Nociceptive and Hyperalgesic Components of Cancer Pain

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Pain types

Neurobiology

- *Inflammatory pain*
  - ↑SP Substance P
  - ↑CGRP Calcitonin gene-regulated peptide
  - ↑ NG Nerve growth Factor
  - ↑ Proinflammatory cytokines
- *Neuropathic pain*
  - ↓ SP, CGRP
  - ↑ Gal Galanin
  - ↑ NPY Neuropeptide Y
- *Tumorigenic pain*
  - ↑ DYN Dynorphine
  - ↑ GFAP Glial fibriallary acidic protein (astrocytosis)
  - ↑ cFos Marker of neuronal activity

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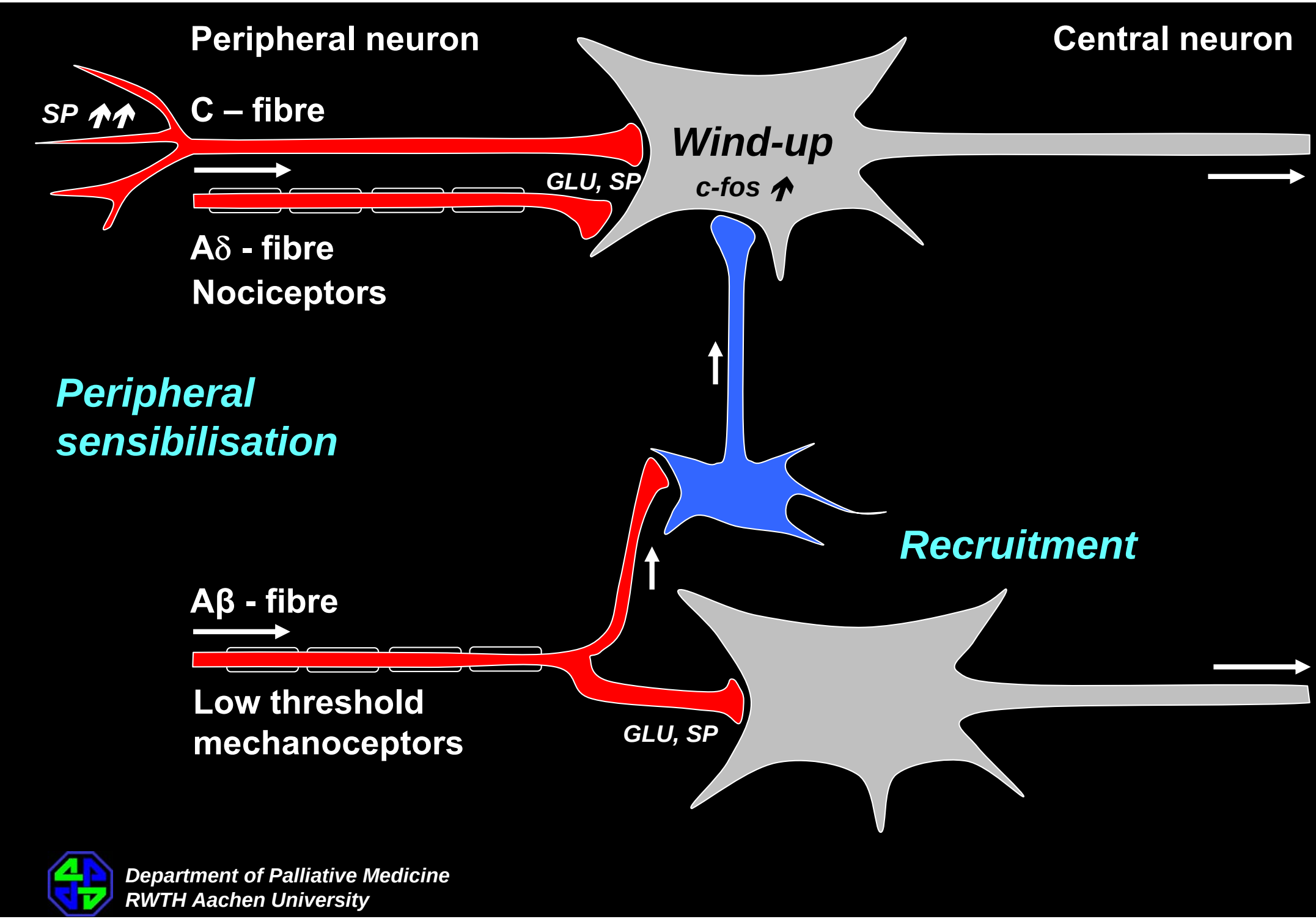
Goblirsch et al. J Cell Biochem 96 (2005) 682-8



