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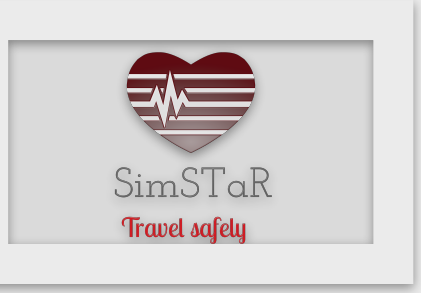
Travel safely

Pathophysiology of Transfer Medicine



Transfer Risks

Worsening disease process

Equipment issues

Human factors

Transfer hazards

Static hazards

Dynamic hazards

Overview

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Risks of Transfer

- Worsening disease process
- Equipment failure
- Human factors

Worsening Disease Process

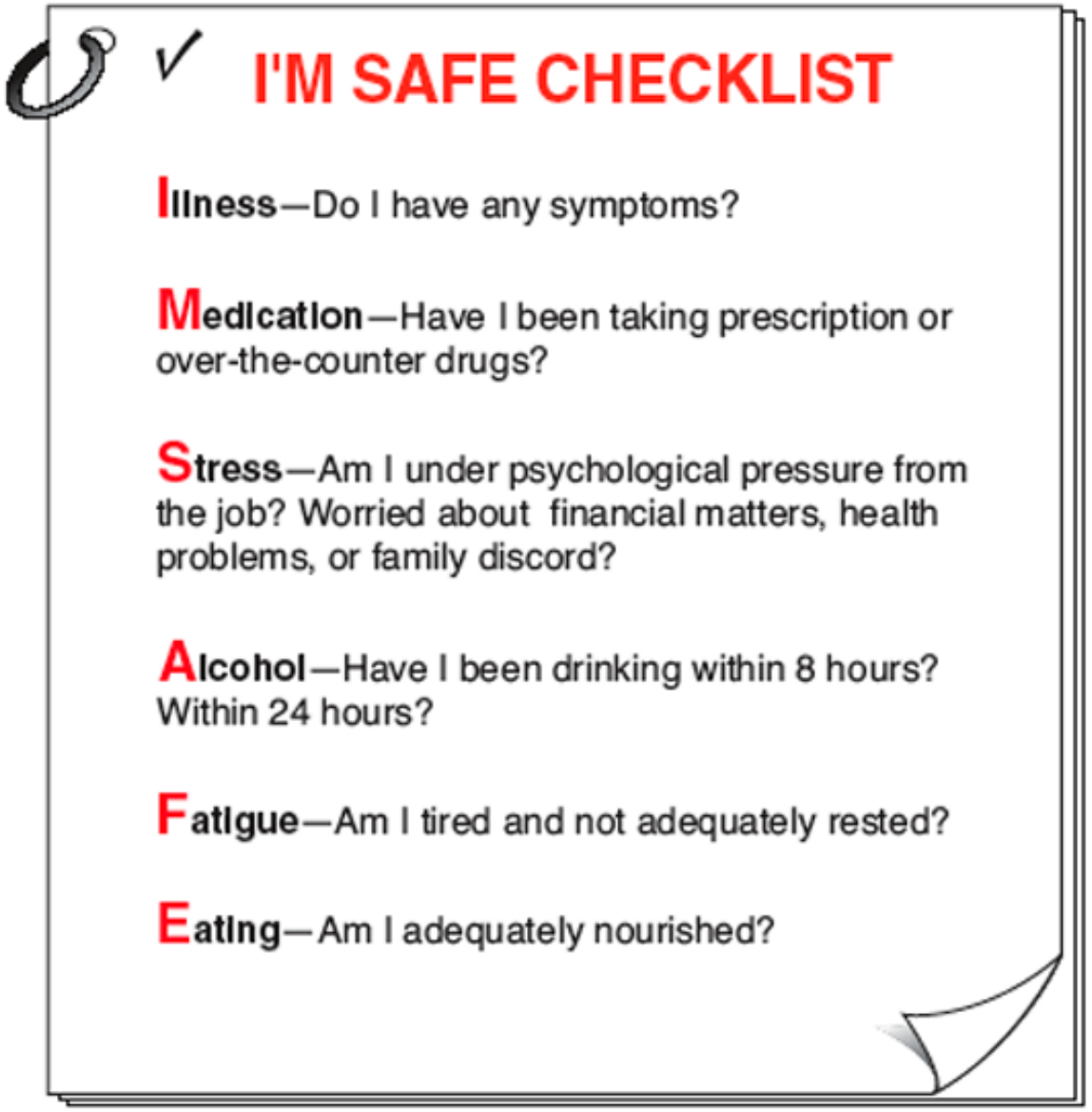
- Clinical deterioration
- Inadequate therapy
- Movement

