



THE UNIVERSITY OF  
NEW SOUTH WALES

DEPARTMENT OF PHYSIOLOGY  
SCHOOL OF MEDICAL SCIENCES

PHSL3221

# ENDOCRINE, REPRODUCTIVE AND DEVELOPMENTAL PHYSIOLOGY

SESSION 2, 2010

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# 1. COURSE STAFF

## Course conveners:

- Dr Karen Gibson  
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- Dr Amanda Boyce  
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## Other Teaching Staff (Lecturers)\*:

Name	Department	Contact e-mail
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Dr Kei Lui	Director, Department of Newborn Care, Royal Hospital for Women/Senior Lecturer, SWCH	Please arrange contact through Drs Boyce or Gibson
Scientia Professor Emeritus Eugenie Lumbers	SOMS/Physiology & Pharmacology	Please arrange contact through Drs Boyce or Gibson
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\* consultation times by arrangement with specific staff member

## **2. COURSE INFORMATION**

### **2a) 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.

### **2b) 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.

## 2c) 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 Attributes can also be found at [http://learningandteaching.unsw.edu.au/content/LT/course\\_prog\\_support/unsw\\_grad\\_atts.cfm?ss=2](http://learningandteaching.unsw.edu.au/content/LT/course_prog_support/unsw_grad_atts.cfm?ss=2).

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.

## 2d) 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 2-7), 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
  - anabolic steroids
  - 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 6-8), 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 8-13), 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
  - 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].

**2e) 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 conveners both conduct their 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 objectives 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 objective 1a], but also to encourage the development of self directed learning, teamwork, and communication and presentation skills [specific learning objectives 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 two '*Glycaemic Index*' classes investigate the concept of glycaemic index and enable you to think critically about the usefulness or otherwise of glycaemic index as a tool for dietary management [learning objective 6]. In these 2 classes you will obtain data from experimental subjects and consider how to analyse the data and present it [learning objective 6]. You will consider the endocrine and renal control of circulating volume in the discussion class on '*Hormonal effects of water immersion*' [learning objective 1a]. In the practical class on the '*Placenta and Fetal membranes*' you will examine museum and wet specimens of placenta and membranes at various stages of gestation and also use virtual microscopy to further your understanding of these important products of conception [learning objective 1c]. 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 objective 2]. You will also critically analyse and present a research topic related to reproduction, developmental or fetal physiology in the form of a **poster presentation** [learning objectives 7 & 8].

### 3. ASSESSMENT

Component	Mark allocation
PBL classes	10%
Endocrinology assignment	10%
Poster presentation	10%
Exam 1 (Endocrine & Reproduction)	35%
Exam 2 (Developmental physiology)	35%
<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.

Problem Based Learning Classes. Your participation 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.

Endocrinology Assignment. This written report based on a case study in endocrinology will contribute to 10% of your final mark and should be handed in to the School of Medical Sciences Office (MG14, Ground floor, Wallace Wurth Building) by **5 pm Friday of Week 8 (17/9/09)**. Details about this assignment will be available on Blackboard. This exercise addresses the specific learning objectives 1b, 4 and 5 (above). Please note that late submission of this assignment will incur a penalty.

Poster Presentation. In the final week of session, you will present a poster providing up to date information on a topic relating to reproduction, fetal or developmental physiology, which will constitute 10% of your final mark. You will work in small groups to prepare and present your posters, and you will be assessed during the session both by your peers and by members of the academic staff. Each member of the group is expected to participate in the poster presentation, and attendance is required for both poster sessions. Topics and further details will be provided later in the session. The poster session helps to achieve specific learning objectives 1c, 2, 4, 5, 7 and 8.

Examinations. Two 90 minute examinations of equal weighting are given in this subject. The first will be held on **Tuesday 14th September (Week 8)** and covers all material relating to the Endocrinology and some of the Reproductive Physiology components of the course, including the Glycaemic Index practicals and the first three PBLs. The second will be held in the official examination period and assesses only the remaining Reproductive Physiology components and all Fetal and Developmental Physiology component. The material which will be covered in the second exam is marked with an asterisk in the timetable. Note this includes the fourth PBL and the Placenta and Fetal Membranes

practical.. Each of these examinations consist of multiple choice questions and short answer (5 minutes or 10 minutes) questions and are designed to help you achieve specific learning objectives 1, 2 and 8.

### Online formative assessment

Formative assessment questions are available online (via blackboard). These questions are multiple choice and are of a similar nature to those that will be in the summative exams. We strongly recommend 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 conveners are more than 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. We will be holding a **practice exam session** before the midsession exam, and a **feedback session** following this exam. You are encouraged to **ask questions during lectures, tutorials and discussion classes**. You will receive **ongoing feedback on your PBL participation and presentations** in the form of emailed comments and marks, and you can also **ask your PBL facilitator for feedback** regarding your presentations and participation in discussions. If you plan your poster early you can **ask the course conveners for feedback** on your design/planned content. If there are any other ways in which you think that we can give you useful feedback, please let us know.

## 4. PROBLEM BASED LEARNING

### 4a) 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 students. Guidelines for how individuals within the group should interact will be discussed and determined by group members with guidance from the facilitator.

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

**1) Known Information:** A summary of the important facts related to the case.

**2) Hypotheses:** Possible hypotheses generated from the summarised information and the group discussion.

**3) 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 Objectives 1 and 2, above) but also addresses objectives 5, 6 and 7.

