



Envelhecimento Celular e Tecidual

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Definições

- Redução da capacidade adaptativa e diminuição da reserva funcional

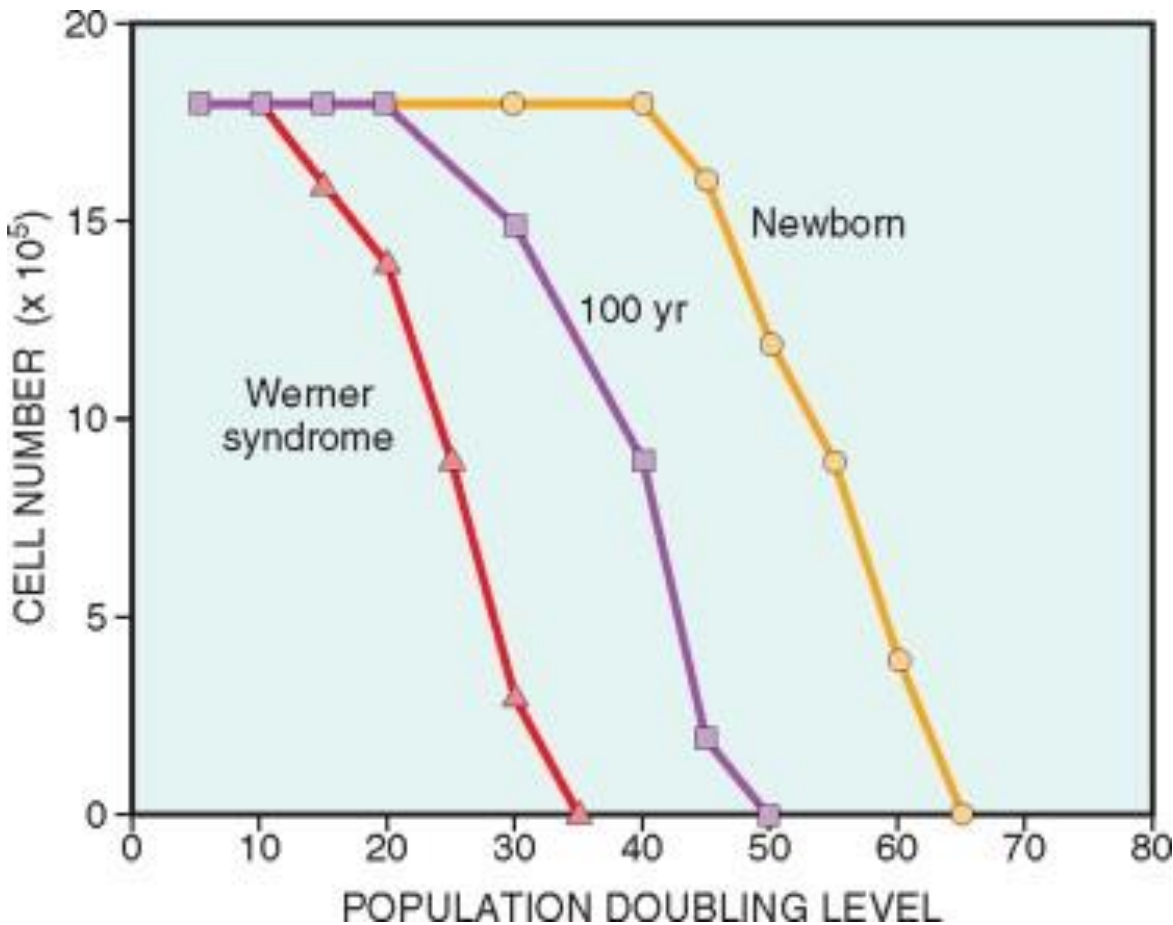
Senescência

Efeitos anatômicos e funcionais naturais do processo de envelhecimento

Senilidade

Alterações produzidas pelas inúmeras afecções que podem acometer o idoso

Senescência



Robbins, Pathologic basis of diseases – 9th edition

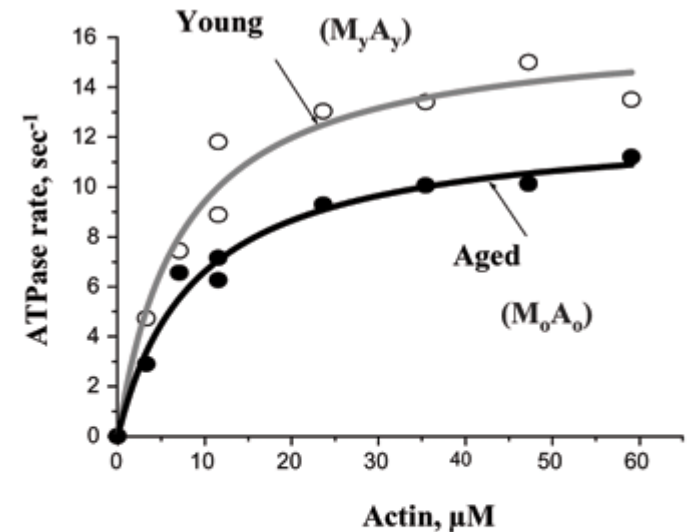
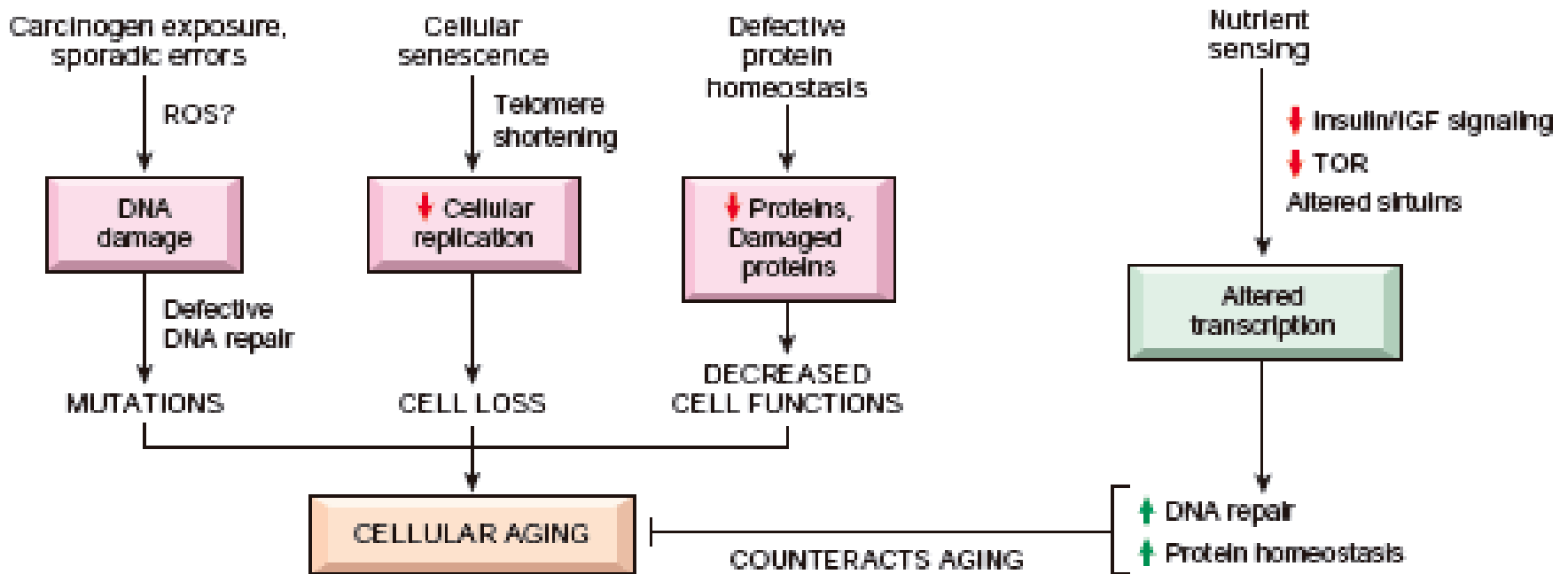