Equipment issues

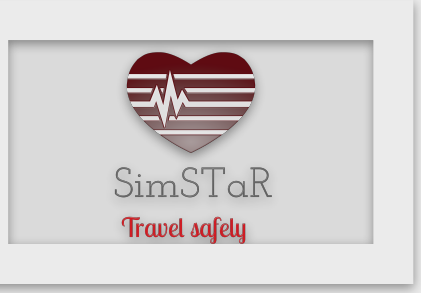
- Inadequate monitoring
- Equipment failure
- Resources - limited access to diagnostics, therapy & personnel

Human Factors

- Technical issues
- Communication failure
- Situational awareness
- Be aware of limitations!



Pre-departure checklist developed for pilots



Static hazards

Dynamic hazards

Hazards of Transfer

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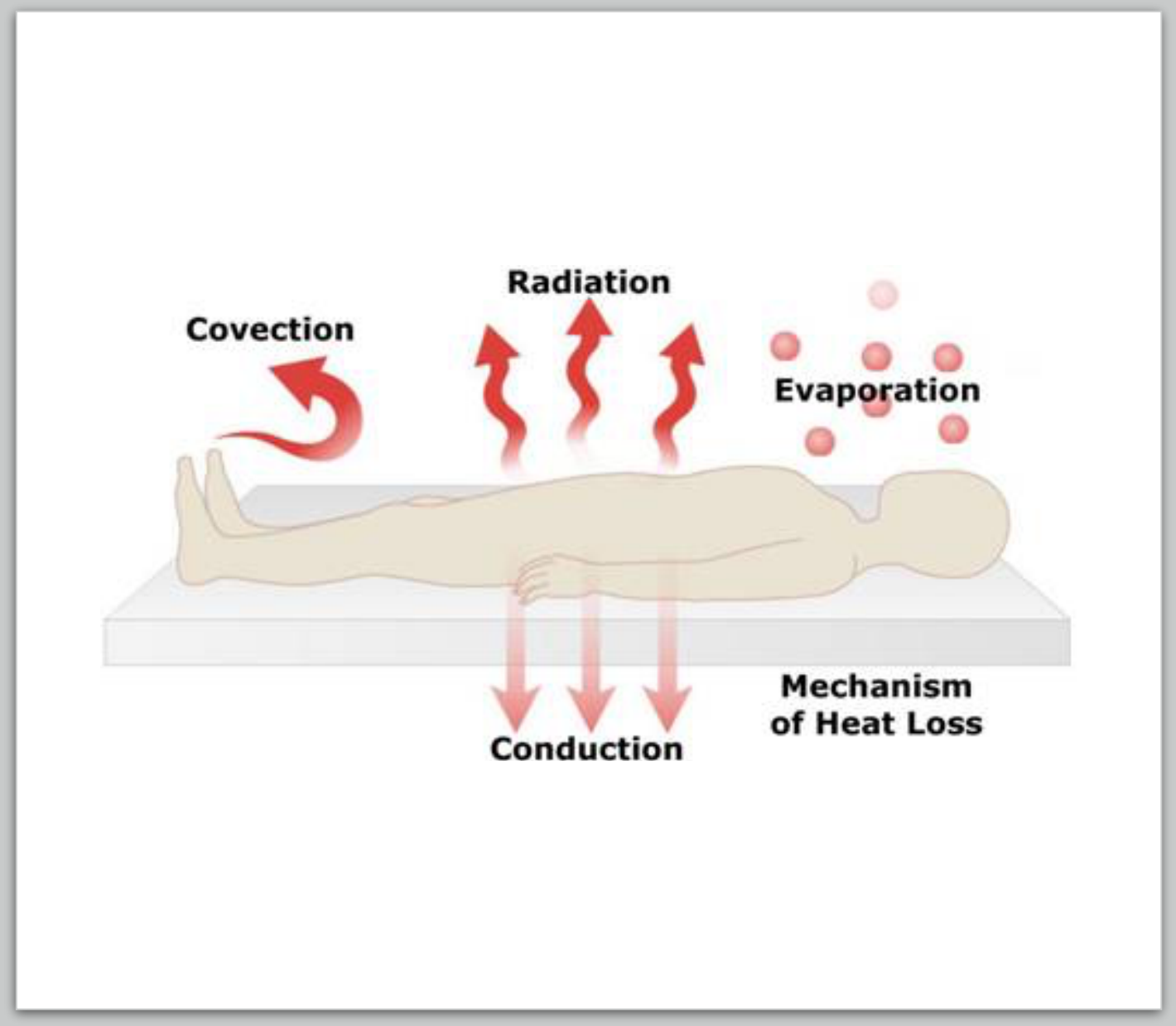
Static hazards

