

# A Primer for the Primary FANZCA examination

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Many people have unknowingly contributed to this work, especially other members of the Primary Exam Subcommittee as well as most of the Panel of Examiners. The information is current as at the start of 2018. The views expressed below are entirely my own, especially with regard to textbooks and the relative importance of some of the topics. There are bound to be errors, also entirely my own, especially as the document links to about 50 workbooks and over 300 googlesheets. Please feel free to point out the shortcomings: [primerfortheprimary@gmail.com](mailto:primerfortheprimary@gmail.com)

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## INTRODUCTION

The Primary Exam is almost certainly the most ambitious and demanding thing that you will undertake in your academic life. Failure is not only financially expensive (if it impedes your progress through the training scheme it is very costly), but it is also psychologically traumatic. For many unsuccessful candidates, it is the first exam they have ever failed. It is never worth “just having a go” as there is almost no element of chance involved and most people are no likely to pass than they are to be able to deal with their subsequent failure.

It is by no means a perfect assessment of your knowledge, understanding or fitness to continue specialist training, but a lot of effort does go into making it as fair and unbiased as possible. Not all areas of the curriculum seem reasonable or relevant to know about, and the examiners may agree with you, so some LO's are only superficially, or rarely, examined. The hardest thing is to gauge how wide and how deep to study each area. What follows is a synthesis of the attitudes of some examiners on the relevance and importance of various learning objectives within the curriculum, organised by topic. This syllabus is hoped to help guide your study. In addition there are links to true/false statements compiled by examiners for many of the learning outcomes so that you can test your knowledge.

When I sat the Primary (over 20 years ago) I was given only one piece of advice that I can recall. It has become the unofficial motto of the Primary Examination Panel:

There is no substitute for knowledge

The quote actually comes from the economist and quality improvement guru W. Edwards Deming. In full, it is:

Knowledge is theory. We should be thankful if action of management is based on theory. Knowledge has temporal spread. Information is not knowledge. The world is drowning in information but is slow in acquisition of knowledge. There is no substitute for knowledge.

And this does have relevance for the Primary. To pass, at some point you will need to display understanding (knowledge) rather than just regurgitate facts (information), especially in the vivas.

A deeper understanding often comes from approaching the same topic from different angles. In the same spirit, it may be easier to explain how to pass the primary by advising on how to fail it.

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## HOW TO FAIL THE PRIMARY

About 400 people sit the Primary each year, and for those who sit for the first time, the pass rate is about 70%. There is endless advice for those planning to sit about study techniques, study groups and resources. I suspect that there is a group of people who will pass whatever strategy they choose, there is another group that will pass only if they choose the right strategy and there is, sadly, a small group who will not succeed whatever they try.

I have encountered a lot of trainees struggling with the Primary, some through my own hospital and many through feedback and remediation interviews. The latter is a compulsory process after the third and fourth failed attempts. So, whilst I cannot give great guidance on how to infallibly pass the exam, over the years I have noticed some factors common amongst that group of people who sit more than once. So here are my tips for anyone determined to fail - you only need to try a few of them!

- Leave gaps in the curriculum
- Don't distinguish between the things you ought to know in great detail and the things where a superficial knowledge is sufficient
- Don't identify where the "one thousand hours" of study is going to come from
- Don't use several resources
- Don't ask questions when you don't know the answers
- Accept other people's answers for MCQs
- Don't practice SAQs
- Don't practice vivas until you get an invitation
- Only ask "nice" people for assessments
- Don't seek out a past or current primary examiner in your region
- Don't buy any books
- Buy lots of books but don't read them
- Mistake familiarity for knowledge
- Don't have a plan or, if you do, don't stick to it
- Don't decide on the purpose of a study group before embarking on it

## FORMAT OF THE EXAM

The exam consists of a written component (MCQ and SAQ) and an oral exam (vivas). Invitation to the vivas is dependent on achieving a minimum standard in the writtens. The MCQ must be passed, but the actual score achieved does not contribute to the final tally which is comprised of SAQ (50%) and viva (50%). The overall mark required to pass is 50%. The invitation mark for the SAQ is 40%, in which case a candidate only just on that threshold would require 60% in the vivas to pass the exam.

The use of a 50% threshold may seem, externally, to be a low bar. However, the exam is pitched at a specific level at which there is a lot of assumed knowledge and so the passing score is set at 50 - each SAQ and viva is calibrated such that 50% is a pass. This gives more potential scores either side in order to allow maximum discrimination.

### MCQ

There are 150 questions of the Single Best Answer type. The entire breadth of the curriculum is examined in this paper. Some questions are easy, some hard. Some questions are highly relevant to practice, some seem more obscure. Some are repeats, some are new. The MCQ exam is "sat" by between 5 and 10 examiners, who also rate the difficulty and relevance on each question. These ratings are entered into an Ebel matrix for standard setting and a passing score derived. The passing score varies from exam to exam but usually sits in the high 80's out of 150 (high 50's in % terms).

Generally, questions that have been published elsewhere are not repeated, so using other resources, such as the "Black Bank", is useful for testing your knowledge and widening your reading but not useful as rote learning.

### SAQ

The SAQ paper consists of 15 short answer questions. There is usually a balance between pure physiology, pure pharmacology, integrated questions, anatomy, safety and equipment. Some questions are repeated, especially those that are deemed important that have been answered poorly in the past. Dangerously some questions appear on a quick scan to be repeats but are not, so, above all - READ THE QUESTION. How many SAQs should you practice? Certainly you should practice writing answers in 8-9 minutes (you have 10 in the exam) and be prepared to write 15 of them in a row. Practice SAQs are a good way of assessing your recall and knowledge but you should not waste time constructing "ideal answers" to rote-learn in case they

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should come up. The Panel has recently elected to start using a holistic marking scheme to grade answers. Rubrics are developed for every question and each question is marked out of 5. The scale is not linear as the important distinction is between 2 (not a pass answer but adequate to be assessed at a viva) and 3 (pass answer). You need to score at least 40% (30 out of 75) to get a viva, but that leaves you needing an above-pass performance in those vivas to pass overall.

## VIVAS

Certainly the most terrifying part of the exam, but most candidates do just fine once they warm up (more than 80% of people who attend the vivas, pass). You get 12 distinct topics of 5 minutes each from a total of six examiners. The lead-up is painfully slow but the hour goes very quickly. The examiners aim to assess the depth of your understanding of each topic (which is marked individually by two examiners) so you will always be taken to a point where you have nothing more to offer unless you are extraordinarily knowledgeable. Don't panic. The range of vivas is considered very carefully and agreed in advance for each group of candidates to minimise overlap with the SAQ and to ensure a good sampling of the curriculum, especially from "core" areas.

## SHOULD YOU BUY ANY BOOKS?

This depends on how you study. All the resources you need to pass the exam are available on the ANZCA library site as ebooks. However, I think that there are a couple that you should consider buying as they are not available as ebooks and are very useful. Both are published under the Oxford Specialty Training banner of the OUP:

- (1) Spoor and Kiffs. Training in Anaesthesia - the essential curriculum. OUP 2010.  
You should probably get this the day you decide to start training in anaesthesia. It's perfect for Basic Training. They do an Advanced Training one too.
- (2) Magee and Tooley. The physics, clinical measurement and equipment of anaesthetic practice - for the FRCA. 2e OUP 2014.

You should seriously consider splashing out on your own copy of Miller 8e. It's a lot of money at \$340 from bookdepository.com (although as nothing compared to the cost of training and examinations), but it's easier than hunting through an electronic version.

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# The syllabus

And so to the meat of this Primer. The syllabus is arranged by Learning Outcome groups, and these are broadly arranged into physiology, pharmacology, anatomy, safety and equipment, and miscellaneous. This taxonomy is by no means perfect, but it is how they are presented within ANZCA's Exams Management System (actually presented alphabetically in there). Each group has one or more Learning Outcomes associated with it. Each Learning Outcome is presented as it's summary (also in EMS).

