

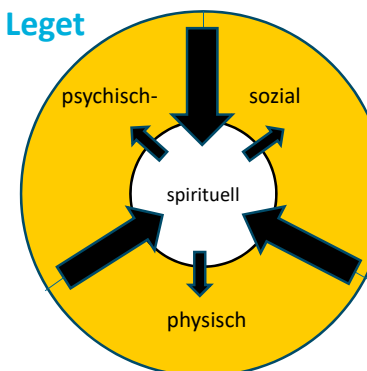
Interventionelle Techniken in der Tumorschmerztherapie

3. Mainzer Palliative Care Symposium
Dr. Heinrich Moser, Anästhesie, Schmerztherapie, Palliativmedizin, FIPP
Kontakt: h.moser@care4homecare.nl

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Das Modell der vier Dimensionen

Prof Carlo Leget



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Epidemiology of cancer pain

- **Prevalence of Pain**
 - Early stage of disease : 30 % to 45% of patients
 - Advanced stage of the disease : > 75 % of patients
 - Persistent pain in Cancer survivors in a consequent growing population
- **Pain Intensity**
 - more than one-third of patients graded their pain as moderate or severe (4-6)
 - high (7- 8/10) : 25 to 30 % of patients

(1) Cancer-related pain: a pan-European survey of prevalence, treatment, and patient attitudes H. Breivik1*, N. Cherny2, B. Collett3, F. de Conno4, M. Filbet5, A. J. Foubert6, Annals of Oncology 20: 1420–1433, 2009
(2) M. Brown , P. Farquhar-Smith: persistant pain in Cancer survivors: Br J Pain, 2014 Nov;8(4):139-53. doi: 10.1177/2049463714542605.

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1070 Journal of Pain and Symptom Management

Vol. 51 No. 6 June 2016

Review Article

Update on Prevalence of Pain in Patients With Cancer: Systematic Review and Meta-Analysis

Marieke H.J. van den Beuken-van Everdingen, MD, PhD, Laura M.J. Hochstenbach, MSc, Elbert A.J. Joosten, PhD, Vivianne C.G. Tjan-Heijnen, MD, PhD, and Daisy J.A. Janssen, MD, PhD

	Cured of cancer	During therapy	Advanced stage
1966-2005	33 %	59 %	64%
2005-2014	39.3 %	55 %	66.4 %

The number of artikels increased with 35 %
Methodological quality improved

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Evidenz und Voraussetzungen – Interventional Pain Management

Indian J Palliat Care. 2015 May-Aug;21(2):137-47.

Evidence-based Clinical Practice Guidelines for Interventional Pain Management in Cancer Pain.

Bhatnagar S¹, Gupta M²

Cancers (Basel). 2019 Mar 29;11(4).

Interventional Techniques to Management of Cancer-Related Pain: Clinical and Critical Aspects.

Kurita GP^{1,2}, Sjögren P^{3,4}, Klepstad P^{5,6}, Mercadante S⁷.

Cardiovasc Intervent Radiol. 2019 Jun;42(6):791-799

Percutaneous Neurolysis for Pain Management in Oncological Patients.

Filippiadis DK¹, Tselikas L², Tsitskari M³, Kelekis A⁴, de Baere T², Ryan AG⁵

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Erweiterung der Behandlungsoptionen

Curr Pain Headache Rep. 2017 Feb;21(2):12. doi: 10.1007/s11916-017-0613-0.

New Cancer Pain Treatment Options.

Candido KD^{1,2,3}, Kusper TM⁴, Knezevic NN^{4,5,6}

- The consequences of implementing suboptimal treatment are far-reaching; therefore, effective treatment methods are in a great demand.
- The face of cancer pain management has changed in considerable ways, and **interventional procedures** have become an integral part of providing multimodal analgesia in cancer pain treatment.
- The previous WHO pain treatment algorithm has been modified to **include interventional pain treatment** modalities that can be opioid sparing

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Evidence-based effective management

Palliat Med. 2020 Jan

Practice review: Evidence-based and effective management of pain in patients with advanced cancer.

Chapman EJ¹, Edwards Z¹, Boland JW², Maddocks M³, Fettes L³, Malia C⁴, Mulvey MR¹, Bennett MI¹

- Tailored approach, selfmanagement and review treatment outcomes
- Opiate
- Bisphosphonate
- Radiotherapie
- Cannabinoids
- Weak opioids, ketamine and lidocaine
- i.e. Interventions not yet supported by robust evidence

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Interventionelle Techniken

Reversibel

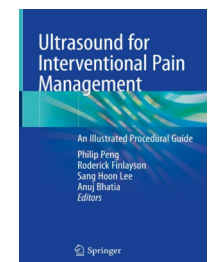
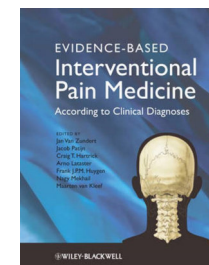
- Nervenblockaden (Kathetertechniken)
- Nervenwurzelbehandlungen
- Nervengruppenblockade

Irreversibel

- Sympathicusblockaden
- Chordotomie (Cordotomy)
- "Lower end Blok"

