

Komplekst regionalt smertesyndrom (CRPS)



CRPS

(Komplekst Regionalt Smertesyndrom) Diagnostikk og behandling

Smertebehandling Bergen 2024

Isak F. Krogstad,
Stipendiat, IPS, UiT Norges Arktiske Universitet

Lena Danielsson
Overlege
Smerteavdelingen, OPIN, UNN Tromsø

CRPS?



CRPS klassifikasjon

Kronisk primær smerte ICD-11 (MG 30.04)

CRPS 1 – uten nerveskade

ICD-10 **G 90.5** (Tidligere: M89.0 Sympatisk refleksdystrofi)

CRPS 2 – med nerveskade

ICD-10 **G 90.6** (Tidligere: G56.4 Kausalgi)

CRPS -NOS – av annen eller uspesifisert type

ICD-10 **G 90.7**

CRPS with Remission of Some Features

3.9

L. Lunden, et al. Delayed diagnosis and worsening of pain following orthopedic surgery in patients with complex regional pain syndrome (CRPS) , Scandinavian Journal of Pain 2016

Diagnostisering av CRPS. IASP 2012 (Budapest kriterier)

- Vedvarende, ikke proporsjonell smerte i forhold til utløsende årsak
- Det finnes ingen andre diagnoser som forklarer symptomene bedre

Pasientangitte symptomer. Undersøkte tegn.

- **A: Sensorisk**
Hyperalgesi, Allodyni
- **B: Vasomotorisk**
Fargeforandringer/assymetri Temperaturforandringer/assymetri
- **C: Sudomotorisk/Ødem**
Ødem/Hevelse Svetteforandringer/assymetri
- **D: Motorisk/Trofisk**
Finger/tær stivhet Svakheter Skjelvinger Muskulatur adlyder ikke Behåring/assymetri Negler/assymetri Hudforandringer

For klinisk diagnose:

- Rapportering av minst ett symptom innen 3 av de 4 kategoriene (A-D) av pasientangitte symptomer, samt minst ett funn av undersøkte symptomer innen minst to av kategoriene (A-D)

For forskningformål

- Rapportering av minst ett symptom innen 4 av de 4 kategoriene (A-D) av pasientangitte symptomer, samt minst ett funn av undersøkte symptomer innen minst to av kategoriene (A-D)

Barkode klistres her

Dato:

Diagnostisering av CRPS. IASP kriterier (2012).

1. Vedvarende, ikke proporsjonell smerte i forhold til utløsende årsak: <input type="checkbox"/>		
Kategorier:	2. Pasientangitte symptomer	3. Undersøkte tegn
A: Sensorisk		
Hyperalgesi, Allodyni	<input type="checkbox"/>	<input type="checkbox"/>
B: Vasomotorisk		
Fargeforandringer/asymmetri	<input type="checkbox"/>	<input type="checkbox"/>
Temperaturforandringer/asymmetri	<input type="checkbox"/>	<input type="checkbox"/>
C: Sudomotorisk/Ødem		
Ødem/Hevelse	<input type="checkbox"/>	<input type="checkbox"/>
Svetteforandringer/asymmetri	<input type="checkbox"/>	<input type="checkbox"/>
D: Motorisk/Trofisk		
Finger/tær stivhet	<input type="checkbox"/>	<input type="checkbox"/>
Svakhet	<input type="checkbox"/>	<input type="checkbox"/>
Skjelvinger	<input type="checkbox"/>	<input type="checkbox"/>
Musklene adlyder ikke	<input type="checkbox"/>	<input type="checkbox"/>
Behåring/asymmetri	<input type="checkbox"/>	<input type="checkbox"/>
Negler/asymmetri	<input type="checkbox"/>	<input type="checkbox"/>
Hudforandringer	<input type="checkbox"/>	<input type="checkbox"/>
4. Det finnes ingen andre diagnoser som forklarer symptomene bedre: <input type="checkbox"/>		
For diagnose må punkt 1. og 4. være oppfylt og avkrysset.		
For klinisk diagnose: Rapportering av minst ett symptom innen 3 av de 4 kategoriene (A-D) av pasientangitte symptomer, samt minst ett funn av undersøkte symptomer innen minst to av kategoriene (A-D)		
For forskningformål: Rapportering av minst ett symptom innen 4 av de 4 kategoriene (A-D) av pasientangitte symptomer, samt minst ett funn av undersøkte symptomer innen minst to av kategoriene (A-D)		