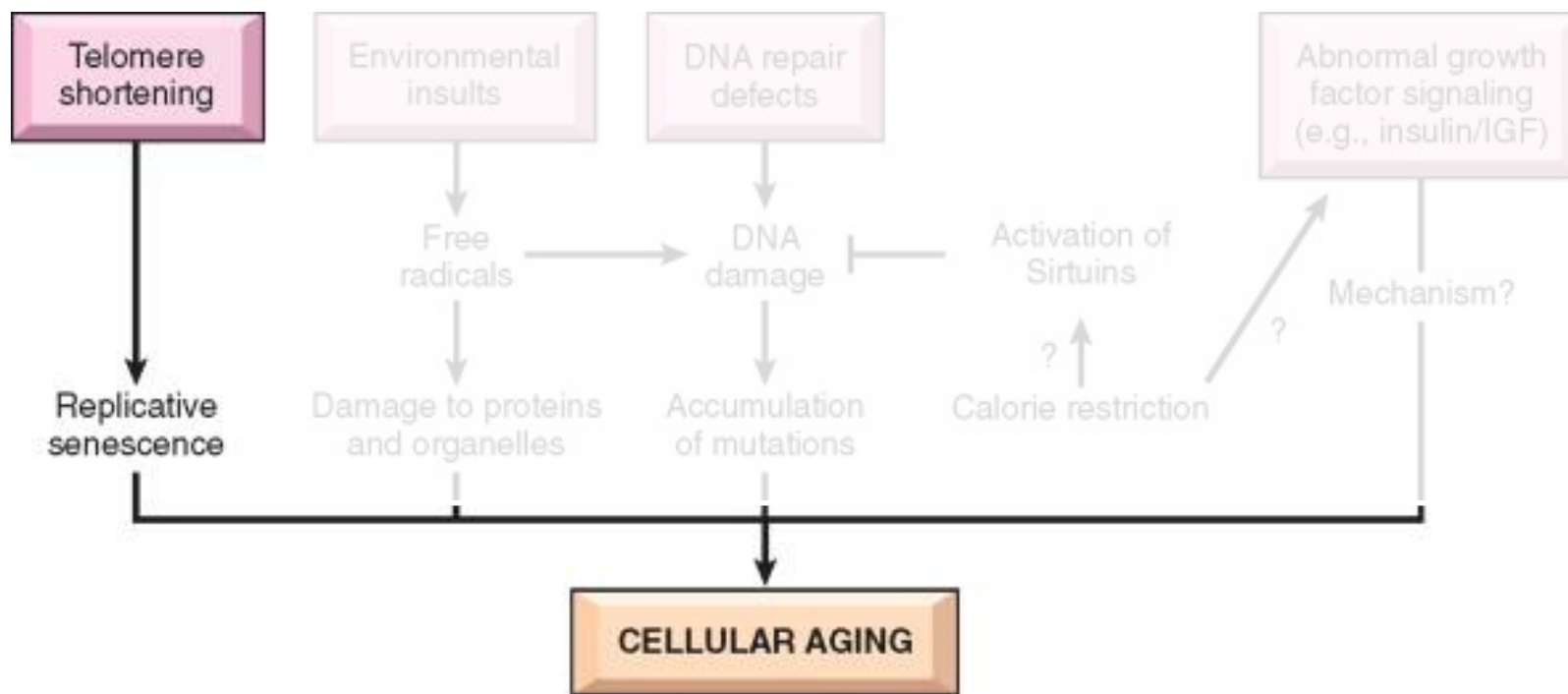
Figure 3. Representative experiment with isolated myosin and actin proteins from young and old rats to determine V_{max} (the maximum rate) and K_m (actin concentration at half V_{max}). The actin-activated myosin ATPase rate was measured at increasing concentrations of actin. The V_{max} and K_m were determined with O=young myosin, young actin, M_yA_y, V_{max} = 16.43 ± 1.00 s⁻¹, K_m = 7.44 ± 1.63 μM; ●=old myosin, old actin, M_oA_o, V_{max} = 12.55 ± 0.62 s⁻¹, K_m = 8.98 ± 1.48 μM.

