

Chronische postoperative Schmerzen - Diagnostische Aspekte neuropathischer Schmerzen

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Klinik für Anästhesiologie,
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Potentielle Interessenskonflikte (EPZ)

Funktionen in Fachgesellschaften und Verbänden



Deutsche Gesellschaft für Anästhesiologie
und Intensivmedizin (DGAI)

- Koordinator der Aktualisierung der S3-Leitlinie „Behandlung akuter perioperativer und posttraumatischer Schmerzen“



Deutsche Schmerzgesellschaft e.V.
Sektion der International Association for the Study of Pain (IASP)

Deutsche Schmerzgesellschaft

- Präsidium (Schriftführer)
- Sprecher Forschungskommission
- AdHoc Kommissionen



IASP

- Chair APSIG
- Council Member IASP

ESA

- Past Chair, Scientific Subcommittee 08: Acute and Chronic Pain Management and Palliative Medicine
- Member Scientific Research Committee



Prospect

(www.postoppain.org)

- Member of Steering Committee



Klinik für Anästhesiologie,
operative Intensivmedizin und Schmerztherapie

Honorierte Vortragstätigkeiten und Beratung/NIT/IIT:

Mundipharma, Novartis, Grünenthal

Laufende Drittmittelprojekte:



G-BA: 01KC1903



- PO1319/3-1
- PO1319/4-1
- PO1319/5-1



- ELAC2015/T07-0713
- IncMeta01KC1903



IMI PainCare grant agreement No [777500]



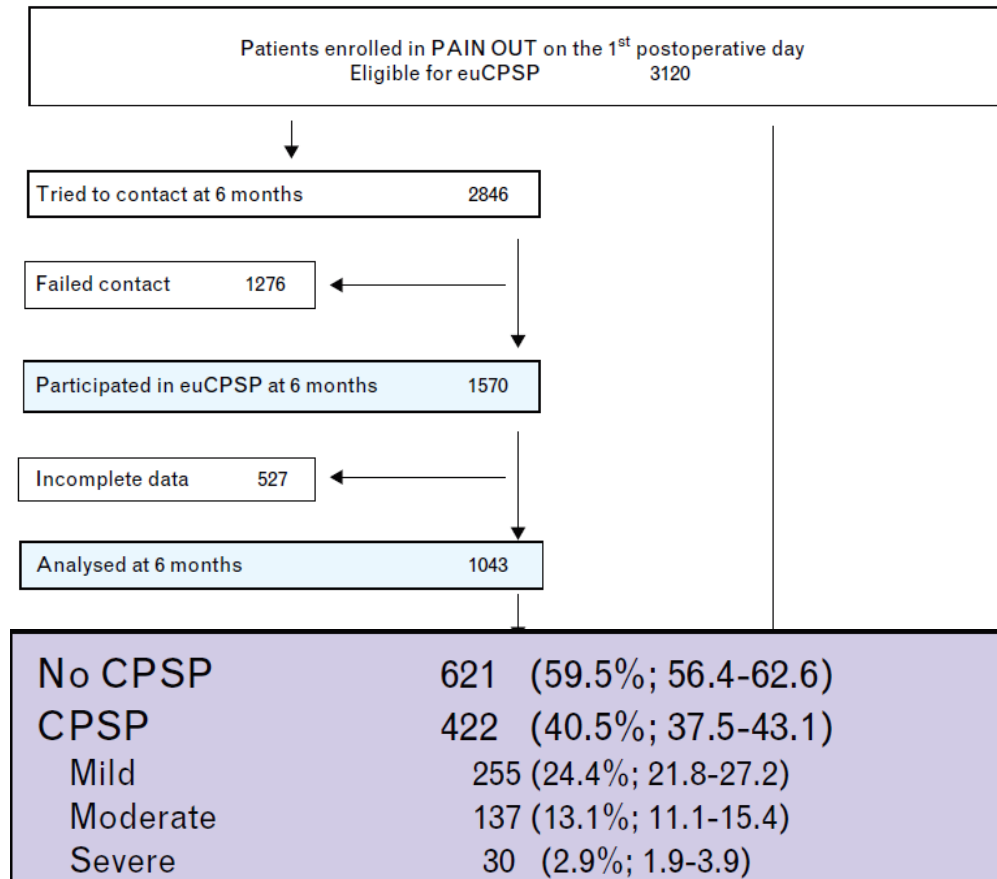
027/2019

Definition chronischer postoperativer Schmerzen

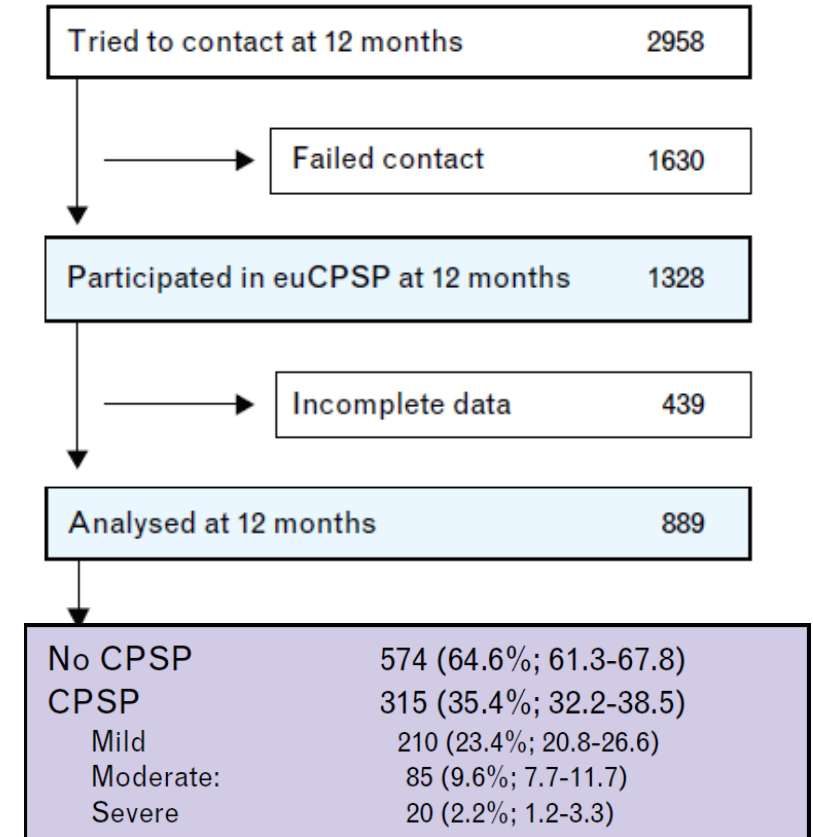
- Schmerz, der sich nach einem chirurgischen Eingriff entwickelt oder dessen Intensität sich erhöht und über den Heilungsprozess hinaus bestehen bleibt (mindestens 3 Monate nach dem auslösenden Ereignis)
- Der Schmerz muss im Operationsfeld lokalisiert werden, projiziert auf das Innervationsgebiet eines Nervs in diesem Bereich oder bezogen auf ein Dermatom oder eine Head-Zone
- Andere Schmerzursachen wie vorbestehende Schmerzzustände, Infektionen oder Malignität sind auszuschließen.

