

Overblik: hvad er hypnose? Hvorfor og hvordan virker hypnose?

"Hypnosis in psychotherapy, psychosomatics and medicine. A brief overview"

Peter B. Hypnosis in psychotherapy, psychosomatics and medicine. A brief overview. *Front Psychol.* 2024 Mar 22;15:1377900. doi: 10.3389/fpsyg.2024.1377900. PMID: 38659672; PMCID: PMC11040694.

Hypnose er et værdifuld værktøj i patientbehandlingen: "hypnosis is not, in and of itself, therapy [...] it is a tool to me and I would like to keep it there" (Peter, 1998). This assessment of hypnosis as a tool is certainly true for the use of hypnosis in medicine, where hypnosis has only an auxiliary function for actual medical treatment, but this does not have to be applied to psychotherapy.

<https://pubmed.ncbi.nlm.nih.gov/38659672/>

"How hypnotic suggestions work - A systematic review of prominent theories of hypnosis"

Zahedi A, Jay Lynn S, Sommer W. How hypnotic suggestions work - A systematic review of prominent theories of hypnosis. *Conscious Cogn.* 2024 Aug;123:103730. doi: 10.1016/j.concog.2024.103730. Epub 2024 Jul 20. PMID: 39032268.

<https://pubmed.ncbi.nlm.nih.gov/39032268/>

"Demystifying hypnosis: Unravelling facts, exploring the historical roots of myths, and discerning what is hypnosis"

Geagea D, Ogez D, Kimble R, Tyack Z. Demystifying hypnosis: Unravelling facts, exploring the historical roots of myths, and discerning what is hypnosis. *Complement Ther Clin Pract.* 2023 Aug;52:101776. doi: 10.1016/j.ctcp.2023.101776. Epub 2023 Jun 22. PMID: 37402329.

<https://pubmed.ncbi.nlm.nih.gov/37402329/>

"Hypnotic Modulation of Autonomic Nervous System (ANS) Activity."

De Benedittis G. Hypnotic Modulation of Autonomic Nervous System (ANS) Activity. *Brain Sci.* 2024 Mar 4;14(3):249. doi: 10.3390/brainsci14030249. PMID: 38539637; PMCID: PMC10968788.

<https://pubmed.ncbi.nlm.nih.gov/38539637/>

"Functional Changes in Brain Activity Using Hypnosis, systematic review"

Wolf TG, Faerber KA, Rummel C, Halsband U, Campus G. Functional Changes in Brain Activity Using Hypnosis: A Systematic Review. *Brain Sci.* 2022 Jan 13;12(1):108. doi: 10.3390/brainsci12010108. PMID: 35053851; PMCID: PMC8773773.

"...evidence of functional changes in brain activity using hypnosis was identified."

<https://pubmed.ncbi.nlm.nih.gov/35053851/>

Anvendelse af hypnose efter specialer:

Brug af hypnose i anæstesien:

"Clinical hypnosis and the anaesthetist: a practical approach."

Slater P, Van-Manen A, Cyna AM. Clinical hypnosis and the anaesthetist: a practical approach. *BJA Educ.* 2024 Apr;24(4):121-128. doi: 10.1016/j.bjae.2024.01.005. Epub 2024 Feb 22. PMID: 38481420; PMCID: PMC10928374.

Artiklen gennemgår den praktiske anvendelse af hypnose som redskab i anæstiesen og viser brugen af hypnose i forskellige settings i form af både konkrete eksempler samt korte videosekvenser:

"By reading this article you should be able to:

- Discuss that the use of clinical hypnosis is evidence-based, effective and has a sound neurobiological basis.
- Integrate hypnotic techniques into your clinical practice to improve care.
- Explain more complex ideas of clinical hypnosis.
- Know that formal hypnosis training can enhance clinical practice, teaching and research."

<https://pubmed.ncbi.nlm.nih.gov/38481420/>

Brug af hypnose i dermatologien:

"Stress and Skin: An Overview of Mind Body Therapies as a Treatment Strategy in Dermatology"

Graubard R, Perez-Sanchez A, Katta R. Stress and Skin: An Overview of Mind Body Therapies as a Treatment Strategy in Dermatology. *Dermatol Pract Concept.* 2021 Sep 1;11(4):e2021091. doi: 10.5826/dpc.1104a91. PMID: 34631261; PMCID: PMC8480446.

