

# Consequences of Fall & Long Lie

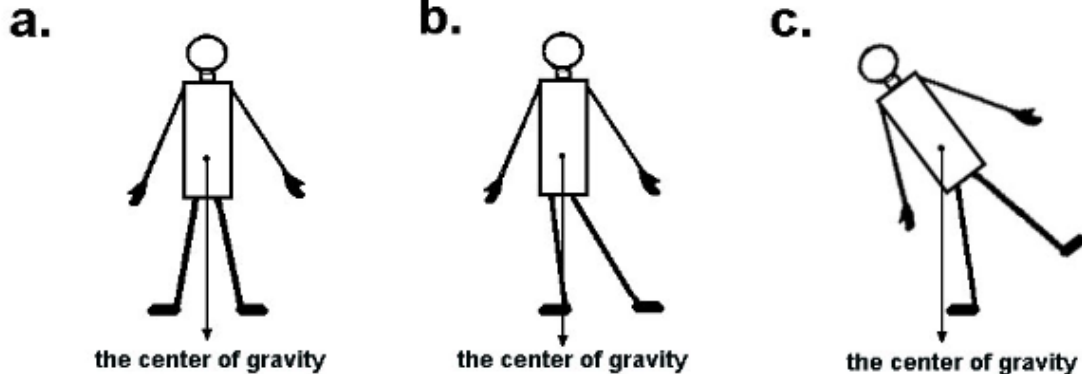
Dr David Shipway FRCP  
Consultant Physician & Perioperative Geriatrician  
Southmead Hospital, North Bristol NHS Trust  
[david.shipway@nbt.nhs.uk](mailto:david.shipway@nbt.nhs.uk)

# Overview

- Explain why older people fall over +/- can't get up
  - Overview of the physiology
- Describe the consequences of long lie
  - Immediate
  - Delayed
- The importance of early intervention to break vicious cycle

# Why do people fall over?

- Centre of Gravity
- We fall when centre of gravity falls outside body
  - Unless we do something about it:
    - e.g. hold on to something for support



# What happens to stop ourselves falling?



What happens?	How?	Where?
Body detects unexpected movement as we lose balance	Retina Vestibular Apparatus Proprioceptive Nerves	Eyes Inner ear Limbs, spine, torso
Nerve signal to spine or brainstem	Cranial Nerves Peripheral Nerves	Brainstem Limbs
Nerve signal up spine to brainstem	Spinal cord	Spine
Brain processes movement	Brainstem Cerebellum	Head
Brain subconsciously decides what action to take (reflex)	Brainstem Cerebellum	Head
Brain evaluates situation (" <i>I'm now standing on ice</i> ")	Fronto-Parietal Lobes	Head
Brain consciously takes deliberate action (e.g. wide slow footsteps on ice, hold on to stick)	Fronto-Parietal Lobes	Head
Brain sends message to legs and arms	Brainstem, spinal cord, peripheral nerves and muscle	Head, spine, limbs, hands/feet

# These processes are complicated

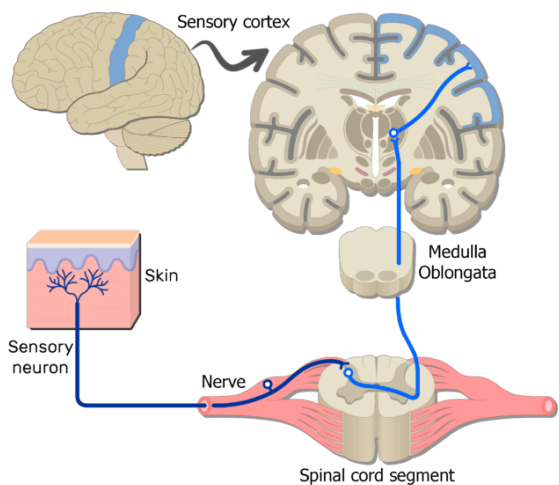
They take a long time to learn and refine



The most complicated neurophysiological processes are the first to break down in a crisis



# So what can go wrong to cause falls?



Component	Problem	How
Brain	Delirium- any cause Stroke Sub-dural Haemorrhage Drugs & Alcohol	Impaired judgment Impaired interpretation of nerve signals Impaired control of limbs
Spine	Spinal Injury Stroke	Impaired sensation of position Limbs don't respond to commands
Nerves	Peripheral Neuropathy Drugs & Alcohol	Impaired sensation of position Limbs don't respond to commands
Muscle	Myopathy; Sarcopaenia Drugs Poor nutrition	Muscles unable to support weight
Bones	Fractures	Limbs integrity broken; pain
Cardio-Respiratory system	Low blood pressure, heart failure arrhythmia, drugs Hypoxia due to any lung disease	Organs (especially brain) fail if inadequate oxygen supply in bloodstream

