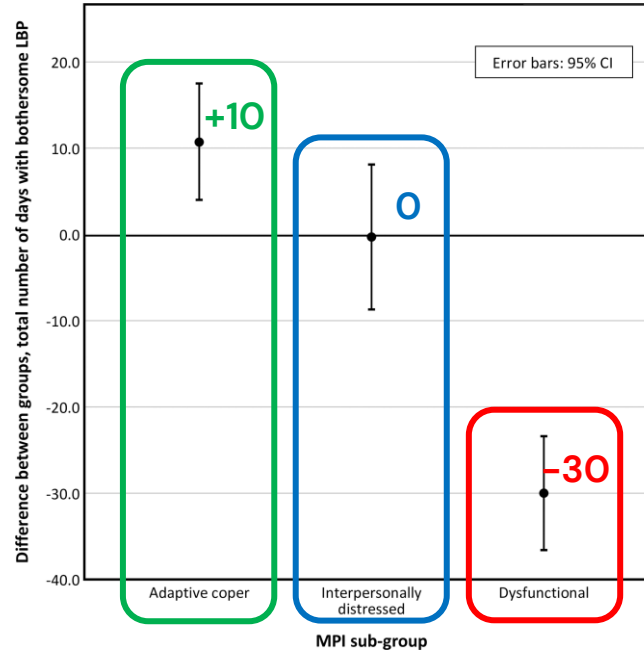
MPI-S (West Haven–Yale Multi Dimensional Pain Inventory)

- **Adaptive Copers (AC)**
- **Interpersonally Distressed (ID)**
- **Dysfunctional (DYS)**

**Cognitive behavioural
conceptualization of pain.**

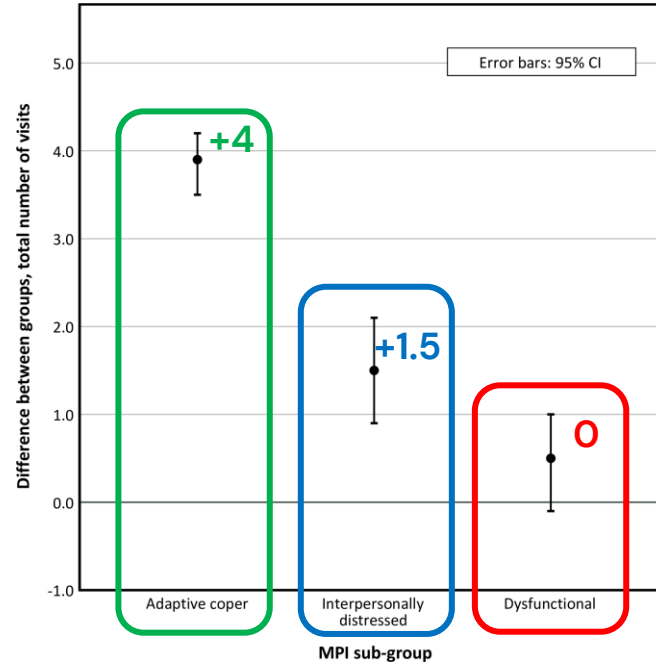


Total number of days with pain



Eklund et.al. 2019. PLoS One.

Total number of visits



Eklund et.al. 2019. PLoS One.



Clinical mechanism

How does it work?

Does MC **prevent new episodes**?

Does MC **increase the pain free periods** between pain events?

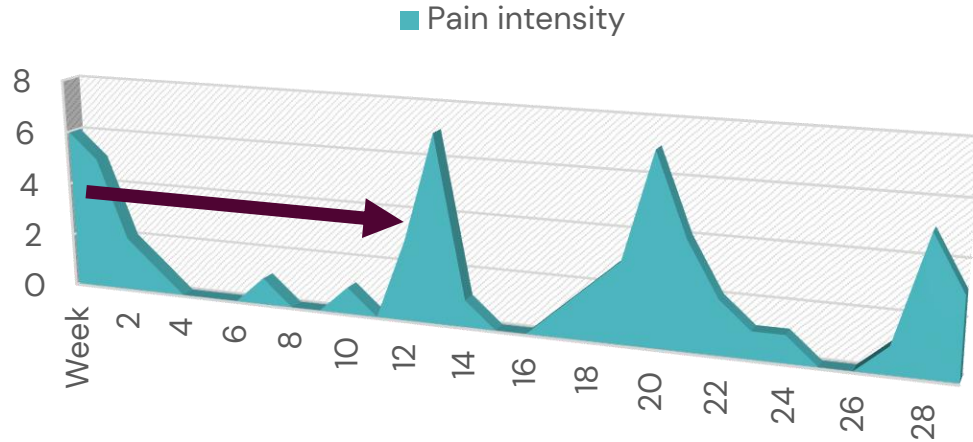
Does the effect depend on the **frequency** of treatments?

