DIPLOMA OF NATUROPATHIC NUTRITION

Nutrition 2 Lecture Guide: Semester 1

Unit 3: Pharmacology, Physiology, Pathology
Unit 3: Pharmacology, Physiology, Pathology

Year 2: Semester 1

Day  | Topic                                    
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1    | Nutrigenomics and Metabolic Detoxification
2    | Nutritional Pharmacology                 
3    | Assessment and Diagnostics               
4    | Herbal Medicine                          
5    | Detoxification and Gastrointestinal health 
6    | Stress and Fatigue                       
7    | Cardiovascular health                    
8    | Over and under nutrition                 
9    | Nervous system health                    
10   | Immune system health                     

Core Learning Outcomes

Your Core Learning Outcomes form the basis of your study programme. For more detailed descriptions of what you will be learning please read the relevant sections of your Lecture Guide below.

Unit 3

1. **Pharmacology** Discuss the actions and potential interactions of commonly prescribed drugs and access the standard pharmaceutical reference sources

2. **Research and Professional Development** Gather and analyse relevant information from a wide variety of standard and accepted reference sources

3. **Pathophysiology** Demonstrate an understanding of the common diseases and show awareness of the importance of referral with ‘red flag’ symptoms

4. **Nutritional Physiology** Explain the application and interpretation of appropriate diagnostic tests

5. **Nutritional Physiology** Evaluate how disease triggers influence health and disease

6. **Nutritional Physiology** Explain how to support systems through nutritional therapy
Year 2

**Essential Reading**


**Recommended Reading**


Ferrans CE,发生于 5/5/2023
Unit 3: Pharmacology, Physiology, Pathology

Day 1: Nutrigenomics and Metabolic Detoxification

Aims:
- To provide a detailed overview and review of how diet and genes interact to promote health or disease – the study of nutrigenetics and nutritional genomics or nutrigenomics
- To explore commonly occurring phase 1 and phase 2 polymorphisms
- To review methylation and the impact of single nucleotide polymorphisms (SNPs) on health and wellness
- To outline naturopathic nutritional approaches to the support of metabolic detoxification
- To explore the ethics around genetic information and client consent

Learning Outcomes:
On successful completion you will be able to:
1. Explain the relevance of nutrigenetics and nutrigenomics to the practise of naturopathic nutrition
2. Describe in detail the functions of phase 1 and phase 2 detoxification and appraise the impact of common polymorphisms
3. Evaluate the importance of methylation and the potential impact of SNPs on health and wellness
4. Outline nutritional therapy approaches to support of metabolic detoxification
5. Show awareness of the importance of appropriate ethics and client care in regards to genetic information

Assessment Criteria
To achieve the learning outcome you must demonstrate the ability to:
- Describe in detail the study of nutrigenomics
- Analyse the relevance of genetic profiling in clinical choices
- Detail phase 1/phase 2 detoxification and methylation pathways including common SNPs
- Describe the use of nutritional therapy including dietary choices and nutraceuticals in the support of metabolic pathways and homeostatic control
- Discuss the issues of ethics and consent in regards to genetic information
## Student Required Reading

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<th>Chapters &amp; Pages</th>
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<tr>
<td><strong>See links within your lecture notes for additional reading required</strong></td>
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## Additional Reading

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Unit 3: Pharmacology, Physiology, Pathology

Day 2: Nutritional Pharmacology

Aims:

- To understand the principles of pharmacokinetics and pharmacodynamics and how they relate to nutritional therapy
- To explore a wide range of commonly used pharmaceutical drugs and their potential interactions with foods and nutritional supplements

Learning Outcomes:

On successful completion you will be able to:

1. Describe the principles of pharmacokinetics and pharmacodynamics
2. Demonstrate knowledge of a wide range of commonly used pharmaceutical drugs, their actions, contraindications and potential interactions with dietary and nutritional supplement recommendations
3. Evaluate the effects of a range of pharmaceutical drugs on human health and possible nutrient depletions and health complications they may cause

Assessment Criteria

To achieve the learning outcomes you must demonstrate the ability to:

- Explain factors affecting variability of responses to drugs, including pharmacokinetics and pharmacodynamics
- Identify reliable sources of information about drug actions, side effects and interactions with foods, herbs and nutritional supplements
- Interpret information regarding pharmaceutical drugs, their actions, side effects and contraindications
- Describe the actions of a range of commonly prescribed pharmaceutical drugs in relation to pathologies of various body systems

Material to be covered

- Principles of pharmacokinetics and pharmacodynamics
- General classification, administration, absorption, metabolism and excretion of pharmaceutical drugs
- Barriers to absorption and metabolism of pharmaceutical drugs
- Detoxification pathways for pharmaceutical drugs in the liver
- Resources for information about individual drugs such as British National Formulary
- Resources for information about drug nutrient interactions
- Detailed description of commonly used drugs for pathologies of different body systems including indications, contraindications, dosages, side effects, administration and interactions with foods and nutritional supplements

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<tr>
<td>British Medical Association (any recent edition) British National Formulary. Royal Pharmaceutical Society.</td>
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Please Note: Students will need to bring a BNF to the lecture in order to participate in group work.