CRPS Severity Score (CSS)

Table 2

CRPS severity score CSS.

Self-reported symptoms

- Continuing disproportionate pain
- Allodynia or hyperalgesia
- Temperature asymmetry
- Skin color asymmetry
- Sweating asymmetry
- Asymmetric edema
- Trophic changes
- Motor changes

Signs observed on examination

- Hyperalgesia to pinprick
- Allodynia
- Temperature asymmetry
- Skin color asymmetry
- Sweating asymmetry
- Asymmetric edema
- Trophic changes
- Motor changes

The maximum CSS score is 16. Every symptom and sign is counted with a score of 1.
CSS, CRPS severity score.

CRPS epidemiologi

- USA 5,5 per 100 000 person år
- Nederland 26,2 per 100 000 person år
- Insidensen øker opp til 70 år
- 3-4 ganger mer kvinner



M. de Mos, et al. The Clinical Journal of Pain 2009 Vol. 25 Issue 7. P. Sandroni et al, PAIN 2003 Vol. 103 Issue 1. M. de Mos et al., 2007; Kim, Lee, Kim, & Kim, 2018; Ott & Maihöfner, 2018

Hvor kan man ha CRPS?



Prediktorer CRPS

- **Immobilisering** er en risikofaktor
- Depresjon og angst: Vi har ikke sikre bevis for at dette er predisponerende
- I en studie hadde 38% PTSD før utvikling av CRPS
- Komplisert fraktur, revmatisk sykdom...

Birklein, F., & Dimova, V. (2017). Complex regional pain syndrome-up-to-date. *Pain reports*

Prediktorer CRPS

- 6 mnd etter total kne artroplastikk → 12.7 % møtte diagnosen CRPS
- Mer intens og omfattende preoperative smerte predikerte CRPS diagnose 6 mnd etter TKA.
- Preoperative sentral sensitisering og pro-inflammatorisk status økt risiko for utvikling av CRPS etter TKA

Bruehl et al,(2022). Preoperative Predictors of Complex Regional Pain Syndrome Outcomes in the 6 Months Following Total Knee Arthroplasty. *The Journal of Pain*.

Decreasing incidence of complex regional pain syndrome in the Netherlands

Groenveld, T. D et al.(2021).*British Journal of Pain*

- Insidens etter distal radius fraktur 0.36%
- Reduksjon fra **520** i 2014 til **223** in 2018.
- Nasjonale data I Nederland viste også nedgang
23.2 per 100,000 person år i 2014
16.1 per 100,000 person år i 2018

*“We hypothesize this to be the result of the changing approach towards CRPS and fracture management, with more focus on **prevention** and the **psychological aspects** of disproportionate posttraumatic pain”*

Groenveld, T. D et al.(2021).*British Journal of Pain*

CRPS prognose (etter 12 mnd)

- Spontan remisjonsrate 22-90%
- Smerte og motorisk dysfunksjon → 51-89%
- Nedsatt styrke i hånden 25-66%
- 30-40 % var **ikke** tilbake i sitt vanlige jobb,
27-35% var tilbake i tilrettelagd jobb etter 12 måneder

Johnson, S., Cowell, F., Gillespie, S., & Goebel, A. (2022). Complex regional pain syndrome what is the outcome? EJP