- Will more frequent treatments increase effect?

Is **timing** of the treatment of importance?



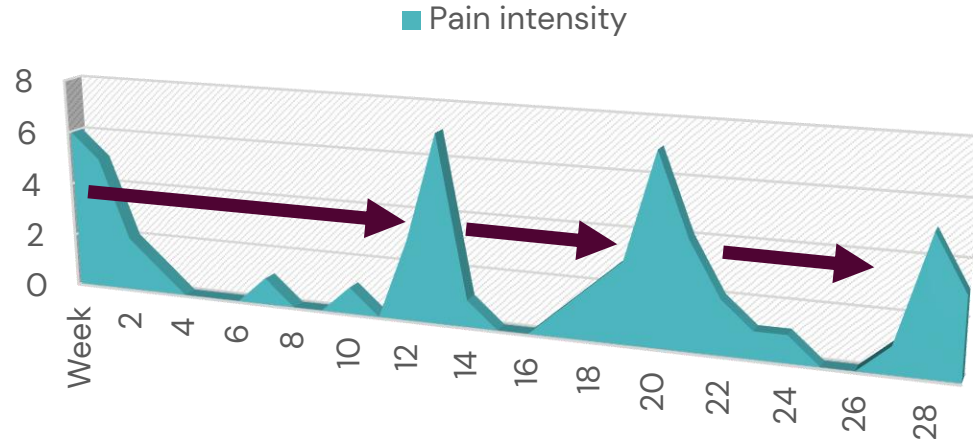
Time to first relapse (pain event/Episode), DYS subgroup



No difference

Eklund et.al. 2020. Chiropractic & Manual Therapies

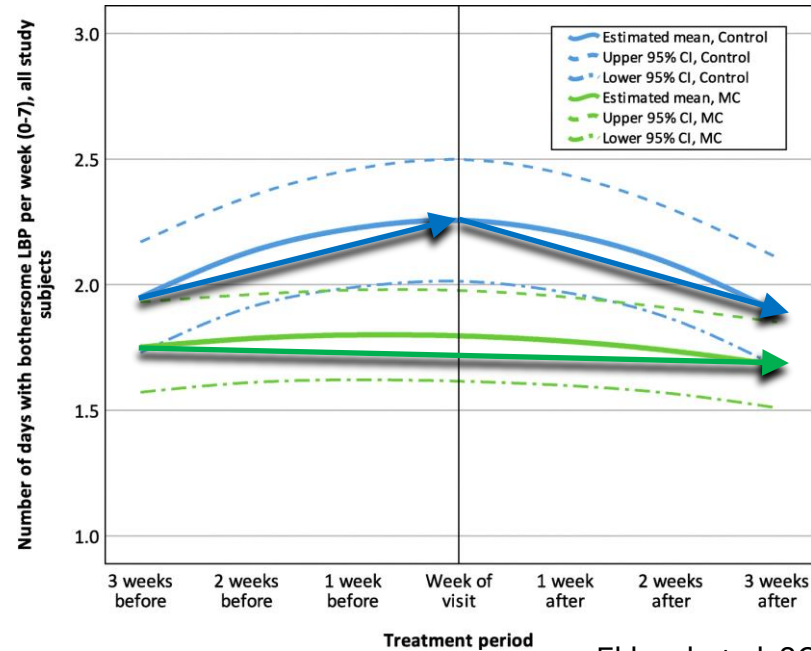
Total pain free time between pain events/episodes, DYS sub-group



