



Australia's  
Global  
University

Faculty of Medicine  
School of Medical Sciences

# PHSL3221

## Endocrine, Reproductive and Developmental Physiology

COURSE OUTLINE and PRACTICAL MANUAL

SEMESTER 2, 2018

CRICOS Provider Code 00098G

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Please read this manual/outline in conjunction with the following pages on the

[School of Medical Sciences website:](#)

- [Advice for Students](#)
- [Learning Resources](#)

(or see "STUDENTS" tab at [medicallsciences.med.unsw.edu.au](http://medicallsciences.med.unsw.edu.au) )

# 1. COURSE STAFF

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## Other Teaching Staff (Lecturers)\*:

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\* consultation times by arrangement with specific staff member

The Department of Physiology in the School of Medical Sciences is located primarily on the 3rd floor of the Wallace Wurth building and is within the School of Medical Sciences, Faculty of Medicine.

**Professor Gary Housley** is Head of Department and appointments may be made directly with him ([g.housley@unsw.edu.au](mailto:g.housley@unsw.edu.au) or phone 9385 1057).

## 2. COURSE INFORMATION

### a) General Introduction

Endocrine, Reproductive and Developmental Physiology is a 3<sup>rd</sup> year Science Course / Level III Physiology course usually undertaken upon successful completion of Physiology 1A (PHSL2101/2121/2501) and 1B (PHSL2201/2221/2502). It is worth six units of credit (6 UOC). The course usually forms part of a major in Physiology and/or Pharmacology in a Bachelor of Science or Bachelor of Medical Sciences degree.

This course has been developed with the aim of stimulating your interest and expanding your knowledge in the areas of endocrinology, reproduction, fertility and fetal development. The endocrine and reproductive physiology component builds on areas covered in Physiology 1B. The study of developmental physiology examines a wide range of organ systems and endocrine functions in the fetus, newborn and pregnant woman, and in this part of the course you will draw on your knowledge of these systems and processes from the relevant parts of Physiology 1A and 1B, and also your understanding of basic anatomy and biochemistry. The Level III Physiology subject most closely related to this course is Cardiovascular Physiology and Pathophysiology (PHSL3211).

The learning and teaching philosophy that underpins this course is our firm belief that a subject offered in the final session of your degree should not only develop a deeper understanding of physiology, but also foster the development of skills useful for your future career. All learning activities in the course are designed with this in mind.

### b) Aims

This course aims to:

1. develop your understanding of the structure, function, control and pathophysiology of endocrine systems;
2. develop your understanding of the mechanisms associated with male and female reproduction and fertility;
3. provide you with an understanding of normal fetal growth and development, post-natal adaptation and survival, and maternal physiology;
4. develop your skills in teamwork, problem solving, communicating with peers, making presentations, independent learning, data analysis and report writing; and
5. stimulate an interest in and appreciation of biomedical research.

### c) Science Graduate Attributes, UNSW

UNSW aims to provide an environment that fosters in you the following qualities, skills and attributes during your time here as a Science student:

#### Science Graduate Attributes, UNSW

1. **Research, inquiry and analytical thinking abilities.**  
Technical competence and discipline specific knowledge. Ability to construct new concepts or create new understanding through the process of enquiry, critical analysis, problem solving, research and inquiry.
2. **Capability and motivation for intellectual development.**  
Capacity for creativity, critical evaluation and entrepreneurship. Ability to take responsibility for and demonstrate commitment to their own learning, motivated by curiosity and an appreciation of the value of learning.
3. **Ethical, Social and Professional Understanding.**  
Ability to critically reflect upon broad ethical principles and codes of conduct in order to behave consistently with a personal respect and commitment to ethical practice and social responsibility. Understanding of responsibility to contribute to the community. Respect and value social, multicultural, cultural and personal diversity.
4. **Communication.**  
Effective and appropriate communication in both professional (intra and inter disciplinary) and social (local and international) contexts.
5. **Teamwork, collaborative and management skills.**  
Ability to recognise opportunities and contribute positively to collaborative scientific research, and to perceive the potential value of ideas towards practical applications. Demonstrate a capacity for self- management, teamwork, leadership and decision making based on open-mindedness, objectivity and reasoned analysis in order to achieve common goals and further the learning of themselves and others.
6. **Information literacy.**  
Ability to make appropriate and effective use of information and information technology relevant to their discipline.

The generic UNSW Graduate Capabilities can also be found at <https://teaching.unsw.edu.au/graduate-outcomes>

Endocrine, Reproductive and Developmental Physiology addresses each of these Science Graduate Attributes. Specific learning outcomes for the course, and the manner in which the course addresses the attributes, are outlined below.

