

SOMESTESIA

per le lezioni del prof. P. Paolo Battaglini



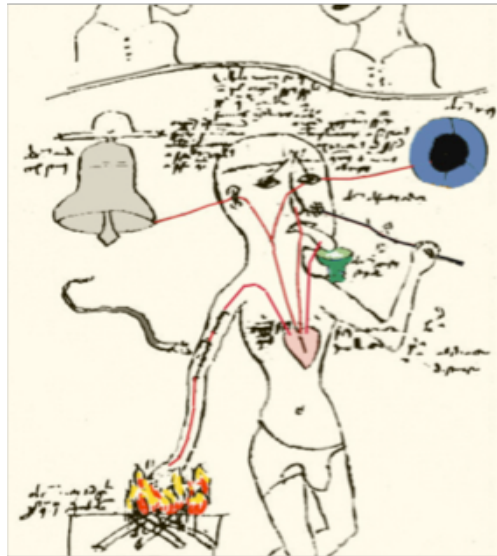
Principali fonti delle figure:

Conti et al., FISILOGIA MEDICA, Edi-Ermes

Kandel et al., PRINCIPI DI NEUROSCIENZE, Ambrosiana

QUADRO GENERALE

- Classificazione dei sistemi sensoriali
- Trasduzione sensoriale: mecanocezione
 - Classificazione dei recettori
 - Recettori cutanei per il tatto
 - Classificazione delle fibre nervose
- Codificazione della intensità e della durata dello stimolo meccanico
 - Campi recettivi cutanei
 - Acuità sensoriale
 - Vie spinotalamica e lemniscale
- Citoarchitettura della corteccia cerebrale
 - Nomenclatura di Brodman
 - Area somestesica primaria
 - Aree citoarchitettoniche che compongono l'area sensitiva primaria



Rappresentazione medioevale della concezione cardiocentrica di Aristotele

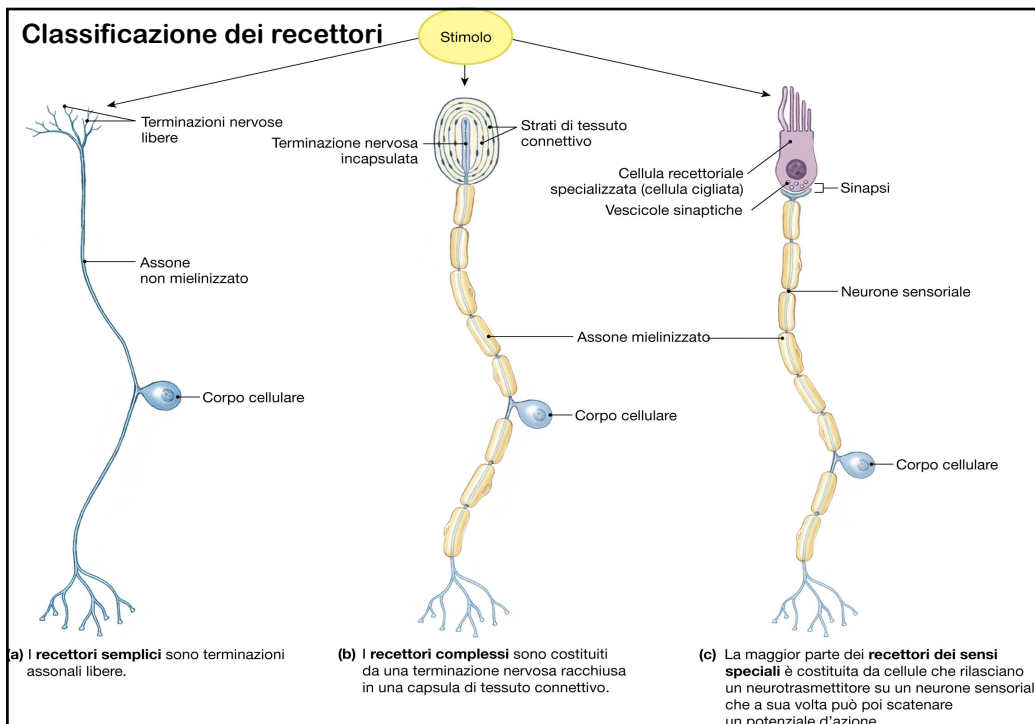
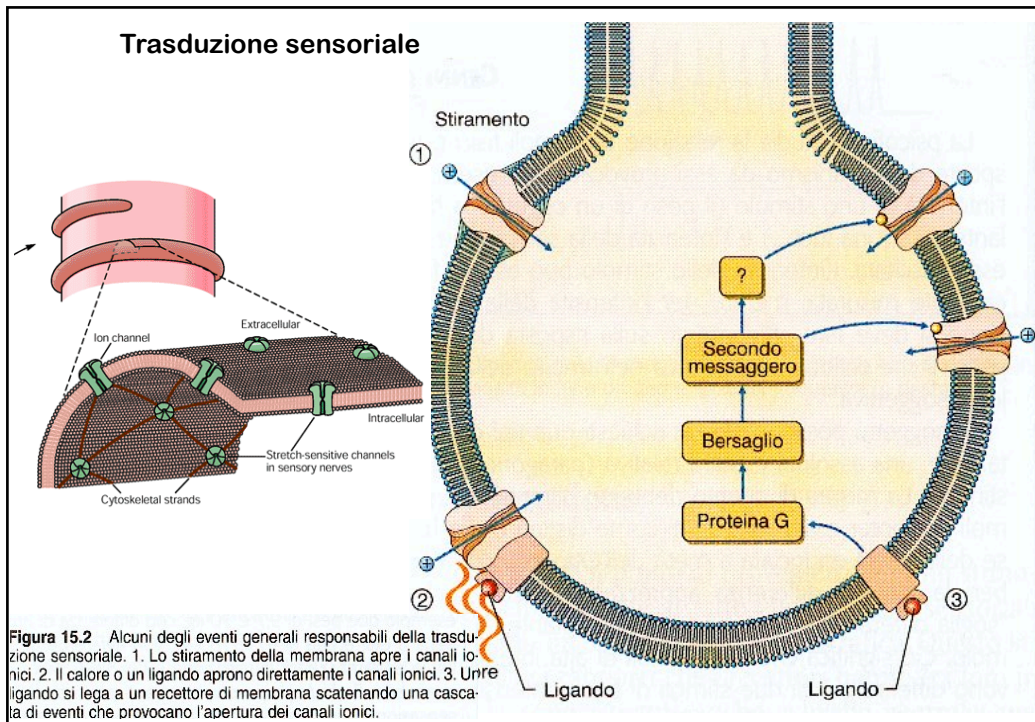
Sistemi sensoriali

