



# MEDICAL SOFTWARE 2017 CATALOGUE



**MEDICAL & SCIENCE MEDIA**

Telephone: (02) 9675-7750 [www.msmedia.com.au](http://www.msmedia.com.au)

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A Price List is included in this catalogue, but as you know prices can change without notice, so we recommend you go to our web site at [www.msmedia.com.au](http://www.msmedia.com.au) regularly to download the latest version.

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## MEDICAL & SCIENCE MEDIA

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# ACCIDENT & EMERGENCY SOFTWARE

## Cat.# AN-1 - ACLS SIMULATOR



- 16 Simulated Cases covers all ACLS guidelines
- Ventricular fibrillation and pulseless V Tach
- Ventricular tachycardia - unstable and stable
- Asystole
- Pulseless electrical activity
- Tachycardias and Bradycardias
- Instructors can write their own scenarios

Windows & Macintosh



**The ACLS Simulator 2011 incorporates two modules: Rhythm Simulator:** Improves your ECG rhythm recognition skills., And **ACLS Simulator:** Enables you and your staff to rehearse megacode scenarios.

- Easy to use real-time simulator:
- Assess the patient and interpret the ECG
- Control the airway, breathing and circulation
- Defibrillate/Cardiovert
- Administer cardiac medications

These programs are available as Single User and Institutional licences. See [page 38](#) for prices

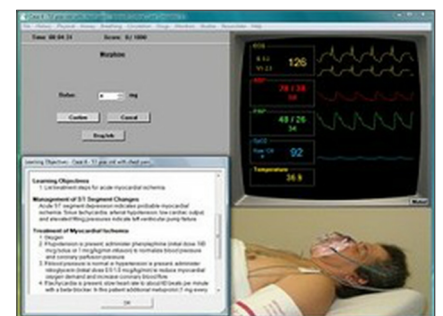
## Cat.# AN-3 - CRITICAL CARE SIMULATOR



### Includes 6 case scenarios:

- Anaphylaxis
- Chest pain
- Diabetic Ketoacidosis
- Head Injury
- Trauma
- Septic Shock

Windows



### Benefits:

- Real-time simulation
- Proven to improve performance
- Helps trainees recognize and treat critical incidents
- Use on your home or office computer
- Have fun while you rehearse management of simulated medical emergencies
- No special hardware requirements
- Instructors can write their own scenarios

**Improve your response to anesthetic critical incidents**



The *Anesthesia Simulator* is a real-time graphical simulator that reproduces the anesthesia environment on a computer screen. It is the only computer program that can help you prepare for emergency situations in anesthesia.

The *Anaesthesia Simulator* includes dozens of scenarios such as myocardial ischemia, anaphylaxis and malignant hyperthermia. Mathematical models of physiology and pharmacology predict the simulated patient's response to your management while an automated record-keeping system summarizes the case and an on-line consultant provides immediate management suggestions.



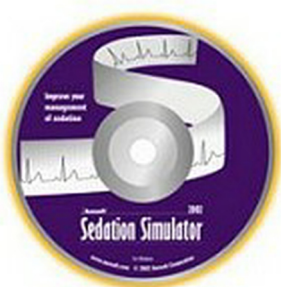
The *Anesthesia Simulator* has 32 cases with general anesthetic problems, and cardiac, neuro, trauma, obstetric and pediatric cases and dozens of anesthetic emergencies, such as Air embolism, Anaphylaxis, Bronchospasm, Carcinoid, Diabetic ketoacidosis, Hyperkalemia, Intracranial hypertension, Latex allergy, Malignant Hyperthermia, Pheochromocytoma, Preeclampsia, Venous air embolism.

**Benefits:**

- Proven to improve performance
- Helps trainees recognize and treat critical incidents
- Practicing anesthesiologists can review rare events
- Prepare for board exams
- Instructors can write their own scenarios

These programs are available as Single User and Institutional licences. See [page 38](#) for prices

**Improve your management of moderate sedationImprove your response to anesthetic critical incidents**



**Common sedation scenarios:**

- Radiology
- Gastroenterology
- Oral surgery
- Emergency room procedures
- Minor surgery

**32 cases with dozens of emergencies:**

- Agitation
- Anaphylaxis
- Aspiration
- Apnea
- Bradycardia
- Hypertension
- Hypotension
- Myocardial ischemia
- Tachycardia

**Benefits:**

- Easy to use real-time simulation
- Use on your home or office computer



Designed in conjunction with radiologists, gastroenterologists and oral surgeons

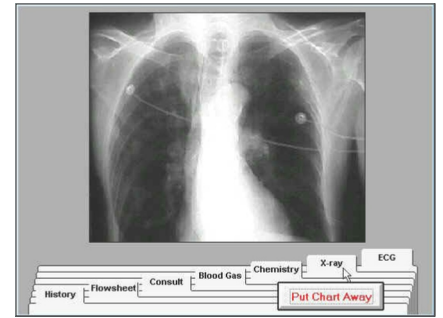




Based on the latest American Heart Association® ACLS Guidelines. Exciting live-action video teaches actions for tough clinical problems like hypocalcemia, hyperkalemia, hypothermia, Kawasaki disease, and more. Current to the latest ACLS guidelines, *Cardiac Arrest!* sharpens Advanced Cardiac Life Support (ACLS) skills in an exciting and realistic ER simulation. You call the shots. You have at your disposal a highly trained team, but they await your orders. Whether the patient can be revived depends entirely on your efforts. The patient's history is presented, and your resuscitation efforts begin. You read the live ECG, interpret the vital signs and lab data, and give treatment orders. Just click on common intervention buttons, or type your orders in plain English.

*Cardiac Arrest!* provides drug information, an on-line text book and algorithm flowcharts for assistance if you need it. Featuring 45 patients (30 adult & 15 PALS). Perfect ACLS re-certification preparation. Combine with Code Team! For the ultimate ACLS training.

**Systems Requirements:** Windows® operating system. Compatible with Windows 7, Vista, XP.



These programs are available as Single User and Institutional licences. See [page 38](#) for prices

## Cat.# MS-6 - TRAUMA ONE!

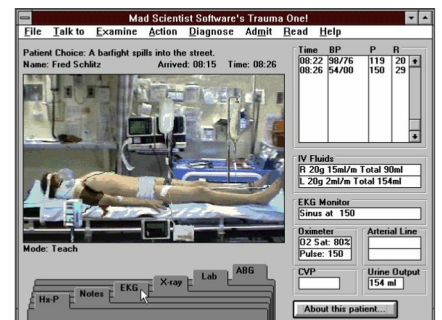
Windows



The real world is not the place to practice advanced trauma management. Instead, use this ruthless simulator to develop a rock-solid approach to trauma stabilization and workup.

*Trauma One!* presents a trauma victim and you begin management. Undertake stabilization measures, obtain historical and physical exam information, order tests, and perform procedures on your patient. See the interventions in the "trauma room" on your computer screen. With 36 critical patients, *Trauma One!* solidifies your approach to the trauma victim. It teaches therapeutic priorities, threshold for action, and completeness of workup. With a complete trauma-management manual, *Trauma One!* is the best way to learn solid trauma management.

**Systems Requirements:** PC with 300 megahertz (MHz) or higher processor clock speed, 128 megabytes (MB) of RAM or higher, 5 MB Hard Disk Space, Super VGA (800 × 600) or higher resolution video adapter and monitor, CD-ROM or DVD drive, Keyboard, Mouse. Windows® operating system. Compatible with Windows 7, Vista, XP.



## Cat.# MS-1 - BLOOD GASES

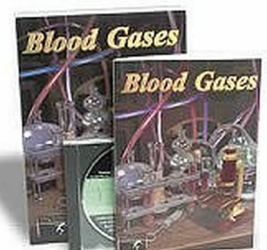
Windows

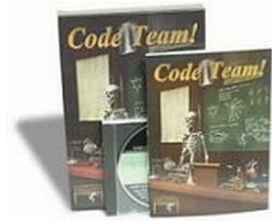
This valuable training aid teaches some of the most difficult, yet most important material in medicine. Use interactive tutorials, drills and quizzes to learn:

- Normal values
- Aa gradient calculation and interpretation
- Bedside acid-base balance interpretation
- Acidosis correction
- Bicarbonate dosage calculation

Blood Gases will even interpret lung function, acid-base balance, and blood gas values for you. A detailed manual features helpful hints, explanations, and extra information.

**Systems Requirements:** PC with 300 megahertz (MHz) or higher processor clock speed, 128 megabytes (MB) of RAM or higher, 5 Megabytes (MB) available hard disk space, Super VGA (800 × 600) or higher resolution video adapter and monitor, CD-ROM or DVD drive, Keyboard, Mouse. Windows® operating system. Compatible with Windows 7, Vista, XP.





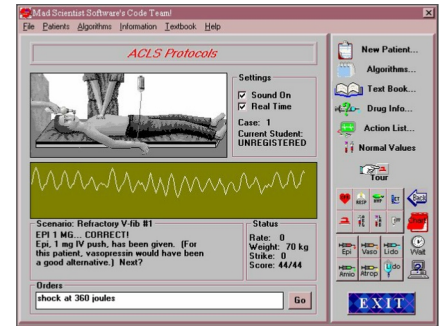
Re-certifying for ACLS? No problem. *Code Team!* is current to the latest American Heart Association® ACLS guidelines and features 3 modules for complete certification preparation:

**Cardio Quiz** – ten self-teaching tutorials mixed with quiz questions prepare you for the written ACLS certification test. Covers airway management, IV techniques, cardiac drugs, case management priorities, Basic Life Support review, and more.

**EKG Teaching** – Live EKG with sound, stimulating tutorials and quizzes teach 3-lead rhythm strip interpretation. Covers normal and abnormal ECG parts and rhythms, with pathology pattern and recognition such as hypercalcemia, hyperkalemia, and hypothermia.

**ACLS Protocols** – features multiple interactive simulations that teach application of the AHA's arrhythmia treatment algorithms to clinical situations. Among the protocols practiced are asystole, bradycardia with and without pulse, V-tach with and without pulse, V-fib, PAT, endotracheal drugs, and acidosis therapy. Perfect preparation for the dreaded MEGACODE portion of the ACLS certification.

**Systems Requirements:** PC with 300 megahertz (MHz) or higher processor clock speed, 128 megabytes (MB) of RAM or higher, 5 MB Hard Disk Space, Super VGA (800 × 600) or higher resolution video adapter and monitor, CD-ROM or DVD drive, Keyboard, Mouse. Windows® operating system. Compatible with Windows 7, Vista, XP.



**ACLS Teaching Series** - This package includes Cardiac Arrest! and Code Team! This package is very popular with teaching institutions and hospitals, but it's a great deal for anyone who needs to learn ACLS! Updated frequently, and always current to the latest ACLS guidelines.

**Systems Requirements:** PC with 300 megahertz (MHz) or higher processor clock speed, 128 megabytes (MB) of RAM or higher, 2.3 Gigabytes (GB) available hard disk space, Super VGA (800 × 600) or higher resolution video adapter and monitor, CD-ROM or DVD drive, Keyboard, Mouse. Windows® operating system. Compatible with Windows 7, Vista, XP.

These programs are available as Single User and Institutional licences. See [page 38](#) for prices

Featuring all six of our award winning software programs in one great package! Receive the latest versions of:

- Cardiac Arrest!
- Code Team!
- Trauma One!
- Chest Pain Simulator
- MicroEKG
- Blood Gases



This package covers many of the most important skills needed during a medical emergency. Includes teaching programs and simulations for ACLS, PALS, ATLS, 3 and 12-lead EKG interpretation, chest pain diagnosis, blood gas analysis, and more. The EmergiMed Suite is current to the 2006 ACLS guidelines.

**Systems Requirements:** PC with 300 megahertz (MHz) or higher processor clock speed, 128 megabytes (MB) of RAM or higher, 2.3 Gigabytes (GB) available hard disk space, Super VGA (800 × 600) or higher resolution video adapter and monitor, CD-ROM or DVD drive, Keyboard, Mouse. Windows® operating system. Compatible with Windows 7, Vista, XP.

# CARDIOLOGY SOFTWARE

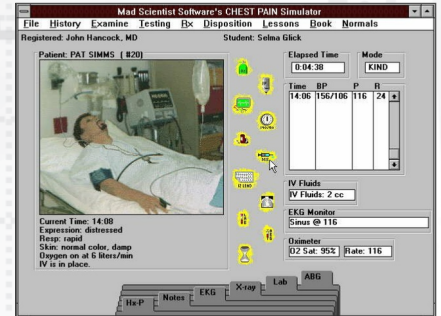
## Cat.# MS-3 - CHEST PAIN SIMULATOR

Windows



Opportunity. Danger. The workup of chest pain presents both. With thrombolytic drugs, the physician can help the MI patient as never before. Yet never has the danger been greater: Lawsuits for improper management of chest pain are the biggest-dollar loss to internists and emergency physicians.

The *Chest Pain Simulator* addresses both the opportunity and the danger. It simulates the workup of chest pain, including many non-cardiac causes of pain, and gives the user practice in determining the indications and contraindications to thrombolytics.



user practice in determining the

"This program is an excellent training environment for physicians interested in learning state-of-the-art thrombolytic therapy for acute myocardial infarction." Medical Software Reviews

The *Chest Pain Simulator* screen is designed for easy history-taking, examination, testing, and intervention. You manage the *Chest Pain Simulator* patients like real ones: stabilize, take a full history, perform a physical exam, order and interpret tests, and give treatment orders. The computer watches your workup, looking for weaknesses and pointing them out. The program also rates your time- and cost-efficiency. The program features a single-student, or multiple student mode that is set up at program installation. Tutorials help you get "up to speed" on thrombolytic therapy and chest pain workup. And the manual contains some of the most practical information you've ever read. It's even available in the program. Other nice features include an on-line patient chart.

**Systems Requirements:** Pentium processor 133Mhz or faster, 8 MB RAM, 5 MB hard drive space, CD-ROM drive, 256colour VGA monitor, keyboard, mouse. Windows® operating system. Compatible with Windows 95, 98, NT, Me, 2000 and XP®.

These programs are available as Single User and Institutional licences. See [page 38](#) for prices

## Cat.# MS-5 - MICROEKG

Windows



Learn 12-lead ECG interpretation on your desktop computer with the *MicroEKG* program. There's no faster or easier way to learn to read ECGs. This program is a must-have for every hospital.

*MicroEKG* starts with the basics: Cardiac Anatomy, ECG theory, lead placement, wave-forms and intervals. Next you'll learn rhythm stripe interpretation learn possible meanings of abnormal wave forms, abnormal intervals, and arrhythmias. Once you've mastered the basics, *MicroEKG* goes on to the 12-lead ECG. Through interactive tutorials and quizzes, you'll learn to interpret QRS axis infarct diagnosis, infarct location, and infarct age. You'll learn the causes of ST Depression you'll master diagnosis of chamber enlargement, or hypertrophy, acute and chronic pericarditis, ischemia, and much more. Browse through ECG's and rhythm strips. Pull up a diagnosis and see if you can recognize all

the features on the ECG. Pop up a table, or chart at any time while taking a lesson.

When you're ready, *MicroEKG* will present 12-lead ECG's and rhythm strips for interpretation. You type an ECG diagnosis in plain English, and the program evaluates your interpretation. *MicroEKG* provides hints, pointing out any features you may have overlooked. This program will make you a "master ECG reader" in no time.

**Systems Requirements:** Pentium processor 133Mhz or faster, 8 MB RAM, 5 MB hard drive space, CD-ROM drive, 256colour VGA monitor, keyboard, mouse. Windows® operating system. Compatible with Windows 95, 98, NT, Me, 2000 and XP®.