### 4b) 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 10 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 through it 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.
2. Limit handouts to a maximum of one page of text (diagrams can be extra if necessary).
3. 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.

### 4c) 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 “voluntarily contributing to the group discussion” (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.

### Marking scheme:

#### ***Class Interaction – Assessed by facilitator during session 1 of PBLs 2-4***

Standard	Mark (out of 5)	Required Performance
Very Poor	0-1	- no participation in class discussion
Poor	2	- only participated when directed by facilitator/tutor
Adequate	3	- participated in discussion only when directed by other group members
Good	4	- voluntarily contributed to the group discussion
Very Good	5	- initiated and participated in the group discussion - allowed other members of the group to contribute

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

Standard	Mark (out of 10)	Required Performance
Very Poor	0-2	- no research or preparation on allocated topic
Poor	3-4	- topic clearly not researched - explanation unclear - no understanding of the specific topic
Adequate	5-7	- topic researched and explained clearly - showed some understanding of the specific topic
Good	8-9	- topic researched thoroughly - clear and concise presentation - had a clear understanding of the specific topic
Very Good	10	- topic researched thoroughly - clear and concise presentation - had a clear understanding of the specific topic - able to relate their topic to the whole assignment

#### 4d) Are all four PBLs assessed? How will feedback be given?

We want you to use the first PBL 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 continuing feedback from your tutor to improve your participation and presentation skills.

#### 4e) 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.

## 5. ACADEMIC HONESTY AND PLAGIARISM

Students should be aware of UNSW's policy on academic and student misconduct:

<https://my.unsw.edu.au/student/academiclife/assessment/AcademicMisconductStudentMisconduct.html>

**Plagiarism or failure to acknowledge sources will not be tolerated in submitted work.** The University regards this as academic misconduct and imposes severe penalties. Written assignments may be tested for originality against source documents on the Internet and other submitted assignments using the originality detection software Turnitin. Evidence of plagiarism in submitted assignments, etc. will be thoroughly investigated and may be penalised by the award of a score of zero for the assessable work. Flagrant plagiarism will be directly referred to the Division of the Registrar for disciplinary action under UNSW rules.

Students should be familiar with the following:

### What is Plagiarism?

Plagiarism is the presentation of the thoughts or work of another as one's own.\* Examples include:

- direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.

Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does *not* amount to plagiarism.

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

[www.lc.unsw.edu.au/plagiarism](http://www.lc.unsw.edu.au/plagiarism)

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

\* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle

† Adapted with kind permission from the University of Melbourne.

## 6. COURSE SCHEDULE AND ATTENDANCE REQUIREMENTS

The course timetable is attached at the end of these notes and can also be found on Blackboard. 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 classes 'Glycaemic Index I', 'Glycaemic Index II' and 'Placenta and fetal membranes':*** Attendance is compulsory at these classes. The Glycemic Index classes involve the use of human subjects and have 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, in practical sessions in weeks 10-12. Students will sign up to attend these classes on Blackboard. Unfortunately the hospital cannot accommodate all students. Students who are able to attend 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. These 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.** Held concurrently with the neonatal intensive care visits. Your attendance and participation is essential.

## 7. RESOURCES FOR STUDENTS

### 7a) 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. The others are more specialist textbooks which are held in the UNSW library and could be consulted as a reference if necessary.

*NOTE: Ganong's 'Review of Medical Physiology' is available as an online text through the UNSW library catalogue. Copies of all other texts have been placed in the MyCourse (Reserve) collection of the UNSW library.*

- Ganong, WF. *Review of Medical Physiology*. 23<sup>rd</sup> edition, 2010. Lange.
- Harding, R and Bocking, AD (eds). *Fetal Growth and Development*. Cambridge UP.
- Laycock, J & Wise, P. *Essential Endocrinology*. Oxford UP.
- Griffin, JE & Ojeda, SR (eds). *Textbook of Endocrine Physiology*. Oxford UP.
- Thorburn, G & Harding, R. *Textbook of Fetal Physiology*. Oxford UP.
- Nathanielsz, PW. *Life Before Birth and a Time to be Born*. Promethean Press.

### 7b) 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, Vishwanath, RL, Ganong, WF. *Pathophysiology of Disease: an Introduction to Clinical Medicine*. 4<sup>th</sup> Edition. In MyCourse (Reserve), UNSW library. This is likely to be helpful for the PBLs and the Endocrinology Assignment.
- *Blackboard:* Lecture notes, course-related material such as timetables and outlines, as well as supplementary articles may be placed on Blackboard. Marks for assessment tasks will also be posted here. Announcements will be made via Blackboard and it is your responsibility to regularly check this site.

## 8. CONTINUAL COURSE IMPROVEMENT

### 8a) CATEI

We are continually making changes to this course to keep it current and to make it a worthwhile experience for you. Each year we seek evaluative feedback from students using UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process. Your feedback is taken seriously, and the improvements we make to the course are based in part on such feedback. In recent years many students made the comment that although they very much enjoyed and valued the PBL classes, they felt that the workload involved was too large compared with what was expected from other courses. We reduced the number of PBL classes from 5 to 4, partly in light of this feedback. Students in 2008 asked for more feedback to help their learning. In response, in 2009 we provided feedback to each student via email following each PBL class, and produced two formative assessment tools. We will continue this feedback in 2010. For 2010, we have added a new practical class (Placenta and fetal membranes), two case-based discussion classes (Cross-dressing or crossing over? and Two peas in a pod?) and an end of course revision class (Fetal physiology Q&A).