Kontinuierlich

- Neuromodulation
 - Spinalkatheter
 - Spinalcordstimulation



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Equipment/Voraussetzungen

- Behandlungsraum
- Röntgengerät
- (Plexus) Katheter
- Injektionsmaterial
- Medikamente
- Radiofrequenz- Generator
- Pumpen (extra/intracorporal)
- Spinalcordstimulations- Material



- Abwägung Indikationen und Contraindikationen

S. Bhatnagar 2015" : "technical expertise, proper infrastructure and trained paramedical staff"

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Medikamente

- Lokalanästhetika
- Corticoide (Methylprednisolonacetat, Hydrocortison)
- Clonidine
- Phenol 6% (isobar und hyperbar)
- Alkohol 97%



- Morphin
- Hydromorphon
- Ziconotide
- Clonidine
- Baclofen



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Radiofrequenz Generator

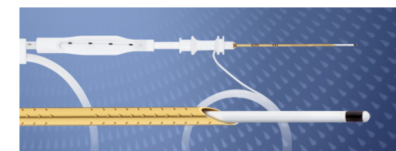


- 1931 zuerst beschrieben durch Kirschner zur Behandlung des Ganglion Gasser
- In den 1980er Jahren weiterentwickelt durch Sluijter en Metha
- 300-500 kHz, versehen mit einem Thermostat an der Nadelspitze
- Radiofrequente und gepulste radiofrequente Behandlungen

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Reversible Interventionen

- Nervenblockaden (sonographische Kathetertechniken)
= vollständige Blockade peripherer Nerven in ihrer Funktion
plexus suprascapularis
plexus brachialis
plexus der unteren Extremität

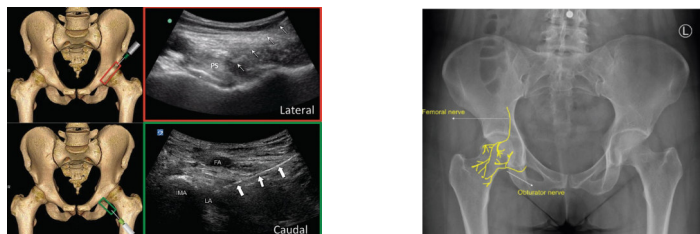


- Kurze Liegedauer
- Risiko der Dislokation
- Schwierig im ambulanten Setting

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Reversible Interventionen

- PENG Blockade bei Hüftkopffrakturen



Reg Anesth Pain Med. 2018 Nov;43(8):859-863.

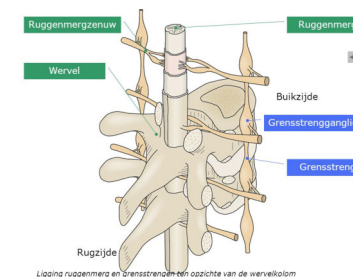
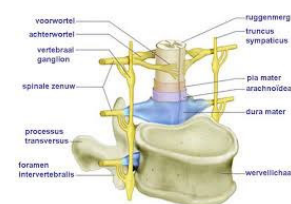
Pericapsular Nerve Group (PENG) Block for Hip Fracture.

Girón-Arango L, Peng PWH, Chin KJ, Brull R, Perlas A

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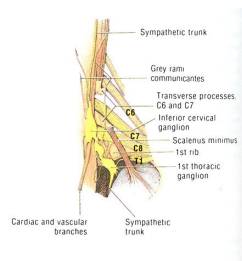
Irreversible Interventionen

- Destruierende Interventionen
= teilweise Blockade peripherer Nerven und des sympathischen Nervengeflechts wobei die Irreversibilität relativ ist
- Radiofrequente Behandlung mit 80° C
- Injektion von Phenol 6% oder Alkohol 97%
- Effect mehrere Monate bis Jahre



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RF vs PRF Ganglion Stellatum: PMPS



Pain Physician. 2018 Jul;21(4):351-362.

Thermal Versus Super Voltage Pulsed Radiofrequency of Stellate Ganglion in Post-Mastectomy Neuropathic Pain Syndrome: A Prospective Randomized Trial.

Abbas DN¹, Reyad RM¹

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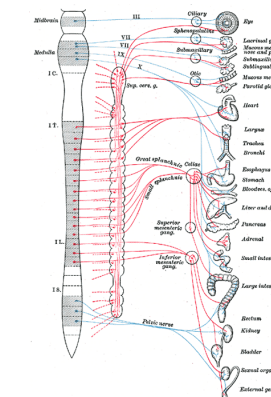
Plexus nervi splanchnici Blockade