# LABORATORY MEDICINE SOFTWARE

## Cat.# WU-3 - GRAM STAIN TUTOR

Online Course

**COURSE OUTLINE:** Introduction: Overview, Gram Stain Procedure, Theory Interpretation. Morphology: Cells, Bacteria, Yeasts, Artefacts. Specimen Sites: CSF, Blood, Respiratory, Urine, Genital, Wound, Eye, Joint Fluid, Stool. Case Studies: Case #1, Case #2, Case #3, Case #4, Case #5, Case #6, Case #7. Exams: Exam #1, Exam #2.

### LEARNING OBJECTIVES:

- State the clinical importance of the Gram stain of body fluids, and describe and state the purpose of each step in the procedure
- List the major organisms isolated from the following specimens: blood, CSF, urine, respiratory, genital, wound, joint, eye, and stool
- State whether a specimen is likely to be normal, contaminated, or infected
- Use the proper generic terminology to systematically describe the morphology of bacteria or yeast
- Use the proper terminology to identify and describe cell types and common artefacts



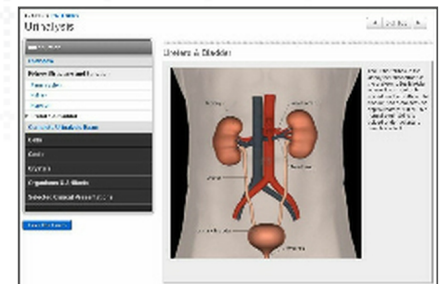
## Cat.# WU-2 - URINALYSIS TUTOR

Online Course

**COURSE OUTLINE:** Introduction: Overview, Kidney Structure and Function, Complete Urinalysis Exam. Cells: Introduction, WBCs, RBCs, Epithelial Cells, Oval Fat bodies, Quiz. Casts: Introduction Types of casts. Crystals: Introduction, Normal, Abnormal, Quiz. Organisms & Artefacts: Introduction, Organisms, Artefacts, Quiz. Selected Clinical Presentations: Glomerular Tubules, Chronic renal failure/End stage renal disease, Urinary Tract Cancer, Inadequate Specimen, Case study. Exams: Exam 1, Exam 2.

### LEARNING OBJECTIVES

- Describe the anatomic structures involved in urine formation
- Describe the three parts of a complete urinalysis
- Describe three methods of enhancing the visualization of urinary sediment structures
- Identify and differentiate the common cell types found in urinary sediment
- Enumerate red blood cells and white blood cells in unstained urinary sediment
- Identify the types of casts seen in urinary sediment and state the clinical significance associated with each finding
- Differentiate between crystals found in normal urine and crystals associated with clinical disease
- Describe typical urinary sediment findings and key biochemical findings associated with selected renal disorders

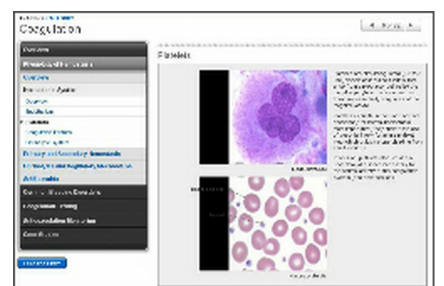


## Cat.# WU-17 - COAGULATION TUTOR

Online Course

### LEARNING OBJECTIVES

- Describe the basic physiology of hemostasis and its regulation
- Name the common bleeding disorders and their associated defects
- Understand the methodology of common coagulation tests and their role in diagnosing bleeding disorders
- Know the common abnormal coagulation test result patterns and the bleeding disorders most frequently associated with them
- Understand the role of coagulation tests in monitoring anticoagulant therapy

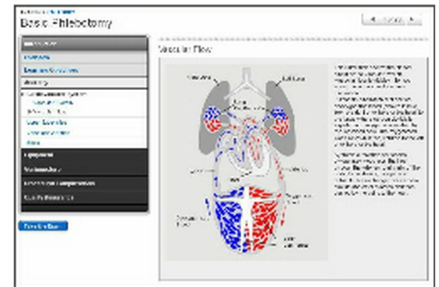




**COURSE OUTLINE:** Introduction: Overview, Learning Objectives, Anatomy, Equipment: Tubes, Needles, Tourniquets, Other. Venipuncture: Patient Introduction, Prepping, Blood Draw. Procedural Complications: Needle Insertion, Other Problems. Quality Assurance: Patient Complications, Suboptimal Specimens.

### LEARNING OBJECTIVES:

- Discuss the function and structure of veins. Identify the names and locations of the veins most suitable for phlebotomy
- List equipment and supplies needed to collect blood and discuss the correct use of each
- Describe the steps in performing a venipuncture procedure
- Discuss techniques and equipment used to minimize biohazard exposure
- Identify procedure errors and discuss remedies for each
- Identify complications associated with blood collection and discuss how appropriately to respond when each occurs
- Recognize sub-optimal specimens and their effect on the quality of laboratory test results



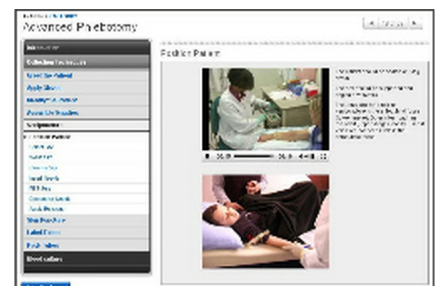
These programs are available as Online Licences. The duration of the licence is 5 years. See [page 38](#) for prices

### Venipuncture techniques for alternate sites, and skin puncture and blood culture collection procedures

**COURSE OUTLINE:** Introduction: Learning objectives, Equipment Overview. Collection Techniques: Greet the Patient, Apply Gloves, Identify the Patient, Assemble Supplies, Venipuncture, Skin Puncture, Label Tubes, Pack Tubes. Blood Culture: Overview, Equipment, Procedure.

### LEARNING OBJECTIVES:

- List the equipment and supplies needed for blood collection and describe the correct use of each
- Describe the steps in performing venipuncture procedures using the evacuated tube assembly with butterfly needle
- Describe the steps in performing a skin puncture procedure
- Describe the steps in performing a blood culture procedure



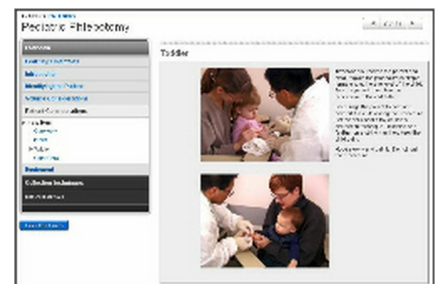
### Pediatric Phlebotomy Module

#### Techniques for blood collection from paediatric patients, including use of special equipment and distraction techniques

**COURSE OUTLINE:** Overview: Learning Objectives, Introduction, Identifying the Patient, Volume Considerations, Patient Considerations, Equipment. Collection Techniques: Venipuncture, Heel stick, Finger stick, Capillary, Blood Gas. Difficult Draws: Example 1, Example 2.

### LEARNING OBJECTIVES:

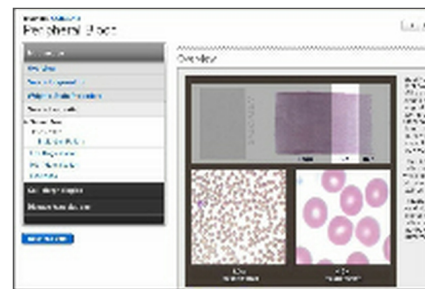
- List the equipment and supplies needed to perform a paediatric blood draw
- List the key patient considerations for various age groups of paediatric patients
- Describe the steps in performing a paediatric venipuncture using a syringe and butterfly needle
- Describe the steps in performing paediatric finger stick and heel stick procedures
- Describe the steps in performing a capillary blood gas



**COURSE OUTLINE:** Introduction: Overview, Smear Preparation, Wright's Stain Procedure, Smear Evaluation. Cell Morphologies: Blood Cell Structure, Red Blood Cells, White Blood Cells, Platelets Artefacts Quiz. Disease Associations: Red Blood Cells, White Blood Cells, Neoplastic Disorders.

**LEARNING OBJECTIVES:**

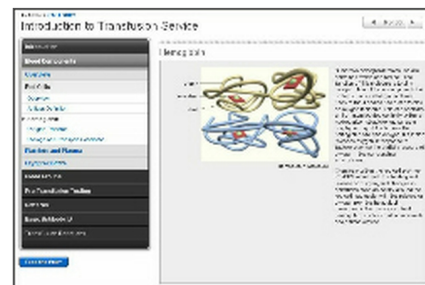
- Describe the steps necessary for the preparation of a Wright-stained peripheral blood smear and its proper microscopic evaluation
- Identify the sequence of cell types encountered during normal maturation of myeloid, erythroid, and megakaryocytic cells in the marrow
- Recognize and name the normal and abnormal forms of neutrophils, erythrocytes, lymphocytes, macrophages, and platelets using proper medical terminology
- Correlate single morphologic abnormalities seen in any of the above cell lineages to one or more specific disease states
- Integrate combinations of morphologic abnormalities involving one or more cell lineages to suggest a diagnosis of a disease state



**COURSE OUTLINE:** Introduction: Learning Objectives, Overview. Blood Components: Overview, Red Cells, Platelets and Plasma, Cryoprecipitate. Blood Groups: Overview, ABO and Compatibility, Rh. Pre-Transfusion Testing: Overview, Agglutination, Determining ABO/Rh Group, Other Required Pre-transfusion Testing, Other Optional Pre-transfusion Testing. Patterns Anti-D, Warm Auto-antibody, Antibody to High Frequency Antigen, HTLA, Anti-M. Basic Antibody ID: Overview, Exclusion/Inclusion Criteria, Examples. Transfusion Reactions: Overview, Haemolytic Transfusion Reaction, Dangerous Reactions without Haemolysis.

**LEARNING OBJECTIVES:**

- Name the 4 components that can be made from a unit of whole blood and describe the function of each
- Define the following terms: antigen, clinically significant antibody, hemolysis, and the complement system
- List compatible components for the following patient blood groups: A, B, O, and AB
- Define the antibody screen and explain why it is important in pre-transfusion testing
- Name 3 crossmatch tests and define when an antiglobulin crossmatch must be done
- Describe the laboratory's role in the evaluation of a suspected transfusion reaction
- Define the elements of accurate and thorough testing prior to infusion of blood components to a patient

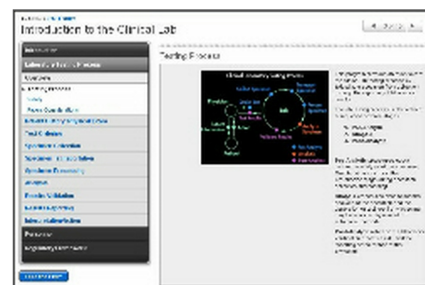


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**COURSE OUTLINE:** Introduction: Learning Objectives, Clinical Lab and Healthcare. Laboratory Testing Process: Overview, Patient History/Physical Exam Test Ordering, Specimen Collection, Specimen Transportation, Specimen Processing Analysis, Results Validation, Results Reporting, Interpretation/Action. Personnel: Overview Collection/Transportation, Specimen Processing, Analysis/Reporting Administration/ LIS. Regulatory Framework: Overview, Lab Quality. Final Exam: Exam 1.

**LEARNING OBJECTIVES:**

- Describe the pre-analytic, analytic and post-analytic stages of laboratory testing and list the important aspects of specimen collection and transportation
- Define Standard Precautions and recognize the importance of following safety guidelines
- Understand the patient's right to confidentiality and considerate treatment
- List the classical laboratory divisions and the common specimens and tests in each
- Describe clinical laboratory personnel and their roles
- Define Quality Assurance

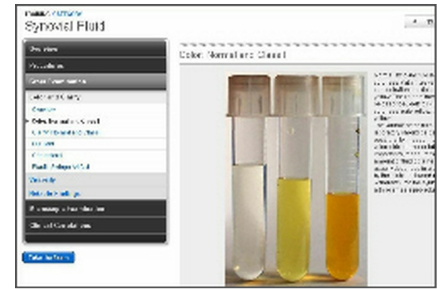


**Synovial Fluid Module****Classification of synovial effusions. Gross and microscopic examination, including the use of polarized light**

**COURSE OUTLINE:** Overview: Learning Objectives, Anatomy, Specimen Collection, SF Classification. Procedures: Polarized Light, Stains. Gross Examination: Colour and Clarity, Viscosity, Notable Finding. Microscopic Examination: Cells, Crystals, Micro-organisms, Lipids, Artefacts. Clinical Correlations: Gout, Pseudogout.

**LEARNING OBJECTIVES**

- Describe the basic classification of synovial effusions
- Describe the gross appearance of synovial fluid specimens
- Discuss the principles and applications of polarizing microscopy and compensated polarizing microscopy, and how to perform them
- Distinguish urate crystals from calcium pyrophosphate dihydrate (CPPD) crystals
- Describe other crystals, artefacts, inclusions, and cell types that may be present in synovial fluids

**Serous Fluid Module****Serous fluid production. Distinguishing transudates and exudates using laboratory testing. Gross and microscopic examination of serous fluids**

**COURSE OUTLINE:** Overview: Learning Objectives, Anatomy, Normal Production, Transudate, Exudate, Laboratory Findings, Clinical Causes. Gross Examination: Transudate, Turbid, Haemorrhagic, Clot, Bile Stained, Chylous. Procedures: Cell Count, Cyto-centrifuge, Wright Stain, Gram Stain. Microscopic Exam: Cell Types, Normal, Inflammation, Haemorrhage, Infection, Malignancy. Exams: Exam 1, Exam 2.

**LEARNING OBJECTIVES**

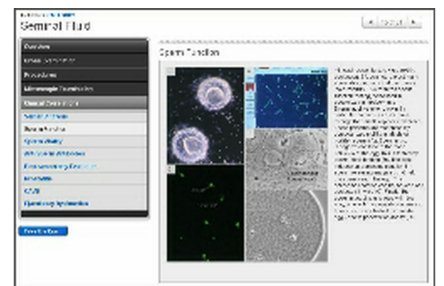
- Describe the normal production of serous fluids and the mechanisms of formation of transudates and exudates
- Distinguish transudates and exudates using lab testing, and understand their significance
- Describe the gross appearance of serous fluid specimens
- Describe the principles of manual chamber counts, cytocentrifuge preparation, and Wright staining
- Identify the major types of normal and abnormal cells in serous fluids and their significance

**Seminal Fluid Module****Semen analysis, including the determination of sperm concentration, motility and morphology**

**COURSE OUTLINE:** Overview: Learning Objectives, Anatomy, Specimen Collection Quality Control, References. Gross Examination: Fluid Characteristics, pH. Procedures: Prepare Wet Mount, Load Hemacytometer, Prepare Semen Smear, Staining. Microscopic Examination: Components of Fluid, Sperm Motility, Other Wet Mount Observations, Sperm Concentration, Sperm Morphology, Other Cell Types, Differential Count. Clinical Correlations: Semen Analysis, Sperm Function, Sperm Vitality, Anti-Sperm Antibodies, Post-vasectomy Evaluation, Prostatitis, CAVD, Ejaculatory Dysfunction.