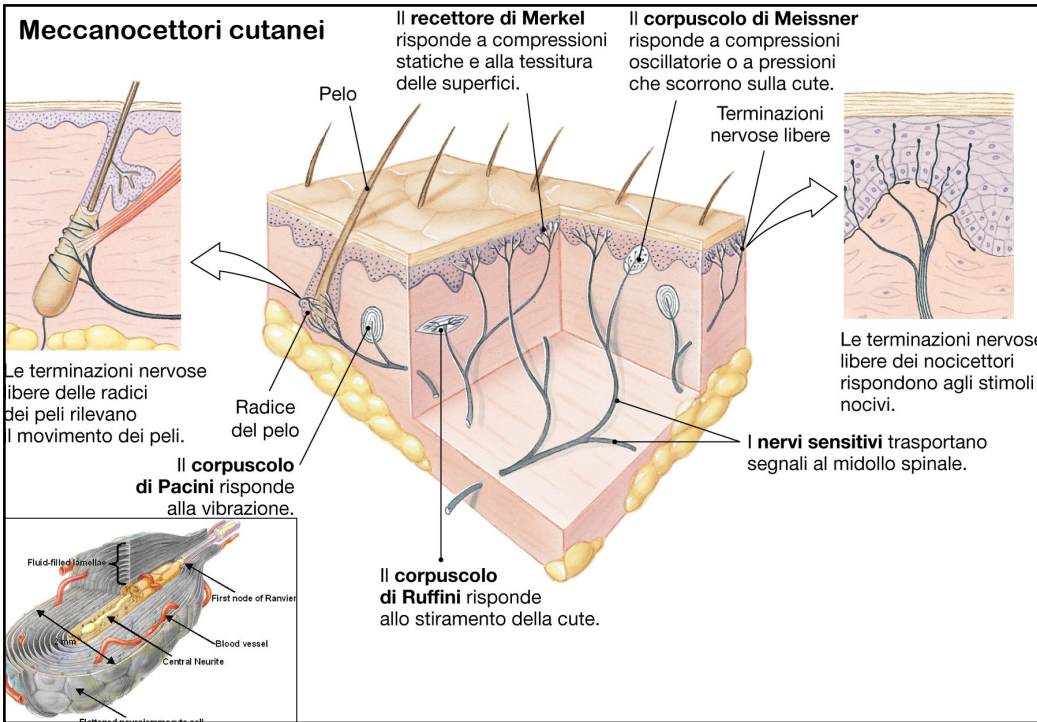


Figure 21-1 The major sensory modalities in humans are mediated by distinct classes of receptor neurons located in specific sense organs. Each class of receptor cell transforms one type of stimulus energy into electrical signals that are encoded as trains of action potentials. The principal receptor cells include photoreceptors (vision), chemoreceptors (smell, taste, and pain), thermal receptors, and mechanoreceptors

(touch, hearing, balance, and proprioception). The classic five senses—vision, smell, taste, touch, and hearing—and the sense of balance are mediated by receptors in the eye, nose, mouth, skin, and inner ear, respectively. The other somatosensory modalities—thermal senses, pain, and proprioception—are mediated by receptors distributed throughout the body.

Da Kandel, Principles of Neural Sciences





MECCANOCETTORI CUTANEI

nome	tipo	localizzazione	modalità di attivazione
corpuscoli di Meissner	RA I	superficiali	contatto rapido, sfioramento, velocità, direzione del movimento
corpuscoli di Pacini (PC)	RA II	profondi (sottocute)	vibrazione (caratteristiche delle superfici)
dischi di Merkel	SA I	superficiali	deformazione della cute (forme, dimensioni e trama degli oggetti)
corpuscoli di Ruffini	SA II	profondi	tensione
recettori dei follicoli piliferi	RA	cute villosa	spostamento dei peli

A Slowly adapting mechanoreceptors

Meissner corpuscles (RA1)

Merkel cells (SA1)