Each group gets its own page, but links from the list below. I have included the usual number of MCQs from our template. This gives a vague guide to the distribution of your study as well. If you multiply the usual number of MCQs by 5 hours (about 150 x 5 hrs = 750 hours) you have an approximation of the amount of time you should consider devoting to each topic.

Each group has the LOs ordered by the importance that I think it merits during your study. Please remember that some LOs may be ho-hum but will have a few really essential things you should know, so it's difficult to generalise too much.

<b>Importance</b>	<b>High</b>	<b>Moderate</b>	<b>Low</b>
Depth of knowledge required	High	Moderate	Low
Sources used to acquire knowledge	Several	Few	One
SAQ likelihood	High	Moderate	Low
Viva likelihood	High	High	Moderate
Recall requirement	Immediate and familiar	With a bit of thought	Dredged up

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Each of the LOs links to a googlesheet where you can test yourself on your knowledge of an area with some True/False statements (similar to the ones that appear on PLOOTD (Primary Learning Outcome of The Day), accessed [here](#)).

These statements form part of the LO curation project undertaken by Primary Exam Panel members who have tried to generate some statements for each LO. Some of the links will have no statements yet, but plenty do. Each statement is (meant to be) referenced and rated by the statement author for difficulty and relevance. The answer column is hidden; it's useful to find your own answers. Besides, some of our answers might be wrong. Knowledge changes. The sheets cannot be edited, downloaded, printed, or shared at this stage (mostly because if you copy and paste the T/F column becomes visible!)

Please note that although Statistics was removed from the Primary Exam in the 2013 Curriculum, one LO still remains (BT\_PO 1.2). All the rest was removed to make room for Anatomy and Equipment / Safety.

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# Learning Outcome Groups

[Acid Base Physiology](#)

[Body Fluids and electrolytes](#)

[Cardiovascular physiology](#)

[Cellular Physiology](#)

[Clinical Monitoring](#)

[Endocrine physiology](#)

[Fetal and Neonatal](#)

[Gastrointestinal physiology](#)

[Haematology](#)

[Immunology](#)

[Liver physiology](#)

[Maternal physiology](#)

[Muscle Physiology](#)

[Nervous System Physiology](#)

[Nutrition and Metabolism](#)

[Principles of measurement](#)

[Renal Physiology](#)

[Respiratory Physiology](#)

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[Antiarrhythmics](#)

[Adrenoreceptor Blocking agents](#)

[Antiemetics](#)

[Antihypertensives](#)

[Cardiac Arrest, Ischaemia and failure](#)

[Anticholinesterase Drugs](#)

[Drugs and the Coagulation System](#)

[Diuretics](#)

[Endocrine Pharmacology](#)

[Gastrointestinal pharmacology](#)

[Pharmaceutical aspects and drug development](#)

[Pharmacodynamics](#)

[Pharmacokinetics](#)

[Variability in drug response](#)

[Histamine and Serotonin](#)

[Inhalational Anaesthetic Agents](#)

[IV anaesthetic agents](#)

[IV fluids](#)

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[Neuromuscular blocking agents](#)

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[Opioid agonists and antagonists](#)

[Pain](#)

[Autonomic NS Pharmacology](#)

[Respiratory Pharmacology](#)

[Anatomy](#)

[Equipment and Safety](#)

[Integrated / Miscellaneous](#)

## ACID BASE PHYSIOLOGY

Regulation of acid/base balance	High	<a href="#">BT_PO 1.78</a>
Acid-base chemistry	High	<a href="#">BT_PO 1.79</a>

Usual number of MCQs - 4

Examiners love this stuff! You can be asked to interpret some arterial blood gases, but only those of respiratory acidosis / alkalosis (see BT\_RT 1.39) so you don't need to memorise the causes of metabolic acidosis and the rules of compensation for PEx. However, you need a good understanding of acid-base chemistry, including the Stewart approach. Kerry Brandis's website has an excellent [description of this](#). PLOOTD has some other T/F statements on both [acid base regulation](#) and 3 days of acid base chemistry ([1](#), [2](#), [3](#)).

No more links to PLOOTD after this! You can search the site yourself by putting the LO number into the search bar.

## BODY FLUIDS AND ELECTROLYTES

Physiology of Na, K, Mg, Ca and PO <sub>4</sub> ions	High	<a href="#">BT_PO 1.72</a>
Maintenance of fluid and electrolyte balance	High	<a href="#">BT_PO 1.73</a>
Constituents and functions of plasma	High	<a href="#">BT_PO 1.74</a>
Osmotic pressure	High	<a href="#">BT_PO 1.75</a>
Regulation of osmolality	High	<a href="#">BT_PO 1.76</a>
Oncotic pressure	High	<a href="#">BT_PO 1.77</a>

Usual number of MCQs - 3

Kerry Brandis: Fluid and electrolyte physiology. In the Physiology Viva  
Miller 8ed Ch 59  
Hemmings and Egan Ch 33 (especially good on IV fluid kinetics)

## CARDIOVASCULAR PHYSIOLOGY

Cardiac electromechanical physiology	High	<a href="#">BT_PO 1.43</a>
Cardiac muscle physiology	High	<a href="#">BT_PO 1.44</a>
Cardiac output and pressure volume relationships	High	<a href="#">BT_PO 1.45</a>
Myocardial oxygen supply and demand	High	<a href="#">BT_PO 1.46</a>
Control of blood pressure and regional blood flow	High	<a href="#">BT_PO 1.47</a>
Shock	High	<a href="#">BT_RT 1.1</a>
Classification of shock	High	<a href="#">BT_RT 1.2</a>
Describe the physiological consequences of shock	High	<a href="#">BT_RT 1.3</a>
Cardiovascular responses to posture, exercise, IPPV, pneumoperitoneum and other stressors	High*	<a href="#">BT_PO 1.48</a>
Cardiovascular changes that occur with ageing	Mod	<a href="#">BT_PO 1.49</a>
Cardiovascular changes that occur with morbid obesity	Mod	<a href="#">BT_PO 1.50</a>
Clinical signs of shock in ageing	Mod	<a href="#">BT_RT 1.30</a>

\* IPPV High, others Mod

Usual number of MCQs - 12

You can start with Miller 8e Ch10 and Hemmings and Egan Ch 20 and 21, but you will need to progress to Pappano and Wier Cardiovascular Physiology 10e. You don't need to memorise it all, but you need to get to a level of conceptual understanding such that you can debate topics such as mean systemic filling pressure without getting in a dreadful muddle in a viva. There's a lot to be said for reading about Guyton curves in Guyton and Hall 13e Ch 20, and the chapter on vascular distensibility (15) is enlightening. No-one is going to get you to construct a Wiggers diagram in a viva (wastes too much time), but cardiac PV loops are popular. Stoelting 5e has a good chapter (46) on the physiologic and pharmacologic impacts of ageing.

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## CELLULAR PHYSIOLOGY

Cellular physiology

Low

[BT\\_PO 1.82a](#)

Usual number of MCQs - 2

Any physiology text will give you the basic information you require. Most of it can be read and understood rather than memorised, but you need to be able to describe the generation and maintenance of transmembrane potentials.

