

An introduction to Metabolic Syndrome MetS

Condition Module 1 (Assignments 1-6)

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Introduction to MetS

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Follow these steps to earn the MNI Academy credits:

1. Read the learning objectives
2. Study the educational content
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Learning Objectives

This module will update the participant's awareness of Metabolic Syndrome (MetS) and the role they as primary care practitioners can play in the prevention and/or management thereof.

Expected outcomes:

After completing the module, the participant will demonstrate:

- An understanding of the term Metabolic Syndrome
- An understanding of the role primary care providers can play
- The ability to create individualised intervention strategies aimed at prevention &/or management

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Abstract

“Physicians and scientists have long known that certain conditions increase a person’s risk of developing atherosclerotic cardiovascular disease (CVD) and it has become increasingly clear that certain CVD risks tend to cluster, or occur together. This clustering of some risk factors and their shared responsiveness to lifestyle modifications suggests that they are not independent of one another and that they share underlying causes, mechanisms and features” .

Module 1 components:

1. Assignment 1
 - 1.1. Introduction
 - 1.2. Epidemiology
 - 1.3. Causes and risk factors
 - 1.4. Normal physiology
2. Assignment 2
 - 2.1. Pathophysiology
 - 2.1.1. Insulin resistance
 - 2.1.2. Glucose intolerance
 - 2.1.3. Dyslipidaemia
 - 2.1.4. Systemic inflammation
 - 2.1.5. Abdominal adiposity and hypertension
3. Assignment 3
 - 3.1. Clinical indicators
 - 3.2. Diagnosis
 - 3.3. Complications
- 3.4. Management
4. Assignment 4
 - 4.1. Secondary intervention
 - 4.1.1. Insulin resistance
 - 4.1.2. Glucose intolerance
 - 4.1.3. Dyslipidaemia
 - 4.1.4. Systemic inflammation
 - 4.1.5. Hypertension
5. Assignment 5
 - 5.1. Metabolic syndrome in the primary healthcare environment
 - 5.2. Conclusion
6. Assignment 6
 - 6.1. Summary of the MNI product range
 - 6.2. The MNI Metabolic syndrome diagrammatic summary

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Assignment 1

Assignment will include:

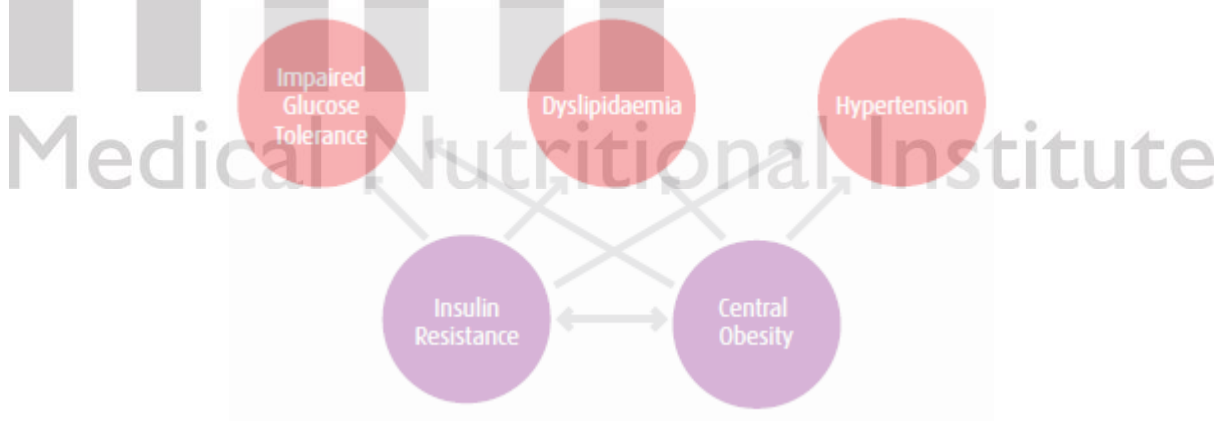
- 1.1 Introduction
- 1.2 Epidemiology
- 1.3 Causes and risk factors
- 1.4 Normal physiology

1.1 Introduction

The metabolic syndrome is a combination of the highest cardiovascular risk factors occurring in one individual simultaneously. These include central obesity, dyslipidaemia, glucose intolerance/diabetes and hypertension.

Those with the metabolic syndrome have a significantly increased risk of developing serious complications. These include a marked increase in the development of diabetes, myocardial infarction and cardiovascular accident (heart attack or stroke), and it is an increased risk that these insults will be fatal.

The metabolic syndrome is also known as “The insulin resistance syndrome”, or “cardiovascular dysmetabolic syndrome.”



Metabolic syndrome is associated with a five-fold increased risk of developing diabetes, three times the risk to have a heart attack or stroke and twice the risk of MI/CVA being fatal.

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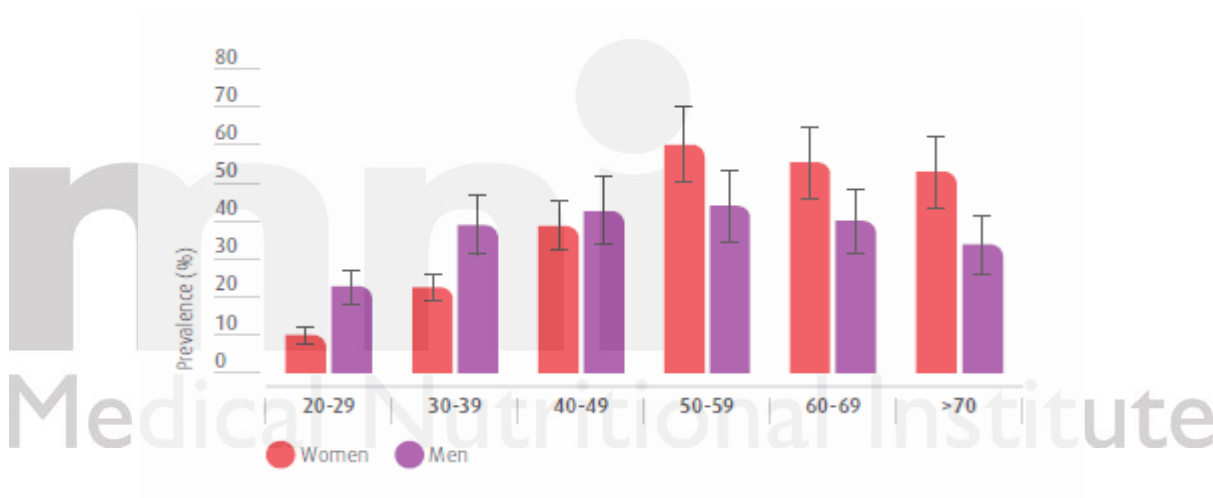
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1.2 Epidemiology

The metabolic syndrome is alarmingly common and according to the IDF (International Diabetes Federation), affects 25% of the global population. Contrary to popular belief, it is not restricted to first world communities, and it is predicted that in the future more new cases of metabolic syndrome will be diagnosed in third world countries than anywhere else.