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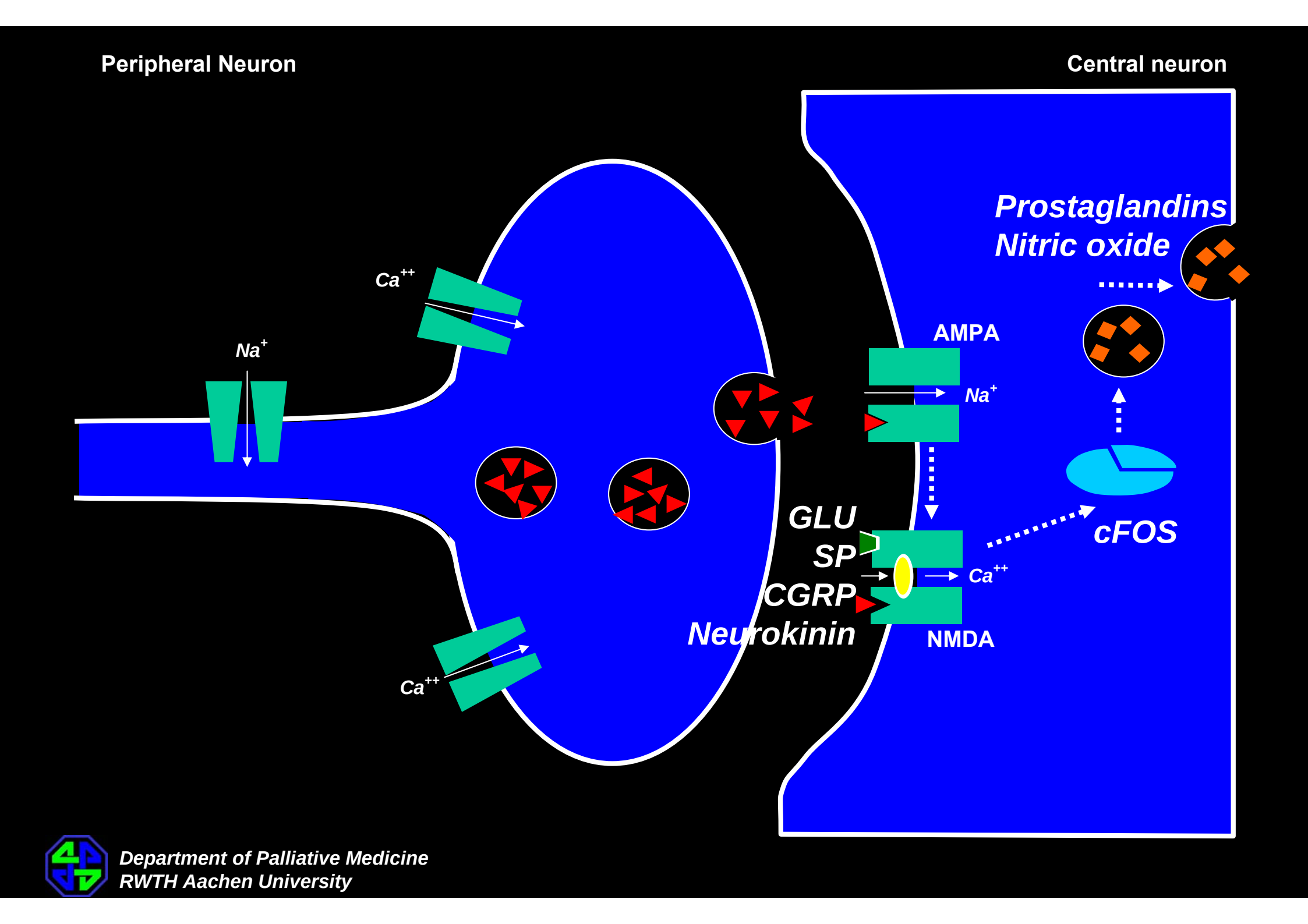

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Pain types

Cancer bone pain: mouse model

	Sarcoma	*Melanoma*	*Colon*
• ***Central sensitization***			
Dynorphin	↑	↑	↑
Gliosis	10-fold	2-fold	10-fold
cFos in dorsal horn	↑	↑	↑
• ***Peripheral sensitization***			
cFos in superficial dorsal horn	↑	↑	(↑)

