

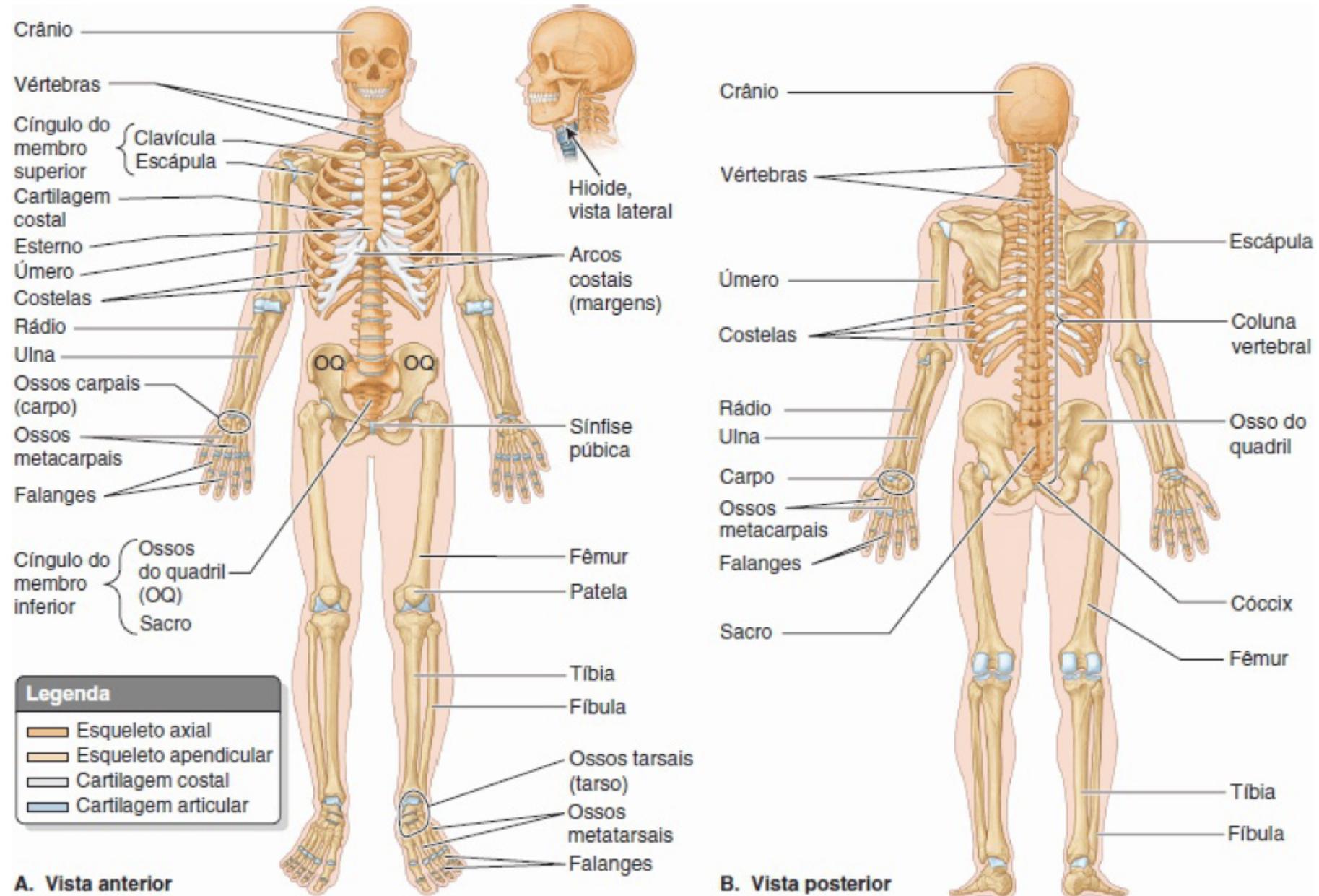
# Sistema esquelético- muscular

# Sistema esquelético

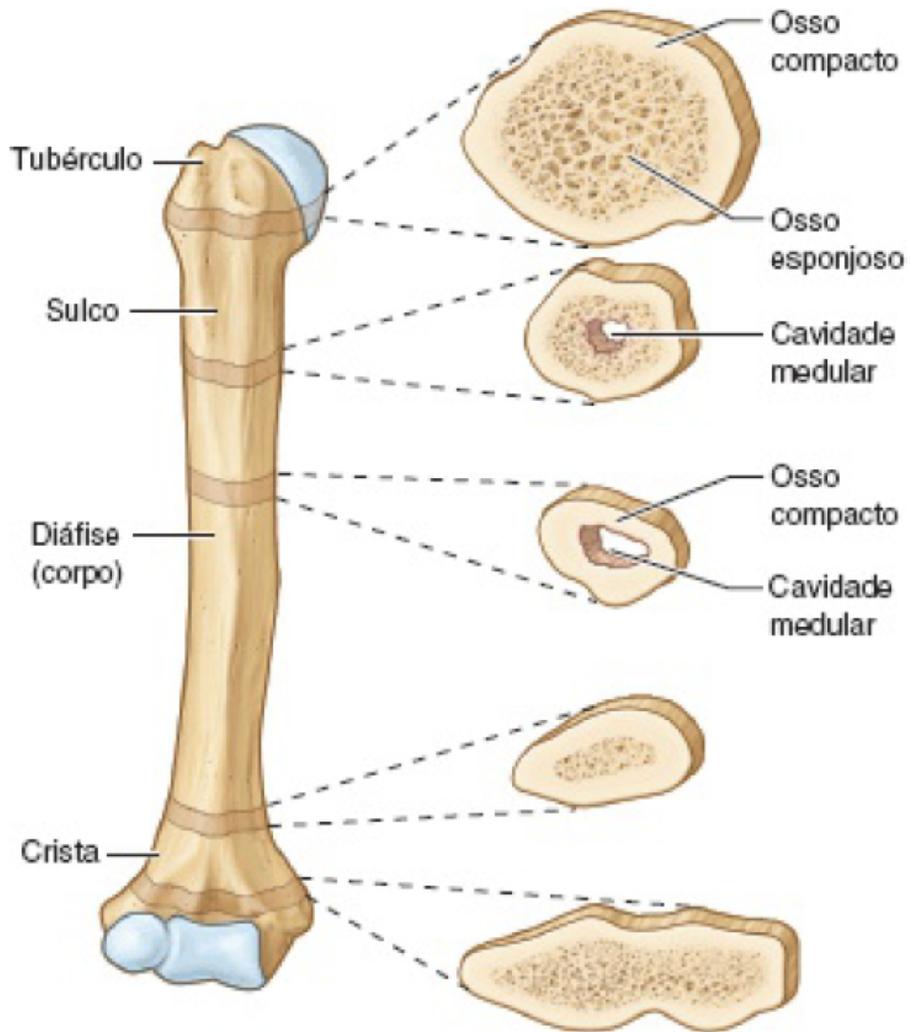
## Ossos, cartilagens, tendões e músculos

**Esqueleto axial:** caixa craniana, coluna vertebral e caixa torácica (costelas e esterno)

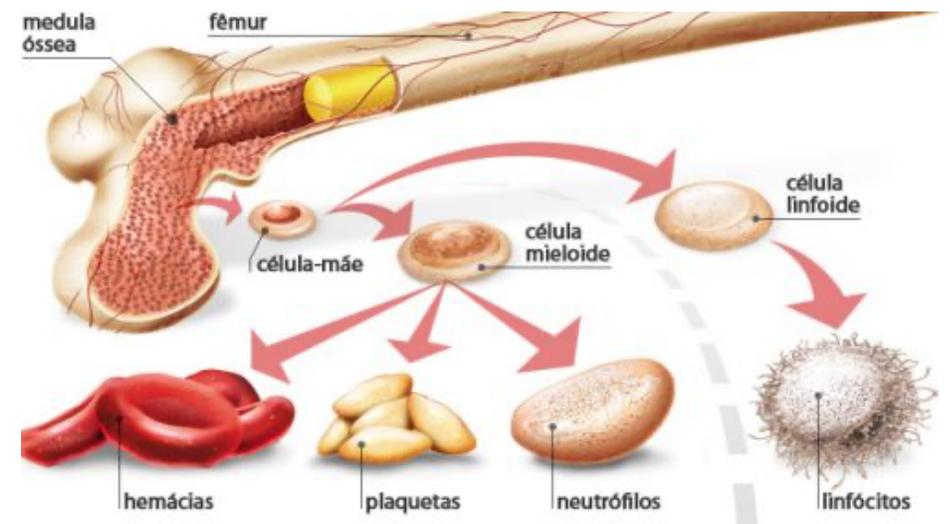
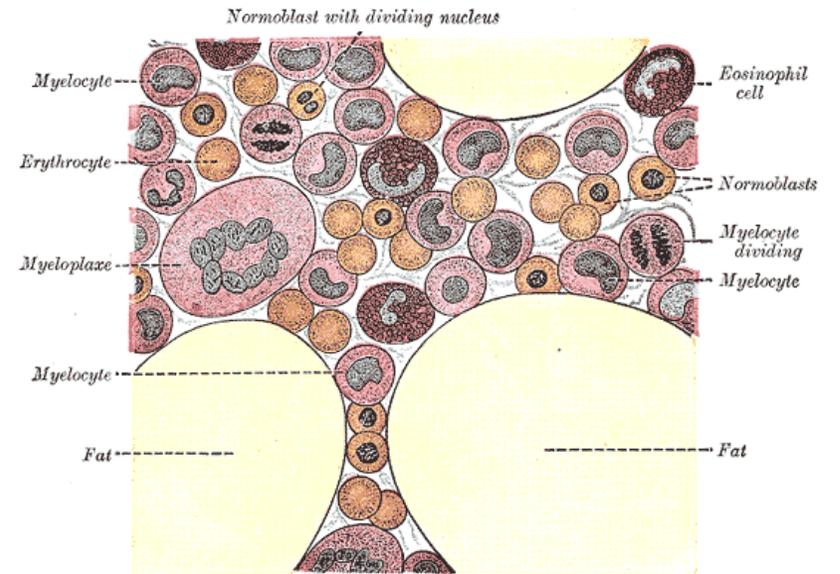
**Esqueleto apendicular:** cintura escapular (escápula e clavículas), cintura pélvica (ossos ilíacos) e esqueleto dos membros superiores e inferiores.