### 8b) Student panel

While we welcome individual students providing us with feedback, your views regarding the course can also be put forward to the course convenors by a small panel of student representatives. These representatives will have the opportunity to meet with the course convenors during session to provide feedback on the course structure, learning activities and staff. We hope that this will be a useful avenue for you to make your views known while the course is running.

## 9. GENERAL INFORMATION

The Department of Physiology in the School of Medical Sciences is located primarily on the 2<sup>nd</sup> and 3<sup>rd</sup> floors of the Wallace Wurth building and is within the School of Medical Sciences, Faculty of Medicine. General inquiries can be made at the School of Medical Sciences Reception, located at MG14 on the ground floor of the Wallace Wurth building (office hours are 8:30am - 5:00pm).

**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).

The SOMS Student Advisor, Ms Carmen Robinson ([Carmen.Robinson@unsw.edu.au](mailto:Carmen.Robinson@unsw.edu.au), ph: 9385 2464, G27 Biosciences Building), is able to provide additional information on any courses offered by the School.

### SCHOOL OF MEDICAL SCIENCES HONOURS PROGRAM

There is an Honours program conducted by the School. This program is coordinated by Dr Patsie Polly ([patsie.polly@unsw.edu.au](mailto:patsie.polly@unsw.edu.au), Room 508 WW, ph: 9385 2924). Any students considering an Honours year should discuss the requirements with Dr Polly. 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 coordinator, Dr Pascal Carrive ([p.carrive@unsw.edu.au](mailto:p.carrive@unsw.edu.au)).

### VACATION SCHOLARSHIPS

The School of Medical Sciences several vacation scholarships each year to enable good students to undertake short research projects within the Department. For further details contact the Student Advisor, Carmen Robinson.

### **BEHAVIOUR IN PRACTICAL CLASSES**

Students must take due care with biological and hazardous material and make sure all equipment is left clean and functional. Covered shoes are compulsory in all practical classes. Please note that photography of experiments involving either animal or human subjects is not permitted under UNSW Ethics committee guidelines.

### **CONSENT FORMS**

Practical classes involving your participation as a subject require you to sign a witnessed, informed consent form.

### **OFFICIAL COMMUNICATION BY EMAIL**

Students are advised that email is now the official means by which the School of Medical Sciences at UNSW will communicate with you. All email messages will be sent to your official UNSW email address (e.g., z1234567@student.unsw.edu.au). If you do not wish to use the University email system, you **MUST** arrange for your official email to be forwarded to your chosen address. The University recommends that you check your email at least every other day. Facilities for checking email are available in the School of Medical Sciences and in the University Library. Further information and assistance is available from UNSW IT Services, 9385 1333. Free email courses are run by the UNSW Library.

### **UNSW Blackboard**

To access UNSW Blackboard go to:

<http://telt.unsw.edu.au/>

Click on Login to UNSW Blackboard then log on using your zPass Username and Password. zStudentNo and password) and select the course PHSL3221. You should have access to it if you are properly enrolled.

#### *System Requirement for BBL:*

UNSW Blackboard supports the following web browsers for Windows XP or VISTA.

- Internet Explorer (IE) version 7 or 9
- Firefox 3.0x (must run version 3.0.3 and above)

UNSW Blackboard supports the following web browsers for Mac 10.4 or 10.5 (Mac OS 10.3 is not supported)

- Firefox 3.0.x(must run version 3.0.3 and above)
- Safari 2 or 3

*Firefox is the preferred browser in both PC & Mac environment.*

### **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.

### **APPLICATIONS FOR SPECIAL CONSIDERATION**

Students who miss an assessment through sickness or misadventure, or believe that their performance has been adversely affected by sickness, misadventure or other circumstances beyond their control must submit an application for consideration within **three working days** to UNSW Student Central. Full details for the application (e.g., Medical Certificate, etc.) are available at

<https://my.unsw.edu.au/student/atoz/SpecialConsideration.html>

You should also contact the course convenors to inform them that you have applied for special consideration.

## **MISSED EXAMS**

If in any circumstances you unavoidably miss an examination, you must inform the Registrar and also contact the relevant Course Office immediately. Normally, if you miss an exam (without medical reasons) you will be given an absent fail. If you arrive late for an exam no time extension will be granted. It is your responsibility to check timetables and ensure that you arrive with sufficient time.

## **DEFERRED 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. You cannot assume you will be granted supplementary assessment. It is intended that supplementary exams for the School of Medical Sciences in Semester 2, 2010 will be held in the week commencing Monday 7<sup>th</sup> December, 2010.

## **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 Boyce or 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.

## **STUDENT RIGHTS AND RESPONSIBILITIES**

Refer to <http://www.policy.unsw.edu.au/policy/studegrv.htm>

## **STUDENT SUPPORT SERVICES**

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course conveners prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or <http://www.studentequity.unsw.edu.au/content/default.cfm?ss=0>). Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

## **APPEAL PROCEDURES**

Refer to

<https://my.unsw.edu.au/student/academiclife/assessment/academicstandinghowtoappeal.html>

## **GRIEVANCE OFFICER**

In case you have any problems or grievance about the course, you should try to resolve it with the Course Conveners. If the grievance cannot be resolved in this way, you should contact the Head of Department, Prof Gary Housley, or the School's Grievance Officer, Dr Priti Pandey ([p.pandey@unsw.edu.au](mailto:p.pandey@unsw.edu.au), 9385 2483).