Sabino et al. Int J Cancer 104 (2003) 550-8

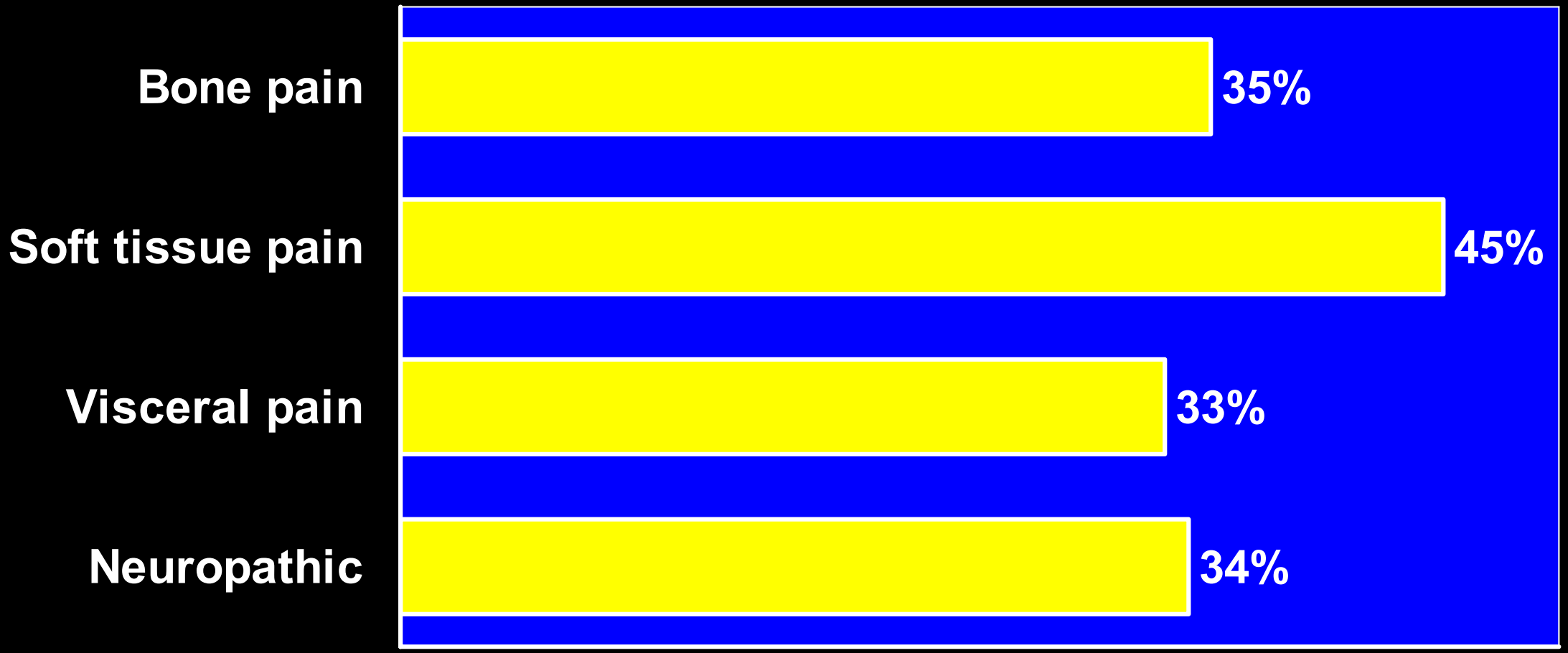
Pain types

Phenomenology

- *Nociceptive pain*
  - Bone pain
  - Soft tissue pain
  - Visceral pain
- *Neuropathic pain*
  - Peripheral neuropathic pain
  - Central neuropathic pain
  - Sympathetically maintained pain

Cancer Pain

Pain type (n= 2266)



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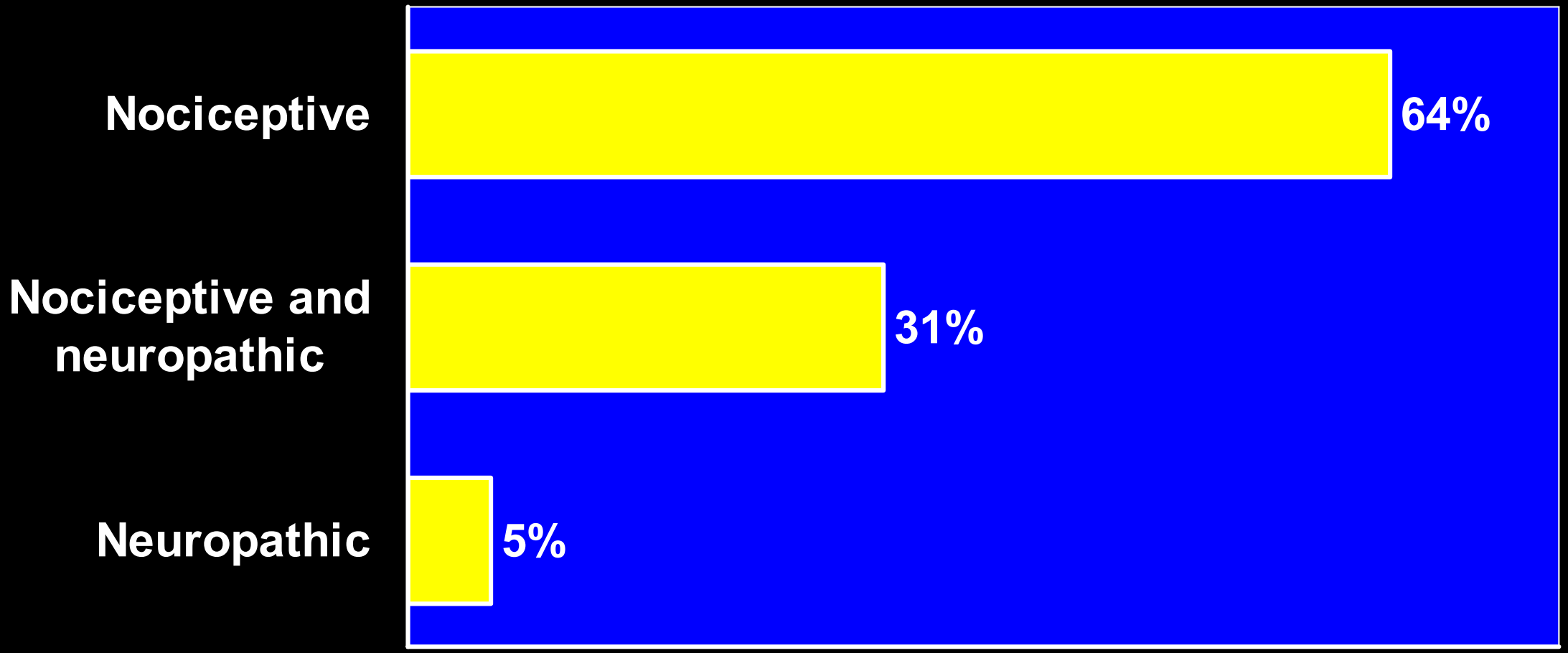
Grond et al. Pain 64 (1996) 107-14