# Estrutura óssea



# Medula óssea



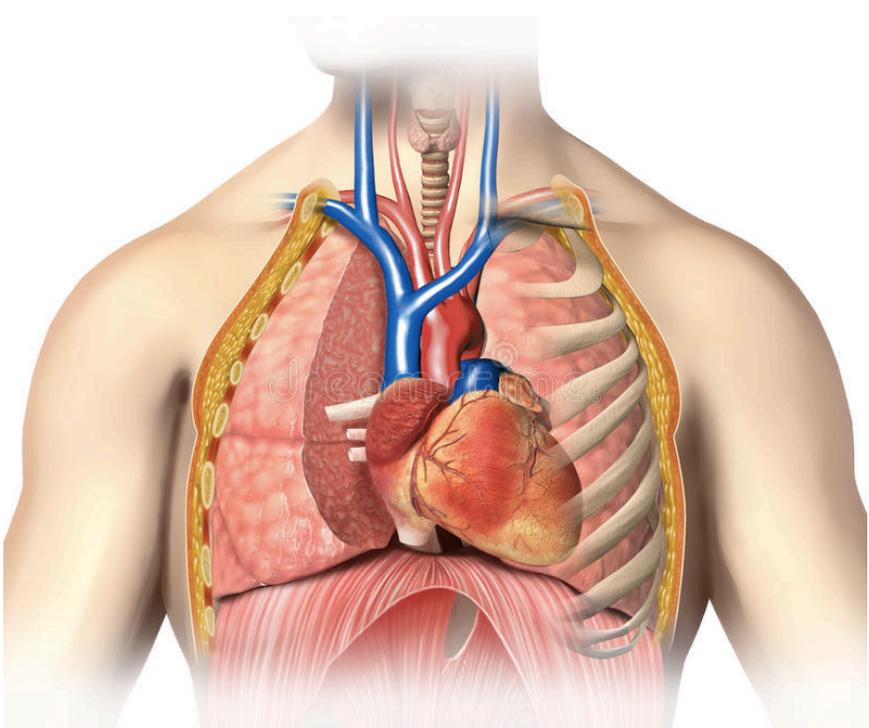
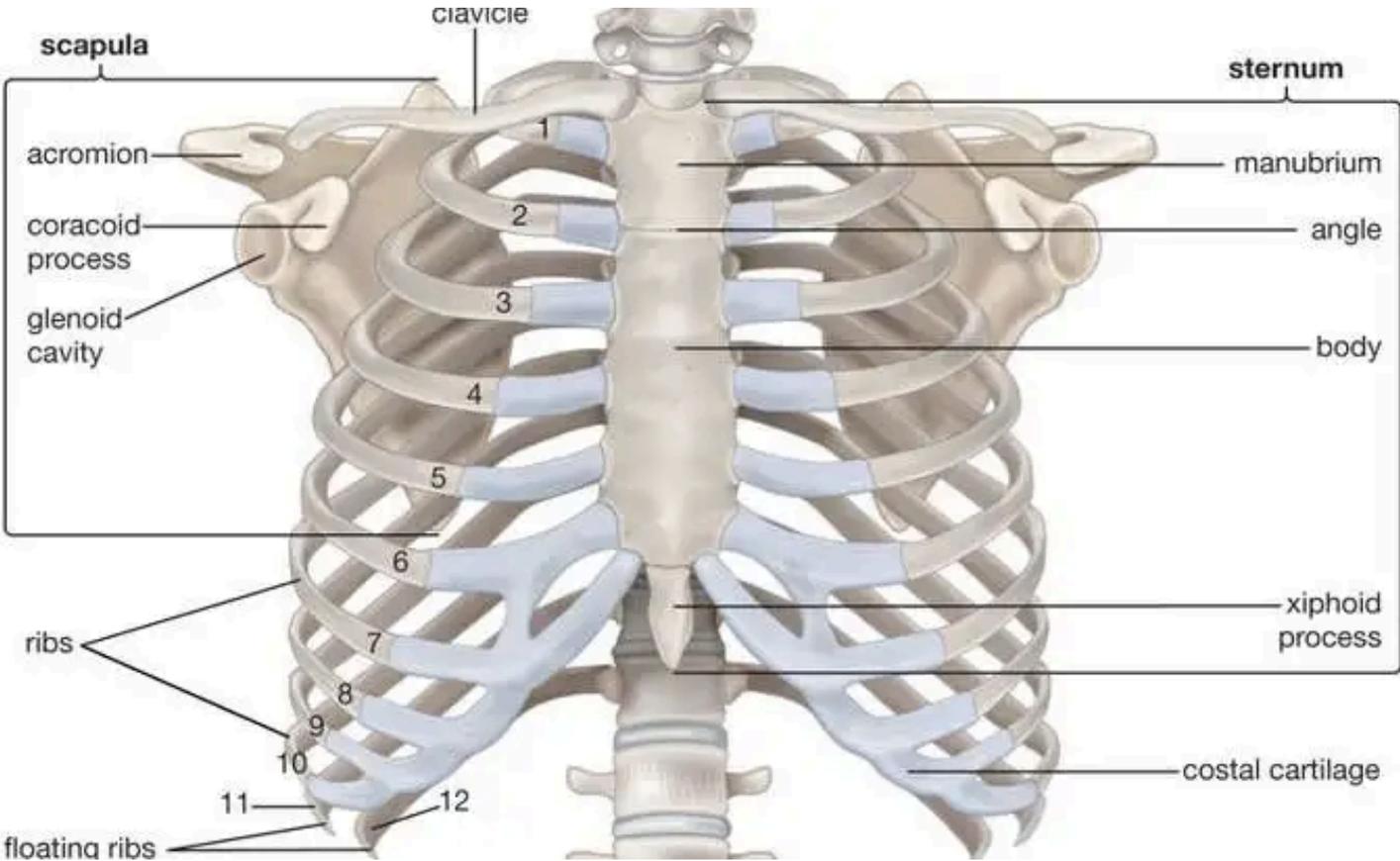
# Sistema esquelético: funções

## 1. Proteção: caixa craniana



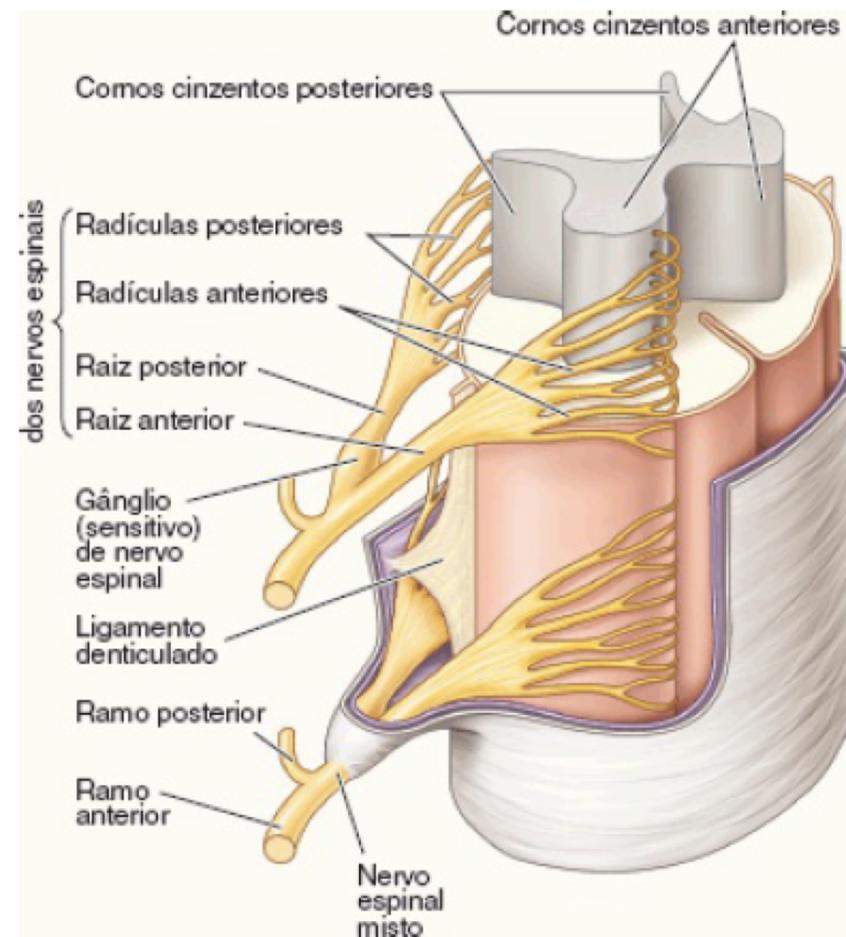
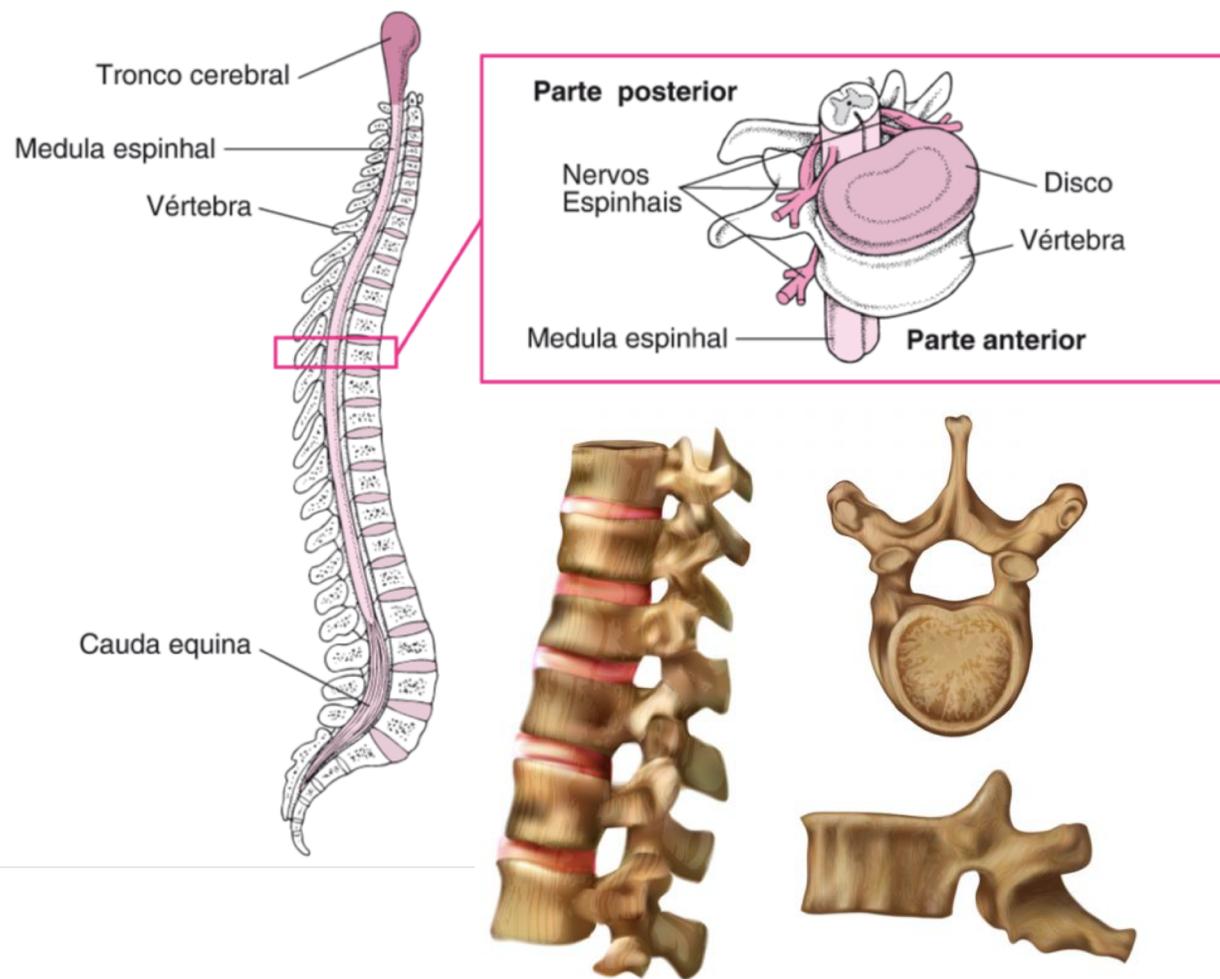
# Sistema esquelético: funções

