ULSS21 LEGNAGO

Le malattie professionali da sovraccarico biomeccanico degli arti superiori

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UOC Neurologia

DISTURBI E PATOLOGIE DA SOVRACCARICO MECCANICO CORRELATI CON IL LAVORO

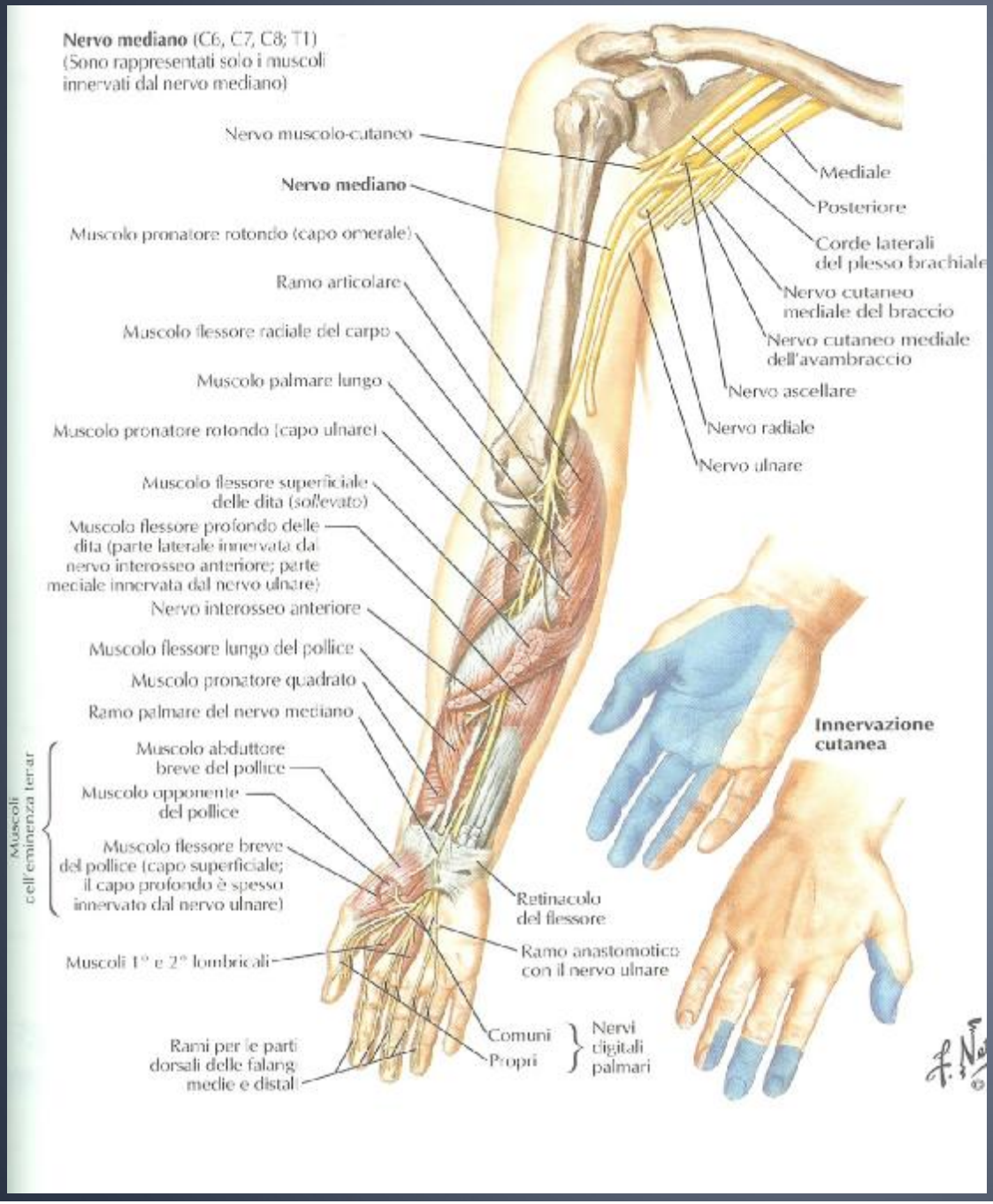
"Un complesso gruppo di disturbi e patologie, a carico dei sistemi ed apparati osteo-articolari, muscolo-tendinei, neurologico e vascolare, che possono essere causati e/o aggravati da sovraccarico biomeccanico dell'arto superiore o del rachide in ambiente lavorativo"

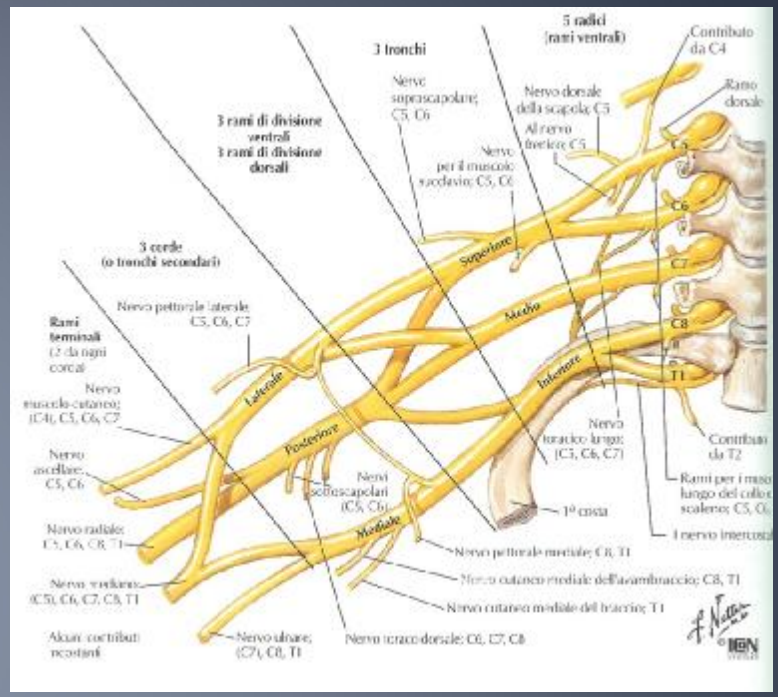
Sindromi da intrappolamento dei tronchi nervosi

- **Sindrome del tunnel carpale (Lista I)**
- **Sindrome del canale cubitale (Lita II)**
- **Sindrome del canale di Guyon (Lista II)**
- **Sindrome del tunnel tarsale (Lista II)**

Microtraumi e posture incongrue a carico degli arti superiori (o del piede e della caviglia) per attività eseguite con ritmi continui e ripetitivi per almeno la metà del tempo del turno lavorativo

