Using Decision Support Resources

FSU College of Medicine
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# Using Decision Support Resources

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Access each of the above subscription resources thru the FSU College of Medicine Web site:

[www.med.fsu.edu/library](http://www.med.fsu.edu/library)

Use EZProxy from off campus.

This handout was designed for FSU College of Medicine faculty and students to assist them in using the extensive resources of the Maguire Medical Library for decision support. Exercises for practice are included.
Point of Care (POC) Decision Support Resources

For years the medical student, resident and practicing physician relied on a white coat stuffed with notes and manuals to use as point of care quick references. By the end of the 20th century, these had been largely replaced by mobile technology: handheld devices loaded with much more information that could ever be stuffed into the pockets of a white coat.

In the last 10 years, these handheld devices have morphed from low memory, hard to load PDAs like the Palm Pilot and PocketPC to multi-function, large capacity smart phones and tablets. Those physicians who have the luxury of an iPad easily at hand while seeing patients have also the resources of the web to call on to answer questions at the point of care.

The library web site has organized their clinical resources to reflect the types used by physicians on a daily basis. We have developed faculty development workshops to address each of three types of resources: Evidence based medicine tools, drug resources, patient education resources, and point of care resources.

This handout supports the content covered in our Point of Care Decision Support workshop and covers how to use most of the resources listed under Point of Care on the Maguire Medical Library website. These resources can be broken down into the following categories:

- **Differential Diagnosis Generators**
- **Disease Quick References**
- **Medical Calculators**
- **Laboratory resources**

Currently, the subscription resources covered include Epocrates Essentials and Epocrates Online, PEPID, Essential Evidence Plus, Dynamed, Pediatric Care Online, the multiple resources in uCentral and Access Medicine. Both PEPID and Epocrates include all of the tools listed above, plus drug information. There are some nice free resources that need to be mentioned, like Medscape’s app.
**PEPID DDX— Online and Mobile**

This feature of PEPID lets you enter symptoms, labs and findings and generates a differential with the possibilities given a score from a high of 5 to a low of 1.

**PEPID Online**

From the library website, follow the link to PEPID. Click on the DDX tab on the tool bar.

One at a time, enter the first few letters of your symptoms, findings or labs, then click on the appropriate choice adding them to the bottom half of the tool. The diagnoses will pop up as you add terms. These are ranked from most likely (5) to least likely (1).

1. Type in first few letters of symptom, finding or lab

2. Click appropriate term to add to bottom

Results can be filtered by Gender, age group, severity, etiology and onset.
PEPID DDX— Online and on the iPhone

PEPID Online

continued

Click on a diagnosis in the list to bring up the disease monograph.

PEPID MOBILE

iOS or Android

On the mobile device, run PEPID, choose the Clinical Rotation Companion from the first page, then click the DDX icon. A very similar interface to the web comes up. Type the first few letters of your symptoms, click the appropriate term to add it to the list. Once all the symptoms, findings and labs are added, click Right Arrow to get the list. Items in the differential are assigned a numerical score from 5, the most likely, to 1, the least likely. You tap the disease to see the disease monograph. To Filter by Age, gender, etc. click the Filter (funnel) symbol at the center bottom.
Diagnosaurus — Online and on the iPhone

Diagnosaurus is a very simple quick reference that provides 1000 differential diagnoses by symptom, disease or system. It is available online in Access Medicine and in the Access Medicine app. Access Medicine can be reached in the Quick Links dropdown on the Medical Library web page.

Links are provided in the lists of possible diagnosis, which search the content of the resources in Access Medicine, which includes most of the McGraw-Hill textbooks, a Quick Dx reference, as well as patient ed materials.
Disease Quick References

**uCentral — Online and App**

**uCentral** is the online and mobile interface created by Unbound Medicine, Inc. The CoM Medical Library subscribes to many excellent resources with this company because of the multiplatform options and excellent interfaces. We will be adding more as time goes on.

Currently (Summer 2016) we subscribe to the resources pictured at left and below in **uCentral**.

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5-Minute Clinical Consult (5MCC) helps diagnose, treat, and follow up on over 600 medical conditions seen in everyday practice. 5MCC 2014 is organized in a proven, rapid-access format with concise, action-oriented entries, so you can answer questions fast and provide premium care to your patients. 5MCC also includes 200 pediatric topics from the latest edition of 5-Minute Pediatric Consult.

**Harrison’s Manual of Medicine.** Derived from the best-selling internal medicine reference in the world, Harrison’s Principles of Internal Medicine, this popular reference delivers fast, to-the-point guidance on the clinical problems seen in everyday practice. It focuses on diagnosis and therapy with an emphasis on patient care. It offers high-yield coverage of etiology, signs and symptoms, physical examination, laboratory findings, and practice guidelines.

The **Washington Manual of Medical Therapeutics** provides residents and senior medical students on inpatient medicine rotations practical clinical recommendations in an easy to digest format. This application streamlines access to clear information outlining general principles, diagnosis, and extensive treatment options for hundreds of common medical conditions. Tables and charts have been optimized for easy viewing on any of your mobile devices.
Disease Quick References

5 Minute Clinical Consult (5MCC) — Online and on the iPhone

We will focus on this resource because of the utility of the resource in the uCentral interface. The navigation is simple yet effective.

All 600+ commonly encountered adult and pediatric conditions are organized in the same manner using the structure above right which makes it easy to navigate to the needed information in a well built clinical question. Topics are cross-linked with similar or related topics in other uCentral Resources, as shown in the Asthma monograph below. There are also algorithms, images, and sufficient coding information to classify this as a coding tool.
Epocrates Diseases Mobile

Epocrates Essentials includes a disease quick reference which contains the content from BMJ that has evidence-based recommendations and nice images. The Epocrates developers have made it highly convenient in that it links drugs to the Rx section so that a series of questions on one topic can be answered in a minimum number of taps. The main index will feel very familiar. The iPhone version has a lot of moving forward and going back. The pictures are not actually stored on the iPhone. They are pulled from the web, so you need an internet connection, either 3G or wifi to see the pictures.

Disease Quick References

Sections List
- **Highlights & Basics**—description, genetics, incidence and prevalence, predominate age, risk factors, age-related factors, complications, prognosis, associated conditions.
- **Tx Options**—setting general measures, surgical measures, activity/diet, patient education, medications, prevention.
- **Emerging Treatments**
- **Treatment Approach**
- **Hx/Exam**
- **Tests**
- **Differential Diagnosis**
- **Diagnostic Approach**
- **Follow-Up**
- **Citations**
- **Image Library**

**Notes** — There is a little icon in the bottom right corner that allows you to annotate the monograph.
**DynaMed Plus - Web Version**

*DynaMed Plus* is an evidence-based reference designed to provide the most useful and current disease information at the point-of-care for health care professionals. Information on diseases, drugs, procedures and clinical presentations are organized into categories for ease of use and quick answers to clinical questions. In addition, are images and graphics, the Micromedex drug database, MedCalc 3000 calculators and ICD9/ICD10 codes. *DynaMed Plus* provides citation links to the supporting articles for the given topic.

To find a topic, image or calculator, type a few words into the Search box.

- You now have two choices for searching:
  1. Pick a topic from the drop down which will take you directly to the subject or
  2. Use the Search function that will pull up all the resources that contain the word or phrase you typed. Search results are organized with images listed first, then calculators, followed by topics.