Cancer Pain

Pain type (n= 593)



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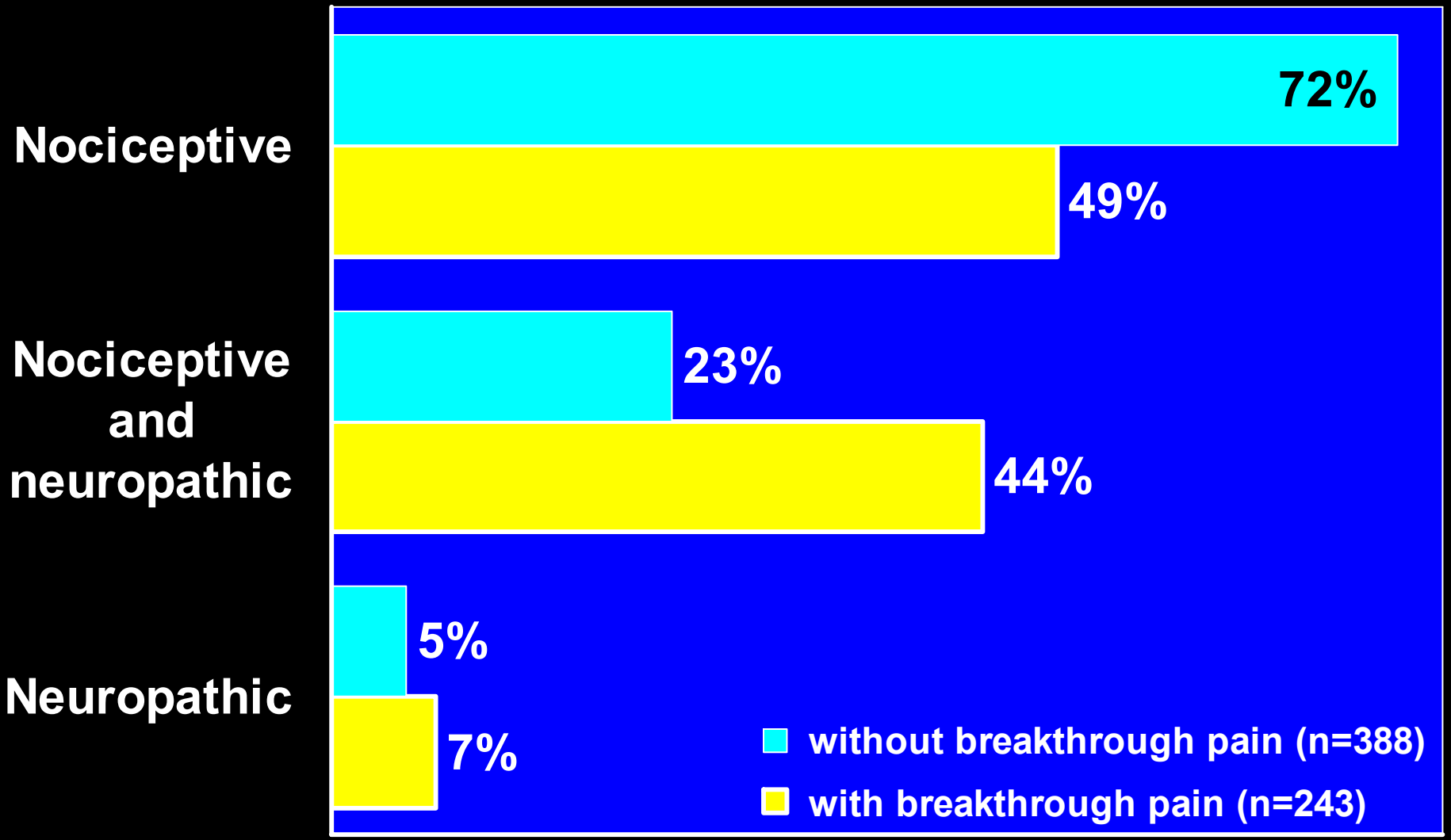
Grond et al. Pain 79 (1999) 15-20

Breakthrough Pain

Pain type (n=631)