Inzidenz chronischer postoperativer Schmerzen

21 Krankenhäuser, 11 unterschiedliche Europäische Länder

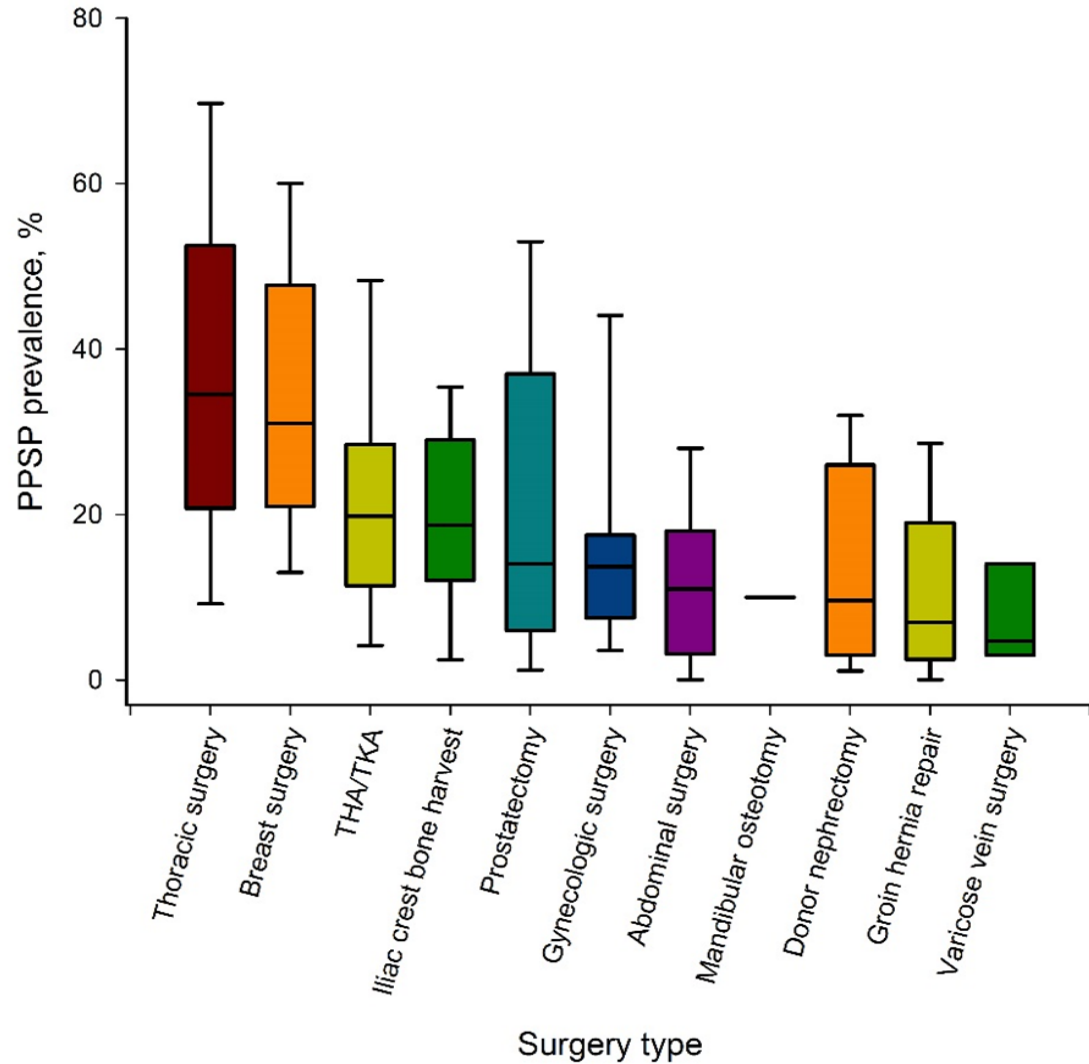


6 Monate nach OP

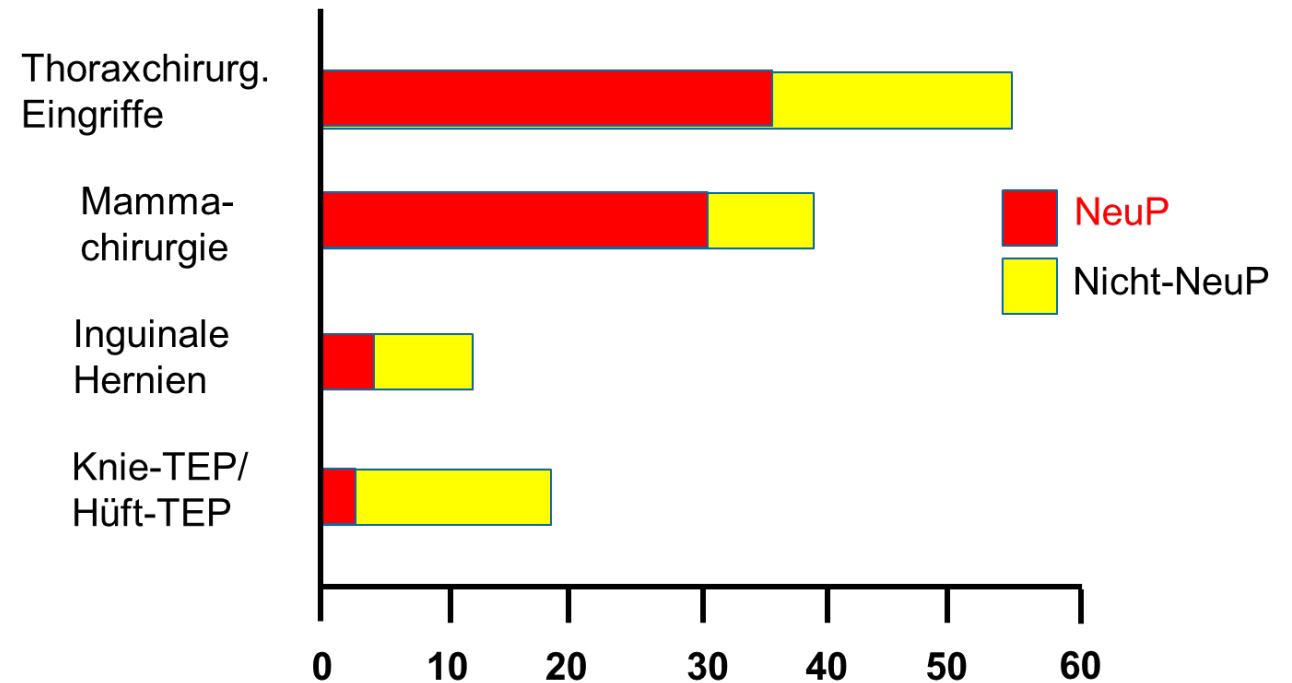


12 Monate nach OP

Inzidenz chronischer postoperativer Schmerzen



Anteil von Patienten mit neuropathischen Schmerzen nach Operationen



Neuropathic pain after surgery

Signs of neuropathic pain at **6 month**
and **12 months** after surgery

mild CPSP:

16.3% (11.4 to 22.1)

16.3% (10.8 to 22.9)

moderate CPSP:

31.3%(2.8 to 40.7)*

35.4% (23.9 to 48.3)**

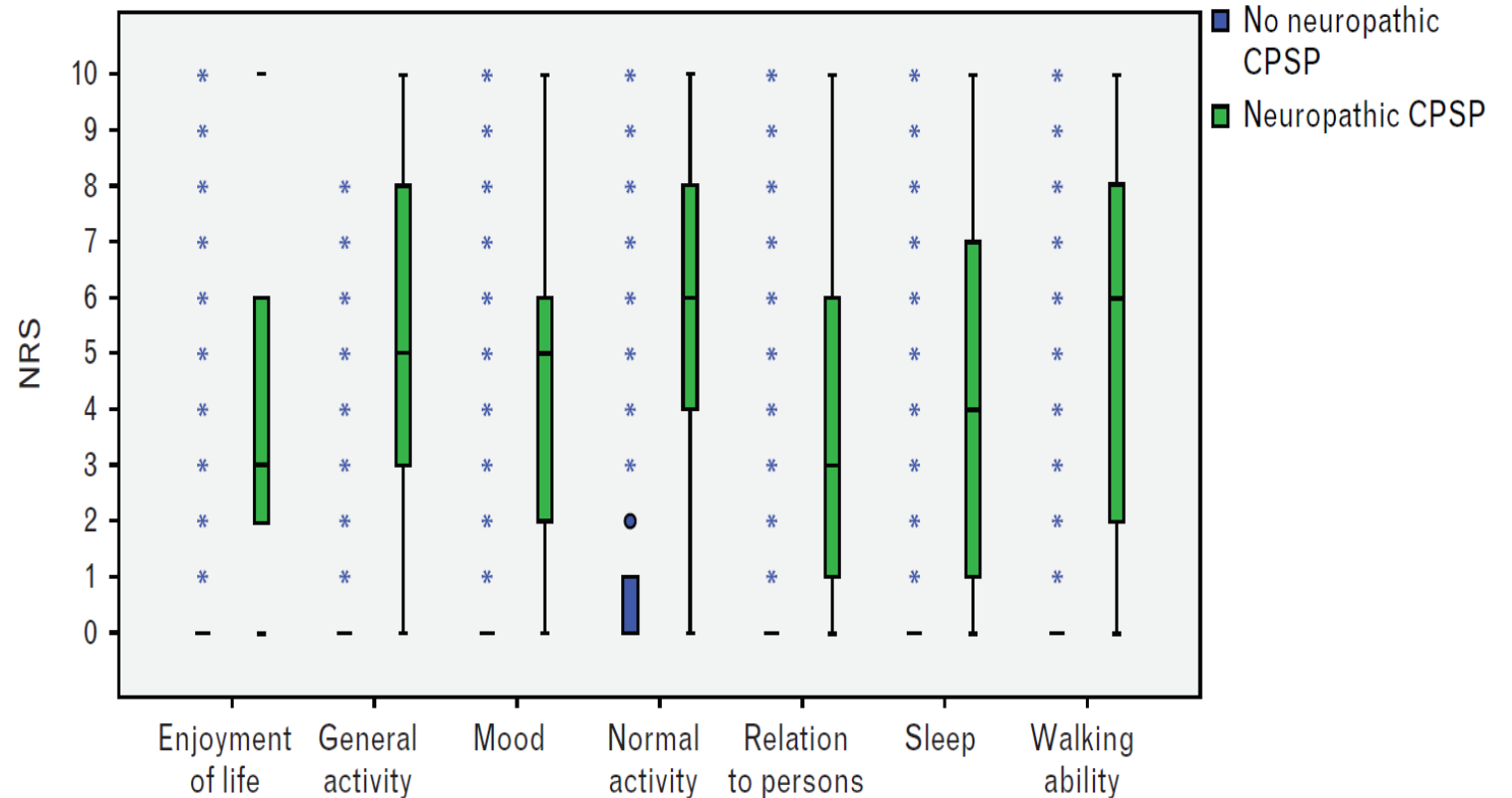
severe CPSP:

30.4% (13.2 to 53.0)

57.1% (30.7 to 83.4)

*P= 0.02 vs mild CPSP

**P= 0.03 vs mild CPSP



ICD-11: CPSPS

<https://www.iasp-pain.org/PublicationsNews/NewsDetail.aspx?ItemNumber=8340>

Chronic Pain has arrived in the ICD-11

Jan 17, 2019

Chronic pain affects 20% of people worldwide. Distress, demoralization and functional impairment often accompany chronic pain, making it a major source of suffering and economic burden. Yet, in the current version of the International Classification of Diseases (ICD-10), chronic pain diagnoses are not represented systematically.

