Société Française de NeuroModulation | INS French Chapter

Place de la stimulation médullaire et corticale dans les douleurs neuropathiques du cancer

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VIII° Symposium | *Vendredi 04 – Samedi 05 Octobre 2024, Lorient*

Conflit d’intérêt

- Medtronic
- Elekta
- Boston Scientific
- Abott
- Grünenthal

Douleur & Cancer

TABLEAU N°1 : FRÉQUENCE ET INTENSITÉ DE LA DOULEUR EN FONCTION DES PHASES DE TRAITEMENT

Situation	Patients douloureux	Personnes parmi les patients douloureux avec une douleur d'intensité moyenne à forte
Tous cancers, en phase de traitement du cancer*	40-70 %	30 %
Cancer avancé*	60-70 %	45 %
À distance du traitement curatif (phase de surveillance)*#	30-50 %	10-40 %

* VanDenBreuken 2007 (A)
\# VanDenBreuken 2007 (B)

- Prévalence des douleurs de cancer
  - 50% au moment du diagnostic
  - 70% en phase terminale

- 80% à 90% des douleurs sont soulagées par la prise en charge antalgique + oncologique

→ 10% à 20% des patients présentent des douleurs réfractaires invalidantes

Douleur & Cancer

APPUI À LA DÉCISION

AXES OPPORTUNS D'ÉVOLUTION DU PANIER DE SOINS ONCOLOGIQUES DE SUPPORT

/réponse saisine

POINTS ESSENTIELS

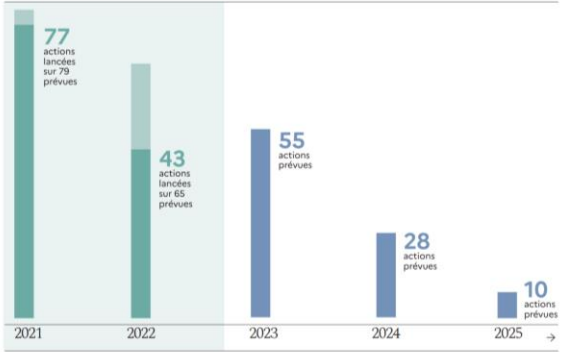
- En réponse à la saisine DGOS 085-15 du 31 juillet 2015, l'INCa s'est appuyé sur une analyse bibliographique, la consultation d'un groupe d'experts et les contributions d'acteurs institutionnels et de terrain impliqués dans les soins oncologiques de support (SOS) ainsi que celle de l'AFSOS pour proposer un **« panier-référentiel » du contenu de l'offre et de l'organisation des soins de suppor**t à garantir aux patients atteints de cancer et à leurs proches.
- Le « panier-référentiel » est constitué d'un socle de base de 4 soins de supports, complété par 5 soins de support complémentaires et 2 techniques particulières d'analgésie, l'ensemble formant le nouveau socle de base « élargi » ou panier « actualisé ».
- **Le socle de base, constitué de 4 soins de support :**
  - la prise en charge de la douleur
  - la prise en charge diététique et nutritionnelle
  - la prise en charge psychologique
  - la prise en charge sociale, familiale et professionnelle

Douleur & Cancer

STRATÉGIE DÉCENNALE DE LUTTE CONTRE LES CANCERS 2021-2030

LE POINT, DEUX ANS APRÈS LE LANCEMENT

237 actions viennent décliner, de façon très opérationnelle, les ambitions de la stratégie décennale 2021-2030. Sur ces 237 actions, 120 sont déjà lancées, soulignant l'élan et la mobilisation collective des acteurs concernés.



1,74 Md€

consacré à la Stratégie décennale d'ici à 2025, soit + 20 % par rapport au dernier plan cancer.

Au total, ce sont 120 actions, sur les 237 de la stratégie, qui ont démarré, soit plus de la moitié.

ÉTAT D'AVANCEMENT PAR AXE STRATÉGIQUE

AXE 1

Améliorer la prévention

35 actions en cours ou terminées, soit 45 % des actions prévues

Ex.: labellisation de réseaux de recherche en prévention primaire pour renforcer la connaissance des facteurs de risque de cancer; ouverture de la commande en ligne du kit de dépistage du cancer colorectal; appel à projets « réduire les expositions aux polluants en milieu scolaire »...

AXE 2

Limiter les séquelles et améliorer la qualité de vie

41 actions en cours ou terminées, soit 53 % des actions prévues

Ex.: réforme du régime d'autorisation de l'activité de traitement du cancer afin d'améliorer la structuration et la qualité de l'offre; extension du droit à l'oubli désormais fixé à cinq ans; organisation du colloque « Vivre et travailler avec un cancer »...

AXE 3

Lutter contre les cancers de mauvais pronostic

16 actions en cours ou terminées, soit 50 % des actions prévues

Ex.: refonte du programme AcSé pour développer et sécuriser l'accès, hors autorisation de mise sur le marché, à des thérapies ciblées innovantes; financement de six projets de recherche disruptifs dans une démarche « High Risk, High Gain »...

AXE 4

S'assurer que les progrès bénéficient à tous

28 actions en cours ou terminées, soit 56 % des actions prévues

Ex.: mise en ligne du site pediatrie.e-cancer.fr à destination des familles, des professionnels de santé et des chercheurs; mise à disposition de fiches d'information simplifiées pour sensibiliser aux dépistages les personnes qui ont des difficultés pour communiquer...

une année charnière

En 2023, ce sont 55 nouvelles actions qui seront lancées avec des projets très structurants, qui concernent à la fois l'Institut et ses partenaires.

- Renouvellement du plan national de lutte contre le tabac (PNLT).
- Révision du modèle de pilotage et d'organisation des dépistages, avec notamment la modification des missions des centres régionaux de coordination des dépistages.
- Création d'un dispositif de déploiement à une large échelle des interventions les plus probantes en matière de prévention.
- Création d'un dispositif de fin de traitement pour améliorer l'accompagnement de la personne après la fin de ses traitements actifs et l'entrée dans l'après-cancer.
- Mise en place d'un observatoire des aidants.
- Élaboration d'une feuille de route pour améliorer l'accès à la reconstruction mammaire.
- Mise en œuvre de la campagne de vaccination HPV des élèves de collège.
- Étude de faisabilité d'un programme de dépistage du cancer du poumon.
- Labellisation de centres de recherche intégrée d'excellence en oncopédiatrie et financement de chaires de recherche seniors internationales.
- Travail d'expertise sanitaire sur la conciliation médicamenteuse.

AMÉLIORER LE PARCOURS DE SOINS ET LE SUIVI DES PATIENTS

L'enjeu • La fluidité des parcours de soins, la réduction de la lourdeur des traitements constituent des conditions essentielles au maintien de la qualité de vie des patients. L'accompagnement des praticiens, en particulier des médecins généralistes, contact privilégié des patients, et les réflexions autour de la désescalade thérapeutique font partie des actions prioritaires à engager.

Favoriser la désescalade thérapeutique

La lourdeur des traitements contre le cancer obère fortement la qualité de vie des malades. Elle constitue également un facteur important de risque de séquelles. Mais alléger les parcours de soins sans sacrifier l'efficacité thérapeutique est une véritable gageure. C'est pour tenter de relever ce défi qu'en 2022, a été lancé, à destination des établissements de santé, un appel à projets visant à encourager l'émergence ou le développement de démarches de désescalade thérapeutique.
Six projets, dont la moitié est consacrée aux cancers du sein, ont été sélectionnés. Financés durant 18 mois, ils permettront d'expérimenter de nouveaux modèles organisationnels dans les parcours de soins. Une fois leur caractère probant démontré, il s'agira d'en favoriser le déploiement en s'appuyant, autant qu'il le faudra, sur des évolutions d'ordre normatif ou financier. Ce sera notamment l'objet de la prochaine édition de cet appel à projets. Par ailleurs, sur les 36 projets de recherche sélectionnés dans le cadre du dernier Programme hospitalier de recherche clinique en cancérologie (PHRC), sept étaient dédiés à la désescalade thérapeutique. L'édition 2022-2023 a été lancée et une enveloppe spécifique a été réservée à cette même thématique.

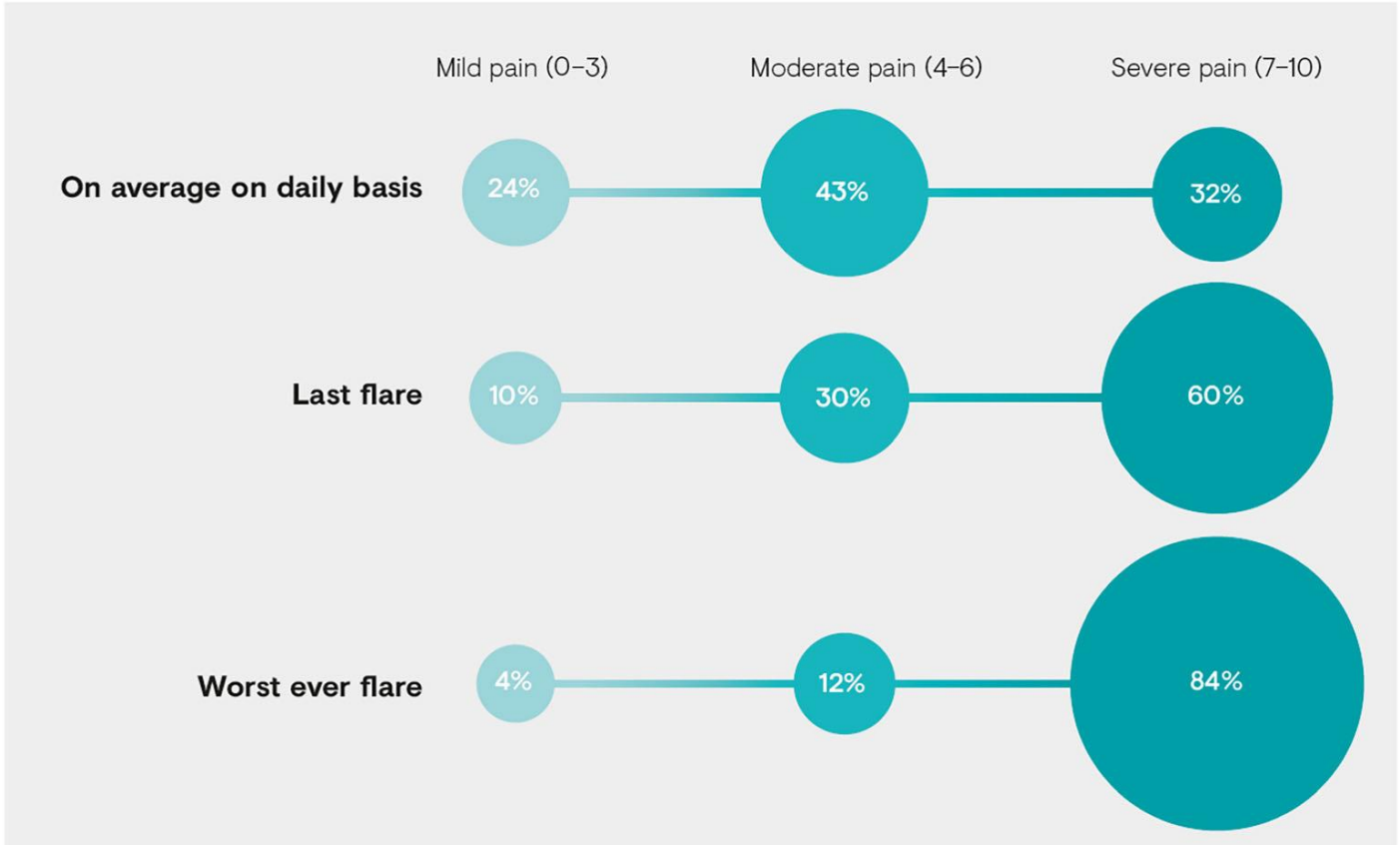
Des outils pour accompagner les médecins généralistes

Proches de leurs patients, les médecins généralistes exercent un rôle clé dans la prévention, le dépistage et la prise en charge des souffrances ou séquelles, physiques comme psychologiques, liées au cancer ou à ses traitements. Ils constituent également des relais d'information privilégiés pour leurs patients. L'Institut national du cancer s'est donné pour mission de les accompagner au mieux dans leur pratique quotidienne. Trois nouvelles publications ont ainsi été mises à leur disposition en 2022. La première présente, de façon synthétique, les enjeux et modalités de la préservation de la santé sexuelle et de la fertilité en cas de cancer, et éclaire les praticiens sur la manière d'aborder ces sujets avec leurs patients. Deux autres fiches pour la pratique sont par ailleurs consacrées au repérage des patients à risque de cancer du foie et aux actions de prévention et de suivi du lymphœdème après traitement d'un cancer. Ce gonflement chronique d'un membre peut en effet entraîner des complications et altérer fortement le quotidien des patients.