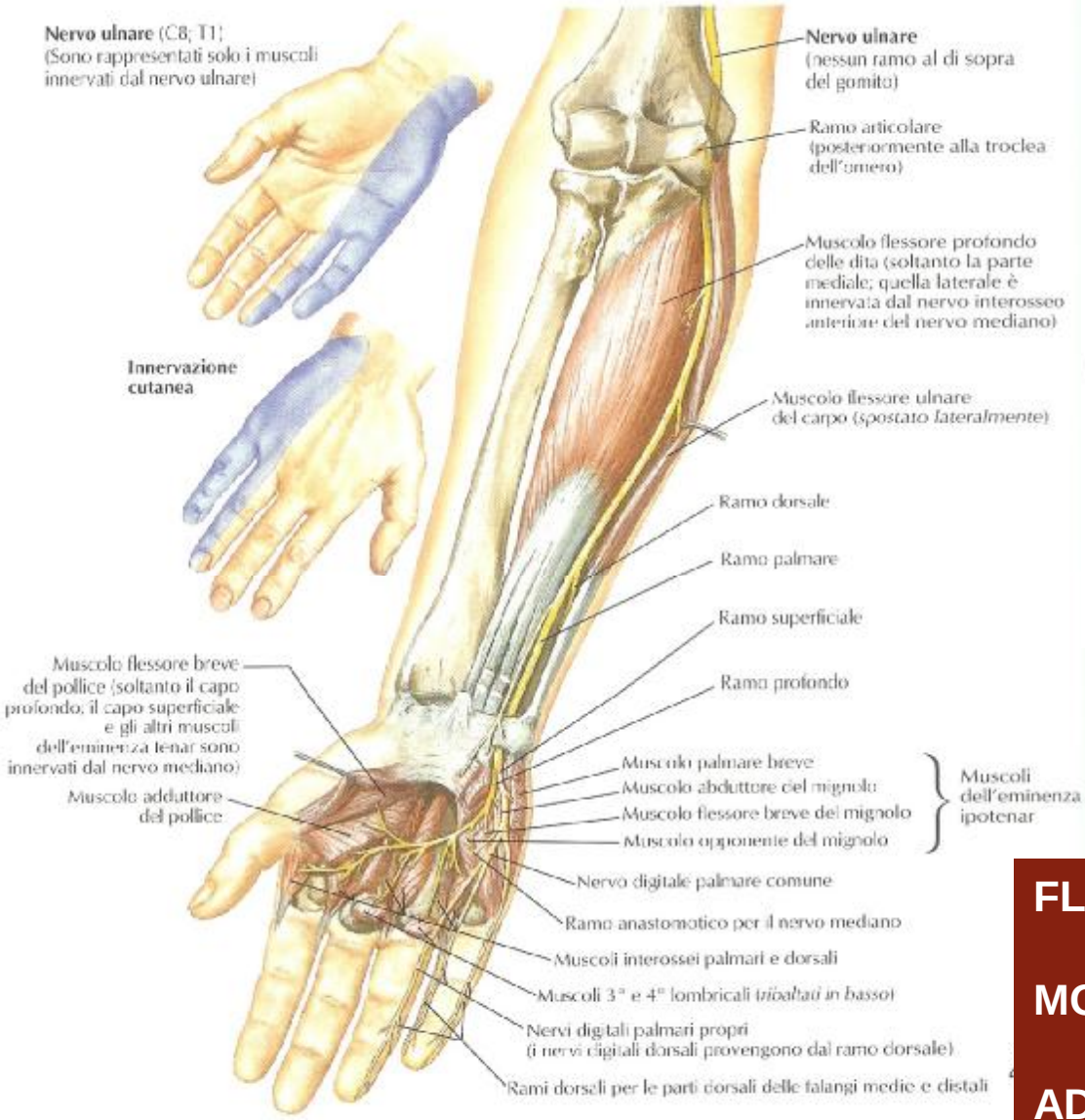
N MEDIANO

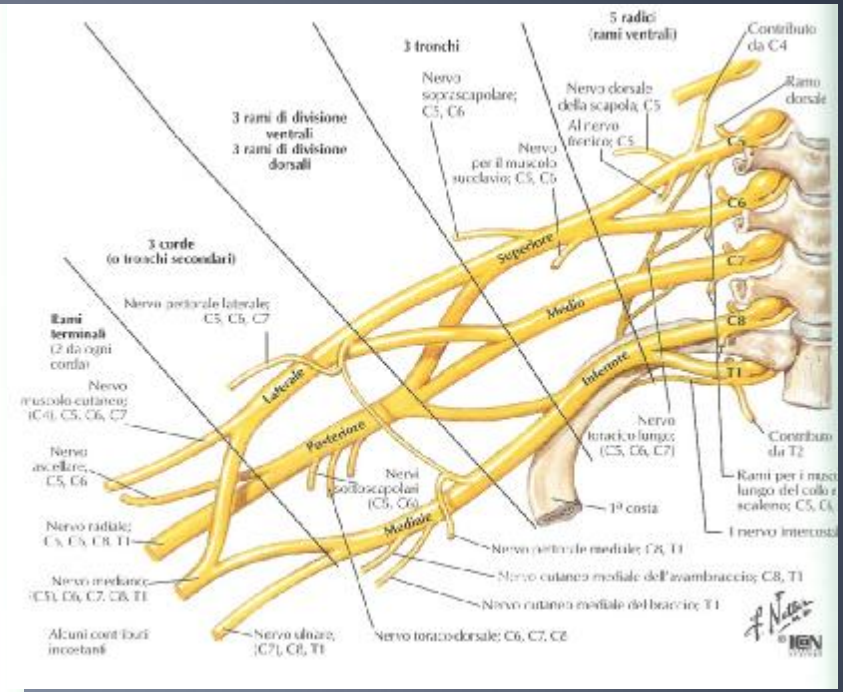




PRONAZIONE AVAMBRACCIO
FLESSIONE DITA E POLSO
MOVIMENTI PROPRI DEL 1 DITO

N ULNARE



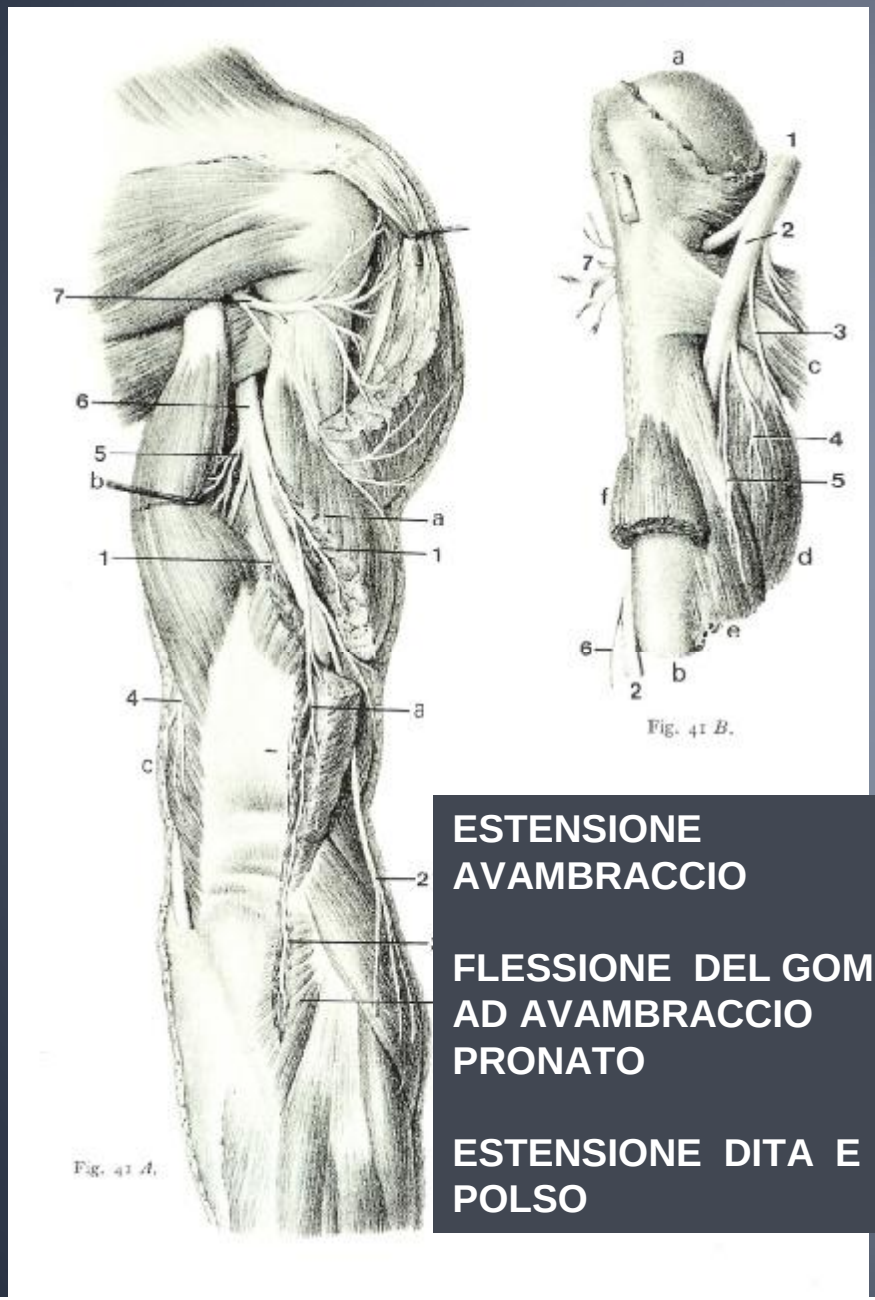


FLESSIONE DELLE DITA E DEL POLSO

MOVIMENTI PROPRI DEL 5 E 1 DITO

ADDUZIONE-ABDUZIONE DELLE DITA

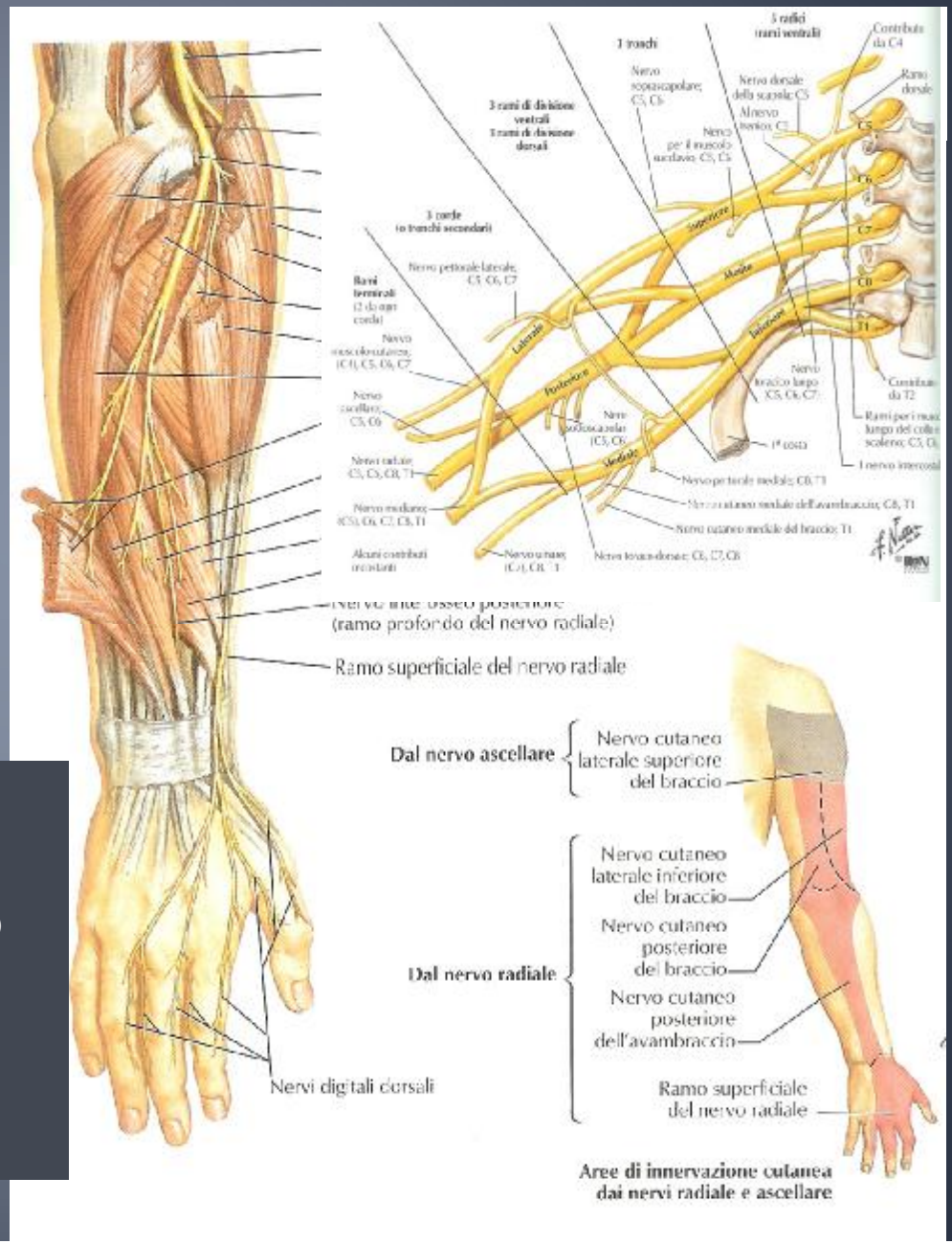
NN ASCELLARE - RADIALE



ESTENSIONE AVAMBRACCIO

FLESSIONE DEL GOMITO AD AVAMBRACCIO PRONATO

ESTENSIONE DITA E POLSO



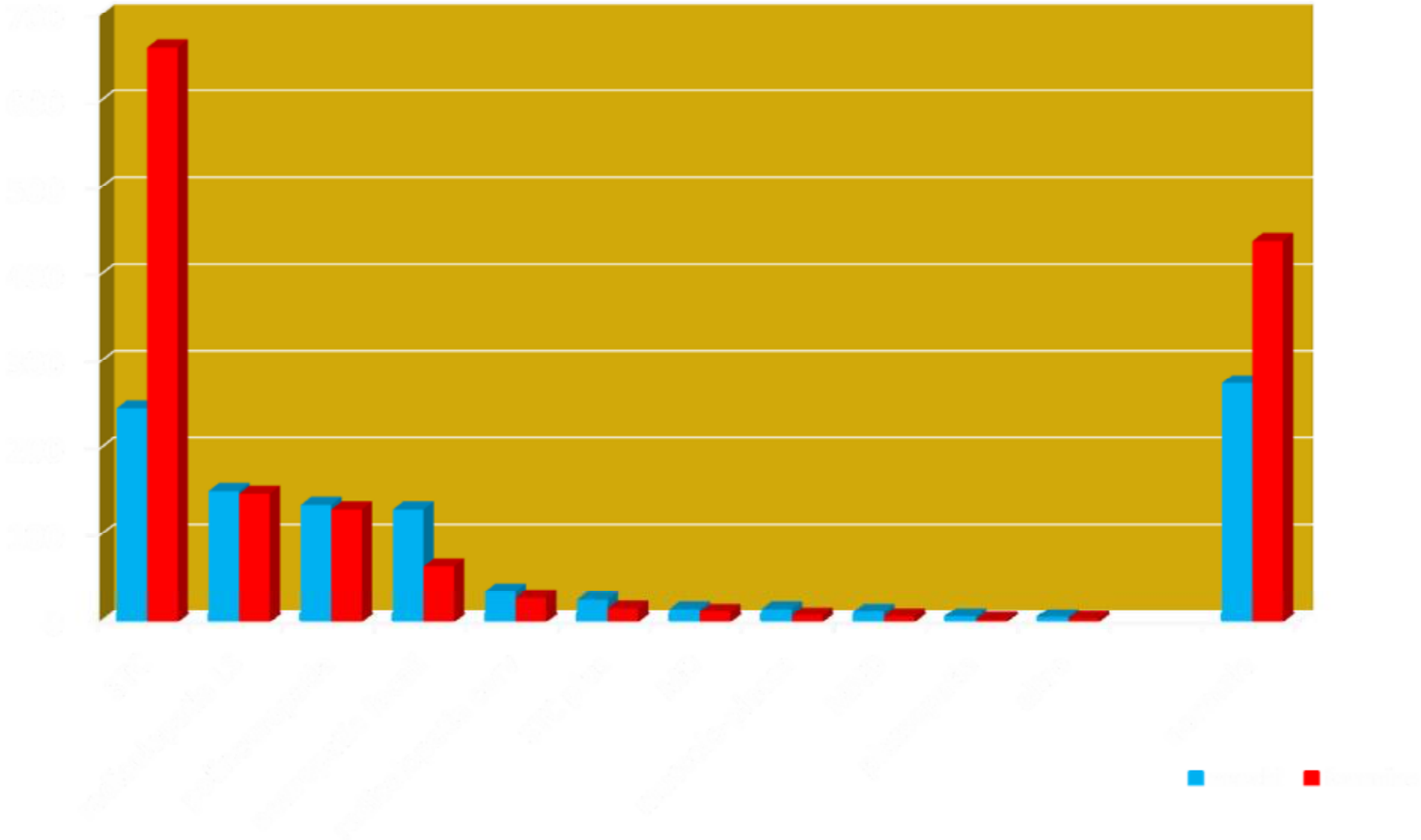
EPIDEMIOLOGIA

LA FORMA PIU' COMUNE DI NEUROPATIA DA COMPRESSIONE AGLI ARTI SUPERIORI

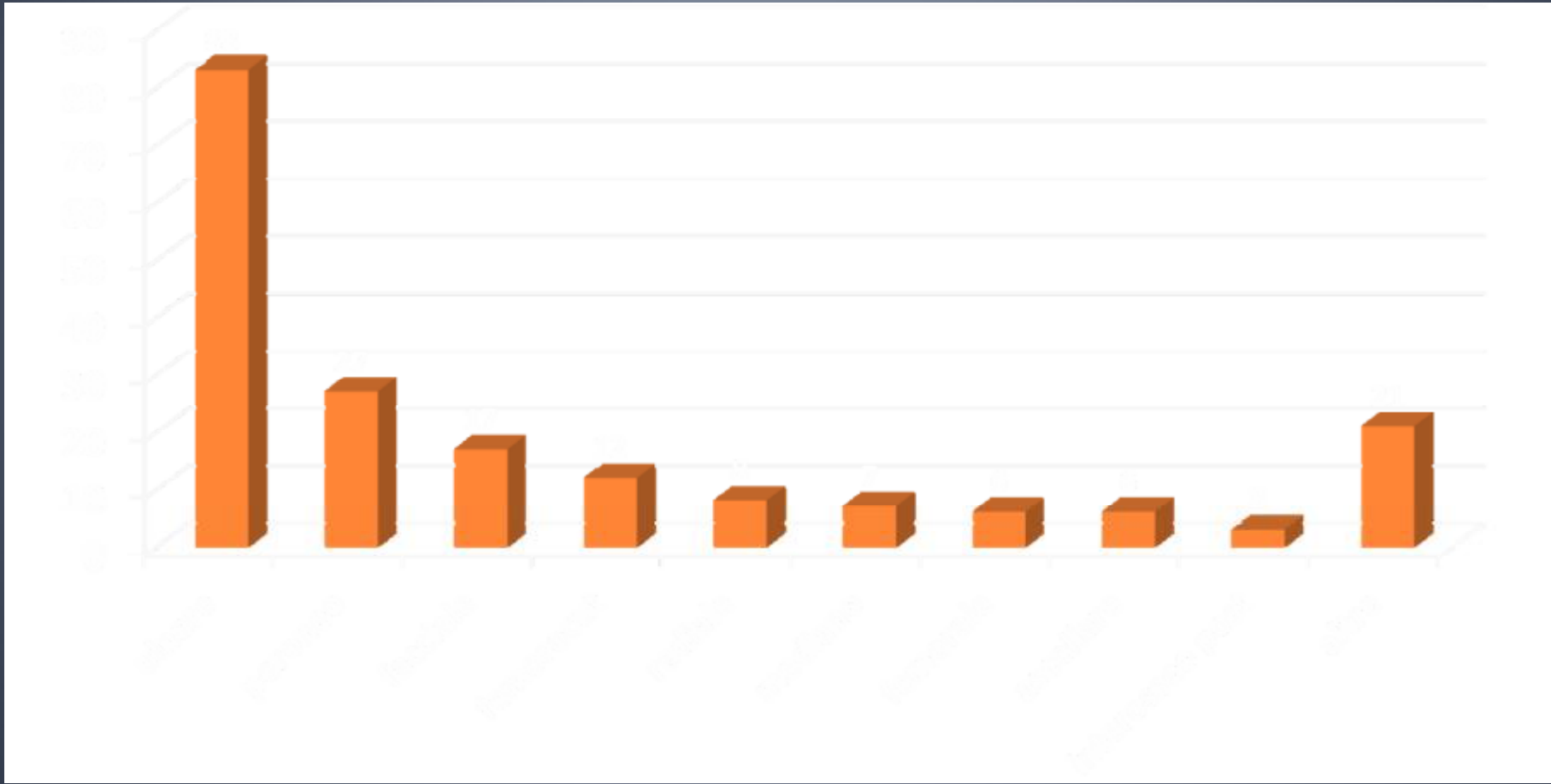
SINDROME DEL TUNNEL CARPALE

SINDROME DEL TUNNEL CUBITALE

Diagnosi neurofisiologica: 2012