**Additional Reading**

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<tr>
<td>BMA Concise Guide to Medicines and Drugs. 7th ed</td>
<td>As required</td>
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<tr>
<td>Foster RW (2001) Basic Pharmacology. 4th edn.</td>
<td>All</td>
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Unit 3: Pharmacology, Physiology, Pathology

Day 3: Assessment and Diagnostics/Functional Testing

Aims:
- To provide a comprehensive overview of the range of tests and assessments used by nutritional therapists
- To develop an understanding of how testing can enhance and inform nutritional therapy practice.

Learning Outcomes:
On successful completion you will be able to:
1. Evaluate the use of functional testing in nutritional therapy
2. Interpret the results of a range of anthropometric and functional tests
3. Explain the application of various types of testing available to nutritional therapists

Assessment Criteria
To achieve the learning outcome you must demonstrate the ability to:
- Explain how a range of functional and anthropometric tests are carried out
- Identify a range of basic medical test results and what they indicate about the client’s state of health
- Identify how and when to use a wide range of specialist diagnostic tests to inform nutritional therapy therapeutics
- Critically assess the use and limitations of functional tests and conventional tests as tools within a naturopathic practice

Material to be covered:
- Types of testing
- Anthropometric testing
- DEXA scanning
- Standard medical blood tests including haematology, blood chemistry and full Blood count
- Nutritional testing suppliers
- Allergy testing
- Digestive and parasite testing
- Hormonal testing
- Vitamin and mineral Profiles
- Cardiovascular screening
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Unit 3: Pharmacology, Physiology, Pathology

Day 4: Herbal Medicine

Aims:
- To develop an understanding of herbal terminology, preparation and quality control of herbs, common culinary and therapeutic herbs and their applications in various health conditions.
- To develop an awareness of safety issues surrounding the use of herbal remedies in nutritional therapy and potential interactions with foods, nutraceuticals and pharmaceutical drugs.

Learning Outcomes:
On successful completion you will be able to:
1. Identify commonly used culinary and therapeutic herbs and explain their applications in a number of health conditions affecting different body systems
2. Describe the safety considerations surrounding the use of herbs in nutritional therapy and their interactions with other medications
3. Explain the factors affecting production and licensing of herbal remedies

Assessment Criteria
To achieve the learning outcome you must demonstrate the ability to:
- Describe the different classifications of herbs and their actions.
- Explain factors affecting quality control of herbal preparations
- Explain the safety aspects of prescribing herbal preparations.
- Describe a number of potential drug/herb interactions
- Explain the concept of licensing in herbal medicine
- Demonstrate an understanding of herbal terminology
- Describe different methods of herbal preparation
- Describe the health benefits of a number of culinary and therapeutic herbs

Material to be covered
- Definitions and classification of different types of herbs
- Quality control in production of herbal remedies
- Licensing of herbal preparations
• Safety in prescribing herbal preparations and limitations of prescribing in nutritional therapeutics.
• Drug/herb interactions
• Herbal terminology
• Preparation of herbs
• Common culinary herbs, their usage, safety considerations and research supporting their therapeutic effects
• Commonly used therapeutic herbs and their application in various health conditions affecting different body systems
• Synergistic herbal formulas

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Unit 3: Pharmacology, Physiology, Pathology

Day 5: Detoxification and Gastrointestinal Health.