Patofysiologi

- **Multifaktoriell patofysiologi**

- Inflammasjon, auto-antibodies, cytokiner
- Genetiske faktorer
- Nociceptiv sensitisering
- Vasomotorisk dysfunksjon
- Nevropsykologiske forandringer
- Maladaptiv nevrogen nevroplastisitet

MRI undersøkelser viser både strukturelle og funksjonelle forandringer i hjernen

Nevrofysiologiske Forandringer i CRPS

- Kroppsrepresentasjon
- Selv-rapportert body perception disturbances (BPD)
 - Lem lateral gjenkjennelse
 - Estimere størrelse på lem, posisjon og bevegelse

Halicka et al, Behavioural Neurology 2020

CRPS – «Body perception disturbance»



BEHANDLING

Behandling må tilpasses individuelle!

- Kartlegging: Sykehistorie, Budapest kriterier, «Body perception disturbance», andre belastende faktorer
- Forklaring av CRPS
- Forklare at smerten er ufarlig
- Før behandling starter må pasienten ha akseptert og forstått ideen bak
- Utfra pasientens symptomer/muligheter/forståelse beslattes det om hva vi går videre med av behandling (kortikal sentrert sensorisk-motorisk rehabilitering, psykoterapi)

Informasjon om CRPS

- 60% opplevde at helsepersonell **ikke** gav adekvat informasjon
- Utydelig og feil informasjon

Moore et al., 2021, Moore et al. 2022

<https://www.emazzanti.net/10-tips-for-finding-information-on-the-internet/>

Medikamenter?

Steroider (akutt fase)

Bifosfonater (akutt fase)

Calcitonin

NMDA antagonister (Ketamin)

DMSO (Dimethyl sulfoxide N-acetylcystein)

Antiepileptika (gabapentin)

TCA (søvn)

Forebygging: Vitamin C

NSAIDs

TNF- α hemmere

Antidepressive

Opioider

Cannabinoider

α -adrenerge agonister

Capsaicin plaster

Lidocain plaster

Botulinum toxin A

Birklein, F., & Dimova, V. (2017). Complex regional pain syndrome-up-to-date. *Pain reports*

Klouche et al (2017). Efficacy of vitamin C in preventing complex regional pain syndrome after wrist fracture: A systematic review and meta-analysis.

Invasive tiltak?

- Ryggmargstimulering (SCS)
- Dorsalrots stimulering
- Sympatikusblokkade (Guanetidin, Lidocain, Klonidin)
- Intratekalt baclofen (dystoni)

Nevropsykologiske Forandringer CRPS

Halicka et al, Behavioural Neurology 2020

Supraspinal modulering av sensoriske, motoriske, og autonome funksjoner
(nevrorehabilitering, nevrokognitiv behandling)

Eksempel:

Graded motor imagery (GMI), Mirror therapy

Hø/ve diskriminering

Recognise hand - app

SPEED

ACCURACY

Recognise hand app kan gi statistikk
på hurtighet og korrekthet

Visualisering

Speilbehandling

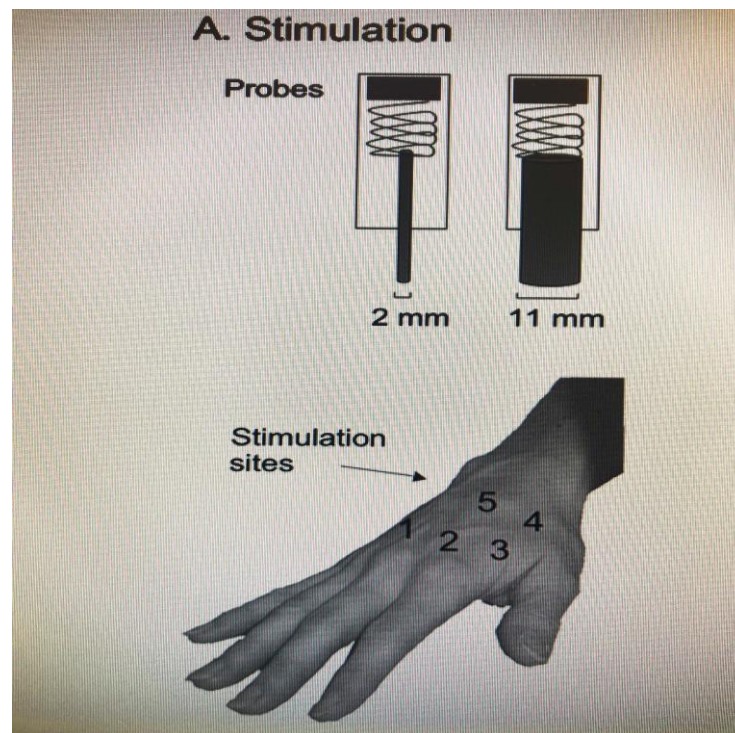
Virtual reality

Harvie et al, (2022). Visually evoked pain and its extinction using virtual reality in a patient with complex regional pain syndrome type II. *Pain*,

Ortiz-Catalan et al, (2016). Phantom motor execution facilitated by machine learning and augmented reality as treatment for phantom limb pain: a single group, clinical trial in patients with chronic intractable phantom limb pain. *Lancet*

Sensorisk diskriminerings trening

Taktil stimulering



Graded Motor Imagery and tactile desensitization treatment for CRPS

An Interview study of patient experiences

- Illness comprehension,
- Taking back control
- Altered perceptions of the affected limb
- Strong clinician support

All of these seemed vital to the positive change.

“Receiving a diagnosis and understanding more of what this is ... now I know that pain is not dangerous. That I can use my arm and it is not going to make it worse. Someone can touch me and it is not going to break me. I feel much safer now. I know that it is not dangerous.” (Jenny)

«You might as well have chopped off the arm (the affected limb) ... I couldn't use it for anything. It hurt, it was swollen ... it was just in the way! That was the feeling. But then I started using it more and more. Gradually, it started becoming a part of me again. I could start using it again ... it was a process. It has taken a long time.” (Tracy)