The incidence of metabolic syndrome increases proportionately with increasing age with 10% of those in their 20's to approximately 40% of those over 60 years are affected. Similarly, it affects 22% of those who are overweight (BMI 25-29.9kg/m²) and 60% of those who are obese (BMI ≥30kg/m²). As the global obesity epidemic continues, metabolic syndrome is becoming increasingly common in younger adults and is now even being diagnosed in children.

There is a slightly higher incidence in men vs. women, until after the age of menopause, where the syndrome is more prevalent in women.



1.3 Causes and risk factors

Excess energy intake

Dr Roger Unger's baldly titled "Gluttony, sloth and the metabolic syndrome -a road map to lipotoxicity", is a thought provoking expose' on the lifestyle habits that increase the risk of all the components of the metabolic syndrome.

He describes how since the 1950s the "gastronomic revolution" has exploded, with a generalized over consumption and under-utilization of calories. As our lives have become modernised, with each new invention aimed at decreasing energy expenditure, we consume on average 500kcal more than are required for survival. This inevitably leads to weight gain which rapidly progresses to obesity.

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Inflammatory diet

In combination with over consumption, the “modern” diet and the food that we consume tend to have an inflammatory effect on the body. And systemic inflammation (as will be described in pathophysiology) may initiate and accelerate insulin resistance.

Genetics

Genetic factors appear to play a role in the individual components and in the development of the syndrome, and a family history of either type 2 diabetes, hypertension and/or early heart disease greatly increases the chance that an individual will develop the syndrome. Current research indicates that while a genetic defect may be an underlying cause, at this stage it has not been identified and is therefore of academic interest only.

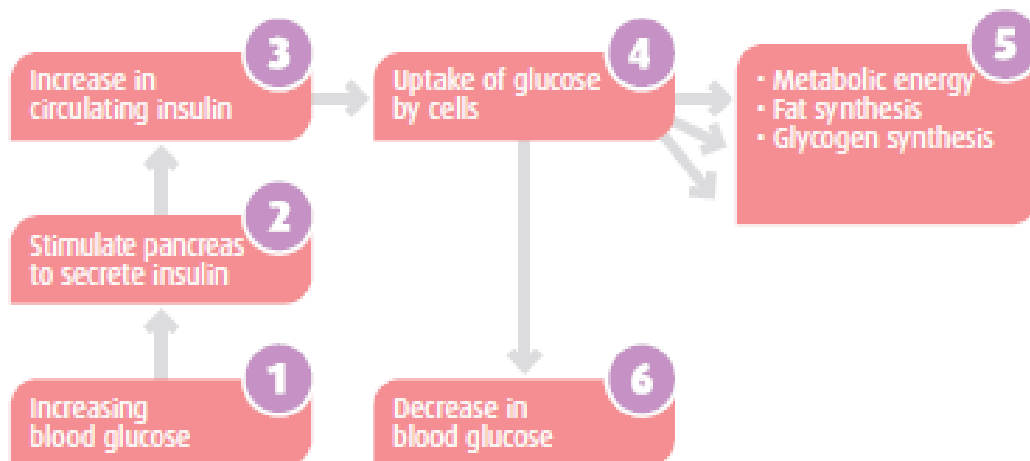
1.4 Physiology

To understand the pathophysiology behind the progression of the components of metabolic syndrome and the link between each factor, it is important to revise normal physiology, particularly with regards to insulin and the role it plays in metabolism.

Insulin is arguably the most metabolically active hormone in human physiology.

Its function is to control energy metabolism in such a way as to give us the best chance of survival in times of nutritional deprivation.

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Carbohydrates are our main source of energy. When they are consumed, the digestive system breaks them down to glucose which then moves into the blood stream.

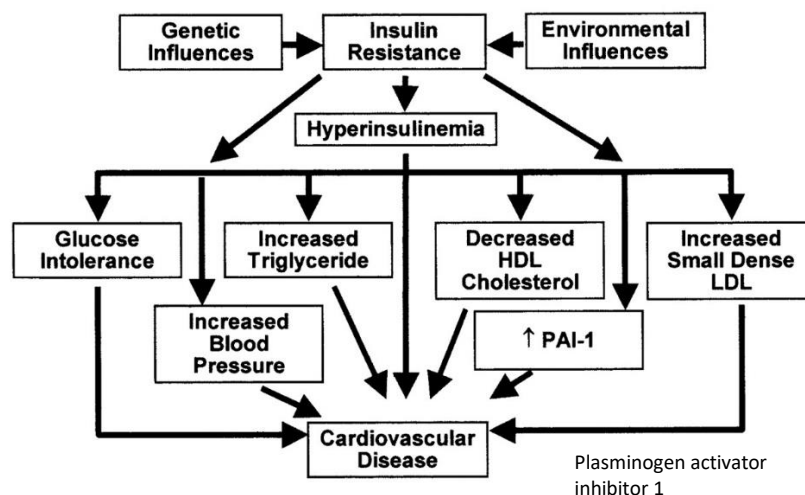
As plasma glucose levels increase, the beta cells within the islets of Langerhans in the pancreas respond by secreting insulin. Insulin binds to insulin receptors on the cell walls, effectively “unlocking” them and allowing glucose to move from the blood stream into the cells, where it is further metabolised and utilized for immediate energy requirements. Any excess glucose is then stored, via the action of insulin, for future use. This storage, or glycogen synthesis, occurs within the liver and muscle stores. Once these areas have reached their maximum storage load, excess glucose is stored in adipose tissue as fat. And the storage capacity of adipose tissue is infinite. As plasma glucose levels drop, the pancreas stops secreting insulin and the systems returns to normal.

Insulin also has other functions such as the uptake and incorporation of amino acids into cell proteins and the increased uptake of potassium in cells, but for the purpose of this article we will not be expanding on these.

Assignment 2

2.1 Pathophysiology

- 2.1.1 Insulin resistance
- 2.1.2 Glucose intolerance
- 2.1.3 Dyslipidaemia
- 2.1.4 Systemic inflammation
- 2.1.5 Abdominal adiposity and hypertension



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2.1.1 Insulin resistance

There is much debate regarding the obesity-insulin resistance link: which comes first? Much like the chicken and egg scenario. It is generally accepted that the initiation of insulin resistance begins with the onset of weight gain.

As an individual gains weight, for reasons that are not yet fully understood, the insulin receptors begin to develop a resistance to insulin. Ingested carbohydrates are converted to glucose which rises in the blood stream, in an effort to achieve homeostasis the pancreas secretes insulin. Insulin binds to the insulin receptors, but they fail to respond and plasma glucose levels remain high. The pancreas secretes further insulin and eventually the receptors respond. Glucose moves into the cells and is metabolised – but with higher insulin levels (hyperinsulinaemia) being required to do so.