## CLINICAL MONITORING

Depth of anaesthesia	High	<a href="#">BT_GS 1.51</a>
Prevention of awareness	High	<a href="#">BT_GS 1.51a</a>
Monitoring depth of anaesthesia	High	<a href="#">BT_GS 1.52</a>
Blood gas analysis in respiratory failure	High	<a href="#">BT_RT 1.39</a>
Temperature monitoring	Mod	<a href="#">BT_GS 1.69a</a>

Usual number of MCQs - 3

Whilst it pains me to recommend a book not available as an ebook in the ANZCA library (I wrote to OUP but they didn't reply), I do recommend buying a copy of Physics, Clinical Measurement and Equipment of Anaesthetic Practice 2E by Magee and Tooley. It's \$100 well spent. You still need to supplement this, especially for depth of anaesthesia monitoring (Miller 8e Ch 50 for instance) but it covers nearly everything. Beware however that some equipment mentioned does not conform to AS/NZS Standards. More on that in Equipment and Safety.

## ENDOCRINE PHYSIOLOGY

Role of the hypothalamus	Low	<a href="#">BT_PO 1.86</a>
Control of secretion and the functions of various hormones	Low	<a href="#">BT_PO 1.87</a>
Regulation of plasma calcium and related hormones	Low	<a href="#">BT_PO 1.88</a>
Role of prostaglandins and other autocooids	Low	<a href="#">BT_PO 1.89</a>

Usual number of MCQs - 1

Any standard physiology text, but adequately covered in Hemmings and Egan Ch 30



## FOETAL AND NEONATAL

Neonatal airway anatomy	High	<a href="#">SS_PA 1.1</a>
Foetal circulation	High	<a href="#">SS_PA 1.21</a>
Circulatory and respiratory changes that occur at birth	Mod	<a href="#">SS_PA 1.22</a>
Body fluid composition in the neonate	Mod	<a href="#">SS_PA 1.25</a>
Pharmacodynamics of drugs used in anaesthesia in neonates and children	Mod	<a href="#">SS_PA 1.52</a>
Pharmacology of agents used for premedication in children	Mod	<a href="#">SS_PA 1.53</a>
Physiological changes during growth and development of the neonate	Low	<a href="#">SS_PA 1.24</a>
Glucose homeostasis in the neonate	Low	<a href="#">SS_PA 1.26</a>
Vital signs for children of different ages	Low	<a href="#">SS_PA 1.27</a>
Pharmacokinetics of drugs used in anaesthesia in neonates and children	Low	<a href="#">SS_PA 1.51</a>

Usual number of MCQs - 1

This is not a core topic for PEx but this and obstetrics are the only two SSUs that have some of their LO's in PEx. It's hard to recommend a text that will give you what you need without side-tracking you with a load of information that will be important in FEx but not examined here. Power and Kam 3e Ch 14 is fairly comprehensive for the neonatal material, as is Stoelting 5e 44 and 45. Another good source is Spoons and Kiff: Training in Anaesthesia, the essential curriculum (Oxford Specialty Training). Like Magee and Tooley this is also not available as an ebook but it is a superb introduction to anaesthesia training for about \$150 and provides excellent revision on just about everything in Basic Training, including much of what is examined in PEx.

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## GASTROINTESTINAL PHYSIOLOGY

Nausea & Vomiting - Physiology

Low [BT\\_GS 1.43](#)

Physiology of swallowing, the oesophagus and stomach

Low [BT\\_PO 1.107](#)

Usual number of MCQs - 1

Most physiology texts will have the necessary information, however it is neatly covered (with an anaesthetic flavour) in Spoor and Kiff Ch 17.

## HAEMATOLOGY

Physiology of haemostasis <a href="#">1.112</a>	High	<a href="#">BT_PO</a>
Blood products <a href="#">1.116</a>	High	<a href="#">BT_PO</a>
Changes in stored blood <a href="#">1.117</a>	High	<a href="#">BT_PO</a>
Changes in stored blood Physiological consequences of acute and chronic anaemia <a href="#">1.110</a>	High Mod	<a href="#">BT_RT 1.8</a> <a href="#">BT_PO</a>
Physiological mechanisms of limiting and preventing thrombosis <a href="#">1.113</a>	Mod	<a href="#">BT_PO</a>
Methods for assessing coagulation, platelet function and fibrinolysis <a href="#">1.114</a>	Mod	<a href="#">BT_PO</a>
Blood groups and transfusion reactions	Mod	<a href="#">BT_RT 1.7</a>
Massive transfusion	Mod	<a href="#">BT_RT 1.9</a>
Haemoglobinopathies <a href="#">1.111</a>	Low	<a href="#">BT_PO</a>
Blood groups and cross matching <a href="#">1.115</a>	Low	<a href="#">BT_PO</a>

Usual number of MCQs - 2

Hemmings and Egan Ch 35 and 36 covers much of the material, as does Power and Kam 3e Ch 9.

Needless to say, many of our patients are either on anticoagulant drugs or have profound abnormalities of haemostasis. In the middle of the night, the only person in theatre who is likely to have any understanding of what the issues are will be the one standing next to the anaesthetic machine.

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## IMMUNOLOGY

Hypersensitivity	Mod	<a href="#">BT_PO 1.128</a>
Systemic inflammatory response	Mod	<a href="#">BT_RT 1.5</a>
Anaphylactic and anaphylactoid reactions	Mod	<a href="#">BT_RT 1.6</a>
Body defences against infection	Low	<a href="#">BT_PO 1.126</a>
Effects of anaesthesia and surgery on immune function	Low	<a href="#">BT_PO 1.127</a>
Tissue/organ transplantation and rejection	Low	<a href="#">BT_PO 1.129</a>

Usual number of MCQs - 2

Power and Kam 3e Ch 10

## LIVER PHYSIOLOGY

Hepatic blood flow and effect of anaesthesia	Mod	<a href="#">BT_PO 1.104</a>
Laboratory assessment of liver function and hepatic failure	Mod	<a href="#">BT_PO 1.106</a>
Functions of the liver and consequences of hepatic disease	Low	<a href="#">BT_PO 1.103</a>
Portal circulation	Low	<a href="#">BT_PO 1.105</a>

Usual number of MCQs - 1

Hemmings and Egan Ch 27

## MATERNAL PHYSIOLOGY

Physiological changes in pregnancy	High	<a href="#">SS_OB 1.1</a>
Transition from foetal to neonatal circulation and ventilation	Mod	<a href="#">SS_OB 1.3</a>
Reference ranges for physiological and biochemical variables in pregnancy		
	Low	<a href="#">SS_OB 1.2</a>
Placental physiology	Low	<a href="#">SS_OB 1.4</a>
Aortocaval compression	Low	<a href="#">SS_OB 1.5</a>

Power and Kam 3e Ch 14 covers it better than most, so does Stoelting 5e Ch

## MUSCLE PHYSIOLOGY

Skeletal muscle physiology

Mod

[BT\\_PO 1.98a](#)

Usual number of MCQs - 2

This is an area that, beyond the neuromuscular junction, is not really core anaesthesia. In many ways cardiac and smooth muscle are far more relevant to our working lives. However, skeletal muscle physiology is well-understood as well as being quite interesting. Hence it tends to get examined. All you need to know is contained in a few pages of Ch 1 in Power and Kam 3e.