Aims:
- To develop an in-depth understanding of factors affecting the health of the gastrointestinal tract and how nutritional therapy may be used to optimise gastrointestinal health
- To develop a critical awareness of the role of the gastrointestinal tract in detoxification

Learning Outcomes:
On successful completion you will be able to:
1. Evaluate the role of the gastrointestinal tract in detoxification
2. Describe the scope of nutritional therapy in the support of gastrointestinal health
3. Explain the detailed functions of the gastrointestinal tract
4. Show awareness of the importance of referral with ‘Red Flag’ symptoms

Assessment Criteria
To achieve the learning outcome you must demonstrate the ability to:
- Define the concept of toxicity and the nature of a toxin
- Differentiate between endogenous and exogenous toxins and their sources
- Identify symptoms of poor detoxification
- Describe in detail the functions of the gastrointestinal tract
- Outline measures for improving detoxification
- Explain the importance of healthy gut mucosa and the aetiology and implications of leaky gut
- Describe intestinal dysbioisis and the application or probiotic therapy
- Explain the different phases of liver detoxification
- Discuss the potential role of antioxidants in health
- Outline nutritional protocols for GI health

Material to be covered
- Definition of toxins and detoxification
- Definition of endogenous and exogenous toxins and their sources
- Symptoms of poor detoxification and the effects on body systems.
- Physiology and functions of the gastrointestinal tract
- Measures for improving detoxification
- Nature and role of gastrointestinal secretions such as HCl, Pancreatic Enzymes and Bile Acids and their key role in the overall health and immunity
- Intestinal bacteria populations, dysbiosis and use of probiotics
- Liver function and Phases 1, 2 and 3 of detoxification.
- Different types of antioxidants and their potential role in disease prevention
- Nutritional protocols for gastrointestinal health
- Common pathologies of the GIT

Additional Reading

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Unit 3: Pharmacology, Physiology, Pathology

Day 6: Stress and Fatigue

Aims:
- To provide a detailed analysis of the physiological impact of stress on the human body
- To explore multiple factors which create stress within the body
- To outline nutritional strategies for modulating stress response pathways

Learning Outcomes:
On successful completion you will be able to:
1. Evaluate the physiological effects of stress on all body systems
2. Discuss the impact of stress on nutrient status and modulating the HPA axis using nutritional therapy
3. Discuss the range of factors contributing to Chronic Fatigue Syndrome and the benefits of using nutritional therapy

Assessment Criteria
To achieve the learning outcome you must demonstrate the ability to:
- Recognise the signs and symptoms of stress within the body
- Explain how the body responds to mental and physical stressors via the HPA axis and endocrine system
- Explain the effects of mental and physical stressors on a wide range of body systems
- Understand the importance of the adrenal glands in modulating the body’s stress response
- Outline a range of nutrients used to modulate stress response pathways
- Explain the physiology behind chronic fatigue syndrome

Material to be covered
- Definition of stress
- Re-cap of nervous system and the body’s stress response mechanism
- The HPA axis and “Fight or Flight”
- Physiological effects of stress on all body systems ie. Thyroid, Adrenals, Immune system and reproduction.
- Physiological stressors eg. Inflammation and insulin resistance
- Assessment of adrenal function and the HPA
- Nutritional promotion of healthy adaptive response and coping with the modern lifestyle
- Fatigue and mitochondrial function
- Support for Chronic Fatigue Syndrome (CFS)

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Unit 3: Pharmacology, Physiology, Pathology

Day 7: Cardiovascular Health

Aims:
- To provide an overview of common diseases affecting the cardiovascular system
- To outline orthodox diagnostic testing and treatment approaches to cardiovascular disease
- To explore nutritional approaches to optimising the cardiovascular system

Learning Outcomes:
On successful completion you will be able to:
1. Explain the application of nutritional therapy to optimising the cardiovascular system
2. Evaluate orthodox medical approaches to cardiovascular disease
3. Explain the aetiology of common cardiovascular pathologies
4. Show awareness of the importance of referral with ‘Red Flag’ symptoms

Assessment Criteria
To achieve the learning outcome you must demonstrate the ability to:
- Recognise the signs and symptoms of cardiovascular disease
- Outline a range of orthodox medical tests for cardiovascular disease
- Outline a range of orthodox medical treatments for cardiovascular disease
- Outline nutritional interventions which help to support people with cardiovascular pathologies including both dietary changes and nutraceuticals.