### d) Specific Learning Outcomes

1. On completion of this course you should be able to demonstrate your knowledge and understanding of each of the three course themes outlined below [this relates to Science Graduate Attribute (SGA) 1]. You should be able to:
  - 1a) better understand the structure, function and control of endocrine systems (weeks 1-6), including:
    - thyroid physiology and pathophysiology

- insulin physiology; type 2 diabetes mellitus
  - endocrine control of body weight; endocrine functions of white adipose tissue
  - biosynthesis and actions of adrenal corticosteroids
  - the adrenal medulla and pathophysiology
  - the endocrine and renal response to water immersion
  - calcium metabolism and its hormonal control
  - the renin-angiotensin system
- 1b) better understand the science underlying male and female reproduction and fertility (weeks 4-7), including:
- changes with puberty, menopause and andropause
  - hormonal contraception
  - fertility and assisted reproductive techniques
- 1c) describe the main features of fetal growth, development and adaptation to life after birth (Weeks 7-13), including:
- cardiovascular development and the unique structural and functional aspects of the fetal cardiovascular system
  - fetal fluid regulation and renal function
  - fetal endocrinology
  - structure and functions of the placenta
  - lung development and fetal breathing movements
  - maternal adaptations to pregnancy
  - the transition from fetal to neonatal life
  - lactation and early infant nutrition

**In addition, after you have completed this course you should be able to:**

2. Use your knowledge of developmental physiology to develop an understanding of major areas of current interest in developmental research [SGAs 1 & 6], including:
  - developmental origins of health and adult disease
  - imprinting/epigenetics
  - the physiological basis of neonatal intensive care
3. Demonstrate an ability to contribute effectively in a group to solve a scientific problem. An effective contribution includes critical enquiry i.e. asking questions to clarify points/prompt scientific discussion [SGAs 1, 3, 4, 5].
4. Identify areas in your knowledge of physiology that could be improved, and carry out the self-directed learning necessary to “fill the gaps” [SGAs 1, 2, 6].
5. Research scientific information and communicate it to your colleagues and academic staff in written and oral format [SGAs 1, 4, 6].
6. Critically analyse and report on experimental data in the light of current information within the literature [SGAs 1, 2, 4, 6].
7. Conduct a focused literature search on a topic related to reproduction and developmental physiology and succinctly present this synopsis to your colleagues and academic staff [SGAs 1, 2, 4, 6].
8. Demonstrate some familiarity with examples of research in areas related to fetal physiology and development [SGAs 1, 6].

## e) Teaching Strategies

A variety of teaching strategies are used in this course:

**Lectures** introduce aspects of core material and insights into recent research and current practice. The course convenor conducts research in fetal and developmental physiology. We are also fortunate to have a large number of guest lecturers who are expert in their particular area of research or clinical practice. This means that you will gain an insight into both the basics and the latest issues relating to each of the course themes [specific learning outcomes 1 and 2].

The **problem based learning tutorials** (PBLs) will form a large part of your study of endocrinology. These are designed not only to develop your knowledge of endocrine physiology [specific learning outcome 1a], but also to encourage the development of self-directed learning, teamwork, and communication and presentation skills [specific learning outcomes 3, 4, 5]. More information about PBL tutorials is given later in these notes.

**Practical sessions and discussion classes** are designed to give you a deeper understanding of particular aspects of the course. The practical class '*Gestational diabetes and screening in pregnancy*' enables you to carry out a glucose tolerance test, to learn more about gestational diabetes (a condition affecting 3-8% of pregnant women in Australia) and to examine screening principles including sensitivity, specificity, positive predictive value and negative predictive value [learning outcome 6]. You will consider the endocrine and renal control of circulating volume in the discussion class on '*Hormonal effects of water immersion*' [learning outcome 1a]. In '*Cross-dressing or crossing over*' you will consider sex determination in humans and the issue of intersex [learning outcomes 1b/c and 3]. During a **visit to the neonatal intensive care unit** at the Royal Hospital for Women, Randwick you will have a 'once in a lifetime' opportunity to see how our understanding of fetal and neonatal physiology is applied to treating preterm infants [learning outcome 2]. You will also critically analyse and present a research topic related to reproduction, developmental or fetal physiology in the form of an **oral presentation** [learning outcomes 7 & 8].

### 3. ASSESSMENT

Component	Mark allocation
Case based learning	25%
Group oral presentation	15%
Exam 1 (Endocrine & Reproduction)	30%
Exam 2 (Developmental physiology)	30%
<b>Total</b>	<b>100%</b>

#### Details of assessment components and their rationale

The assessment components in this course are designed to help you to develop the skills outlined in the specific learning outcomes, as well as assessing your knowledge.

#### Case-Based Learning.

There are two parts to this

- (1) Problem Based Learning Classes. Your participation and presentations in three of the four problem based learning (PBL) classes contributes 10% to your final mark. A description of problem based learning and its assessment is included on the following pages.
- (2) Endocrinology Assignment. This written report based on a case study in endocrinology will contribute to 15% of your final mark and should be submitted via Moodle by **10 am Monday of Week 9 (17/9/18)**. Details about this assignment are on pp.17-19. This exercise addresses the specific learning outcomes 1b, 4 and 5 (above). Please note that late submission of this assignment will incur a penalty.

Group Oral Presentation. In week 11 or week 13, you will give an oral presentation in which you provide your colleagues with up to date information on a topic relating to reproduction, fetal or developmental physiology, which will constitute 15% of your final mark. You will work in small groups to prepare and present your talks, and you will be assessed both by your peers and by members of the academic staff. Each member of the group is expected to participate in the presentation and be able to answer questions on the topic. Attendance is required for all presentations (ie not just your own presentation). Topics and further details will be provided later in the session. The oral presentation session helps to achieve specific learning outcomes 1c, 2, 4, 5, 7 and 8.