Superficial layers

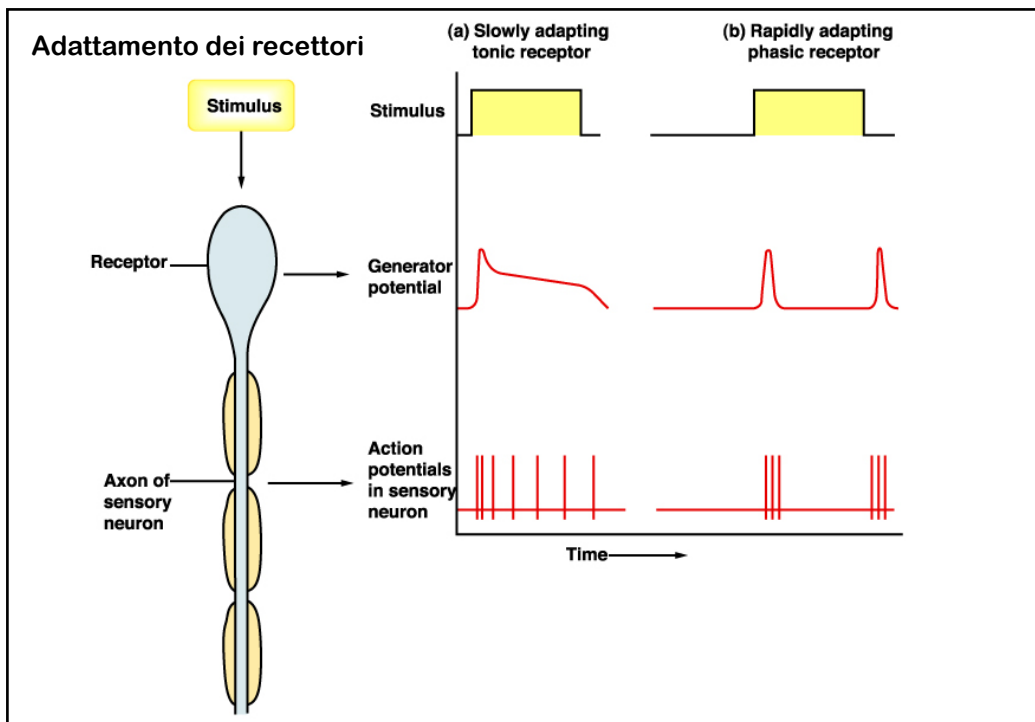
B Rapidly adapting mechanoreceptors

Pacinian corpuscles (RA2)

Ruffini endings (SA2)

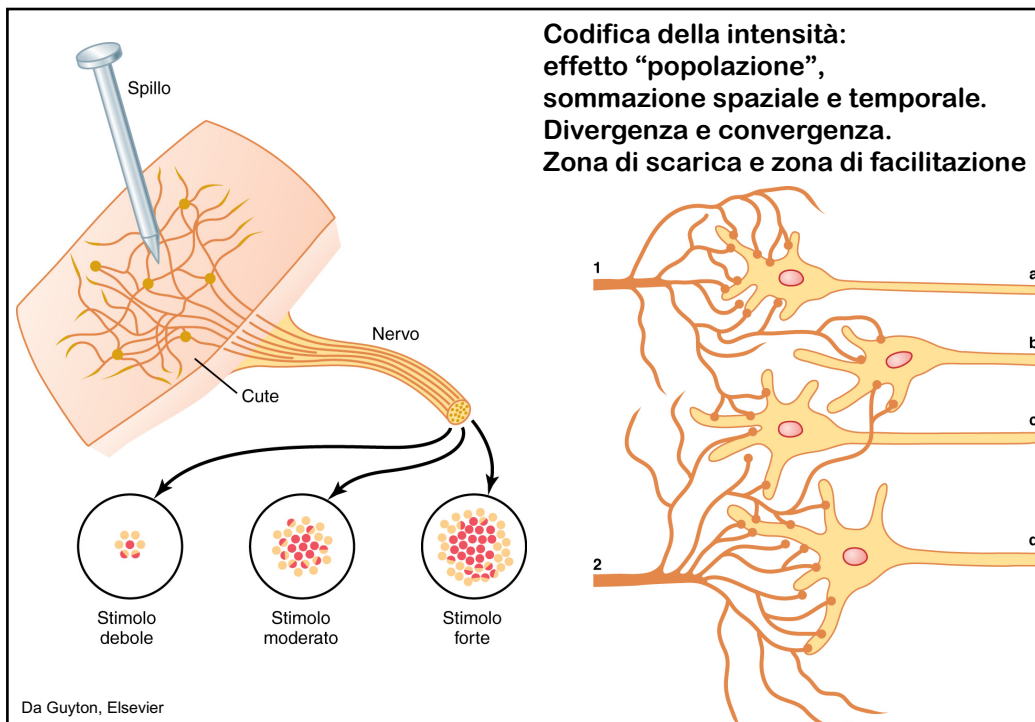
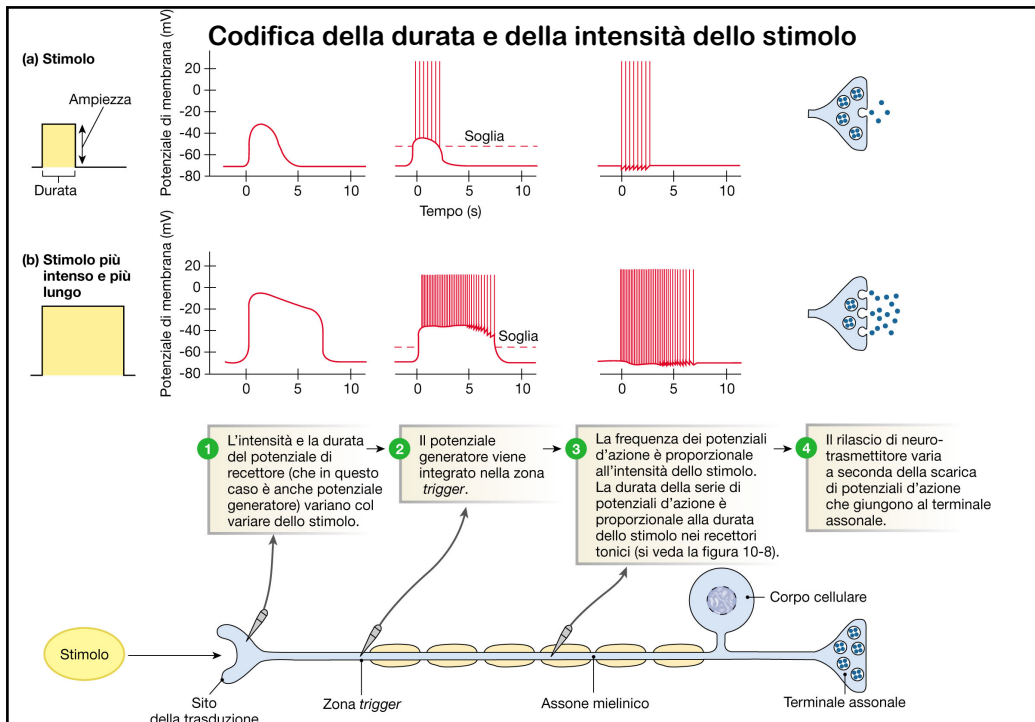
Deep layers