**LEARNING OBJECTIVES**

- List the glandular contributions and cellular components of seminal fluid
- Describe the methods used to determine sperm concentration, motility and morphology
- List the abnormalities detected and reference ranges for semen analysis
- Discuss the goals and limitations of semen analysis in the clinical setting



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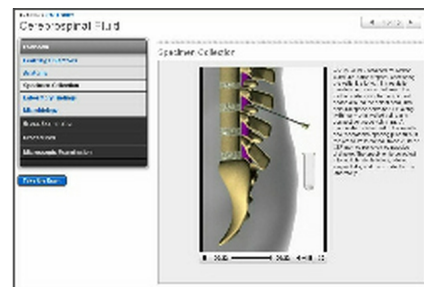
## Cerebrospinal Fluid Module

### Overview of the lumbar puncture procedure. Gross and microscopic examination of cerebrospinal fluid

**COURSE OUTLINE:** Overview: Learning Objectives, Anatomy, Specimen Collection, Laboratory Findings, Microbiology. Gross Examination: Overview, Clarity, Traumatic Tap. Procedures Cell Count, Cyto-centrifuge, Wright Stain, Gram Stain, Electrophoresis, Latex Agglutination. Microscopic Examination: Cell Types, Normal, Inflammation, Haemorrhage, Infection, Malignancy. Exams: Exam 1, Exam 2.

#### LEARNING OBJECTIVES

- Describe the production and collection of cerebrospinal fluid (CSF)
- Describe the gross appearance of CSF specimens
- Describe the principles of manual chamber counts, cytocentrifuge preparation, and Wright staining
- Identify the major types of normal and abnormal cells in CSF and describe their significance



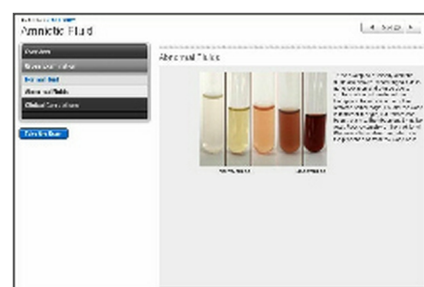
## Amniotic Fluid Module

### The amniocentesis procedure and laboratory analysis of amniotic fluid

**COURSE OUTLINE:** Overview: Learning Objectives Specimen Collection. Gross Examination: Normal Fluid, Abnormal Fluids. Clinical Correlations: Screening for Birth Defects, Genetic Testing, Open Neural Tube Defects, Foetal Maturity, Haemolytic Disease.

#### LEARNING OBJECTIVES

- Describe the amniocentesis procedure and the most common indications for amniocentesis
- List the most common genetic abnormalities detected by cytogenetic analysis and their clinical features
- Describe the L/S ratio and other assays used to assess foetal lung maturity
- Describe the tests used to screen for open neural tube defects
- Describe haemolytic disease of the newborn (HDN) and how the severity of HDN is assessed in the lab



These programs are available as Online Licences. See [page 38](#) for prices

## Cat.# WU-7 - PATIENT SAFETY TUTOR

Online Course

**COURSE OUTLINE:** Introduction: Learning Objectives, Overview. Biosafety: Overview, Standard, Precautions, Personal Protective Equipment, Handwashing, Sharps, Biosafety Cabinet, Centrifuge, Cleanup, Waste Management, Labeling, Exposure, Exam. Chemical Hygiene: Overview, PPE, Chemical Fume Hood, Labeling, MSDS, Storage, Spill Cleanup, Exposure, Exam. Fire Safety: Overview, Flammable Materials, Types of Fires, Fire Extinguishers, Evacuation, First Aid, Exam. Electrical Safety: Overview, Outlets, Extension Cords, Grounding Equipment, Inspections, Exposure, Exam. Ergonomics: Overview, Symptoms, Avoidance, Exam, U.V. Light Safety, Overview, PPE, Exposure, Exam.

#### LEARNING OBJECTIVES:

- State 2 reasons why most labs do not have a "patient safety culture"
- List 3 major findings from studies of patient safety
- List 3 sources of cases of lab-related patient injuries
- Injuries and techniques for overcoming these barriers
- Define cognitive and noncognitive errors
- Characterize any case of lab-related injury (or potential injury) regarding:
  1. Patient outcome
  2. Responsibility for problem
  3. Phase of testing
  4. Preventability and error type
  5. Interventions to prevent similar cases.



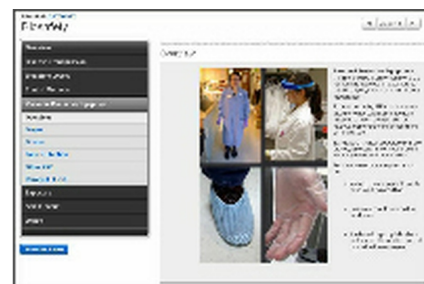


**Biosafety Module****Standard precautions, personal protective equipment and spill cleanup**

**COURSE OUTLINE:** Overview: Learning Objectives, Introduction, Health Risks, Standard Precautions. Disease Transmission: Overview, Parenteral, Respiratory, Contact, Phlebotomy Biosafety. Biosafety Levels: Overview. Control Methods: Overview, Engineering Controls, Work Practice, Controls. Personal Protective Equipment: Overview, Gloves, Gowns, Face Protection, Other PPE, Removal of PPE. Exposure: Overview. Spill Cleanup: Overview, Procedure, Disinfectants Waste: Disposal. Final Exam: Exam 1.

**LEARNING OBJECTIVE:**

- List 3 modes of disease transmission and a way to reduce risk of laboratory transmission for each mode
- List the 3 control methods used to limit exposure in laboratories, and give 2 examples of each
- List 4 types of Personal Protective Equipment (PPE) commonly used in laboratories and when to use them
- State the steps to follow when cleaning up a spill of biohazardous material
- List 3 items that should be discarded as regulated medical waste

**Chemical Safety Module****Proper handling, storage, and disposal of laboratory chemicals, and methods for responding to chemical spills and exposure**

**COURSE OUTLINE:** Introduction: Learning Objectives, Overview. Laboratory Standard: Overview, Right to Know Training, Monitoring, Particularly Hazardous Substances. Exposure Hazards: Overview, Routes of Entry, Acute Effects, Chronic Effects, Exposure Definitions, Chemical Effects, Chemical Definitions. Hazard Labeling: Overview, Chemical Labeling, Secondary Labeling, Hazard Identification System, Room Signs. Material Safety Data Sheets: Overview, MSDS Contents. General Handling: Overview, Work Practice Controls, Basic Chemical Handling, Basic Compressed Gas Handling, Working Alone, Personal Protective Equipment, Standard Operating Procedures, Chemical Inventory. Transport and Storage: Transport, Storage. Waste Management: Overview, Source Reduction, Packaging Storage for Disposal, Waste Disposal. Spills: Overview, Spill Kits, Assessing Spills, Cleanup, Mercury. Chemical Exposure: Exposure Routes, Eyewash, Emergency Shower, Medical Consultation. Final Exam: Exam 1.

**LEARNING OBJECTIVES:**

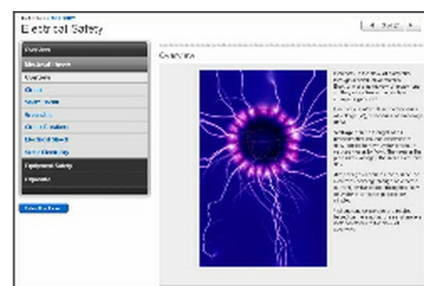
- List the 4 routes of entry for hazardous chemicals
- Define acute and chronic health effects
- Describe the proper method for labeling hazardous chemicals
- Describe the purpose of a material safety data sheet and list the 7 required types of information
- State the main hazard classes for dry chemicals, liquid chemicals and compressed gases
- List 5 requirements for disposal of hazardous chemicals
- State the method for assessing and cleaning a hazardous chemical spill
- State the steps to follow after exposure to a chemical

**Electrical Safety Module****Basic electrical theory, and how to identify and avoid electrical problems in the lab**

**COURSE OUTLINE:** Overview: Learning Objectives. Introduction. Electrical Theory: Overview, Circuit, Short Circuit, Grounding, Circuit Breakers, Electrical Shock, Static Electricity. Equipment Safety: Overview, Damaged Equipment, Power Cords, Maintenance, Extension Cords, Wet Locations, Flammables. Exposure: Course of Action. Finals: Exam 1.

**LEARNING OBJECTIVES:**

- Describe the basic theory behind Voltage, Amperage, Short Circuits and Grounding Systems
- List 3 things that are indications of electrical problems in an instrument
- Identify 2 serious outcomes associated with electrical shock
- Describe when and how to inspect portable electrical equipment
- List the steps to take if someone is experiencing electrical shock



## Ergonomic Safety Module

### **Risk factors and symptoms for repetitive stress injury in the clinical laboratory, with explanation and demonstration of ergonomically correct practices**

**COURSE OUTLINE:** Overview: Learning Objectives, Introduction. Repetitive Stress Injury: Overview, Symptoms, Risk Factors, Neutral Posture, Awkward Postures, Static Positions, Forceful Exertions, Repetitive Motion, Contact Stress, Lifting, Vibration or Repeated Impact, Environmental Conditions. Avoiding RSI: Take Action, Activity at Home.

#### **LEARNING OBJECTIVES:**

- Identify eight risk factors for repetitive stress injury
- Identify symptoms of repetitive stress injury
- List eight methods of avoiding repetitive stress injury



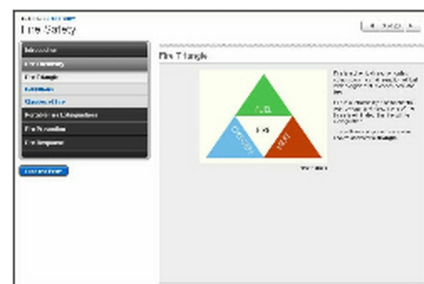
## Fire Safety Module

### **The selection and use of portable fire extinguishers, types of fires and fire hazards, and the steps to take in the event of a fire**

**COURSE OUTLINE:** Introduction: Learning Objectives, Overview. Fire Chemistry: Fire Triangle, Definitions, Classes of Fire. Portable Fire Extinguishers: Overview, Dry Chemical Extinguishers, Water Fire Extinguishers, Other Types, Selection of Extinguishers. Fire Prevention: Overview, Identify Hazards, Housekeeping, Fire Response Equipment, Flammable Chemicals. Fire Response: Overview, Be Prepared, Response to Fire, Assessing and Fighting Fire, Operation of a Portable Fire Extinguisher.

#### **LEARNING OBJECTIVES:**

- List the 3 legs of the Fire Triangle
- List the 4 classes of fire and an example of each
- Identify 5 types of fire extinguishers and the class(es) of fire each can be used on
- Describe the proper use of a portable fire extinguisher
- List the 4 steps to follow if you discover a fire



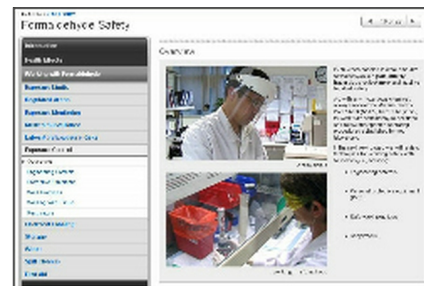
## Formaldehyde Safety Module

### **Proper handling, storage, and disposal of Formaldehyde, and methods for responding to spills and exposure**

**COURSE OUTLINE:** Introduction: Learning Objectives, Overview, Properties, Forms of Formaldehyde. Health Effects: Overview, Carcinogenic and Reproductive Effects, Toxic Effects, Irritant, Corrosive, Sensitizer. Working with Formaldehyde: Exposure Limits, Regulated Areas, Exposure Monitoring, Medical Surveillance, Laboratory Exposure Risks, Exposure Control, Chemical Labeling, Storage, Waste, Spill Cleanup, First Aid.

#### **LEARNING OBJECTIVES:**

- List 4 hazards associated with formaldehyde
- List 4 symptoms associated with overexposure to formaldehyde fumes
- State the airborne exposure limits for formaldehyde
- Describe an appropriate label for formaldehyde-containing solutions
- List the required personal protective equipment necessary when working with concentrated formaldehyde
- Describe appropriate steps to take when cleaning a minor spill of formaldehyde



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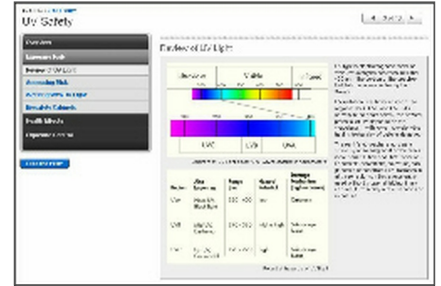
## UV Safety Module

### The hazards associated with UV light in the clinical laboratory and the proper use of safety equipment to avoid exposure

**COURSE OUTLINE:** Overview: Learning Objectives, Introduction. Exposure Risk: Review of UV Light, Assessing Risk, Working With UV Light, Biosafety Cabinets. Health Effects: Overview, Skin, Eye. Exposure Control: Shields, Personal Protective Equipment. Final Exam: Exam 1.

#### LEARNING OBJECTIVES:

- List two negative health effects of UV light exposure
- List four pieces of UV personal protective equipment and describe how to use them appropriately
- Describe how to distinguish UV protective shielding from shielding that does not protect against UV light



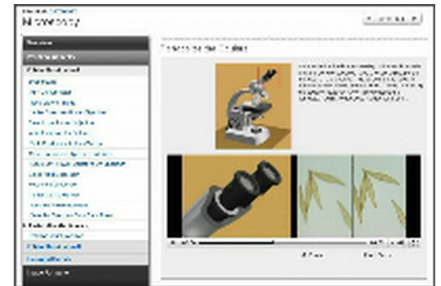
## Cat.# WU-13 - MICROSCOPY TUTOR

Online Course

**COURSE OUTLINE:** Overview: Key Concepts, Microscope Anatomy, Optical Path. Practical Aspects: Köhler Illumination I, Köhler Illumination II, Essential Details. Image Formation: Optics, Image Formation, Limits to Resolution.

#### LEARNING OBJECTIVES:

- Explain the function of each part of the light microscope and show where it is located
- Define "resolution", "contrast", and "definition" as they relate to the light microscope. Explain which parts of the microscope affect each. Manipulate these parts
- The user will be able to summarize the optical path of light throughout the microscope from beginning to end
- The user can determine the magnification, numerical aperture, and optimum cover-slip thickness of an objective lens
- The user can perform each step in the process of Köhler illumination in order. They can also use the fine focus control to visualize the third dimension of a specimen
- The user can recognize when an objective lens is dirty and can perform this simple maintenance procedure
- The user can understand common lens aberrations as evidenced by choosing the best optics for a given application. The user will also be capable of critically evaluating manufacturer's specifications
- The user will have a spatially accurate, 3-D understanding of the three properties of light and how they relate to the light microscope



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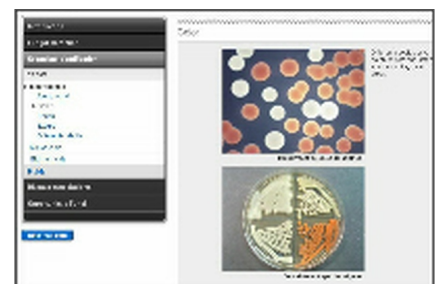
## Cat.# WU-4 - MYCOLOGY TUTOR

Online Course

**COURSE OUTLINE:** Introduction: Overview, Safety. Fungal Detection: Direct Techniques, Isolation Techniques. Organism Identification: Yeasts, Moulds. Disease Associations: Superficial Mycoses, Subcutaneous Mycoses, Systemic Mycoses. Opportunistic Fungi: Overview, Common Opportunists, Less Common Opportunists.