Examinations. Two examinations of equal weighting are given in this subject. Both exams are of 2h duration. The midsession exam will be held on **Wednesday 5th September (Week 7) at 3:00pm**, and covers all material presented up until the end of week 6 relating to the Endocrinology and Reproductive Physiology components, including all the PBLs. The final exam will be held in the official examination period and assesses all material presented from the beginning of week 7 until the end of the course. Other than the lecture on Menopause and Andropause, the final exam relates to the Fetal and Developmental Physiology component of the course including the *Gestational diabetes and screening in pregnancy* practical class. Note: all course material presented prior to and including the 10 am lecture on 31<sup>st</sup> August is examinable in the midsession exam. All course material presented after and including the 12 pm lecture on 4<sup>th</sup> September is examinable in the final exam. Each of these examinations will consist of multiple choice questions and short answer (5, 10 or 15 minutes) questions and are designed to help you achieve specific learning outcomes 1, 2 and 8.



## Online formative assessment

Formative assessment questions are available online (via Moodle). These questions are multiple choice and are of a similar nature to those that will be in the summative exams. It is strongly recommended that you use these as a guide when studying for these exams and to provide feedback to help you learn.

### What other feedback can I get to help my learning and to get the most out of this course?

This is a challenging course and the course convenor is very willing to help make this an interesting, satisfying way to end your 3<sup>rd</sup> year of studies. **Past exam questions** are given at the end of this outline, and you are encouraged to work through them to provide yourself with feedback on your progress. There will be a **practice exam questions and feedback session** before both the midsession and final exams.

Participation in the **Reading Game** is a good way to increase your familiarity with the course content and assessment performance. To encourage your participation in the Reading Game at least one question from the Reading Game will be included in each of the examinations. As well, students need to participate in the Reading Game to be eligible to attend the Neonatal Intensive Care Unit. Prizes are also awarded.

You are encouraged to **ask questions during lectures, tutorials and discussion classes**. You will receive **feedback on your PBL participation and presentations** in the form of emailed comments and marks after both sessions of the first PBL, and you can also **ask your PBL facilitator for feedback** regarding your presentations and participation in discussions. You will receive feedback as well as marks for your assignment and presentations.

If you plan your oral presentation early you can **ask the course convenor for feedback** on your design/planned content. If there are any other ways in which you think that you can obtain useful feedback, please contact the course convenor.

## 4. PROBLEM BASED LEARNING

### a) Introduction

Problem based learning provides an opportunity for you, working in a group with others, to determine what you need to know in order to solve a given problem. A facilitator/tutor is present in the class and you are provided with information relating to a clinical problem. The role of the facilitator is to maintain and/or provide direction for the group discussion, but not to lead the discussion. Each group will have approximately 10-12 students. Guidelines for how individuals within the group should interact will be discussed and determined by group members with guidance from the facilitator. Each group will have a Discussion Forum on Moodle which only members of their group and their tutor can access.

Throughout the group discussions a scribe lists relevant information extracted from the information provided, and from the group discussion, under the following three headings:

- i. **Known Information:** A summary of the important facts related to the case.
- ii. **Hypotheses:** Possible hypotheses generated from the summarised information and the group discussion.
- iii. **Learning Objectives:** During the group discussion you set Learning Objectives, a list of topics/questions, which will require further investigation and later reporting to the group. This is the most important part of the exercise. At the end of the first session for each PBL case the facilitator divides the list of topics/questions among the group. Each student researches a learning topic and the following week presents the information they have researched to their group.

This entire process aims to help you not only improve your understanding of endocrine and reproductive physiology (Specific Learning Outcomes 1 and 2, above) but also addresses outcomes 5, 6 and 7.

### b) PBL presentations – how to minimise your group’s workload!

These PBL presentations will probably occupy the majority of the time away from class that you allocate to the first part of the course. You must keep in mind that you will come away from each PBL session with information from at least 9 other students. PBL content is assessed in the exam and so you need to make sure that you are providing each other with effective study materials. A big part of what makes a good presentation in this context (and this is included in the marking scheme, below) is conciseness. Think about how effective your handout will be as a study guide for the rest of the group. Once it is written, read it through and take out any unnecessary information. At the first PBL session, discuss with your group what rules you want to establish for giving presentations. These rules should be revised after the first round of presentations if necessary. Start with the following basics:

#### ***Basic rules for PBL presentations***

A strict five minute time limit (shorter if possible – remember that questions take extra time and that you need to get through ~10 presentations in 90 minutes).

1. Limit each presentation to 4 slides (not including title slide and references).
2. Limit handouts to a maximum of one page of text (diagrams can be extra if necessary).
3. Handouts and presentation slides should be posted to your group’s PBL discussion forum prior to the relevant session.
4. A brief reference list is compulsory. Highlight any references you found particularly informative and which would be useful for the rest of the group to study from.