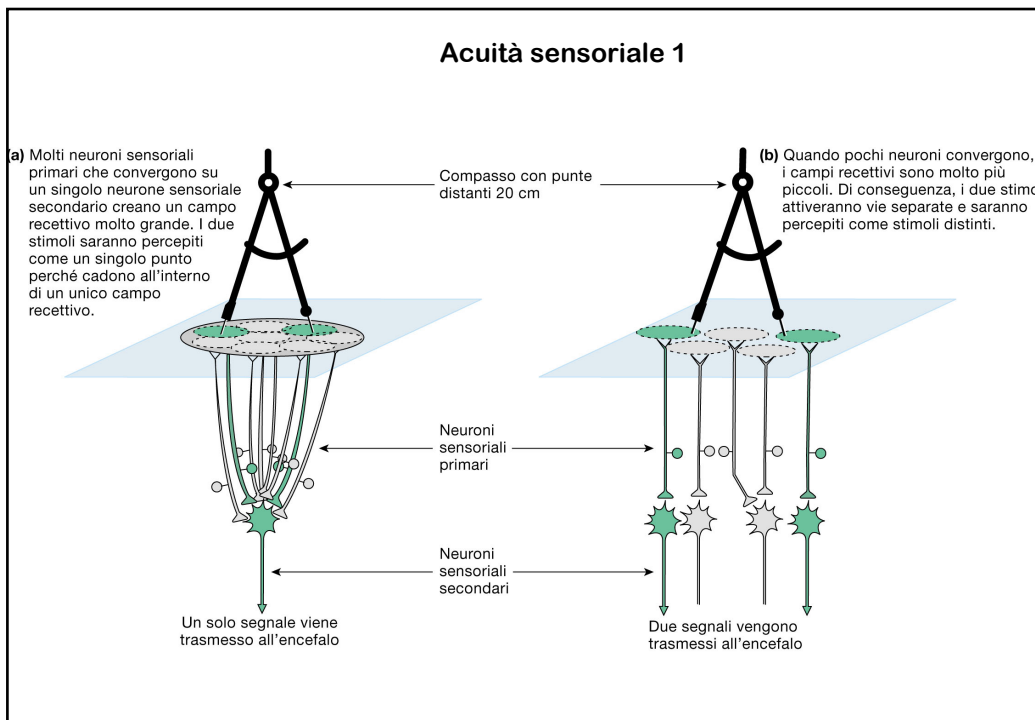
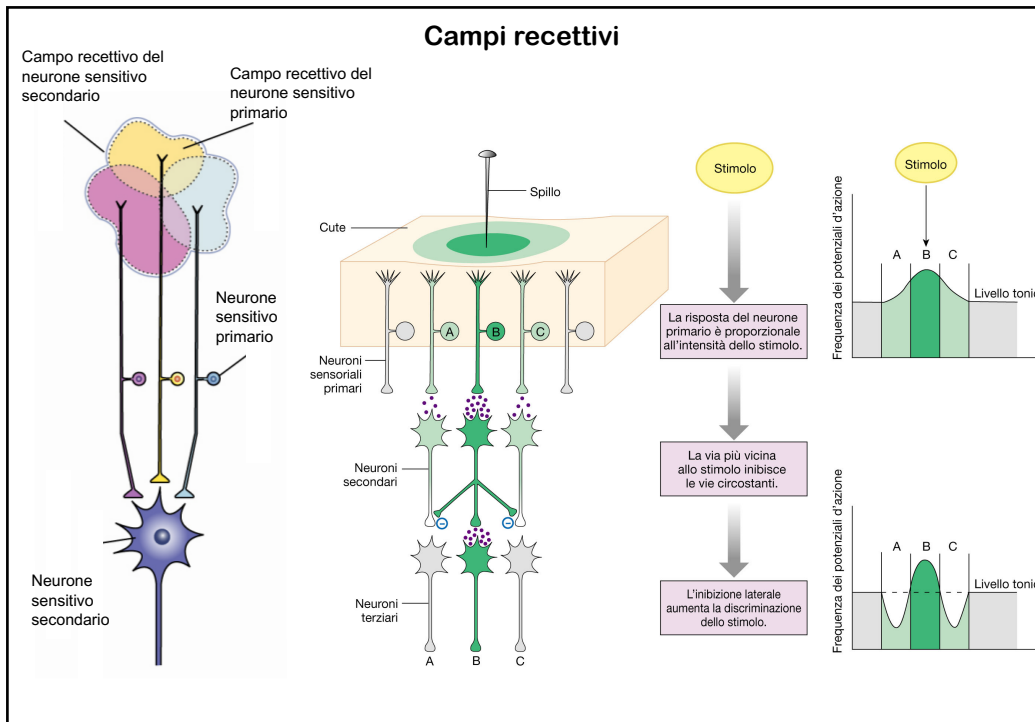
Da Conti et al., Fisiologia Medica; Kandel, Principles of Neural Sciences