"Hypnosis has been employed in dermatology to reduce pain and pruritus from skin disorders, to reduce procedure-related anxiety, to reduce harmful behaviors, and as an aid for healing skin disease. ... statistically significant improvements in scratching, discomfort, and sleep disturbances, following hypnotherapy ... In addition, corticosteroid use decreased by 60% at 16 weeks. ... significantly greater improvement in skin severity with hypnotherapy (in conjunction with conventional treatment) ... Hypnosis may also be used as adjunct therapy in the treatment of verruca vulgaris. In 1 interesting trial, 17 patients with bilateral warts were hypnotized and given the suggestion that the warts would improve on one side only. In 3 months, 53% of the experimental group showed resolution on the treated side alone, as compared to no improvement, in a control group receiving no therapy. In another trial, subjects who received hypnotic suggestion showed greater remission of warts than a placebo light treatment or a control group who received no treatment."

<https://pubmed.ncbi.nlm.nih.gov/34631261/>

"Integrative Treatment Approaches with Mind-Body Therapies in the Management of Atopic Dermatitis"

Yosipovitch G, Canchy L, Ferreira BR, Aguirre CC, Tempark T, Takaoka R, Steinhoff M, Misery L. Integrative Treatment Approaches with Mind-Body Therapies in the Management of Atopic Dermatitis. *J Clin Med.* 2024 Sep 11;13(18):5368. doi: 10.3390/jcm13185368. PMID: 39336855; PMCID: PMC11432615.

Hypnoterapi ved atopisk dermatitis har smertestillende effekt, derudover angives benefits for kløe, sygdommens sværhedsgrad og livskvalitet"

<https://pubmed.ncbi.nlm.nih.gov/39336855/>

Brug af hypnose i idrætsmedicin:

"The Application of Hypnosis in Sports"

Li Z, Li SX. The Application of Hypnosis in Sports. *Front Psychol.* 2022 Jan 24;12:771162. doi: 10.3389/fpsyg.2021.771162. PMID: 35140655; PMCID: PMC8820393.

"...hypnosis may be a helpful tool to address a variety of issues in sports; for example, hypnosis may help athletes improve their psychological quality, increase their self-confidence, relieve their fatigue, restore energy, help them better concentrate on the daily training and competition, and better improve their skills."

<https://pubmed.ncbi.nlm.nih.gov/35140655/>

Brug af hypnose i onkologien:

"Hypnosis for Symptom Management in Adult Cancer Patients: What is the Evidence?"

Vayne-Bossert P. Hypnosis for Symptom Management in Adult Cancer Patients: What is the Evidence? *Curr Treat Options Oncol.* 2024 Mar;25(3):364-375. doi: 10.1007/s11864-023-01168-y. Epub 2024 Jan 4. PMID: 38236333; PMCID: PMC10894763.

<https://pubmed.ncbi.nlm.nih.gov/38236333/>

"Mind-body therapies for sleep disturbance among patients with cancer: A systematic review and meta-analysis"

Han J, Cheng HL, Bi LN, Molasiotis A. Mind-body therapies for sleep disturbance among patients with cancer: A systematic review and meta-analysis. *Complement Ther Med.* 2023 Aug;75:102954. doi: 10.1016/j.ctim.2023.102954. Epub 2023 May 25. PMID: 37244384.

"...hypnosis were effective in sleep disturbance severity reduction among patients with cancer at post-intervention."

<https://pubmed.ncbi.nlm.nih.gov/37244384/>

"Self-Managed Non-Pharmacological Interventions for Breast Cancer Survivors: Systematic Quality Appraisal and Content Analysis of Clinical Practice Guidelines"

Tan JB, Zhai J, Wang T, Zhou HJ, Zhao I, Liu XL. Self-Managed Non-Pharmacological Interventions for Breast Cancer Survivors: Systematic Quality Appraisal and Content Analysis of Clinical Practice Guidelines. *Front Oncol.* 2022 May 30;12:866284. doi: 10.3389/fonc.2022.866284. PMID: 35712474; PMCID: PMC9195587.

Flere internationale kliniske retningslinier anbefaler hypnose til håndtering af angst, søvnbesvær, smertelindring m.m. ved senfølger efter brystkræft: "A growing number of clinical practice guidelines (CPGs) regarding non-pharmacological interventions for breast cancer survivors are available."