Pour une meilleure prise en compte des besoins des patients âgés

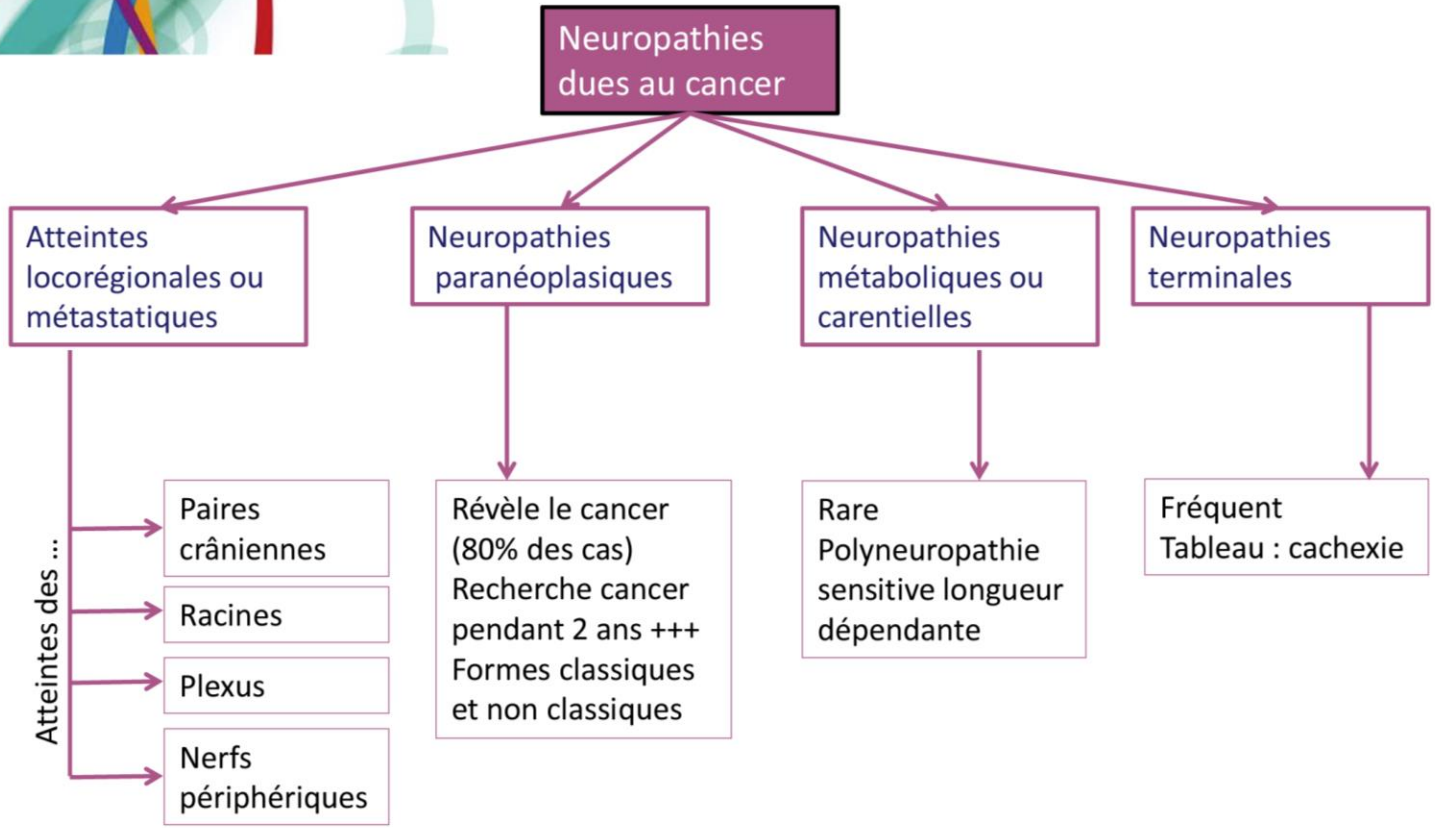
Dans un contexte démographique marqué par le vieillissement constant de la population, le Comité de déontologie et d'éthique de l'Institut a souhaité se saisir de la question du respect des personnes âgées et de la prise en compte de la spécificité et de la diversité de leurs besoins, médicaux, psychologiques, relationnels par le système de santé. Cette réflexion a donné lieu à plusieurs publications, et en 2022 à la publication d'un avis intitulé « Enjeux éthiques en oncogériatrie : la personne âgée est-elle toujours respectée ? ». Le texte conclut notamment à la nécessité de travailler à une meilleure intégration de nos aînés dans la société, et, plus particulièrement, à l'élaboration de parcours de soins tenant compte à la fois de leurs potentielles fragilités et du nécessaire respect de leur autonomie.

Impact des DN sur la qualité de vie

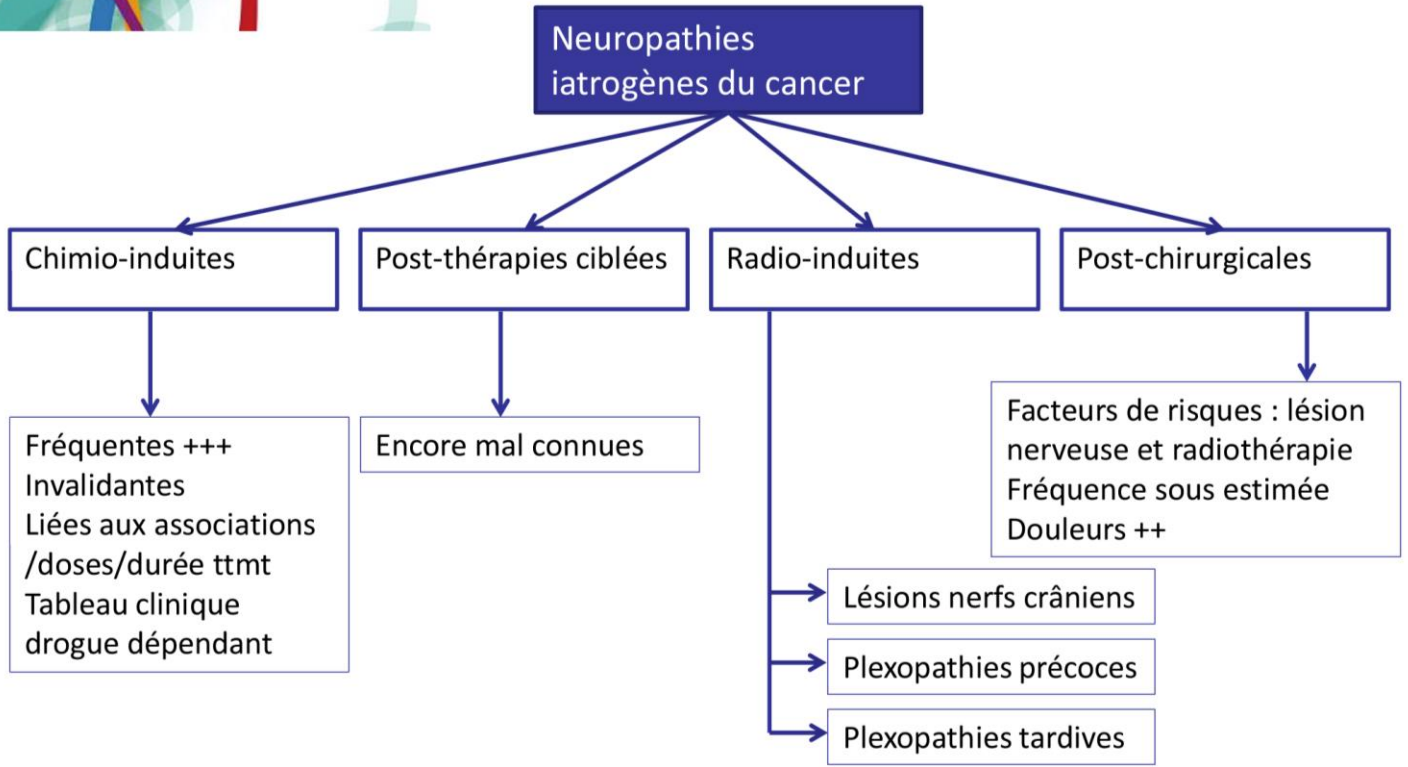


Dupoiron et al. Eur J Cancer Care. 2022;31:e13728

NEUROPATHIES PERIPHERIQUES DANS LE CANCER
DIFFÉRENTS TYPES D'ATTEINTES



NEUROPATHIES PERIPHERIQUES DANS LE CANCER
DIFFÉRENTS TYPES D'ATTEINTES



Intérêt majeur de la détection précoce : questionnaires DN4 et TNS

Neuropathies post-chimiothérapie

- 19% à 85% des patients sous chimiothérapie

- Principales molécules incriminées
  - Sels de platine (cisplatine, carboplatine, & oxaliplatine)
  - Taxanes (Paclitaxel, Docetaxel, & cabacitaxel)
  - Alcaloides (e.g., vinblastine and vincristine)
  - Epothilones (ixabepilone)
  - Bortezomib, Thalidomide
- Survenue progressive pendant la chimiothérapie
  - réduction doses ou espacement des cures
- Dose dépendant
- Régresse à l'arrêt de la chimiothérapie
  - persistent dans 30% des cas

Clinique

- Paresthésies décrites comme des sensations désagréables tels des engourdissements, des fourmillements et des picotements
- Douleurs : brûlures, décharges électriques, allodynies au niveau de l'extrémité des membres.
- Signes moteurs comme des crampes, des spasmes, allant parfois jusqu'à des déficits moteurs
- Une dysautonomie possiblement très importante
- Ces symptômes sont le plus souvent symétriques et peuvent devenir très invalidants
- Cas particulier de l'oxiplatine: neuropathie aigue allodynie au froid

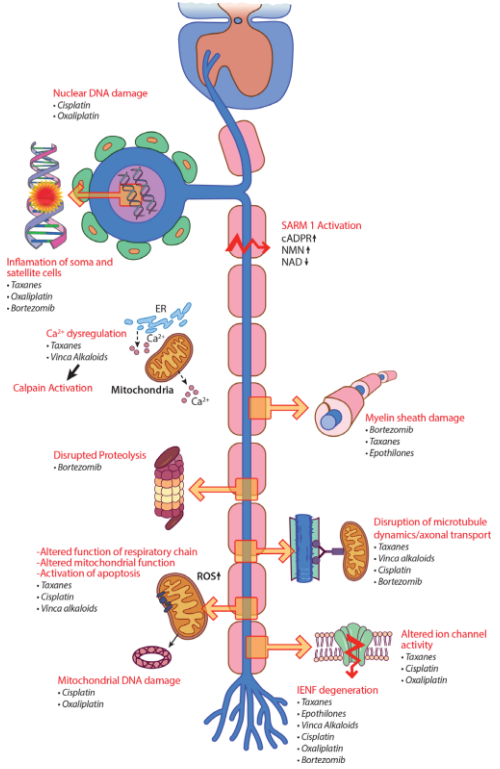
- **Sensory Loss**
  - Numbness
  - Pain
- **Autonomic Problems**

Mécanismes

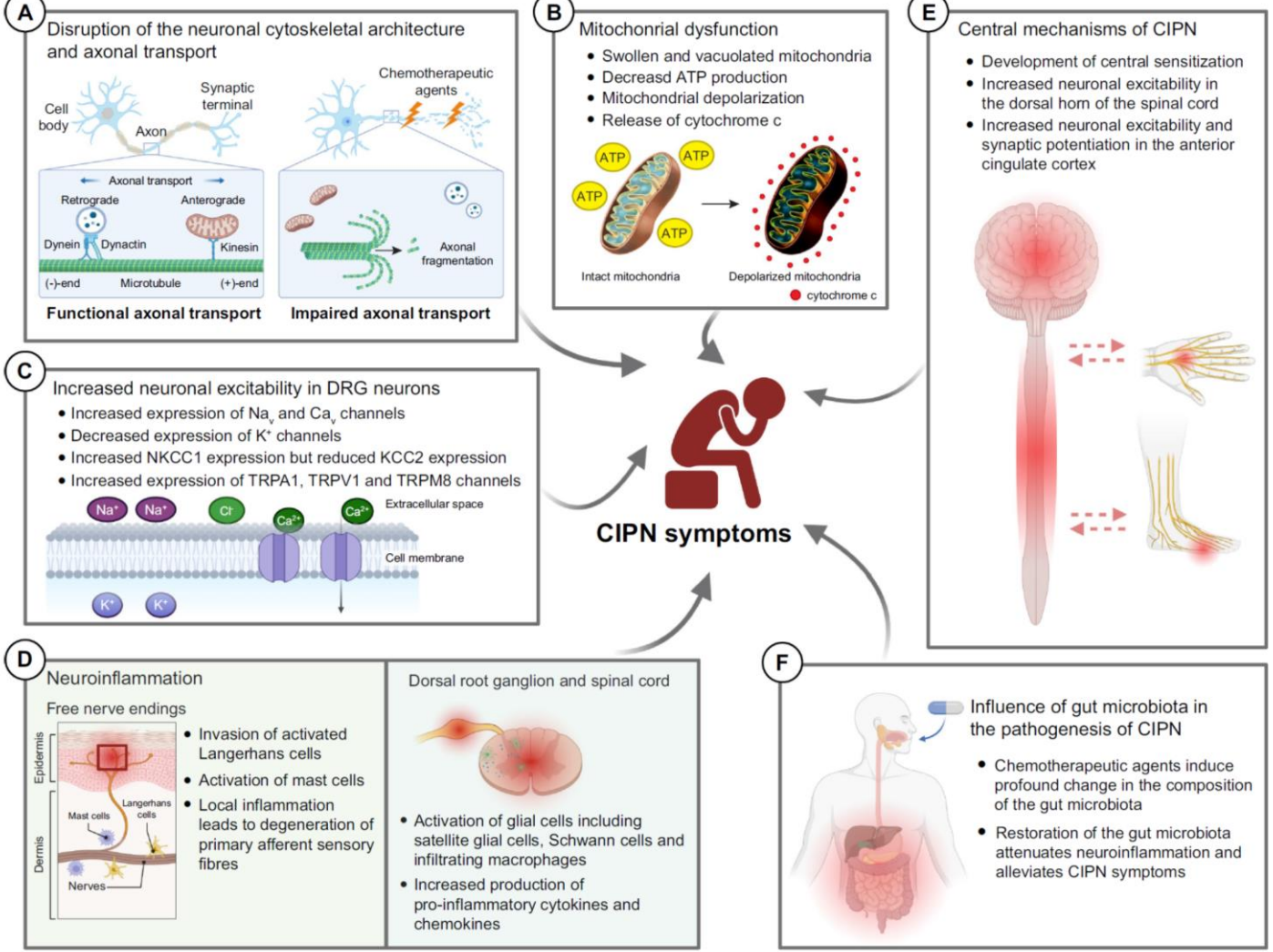
- Sensibilité du SNP aux chimiothérapie du fait de l'absence de barrière protectrice

- Neuropathie longueur-dépendante (taxane- cancer digestifs)
  - les symptômes s'expriment dans un territoire distal
  - touchant d'abord les pieds, puis remontant un peu dans les mollet
  - et parfois dans les mains

- Neuropathie non-longueur dépendante ou ganglionopathies (sel de platine)
  - des déficits moteurs proximaux ou distaux
  - et une sémiologie sensitive riche, souvent douloureuse



Park SB, Cetinkaya-Fisgin A, Argyriou AA, et al. J Neurol Neurosurg Psychiatry 2023;94:962–972.


A
Disruption of the neuronal cytoskeletal architecture and axonal transport
Cell body
Synaptic terminal
Axon
Chemotherapeutic agents
Axonal transport
Retrograde
Anterograde
Dynein
Dynactin
Kinesin
(-)-end
Microtubule
(+)-end
Axonal fragmentation
Functional axonal transport
Impaired axonal transport
B
Mitochonrial dysfunction
Swollen and vacuolated mitochondria
Decreasd ATP production
Mitochondrial depolarization
Release of cytochrome c
ATP
Intact mitochondria
Depolarized mitochondria
cytochrome c
C
Increased neuronal excitability in DRG neurons
Increased expression of Na$_v$ and Ca$_v$ channels
Decreased expression of K$^+$ channels
Increased NKCC1 expression but reduced KCC2 expression
Increased expression of TRPA1, TRPV1 and TRPM8 channels
Na+
Cl-
Ca2+
Extracellular space
Cell membrane
K+
CIPN symptoms
E
Central mechanisms of CIPN
Development of central sensitization
Increased neuronal excitability in the dorsal horn of the spinal cord
Increased neuronal excitability and synaptic potentiation in the anterior cingulate cortex
D
Neuroinflammation
Free nerve endings
Epidermis
Dermis
Mast cells
Langerhans cells
Nerves
Invasion of activated Langerhans cells
Activation of mast cells
Local inflammation leads to degeneration of primary afferent sensory fibres
Dorsal root ganglion and spinal cord
Activation of glial cells including satellite glial cells, Schwann cells and infiltrating macrophages
Increased production of pro-inflammatory cytokines and chemokines
F
Influence of gut microbiota in the pathogenesis of CIPN
Chemotherapeutic agents induce profound change in the composition of the gut microbiota
Restoration of the gut microbiota attenuates neuroinflammation and alleviates CIPN symptoms

Recommandation ASCO 2020

Treatment of chemotherapy-induced peripheral neuropathy that develops while patients are receiving neurotoxic chemotherapy.