- Temperature
- Noise
- Vibration
- Space
- Motion sickness

Temperature

- Affects the patient but also the transferring team



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Noise

Can produce anxiety & discomfort for patients and transferring team.

Adversely affects communication.

Vibration

A bigger issue on air transfers

Can produce blurred vision, motion sickness and even chest pain.

Impairs sweating in patients leading to raised temp & metabolic rate.

Induces fatigue and impairs performance in the transferring team

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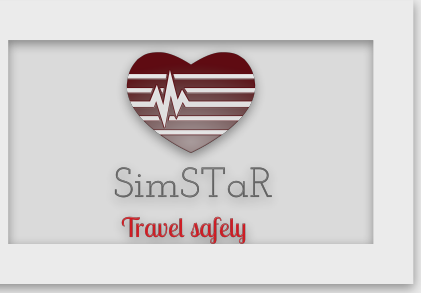
Motion Sickness



G – Forces

Dynamic Hazards

Newton's Laws of Motion

FIRST LAW

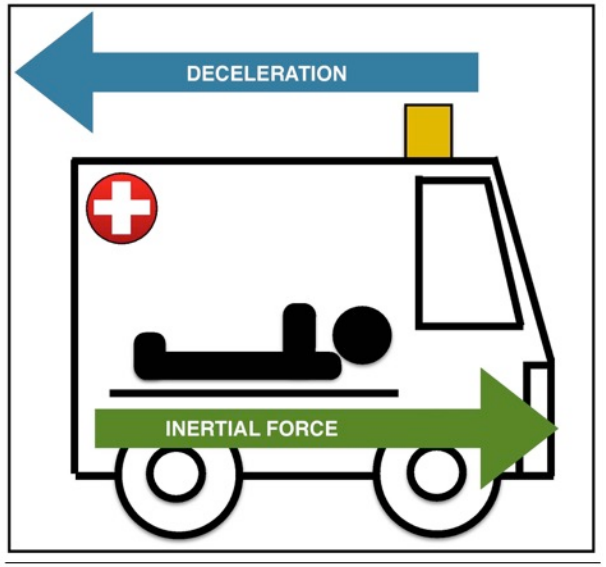
Every object in a state of uniform motion will remain in that state of motion unless an external force is applied