#### LEARNING OBJECTIVES:

- Recognize the four classes of fungi and the sexual cycles used to divide each group
- Demonstrate the ability to use colour, shape, texture, and differential media and tests to accurately and correctly describe a specimen
- Describe in detail the most common procedures to identify yeasts and moulds
- Recognize further tests that are available if necessary
- List the conidiogenesis methods commonly used in the laboratory to recognize and define different moulds
- List the common superficial, subcutaneous, and systemic mycoses and recognize the clinical presentation, obverse and reverse colonies, and microscopic features of each
- Identify macroscopically and microscopically common opportunistic fungi as well as some of the less common opportunists



**COURSE OUTLINE:** Introduction: Learning Objectives, Overview, General Topics: Working With Specimens, Working With People, Lab Organization. Specimen Processing Procedure: Overview, Receiving Data Entry, Dispatch Further Processing, Routing Analysis, Reporting, Follow-up Issues. Exception Handling: Mislabeled Specimen, Damaged Specimen, Inadequate Specimen Final Exam: Exam 1.

**LEARNING OBJECTIVES:**

- Explain the role of Specimen Processing Services (SPS) in the clinical laboratory, and describe each phase of specimen processing
- Describe 2 common safety problems for specimen processing personnel and how to avoid these problems
- Define protected health information (PHI) and list 3 ways that specimen processing personnel must protect patient confidentiality
- Describe 3 common problems that can occur during specimen processing and how to handle and reduce each of these problems
- Describe the following procedures: 1. Add-ons 2. Cancellations 3. Urgency Upgrades



**Identification of clinically important parasites**

**COURSE OUTLINE:** Introduction: Overview Test Selection. Blood Parasites: Diagnostic Techniques, Intracellular Parasites, Extracellular Parasites, Artefacts. Stool Parasites: Diagnostic Techniques, Protozoa, Helminths, Artefacts. Other Sites: Cerebrospinal Fluid, Cyst Fluid, Eye, Genital, Skin, Urine. Final Exams: Blood Parasites Exam, Stool Parasite Exam.

**LEARNING OBJECTIVES:**

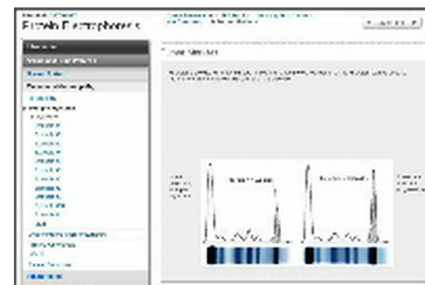
- Explain common parasite life cycles and relate how that knowledge aids in selection of the appropriate test methodology
- Discuss the different lab tests available for detection of parasites and compare each in detail
- Discuss how a particular laboratory approach is chosen to detect a certain parasite and why it is the best choice
- Demonstrate the ability to interpret the results of the various methods of identifying the presence of parasites, both intracellular and extracellular in blood and in stool samples
- Discuss the general geographic distribution of many common parasites seen in the laboratory
- Differentiate between true parasites and common artefacts that are seen and recognize when to pay special attention to the possibility of confusing the two
- Identify parasites found in sites other than blood and stool samples and the appropriate way to test for each of them



**COURSE OUTLINE:** Introduction: Program Overview, Agarose Gel Electrophoresis, Immunofixation, Densitometry. Serum and Urine Patterns: Normal Pattern, Monoclonal Gammopathy, Inflammation, Protein Losing Disorders, Liver Disease, Other Serum Patterns, Other Urine Patterns. Cerebrospinal Fluid: Normal CSF, Abnormal CSF, Review of Disease States: Monoclonal Gammopathy, Inflammation, Liver Disease, CSF Oligoclonal Banding. Final Exam: Exam 1.

**LEARNING OBJECTIVES:**

- Describe the methods of agarose gel electrophoresis, immunofixation, and densitometry
- Name the clinical conditions most commonly associated with monoclonal gammopathy, and some key clinical features of each condition
- View an agarose gel, an immunofixation, and a densitometry and determine if a monoclonal gammopathy is present. If it is present, the user will be able to identify the immunoglobulin type
- View an agarose gel of serum, urine, or cerebrospinal fluid and identify the electrophoresis pattern (e.g., inflammation, liver disease, haemolysis, alpha-1 antitrypsin deficiency, tubular proteinuria, CSF oligoclonal banding, etc)

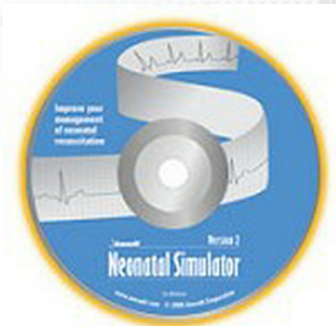




# OBGYN & PEDIATRICS SOFTWARE

## Cat.# AN-7 - NEONATAL SIMULATOR

Windows



### 12 Simulated Cases:

- Normal delivery
- Foetal heart rate decelerations
- Severe foetal bradycardia
- Meconium-stained
- Meconium aspiration

### Benefits:

- Real-time simulation
- Easy to use
- Proven to improve performance
- Use on your home or office computer
- No special hardware requirements



These programs are available as Online Licences. See [page 38](#) for prices

## Cat.# AN-9 - OBSTETRICS SIMULATOR

Windows & Macintosh



### 8 simulated cases:

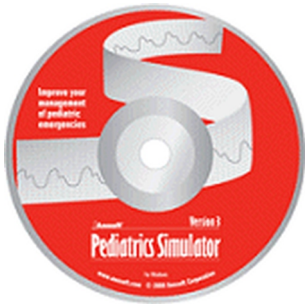
- Trauma in the pregnant patient
- Cardiac arrest
- Placental abruption
- Postpartum hemorrhage requiring single agent medical management
- Postpartum hemorrhage requiring multiple agent medical management
- Ectopic pregnancy requiring surgical intervention
- Ectopic pregnancy allowing medical management
- Includes fetal heart rate monitor simulation
- Designed in conjunction with obstetricians

### Benefits:

- Real-time simulation
- Easy to use
- Proven to improve performance
- Use on your home or office computer
- No special hardware requirements

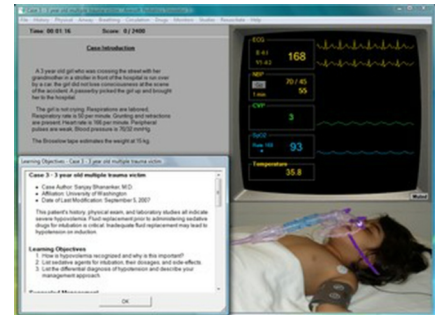


**Rehearse management of pediatric ICU and ER scenarios**



**6 simulated cases:**

- Septic shock
- Status epilepticus
- Multiple trauma
- Meningitis
- Near-drowning
- Diabetic ketoacidosis
- Designed in conjunction with pediatricians



**Benefits:**

- Real-time simulation
- Easy to use
- Have fun while you practice managing pediatric emergencies
- Proven to improve performance
- Use on your home or office computer
- No special hardware requirements

These programs are available as Online Licences. See [page 38](#) for prices



- 16 Simulated Cases cover all PALS guidelines
- Ventricular fibrillation and pulseless V Tach
- Ventricular tachycardia - unstable, stable
- Asystole
- Pulseless electrical activity
- Tachycardias and Bradycardia
- Includes PEARS scenarios - Pediatric Evaluation and Resuscitation
- Instructors can write their own scenarios
- SCORM and AICC-compliant: ideal for institutional learning management systems

**Includes two training modules:**

- Rhythm Simulator - improves your ECG rhythm recognition skills
- PALS Simulator - enables you and your staff to rehearse pediatric megacode scenarios

**Easy to use real-time simulator:**

- Assess the patient and interpret the ECG
- Control the airway, breathing and circulation
- Defibrillate/Cardiovert
- Administer meds used in the PALS algorithms



# PHARMACOLOGY SOFTWARE

## Cat.# SB-16 - LANGENDORFF HEART

This program is highly interactive and simulates experiments, which may be performed on the isolated perfused mammalian heart (Langendorff preparation).

Introduction and Methods sections cover the removal of the heart, setting it up to record ventricular contractile force, heart rate and coronary blood flow and the administration of drugs.

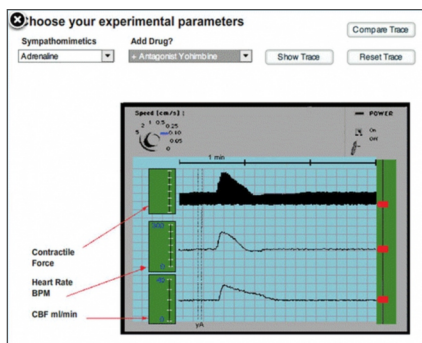
In the Experiments section simulated data, derived from actual data, is presented on a screen display which emulates a chart recorder. Students 'design' experiments by choosing, from a menu, a range of pharmacological agents which may be administered either alone, or in combination with an antagonist or potentiator. Each trace represents several minutes of recording and thus allows students to access a large amount of data in a short period of time. A facility to compare traces of 'drug X alone' with drug X + antagonist Y or drug X + potentiator Z is available. This allows easy visual comparison of qualitative effects and of course more accurate measurements can be taken from the screen.

The program covers:

1. Effects of drugs: sympathomimetics (adrenaline, noradrenaline, salbutamol, clonidine, phenyl-ephrine, dobutamine) antagonists (propranolol, yohimbine, atenolol, prazosin, butoxamide, phentolamine) potentiators (cocaine); parasympathomimetics (acetylcholine, carbachol, methacholine, nicotine) antagonists (atropine, amitriptyline, hexamethonium) potentiator (neostigmine); cardiac glycosides (digoxin, ouabain); coronary vasodilators (nitroglycerine, adenosine (antagonists: theophylline, dipyridamole), histamine (antagonists: cimetidine, mepyramine), verapamil);
2. Effect of ions: (high and low concentrations of calcium, potassium and sodium);
3. Effect of increasing pre-load on contractile (ventricular) force (Starling's Law).

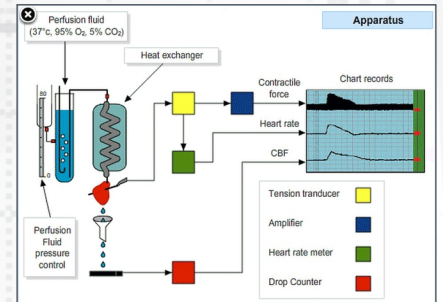
The simulated responses (heart rate, ventricular force and coronary blood flow) are derived from actual experimental data and presented in high resolution colour graphics in a form comparable to that of a chart recorder.

The program contains textual information describing the preparation and experimental method and an editable on screen help facility allows teachers to tailor the information-content of the program to specific groups of students. The package also includes suggested student assignments. It is envisaged that the program could be used in a number of ways: to better prepare students who will perform the practical at a later date; to debrief students after they have performed the practical; as a 'fallback' to provide data for students whose experiments were unsuccessful; as an alternative to the practical, though it should be remembered that different learning objectives may be achieved.



**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

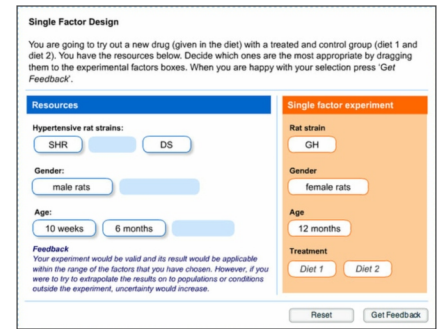
Windows



This program is available as a Multi-User Educational Licence. See [page 38](#) for prices



'Experimental Design' aims to help researchers, particularly those working with animals, to design more effective experiments which will deliver more information, produce more conclusive results, improve interpretation and reduce the number of experimental animals required. It combines real life scenarios, working examples and background theory and throughout the student learns by exploration and engages in interactive practical exercises that give hands on exposure to the key concepts in experimental design. The program has been designed with the close collaboration of research scientists in industry and academia. In addition, members of the scientific community ranging from post-graduates to project leaders have evaluated the software to ensure the appropriateness of its content.



**Aims:** to enable the research scientist to:

- estimate the number of animals needed to attain the scientific objectives economically and effectively.
- select a suitable animal model
- avoid bias and deal with variability
- use appropriate statistical methods or more effectively consult professional statisticians

Sections exploring the key issues in experimental design are accessed from a menu.

**Introduction & Aims** - primes the user as to why experimental design is so critical. Engages the user with data from a simple experiment to highlight design flaws.

**Choice of Animal Model** - explores the use different strains (inbred and outbred stock) and covers the various types of animal model (predictive, explanatory, exploratory).

**The Experimental Unit** - uses interactive examples to explain the critical nature of the experimental unit and it's importance.

**Eliminating Bias** - covers techniques you can employ to remove systematic differences between treatment groups and ensure your experiments are not biased. Again interactive examples are used

**Applying Valid Statistics** - covers the application of valid statistical tests to your data, explores the definition of hypotheses, choices of statistical tests, and interpretation of P.

**Improving Precision** - making experiments more precise so that we can detect treatment differences. Ways of achieving this - ensuring uniformity, use of blocking, using power analysis and the resource equation method.

**Increasing the Range of Applicability** - using your resources effectively to enable you to interpret your findings over a wider range e.g. different treatments, different strains, sexes, sizes. Use of multi-factorial design.

**Planning and Organising** - key issues in designing and analysing effective (simple) experiments.

**Self-Assessment Activity** - series of case studies and true/false questions with feedback to self-assess your understanding.

**Software Tools & References** - where to get further information.



**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

$$t = \frac{X_1 - X_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

$X_1$  and  $X_2$ : Difference between groups  
 $S_1$  and  $S_2$ : within group variances (STD)  
 $n_1$  and  $n_2$ : Number in group

This program is available as a Multi-User Educational Licence. See [page 38](#) for prices



### An interactive computer-based tutorial to introduce the principles of the drug discovery process

This highly interactive program combines a tutorial and a self-assessment exercise in the form of a 'game'.

**Tutorial** – this is divided into several sections, each of which may be accessed in any order:

**The Pharmaceutical Industry** - setting the scene: an introduction to the industry, some historical aspects of drug discovery, different functions of medicines;

**Selecting a Disease Area:** describes the sort of issues which the industry will consider in deciding what sort of drug they wish to develop;

**Selecting the target:** introduces potential drug targets (enzymes, receptors and ion channels) and uses examples of common diseases to illustrate how different drugs act;

**Initial Screening:** describes techniques (high throughput screening) and principles of using an assay to test large libraries of potential compounds;

**The Screening Cascade:** covers the methods (enzyme assay, cell assay, mode of action test, selectivity test and optimization) used to identify a small number of potential compounds with which to proceed into development;

**Safety Testing and Clinical Trials:** describes methods of toxicity testing, and phase I, II and III of clinical trials;

**Self-assessment section:** contains a number of largely multiple-choice questions covering each of the sections

High quality colour graphics are used extensively throughout the program, and features such as animation, a glossary and hotword facility are used to enhance student learning. The program is highly interactive and uses several features to promote this. For example, the main sections all have associated student tasks/self-assessment questions, e.g., true/false questions with feedback, drag-and-drop exercises, data interpretation exercises, calculations, case histories, role-play decision-making group activities. These are designed to consolidate knowledge and to allow students to self-assess their understanding of the section they have completed. They are also used to present additional information and explanations through the feedback. Glossary (definitions of terms) and hotword/hypertext links (fuller explanations of terms and concepts) are used throughout. The section of multiple-choice questions allows students to self-assess their knowledge.

The learning package is intended to be used either: to support existing teaching of modules containing pharmacology, or for independent study. Brief trials with high school students have indicated that it would occupy students for one to two hours of study and that it works best when students study in pairs.