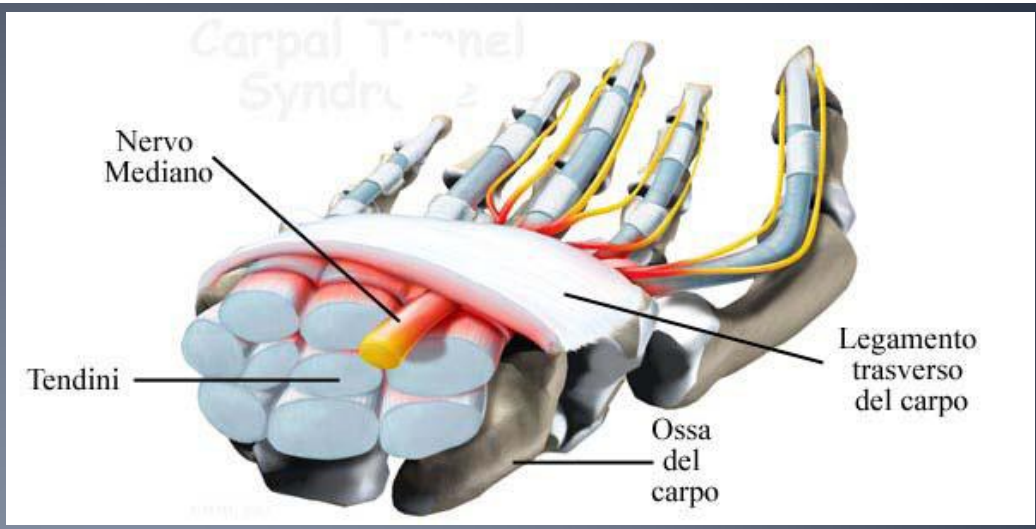
Neuropatie focali:2012
diagnosi neurofisiologica



STC

	Popolazione generale	Donne/uomini	Occupazionale	
Incidenza	**0,125 % - 1 %**	**139,4/67,2**	**5%**	
Prevalenza	**5 % - 16 %**	**Età media: 50 /51**		
		J Neurol Neurosurg Psychiatry 2003	*Orthop Clin North Am*	

Fisiopatologia STC



- La STC configura una eccessiva «pressione» esercitata sul nervo mediano
- Edema, infiammazione, emorragie o depositi di sostanze patologiche come calcio urico, e/o condizioni di amiloidosi, possono ridurre lo spazio libero all'interno del canale.
- L'elevata pressione nel tunnel carpale può portare a danno della mielina (rallentamento della conduzione nervosa) e/o assonale (perdita di fibre)
  - Episodi ricorrenti di compressione possono portare a demielinizzazione segmentale
  - Compressione cronica con conseguente cronica ischemia può portare a degenerazione assonale e disfunzione nervosa irreversibile

clinica della neuropatia compressiva

I stadio (irritativo)

- disturbi sensoriali (parestesie e/o disestesie) descritti variamente come formicolii, intorpidimento, bruciori.

- Tipicamente, durante il sonno (STC) ed è causata dall'edema dovuto ad una ritenzione dei fluidi per la inattività muscolare.

II stadio (compressivo)

- Disturbi della sensibilità tattile: da ipostesia ad anestesia
- Dolore
- Ipostenia con impaccio motorio

III stadio (degenerativo)

- ipotrofia dei muscoli dell'eminenza thenar.