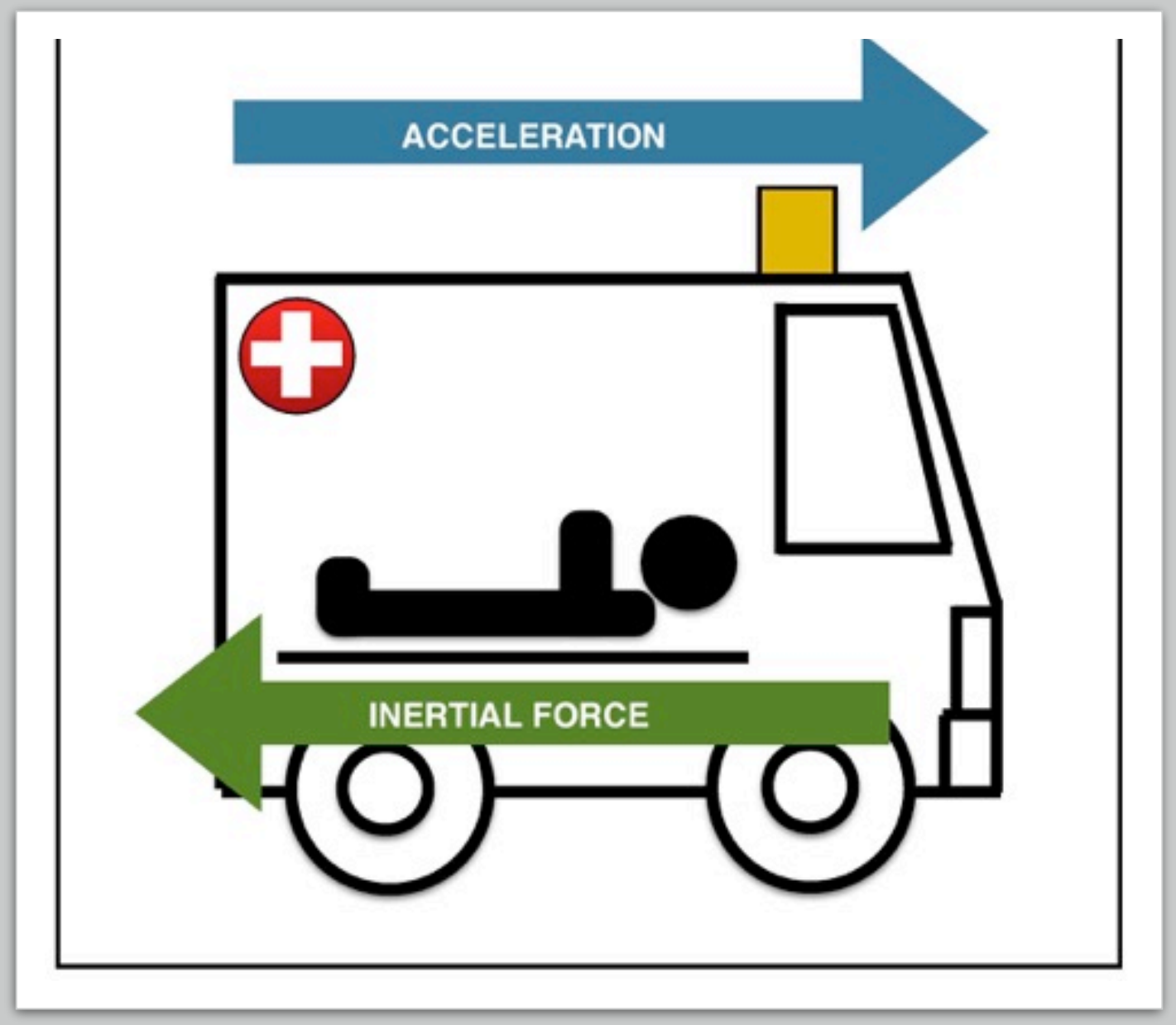
SECOND LAW

The sum of an external force (F) on an object is equal to the mass *m* of that object multiplied by the acceleration *a* vector of that object. F=*ma*

