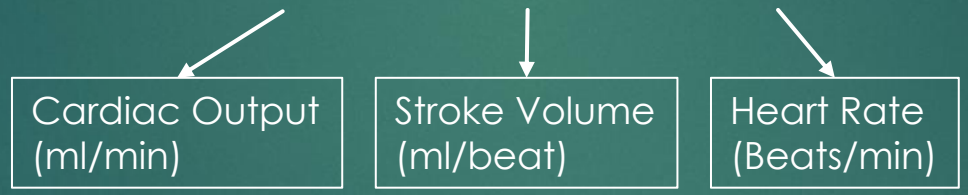
Week 2
Cardio Fitness & Flexibility Exercise

DEPARTMENT OF STUDENT AFFAIRS
TUNKU ABDUL RAHMAN UNIVERSITY COLLEGE

Cardiovascular Fitness

- How efficient is your cardiovascular system in oxygen consumption and blood supply to your entire body.
- Higher cardio fitness = lower heart rate

$$CO = SV \times HR$$

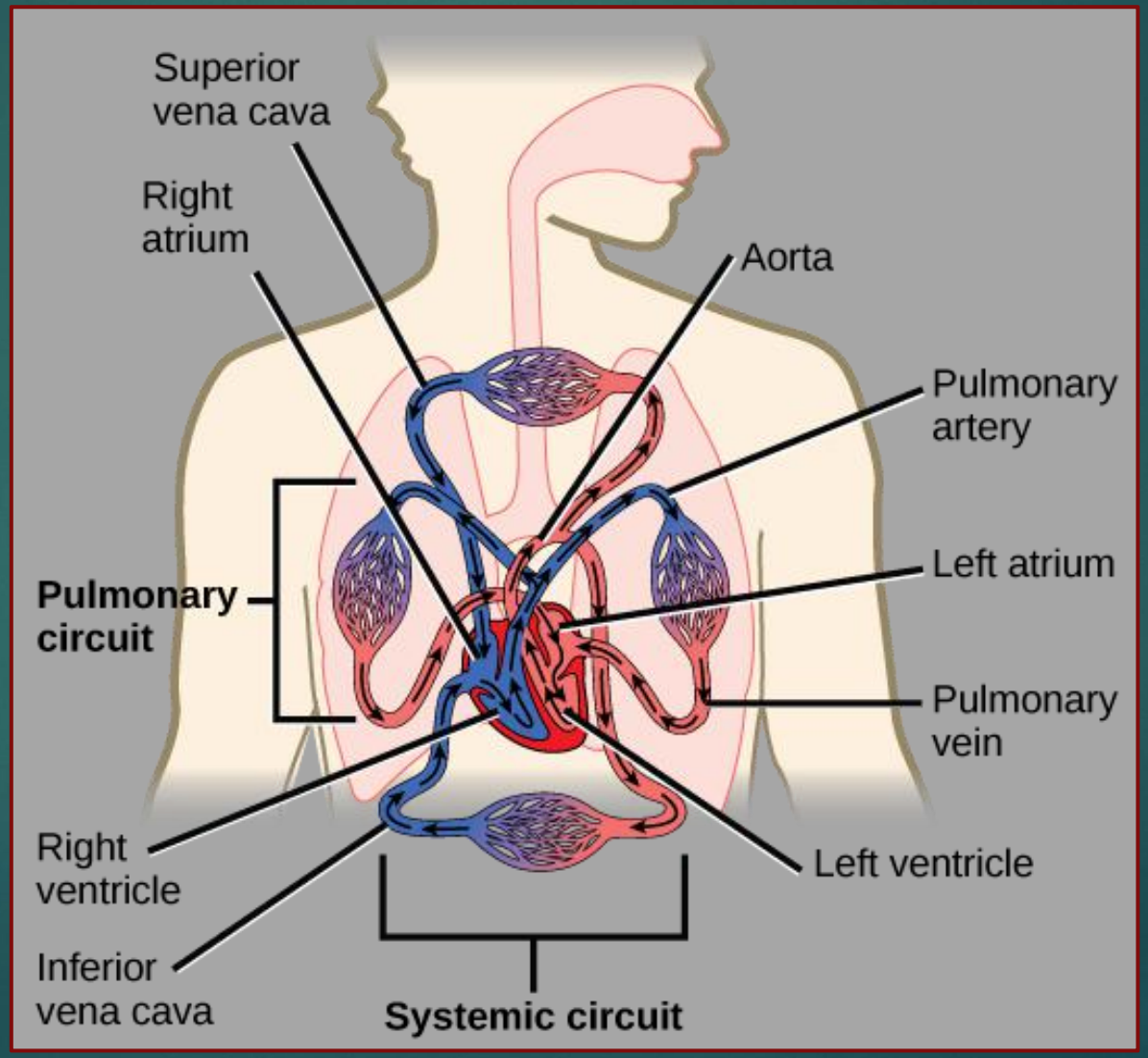


- Higher stroke volumes and cardiac output allows the heart to pump more blood and oxygen in one beat.
- In short, higher cardio fitness equals to less heart Beats Per Minute (BPM) as compared to someone with lower cardio fitness.

Cardiovascular Fitness

- Apart from heart rate, another common index used to determine cardio fitness is Vo2 Max(Maximum Oxygen Consumption) where equipment is needed for the test.
- The higher level of Vo2Max, the more oxygen your body is able to utilize in each breath.