Bei visceralen Schmerzen des Oberbauchs

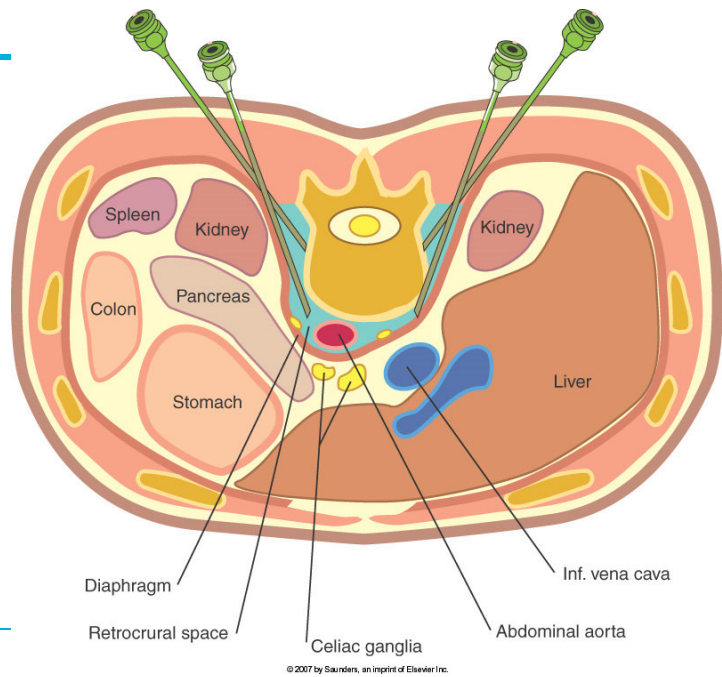
- Magen
- Oesophagus
- Leber + Gallenwege
- Pankreas

Im Frühstadium
Opiatsparend

(Chronische Pankreatitiden)



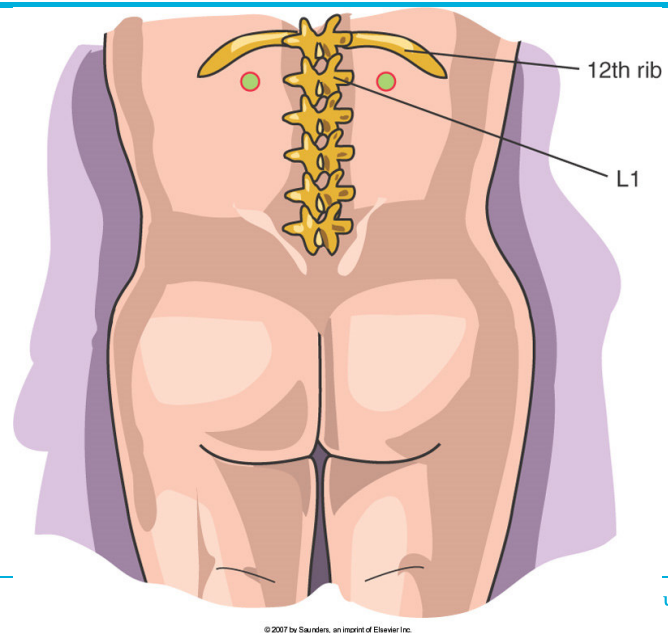
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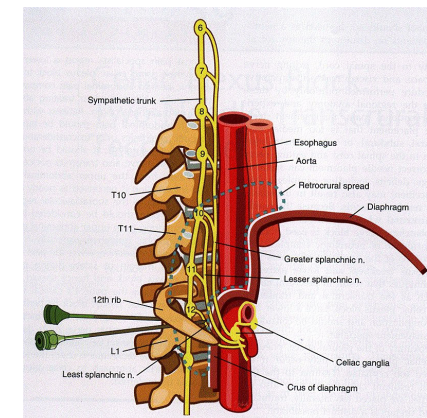
Plexus coelicus Blockade

- Vor allem PanKreastumore
- radiofrequente Behandlung
- Injektion von Phenol 6% oder Alkohol 97%
- Nebeneffekte:
 - Zunahme Darmperistaltik
 - Hypotension kurzfristig