Table 5

Studies that report the risk of Carpal Tunnel Syndrome by occupational title (adapted from Palmer et al [31] with permission of the publishers)

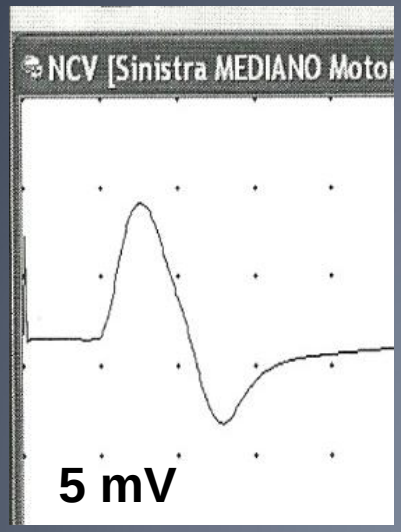
Author (date)	Exposed group	Reference group	Diagnostic criteria	Subgroup	RR (95% CI)
Hand-transmitted vibration:					
Bovenzi *et al* 1991[32]	65 forestry workers	31 mixed blue collar workers	Symptoms + signs		21.3 (p = 0.002)
Bovenzi 1994[33]	145 quarry drillers and 425 stone carvers	258 polishers and machine operators (not exposed)	Symptoms + signs		3.4 (1.4 - 8.3)
Chatterjee *et al* 1982[34]	16 rock drillers	15 matched controls	Electrodiagnosis		10.9 (1.0 - 5.2)
Farkkila *et al* 1988[35]	79 chainsaw workers with >500 hrs of sawing per year	None	Symptoms + nerve conduction		Prevalence 26%
Koskimies *et al* 1990[36]	217 forestry workers using chain saws >500 hrs in past 3 years	None	Symptoms + nerve conduction		Prevalence 20%
Assembly workers, food processors and retailers:					
Abbas *et al* 2001[37]	104 electrical (TV) assembly workers	94 clerical workers	Symptoms and nerve conduction		11.4 (3.6 - 40.2)
Barnhart *et al* 1991[24]	106 ski manufacturing workers in repetitive jobs	67 non-repetitive jobs	Electrophysiology + physical signs		4.0 (1.0 - 15.8)
Bystrom *et al* 1995[38]	60 female automobile assembly workers	90 female general population referents	Symptoms + signs		2.9 (0.1 - 60.0)
Cannon *et al* 1981[39]	Cases - 30 cases of CTS in aircraft engine workers	Controls - 90 randomly selected workers from the same plant	Workman's claims + medical records of CTS		7.0 (3.0 - 17.0)
Leclerc *et al* 1998[40]	Workers from assembly lines (479), clothing and shoe industry (264), food industry (307), packaging (160)	337 controls	Signs or positive nerve conduction	Assembly Clothing Food Packaging	4.5 (2.3 - 9.1) 4.1 (2.0 - 8.7) 3.1 (1.4 - 7.2) 6.6 (3.0 - 14.2)
Leclerc *et al* 2001[41]	Cohort study of 598 workers from 5 sectors - assembly, clothing manufacture, food and packaging, and cashiers; estimates for baseline prevalence and incidence over 3 years		Signs or positive nerve conduction	Prevalence/incidence varied <2-fold between groups	
Chiang *et al* 1990[42]	121 frozen food packers	49 office staff and technicians	Symptoms, signs, and/or delayed nerve conduction		11.7 (2.9 - 46.6)
Kim *et al* 2004[43]	69 fish processors	28 managers and secretaries	Symptoms + nerve conduction	Prevalence 26% (exposed) vs. 0% (unexposed)	
Schottland *et al* 1991[44]	93 poultry workers	85 job applicants for poultry jobs	Delayed nerve conduction		2.9 (1.1 - 7.9)

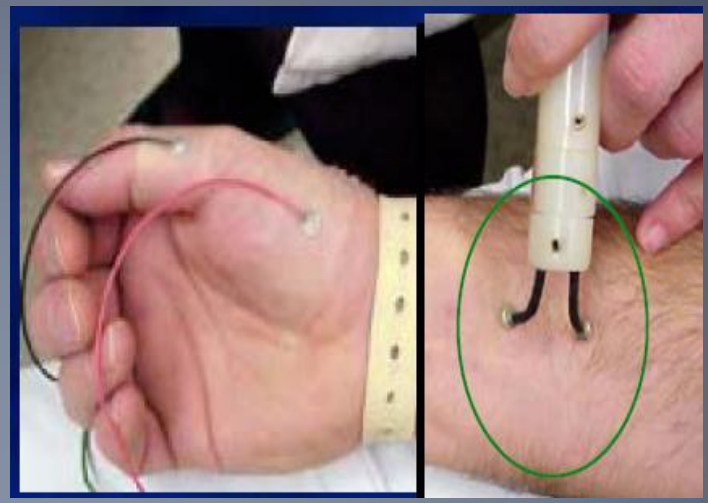
CTS: case definition

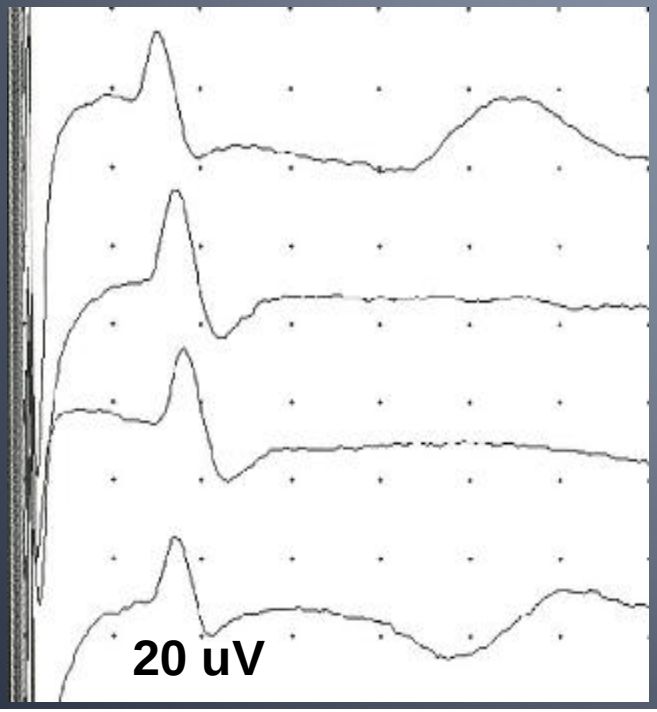
The case definitions requiring symptoms alone, in any part of the hand or fingers, resulted in the highest numbers of cases (11%).
The case definition requiring symptoms specific to the median nerve distribution plus electrodiagnostic abnormality had the lowest number of cases (2,5-6%), while those requiring symptoms plus physical exam or electrodiagnostic abnormality were intermediate.