While this compensatory mechanism initially allows for glucose control, the storage function of insulin becomes exaggerated. Adipogenesis increases with an accumulation of visceral adiposity while lipolysis decreases, resulting in central obesity. As the obesity becomes more severe, so does the degree of insulin resistance. The pancreas now has to secrete ever-increasing amounts of insulin to lower plasma glucose levels, and the obesity-insulin resistance cycle becomes self-perpetuating.

Hyperinsulinaemia has a cascade of systemic effects, including:

2.1.2 Glucose intolerance

In the early stages of insulin resistance, the pancreas is able to compensate for the higher demands of insulin and can control plasma glucose levels within a normal range by secreting more insulin. As the associated weight gain and resulting severity of the degree of insulin resistance continues, the beta cells of the islets of Langerhans within the pancreas begin to fail. The pancreas is no longer able to secrete sufficient insulin to overcome the insulin resistance, and plasma glucose levels begin to rise.

Initially this will present with a glucose intolerance where only post-prandial (within 2 hours of eating) glucose levels are elevated. In time, as the pancreas continues to deteriorate, fasting glucose levels will also begin to rise, until eventually plasma glucose levels are perpetually high and the individual develops type 2 diabetes.

2.1.3 Dyslipidaemia and Cardiovascular disease

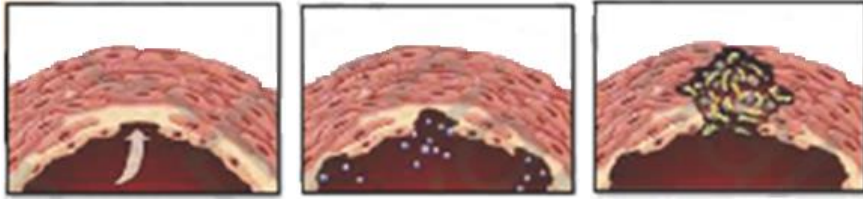
Insulin resistance results in hyperinsulinaemia as pancreatic insulin secretion increases to maintain normal glucose levels. This increase in plasma insulin levels can stimulate lipid storage and altered lipoprotein which in turn increases the risk of cardiovascular damage. Hyperinsulinaemia also stimulates the increased production of triglycerides in the liver which fosters plaque build-up in arterial walls. LDL cholesterol particles tend to be smaller and denser, further increasing the risk of cardiovascular disease, myocardial infarction and cardiovascular accidents (CVA/stroke).

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The increased concentration of insulin (which has a caustic effect on tissues) comes into contact with arterial walls.

This causes an injury to the arterial endothelium and initiates plaque formation. Endothelial dysfunction is fundamental to atherogenesis and its association with type 2 diabetes is well known.



Adiponectin is an anti-inflammatory adipocyte that plays an important role in endothelial function. Adiponectin is also essential in maintaining insulin receptor sensitivity and a deficiency can lead to insulin resistance.

The high LDL levels combined with endothelial dysfunction lead to the formation of atherosclerotic plaques or atheroma.

The resulting cardiovascular disease then causes cerebral ischemia and infarction, myocardial infarction and renal ischemia.



Plasminogen activator inhibitor-1 (PAI-1) is a protein that functions as the principal inhibitor of tissue plasminogen activator (tPA) and urokinase (uPA), the activators of plasminogen and hence fibrinolysis (the physiological process that degrades blood clots).

PAI-1 is mainly produced by the endothelium (cells lining blood vessels), but is also secreted by other tissue types, such as adipose tissue.

PAI-1 also inhibits the activity of matrix metalloproteinases, which play a crucial role in invasion of malignant cells.

PAI-1 is present in increased levels in various disease states (such as a number of forms of cancer), as well as in obesity and the metabolic syndrome. It has been linked to the increased occurrence of thrombosis in patients with these conditions and may promote the progression of vascular disease.

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2.1.4 Systemic inflammation

A number of factors occurring in the metabolic syndrome induce a chronic, systemic inflammatory state.

Lean adipose tissue has a normal metabolic and hormonal function and secretes a finely tuned balance of anti-inflammatory and inflammatory adipokines. These include the anti-inflammatory adiponectin and the inflammatory leptin, TNF- α , interleukins 6 & 8 just to name a few.

Obese adipose tissue takes on an abnormal function, with a decrease in anti-inflammatory and an increase in inflammatory adipokines which result in a generalised systemic inflammatory state. In addition, the majority of people consume a pro-inflammatory diet which includes foods that are high glycaemic index & load, low fibre, high in saturated fats and caffeine and they exceed the recommended alcohol allowance. This diet contributes further to the inflammatory state. In response to this inflammation, white cell counts are raised – which in turn exacerbates insulin resistance and induces atherosclerosis.

2.1.5 Abdominal adiposity and hypertension

White adipose tissue (WAT) is a major site of energy storage and is important for energy homeostasis. However, excess WAT is linked to obesity related diseases.

As abdominal adiposity progresses, it begins to form abnormal proteins which take on an abnormal endocrine function. Known as adipocytokines, they have a generalised inflammatory action and suppress anti-inflammatory hormones such as adiponectin and increase inflammatory hormones such as leptin and tumour necrosis factor (TNF- α). This contributes further to the systemic inflammation already induced by hyperinsulinaemia and diet.

In addition to its role in endothelial health, adiponectin plays a vital role in arterial elasticity and a deficiency of adiponectin results in rigid arteries. This, either singularly or in combination with a narrowed arterial lumen caused by atherosclerotic plaques, leads to hypertension.

Hypertension may be worsened by the turbulent blood flow caused by an inflamed and uneven arterial endothelium and the raised levels of leptin which aggravate vasoconstriction.

Assignment 3

3.1 Clinical indicators

3.2 Diagnosis

3.3 Complications

3.4 Management

3.1 Clinical indicators




The clinical symptoms that form part of the diagnostic criteria of the syndrome as a whole are:

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- central obesity,
- dyslipidaemia,
- glucose intolerance/diabetes and
- hypertension.

Other clinical signs that *may* indicate the presence of hyperinsulinaemia are:

<p>Skin lesions such as Skin tags and/or acanthosis nigricans</p>	 <p>A skin tag is a common, benign condition which consists of a bit of skin that projects from the surrounding skin and may appear attached to the skin. Skin tags can vary in appearance. They may be smooth or irregular, flesh coloured or more deeply pigmented, and either simply be raised above the surrounding skin or have a stalk (a peduncle) so that the skin tag hangs from the skin</p>	 <p>Acanthosis nigricans: A dark brownish or blackish discoloration of the skin related to overweight and high levels of insulin in the blood. Acanthosis nigricans is most likely to develop in the groin or armpits, or around the back of the neck.</p>
<p>Arcus cornealis</p>		<p>Arcus cornealis, a fine white line of cholesterol deposited in the cornea of the eyes.</p>
<p>Hyperandrogenism</p>		<p>Insulin resistance can result in increased circulation of male hormones which may present with hirsutism (male pattern hair growth), acne and/or alopecia (especially male pattern balding)</p>

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Conditions that have a high association with insulin resistance, such as polycystic ovary syndrome, should prompt the primary healthcare provider to assess for the individual components of the metabolic syndrome and the syndrome as a whole.