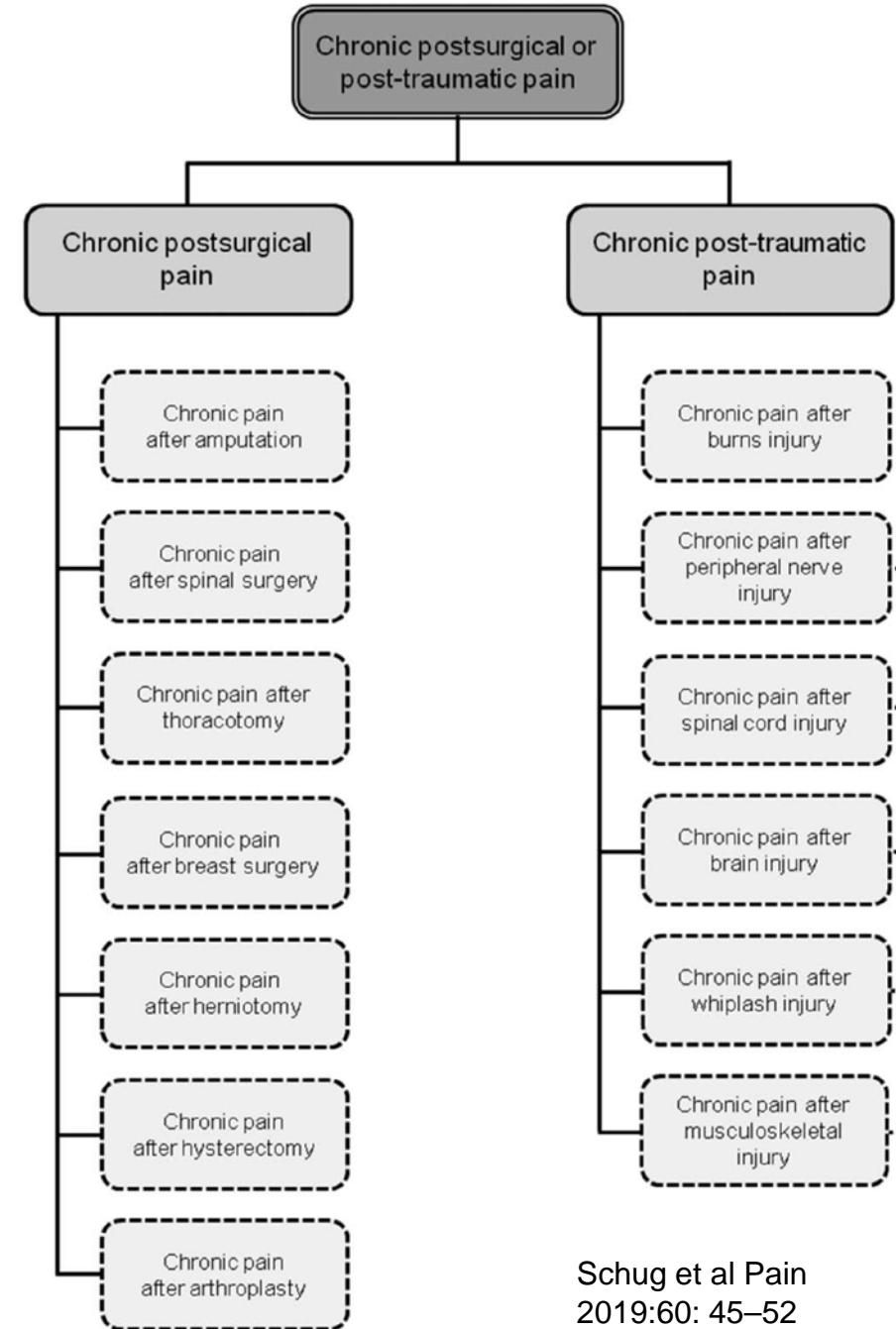
In May 2019, this will change dramatically, when the World Health Organization adopts the new edition, ICD-11. ICD-11 will be the first version to include chronic pain. The chronic pain classification was developed by a Task Force of the International Association for the Study of Pain (IASP) and is based on the current scientific evidence and the biopsychosocial model. Chronic pain is defined as pain that lasts or recurs for more than three months.

A series of 10 papers published in the January 2019 issue of *PAIN* provide a general overview of the classification and explain the **fundamental distinction of chronic primary and chronic secondary pain**. Chronic primary pain represents chronic pain as a disease in itself. Chronic secondary pain is chronic pain where the pain is a symptom of an underlying condition.

Chronic primary pain is characterized by disability or emotional distress and not better accounted for by another diagnosis of chronic pain. Here, you will find chronic widespread pain, chronic musculoskeletal pain previously termed "non-specific" as well as the primary headaches and conditions such as chronic pelvic pain and irritable bowel syndrome. They are recognized as a group of chronic pain syndromes for the first time in ICD-11.

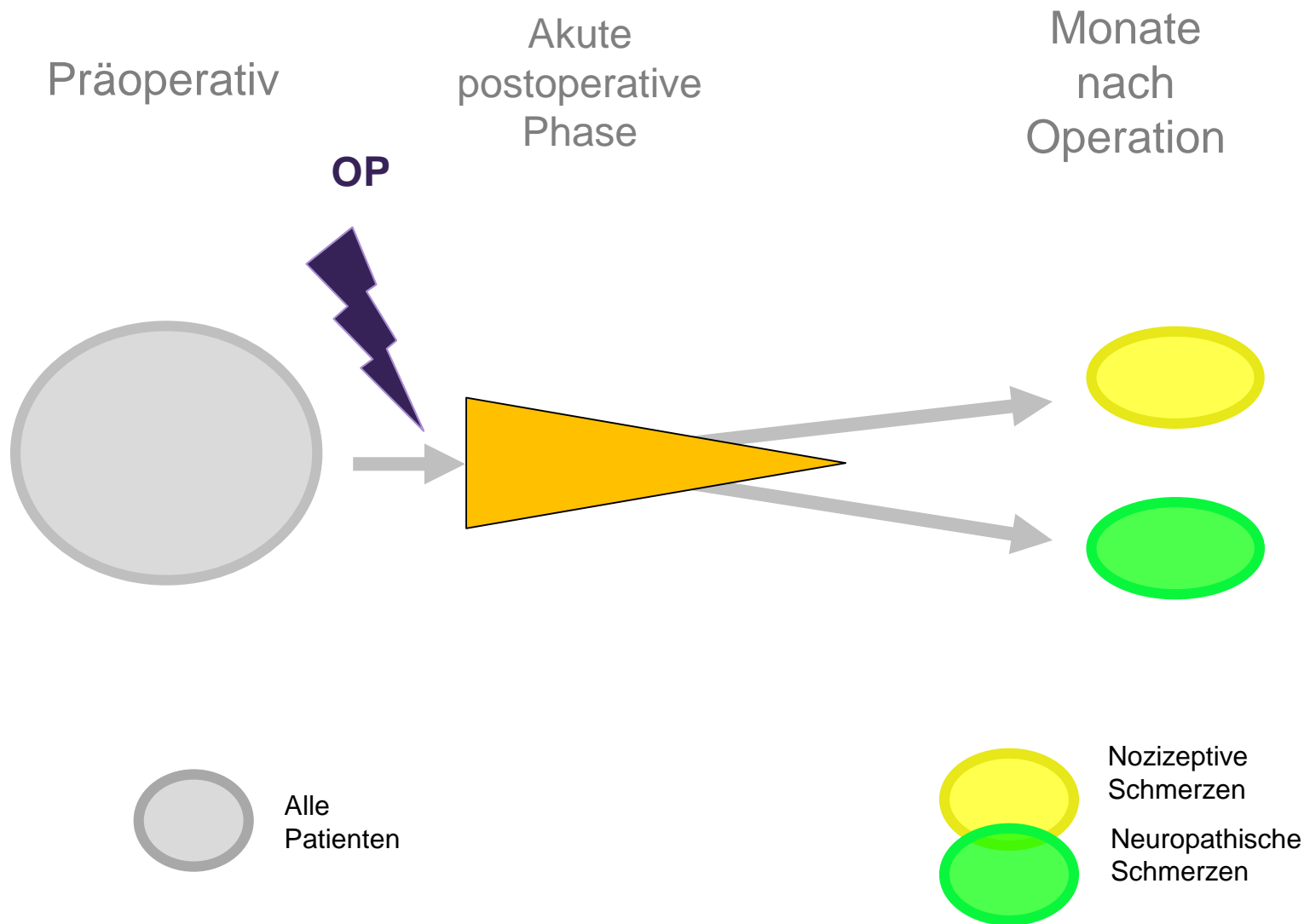
Chronic secondary pain is organized into the following six categories:

1. **Chronic cancer-related pain** is chronic pain that is due to cancer or its treatment, such as chemotherapy. It will be represented in the ICD for the first time.
2. **Chronic postsurgical or post-traumatic pain** is chronic pain that develops or increases in intensity after a tissue trauma (surgical or accidental) and persists beyond three months. It is also part of the ICD for the first time.
3. **Chronic neuropathic pain** is chronic pain caused by a lesion or disease of the somatosensory nervous system. Peripheral and central neuropathic pain are classified here. These diagnoses are also newly represented in the

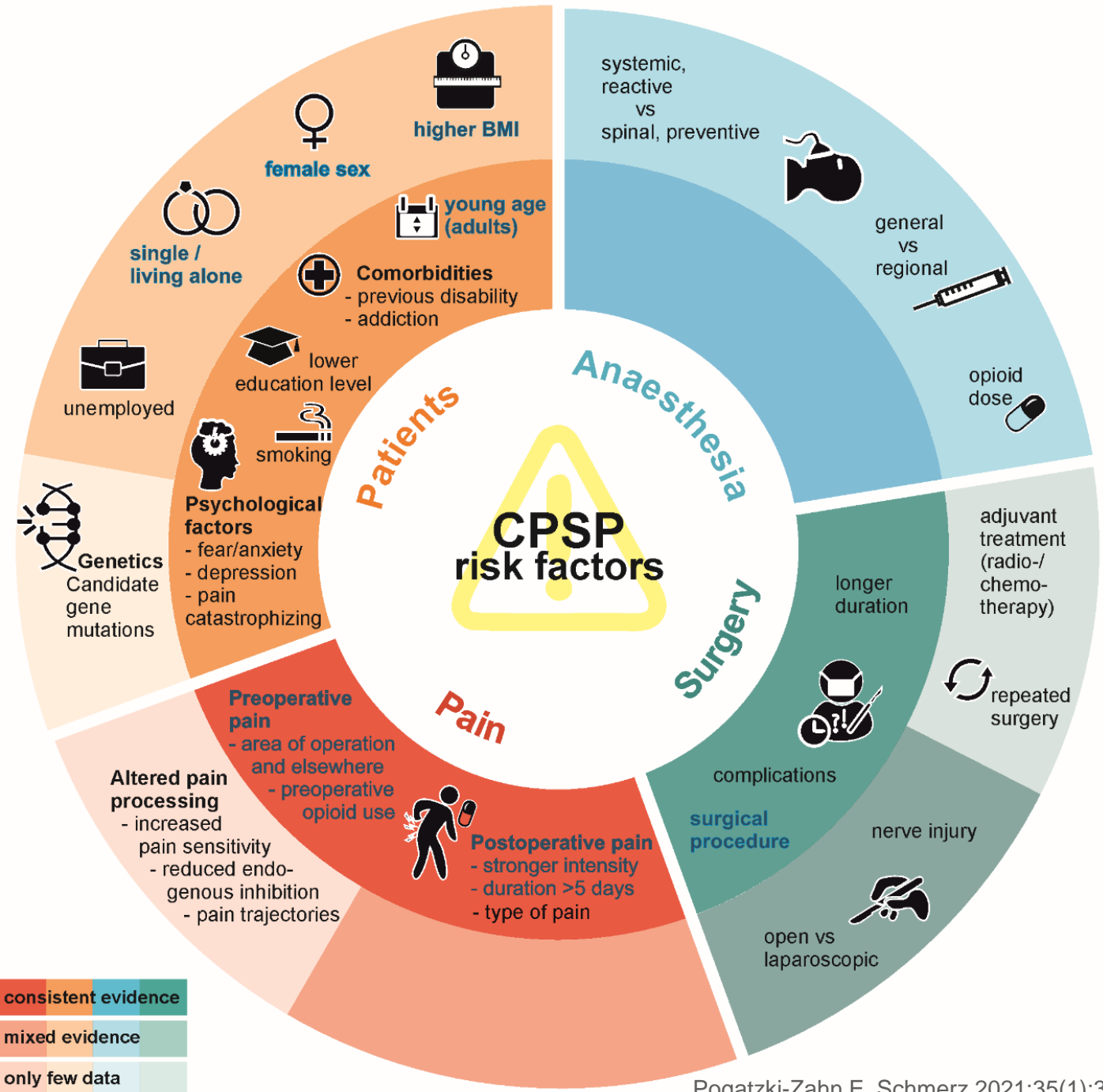


Definition chronischer postoperativer Schmerzen

- Schmerz, der sich nach einem chirurgischen Eingriff entwickelt oder dessen Intensität sich erhöht und über den Heilungsprozess hinaus bestehen bleibt (mindestens 3 Monate nach dem auslösenden Ereignis)
- Der Schmerz muss im Operationsfeld lokalisiert werden, projiziert auf das Innervationsgebiet eines Nervs in diesem Bereich oder bezogen auf ein Dermatom oder eine Head-Zone
- Andere Schmerzursachen wie vorbestehende Schmerzzustände, Infektionen oder Malignität sind auszuschließen.
- **Abhängig von der Art der Operation oder Verletzung können chronische postoperative und posttraumatische Schmerzen häufig neuropathische Schmerzen sein. Selbst wenn neuropathische Mechanismen entscheidend sind, sollten chronische Schmerzen nach einer Operation oder einem Trauma als postoperative oder posttraumatische Schmerzen eingestuft werden.**



Risikofaktoren für die Chronifizierung postoperativer Schmerzen



consistent evidence
mixed evidence
only few data
 included in risk scores



Klinik für Anästhesiologie,
operative Intensivmedizin und Schmerztherapie

Risikofaktoren

- Junges Alter
- Geschlecht
- BMI/ Rauchen
- Bildungsniveau
- Familienstand

- **Präoperative**
 - Schmerzen
 - Opioid
- Komorbiditäten

- **Körperliche Beeinträchtigungen**

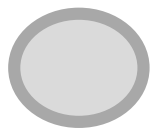
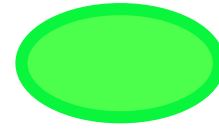
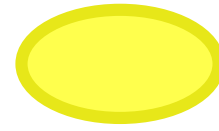
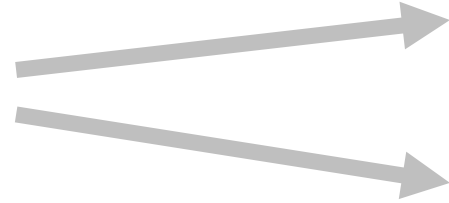
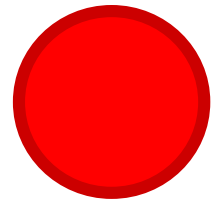
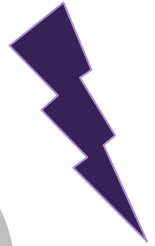
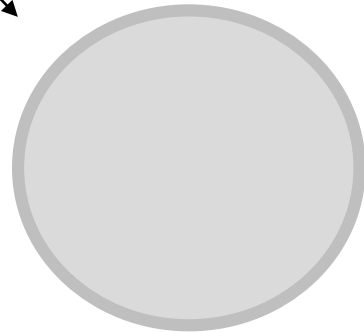
- **Psychologische Faktoren**
 - Stress
 - Angst
 - Katastrophisieren
 - Depression
 - Selbstwirksamkeit