### c) Assessment Criteria for Problem Based Learning Classes

There are two major components in the assessment of the PBL classes:

- 1) **Class interaction.** For these sessions to work well, all members of the group need to participate in the discussion **to the best of their ability**. The facilitator will assess individuals on their **participation** in the group discussion of the topic. This assessment will take into consideration the contribution of the individual to group dynamics e.g. politeness, fairness, respect for the opinions of others, genuine interest in the learning process. If you are not used to working in a group and find this process intimidating, remember that making an effective contribution to the group can be something as simple as taking the initiative to read the information sheet aloud for the rest of the group, or asking somebody to repeat something that you did not understand. This would be regarded as “participated in discussion voluntarily” (see marking scheme below).
- 2) **Reporting.** The second part of the assessment involves the reporting back and discussion of the Learning Objectives, which were allocated in the previous session. The emphasis of the assessment of this component is on how you present the information, and your ability to answer questions on your topic.

### d) Are all four PBLs assessed? How will feedback be given?

The first PBL is to be used to become familiar with the process of problem based learning and to get to know your group. After this PBL, your tutor will send you your assessment via email along with feedback regarding your participation and presentation. **This mark will not contribute to your final assessment.** The remaining 3 PBLs will be formally assessed and we encourage you to use the feedback from your tutor after the first PBL to improve your participation and presentation skills.

### e) How is problem-based learning assessed in the exam?

You are not expected to have an intricate knowledge of all of the material covered during each PBL class for the midsession exam. However, you should be able to demonstrate a broad understanding of the learning objectives outlined in each PBL, and be able to describe the physiology underlying each PBL case. In keeping with this, assessment of problem based learning in the exam will be largely by short answer questions, allowing you to demonstrate a broad understanding of the area, rather than by MCQs, which tend to assess specific aspects of your knowledge. Examples of questions relating to PBL classes in past exams are given at the end of this guide. MCQ questions in the formative assessment and practice exam on topics covered by the PBLs should also guide your learning.

## Marking scheme:

### *Class Interaction – Assessed by facilitator during session 1 of PBLs 1-4*

Standard	Mark (out of 5)	Required Performance
Very Poor	0-1	- no participation in class discussion; not obviously listening to other group members
Poor	2	- minimal participation; only participated in response to direct questioning
Adequate	3	- participated in discussion voluntarily;
Good	4	- voluntarily contributed to the group discussion; provided insightful comments or questions
Very Good	5	- major role in group discussion without dominating the group and still allowing other members of the group to contribute

### *Reporting – Presentation assessed by facilitator during session 2 of PBLs 1-4*

Standard	Mark (out of 10)	Required Performance
Very Poor	0-2	- no research or preparation on allocated topic
Poor	3-4	- inadequate research on the allocated topic - explanation unclear or contains major errors
Adequate	5-7	- adequate research on the topic - mainly accurate information provided, although some errors noted - failure to comply with time limit, slide or handout requirements eg provided too much information
Good	8-9	- topic researched thoroughly - information explained clearly, accurately and concisely - complied with time limit, slide and handout requirements - good understanding of topic and able to answer questions - able to relate their topic to the whole PBL
Very Good	10	- topic researched thoroughly - information explained clearly, accurately and concisely - information presented in an interesting or novel way - complied with time limit, slide and handout requirements - thorough understanding of topic and able to answer questions - able to relate their topic to the whole PBL

## 5. COURSE SCHEDULE AND ATTENDANCE REQUIREMENTS

The course timetable is attached at the end of these notes and can also be found on Moodle. You are expected to attend all rostered activities for their full duration.

Several attendance requirements warrant special mention:

***Problem based learning tutorials.*** PBLs form a major part of your learning for the Endocrinology and Reproductive components of this course. You are relying on other members of your group to attend all sessions, carry out the necessary research and report back to the group, and they are relying on you to do the same. For both of these reasons attendance at all PBL sessions is compulsory. Non-attendance for other than documented medical or other serious reasons, or unsatisfactory performance, will result in an additional assessment exam or in ineligibility to pass the course.

***Practical class 'Gestational Diabetes and Screening in Pregnancy.'*** Attendance is compulsory at this class. The class involves the use of human subjects and has been considered and approved by the university's Committee on Experimental Procedures Involving Human Subjects. Each student must read the details of this experiment carefully before embarking on it, and is required to raise any matters of concern with the person in charge of the class before the experiment has begun. You are expected to behave in a professional manner in this class and demonstrate respect for your colleagues during any experiment involving human subjects. Students volunteering to act as subjects will be required to sign witnessed informed consent forms. These will be distributed and collected in the practical class.

***The neonatal intensive care visit.*** Some students will have the opportunity to visit the Newborn Care Centre at the Royal Hospital for Women, Randwick. These sessions will be held in practical class slots on Wednesday afternoons in weeks 9, 10 and 12. Students will sign up to attend these sessions on Moodle. Unfortunately, places are limited so not all students will be able to attend. Note that in order to be eligible to sign up for these sessions, students need to be participating in the Reading Game. Students who sign up must appreciate that this is a tremendous privilege, and that there may be family members there for whom this is a very stressful time. Please dress appropriately, behave in a professional, respectful manner at all times, and follow any instructions given to you by hospital staff. It is essential that you wear closed in shoes or you will not be permitted into Newborn Care Unit. The hospital staff are spending considerable time and effort to offer you this opportunity and if you volunteer to attend this class your attendance is compulsory.