Zhong et al, 2007

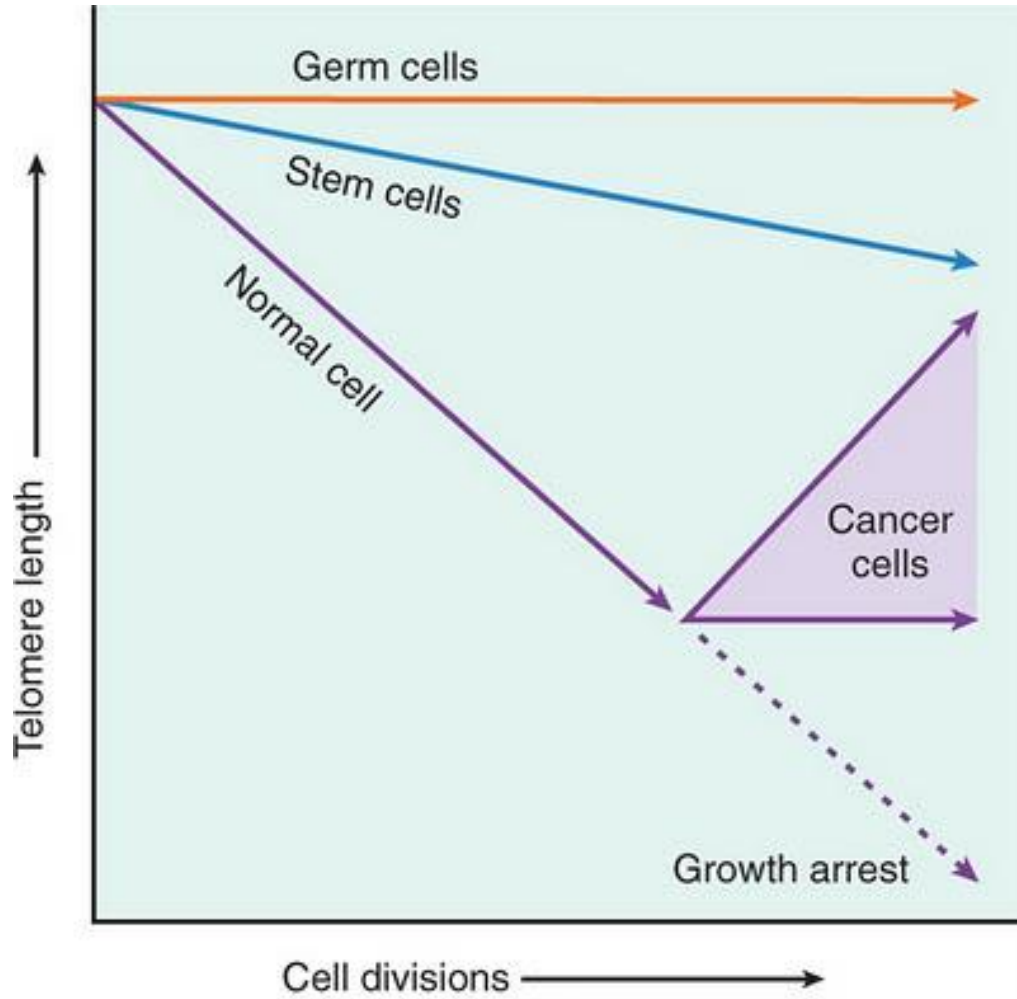
Mecanismos Gerais



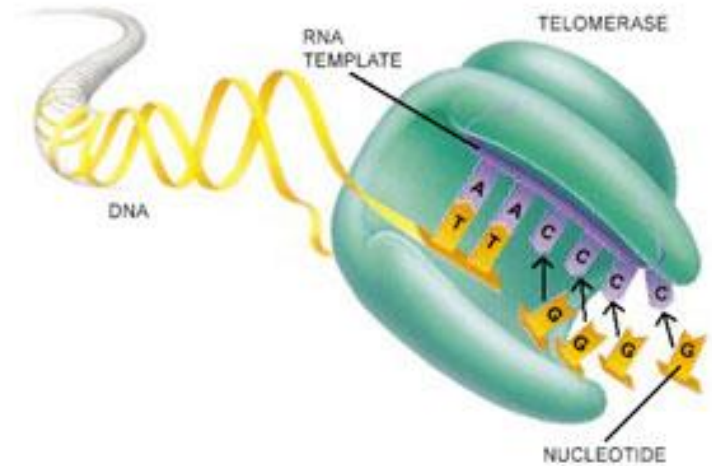
Mecanismos Gerais



Telômeros

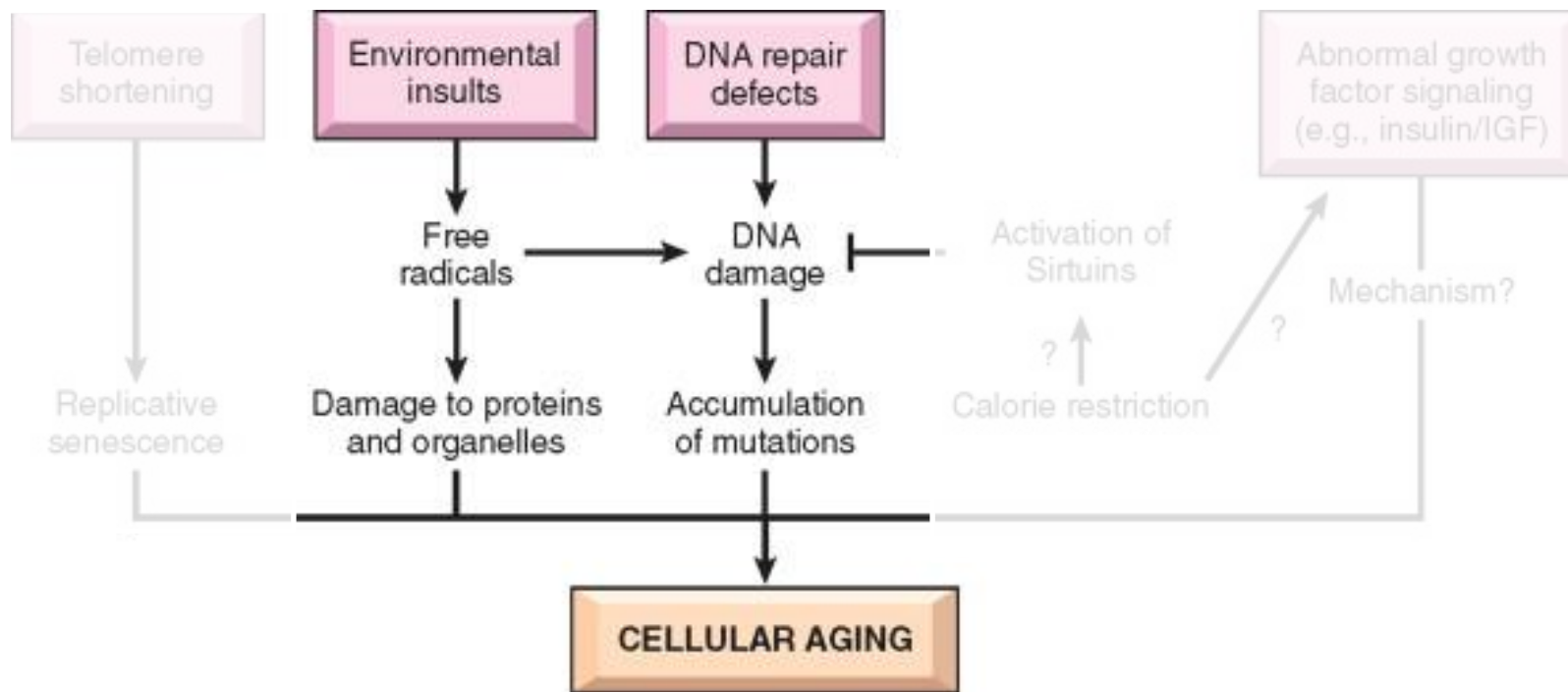


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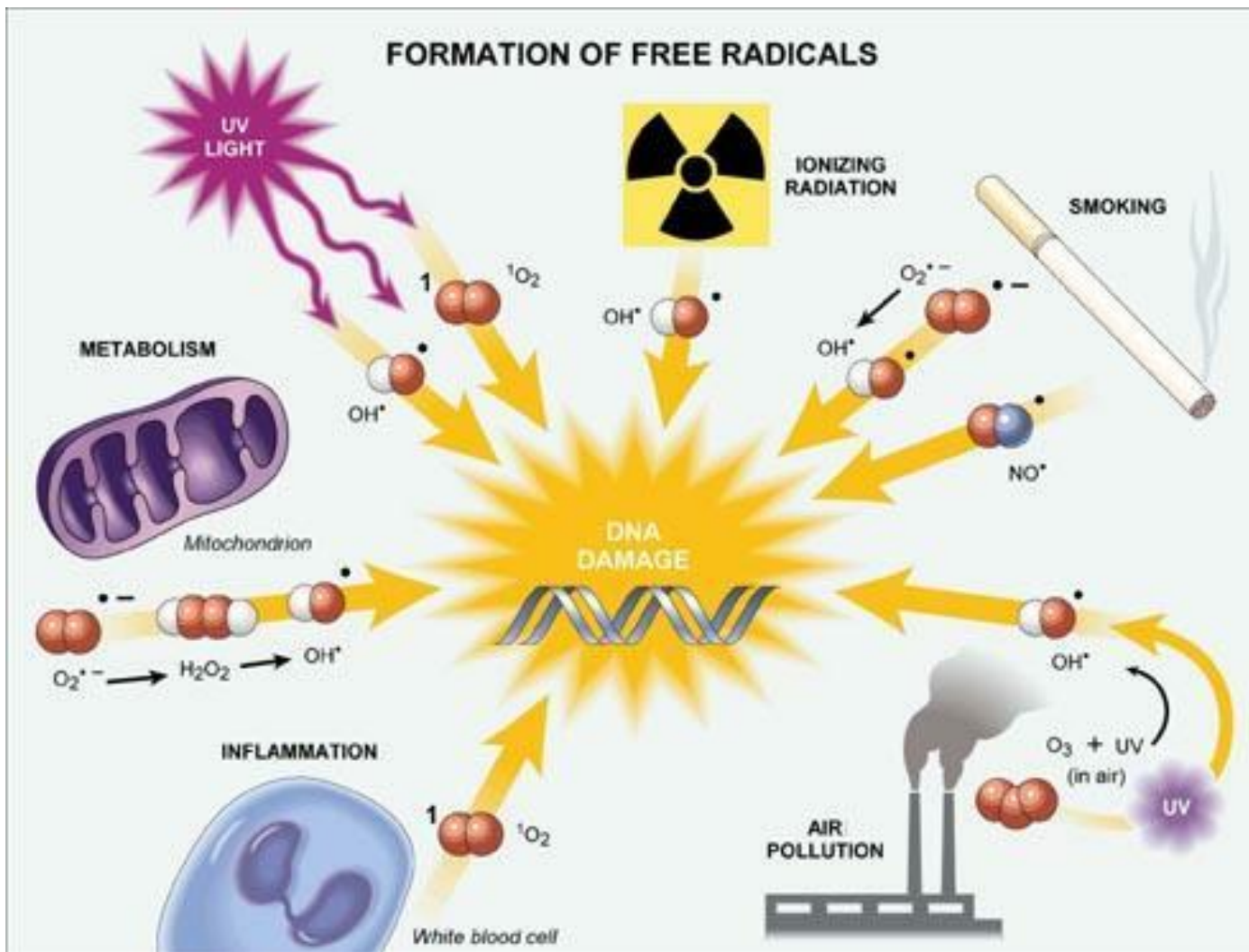