Präoperativ

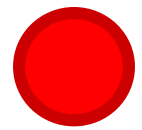
Akute postoperative Phase

Monate nach Operation

OP



Alle Patienten



Patienten mit besonders starken postoperativen Schmerzen



Nozizeptive Schmerzen



Neuropathische Schmerzen

Prolonged postoperative pain predicts persistent chronic postoperative pain

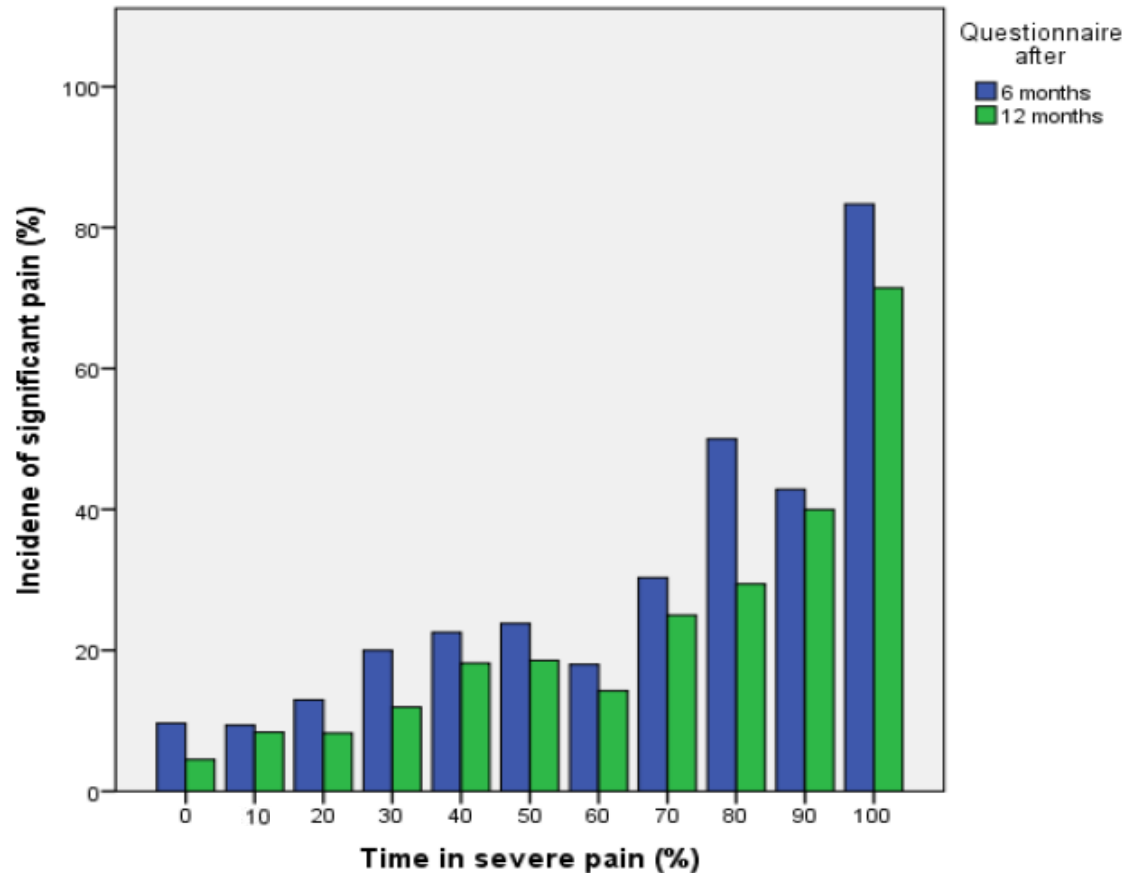
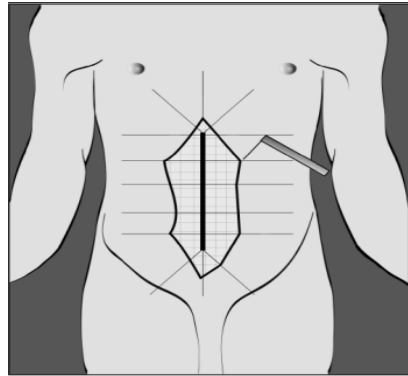
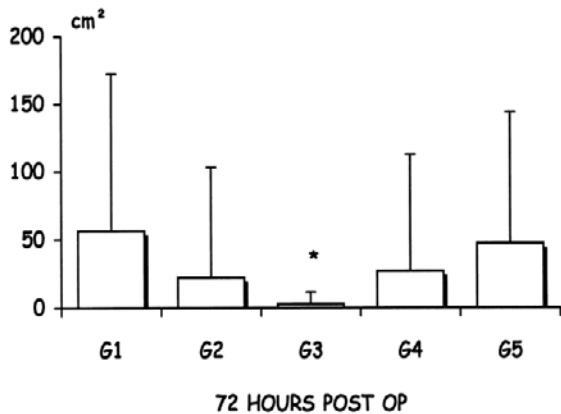


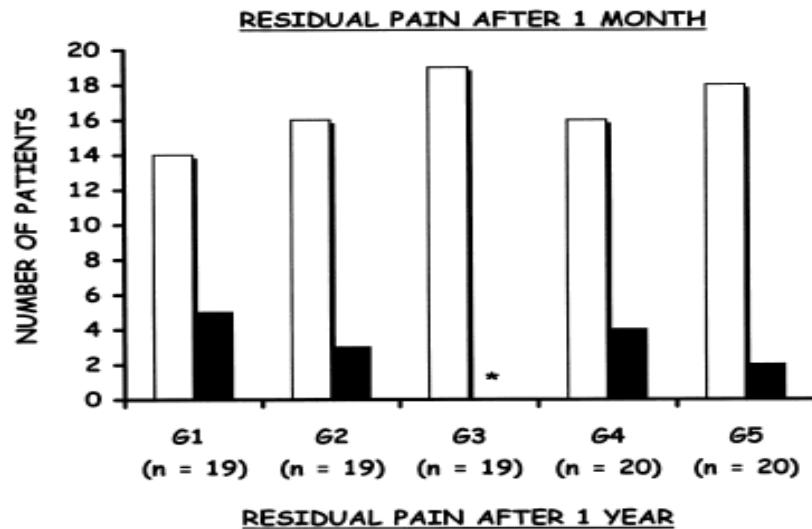
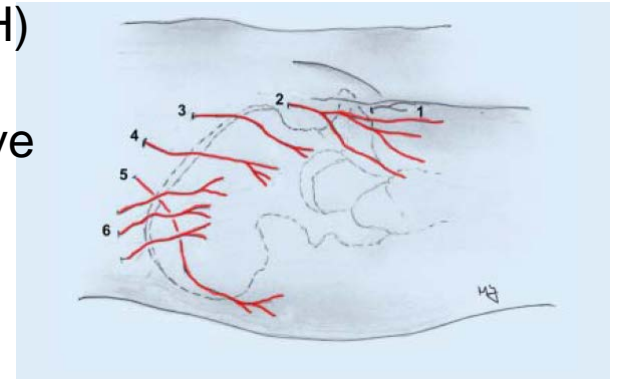
Table 4 Multivariate analysis of risk factors of moderate to severe chronic postsurgical pain at 6 and 12 months

	Odds ratio (95% CI)	<i>P</i>
At 6 months		
Sex (female versus male)	0.99 (0.66 to 1.48)	0.97
Model 4: orthopaedic versus other procedures	2.39 (1.53 to 3.75)	<0.001
Chronic preoperative pain (yes/no)	1.57 (1.04 to 2.37)	0.034
Worst postoperative pain score (NRS)	1.00 (0.92 to 1.10)	0.99
Percentage of time in severe pain	1.24 (1.13 to 1.37)	<0.001
At 12 months		
Model 4: orthopaedic versus other procedures	1.86 (1.08 to 3.18)	0.024
Chronic preoperative pain (yes/no)	1.89 (1.12 to 3.18)	0.017
Anxiety Score (NRS)	1.06 (0.97 to 1.16)	0.208
Worst postoperative pain score (NRS)	0.93 (0.83 to 1.05)	0.230
Percentage of time in severe pain	1.30 (1.16 to 1.46)	<0.001

QST AFTER surgery: predictor of CPSP?



- iliac crest bone harvest (ICBH) used in orthopedic surgery
- severe acute postoperative pain
 - 6–41% incidence of CPSP



Overall logistic regression analysis, with 4 factors, of chronic postsurgical neuropathic pain.^a

Factor	Odds ratio	95% confidence interval	P
Area of secondary hyperalgesia at 48 h	1.02	1.0–1.04	.005
Presence of hypoesthesia at 48 h	2.06	0.34–12.2	.3
Intensity of pain (NRS) at 48 h	1.2	0.9–1.5	.21
DN4 score at 48 h ^a	1.75	1.1–2.6	.009