**Student Exercise** - takes the form of a 'game' and is designed to complement the interactive tutorial. Students are placed in the shoes of a project team working for a fictitious pharmaceutical company 'Lion Pharmaceuticals'. They have a brief to identify three potential new medicines to treat prostate cancer (the selected disease area) starting with Lion's library of compounds and an identified target (a key enzyme).

The team have to make crucial decisions at each step of the process. Poor decisions trigger the intervention of a Project Manager whose job is to keep the team within budget and on schedule. He advises the team when he intervenes but also penalizes them with the loss of a 'life'. The team have to complete the task with the loss of fewer than five 'lives'.

The game is divided into four sections which follow closely mirror the approach of the tutorial program.

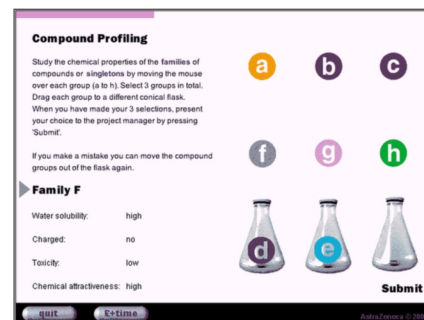
**High Throughput Screening** – students must decide the number of compounds from the library to test and, using a simulated spread-sheet to help them, decide on the optimum use of resources (human and machine) to complete the task.

**The Screening Cascade (enzyme assay, cell assay, mode of action test)** - students have to decide on the best way of conducting this series of tests – either to develop and carry out the tests in series or in parallel.

**Compound Profiling** - here students study the properties (water solubility, toxicity, ionic charge and chemical 'attractiveness') of the small number of families of compounds and singletons and select three to take into the final stage.

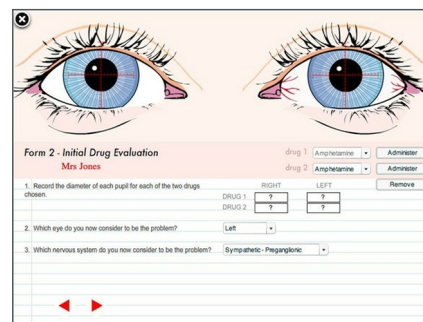
**Animal (in vivo) testing** - at this stage there are ten possible compounds remaining. Students have to reduce this number to three by eliminating 'candidates' from results of five 'in vivo' studies in animals. They are presented with results of the compounds on: plasma concentration (after oral dosing in mice); target enzyme activity in rats; prostate gland weight in rabbits in which prostate cancer has been induced; tumour cell growth rate; and preliminary safety and toxicity testing. The emphasis is on reinforcing their learning and highlighting important principles of the discovery process e.g. efficient use of resources, use relatively inexpensive in vitro testing for preliminary screening, in vivo (animal) studies are expensive, the discovery process is long (several years) and very costly.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



The 'Tutorial' section describes, using text and animated schematic graphics, the sympathetic and parasympathetic control of pupil diameter and how pupil diameter changes in response to a change in ambient light intensity.

The 'Student Exercise' section provides information on how to work through the investigation on a virtual patient using a 'normal' patient as an illustration. Thus students have the opportunity to investigate how the normal pupil will respond to a change in ambient light intensity, investigate the blink reflex and text the action of a number of pharmacological agents. They are encouraged to measure the pupil diameter (using an on-screen cross-hair cursor) at a range of light intensities and to observe, for each eye, the speed with which the pupil diameter changes. They can also investigate the action of a number of pharmacological agents applied topically to the eye (single dose, enough for a large, but not maximal, response in eyes that are responsive) and record their observations on an on-screen chart. The agents available (atropine, pilocarpine, physostigmine, phenylephrine, cocaine, and amphetamine) all affect neurotransmission at the postganglionic sympathetic and parasympathetic synapses and have little effect on ganglionic transmission. There is also a 'washout' facility which instantly removes the applied drugs whereas in the real situation several hours might be required for some of the drug effects to be reversed.



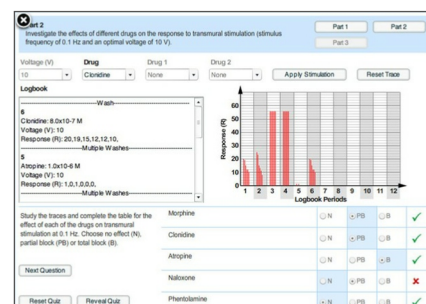
The 'Simulation' section contains four virtual patients each suffering from a medical condition which results in an abnormal pupillary reflex in one eye: Normal but with reddening of the eye and physiological anisochoria, Horner's Syndrome (pre-ganglionic), Horner's syndrome (postganglionic), and Partial parasympathectomy. Students first take measurements of the response to a change in light intensity which should give a clue to the underlying problem. They can then investigate this further by choosing two of the drugs from the list and observing their effects - that is sufficient to test the best hypothesis for each patient. To confirm their diagnosis students can then choose to administer one more agent after which they will be expected to select a diagnosis from the list.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

## Cat.# SB-34 - GUINEA PIG ILEUM

Windows

This program simulates an isolated preparation of the guinea pig ileum, a smooth muscle preparation exhibiting little spontaneous contractile activity, which is extensively used for pharmacological studies. Its aim is to enable the exploration of the effects of drugs and electrical stimulation on the release of, and response to, neurotransmitters in the enteric nervous system. Simulated responses are derived from a model which presents the contractile response of the ileum both to added drugs and to transmural electrical stimulation. Learning is through exploration and the program places at the disposal of the user a range of DRUGS (acetylcholine, histamine, clonidine, morphine, naloxone, phentolamine, atropine, mepyramine) which may be added alone or in combination to the organ bath in a range of DOSES, and an electrical STIMULATOR. A 'magic' WASH facility instantly removes all traces of added drugs and greatly speeds up the process of data collection compared to the real experiment. Simulated contractions of the gut are presented on a scrolling display comparable to that of a chart recorder. Students may take measurements directly from the monitor.



The program has four sections: *Introduction* uses text, high quality graphics and quizzes to enable students to learn the appropriate structures in the small intestine and the pharmacological basis of how motility is controlled. *Methods* describes the apparatus and the experimental protocols. A *Pretest* section tests the students understanding of the information presented in the introduction and methods sections. *Experiments* is the main section and allows students to simulate performing several experiments:

- action of drugs (acetylcholine, histamine, atropine and mepyramine);
- dose response curve for acetylcholine and determination of ED50;
- dose response curve for acetylcholine in the presence of atropine and determination of ED50;
- effects of low frequency transmural electrical stimulation (10V, 0.1 Hz) and the action of drugs (atropine, phentolamine, naloxone, clonidine, morphine)
- effects of high-frequency transmural electrical stimulation (10V, 10Hz) and the action of naloxone and phentolamine.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

This program simulates a range of experiments designed to demonstrate the action of inflammatory mediators and pharmacological agents on the in vivo inflammatory response in the anaesthetised rabbit. The program uses data obtained from actual experiments and is aimed at undergraduate students on courses in which pharmacology is a major component. It may be particularly useful for teaching students either to support laboratory practicals or, in those departments where lack of equipment and/or technical expertise precludes this, as a student-centred alternative.

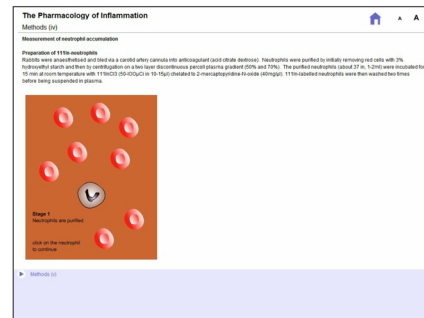
**Introduction and Methods** sections combine text and high-quality colour graphics to describe the animal preparation, the methods employed to measure oedema formation (extravascular accumulation of 125I - albumin) and neutrophil accumulation, and to provide the student with the essential background information required to understand how the inflammatory response is triggered, and the mechanisms involved.

The **Experiments** section allows the student to select, from a menu, to study the effects of the following agents on oedema formation (and where appropriate on neutrophil numbers) in normal rabbits:

1. A range of direct mediators of increased microvascular permeability [histamine, bradykinin, platelet activating factor (PAF), Substance P, leukotriene D4], either alone (dose-response relationships), in the presence of a vasodilator (PGE2) or with receptor antagonists;
2. A range of agents which cause inflammation principally via neutrophil accumulation [complement Factor C5a, cytokines interleukins IL-1 and IL-8, the bacterial peptide f-methyl-leucyl-phenylalanine (FMLP), leukotriene B4, Tumour Necrosis Factor (TNFalpha)], either alone (dose-response relationships) and in the presence of a vasodilator (PGE2). The effects of neutrophil depletion and the importance of adhesion molecules are also covered;
3. Non-steroidal (local and systemic effects) and steroidal anti-inflammatory agents.

A section describing the results of selected experiments using sensitised rabbits is also included and covers the IgG (Reverse Passive Arthus response) and IgE response. The results are presented in graphical form either as bar-charts or line graphs. The program contains numerous self-assessment exercises which demand interpretation of experimental data presented to them, and an understanding of the underlying inflammatory mechanisms. These student-centred activities make the program useful for self-directed learning or, in the ideal situation, it would be incorporated into a structured teaching programme and used with a teacher-designed workbook.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



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## Cat.# SB-33 - INTESTINAL MOTILITY

Windows

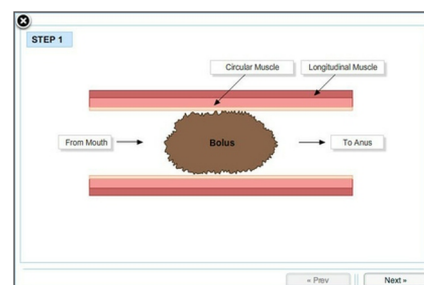
This program is designed to simulate experiments which may be performed on an isolated preparation of rat colon to study intestinal motility. Peristalsis in the rat colon differs in detail, but not in principle, from that in human colon, or indeed from small intestinal peristalsis.

The **Tutorial** section program explains, using animations and high quality graphics the mechanism of peristalsis and the excitatory and inhibitory nervous pathways which influence it. **Methods and Materials** describes with the aid of diagrams the apparatus, the method of administering control and test agents and how the peristaltic reflex test is performed. The effects of these procedures on longitudinal muscle tension (g) and fluid propulsion from a drop counter (number of drops over time) are also explained.

**Experiments** allows the user to see the effects of physiological stimuli (activation of the peristaltic reflex by distension of the colon with saline) and of the following automotive pharmacological agents either administered alone or in combination: saline (control), atropine, neostigmine, acetylcholine, carbachol, epinephrine.

Self-assessment: each experiment is accompanied by a series of true/false questions designed to assess students interpretation of the displayed results and their understanding of the underlying pharmacological mechanisms.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.





An interactive, menu driven and easy to use program which simulates experiments performed on the sciatic nerve-anterior tibialis muscle preparation of the cat (in vivo) to illustrate the important differences in the pharmacological action of depolarizing and non-depolarizing blocking agents.

An on-screen student handbook covers:

- an outline, using text and graphics of the process of neuromuscular transmission
- the preparation of the anaesthetised cat,
- the protocol for sciatic nerve stimulation and isometric recording of evoked contractions of the anterior tibialis muscle.
- a summary of the actions of the different types of blocking agents
- the clinical relevance of the different blocking agents.

The **Experiments Section** presents high-resolution graphic simulations of experimental results (muscle contractions), in accelerated time, on a scrolling display to simulate a chart recorder.

**Phase I Experiments** - each experiment compares the action of the two types of neuromuscular blocking agent using d-tubocurarine as an example of a non-depolarizing blocker and decamethonium as an example of a depolarizing blocker.

- administered i.v.
- administered close arterially
- in conjunction with an anticholinesterase
- in conjunction with a different competitive (non-depolarizing) blocker
- in conjunction with a different depolarizing blocker
- in response to tetanic stimulation
- in response to acetylcholine administered by close arterial injection.

**Phase II Experiments** - the effects of four successive doses of decamethonium followed by the effects of tetanic stimulation and an anticholinesterase

**Student Activities** - Each experiment has an associated student activity designed to assess understanding of the experimental results. These might be a series of true/false statements or a table to complete. There are also some suggested questions which would form the basis of a report of the experiment.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

This highly interactive CBL program is designed to teach the essential physiology and pharmacology of the neuromuscular junction. It is intended for first or second year undergraduate students of medicine, physiology, pharmacology and biological sciences. Some sections may also be appropriate for health-related courses. It is suitable for primary learning, revision or as a resource to support other types of teaching. It should occupy students for 3-4 hours of study.

**Learning Objectives:** after working through this program students should be able to:

- Describe the functional anatomy of the skeletal neuromuscular junction;
- Explain the process of neurotransmission;
- Describe the characteristics of nicotinic acetylcholine receptors and the actions of acetylcholine at these receptors;
- Explain the differences in mode of action of depolarising and non-depolarising neuromuscular blocking agents and the characteristics of the blocks they produce;
- Describe the clinical use of anticholinesterases;
- Discuss the clinical implications of using neuromuscular blocking agents.

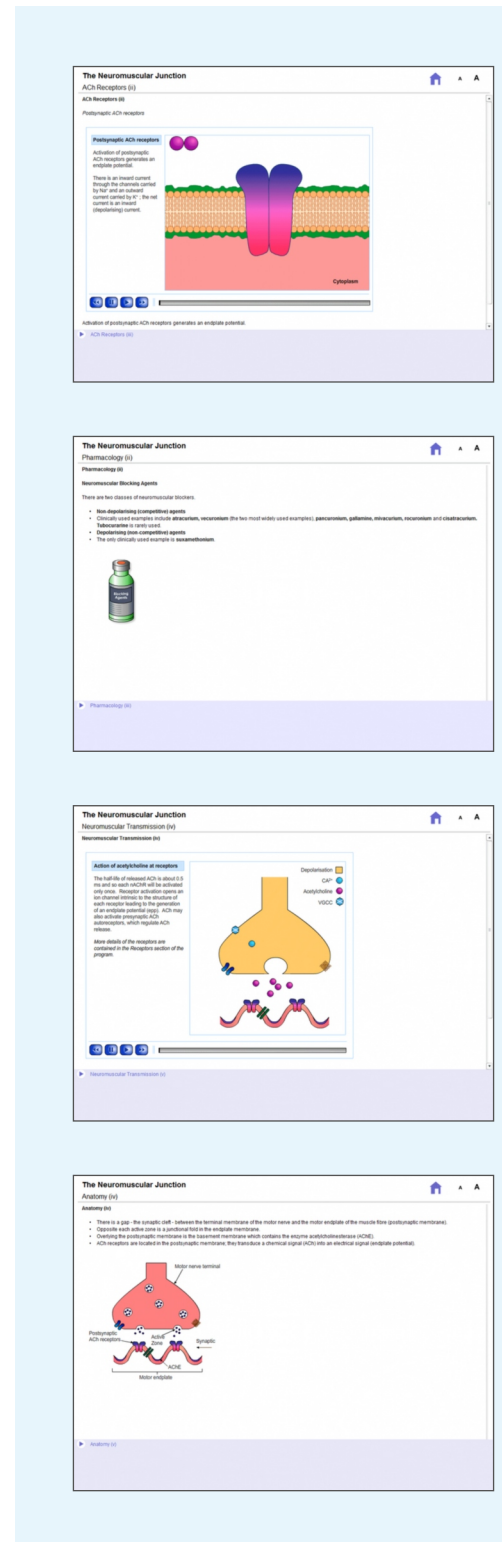
**Content:** the program is divided into several sections:

- Introduction: gives an overview of content and approach of the program;
- Neuromuscular Transmission: uses animated stepwise sequences to describe synthesis of acetylcholine, transmitter release mechanisms, action of acetylcholine at receptors and transmitter inactivation;
- Acetylcholine Receptors: describes the function of and action of acetylcholine at both pre- and post-synaptic nicotinic receptors;
- Pharmacology: gives examples of, and describes the characteristics and mechanism of action of depolarising and non-depolarising neuromuscular blocking agents and anticholinesterases;
- Clinical Aspects: covers the clinical use of neuromuscular blocking agents and anticholinesterases (particularly for treatment of myasthenia gravis). This section describes how depth of blockade may be monitored, and the pharmacokinetics, characteristics, side-effects and drug interactions of clinically used drugs.