Clock Genes

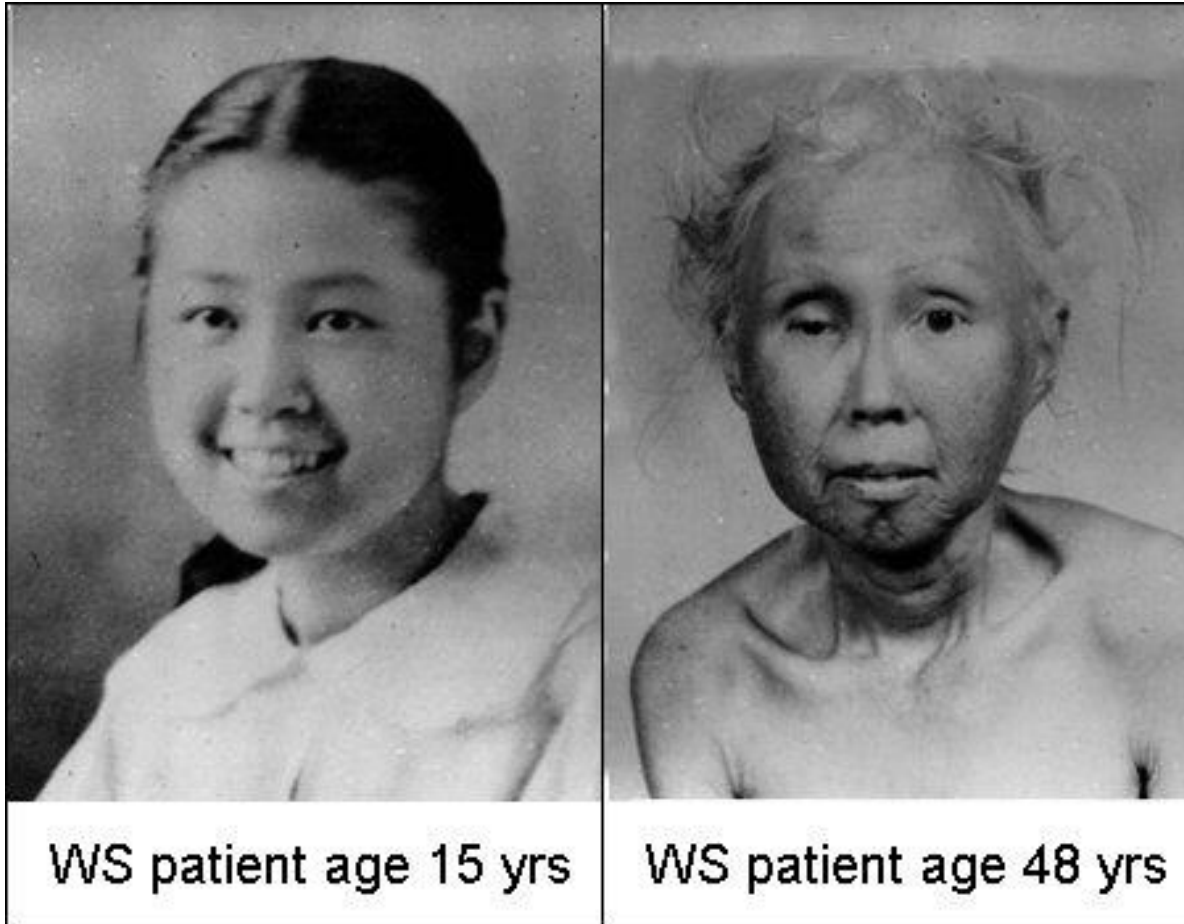
Mecanismos Gerais



Radicais Livres

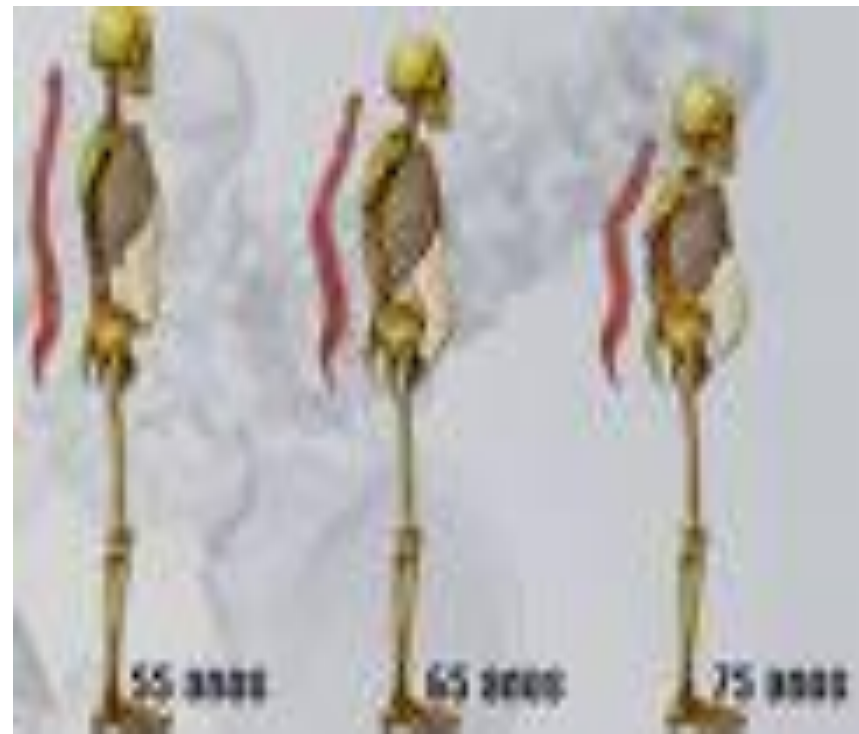


Síndrome de Werner



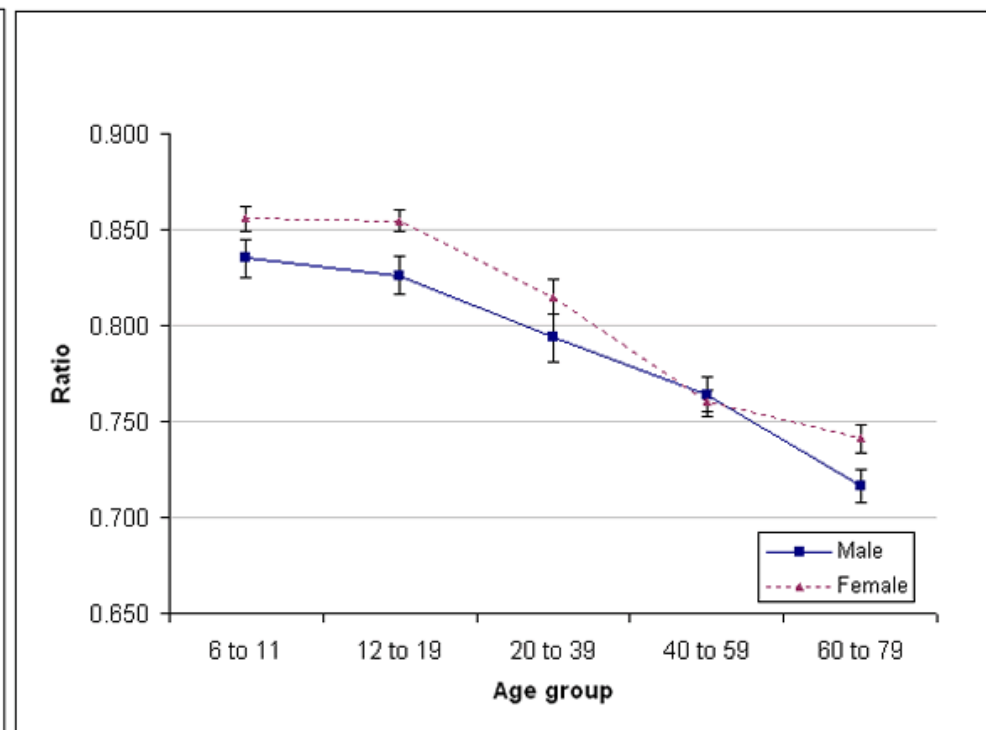
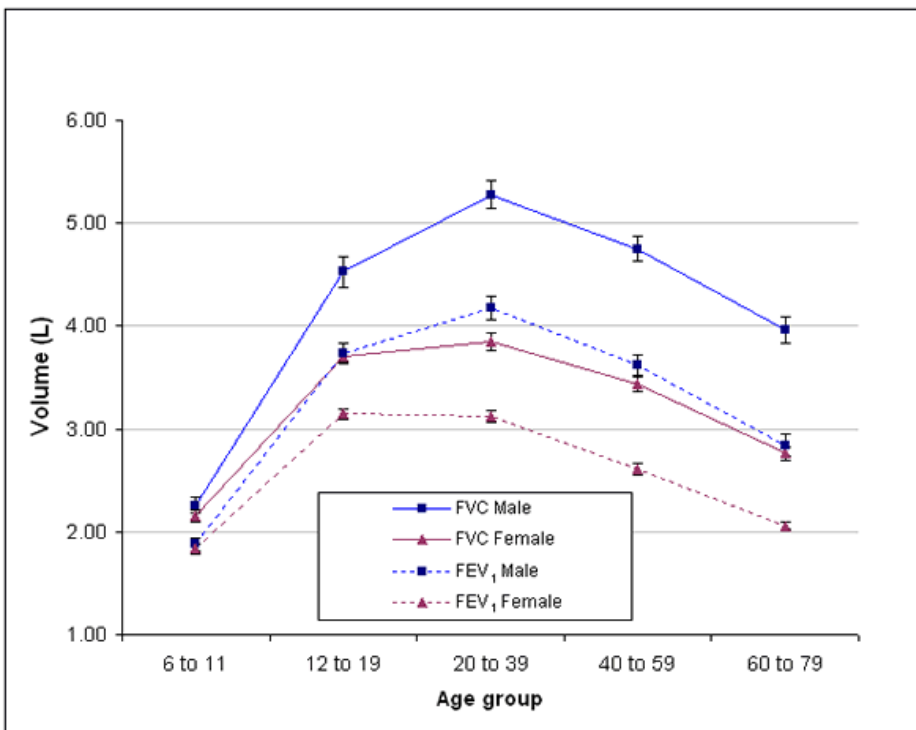
Aspectos Gerais