Material to be covered
- Pathophysiology, diagnostic criteria orthodox approaches and nutritional support to cardiovascular pathologies eg:
  - Hypertension
  - Hypercholesterolemia/dyslipidemia
  - Atherosclerosis
  - Metabolic syndrome
  - Raynaud’s syndrome
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<tr>
<td>Encyclopaedia of Natural Medicine</td>
<td>Chapters: Heart and Cardiovascular Health Please also see Section IV for specific cardiovascular conditions</td>
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Unit 3: Pharmacology, Physiology, Pathology

Day 8: Over and Under Nutrition

Aims:
- To explore factors affecting fat storage in the body
- To outline nutritional approaches to managing body weight and excess fat storage
- To explore the role/scope of nutritional therapy in supporting clients with eating disorders

Learning Outcomes:
On successful completion you will be able to:
1. Evaluate nutritional approaches to reducing excess fat storage
2. Discuss the physical, mental and social factors which contribute to eating disorders
3. Evaluate the role/scope of the nutritional therapist and nutritional approaches in the support of clients with eating disorders

Assessment Criteria
To achieve the learning outcome you must demonstrate the ability to:
- Identify factors perpetuating fat storage within the body
- Outline the physiological effects of visceral abdominal fat
- Outline nutritional interventions for reducing fat storage including dietary changes and nutraceuticals
- Identify the factors which contribute to eating disorders
- Explain the physiological effects of eating disorders
- Discuss the role of the nutritional therapist in supporting clients with eating disorders
- Show awareness of the importance of referral with ‘Red Flag’ symptoms
- Outline nutritional strategies to support healthy weight management

Material to be covered
- Factors perpetuating fat storage within the body
- Factors affecting and resulting from visceral abdominal fat
- Naturopathic nutritional therapy for excess fat storage
- Aetiology and occurrence of eating disorders
- Role of the nutritional therapist in supporting clients with eating disorders
- Recommendations for supporting and maintaining a healthy body weight in clients with eating disorders

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Unit 3: Pharmacology, Physiology, Pathology

Day 9: Nervous System Health

Aims:
- To provide a detailed understanding of the actions, pre-cursors and synthesis of key neurotransmitters
- To develop an understanding of orthodox medical diagnosis and treatment of neurological disorders
- To present a range of naturopathic nutritional support to neurological health

Learning Outcomes:
On successful completion you will be able to:
1. Explain the role of neurotransmitters in nervous system health
2. Evaluate orthodox medical testing and treatment of neurological disorders
3. Outline nutritional approaches to supporting neurological health
4. Show awareness of the importance of referral with ‘Red Flag’ symptoms

Assessment Criteria
To achieve the learning outcome you must demonstrate the ability to:
- Describe the functions and synthesis of key neurotransmitters
- Outline orthodox medical diagnostics for neurological disorders
- Outline orthodox medical treatment for a range of neurological disorders
- Outline the role of dietary changes and nutraceuticals on the production of key neurotransmitters
- Outline general nutritional interventions for support of nervous system function
- Describe how addictive behaviours can influence the efficacy of nutritional therapy
- Recognise when to refer on

Material to be covered
- Actions of key neurotransmitters
- Nutritional pre-cursors to key neurotransmitters
- Creation and conversion of key neurotransmitters
- Diagnostic criteria, orthodox and naturopathic nutritional approaches to:
- Depression
- Bipolar disorder
- Epilepsy
- Insomnia
- Anxiety and panic attacks
- Addictive behaviour – and factors affecting nutritional therapy

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Unit 3: Pharmacology, Physiology, Pathology

Day 10: Immune System Health

Aims:
- To provide a detailed overview of the physiology of the immune system
- To explore the pathophysiology of inflammation and the role of inflammatory markers
- To outline the pathophysiology and different therapeutic approaches relating to autoimmune diseases and viral infections

Learning Outcomes:
On successful completion you will be able to:
1. Explain the major pathophysiologies of the immune system
2. Describe in detail the functions of different aspects of the immune system
3. Evaluate orthodox medical testing and treatment for autoimmune diseases
4. Outline nutritional therapy approaches to optimal immune function
5. Show awareness of the importance of referral with ‘Red Flag’ symptoms

Assessment Criteria
To achieve the learning outcome you must demonstrate the ability to:
- Describe the immune response mechanism and the role of GALT
- Identify the aetiology of inflammation
- Identify and explain the use of inflammatory markers
- Describe the functions of different types of T helper cells
- Outline the aetiology of autoimmune diseases
- Recognise when to refer for orthodox medical assessment
- Describe the use of nutritional interventions including dietary changes and nutraceuticals in the support of healthy immune function
- Explain the aetiology of common viral infections and the role of nutritional therapy in supporting the body’s immune defences

Material to be covered
- The body’s immune response mechanism including the role of GALT
- Inflammation and inflammatory markers
- T helper cells and their functions including Th1/Th2/Th3
- Autoimmune diseases eg. SLE, AS, juvenile RA
- Viral infections including AIDS

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~ End of Unit 1: Pharmacology, Physiology, Pathology ~