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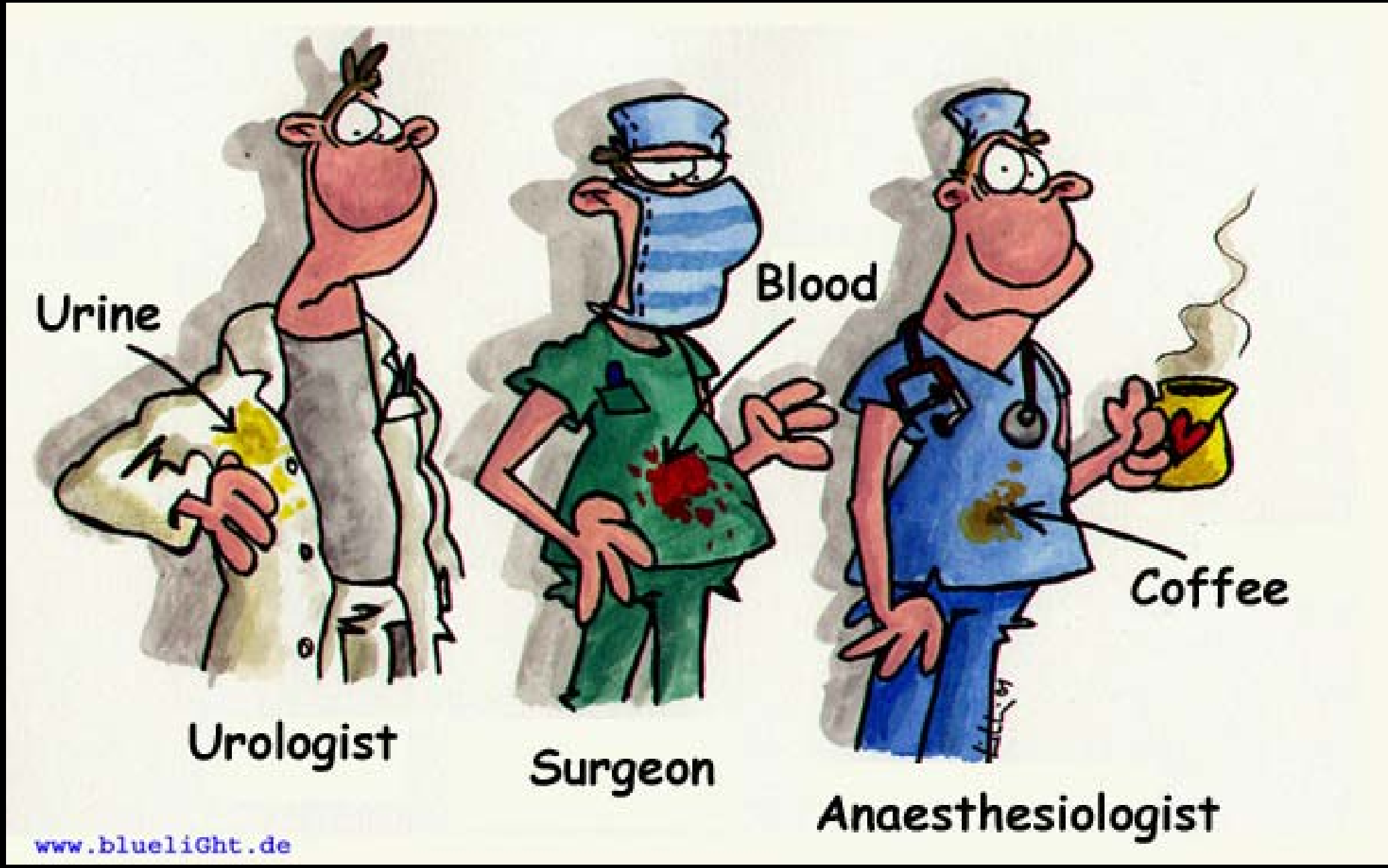
Petzke et al. JPSM 17 (1999) 391-401


Urine
Blood
Coffee
Urologist
Surgeon
Anaesthesiologist
www.blueliGht.de

Pain types

Phenomenology

Nociceptive pain	*Neuropathic pain*
• local, spreading locally	• area of nerve structures (dermatomes, peripheral nerve distribution, glove, hemibody)
• sharp, stabbing or dull, cramping	• lancinating, shooting or burning
	• allodynia, hyperpathia
• without neurological deficits	• with neurological deficits