- Perda de estatura – 1 cm por década
- Aumento de peso
- Diminuição água corporal
- Perda de pelos
- Perda de turgor e elasticidade cutâneos
- Alteração de olfato e gustação
- Presbiopia e presbiacusia

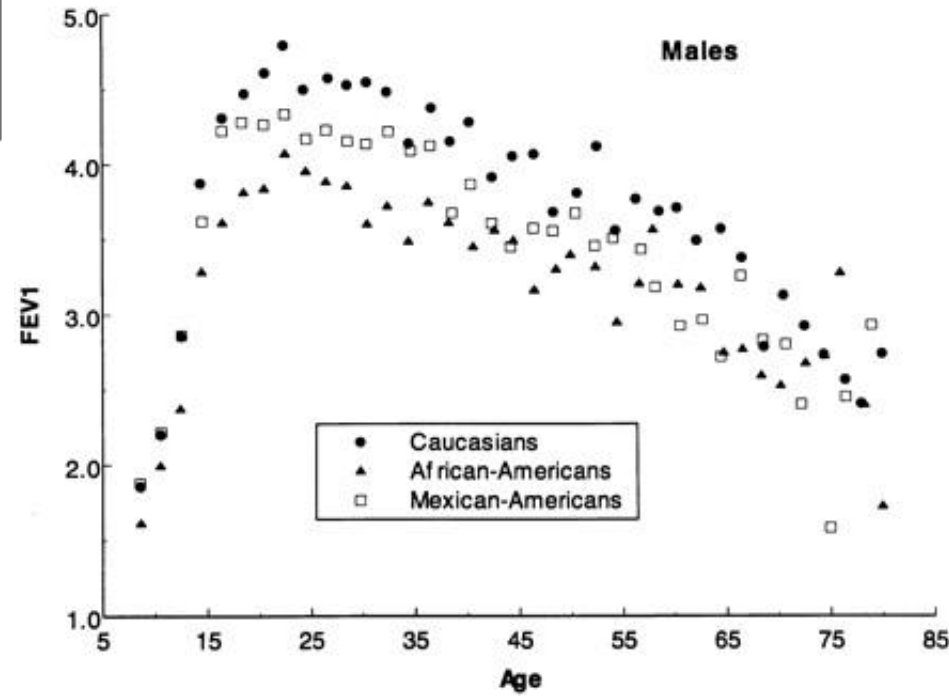
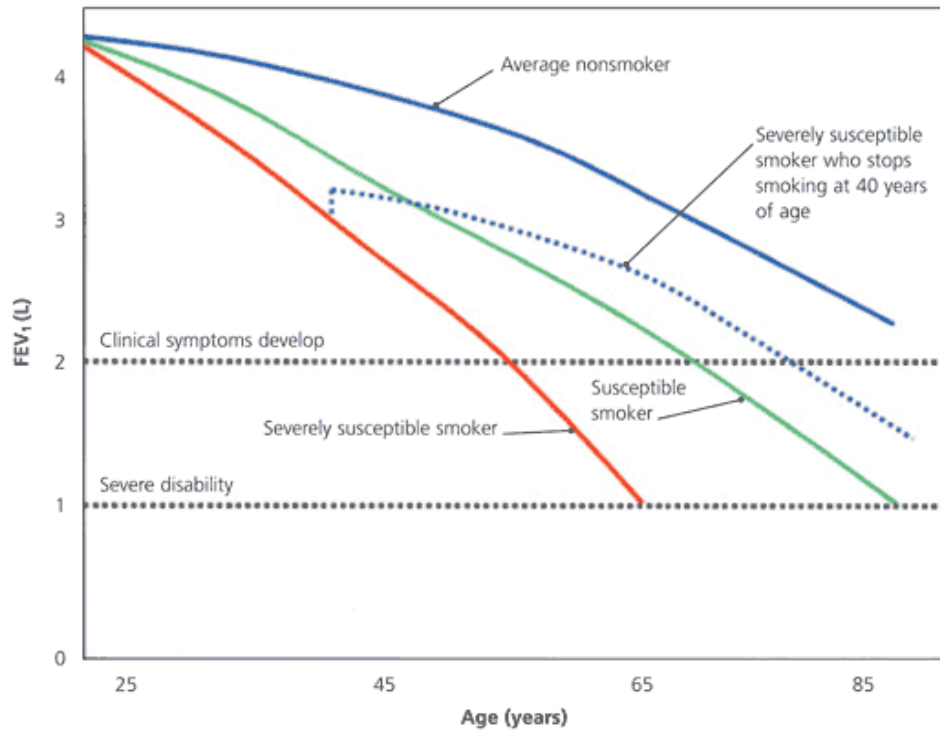