MC resulted in **10 more** pain free weeks

Eklund et.al. 2020. Chiropractic & Manual Therapies

Pain trajectory around visit, DYS sub-group



Eklund et.al. 2020. Chiropractic & Manual Therapies

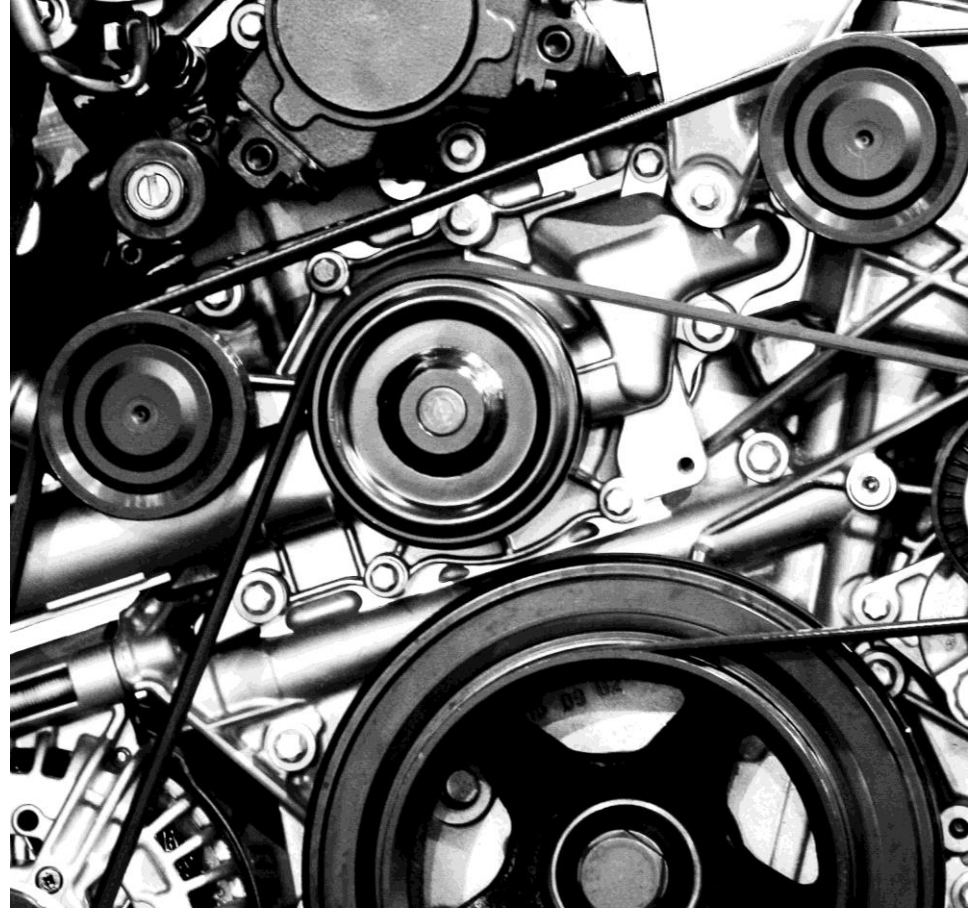
Clinical mechanism

MC does not prevent new pain events/episodes

BUT among the DYS sub-group

- MC increase pain-free periods
- MC stabilize the pain event

Effectiveness seems to depend on timing rather than frequency



A woman's profile is shown in a three-quarter view, facing right. She has a vibrant, multi-colored floral headpiece in shades of purple, pink, and orange. Her hair is pulled back, and she has a serene expression. She is wearing bright red lipstick. The background is a soft, light gray. A large, dark, circular graphic with a textured, abstract pattern in shades of purple, blue, and green is overlaid on the left side of the image. The text "Patient Experience" is written in a clean, white, sans-serif font across the center of this dark circle.

Patient Experience

Patient experience of maintenance care

Semi-structured interviews, n=24

Purposeful sampling

- MPI-subgroup, age, sex

Two overarching dimensions

- When MC is of high value
- When MC is of low value



When MC is of high value



3 categories:

**Care that
improves
quality of life!**

**Care that is
structured,
accessible &
appreciated!**

**Care that is
patient-
centered!**

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

Care that is improving quality of life!



Free of pain – moving & performing better

- Pain-free, staying well over time, improved physical abilities, healthier behaviors.

Makes me feel great!

- Life enjoyment, positive emotions, improved self-confidence.

I don't want to be off work

- Reducing sick leave, more productive at work.