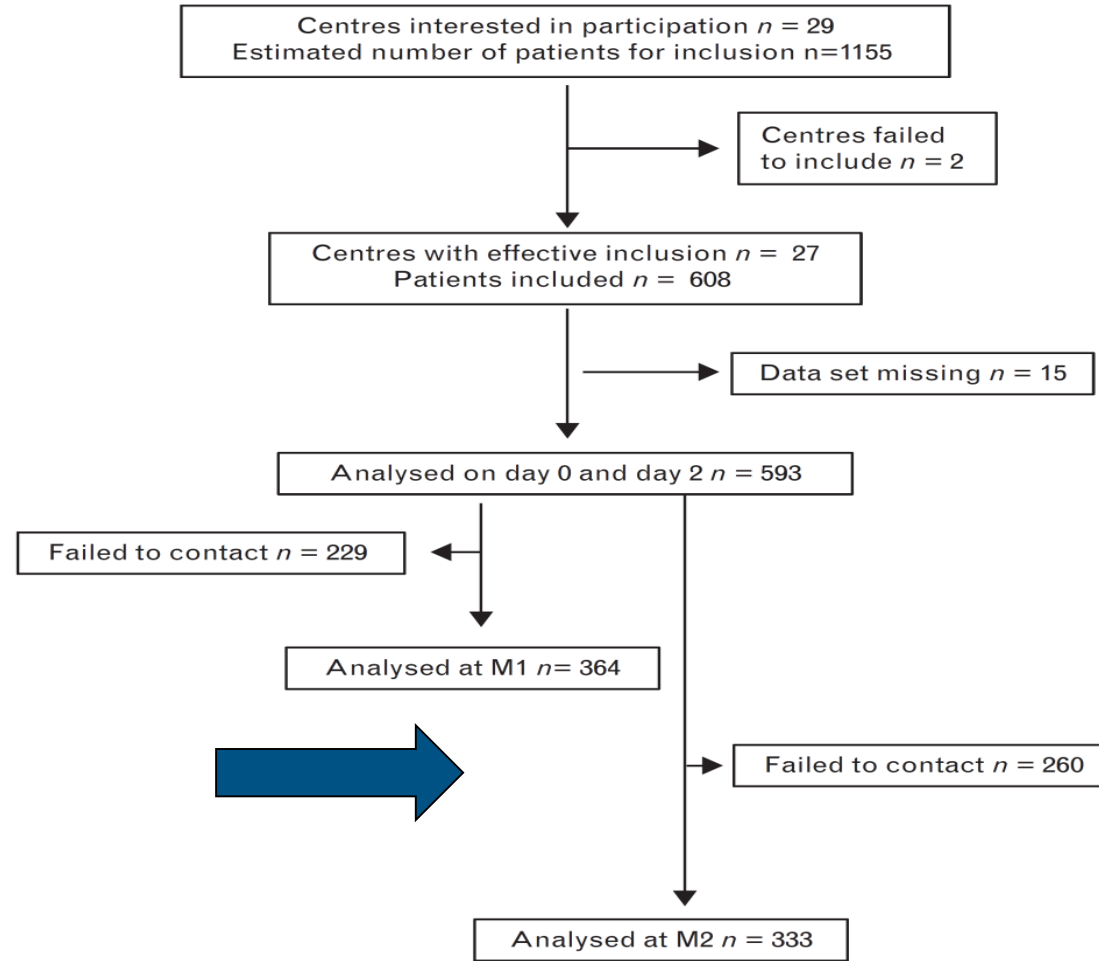
^a DN4, Douleur neuropathique 4 questionnaire; NRS, numerical rating scale.

Early postoperative neuropathic pain predicts persistent neuropathic pain

Table 4 Step-by-step analysis of factors of persistent postsurgical neuropathic pain

Variable, $n = 333$

D0/D2 DN4 ≥ 4



factors of persistent postsurgical neuropathic pain at M2)

P

<0.0001

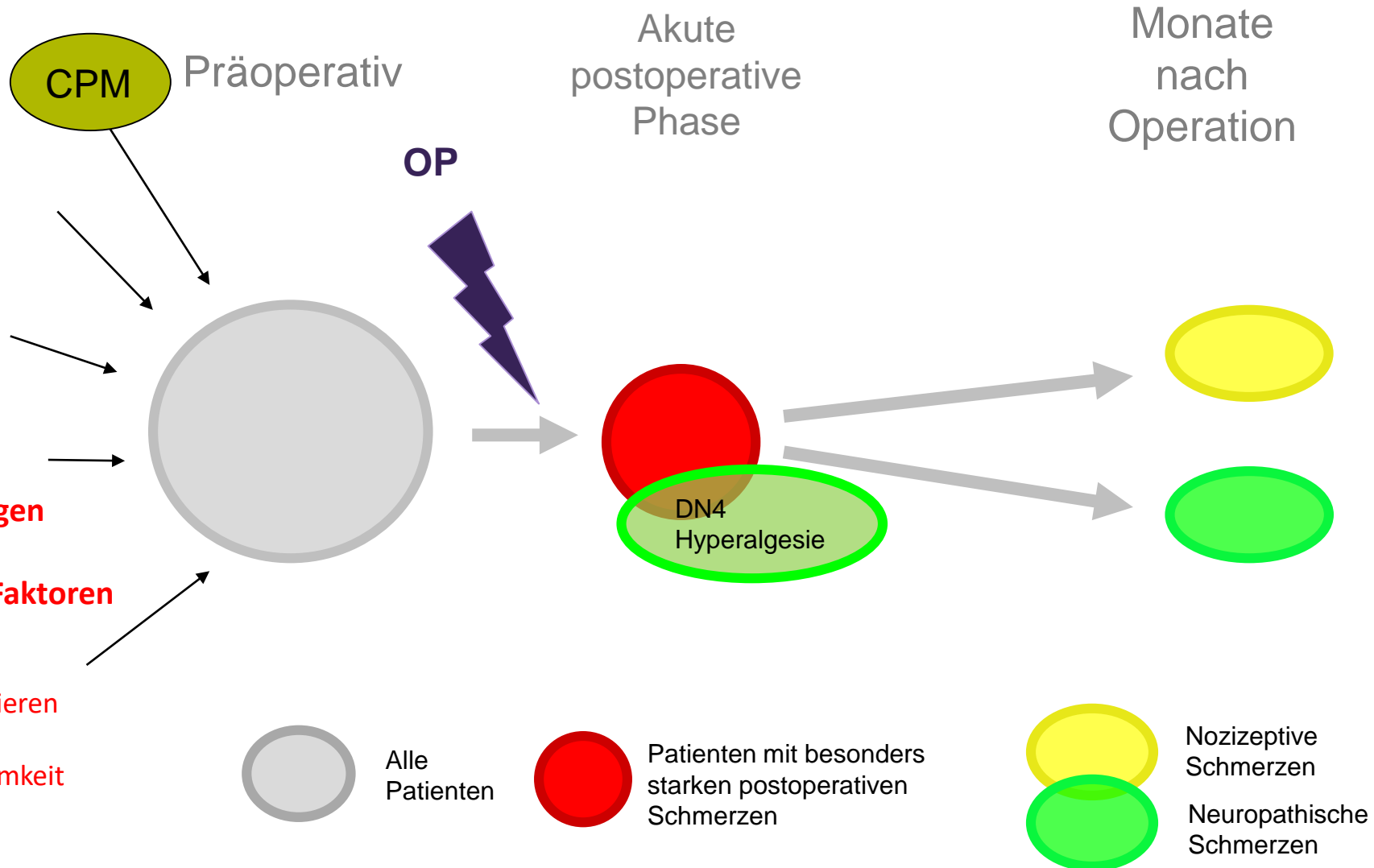
Risikofaktoren

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- Familienstand

- **Präoperative**
 - Schmerzen
 - Opioid
- Komorbiditäten

- **Körperliche Beeinträchtigungen**

- **Psychologische Faktoren**
 - Stress
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 - Depression
 - Selbstwirksamkeit



Risk Score

Study	Type of Surgery	N	Predictive values	Characteristics, quality, comments
Meretoja et al 2017	Breast cancer surgery	Multicenter, n= 860 (development) n=231+453 (validation)	4 items: <ul style="list-style-type: none"> - operative pain in the operative area (P=.001), - high body mass index (P= .039), - axillary lymph node dissection (P= .008), - more severe acute postoperative pain intensity at the seventh postoperative day (P= .003) 	sensitivity of 32-47%, specificity of 82-94%; ROC-AUC 0.74; performed well in the Danish (ROC-AUC, 0.739) and Scottish (ROC-AUC, 0.740) cohorts. Online tool for risk score, easily applicable includes postoperative pain level (after 7 days) → no preoperative screening possible
Althaus et al 2011	Orthopaedic surgery, general surgery, visceral surgery neuro-surgery; only selective surgery	Unicenter, n=150	5 items: <ul style="list-style-type: none"> - preoperative pain in the operating field, - other preoperative pain, - postoperative acute pain, - capacity overload, - comorbid stress symptoms 	sensitivity of 70.8%, specificity of 72.7% ROC AUC: 0.766, 95% CI 0.688–0.843 includes postoperative pain level (after 5 days) → no preoperative screening possible
Mathes et al 2017	orthopedic surgery, general surgery, visceral surgery, neurosurgery	Multicenter, n=205 (n=167 in follow up after 6 months)	5 items: <ul style="list-style-type: none"> - preoperative pain in the operating field, - other preoperative pain, - postoperative acute pain, and <ul style="list-style-type: none"> - female sex, - marital status = not married/partnership 	All 5 items: sensitivity of 74.6%, specificity of 72.6% AUC: 0.813, 95% CI: 0.740–0.886 Only first 3 items: sensitivity of 76.3%, specificity of 75.0% AUC: 0.787; 95% CI: 0.714–0.860
Montes et al 2015 Montes et al 2020	inguinal hernia repair, hysterectomy (vaginal or abdominal), thoracotomy	Multicenter (development) n=2929 Multicenter (validation) n=1088	6 items: <ul style="list-style-type: none"> - surgical procedure, - age, - physical health (Short Form Health Survey-12), - mental health (Short Form Health Survey-12), - preoperative pain in the surgical field, - preoperative pain in another area 	Discrimination was moderate (c-statistic, 0.731; 95% CI, 0.705 to 0.755) Different weighting of predictors through generalized linear mixed model-derived β coefficients only preoperative factors → preoperative screening possible no external validation



Perioperative pregabalin administration does not prevent chronic postoperative pain: systematic review with a meta-analysis of randomized trials

Valeria Martinez^{a,b,c,*}, Xavier Pichard^b, Dominique Fletcher^{a,b,c}

Table 3

Summary of the meta-analysis.