***Two peas in a pod.*** Your attendance and participation at your scheduled class (either week 9 or week 10) is essential.

***Presentation preparation time.*** Time has been allocated during at least one of the practical class sessions in weeks 9,10 and 12 to allow you to work on your presentation. You are encouraged to use this time to get together with other group members to ensure that your presentation forms a cohesive whole.

## 6. RESOURCES FOR STUDENTS

### a) Textbooks

There are no prescribed texts for this course. '*Ganong's Review of Medical Physiology*' provides a very good coverage for the endocrine component of the course, while Harding & Bocking '*Fetal Growth and Development*' is an excellent reference for developmental physiology. Blackburn's '*Maternal, Fetal & Neonatal Physiology*' is useful for the reproduction and developmental components of the course. The others are more specialist textbooks which are held in print in the UNSW library or can be accessed online through the UNSW library catalogue or the links below and could be consulted as a reference if necessary. (**You may need to log in with your zpass.**)

- Barrett KE, Barman SM, Boitano S & Brooks HL. *Ganong's Review of Medical Physiology*. 25th edition, 2016. Lange. (Note: it is fine to use the 24<sup>th</sup> or 23<sup>rd</sup> Edition).  
<http://accessmedicine.mhmedical.com/book.aspx?bookid=1587>
- Blackburn ST. *Maternal, Fetal & Neonatal Physiology*. 4<sup>th</sup> Edition, 2013. Elsevier.  
<https://ebookcentral-proquest-com.wwwproxy1.library.unsw.edu.au/lib/unsw/detail.action?docID=2072142>
- Gardner DG & Shoback D. *Greenspan's Basic & Clinical Endocrinology*. 10<sup>th</sup> edition. 2018, Lange.  
<https://accessmedicine.mhmedical.com/book.aspx?bookid=2178>
- Harding, R and Bocking, AD (eds). *Fetal Growth and Development*. Cambridge UP.
- Holt RIG & Hanley, NA. *Essential Endocrinology and Diabetes*. 6<sup>th</sup> Edition. Wiley-Blackwell, 2012.  
<https://ebookcentral-proquest-com.wwwproxy1.library.unsw.edu.au/lib/unsw/detail.action?docID=822511>
- Kovacs WJ & Ojeda, SR. *Textbook of Endocrine Physiology*. 6<sup>th</sup> Edition, Oxford UP, 2012.  
<https://ebookcentral-proquest-com.wwwproxy1.library.unsw.edu.au/lib/unsw/detail.action?docID=845972>

### b) Other Resources

- The learning activities may involve supplementary reference articles and printed lecture notes.
- For the PBLs you may find Harrison's online (a medical database, the online version of Harrison's Principles of Internal Medicine) and the Oxford Textbook of Medicine (electronic resource) useful resources. These can be accessed via the UNSW library catalogue.
- McPhee, SJ & Hammer GD. *Pathophysiology of Disease: An Introduction to Clinical Medicine*. 7th Edition. Lange. Available as an online text accessed via the UNSW library catalogue. This is likely to be helpful for the PBLs and the Endocrinology Assignment.
- Moodle: Lecture notes, course-related material such as timetables and outlines, as well as supplementary articles may be placed on Moodle. Marks for assessment tasks will also be posted here. Announcements will be made via Moodle and it is your responsibility to regularly check this site.
- All lectures taped by UNSW Lecture Recordings + and can be accessed via UNSW Moodle.

See also: [Learning Resources](#) on the SoMS website.

## 7. CONTINUAL COURSE IMPROVEMENT

## **a) MyExperience**

Changes are continuously being made to this course to keep it current and to make it a worthwhile experience for you. UNSW introduced MyExperience for student feedback in all courses starting from Semester 1 2017, and this tool will be used in this course. This evaluation tool replaces the Course and Teaching Evaluation and Improvement (CATEI) Process. Your feedback is taken seriously, and the improvements that are made to the course are based in part on such feedback. In previous years many students made the comment that they wanted more feedback to help their learning. In response this, PBL facilitators email students individually to provide feedback on their presentations and class participation, and two formative assessment tools have been produced. Participation in the Reading Game also provides feedback. Other recent changes include submission of the Endocrine Assignment via Moodle rather than a hard copy, which made it easier for students to access their feedback once the assignment was marked. Some students have commented that they would have preferred a greater percentage of the course mark allocated to the assignment and group presentation, given the amount of time that they spent on these activities. Therefore, in 2018, both of these components have been increased to 15% of the course marks (previously 10%), and each of the examinations have correspondingly been reduced from 35% to 30%. As well, this year peer evaluation will be incorporated into the marks allocated to the group oral presentation. Disappointingly, in 2017, only 23% of the students enrolled in the course responded to the MyExperience survey. However, of these, 92.9% agreed with the statement "Overall I was satisfied with the quality of the course".

## **b) Student panel**

While individual students are welcome to provide feedback to the course convenor, your views regarding the course can also be put forward by a small panel of student representatives. These representatives will have the opportunity to meet with the course convenor during session to provide feedback on the course structure, learning activities and staff. This will enable you to make your views known while the course is running, as opposed to at the end of the course (which is a disadvantage of MyExperience evaluation).