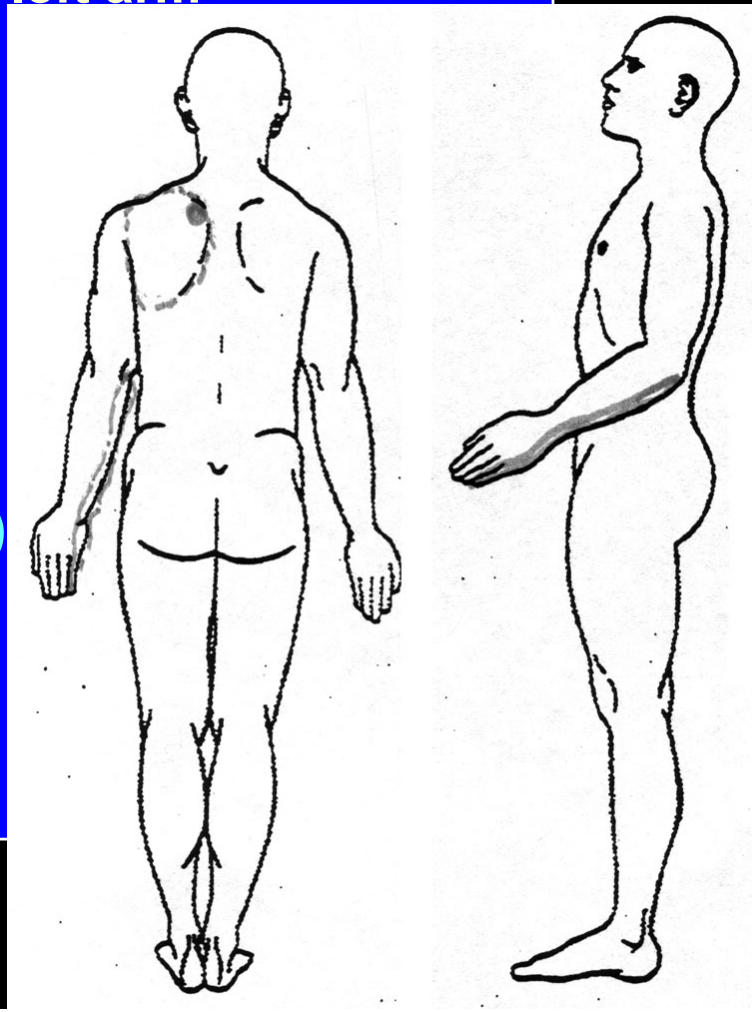
Male, 46 years

History: Male, pancoast tumour left lung apex, diagnosed 1/2002
radiotherapy 59 Gy, chemo carboplatin + navebine.

Pain: continuous pain in the left shoulder
hyperaesthesia and allodynia in the lower left arm
up to NRS 8
sweating

Pretreatment: Fentanyl TTS 5x100,
Ibuprofen 400
Dipyrone 3x 750
Carbamazepine 2x300
Morphine prn 120 mg

Treatment: *Hydromorphone 3x24 mg ⇨ 2-2-3 (168mg)*
Gabapentin 2100 mg
Dexamethasone 24 mg
Ibuprofen SR 3x800
Sweatosan 1-1-2



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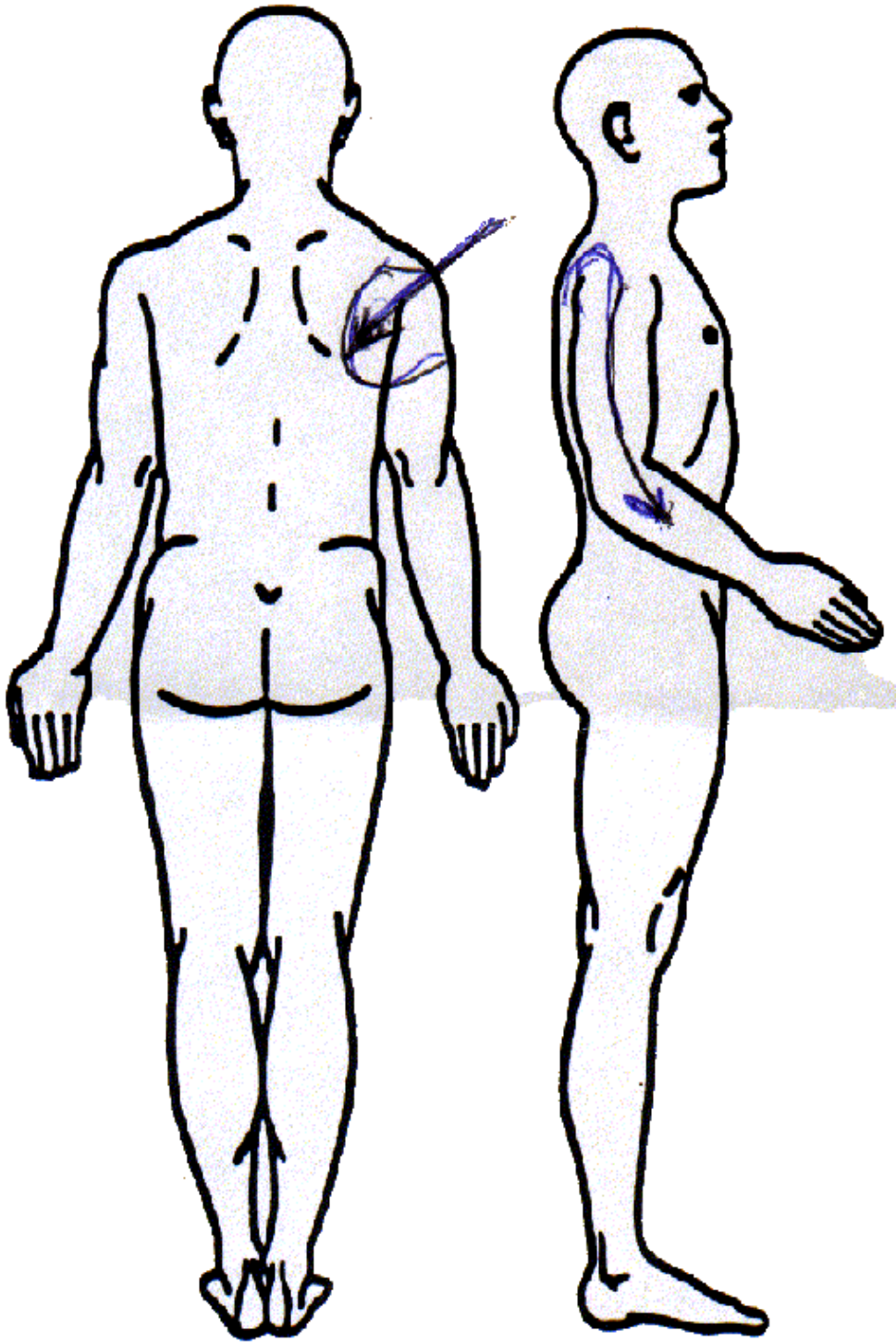
Male, 67 years