## 1. Proteção: caixa torácica



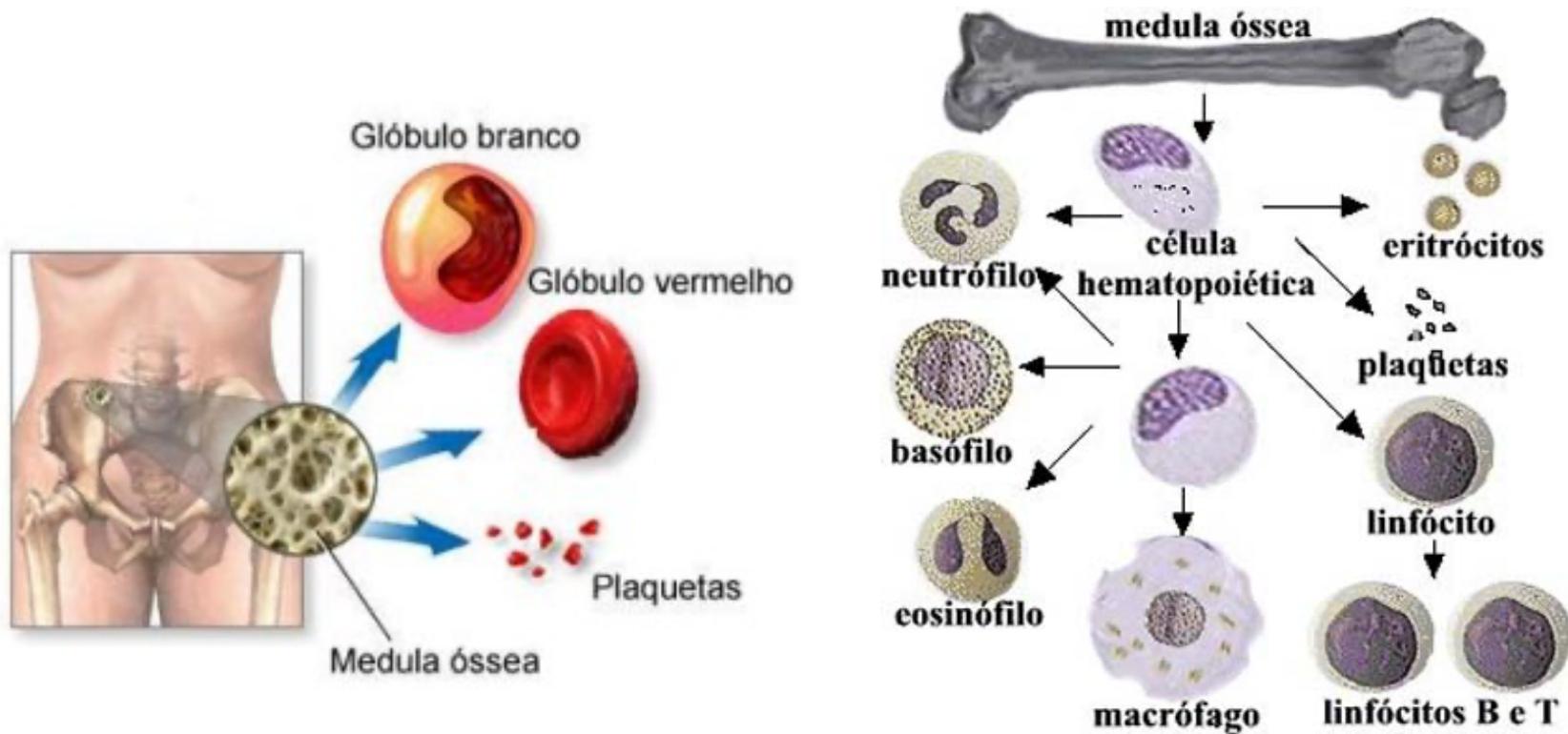
# Sistema esquelético: funções

## 1. Proteção: vértebras/discos



# Sistema esquelético: funções

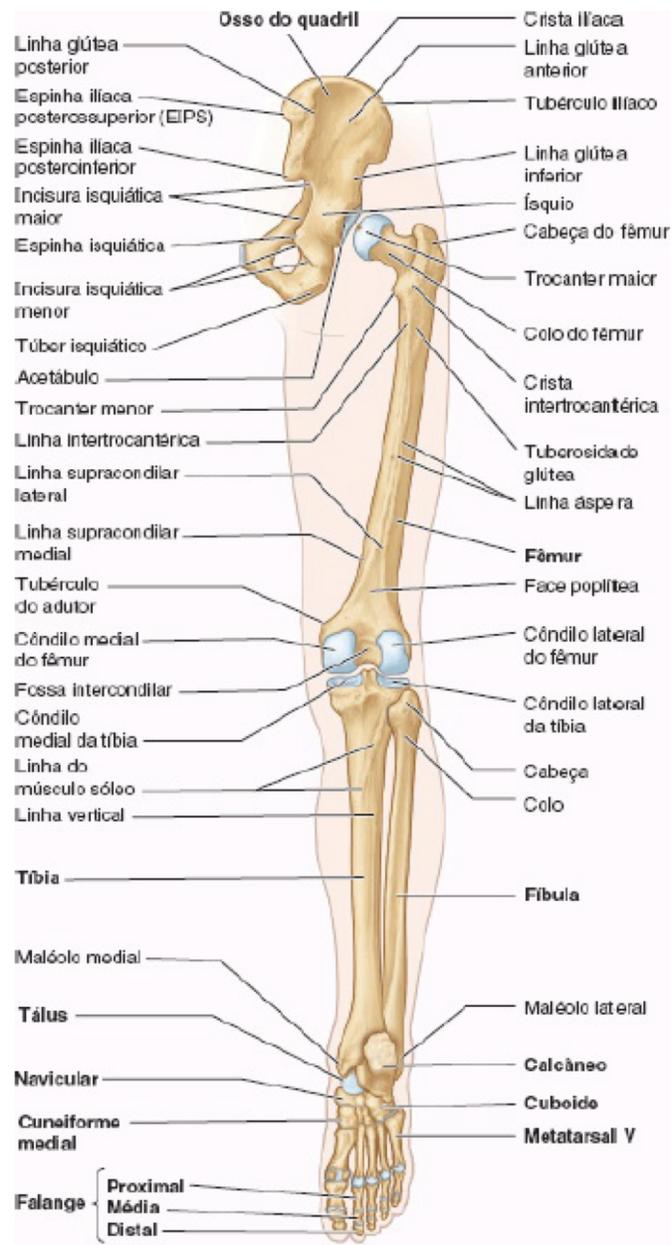
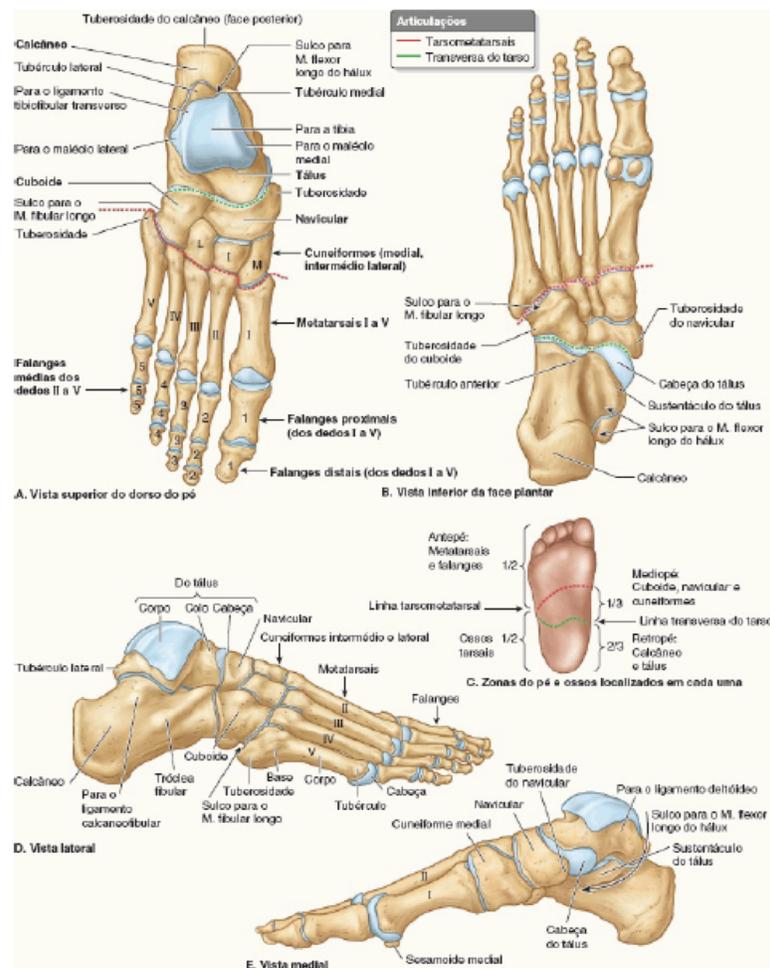
## 2. Hematopoiese (medula óssea, tecido hematopoiético)