The following is an example of the Search feature using the term “diabetes risk”.

_TIP:_ Selecting the *DynaMed Plus* logo next to the search button takes you back to the homepage.
DynaMed Plus - Web Version

Each topic begins with a section called Overview and Recommendations which is a summary of the major content. Blue text are always hyperlinks to either definitions, other topics, or other places within the current topic.

For ease of finding answers to specific clinical questions, you have the ability to Search Within Text which will highlight all occurrences of the term and allow you to jump to the Next or Previous incidence of the term.
**DynaMed Plus - Web Version**

**Following citation links to the original articles thru PubMed**

All article reviews are graded with either a Level of Evidence or Strength of Recommendation, and linked to the original article citation in PubMed (see below). If you should have any problems or issues obtaining an article, contact the Maguire Medical Library, (850) 644-3883 for assistance.
1. A 65 year old Jewish woman is worried that she may get Parkinson’s Disease because her father was diagnosed with it when he was 65. He was a heavy smoker. She does not smoke or drink alcohol or coffee. What do you tell her?

2. What might she do to help prevent Parkinson’s Disease?

3. Can you give her any information to take home with her?

**DynaMed Plus Online** Exercises for Practice

DynaMed Plus Online is an online resource that provides comprehensive and evidence-based information on diseases, symptoms, tests, and treatments. It is updated regularly to ensure the information is current and accurate. Users can search for specific topics and access detailed information on each disease. The platform is user-friendly and designed to provide quick access to necessary information.

**DynaMed Plus — MOBILE Version**

The mobile version of DynaMed Plus contains all of the content that is online. The app is designed to update in the background, ensuring that the information is always up-to-date. Search results are organized like the online version. Sections within topics are accessed by a button at the top right of the screen. You can search within text in a topic for terms or phrases. Terms will be highlighted and navigation between terms is at the bottom of the screen.

Some content requires a Wi-Fi or cellular connection to the web to access. These include definitions of terms and links to referenced journal articles.

Reference links are embedded in the content which will direct you to the mobile PubMed listing for the article. Online, the Find@FSU button will appear, linking to the full text article. On the app, the button will not appear, but there are links to the full text articles which may work. Many of the journal sites are mobile-formatted.

**DynaMed Plus Mobile Exercise for Practice**

What is the prognosis for a 60 y/o female with Stage IV metastatic breast cancer?
Medscape Reference Website

While not the most current, evidence-based disease reference, the disease references in Medscape, which used to be called eMedicine, are very popular with students because the content will show up in a Google search. The site contains a nice collection of images.

Search for Topic Desired

Use Tabs and Links to navigate monograph

Medscape Exercises for Practice
A) What is the mortality rate for persons with Acute Respiratory Distress Syndrome?

B) A 55 year old man is having trouble sleeping at night. He wants to know if there is a particular medicine he should take as he has seen quite a few advertised on the television.
Medscape App (disease information)

Medscape is also available as a free resource on mobile devices. In addition to the disease content from eMedicine, it contains a drug reference, interaction checker, and procedures section that is unique. You should use the Search feature to find the condition desired because tapping on Diseases and Conditions brings up a list of specialties.

The disease reference is organized into the following categories: clinical presentation, differential, workup, treatment & medications, medications, and follow-up. Under Workup, if there are histological findings, imaging studies and such, there are sometimes images. Look for Media Gallery which will contain all the images from that condition.

The sections are accessed by touching the link under the condition name at the top center.
PEPID Web Version

PEPID, which used to stand for “Portable Emergency Physician Information Database” when it was developed back in the '90s, is now a very comprehensive, highly respected reference that is available in a variety of formats for all specialties and types of providers. We have purchased the Clinical Rotation Companion, which is their top-of-the-line resource, and compares with Epocrates Essentials in its usefulness at the point of care. Here we will discuss the disease reference aspects of PEPID. We will emphasize the way that disease summaries are linked to drug information, images, and the evidence-based FPIN clinical inquiries.

From the library web page, click on the PEPID link in Quick Links list. You will see the main interface and Table of Contents in the middle, with navigation tabs at the top of the screen.

To find information on a disease or condition, type the first few letters of the condition in the search box. The alphabetical list will automatically advance to find the first letters you have typed. When you see the condition, click on it, such as Otitis at right. The TOC on ENT conditions will open. Find Otitis Media, and click on Diagnosis or Treatment depending on your clinical question.
Here is the Treatment section of the Otitis Media monograph. Notice that the drugs are highlighted and underlined. These are linked to the extensive Drug Reference section of PEPID. We will look at those links in the Mobile version. However, here note the links to the Evidence-Based Inquiry.

Clicking on the link will jump down to the Evidence-Based Inquiries in FPIN on otitis media. Selecting the one shown will pull up the summary of the evidence on treatment of OM shown below.
**PEPID Web Version (continued)**

**PEPID** includes *illustrations* including Clinical Anatomy, Examination, Rhythm Strips, Women's Health & Obstetrics, Anesthesia / Blocks, Airway, Trauma, Procedures and other images. Look for the View Image link to pull up images in the medical content or use the **Table of Contents** to see all Illustrations.

**Navigation of PEPID**

PEPID has a medical dictionary accessed from the last tab on the navigation bar. Because it was originally designed to be an emergency reference, there is also extensive information like the section on Toxicology (above), and protocols for ACLS, ATLS, and PALS. Search for these like you would any disease or drug.
PEPID Mobile Version

The Mobile version of PEPID is very similar to the Web version. To get to the Medical Content, when PEPID opens, select the CRC Platinum Suite. Type the first few letters of the condition you are looking for and the Index will jump to the closest word. Tap the condition. The Table of Contents will come up. Select the specific condition. In this example, Migraine Diagnosis, Treatment or Prevention. The navigation pane for the section retracts from the right with a little arrow. Internal links are imbedded to drugs and other topics.

Tap the drug to jump to the drug monograph.
Medical Calculators

Epocrates Online and Dynamed Plus — MedCalc 3000 Medical Equations

Epocrates and Dynamed Plus features an impressive collection of medical calculators produced by MedCalc3000. These are not available on the Mobile version of Epocrates, but are in Dynamed Plus. Instead the Epocrates App has a the MedMath calculators which have been available free for the PDA for years. MedCalc has unit and dose converters as well as calculators that it calls Medical Equations. See the next page for a list of these Medical Equations.

![Image showing Epocrates Online calculator interface]

1. Pick your calculator from list

2. Enter values and units

3. Click Calculate/Recalculate

The same MedCalc3000 calculators that are in Epocrates Online can also be found in Dynamed online, Medscape, MerckMedicus, Facts and Comparisons online, Up-To-Date, and a number of other commonly used medical resources. Dynamed Plus lists calculators in their Search Results. Epocrates does not.