# 10. PAST EXAMINATION QUESTIONS

## MIDSESSION EXAMINATION, OCTOBER, 2005

1) 20 multiple choice questions (a mixture of A-E and K-code) in 40 minutes.

2) 8 short answer questions in 50 minutes:

Question 1. (5 minutes)

A close female friend who is on the Combined Oral Contraceptive Pill (The Pill) confides that she missed taking the last hormonal tablet prior to the week of “sugar” tablets. She says she is not worried about becoming pregnant because her “period” came as usual 3 days later while taking the sugar tablets. You, however, are worried on her behalf. Explain the physiological reason for your concern.

Question 2. (5 minutes)

- a) What are the normal changes in male sexual function with ageing?
- b) How could you differentiate between erectile dysfunction arising from a psychological cause from that due to an organic (physical) disorder?

Question 3. (5 minutes)

The following test results were taken from an 8 year old child with a history of precocious sexual development:

	Patient level	Normal level
Plasma:		
11-deoxycortisol	10-30 µg/100 mL	<0.1 µg/100 mL
ACTH	500 pg/mL	30-120 pg/mL
Urine:		
17-ketosteroids	15-20 mg/24h	<0.5 mg/24h
tetrahydrocompound S	1 mg/h	<0.5 mg/h

- a) Briefly explain why each of these results might be abnormal.
- b) Why might this child have hypertension?

Question 4. (5 minutes)

Briefly describe how plasma calcium levels are regulated.

Question 5. (5 minutes)

Write notes on growth hormone.

Question 6. (5 minutes)

An overweight friend has been following a sensible low fat low calorie diet for 3 months. In the first 2 months on the diet, he lost weight every week. Now, however, his weight loss has slowed down to almost nothing, despite the fact that he continues to follow the diet. He still needs to lose more weight.

Your friend wonders why he has stopped losing weight. How would you explain this phenomenon to him (in lay terms)?

Question 7. (10 minutes)

Describe the maternal changes which occur during pregnancy in

- (a) blood volume and composition, and
- (b) the cardiovascular system.

**Question 8.** (10 minutes)

A 15 year old boy has been brought unconscious into the emergency department by his worried parents. They say that he has always been in good health, but has been feeling unwell for the past day or so. He has also been very thirsty and has been drinking “lots of water”. Blood tests, renal function tests and a physical examination are carried out.

Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	<b>Patient result</b>	<b>Normal result</b>	<b>Brief explanation</b>
Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		

\*\*\*\*\*The remainder of this question has not been released \*\*\*\*\*

**FINAL EXAMINATION, NOVEMBER, 2005**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 35 minutes.**

**2) 9 short answer questions in 55 minutes:**

Question 1. (10 minutes).

“The fetus is a miniature adult.” Discuss, with reference to two organ systems.

Question 2. (10 minutes).

Describe a method that can be used to reversibly reduce maternal arterial oxygen tension in a pregnant ewe. Explain the effects this procedure has on -

- (i) maternal and fetal blood gases and pH
- (ii) fetal blood pressure and heart rate
- (iii) fetal urine production.

Question 3. (5 minutes).

Describe the human placenta. Explain how placental transfer increases in late gestation even though placental weight remains fairly constant.

Question 4. (5 minutes).

Briefly describe the changes that occur in the neonate’s cardiovascular system after birth.

Question 5. (5 minutes).

“Human chorionic gonadotropin is the most important hormone in early pregnancy”. Discuss.

Question 6. (5 minutes).

Describe the fluid fluxes into and out of the amniotic cavity in the second half of gestation.

Question 7. (5 minutes).

Write brief notes on how the following affect fetal breathing movements:

- (i) A reduction in fetal arterial oxygen tension ( $PO_2$ ).
- (ii) An increase in fetal carbon dioxide tension ( $PCO_2$ ).
- (iii) Fetal asphyxia (reduced  $PO_2$  and increased  $PCO_2$ ).

Question 8. (5 minutes).

Briefly describe the effects of a low protein diet in pregnant rats on the renin-angiotensin system and kidneys of the offspring. Include in your answer an explanation of why the renin-angiotensin system is thought to be important for renal development.

Question 9. (5 minutes).

Describe the cycle of events that is likely to result in fetal death when there is a sustained fall in fetal oxygen availability of more than 50%.

**MID SESSION EXAMINATION, SEPTEMBER, 2006**

**1) 25 multiple choice questions (a mixture of A to E and K-code) in 50 minutes.**

**2) 6 short answer questions in 40 minutes:**

Question 1. (5 minutes).

Describe the renal effects of head-out water immersion. What are the hormonal mechanisms underlying these effects?

Question 2. (5 minutes).

For each of the 4 gut hormones: gastrin, cholecystokinin (CCK), secretin and gastric inhibitory peptide (GIP), briefly describe: (a) its site of production, (b) its stimulus for release, and (c) its major action.

Question 3. (5 minutes)

Harry and his partner Sue are both 40 years old and have been trying unsuccessfully to conceive for 18 months. Briefly describe the factors which might be contributing to their infertility.

Question 4 (5 minutes).

Compare and contrast menopause and "andropause".

Question 5 (10 minutes).