ESO (European School of Oncology) og ESMO (European Society for Medical Oncology) nævner i deres CPGs hypnose som terapi-mulighed til Senfølger efter Brystkræft ved:

- Angst, depression, distress, I/B (generally recommended)
- Fatigue, I/B (generally recommended)
- Postoperative smerter, C (considered)
- Quality of Life, I/B (generally recommended)

<https://pubmed.ncbi.nlm.nih.gov/35712474/>

"Integrative Therapies in Cancer Care: An Update on the Guidelines"

Gowin K, Muminovic M, Zick SM, Lee RT, Lacchetti C, Mehta A. Integrative Therapies in Cancer Care: An Update on the Guidelines. *Am Soc Clin Oncol Educ Book.* 2024 Jun;44(3):e431554. doi: 10.1200/EDBK_431554. PMID: 38820485.

ASCO (American Society of Clinical Oncology) og SIO (Society for Integrative Oncology) anbefaler bl.a. hypnose i deres 2024 "guidelines for the application of integrative approaches in the management of anxiety. There is a moderate recommendation for hypnosis to be offered to patients with cancer to improve anxiety during diagnostic and treatment procedures."

<https://pubmed.ncbi.nlm.nih.gov/38820485/>

Brug af hypnose i pædiatrien:

"A whole new world of healing: exploring medical hypnotherapy for pediatric patients."

Bastek V, van Vliet M. A whole new world of healing: exploring medical hypnotherapy for pediatric patients : A review. *Eur J Pediatr.* 2023 Jul;182(7):3021-3032. doi: 10.1007/s00431-023-04983-5. Epub 2023 May 5. PMID: 37145215; PMCID: PMC10160735.

"Studies suggest the effectiveness of hypnotherapy in a high variety of pediatric symptoms and disease. Hypnotherapy is a unique mind–body treatment which potential goes far beyond its current utilization."

<https://pubmed.ncbi.nlm.nih.gov/37145215/>

"Nonfarmakologisk smerte- og angstbehandling af børn"

Møller-San Pedro AJ, Fisker LYV, Pedersen LK, Møller-Madsen B. Non-pharmacological treatment for pediatric pain and anxiety. *Ugeskr Laeger.* 2024 Jan 8;186(2):V06230364. Danish. doi: 10.61409/V06230364. PMID: 38235722.

"Hypnose eller hypnoterapi har været omdiskuteret, men i større reviews er det vist, at det er klinisk effektivt. Hypnose kan støtte patienten ved at reducere udefrakommende distraktioner og opnå større mental ro. ... findes positiv effekt af hypnose, både på den selvrapporterede smerte og i selvrapporteret ængstelighed. ... Den største udfordring er uddannelse af personale, som både er tidskrævende og dyr. Efter den initiale investering kan mindre hypnosebaserede teknikker dog være en relativt hurtig, nem og billig intervention til at mindske procedurebaserede smerter hos de mere ukomplicerede patienter, mens de mere komplikerede patienter kan have brug for mere tid til at mestre teknikken nok til at have en effekt."

<https://pubmed.ncbi.nlm.nih.gov/38235722/>

„Clinical Hypnosis with Children and Adolescents - What? Why? How?: Origins, Applications, and Efficacy“

Kohen DP, Kaiser P. Clinical Hypnosis with Children and Adolescents-What? Why? How?: Origins, Applications, and Efficacy. Children (Basel). 2014 Aug 12;1(2):74-98. doi: 10.3390/children1020074. PMID: 27417468; PMCID: PMC4928724

<https://pubmed.ncbi.nlm.nih.gov/27417468/>

“Psychosocial interventions for recurrent abdominal pain in childhood”

Abbott RA, Martin AE, Newlove-Delgado TV, Bethel A, Thompson-Coon J, Whear R, Logan S. Psychosocial interventions for recurrent abdominal pain in childhood. Cochrane Database Syst Rev. 2017 Jan 10;1(1):CD010971. doi: 10.1002/14651858.CD010971.pub2. PMID: 28072460; PMCID: PMC6464036.