## NERVOUS SYSTEM PHYSIOLOGY

Basic electrophysiology of nerve conduction	High	<a href="#">BT_PO 1.92</a>
Physiology of nerve conduction	High	<a href="#">BT_RA 1.1</a>
Determinants and regulation of intracranial pressure	High	<a href="#">BT_RT 1.12</a>
Autonomic nervous system	Mod	<a href="#">BT_PO 1.51</a>
Physiology of spinal cord perfusion, intracranial pressure, cerebral blood flow	Mod	<a href="#">BT_PO 1.95</a>
Cerebrospinal fluid	Mod	<a href="#">BT_PO 1.97</a>
Cerebral circulation and autoregulation	Mod	<a href="#">BT_RT 1.13</a>
Cerebral perfusion pressure	Mod	<a href="#">BT_RT 1.14</a>
Physiology of sleep	Low	<a href="#">BT_PO 1.93</a>
Basis of the electroencephalogram	Low	<a href="#">BT_PO 1.94</a>
Blood brain barrier	Low	<a href="#">BT_PO 1.96</a>
Cerebral and spinal cord metabolism, cell damage and death	Low	<a href="#">BT_PO 1.98</a>
Spinal cord blood supply and blood flow	Low	<a href="#">BT_RT 1.15</a>
Spinal cord perfusion pressure	Low	<a href="#">BT_RT 1.16</a>

Usual number of MCQs - 5

It's difficult to assign importance level to some of these LO's. Many of them overlap. Some of them have some elements of high importance (e.g. some components of the ANS) in a morass of less important features. Equally I don't consider that the composition, generation and absorption of CSF is very important for most anaesthetists, but it is easy to examine, so beware. The physiology of sleep should be really important to an anaesthetist but is actually quite difficult to examine; same goes for the basis of the EEG given the current fad for monitoring processed frontal EEG despite little understanding of how it is generated. So don't spend lots of precious time on the detail of these things but know some core facts well so that you can avoid a blank SAQ answer book or an unpleasant, lengthy silence in a viva.

Hemmings and Egan Ch 7 & 8 is a great place to start, so is Power and Kam 3e Ch 2

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## NUTRITION AND METABOLISM

Control of blood glucose	High	<a href="#">BT_PO 1.85</a>
Physiological consequences of starvation	Low	<a href="#">BT_PO 1.83</a>
Factors that influence metabolic rate	Low	<a href="#">BT_PO 1.84</a>

Usual number of MCQs - 2

Obviously the effects of fasting are important, but starvation less so. Knowledge of blood glucose control and lactate metabolism are very pertinent. Many of our sicker patients have been effectively starved for days due to their illness, or from a prolonged stay in Intensive Care.

Miller 8e Ch 106 Power and Kam 3e Ch 12

## PRINCIPLES OF MEASUREMENT

Basic physics applicable to anaesthesia	High	<a href="#">BT_SQ 1.5</a>
Methods of measurement applicable to anaesthesia	High	<a href="#">BT_SQ 1.6</a>

Usual number of MCQs - 2

SQ 1.6 is HUGE. Our profession is very equipment-heavy; that and the modern drugs are probably what has really improved the safety of anaesthesia, rather than an improved knowledge of physiology. You are almost certain to get some of this in the viva, and probably at least one SAQ. I recommend Magee and Tooley, but there are other dedicated equipment books in the reading list you can use. Miller has excellent sections. You can also try <https://www.howequipmentworks.com> which is a great site and quite entertaining. One key thing to bear in mind is to identify the circumstances in which monitoring equipment may give misleading results. It is just as important to know when a device may be misleading as it is to know what it means when it is accurate.

## RENAL PHYSIOLOGY

Renal responses to hypovolaemia	High	<a href="#">BT_PO 1.70</a>
Physiology of renal blood flow	Mod	<a href="#">BT_PO 1.62</a>
Glomerular filtration and tubular function	Mod	<a href="#">BT_PO 1.63</a>
Counter-current mechanisms in the kidney	Mod	<a href="#">BT_PO 1.64</a>
Regulation of renal function	Mod	<a href="#">BT_PO 1.65</a>
Physiological effects and clinical assessment of renal dysfunction	Mod	<a href="#">BT_PO 1.69</a>
Functional anatomy of the kidneys and urinary tract	Low	<a href="#">BT_PO 1.61</a>
Effects of anaesthesia on renal function	Mod	<a href="#">BT_PO 1.71</a>
Endocrine functions of the kidney	Low	<a href="#">BT_PO 1.66</a>
Role of the kidney in the handling of glucose, nitrogenous products and drugs	Low	<a href="#">BT_PO 1.67</a>
Principles of measurement of glomerular filtration rate and renal blood flow	Low	<a href="#">BT_PO 1.68</a>

Usual number of MCQs - 6

Whilst Vander is a good book, you probably do not need to read it all to get through the Primary. It's covered pretty well in Power and Kam 3e Ch 7 and Hemmings and Egan Ch 32.

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## RESPIRATORY PHYSIOLOGY

Preoxygenation	High	<a href="#">IT_AM 1.9</a>
Artificial ventilation and physiological consequences	High	<a href="#">BT_AM 1.19</a>
Control of ventilation	High	<a href="#">BT_PO 1.9</a>
Surfactant	High	<a href="#">BT_PO 1.10</a>
Compliance	High	<a href="#">BT_PO 1.11</a>
Fast and slow alveoli / time constants	High	<a href="#">BT_PO 1.12</a>
Elastic properties of the chest wall	High	<a href="#">BT_PO 1.13</a>
Pleural pressure gradient	High	<a href="#">BT_PO 1.14</a>
Physics of gas flow	High	<a href="#">BT_PO 1.15</a>
Airway resistance	High	<a href="#">BT_PO 1.16</a>
Closing capacity	High	<a href="#">BT_PO 1.17</a>
Work of breathing	High	<a href="#">BT_PO 1.18</a>
Altered lung mechanics	High	<a href="#">BT_PO 1.19</a>
Lung volumes	High	<a href="#">BT_PO 1.20</a>
Dead space	High	<a href="#">BT_PO 1.21</a>
Ideal alveolar and mixed expired gases	High	<a href="#">BT_PO 1.22</a>
Oxygen cascade	High	<a href="#">BT_PO 1.23</a>
Alveolar exchange of oxygen and carbon dioxide	High	<a href="#">BT_PO 1.24</a>
Diffusion capacity	High	<a href="#">BT_PO 1.25</a>
V/Q matching	High	<a href="#">BT_PO 1.26</a>
West's zones	High	<a href="#">BT_PO 1.27</a>
Shunt	High	<a href="#">BT_PO 1.28</a>
V/Q mismatch - oxygenation and carbon dioxide elimination	High	<a href="#">BT_PO 1.29</a>
Carriage of oxygen in the blood	High	<a href="#">BT_PO 1.31</a>
Carriage of carbon dioxide in the blood	High	<a href="#">BT_PO 1.32</a>
Pulmonary v systemic circulation	High	<a href="#">BT_PO 1.33</a>
Pulmonary vascular resistance	High	<a href="#">BT_PO 1.34</a>
IPPV and PEEP - Physiological effects	High	<a href="#">BT_PO 1.35</a>
Effects of hypoxaemia, hyper and hypocapnia, and carbon monoxide	High	<a href="#">BT_PO 1.36</a>
Causes of hypoxaemia	High	<a href="#">BT_RT 1.10</a>
Consequences of hypoxaemia	High	<a href="#">BT_RT 1.11</a>
Respiratory failure	High	<a href="#">BT_RT 1.38</a>

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Physiology of the airway	Mod	<a href="#">BT_AM 1.2</a>
Anatomy - chest wall and diaphragm	Mod	<a href="#">BT_PO 1.6</a>
Anatomy - lower airways	Mod	<a href="#">BT_PO 1.7</a>
Anatomy - pulmonary and bronchial circulations	Mod	<a href="#">BT_PO 1.8</a>
V/Q mismatch - measurement	Mod	<a href="#">BT_PO 1.30</a>
Ventilatory effects of posture, exercise, altitude, anaesthesia, ageing, morbid obesity	Mod	<a href="#">BT_PO 1.37</a>
Humidity	Mod	<a href="#">BT_PO 1.38</a>
Non-ventilatory functions of the lungs	Mod	<a href="#">BT_PO 1.39</a>

Usual number of MCQs - 14

Depressing isn't it? A lot of the material is succinctly covered in Power and Kam 3e Ch 3 and Miller 3e Ch 19, however there is no getting away from the fact that the Primary Exam tome for respiratory physiology is Nunn's 8e, and the *vade mecum* is West 9e.