Pleuramesothelioma, pain right arm and shoulder



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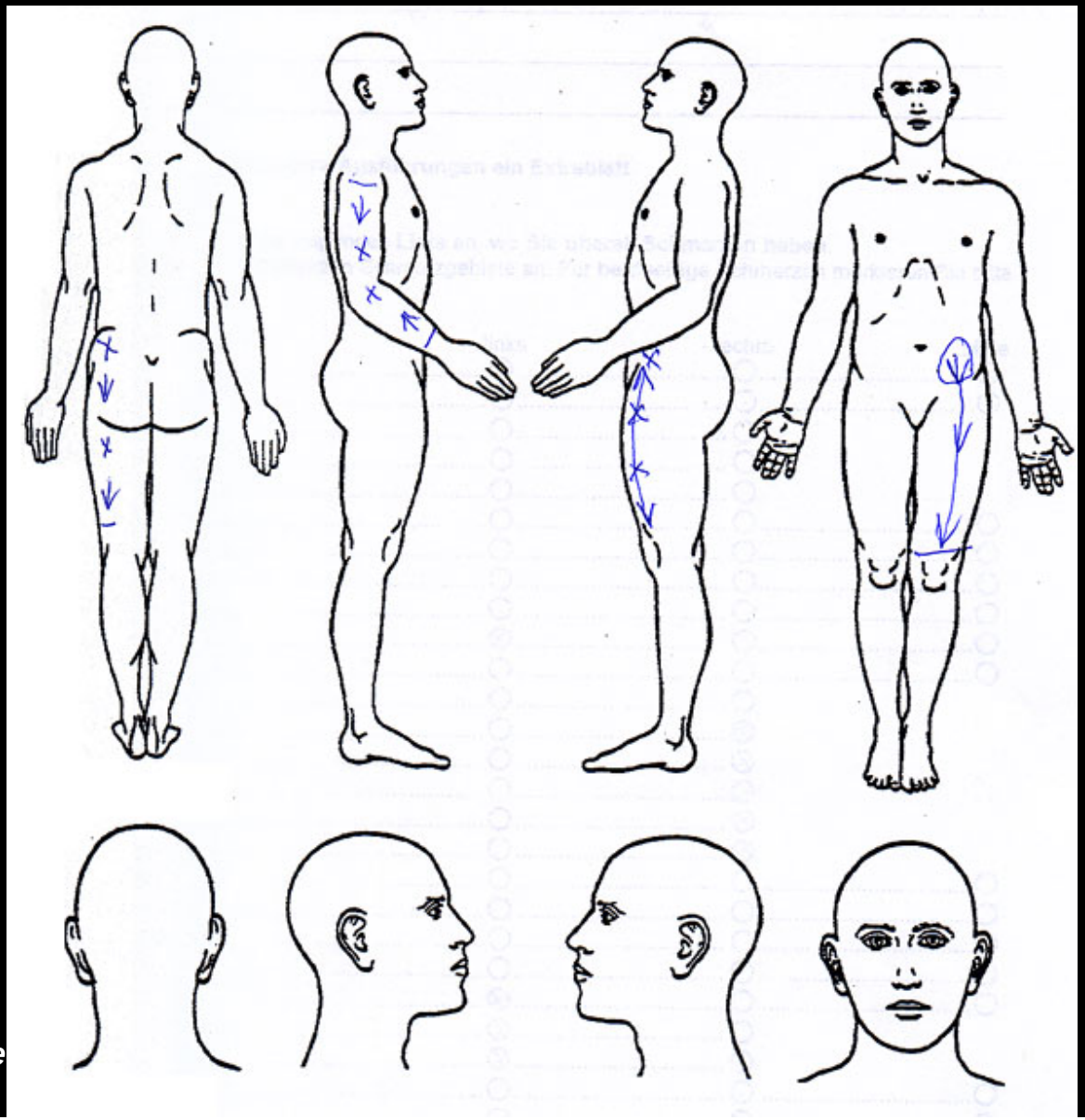
Male, 60 years
Recurrent renal cancer