Scand J Work Environ Health. 2011

Conduzione Motoria

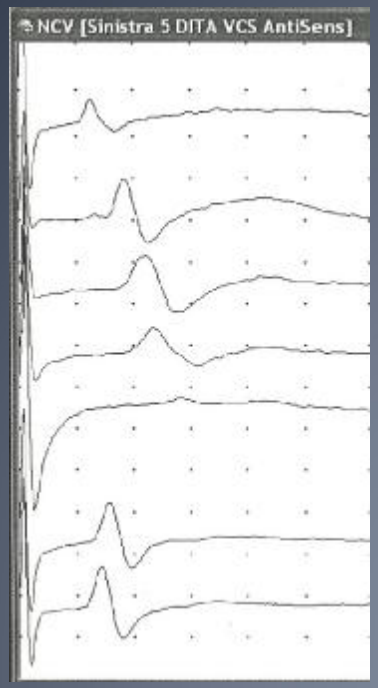


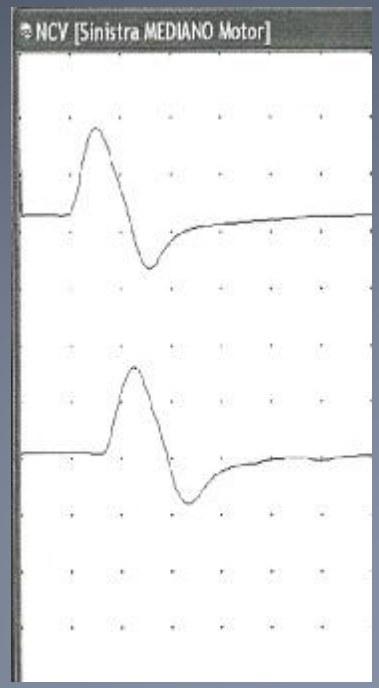


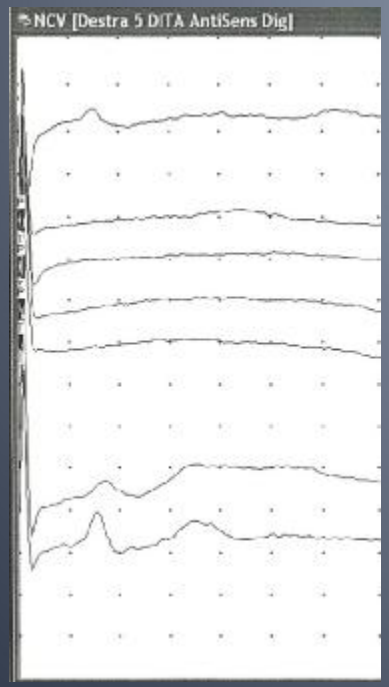


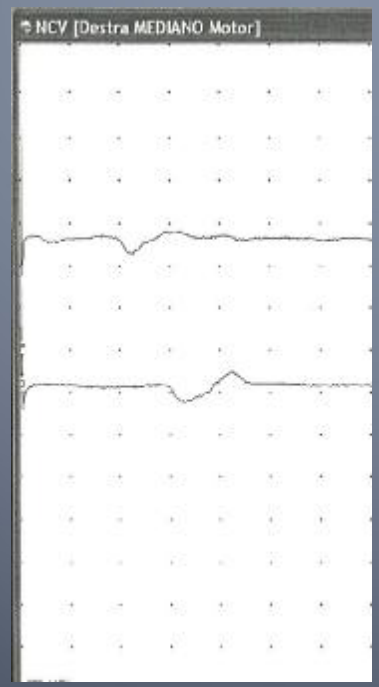
Conduzione Sensitiva

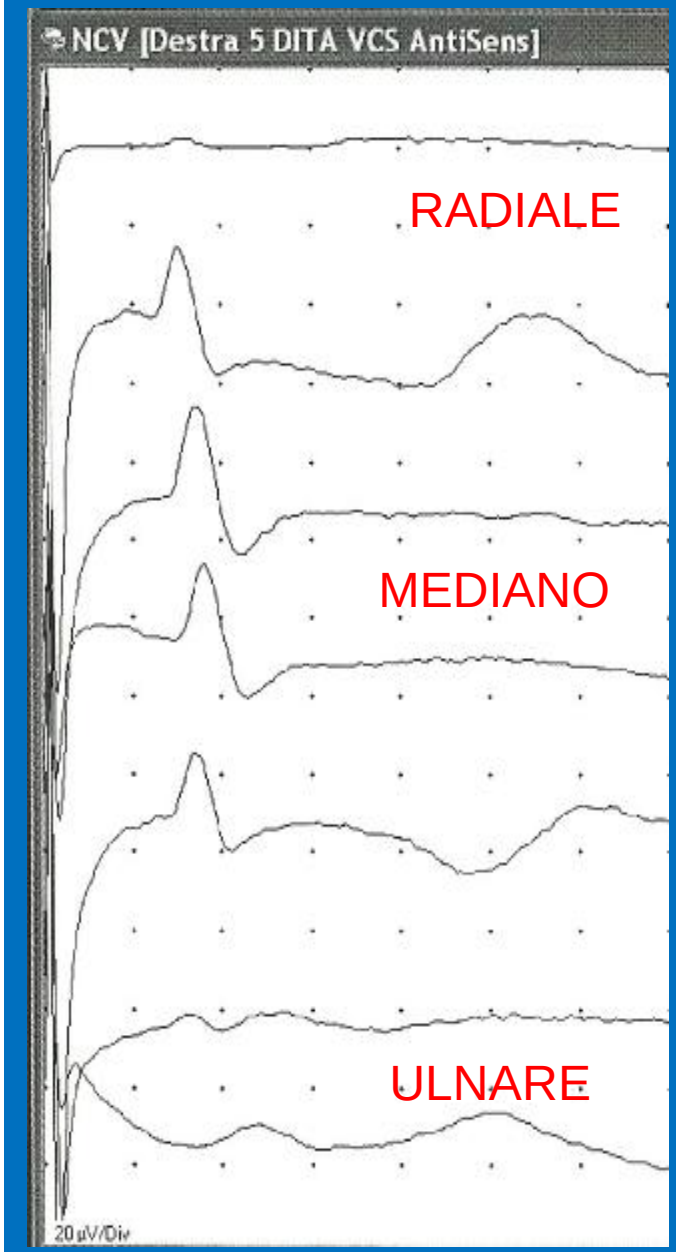
STC

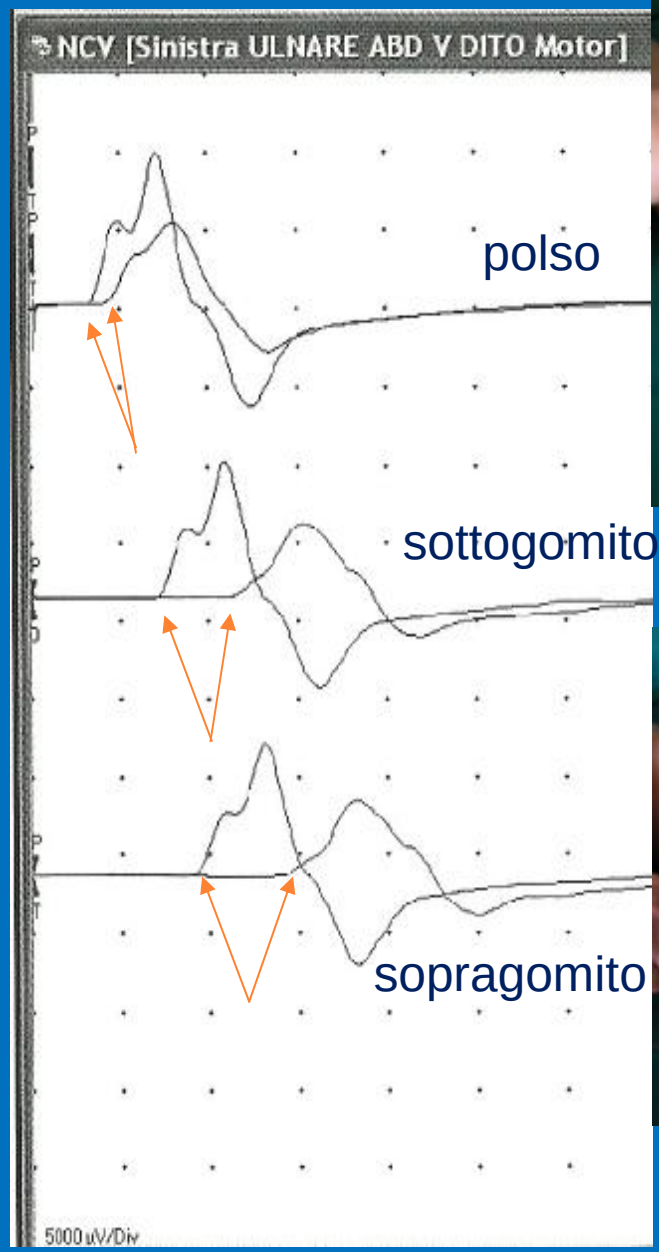

NCV [Sinistra 5 DITA VCS AntiSens]


NCV [Sinistra MEDIANO Motor]


NCV [Destra 5 DITA AntiSens Dig]