## 8. GENERAL INFORMATION

Note: further advice on SoMS website:

<https://medicalsciences.med.unsw.edu.au/students/undergraduate/advice-students>

### SCHOOL OF MEDICAL SCIENCES HONOURS PROGRAM

There is an Honours program conducted by the School. This program is coordinated by Dr Greg Smith ([g.smith@unsw.edu.au](mailto:g.smith@unsw.edu.au) ph: 9385 8075). Any students considering an Honours year should discuss the requirements with Dr Smith. Outstanding students may be considered for scholarships offered annually by the University and School.

### POSTGRADUATE RESEARCH DEGREES

The Department offers students the opportunity to enter into the following graduate programs:

**Doctorate (PhD):** For further information contact the coordinators, A/Prof Pascal Carrive ([p.carrive@unsw.edu.au](mailto:p.carrive@unsw.edu.au)) or Dr Nicole Jones ([n.jones@unsw.edu.au](mailto:n.jones@unsw.edu.au)).

### HANDWRITING

Students whose writing is difficult to understand will disadvantage themselves in their written assessment. Make every effort to write clearly and legibly. Do not use your own abbreviations.

### SUPPLEMENTARY EXAMS

If you miss an exam for medical reasons you must supply adequate documentation (including a medical certificate) to UNSW Student Central within 3 working days of the date of the exam. Your request for consideration will then be assessed and a deferred exam may be granted. Supplementary exams for the School of Medical Sciences in Semester 2, 2018 will be held Saturday 8 December – Saturday 15 December. **Further assessment will NOT be offered on any alternative dates and failure to sit for the appropriate exam may result in an overall failure for the course.** Supplementary exams may include a significant oral element.

### MEDICAL CERTIFICATES

Students who miss classes due to illness or for other reasons must submit a copy of medical certificates or other acceptable documentation to Dr Gibson. **Certificates should be lodged no more than 7 days after an absence. Certificates lodged after 7 days will not be accepted.** The following details must be attached:

Name, Student number, Course number, Date of the class, Name of class/es missed.



## 9. ENDOCRINOLOGY ASSIGNMENT

### Task Description

Each of the 3 cases below describes a patient with an endocrine disorder. Choose **one** case and write a report about the patient's endocrine disorder.

In your report you should include:

- (1) a description of the biosynthesis of the main hormone(s) involved (4 marks)
- (2) a description of the normal mechanisms which control secretion of the main hormone(s) involved (4 marks)
- (3) an explanation of the mechanisms underlying each of the patient's symptoms, signs and test results (8 marks)
- (4) a brief explanation of possible causes/etiology of the disease (3 marks)
- (5) a brief explanation of possible treatments (3 marks).

Your report should be 2000 words (excluding references, figures and tables), and be properly referenced with in text references and a reference list. Please use the APA Referencing System. Further details about APA referencing are available at <https://student.unsw.edu.au/apa>.

You must submit your assignment electronically via Turnitin Moodle by the due date and time. Please include in the file name of your assignment which case (1, 2 or 3) you have chosen. As well you must include the word count on the front cover sheet.

**Due date: 10 am Monday 17<sup>th</sup> September (Week 9).**

A penalty will be applied for late submission.

### Assessment Criteria

You will be assessed on:

- the scientific content of your report
- how well you have communicated your ideas (use of clear, simple, grammatical language; clear explanations; logical structure; appropriate language; effective use of illustrations where appropriate)
- evidence of critical thinking (discussion of inconsistencies in the literature; use of logical argument)
- whether your report is appropriately referenced
- your choice of sources (range, quality, relevance).

Your assignment will be marked out of 25. In addition to the 22 marks which are allocated as described above, 3 marks are allocated for communication and referencing. Marks will be deducted for exceeding the word limit.

Questions related to the assignment can be posted on the relevant Moodle discussion board.

Note: for this assignment, it is not a requirement to use original research sources, although you should ensure that you choose reliable resources. The resources listed on p.14 of this course outline would be suitable sources to start with. In general, you should not be referencing lecture slides. Also, avoid referencing websites of questionable authority.

## **CASE 1**

A 20 year old woman presents to her doctor with increased urine production. Beginning about a month previously she had noticed that she was waking up a couple of times a night to pass urine. More recently she noticed that she was also passing urine more frequently during the day, sometimes as often as once an hour.

Her mother had suggested that this increased urine production might have been due to her high caffeine consumption. However, for the past week she had limited herself to one cup of coffee per day, but still found that her urinary frequency continued. In addition she found that she was always thirsty. She had started carrying a large water bottle with her and re-filling it several times a day. She had also noticed that the urine she passed was almost colourless, rather than yellow.

On physical examination the doctor found no abnormalities.

Blood and urine tests were ordered which showed:

Plasma sodium concentration 149 mmol/L (reference range 136-145 mmol/l)

Plasma osmolality 308 mOsm/kg (reference range 285-295 mOsm/kg)

Fasting plasma glucose 5 mmol/l (reference range 4.2-6.4 mmol/l)

Urinary osmolality 200 mOsm/kg.

Urinary glucose - negative.