2.1 Clinicians should assess, and discuss with patients, the appropriateness of dose delaying, dose reduction, or stopping chemotherapy (or substituting with agents that do not cause CIPN) in patients who develop intolerable neuropathy and/or functional nerve impairment (Type of recommendation: informal consensus, benefits outweigh harms; Evidence quality: low; Strength of recommendation: moderate).

Treatment of chemotherapy-induced peripheral neuropathy for patients who have completed neurotoxic chemotherapy.

3.1 For patients with cancer experiencing painful CIPN, clinicians may offer duloxetine (Type of recommendation: evidence based, benefits equal harms; Evidence quality: intermediate; Strength of recommendation: moderate).

3.2 Outside the context of a clinical trial, no recommendations can be made on the use of the following interventions for the treatment of CIPN:

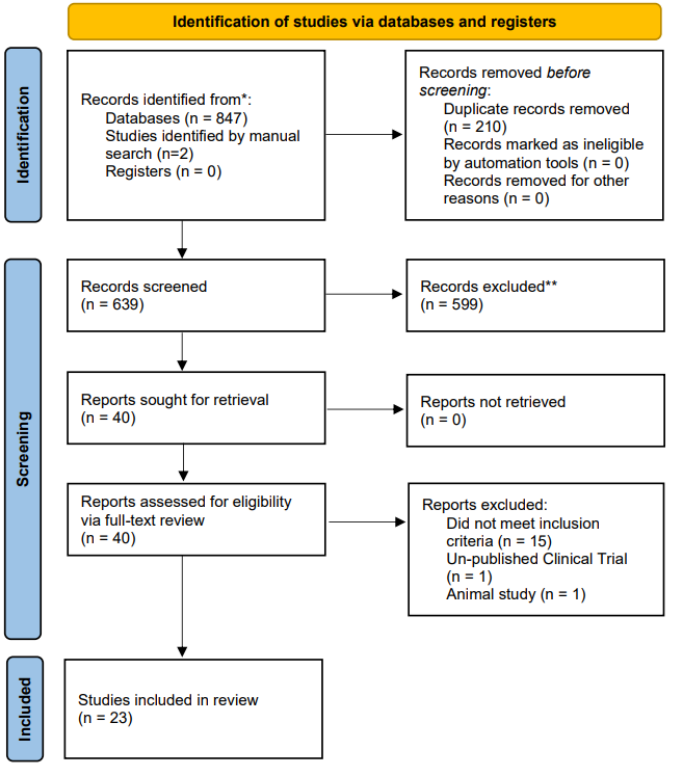
- Exercise therapy
- Acupuncture
- Scrambler therapy
- Gabapentin/pregabalin
- Topical gel treatment containing baclofen, amitriptyline HCL, plus/minus ketamine
- Tricyclic antidepressants
- Oral cannabinoids

SCS et neuropathie chimio-induite

Neuromodulation Therapy for Chemotherapy-Induced Peripheral Neuropathy: A Systematic Review

Ryan S. D'Souza [1], Yeng F. Her [1], Max Y. Jin [2], Mahmoud Morsi [3] and Alaa Abd-Elsayed [2,*]

- Articles publiés avant Mai 2022
- Uniquement cas cliniques / Séries de cas
- 23 études
  - 15 SCS – 15 patients



Author/ Year	Study Design	Funding Source	Mean Age	Type of Intervention (Location)	Stimulation Settings	Pain Outcomes	Neurological Function Outcomes	Other Outcomes
Dorsal Column Spinal Cord Stimulation								
Abd-Elsayed et al. 2021 [36]	Case report	No funding	47 years (n = 1)	SCS (C3–C4)	45 Hz; 450 µs pulse width; 2.8 mA right side and 3.2 mA left side amplitude	Pain decreased 80% during trial and maintained improvement through permanent implant	Improved ability to use hands	Improved ability for daily activities
Chai et al. 2017 [38]	Case report	No funding	57 years (n = 1)	SCS (C4 and T8)	Two leads at C4 for upper limb pain and two leads at T8 for lower limb pain	>50% pain relief during trial	NR	NR
Abd-Elsayed et al. 2015 [42]	Case report	NR	47 years (n = 1)	SCS (C4–C5)	NR	70–80% reduction in pain during trial with sustained relief post-implant	Improvement of function and ability to use hands	NR
Sarkar et al. 2019 [30]	Case report	No funding	55 years (n = 1)	SCS (C4 and T9)	10-kHz	>90% pain improvement	NR	NR
Kamdar et al. 2021 [35]	Case report	No funding	62 years (n = 1)	SCS (T8–T9)	60 Hz frequency; intensity of 6.5 mA	VAS pain score improved from 8/10 to 2/10 during 7-day trial that was maintained through permanent implant	Improved gait and decreased frequency of falls. Able to walk barefoot on cold surfaces and tolerated a pedicure for the first time. Sensory exam was mostly unchanged (no pinprick sensation below the mid-shin and no vibration sensation in feet)	NR
Grant et al. 2019 [31]	Case report	No funding	47 years (n = 1)	SCS (T9 and T10)	NR	Trial VAS score decreased to 3/10 from 7/10 at baseline; post-implant VAS: 0/10	NR	NR
Sisson et al. 2017 [32]	Case report	No funding	69 years (n = 1)	SCS (T9–10 disc space)	10-kHz	100% pain improvement in CPIN at 3-month follow-up	NR	NR
Panchal et al. 2016 [33]	Case report	Industrial funding	70 years (n = 1)	SCS (T9–T11) (Wireless staggered by 4 cm)	120 Hz and 300 µs pulse width, at an amplitude of 2.5 mA	90% improvement in pain	Able to sit, stand, walk and lay down with a significant reduction in pain	NR
Braun Filho et al. 2007 [40]	Case report	NR	72 years (n = 1)	SCS (T10)	80 Hz; 300 µs pulse width; 0–4 V	VAS pain score improved from 10/10 to 3/10. Pain relief was sustained 3 months after implant	NR	Improved quality of life
Wright et al. 2021 [28]	Case report	No funding	60 years (n = 1)	SCS (T10)	Two 8-contact dorsal column leads with intermittent burst programming	5-day trial yielded 80% pain improvement; Post-implant: VAS 0/10 was maintained at 2-year follow-up	NR	Improved quality of sleep

D'Souza et al.; Biomedicines 2022, 10, 1909.

Author/ Year	Study Design	Funding Source	Mean Age	Type of Intervention (Location)	Stimulation Settings	Pain Outcomes	Neurological Function Outcomes	Other Outcomes
Dorsal Column Spinal Cord Stimulation								
Abd-Elsayed et al. 2016 [29]	Case series	NR	39 years (n = 1)	SCS (T10–T11)	NR	95% pain relief during 1-week trial. Pain relief was sustained 3 months after implantation	NR	Improvement in sleep pattern, able to be more independent in performing daily activities
Lopes et al. 2020 [37]	Case report	NR	51 years (n = 1)	SCS (T10–T12)	40 Hz frequency; 350 µs pulse width; 1 V	About 50% pain improvement for both 7-day trial and permanent implant	NR	NR
Cata et al. 2004 [41]	Case report	NR	55.5 years (n = 2)	SCS (Patient 1 = L1, Patient 2 = T11)	Patient 1: 22 Hz; 286 µs pulse width; 0–2V. Patient 2: 80 Hz; 500 µs pulse width; 0–4 V	Patient 1: VAS pain score improved from 4.5/10 to 0.2/10 during trial and 2/10 after permanent implant. Patient 2: VAS 4.6/10 to 0/10 during trial and 3.6/10 after permanent implant	Improved gait, flexibility of legs, and touch detection for both patients. Improved sharpness detection for patient 1, none for patient 2. No change in thermal thresholds for patient 2	NR
Michael et al. 2020 [29]	Case report	No funding	48 years (n = 1)	SCS (NR)	NR	100% pain improvement in CIPN	NR	NR
Sayed et al. 2015 [34]	Case Report	NR	NR (n = 1)	SCS (NR)	NR	>50% pain relief sustained at 3-month follow-up	NR	NR

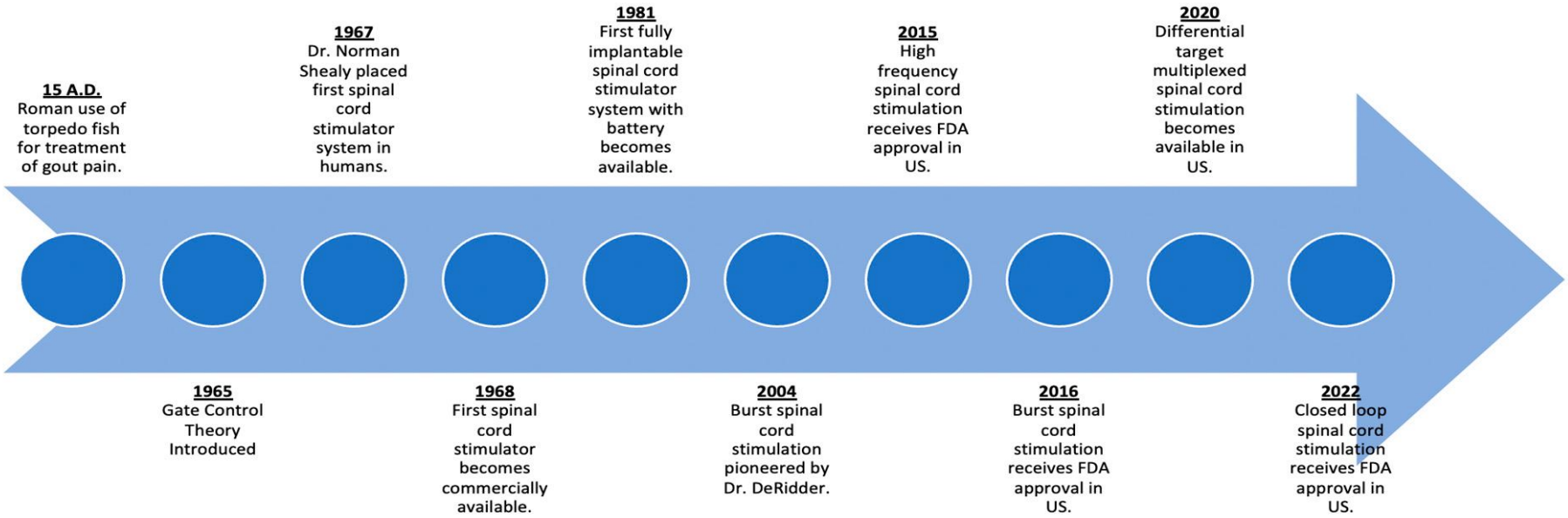
D'Souza et al.; Biomedicines 2022, 10, 1909.

Niveau de preuve

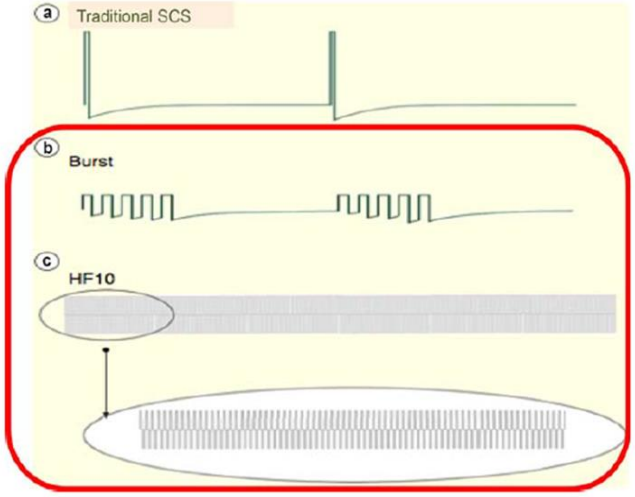
Participants (Studies) Follow-Up	Risk of Bias	Inconsistency	Indirectness	Imprecision	Publication Bias	GRADE Certainty of Evidence
Pain relief						
73 (23 studies)	Very Serious [a,b]	Serious [a,b,c]	Serious [b,c]	Very serious [a,b,c,d]	publication bias strongly suspected [a,e,f]	⊕◯◯◯ Very low
Improvement in neurological function						
73 (23 studies)	Very Serious [a,b,f]	Very Serious [b,c,f]	Very Serious [b,c,g]	Very Serious [d,f]	publication bias strongly suspected [e,f]	⊕◯◯◯ Very low

D'Souza et al.; Biomedicines 2022, 10, 1909.