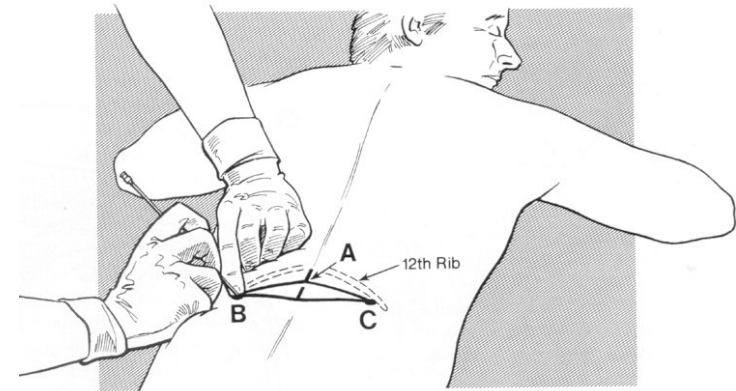
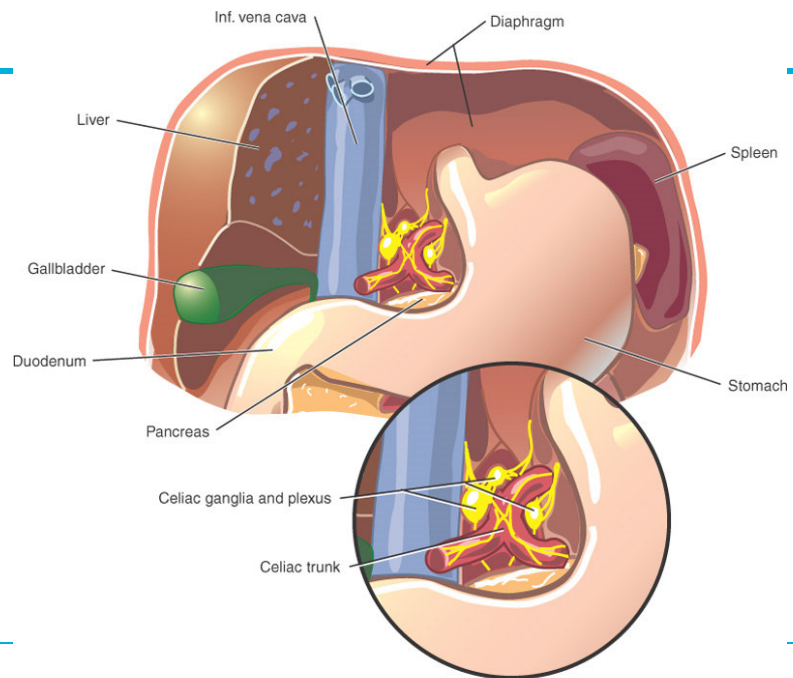
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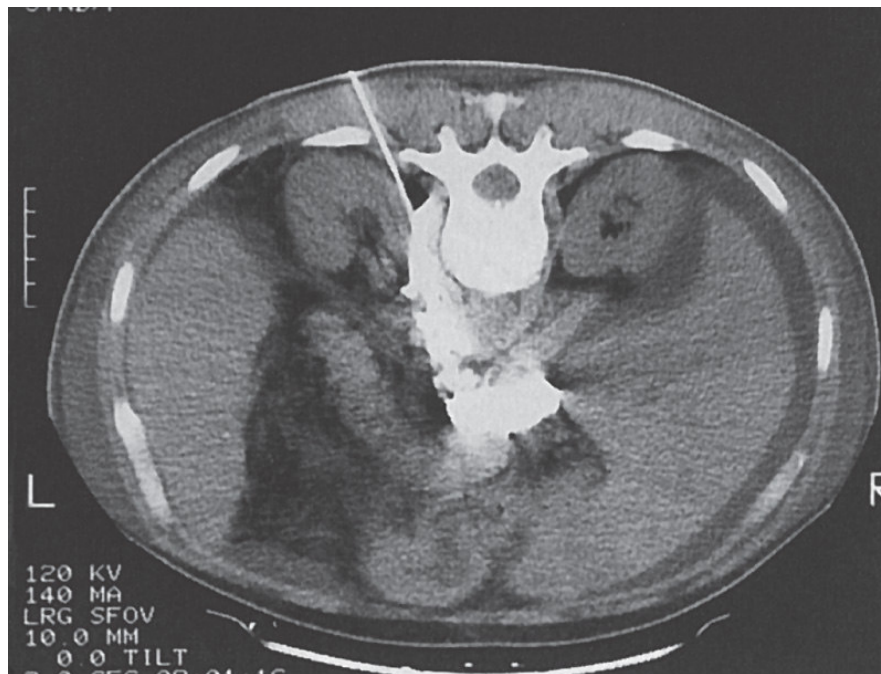
Anatomie in Relation mit WS und großen Gefaessen



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Effekt auf Schmerzen

Pankreascarcinom

Nach 2 Wochen: 89% Schmerzreduktion
58% schmerzfrei

Nach 3 Monaten: 90% Schmerzreduktion
56% schmerzfrei

Chronische Pankreatitis

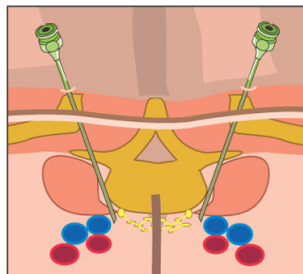
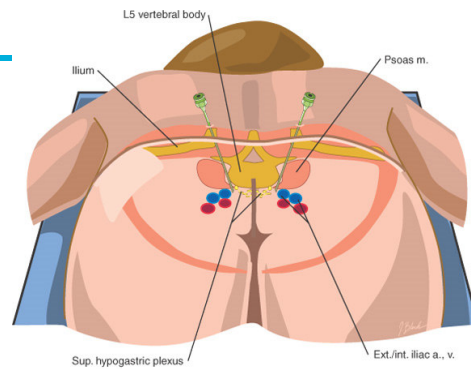
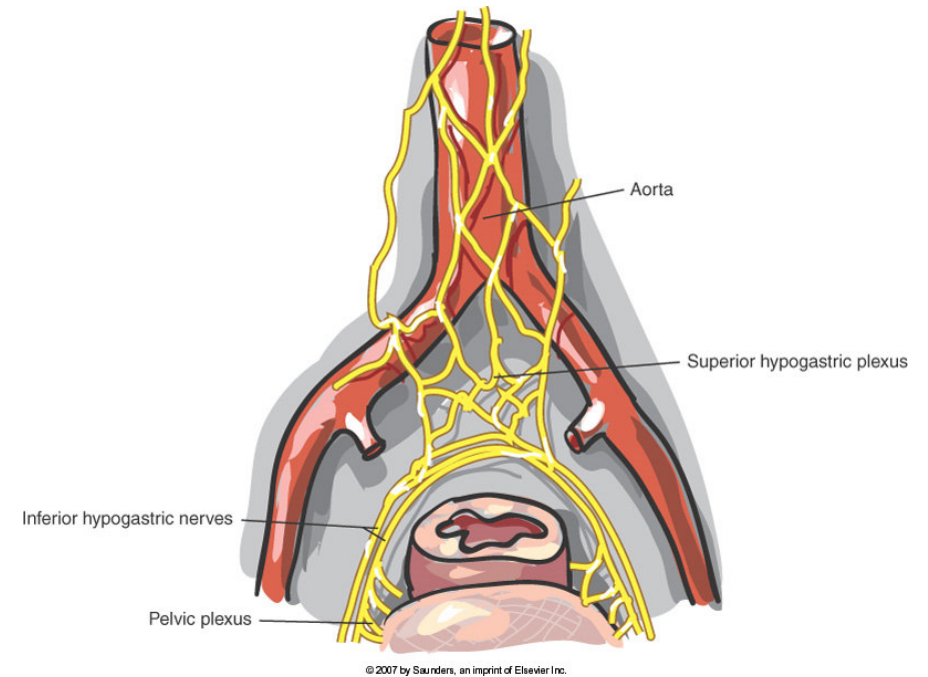
Nach 2 Wochen: 50-70% deutliche Schmerzreduktion
Wiederholung nach 3-6 Monaten