Outcomes	No. of trials	No. of participants	RR random effect (95% CI)	Heterogeneity (I^2), %	Quality of evidence (GRADE)
Incidence of CPSP at 3 mo*	15	1884	0.87 (0.66-1.14)	57	⊕⊕⊕⊕†
Incidence of CPSP at 6 mo	5	1360	0.79 (0.44-1.41)	62	⊕⊕⊕⊕†
Incidence of CPSP at 12 mo	2	200	0.42 (0.18-0.99)	0	⊕⊕⊕⊕‡
Incidence of CPSNP at 3 mo	4	451	0.16 (0.04-0.73)	15	⊕⊕⊕⊕‡§
Incidence of CPSNP at 6 mo	1	228	0.07 (0.00-1.33)	NA	⊕⊕⊕⊕‡§
Incidence of CPSNP at 12 mo	0	0	NA	NA	NA

* Primary outcome. The level of evidence was assessed by the GRADE method from very LOW ⊕⊕⊕⊕ to ⊕⊕⊕⊕ high.

† Downgrade for inconsistency ($I^2 > 50\%$) serious.

‡ Downgrade for imprecision: Optimal information size not reached: very serious.

§ Downgrade for probable publication bias.

CI, confidence interval; CPSP, chronic postsurgical pain; CPSNP, chronic postsurgical neuropathic pain; NA, not applicable; RR, risk ratio.

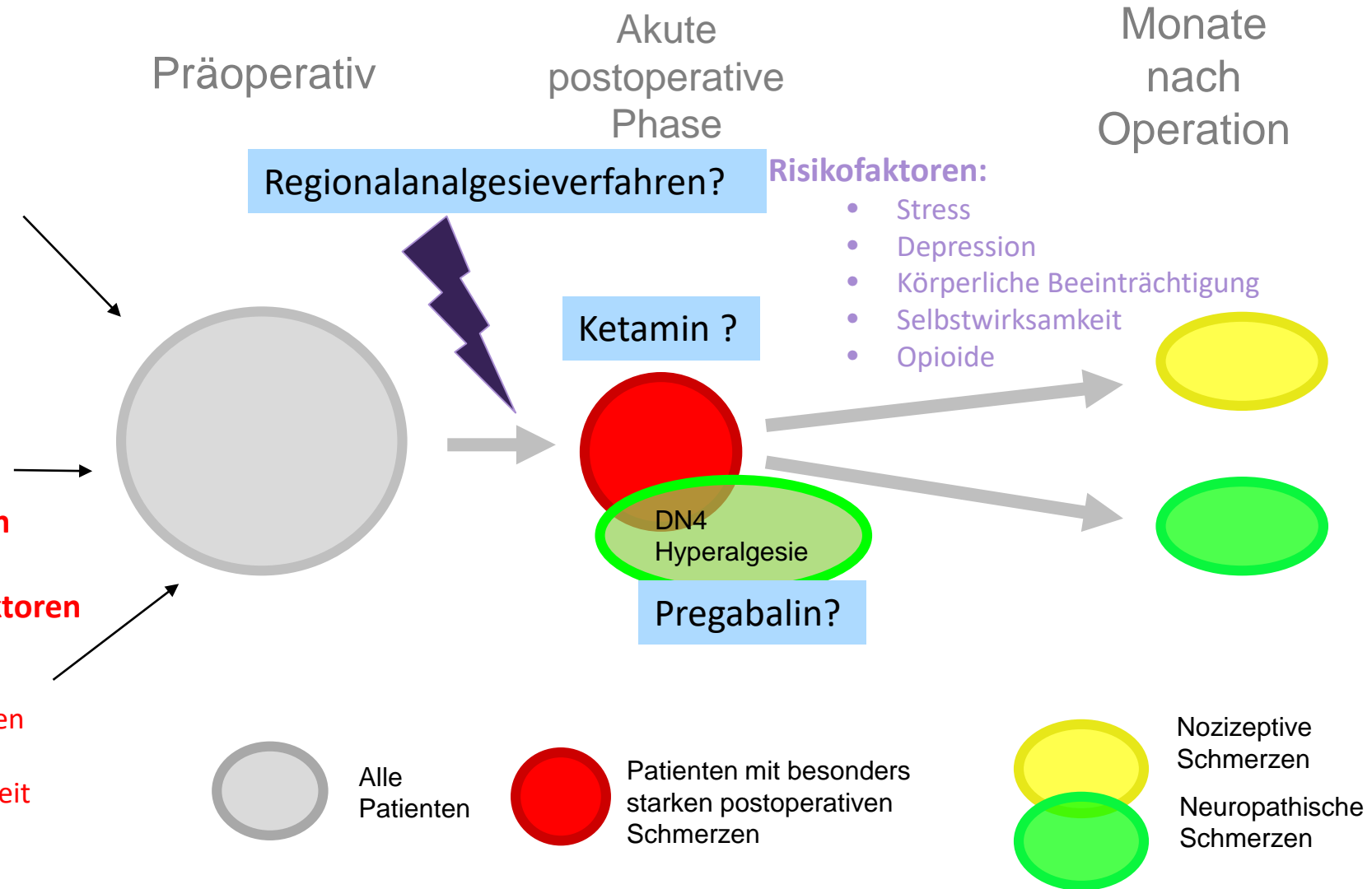
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- **Psychologische Faktoren**
 - Stress
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 - Katastrophisieren
 - Depression
 - Selbstwirksamkeit



Innovationsfondsprojekt der Deutschen Schmerzgesellschaft

Titel:

Prävention operationsbedingter chronischer Schmerzen durch Einführung eines perioperativen „**Transitional Pain Service**“

Akronym:

„POET-Pain“

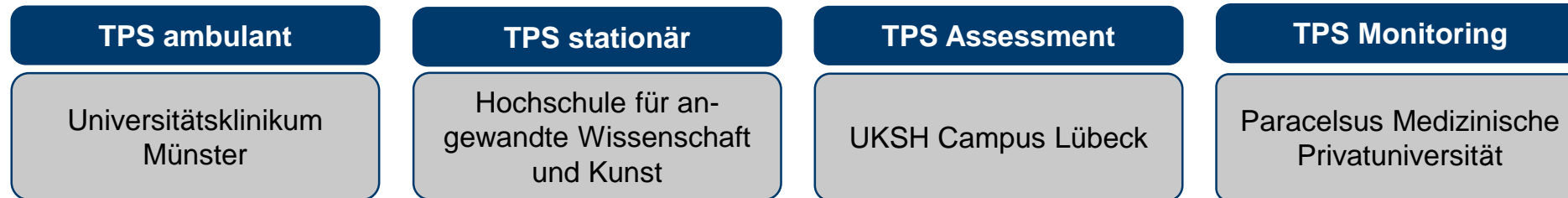


Konsortialführung Deutsche Schmerzgesellschaft e.V.

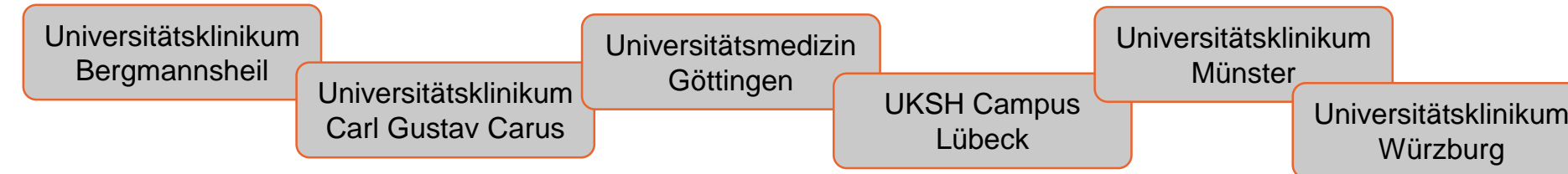


Konsortialpartner

Teilprojekte



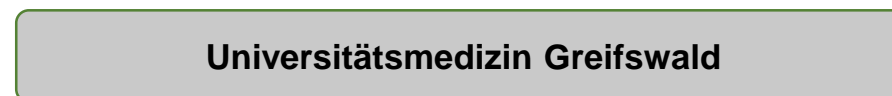
Anbieter



Krankenkassen



Evaluation



	TPS Assessment -prästationär-	OP	TPS stationär -postoperativ-	TPS ambulant -Nachsorge-
Modul Schmerz- medizin	Erstgespräch, Aufklärung über TPS Assessment Kommunikation		Med. Betreuung Patient, Visite Entlassgespräch Kommunikation Koordination	Med. Betreuung Patient Koordination Nachbehandlung Kommunikation
Modul Pflege	Assessment	Teambesprechung TPS	Anleitung zum aktiven Selbst-Management Edukation zur schmerz- bezogenen Selbstwirk- samkeit, Entspannung	Auffrischung: Evaluation d. Edukations- maßnahmen, ggf. Anpassungen
Modul Physiotherapie	Assessment und Edukation	Teambesprechung TPS	Anleitung zum aktiven Selbst-Management Physiotherapeutische (Be-)Übung Edukation	Auffrischung: Evaluation d. Edukations- maßnahmen, ggf. Anpassungen
Modul Psychologie	Fragebögen des CRFs	Teambesprechung TPS	Anleitung zum aktiven Selbst-Management Mentales Kontrastieren Wenn-Dann-Techniken	Auffrischung und ggf. Modulation der psychologischen Parameter