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

“Well apart from the physical aspect, to not have pain, and how shall I put it, being more confident that my back and body can handle the things I need to do, maintenance care has also helped my mental state.”

To know that I can carry, play and have fun with my children, be able to participate in physical activities without having to be left on the side-line wondering whether I can do it has been invigorating mentally.”

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

Care that is structured, accessible & appreciated!



It fits into my life

- Readily available, time efficient and effective, small effort/no hassle, societal or employer reimbursement.

A form of care, scaffolding for regularity and appreciation

- Regular visits offered continuity & motivation, a feeling of reassurance.

Important piece of the puzzle

- Complements other health actions.

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

“When the pain came back, I knew I had an appointment booked which meant I got help fast. I thought this was reassuring and felt sort of comforting.

There was a period where I felt worse and wasn't as active with my training. During that time, it was very comforting to know that I had my appointment booked in advance.”

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

Care that is patient centered!



The competent clinician providing for great doctor-patient report.

- Professional, caring and personal relationship, provided information guidance and education

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

"I would say that the clinician acted professionally and with care which meant I felt trust and confidence in her ability as well as for the chiropractic profession in a way that I hadn't before."

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

When MC is of low value



3 categories:

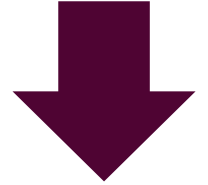
**Does the
benefit of
maintenance
care outweigh
the cost?**

**Is
maintenance
care
accessible?**

**Is
maintenance
care patient-
centered
perspective?**

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

Does the benefit of maintenance care outweigh the cost?



Considerable personal investment

- Time consuming, expensive

Is it worth it?

- Questionable benefit, sense of low value, only one aspect of a wider need.

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

“...to set aside time, to simply get away (from work/everyday life) is a barrier. Add to that the cost. It’s fairly expensive for a short treatment session.

One might be there for roughly ten minutes for a fairly large amount of money.”

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

Is maintenance care accessible?



Limited accessibility

- Perceived as unavailable, logistical challenges.

Perceived as separate from mainstream care

- Inherent social and cultural beliefs, not part of the system, lack of knowledge regarding MC.

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

“Well, it can be difficult to find available treatment times if the chiropractor is popular.

I perceived this as a challenge, to find treatment times which suited my work schedule.”

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

Is maintenance care being delivered congruent with a patient centred perspective?



A feeling of inadequate patient–doctor relationship

- Intimacy and personal space, communication, trust and report, sensation of retention.

Unpleasant feelings and experiences associated with care

- Undesired reactions, fear of treatment.

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies

"If you have visited the chiropractor maybe eight or nine times, and you feel that "no, things are good".

At that point they sort of wanted me to keep coming, even though I felt done and didn't want to.

I felt like I could manage on my own. This was a little negative."