# Similar physiology needed to get up

And after the fall there are often new problems



# Surgical Consequences of Falls

## Often cause long lie

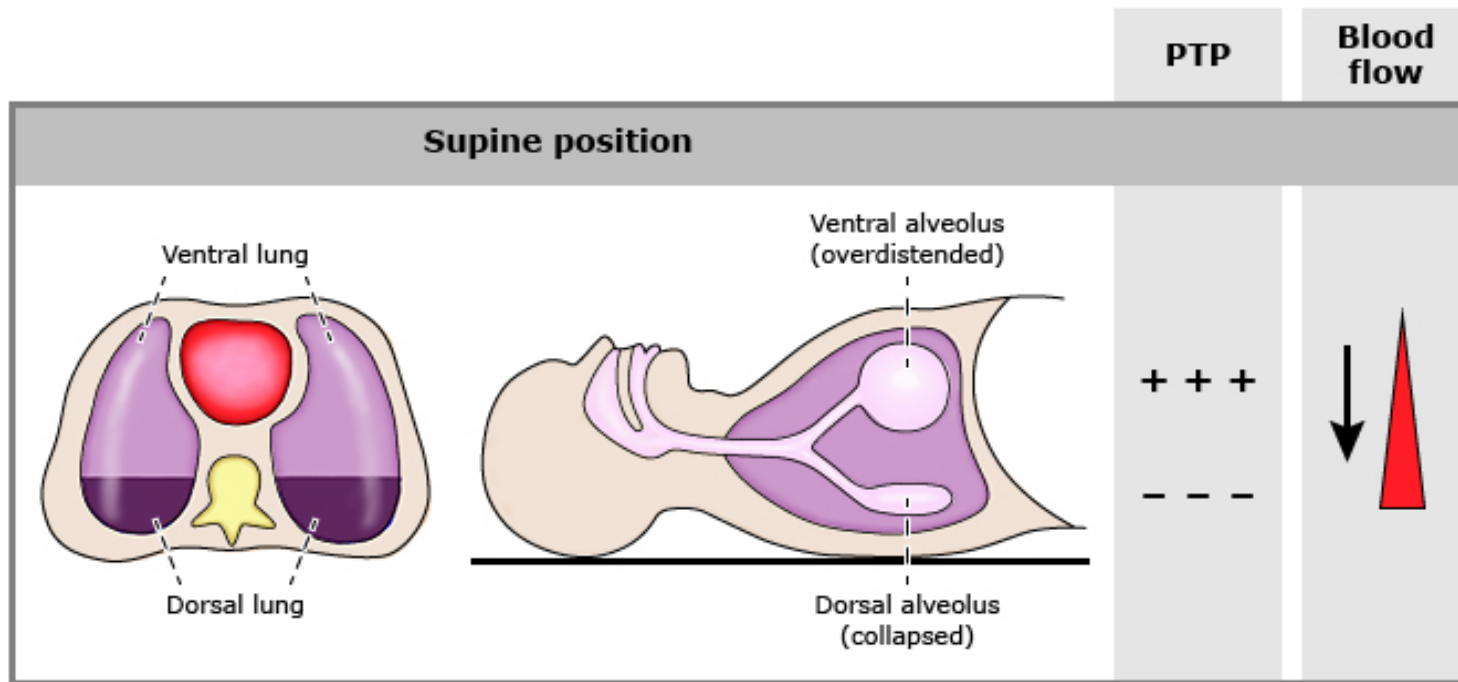
- Head injury- low GCS or neurological weakness
- Fracture – loss of limb integrity





# General Consequences of Falls & Long Lie

- Hypothermia
- Dehydration
- Acute Kidney Injury
- Hypoglycaemia
- Hypoxia
- Atelectasis
- Pneumonia