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Hypogastricus Blockade

- Viszeraler Schmerz durch Tumoren im kleinen Becken
 - Blase
 - Prostata
 - Uterus
 - Vagina
 - Penis
 - Nach Bestrahlungen (Proctitis)

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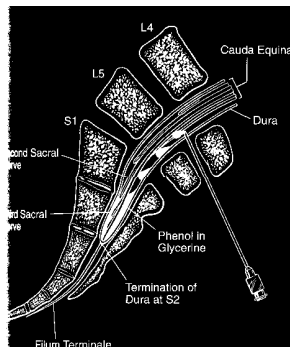
(From Waldman SD: Atlas of Interventional Pain Management, 2nd ed. Philadelphia, Saunders, 2003, p 417, Fig. 90-1.)

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Lower End-Blockade

- Destruierende Interventionen im Spinalkanal
- Durch Injektion von hyperbarem Phenol 6%
- Tumoren die in das Perineum einwachsen
- Vaginale Tumore
- Effekt: sehr rasche Schmerzreduktion um 60%
- Nebeneffekt: sehr wahrscheinlich inkontinent für Urin

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Chordotomie (Cordotomy)

- Destruierende/ablative Interventionen bei opiatresistenten Schmerzen >C5
- radiofrequente Behandlung des Tractus spinothalamicus C1/C2
- Aufsteigende Schmerzbahnen werden durchtrennt
- 1912 erstmals durchgeführt durch Spiller und Martin
- Röntgen (Fluoroscopie) oder CT gesteuert oder als neurochirurgische Eingriff

- Mesotheliome
- Pancoasttumoren

Cordotomy.

Teoli D¹, An J².

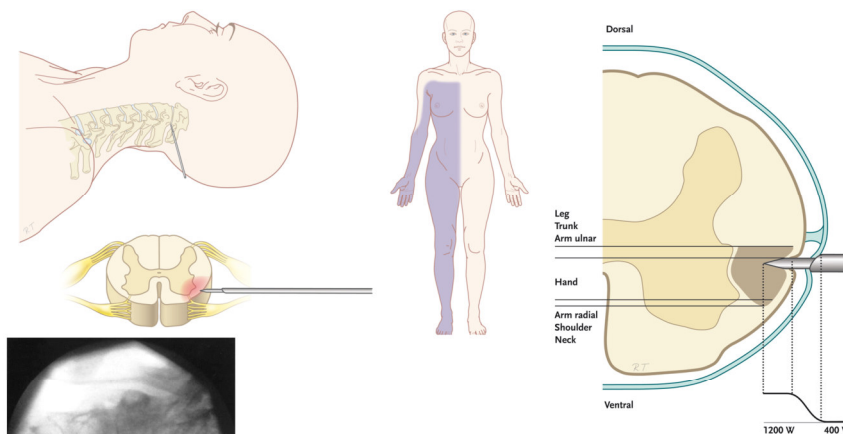
Source

StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020-. 2019 Nov 10

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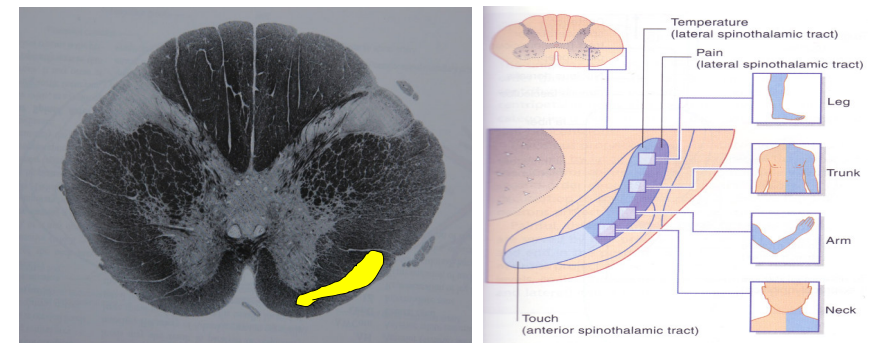
Cervical cordotomy: Unilateral pain below C5 – shoulder



Pain Pract. 2011 Sep-Oct;11(5):453-75. doi: 10.1111/j.1533-2500.2011.00473.x. Epub 2011 Jun 17.