Exercises for Practice

What is the predicted peak flow for a 60 year old woman with asthma? She is 5’2”.
Epocrates Online and Dynamed Plus MedCalc Medical Equation Calculators

- A-a Gradient
- a/A Ratio
- AaPO2 Correction for FiO2
- Absolute Lymphocyte Count
- Absolute Neutrophil Count
- Absolute Reticulocyte Count
- Allowable Blood Loss
- Amikacin Dosing q24hr (also Kanamycin and Streptomycin)
- Amikacin to Produce Desired Peak and Trough Levels
- Amikacin Level Prediction from Maintenance Dosing
- Amikacin Steady State Dosage Adjustment
- Aminoglycoside Clearance Estimate
- Amortization of Student Loans
- Anion Gap Delta Delta Ratio Multicalc®
- Anion Gap in Hypoalbuminemia
- Anion Gap Multicalc®
- Ascites Albumin Gradient
- Basal Energy Expenditure (Harris-Benedict estimation)
- Bayesian Statistics I Multicalc®
- Bayesian Statistics II Multicalc®
- Benefit Increase / Number Needed to Treat
- Body Surface Area (Mosteller, square root formula)
- Body Surface Area (Du Bois Method)
- Body Surface Area (Mosteller, square root method)
- Burn Injury Fluid Resuscitation (Brooke estimate)
- Burn Injury Fluid Resuscitation (Demling dextan estimate)
- Burn Injury Fluid Resuscitation (Evans estimate)
- Burn Injury Fluid Resuscitation (Modified Brooke crystalloid estimate)
- Burn Injury Fluid Resuscitation (Slater estimate)
- Burn Injury Fluid Resuscitation, Adult (Parkland crystalloid estimate)
- Calcium Correction in Hypoalbuminemia (SI units)
- Calcium Correction in Hypoalbuminemia
- Carbon Dioxide Production
- Carbon Monoxide AUC Dose Calculation (Calvert formula)
- Cardiac Output Multicalc®
- Cardiac Output
- Chi Square Analysis
- Closing Capacity to Total Lung Volume Capacity
- Closing Capacity
- Closing Volume to Vital Capacity Ratio
- Confidence Interval of a Binomial Proportion
- Confidence Interval of a Difference Between Proportions
- Confidence Interval of a Ratio of Proportions
- Confidence Interval of a Ratio of Ratios
- Confidence Interval of a Survey
- Creatinine Clearance (measured)
- Creatinine Clearance (measured, SI units)
- Creatinine Clearance by Mass
- Creatinine Clearance Estimate by Cockcroft-Gault Equation (SI units)
- Creatinine Clearance Estimate by Cockcroft-Gault Equation
- Creatinine clearance estimate for changing serum creatinine
- Creatinine Kinetics Multicalc®
- CSF IgG Index
- CSF Protein Concentration Correction in Blood Contaminated CSF
- CSF WBC Correction in Blood Contaminated CSF
- Digitalis Body Load
- Dose Adjustment for Body Surface Area
- Dose Driven IV-Drip Rate Calculator
- Epidural Formulation Compounding Calculator
- Epoprostanol (Flolan) Infusion Rate Calculator
- Estimated Blood Volume
- Estimated Date of Delivery (EDD) Pregnancy Calculator
- False Negative Rate from Sensitivity and Prevalence
- False Negative Ratio from Sensitivity and Prevalence
- False Positive Rate from Specificity and Prevalence
- False Positive Ratio from Specificity and Prevalence
- Fractional Excretion of Amylase (Amylase to creatinine clearance ratio)
- Fractional Excretion of Sodium (SI units)
- Fractional Excretion of Sodium
- Fractional Excretion of Urate
- Friedewald Equation for Low Density Lipoprotein (LDL, SI units)
- Friedewald Equation for Low Density Lipoprotein
- Functional Residual Capacity
- Gentamicin Dosing q24hr
- Gentamicin Dosing to Produce Desired Peak and Trough Levels
- Gentamicin Level Prediction from Maintenance Dosing
- Gentamicin Steady State Dosage Adjustment
- Gestational Age from Estimated Date of Delivery (EDD)
- Glomerular Filtration Rate Estimate by Quadratic Equation
- Glomerular Filtration Rate Estimate by Quadratic Equation
- Glomerular Filtration Rate Estimate by the Abbreviated MDRD Study Equation (SI units)
- Glomerular Filtration Rate Estimate by the Abbreviated MDRD Study Equation
- Glomerular Filtration Rate Estimate by the MDRD Equation
- Gorlin Formula for Valve Area
- Height for Age Percentiles for Boys (2 - 20 years)
- Height for Age Percentiles for Girls (2 - 20 years)
- Height Potential Prediction by Mid-parental Height
- Hemoglobin A1C Estimation from Mean Plasma Glucose
- Hemoglobin A1C to Mean Plasma Glucose Estimation
- Hemoglobin A1C from Mean Plasma Glucose
- Hemoglobin A1C from Mean Plasma Glucose
- Hepatitis C Fibrosis Prediction Score
- HOMA Formula: Homeostasis Model Assessment of Insulin Resistance
- Housestaff Activity Index
- Hypnometrica Correction for Infusate Rate
- Ideal Body Weight Percentage
- Ideal Body Weight
- IME Adjusted Ratio for Medical Education
- Medicare Payments to Teaching Hospitals
- In-Flight PaO2 Estimation (using PFT's)
- In-Flight PaO2 Estimation
- Infant Head Circumference for Age Percentiles (< 36 months)
- Infant Length for Age Percentiles (< 36 months)
- Infant Weight for Age Percentiles (< 36 months)
- Infant Weight for Length Percentiles (< 36 months)
- Inspiratory Capacity
- International Normalized Ratio of Prothrombin Time (INR)
- Iron Replacement (parenteral dosing) for Iron Deficiency
- IV Drip Maintenance Rate Calculator
- Kappa Measurement of Inter-observer Agreement Multicalc®
- Kappa Measurement of Inter-observer Agreement: Bennett's Kappa
- Kappa Measurement of Inter-observer Agreement: Cohen's Kappa
- Kappa Measurement of Inter-observer Agreement: Scott's Kappa
- Kt/V Dialysis Dose Barth Formula
- Kt/V Dialysis Dose Basile Formula
- Kt/V Dialysis Dose Daugirdas Formula
- Kt/V Dialysis Dose Formulae Multicalc®
- Kt/V Dialysis Dose Jindal Formula
- Kt/V Dialysis Dose Kerr Formula
- Kt/V Dialysis Dose Keshaviah Formula
- Kt/V Dialysis Dose Lowrie Formula
- Lean Body Weight (Female)
- Lean Body Weight (Male)
- Lean Body Weight Based on Creatinine Production
- Likelihood Ratio Multicalc®
- Likelihood Ratio of Negative from Raw Data
- Likelihood Ratio of Positive from Raw Data
- Lung Age Estimation for Smoking Cessation Counseling
- Lung Volume Multicalc®
- Maintenance Fluid Calculation for Children
- Mean Corpuscular Hemoglobin Concentration
- Mean Corpuscular Hemoglobin
- Mean Corpuscular Volume
- Mean Vascular Pressure (systemic or pulmonary)
- MELD Score for End-Stage Liver Disease (NOT appropriate for patients under the age of 12)
- MELDna Score for End-Stage Liver Disease (NOT appropriate for patients under the age of 12)
- Nasal Canula Oxygen Fractional Inspired O2 (FiO2) Estimate
- Negative Predictive Value from Raw Data
- Negative Predictive Value of a Test
- Normal Range for Body Weight
- Number Needed to Harm (NNH) from Odds Ratio (OR) and Patient Expected Event Rate (PEER)
- Number Needed to Treat (NNT) from Odds Ratio (OR) and Patient Expected Event Rate (PEER)
- Odds from Probability
Epocrates Online and Dynamed Plus MedCalc Medical Equation Calculators