3.2 Diagnosis

There is still some debate regarding the diagnosis of the metabolic syndrome. The latest consensus released by the IDF (International Diabetes Federation) is as follows:

In order for the diagnosis of metabolic syndrome to be made, an individual must display any 3 of the following:

Central Obesity	
Waist circumference	Female ≥80cm* Males ≥94cm*
Raised triglycerides	≥1.7 mmol/l or on a specific treatment for this lipid abnormality
Low HDL-cholesterol	≤1.03 mmol/l in men ≤1.29 mmol/l in women Or on a specific treatment for this lipid abnormality
Raised blood pressure	Systolic ≥130mmHg or Diastolic ≥85mmHg Or on treatment for previously diagnosed hypertension
Impaired fasting glucose	Fasting plasma glucose ≥5.6 mmol/l or Previously diagnosis of type 2 diabetes

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3.3 Complications

As mentioned, the metabolic syndrome increases an individuals' risk of early morbidity and mortality.

This includes an increased risk of diabetes, heart attacks and/or strokes and also increases the risk that these events will be fatal. The pathophysiology of insulin resistance and the metabolic syndrome components clearly explains the increased risk profile.

The accompanying inflammatory state has also been linked to an increasing number of morbidities including cancers and osteoarthritis.

3.4 Management

To date there is no single treatment for the metabolic syndrome and management strategies are based on treating the associated risk factors, underlying causes and the individual components of the syndrome.

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The metabolic syndrome is (generally speaking) a condition induced by sub-optimal lifestyles and this is therefore a fundamental area that must be focused on in management.

Integrative healthcare

The Medical Nutritional Institute (MNI) is a pharmaceutical company striving to improve health and to prevent disease. We develop natural products that are designed for prophylaxis, for use in early disease management and that can also be used in combination with orthodox treatments. Extensive medical research illustrates the positive effect that lifestyle changes have on a variety of disease processes. As such, we advocate an integrative healthcare approach, combining natural medication, lifestyle changes and orthodox treatments that collectively optimize patient outcome.

3.4. 1 Lifestyle management

3.4.1.1 Dietary modification

In individuals who are not insulin resistant, overweight is simply corrected and maintained by equalising the energy equation: energy expenditure must exceed energy intake.

Calorie restrictions must be applied and generally a deficit of 500kcal a day will result in a weight loss of approximately 0.5kg a week.

For those with insulin resistance this is however seldom effective and energy restriction must be accompanied by breaking the cycle of insulin resistance if they are to have any chance of successful weight loss.

Once again, there is much debate on which meal plan is most beneficial to insulin resistant persons. MNI's research and experience in this field have proven that these individuals need to learn to recognise and understand the different food groups (carbohydrates, proteins and fats) and how each of these influences not simply calorie intake, but glucose levels and therefore insulin levels.

MNI has developed the insulin-friendly C.A.P.E meal plan and weight loss programme. It is a moderate and sustainable way of eating that improves blood glucose and insulin levels and is an "insulin friendly" way of eating. It is suitable for diabetics, hypertensives and those with lipid abnormalities. The fact that it can be adapted for the whole family means that it has a ripple effect within a household, teaching correct eating habits to children at an early age and managing potential weight issues in family members where this may be a sensitive subject.

3.4.1.2 Exercise

Exercise has a multitude of health benefits.

Cardiovascular exercise improves glucose control, blood pressure and reduces cortisol levels.

As a weight loss strategy, it is, however, not very effective.

Resistance (or weight) training on the other hand, is an



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extremely effective fat burner. Within the MNI programme we encourage some cardiovascular exercise, but emphasis resistance training to get good results as quickly as possible, continuing the theme of strategy versus effort.

In this way exercise is introduced gradually into the lives of people who would generally prefer not to exercise at all.

Assignment 4

4.1 Secondary intervention

- 4.1.1 Insulin resistance
- 4.1.2 Glucose intolerance
- 4.1.3 Dyslipidaemia
- 4.1.4 Systemic inflammation
- 4.1.5 Hypertension

4.1 Secondary intervention

Secondary intervention should be considered if lifestyle changes are insufficient and for those who are classified as high risk.

Referral and possibly pharmaceutical treatment should be advised for those with a BMI above 27 kg/m² when they have additional risk factors such as:

- (a) raised triglycerides ≥ 1.7 mmol/l and/or
- (b) LDL cholesterol > 2.6 mmol/l;
- (c) a known diagnosis of diabetes and/or
- (d) hypertension

The MNI products are classified as complimentary medications. They have been formulated to ① assist in the treatment of the early stages of disease (prior to prescription medication becoming necessary), and can also be ② used in combination with most prescription medications to improve patient outcome. In certain circumstances they may also be beneficial in a ③ prophylaxis capacity.

Each MNI product includes multiple ingredients which act on various pharmaceutical pathways simultaneously. This synergistic action improves patient outcome, while the lower dose per ingredient ensures that they are well tolerated with a low side-effect profile. In chronic conditions where long-term patient compliance is traditionally poor, the efficacy and tolerability of the MNI product range may play a significant role in improving compliance.

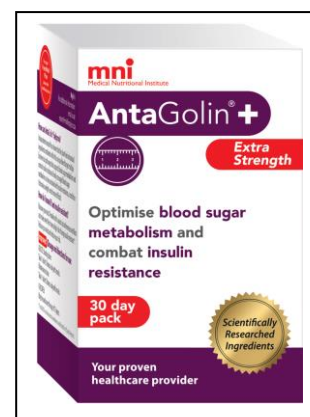
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4.1.1 Insulin resistance

While lifestyle rehabilitation remains the cornerstone of treatment for insulin resistance, many medical practitioners include scheduled medication in their treatment plan. This decision is usually based on the results of the patients' glucose profile and the presence of concurrent risks such as hypertension and/or dyslipidaemia.

AntaGolin contains a blend of plant-derived phytochemical ingredients that combats insulin resistance and optimises blood-sugar metabolism. This unique combination supports multiple pathways involved in the input, output and processing of sugars in the body and the optimal regulation of metabolism.



It indicated in early insulin resistance before prescription medication is necessary and has the added advantage that it can be used in combination with most prescriptions.

It contains a number of ingredients which act synergistically to improve insulin sensitivity. achieves an optimal patient outcome with a low side effect profile.

Banaba leaf is a natural agent that mimics the biochemical effects of insulin by actively stimulating the transport of glucose across the cell membrane. Less insulin is therefore required and released by the pancreas, lowering blood insulin levels. Banaba leaf also improves insulin receptor sensitivity and may inhibit gluconeogenesis. Banaba extract exerts anti-diabetic and anti-obesity effects.