23. Pain in patients with cancer.

Vissers KC¹, Besse K, Wagemans M, Zuurmond W, Giezeman MJ, Lataster A, Mekhail N, Burton AW, van Kleef M, Huygen F.



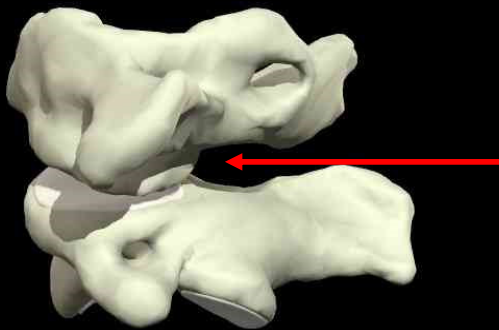
UMC St Radboud

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C1

C2



umc

Resultate Chordotomie

- Starke Schmerzverminderung: 82-95%
- Opiatverbrauch 50% halbiert
40% stop

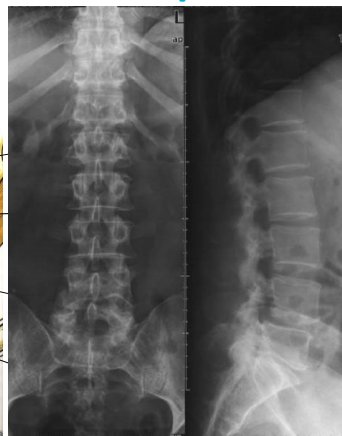
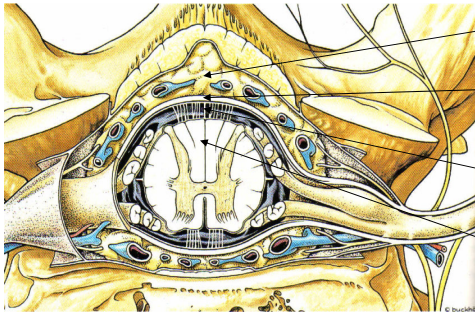
Neurosurgery. 2020 Feb 3

Percutaneous Cordotomy for Pain Palliation in Advanced Cancer: A Randomized Clinical Trial Study Protocol.

Viswanathan A¹, Vedantam A¹, Williams LA², Koyyalagunta D³, Abdi S³, Dougherty PM³, Mendoza T², Bassett RL⁴, Hou P⁵, Bruera E⁶

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Intrathekale oder epidurale Therapien



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Anesth Analg. 2020 Feb;130(2):289-297.

Intrathecal Drug Delivery Systems for Cancer Pain: An Analysis of a Prospective, Multicenter Product Surveillance Registry.

Stearns LM¹, Abd-Elseyed A², Perruchoud C³, Spencer R⁴, Hammond K¹, Stromberg K⁴, Weaver T⁴

Intrathecal Drug Delivery Systems for Refractory Pancreatic Cancer Pain:

Observational Follow-up Study Over an 11-Year Period in a Comprehensive Cancer Center.

Carvajal G, Dupoiron D, Seegers V, Lebrec N, Boré F, Dubois PY, Leblanc D, Delorme T, Jubier-Hamon S.

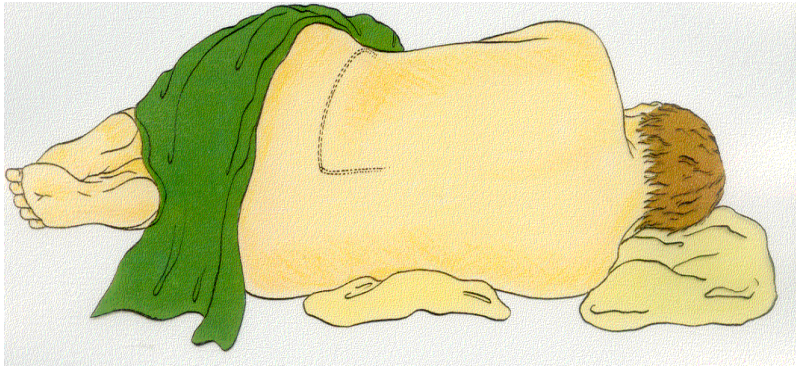
Anesth Analg. 2018 Jun;126(6):2038-2046.

Neuromodulation. 2019 Oct;22(7):765-768.

