

Week 2 & 3 – Introduction to Fitness Assessments:

Why do we test physical fitness?

- To create an **individualized** training program tailored to the clients goals & needs
- Enables the creation of a **safe & effective** training program that considers the functional capacity (level of fitness & health) of the individual.
- Allows for the **evaluation** of a training program to ensure the client's goals (health/performance related) are being achieved.
- Covers you from a **legal** perspective.

Types of information that you can collect:

Subjective information:

- General history, medical history (past musculoskeletal injuries, chronic conditions, medications currently being taken), lifestyle (do they participate in leisure type activities etc.), occupational (is their occupation active or sedentary, long or short working hours, stress levels etc.) & personal information.

*Subjective information is collected **before** collection of objective information.

Objective information:

- **Health Related:** resting HR, resting blood pressure, body composition, postural assessment, aerobic capacity, muscle strength, muscle endurance, flexibility.
- **Skill related:** power, speed, agility & balance.

Purposes of pre-participation health screening:

- To provide information relevant to the **safety** of fitness testing & an exercise program
- To **identify possible cardiovascular disease and associated risk factors**, and other **preventable chronic diseases** so that appropriate lifestyle interventions can be initiated.

Why measure resting heart rate?

- Can be used as a baseline measure for future comparison of fitness
 - Can be used to inform your fitness program
 - Can be used in calculations of appropriate exercise intensities in cardiorespiratory fitness training
-
- **Elevated resting HR has been shown to be associated with increased risk of:**
 - All cause mortality
 - Cardiovascular disease mortality
 - Development of cardiovascular disease
 - **For the general population, an elevated resting HR can be avoided by:**
 - Engaging in regular physical activity
 - Avoiding psychological stress
 - Avoiding the excessive use of stimulants such as caffeine

*Pharmacological reduction of HR is *not* recommended in populations with no symptoms of CVD.

Blood Pressure:

Is presented as systolic pressure over diastolic pressure (e.g. 120/80).

*Always take multiple readings of BP.

➤ **Systolic pressure:**

- The highest arterial pressure produced by the heart during a cardiac cycle
- Normal systolic pressure is less than 120 mm Hg.

➤ **Diastolic pressure:**

- The minimum arterial pressure through a full cardiac cycle
- Normal diastolic pressure is less than 80 mm Hg.

Why measure BP?

- Elevated BP is a **risk factor** for CHD, heart failure, CVD, peripheral vascular disease, and renal failure.
- BP levels correlate inversely with **cognitive function**.
- Hypertension is associated with an increased incidence of **dementia**.
- CHD and stroke mortality increase progressively & linearly from BP levels as low as 115 mmHg systolic and 75 mmHg diastolic upwards.
- BP values in the 130-139/85-89 mmHg range are associated with a greater than 2-fold increase in relative risk of CVD compared with those BP levels below 120/80 mmHg

Blood Pressure Category	Systolic mm Hg (upper #)		Diastolic mm Hg (lower #)
Normal	less than 120	and	less than 80
Prehypertension	120 – 139	or	80 – 89
High Blood Pressure (Hypertension) Stage 1	140 – 159	or	90 – 99
High Blood Pressure (Hypertension) Stage 2	160 or higher	or	100 or higher
Hypertensive Crisis (Emergency care needed)	Higher than 180	or	Higher than 110

*The cut off point (for a +1 risk factor) on the ESSA manual is 139/89

The 'White Coat' Effect: **anxiety** may arise due to having blood pressure measured (e.g. by a medic in a white coat or during a fitness assessment). When people get anxious, their BP may go up by as much as **30 mmHg**. It can occur in anyone (regardless of age etc.).

Reassurance & familiarity with the measurement technique usually reduces or eliminates this effect.

- **'White coat' hypertension:** where a normotensive person becomes hypertensive during BP measurement, but pressures then settle back to normal outside the medical environment. This creates the potential for misdiagnosis. This can be checked by having the person take their blood pressure on their own at home, or by wearing a 24-hour BP measurement device.

Cholesterol:

Healthy range:

- **LDL** <130mg/dl (<3.37mmol/L)
- **Total serum cholesterol** of <200mg/dl (<5.18mmol/L)
*Not a very useful measure because it cannot distinguish between 'good' (HDL) and 'bad' (LDL) cholesterol
- **HDL** of > 40 mg/dl (1.04 mmol/L)
- HDL of >60 mg/dl (>1.55 mmol/L) is a negative risk factor (a good thing)

Fasting Blood Glucose:

- Should be less than **5.5 mmol/L**
- The client should fast for a minimum of 12 hours before taking this reading. This is because after fasting for 12 hours, if the pancreas is producing insulin correctly there should only be low amounts of glucose in the blood.
- A person with diabetes will still have high blood glucose since the pancreas isn't producing sufficient insulin.

Body Mass Index:

- A ratio of weight and height (not actually your body composition)
- **BMI** = $\frac{weight(kg)}{height(m)^2}$
- Used to determine overweight & obesity levels
- A simple, rough estimate used in **general population & large research samples**
- Elevated BMI is associated with increased risk of developing type 2 diabetes, hypertension & CVD.
- BMI **does not differentiate between fat mass & fat free mass**. Therefore, it is particularly inaccurate for muscular & athletic individuals.
- It is a relatively poor predictor of BF %
- BMI can often categorize a person as healthy when they are actually obese (BMI commonly underestimates the rate of obesity). (People can be 'normal-weight obese')

BMI	Classification
< 18.5	underweight
18.5–24.9	normal weight
25.0–29.9	overweight
30.0–34.9	class I obesity
35.0–39.9	class II obesity
≥ 40.0	class III obesity