- Odds Ratio and Relative Risk
- Osmolal Gap Calculator (SI units)
- Osmolal Gap Calculator
- Osmolality Estimator (serum)
- Osmolar Clearance
- Overall Accuracy of a Test from Raw Data
- Overall Accuracy of a Test from Sensitivity, Specificity and Prevalence
- Oxygen Consumption
- Oxygen Content of Arterial Blood
- Oxygen Content of Venous Blood
- Oxygenation Index (OI)
- PaO2 / FIO2 Ratio (for MODS calculation)
- PaO2 Correction for FIO2
- Peak Expiratory Flow Prediction
- Peak Expiratory Flow Variability
- PELD Score for End-Stage Liver Disease (patients less than 12 years old)
- PFT Adjusted Predicted Values for Men
- PFT Adjusted Predicted Values for Women
- PFT Predicted Values for Boys
- PFT Predicted Values for Girls
- PFT Predicted Values for Men
- PFT Predicted Values for Women
- Phenytoin Free (Unbound) Drug Level (Adjusted for Hypoalbuminemia and Renal Function)
- Phenytoin Total Drug Level (Adjusted for Hypoalbuminemia and Renal Function)
- Pleurothorax Degree of Collapse
- Positive Predictive Value from Raw Data
- Post Test Odds of a Finding or Disease from Test Data
- Probability from Odds
- Protein Bound Calcium
- Protein Catabolic Rate (normalized PCR)
- Protein Catabolic Rate
- Pulmonary Vascular Resistance
- Pulse Pressure Variation (percentage)
- QT Interval Correction (EKG)
- QUICKI Formula for Insulin Resistance
- Red Blood Cell Volume by Radiocli
cotide Dilution
- Renal Failure Index
- Residual Volume to Total Lung Capacity Ratio
- Respiratory Quotient
- Reticulocyte Production Index
- Right to Left Shunt Fraction Qs/Qt
- Risk Increase / Number Needed to Harm Multicalc®
- Risk Reduction / Number Needed to Treat Multicalc®
- Sensitivity of a Test
- Serum Sodium Concentration Change Considering Infused and Excreted Cations
- Sodium Change in Hyperlipidemia
- Sodium Change in Hyperproteinemia
- Sodium Correction in Hyperglycemia
- Sodium Deficit in Hyponatremia
- Specificity of a Test
- Stool Osmolal Gap
- Survey Sample Size with Population Correction
- Survey Sample Size
- Systemic Vascular Resistance
- Systolic Pressure Variation (percentage)
- Time Averaged Concentration of Urea in Hemodialysis
- TIPS Risk predictor / Survival predictor (Transjugular Intrahepatic Portosystemic Shunt)
- Tobramycin Dosing to Produce Desired Peak and Trough Levels
- Tobramycin Level Prediction from Maintenance Dosing
- Tobramycin Steady State Dosage Adjustment
- Total Body Water in Women (Johansson formula)
- Total Body Water in Men (Humes-Weyer formula)
- Total Body Water in Women (Lee formula)
- Total Body Water in Men (Watson formula)
- Total Daily Energy Requirement Estimation
- Total Lung Capacity
- Transtubular Potassium Gradient at CCD
- True Negative Ratio from Specificity and Prevalence
- Urea Reduction Percentage in Hemodialysis (PRU)
- Urea Reduction Ratio in Hemodialysis (URR)
- Urinary Protein Excretion Estimation
- Vancomycin Dosing to Produce Desired Peak and Trough Levels
- Vancomycin Level Prediction from Maintenance Dosing
- Vancomycin Steady State Dosage Adjustment
- Ventilation Index
- Very Low Density Lipoprotein (VLDL)
- Vital Capacity
- Volume of Distribution of Urea
- Water Deficit in Hyponatremia
- Weight Based Dosage Calculator
- Weight for Age Percentiles for Boys (2-20 years)
- Weight for Age Percentiles for Girls (2-20 years)
- Weight for Height Percentiles for Boys (77-121 cm tall)
- Weight for Height Percentiles for Girls (77-121 cm tall)
- WHO Assessment of Malnutrition in Boys 0 to 2 Years Old
- WHO Assessment of Malnutrition in Boys 2 to 5 years Old
- WHO Assessment of Malnutrition in Girls 0 to 2 Years Old
- WHO Assessment of Malnutrition in Girls 2 to 5 years Old
- Winter's Formula for Expected PCO2
- Z Score to Percentile Estimation
Epocrates Online and Dynamed Plus — MedCalc Clinical Criteria Calculators

The MedCalc 300 Clinical Criteria Calculators include diagnostic, risk, and other decision support calculators based on criteria and numbers. The full list of these follows on the next page.

1. Pick your calculator from list or you can Search by Specialty where they have grouped both medical equations and clinical criteria calculators by specialty.

Examples presented here are the Atrial Fibrillation and Arterial Thromboembolism Risk calculator at right, and the Warfarin Dosing Tree Calculator below.

Exercise for Practice
A 40 year old woman has just had a mastectomy. She had a grade 1 tumor, no lymph nodes and no lymphatic or vascular invasion. What is her Breast Cancer Recurrence risk?
Epocrates Online and Dynamed Plus—MedCalc Clinical Criteria Calculators

Acetaminophen (Paracetamol) Toxicity Assessment
Activity Score for Nursing Home Patients AIDS Progression Estimate While on Anti Viral Rx
Epocrates Online and Dynamed Plus—MedCalc Clinical Criteria Calculators