In the old days, we were advised to read through Nunn and revise from West. That is perhaps a bit extreme as Nunn has expanded somewhat with the addition of interesting, but not so relevant, chapters. However, you need to know nearly everything in West and it helps to dip into Nunn to clarify some of the conceptual material and fill in a few gaps. The various effects of trekking at high altitude, or even to the top of Everest will be of practical use to very few trainees, but it is fair to say that you will not be able to adequately explain the effects of altitude without a solid understanding of the basic physiology, which is why this topic is of such enduring interest to examiners.

## THERMOREGULATION

Maintenance of temperature during anaesthesia	High	<a href="#">BT_GS 1.69</a>
Heat	Mod	<a href="#">BT_GS 1.65</a>
Hypo/hyperthermia	Mod	<a href="#">BT_GS 1.66</a>
Environmental temperature changes and anaesthesia	Mod	<a href="#">BT_GS 1.68</a>
Thermoneutral zone, neonatal thermoregulation	Mod	<a href="#">SS_PA 1.23</a>
Energy requirements and body temperature	Low	<a href="#">BT_GS 1.67</a>

Usual number of MCQs - 2

Power and Kam 3e Ch 12; Spoor and Kiffs 18.11

## ANTIARRHYTHMICS

Physiology and pharmacology basis of antiarrhythmic therapy

Mod [BT\\_PO 1.56](#)

Pharmacology of antiarrhythmic agents

Mod [BT\\_PO 1.57](#)

Usual number of MCQs - 2

At last some pharmacology LO's!

Hemmings and Egan has a good chapter on this topic (24), but lacks some detail on digoxin and amiodarone - two antiarrhythmics that you will encounter frequently in clinical practice. Stoelting 5e Ch 21 is better, but even that is weak on digoxin.

Goodman and Gilman 13e Ch 30 is probably the best for that detail. In all of them remember to ignore drugs not available in Australia and New Zealand.

## ADRENORECEPTOR BLOCKING AGENTS

Pharmacology of alpha and beta blockers

Mod

[BT\\_PO 1.54](#)

Usual number of MCQs - 2

Any standard pharmacology text should do, but remember to ignore those drugs that are not available in Australia and New Zealand. Focus on the agents commonly encountered in clinical practice. Hemmings and Egan Ch 23 covers all the drugs, but you may want to get more detail on some specific agents from Goodman and Gilman 13e.



## ANTIEMETICS

Management of PONV

Mod

[BT\\_GS 1.62](#)

Usual number of MCQs - 2

Hemmings and Egan Ch 29, Miller 8e Ch 97. Both chapters are authored by Christian Apfel.

## ANTIHYPERTENSIVES

Pharmacology of antihypertensive agents

Mod

[BT\\_PO 1.58](#)

Usual number of MCQs - 2

Same advice as for [adrenoceptor blockers](#). Alpha-2 agonists are particularly popular. Focus on those that are used clinically in anaesthesia care rather than those for the treatment of chronic hypertension.

## CARDIAC ARREST, ISCHAEMIA AND FAILURE

Drugs for management of shock	High	<a href="#">BT_RT 1.17</a>
Drugs for cardiopulmonary resuscitation	High	<a href="#">BT_RT 1.18</a>
Pharmacology of drugs to manage myocardial ischaemia	Mod	<a href="#">BT_PO 1.59</a>
Pharmacology of drugs to manage cardiac failure	Low	<a href="#">BT_PO 1.60</a>
Oxygen delivery and indicators of tissue oxygenation in resuscitation	High	<a href="#">BT_RT 1.4</a>

Usual number of MCQs - 2

No single text seems to have all the information you need. The chapter on CPR in Oh's Intensive Care Manual 7e Ch 21 is very good. Other chapters in there are good too but don't have a lot of detailed pharmacology. Hemmings and Egan Ch 22 and 23 has a fair bit of information, but again, you may need to get more detailed pharmacology from Goodman and Gilman 13e. I'm not convinced that the LO's are really up to date in this section as lignocaine is still in the BT\_RT 1.18 and there is less appetite for measuring mixed venous oxygen saturation (requires a PA catheter) than in former times (BT\_RT 1.4).

## ANTICHOLINESTERASE DRUGS

Neuromuscular blocking agents - reversal agents  
Anticholinesterases

High

[BT\\_GS 1.39](#)

High

[BT\\_GS 1.40](#)

Usual number of MCQs - 1

There's some good information in most anaesthetic pharmacology texts but it's worth reading through Ch 35 in Miller 8e at least once.

## DRUGS AND THE COAGULATION SYSTEM

Pharmacology of heparin	Mod	<a href="#">BT_PO 1.118</a>
Warfarin and other anticoagulants	Mod	<a href="#">BT_PO 1.120</a>
Reversal of warfarin	Mod	<a href="#">BT_PO 1.121</a>
Anti-platelet agents	Mod	<a href="#">BT_PO 1.122</a>
Protamine	Low	<a href="#">BT_PO 1.119</a>
Thrombolytic agents	Low	<a href="#">BT_PO 1.123</a>
Antifibrinolytic agents	Low	<a href="#">BT_PO 1.124</a>

Usual number of MCQs - 2

The first four are popular viva topics, and given that nearly every inpatient will get a LMWH and every other patient seems to be on some antiplatelet therapy, perhaps these should be rated as “High”. Even though I have yet to read reports of patients dying from haemorrhage caused by anaesthesia, perioperative management of these medicines frequently falls to the anaesthetist. It’s all well-covered in Hemmings and Egan Ch 37. As for the other three LO’s I would stick to knowing something about protamine and tranexamic acid (aminocaproic acid and aprotinin are no longer available in Australia and will not be examined). I’ve not seen anyone quizzed on thrombolytic agents in my 12 years of examining.

## DIURETICS

Physiological basis for classification of diuretics related to their site of action

Mod [BT\\_PO 1.81](#)

Pharmacology of diuretics

Mod [BT\\_PO 1.82](#)

Usual number of MCQs - 1

A topic that lends itself to the integrated exam, although pretty mind-numbing and something an anaesthetist would rarely prescribe (at least, not for their diuretic action). Hemmings and Egan Ch 34 canters through it pretty well without too much excruciating detail.

## ENDOCRINE PHARMACOLOGY

Pharmacology of insulin, oral hypoglycaemics, corticosteroid drugs

High [BT\\_PO 1.90](#)

Pharmacology of thyroid hormone, anti-thyroid drugs, glucagon, vasopressin and analogues

Low [BT\\_PO 1.91](#)

Usual number of MCQs - 1

A lot of patients get steroids, a great many are diabetic. Again, it often falls to the anaesthetist to manage these perioperatively. Hemmings and Egan Ch 31 covers it nicely. There is an overlap here with the physiology of metabolism of fat and glucose, which was covered in a [previous topic](#).

## GASTROINTESTINAL PHARMACOLOGY

Nausea & Vomiting - Treatment

High [BT\\_GS 1.44](#)

Pharmacological treatment of peptic ulcer disease and reflux

Low [BT\\_PO 1.109](#)

Usual number of MCQs - 1

The first of these is really the same material as in [ANTIEMETICS](#). Acid suppression is covered in most dedicated pharmacology texts.



## PHARMACEUTICAL ASPECTS AND DRUG DEVELOPMENT

Drug additives

Mod

BT\_GS 1.22

Usual number of MCQs - 1

The best single resource remains Ross McPherson's article from 2001. It's on the recommended reading list and can be downloaded through the ANZCA library. You can also view it [here](#). It is unlikely that you will ever get a mark for pointing out that a drug is presented as a "clear, colourless solution".