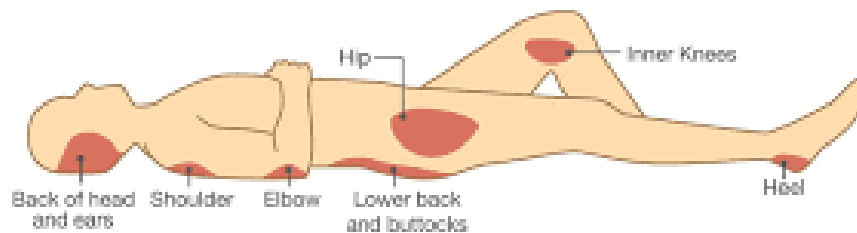


# Consequences of Falls

## Skin Pressure Injury

### LONG LIE

- Pressure injury
  - Skin
  - Soft tissue
- Burns
  - Lying next to radiator

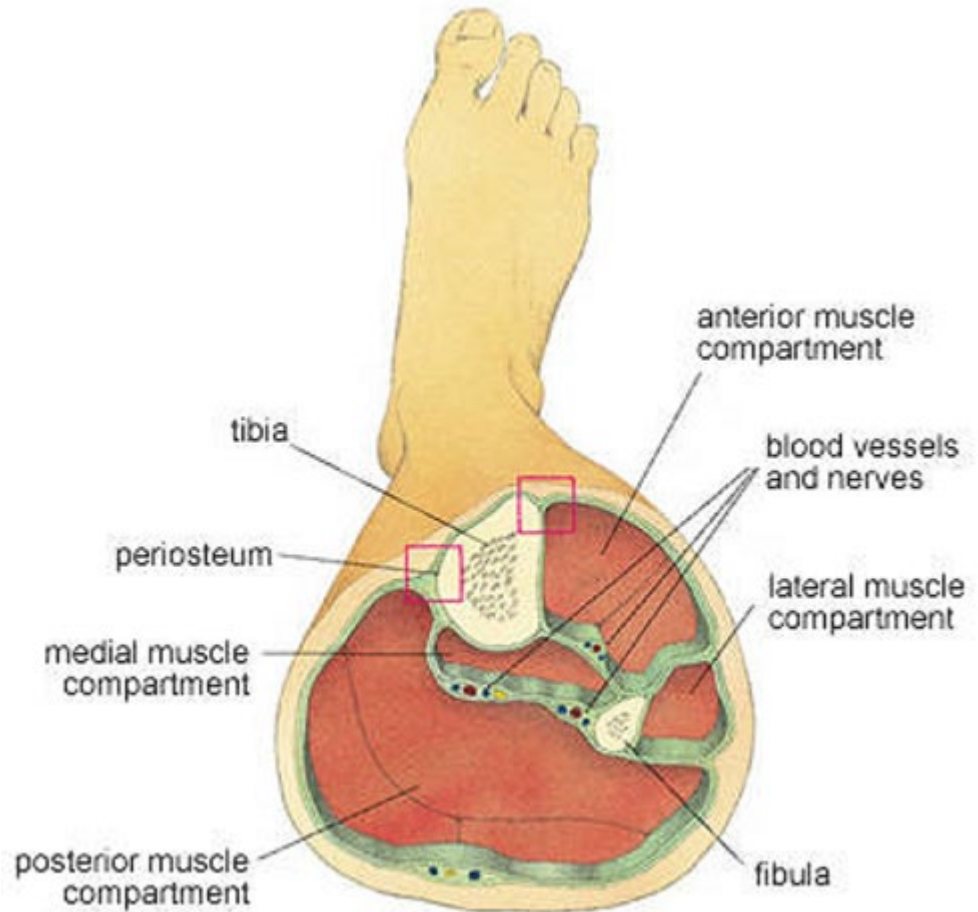


PRESSURE SORES

# Consequences of Falls

## Soft Tissue Compression

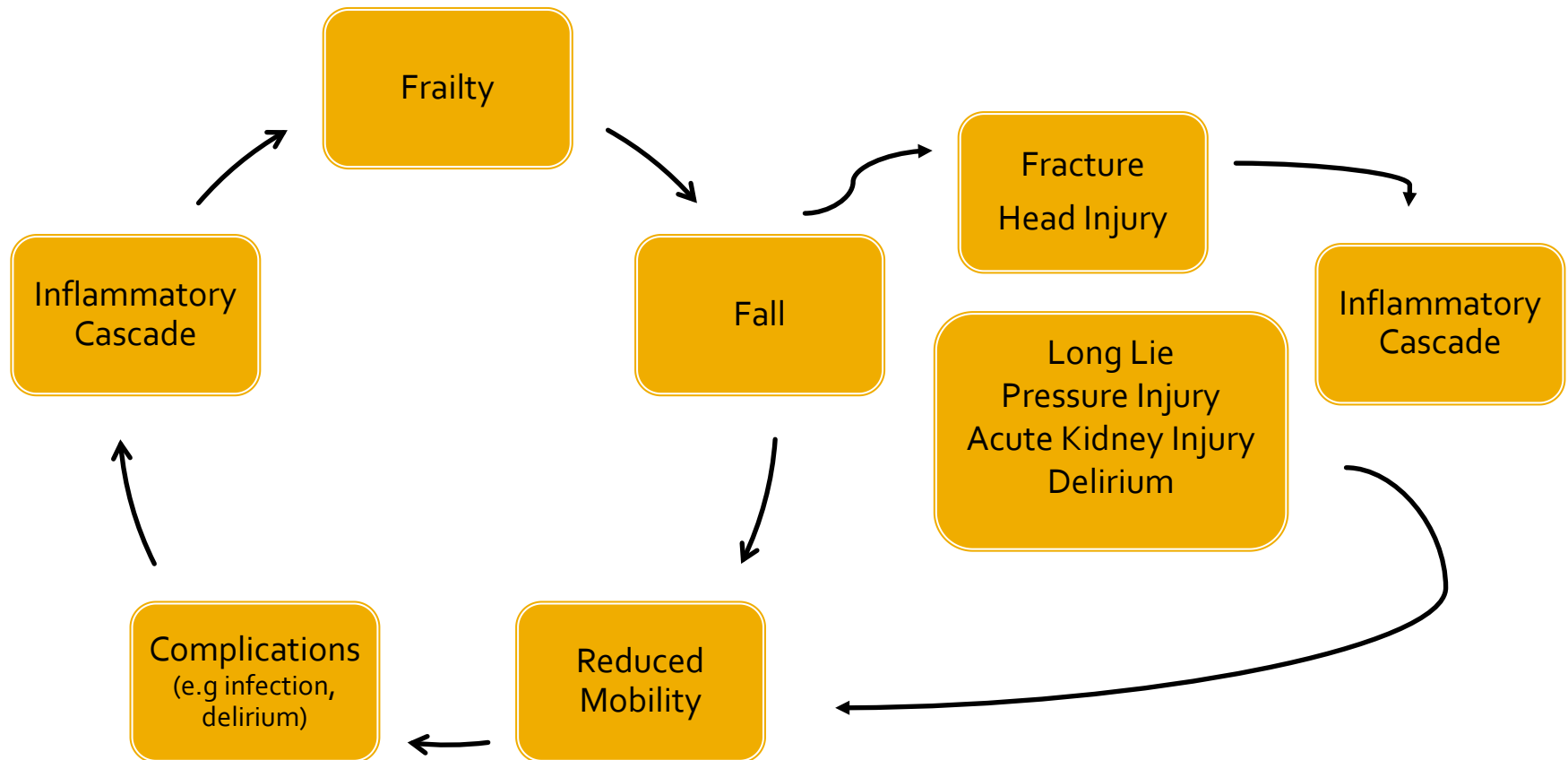
- Soft tissue compression
  - Obstruction of blood supply or venous return
  - Increased pressure
  - Muscle injury
  - Release of toxins
  - More muscle damage
  - More toxin release- vicious cycle
- Compartment syndrome
- Rhabdomyolysis
- Toxins cause kidney failure
- Delirium



# What does this mean in practical terms?

- Medical admission
  - Rewarming
  - Electrolyte correction
  - Meticulous fluid balance
  - IV fluids
  - Antibiotics?
  - Haemofiltration?
  - Surgical decompression?
- Avoidance of further complications
- Meticulous pressure care
  - If unable to offset pressure, can necessitate 2-hourly turns
  - May take weeks to heal
- Delirium nursing
- Complex discharge planning
- Avoidance of further falls