Further questioning revealed that no other family members had ever displayed these symptoms. There was no history of traumatic head injury. An MRI of her brain was normal.

A two-hour water deprivation test was performed. After two hours of not being able to drink water, the osmolality of her plasma and urine were measured a second time. Her urinary osmolality remained at ~ 200 mOsm/kg, but her plasma osmolality increased to 315 mOsm/kg. She was then injected with a drug called DDAVP. One hour after the injection, the osmolality of her plasma decreased to 290 mOsm/kg and the osmolality of her urine increased to 425 mOsm/kg.

The diagnosis of idiopathic pituitary diabetes insipidus was made.

## **CASE 2**

A 60 year old man with a history of hypertension and non-insulin dependent diabetes mellitus, presented to his doctor because, although normally an active man, he was finding that his muscles were weak and he was tiring more easily. On examination, his diastolic pressure was more elevated than usual but no other abnormalities were detected. A blood test was ordered which indicated that his potassium level was 2.8 mmol/l (reference range 3.3-4.7 mmol/l).

As the man was taking frusemide (a potassium-wasting diuretic drug) to treat his hypertension, it was initially considered that this drug was the likely cause of the hypokalaemia. Consequently, frusemide was discontinued, and the man was commenced on oral potassium supplementation.

A week later, the man had further blood tests which showed:

Plasma potassium 2.7 mmol/l (reference range 3.3-4.7 mmol/l)

Plasma sodium 144 mmol/l (reference range 137-145 mmol/l)

Plasma chloride, magnesium, bicarbonate and pH were all within normal limits.

Red blood cell and white cell counts were normal.

In view of the persistent hypokalaemia, several hormone assays were performed with blood sampled at 9.30 am, after he had been seated for one hour.

Upright plasma aldosterone concentration 38 ng/dl (reference range 4-31 ng/dl)

Upright plasma renin activity - 0.4 ng/ml/h

Plasma aldosterone concentration to plasma renin activity ratio – 95 ng/dl per ng/ml/h (a ratio > 30 is strongly suggestive of autonomy of aldosterone secretion).

Primary hyperaldosteronism was confirmed by an acute intravenous isotonic saline load test. Pre and post infusion aldosterone levels were 35 and 17 ng/dl, respectively (maximum acceptable level after infusion = 5 ng/dl).

A high resolution abdominal CT scan was performed which demonstrated enlargement of the left adrenal gland and one cortical nodule approximately 1.5 cm in diameter. A diagnosis of Conn's syndrome was made and the patient was scheduled for surgery.

### **CASE 3**

A 37-year-old man presented to the emergency department with a five-week history of nausea, vomiting and weakness. He said that he did not weigh himself routinely, but he felt that he had lost weight because his clothes were looser and he had needed to get an extra hole in his belt so that his jeans did not fall down. He had seen his general practitioner on a couple of occasions for symptoms of fatigue, nausea and anorexia. Because of the gastrointestinal nature of his symptoms, he had been treated with cimetidine and antacids, without improvement. More recently he found he was craving salt.

On physical examination, the man looked unwell. His blood pressure was 100/47 mmHg while he was lying down but fell to 70/30 mmHg when he stood up. There were areas of blue/black discolouration on his gums, and he appeared to be tanned in patches over pressure areas on his knees and elbows. Physical examination was otherwise normal.

Laboratory results were as follows:

Plasma potassium 5.8 mmol/l (reference range 3.3-4.7 mmol/l)

Plasma sodium 127 mmol/l (reference range (136-145 mmol/l)

Morning cortisol level 69 nmol/L (reference range 138 to 635 nmol/L).

Plasma ACTH level was 54.8 pmol/L (reference range 2.0 to 11.5 pmol/L).

A screening test for adrenal function was performed.

Plasma cortisol levels at 30, 60 and 90 minutes after injection of cosyntropin (250 µg) were 72 nmol/L, 74 nmol/L and 55 nmol/L respectively.

At 90 minutes, the plasma aldosterone level was less than 28 pmol/L (the normal incremental increase is >111 pmol/L).

A CT scan showed a severe reduction in the size of the adrenal glands bilaterally. His chest X ray was normal, except that the heart size seemed rather small. The tuberculin skin test was negative. His blood contained autoantibodies against 21 hydroxylase.

A diagnosis of Addison's disease was made and steroid replacement therapy with hydrocortisone and fludrocortisone acetate was begun.

## TIMETABLE 2018

### PHSL3221 Endocrine, Reproductive and Developmental Physiology

Lectures: Tuesday 12- 1 pm (Mat D), Friday 9 – 11 am (Vall 121).

Pracs/PBLs: Wednesday 3 - 6 pm (location indicated below).