Coleta para transplante de medula óssea

# Sistema esquelético: funções

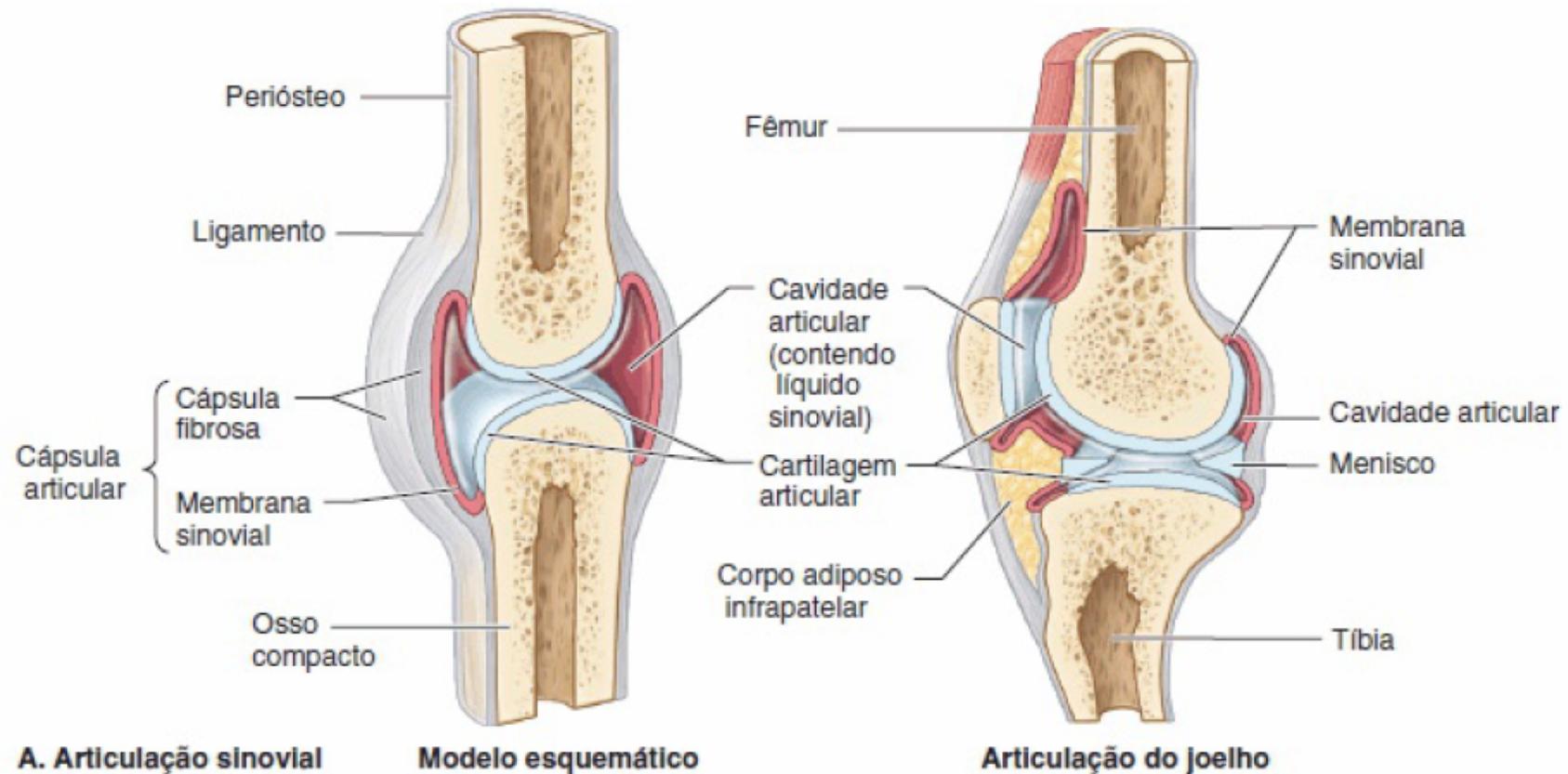
## 3. Sustentação, movimentação

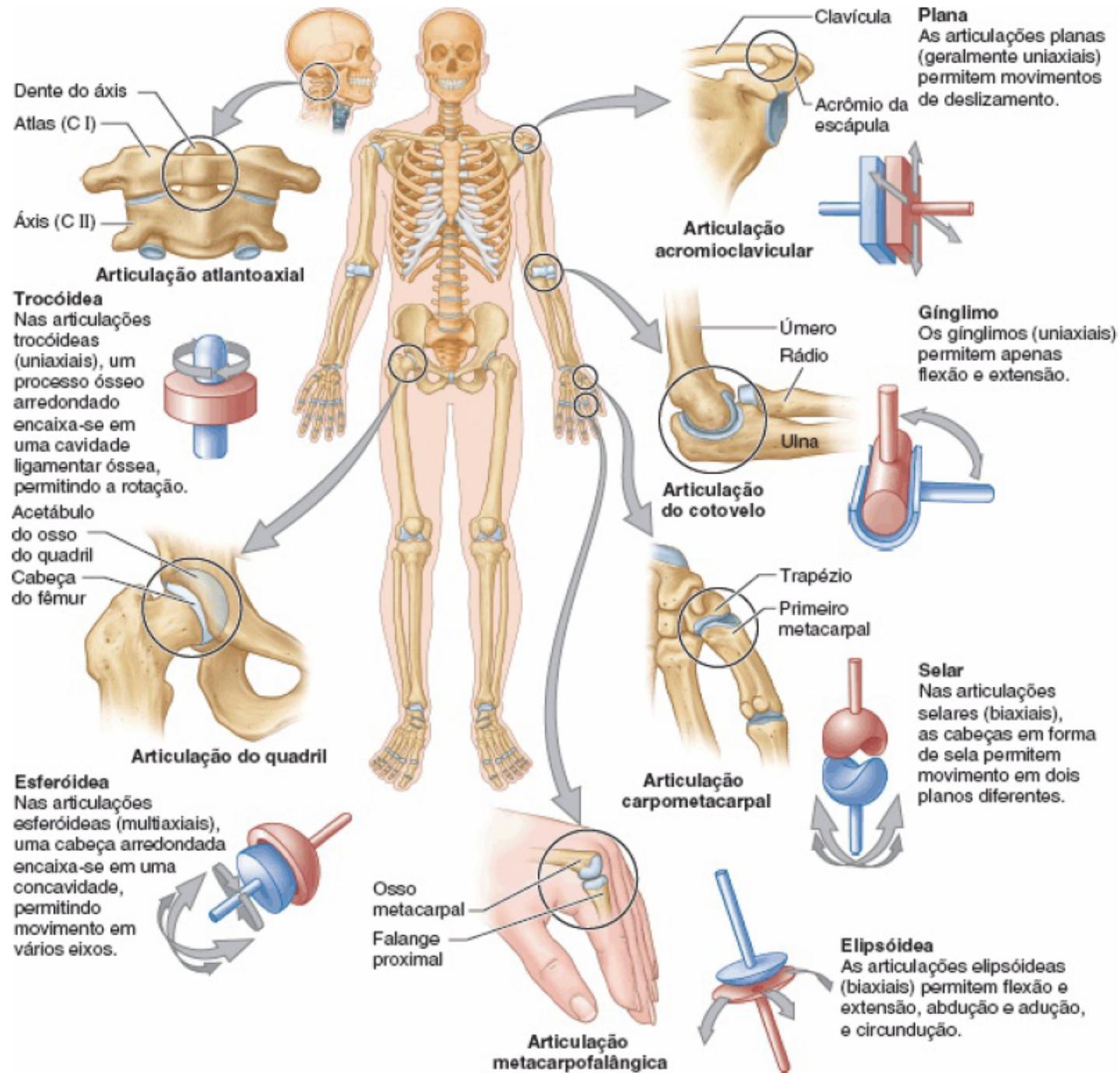


# Sistema esquelético: funções

## 3. Sustentação, movimentação

### Articulações

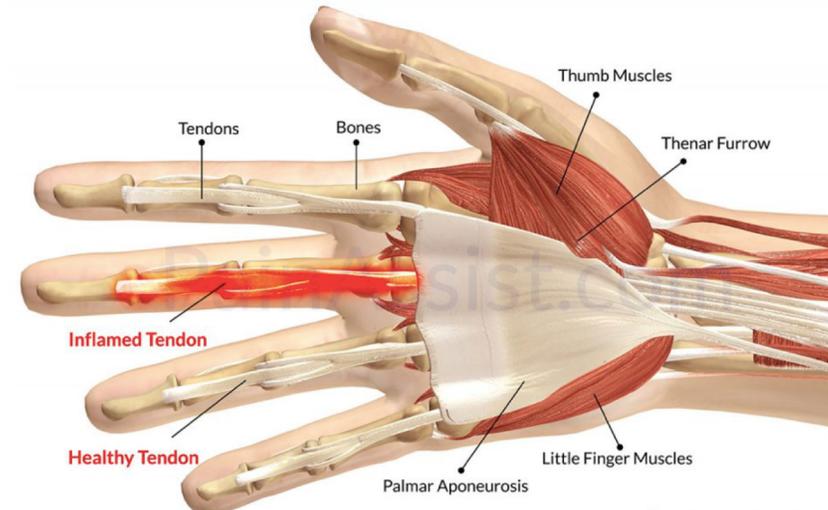
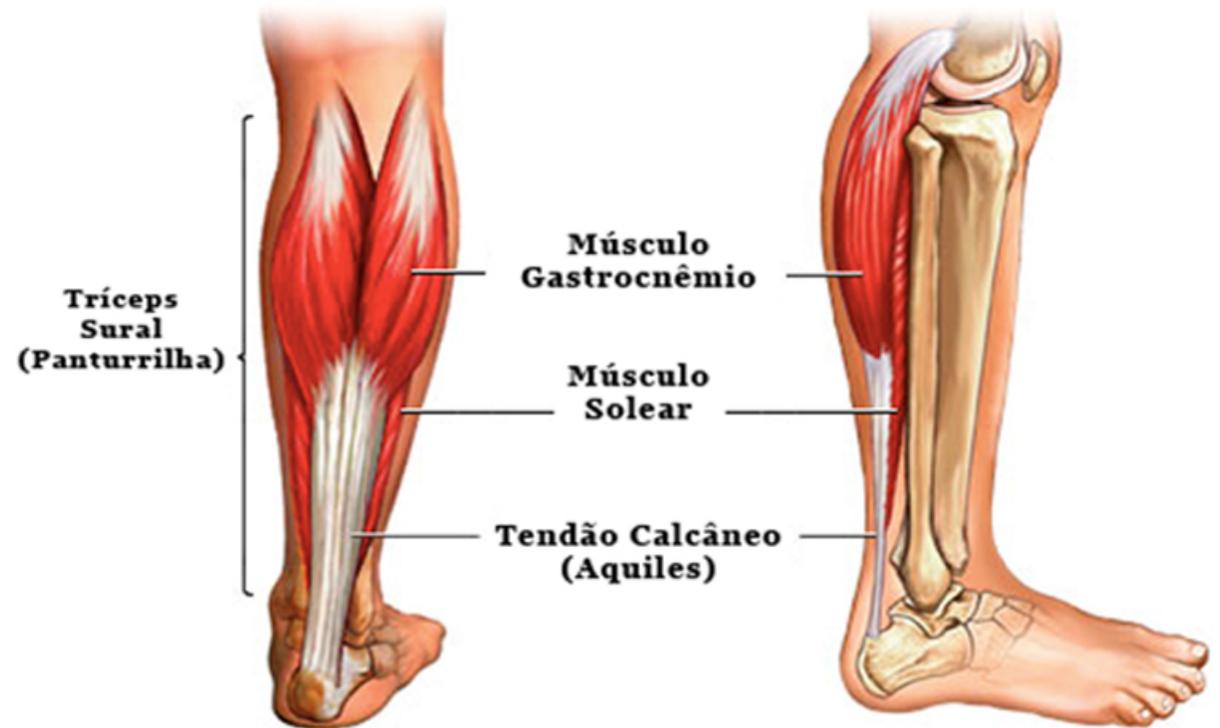
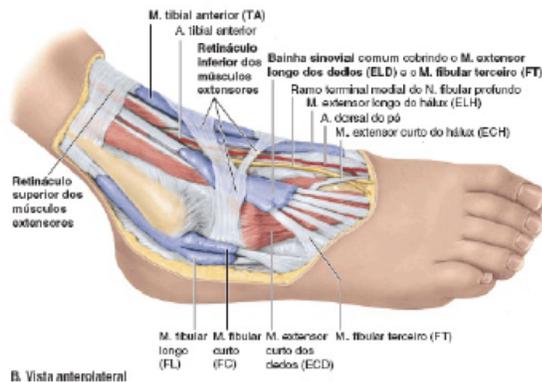
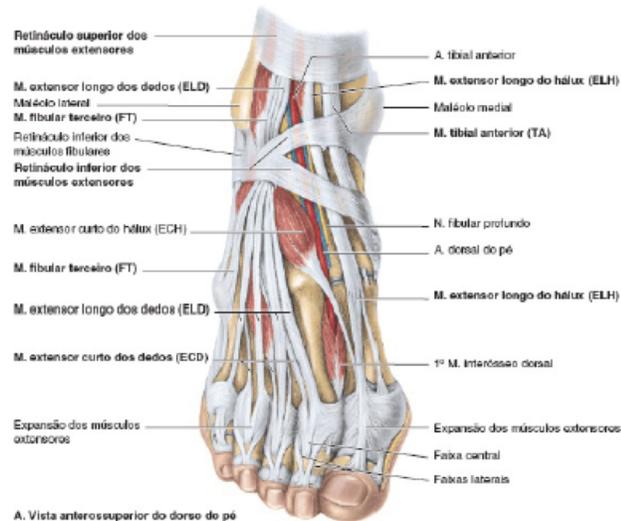