# The Falls Vicious Cycle





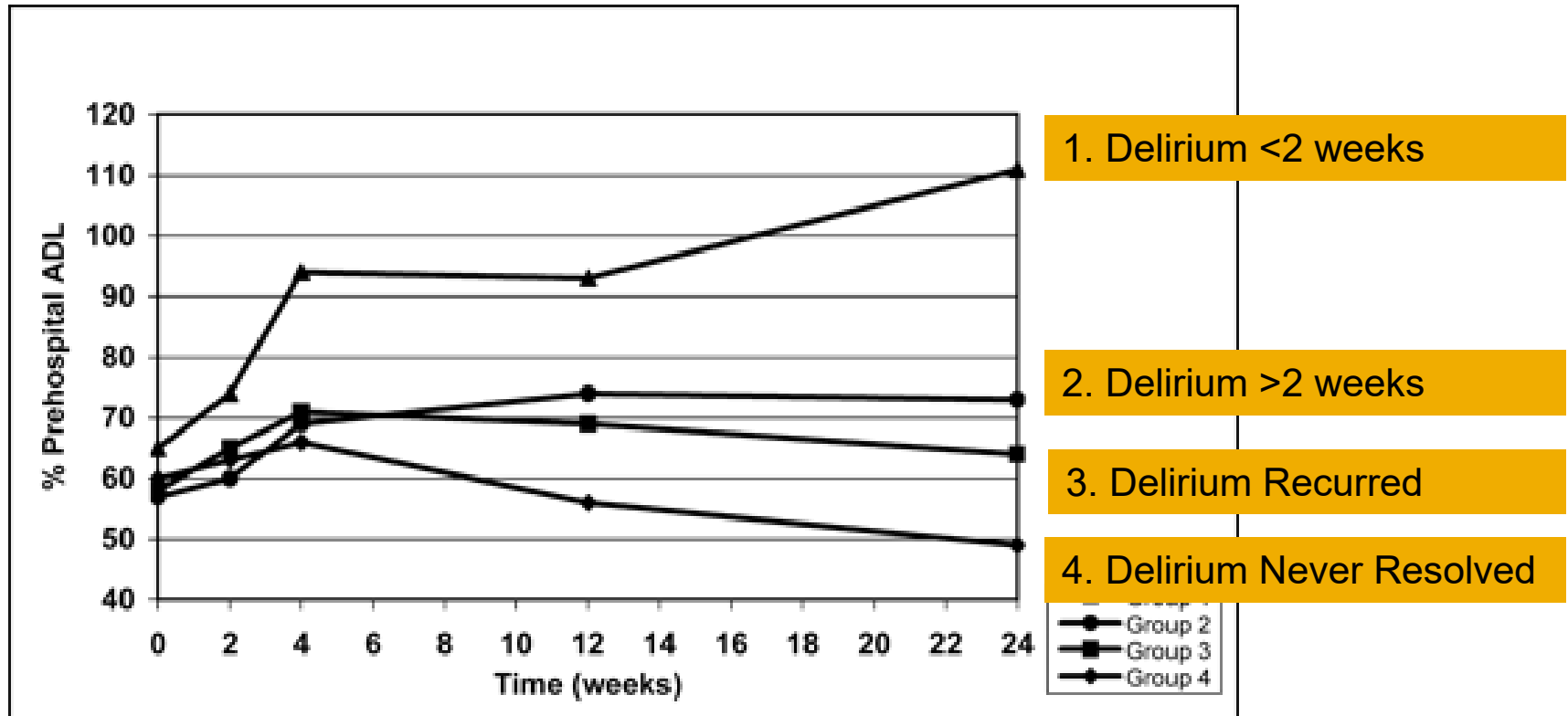
# Long term consequences

## Immobility sarcopaenia



- 18 days brace immobilisation in fit healthy male post ACL rupture
- 40% loss muscle strength 1 week
  - Parry et al, Extrem Physiol Med 2015
- Global sarcopaenia = basis for functional decline

# Delirium & Functional Outcomes



# So these people don't go home And ambulances can't offload



**THE**  
**Sun**

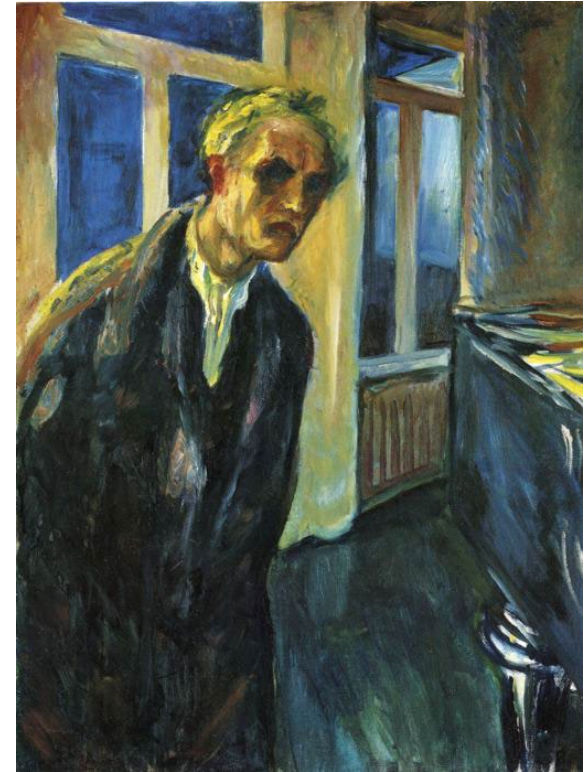
ELDERLY 'TRAPPED'  
IN HOSPITAL BEDS





# Summary

- Falls are caused by decompensating neurophysiology
- Even if no immediate injuries, complications of long lie can be serious
  - Medical complications
  - Pressure injury: skin & muscle
  - Vicious cycle of functional decline
- Essential to break this cycle early where possible



*The Night Wanderer.*  
Edvard Munch, 1923