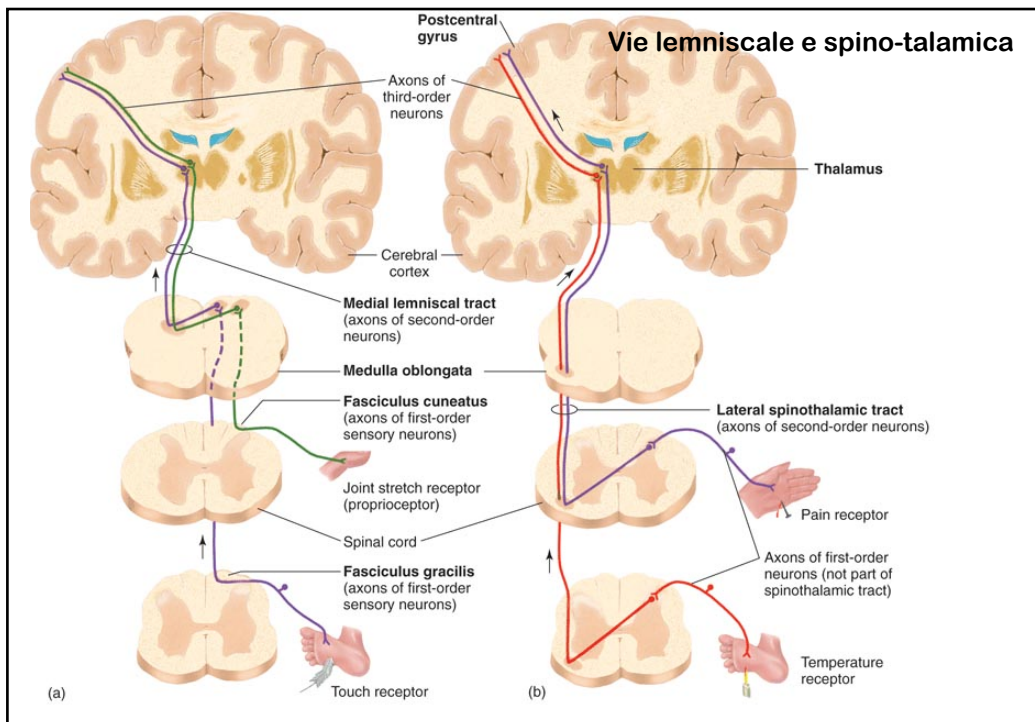
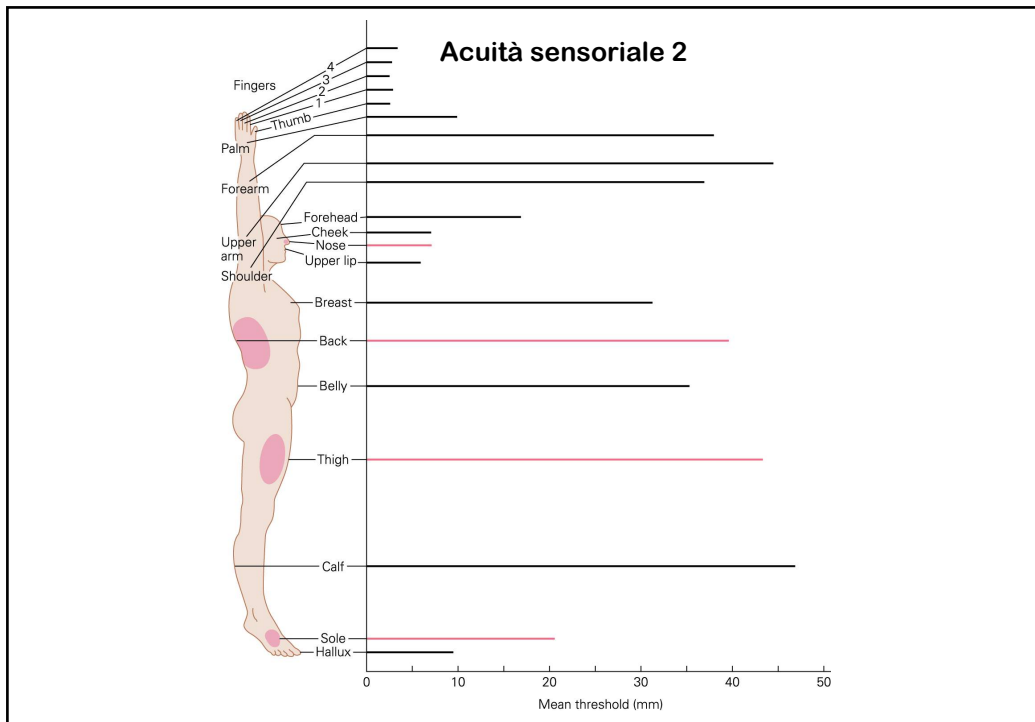