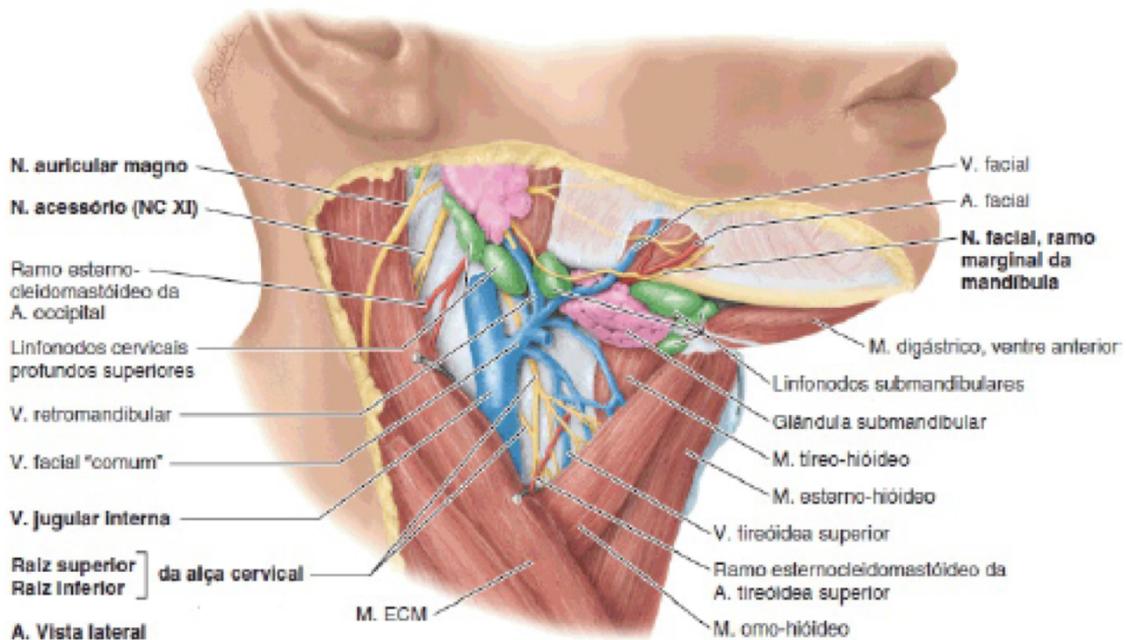


# Sistema esquelético/muscular: funções

## 3. Sustentação/movimentação

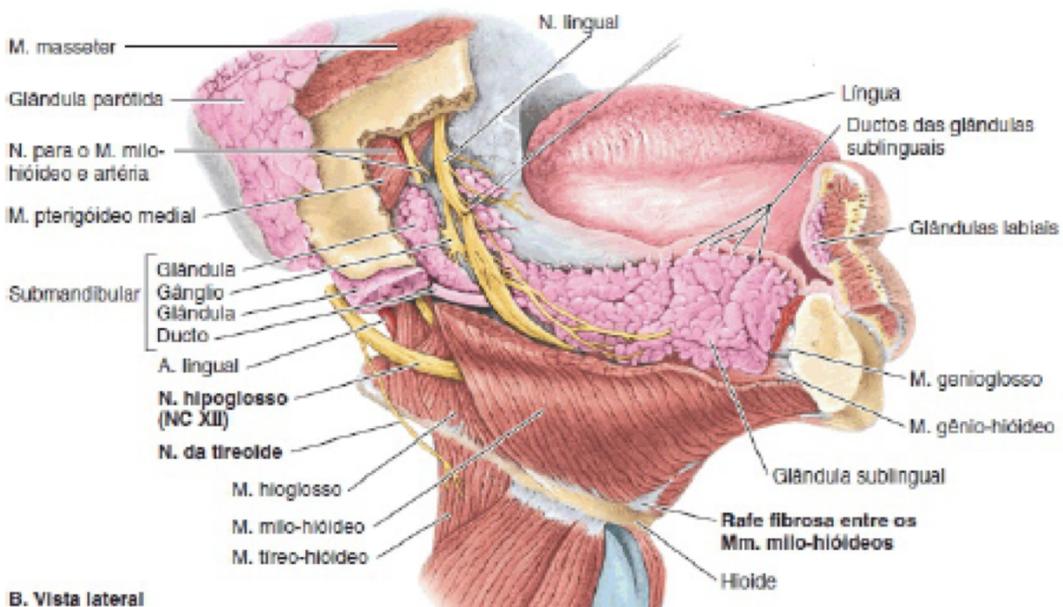
### Tendões e músculos



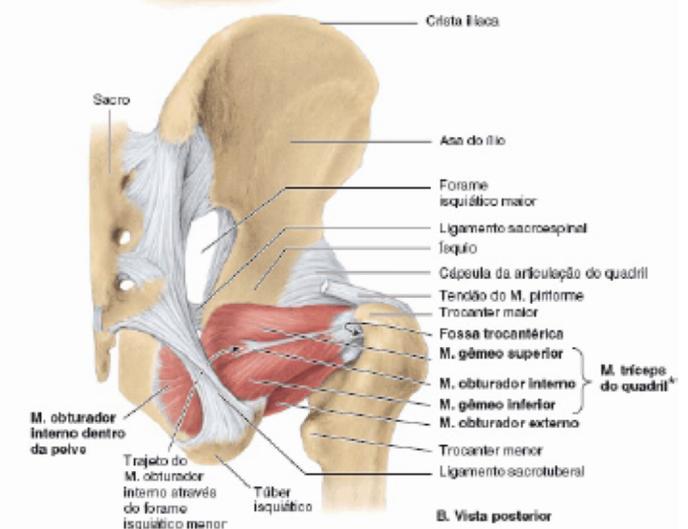
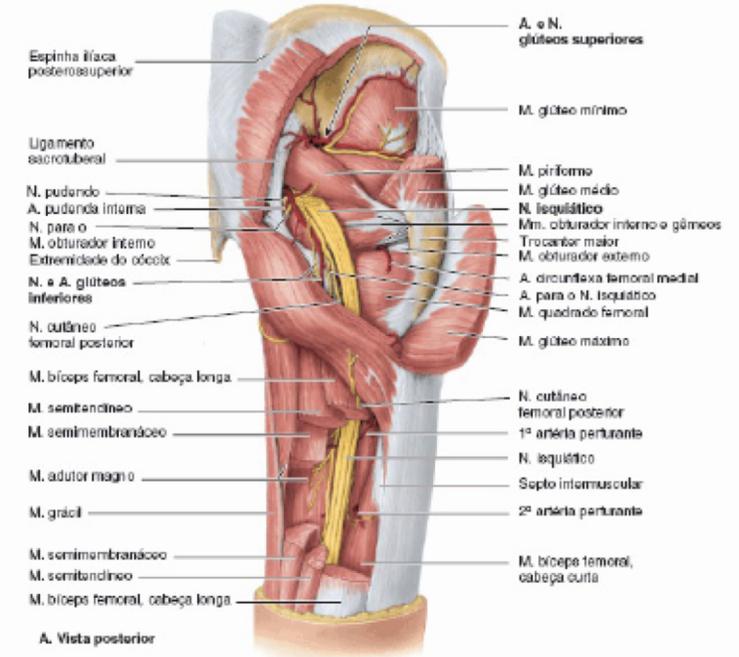
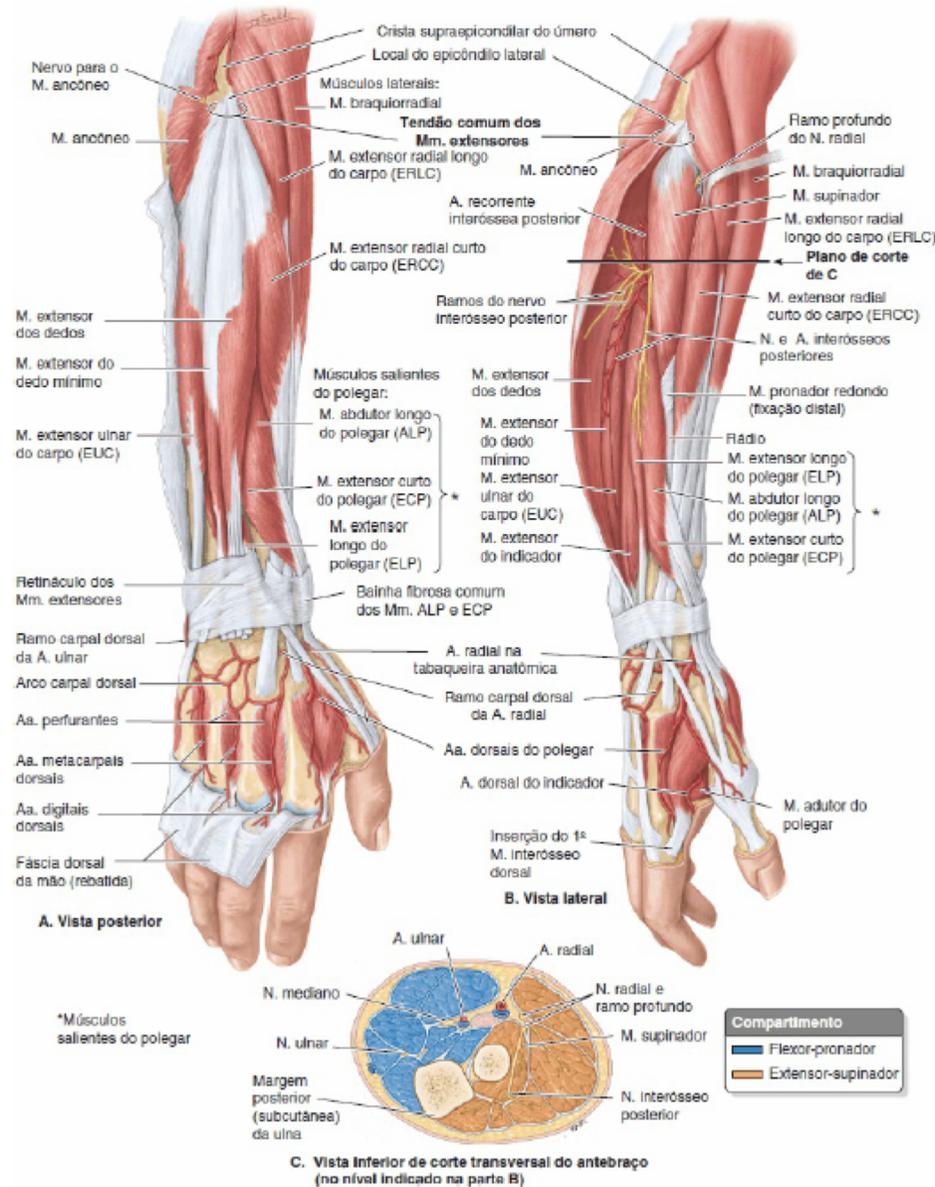


## Pescoço

- sustentação e movimentação da cabeça

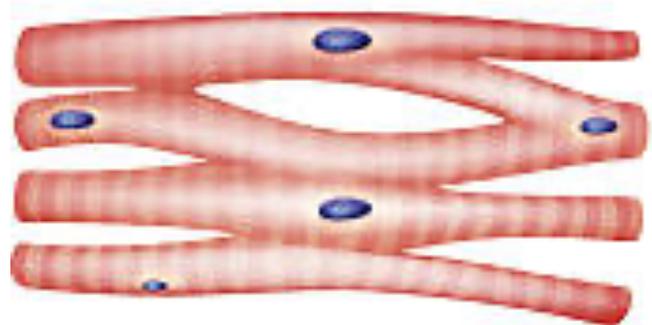


# Músculos

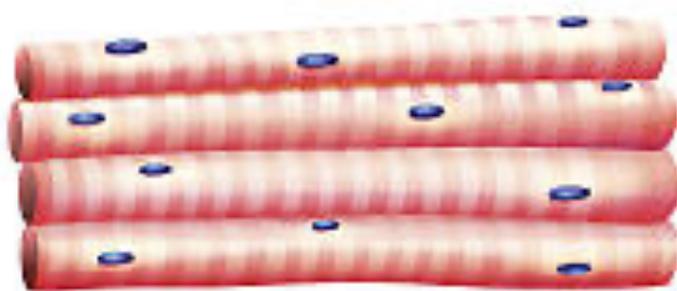


\*N.R.T.: A terminologia anatómica não contempla o M. bíceps do quadril, citando apenas os Mm. gêmeos e obturador interno.