Cochrane finder evidens for, at hypnose ved børn med abdominale smerter kan både reducere smerteintensiteten og smertefrekvensen med et vedvarende effekt også efter fem år:

"For hypnotherapy ... compared to control, we found evidence of greater treatment success postintervention ... as well as reductions in pain intensity and pain frequency ... study of long-term effect reported continued benefit of hypnotherapy compared to usual care after five years, with 68% reporting treatment success compared to 20% of controls (P = 0.005).

<https://pubmed.ncbi.nlm.nih.gov/28072460/>

„Hypnotherapeutic treatment of children and adolescents with functional abdominal pain disorder“

Knakergaard A, Thomsen PH, Rask CU. [Hypnotherapeutic treatment of children and adolescents with functional abdominal pain disorder]. Ugeskr Laeger. 2018 Jun 11;180(24):V10170797. Danish. PMID: 29886890.

<https://pubmed.ncbi.nlm.nih.gov/29886890/>

Anvendelse af hypnose efter symptomer:

Brug af hypnose ved angst:

„The efficacy of hypnosis as a treatment for anxiety: a meta-analysis“

Valentine KE, Milling LS, Clark LJ, Moriarty CL. THE EFFICACY OF HYPNOSIS AS A TREATMENT FOR ANXIETY: A META-ANALYSIS. *Int J Clin Exp Hypn.* 2019 Jul-Sep;67(3):336-363. doi: 10.1080/00207144.2019.1613863. PMID: 31251710.

"The average participant receiving hypnosis reduced anxiety more than about 79% ... and improved more than about 84% of control participants. Hypnosis was more effective in reducing anxiety when combined with other psychological interventions than when used as a stand-alone treatment."

<https://pubmed.ncbi.nlm.nih.gov/31251710/>

„Interventions to reduce adult state anxiety, dental trait anxiety, and dental phobia: A systematic review and meta-analyses of randomized controlled trials“

Steenen SA, Linke F, van Westrhenen R, de Jongh A. Interventions to reduce adult state anxiety, dental trait anxiety, and dental phobia: A systematic review and meta-analyses of randomized controlled trials. *J Anxiety Disord.* 2024 Jul;105:102891. doi: 10.1016/j.janxdis.2024.102891. Epub 2024 Jun 24. PMID: 38945067.

"To alleviate adult state anxiety (the presence of fear, or acute emotional distress) during oral surgery, moderate-certainty evidence supports employing hypnosis, and low-certainty evidence supports prescribing benzodiazepines, with comparably small effect sizes. Furthermore, with moderate certainty, the results indicated that virtual reality exposure therapy, virtual reality distraction, background music, acupuncture, or preoperative video information provision did not alleviate state anxiety, and, with low certainty, that aromatherapy did not reduce state anxiety."

<https://pubmed.ncbi.nlm.nih.gov/38945067/>

Brug af hypnose ved funktionelle lidelser:

Funktionel dyspepsi:

“The role of psychotherapeutic approaches in treatment of functional dyspepsia, systematic review, and meta-analysis”

Zhang W, Shen Y, Hao J, Zhao Y. The role of psychotherapeutic approaches in treatment of functional dyspepsia, systematic review, and meta-analysis. *Acta Gastroenterol Belg.* 2024 Apr-Jun;87(2):294-303. doi: 10.5182/187.2.13044. PMID: 39210762.

"... significant effect on reducing gastrointestinal symptoms and anxiety in patients ..."

<https://pubmed.ncbi.nlm.nih.gov/39210762/>

Funktionel neurologisk lidelse (functional neurological disorder, FND):

"Hypnosis and suggestion as interventions for functional neurological disorder: A systematic review"

Connors MH, Quinto L, Deeley Q, Halligan PW, Oakley DA, Kanaan RA. Hypnosis and suggestion as interventions for functional neurological disorder: A systematic review. *Gen Hosp Psychiatry*. 2024 Jan-Feb;86:92-102. doi: 10.1016/j.genhosppsych.2023.12.006. Epub 2023 Dec 14. PMID: 38154334.

"Of 1584 patients receiving either intervention, 1379 (87%) showed significant improvements, including many who demonstrated resolution of their symptoms in the short-term:

- > 85% of patients demonstrated clinically significant improvements
- > 75% had a resolution or near resolution of symptoms in the short-term."

