

CLINICAL INTERNSHIP 1
CLINICAL CHEMISTRY

OVERVIEW OF AUTOMATED CLINICAL CHEMISTRY TESTS

Machines used in sequence:

- For routine chemistry tests:
 - Siemens Dimension
 - Pentra C400
- For blood gas and electrolyte tests:
 - OPTI-CCA TS

Clinical chemistry evaluates the biochemical components of the liquid portion of the blood which is plasma/ serum. Most commonly used specimen is serum.

*What are the different tests in clinical chemistry?

- **Kidney Function Test** which include creatinine, blood urea nitrogen (BUN) and uric acid.
 - ❖ **Creatinine and BUN** measures kidney function.
 - ❖ **Creatinine** is the more specific test and is done using either enzymatic or colorimetric methods. Enzymatic is said to be the better method for the determination of any laboratory tests.
 - ❖ **Uric acid** is not really a kidney function test but it can also attest kidney function, while it's also an indicator of joint diseases especially rheumatoid, gouty arthritis and other types of arthritis.
- **Liver or Hepatic Panel** this includes ALT (SGPT), AST (SGOT), total protein, albumin, globulin, alkaline phosphatase, direct and indirect bilirubin and GGT (an indicator of alcoholic cirrhosis) while all other test will test liver function.
 - ❖ **Prothrombin time** is also part of the hepatic panel, it can assess several clotting factors and also vitamin K dependent this includes factors 2, 7, 9 and 10.
 - ❖ **Clotting factors: 2, 7, 9, and 10** - independent on prothrombin time because they are *vitamin K dependent*.
- **Thyroid Panel** this includes TSH, Free T3, Free T4, T3 and T4.
 - ❖ All of this test will attest hyperthyroidism, hypothyroidism and euthyroidism.
- **Executive Panel #3/ Cardiac Panel** it will assess cardiac enzymes like the CKMB (creatine-kinase-MB) and AST.
 - ❖ The most accurate cardiac enzyme is called the **CKMB** because it is more secreted from the cardiac muscle and it is not so concentrated in the skeletal muscle.
 - ❖ The most specific protein and the most specific cardiac muscle is **Troponin**.
 - It has two types: **Troponin T and Troponin I**
 - Both are specific except the troponin I lacks periodicity compared to troponin T. **Troponin I** is more specific. Other tests in cardiac function although it is not done in the hospital includes *myoglobin* and *AST* (not anymore part of the cardiac panel).

Clinical Chemistry Case Studies With Answers Sunsec

Philip D Mayne, Andrew P Day



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Diagnostic Reasoning Ibrahim A. Hashim, 2025-02-01 Training in clinical chemistry is acquired via different avenues that include didactic lectures on pathophysiology of disease methodologies and practical aspects of testing and through attendance of operations meetings sign out sessions seminars and tutorials There is little instruction on how to apply the vast amount of knowledge gained in the process to practice In other branches of medicine cases are regularly presented with clinical information and therapeutic interventions which form the basis of training Diagnostic Reasoning Laboratory Based Case Studies in Clinical Chemistry fills this gap for clinical chemistry The concise and practical approach of the book including real life scenarios is an excellent resource for pathology trainees clinical laboratory science students clinical chemistry fellows clinical laboratory professionals and clinicians These cases help professionals remain competent in the field and be successful in their board exams The cases are stated as they present often with no or few clinical details accompanying the sample request with only barcoded samples arriving into the laboratory In a busy laboratory thousands of these cases are received daily and it is impossible to review the clinical information associated with the specimens There are no books with a similar approach and emphasis Fills the gap in teaching by addressing the subject from a laboratory practical prospective with concomitant application of evidence based laboratory investigation Presents laboratory data in tabulated format to resemble real life scenarios shows list of abbreviations and conversion factors Cases begin with clinical presentation and information not available to those within the clinical laboratory Discusses the differential diagnosis and suggests additional testing or investigations as necessary Clinical Chemistry David N. Bailey, Robert L. Fitzgerald, 2024-12-12 This book is a toolkit for teaching a course on the pathophysiology of disease and how the most widely utilized laboratory tests can be used to diagnose these conditions Tests for the major common diseases are presented by organ system It is also a study guide for students and trainees as they prepare for their respective board examinations Each topic includes succinct text focusing on a disease topic along with a set of PowerPoint lecture slides and clinical cases with answers The toolkit also contains instructions for preparing the teaching laboratories for the course a comprehensive list of differential diagnoses for the most frequent clinical chemistry abnormalities discussion of selected cases taken by pathology residents while on night call and quiz questions with answers Analytical methodology is not presented unless it is important in understanding the test This third edition includes updated material on tumor markers Alzheimer s disease markers markers for pre eclampsia additional drugs for which therapeutic monitoring is available and biomarkers for ethanol abuse among others The comprehensive toolkit is the result of more than 40 years of teaching an introductory course in clinical chemistry to second year medical students at the University of California San Diego Elements of this book have also been used in teaching UC San Diego clinical laboratory scientist training program students pharmacy students clinical chemistry postdoctoral fellows and pathology residents This work has been previously published in two editions 2017 and 2021 by the