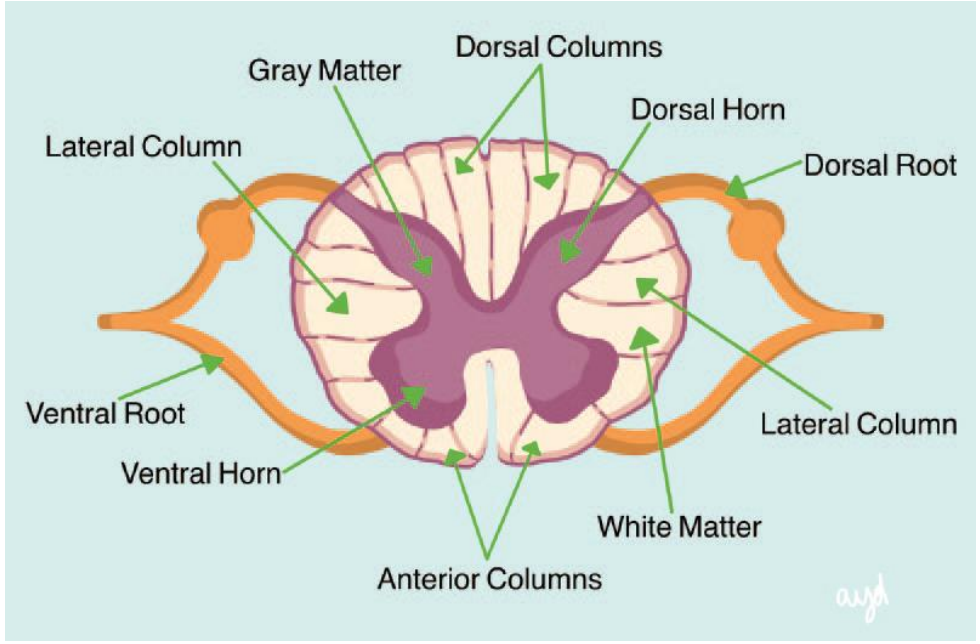
Stimulation médullaire & CIPN

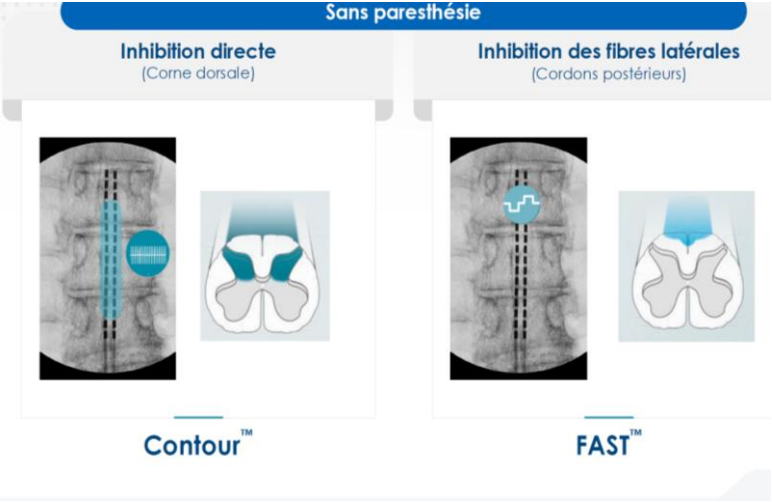


*Lam et al.; Bioengineering **2023**, 10, 185*



Linderoth et al. Neuromodulation 2017



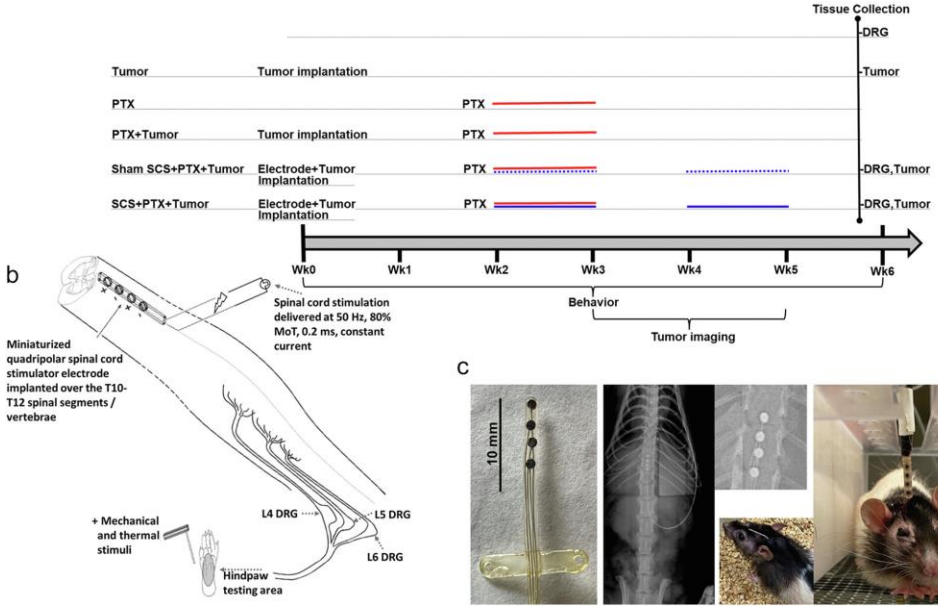


SCS et neuropathie chimio-induite

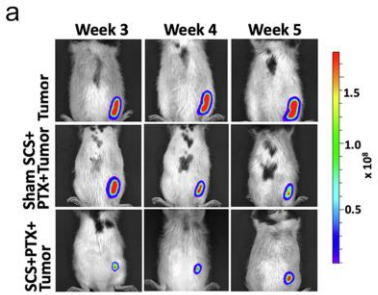
Spinal Cord Stimulation Increases Chemoefficacy and Prevents Paclitaxel-Induced Pain via CX3CL1

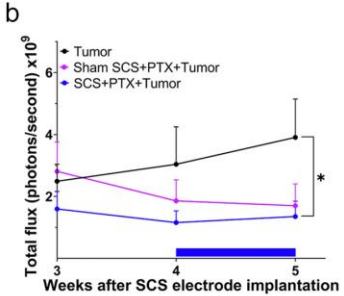
- SCS prévention neuropathie chimio-induite
- Régulation de la population de macrophages au niveau du DRG

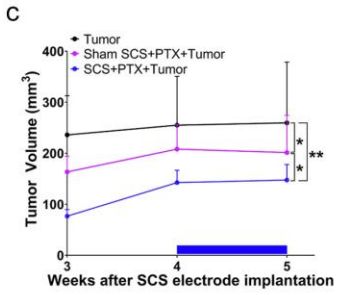
- PTX induit
  - Hyperalgesie froid
  - Alldoynie
- Non observé dans le groupe PTX+SCS

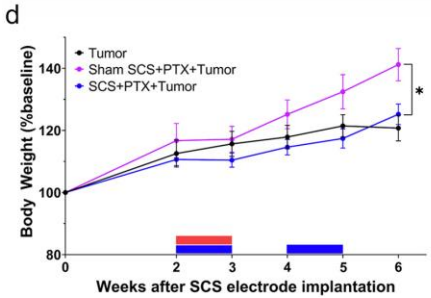


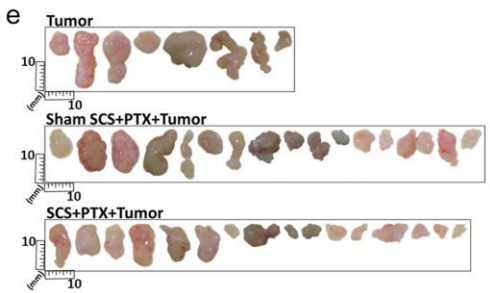
SCS et neuropathie chimio-induite

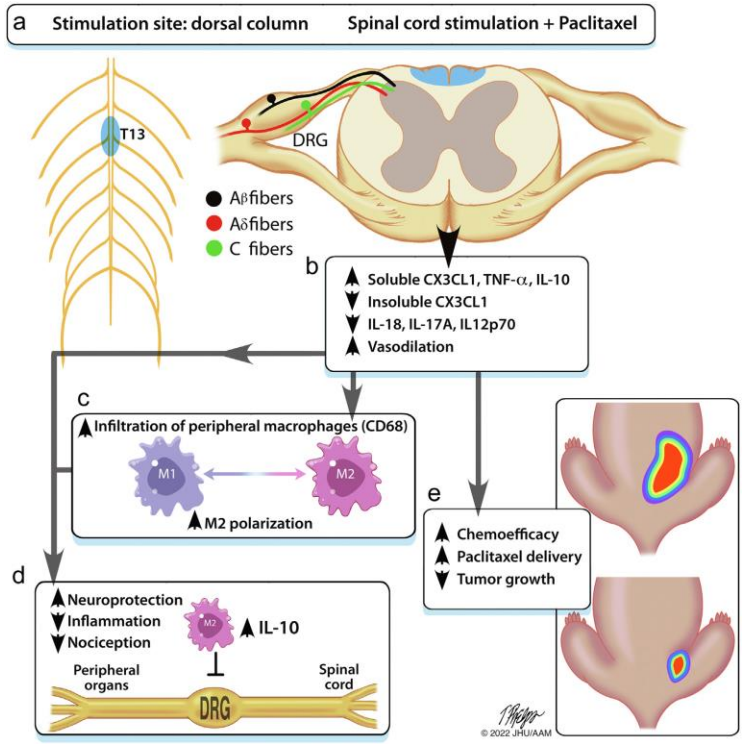










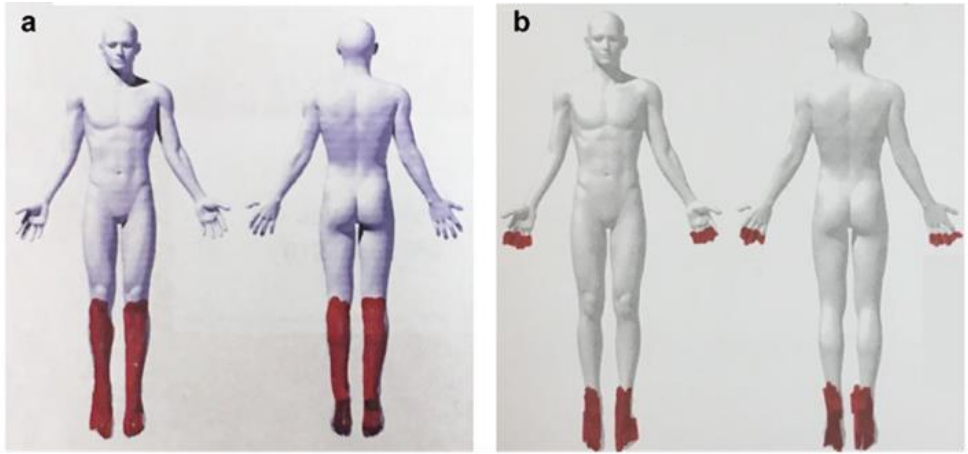


Analogie avec la neuropathie diabétique

- PNDD – fibres de petits calibres non myélinisées, Aβ et Aα

- Brûlures, décharges , coup de couteau, paresthésies, picotement

- 3 RCT
  - De Vos 2014
  - Slangen et am. 2014
  - SENZA 2021



Chen et al.; Journal of Diabetes Science and Technology 2022, Vol. 16(2) 282–288

Impact sur la qualité de vie

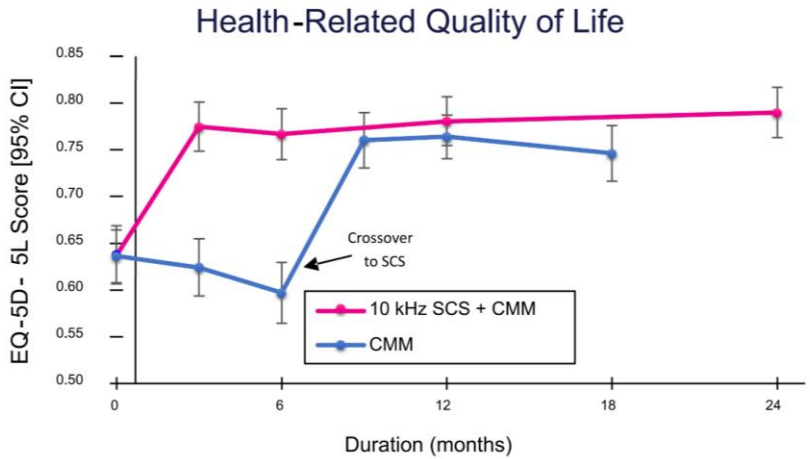


Fig. 3. SENZA-PDN change in EQ-5D index score over 24-months follow up in SCS and control PDN patients.

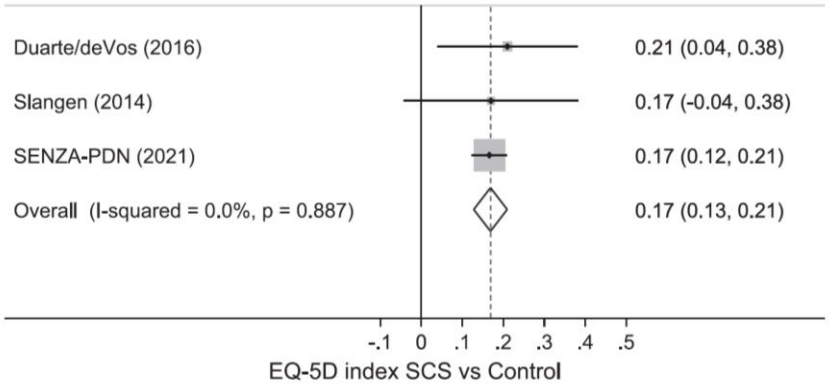
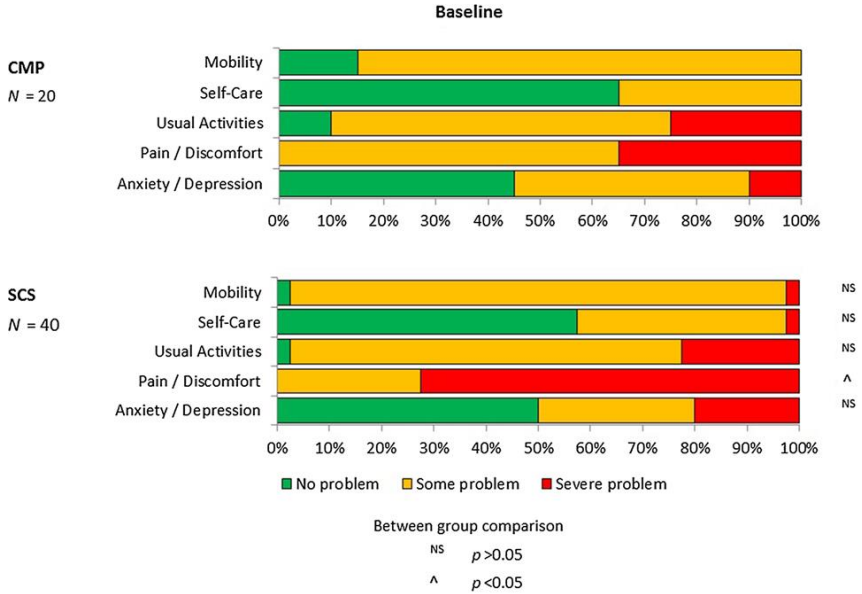
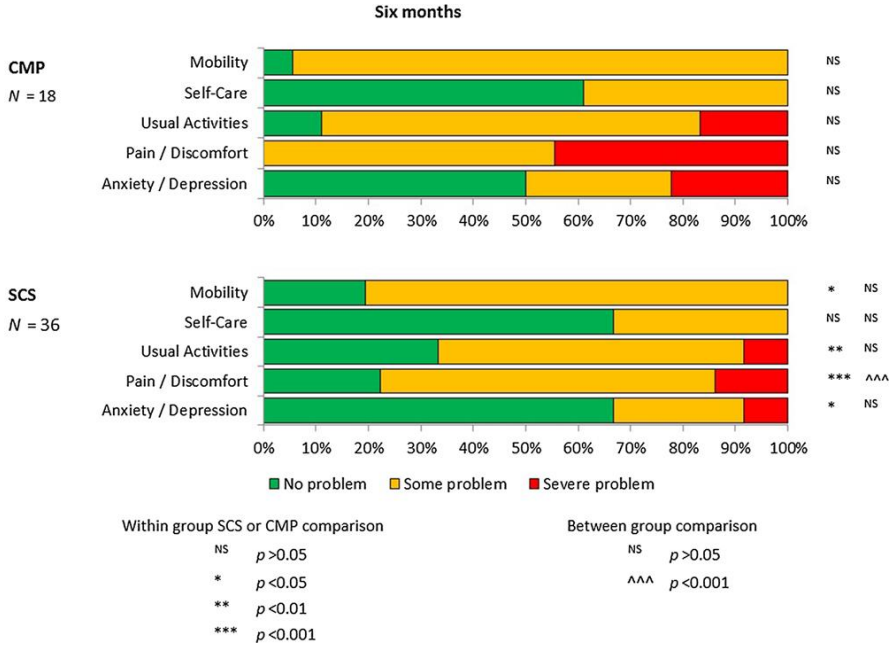


Fig. 1. Meta-analysis of RCTs of SCS for PDN – impact on EQ-5D index score at 6-months follow up. Studies pooled using a fixed effect *meta*-analysis model ($I^2 = 0\%$).