Referanser

- Lunden, Lars K., Kleggetveit, Inge P., Jørum Ellen (2016). Delayed diagnosis and worsening of pain following orthopedic surgery in patients with complex regional pain syndrome (CRPS). *Scandinavian Journal of Pain* 11, 27-33. doi: [10.1016/j.sjpain.2015.11.004](https://doi.org/10.1016/j.sjpain.2015.11.004)
- Aïm, F., Klouche, S., Frison, A., Bauer, T., & Hardy, P. (2017). Efficacy of vitamin C in preventing complex regional pain syndrome after wrist fracture: A systematic review and meta-analysis. *Orthopaedics & Traumatology: Surgery & Research*, 103(3), 465-470. doi:<https://doi.org/10.1016/j.otsr.2016.12.021>
- Birklein, F., & Dimova, V. (2017). Complex regional pain syndrome-up-to-date. *Pain reports*, 2(6), e624-e624. doi:10.1097/PR9.0000000000000624
- Bruehl, S., Billings, F. T., Anderson, S., Polkowski, G., Shinar, A., Schildcrout, J., . . . Harden, R. N. (2022). Preoperative Predictors of Complex Regional Pain Syndrome Outcomes in the 6 Months Following Total Knee Arthroplasty. *The Journal of Pain*. doi:<https://doi.org/10.1016/j.jpain.2022.04.005>
- Dubuis, E., Thompson, V., Leite, M. I., Blaes, F., Maihöfner, C., Greensmith, D., . . . Goebel, A. (2014). Longstanding complex regional pain syndrome is associated with activating autoantibodies against alpha-1a adrenoceptors. *PAIN®*, 155(11), 2408-2417. doi:<https://doi.org/10.1016/j.pain.2014.09.022>
- Groenveld, T. D., Boersma, E. Z., Blokhuis, T. J., Bloemers, F. W., & Frölke, J. P. M. (2021). Decreasing incidence of complex regional pain syndrome in the Netherlands: a retrospective multicenter study. *British Journal of Pain*, 16(2), 214-222. doi:10.1177/20494637211041935
- Harden, R. N., Bruehl, S., Perez, R. S. G. M., Birklein, F., Marinus, J., Maihofner, C., . . . Vatine, J.-J. (2010). Development of a severity score for CRPS. *PAIN®*, 151(3), 870-876. doi:<https://doi.org/10.1016/j.pain.2010.09.031>
- Harvie, D. S., Stanton, T. R., Kennedy, H., & Coppieters, M. W. (2022). Visually evoked pain and its extinction using virtual reality in a patient with complex regional pain syndrome type II. *Pain*, 163(10), 1874-1878. doi:10.1097/j.pain.0000000000002605
- Johnson, S., Cowell, F., Gillespie, S., & Goebel, A. (2022). Complex regional pain syndrome what is the outcome? - a systematic review of the course and impact of CRPS at 12 months from symptom onset and beyond. *Eur J Pain*, 26(6), 1203-1220. doi:<https://doi.org/10.1002/ejp.1953>
- Keefe, F. J., Jensen, M. P., Williams, A. C. d. C., & George, S. Z. (2022). The yin and yang of pragmatic clinical trials of behavioral interventions for chronic pain: balancing design features to maximize impact. *Pain*, 163(7), 1215-1219. doi:10.1097/j.pain.0000000000002546
- Llewellyn, A., Buckle, L., Grieve, S., Birklein, F., Brunner, F., Goebel, A., . . . McCabe, C. (2022). Delphi study to define core clinical outcomes for inclusion in a complex regional pain syndrome international research registry and data bank. *Pain*, 10.1097/j.pain.0000000000002729. doi:10.1097/j.pain.0000000000002729
- Mescouto, K., Olson, R. E., Hodges, P. W., & Setchell, J. (2022). A critical review of the biopsychosocial model of low back pain care: time for a new approach? *Disability and Rehabilitation*, 44(13), 3270-3284. doi:10.1080/09638288.2020.1851783
- Moore, E., Braithwaite, F. A., Stanton, T. R., Bellan, V., Moseley, G. L., & Berryman, C. (2022). What do I need to know? Essential educational concepts for complex regional pain syndrome. *Eur J Pain*, 26(7), 1481-1498. doi:<https://doi.org/10.1002/ejp.1976>
- Moore, E., Stanton, T. R., Traeger, A., Moseley, G. L., & Berryman, C. (2021). Determining the credibility, accuracy and comprehensiveness of websites educating consumers on complex regional pain syndrome accessible in Australia: a systematic review. *Australian Journal of Primary Health*, 27(6), 485-495. doi:<https://doi.org/10.1071/PY21066>
- Nicholas, M. K. (2022). The biopsychosocial model of pain 40 years on: time for a reappraisal? *Pain*, 163(S1). Retrieved from https://journals.lww.com/pain/Fulltext/2022/11001/The_biopsychosocial_model_of_pain_40_years_on.2.aspx