The following test results were taken from an 8 year old child with a history of precocious sexual development:

	<b>Patient level</b>	<b>Normal level</b>
Plasma:		
11-deoxycortisol	10-30 $\mu$ g/100 mL	<0.1 $\mu$ g/100 mL
ACTH	500 pg/mL	30-120 pg/mL
Aldosterone	3 ng/100 mL	5-20 ng/100 mL
Urine:		
17-ketosteroids	15-20 mg/24h	<0.5 mg/24h
Tetrahydrocompound S	1 mg/h	<0.5 mg/h

- a) Briefly explain why each of these results might be abnormal.
- b) Why might there be ambiguous genitalia?
- c) This child is hypertensive. What is the most likely reason for this?
- d) Why might this child be treated with daily cortisone?

**Question 6** (10 minutes).

A 20 year old woman has been brought unconscious into the emergency department by her worried boyfriend. He says that she has always been in good health, but has been feeling unwell for the past day or so. She has also been very thirsty and has been drinking “lots of water”. Blood tests, renal function tests and a physical examination are carried out.

Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	<b>Patient result</b>	<b>Normal result</b>	<b>Brief explanation</b>
Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		

\*\*\*\*\*The remainder of this question has not been released \*\*\*\*\*

**FINAL EXAMINATION, NOVEMBER, 2006**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 50 minutes:**

**Question 1.** (10 minutes)

“The fetus is a miniature adult.” Discuss, with reference to two organ systems.

**Question 2.** (10 minutes)

Describe how the fetus responds to an acute fall in oxygen availability. How does this differ from the responses observed when the fetus has been hypoxic for some time (chronic hypoxia)?

**Question 3.** ( 5 minutes)

Why would removal of the maternal ovaries cause abortion of a human pregnancy at 5 weeks LMP but not at 12 weeks LMP?

**Question 4.** (5 minutes)

Briefly describe the composition, formation and importance of lung liquid.

**Question 5.** (5 minutes)

- (a) How long is gestation in humans and what is meant by the terms “Preterm” and “Post-term”?
- (b) A woman with a regular 28 day menstrual cycle has recently discovered that she is pregnant. If her last menstrual period had commenced on the 10th of October 2006, what is her estimated date of delivery?
- (c) List 6 important risk factors for premature labour.

**Question 6.** (5 minutes)

Why does the newborn, especially the premature newborn, have difficulty maintaining its body temperature?

Question 7. (5 minutes)

What are fetal breathing movements? Briefly describe the major factors that control them.

Question 8. (5 minutes)

What do you understand by the term “fetal programming”? Include an example in your answer.

**MID SESSION EXAMINATION, SEPTEMBER, 2007**

**1) 25 multiple choice questions (a mixture of A to E and K-code) in 50 minutes.**

**2) 6 short answer questions in 40 minutes:**

Question 1. (5 minutes)

An overweight friend has been following a sensible low fat low calorie diet for 3 months. In the first 2 months on the diet, he lost weight every week. Now, however, his weight loss has slowed down to almost nothing, despite the fact that he continues to follow the diet. He still needs to lose more weight. Your friend wonders why he has stopped losing weight. How would you explain this phenomenon to him (in lay terms)?

Question 2. (5 minutes)

Describe the hormonal changes which occur in the hypothalamic-pituitary-gonadal axis at the onset of puberty. What factors influence the timing of puberty?

Question 3. (5 minutes)

Harry and his partner Sue are both 40 years old and have been trying unsuccessfully to conceive for 18 months. Briefly describe the factors which might be contributing to their infertility.

Question 4. (5 minutes)

Physical examination and blood and urine tests taken from a 6 year old child with a history of precocious sexual development revealed the following:

	<b>Patient level</b>	<b>Normal level</b>
<u>Physical examination</u>		
Height	130 cm	95th percentile = 125 cm
Weight	33 kg	95th percentile = 27 kg
Blood pressure	150/90	~ 100/70
<u>Plasma</u>		
11-deoxycortisol	10-30 µg/100 mL	<0.1 µg/100 mL
ACTH	500 pg/mL	30-120 pg/mL
<u>Urine</u>		
17-ketosteroids	15-20 mg/24h	<0.5 mg/24h
Tetrahydrocompound S	1 mg/h	<0.5 mg/h

What do you think is the likely diagnosis? Briefly explain why each of the above results might be abnormal.

Question 5. (10 minutes)

- (a) What is glycaemic index?
- (b) Describe in detail how you could measure the glycaemic index of a new brand of biscuits available in supermarkets and classify the biscuits as low, medium or high GI.
- (c) What is glycaemic load?
- (d) Which of these terms (glycaemic index or glycaemic load) do you consider to be the more useful and why?

Question 6. (10 minutes)

A 20 year old science student has been brought unconscious into the emergency department late at night by her worried parents. They say that she has always been in good health, but has been feeling unwell for the past few days. They had wanted her to go to her local doctor yesterday but she had said that she was too busy studying for exams. She has also been very thirsty and has been drinking “lots of water”. Blood tests, renal function tests and a physical examination are carried out. Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	<b>Patient result</b>	<b>Normal result</b>	<b>Brief explanation</b>
Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		

\*\*\*\*\*The remainder of this question has not been released\*\*\*\*\*

**FINAL EXAMINATION, NOVEMBER, 2007**

**1) 25 multiple choice questions (a mixture of A to E and K-code) in 50 minutes.**

**2) 6 short answer questions in 40 minutes:**

Question 1. (10 minutes)

Describe the maternal changes that occur during pregnancy in

- (a) blood volume and composition
- (b) the cardiovascular system.