<https://pubmed.ncbi.nlm.nih.gov/38154334/>

***Irritabel tyktarm* (Irritable Bowel Syndrome, IBS):**

"Irritable Bowel Syndrome: Treating the Gut and Brain/Mind at the Same Time"

Jayasinghe M, Damianos JA, Prathiraja O, Oorloff MD, Nagalmulla K GM, Nadella A, Caldera D, Mohtashim A. Irritable Bowel Syndrome: Treating the Gut and Brain/Mind at the Same Time. *Cureus*. 2023 Aug 13;15(8):e43404. doi: 10.7759/cureus.43404. PMID: 37706135; PMCID: PMC10496425.

"Skype hypnotherapy, like traditional hypnosis, was found to improve all of the particular IBS symptoms as well as noncolonic symptoms, quality of life, anxiety, and depression scores. Many drugs, on the other hand, simply treat one or two symptoms, such as pain or gastrointestinal distress."

<https://pubmed.ncbi.nlm.nih.gov/37706135/>

"Gut-directed hypnosis and hypnotherapy for irritable bowel syndrome: a mini-review"

Häuser W. Gut-directed hypnosis and hypnotherapy for irritable bowel syndrome: a mini-review. *Front Psychol*. 2024 Jun 3;15:1389911. doi: 10.3389/fpsyg.2024.1389911. PMID: 38887623; PMCID: PMC11181908.

<https://pubmed.ncbi.nlm.nih.gov/38887623/>

Brug af hypnose ved graviditet og fødsel:

"Impact of Hypnotherapy on Fear, Pain, and the Birth Experience: A Systematic Review"

Fernández-Gamero L, Reinoso-Cobo A, Ruiz-González MDC, Cortés-Martín J, Muñoz Sánchez I, Mellado-García E, Piqueras-Sola B. Impact of Hypnotherapy on Fear, Pain, and the Birth Experience: A Systematic Review. *Healthcare (Basel)*. 2024 Mar 8;12(6):616. doi: 10.3390/healthcare12060616. PMID: 38540580; PMCID: PMC10970289.

"The analysis covered the use of epidural anesthesia, pharmacological analgesia during labor, self-reported pain, labor duration, type of delivery, fear of childbirth, and childbirth experience. The results demonstrated benefits in reducing fear and pain during labor, along with an enhancement

in the overall childbirth experience. Hypnotherapy can be a valuable resource for reducing fear and pain during labor and improving the lived childbirth experience."

<https://pubmed.ncbi.nlm.nih.gov/38540580/>

Brug af hypnose ved menopausale symptomer:

„*Menopause and Sleep Disorders*“

Tandon VR, Sharma S, Mahajan A, Mahajan A, Tandon A. *Menopause and Sleep Disorders*. J Midlife Health. 2022 Jan-Mar;13(1):26-33. doi: 10.4103/jmh.jmh_18_22. Epub 2022 May 2. PMID: 35707298; PMCID: PMC9190958.

"Self-Hypnosis is a non-pharmacological treatment for poor sleep and hot flashes in menopausal women. The goal of hypnosis is to help educate and train the subjects to perform self-hypnosis to alleviate the underlying symptoms. The use of hypnosis as a treatment for poor sleep has shown benefits for both acute and chronic insomnia. There were clinically meaningful improvements in reducing the perception of poor sleep quality in 50%–77% of women across time."

<https://pubmed.ncbi.nlm.nih.gov/35707298/>

Brug af hypnose ved smerter:

„*Adjunctive use of hypnosis for clinical pain: a systematic review and meta-analysis*“

Jones HG, Rizzo RRN, Pulling BW, Braithwaite FA, Grant AR, McAuley JH, Jensen MP, Moseley GL, Rees A, Stanton TR. Adjunctive use of hypnosis for clinical pain: a systematic review and meta-analysis. Pain Rep. 2024 Sep 10;9(5):e1185. doi: 10.1097/PR9.0000000000001185. PMID: 39263007; PMCID: PMC11390056.

Artiklen konkluderer, at hypnoterapi som adjunkt til både farmakologiske og non-farmakologiske terapier forstærker deres smertelindrende effekt.

<https://pubmed.ncbi.nlm.nih.gov/39263007/>

„*Opioid sparing strategies for perioperative pain management other than regional anaesthesia: A narrative review*“

Ghai B, Jafra A, Bhatia N, Chanana N, Bansal D, Mehta V. Opioid sparing strategies for perioperative pain management other than regional anaesthesia: A narrative review. J Anaesthesiol Clin Pharmacol. 2022 Jan-Mar;38(1):3-10. doi: 10.4103/joacp.JOACP_362_19. Epub 2022 Feb 4. PMID: 35706649; PMCID: PMC9191794.