Phlorodene is a proprietary formulation prepared from the bark of apple trees. It is the first known inhibitor of SGLT-2 therefore it inhibits the reabsorptions of glucose in the kidneys. The net metabolic effect is to help lower blood sugar which assists with bodyweight reduction and optimised blood sugar control.

Inositol increases the action of insulin by improving insulin sensitivity.

Berberine stimulates glucose transport, lowers elevated blood glucose levels, prevents or alleviates insulin resistance and increases insulin receptor expression. It inhibits adipogenesis and may play a role in weight loss. Berberine has the unique biochemical property of being able to up-regulate the activity of both insulin receptor and low-density-lipoprotein receptor. This multiple-target characteristic makes berberine an attractive agent for the treatment of obesity in the presence of the metabolic syndrome.

Chromium has been shown to reduce HbA_{1c} levels and fasting blood sugar levels.

Poorly managed blood sugar metabolism can be associated with insulin resistance, a condition that makes it difficult to lose weight. If Insulin resistance is not identified and managed appropriately it can lead to numerous conditions.

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These include:

- Increase in weight gain.
- The metabolic syndrome
- Abnormal cholesterol
- Poor cardiovascular health
- Diabetes
- Liver disease

4.1.2 Glucose intolerance

AntaGolin is recommended for optimising blood sugar control and managing insulin resistance. It does so by improving insulin receptor sensitivity, which improves glucose control. As such, **AntaGolin** is also indicated in the management of glucose intolerance and type 2 diabetes. Dosage

- ADULTS: Starting dose:
 - Take 1 tablet 3 times a day with meals.
- Maintenance dose:
 - Take 1 tablets 2 times a day with meals.
- Children
 - May be used from the age of 12 years.

We recommend that treatment with **AntaGolin** is combined with the MNI insulin-friendly CAPE meal plan, designed to optimize glucose and insulin levels and can be accessed below:
<https://www.mnilifestyle.co.za/meal-plans/>

AntaGolin can generally be combined with oral anti-diabetic agents such as metformin. Once again, patients must be reminded to take **AntaGolin** with food to avoid hypoglycaemia and they should continue to monitor their blood glucose levels regularly. Those prone to low blood sugar should use **AntaGolin** with caution.

Should a patient consider changing their prescription medication regime, this must be done in consultation with the prescribing doctor.

4.1.3 Dyslipidaemia

Once again, lifestyle changes can positively influence cholesterol levels. The MNI weight loss programme is suitable for those with dyslipidaemia and need to lose weight.

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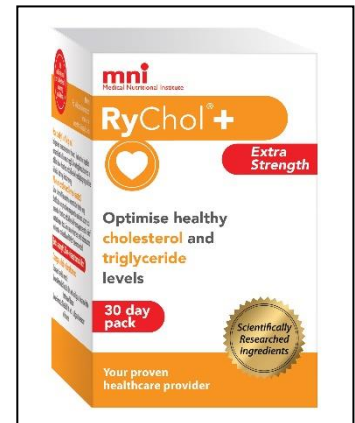
For those that are within their ideal body mass index range, MNI offers dietary guidelines <https://www.mnilifestyle.co.za/meal-plans/> that may assist in improving their lipid profile.

While some individuals may respond to dietary changes and exercise, many require further assistance. This is most likely due to the fact that while approximately 33% of our cholesterol is actually ingested, the majority being either formed by the body (biosynthesis) or is reabsorbed in the gut.

RyChol extended-release formulation contains a unique blend of plant-derived phytochemical ingredients known to reduce blood cholesterol, triglyceride, and LDL levels. This unique combination supports multiple pathways involved in the digestion, absorption and clearance of cholesterol and the other detrimental fats from the system.

As with all MNI products, **RyChol** has multiple ingredients which work synergistically to alleviate dyslipidaemia via multiple pathways.

- **Berberine** lowers LDL-cholesterol levels by improving hepatic LDL-receptor sensitivity.
- **Phytosterols** decrease the amount of cholesterol which is reabsorbed in the gut.
- **Apple polyphenols** decrease the enzyme pancreatic lipase and thereby reduce absorption of dietary triglycerides.
- **Psyllium** increases the faecal elimination of bile acids via entrapment and absorption, thus aids to facilitate the natural expulsion of cholesterol, triglyceride and LDL contained in bile.
- **Coenzyme Q10** is an effective cardiac anti-oxidant.



Raised triglyceride levels are an independent risk factor for cardiovascular disease. A 10% reduction in cholesterol can reduce your cardiovascular disease risk by 50%.(WHO)

RyChol can be used:

- As prophylaxis (prevention) in high-risk individuals
- In early dyslipidaemia, before prescription medication become necessary.
- In combination with other lipid-lowering drugs
- In patient's intolerant or non-compliant with prescription medication
- Familial hypercholesterolemia

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The recommended dosage of RyChol:

Cholesterol levels in mmol/l:

- Above 4.9mmol/l: Take 2 **RyChol** with a full glass of water with the first meal of the day.
- Above 6mmol/l: Take 2 **RyChol** with a full glass of water twice a day.

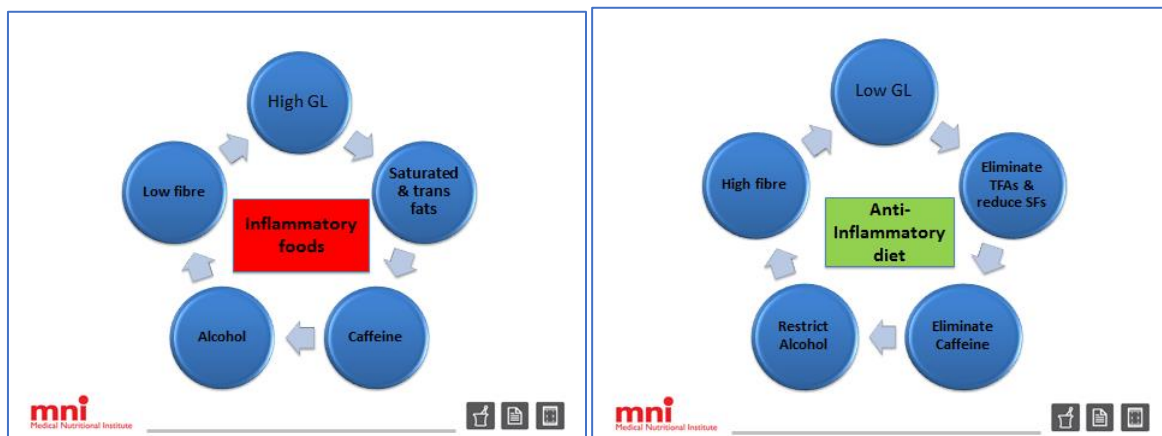
Diabetics have an exponentially high risk of cardiovascular disease and LASSA (Lipid and Atherosclerotic Society of Southern Africa) now follows the international recommendation of prescribing prophylactic lipid management therapy to decrease this risk as far as possible. Diabetic patients are automatically classified as high risk cardiovascular patients, regardless of their cholesterol profile. LASSA recommends prophylactic treatment and have lowered the LDL-cholesterol treatment goal to 1.8mmol/L. This is extremely difficult (if not impossible) to achieve with lifestyle modification such as dietary changes and exercise. While these remain extremely important and must be included in their treatment plan, medication should also be considered.