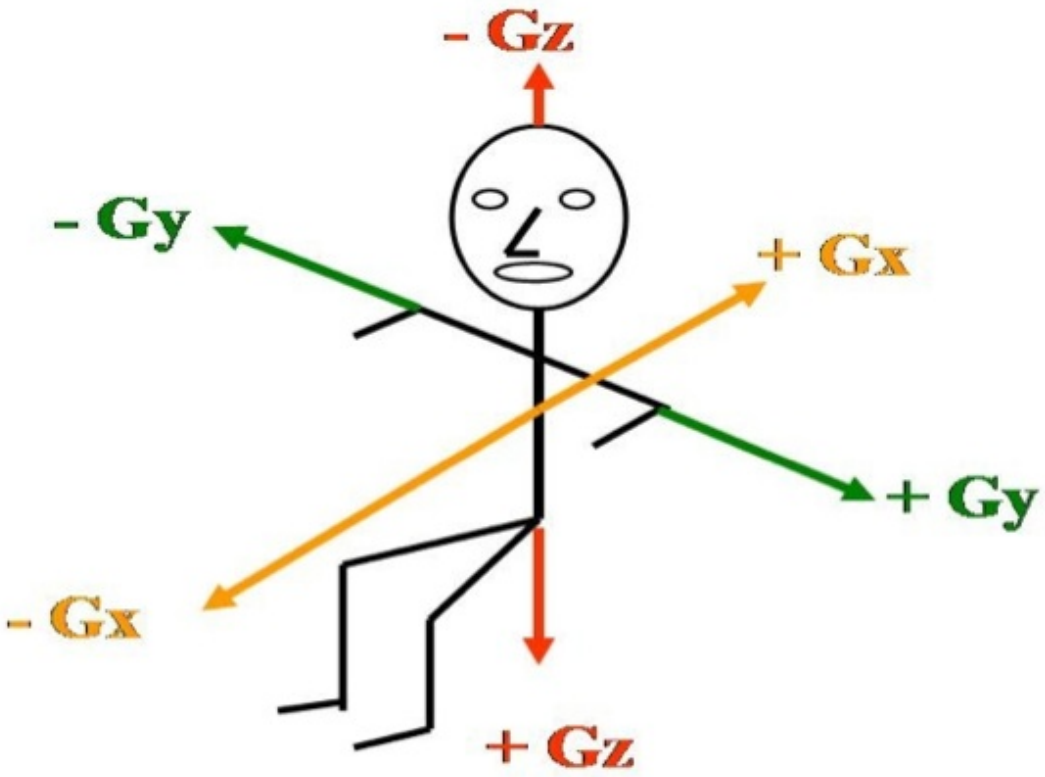
THIRD LAW

For every action there is an equal an opposite reaction


DECELERATION
INERTIAL FORCE

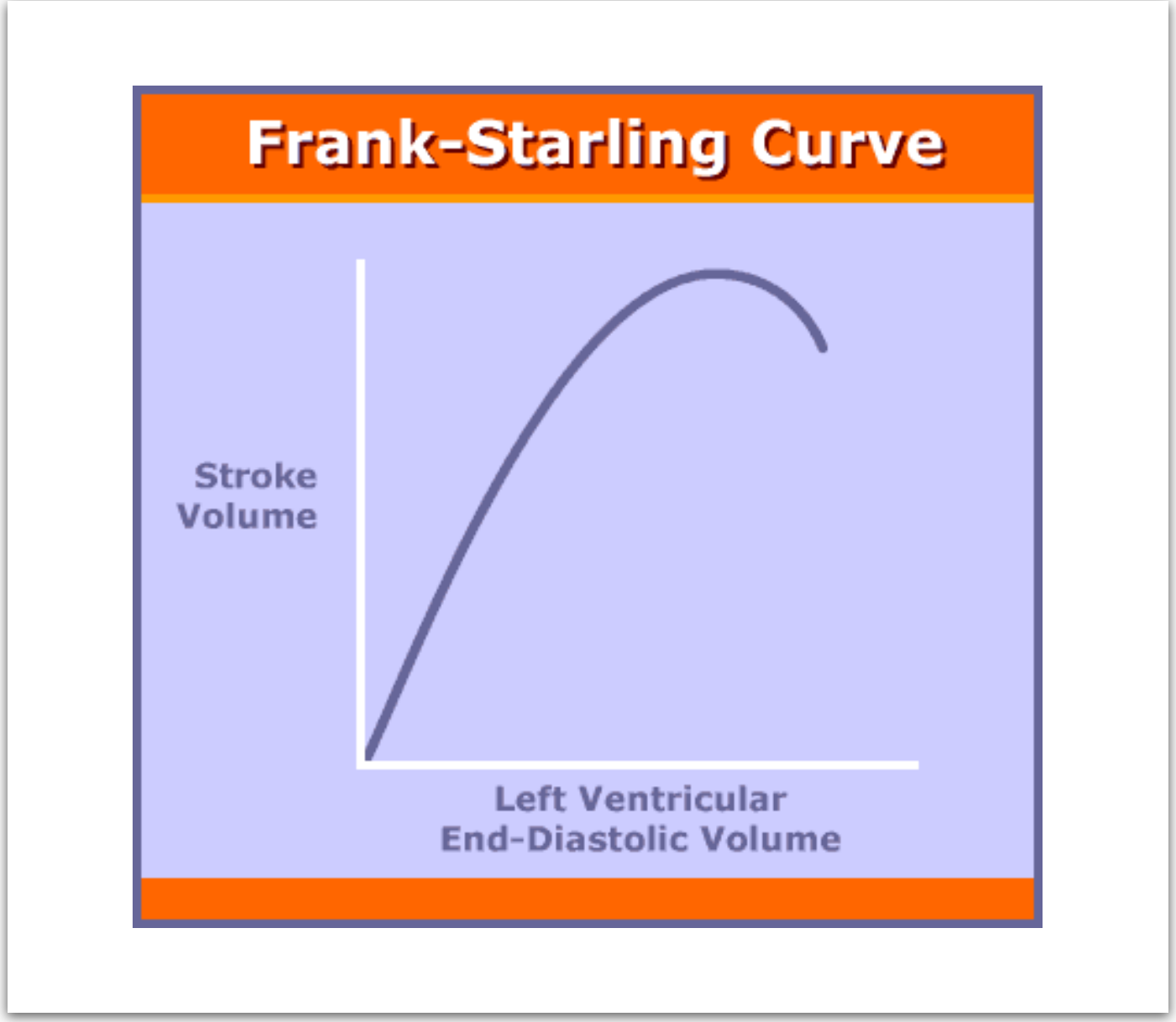

ACCELERATION
INERTIAL FORCE

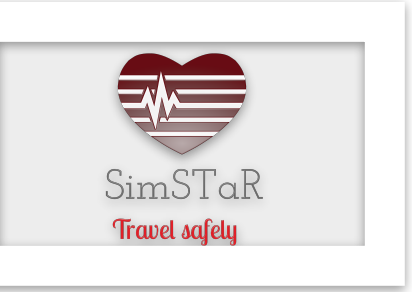
G – Forces - Direction



Cardiovascular effects

- Acceleration
  - Blood rushes to feet
  - Reduced cardiac output
  - Tachycardia/ arrhythmias
- Deceleration
  - Blood rushes to head
  - Cardiac decompensation and pulmonary oedema