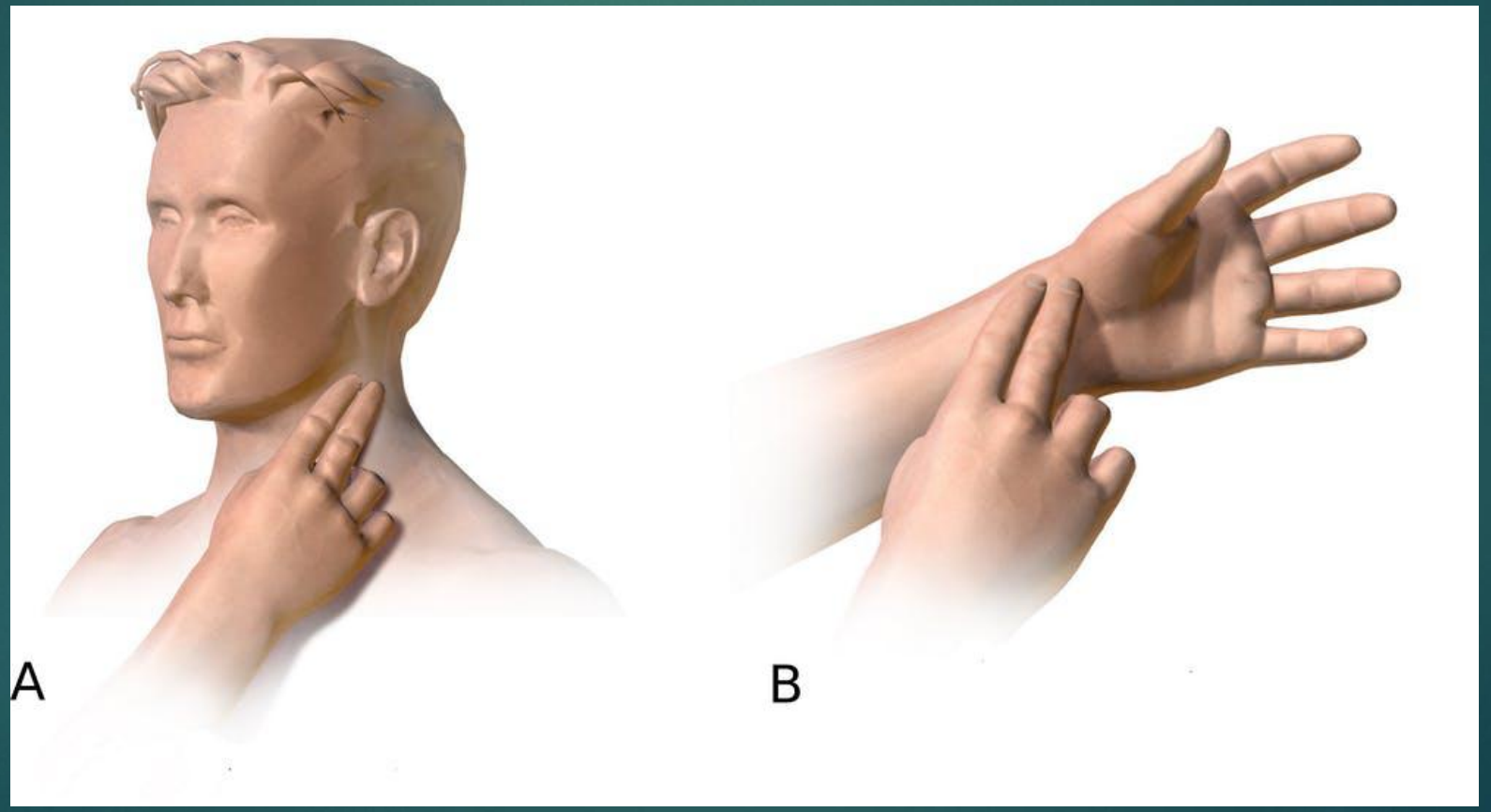
Cardiovascular system



Methods of Measuring Heart Rate

Carotid

Radial



Types of Heart Rate

- **Maximum Heart Rate (MHR)** – maximum number of heart beats in 1 minute of effort.
  - Example 220 – **20 year old (age)** = 200 (MHR)
- **Resting Heart Rate (RHR)** – heart rate when resting; usually when sleeping.
  - Adult RHR is between 60 – 100 bpm
- **Heart Rate Reserve (HRR)** – Used for calculating target exercise intensity
  - Example **200** (MHR) – **60** (RHR) = **140** (HRR)
- **Calculating (Target) Threshold Heart Rate (THR)** – (Target Intensity x HRR) + RHR
  - Target 85% (0.85 x 140) + 60 = 179 (THR)

Guidelines to Improve Cardiovascular Endurance

- FREQUENCY : 3-5 times per week
- INTENSITY: Between 40% – 90% dependable on fitness level
- TIME / DURATION: between 4 – 60 min per session
- TYPE OF EXERCISE: Continuous or Intermittent (interval)
- ENJOYMENT: Cycle while watching TV, Listening to MP3 while running etc

Target HR of exercises for cardio fitness

Intensity (%MHR)	Heart Rate (bpm)	Utilization % of Carbohydrate	Utilization % of Fat
65-70	130-140	15	85
70-75	140-150	35	65
75-80	150-160	65	35
80-85	160-170	80	20
85-90	170-180	90	10
90-95	180-190	95	5
100	190-200	100	-

High Intensity Interval Training (HIIT)

- HIIT is a form of interval training.
- Alternating between high intensity and low intensity exercises.
- Workout time is between 4 – 30 minutes.
- Target exercise HR is 70% – 95%.
- Recovery HR is 40% – 65% .
- Examples of HIIT regimens are Tabata, Gibala and Zuniga.