Aparelho Respiratório

- Redução da expansibilidade torácica
- Redução da eficiência do transporte mucociliar
- Redução do reflexo de tosse
- Alterações de volume residual
- Redução da elasticidade pulmonar

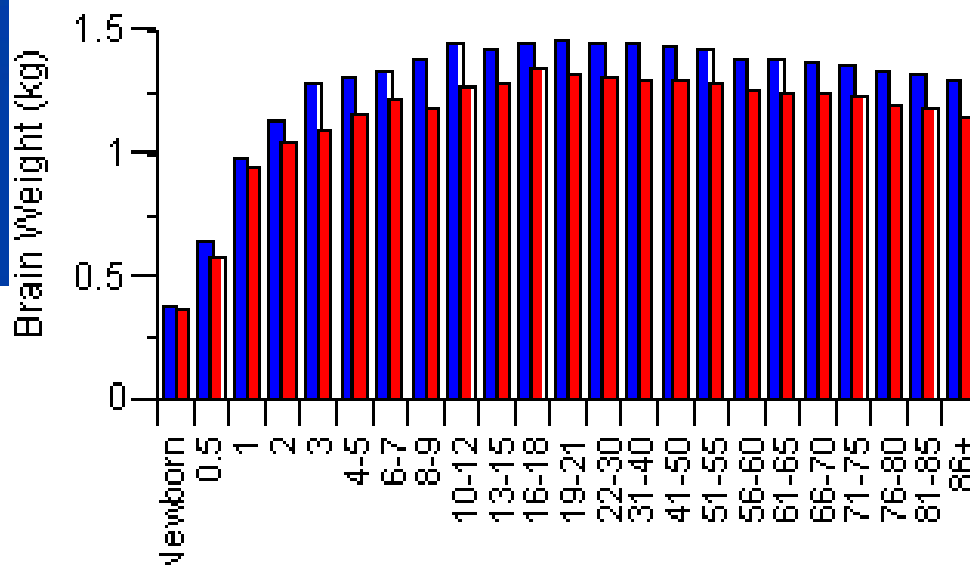
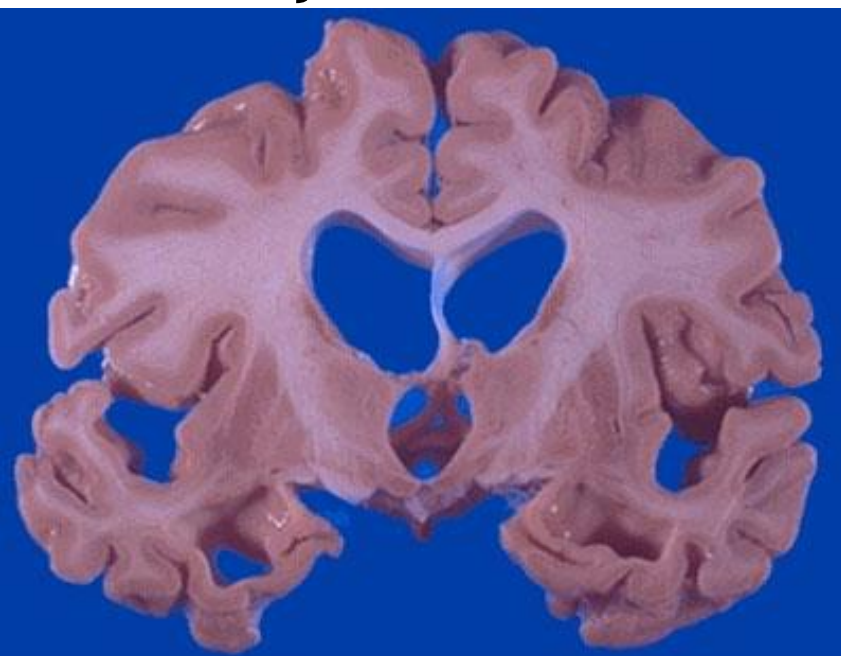