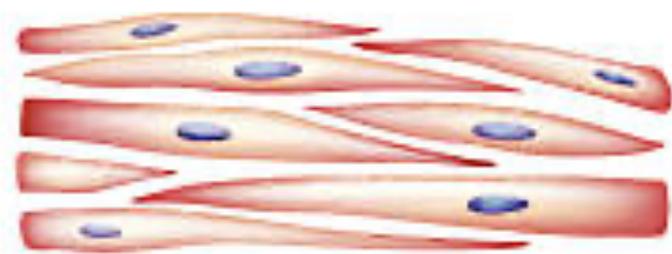
# Types of Muscle



**Cardiac muscle**



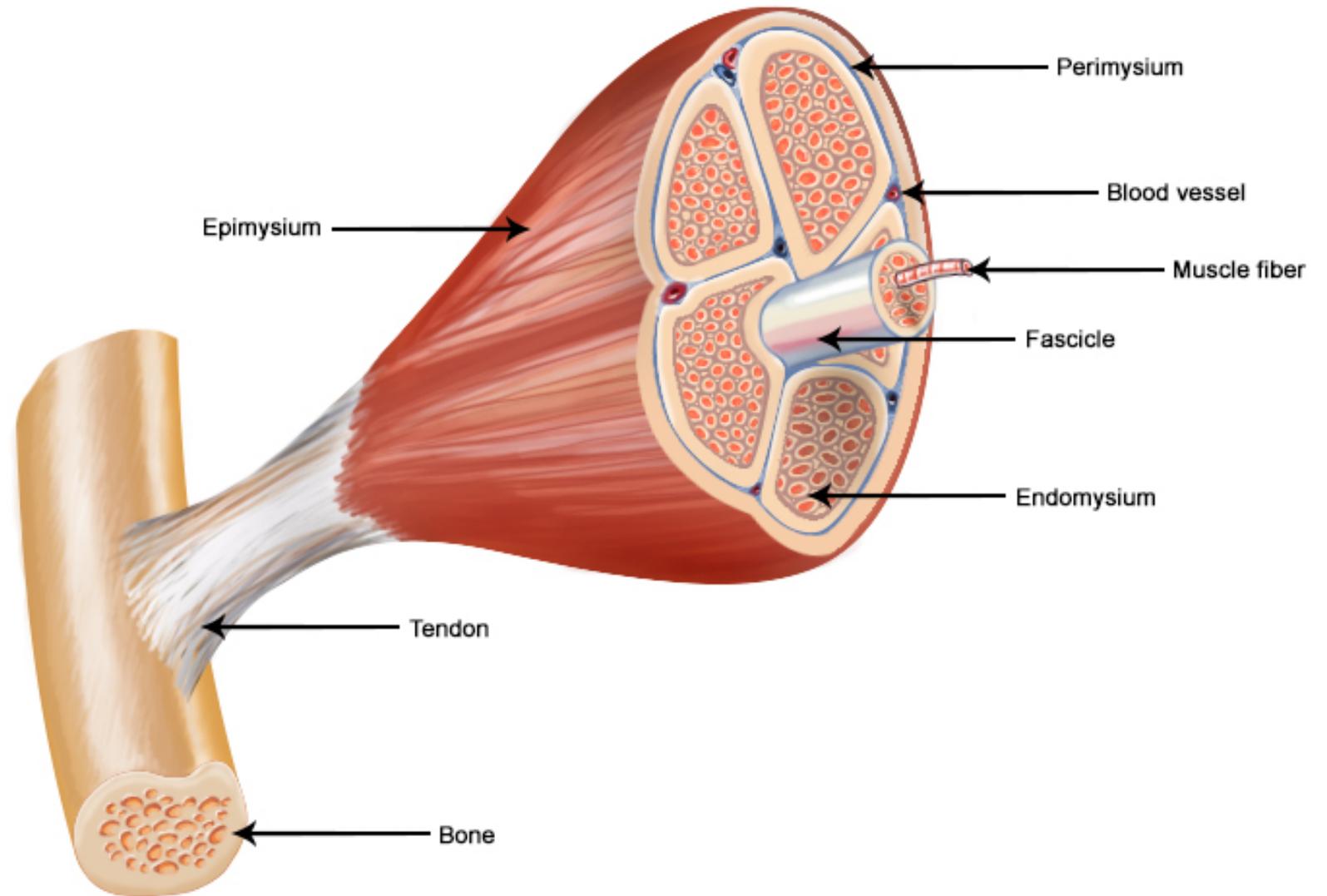
**Skeletal muscle**



**Smooth muscle**

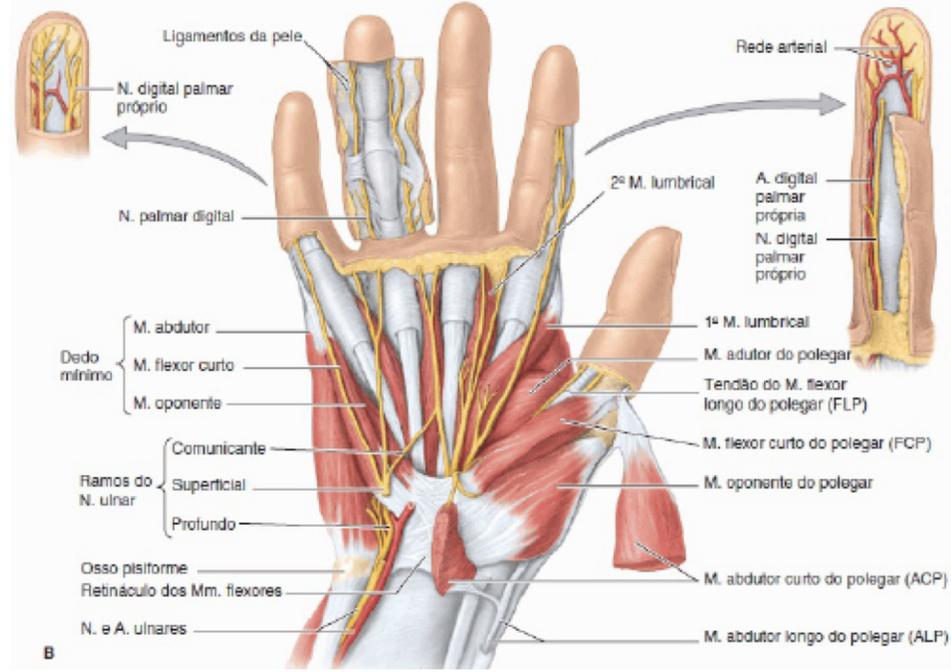
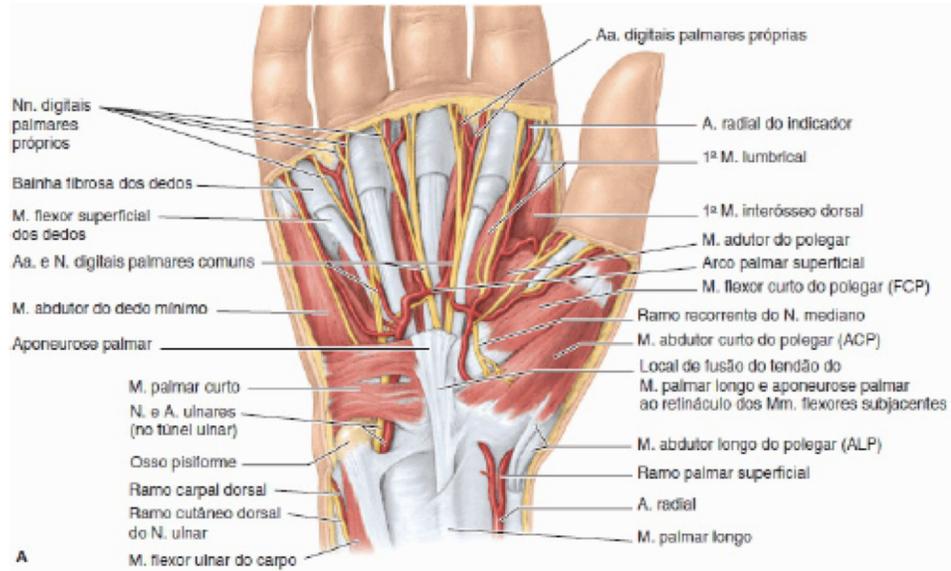
# Músculo esquelético

- Força
- Movimento
- Sustentação