Hjertstrand et.al. 2021. Chiropractic & Manual Therapies



Clinical Instrument

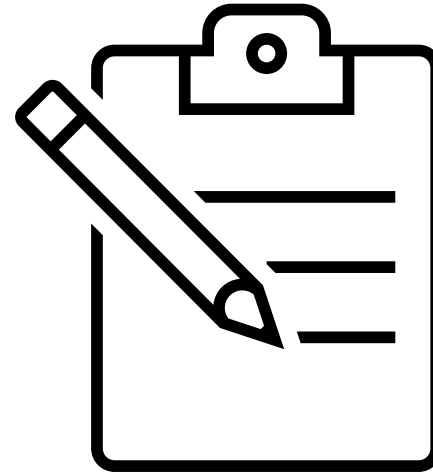
The MAINTAIN instrument

10 questions

5 dimensions

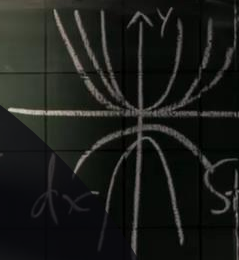
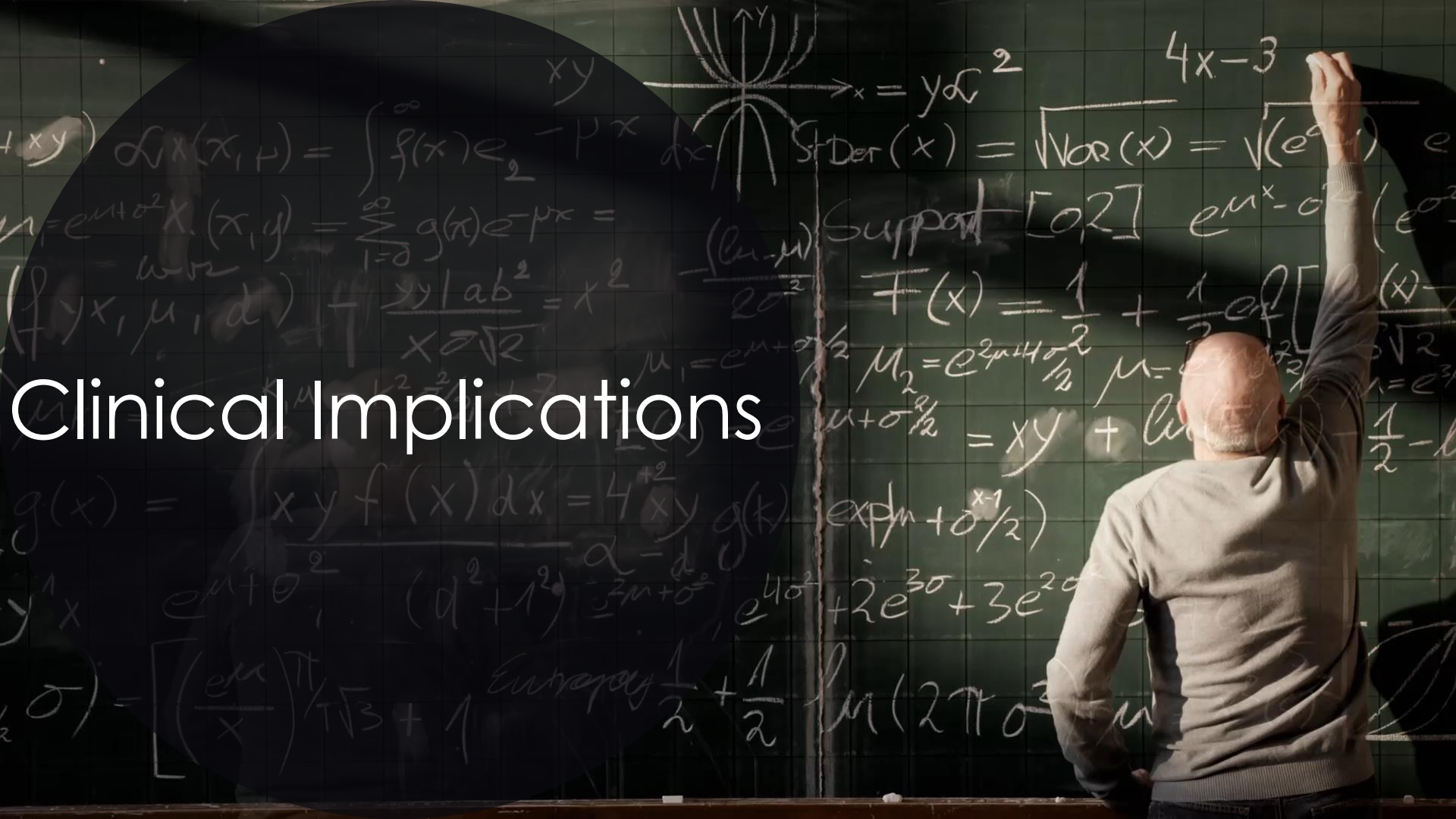
- Pain severity
- Interference
- Life control
- Support
- Affective distress

