

## CLINICAL LABORATORY TESTS – REFERENCE VALUES

This table lists reference ranges (expressed in both SI units and traditional units) for the most common laboratory tests and is intended for interpretation of the results as they are provided in the examinations. Most of the values apply to adults and where they differ for children it will be indicated. Many important laboratory reference values are not listed here, because of the less frequent use of these tests. Such values are inserted parenthetically following the result recorded in the examination question.

| Tests   | SI Units                      | Traditional Units               |
|---|-------------------------------|---------------------------------|
| Activated partial thromboplastin time (aPTT)        | 25-40 sec                     | 25-40 sec                       |
| Albumin (serum)                                     | 35-50 g/L                     | 3.5-5.0 g/dL                    |
| Amylase (serum)                                     | 25-125 IU/L                   | 25-125 U/L                      |
| Bicarbonate (HCO <sub>3</sub> ) (serum)             | 23-29 mmol/L                  | 23-29 mEq/L                     |
| Bilirubin (serum)* Neonates (conjugated)            | 0-10 µmol/L                   | 0-0.6 mg/dL                     |
| (total)   | 1.7-180 µmol/L                | 1.0-10.5 mg/dL                  |
| Adults (conjugated)                                 | 0-5 µmol/L                    | 0-0.3 mg/dL                     |
| (total)   | 3-22 µmol/L                   | 0.2-1.3 mg/dL                   |
| Bleeding time (Dvy)                                 | < 5 min                       | < 5 min                         |
| Calcium (serum)**                                   |                               |                                 |
| Total   | 2.10-2.50 mmol/L              | 8.4-10.6 mg/dL                  |
| Ionized   | 1.15-1.35 mmol/L              | 4.6-5.1 mg/dL                   |
| Calcium (urine)                                     | < 6.2 mmol/d                  | < 250 mg/24h                    |
| Carcinoembryonic antigen (CEA) (serum)              | < 3.0 µg/L                    | < 3.0 ng/ml                     |
| CO <sub>2</sub> (total)**                           | 22-29 mmol/L                  | 22-29 mEq/L                     |
| Chloride (serum)                                    | 96-106 mmol/L                 | 96-106 mEq/L                    |
| Chloride (urine) Infant                             | 2-10 mmol/d                   | 2-10 mEq/24h                    |
| Child   | 14-50 mmol/d                  | 14-50 mEq/24h                   |
| Adults  | 110-250 mmol/d                | 110-250 mEq/24h                 |
| Cholesterol (serum)**                               | < 5.2 mmol/L                  | < 200 mg/dL                     |
| Cortisol (plasma) 8 AM                              | 170-635 nmol/L                | 6-23 µg/dL                      |
| 4 PM  | 82-413 nmol/L                 | 3-15 µg/dL                      |
| Creatinine (serum)                                  | 50-110 µmol/L                 | 0.6-1.2 mg/dL                   |
| Creatinine (urine) Males                            | 8.8-17.6 mmol/d               | 1.0-2.0 g/24h                   |
| Females   | 7.0-15.8 mmol/d               | 0.8-1.8 g/24h                   |
| Creatine kinase (CK, CPK) - Males (race dependent)  | 20-215 IU/L                   | 20-215 U/L                      |
| Females (race dependent)                            | 20-160 IU/L                   | 20-160 U/L                      |
| Erythrocytes (RBCs) - Children**                    | 4.5-5.1 x 10 <sup>12</sup> /L | 4.5-5.1 million/mm <sup>3</sup> |
| Males   | 4.6-6.2 x 10 <sup>12</sup> /L | 4.6-6.2 million/mm <sup>3</sup> |
| Females   | 4.2-5.4 x 10 <sup>12</sup> /L | 4.2-5.4 million/mm <sup>3</sup> |
| Ferritin (serum)                                    | 20-200 µg/L                   | 20-200 ng/ml                    |
| Follicle-stimulating hormone (FSH) (plasma)         |                               |                                 |
| Males   | 1-10 IU/L                     | 1-10 mIU/ml                     |
| Females, premenopausal                              | 20-80 IU/L                    | 20-80 mIU/ml                    |
| Females, postmenopausal                             | 40-250 IU/L                   | 40-250 mIU/ml                   |
| Glucose (fasting) (plasma or serum)                 | 3.9-6.1 mmol/L                | 70-110 mg/dL                    |
| Growth hormone (hGH) (serum, adult) fasting         | 0-10 µg/L                     | 0-10 ng/ml                      |
| Hematocrit - Newborn                                | 0.49-0.54                     | 49-54%                          |
| Children**  | 0.35-0.49                     | 35-49%                          |
| Males   | 0.40-0.54                     | 40-54%                          |
| Females   | 0.37-0.47                     | 37-47%                          |
| Hemoglobin (Hb) - Newborn                           | 163-195 g/L                   | 16.3-19.5 g/dL                  |
| Children**  | 112-165 g/L                   | 11.2-16.5 g/dL                  |
| Males   | 140-180 g/L                   | 14.0-18.0 g/dL                  |
| Females   | 120-160 g/L                   | 12.0-16.0 g/dL                  |
| High density lipoproteins (HDL) (recommended range) | > 0.91 mmol/L                 | > 35 mg/dL                      |
| INR   | 0.9-1.1                       | 0.9-1.1                         |
| Iron (serum) - Males                                | 13-31 µmol/L                  | 75-175 µg/dL                    |
| Females   | 5-29 µmol/L                   | 28-162 µg/dL                    |
| Iron binding capacity (serum) (TIBC)                | 45-73 µmol/L                  | 250-410 µg/dL                   |
| Lactate dehydrogenase (LDH) (serum) - Adult         | 45-90 IU/L                    | 45-90 U/L                       |
| Child   | 60-170 IU/L                   | 60-170 U/L                      |
| > 60 years old                                      | 55-100 IU/L                   | 55-100 U/L                      |