## PHARMACODYNAMICS

Mechanisms of drug action	High	<a href="#">BT_GS 1.1</a>
Receptors	High	<a href="#">BT_GS 1.2</a>
Dose-effect relationships	High	<a href="#">BT_GS 1.3</a>
Efficacy and potency	High	<a href="#">BT_GS 1.4</a>
Law of mass action	High	<a href="#">BT_GS 1.5</a>
Mechanisms of adverse drug effects	High	<a href="#">BT_GS 1.6</a>
Mechanisms of anaesthesia	High	<a href="#">BT_GS 1.49</a>

Usual number of MCQs - 5

Hemmings and Egan Ch 1, 2, 5 & 6 covers most of these, and Ch 9 & 10 has plenty of detail on mechanisms. This and pharmacokinetics are the main conceptually difficult topics in Pharmacology, so it is worth reading it several times and from several sources and perspectives to get a good understanding. Examiners care far more about this than the rote learning of pharmacokinetic parameters of various drugs.

## PHARMACOKINETICS

Pharmacokinetic modelling	High	<a href="#">BT_GS 1.7</a>
Drugs absorption	High	<a href="#">BT_GS 1.8</a>
Drug distribution	High	<a href="#">BT_GS 1.9</a>
Drug clearance	High	<a href="#">BT_GS 1.10</a>
Drug metabolism	High	<a href="#">BT_GS 1.11</a>
Drug infusion kinetics	High	<a href="#">BT_GS 1.12</a>
Drug monitoring	High	<a href="#">BT_GS 1.13</a>
Target controlled infusions	High	<a href="#">BT_GS 1.59</a>

Usual number of MCQs - 4

Hemmings and Egan Ch 2, 3 & 4 packs it in but, as with pharmacodynamics, read widely. You need a detailed understanding of propofol pharmacokinetics and TCI models, especially their limitations.

## VARIABILITY IN DRUG RESPONSE

Variations in individual drug responses	High	<a href="#">BT_GS 1.14</a>
Tachyphylaxis, tolerance, addiction, dependence and idiosyncrasy	High	<a href="#">BT_GS 1.15</a>
Changes in drug response due to physiological change with particular reference to the elderly	High	<a href="#">BT_GS 1.16</a>
Adverse drug effects	High	<a href="#">BT_GS 1.18</a>
Drug interactions	High	<a href="#">BT_GS 1.19</a>
Pharmacogenetics	High	<a href="#">BT_GS 1.20</a>
Changes in drug response due to cardiac, respiratory, renal and hepatic disease	Mod	<a href="#">BT_GS 1.17</a>
Isomerism	Mod	<a href="#">BT_GS 1.21</a>
Analgesic agents and pathological disturbance	Mod	<a href="#">BT_PM 1.10</a>
Alterations to drug response due to renal disease	Mod	<a href="#">BT_PO 1.80</a>
Alterations to drug response due to hepatic disease	Mod	<a href="#">BT_PO1.108</a>
Use of dantrolene for treating malignant hyperthermia	Mod	<a href="#">BT_RT 1.19</a>
Changes in pharmacokinetics and pharmacodynamics of drugs during pregnancy	Mod	<a href="#">SS_OB 1.9</a>
Inadvertent intra-arterial injection	Low*	<a href="#">BT_GS 1.58</a>
Failure to wake	Low*	<a href="#">BT_GS 1.63</a>
Postoperative delirium	Low*	<a href="#">BT_GS 1.64</a>

Usual number of MCQs - 3

\*The last three are rated “low” not because they are not important but because they really belong in the Final Exam, so whilst technically fair game it would be bad form to examine them in any detail.

You will need to cast your net wide to gather most of the material for this topic as it is quite diverse and often buried in chapters on other things. Fortunately there are a few double-ups. Hemmings and Egan Ch 4, 5 & 6 is a good place to start.

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## HISTAMINE AND SEROTONIN

Pharmacology of drugs acting via serotonin or serotonin receptors

Mod [BT\\_PO 1.101](#)

Clinical features and management of serotonin syndrome

Mod [BT\\_PO 1.102](#)

Pharmacology of histamine antagonists

Low [BT\\_PO 1.100](#)

Usual number of MCQs - 1

Drugs acting on serotonergic pathways are relevant to anaesthetic pharmacology, but obviously the detailed pharmacology of antidepressants is not required. It's hard to find a single source for all the information you might want. Katzung 13e Ch 16 has a comprehensive chapter on histamine, serotonin and the ergot alkaloids - it's more than you need for everything (except the antiemetics!) and is available directly through the Primary [library guide](#).

## INHALATIONAL ANAESTHETIC AGENTS

Inhalational agents - physical properties	High	<a href="#">BT_GS 1.23</a>
Inhalational agents - pharmacokinetics	High	<a href="#">BT_GS 1.24</a>
Inhalational agents - system effects	High	<a href="#">BT_GS 1.25</a>
Inhalational agents - toxicity	High	<a href="#">BT_GS 1.26</a>
Inhalational agents - nitrous oxide	High	<a href="#">BT_GS 1.27</a>
Inhalational agents - comparative pharmacology	High	<a href="#">BT_GS 1.28</a>
MAC	High	<a href="#">BT_GS 1.50</a>

Usual number of MCQs - 6

It would be surprising if you didn't get an SAQ and/or a viva on inhalational agents. There is plenty of material in Hemmings and Egan Ch 3 & 10, massive amounts in Miller 8e Ch 25-28, but my favourite is "The Pharmacology of Inhaled Anaesthetics" by Eger, Eisenkraft and Weiskopf, for sheer elegance, readability, authority, and brevity (250 pages but not close-written). It was written by a giant of anaesthesia, Ted Eger, who passed away last year. He developed the concept of MAC and produced a huge volume of research about inhalational agents. The book was available free (thanks to an Educational Foundation and Baxter) so someone in your department may well have a copy to lend you. It came with two DVDs of excellent lectures and has a bunch of MCQs at the back some of which might make their way into our MCQ bank.... You can get it on Amazon (which is a bit outrageous as it was given away free when it came out in 2003). The last chapter alone is worth the price of admission.

## IV ANAESTHETIC AGENTS

Sedatives and hypnotics	High	<a href="#">BT_GS 1.29</a>
Intravenous and sedative agents - pharmacokinetics	High	<a href="#">BT_GS 1.30</a>
Intravenous and sedative agents - effects on body systems	High	<a href="#">BT_GS 1.31</a>
Intravenous, sedative and premedicant agents - adverse effects	High	<a href="#">BT_GS 1.32</a>
Intravenous and sedative agents - altered physiological states	High	<a href="#">BT_GS 1.33</a>
Ketamine	High	<a href="#">BT_PM 1.27</a>

Usual number of MCQs - 6

No excuses :) Hemmings Ch 9, Miller 8e Ch 30

## IV FLUIDS

Colloids and crystalloids

High

[IT\\_GS 1.5](#)

Usual number of MCQs - 1

Hemmings and Egan Ch 33



## LOCAL ANAESTHETIC DRUGS

Pharmacology of local anaesthetic agents	High	<a href="#">BT_RA 1.3</a>
Maximum safe doses of local anaesthetic agents in neonates and children	High	<a href="#">SS_PA 1.79</a>
Pharmacokinetics of local anaesthetic agents in neonates and children	Low	<a href="#">SS_PA 1.78</a>

Usual number of MCQs - 4

Stoelting 5e Ch 10 is particularly comprehensive, even more so perhaps than Miller 8e Ch 36.

## ANTIMICROBIALS/CHEMOTHERAPEUTIC AGENTS

Antimicrobial agents	Mod	<a href="#">BT_PO 1.3</a>
Pharmacology of antimicrobial drugs	Mod	<a href="#">BT_PO 1.130</a>
Principles of antibiotic prophylaxis	Mod	<a href="#">BT_PO 1.131</a>
Cancer chemotherapeutic agents	Low	<a href="#">BT_PO 1.125</a>
Pharmacology of antiseptics and disinfectants	Low	<a href="#">BT_PO 1.132</a>

Usual number of MCQs - 1

Stoelting 5e Ch 41 and 42 has it all. You may also want to skim through ANZCA's [professional document PS28](#) on infection control.