NIH Stroke Score
Non Q Wave Myocardial Infarction Prediction
Nonbiliary Cirrhosis Prognostic Criteria for One Year Survival
Norton Scale to Stratify Risk of Pressure Sores
Obesity Management Guidelines, National Institutes of Health / NHLBI TreeCalc®
Omeprazole Therapeutic Gain (over placebo) in Dyspepsia
Omeprazole Therapeutic Index in Dyspepsia
Osteoporosis Risk Assessment by Composite Linear Estimate (ORAI score)
Osteoporosis Risk Assessment Index (ORAI)
Osteoporosis Risk SCORE (Simple Calculated Osteoporosis Risk Estimation)
Osteoporosis Self Assessment Tool for Men
Osteoporosis Self Assessment Tool for Women
Oswestry Disability Index Version 1
Oswestry Disability Index Version 2
Ottawa Ankle Rule for the Use of X-Ray in Ankle Injury
Ottawa Foot Rule for the Use of X-Ray in Foot Injury
Ottawa Knee Rule for use of X Ray in Knee Injury
Pacer Need After Heart Valve Surgery
Palliative Prognostic Score in Terminal Illness
Pancreatitis Prognosis Criteria
When Disease Due To Gallstones
Pancreatitis Prognosis Criteria
Panic Disorder Screener
Perioperative Cardiac Evaluation TreeCalc®
Pittsburgh Knee Rule for X-Ray Evaluation of Knee Injury
TreeCalc®
Pneumonia Mortality in Nursing Home Patients by Logistic Regression
Pneumonia Mortality Prediction in Nursing Home Patients (SI Units)
Pneumonia Mortality Prediction in Nursing Home Patients
Pneumonia Mortality Predictor In the Elderly
Pneumonia Probability in Nursing Home Patients
Pneumonia Risk in Post Operative Period of Non-Cardiac Surgery
Polycythemia Vera Diagnostic Criteria
POSSUM Score for Orthopedic Procedure Prognosis (SI Units)
POSSUM Score for Orthopedic Procedure Prognosis
PROCAM Risk Score (Munster Heart Study imperial units)
PROCAM Risk Score (Munster Heart Study)
Prostatism Symptom Score
PTCA Complication Prediction Score (death, MI, urgent bypass)
PTCA Mortality Prediction
Pulmonary Embolism Risk by Pisa Study (with chest x-ray)
Pulmonary Embolism Risk by Pisa Study (without chest x-ray)
Pulmonary Embolism Wells Score Prediction
Pulmonary Fibrosis Survival Prediction (CRP Score for abbreviated model)
Pulmonary Fibrosis Survival Prediction (CRP score for complete model)
Rabies Post Exposure Prophylaxis (PEP) TreeCalc®
Renal Artery Stenosis Prediction Rule
Respiratory Failure Risk in Post Operative Period of Non-Cardiac Surgery
Rheumatoid Arthritis Clinical Disease Activity Index (CDC)
Rheumatoid Arthritis Criteria (1987 revision, American Rheumatism Association)
Rheumatoid Arthritis Disease Activity Score DAS-28
Rheumatoid Arthritis Simplified Disease Activity Index SDAI
Roland-Morris Disability Score
Romhilt-Estes Criteria for Left Ventricular Hypertrophy
Rotator Cuff Tear Diagnosis
SARS (Severe Acute Respiratory Distress Syndrome) CDC Case Definition (4/20/2003) TreeCalc®
SARS Prognosis Predictor (basic parameters)
SARS Prognosis Predictor (with lab and x-ray parameters)
Septic Arthritis Prediction in Pediatric Hip Pain Syndrome
Smallpox Risk Assessment (CDC version 1.0, 2002) TreeCalc®
Smoking Cessation and Intervention TreeCalc®
Solitary Pulmonary Nodule Malignancy Risk
Sore Throat (Pharyngitis) Evaluation and Strep Prediction (Attia)
Sore Throat (Pharyngitis) Evaluation and Treatment Criteria (McIsaac)
Spinal Manipulation Success Prediction for Low Back Pain
Stage III Pressure Ulcer TreeCalc®
Stage IV Pressure Ulcer TreeCalc®
Stress Test Outcome Risk Factors
Stroke Recovery Prediction
Stroke Risk in Diabetes Type 2 UKPDS 60
Stroke Risk in Patients 55-84 Years Old (Framingham data)
Suggested Management of Patients with Raised Lipid Levels TreeCalc®
Syncope Risk Prediction
Systemic Lupus Erythematosus
American Rheumatism Association 11 Criteria
Systolic Murmur Significance Probability
Thrombolysis in Myocardial Infarction (TIMI) Score for ST Elevation Acute Myocardial Infarction
Thrombolysis in Myocardial Infarction (TIMI) Score for Unstable Angina Non ST Elevation Myocardial Infarction
Thyroid Disease Screening for Females More Than 50 Years Old TreeCalc®
TIA Prognosis: Risk of Stroke by 90 Days After Presentation
Tuberculosis Risk Prediction
Unstable Angina and Tirofiban Benefit Prediction
Unstable Angina Outcome Prediction
Unstable Angina Risk Stratification (Piombo)
Unsupported Risk Stratification (Solomon)
Vector and Scalar Electrocardiography
Venous Leg Ulcer Healing Prediction
Warfarin Dosing Nomogram for 10 mg Initiation (Crowther) TreeCalc®
Warfarin Dosing Nomogram for 10 mg Initiation (Kovacs) TreeCalc®
Warfarin Dosing Nomogram for 5 mg Initiation (Crowther) TreeCalc®
Warfarin Dosing TreeCalc®
Warfarin Weekly Dose Estimate in Non-rheumatic A-fib
Waterlow Scale for Stratification of Pressure Sore Risk
On the iPhone and other platforms, Epocrates has included the popular MedMath calculators. There aren’t many calculators in MedMath, which is why we recommend that students download Archimedes or use the calculators in PEPID and Essential Evidence Plus. See the list of calculators in MedMath below.

### Calculators in Epocrates

- A-a O₂ Gradient
- Absolute Neutrophil Count
- Anion Gap (Serum)
- Anion Gap (Urine)
- Basal Energy Expenditure
- Body Mass Index (Quetelet’s index)
- Body Surface Area (Du Bois Method)
- Body Surface Area (Gehan & George)
- Corrected QTc
- Corrected Serum Calcium
- Corrected Serum Phenytoin
- Corrected Serum Sodium
- Creatinine Clearance (Cockcroft-Gault)
- Creatinine Clearance (measured)
- Dosing Calculator
- Fractional Excretion of Sodium
- GFR Estimation using the MDRD Equation (Modification of Diet in Renal Disease Study Group)
- Henderson-Hasselbalch Equation
- Hepatitis Discriminant Function
- Ideal Body Weight
- Kidney Tumor Volume
- LDL Cholesterol
- MELD Score (Mayo/UNOS)
- Mean Arterial Pressure
- Osmolality (serum)
- Parkland Formula
- Peak Flow (predicted)
- Pediatric Maintenance Fluids
- Pregnancy Tool
- Reticulocyte Production Index
- Unit Converter
- Water Deficit

### Exercises for Practice

What is the body mass index and ideal body weight for a 38 year old woman who is 5’2” and weighs 138 lbs? Is she overweight?
Clinical Rules, Decision Trees or Criteria Calculators

These calculators are truly decision support tools in that they influence how a case is managed. Examples might include the Ottawa Ankle Rule calculator below that tells whether an x-ray is necessary for an ankle sprain or a calculator that assigns the NIH Stroke score.

Essential Evidence Plus (EE+) Online and Mobile

The complete EE+ database is available on either the web, desktop or the Mobile versions. EE+ has a large number of calculator like tools which can be incorporated into the decision making process of the clinical encounter. Let’s look at each of these types of tools.

Decision Support Tools (Calculators)

More than 225 calculators designed to help estimate the likelihood of a diagnosis, calculate a patient’s risk for disease, estimate a prognosis, or calculate a drug dose.

Purpose: To support the clinical decision making of a healthcare professional by offering risk and probability assessments.

Example: The clinical decision rules can help evaluate patients with ankle sprains, (Ottawa Ankle Rule at right), estimate the risk of stroke in patients with atrial fibrillation, or assist in determining doses of drugs like warfarin.

Detailed Description: These clinical decision rules are created based on results of valid and relevant studies. Each calculator has a more information button that references the study and outlines its characteristics. Each calculator asks users to provide patient information and leads to a result that is specific for the patient.


Finding the Decision Support Tools

Online, the index of Clinical Rules and Calculators is found under Browse Our Databases and Interactive Tools on the main page. You must then drill down to find the calculator you want by system.

On a mobile device, follow the same link to Decision Support Tools. Click on any category to expand it to show all the calculators in that category.