\*Test values are method dependent

\*\*Test values vary with age

\*\*\*Test values are diet dependent

.../over

# Clinical Laboratory Tests Reference Values

**Deborah B. Proctor, Brigitte  
Niedzwiecki, Julie Pepper, Marti  
Garrels, Helen Mills**

## **Clinical Laboratory Tests Reference Values:**

**Clinical Laboratory Medicine** Kenneth D. McClatchey, 2002 This thoroughly updated Second Edition of Clinical Laboratory Medicine provides the most complete current and clinically oriented information in the field The text features over 70 chapters seven new to this edition including medical laboratory ethics point of care testing bone marrow transplantation and specimen testing providing comprehensive coverage of contemporary laboratory medicine Sections on molecular diagnostics cytogenetics and laboratory management plus the emphasis on interpretation and clinical significance of laboratory tests why a test or series of tests is being done and what the results mean for the patient make this a valuable resource for practicing pathologists residents fellows and laboratorians Includes over 800 illustrations 353 in full color and 270 new to this edition Includes a Self Assessment and Review book

**Tietz Textbook of Clinical Chemistry and Molecular Diagnostics - E-Book** Carl A. Burtis, Edward R. Ashwood, David E. Bruns, 2011-12-16 As the definitive reference for clinical chemistry Tietz Textbook of Clinical Chemistry and Molecular Diagnostics 5th Edition offers the most current and authoritative guidance on selecting performing and evaluating results of new and established laboratory tests Up to date encyclopedic coverage details everything you need to know including analytical criteria for the medical usefulness of laboratory procedures new approaches for establishing reference ranges variables that affect tests and results the impact of modern analytical tools on lab management and costs and applications of statistical methods In addition to updated content throughout this two color edition also features a new chapter on hemostasis and the latest advances in molecular diagnostics Section on Molecular Diagnostics and Genetics contains nine expanded chapters that focus on emerging issues and techniques written by experts in field including Y M Dennis Lo Rossa W K Chiu Carl Wittwer Noriko Kusukawa Cindy Vnencak Jones Thomas Williams Victor Weedn Malek Kamoun Howard Baum Angela Caliendo Aaron Bossler Gwendolyn McMillin and Kojo S J Elenitoba Johnson Highly respected author team includes three editors who are well known in the clinical chemistry world Reference values in the appendix give you one location for comparing and evaluating test results NEW Two color design throughout highlights important features illustrations and content for a quick reference NEW Chapter on hemostasis provides you with all the information you need to accurately conduct this type of clinical testing NEW Six associate editors lend even more expertise and insight to the reference NEW Reorganized chapters ensure that only the most current information is included