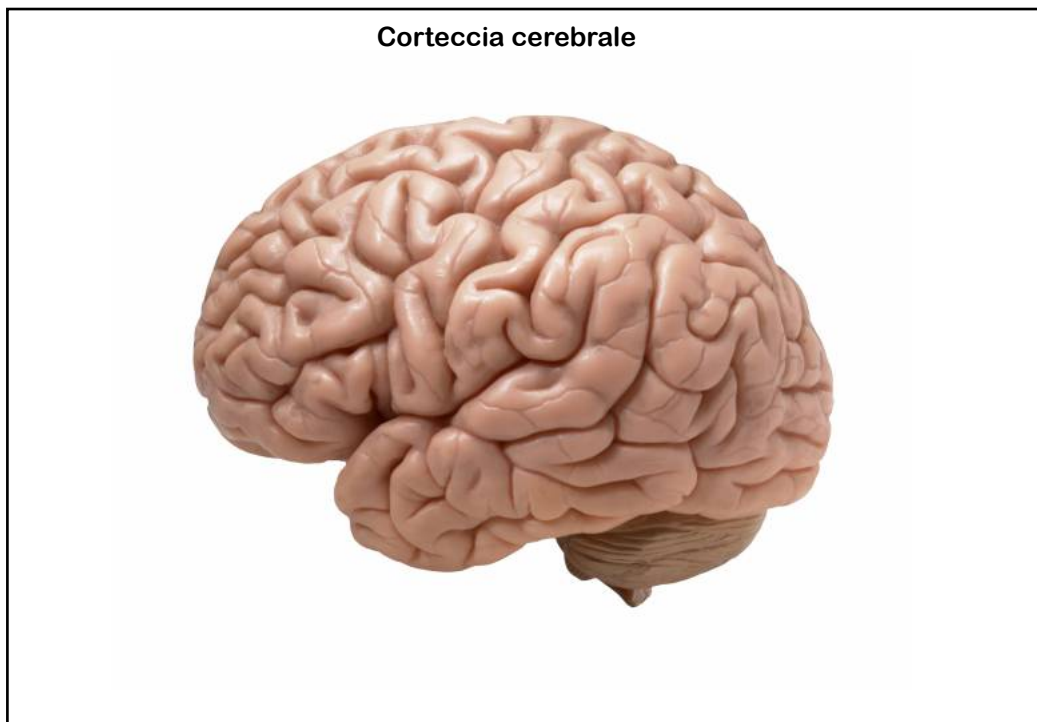
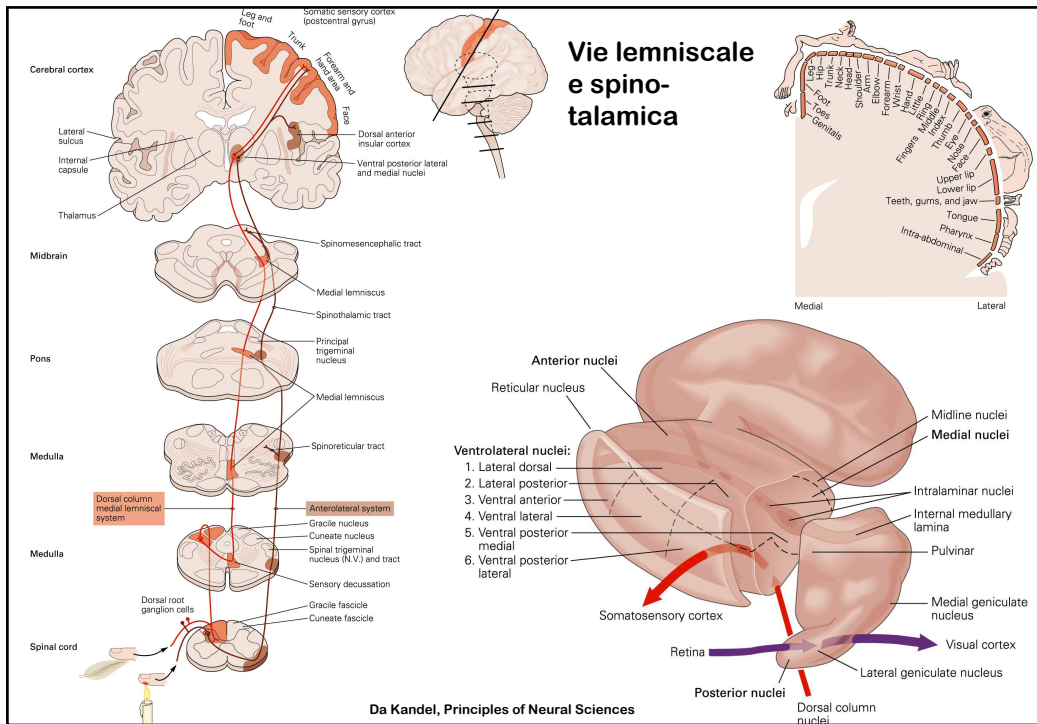
CLASSIFICAZIONE DELLE FIBRE NERVOSE