See a list of the decision support tools (calculators) in EE+ on the next several pages.
### CV: Acute MI/unstable angina
- 6 month ACS mortality (GRACE score)
- ACI-TIPI risk score
- ACS - prob of successful medical tx
- Acute MI diagnosis (Goldman algorithm)
- Intracranial hemorrhage risk w/ thrombolysis
- Invasive vs conservative management
- Mortality in ST elevation AMI
- Probability of normal LVEF
- Prognosis based on initial ECG
- Prognosis in non-ST elevation AMI (TIMI)
- Prognosis in ST elevation AMI (TIMI)
- Risk of death in AMI
- Tirofiban benefit in unstable angina/NQWMI
- Unstable angina prognosis (Piombo)

### CV: Angioplasty
- Angioplasty complication rate (Bates)
- Angioplasty complication rate (CADILLAC)
- Angioplasty complication rate (Kimmel)
- Angioplasty complication rate (Mayo)
- Angioplasty complication rate (Resnic)
- Angioplasty mortality (Michigan score)

### CV: Chest pain and CAD
- Antiplatelet therapy recommendations
- Aortic thoracic artery dissection diagnosis
- CAD mortality risk
- Chest pain diagnosis in primary care (Bosner)
- Chest pain risk stratification (modified TIMI)
- Panic disorder among chest pain patients
- Pretest probability of CAD (Diamond-Forrester)
- Probability of complications requiring ICU care
- Probability of left main CAD
- Probability of significant CAD in outpatients
- Risk of AMI with normal or near-normal ECG
- Stress test interpretation (adenosine SPECT)
- Treadmill interpretation (Duke score)

### CV: DVT and PE
- Bleeding risk on warfarin
- DVT: clinical diagnosis
- PE diagnosis (revised Geneva)
- Pulmonary embolism diagnosis (Geneva)
- Pulmonary embolism diagnosis (Hoelierich)
- Pulmonary embolism diagnosis (Pisa)
- Pulmonary embolism diagnosis (Wells)

### CV: Heart failure
- CHF prognosis (Killip class)
- Framingham criteria for heart failure
- Heart failure diagnosis with proBNP
- Heart failure prognosis for inpatient (Fonarow)
- Heart failure prognosis for inpatient (Lee)

### CV: HTN, lipids, screening
- Hypertension: renal artery stenosis diagnosis
- Screening: cardiac risk profile (Framingham data)
- Screening: NCEP ATP III lipid guideline

### CV: Other
- Atrial fibrillation risk (10 year)
- PAOD diagnosis (Doppler)
- Peripheral vascular disease prognosis
- Return of spontaneous circulation after cardiac arrest (RACA)

### CV: Pre-op evaluation
- AAA surgery mortality risk
- Atrial fibr risk post-op CABG
- CABG risk score
- Implantable cardioverter-defibrillator risk score
- Non-cardiac surgery risk (Detsky score)
- Post-operative pneumonia risk
- Post-operative prognosis (Surgical Ap- gar)
- Pre-op evaluation (ACC/AHA)
- Prognosis after ortho surgery (POSSUM)
- Ruptured AAA repair prognosis (Glasgow)

### CV: Stroke, Aneurism, AVM
- Acute stroke prognosis (6 variable score)
- Acute stroke prognosis (early recovery)
- Acute stroke prognosis (Wang 30 day score)
- Acute stroke prognosis - 30 day (Wang)
- Acute stroke prognosis - 6 mos (G-Score)
- Brain AVM prognosis
- Carotid endarterectomy prognosis
- Cerebral aneurysm rupture risk
- Hemorrhage after thrombolysis for CVA (HAT)
- Intracranial hemorrhage prognosis
- Ischemic vs hemorrhagic stroke (Besson)
- Ischemic vs hemorrhagic stroke (Efstathiou)
- NIH stroke scale
- Stroke diagnosis (Cincinnati Stroke Scale)
- Stroke risk - atrial fibr (Framingham)
- Stroke risk - atrial fibr (SPAF)
- Stroke risk - atrial fibr (vanWalraven)
- Stroke risk - diabetics (UKPDS)
- Stroke risk - next 5 yrs in elderly
- Stroke risk after TIA (ABCD rule)
- Stroke risk in atrial fibr (CHADS-VASC)
- Stroke risk with TIA (ABCD2)
- TIA prognosis

### CV: Valve and endocarditis
- AV replacement in aortic stenosis
- Endocarditis prognosis
- Left atrial thrombi disappearance after commissurotomy
- PACing need after valve surgery

### Drug dosing
- ACE inhibitor cough risk
Adverse drug reaction risk in hospitalized elderly (GerontoNet Score)
Hydrocephalus in patients with acute kidney injury
Lithium dosing

**Endocrinology**
Bariatric surgery risk score
Basal energy requirements
BMI and body surface area calculator
Diabetes mellitus screening
Diabetes risk score
Diabetes risk score (Bang)
Diabetic foot ulcer risk
Hypercalcemia: probability of malignancy
Ideal body weight (adults)
Michigan Neuropathy Screening Instrument
Precocious puberty: need for brain imaging

**Epidemiology**
Diagnostic test calculator (LR and post-test probability)
Treatment calculator (NNT, RRR, and ARR)

**Fluids/electrolytes**
Anion gap
Pediatric IV fluid calculator
Serum osmolality calculator

**Gastroenterology: GERD/dyspepsia**
Dyspepsia: predicting response to omeprazole
Dyspepsia: probability of ulcer
GERD diagnosis (Manterola)
GERD diagnosis (Zimmerman)
GERD: Barretts' prognosis

**Gastroenterology: GI Bleed**
GI bleed (lower): prognosis
GI bleed (upper): predicting need for intervention
GI bleed (upper): probability of persistent bleeding after injection
GI bleed: identification of low risk GI bleeds
GI bleed: inpatient mortality risk

**Gastroenterology: Hepatic**
Abnormal liver function work-up
Bleeding risk after hepatic resection
Cirrhosis: probability of varices
End stage liver disease prognosis
Fibrosis (severe) in NASH
Fibrosis probability (FIB4 index)
Hepatitis C: probability of cirrhosis
Hepatitis C: probability of fibrosis
Hepatitis C: prognosis
NASH in obese patients (HAIR score)
Probability of severe fibrosis in hepatitis C

**Gastroenterology: Lower GI**
Chronic constipation diagnosis
Diarrhea: need for cultures in nosocomial diarrhea
Mortality following colorectal surgery
Rome I Criteria for irritable bowel
Small bowel obstruction: need for surgery

**Gastroenterology: Other**
Abdominal pain diagnosis (men)
Appendicitis diagnosis (Alvarado score)
Appendicitis diagnosis (Ohmann)
Dehydration diagnosis (Gorelick)
Post-op nausea and vomiting

**Gastroenterology: Pancreas**
Acute pancreatitis: prognosis (IMPI score)
Acute pancreatitis: prognosis (Ranson score)
Pancreatitis prognosis (BALI model)

**Gynecology and obstetrics**
Apgar score
Cephalic version success
Diagnosis of polycystic ovarian syndrome
Edinburgh Postpartum Depression Scale (EPDS)
Induction of labor: Bishop score
Induction of labor: Dhall score
Pregnancy wheel
Probability of gestational diabetes
Probability of successful VBAC
Risk of ectopic pregnancy with 1st trimester pain or bleeding
Risk of malignancy index for ovarian cancer
Successful VBAC at 40-42 weeks
Urinary incontinence diagnosis