Question 2. (10 minutes)

Write short notes on

- (a) fetal programming of Syndrome X
- (b) chimeras and maternal disease
- (c) maternal diet, renal development and high blood pressure in adult life.

Question 3. (5 minutes)

- (a) List the main fluxes of fluid into and out of the amniotic cavity during fetal life.
- (b) List the functions of amniotic fluid.

Question 4. (5 minutes)

Briefly describe the adaptations that enable fetal survival despite an arterial oxygen tension that is only about 20% of healthy adult values.

Question 5. (5minutes)

- (a) How long is gestation in humans and what is meant by the terms “Preterm” and “Post-term”?
- (b) A woman with a regular 28 day menstrual cycle has recently discovered that she is pregnant. If her last menstrual period had commenced on the 10th of October 2007, what is her estimated date of delivery?
- (c) List 6 important risk factors for premature labour.

Question 6. (5 minutes)

Why does the newborn, especially the premature newborn, have difficulty maintaining its body temperature?

**MID SESSION EXAMINATION, SEPTEMBER, 2008**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 40 minutes:**

Question 1. (10 minutes).

Peter is an 18 year old gym member who has been injecting himself with Sustanon (testosterone esters) and tamoxifen (a selective estrogen receptor modulator), weekly for the past 6 months. He visits his GP with concerns that he is developing tender swellings on his chest, either side around the area of his nipples (gynaecomastia). On examination it is found that his testes are soft and small.

- a) Describe the physiological effects of anabolic steroids which entice people like Peter to self administer these drugs.
- b) What is the rationale for taking tamoxifen in conjunction with Sustanon?
- c) Why has Peter developed gynaeomastia?
- d) What is the likely explanation for the findings regarding his testes?

Question 2. (10 minutes).

A 20 year old science student has been brought unconscious into the emergency department late at night by her worried parents. They say that she has always been in good health, but has been feeling unwell for the past few days. They had wanted her to go to her local doctor yesterday but she had said that she was too busy studying for exams. She has also been very thirsty and has been drinking "lots of water". Blood tests, renal function tests and a physical examination are carried out.

Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	Patient result	Normal result	Brief explanation
Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		

\*\*\*\*\*The remainder of this question has not been released \*\*\*\*\*

Question 3. (5 minutes)

Describe the mechanisms of action of the combined oral contraceptive pill.

Question 4 (5 minutes).

Belinda is a 38 year old mother of two and a substitute teacher. Over the last 2 years she has gradually gained 10 kg of weight. She has been feeling depressed and chronically exhausted. She feels cold all

the time, and now her hair is starting to fall out. She has also been constipated despite the fact that she eats a healthy high-fiber diet and drinks plenty of water.

On examination she has a soft swelling in her neck which moves on swallowing.

Blood test results were:

T4	2 µg/100 ml	(normal 4 – 11 µg/100 ml)
TSH	>10 mU/L	(normal 0.5-5.0 mU/L)

Explain the physiology behind Belinda's symptoms, signs and blood results.

Question 5 (5 minutes).

Rebecca and her partner Brett have been trying unsuccessfully to conceive for the past 18 months, since Rebecca ceased taking the oral contraceptive pill.

- How could you assess whether Rebecca was ovulating?
- Brett provided a semen sample for analysis. What would you consider to be a normal result?

Question 6 (5 minutes).

Matthew is 8 years old and is the shortest child in his class at school. He is concerned that he will always be short. Describe the factors which determine final adult height.

Question 7 (5 minutes)

Explain what is meant by the terms 'glycaemic index' and 'glycaemic load' and how these values are determined.

Question 8 (5 minutes)

A 52 year old woman who is otherwise healthy, presents to her GP suffering from hot flushes, night sweats and insomnia.

- What changes occur in the hypothalamic-pituitary-ovarian axis as women age?
- What other signs and symptoms are likely to occur around menopause and why?

## **FINAL EXAMINATION, NOVEMBER, 2008**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 50 minutes:**

Question 1. (10 minutes)

Use your knowledge of maternal physiology to explain the mechanisms underlying each of the following conditions which are commonly experienced by pregnant women:

- ankle swelling
- supine hypotension
- anaemia
- warm hands and feet even when the weather is cold
- glycosuria.

Question 2. (10 minutes)

"The fetus is a miniature adult." Discuss, with reference to the cardiovascular system and at least one other body system.

Question 3. (5 minutes)

Describe the cycle of events that is likely to result in fetal death when there is a sustained fall in oxygen availability of more than 50%.

Question 4. (5 minutes)

Write brief notes on how the following affect fetal breathing movements:

- i) A reduction in fetal arterial oxygen tension ( $P_{aO_2}$ ).
- ii) An increase in fetal arterial carbon dioxide tension ( $P_{aCO_2}$ ).
- iii) Fetal asphyxia (reduced  $P_{aO_2}$  **and** increased  $P_{aCO_2}$ ).

**Very briefly** comment on the effects that these three changes in blood gases would have on alveolar ventilation in an adult.

Question 5. (5minutes)

What is the evidence that renal development can be programmed?

Question 6. (5 minutes)

Compare and contrast fetal urine and fetal lung liquid.

