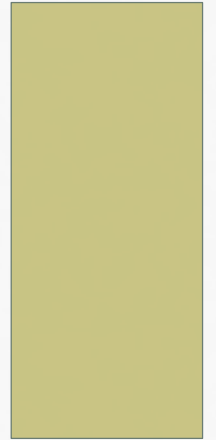


# BIOLOGICAL

DETERMINANTS OF HEALTH (3.1.5)



# BIOLOGICAL

- Body weight
- Blood pressure
- Birth weight
- Impaired glucose regulation
- Genetics
- Blood Cholesterol

# BODY WEIGHT

- The body weight of an individual can have a range of impacts on health and can itself be a risk factors for numerous health concerns.
- Can you think of some examples???

# BODY WEIGHT

The Body Mass Index (BMI) is used to classify adult body weight.

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

*Example*

*A female is 155cm tall and weighs 65kg*

*A male is 190cm and weighs 110kg*

How would you classify these people??

# BMI SCALE

BMI	Classification
Under 18	Very underweight
19-20	Underweight
20-25	Healthy weight range
26-30	Overweight
30+	Obese

# BODY WEIGHT

- Obesity increases the chances of developing high blood pressure, high blood cholesterol and impaired glucose regulation.
- Cardiovascular Disease – physical health
- Some cancers (such as colorectal cancer) – physical health
- Social exclusion – social health
- Arthritis – physical health
- Self-esteem issues – mental health
- Respiratory problems – physical health

# BIRTH WEIGHT

- Babies born with a low birth weight (under 2.5kg) are more likely to have an under developed immune system making them more susceptible to infections.
- Low birth weight can also contribute to health concerns in adulthood. E.g. high blood pressure, type 2 diabetes and cardiovascular disease.

# BIRTH WEIGHT

- Causes of low birth weight include:
  - Premature birth
  - The age of the mother
  - The mother's nutritional status
  - Smoking, excessive alcohol consumption and drug use by the mother during pregnancy
  - Illness of the mother during pregnancy.  
E.g. chickenpox



# BLOOD PRESSURE

## **What is blood pressure???**

*As blood circulates around the body through the blood vessels it applies pressure to the blood vessel walls*

*Therefore.....*

*Blood pressure is the force exerted on the blood vessel walls*

<http://video.au.msn.com/watch/video/what-is-blood-pressure/xjw1omb?tab=m1097&mediaid=101811&from=39>

<http://www.virtualmedicalcentre.com/health/hypertension-high-blood-pressure/69>

# BLOOD PRESSURE

120/80 indicates normal blood pressure

- Blood pressure varies throughout the day and can be affected by certain factors including:
  - Physical activity
  - Stress
- A person with high blood pressure has hypertension – a common health concern globally.
- Hypertension is a contributing factor to many conditions including cardiovascular diseases such as heart attacks, stroke and kidney failure.
- Regular check-ups are the only way to monitor blood pressure.

# BLOOD PRESSURE

Contributing factors:

- Stress
- Smoking
- Excessive alcohol consumption
- Genetic predisposition
- Poor diet (high sodium intake in particular)

# CHOLESTEROL

It is a type of fat required by the body for numerous processes.

- Cholesterol is produced by the liver and it can also be found in animal products such as full cream milk and eggs.
- If too much cholesterol is produced, the risk of cardiovascular disease, such as stroke and coronary heart disease, increases.

# CHOLESTEROL

When there is too much 'bad' cholesterol in the blood it tends to stick to the walls of the blood vessels and allows other substances to become embedded which leads to hardening and narrowing of the arteries.

This condition is called **arthrosclerosis**

(Refer to page 49, Figure 2.9)

<http://www.youtube.com/watch?v=-WhADd1GKtA&feature=related>

# CHOLESTEROL

## **Risk factors:**

- Excessive alcohol consumption
- Smoking
- A diet high in saturated fat
- Lack of exercise
- Genetic predisposition

<http://www.youtube.com/watch?v=IEc-Rsv9pMc&feature=related>

# IMPAIRED GLUCOSE REGULATION

## Impaired glucose regulation

- Glucose is the preferred fuel for energy within the cells.
- If blood glucose levels are consistently high, then the levels of insulin rise to help move glucose from the blood into cells.
- Over a long period of time the cells become resistant to the action of insulin – this is known as **insulin resistance**.