Low Intensity Steady State (LISS) exercise

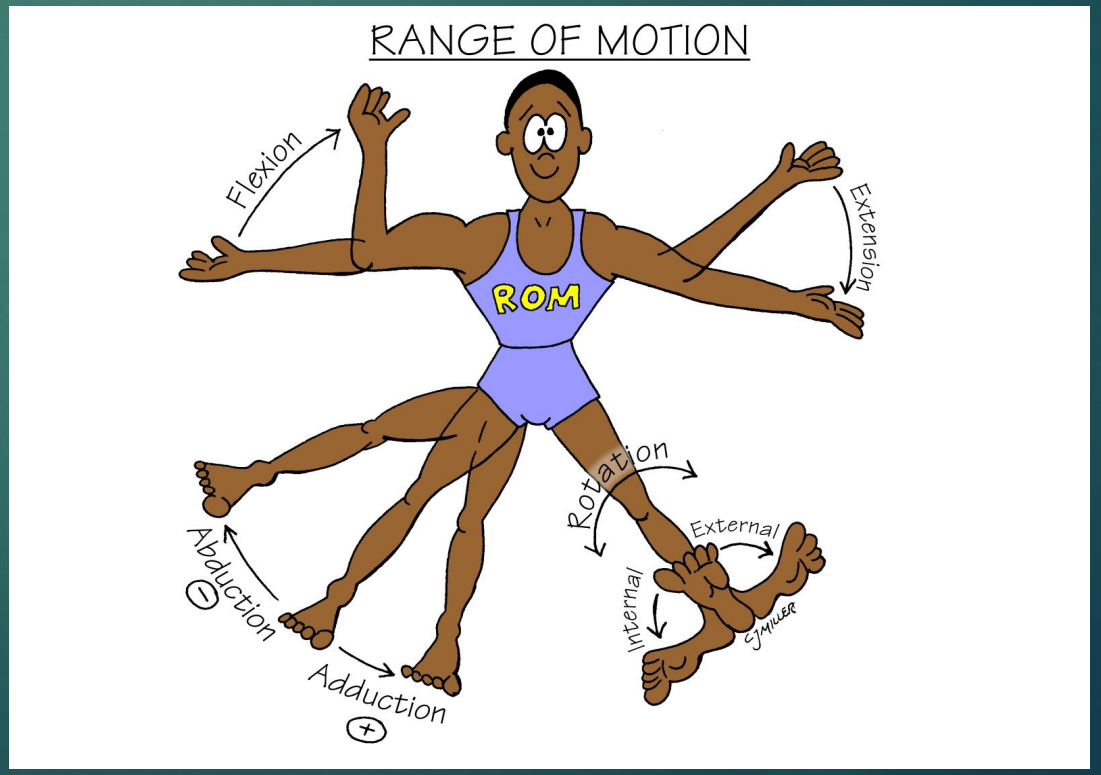
- LISS is a form of cardio exercise.
- Performed at low intensity without rest for a set period of time.
- Exercise period are more than 20 minutes.
- Target exercise HR is 40% – 65%.
- Examples of LISS exercises are swimming, running and cycling.

Flexibility Exercise

- Flexibility is one of the health related component for fitness
- The more flexible the muscles, the lower the risk of soft tissue injury.
- Flexibility exercises are part of warming up and cooling down exercises.
- There are THREE types of flexibility exercises;
  - Dynamic,
  - Static
  - Isometric