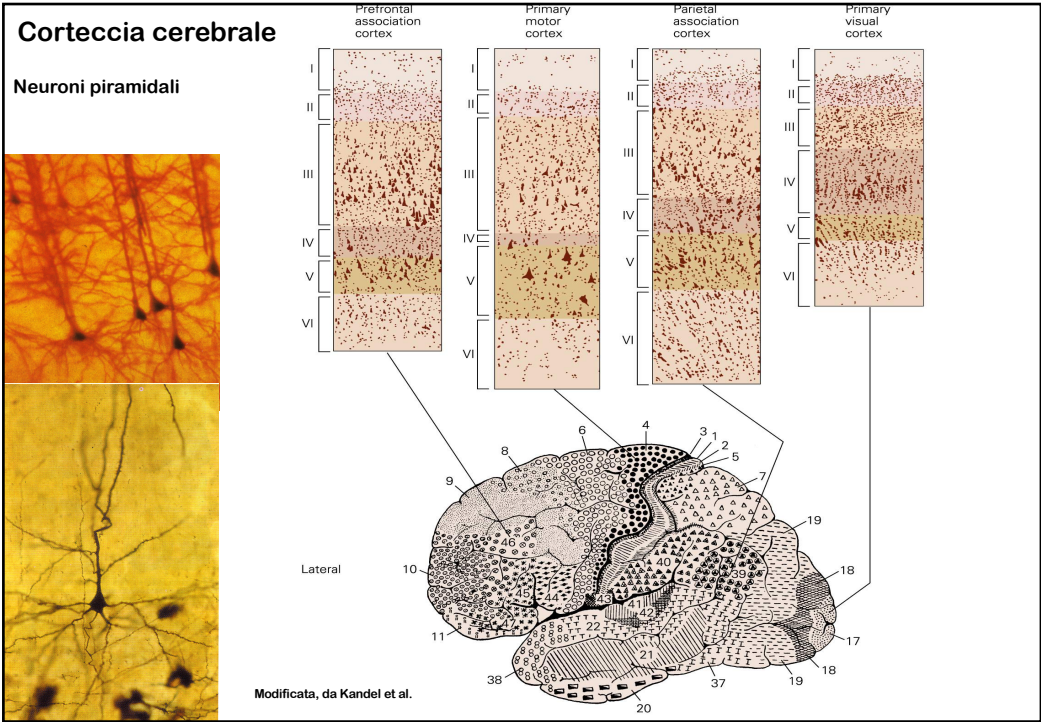
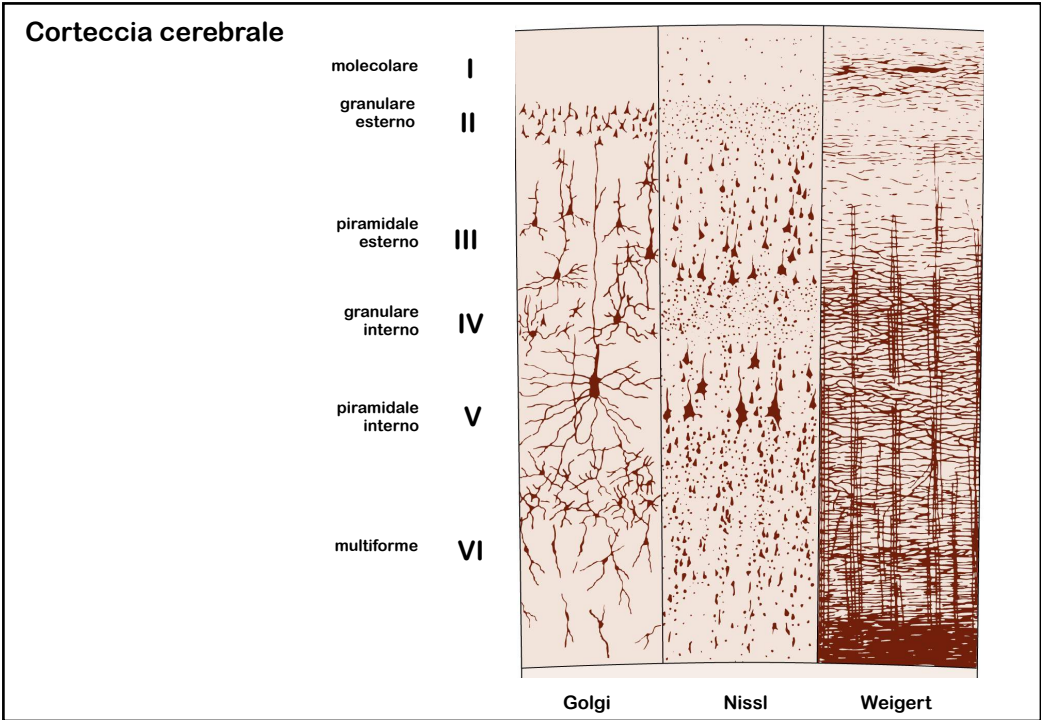
Nervo misto	Funzione	Diametro (μm)	Velocità di conduzione (m/sec)	Radice dorsale
A-alfa	Propriocezione (terminazioni anulo-spirali e organo tendineo del Golgi), motrici per i muscoli scheletrici	12-20	70-120	IA, IB
A-beta	Tatto, pressione, vibrazione	6-12	40-70	II
A-gamma	Motrici per i fusi neuromuscolari	3-6		
A-delta	Dolore (da stimoli meccanici e termici), temperatura	2-3	12-36	III
B	Pregangliari (Sistema Nervoso Autonomo)	<3	2-12	III
C	Dolore (polimodali/chemocettive), postgangliari del Sistema Nervoso Autonomo	0,3-1,3	0,5-2	IV