The approach is to combine succinct textual/factual descriptions with graphics and to use features such as animation and hotwords where appropriate. Hotwords function either to define terms which may be unfamiliar to the student or to provide additional, sometimes more detailed or advanced information. Some experimental data, which illustrates the different actions of neuromuscular blocking agents in animal models, is also used.

The program contains numerous self-assessment questions e.g. multiple choice and true/false questions with feedback, drag and drop exercises (to test e.g. knowledge of stepwise sequences), and clinically-related scenarios. These are designed primarily to promote and reinforce learning rather than to test students. Learning by this method is non-intimidating, is independent of time and place, may be self-paced and may take place either individually or in small groups.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



This highly interactive program uses pulmonary function data obtained from guinea pig to teach the fundamental pharmacology of the airways.

1. AIMS, INTRODUCTION and METHODS sections of the program use a combination of text and high-resolution colour graphics to describe:

- The aims and objectives of the program
- The structure of the airways, the physiological control of bronchial smooth muscle tone pharmacology, airway smooth muscle receptor pharmacology, pathophysiology (asthma and COPD) and it's treatment.
- The guinea pig preparation and the apparatus used to monitor airway function.

2. EXPERIMENTS is the main section and allows the student to select, from a menu, to study the effects of various mediators and inhibitory agents in the normal and allergen-sensitized animals.

**Normal Guinea Pig:**

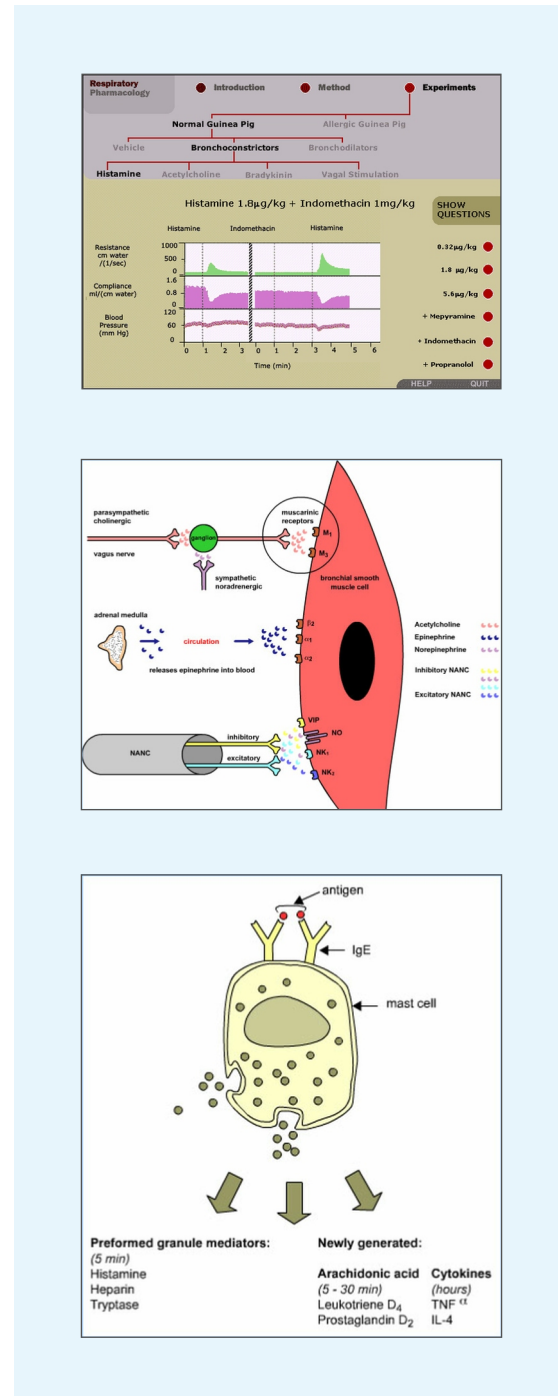
- Vehicle (0.9ml saline);
- Bronchoconstrictors (Histamine: 3 single doses and + mepyramine, + indomethacin + propranolol);
- Acetylcholine (3 single doses and + atropine, + indomethacin, + propranolol);
- Bradykinin (3 single doses and + indomethacin);
- Vagal Stimulation: (low frequency stimulation, LF + atropine, high frequency stimulation, HF + atropine);
- Bronchodilators (bombesin treated: single dose, + epinephrine, + mepyramine)

**Allergen-sensitized Guinea Pig:**

- Histamine, + mepyramine;
- LTC4 + mepyramine, + montelukast;
- Antigen (i.v.) + mepyramine; + mepyramine and montelukast.

For each experiment the display shows simultaneous traces of resistance, dynamic compliance and blood pressure which are presented in a form similar to that in the Mumed recording system. Each set of data is accompanied by self-assessment questions which demand interpretation of experimental data presented to them, and an understanding of the underlying control mechanisms. These student-centred activities make the program useful for self-directed learning or, in the ideal situation, it would be incorporated into a structured teaching programme and used with a teacher-designed workbook.

It is envisaged that the program could be used in a number of ways: to better prepare students who will perform the practical at a later date; to debrief students after they have performed the practical; as a 'fallback' to provide data for students whose experiments were unsuccessful; as an alternative to the practical, though it should be remembered that different learning objectives may be achieved.



**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

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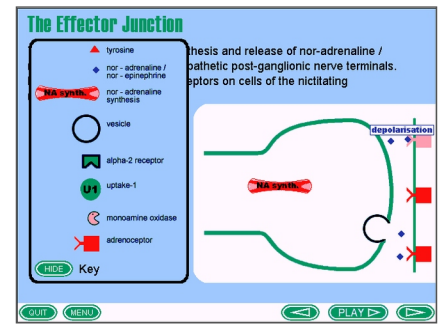


An interactive, menu driven program which simulates experiments on the superior cervical ganglion-nictitating membrane preparation of the cat (in vivo) to teach the pharmacology of ganglionic transmission and sympathetically innervated smooth muscle.

**Introduction:** provides information about the program and its curricula context;

**Tutorial:** presents diagrammatic representations of the effector junction and the superior cervical ganglion. This section of the program uses animated sequences to demonstrate the stages of transmission at both the synapse and neuro-effector junction and highlights possible sites of action of drugs;

**Methods:** describes the preparation, protocols for nerve stimulation and administration of drugs to the superior cervical ganglion and the nictitating membrane, and the method of recording contractions of the nictitating membrane.



**Experiments:** allows students to perform simulated experiments on the preparation and provides recordings of the force of contraction of both ipsilateral and contralateral nictitating membranes which are displayed on a screen designed to emulate a chart recorder. A sub-menu gives students some control over experimental parameters (they can choose:

1. to administer an agent from a list: saline (vehicle control), acetylcholine, noradrenaline, atropine, phentolamine, propranolol, isoprenaline, hexamethonium, physostigmine, nicotine (low and high dose), tyramine, an unknown (which is randomly selected from the list above when the program is run);
2. the site of administration;
3. whether to electrically stimulate preganglionic nerves (half-maximal stimulation).

Although it is envisaged that the tutor will develop a set of tasks for students to address when using the simulation which will meet their own teaching objectives, this section does also include some suggested tasks to aid independent use of the program.

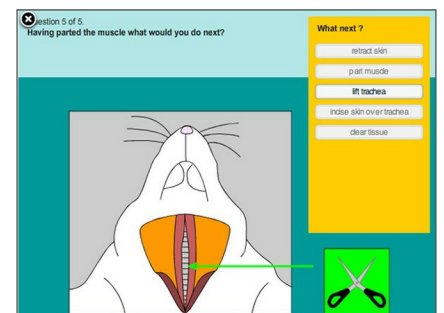
**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

## Cat.# SB-31 - RAT BLOOD PRESSURE

This highly interactive program simulates a range of experiments to demonstrate the effects of a variety of pharmacological agents/procedures on blood pressure and heart rate of the anaesthetized rat (in vivo). It is aimed at undergraduates studying pharmacology modules on a range of medical and science courses. Each section combines text, high quality colour graphics, and animation with interactive questions designed to reinforce learning.

The main menu allows students to access sections covering different aspects of the laboratory class;

- Introduction: Home Office Licence requirements,
- Preparation: anaesthesia/anaesthetization, cannulation of trachea, jugular vein and carotid artery,
- Apparatus: equipment used to maintain body temperature, record blood pressure and heart rate,
- Measurements: describes how to take measurements from the simulated chart recorder and how to calculate mean BP and pulse pressure,
- Experiments: provides typical data for 16 different experiments selected to teach the essential pharmacology: catecholamines; pressor agents; acetylcholine; ganglion stimulants; uptake1-blockers; alpha-blockers; beta-blockers; adrenaline reversal; guanethidine; sympathetic nerve stimulation; depressor drugs; ganglion blockade; quantitative effects of alpha-blockade; quantitative effects of beta-blockade; reserpine; pithing



Students are expected to record and tabulate data from the screen display and to then complete student assignments e.g. a series of MCQ questions, with feedback, to assess accuracy of data collection and data interpretation; a student task (typical of a traditional lab-class report) to be completed in their own time. In addition there is a section containing a selection of MCQ's with feedback covering cardiovascular pharmacology which students can use for revision.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

# PHYSIOLOGY SOFTWARE

Cat.# SB-2 - BLOOD PHYSIOLOGY

Windows

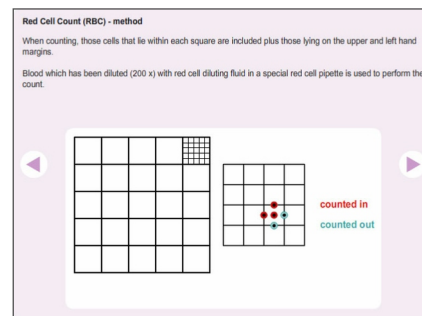
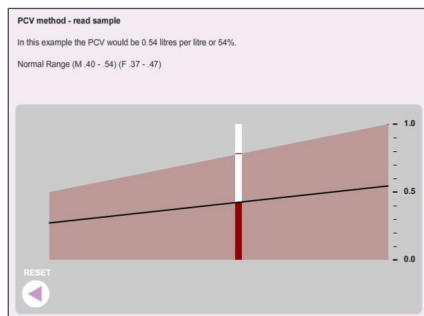
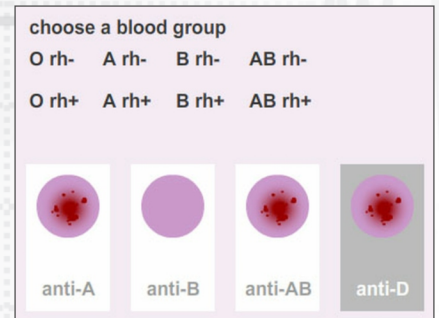
**1. Red Blood Cell Indices** - this program simulates the determination of standard red blood cell indices, which may be performed in the laboratory using fresh blood samples, and used to produce a haematological profile. Red blood cell count - simulated haemocytometry, Haematocrit (PCV) - simulation of the use of an haematocrit reader Haemoglobin (Hb) concentration - simulated spectrophotometry including the construction of a standard haemoglobin curve.

In the **Methods Section** the principles of each method are explained using a combination of text and imaginative graphics. Students can then simulate performing the tests on either a normal male or a normal female subject. This allows them to interactively obtain results for red cell count, PCV and [Hb] which may then be entered into a simple calculation program to give MCV, MCH and MCHC. The complete haematological profile may then be printed.

**2. Blood Groups** - text and graphics are used to introduce and explain the basis of the determination of ABO and Rhesus blood groups. There is then an exercise in which students can observe the interaction of a blood sample, from a subject of unknown blood group, and known antisera (anti-A, anti-B and anti-D). They are then asked to select the correct blood group from a list of possible answers. Different blood groups are generated randomly and students can try as many examples as they wish. A record of their score is kept and displayed on-screen.

**3. Anaemia's** - Nine patient case histories are used to teach the principles of how the medical history, peripheral blood films and the results of haematological tests can contribute to diagnosis of anaemias. Each case has a brief medical history, a haematological profile (RBC count, Hb concentration, PCV, MCV, MCH, MCHC), a peripheral blood film which indicates how this differs from normal blood and the results of other blood indices.

Students are required to select an appropriate diagnosis initially from one of the four main types (iron deficiency, megaloblastic, haemolytic and aplastic) and then with the aid of additional test results to further define this by selecting one from nine possible diagnoses (enzyme deficiency, thalassaemia, haemorrhage, sickle cell, bone marrow aplasia, folate deficiency, hereditary spherocytosis, vitamin B12 deficiency, autoimmune (drug induced), iron deficiency).



**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

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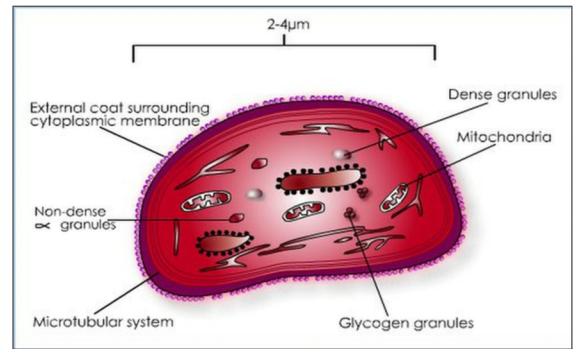
The program is divided into several sections:

**Tutorials:** uses text, colour graphics and animated graphics to teach the morphology and physiological function of platelets, the haemo-static mechanisms: platelet plug formation and coagulation (intrinsic, extrinsic and common pathways) and anti-clotting mechanisms especially fibrinolysis.

**Methods:** uses text and animated graphics to describe the principles and a step-by-step method of each of the major laboratory tests used in producing a haemostatic profile (Bleeding time, Prothrombin Time, Activated Partial Thromboplastin Time (APTT), Thrombin Time). It also includes details of an automated technique using a coagulometer.

In **Clinical Cases** the use of the test results in diagnosis is taught using a highly interactive problem-solving approach which requires students to use data from selected clinical case histories to make a diagnosis. For each of five different cases (haemophilia, Disseminated Intravascular Coagulation, von Willebrand Disease, alcohol-induced liver disease, pro-myelocytic leukaemia) a brief patient history and a haemostatic profile is provided. Students must answer on-screen questions and may access relevant further test results. They must then use this information to make a correct diagnosis from a list of possible conditions. Feedback and help are available throughout and there is also a glossary, which explains the medical terms used.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



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The program simulates experiments designed to demonstrate by investigation the important characteristics of the transport of two important nutrients - hexoses and amino acids, in the small intestine.

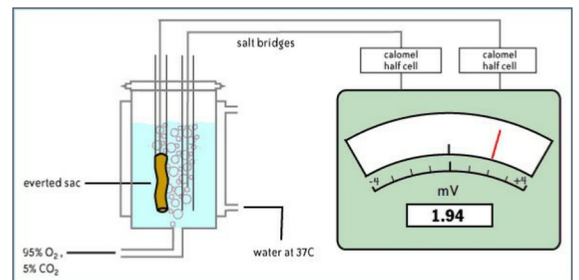
**Introduction and Methods** use a combination of text and high-resolution graphics to explain the process of carrier-mediated transport of these nutrients, the everted sac preparation and the methods used to measure nutrient transport: using radio labelled galactose, glycine and methionine and a scintillation counting technique; measuring the transmural potential difference particularly for kinetic analysis of the transport system.