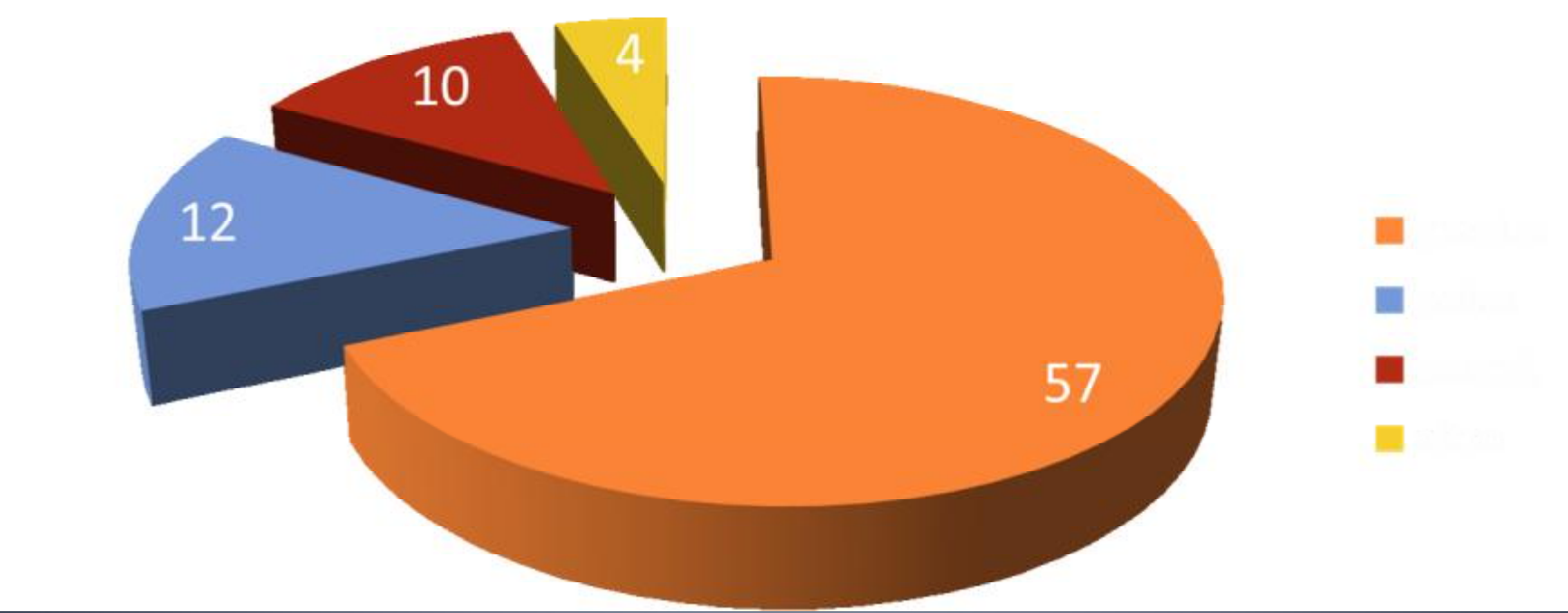

NCV [Destra MEDIANO Motor]



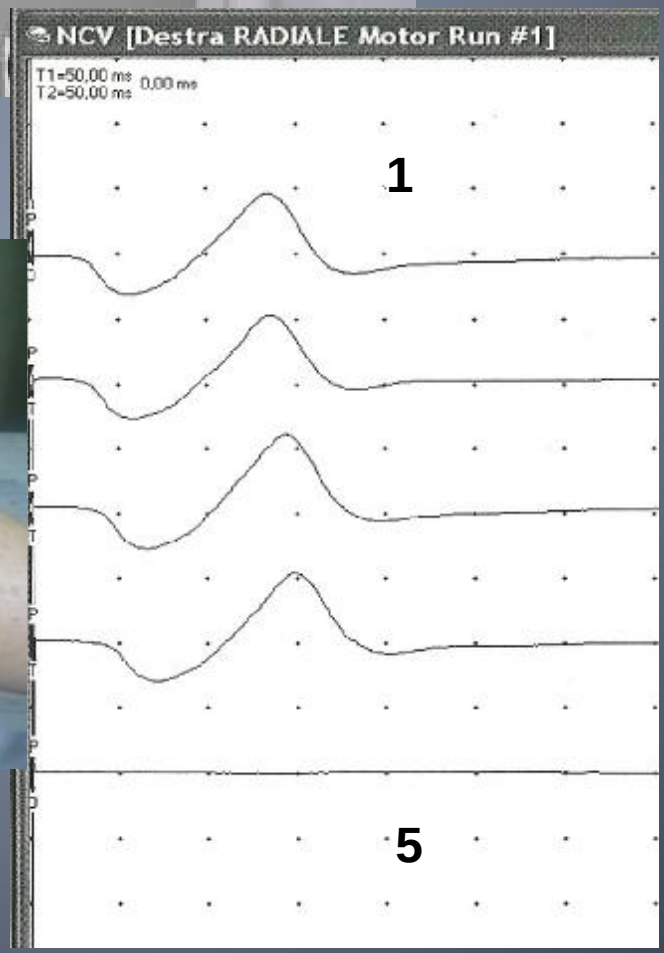


NEUROPATIA ULNARE AL GOMITO

Lesioni n ulnare



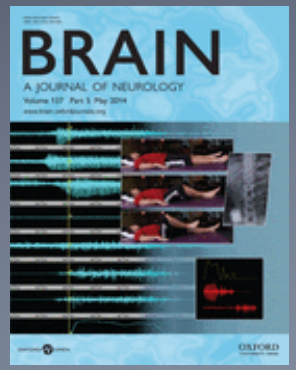
5
1


NCV [Destra RADIALE Motor Run #1]
T1=50,00 ms
T2=50,00 ms
0,00 ms
1
5

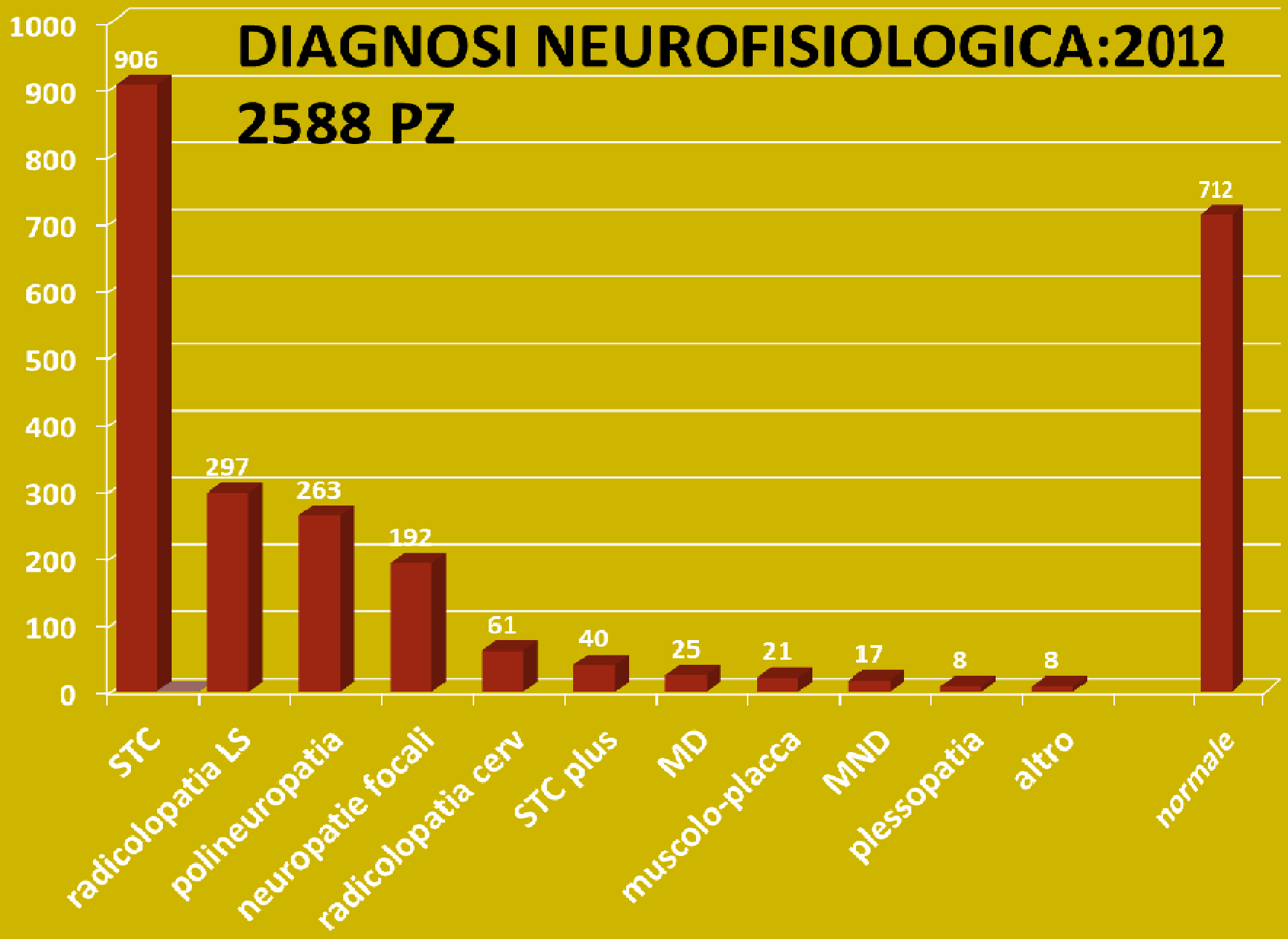
Iatrogenic nerve palsy

- A total of 707 humerus shaft fractures were treated operatively at our two hospitals over a 10-year period. Of these, 30 patients sustained iatrogenic radial nerve palsy.