**Tietz Textbook of Clinical Chemistry and Molecular Diagnostics - E-Book** Nader Rifai, 2017-01-16 The Tietz Textbook of Clinical Chemistry and Molecular Diagnostics 6th Edition provides the most current and authoritative guidance on selecting performing and evaluating the results of new and established laboratory tests This classic clinical chemistry reference offers encyclopedic coverage detailing everything you need to know including analytical criteria for the medical usefulness of laboratory tests variables that affect tests and results laboratory medicine applications of statistical methods and most importantly clinical utility and interpretation of laboratory tests It is THE definitive reference

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*Clinical Biochemistry in Hepatobiliary Diseases* Francesco Salvatore,Aldo Roda,Lucia Sacchetti,2013-03-07 The clinical biochemistry ofhepatobiliary diseases is very widely studied and publica tions abound on this topic However there is no recent publication that provides a comprehensive collection of the various leading aspects that go to make up this complex theme Therefore we thought it useful to gather together a few

scientists whose work has focused on the various clinical biochemistry aspects of these disorders in order that they might discuss their experience and expertise The aim of the International Satellite Symposium on Clinical Biochemistry in Hepatobiliary Disease in addition to reviewing the individual aspects was to describe the state of the art so as to provide useful data for laboratory scientists and also for physicians working in the field of hepatobiliary diseases and these two aims are clearly reflected in the chapters of this volume The volume opens with an introductory chapter that gives a general overview of the various aspects of the clinical biochemistry of these disorders while the closing chapter deals with an important aspect that deserves to be increasingly emphasized in laboratory medicine i e strategies to integrate information coming from the laboratory to make them more useful for clinical diagnosis

**Clinical Decision Levels for Lab Tests**  
Bernard E. Statland,1987 *Kinn's The Medical Assistant* Deborah B. Proctor,Brigitte Niedzwiecki,Julie Pepper,Payel Madero,Marti Garrels,Helen Mills,2016-05-04 Comprehensive Medical Assisting begins with Kinn Elsevier s 60th Anniversary edition of Kinn s The Medical Assistant 13th Edition provides you with real world administrative and clinical skills that are essential to working in the modern medical office An applied learning approach to the MA curriculum is threaded throughout each chapter to help you further develop the tactile and critical thinking skills necessary for working in today s healthcare setting Paired with our adaptive solutions real world simulations EHR documentation and HESI remediation and assessment you will learn the leading skills of modern administrative and clinical medical assisting in the classroom Basics of Diagnostic Coding prepares you to use the ICD 10 coding system Learning objectives listed in the same order as content makes it easy to review material Clinical procedures integrated into the TOC give you a quick reference point Professional behavior boxes provide guidelines on how to interact with patients families and coworkers Patient education and legal and ethical issues are described in relation to the Medical Assistant s job Applied approach to learning helps you use what you ve learned in the clinical setting Learning objectives and vocabulary with definitions highlight what s important in each chapter Critical thinking applications test your understanding of the content Step by step procedures explain complex conditions and abstract concepts Rationales for each procedure clarify the need for each step and explains why it s being performed Portfolio builder helps you demonstrate your mastery of the material to potential employers NEW Chapter on The Health Record reviews how you ll be working with a patient s medical record NEW Chapter on Technology in the Medical Office introduces you to the role EHR technology plays in the medical office NEW Chapter on Competency Based Education helps you understand how your mastery of the material will affect your ability to get a job NEW Clinical procedure videos helps you visualize and review key procedures