# Mecânica das mãos

## - apreensão/movimentos finos



A. Vista lateral; apreensão palmar



B. Vista anterior; apreensão em gancho



C. Vista medial; apreensão com manuseio de precisão



D. Vista medial; apreensão de precisão



E. Vista medial; pinçamento

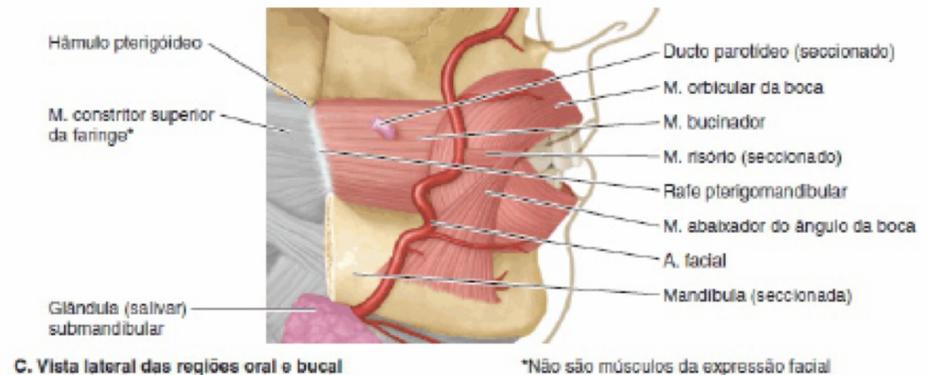
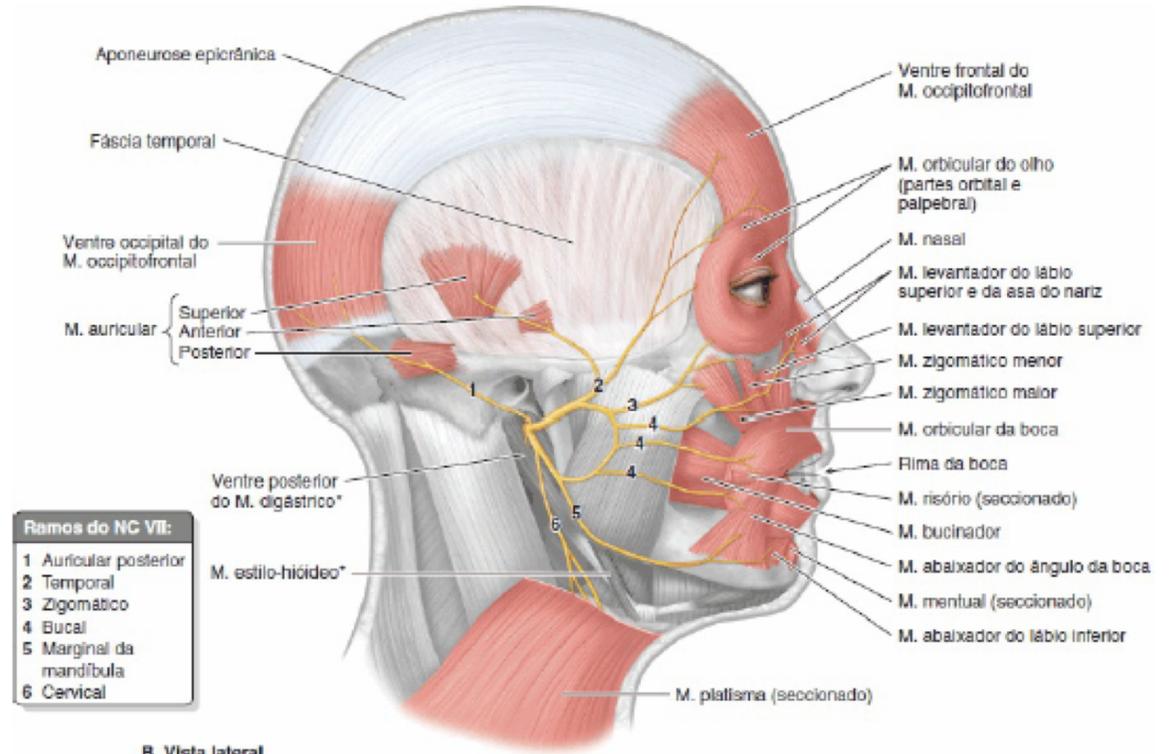
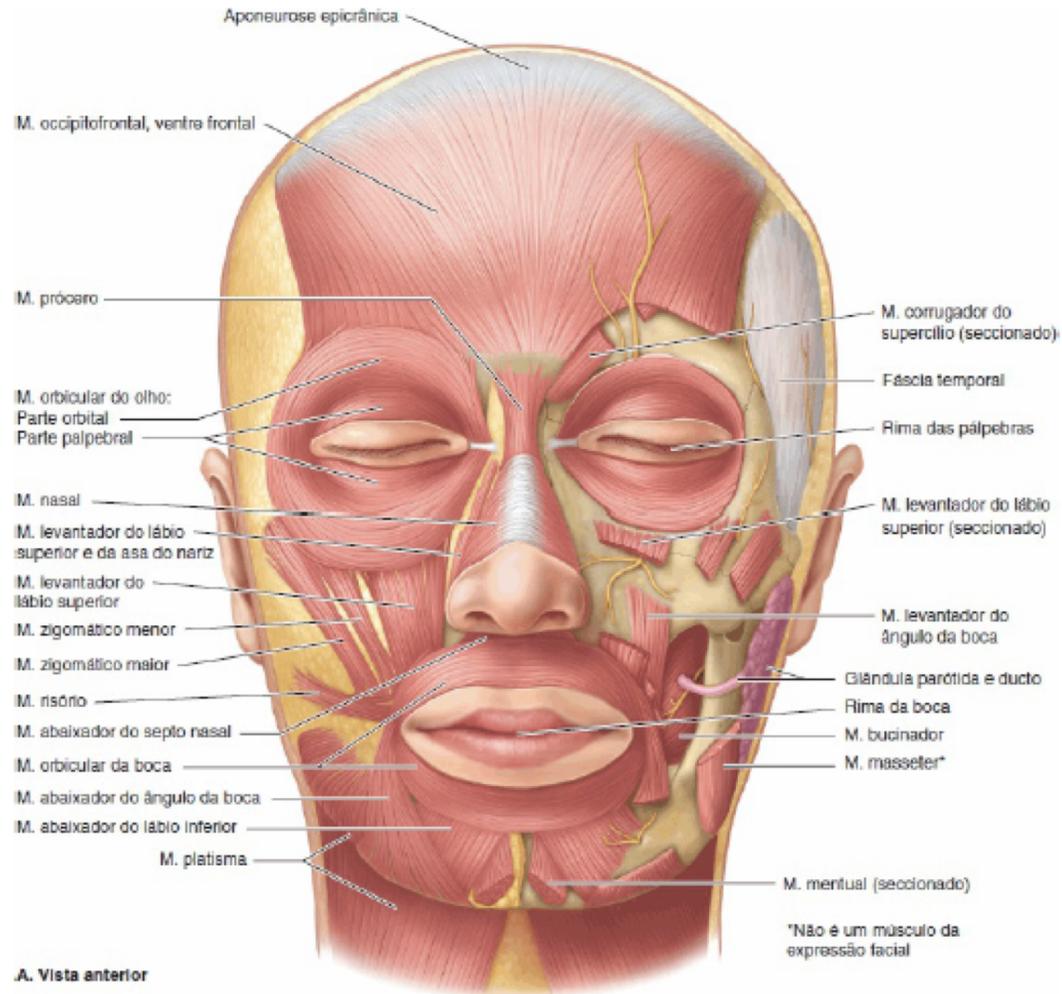