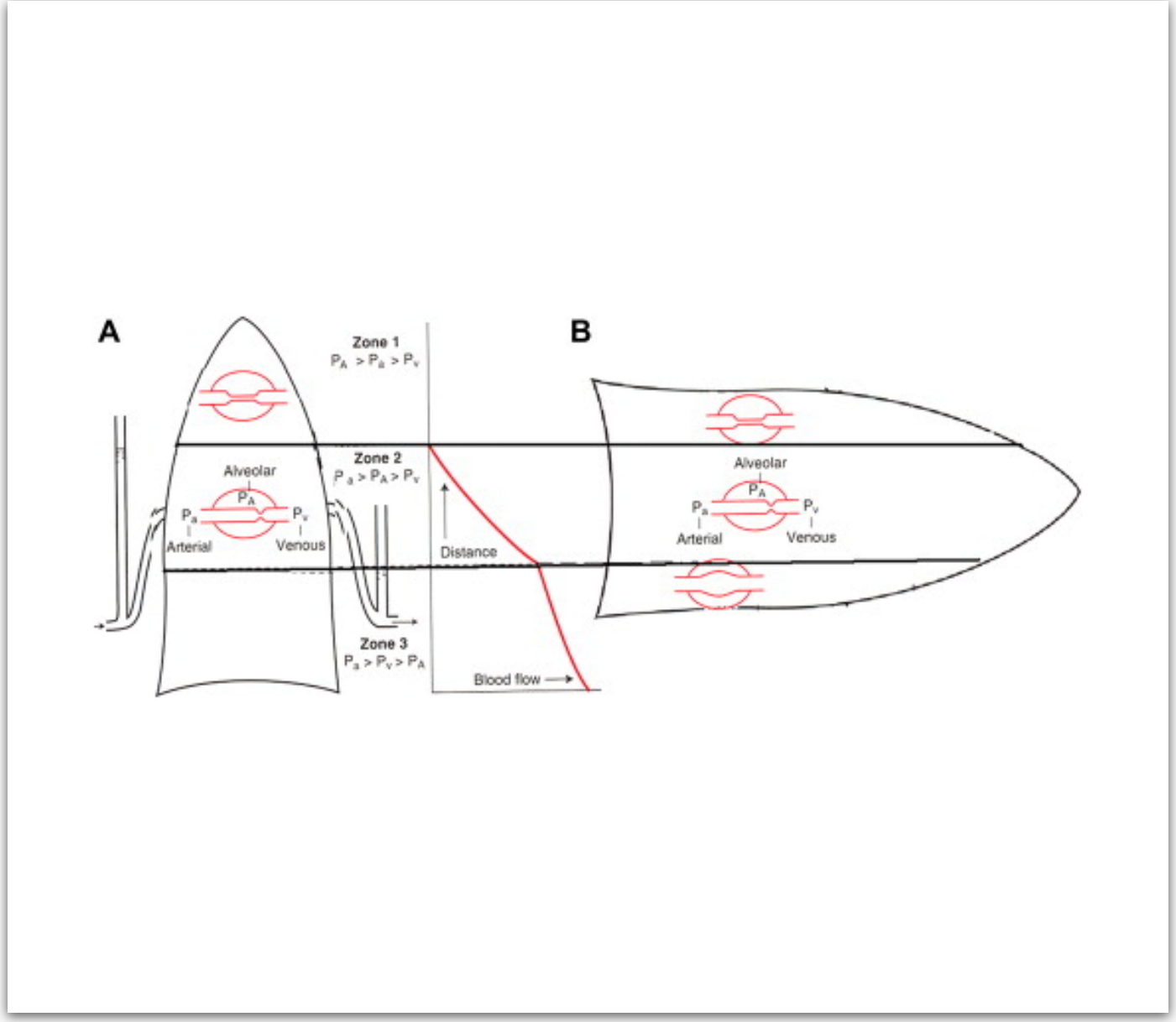


FULL patients travel BETTER

Respiratory effects

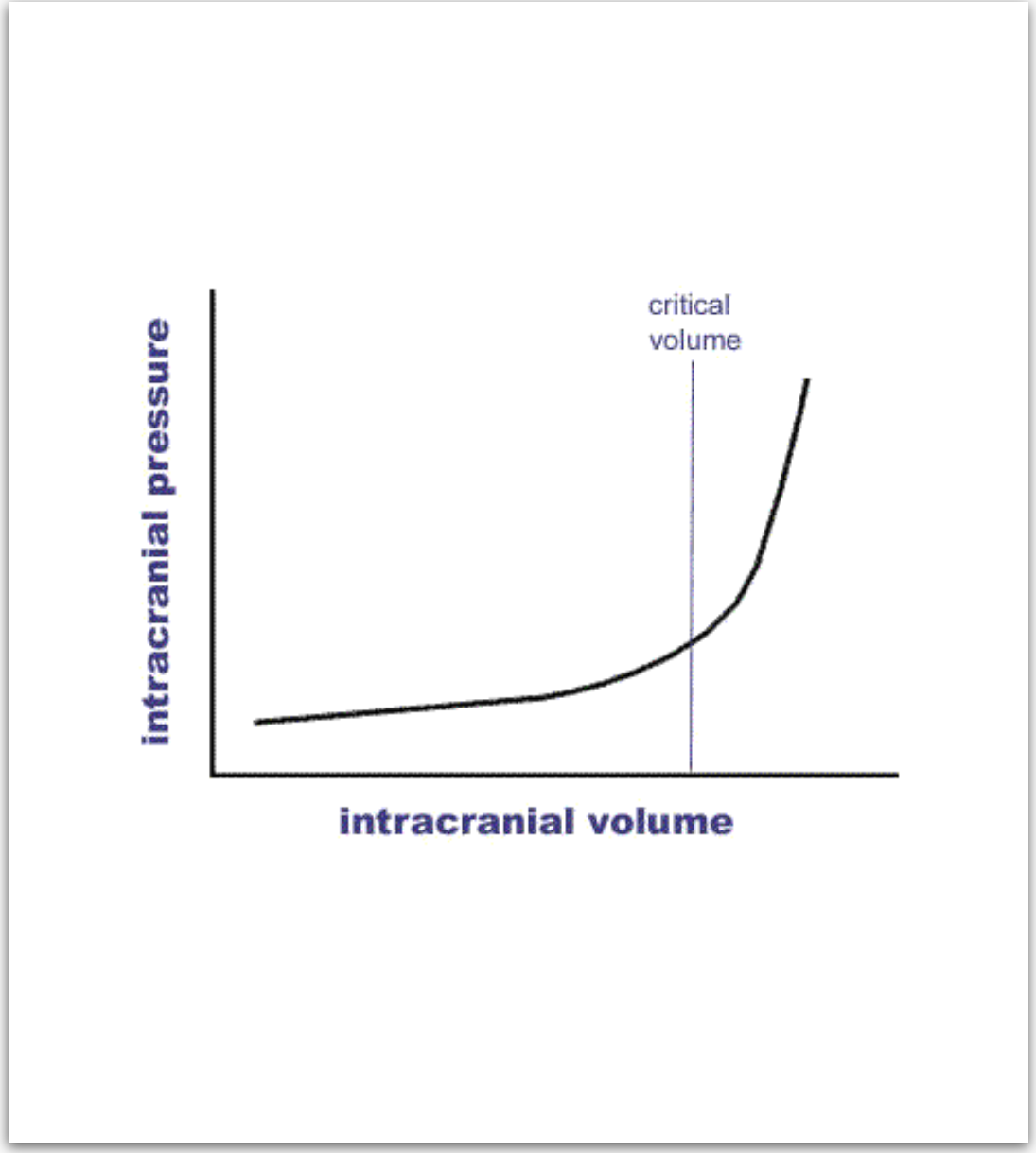
- Acceleration & deceleration forces can increase the risk of and rate of atelectasis/ collapse.
- Changes in venous return can increase the degree of any shunt

- Increased V/Q mismatch & Increased shunt both can occur.



Central Nervous System Effects

- Deceleration
  - Blood rushes to head
  - Impaired venous drainage
  - Raised ICP
- Acceleration
  - Blood pools in feet
  - Reduced cerebral blood flow



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Keep them full,
move them slow and steady!

G – Forces – Safety Aspects

- Avoid high speed transfers
- Ensure all equipment fixed or stored
- Seatbelts to be worn at all times
- Patient well secured to trolley

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Summary

- Significant risks and hazards involved in patient transfer
- Static hazards risk management
- G-forces may cause clinical deterioration
  - Resuscitate patient before transfer
  - Avoid unnecessary high speeds
  - Anticipate potential need for increased support