**Kinn's The Clinical Medical Assistant** Deborah B. Proctor,Brigitte Niedzwiecki,Julie Pepper,Marti Garrels,Helen Mills,2016-05-10 Clinical Medical Assisting begins with Kinn Elsevier s Kinn s The Clinical Medical Assistant 13th Edition provides you with the real world clinical skills that are essential to working in the modern medical office An applied learning approach to the MA curriculum is threaded throughout each chapter to help you further develop the tactile

and critical thinking skills necessary to assist with medications diagnostic procedures and surgeries Paired with our adaptive solutions real world simulations EHR documentation and HESI remediation and assessment you will learn the leading skills of modern clinical medical assisting in the classroom Applied approach to learning helps you use what you ve learned in the clinical setting Clinical procedures integrated into the TOC provide you with a quick reference Detailed learning objectives and vocabulary with definitions highlight what s important in each chapter Step by step procedures explain complex conditions and abstract concepts Rationales for each procedure clarify the need for each step and explains why it s being performed Critical thinking applications test your understanding of the content Patient education and legal and ethical issues are described in relation to the clinical Medical Assistant s job Threaded case scenarios help you apply concepts to realistic clinical situations Portfolio builder helps you demonstrate clinical proficiency to potential employers NEW Chapter on The Health Record reviews how you will maintain and interact with the medical record NEW Chapter on Competency Based Education helps you confidently prepare for today s competitive job market NEW Clinical procedure videos help you to visualize and review key procedures

*Lab Values Interpretation* Dr Gabriel J Connor,2020-10-19 Can you decipher the myriad values that you see when the morning lab results come back Is this value high or low Is it a critical value Which ones do you need to be sure get addressed first Is your patient at risk if you wait for the physician Getting familiar with and interpreting laboratory values can be intimidating There s always the fear of messing things up and not being able to meet the patients health needs But guess what Familiarizing and interpreting laboratory values don t always have to feel that way With the right tips you ll be able to overcome those fears and complete your tasks easily But First A Warning Before we go further let me make something abundantly clear This book does not contain a magic wand that will bring you instant knowledge without having to do any work This book provides in depth knowledge of the full spectrum of lab tests used today But this only works for those who are willing to apply take notes read and re read the chapters So with that said let me tell you Take Lab Values from random numbers and turning them into functional concepts that are actually fun Look beyond the numbers and finally understand what the values mean Learn an intuitive multi dimensional approach to assessing multiple lab tests and integrating them into your clinical practice This is not hype this is what my audience commonly report

**Interpretation of Clinical Laboratory Tests** G. Siest,1985 *Reference Values in Laboratory Medicine* R.

Grasbeck,Helge Erik Solberg,Ralph Gräsbeck,T. Alstrom,H. E. Solberg,Torgny Alström,1981 **Lab Values Interpretation** Gabriel J. Connor,2020-09-29 Can you decipher the myriad values that you see when the morning lab results come back Is this value high or low Is it a critical value Which ones do you need to be sure get addressed first Is your patient at risk if you wait for the physician Getting familiar with and interpreting laboratory values can be intimidating There s always the fear of messing things up and not being able to meet the patients health needs But guess what Familiarizing and interpreting laboratory values don t always have to feel that way With the right tips you ll be able to overcome those fears and complete

your tasks easily But First A Warning Before we go further let me make something abundantly clear This book does not contain a magic wand that will bring you instant knowledge without having to do any work This book provides in depth knowledge of the full spectrum of lab tests used today But this only works for those who are willing to apply take notes read and re read the chapters So with that said let me tell you Take Lab Values from random numbers and turning them into functional concepts that are actually fun Look beyond the numbers and finally understand what the values mean Learn an intuitive multi dimensional approach to assessing multiple lab tests and integrating them into your clinical practice This is not hype this is what my audience commonly report

Common Problems in Clinical Laboratory Management Judith A. O'Brien,2000 A valuable look at the clinical challenges and questions that arise in the everyday operation of the clinical lab Focuses on practical solutions to the most common but not necessarily easy to solve problems Covers procedures and policies planning continuing education establishing quality control and quality assurance protocols tuberculosis control OSHA and CLIA 88