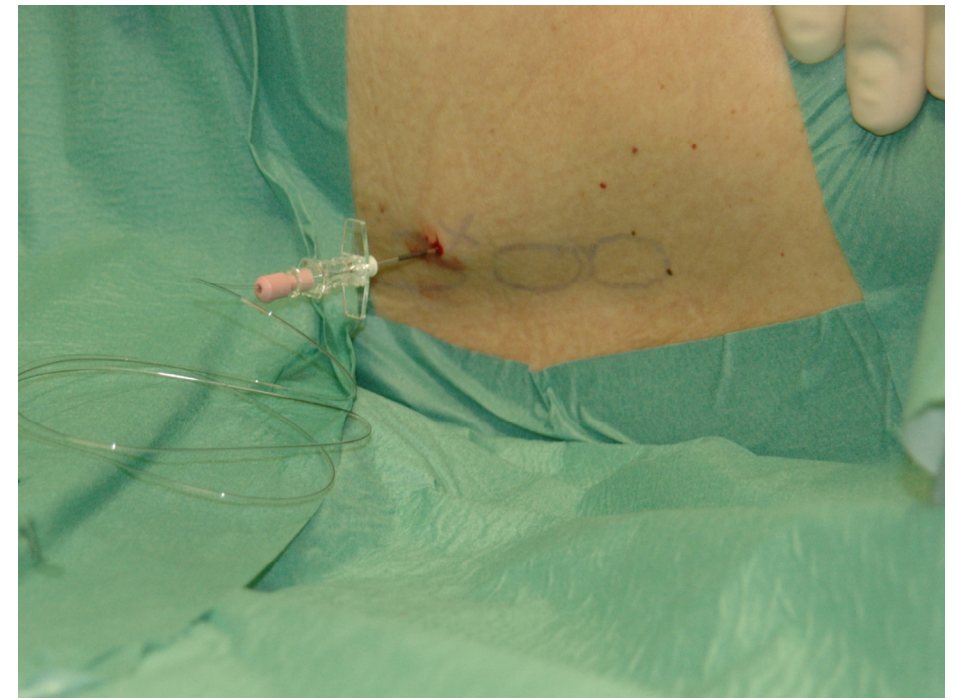
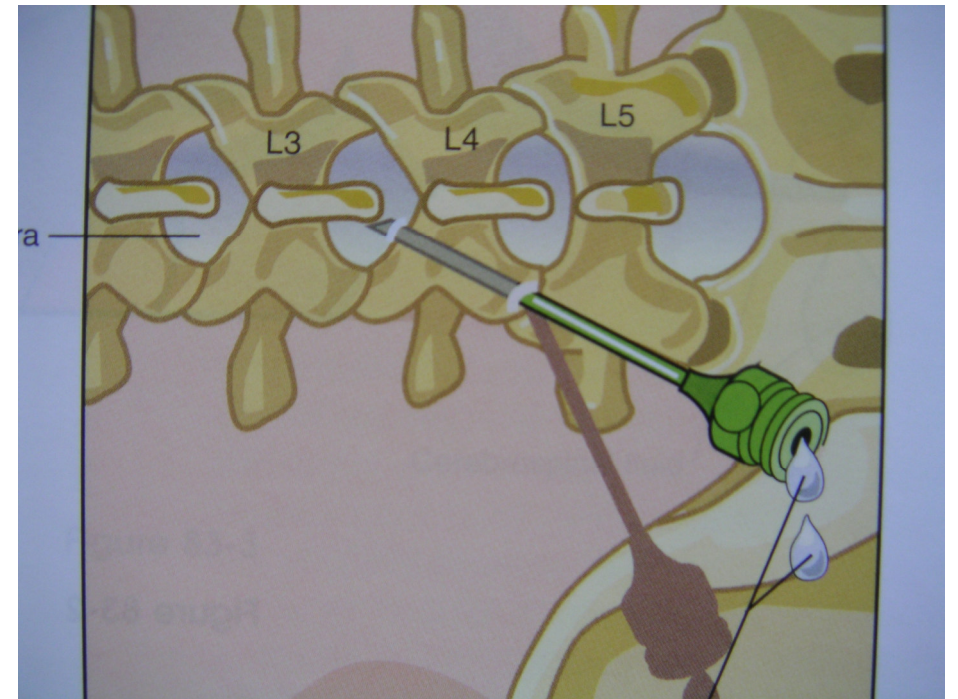
Physician Guidance on the Use of Off-Label Drugs in Intrathecal Drug Delivery Systems for Chronic Pain.

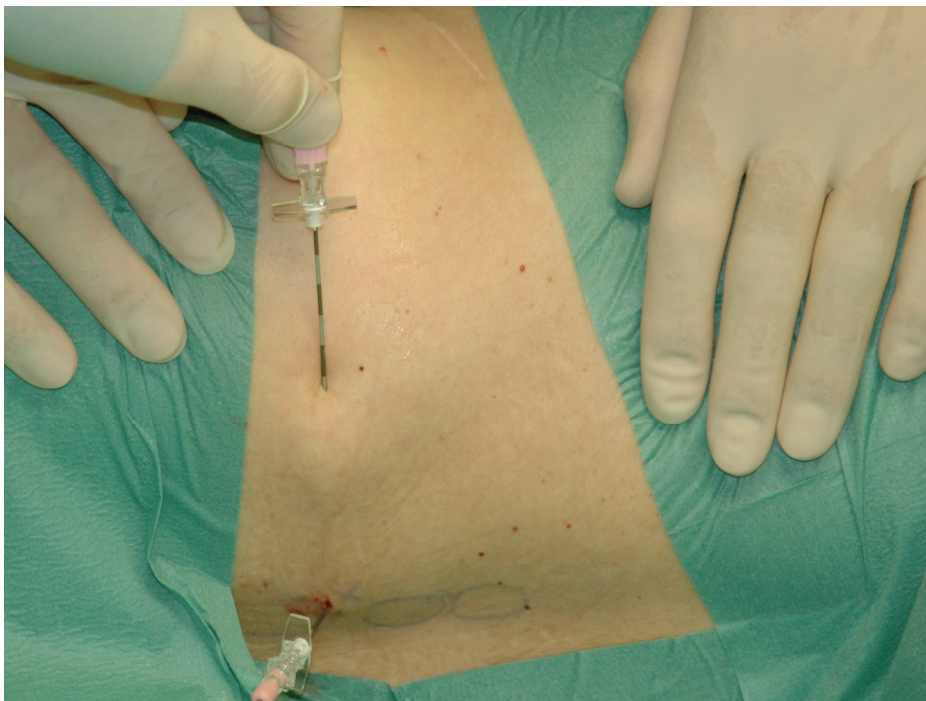
Deer T¹, Kim P², Pope JE³, Hayek S⁴, McDowell G⁵, Mekhail N⁶, Diwan S⁷, Saulino M⁸, et al