## NEUROMUSCULAR BLOCKING AGENTS

Neuromuscular physiology and blocking agents	High	<a href="#">BT_GS 1.35</a>
Neuromuscular blocking agents - pharmacokinetics	High	<a href="#">BT_GS 1.36</a>
Neuromuscular blocking agents - comparative pharmacology	High	<a href="#">BT_GS 1.37</a>
Neuromuscular blocking agents - adverse effects	High	<a href="#">BT_GS 1.38</a>
Neuromuscular blocking agents - reversal agents	High	<a href="#">BT_GS 1.39</a>
Depth of neuromuscular blockade and neuromuscular monitoring	High	<a href="#">BT_GS 1.55</a>
Inadequate reversal of neuromuscular blockade	High	<a href="#">BT_GS 1.56</a>
Indication for muscle relaxation	Mod	<a href="#">BT_GS 1.47</a>

Usual number of MCQs - 6

One of the few topics that truly lends itself to integrated assessment of physiology, pharmacology and equipment, and therefore popular with examiners, especially in vivas. I think it is well-covered in Hemmings and Egan Ch 18 and 19, also Miller 8e 34 and 35. Sugammadex is well-covered in Stoelting 5e Ch 12. Obviously the indications for muscle relaxation are important but there are a bit more FEX than PEX. The same argument could be mounted for inadequate reversal, but it is so important, and so tied up with the pharmacology of the agents, that you should be very familiar with it.

## NEUROPHARMACOLOGY

Physiological consequences of a central neuraxial block	High	<a href="#">BT_RA 1.2</a>
Dose and choice of agents for spinal anaesthesia and epidural anaesthesia/analgesia	High	<a href="#">BT_RA 1.14</a>
Adjuvant drugs in neuraxial blockade	High	<a href="#">BT_RA 1.16</a>
Anticonvulsants	Mod	<a href="#">BT_PM 1.28</a>
Effect of baricity in spinal anaesthesia	Mod	<a href="#">BT_RA 1.15</a>
Flumazenil	Low	<a href="#">BT_GS 1.34</a>
Pharmacology of psychiatric drugs and other neurological disorders	Low	<a href="#">BT_PO 1.99</a>

Usual number of MCQs - 4

Some odd ones lumped in together here. Hence it is impossible to find a single source of information. Miller 8e Ch 56 covers neuraxial blocks more than comprehensively. Spoor and Kiff Ch 6.11-6.15 is an excellent introduction. Hemmings and Egan Ch 11 covers the rest (gapapentinoids are covered in Ch 16). My rating of the LO on flumazenil accords precisely with my view on its clinical worthlessness in anaesthesia.

NSAIDs

NSAIDs

Paracetamol

Prostaglandins

High

High

Low

[BT\\_PM 1.24](#)

[BT\\_PM 1.25](#)

[BT\\_PM 1.23](#)

Usual number of MCQs - 2

Anything you prescribe frequently, you need to know a lot about. Evers and Maze 2e Ch 34 covers NSAIDs and prostaglandins very nicely. Paracetamol is surprisingly well-covered in Spoor and Kiff Ch 7.28 and overdose on p439, and surprisingly poorly-covered in most anaesthetic pharmacology texts.

## OBSTETRIC PHARMACOLOGY

Pharmacology of oxytocic agents	High	<a href="#">SS_OB 1.10</a>
Pharmacology of tocolytic agents	Mod	<a href="#">SS_OB 1.11</a>
Pharmacology of agents used for the treatment of pre-eclampsia	Mod	<a href="#">SS_OB 1.12</a>
Placental drug transfer	Mod	<a href="#">SS_OB 1.13</a>
Drugs and breastfeeding	Mod	<a href="#">SS_OB 1.15</a>
Foetal and neonatal effect of drugs administered during pregnancy	Low	<a href="#">SS_OB 1.14</a>

Usual number of MCQs - 2

Evers and Maze 2e Ch 58 has good coverage of this topic, also Miller 8e Ch 77.

## OPIOID AGONISTS AND ANTAGONISTS

Opioids - clinical application	High	<a href="#">BT_GS 1.41</a>
Opioids - pharmacokinetics	High	<a href="#">BT_GS 1.42</a>
Opioid receptors	High	<a href="#">BT_PM 1.12</a>
Opioids - mechanisms of action	High	<a href="#">BT_PM 1.13</a>
Agonists, partial agonists, mixed agonists-antagonists, antagonists	High	<a href="#">BT_PM 1.14</a>
Opioids - routes of administration	High	<a href="#">BT_PM 1.15</a>
Opioid conversions	High	<a href="#">BT_PM 1.16</a>
Opioid pharmacokinetics	High	<a href="#">BT_PM 1.17</a>
Opioids - epidural and intrathecal	High	<a href="#">BT_PM 1.18</a>
Opioids - adverse effects	High	<a href="#">BT_PM 1.19</a>
Opioids - drug interactions	High	<a href="#">BT_PM 1.20</a>
Individual opioid pharmacodynamics	High	<a href="#">BT_PM 1.22</a>
Opioid antagonists	Mod	<a href="#">BT_PM 1.21</a>

Usual number of MCQs - 5

Evers and Maze 2e Ch 31-33; Hemmings and Egan Ch 15; Stoelting 5e Ch 7. Each is good in its own way. If you read all of them then you'll get plenty of reinforcement! There is also a lot of clinical information in the [Acute Pain Management handbook](#).

## PAIN

Physiology of pain	High	<a href="#">BT_PM 1.3</a>
Response to acute pain	High	<a href="#">BT_PM 1.5</a>
Pain and the elderly	High	<a href="#">BT_PM 1.8</a>
Analgesic agents	High	<a href="#">BT_PM 1.9</a>
Analgesic agents - modes of administration	High	<a href="#">BT_PM 1.11</a>
NMDA receptors	High	<a href="#">BT_PM 1.26</a>
Pain and sensory pathways	High	<a href="#">BT_RA 1.7</a>
Multimodal and pre-emptive analgesia	Mod	<a href="#">IT_PM 1.3</a>
Pharmacology of analgesics	Mod	<a href="#">IT_PM 1.4</a>
Progression from acute to chronic pain	Mod	<a href="#">BT_PM 1.4</a>
Neuropathic pain	Low	<a href="#">BT_PM 1.6</a>
Pain and organ dysfunction	Low	<a href="#">BT_PM 1.7</a>

Usual number of MCQs - 2

There are several double-ups here. Everything you need is probably in the [Acute Pain Management handbook](#), but it is a comprehensive survey and interpretation of the literature to be used as a guide, thus it is not as readable as the narrative style of textbooks. Pain physiology is well-covered in Hemmings and Egan Ch 14, Stoelting 5e Ch6, Power and Kam 3e Ch 13, and even more succinctly in Spoor and Kiffs 7.26 and 7.27. A lot of the pharmacology is covered elsewhere but remember to fill in any gaps (like antidepressants and methoxyflurane). The Introductory Training LOs and the more clinical ones have been rated of lower importance simply because of the timing of the Primary (after IT and before AT).



## AUTONOMIC NS PHARMACOLOGY

Pharmacology of sympathomimetic and anticholinergic drugs	High	<a href="#">BT_PO 1.52</a>
Pharmacology of adrenergic agonists	High	<a href="#">BT_PO 1.53</a>
Drug interactions with the autonomic nervous system	High	<a href="#">BT_PO 1.55</a>

Usual number of MCQs - 3

Hemmings and Egan Ch 13, Evers and Maze 2e Ch 40 and 41. No-one expects you to be able to draw the drugs, however you may be asked to recognise one and be asked about structure activity relationships (ditto for local anaesthetics).