Taylor, Diabetes Research and Clinical Practice 206 (2023) 110826

Impact sur la qualité de vie

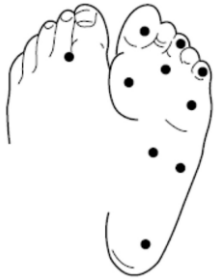




Duarte et al.; Qual Life Res (2016) 25:1771–1777

SCP et récupération fonctionnelle

- PND
  - douleur
  - perte de la sensibilité douloureuse
    - surface plantaire
    - X2 risque ulcération
    - X3 risque d'amputation
- Mortalité 5 ans diabétique amputé 5 ans



Improvement in Protective Sensation: Clinical Evidence From a Randomized Controlled Trial for Treatment of Painful Diabetic Neuropathy With 10 kHz Spinal Cord Stimulation

Charles E. Argoff, MD[1], David G. Armstrong, DPM, MD, PhD[2], Zachary B. Kagan, PhD[3], Michael J. Jaasma, PhD[3], Manish Bharara, PhD[3], Kerry Bradley, MS[3], David L. Caraway, MD, PhD[3], and Erika A. Petersen, MD[4] for Investigators

Journal of Diabetes Science and
1–7

DOI: 10.1177/19322968231222
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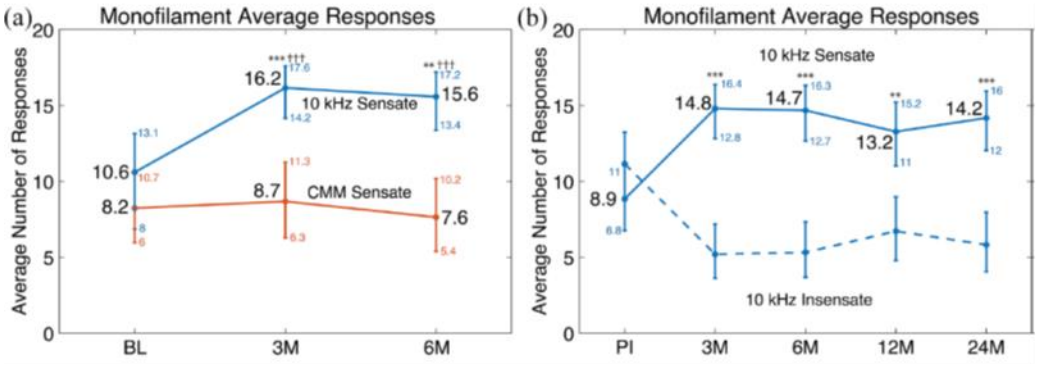
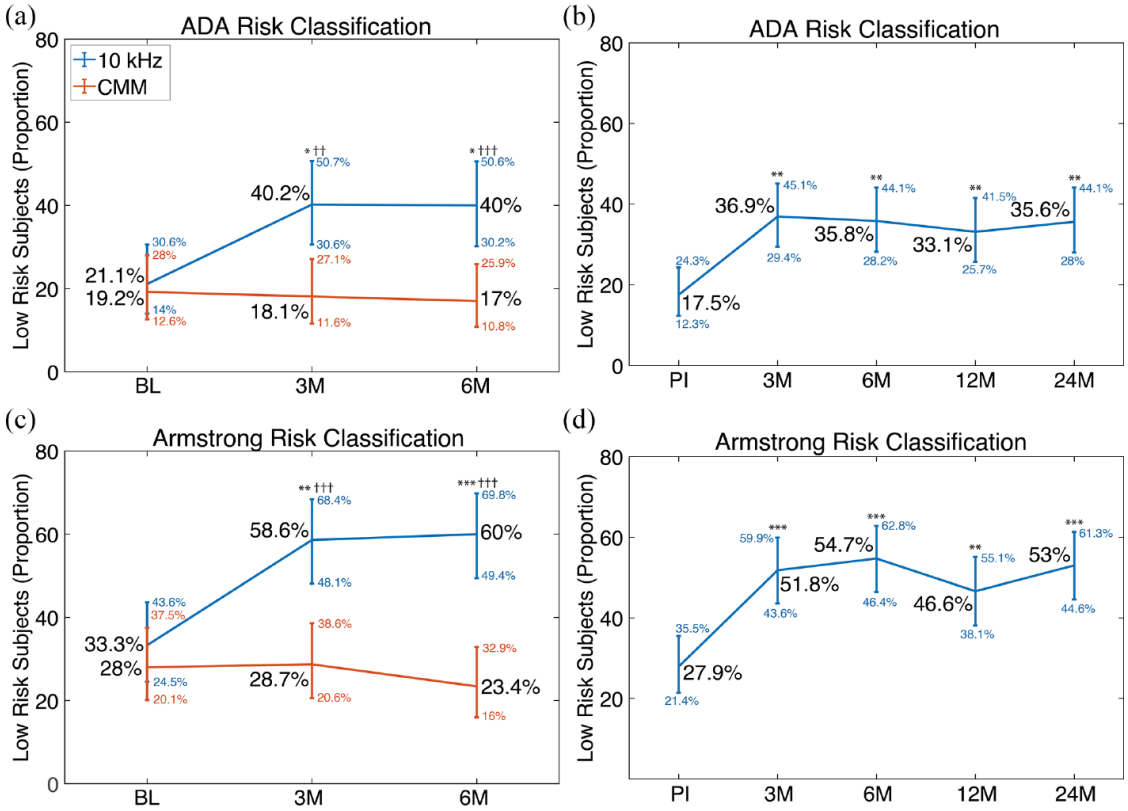


SCP et récupération fonctionnelle



Pain Medicine, 24(S2), 2023, S33–S40
https://doi.org/10.1093/pm/pnad096
Original Research Article

OXFORD

High-frequency spinal cord stimulation (10 kHz) alters sensory function and nerve fiber density in painful diabetic neuropathy: a pilot prospective open-label study

Jeffrey Chen, MD, MHS*[,1], Katie Frizzi, MAS[2], Shawn Zardouz, MD[1], Rose Province-Azalde, MS[3], Tim Furnish, MD[1], Mark Wallace, MD[1], Joel Castellanos, MD[1], Alireza Tayarani, MD[2], Kenneth Halter, PA[1], Katie Lam, RN[1], Sarah Banducci, PhD[3], Alex Chieu, BS[3], Nigel Calcutt, PhD[2]

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Abstract

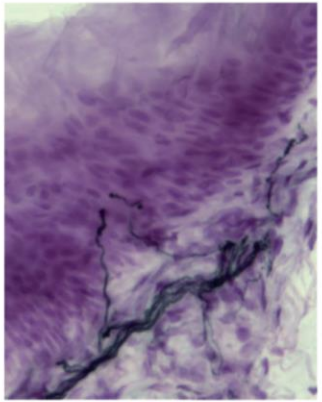
Objective: Spinal cord stimulation at 10 kHz has provided effective pain relief and improved function in painful diabetic peripheral neuropathy. This study aims to confirm the clinical outcomes for 10-kHz spinal cord stimulation treatment of painful diabetic peripheral neuropathy and explore its impact on objective quantitative measures of nerve pathology and function.

Methods: This single–academic center, prospective, open-label, observational study examined the pain relief success of 10-kHz spinal cord stimulation in patients >18 years of age with diabetic peripheral neuropathy. Patients underwent skin biopsies to measure intra-epidermal nerve fiber densities and corneal confocal microscopy measurements before implantation and at the 3-, 6-, and 12-month follow-up visits. Numerical rating scale for pain, visual analog scale, neuropathy pain scale, Short Form-36, and Neuropen (pin prick and monofilament) assessments were also conducted.

Results: Eight patients met the criteria and were enrolled in the study. A successful trial was achieved in 7 subjects, and 6 completed the study. Significant pain relief ($P < .001$) was achieved at all follow-up visits. Neurological assessments showed reduced numbers of "absent" responses and increased "normal" responses from baseline to 12 months. Both proximal and distal intra-epidermal nerve fiber densities were higher at 12 months than at baseline ($P < .01$). Confocal microscopy measurements showed a steady increase in nerve density from baseline (188.8% increase at 12 months; $P = .029$).

Conclusions: We observed pain relief and improvements in sensory function after stimulation that were accompanied by increases in lower-limb intra-epidermal nerve fiber density and corneal nerve density. Further evaluation with a blinded and controlled study is needed to confirm the preliminary findings in this study.

Keywords: 10-kHz spinal cord stimulation; painful diabetic peripheral neuropathy; nerve fiber density



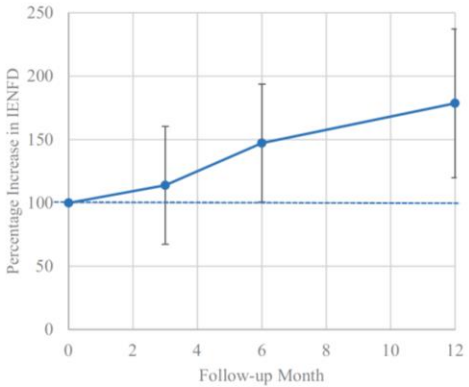
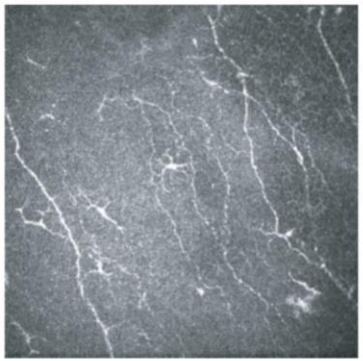
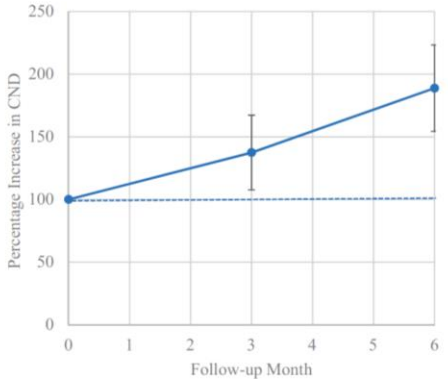


Figure 4. Representative image of nerve fibers crossing the dermal–epidermal interface in the skin of a study subject (left) and mean percentage increase from baseline in IENF density measurements (right). At 3 months, the average nerve density was 113.9% of the baseline value (a 13.9% increase), which was not a statistically significant change over baseline ($P = .42$). However, the increase became significant at 6 months, when the average ratio to baseline was 147% (95% CI: 108%–201%, $P = .024$), and it increased further at 12 months to 179% (95% CI: 129%–247%; $P = .002$). CI = confidence interval; IENF = intra-epidermal nerve fiber; IENFD = IENF density.





A 3 mois densité nerveuse augmentée de 113%

Sécrétion de facteurs de croissance

Neuropathie post-radiothérapie

- Plexopathie précoce
  - Surviennent dans l'année suivant la radiothérapie
  - Réversibles en général
- Plexopathie tardive: plexopathie radio-induite ou PRIT
  - rare
  - pronostic fonctionnel sévère
  - délai de survenue de plus d'un an (4 ans en moyenne)
  - progression est lente et irréversible
  - diagnostic est fait sur Électromyogramme (EMG) : affirme l'atteinte plexique et retrouve des myokymies
  - IRM : écarte l'atteinte tumorale
  - Si doute PET Scan FDG-18

SCS & radiothérapie

Table 1. Patient Demographics and Clinical Summary.

Patient ID	Age at SCS trial (y)	Sex (M/F)	Type of cancer	Location of pain	Type of pain	Level of SCS implant	Mode of SCS implant	Clinical summary
1	45.8	M	Non–small cell lung cancer	Anterior chest wall	Viscerosomatic	T5 (midline)	60–100 Hz	45M, NSCLC with metastases to the pleura and LNs and encasement of the left mainstem bronchus s/p chemoradiation.
2	69.4	F	Papillary thyroid cancer	Flank, sacrum, unilateral lower extremity	Somatic-neuropathic (entrapment neuropathy)	T7 (right)	60–100 Hz	69F, papillary thyroid cancer with sacral metastasis s/p radiotherapy and sacral cement augmentation.
3	42	M	Multifocal peripheral schwannoma	Low back, upper abdomen	Neuropathic (compressive neuropathy)	T7 (midline)	60–100 Hz	42M, schwannomatosis with metastatic lesions involving the pleura and liver.
4	59.3	M	Renal cell carcinoma	Lower back, hip	Somatic-neuropathic (radiculopathy)	T9, T10	60–100 Hz	59M, renal cell carcinoma with metastases to bone, liver, lung, LNs, and right psoas s/p kyphoplasty, chemoradiation, and separation surgery.[8]
5	63.9	F	Rectal cancer	Unilateral lower extremity	Neuropathic (radiculopathy, neuritis)	T10 (midline)	60–100 Hz	63F, rectal cancer s/p chemoradiation c/b recurrent sacral sarcoma, worsening radiation neuritis with neural foraminal stenosis.
6	77.1	F	Chordoma	Unilateral lower extremity, peripheral neuropathy	Somatic-neuropathic (neuritis)	T8, T10	60–100 Hz	77F, chordoma s/p XRT and lumbar decompression/fusion, c/b refractory postoperative neuritis.
7	58.8	F	Liposarcoma	Unilateral thigh and upper extremity	Neuropathic (neuritis, neuralgia)	T8 (mid), T8 (top)	>200 Hz	58F, liposarcoma s/p two right-sided peritoneal resections and radiation, c/b right thigh neuritis and neuralgia.
8	63.7	M	Renal cell carcinoma	Unilateral thigh and knee	Somatic-neuropathic (radiculopathy, neuritis)	T8, T9	>200 Hz	63M, renal cell carcinoma with metastases to brain and bone s/p palliative cement augmentation of right acetabulum c/b right pelvic abscess requiring drainage and chronic right groin and thigh pain.

c/b, complicated by; F, female; LN, lymph node; M, male; NSCLC, non–small cell lung cancer; s/p, status post; XRT, external radiation therapy.