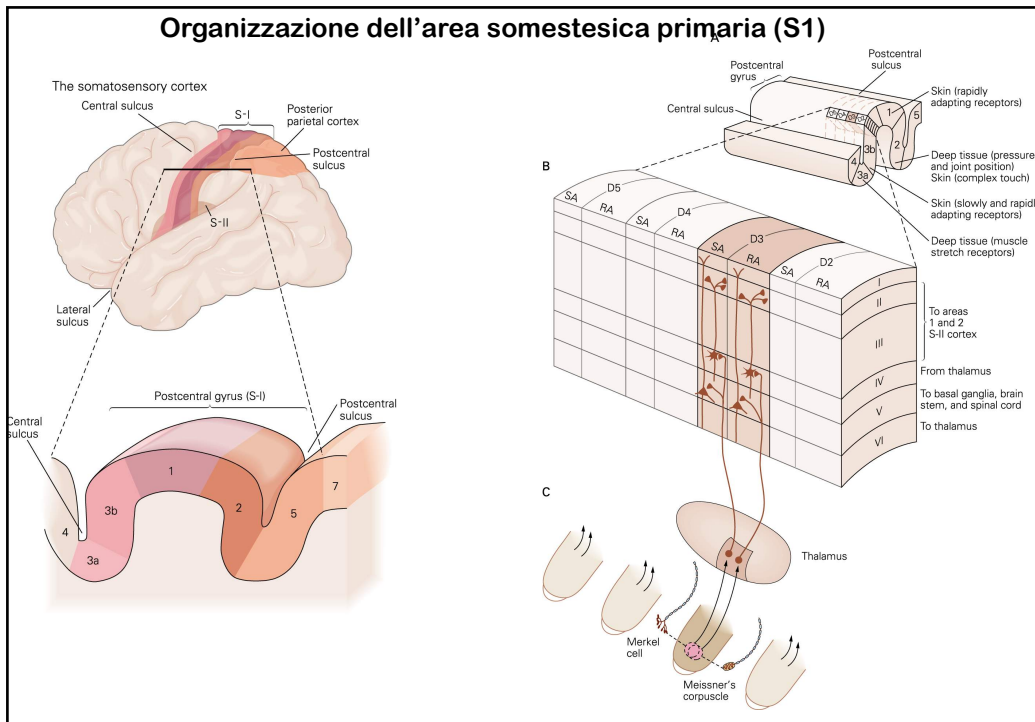




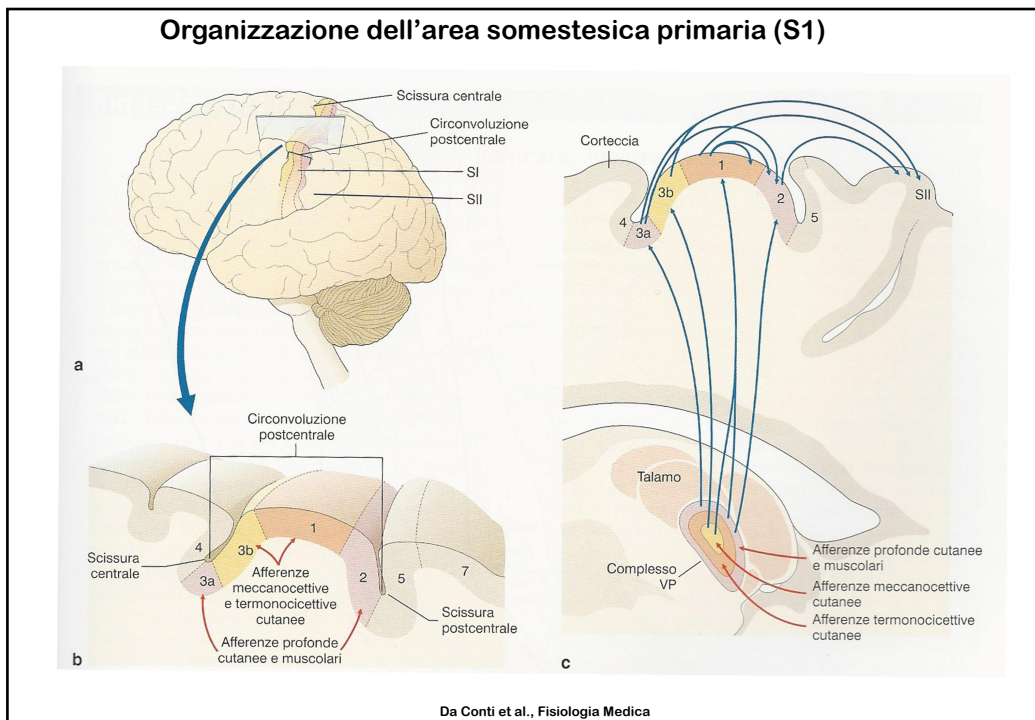




Organizzazione dell'area somestesica primaria (S1)



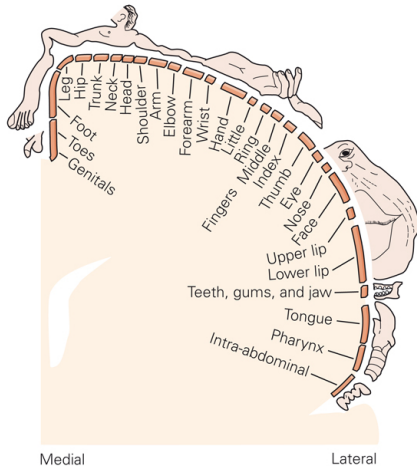
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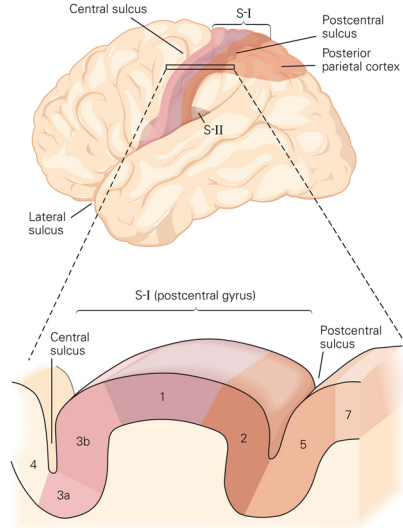
Da Conti et al., Fisiologia Medica

Codifica della localizzazione e della modalità

Sensory homunculus

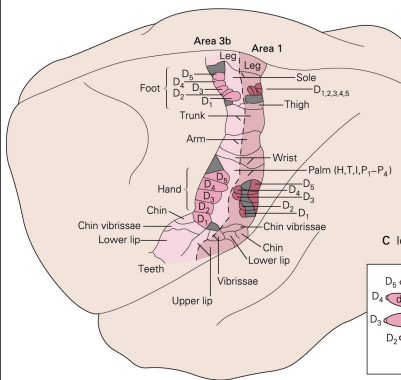


The somatosensory cortex

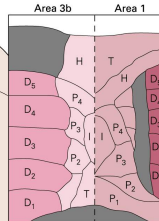


Organizzazione dell'area somestesica primaria (S1)

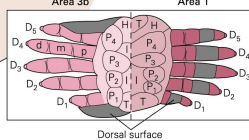
A Somatosensory maps in the cortex of the owl monkey



B Detail of representation of the palm



C Idealized somatosensory map of hands



Effetti di lesione reversibile dell'area 2