Question 7. (5 minutes)

Describe the human placenta. In what ways does the sheep placenta differ from the human placenta?

Question 8. (5 minutes)

Lisa, a mother who is breast feeding her 5 month old baby, is concerned that her periods have not yet returned. Her friend Joanna, who delivered her baby only 4 months previously has already had two normal periods. Joanna is bottle feeding her baby. Use your knowledge of the physiology of lactation to explain Lisa's amenorrhea.

**MIDSESSION EXAMINATION, SEPTEMBER 2009**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 50 minutes:**

Question 1. (10 minutes)

A 6 year old child with a history of precocious sexual development presents to a paediatric endocrinologist. Physical examination and blood and urine tests revealed the following:

	<u>Patient level</u>	<u>Normal level</u>
<u>Physical examination</u>		
Blood pressure	150/90	~ 100/70
<u>Plasma</u>		
11-deoxycortisol	10-30 $\mu\text{g/dL}$	<0.1 $\mu\text{g/dL}$
Cortisol	not detected	5-25 $\mu\text{g/dL}$
ACTH	500 $\text{pg/mL}$	30-120 $\text{pg/mL}$
Aldosterone	0.1 $\text{ng/dL}$	3-10 $\text{ng/dL}$
<u>Urine</u>		
17-ketosteroids	15-20 $\text{mg/24h}$	<0.5 $\text{mg/24h}$

- (a) What do you think is the likely diagnosis?
- (b) Explain why each of the above results might be abnormal.
- (c) Why was this child given glucocorticoid treatment?

Question 2. (10 minutes).

A 20 year old science student has been brought unconscious into the emergency department late at night by her worried parents. They say that she has always been in good health, but has been feeling unwell for the past few days. They had wanted her to go to her local doctor yesterday but she had said that she was too busy studying for exams. She has also been very thirsty and has been drinking "lots of water". Blood tests, renal function tests and a physical examination are carried out.

Provide a **very brief** explanation for each of the results below, using only the space provided. The table continues over the page.

	Patient result	Normal result	Brief explanation
Blood glucose concentration	70 mmol/L	<8 mmol/L	
Glucosuria	++++		

\*\*\*\*\*The remainder of this question has not been released \*\*\*\*\*

**Question 3.** (5 minutes)

You are having a conversation with a health conscious friend. He has heard about the glycaemic index and has decided to only eat foods that are labelled “low GI”. Given your knowledge of the glycaemic index and how it is measured, do you think that this is a sensible diet regime? Justify your answer.

**Question 4.** (5 minutes)

Describe how the ratio of testosterone to epitestosterone can be used to detect testosterone use in performance athletes. Include in your answer a description of methods that could be used to escape detection (i.e. to produce a normal ratio), and an explanation of their physiological basis.

**Question 5.** (5 min)

This question relates to the progesterone only pill (minipill).

- (a) Briefly describe the mechanisms of action of this pill.
- (b) Under what circumstances might women take this pill?
- (c) How effective is this pill?

**Question 6.** (5 minutes)

What effect does head-out water immersion have on renal sodium excretion? Explain the mechanisms by which this occurs.

**Question 7.** (5 minutes)

Name three gut peptides that regulate food intake or energy homeostasis and describe (a) the sites of their synthesis, (b) the stimulators for their release and (c) their major physiological actions.

**Question 8.** (5 minutes)

Your 16 year old niece is concerned that she has not yet had her first menstrual period. Given your knowledge of puberty and the factors which influence the timing of puberty, what advice would you give her? How could you assess if her pubertal development has commenced?

**FINAL EXAMINATION, NOVEMBER 2009**

**1) 20 multiple choice questions (a mixture of A to E and K-code) in 40 minutes.**

**2) 8 short answer questions in 50 minutes:**

**Question 1.** (10 minutes).

“The fetus is a miniature adult.” Discuss, with reference to the respiratory system and at least one other body system.

Question 2. (10 minutes).

What is the evidence that renal development can be programmed? Give examples of approaches (experiments, animal models etc) that could be used to examine this phenomenon.

Question 3. (5 minutes).

- (a) Describe the changes that occur in the maternal cardiovascular system during pregnancy.
- (b) Why should hospital staff not leave pregnant women lying supine for extended periods?

Question 4. (5 minutes).

- (a) Describe the functions of amniotic fluid.
- (b) What problems result from oligohydramnios and polyhydramnios?

Question 5. (5 minutes).

The fetus consumes twice as much oxygen per kg body weight as the newborn, and yet its oxygen supply is much lower. Describe how it has adapted to develop in a low oxygen environment.

Question 6. (5 minutes).

Draw a graph showing luteinising hormone (LH) levels from 10 weeks gestation to term. Explain why this pattern of secretion occurs.

Question 7. (5 minutes).

Describe the production of oxytocin and its role in human labour.

Question 8. (5 minutes).

Describe the changes that occur in the neonate's cardiovascular system after birth.