F. Vista medial; posição de repouso



# Músculos da face

## - expressões

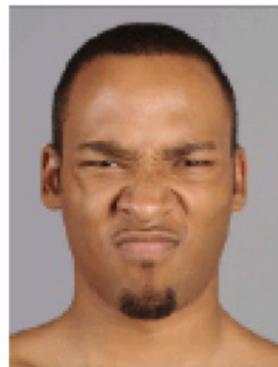




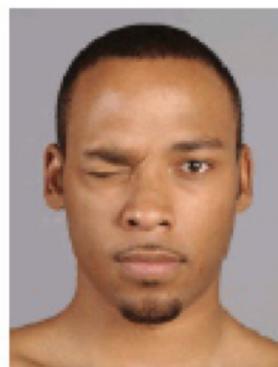
M. occipitofrontal



M. corrugador do supercílio



M. prócaro + parte transversa do M. nasal



M. orbicular do olho



M. lev. do lábio superior e da asa do nariz + parte alar do M. nasal



M. bucinador + M. orbicular da boca



M. zigomático maior + M. zigomático menor



M. risório



M. risório + M. abaixador do lábio inferior



M. levantador do lábio superior + M. abaixador do lábio



Mm. dilatadores da boca:  
M. risório + M. levantador do lábio superior + M. abaixador do lábio inferior



M. orbicular da boca



M. abaixador do ângulo da boca



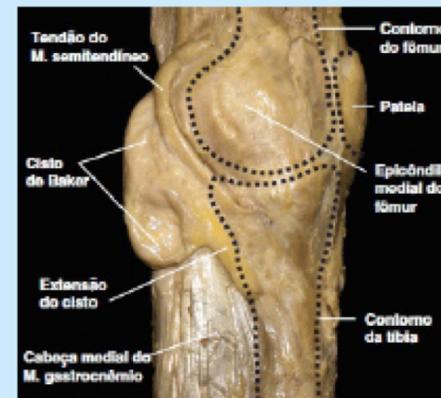
M. mentual



M. platíma

# Patologias/fraturas perdas associadas

- Acidentes automobilísticos, de trabalho, doméstico
- Doenças degenerativas
- Câncer



Vista medial de dissecação do joelho esquerdo

Figura B5.37

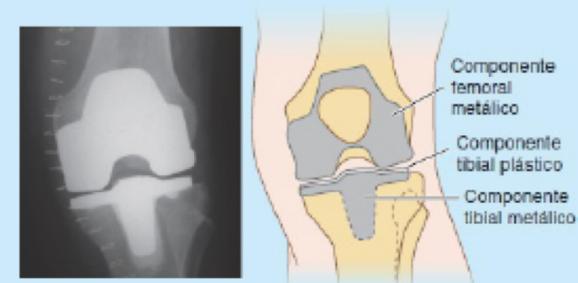


Figura B5.38

# Exoesqueleto

Article

## Exoskeleton for Gait Rehabilitation: Effects of Assistance, Mechanical Structure, and Walking Aids on Muscle Activations

Alice De Luca <sup>1,\*</sup>, Amy Bellitto <sup>1,†</sup>, Sergio Mandraccia <sup>2</sup>, Giorgia Marchesi <sup>1</sup>, Laura Pellegrino <sup>1</sup>, Martina Coscia <sup>3</sup>, Clara Leoncini <sup>2</sup>, Laura Rossi <sup>2</sup>, Simona Gamba <sup>2</sup>, Antonino Massone <sup>2</sup> and Maura Casadio <sup>1</sup>

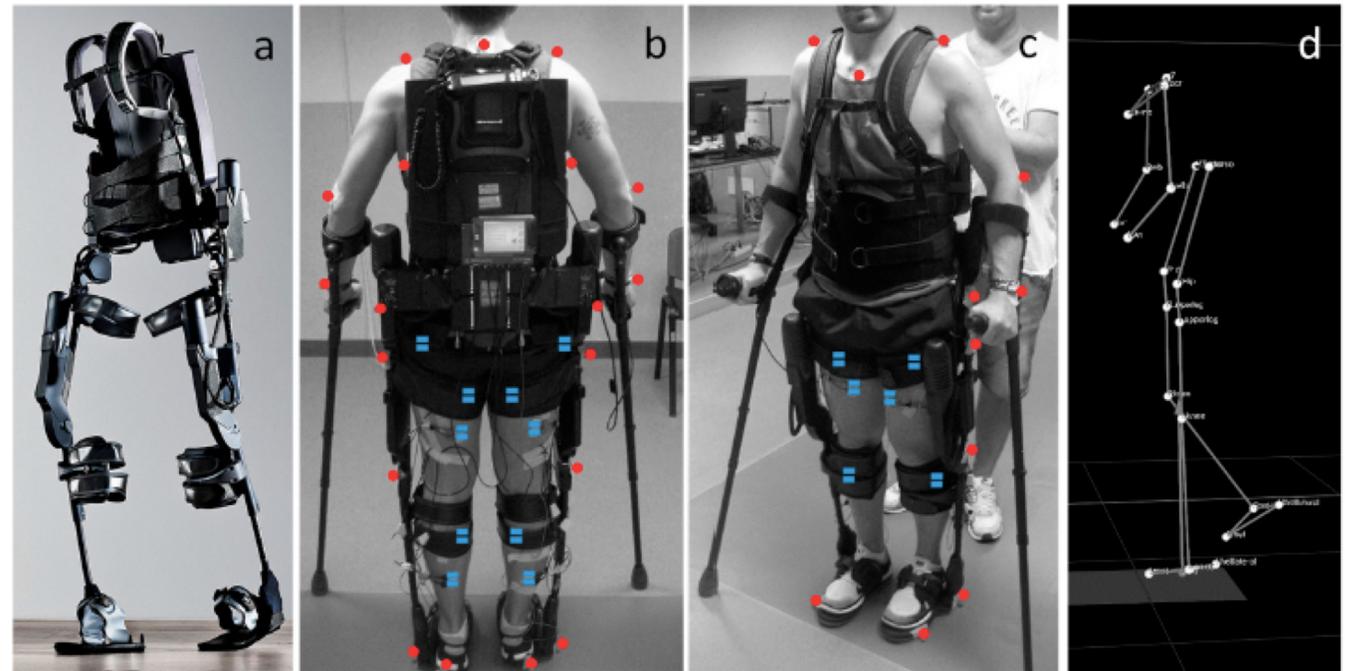
<sup>1</sup> Department of Informatics, Bioengineering, Robotics and System Engineering, University of Genoa, 13-16145 Genoa, Italy

<sup>2</sup> Spinal Cord Unit, Santa Corona Hospital, ASL2 Savonese, 38-17027 Pietra Ligure (SV), Italy

<sup>3</sup> Wyss Center for Bio- and Neuroengineering, CH-1202 Geneva, Switzerland

\* Correspondence: [alice.deluca@edu.unige.it](mailto:alice.deluca@edu.unige.it)

† Indicates equal contribution.



**Figure 1.** (a) Exoskeleton Ekso; (b,c) Participants wearing the Ekso. Red dots indicate the positions of the reflective markers for the motion analysis and the blue rectangles indicate the position of the surface electromyographic (EMG) electrodes. (d) Markers recorded by the motion analysis system (lateral view in the center of the motion analysis lab pathway).

# Próteses robóticas



<https://www.youtube.com/watch?v=PZiQg0wlxQM>