**Experiments** allows the user to collect sample data from a range of experiments designed to:

1. Measure the transport of each of these nutrients - Control experiments;
2. Demonstrate the  $\text{Na}^+$  dependence of the transport process by measuring transport of each nutrient when the mucosal fluid contains reduced concentrations of sodium ions ( $\text{NaCl}$  partly replaced with  $\text{KCl}$ /tris chloride/choline chloride); investigate the mutual interaction of the hexose and amino acid transport systems by performing a series of experiments (including a kinetic analysis and calculation of apparent  $K_m$  and  $V_{max}$  for the transport process) to assess whether the interaction is due to competition for energy or competition at the carrier level.

Students are presented with raw data: weights: wet empty sac; weight of sac containing 0.5 ml Krebs bicarbonate saline; wet weight after incubation in mucosal fluid containing a nutrient; wet weight of final empty sac; radioactive counts) cpm, ESR, dpm, blank-corrected dpm): blank; control sample; serosal sample, gut sample. The data is based on predictive models of carrier-mediated transport, which have been verified by experiment. Students collect the data and use them to calculate transport parameters e.g. mucosal fluid transfer, total amount of nutrient transferred, final gut concentration and T/M ratio, in much the same way as they would if they performed the experiment for real.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.





This program is designed to cover the principles of respiratory function testing and adopts a patient orientated, case-centred approach to teach, by investigation, the use of these tests in the diagnosis of common respiratory disorders. It is aimed at undergraduate medical/science students studying physiology on a range of biomedical courses.

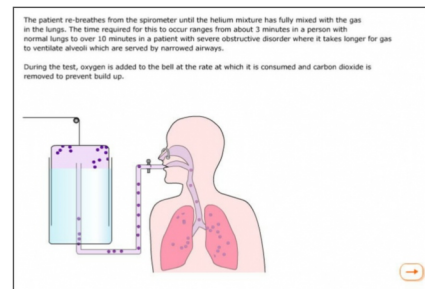
The program is divided into several sections:

**Tutorials** is subdivided into: Introduction; Limitation to Airflow; Lung Size; Gas Transfer; Bronchodilation; Constriction; Normal Values; Test your knowledge. Each section typically combines text, high-quality graphics, animations to explain the underlying physiology, anatomy and pathophysiology. Self-assessment questions are used for students to assess how much they have understood.

**Methods** is subdivided into: Introduction; Peak Expiratory Flow; Spirometry; Reversibility; Challenge Tests (Metacholine, exercise); Lung Volumes; Transfer Factor; Each section typically combines text, high-quality graphics, animations and video-clips to explain, in detail, the principles of the investigative methods used to assess respiratory function. Self-assessment questions are used for students to assess how much they have understood.

**Cases** contains details of seven patients including a normal subject and patients suffering a range of respiratory disorders. For each the user is presented with the results of relevant respiratory function tests which may be compared to predicted normal values for that patient. Users are required to draw conclusions (in the form of true/false questions) about the patients' conditions.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



## Cat.# SB-25 - RESPIRATORY PHYSIOLOGY

This highly interactive program is designed to be used as a student-centred, self-paced learning resource and would occupy students for 3-4 hours. The content is divided into several sections accessible from a menu:

**Introduction** - the basic principles of respiration put into a health context by introducing some of the more common respiratory disorders.

**Structure of the respiratory tract** - structure and function of the upper respiratory tract (nose, mouth, pharynx and larynx), trachea, lungs, bronchial tree and alveoli.

### Transport of gases

- transport of oxygen by haemoglobin (normal dissociation curve and physiological factors affecting it),
- carbon dioxide (dissolved in plasma, in combination with haemoglobin, as bicarbonate).

### Mechanics of breathing

- introduces respiratory volumes and capacities and covers how the contractions of the respiratory muscles and diaphragm give rise to inspiration and expiration. Muscles involved in forced respiratory movements .

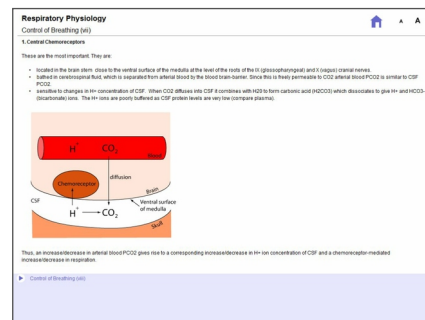
- Control of Respiration

**Nervous control** - central respiratory centres, autonomic reflexes and conscious control of breathing.

**Chemical control** - central and peripheral chemoreceptors, influence of hydrogen ions, carbon dioxide and oxygen in regulation of breathing.

High quality interactive graphics and animations are used extensively to explain principles such as how the respiratory muscles and diaphragm interact to cause inspiration and expiration. Throughout the emphasis is on problem-based tasks - interpretation of graphical data (e.g. haemoglobin dissociation curves), interpretation of experimental data, calculations (e.g. ventilatory volumes and dead space, volume of oxygen in arterial and venous blood), and exercises to stimulate understanding. There are also self-assessment questions (multiple choice, multiple true/false) in each section.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



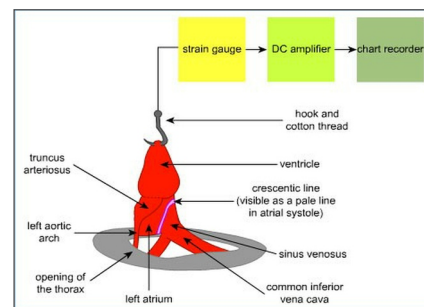
An interactive, menu-driven and easy to use program which simulates a number of experiments which can be performed on the 'in situ' heart of a pithed frog. High-resolution simulations of contractions of the frog heart, derived from real data, are presented on a scrolling display to simulate a chart recorder. The trace may be paused to facilitate measurement of heart rate or to assess changes in the amplitude of atrial or ventricular contraction.

#### Experiments include:

- Interpretation of a typical trace;
- the effects of adrenaline;
- the effects of acetylcholine (with physostigmine or atropine);
- the effects of temperature;
- refractory period;
- electrical conduction through the heart (Stannius ligatures).

Each experiment is prefaced by introductory text and includes an experiment guide and assignments.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



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#### An interactive, foundation level computer-based tutorial to introduce the endocrine system

This highly interactive program is divided into several sections, each of which may be accessed from a menu:

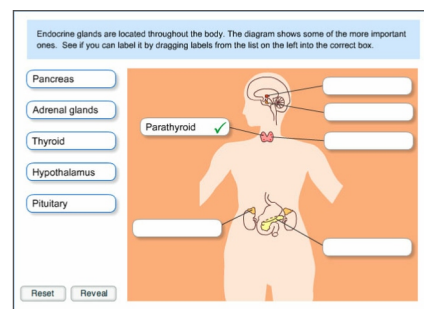
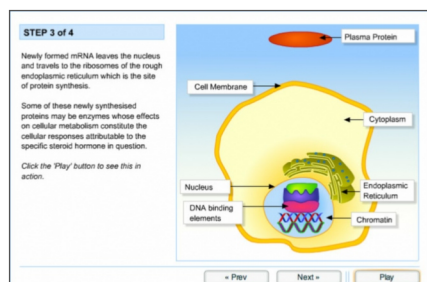
**Introduction:** an overview of the function of the endocrine system, location of some of the important endocrine glands;

**Chemical properties:** covers the three main chemical groups of hormones: peptides and glycoproteins, steroids and amines, giving examples of each. For each group the program describes the synthesis, transport and physiological implications of the chemical properties.

**Cellular Mechanisms of Action:** covers the main features of how (i) peptide and catecholamine hormones act at the cellular level (second messengers) and (ii) steroids and thyroid hormones act at the cellular level;

**Hypothalamus - Pituitary:** describes the anatomy of the structures and the relationship and connections between the hypothalamus and the pituitary gland; the hormones of the anterior and posterior lobes, regulation of their release and main physiological functions.

High quality colour graphics are used extensively throughout the program and features such as animation and a hotword facility are used to enhance student learning. The program is highly interactive and uses several features to promote this. For example the main sections all have associated student tasks e.g. true/false questions with feedback, drag-and-drop exercises. These are designed to allow students to assess their understanding of the section they have completed and also to present additional information and explanations through the feedback. The learning package is intended to be used either: to support existing teaching methods, or for independent study where it could be used as an alternative to staff-led tutorials or lectures. It is estimated that it would occupy students for two to three hours of fairly intensive study and is suitable for primary learning or revision. The question-answer sections may also be useful for self-assessment.

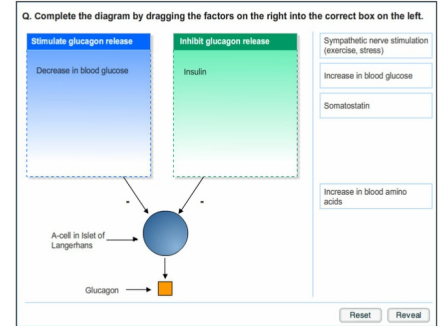


**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

The highly interactive program is designed to teach the basic physiology of the pancreatic hormones and the regulation of blood glucose.

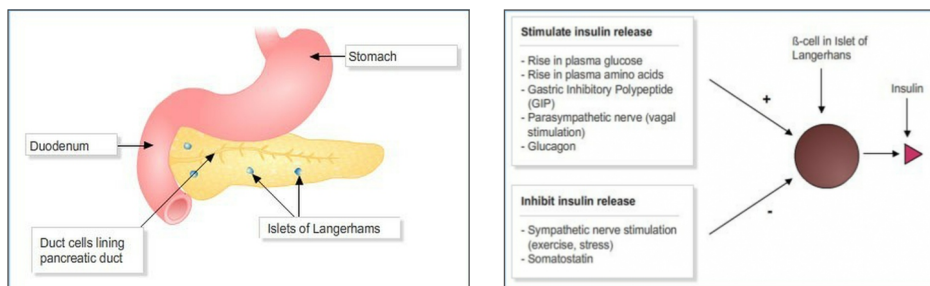
The program covers:

- location and structure of the Islets of Langerhans
- factors affecting release of insulin and glucagon and their effects on target cells
- principal clinical disorders - Type I and Type II diabetes mellitus (causes, symptoms and treatment)
- hypoglycaemia and hyperglycaemia



High quality colour graphics are used extensively throughout the program and features such as a Hypertext facility are used to enhance student learning. The program uses several features to promote interactivity e.g. students are required to:

1. Identify correct actions of hormones or characteristics of certain clinical conditions by "dragging" phrases/words from a list and "dropping" them into the appropriate box on the diagram,
2. Answer a variety of self-assessment questions on the glucose tolerance test.

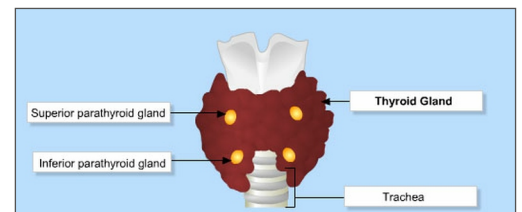


**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

The highly interactive program is designed to teach the basic physiology of the hormones involved in the regulation of plasma calcium.

The program covers:

- location and structure of the parathyroid glands,
- synthesis, release, transport and action of parathyroid hormone, calcitonin and vitamin D on bone, kidney and gastrointestinal tract,
- physiological role of calcium,
- structure of bone and bone remodelling,
- principal abnormalities of calcium metabolism - hyperparathyroidism, hypoparathyroidism, vitamin D deficiency and osteoporosis.



High quality colour graphics are used extensively throughout the program and features such as animation and a Hypertext facility are used to enhance student learning. The program uses several features to promote interactivity e.g. students are required to:

- (i) label diagrams by "dragging" labels from a list and "dropping" them into the appropriate box on the diagram,
- (ii) answer a variety of self-assessment questions (multiple choice, selecting correct phrases from a list to complete a statement, and true/false questions with feedback).

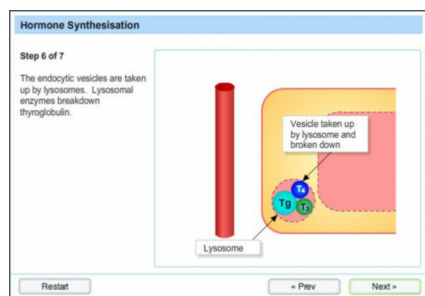
**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

The highly interactive program is designed to teach the basic physiology of the thyroid hormones and covers:

- location and structure of the thyroid glands,
- synthesis, release, transport and mechanism of action of the thyroid hormones,
- function of the thyroid hormones T3 and T4,
- principal abnormalities of thyroid function - hypothyroidism and hyperthyroidism.

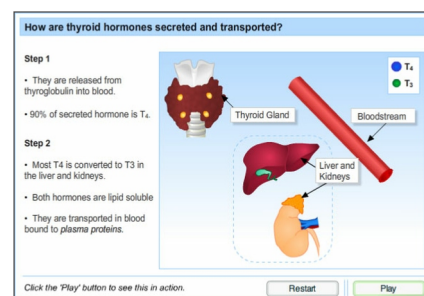
High quality colour graphics are used extensively throughout the program and features such as animation and a Hypertext facility are used to enhance student learning. The program is highly interactive and uses several features to promote this.

For example students are required to: 1. Label diagrams by "dragging" labels from a list and "dropping" them into the box corresponding to the correct position on the diagram,



2. Answer a variety of questions included in each section. These may be multiple choice, selecting correct phrases from a list to complete a statement, and true/false questions with feedback.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



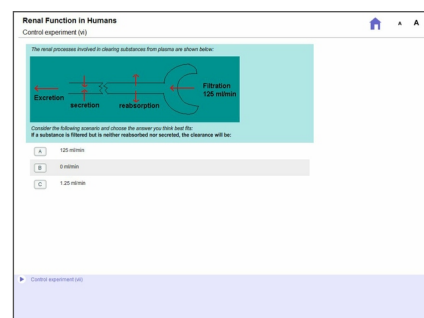
## Cat.# SB-23 - EXPERIMENTS ON RENAL FUNCTION IN HUMANS

This highly interactive computer program is designed to allow students to collect urine and plasma data from groups of healthy male students who took part in the following investigations:

1. Control experiment (no water loading)
2. Water loading experiment
3. Experiments to investigate the action of four diuretics (acetazolamide, amiloride, hydrochlorothiazide, bumetanide) in water loaded subjects

For each experiment, data are presented (mean values: n=10) graphically for:

- plasma electrolyte concentrations (Na<sup>+</sup>, K<sup>+</sup>, Cl<sup>-</sup>, HCO<sub>3</sub><sup>-</sup>)
- plasma creatinine concentration and plasma osmolality
- urine electrolyte (Na<sup>+</sup>, K<sup>+</sup>, Cl<sup>-</sup>, HCO<sub>3</sub><sup>-</sup>)
- urine creatinine output and total solute output
- urine osmolality
- urine flow



Students observing data from water-loaded subjects may superimpose control data to give a visual comparison. Similarly, water-loading data can be superimposed for each of the diuretic experiments. The program also describes the protocol for each experiment and, in brief, the methods used to analyse urine and plasma. Accompanying each experiment are several interactive questions and tasks to emphasise the important physiological principles. These may be questions (e.g. multiple choice or true false with feedback), data interpretation exercises, or calculations. For example, for each experiment and in addition to other questions, students are asked to calculate using data they have collected from the program: glomerular filtration rate; total and fractional (%) water re-absorption; total and fractional (%) Na<sup>+</sup> re-absorption. The calculations require them to take measurements from the graphical screen displays, enter it into well-established formulae and type in their answers. Assistance with the calculations is available via an on-screen "Help" and, if they get the answer incorrect, there is also a "Tell" facility which demonstrates how the correct answer is arrived at. These questions are designed to consolidate knowledge and to allow students to self-assess their understanding of the section they have completed. A summary of all other data, which may be calculated, is also incorporated.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



This highly interactive program is divided into several sections each of which may be accessed from a menu:

### Introduction,

**Terminology:** definitions and explanations of important terms e.g. pain, analgesia, allodynia, hyperalgesia, nociceptors,

**Types of Pain:** e.g., acute, chronic, nociceptive, neuropathic,

**Functions of Pain:** under normal physiological conditions,

**Pain and Injury:** examples of the variable link between pain and injury,

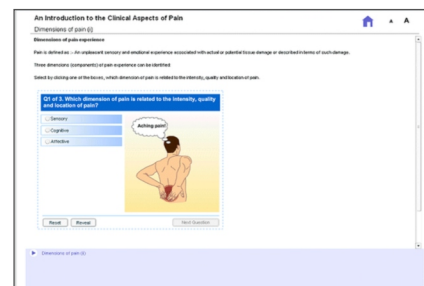
**Dimensions of Pain:** sensory, affective, cognitive,

**Pain Assessment:** pain assessment tools including rating scales and pain location charts,

**Pain Management:** introduction to pharmacological and non-pharmacological methods of pain relief,

### Summary,

**Revision:** 20 self-assessment MCQ questions.



High quality colour graphics, animation and Hypertext are used extensively throughout the program to enhance student learning. The program is highly interactive and uses several features to promote this - e.g. students are required to:

1. Label diagrams by "dragging" labels from a list and "dropping" them into the box corresponding to the correct position on the diagram;
2. Interpret different pain charts,
3. Answer a variety of questions which may be multiple choice, selecting correct phrases from a list to complete a statement, true/false questions with feedback, hangman game, matching definitions with statements etc.