## 11. TIMETABLE – 2010

**Lectures:** Tuesday 9am (Wallace Wurth LG03)  
 Tuesday 10 am (Wallace Wurth LG03)  
 Thursday 10 am (Biomed E)

**Pracs/PBLs:** Wednesday 2-5 pm (location TBA).

*\* = material to be examined in the final exam.*

<b>WEEK 2</b>			
Tuesday 27/7	9 am	Introduction and course information (LG03)	Gibson/Boyce
	10 am	Concepts in endocrinology (LG03)	Dr K Gibson
Wednesday 28/7	2 pm	PBL 1.1	PBL tutors
	4 pm	Body weight regulation (Lab 204. Note: this lecture cannot be taped)	Dr A. Sainsbury-Salis
Thursday 29/7	10 am	Insulin physiology (Biomed E)	Prof E Kraegen
<b>WEEK 3</b>			
Tuesday 3/8	9 am	Regulation of growth (LG03)	Dr K Gibson
	10 am	Diabetes and islet $\beta$ cells (LG03)	Dr R Laybutt
Wednesday 4/8	2 pm	PBL 1.2	PBL tutors
	3.30 pm	PBL 2.1	PBL tutors
Thursday 5/8	10 am	Endocrine functions of white adipose tissue (Biomed E)	Dr M Swarbrick
<b>WEEK 4</b>			
Tuesday 10/8	9 am	Discussion class: Control of blood volume (LG03)	Dr A Boyce
	10 am	Gastrointestinal hormones & transmitters (LG03)	Dr L Liu
Wednesday 11/8	2 pm	Glycaemic Index 1 (Lab 202)	Boyce/Gibson
Thursday 12/8	10 am	Androgens and anabolic steroids (Biomed E)	Dr A Boyce
<b>WEEK 5</b>			
Tuesday 17/8	9 am	Calcium metabolism (LG03)	Dr K Gibson
	10 am	Update on the renin-angiotensin system (LG03)	Dr A Boyce
Wednesday 18/8	2 pm	PBL 2.2	PBL tutors
	3.30 pm	PBL 3.1	PBL tutors
Thursday 19/8	10 am	Regulation of mood by hormones and neurotransmitters (Biomed E)	Dr B Hegarty
<b>WEEK 6</b>			
Tuesday 24/8	9 am	Hormonal contraception (LG03)	Dr L Ulman
	10 am	Puberty (LG03)	Dr K Gibson
Wednesday 25/8	2 pm	Glycaemic Index 2 (Lab 202)	Boyce/Gibson
Thursday 26/8	10 am	Menopause and andropause (Biomed E)	Dr K Gibson
<b>WEEK 7</b>			
Tuesday 31/8	9 am	Fertility & assisted reproductive technology* (LG03)	Dr A Clark
	10 am	Practice exam questions and feedback (LG03)	Dr K Gibson
Wednesday 1/9	2 pm	PBL3.2	PBL tutors
	3.30 pm	PBL 4.1*	PBL tutors
Thursday 2/9	10 am	Discussion class: Cross-dressing or crossing over? (Biomed E)	Dr A Boyce
<b>RECESS 4<sup>th</sup> September – 12th September</b>			

<b>WEEK 8</b>			
Tuesday 14/9	9 am	Midsession exam (LG 03)	Gibson
Wednesday 15/9	2 pm	PBL 4.2*	PBL tutors
Thursday 16/9	10 am	Introduction to Fetal Physiology* (Biomed E)	Dr K Gibson
Friday 17/9	5 pm	<b>Endocrinology assignment due</b>	
<b>WEEK 9</b>			
Tuesday 21/9	9 am 10 am	Fetal circulation* (LG 03) Placenta A* (LG03)	Dr A Boyce Dr K Gibson
Wednesday 22/9	2 pm	Placenta and fetal membranes* (Lab 202)	Dr M Smith
Thursday 23/9	10 am	Fetal responses to hypoxia* (Biomed E)	Dr A Boyce
<b>WEEK 10</b>			
Tuesday 28/9	9 am 10 am	Placenta B* (LG03) Neonatal Intensive Care* (LG03)	Dr K Gibson Dr K Lui
Wednesday 29/9	2 pm	Neonatal nursery visit (Group A) - RHW Two peas in a pod* (Groups B and C) - 202 Imprinting film* and poster Prep (Group D)	Boyce/Gibson
Thursday 30/9	10 pm	Fetal endocrinology* (Biomed E)	Dr A Boyce
<b>WEEK 11</b>			
Tuesday 5/10	9 am 10 am	Fetal breathing* (LG03)* Regulation of fetal fluids* (LG03)	Dr A Boyce Dr K Gibson
Wednesday 6/10	2 pm	Neonatal nursery visit (Group B) - RHW Two peas in a pod* (Groups A and D) - 202 Imprinting film* and poster Prep (Group C)	Boyce/Gibson
Thursday 7/10	10 pm	Maternal Physiology* (Biomed E)	Dr K Gibson
<b>WEEK 12</b>			
Tuesday 12/10	9 am 10 am	Epigenetics* (LG03) Developmental origins of health and disease* (LG03)	Prof E Lumbers Prof E Lumbers
Wednesday 13/10	2 pm	Neonatal nursery visit (Group C) - RHW Imprinting film* and Poster Prep (Groups A, B and D)	Boyce/Gibson
Thursday 14/10	10 pm	Parturition* (Biomed E)	Dr K Gibson
<b>WEEK 13</b>			
Tuesday 19/10	9 am 10 am	Adaption to life after birth* (LG03) Lactation and early infant nutrition* (LG03)	Dr K Gibson Dr K Gibson
Wednesday 20/10	2 pm	Poster session – M210	Boyce/Gibson
Thurs 21/10	10 am	Fetal physiology Q & A* (Biomed E)	Boyce/Gibson