4.1.4 Systemic inflammation

Systemic inflammation can be managed with a 3-fold approach:

1. Changing from an inflammatory to an anti-inflammatory way of eating (as is included in the [C.A.P.E meal plan: https://www.mnilifestyle.co.za/meal-plans/](https://www.mnilifestyle.co.za/meal-plans/))

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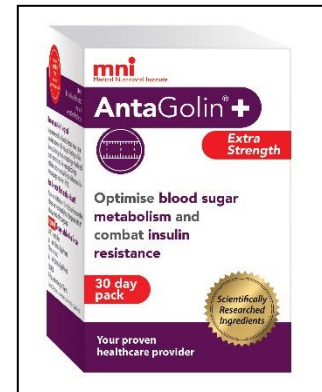
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2. Managing hyperinsulinaemia

An individual with very mild insulin resistance may be able to improve insulin sensitivity by losing weight based on restricting calories. Those with a more significant degree of insulin resistance usually require medical intervention.

AntaGolin contains a blend of plant-derived phytochemical ingredients that combats insulin resistance and optimises blood-sugar metabolism. This unique combination supports multiple pathways involved in the input, output and processing of sugars in the body and the optimal regulation of metabolism. It has 5 ingredients: banaba leaf, phlorodene inositol, berberine and chromium.

These ingredients have a synergetic effect on insulin sensitivity, providing improved glucose control with lower insulin levels.



3. Natural Anti-Inflammatory for everyday use

FlamLeve is a natural anti-inflammatory product that combats inflammatory pain and protects the body and internal organs against the harmful effects of inflammation. This unique combination of plant-derived phytochemical ingredients ensures superior absorption and bioavailability, making **FlamLeve** 500 times more potent than standard turmeric.

Leve's unique combination of ingredients combats neuro-inflammation and systemic inflammation in:

- Obesity patients
- Cardiovascular patients
- Diabetes
- Prostatitis in males
- Breast density in pre-menopausal women
- Bowl disorder
- Cluster headaches



4.1.5 Hypertension

While the MNI products are formulated to lower blood pressure, they do improve some of the major causes of hypertension such as obesity, insulin resistance and dyslipidaemia.

As these conditions improve, a corresponding decrease in blood pressure is noticed.

Cardiovascular exercise also improves blood pressure and a weight loss of as little as 5-10% of body weight improves blood pressure further.

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Assignment 5

5.2 Metabolic syndrome in the primary healthcare environment

5.2 Conclusion

5.1 The metabolic syndrome in the primary healthcare environment

The metabolic syndrome is associated with an increase in the occurrence and severity of a number of co-morbidities including heart attacks, strokes, cancers and arthritic conditions to name a few. As the fundamental risk factors underlying the metabolic syndrome are those associated with lifestyle, the primary healthcare professional is an ideal situation to optimise patient outcome.

One of the principle roles that the pharmacist and nurse practitioner play is that of the educator. While it is tempting in a busy pharmacy or clinical environment to simply advise a client on how to take their prescribed medicine, it is our ethical responsibility to educate our patients. This includes not only how the treatment works and why compliance is important, but to also emphasise the benefit of lifestyle modification.

Explaining associated disease conditions is also fundamental to equipping a patient with the tools they need to optimise their health. This then enables the patient to take far more responsibility for their own health and the health of their families.

For the pharmacist with a long queue of clients impatiently waiting for their prescription to be dispensed, it may be preferable for them to advise the client to see the nurse practitioner who can spend more time with them.

These clients then truly become patients of the pharmacy team.

Screening and assessments

The primary healthcare practitioner has the knowledge, experience, equipment and facilities available to perform accurate screenings of both the individual components of the metabolic syndrome and of the syndrome in its entirety.

While early disease can be managed within the primary healthcare setting, non-responders or those with progressive conditions can be referred with confidence.

MNI advocates an integrative form of healthcare using all options available in our treatment arsenal: natural medicine, lifestyle modification and orthodox prescription medication.

Screening should be done routinely from the age of 25 years on an annual basis. For high risk individuals this may even be necessary from the age of 20 years. Many medical aids are promoting wellness and the early identification of overweight, glucose intolerance, hypertension and dyslipidaemia, which is increasing awareness in the community and driving patients to the pharmacy clinics.

The purpose of this module is to encourage screening, education, management and where necessary referral of these patients.

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The indicators of the metabolic syndrome are outline below:

International Diabetes Federation Diagnostic criteria for the Metabolic Syndrome	
Central Obesity	
Waist circumference	Female ≥88cm Males ≥102cm
Plus any two of the following:	
Raised triglycerides	≥1.7 mmol/l or on a specific treatment for this lipid abnormality
Low HDL-cholesterol	≤1.03 mmol/l in men ≤1.29 mmol/l in women Or on a specific treatment for this lipid abnormality
Raised blood pressure	Systolic ≥130mmHg or Diastolic ≥85mmHg Or on treatment for previously diagnosed hypertension
Impaired fasting glucose	Fasting plasma glucose ≥5.6 mmol/l or Previously diagnosis of type 2 diabetes

5.2 Conclusion

The metabolic syndrome currently affects 25% of the global population. It dramatically increases an individuals' risk of developing diabetes and cardiovascular incidents such as MIs and CVAs. Professionals within the primary healthcare environment have the ability to improve a patient's outcome by assisting them in incorporating an integrative approach to their health.

It is important to remember that many lean individuals also follow unhealthy lifestyles with decreased physical activity, high stress levels and inflammatory eating patterns. While they may not present with the easy to identify central obesity, they are at high risk of developing dyslipidaemia and hypertension, which may then be followed by glucose intolerance and later central obesity. It is therefore important that they are screened for these conditions annually and that they receive the necessary information and education about the risks associated with sub-optimal lifestyles.

Many individuals question the effectiveness of lifestyle changes, wondering if the effort required is actually going to make a measurable difference.

The tables below are useful tools that clearly illustrate the positive impact that can be achieved. Combining dietary modification with physical activity can decrease the development of diabetes by 58% (table 1), and can reduce blood pressure by more than 10mmHg (table 2), while every 1mmol/l drop in LDL-cholesterol shows a significant reduction in heart attacks and strokes (table 3).

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Table 1 shows the outcomes of a number of studies that compared various combinations of management strategies for preventing diabetes. It clearly illustrates the significant impact of lifestyle modification which reduces diabetes occurrence by up to 58%.