## RESPIRATORY PHARMACOLOGY

Drugs and airway reflexes	High	<a href="#">BT_AM 1.3</a>
Anti-asthma drugs	High	<a href="#">BT_PO 1.40</a>
Oxygen therapy	High	<a href="#">BT_PO 1.41a</a>
Drugs for pulmonary hypertension	Low	<a href="#">BT_PO 1.41</a>

Usual number of MCQs - 1

Hemmings and Egan Ch 26 covers pulmonary pharmacology. The “airway reflex” LO is just a compilation of this specific side-effect of drugs covered elsewhere. Oxygen therapy is best covered in Oh’s Intensive Care Manual 7e Ch 28.

## ANATOMY

Upper airway and laryngeal anatomy	High	<a href="#">IT_AM 1.1</a>
Anatomy of the upper airway, larynx and trachea	High	<a href="#">BT_AM 1.1</a>
Anatomy relevant to central neuraxial blockade	High	<a href="#">BT_RA 1.4</a>
Midline and paramedian approaches to neuraxial blockade	High	<a href="#">BT_RA 1.17</a>
Anatomy of peripheral venous system	Mod	<a href="#">BT_GS 1.70</a>
Anatomy of the great veins	Mod	<a href="#">BT_GS 1.72</a>
Anatomy of peripheral arteries	Mod	<a href="#">BT_GS 1.74</a>
Anatomy of sensory pathways	Mod	<a href="#">BT_PM 1.1</a>
Anatomy of the major arteries and veins	Mod	<a href="#">BT_PO 1.42</a>
Dermatomes	Mod	<a href="#">BT_RA 1.5</a>
Anatomy relevant to vascular access in resuscitation	Mod	<a href="#">BT_RT 1.20</a>
Anatomy relevant to drainage of the pleural space	Mod	<a href="#">BT_RT 1.22</a>
Anatomy of the cerebral and spinal cord circulation	Mod	<a href="#">BT_RT 1.23</a>
Airway changes in pregnancy	Mod	<a href="#">SS_OB 1.6</a>
Neuraxial changes in pregnancy	Mod	<a href="#">SS_OB 1.7</a>
Anatomy and physiology of pain in labour and childbirth	Mod	<a href="#">SS_OB 1.8</a>
Anatomy of the autonomic nervous system	Low	<a href="#">BT_PM 1.2</a>
Myotomes	Low	<a href="#">BT_RA 1.6</a>
Anatomy relevant to the drainage of pericardial fluid	Low	<a href="#">BT_RT 1.21</a>

Usual number of MCQs - 3

Spoor and Kiff Ch 6 pretty much covers it. For the detailed approach, and some excellent applied procedural anatomy, read Ellis's Anatomy for Anaesthetists 9e.

## EQUIPMENT AND SAFETY

Equipment for airway management	High	<a href="#">IT_AM 1.6</a>
Principles and safety of nerve stimulation	High	<a href="#">BT_RA 1.9</a>
Mandatory safety requirements for anaesthetic machines	High	<a href="#">BT_SQ 1.3</a>
Microshock and macroshock	High	<a href="#">BT_SQ 1.7</a>
Scavenging and hazards of anaesthetic gas pollution	High	<a href="#">BT_SQ 1.9</a>
Supply of medical gases	High	<a href="#">BT_SQ 1.10</a>
Medical suction	High	<a href="#">BT_SQ 1.11</a>
Vapourisers	High	<a href="#">BT_SQ 1.12</a>
Breathing systems	High	<a href="#">BT_SQ 1.13</a>
Systems for delivery of supplemental oxygen	High	<a href="#">BT_SQ 1.14</a>
CO2 absorbers	High	<a href="#">BT_SQ 1.15</a>
Safety of methods for maintaining body temperature	High	<a href="#">BT_SQ 1.17</a>
Surgical diathermy	High	<a href="#">BT_SQ 1.18</a>
Principles and safety of ultrasound imaging	Mod	<a href="#">BT_RA 1.8</a>
Fires and explosions in the operating suite	Mod	<a href="#">BT_SQ 1.8</a>
Level 1 anaesthesia machine check	Mod	<a href="#">BT_SQ 1.16</a>
Cleaning and/or treatment of reusable equipment	Low	<a href="#">IT_SQ 1.5</a>
Lasers	Low	<a href="#">BT_SQ 1.19</a>

Usual number of MCQs - 6

Any of the equipment texts should do. Note that there are different standards in different countries. There is sadly no Australian/New Zealand-specific text since Russell's Anaesthetic Equipment went out of print. I think Magee and Tooley is better than the other texts available online through the library. There's a lot in Miller 8e and a surprisingly large amount in Spoor and Kiff (mostly in Ch 2). Professional document [PS54](#) covers the mandatory safety requirements for anaesthetic machines, [PS31](#) covers the indications for a Level 1 machine check and [PS28](#) covers the standards for cleaning and disinfection.

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## INTEGRATED / MISCELLANEOUS

Pneumoperitoneum	High	<a href="#">IT_GS 1.8</a>
Physiology of patient positions	High	<a href="#">IT_GS 1.9</a>
Respiratory effects of anaesthesia and patient positioning	High	<a href="#">BT_AM 1.4</a>
Choice of agents for anaesthesia	High	<a href="#">BT_GS 1.46</a>
Synergism between anaesthetic agents, opioids and regional blockade		
	High	<a href="#">BT_GS 1.53</a>
Intravenous and inhalational induction	High	<a href="#">BT_GS 1.57</a>
Respiratory effects of anaesthesia	High	<a href="#">BT_GS 1.60</a>
Anaesthetic agents and regional circulation	Mod	<a href="#">BT_GS 1.48</a>
Dealing with changing surgical stimulus	Mod	<a href="#">BT_GS 1.54</a>
Diagnostic tests	Mod	<a href="#">BT_PO 1.2</a>
Pharmacology of illicit drugs	Mod	<a href="#">BT_PO 1.3a</a>
Motherhood statement	Low	AR_ME 1.3
Knowledge and understanding of procedures and technical skills	Low	AR_ME 2.2
Procedure catch-all statement	Low	AR_ME 3.2
Basic pharmacology of drugs used in anaesthesia	Low	IT_GS 1.1
Immune, haematological and endocrine effects of anaesthesia	Low	<a href="#">BT_GS 1.61</a>
Outline the pharmacology of radiological contrast agents	Low	<a href="#">BT_SQ 1.20</a>
Pharmacology of herbal medicines	Low	<a href="#">BT_PO 1.4a</a>

Usual number of MCQs - 6

A mixed bag of stuff. The AR\_ME LO's are just bureaucratic catch-all statements to obviate the need to include hundreds of LOs in the "Medical Expert role in practice" in the Training Program Curriculum. IT\_GS 1.1 is covered elsewhere! Spoor and Kiff is good on patient positioning (4.2), pneumoperitoneum (4.17), choice of agents and inhalational induction (3.2), and diagnostic tests (p571). Respiratory effects of anaesthesia is well-covered in Nunn 8e Ch 20. Synergism is tricky. You need to know a bit about isobolograms and response surfaces, as well as the clinical implications of giving regional and general anaesthesia simultaneously. Effects of drugs on regional circulation is part of the pharmacology of those drugs. Changing surgical depth is really FEX. Illicit drugs and herbal medicines are covered in general pharmacology books like Katzung 13e Ch 32 and 65 although their specific effects relevant to anaesthesia and surgery are not well-covered. There is a link to anaesthetic articles on illicit drugs [here](#) and on herbal medicines [here](#).

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