Bulat et al.; Neuromodulation 2023; 26: 1051–1058

Neuropathie post-chirurgicale

- Essentiellement thoracique et mammaire

- Fréquence sous estimée:
  - 25 à 50% des patients après thoracotomie
  - 25 à 60 % des patients après mastectomie

- 2 facteurs de risque :
  - une lésion nerveuse et/ou la radiothérapie

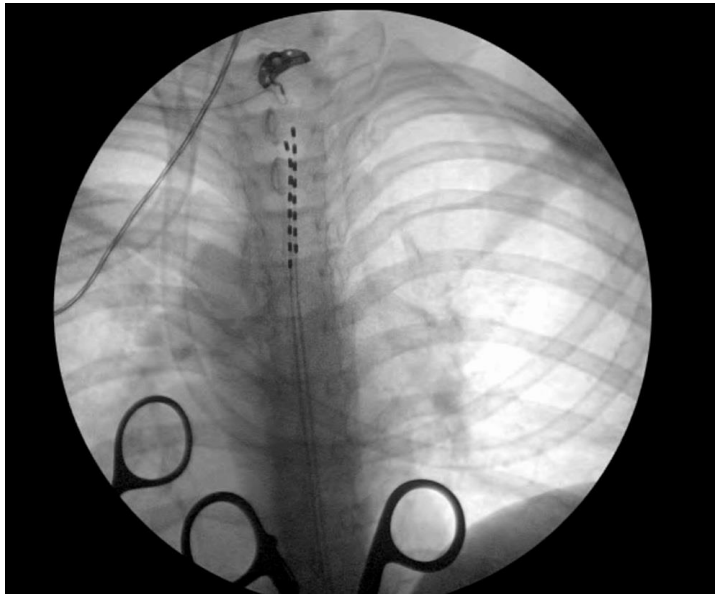
SCS & lésion chirurgicale

Neuromodulation for Adjunctive Treatment in Postmastectomy Pain Syndrome

Kennedy Kirkpatrick [1] , Jay D. Shah [1] , Krishna Shah [1, 2]

1. Anesthesiology, Baylor College of Medicine, Houston, USA 2. Anesthesiology and Interventional Pain, Baylor College of Medicine, Houston, USA

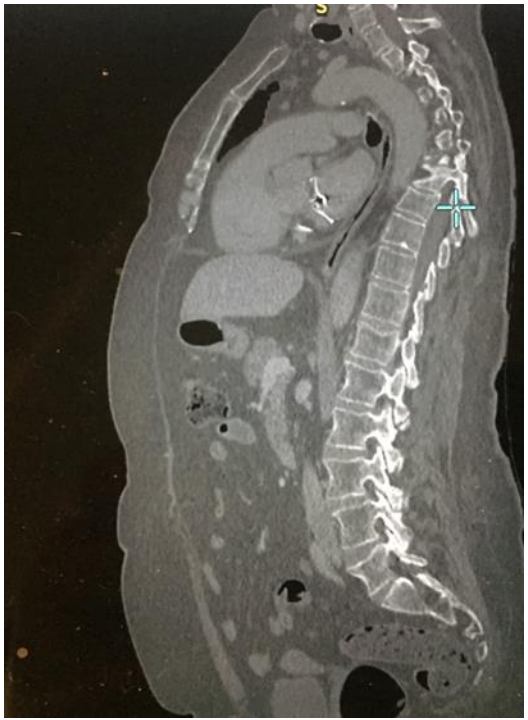
Review began 09/27/2023
Review ended 10/25/2023
Published 10/27/2023

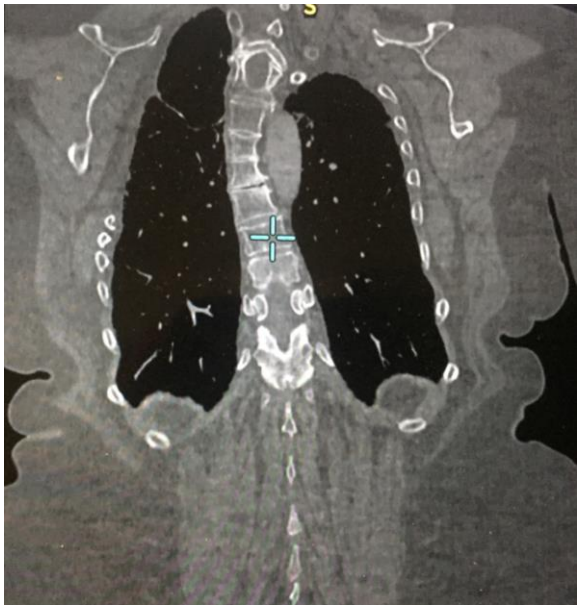


	Before implantation	Six months after implantation
Oswestry Disability Index (ODI) Score	42%	0%
Pain	6	0
Neuropathic pain medication dose	75mg Lyrica	None
NSAID dose	PRN, daily	None
Sleep score	Pain with medications, <4 hours of sleep	No effect on sleep
Social life	Restricted social life due to pain	No effect on social life
Travel	Trips limited to <1 hour	No effect on travel
Lifting	Able to lift light weights	Able to lift heavy weights without pain
Homemaking	Pain prevents anything but light activity	No limitation on activity
Walking	No limitations	No limitations
Sitting	No limitations	No limitations
Standing	No limitations	No limitations

SCS & lésion chirurgicale

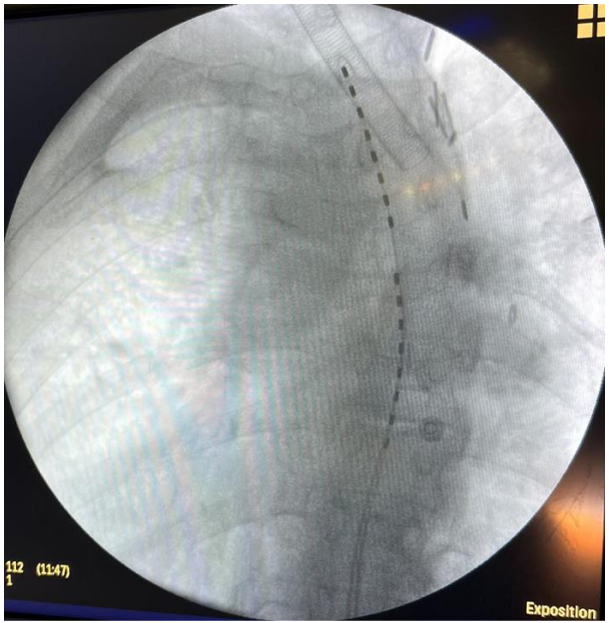
- Patiente de 63 ans
- Carcinome épidermoïde bronchique
- Lobectomie droite + radiothérapie
- Douleurs neuropathiques T1-T7
  - étau
  - brulures
  - paresthésies
  - allodynie
  - froid douloureux
  - décharges électriques
- Fond douloureux permanent 7/10
  - 10 accès paroxystique /jour





SCS & lésion chirurgicale

- Echec
  - Qutenza
  - TENS
  - rTMS
  - Toxine botulique
  - Lidocaine IV
  - Versatis
  - Cymbalta
  - Lyrica
  - Neurontin

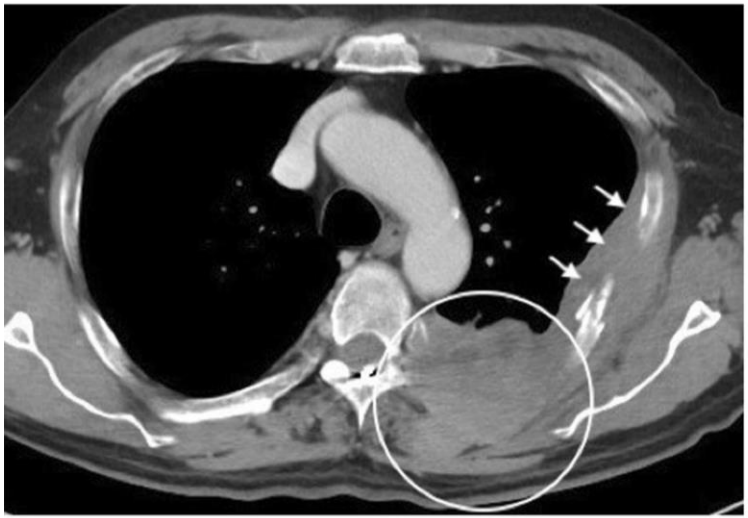


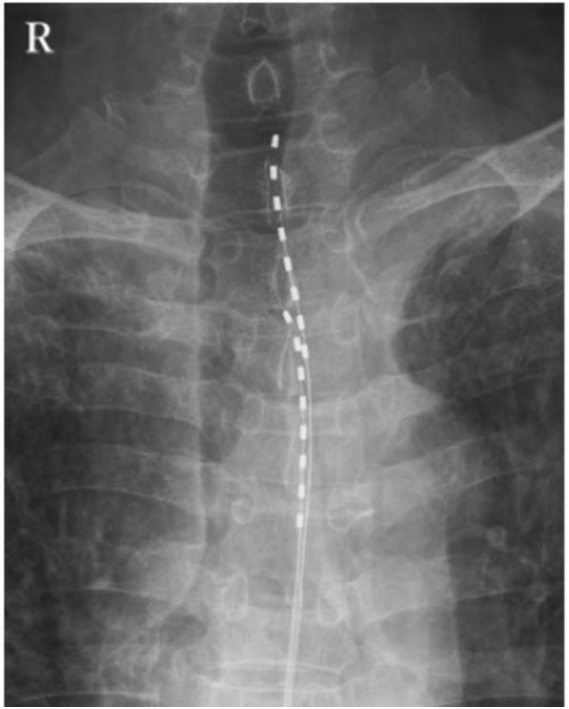
SCS & envahissement tumoral

CASE REPORT Open Access

Spinal cord stimulation alleviates intractable pain due to malignant pleural mesothelioma: a case report

Aiko Maeda[1*], Masatsugu Watanabe[2], Chiaki Saigano[2], Shoko Nakayama[1] and Ken Yamaura[3]



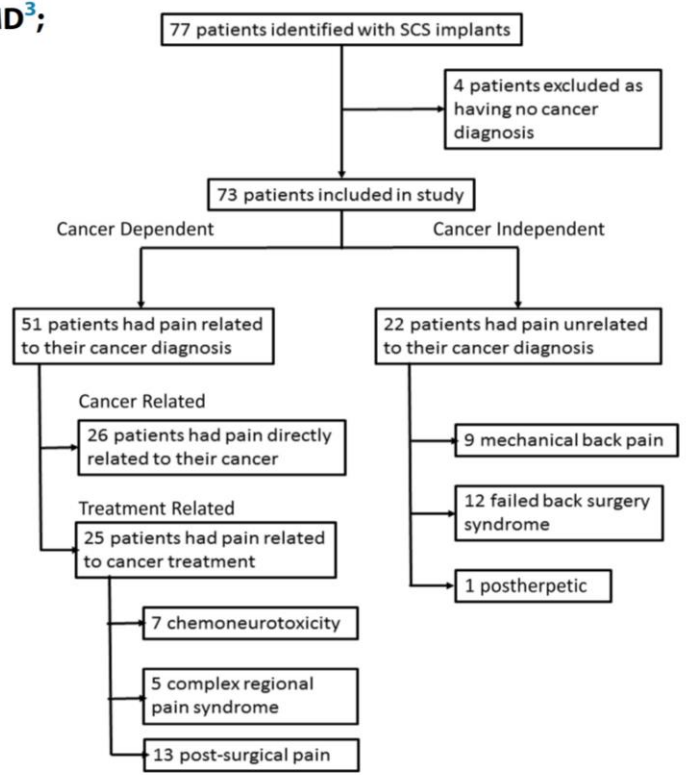


Spinal Cord Stimulation in the Treatment of Cancer Pain: A Retrospective Review

Jason E. Crowther, MD, PhD[1]; Grant H. Chen, MD[2]; Aron Legler, MD[3]; Amitabh Gulati, MD[3]

Table 3. SCS Trial Success Rate and Implantation Rate.

Patient characteristic related to cancer pain syndrome	*n*	Trial success rate	Implant rate
Cancer dependent	51	0.73	0.59
Cancer related	26	0.69	0.54
Treatment related	25	0.76	0.64
Cancer independent	22	0.77	0.68



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[Intervention Review]

Spinal cord stimulation for cancer-related pain in adults

Lihua Peng[1], Su Min[1], Zhou Zejun[1], Ke Wei[2], Michael I Bennett[3]

[1]The Department of Anaesthesia and Pain Medicine, The First Affiliated Hospital, Chongqing Medical University, Chongqing, China. [2]Department of Anaesthesia and Pain Medicine, The First Affiliated Hospital, Chongqing Medical University, Chongqing, China. [3]Leeds Institute of Health Sciences, University of Leeds, Leeds, UK

Contact: Su Min, The Department of Anaesthesia and Pain Medicine, The First Affiliated Hospital, Chongqing Medical University, No 1 Youyi Road, Yuan-jia-gang, Yu-zhong District, Chongqing, 40016, China. ms89011068@163.com.

Editorial group: Cochrane Pain, Palliative and Supportive Care Group.
Publication status and date: Stable (no update expected for reasons given in 'What's new'), published in Issue 7, 2019.

Citation: Peng L, Min S, Zejun Z, Wei K, Bennett MI. Spinal cord stimulation for cancer-related pain in adults. *Cochrane Database of Systematic Reviews* 2015, Issue 6. Art. No.: CD009389. DOI: 10.1002/14651858.CD009389.pub3.

Implications for research

General

Future research should focus on the implantation of SCS in patients with cancer-related pain at an early stage, and randomised controlled trials with larger samples are urgently needed to quantify the benefits and harms of this procedure, especially life-quality improvement and adverse events.

Design

Large, parallel randomised controlled trials, with at least 200 participants per arm, comparing spinal cord stimulation with other analgesic methods are urgently needed.

Measurement (endpoints)

Short-term and long-term analgesic efficacy and adverse events should be evaluated in future studies.

Other

Economic analysis of spinal cord stimulation for pain management in cancer patient could also be carried out in further research.

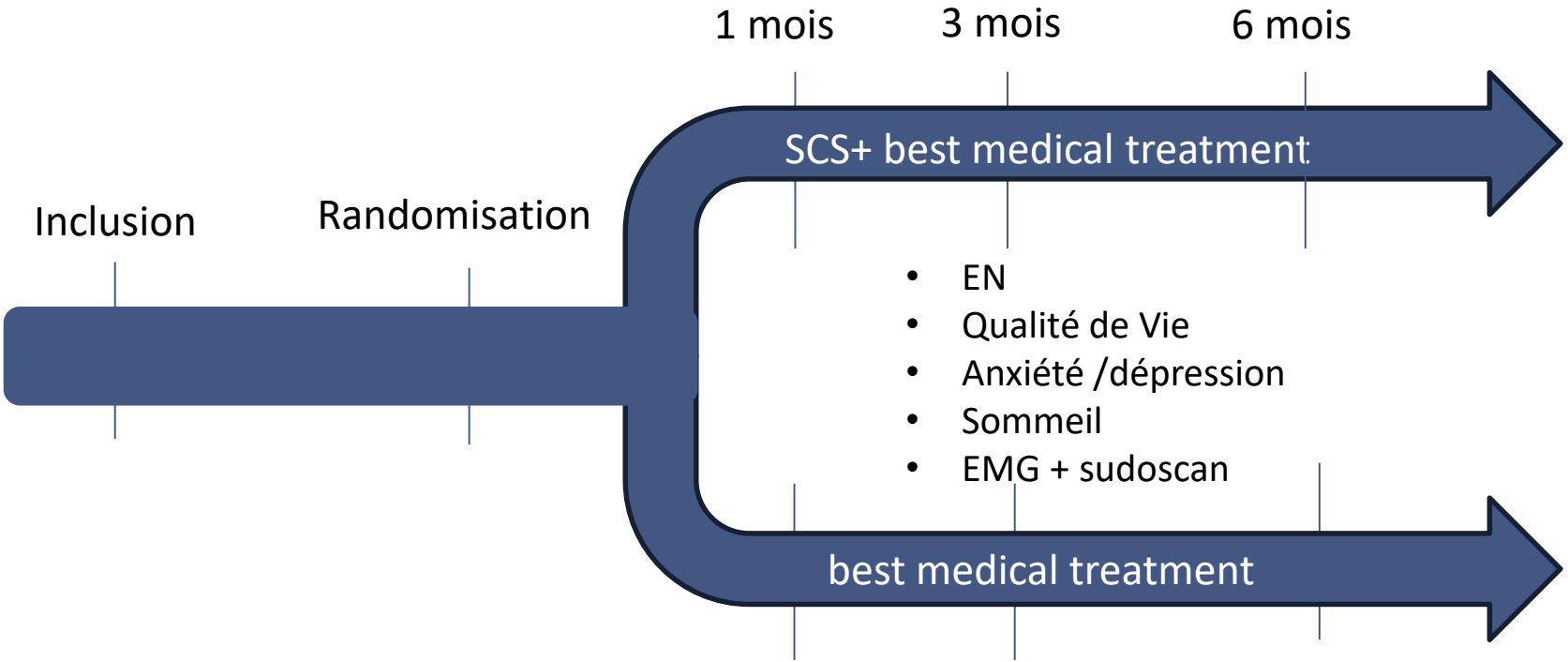
Eléments à considérer

- Quels patients implanter ?
  - Neuropathie post-chimiothérapie
  - Séquelles de thoracotomies
  - Plexopathie post-radiothérapie
  - Envahissement tumoral direct…
- Place relative de la PIT/ stimulation médullaire
- Difficulté d'accès pour ces patients au CETD douleur chronique mais souvent non pris en charge par les algologues en cancérologies (surtout si en rémission)
- La SCS doit-elle se limiter aux patients en rémission
- Patients fragiles, dénutrits
- Nécessité d'imagerie fréquente – IRM compatibilité?
- Problématique des chimios
- Sélection psycho est elle la même que pour des douloureux chronique …