**Hematology/Anticoagulation**
Bleeding risk (HAS-BLED score)
Bleeding risk (HEMORRHAGES)
Bleeding risk in elderly on warfarin at 90 days
Bleeding risk on warfarin
Bleeding risk on warfarin at 3 and 12 mos (OBRI)
Hemorrhage on warfarin in AF (ATRIA score)
Heparin dosing by weight
Risk of bleeding with warfarin treatment for DVT
Warfarin dose (elderly)
Warfarin dosing: adjustment
Warfarin dosing: initial
Warfarin initial dose (10 mg protocol)

**Infectious disease**
AIDS progression likelihood
Bacteremia risk (age 3 to 36 months)
Chagas Heart disease prognosis
Influenza diagnosis (adults)
Leprosy: predicting nerve function impairment
Lyme meningitis diagnosis (Rule of 7’s)
Meningitis diagnosis children (Bacterial Meningitis Score)
Need for LP in children with meningeval signs
New head CT lesions in HIV patients
Orbital abscess in patients with periorbital infection
Rochester criteria - pediatric fever
Prognosis in nosocomial infection
SARS diagnosis
Sepsis treatment (goal-directed therapy)
TB isolation decision-making (Wisnivesky)

**Musculoskeletal: Diagnostic criteria**
Ankylosing spondylitis diagnosis
Ankylosing spondylitis diagnosis (Gran)
Rheumatoid arthritis diagnostic criteria
SLE diagnostic criteria

**Musculoskeletal: Need for imaging**
Ankle injury: x-ray needed (Ottawa)
C-spine radiography (NEXUS)
C-spine radiography rule (Canadian)
Foot injury: x-ray needed (Ottawa)
Head CT after minor head injury (Canadian)
Head CT after minor head injury (New Orleans)
Knee injury: x-ray needed (Ottawa)
TBI in children < 2 years: need for CT
TBI in children 2+ years: need for CT

**Musculoskeletal: Osteoporosis**
Fracture risk with steroid treatment
Hip fracture risk in women (FRACTURE)
Hip fracture risk in women (FRAMO)
Osteoporosis risk (men)
Osteoporosis screening (Dutch instrument)
Osteoporosis screening (NOF)
Osteoporosis screening (ORAI)
Osteoporosis screening (OST)
Osteoporosis screening (SCORE)

**Musculoskeletal: Other**
Back pain evaluation guideline
Benefit from spinal manipulation
Carpal tunnel: success of medical tx
Familial Mediterranean fever diagnosis
Fibromyalgia screening
Gout diagnosis
Knee surgery referral guide
Neck pain prognosis at 6 months
Netherlands rheumatoid arthritis score
PMR disease activity score
Rotator cuff diagnosis
Septic arthritis diagnosis
TMJ disorders diagnosis

**Neurology**
30 day syncope prognosis (San Francisco Rule)
Cognitive impairment screening (6 item screener)
Cognitive impairment screening (AD8)
Delirium probability in elderly inpatient
Delirium probability at discharge
Dementia screening (Time and Change test)
Driving competency screen for elderly (Clock test)
Glasgow Coma Score
Headache diagnosis in children
Intracerebral hemorrhage with IV alteplase (SITS)
Meningitis diagnosis children (Bacterial Meningitis Score)
Meningitis diagnosis children (Bacterial Meningitis Score)
Mental status screen (GOAL score)
Migraine screener
Mini-Cog
Need for mechanical ventilation in Guillain-Barre
Nontraumatic coma prognosis
Pediatric head injury prognosis
Probability of bad outcome in syncope
Status epilepticus prognosis
Essential Evidence Plus Clinical Rules and Calculators

Oncology: Other
Overian cancer dx: M and B rules
Probability of cancer with unwanted weight loss

Oncology: Prognosis
Bladder cancer prognosis
Chronic lymphocytic leukemia prognosis
Colon cancer hepatic metastasis
Febrile neutrophilia in CA risk score
Gastric cancer prognosis
Melanoma 10 year prognosis
Melanoma 2 and 5 year prognosis
Non-small cell lung cancer
Pancreatic neuroendocrine tumor prognosis
Post-op mortality for CRC surgery in elderly
Probability that prostate CA is indolent
Prostate CA: prognosis for abl dis post-op PSA
Prostate cancer (d’Amici)
Prostate cancer (UCSF-CAPRA)
Prostate cancer - predicting histologically aggressive tumors
Renal cell CA prognosis (metastatic)
Spinal metastases
Spinal metastasis prognosis
Terminal lung cancer
Thyroid cancer 5 year

Oncology: Risk
Breast cancer (Gail model)
Esophageal cancer risk with dysphagia
Hepatic metastases from CRC prognosis
Lung cancer
Ovarian cancer risk (Harvard)
Ovarian cancer risk (SEER)
Pancreatic cancer
Proximal colon cancer
Pulmonary nodule (PET + Swensen rule)
Pulmonary nodule (Swensen rule)

Overall mortality and screening
1 year mortality after discharge in elderly
10 year mortality for various conditions
4 year mortality in older adults
ACLS termination criteria
APACHE 2 score
BLS termination criteria
Charlson Comorbidity Index
Cooper Clinic Risk Index (15 yr mortality)
CPR prognosis (inpatient)
Exercise capacity by age
Height estimation from knee/heel measure
Hospital d/c prognosis for elderly
In-hospital mortality of elderly patients (MEWS)
Individualized screening guidelines (USPSTF)
Out-of-hospital CPR prognosis
Prognosis: Palliative Prognosis Score
Sepsis mortality risk

Perinatal and infant
Bilirubin prediction based on initial level
Difficult IV access in children (DIVA score)
Neonatal jaundice guideline (AAP)
Prognosis with LBW (500-999 gms)
Respiratory prognosis NICU

(Richardson)
Serious bacterial infection risk
Severe bacterial infection 1 wk to 3 yrs (Lab Score)

Psychiatric and substance abuse
Adolescent substance abuse (CRAFFT)
Adult ADHD screener (WHO ASRS)
Alcohol withdrawal management
Alcoholic hepatitis prognosis
Alcoholic hepatitis prognosis (Glasgow)
AUDIT-C (alcohol use disorder screen)
Bipolar disorder (Mood Disorder Questionnaire)
CAGE score (alcoholism screening)
Depression screening
Depression screening (PHQ-2)
Depression screening in elderly
Eating disorder likelihood
Generalized anxiety disorder diagnosis (GAD-2)
Generalized anxiety disorder diagnosis (GAD-7)
Panic disorder (single question)
Panic disorder (three question)
Perinatal depression
Risk of repeated self-harm or suicide
Social anxiety disorder diagnosis (Mini-SPIN)
Suicidal ideation risk
Which high users are somatizers

Renal disease
Acute renal failure diagnosis (FE-Na)
BPH symptom index (AUA)
Chronic kidney disease screening test
Creatinine clearance (MDRD 4 variable)
Creatinine clearance (MDRD 6 variable)
Creatinine clearance calculator
Dialysis prognosis
GFR estimation (quadratic equation)
Nephropathy risk with PCI
Probability of dialysis post-operatively
Renal lithiasis diagnosis (Elton)
Renal lithiasis diagnosis (Eskelinen)
UTI diagnosis
UTI diagnosis (Leibovici)
UTI diagnosis (McIsaac)
UTI diagnosis girls < 2 years

Respiratory disease: Asthma and COPD
Asthma relapse in adults
COPD diagnosis
COPD prognosis (BODE index)
Peak flow - normal values
Peds asthma - hospitalization risk

Respiratory disease: Bronchiolitis and croup
Bronchiolitis: need for hospitalization
Croup score (Syracuse)
RSV prognosis (pediatric)