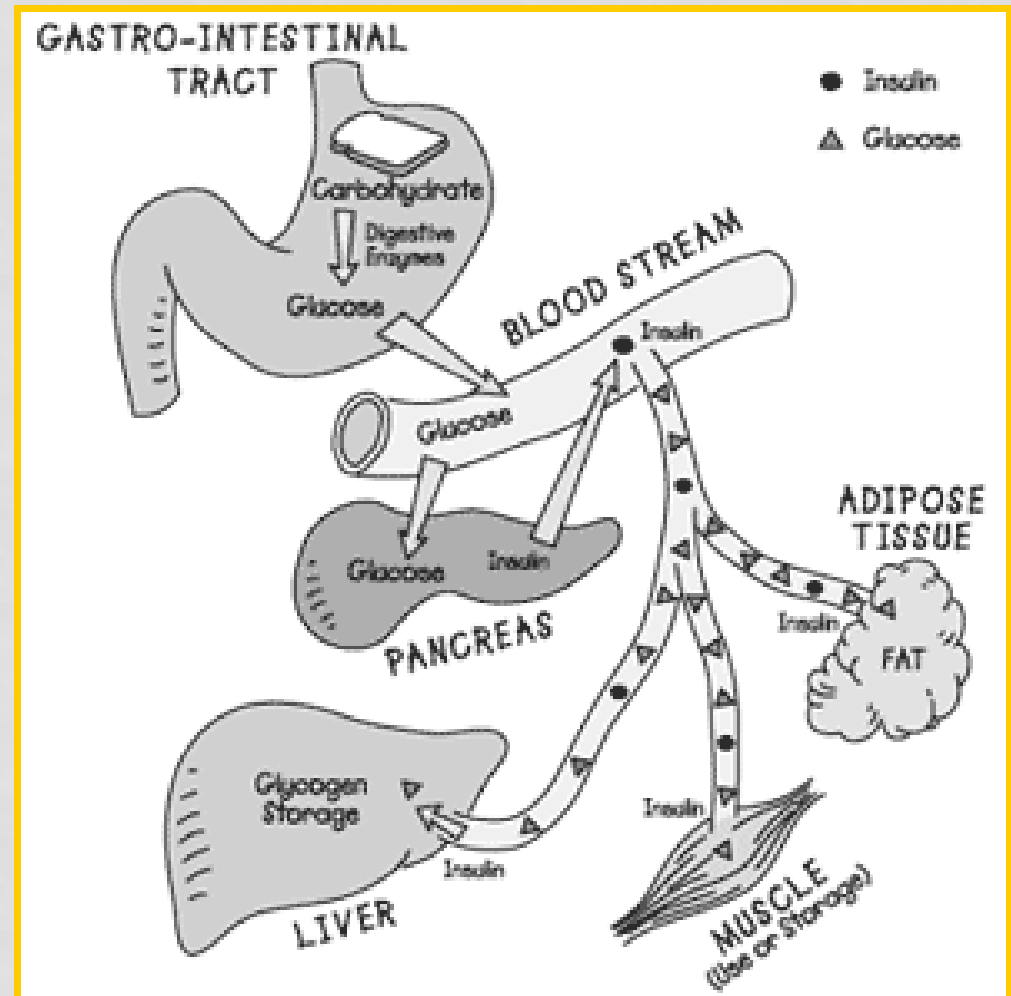
<http://www.youtube.com/watch?v=ECBDU5X2mcg>

<http://www.youtube.com/watch?v=sTgBvJsHcCk&feature=channel>

<http://www.medmovie.com/mmdatabase/MediaPlayer.aspx?ClientID=65&TopicID=923>

# IMPAIRED GLUCOSE REGULATION

1. The pancreas makes little or no insulin, or is unable to use insulin efficiently.
2. Little or no insulin enters the bloodstream.
3. Glucose (sugar) builds up in the bloodstream because it cannot get inside the cells.





# IMPAIRED GLUCOSE REGULATION

Impaired glucose regulation can occur as a result of:

- Genetic predisposition
- Pregnancy
- Lack of exercise
- Being overweight
- High blood cholesterol
- High blood pressure
- Poor diet

# IMPAIRED GLUCOSE REGULATION

Impaired glucose regulation is a risk factor for:

- Cardiovascular disease
- Type 2 Diabetes

# GENETICS

The genetic material that everyone has controls many aspects of life that influence health, such as sex, body type, hormone production, predisposition to disease and aspects of personality.

[http://teachertube.com/viewVideo.php?video\\_id=113563&title=DNA\\_101](http://teachertube.com/viewVideo.php?video_id=113563&title=DNA_101)

# GENETICS

## **Predisposition to disease**

Genetics can influence how likely someone is to develop a certain condition or disease. This doesn't mean that a person with a predisposition to a certain condition will necessarily develop it, but they are at an increased risk.

*Some conditions with a genetic predisposition include:*

- Cancer (including breast and prostate cancer)
- Cardiovascular disease
- Diabetes (types 1 and 2)
- Hypertension

# GENETICS (HORMONES)

**Hormones** regulate many processes in the body and control many aspects of health. Hormones are also responsible for the formation of male and female sex characteristics that lead to differences in some of the health conditions experienced by males and females.

For example;

- Women can't get prostate or testicular cancer
- Men can't get ovarian cancer

# GENETICS (HORMONES)

## **Hormones**

- Oestrogen helps to maintain bone density by keeping the bones strong. When a woman enters menopause, the levels of oestrogen decline. This decline leads to a loss of bone mass from the skeletal system, making the bones porous, weak and more susceptible to breaks and fractures.

# GENETICS (HORMONES)

- Oestrogen may also have a protective role in the development of cardiovascular disease, as well as having a link with fat distribution around the body. Oestrogen tends to deposit fat around the buttocks and thighs, whereas men are more likely to accumulate fat around the abdomen, which increases their risk of heart disease.
- See Figure 2.16 p. 48

# GENETICS (HORMONES)

- Testosterone may increase the likelihood of risk taking and smoking rates which contribute to ill health. When testosterone levels drop in men there can be numerous symptoms, including loss of sex drive, fatigue and depression.
- High levels of testosterone may reduce risk of heart disease.