Commission Neuromodulation SFETD

- Réunion de la commission de Neuromodulation et de la Commission Douleur de Cancer pour cette thématique
- Groupe de travail de 12 :
  - Anesthésistes
  - Algologues
  - Neurochirurgiens
  - Oncologues
  - Psychologues
  - Infirmière Douleur
  - Radiothérapeut
- 1ère réunion 26/1/24
- Présentation à la SFETD novembre 2024
  - Parcours de soins
  - Recommandations
  - Sélection des patients…

PHRC CHEMOSTIM



PHRC CHEMOSTIM

- Etude prospective randomisée multicentrique
  - 10 centres
- 80 patients
- 6 mois de suivi
- SCS vs best medical treatment

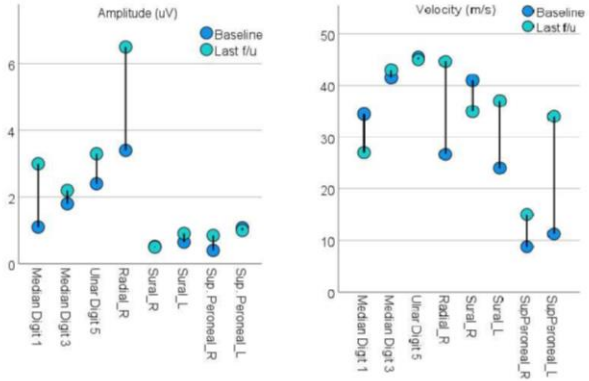
- **Inclusion Criteria:**
  - Adult patients ≥18 years of age who have been clinically diagnosed with chronic CIPN for more than 1 year
  - Average pain intensity ≥ 5/10-VAS in the lower extremities at enrollment
  - Failed conventional medication management with at least two neuropathic pain medications
  - Have electrophysiological evidence of length-dependent peripheral neuropathy
  - Have stable neurological status
  - Be on a stable analgesic regimen
  - Be an appropriate candidate for SCS
  - Be able to read and understand French-written questionnaires and sign an informed consent form
  - Be willing and capable of giving informed consent
  - Be willing and able to complete study-related requirements, procedures, and visits
  - Be affiliated to the French social Health security regimen

PHRC CHEMOSTIM

Neurological Function

Large Fibers

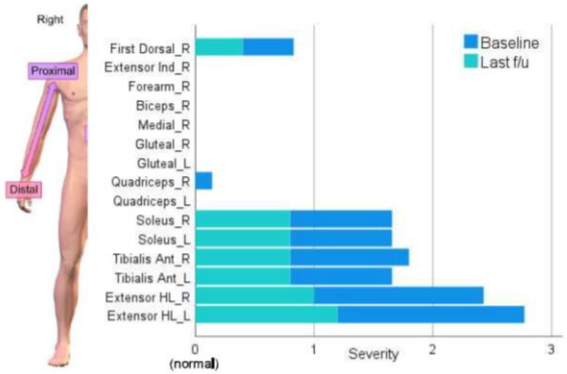
Nerve Conduction Study (Sensory Nerves)



Result: A progressive recovery in large sensory nerves (i.e. amplitude and velocity) is seen in both upper and lower limbs.

In motor nerves, this trend is not observed. Whether this is due to slower recovery, lack of effect, or muscle dysfunction is still unknown.

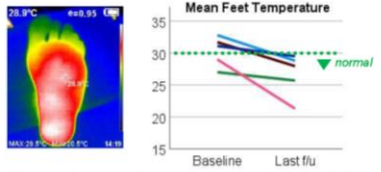
Electromyography (EMG)



Result: A distal-to-proximal pattern of affection was obtained at baseline. At last follow-up, EMG recordings showed a gradual reduction in severity and normalization in some subjects.

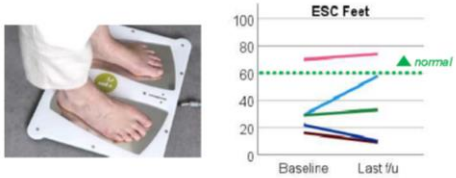
Small Fibers

Thermography



Result: Mean temperature decreased in feet from 30.8° to 26.7°; p=0.04 and hands from 31.8° to 30.3°; p=0.04

Electrochemical Skin Conductance (ESC)



Result: Positive trends toward recovery were seen in some subjects at long-term (6-to-12 mo), but group results are still inconclusive.

Paz-Solis et al.; Poster INS 2024

NOT YET RECRUITING

Spinal Cord Stimulation for Chemotherapy Induced Peripheral Neuropathy

ClinicalTrials.gov ID NCT06596200

Sponsor University of Maryland St. Joseph Medical Center

Information provided by University of Maryland St. Joseph Medical Center (Responsible Party)

Last Update Posted 2024-09-19

Study Overview

Brief Summary

Spinal Cord Stimulation using 10 kHz **stimulation** to the thoracic **spinal cord** will be a safe and effective treatment for CIPN, reducing pain in the lower extremities by at least 50%.

Official Title

Pilot Study for the Use of **Spinal Cord Stimulation** to Alleviate **Pain** from **Chemotherapy Induced** Peripheral **Neuropathy** Due to Taxane or Platinum Based Agents

Conditions

Chemotherapy-induced Peripheral **Neuropathy**

Intervention / Treatment

- Device: **Spinal Cord Stimulation** Implant

Other Study ID Numbers

- 00110894

Study Start (Estimated)

2024-09-15

Primary Completion (Estimate

2025-11-15

Study Completion (Estimated)

2026-11-15

Enrollment (Estimated)

10

Study Type

Interventional

Phase

Phase 4

RECRUITING

Assessing Effect of Spinal Cord Stimulation on Pain and Quality of Life with Chemotherapy-Induced Peripheral Neuropathy

ClinicalTrials.gov ID NCT05411523

Sponsor Mayo Clinic

Information provided by Mayo Clinic (Responsible Party)

Last Update Posted 2024-09-19

Brief Summary

This study examines how **spinal cord stimulation** (SCS) affects pain level and quality of life in patients experiencing chemotherapy-induced peripheral neuropathy (CIPN). CIPN is a nerve problem and one of the potential side effects of chemotherapy that causes pain, numbness, tingling, swelling, or muscle weakness in different parts of the body. CIPN usually begins in the hands or feet and gets worse over time. SCS is a type of therapy that has proven to be effective in treating numerous non-malignant pain disorders including failed back surgery syndrome, refractory angina, limb ischemia, complex regional pain syndrome, and diabetic peripheral neuropathy. SCS may also be useful in patients with CIPN. This study evaluates how SCS affects pain and quality of life in patients undergoing **spinal cord stimulation** for CIPN.

– Show less

Detailed Description

PRIMARY OBJECTIVES:

I. To measure percentage of responders who had at least 50% reduction in lower extremity pain at 6 months.

II. To measure overall improvement in neurological assessment at 6 months. III. To measure secondary metrics including change in perceived global change/satisfaction, health-related quality of life, and sleep disturbance.

IV. To determine if there are any significant adverse events encountered with spinal cord stimulation (SCS) therapy for cancer-related pain.

Study Start (Actual)
2022-04-14

Primary Completion (Estimated)
2026-04-15

Study Completion (Estimated)
2026-04-15

Enrollment (Estimated)
20

Study Type
Observational

DRG

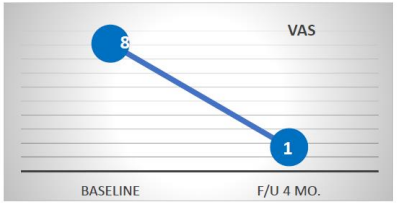
Dorsal Root Ganglion Stimulation								
Yelle et al. 2017 [46]	Case report	NR	49 years (n = 1)	DRG-S (L4–L5)	NR	>60% improvement in pain intensity	Increased walking distance without pain	Improved mood and dramatic improvement in sleep
Rao et al. 2019 [45]	Case report	No funding	53 Years (n = 1)	DRG-S (L5)	NR	Trial lead to >75% pain improvement	Worsened right side lower extremity numbness (buttock, posterior thigh, calf, and heel)	NR
Groenen et al. 2019 [49]	Case report	No funding	52 years (n = 1)	DRG-S (S1)	NR	VAS pain score improved from 8/10 to 0/10 for trial. VAS was 1/10 five months post-implantation	Regained ability to stand for prolonged period of time. EQ-5D score improved from 0.13 to 0.85. SF-36 physical component score improved from 23 to 31	SF-36 mental component score improved from 7 to 59
Finney et al. 2017 [47]	Case report	No funding	47 years (n = 1)	DRG-S (S1 and S2)	NR	50% pain improvement at 1-month follow-up	NR	NR
Sindhi et al. 2021 [43]	Case report	No funding	23 years (n = 1)	DRG-S (S3)	NR	7-day trial led to >65% pain improvement; Post-implant: >60% for 5 months	NR	Able to work 12 h shift with no pain
Kim et al. 2020 [44]	Case report	No funding	50 years (n = 1)	DRG-S (NR)	NR	Trial led to 100% pain improvement; Post-implant: 100% pain improvement at 3-year follow-up	NR	Able to wear shoes and exercise regularly
Grabnar et al. 2021 [48]	Case report	No funding	50 years (n = 1)	DRG-S (NR)	NR	VAS pain score improved from 8/10 to 0/10 during 7-day trial that was maintained through permanent implant	Lacked sensation to light touch and pinprick	Improved ability to wear shoes and exercise

D'Souza et al.; Biomedicines 2022, 10, 1909.

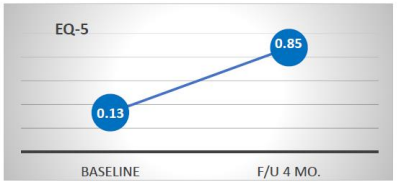
- Patiente de 52 ans
- Cyclophosphamide
- Douleur en chaussette à type de brulure
- EN 8/10

Results

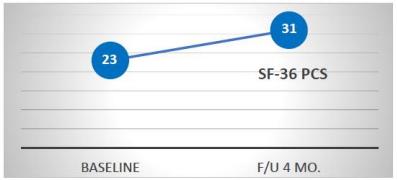
Pain by Visual Analogue Scale (VAS)



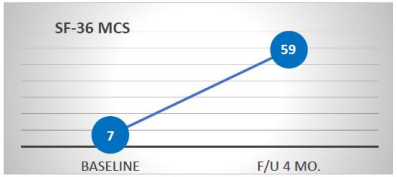
Generic Health by EQ-5D



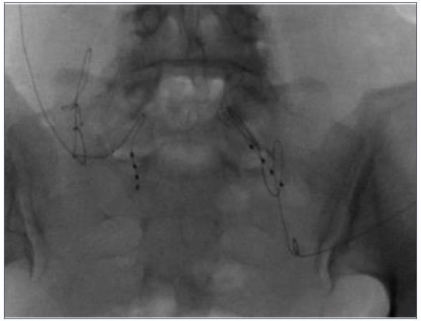
Physical Component of Quality of Life by SF-36



Mental Component of Quality of Life by MCS



Results



Anterior/posterior fluoroscopic view of the bilateral dorsal root ganglion stimulation electrodes (Axium, Abbott, Chicago, IL, USA) on the S1 level.

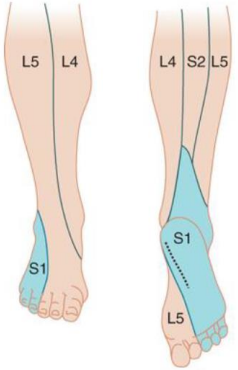
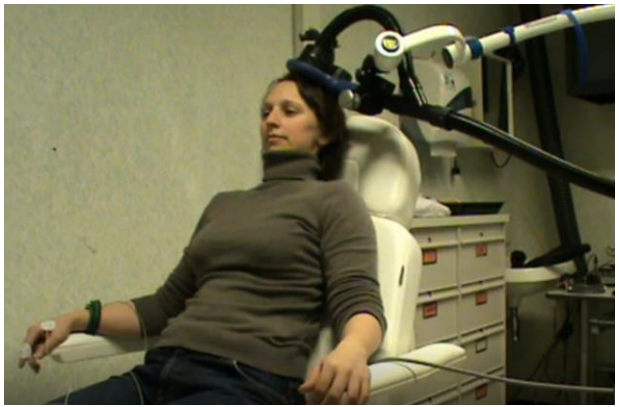


Illustration of the S1 dermatome. In this case we were able to obtain coverage of the entire feet with single S1 leads in addition to the areas that would normally be expected to be covered by stimulation at the S1 level. We attribute this extended coverage to inhibition of converged fibers from different dermatomes at the spinal cord level.