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Intrathecale Katheter mit externer Pumpe



- Morphin und langwirkende Lokalanästhetika
- Protokoll
- Ganz enge Zusammenarbeit mit der bereitenden Apotheke, Hausärzten und den Versorgungsdiensten

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Geschichte



- Erste Implantationen Beginn 1980er Jahre
- Penn and Kroin /Dralle et al 1985 erste Studien
- Erste Implantationen in den Niederlanden Beginn 1990er Jahre

- Erste Literatur ab 1991 aus den Niederlanden
- Vor allem Baclofen



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ITDD = Intrathecal Drug Delivery

Indikationen

Orale oder transdermale Applikation

- Nicht ausreichende Schmerzreduktion
- Nicht tolerierbare Nebenwirkungen
- Opiatabhängigkeit
-



Vorteile:

- Applikation nahe am zentralen Rezeptor und nahe Prozesse des Schmerzleitungssystems
- Möglichkeit um mehrere auch additiv wirkende Substanzen zu kombinieren (e.g. bupivacaine, clonidine)

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Internationale Empfehlungen ITDD

[Neuromodulation](#). 2017 Feb;20(2):155-176. doi: 10.1111/ner.12579. Epub 2017 Jan 2.

The Polyanalgesic Consensus Conference (PACC): Recommendations for Intrathecal Drug Delivery: Guidance for Improving Safety and Mitigating Risks.

Deer TR¹, Pope JE², Havel SM³, Lamer TJ⁴, Veizi JE⁵, Erdek M⁶, Wallace MS⁷, Grider JS⁸, Levy RM⁹, Prager J¹⁰, Rosen SM¹¹, Saulino M¹², Yaksh TL¹³, De Andrés JA¹⁴, Abejon Gonzalez D¹⁵, Vesper J¹⁶, Schu S¹⁷, Simpson B¹⁸, Mekhail N¹⁹.

CONCLUSION: Intrathecal therapy is a viable and relatively safe option for the treatment of cancer- and noncancer-related pain. Continued research and expert opinion are required to improve our current pharmacokinetic and pharmacodynamic model of intrathecal drug delivery, as this will undoubtedly improve safety and efficacy.

[Pain Med](#). 2018 Aug 22. doi: 10.1093/pm/pny132. [Epub ahead of print]

Intrathecal Therapy for Chronic Pain: A Review of Morphine and Ziconotide as Firstline Options.

Deer TR¹, Pope JE², Hanes MC³, McDowell GC 2nd⁴.

CONCLUSION: Based on the available evidence, morphine and ziconotide are recommended as firstline IT monotherapy for cancer-related and non-cancer-related pain. The choice of first-in-pump therapy should take into consideration patient characteristics and the advantages and disadvantages of each medication.

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Chemotherapie induzierte PNP

[Pain](#). 2013 Dec;154(12):2877-87.

Pain in chemotherapy-induced neuropathy--more than neuropathic?

[Geber C](#)¹, [Breimhorst M](#), [Burbach B](#), [Egenolf C](#), [Baier B](#), [Fechir M](#), [Koerber J](#), [Treede RD](#), [Vogt T](#), [Birklein F](#).

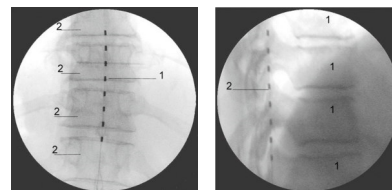
[Oncology \(Williston Park\)](#). 2016 Nov 15;30(11):1020-9.

New Practical Approaches to Chemotherapy-Induced Neuropathic Pain: Prevention, Assessment, and Treatment.

[Majithia N](#), [Loprinzi CL](#), [Smith TJ](#)

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Spinalcordstimulation (SCS) als Therapie?



NL trial Register:
NL 3055/ NTR3203 (Pilot)
Medisch Spectrum Twente

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Take home message



- Zahlreiche interventionelle Techniken für akute und chronische Tumor/Tumorthherapie assoziierte Schmerzen
- 5 Rs van Bathnagar
- Teil einer multidimensionalen/multidisziplinären Behandlung
- Gute Protokolle und Standardisierung
- Zusammenarbeit mit Zuweisern und der Nachsorge ist wichtig

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