*The Medical Library Association Encyclopedic Guide to Searching and Finding Health Information on the Web* P. F. Anderson,Nancy J. Allee,2004 Searching for health information may be the most important type of search a librarian performs in a day Instead of starting a health care search with a blank computer screen or simply accessing ordinary information available most anywhere on the Web you can begin with help from the prestigious Medical Library Association Each entry will show you how an experienced health sciences librarian would approach the question You can begin a truly valuable search knowing Special searching issues What to ask Where to start Supplementary search strategies Topic profile Recommended search terms and important sites Hotline phone numbers FAQs Publications on the Internet Professional Organizations Patient Support organizations and discussion groups Best One Stop Shops Finally there s one read reference source written by librarians to help their colleagues that contains every important aspect of the question you or your patron want to answer It s time saving it s authoritative it sets a new standard for comprehensive medical information reference Let a fellow librarian be your guide through the sometimes dizzying amount of information available Find hundreds of specific entries grouped in three easy to use volumes

*The Scandinavian Journal of Clinical & Laboratory Investigation* ,1951

Choosing Effective Laboratory Tests Carl E. Speicher,Jack W. Smith,1983

Laboratory Tests and Diagnostic Procedures Jane Vincent Corbett,2008 Written by a highly respected author in the lab and diagnostic test field this reference explains in detail the clinical significance of tests and diagnostic procedures Its comprehensive coverage is augmented by a strong emphasis on nursing care as applied to lab and diagnostic tests and on the relationship between nursing diagnoses and nursing care Both scholarly and practical it is ideal for use in both classroom and clinical settings Each chapter is organized as an independent study unit complete with objectives an organizing theme with background information called an expository organizer and test questions

**Laboratory Tests and Diagnostic Procedures with Nursing Diagnoses** Jane Vincent Corbett,2004 Written by a highly respected author in the lab and diagnostic test field this resource explains in detail

the clinical significance of tests and diagnostic procedures Its comprehensive coverage is augmented by a strong emphasis on nursing care as applied to lab and diagnostic tests and on the relationship between nursing diagnoses and nursing care Both scholarly and practical it is ideal for use in both classroom and clinical settings Each chapter is organized as an independent study unit complete with objectives an organizing theme with background information called an expository organizer and test questions NEW TO THE SIXTH EDITION Evidence based practice with extensive reference lists for each chapter Updates on tests and treatments that provide the latest breakthroughs in diagnostic testing and treatment modalities Laboratory data updates such as issues on point of care testing use of panic or critical values and more Updated guidelines and diagnostic procedures for mammogram revised Bethesda guidelines for reporting cervical cytology sentinel node biopsies using radionuclides and expanded use of CT and MRI scans 300 new references provide the most current and reliable information KEY FEATURES Focus on the nurse explains lab tests are used in nursing care and the nurse s role for diagnostic procedures Chapters grouped by possible nursing diagnoses with objectives and review questions Reference values and wide range of examples of use for entire life span and in a variety of settings Current NANDA nursing diagnoses with specific nursing interventions for each test and procedure Medical diagnoses and medical interventions that include a discussion of usual medical intervention for a particular set of circumstances Part II includes four case studies for practice in critical thinking and interpretation of laboratory data

*Clinical Chemistry* Lawrence A. Kaplan, Amadeo J. Pesce, Steven C. Kazmierczak, 2003 This comprehensive up to date readable text acts as a complete clinical chemistry course and professional reference providing detailed specific information on the principles of clinical chemistry in laboratory diagnosis as well as the pathophysiologic changes that occur in disease and affect testing outcomes Explanations of Laboratory Techniques Part 1 lead the reader through various necessary laboratory techniques and practices Chapters on Pathophysiology Part 2 provide descriptions of how specific diseases affect the human body A companion CD ROM packaged with the book features Methods of Analysis a comprehensive Urinalysis Manual and an interactive Study Guide Workbook to reinforce concepts The book s clear writing and comprehensive coverage make it an ideal resource for both students and practitioners Instructor resources are available to qualified adopters contact your sales representative for more information

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