Summary measure -12 to 48



Eklund et. al. 2022. Chiropractic & Manual Therapies

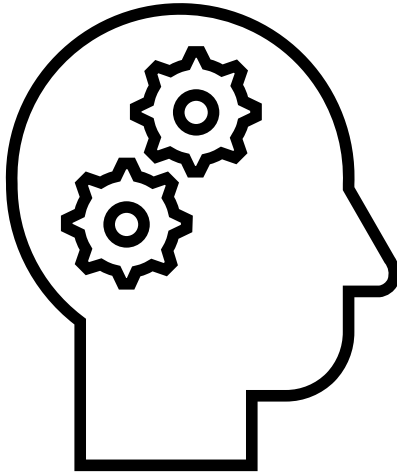
Clinical Implications



$$f(x) = \int_0^{\infty} f(x) e^{-px} dx$$
$$f(x, y) = \sum_{k=0}^{\infty} g(k) e^{-pk} =$$
$$f(x, \mu, \sigma) = \frac{xy}{ab^2} = x^2$$
$$g(x) = \int xy f(x) dx = 4xy$$
$$\sigma = \left[\left(\frac{e^{\mu}}{x} \right)^{\frac{1}{\sqrt{3} + 1}} \right]$$

$$x = y^2$$
$$f(x) = \sqrt{\text{Var}(x)} = \sqrt{(e^{\mu})}$$
$$\text{Support } [0, 2]$$
$$F(x) = \frac{1}{2} + \frac{1}{2} e^{-x}$$
$$M_2 = e^{2\mu + \frac{\sigma^2}{2}}$$
$$\mu = \frac{1}{2} \ln(2\pi\sigma^2)$$
$$= xy + \ln(2\pi\sigma^2)$$

Clear patient profile where MC is appropriate



Recurrent and persistent LBP

- >30 days the previous 12 months.

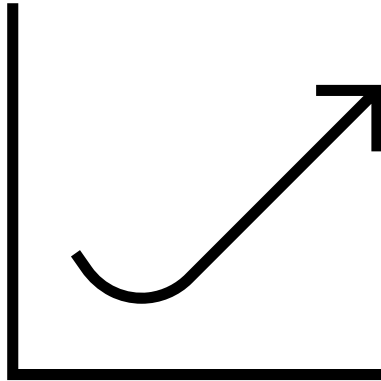
Good initial effect from treatment

- 4th visit.

Focus on dysfunctional patients

- **MAINTAIN score** of 18 or more.
 - High severity
 - High interference with everyday life
 - High affective distress
 - Low perception of life control
 - Low activity levels

If taken into account, what can we expect?



Fewer days with activity limiting pain (30 days).

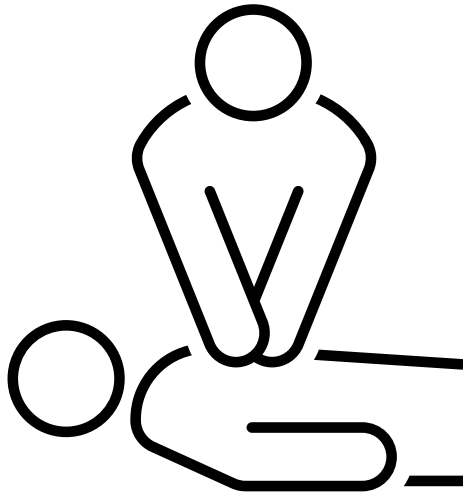
More pain free weeks (10 weeks).

Less acute flare-ups.

Cost neutral from a patient perspective.

Cost saving from a societal perspective.

How does it work?



We don't know at this point!

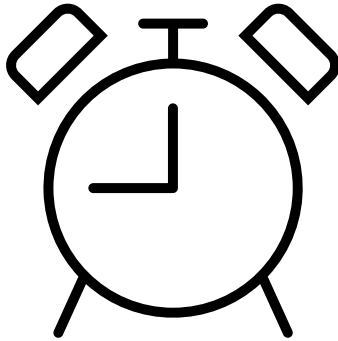
Neurological/Bio-mechanical mechanism?

- Global/segmental ROM, neuro-muscular function, pain inhibition.

Psychological mechanism?

- Safe frame-work, reassurance, coping strategies, reducing fear-avoidance behavior and anxiety.

When and how?



Exercise and self-management first!

If active strategies are **not effective** or **not feasible**, consider MC.

Focus on:

- Reduction of fear
- Empowerment
- Improving coping strategies
- Increased activity

Transition from DYS to AC perhaps the core objective?

Provide **high-value care!**

- Care that improves quality of life!
- Care that is structured, accessible & appreciated!
- Care that is patient centered!

Aknowledgements

Clinicians and patients

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- Professor Charlotte Lebouf-Yde

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- IKON
- ECCRE
- KI



Thank you!

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