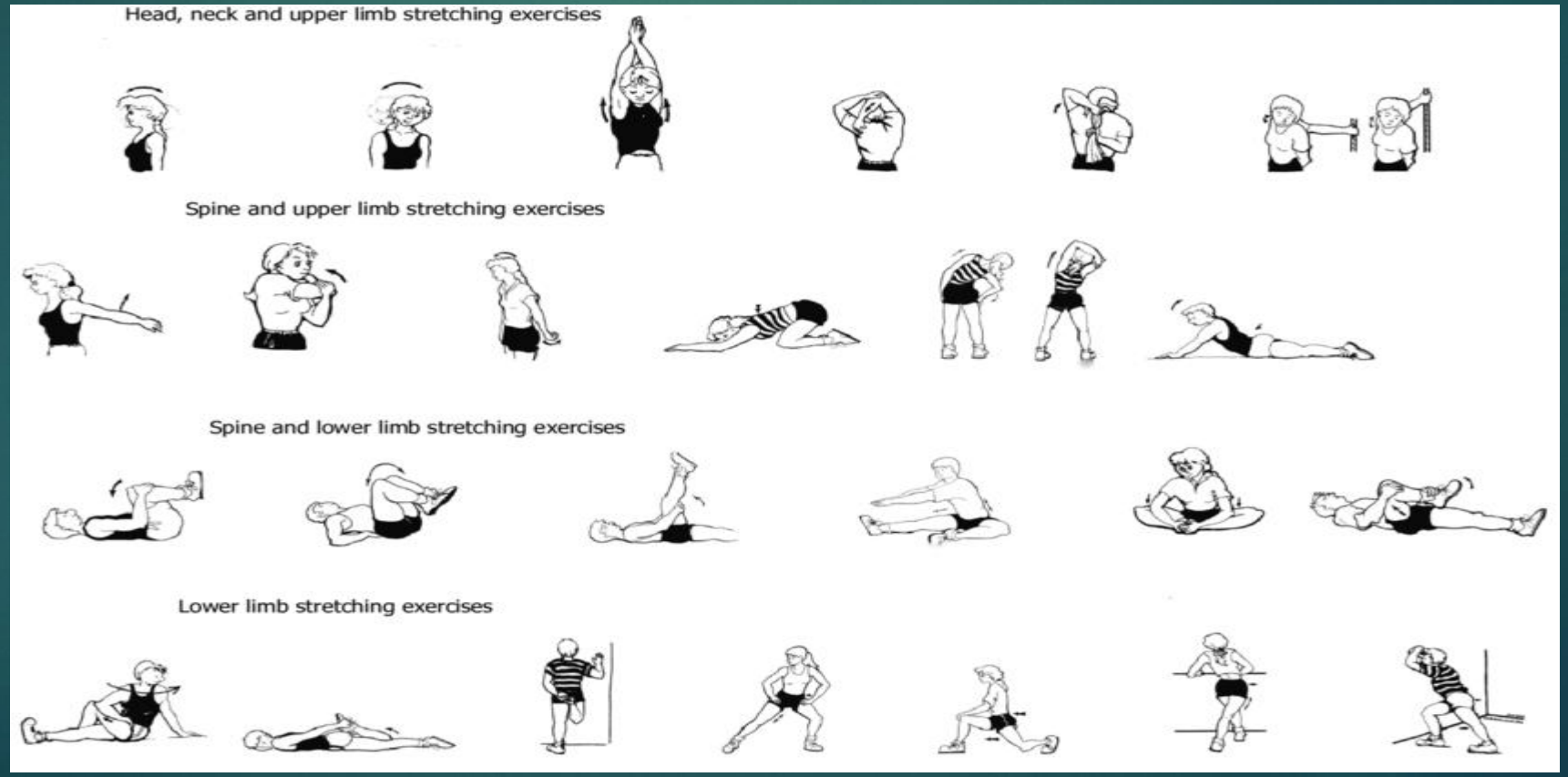
What is Flexibility?

- Flexibility is the ability to move a joint freely through a full range of motion (ROM).
- ROM is an angle through which a joint can move from an anatomical position up to the limit of segment motion in a particular direction.



Flexibility Training (Stretching)

- Stretching - moving the joints beyond the accustomed range of motion (ROM).



Methods of stretching

1. Static stretching
   - Used to stretch muscles while the body is at rest.
   - Composed of various techniques that gradually lengthen muscle to a elongated position and held for minimum of 15 seconds to 2 minutes.

2. Dynamic stretching
   - Use movement or momentum of limb or trunk to move muscles within the Range of Motion (ROM) of the joint.
   - It should be a controlled movement and not be vigorous or bouncy at the end of ROM.

Methods of stretching

3. Isometric stretching
   - Based on several studies, many expert believe this is the most efficient method of stretching to improve flexibility
   - It needs someone to push or apply force on your stretching muscles and we push back against it with the contraction of the muscle in static way.

Flexibility Assessment

- Sit and Reach

- Goniometer

Guidelines for Flexibility Exercise

1. Start with a general body warm up
2. Use static stretching or PNF to begin
3. Do not overstretch or perform ballistic stretches
4. Do not stretch joints that are injured
5. Should NOT feel pain when stretching
6. Avoid dangerous exercises (yoga plow)
7. Hold each stretch for at least 30 seconds
8. Stretch before and after
9. Stretch all sides
10. Breath normally and steadily

Benefits of Flexibility and Stretching

- Enhance physical fitness
- Increase flexibility (ROM)
- Improve body posture
- Increase coordination
- Enhance ability to learn and perform skilled movements
- Increase mental and physical relaxation
- Enhance development of body awareness
- Reduce risk of injury to joints, muscles, and tendons
- Reduce muscle soreness
- Reduce muscle tension