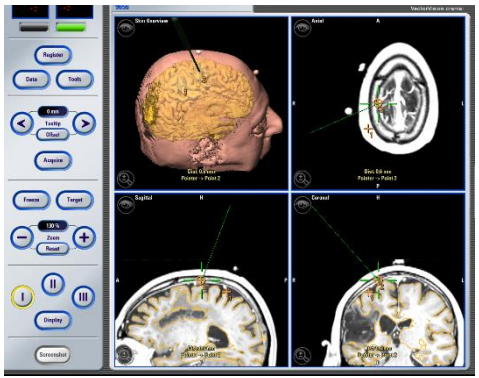
Chapman et al.; Dorsal root ganglion stimulation to treat chemotherapy induced peripheral neuropathy case report

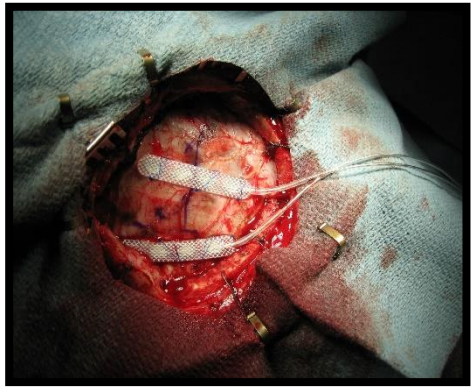
Stimulation cérébrale

- Non-invasive
  - rTMS
  - tDCS



- Invasive
  - Stimulation corticale





rTMS

European Journal of Pain

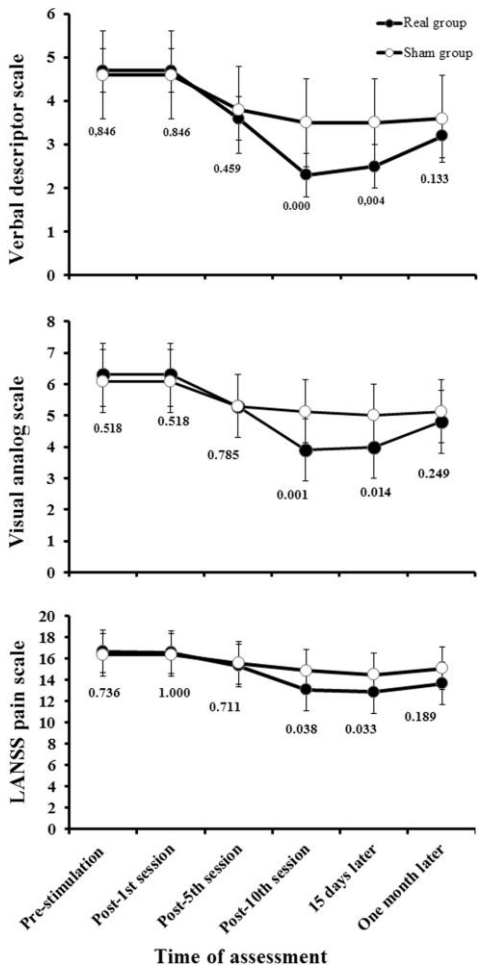
ORIGINAL ARTICLE

Repetitive transcranial magnetic stimulation in neuropathic pain secondary to malignancy: A randomized clinical trial

E.M. Khedr[1], H.I. Kotb[2], M.G. Mostafa[3], M.F. Mohamad[3], S.A. Amr[3], M.A. Ahmed[1], A.A. Karim[4,5], S.M.M. Kamal[3]

1 Department of Neurology, Assiut University Hospital, Egypt
2 Department of Anesthesiology, Assiut University Hospital, Egypt
3 Anesthesia, Intensive Care and Pain Management, South Egypt Cancer Institute, Assiut University, Egypt
4 Department of Prevention, Health Psychology and Neurorehabilitation, SRH University, Riedlingen, Germany
5 Department of Psychiatry and Psychotherapy, University Clinic Tübingen, Germany

- 34 patients
- Douleurs neuropathiques dans le cadre du cancer
  - post mastectomie
  - envahissement tumoral
  - post-chimiothérapie
  - post-radiothérapie



rTMS & CIPN

Pilot study of repetitive transcranial magnetic stimulation in patients with chemotherapy-induced peripheral neuropathy

Yuko Goto [a,b,c], Koichi Hosomi [a,b], Toshio Shimokawa [d], Takeshi Shimizu [e], Kiyoshi Yoshino [f], Seung Jin Kim [g], Tomoo Mano [a], Haruhiko Kishima [b], Youichi Saitoh [a,b,*]

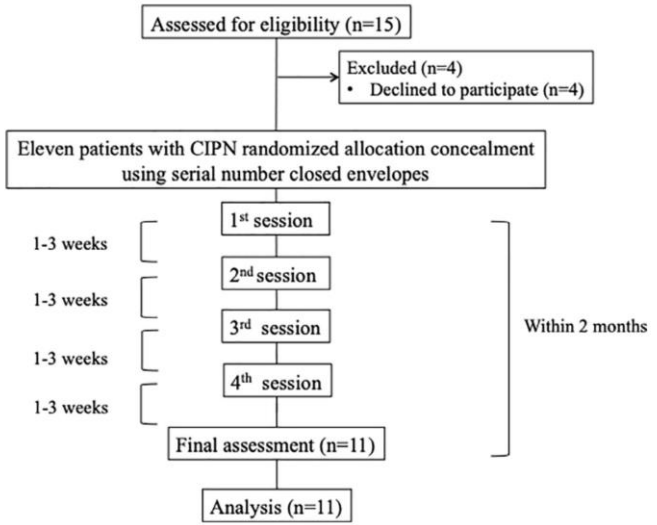
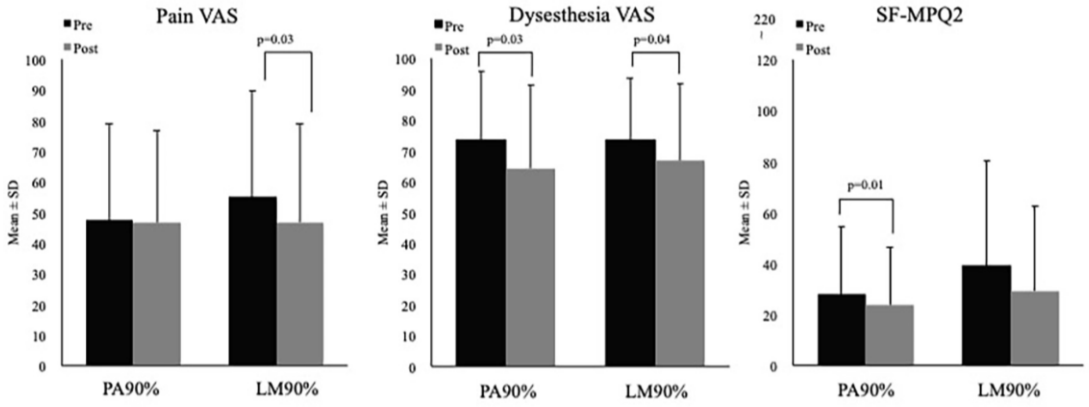


Fig. 1. Flowchart of the organizational structure of the study, with numbers of patients initially enrolled (n = 15).



rTMS: repetitive transcranial magnetic stimulation, VAS: visual analog scale,
SF-MPQ2: Short-form McGill Pain Questionnaire 2, PA: posterior-anterior, LM: lateral-medial

tDCS & douleur de cancer

Efficacy of transcranial direct current stimulation (tDCS) on pain and shoulder range of motion in post-mastectomy pain syndrome patients: a randomized-control trial

Mira Hany Zaky Hanna[1*], Soheir Shehata RezkAllah[1], Amr Saadeldeen Shalaby[1] and Monir Zaki Hanna[2]

Abstract

Background Post-mastectomy pain syndrome (PMPS) is a highly prevalent complication after surgical treatmer for breast cancer, and it affects the patient's quality of life in aspects of losing shoulder full range of motion, pain, depression. Transcranial direct current stimulation (tDCS) is non-invasive brain stimulation technique that was us numerous clinical applications and in pain reduction in cancer patients. However, the effectiveness of tDCS on PI has never been evaluated in an experimental study.

Aim To investigate the effect of bilateral anodal tDCS of motor cortex (M1) on pain, depression, and shoulder ra of motion (ROM) in post-mastectomy pain syndrome.

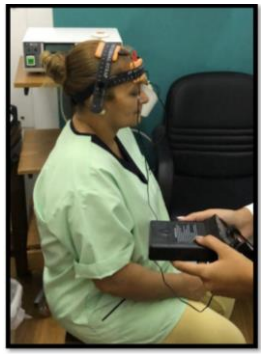
Study design Randomized controlled trial.

Methods A total of 30 female patients with post-mastectomy neuropathic pain were randomized into two grou the intervention group which received bilateral tDCS on motor cortex (M1) and the control group that received bilateral tDCS on M1. As pain affects shoulder range of motion (ROM), shoulder ROM was measured by electroni goniometer pre- and post-tDCS application. In addition, the levels of pain and depression have been measured and post treatment. Pain has been measured with visual analogue scale (VAS) and depression with Beck-Depress Inventory-BDI questionnaire (BDI).

Results A significant difference was noted in group A regarding pain, depression and shoulder ROM (p= 0.001, 0.003, and p= 0.003, respectively). Between group comparison revealed a significant difference of VAS scores and shoulder flexion ROM between groups, the study group and the control group (p=0.041 and 0.048, respectively) decreased by 32% and Shoulder flexion increased by 4.8% post-treatment while there were no significant differe in group B (p=0.567 and p=0.866, respectively).

Conclusions The application of tDCS decreases the severity of pain and improves shoulder range of motion suf by breast cancer patients after total mastectomy surgery.

Keywords Transcranial direct current stimulation, Mastectomy, Neuropathic pain



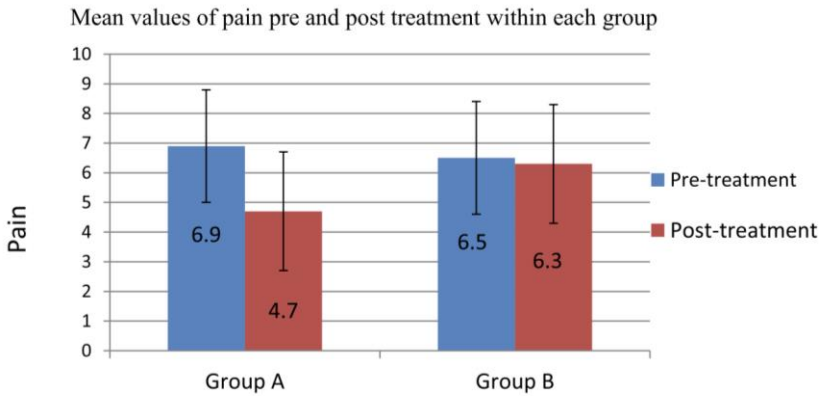


Fig. 7 Mean values of pain pre- and post-treatment within each group

NOT YET RECRUITING

Neural and Immune Correlates of CIPN and Possible Analgesic Effect of Non-invasive Motor Cortex Stimulation (NIBS4CIPN)

ClinicalTrials.gov ID NCT06522685

Sponsor Morgan State University

Information provided by Morgan State University (Responsible Party)

Last Update Posted 2024-07-26

Study Overview

Brief Summary

Over half of cancer patients receiving common chemotherapy treatments experience painful nerve damage called chemotherapy-induced peripheral neuropathy (CIPN). Non-Hispanic Black (NHB) patients are more likely to suffer from this condition and more often need to reduce their chemotherapy doses compared to Non-Hispanic White (NHW) patients.

Currently, only one medication, duloxetine, is approved for treating CIPN, but it doesn't work for everyone. A new approach, transcranial direct current stimulation (tDCS), shows promise as a safe and effective treatment. tDCS can be done at home and reduces the need for hospital visits.

Research indicates that tDCS can improve pain responses in the brain's pain control network. There are differences in pain sensitivity and brain activity related to pain between NHB and NHW individuals, which may influence the effectiveness of treatments.

This research aims to conduct a study to:

1. Test if tDCS is a helpful treatment for painful CIPN.
2. Investigate how CIPN affects brain function in NHB and NHW patients.
3. Examine the role of inflammation in CIPN and its connection to pain severity and brain function.

Nguyen et al. BMC Palliative Care (2023) 22:15
https://doi.org/10.1186/s12904-023-01129-0

STUDY PROTOCOL Open Access

Bicentre, randomized, parallel-arm, sham-controlled trial of transcranial direct-current stimulation (tDCS) in the treatment of palliative care patients with refractory cancer pain

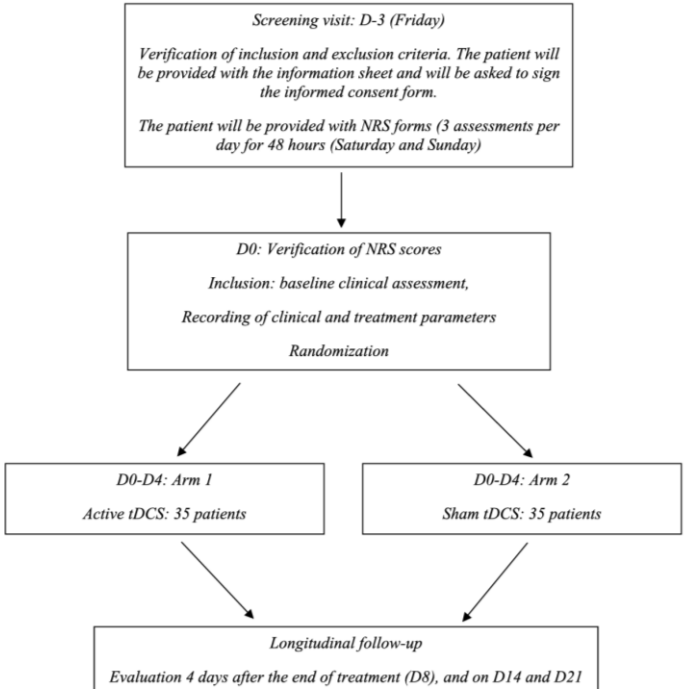
Jean-Paul Nguyen[1,2], Hélène Gaillard[2], Alcira Suarez[1], Élie Terzidis-Mallat[3], Diane Constant-David[2], Aurélien Van Langhenhove[2], Adrien Evin[2], Catherine Malineau[1], Son V. O. Tan[4], Alaa Mhalla[5,6], Jean-Pascal Lefaucheur[5,7] and Julien Nizard[2,5*]

Inclusion criteria

- Patients between the ages of 18 to 80 years with cancer pain refractory to medical treatment (mean NRS ≥ 4/10 on 2 consecutive days) in the palliative care setting.
- Patients agreeing to participate in a research protocol in this palliative care setting.

Exclusion criteria

- Patients younger than 18 years or older than 80 years.
- NRS < 4/10 (pain controlled by adapted medical treatment and global management).
- Patients unable to fill in the various questionnaires, specifically chosen to be simple and easy to fill in.
- Patients refusing to sign the informed consent form.
- Patients with cognitive impairment, metal implantation in the brain and mood disorders
- Patients with a life expectancy less than 3 weeks (duration of study follow-up).



Conclusion

- Peu de données dans la littérature
- Beaucoup de patients
- Distinguer le type d'atteinte à l'origine des douleurs
- Distinguer le type de douleur
- Distinguer la population de patients (évolutif ou rémission)
- Neuromodulation invasive
  - Patients fragiles
  - IRM compatibilité
  - Nécessité de pluridisciplinarité +++
    - Oncologues
    - Radiothérapeutes…
  - Sélection des patients / Nécessité d'intervenir au bon moment
- Besoin d'établir des recommandations sur le parcours de soins → SFETD 25-27/11 Lille
- Nécessité d'essais randomisés contrôlés

Merci pour votre attention

anne.balossier@ap-hm.fr