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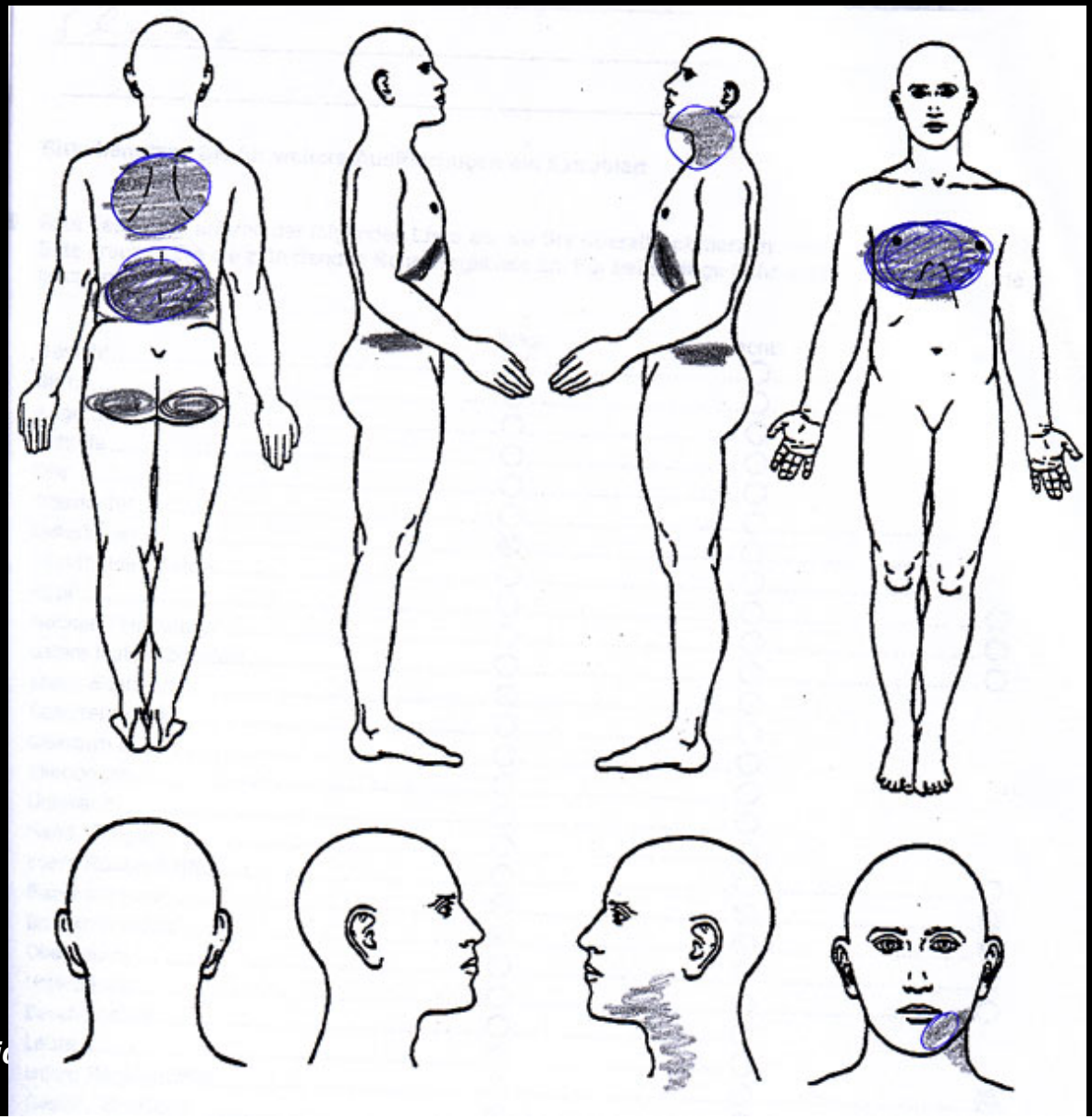
Male, 37 years
Parotis cancer



Female, 57 years

Quantitative Sensory Testing (QST)		control	test side
Thermal:	cold detection threshold	-16.1 °C	-9.7 °C
	warm detection threshold	12.1 °C	8.2 °C
	thermal sensory limen	22.7 °C	15.6 °C
	paradoxical heat sensations	0 / 3	0 / 3
	cold pain threshold	22.7 °C	15.6 °C
	warm pain threshold	42.8 °C	45.4 °C
Mechanical:	detection threshold	13.0 mN	36.8 mN
	pain threshold	27.9 mN	45.3 mN
Stimulus/ response:	mechanical pain sensitivity	0.7	0.8
	allodynia	0.0	0.0
Wind-up ratio:		n.a.	n.a.
Vibration threshold:	→ *polyneuropathy*	4.5 / 8	0.3 / 8
Pressure pain threshold:		173 kPa	164 kPa

Nociceptive/Hyperalgesic
Take-home Message

- *Neuropathic pain syndromes are frequent in cancer patients*
  often no clear differentiation possible
- *Diagnosis from phenomenology*
  pain type and location
- *Quantitative Sensory Testing*
  if indicated

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