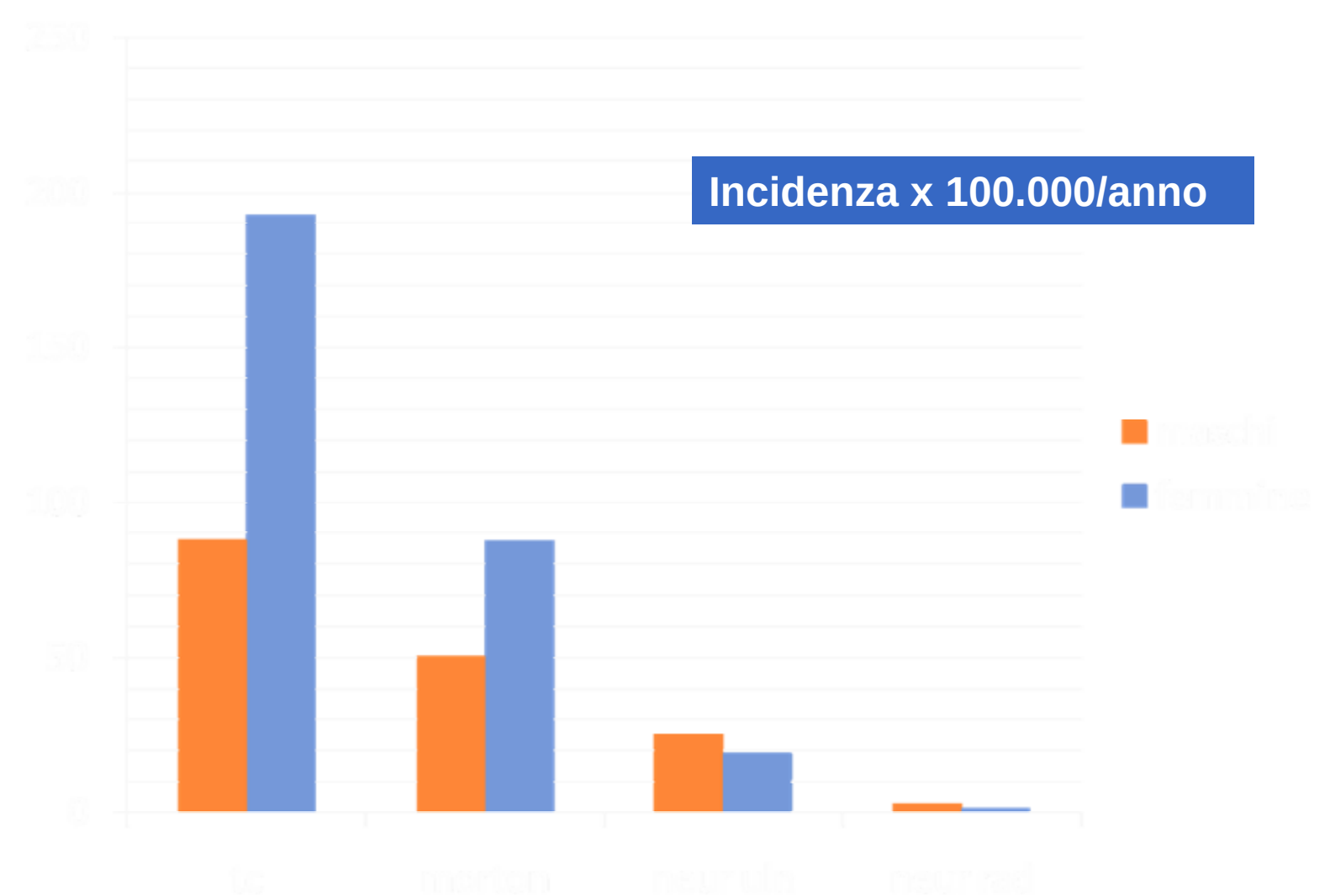
- Wang J et al. J Trauma. 2009



- 2009
- Bilateral widespread mechanical pain sensitivity in carpal tunnel syndrome: evidence of central processing in unilateral neuropathy


DIAGNOSI NEUROFISIOLOGICA:2012
2588 PZ
1000
900
800
700
600
500
400
300
200
100
0
906
297
263
192
61
40
25
21
17
8
8
712
STC
radicolopatia LS
polineuropatia
neuropatie focali
radicolopatia cerv
STC plus
MD
muscolo-placca
MND
plessopatia
altro
normale

Neuropatie focali



- **R Latinovic et al. J Neurol Neurosurg Psychiatry 2006**

Diagnostic properties of nerve conduction tests in population-based carpal tunnel syndrome (B)

- NCS is considered to be the gold standard in the diagnosis of CTS because it is an objective test that provides information on the physiological health of the median nerve across the carpal tunnel.

Open Orthop J 2012

Dilemma: diagnosi STC

- Clinica: positiva
- NCS: negativo

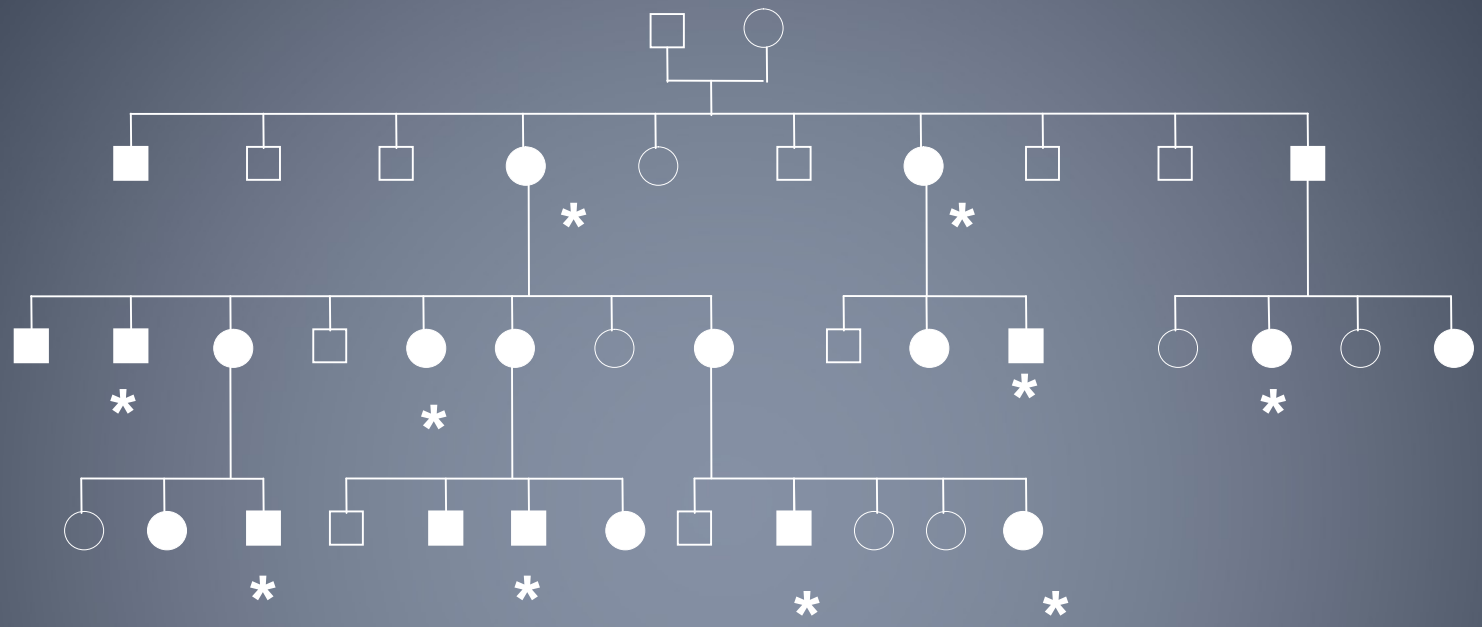
- Clinica: negativa
- NCS: positivo

PREGANCY AND CTS

- 63 patients :CTS was clinically diagnosed in more than half of women (62%). Neurophysiological evaluation provided diagnosis of CTS 43%of women in one hand at least.

- Acta Neurochir (Wien). 2006

Familiar painless - recurrent brachial plexus palsy



HNPP : deletion or abnormal structure of the PMP22 gene on 17p12-p11.2