Aparelho Respiratório

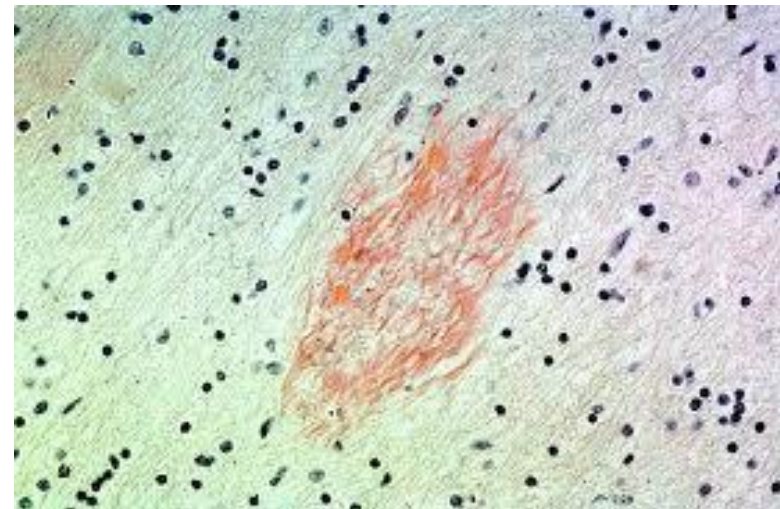
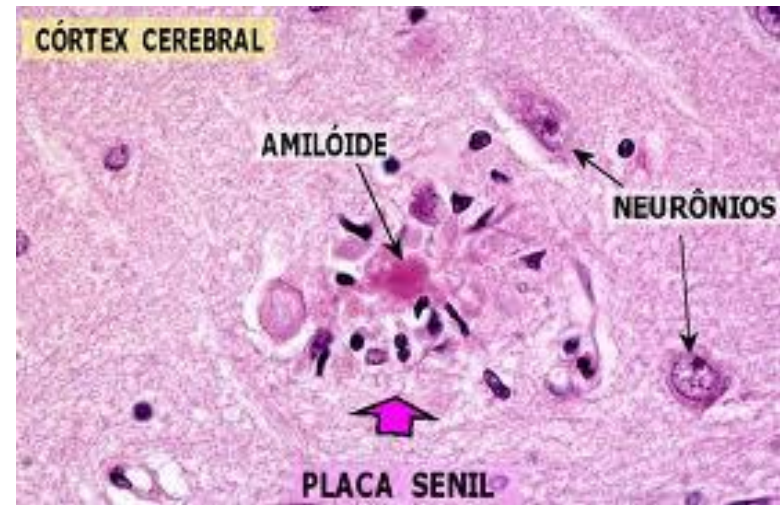
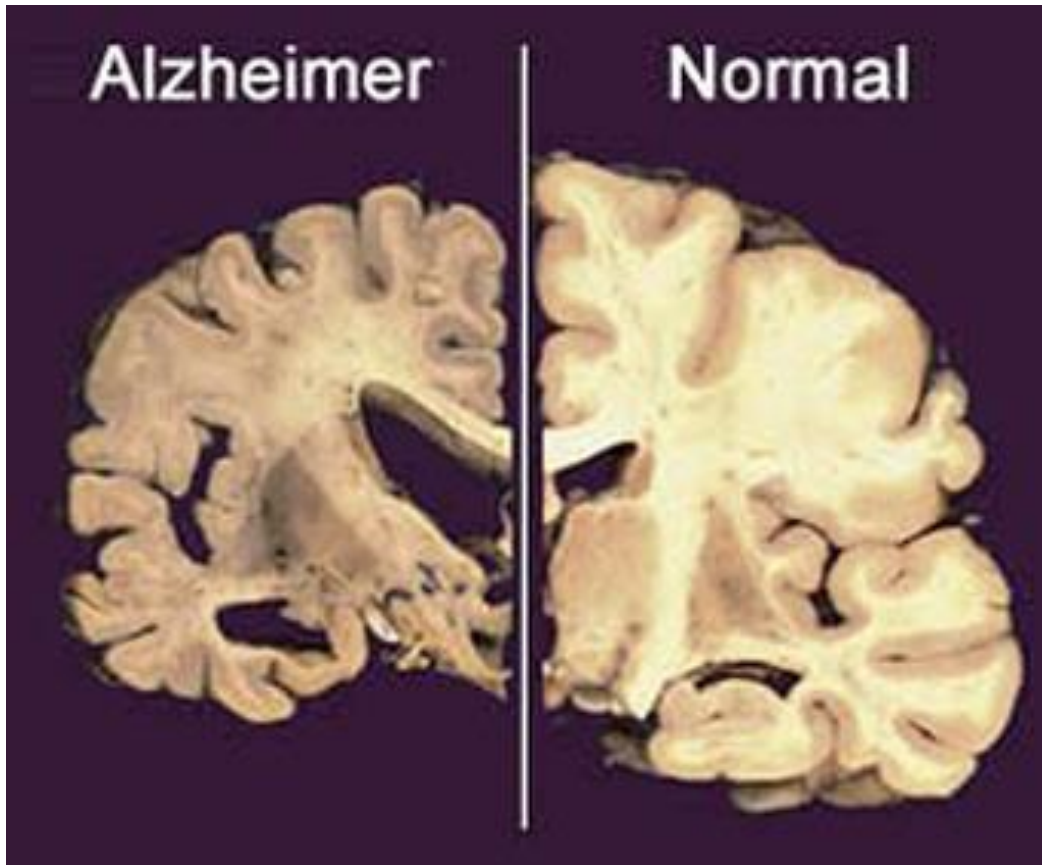


Sistema Nervoso

- Redução do número de neurônios e peso cerebral
- Redução da condução nervosa
- Redução de neurotransmissores



Sistema Nervoso

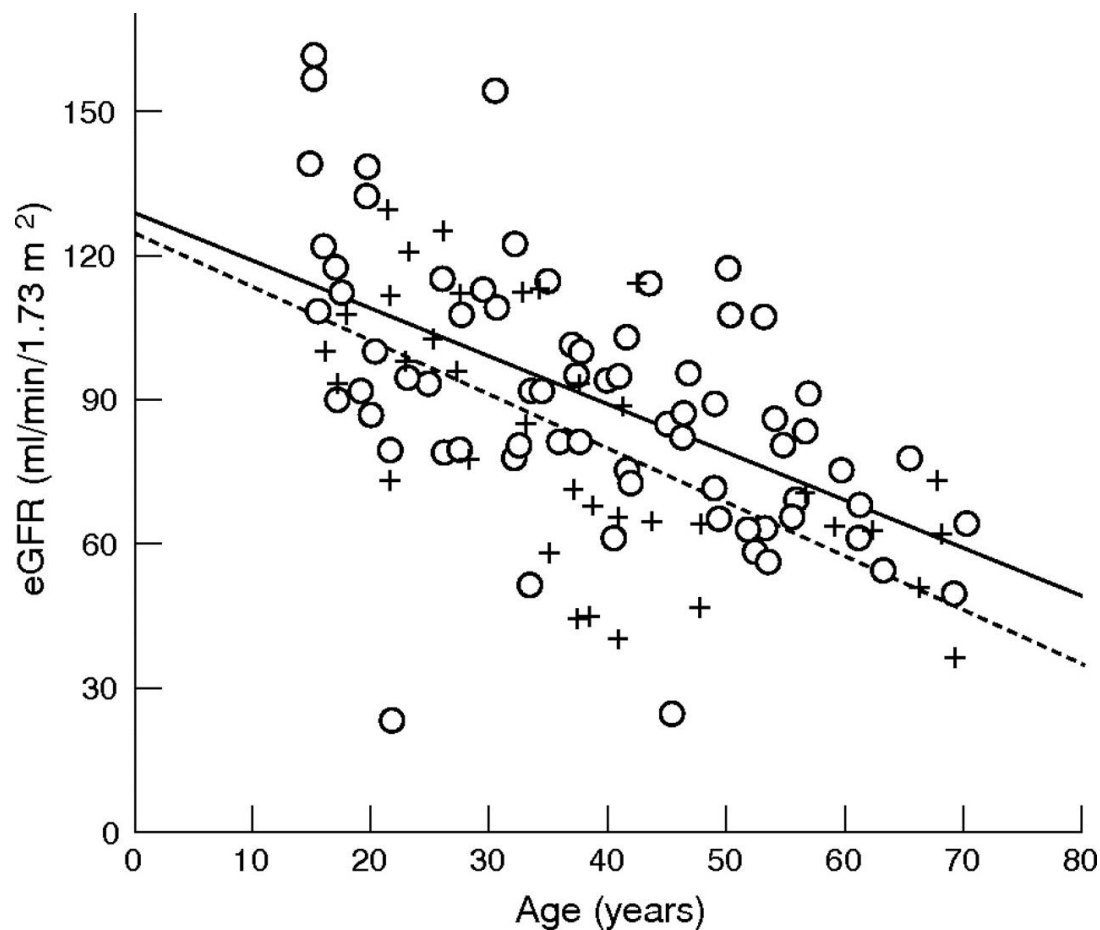


Aparelho Cardiovascular

- Espessamento valvar
- Diminuição complacência ventricular
- Diminuição da frequência cardíaca
- Aumento rigidez da parede vascular