Zusammenfassung

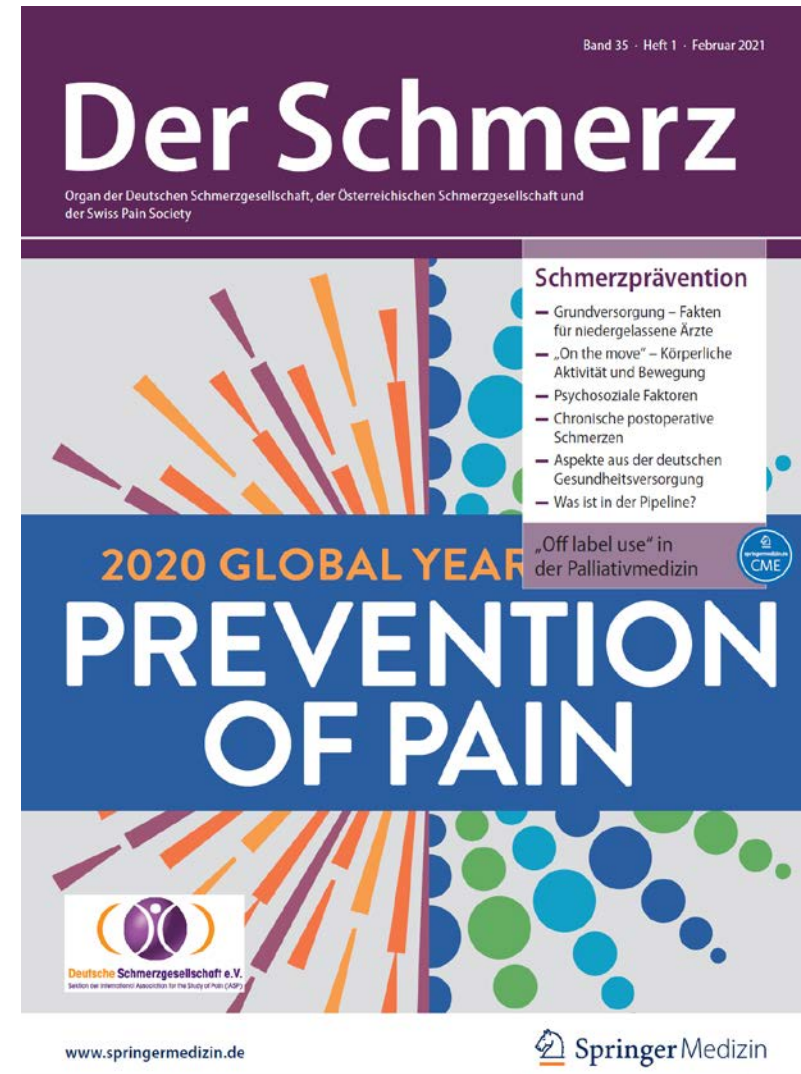
- CPSP ist in der ICD-11 erstmals berücksichtigt
- Der Prozess, der zu einer Chronifizierung von Schmerzen nach Operationen führt, ist komplex.
- Eine Vielzahl schon präoperativ erhebbarer Risikofaktoren sind bekannt
- Postoperatives Assessment (e.g. für neuropathische Schmerzen)
- Risikoscores sind gerade in der Entwicklung – simple, zuverlässige Scores müssen biologische, psychologische und soziale Faktoren berücksichtigen
- Ziel: frühe Identifizierung von Risikopatienten, gezielte Behandlung
- Da der Chronifizierungsprozess in die postoperative Phase hineinzureichen scheint und biopsychosozialen Aspekte einen komplexen interaktiven Prozess beinhaltet, sollten die Präventions- und Behandlungsansätze auch interdisziplinär sein
- POETpain Projekt der Deutschen Schmerzgesellschaft

Zum Nachlesen



De Gruyter; 1. Edition (7. Dezember 2020)
Gebundene Ausgabe : 426 Seiten

ISBN-10 : 311059644X
ISBN-13 : 978-3110596441



Prävention chronischer postoperativer Schmerzen durch perioperative Regionalanalgesieverfahren?

- Epiduralanalgesie bei Thorakotomien (3-18 Monate) **NNT: 7**
 - OR 0.52 (95% CI 0.32 to 0.84, 7 RCTs, Qualität der Evidenz moderat).
- Regionalanalgesie bei Brustoperationen (3-12 Monate) **NNT: 7**
 - OR 0.43 (95% CI 0.28 to 0.68, 18 RCTs, Qualität der Evidenz niedrig).
- Regionalanalgesie bei Kaiserschnitt-OP (3-8 Monate) **NNT: 19**
 - OR 0.46, (95% CI 0.28 to 0.78; 4 RCTs, Qualität der Evidenz moderat).
- Kontinuierliche Lokalanästhetikainfusionen bei Beckenkamm-Spanentnahme (3-55 Monate)
 - OR 0.20 (95% CI 0.04 to 1.09; 3 RCTs, Qualität der Evidenz niedrig).
- iv-Lidocain bei Brustoperationen (3-6 Monate)
 - OR of 0.24 (95% CI 0.08 to 0.69, 2 RCTs, Qualität der Evidenz moderat).

Prävention chronische postoperative Schmerzen durch pharmakologische perioperative Adjuvantien?

Pharmacotherapy for the prevention of chronic pain after surgery in adults (Review)

Chaparro LE, Smith SA, Moore RA, Wiffen PJ, Gilron I



**THE COCHRANE
COLLABORATION®**

Ketamin: OR 0.50 (95% CI 0.33 to 0.76).
NNT : 10.83 (95% CI 5.69 to 109).

Niedrige Evidenzlage, wahrscheinlich
Überschätzung der Effektivität auf Grund von
nedrigen Fallzahlen

Alle anderen Substanzen:

- Kein signifikanter Effekt

Date	Event	Description
7 June 2017	Review declared as stable	See Published notes .

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2013, Issue 7

<http://www.thecochranelibrary.com>

Ketamin reduziert postoperative Schmerzen bei chronischen Schmerzpatienten mit Opioidvormedikation

101 Patienten mit chronischen Rückenschmerzen und Opioidtherapie präoperativ, Elektive lumbale WS-OP

Start intraoperativ,

- Bolus: 0.5 mg/kg vor Schnitt
- kontinuierliche Infusion: 10 µg/kg/min bis Wundverschluss

Table 4. Outcomes

	Placebo	Ketamine	<i>P</i> Value
24 hr ME, total mg/24 hr	202 (176)	142 (82)	0.032
48 hr ME, total mg/48 hr	309 (341)	195 (111)	0.029
48 hr ME Adjusted, mg*	323 (347)	203 (109)	0.045
PACU VAS, cm	5.6 (3.0)	4.1 (3.1)	0.033
PACU ME, mg total	22 (20)	18 (14)	0.218
Ward VAS 24-hr, cm	4.8 (2.4)	4.7 (2.7)	0.902
Ward VAS 48-hr, cm	5.3 (2.2)	5.4 (2.1)	0.838
6-wk ME, mg/hr intravenous morphine	2.8 (6.9)	0.8 (1.1)	0.041
6-wk VAS, cm	4.2 (2.4)	3.1 (2.4)	0.026
PACU Discharge Time, min	160 (77)	174 (62)	0.321
Hospital Discharge Time, min	4,571 (4,099)	4,364 (2,296)	0.728

Data are presented as mean (SD).

* Analysis of patients who did not receive intraoperative nonsteroidal medications (ketorolac).


ME = morphine equivalent; PACU = postanesthesia care unit; VAS = visual analog scale.

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PERSPECTIVES

The Toronto General Hospital Transitional Pain Service: development and implementation of a multidisciplinary program to prevent chronic postsurgical pain

Observational study

New approach for treatment of prolonged postoperative pain: APS Out-Patient Clinic

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