The learning package is intended to be used either to support existing teaching methods or for independent study where it could be used as an alternative to staff-led tutorials or lectures (the material covers approximately two to three one-hour lectures to first year students). It is estimated that it would occupy students for two to four hours of fairly intensive study and is suitable for primary learning or revision. The question-answer sections may also be useful for self-assessment.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

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## Cat.# SB-3 - PHYSIOLOGY OF THE CIRCULATORY VESSELS

Windows

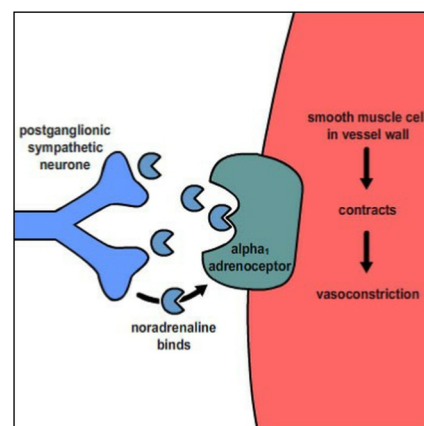
The highly interactive program is designed to teach the basic physiology of the circulation. It is divided into several sections accessed from a menu:

**Introduction:** - structure and function of the circulatory system;

### The Circulatory vessels:

1. Structure and function - blood vessel wall, arteries, arterioles, capillaries, venous vessels;
2. Blood flow - flow, pressure and resistance.
3. Peripheral resistance - peripheral resistance vessels and their control;
4. Blood pressure - measurement, regulation of BP (autonomic reflexes, hormones, intrinsic regulation, long-term control by kidneys).

High quality colour graphics are used extensively throughout the program and features such as animation and a Hypertext facility are used to enhance student learning. The program is highly interactive and uses several similar features to those described opposite.



**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

The highly interactive program is designed to teach the basic physiology of the heart and is designed to complement and accompany a similar program (The Circulation.) covering the physiology of the circulatory vessels. It is divided into several sections accessed from a menu: Introduction: structure and function of the cardiovascular system;

The Heart:

- gross structure - chambers and major blood vessels, the wall of the heart and the pericardium;
- heart valves - structure and function of atrioventricular and semi-lunar valves;
- histology - cardiac muscle and pacemaker cells;
- excitation - spread of depolarization and the ECG;
- heart sounds
- the cardiac cycle - pressure and volume changes;
- cardiac output - control by autonomic nerves, hormones and autoregulation.

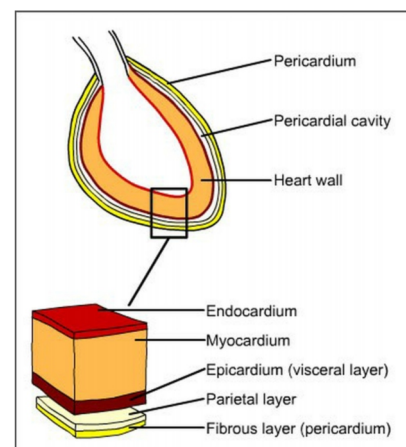
High quality colour graphics are used extensively throughout the program and features such as animation and a Hypertext facility are used to enhance student learning. The program is highly interactive and uses several features to promote this. For example students are required to:

a) label diagrams by "dragging" labels from a list and "dropping" them into the box corresponding to the correct position on the diagram;

b) interpret recordings of pacemaker cell action potentials to better understand the effect of autonomic nerves on heart rate.

In addition they must answer a variety of questions included in each section. These may be multiple choice, selecting correct phrases from a list to complete a statement, and true/false questions with feedback.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



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This highly interactive program is divided into several sections each accessed from a menu:

**Introduction:** incidence of epilepsy, definitions, terminology, symptoms, diagnosis,

**Causes of Seizures:** covers the variety of causes e.g. infection, birth & perinatal damage, metabolic disturbances, genetic causes, head trauma, tumour, drugs, vascular insults, congenital malformations, febrile convulsions in children, neurodegenerative disease,

**Classification of Seizures:** main features and symptoms of partial (simple and complex) and generalised seizures (tonic-clonic, absence, atonic and myoclonic),

**Seizure Mechanisms:** describes the underlying mechanisms and factors contributing to initiation, synchronization and propagation of the abnormal neural discharge,

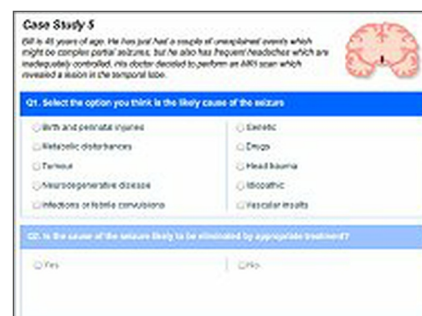
**Screening for potential anti-seizure drugs:** describes the major tests: MES, PTZ and kindling and indicates their usefulness in predicting efficacy of tested drugs against different seizure types,

**Anti-seizure drugs:** focuses on the structure, clinical usefulness, mechanism of action and important clinical pharmacology of phenytoin, carbamazepine, valproate and ethosuximide,

**Status Epilepticus:** describes the main clinical features and treatment of this condition.

High quality colour graphics are used extensively throughout the program and features such as animation, a Hypertext facility and interactive student-tasks are used to enhance student learning.

**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.



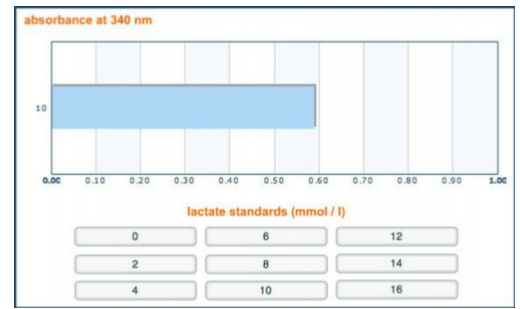
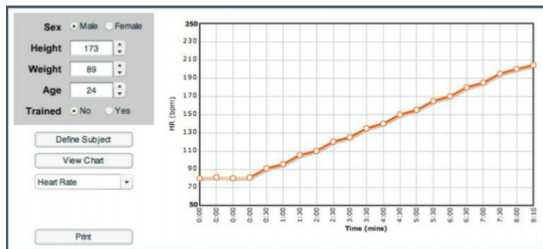
An interactive, menu driven program, suitable for students of biology at high school and undergraduate level. This program simulates some of the important physiological measurements which can be made to assess cardio-respiratory performance or "fitness" in the laboratory.

The program presents results, in a form comparable to a chart recorder (in high resolution graphics), from healthy individuals performing a fixed schedule of graded exercise on a bicycle ergometer, and includes:-

- Heart Rate,
- Minute (Pulmonary Ventilation),
- Oxygen Consumption,
- Blood Lactate Concentration

Measurements can be taken from the trace by pausing it and using the cross-hair cursor facility provided. The program simulates the response of a subject working continuously under a work load which is increased by increments of 20 watts each minute until the subject is exhausted. The screen display also shows a digital clock and work load meter. Heart rate is monitored continuously and respiratory performance is assessed by breath-by-breath analysis of expiratory air samples. Blood samples may be taken during the exercise regime and the [lactate] determined using a simulated spectrophotometer.

The program allows subject parameters (age, weight, height, sex, trained or untrained) to be determined by the user and may thus be used to compare, for example, male with female performance, or the effects of training or age.

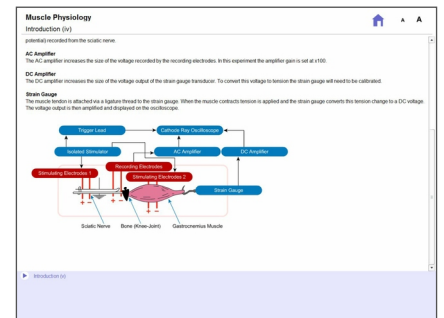


**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

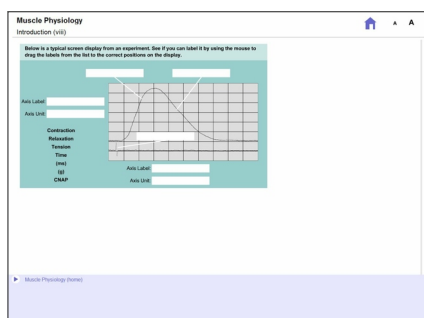
An interactive, menu-driven and easy to use program, which simulates experiments on the frog sciatic nerve - gastrocnemius muscle preparation to illustrate physiological properties of skeletal muscle.

**Experiments include:**

- stimulus voltage/response relationships,
- summation,
- tetanus,
- length-tension relationship,
- action of curare.



Real experimental data is used to generate simulated muscle contractions, which are displayed in a form comparable to that of an oscilloscope. Each experiment is prefaced by introductory text, and experiment guide and includes assignments (MCQ, true-false, data interpretation) for students to complete which are designed to reinforce underlying physiological principles, and test accuracy of data collection and data interpretation.



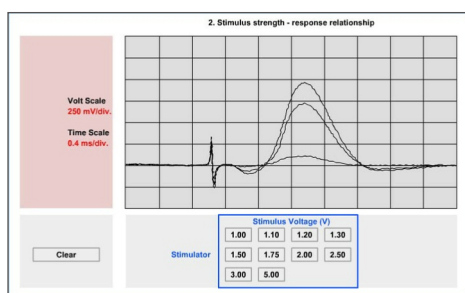
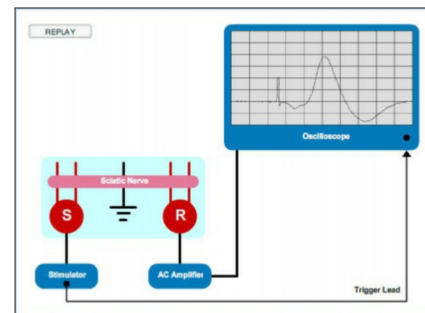
**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

An interactive, menu-driven and easy to use program, which simulates a number of experiments performed on the frog sciatic nerve preparation to illustrate some of the important properties of mixed nerves. High-resolution graphic simulations of compound nerve action potentials, derived from real experimental data, are displayed on a simulated oscilloscope screen.

### Experiments include;

- stimulus voltage/response relationships,
- investigation of refractory period,
- measurement of conduction velocity,
- effects of temperature and action of a local anaesthetic.

Each experiment is prefaced by introductory text, and each experiment has associated assignments. The package includes a manual, tutor's guide and student workbook.



**Recommended System Requirements:** Microsoft Windows XP (32 bit), Windows Server 2003 (32-bit), Windows Server 2008 (32 bit), Windows Vista (32 bit), Windows 7 (32 bit and 64 bit), Windows 8, 2.33GHz or faster x86-compatible processor, or Intel Atom 1.6GHz or faster processor for netbooks, 128MB of RAM (1GB of RAM recommended for netbooks); 128MB of graphics memory, Internet Explorer 7.0 or later, Mozilla Firefox 4.0 or later, Google Chrome, Safari 5.0 or later, or Opera 11.

This program is available as a Multi-User Educational Licence. See [page 38](#) for prices



# PRICE LIST

Valid from May 2017

Cat.#	Product Name	Ex. Tax	Inc. Tax
AN-1	ACLS Simulator 2016 - Single User	\$124.49	\$136.94
AN-1I	ACLS Simulator 2016 - Institutional Licence	\$1314.49	\$1445.94
AN-3	Critical Care Simulator 3 - Single User	\$161.22	\$177.34
AN-3I	Critical Care Simulator 3 - Institutional Licence	\$1314.49	\$1445.94
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AN-2I	Anesthesia Simulator 6 - Institutional Licence	\$1314.49	\$1445.94
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AN-5I	Sedation Simulator 4 - Institutional Licence	\$1314.49	\$1445.94
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MS-1	Blood Gases - Single User	\$49.59	\$54.55
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MS-9	ACLS Teaching Series - Single User	\$177.61	\$195.37
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MS-3	Chest Pain Simulator - Single User	\$49.59	\$54.55
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WU-9	Introduction to Transfusion Services - 1 year Online Course	\$480.81	\$528.89
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WU-10	Introduction to the Clinical Laboratory - 1 year Online Course	\$480.81	\$528.89
WU-6	Laboratory Safety Tutor - 1 year Online Course	\$480.81	\$528.89
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WU-4	Mycology Tutor - 1 year Online Course	\$480.81	\$528.89
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WU-15	Protein Electrophoresis Tutor - 1 year Online Course	\$480.81	\$528.89
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AN-7I	Neonatal Simulator 3 - Institutional Licence	\$1314.49	\$1445.94
AN-9	Obstetrics Simulator 3 - Single User	\$161.22	\$177.34
AN-9I	Obstetrics Simulator 3 - Institutional Licence	\$1314.49	\$1445.94
AN-10	Pediatrics Simulator 3 - Single User	\$161.22	\$177.34
AN-10I	Pediatrics Simulator 3 - Institutional Licence	\$1314.49	\$1445.94
AN-8	PALS Simulator 2016 - Single User	\$124.49	\$136.94
AN-8I	PALS Simulator 2016 - Institutional Licence	\$1314.49	\$1445.94
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SB-11	Physiology of the Heart - Educational Licence	\$399.12	\$439.04
SB-35	Epilepsy - Educational Licence	\$399.12	\$439.04
SB-8	Exercise Physiology - Educational Licence	\$399.12	\$439.04
SB-18	Muscle Physiology - Educational Licence	\$399.12	\$439.04
SB-19	Nerve Physiology - Educational Licence	\$399.12	\$439.04

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<http://www.msmedia.com.au/medical-software>