Study	Year	Intervention				Outcome: % reduction in developing diabetes compared to control groups given general advice
		Diet	Physical activity	Diet & physical activity	Medication	
DaQuing (China)	1997	Yes	-	-	-	31%
		-	yes	-	-	46%
		-	-	yes	-	42%
Finnish Diabetes Prevention study	2001	-	-	yes	-	58%
Diabetes prevention programme-USA	2002	-	-	yes	-	58%
		-	-	-	yes	31%

Table 2 illustrates how even small changes achieved by lifestyle modification can have a far-reaching effect on morbidity and mortality.

Reducing diastolic blood pressure by 5 mmHg: Reduces ischaemic heart disease by +/-22% and Reduces stroke by +/- 34%		
Area of modification	Reduction in BP	Potential accumulative reduction
Reducing alcohol intake to: 3 to 4 units/day in men 2 to 3 units/day in women	+/- 3mmHg	+/- 3mmHg
Salt reduction	+/-5mmHg	+/-8mmHg
30 min moderate exercise 5x/wk	+/-2mmHg	+/-10mmHg
For EVERY 1kg lost	+/-1mmHg	Depends on amount of weight lost!

Diabetes, Metabolic Syndrome & Obesity: Targets and Therapy 2010:3 95-112

Table 3 shows the effect of lowering LDL-cholesterol

Every 1 mmol/l decrease in LDL-cholesterol equates to:
10% reduction in mortality
17% reduction in stroke
20% reduction in all-cause morbidity
23% reduction in major cardiac events

One of the biggest challenges in the primary healthcare environment is incorporating knowledge and information into a realistic and effective patient care plan.

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Once you have convinced a patient that intervention is necessary and have provided him with effective tools to manage his case, it is necessary to monitor his progress regularly and adjust his treatment plan accordingly.

Early detection means management strategies can be formulated to slow the progression of the symptoms and in some situations may actually be able to reverse them.

“Knowing is not enough; we must apply. Willing is not enough; we must do” - Johan Wolfgang von Goethe

Assignment 6

6.1 The summary of the MNI product range

6.2 The MNI Metabolic syndrome diagrammatic summary

6.1 Summary of the MNI product range

The Medical Nutritional Institute (MNI) has developed a range of non-prescription medication from organic molecules that conform to the specifications of local and international medicine regulatory boards in order to be classified as ‘complementary’. The product range is scientifically sound and able to withstand the scrutiny of the mainstream pharmaceutical and medical world.

Quality control, efficacy and safety are a priority and the products are produced to meet pharmaceutical standards and each ingredient has been extensively referenced in numerous scientific trials and studies.

The MNI products have been formulated to ① assist in the treatment of the early stages of disease (prior to prescription medication becoming necessary) and can also be ② used in combination with most prescription medications to improve patient outcome. In certain circumstances they may also be beneficial in a ③ prophylaxis capacity.

Each MNI product includes multiple ingredients which act on various pharmaceutical pathways simultaneously. This synergistic action improves patient outcome, while the lower dose per ingredient ensures that they are well tolerated with a low side-effect profile. In chronic conditions where long-term patient compliance is traditionally poor, the efficacy and tolerability of the MNI product range may play a significant role in improving compliance.

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The complimentary classification of the products means that they are available without prescription and can be recommended by pharmacists and nurse practitioners. In a world of escalating medical costs, MNI has NAPPI coded the full range of products, thereby enabling clients to claim the costs from qualifying medical aid schemes.

Through on-going research, development and progress, MNI has established itself as a leading innovator in the development of complementary, non-prescription medication.

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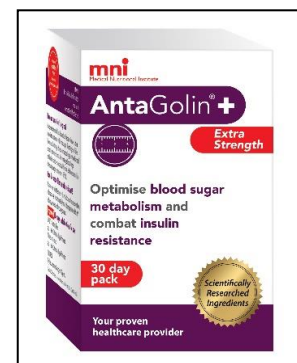
6.1.1 AntaGolin

AntaGolin contains a blend of plant-derived phytochemical ingredients that combats insulin resistance and optimises blood-sugar metabolism. This unique combination supports multiple pathways involved in the input, output and processing of sugars in the body and the optimal regulation of metabolism.

Poorly managed blood sugar metabolism can be associated with insulin resistance, a condition that makes it difficult to lose weight. If Insulin resistance is not identified and managed appropriately it can lead to numerous conditions.

These include:

- Increase in weight gain.
- The metabolic syndrome
- Abnormal cholesterol
- Poor cardiovascular health
- Diabetes
- Liver disease



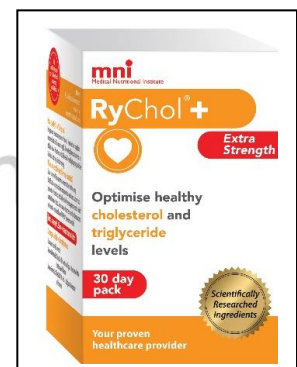
6.1.2 RyChol

RyChol, extended-release formulation contains a unique blend of plant-derived phytochemical ingredients known to reduce blood cholesterol, triglyceride, and LDL levels. This unique combination supports multiple pathways involved in the digestion, absorption and clearance of cholesterol and the other detrimental fats from the system.

Raised triglyceride levels are an independent risk factor for cardiovascular disease. A 10% reduction in cholesterol can reduce your cardiovascular disease risk by 50%.(WHO)

RyChol can be used:

- As prophylaxis (prevention) in high-risk individuals
- In early dyslipidaemia, before prescription medication become necessary
- In combination with other lipid-lowering drugs
- In patient's intolerant or non-compliant with prescription medication
- Familial hypercholesterolemia



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6.1.3 FlamLeave

FlamLeave is a natural anti-inflammatory product that combats inflammatory pain and protects the body and internal organs against the harmful effects of inflammation. This unique combination of plant-derived phytochemical ingredients ensures superior absorption and bioavailability, making **FlamLeave** 500 times more potent than standard turmeric.

FlamLeave's unique combination of ingredients combats neuro-inflammation and systemic inflammation in:

- Obesity patients
- Cardiovascular patients
- Diabetes
- Prostatitis in males
- Breast density in pre-menopausal women
- Bowel disorder
- Cluster headaches

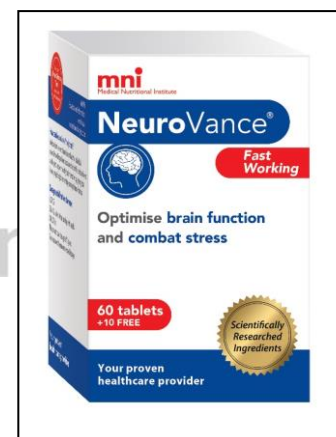


6.1.4 NeuroVance

NeuroVance contains a blend of plant-derived phytochemical ingredients that optimise and support healthy brain function by giving your brain a physiological advantage during times of stress without acting as a sedative or stimulant.