- Ortiz-Catalan, M., Guðmundsdóttir, R. A., Kristoffersen, M. B., Zepeda-Echavarria, A., Caine-Winterberger, K., Kulbacka-Ortiz, K., . . . Hermansson, L. (2016). Phantom motor execution facilitated by machine learning and augmented reality as treatment for phantom limb pain: a single group, clinical trial in patients with chronic intractable phantom limb pain. *Lancet*, 388(10062), 2885-2894. doi:10.1016/s0140-6736(16)31598-7
- Rebhorn, C., Dimova, V., & Birklein, F. (2022). Komplexes regionales Schmerzsyndrom – ein Update. *Der Schmerz*, 36(2), 141-149. doi:10.1007/s00482-022-00641-1
- Smart, K. M., Ferraro, M. C., Wand, B. M., & O'Connell, N. E. (2022). Physiotherapy for pain and disability in adults with complex regional pain syndrome (CRPS) types I and II. *Cochrane Database of Systematic Reviews*(5). doi:10.1002/14651858.CD010853.pub3
- Smart KM, F. M., Wand BM, O'Connell NE. (2022). Physiotherapy for pain and disability in adults with complex regional pain syndrome (CRPS) types I and II (Publication no. DOI: 10.1002/14651858.CD010853.pub3.). (CD010853). from Cochrane Database of Systematic Reviews
- van den Berg, C., de Bree, P. N., Huygen, F. J. P. M., & Tiemensma, J. (2022). Glucocorticoid treatment in patients with complex regional pain syndrome: A systematic review. *Eur J Pain*, 26(10), 2009-2035. doi:<https://doi.org/10.1002/ejp.2025>
- Marinus et al. Clinical features and pathophysiology of complex regional pain syndrom. *Lancet Neurol* 2011;10:637-48
- O'Connell et al Interventions for treating pain and disability in adults with complex regional pain syndrom. *The Cochrane collaboration* 2013
- Sayegh et al. Mirror therapy for CRPS. *Scand Journ of Pain* 4 (2013) 200-207
- Gruenert-Pluess et al. Mirror Therapy in Hand Rehabilitation: A Review of the Literature, the St Gallen Protocol for Mirror Therapy and Evaluation of a Case Series of 52 Patients. *The British Journal of Hand Therapy* Spring 2008 Vol 13 No 1
- Bowering et al. The Effects of Graded Motor Imagery and Its Components on Chronic Pain: A Systematic Review and Meta-Analysis. *The Journal of Pain*, Vol 14, No 1 (January), 2013: pp 3-13
- Moseley et al. Spatially defined modulation of skin temperature and hand ownership of both hands in patients with unilateral complex regional pain syndrome. *Brain* 2012; 135; 3676–3686 |
- Lichtman DM, Bindra RR, Boyer MI, Putnam MD, Ring D, Slutsky DJ, et al. American Academy of Orthopaedic Surgeons clinical practice guideline on: the treatment of distal radius fractures. *J Bone Joint Surg Am.* 2011;93(8):775–8.
- F. Birklein and V. Dimova. Complex regional pain syndrome-up-to-date. *Pain reports* 2017 Vol. 2 Issue 6 Pages e624-e624
- A. Goebel, F. Birklein, F. Brunner, J. D. Clark, J. Gierthmühlen, N. Harden, et al. The Valencia consensus-based adaptation of the IASP complex regional pain syndrome diagnostic criteria. *Pain* 2021 Vol. 162 Issue 9 Pages 2346-2348
- M. Halicka, A. D. Vittersø, M. J. Proulx and J. H. Bultitude. Neuropsychological changes in Complex Regional Pain Syndrome (CRPS). *Behavioural Neurology* 2020 Vol. 2020
- P. M. Jenkinson, C. Papadaki, S. Besharati, V. Moro, V. Gobetto, L. Crucianelli, et al. Welcoming back my arm: Affective touch increases body ownership following right hemisphere stroke. *bioRxiv* 2019 Pages 851055.
- V. Kotiuk, O. Burianov, O. Kostrub, L. Khimion and I. Zasadnyuk. The impact of mirror therapy on body schema perception in patients with complex regional pain syndrome after distal radius fractures. *British Journal of Pain* 2019 Vol. 13 Issue 1 Pages 35-42
- O. Sündermann, I. Flink and S. J. Linton. My body is not working right: a cognitive behavioral model of body image and chronic pain. *PAIN* 2020 Vol. 161 Issue 6
- M. Shokouhi, C. Clarke, P. Morley-Forster, D. E. Moulin, K. D. Davis and K. St. Lawrence. Structural and Functional Brain Changes at Early and Late Stages of Complex Regional Pain Syndrome. *The Journal of Pain* 2018 Vol. 19 Issue 2 Pages 146-157