American Society for Clinical Pathology ASCP Press under the title Practical Laboratory Diagnosis of Disease Clinical Chemistry **Government Reports Announcements & Index**, 1979-03 Clinical Chemistry, Immunology and Laboratory Quality Control Amitava Dasgupta, Amer Wahed, 2013-12-02 All pathology residents must have a good command of clinical chemistry toxicology immunology and laboratory statistics to be successful pathologists as well as to pass the American Board of Pathology examination Clinical chemistry however is a topic in which many senior medical students and pathology residents face challenges Clinical Chemistry Immunology and Laboratory Quality Control meets this challenge head on with a clear and easy to read presentation of core topics and detailed case studies that illustrate the application of clinical chemistry knowledge to everyday patient care This basic primer offers practical examples of how things function in the pathology clinic as well as useful lists sample questions and a bullet point format ideal for quick pre Board review While larger textbooks in clinical chemistry provide highly detailed information regarding instrumentation and statistics this may be too much information for students residents and clinicians This book is designed to educate senior medical students residents and fellows and to refresh the knowledge base of practicing clinicians on how tests are performed in their laboratories i e method principles interferences and limitations Takes a practical and easy to read approach to understanding clinical chemistry and toxicology Covers all important clinical information found in larger textbooks in a more succinct and easy to understand manner Covers essential concepts in instrumentation and statistics in such a way that fellows and clinicians understand the methods without having to become specialists in the field Includes chapters on drug herb interaction and pharmacogenomics topics not covered by textbooks in the field of clinical chemistry or laboratory medicine

Clinical Chemistry - E-Book Donna Larson, 2015-12-17 Gain a clear understanding of pathophysiology and lab testing Clinical Chemistry Fundamentals and Laboratory Techniques prepares you for success as a medical lab technician by simplifying complex chemistry concepts and lab essentials including immunoassays molecular diagnostics and quality control A pathophysiologic approach covers diseases that are commonly diagnosed through chemical tests broken down by body system and category such as respiratory gastrointestinal and cardiovascular conditions Written by clinical chemistry educator Donna Larson and a team of expert contributors this full color book is ideal for readers who may have minimal knowledge of chemistry and are learning laboratory science for the first time Full color illustrations and design simplify complex concepts and make learning easier by highlighting important material Case studies help you apply information to real life scenarios Pathophysiology and Analytes section includes information related to diseases or conditions such as a biochemistry review disease mechanisms clinical correlation and laboratory analytes and assays Evolve companion website includes case studies and animations that reinforce what you've learned from the book Laboratory Principles section covers safety quality assurance and other fundamentals of laboratory techniques Review questions at the end of each chapter are tied to the learning objectives helping you review and retain the material Critical thinking questions and discussion questions

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Clinical Chemistry Theresa Dean, Sheryl Whitlock, 1997 This complete procedural manual offers laboratory technicians hands on coverage of all aspects of clinical chemistry Using numerous real world case studies it fully examines test principles and demonstrates correct test techniques and procedures Effective quality control and safety procedures are incorporated throughout 55 illus

Chemistry Case Studies for Allied Health Students Colleen Kelley, 2006 Clinical Chemistry William J. Marshall, Márta Lapsley, Kate Shipman, Andrew Day, 2020-06

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Chemistry Case Studies for Allied Health Colleen Kelley, Wendy Weeks, 2006-03-10 Case Studies Approach Students are asked to work in groups to solve real life health and environmental cases The case studies approach is very common in other allied health classes and brings relevance to the chemistry class Students also learn to think like diagnosticians to approach and solve a problem Active Learning Group Work Students work together in groups to solve the case This collaboration helps train them for their future careers where they will most often work as part of a team to provide patient care Instructor s Manual An Instructor s Manual is available to accompany the Kelley Weeks text The manual provides detailed answers and also gives guidance and advice on how to teach using a case approach

Clinical Chemistry William J. Marshall, Stephen K. Bangert, Márta Lapsley, 2012-04-25 Clinical Chemistry considers what happens to the body s chemistry when affected by disease Each chapter covers the relevant basic science and effectively applies this to clinical practice It includes discussion on diagnostic techniques and patient management and makes regular use of case histories to emphasise clinical relevance summarise chapter key points and to provide a useful starting point for examination revision The clear and engaging writing style appreciated by generations of readers has been retained in this new eighth edition while the content has been thoroughly updated throughout The approach and scope of this trusted text makes it ideal for integrated medical curricula for medical training and for students and practitioners of clinical and biomedical science Additional electronic self assessment material completes this superb learning package Bonus self assessment materials interactive clinical cases and two tier level MCQs standard and advanced New introductory chapter on basic biochemistry including solutions solutes ionisation pH buffers amino acids peptides and proteins enzyme activity

including kinetic properties DNA structure Light bulb sections give practical advice and clarify difficult concepts or potential pitfalls Updated references to core guidelines UK and international reflect latest best practice

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Clinical Chemistry National Learning Corporation, 2018 The College Level Examination Program CLEP enables students to demonstrate college level achievement and earn college credit in various subject areas based on knowledge acquired through self study high school and adult courses or through professional means The CLEP Clinical Chemistry Passbook R prepares you by sharpening knowledge of the skills and concepts necessary to succeed on the upcoming exam and the college courses that follow

Clinical Chemistry, 1974 **Advances in Clinical Chemistry**, 2025-01-16 Advances in Clinical Chemistry Volume 124 provides the fundamentals of physiologic and pathophysiologic biochemistry in general and clinical chemistry Complex molecular pathways are elucidated using historical current and emerging technologies such as biosensor design and development Identification of novel biomarkers and accurate and precise analysis are key to cutting edge patient care diagnostics and treatment This series strategically focuses on new tools for the detection of novel biomarkers especially in light of an aging worldwide population faced with increased prevalence of chronic disease many of which lack early

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