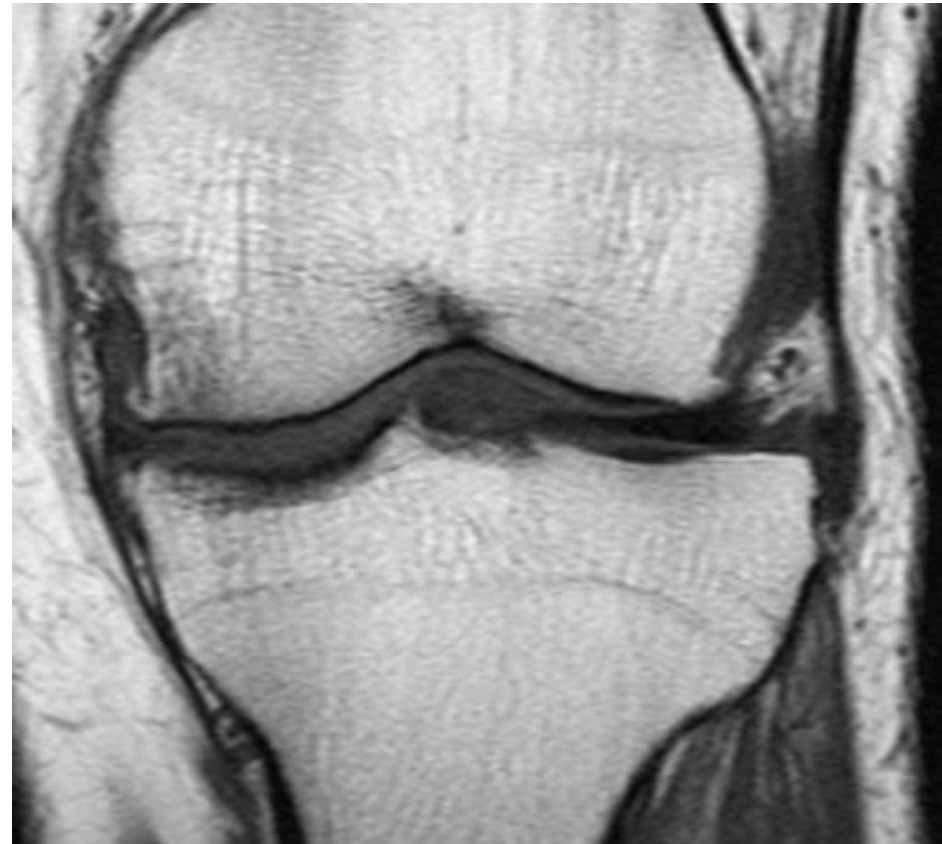
Aparelho Urinário

- Redução do fluxo renal – 1% ao ano após os 50
- Redução da capacidade de modificação da [] urinária
- Redução da filtração glomerular



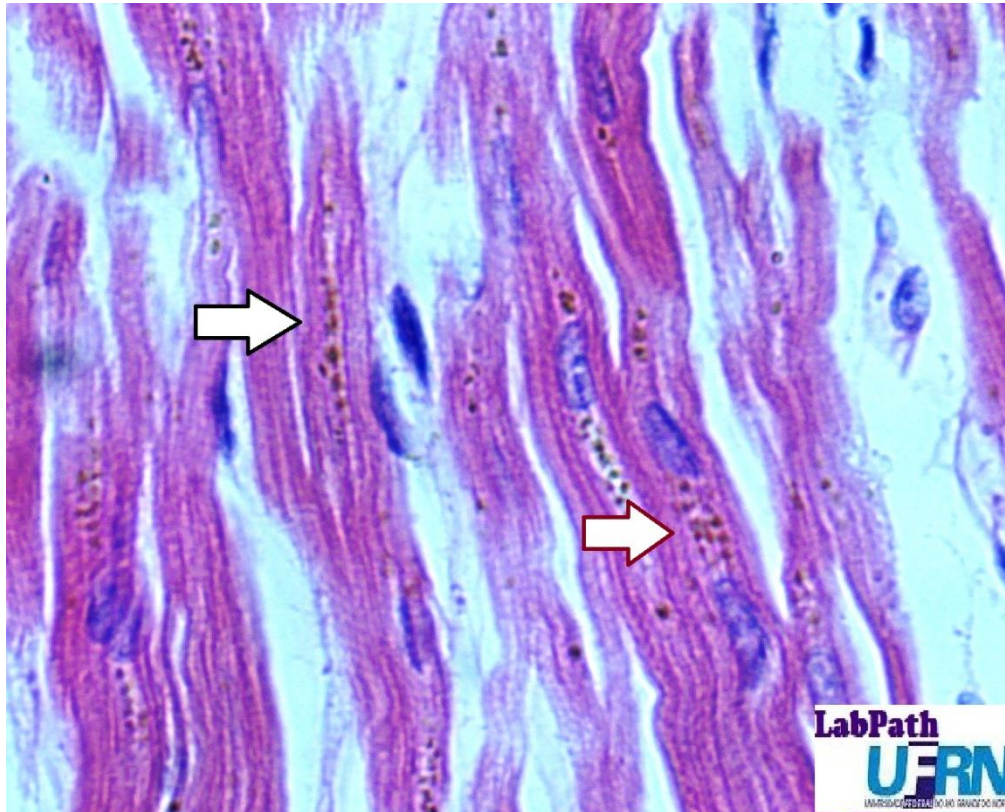
Aparelho Locomotor

- Redução de até 50% nas fibras musculares
- Fragmentação e degeneração de fibras elásticas
- Redução progressiva da massa óssea – osteopenia
- Redução hidratação de cartilagens



Aparelho Locomotor

- Redução do débito cardíaco
- Diminuição da complacência e frequência cardíaca
- Rigidez vascular e aterosclerose



Resumo

Table 1. Summary of Physiologic Changes Reported with Aging

Function	Change
Neurologic	
Brain mass	↓
Cerebral blood flow/cerebral oxygen consumption	± ^a
Thermoregulation	Impaired
Hearing, vision, memory	↓
Motor efficiency, strength	↓
Prevalence of dementia	↑
Cardiovascular	
Systolic blood pressure	↑
Peripheral vascular resistance	↑
Heart rate	↓
Stroke volume	No change
Ejection fraction	No change
Conduction abnormalities, dysrhythmias	↑
Response to adrenergic stimulation	↓

Respiratory	
Maximal inspiratory capacity	↓
Work capacity	↓
Chest wall compliance	↓
Lung compliance	↑
Total lung capacity	No change
Residual volume	↑
Functional residual capacity	↑
Closing volume	↑
Diffusing capacity	↓
Ventilatory response to hypercapnia	↓
Cough reflex	↓
Renal	
Renal blood flow	↓
Creatinine clearance	↓
Response to acid-base, water electrolyte abnormalities	↓
Gastrointestinal/nutrition	
Motility	↓
Secretory function	↓
Absorption	↓
Acid secretion by stomach	↓
Lean body mass	↓
Energy expenditure	↓
Glucose tolerance	↓