<b>WEEK 1</b>			
Tuesday 24/7	12 pm	Introduction and course information	Dr K Gibson
Friday 27/7	9 am	Concepts in endocrinology	Dr K Gibson
Friday 27/7	10 am	Insulin physiology	A/Prof N Turner
<b>WEEK 2</b>			
Tuesday 31/7	12 pm	Diabetes and islet B cells	Dr R Laybutt
Wednesday 1/8	3 pm	PBL 1.1 WW116/Mat 302/Mat303/Mat306/Mat313	PBL tutors
Friday 3/8	9 am	Growth	Dr K Gibson
Friday 3/8	10 am	Endocrine functions of white adipose tissue	Dr M Swarbrick
<b>WEEK 3</b>			
Tuesday 7/8	12 pm	Discussion class: hormonal effects of water immersion	Dr K Gibson
Wednesday 8/8	3 pm	PBL 1.2: PBL 2.1 WW116/Mat 302/Mat303/Mat306/Mat313	PBL tutors
Friday 10/8	9 am	Update on the renin angiotensin system	Dr K Gibson
Friday 10/8	10 am	Hypothalamic regulation of body weight	Dr K Ip
<b>WEEK 4</b>			
Tuesday 14/8	12 pm	Gut hormones	Dr L Liu
Wednesday 15/8	3 pm	PBL 2.2; PBL 3.1 WW116/Mat 302/Mat303/Mat306/Mat313	PBL tutors
Friday 17/8	9 am	Puberty	Dr K Gibson
Friday 17/8	10 am	Regulation of fertility	Dr A Finch
<b>WEEK 5</b>			
Tuesday 21/8	12 pm	Fertility and assisted reproductive technology	Dr A Clark
Wednesday 22/8	3 pm	PBL 3.2; PBL 4.1 WW116/Mat 302/Mat303/Mat306/Mat313	PBL tutors
Friday 24/8	9 am	Androgens and anabolic steroids	Dr K Gibson
Friday 24/8	10 am	Oocyte development and Maturation	Dr M Bertoldo
<b>WEEK 6</b>			
Tuesday 28/8	12 pm	Discussion class: Cross-dressing or crossing over?	Dr K Gibson
Wednesday 29/8	3 pm	PBL 4.2 WW116/Mat 302/Mat303/Mat306/Mat313	PBL tutors
Friday 31/8	4:30pm	Practice exam questions and feedback – WW116	Dr K Gibson
Friday 31/8	9 am	Oversecretion: catecholamines and serotonin	Dr K Gibson
Friday 31/8	10 am	Calcium metabolism	Dr K Gibson
<b>WEEK 7</b>			
Tuesday 4/9	12 pm	Menopause and andropause	Dr K Gibson
Wednesday 5/9	3 pm	<b>Midsession Exam (WW115)</b>	Dr K Gibson
Friday 7/9	9 am	Introduction to Fetal Physiology	Dr K Gibson
Friday 7/9	10 am	Maternal Physiology	Dr K Gibson

<b>WEEK 8</b>			
Tuesday 11/9	12 pm	Regulation of fetal fluids	Dr K Gibson
Wednesday 12/9	3 pm	Practical Class – Gestational diabetes and screening in pregnancy (WW 116)	Dr K Gibson + staff
Friday 14/9	9 am	Fetal circulation	Dr K Gibson
Friday 14/9	10 am	Fetal responses to hypoxia	Dr K Gibson
<b>WEEK 9</b>			
<b>Monday 17/9</b>	<b>10 am</b>	<b>Endocrine assignment due</b>	<b>Moodle</b>
Tuesday 18/9	12 pm	Neonatal Intensive Care	Dr K Lui
Wednesday 19/9	3 pm	Group A - Neonatal Nursery (Royal Hospital for Women)	Dr K Lui
	3:30 pm	Groups B & C – Two peas in a pod (WW116)	Dr K Gibson
		Groups D – Free time/presentation preparation	
Friday 21/9	9 am	Placenta A	Dr K Gibson
Friday 21/9	10 am	Placenta B	Dr K Gibson
<b>RECESS:</b>		<b>24<sup>th</sup> September – 1<sup>st</sup> October</b>	
<b>WEEK 10</b>			
Tuesday 2/10	12 pm	“Ghost in your genes” – on Moodle	
Wednesday 3/10	3 pm	Group B - Neonatal Nursery (Royal Hospital for Women)	Dr K Lui
	3:30 pm	Groups A & D – Two peas in a pod (WW116)	Dr K Gibson
		Group C – Free time/presentation preparation	
Friday 5/10	9 am	Fetal breathing	Dr K Gibson
Friday 5/10	10 am	Developmental Origins of Health and Disease	Dr C Maloney
<b>WEEK 11</b>			
Tuesday 9/10	12 pm	Fetal endocrinology	Dr K Gibson
Wednesday 10/10	3 pm	Group oral presentations – all students (LG03)	Dr K Gibson + staff
Friday 12/10	9 am	Parturition	Dr K Gibson
Friday 12/10	10 am	Epigenetics	Dr C Maloney
<b>WEEK 12</b>			
Tuesday 16/10	12 pm	Adaptation to life after birth	Dr K Gibson
Wednesday 17/10	3 pm	Group C - Neonatal Nursery (Royal Hospital for Women)	Dr K Lui
		Groups A, B, D – free time/presentation preparation	
Friday 19/10	9 am	Lactation and early infant nutrition	Dr K Gibson
Friday 19/10	10 am	Practice exam questions	Dr K Gibson
<b>WEEK 13</b>			
Wednesday 24/10	3 pm	Group oral presentations – all students (LG03)	Dr K Gibson + staff