"Clinical Hypnosis is an adjunct to reduce pain. ... There is evidence that supports clinical hypnosis to decrease pain after pediatric and adolescent surgeries as well as after techniques like bone marrow aspiration."

<https://pubmed.ncbi.nlm.nih.gov/35706649/>

„Integrative Medicine for Cancer-Related Pain: A Narrative Review“

Samuels N, Ben-Arye E. Integrative Medicine for Cancer-Related Pain: A Narrative Review. *Healthcare (Basel)*. 2024 Feb 4;12(3):403. doi: 10.3390/healthcare12030403. PMID: 38338288; PMCID: PMC10855884.

“Society for Integrative Oncology (SIO) og American Society for Clinical Oncology (ASCO), support the use of ... hypnosis for procedural pain or pain due to diagnostic workup; ...”

<https://pubmed.ncbi.nlm.nih.gov/38338288/>

„Non-pharmacological interventions feasible in the nursing scope of practice for pain relief in palliative care patients: a systematic review“

van Veen S, Drenth H, Hobbelin H, Finnema E, Teunissen S, de Graaf E. Non-pharmacological interventions feasible in the nursing scope of practice for pain relief in palliative care patients: a systematic review. *Palliat Care Soc Pract*. 2024 Jan 10;18:26323524231222496. doi: 10.1177/26323524231222496. PMID: 38223744; PMCID: PMC10785737.

“... significant ($p = 0.0001$) [painreduction chronic pain] in the hypnosis group after 1- and 2-year follow-up. Hypnosis therapy was associated with a decreased risk of 66% of needing to increase the opioids treatment for pain control ($p = 0.03$).”

<https://pubmed.ncbi.nlm.nih.gov/38223744/>

„Efficacy and Feasibility of Behavioral Treatments for Migraine, Headache and Pain in the Acute Setting, Emergency Department and Urgent Care Settings“

Vekhter D, Robbins MS, Minen M, Buse DC. Efficacy and Feasibility of Behavioral Treatments for Migraine, Headache, and Pain in the Acute Care Setting. *Curr Pain Headache Rep*. 2020 Sep 26;24(10):66. doi: 10.1007/s11916-020-00899-z. PMID: 32979092; PMCID: PMC7754250.

“... evidence exists for ... hypnosis/self-hypnosis, ... for acute pain, migraine and headache.”

<https://pubmed.ncbi.nlm.nih.gov/32979092/>

„Hypnosis on acute dental and maxillofacial pain relief: A systematic review and meta-analysis“

Merz AE, Campus G, Abrahamsen R, Wolf TG. Hypnosis on acute dental and maxillofacial pain relief: A systematic review and meta-analysis. *J Dent*. 2022 Aug;123:104184. doi: 10.1016/j.jdent.2022.104184. Epub 2022 Jun 9. PMID: 35691451.

“... evidence can be confirmed for the effects of hypnosis on acute pain relief in dental/maxillofacial area.”

<https://pubmed.ncbi.nlm.nih.gov/35691451/>

“Neuroscientific results of experimental studies on the control of acute pain with hypnosis and suggested analgesia.”

Miltner WHR, Franz M, Naumann E. Neuroscientific results of experimental studies on the control of acute pain with hypnosis and suggested analgesia. *Front Psychol*. 2024 Apr 4;15:1371636. doi: 10.3389/fpsyg.2024.1371636. PMID: 38638524; PMCID: PMC11025616.

<https://pubmed.ncbi.nlm.nih.gov/38638524/>

„The Role of Electroencephalogram-Assessed Bandwidth Power in Response to Hypnotic Analgesia”

Jensen MP, Barrett TD. The Role of Electroencephalogram-Assessed Bandwidth Power in Response to Hypnotic Analgesia. Brain Sci. 2024 May 30;14(6):557. doi: 10.3390/brainsci14060557. PMID: 38928559; PMCID: PMC11201437.

“Research supports the efficacy of therapeutic hypnosis for reducing acute and chronic pain.”

<https://pubmed.ncbi.nlm.nih.gov/38928559/>