Your brain is the hardest working organ in your body, but it's often the most neglected. If left neglected, you may start to experience some of the following symptoms:

- Difficulty concentrating
- Fatigue
- Poor job performance
- Tension headaches
- Burnout
- Fast working



6.1.5 NeuroVance kids

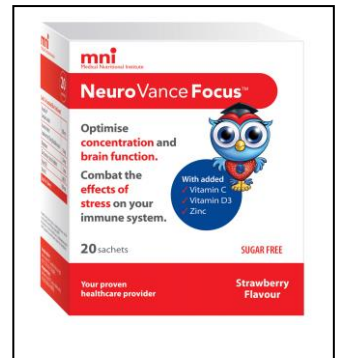
NeuroVance kids syrup contains a blend of plant-derived phytochemical ingredients that will optimise your child's concentration, brain function and focus during times of stress. By targeting multiple neurological pathways simultaneously, it can assist your child in reaching their full potential without acting as a sedative or stimulant.

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6.1.6 NeuroVance Focus

NeuroVance Focus contains a unique blend of plant-derived phytochemicals ingredients, vitamins and minerals. This advanced combination of ingredients optimises your child's general health by targeting multiple neurological and immunological functions simultaneously, helping your child in achieving their optimal scholastic potential while combating the effects of stress on their immune system. **NeuroVance Focus** is fast working and contains no sedatives or stimulants.

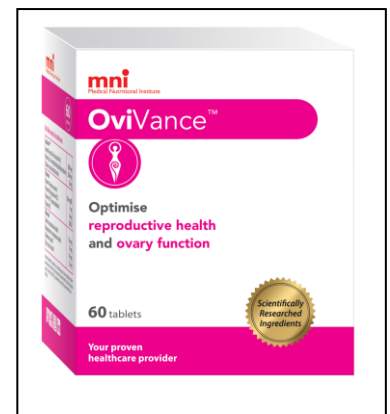


6.1.7 OviVance

OviVance contains a unique blend of plant-derived phytochemical ingredients, vitamins and minerals that targets PCOS and its symptoms, optimises reproductive health and combat insulin resistance related to common gynaecological and metabolic disorders. This blend leads to more rapid improvement in insulin sensitivity and hormonal imbalances.

Hormonal disorders can cause:

- Irregular and painful periods
- Abnormal hair growth
- Trouble falling pregnant
- Weight gain
- Menopausal symptoms



6.1.8 SkinVance + Zinc

SkinVance + Zinc contains a unique blend of plant-derived phytochemical ingredients and nutrients that optimise skin health, combat hormonal acne and alleviate skin inflammation in the presence of Insulin resistance.

Insulin resistance has several pathological skin manifestations which include:

- Hormonal acne (especially during teen years or menopause)
- Androgenetic alopecia
- Hirsutism (excess hair)
- Skin pigmentation (acanthosis nigricans)



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- Development of skin tags or polyps (acrochordons) in regions such as the neck, armpits, and groin.
- Skin inflammation

Insulin resistance (IR) and metabolic syndrome (MetS) have also been strongly associated with other skin disorders such as psoriasis and hidradenitis suppurativa, a chronic inflammatory skin condition characterized by painful nodules, abscesses, and draining pits in regions such as the armpits, buttocks, and groin.

These pathological skin changes all happen as a result of the hormonal effects that elevated insulin levels have either directly on cellular structures in the skin, or indirectly through its regulatory effect on other metabolic pathways involved in the release and regulation of androgenic hormones, inflammatory cytokines, and growth factors.

6.1.9 RheumaLin

RheumaLin contains a unique blend of plant-derived phytochemical ingredients that can inhibit the production of key inflammatory mediators that act as triggers for inflammation, thereby addressing the source of inflammation. **RheumaLin** is gentle on your stomach and can therefore be used over extended periods of time.

RheumaLin, your natural anti-inflammatory and joint preservation solution.



6.1.10 ImmunoVance

ImmunoVance contains a blend of plant-derived phytochemicals, vitamins and minerals. This blend of essential ingredients works synergistically together to optimise the immune system, and combat colds and flu.

ImmunoVance is ideal for those who are stressed, living an active life and want to support their immune systems, fight off diseases, and shorten their recovery time after a cold of flu.



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6.1.11 ImmunoVance kids

ImmunoVance kids contains a blend of plant-derived phytochemicals, vitamins and minerals. This blend of essential ingredients works synergistically together to optimise the growing immune system, modulate the immune response, and primes the immune system for defense against bacteria and viruses.

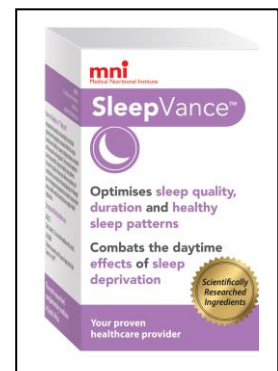
ImmunoVance kids is ideal for children who are exposed to colds and flu in school, live active lifestyles or want to feel better faster.

ImmunoVance is more than just a multi-vitamin.



6.1.12 SleepVance

SleepVance contains a unique blend of plant-derived phytochemical ingredients and nutrients. This blend has the ability to target multiple pathways associated with sleep and mood regulation. **SleepVance** optimises healthy sleep patterns, increases the quality of sleep, and alleviates symptoms and complications associated with sleep deprivation. Prolonged poor, or inadequate sleep patterns may lead to various other serious health complications that have negative health implication.



6.1.12 SleepVance Kids

SleepVance kids contains a unique blend of plant-derived phytochemical ingredients and nutrients that has been developed to optimise healthy sleep patterns, improve sleep quality, maximise sleep duration as well as combatting hyperactivity and inattention in your child by targeting multiple neuronal pathways associated with these functions. By doing this, it has the ability to improve your child's overall mental wellbeing and help them to function optimally, making it easier for them to complete their daily mental and physical objectives.



The MNI product range is designed to be used:

- to maintain health
- in early disease, before the need for prescription medication arises and
- in combination with prescription medication

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Individuals considering altering their prescribed medication are advised to do so only in consultation with their doctor.

6.3 Diagrammatic summary of the metabolic syndrome and the MNI product range


Metabolic Syndrome

The Metabolic Syndrome increases your risk of developing diabetes, heart disease & stroke



MetS


If you have any 3 of the following conditions you may be at risk for developing the Metabolic Syndrome. As soon as one is present it is important to screen for all other risk factors.




Stress

Stress may be a trigger for insulin resistance.

Solution >







Excess Central Weight

If your waist circumference is more than 80 - 88 cm for females & 94 - 102 cm for males, you may have insulin resistance.

World Health Organization (WHO)
*The ICMDSA considers waist circumference a risk factor from 94 and 98 cm respectively.

Solution >







Abnormal Cholesterol

Triglycerides: ≥ 1.7 mmol/l
HDL Cholesterol: < 1.0 mmol/l (M) < 1.28 mmol/l (F)
Total Cholesterol > 4.9 mmol/l

Solution >







Diabetic or Abnormal Blood Sugar


Fasting glucose ≥ 5.6 mmol/l

Solution >






Raised Blood Pressure



$\geq 130/85$ mmHg
Regular visits to your healthcare professional.



visit www.mnilifestyle.co.za

1. Society for Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA).

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