Respiratory disease: Other
A-a gradient
ABG interpretation
Acute lung injury vs pulmonary edema diagnosis
Bacteremia risk in older patients with CAP
Hypersensitivity pneumonitis diagnosis
Inhalation anthrax diagnosis
Pleural effusion (Light’s criteria)
Post-op likelihood of pneumonia
Post-op need for mechanical ventilation
Pulmonary fibrosis survival
Sleep apnea diagnosis
TB isolation decision-making (El-Solh)

Respiratory disease: Pneumonia
Diagnosis of pneumonia (Dihr)
Diagnosis of pneumonia (Heckerling)
Diagnosis of pneumonia (nursing home)
Diagnosis of pneumonia (Singal)
Hospitalization or death due to flu or pneumonia
Mycoplasma in children with pneumonia
Pneumonia in wheezing children
Pneumonia prognosis (CURB-65)
Pneumonia prognosis (Pneumonia Severity Index)
Pneumonia prognosis: mortality in elderly
Pneumonia prognosis: nursing home
Severe pneumonia probability (Spanish)

Respiratory disease: Upper respiratory disease
Sinusits diagnosis (Berg)
Sinusits diagnosis (Williams)
Strep diagnosis in sore throat
Strep score (pediatric)

Respiratory disease: Vent weaning
CROP index
Rapid Shallow Breathing score
Ventilation index

Skin disease
Necrotizing fascitis diagnosis
Predicting pressure ulcer development with Braden Score
Venous leg ulcer healing

Surgery and trauma
Bowel obstruction diagnosis: need for x-ray
Burn injury prognosis
Burn injury prognosis (Belgian)
Clinically important brain injury 2-18 yrs (PECARN)
Common bile duct stone risk
Fall risk in assisted living
Fall risk in elderly
Hip fracture length of stay in NH
Hip fracture prognosis
Intimate partner violence screening (combined protocol)
Lap chole: probability of conversion
Need for massive transfusion in trauma
Pediatric appendicitis score
Peritonitis prognosis (Mannheim)
Prognosis in near drowning
Severe head injury prognosis
Spinal cord injury prognosis
Traumatic brain injury prognosis
(Marshall CT score)
Traumatic wound infection risk
Diagnostic Test Calculators

Calculators of the clinical performance of a diagnostic test

**Purpose:** To help clinicians choose the best diagnostic test and interpret the test results

**Example:** The calculator answers questions such as: What is the best test to rule out renal artery stenosis? (below) What is the likelihood of Trichomonal infection in women with Trichomonas on pap smear? What is the 10-year mortality risk for a patient who smokes and has hypertension?

**Detailed Description:** The tool offers test characteristics and an estimate of the probability of disease before doing the test. The calculator also outlines the probability of the disease based upon the results of test. Users can choose from one of several tests based on what is available and whether they are interested in ruling-in or ruling-out a disease. Additionally, users can change the probability of disease based upon a clinical decision rule or gestalt. This allows users to tailor test result interpretations to the clinical circumstances.

### Essential Evidence Plus Clinical Rules and Calculators

#### Hypertension: renal artery stenosis probability calculator

**Definitions:**

- **Pretest:** Best estimate of percent with disease before any testing or probability based on calculation
- **Sensitivity:** Percent with disease who have a positive test
- **Specificity:** Percent without disease who have a negative test
- **LR:** Likelihood ratio for each level of test. The higher it is, the better it rules-in disease. The lower it is, the better it rules it out.
- **LR+:** Positive likelihood ratio (how well a positive test rules-in disease)
- **LR-:** Negative likelihood ratio (how well a negative test rules-out disease)
- **LR = 1:** No change in disease likelihood
- **Prob:** Probability of disease for patients with this test result

Determine the likelihood of a patient having a disease based on the results of a diagnostic test.

**Symptom:** Hypertension
**Disease:** renal artery stenosis
**Diagnostic Tests:** (sorted by LR+)

**LR+**

- **8.0 - CT angiography**
- **8.0 - Ultrasonography**

**LR-**

- **0.4**

**Pre-test Probability (%)**

- **10**

**LR = 1**

**Prob**

**More Info**

Determine the likelihood of a patient having a disease based on the results of a diagnostic test.

**Symptom:** Hypertension
**Disease:** renal artery stenosis
**Diagnostic Tests:** (sorted by LR+)

**LR+**

- **8.0 - CT angiography**

**LR-**

- **0.4**

**Pre-test Probability (%)**

- **24**

**LR = 1**

**Prob**

**More Info**

Go to **Diagnostic Test Calculators**, then find **Cardiovascular**, then **Hypertension > Renal Artery**
Physical exam determining chest expansion of less than 2.5 cm is shown to be a 94% positive likelihood of ankylosing spondylitis based on 39% pretest probability calculated based on history. Drop down the list to see other findings and compare their positive predictive value.

Using the 94% likelihood based on the low chest expansion, you can then use the diagnostic test calculator to select the best test to order to confirm your diagnosis. With a 94% pretest probability, x-ray has a positive predictive value of 94.5%, meaning that if the x-ray is positive, there is a 99.6 chance that the patient has ankylosing spondylitis.
Exercises for Practice

Essential Evidence Plus Clinical Rules and Calculators, Diagnostic test Calculators and History and Physical Exam Calculator

A 24 year old female comes to her doctor because one leg seems to be swollen while the other is not. She says that she has been in bed for several days with the flu, but otherwise has no other pertinent history. The doctor examines the patient and finds that she has pitting edema in the swollen leg, and the circumference of the calf is 4 cm larger than the unaffected leg.

IR Decision Support Calculators
A) Using a clinical decision rule, estimate the probability of DVT in her patient (Level 1a evidence). The DVT decision support calculator should give her clinical guidance depending on the outcome of the ultrasound and d-dimer, if indicated.

IR Diagnostic Test Calculator
B) If she desires more information on the accuracy of the ultrasound on this particular patient. Using the diagnostic test calculator for "DVT suspected (symptomatic) → DVT (all) (diagnostic test)" based on the pretest probability calculated above, determines the likelihood of DVT if the venous ultrasound is either positive or negative. Compare to d-dimer.

IR Diagnostic Test Calculator
C) Based on history and physical exam you suspect that a 25 year old man with positive hematuria has about a 50% chance of having kidney stones. (renal lithiasis) Using the Diagnostic test calculator, with a 50% pretest likelihood of stones, what is the better test to order, an IVP or a helical CT?
PEPID Calculators (Both Medical Calculators and Decision Support)

PEPID provides a comparable number and variety of calculators and decision support tools to Epocrates Online’s MedCalc 3000. Unlike Epocrates, the tools are available in PEPID online and on the mobile device. The calculator icon on the navigation toolbar will take you to the calculator alphabetical like on the web. Calculators appear individually in the PEPID index. There is also a link to the calculator index in the Table of Contents. The fastest way to find a calculator is to search for it in the Search box.

The calculators appear in the far left column on the Online version. Links are embedded into content in the right column. Below is the IADL content in the Geriatrics section of the resource. Note the (Open Calc) by the title. Click this to bring up the interactive calculator in the left column.

Included with each calculator is a description of the tool, with instructions for scoring and interpreting the calculation.
PEPID Calculators on the Mobile device

PEPID calculators on the Mobile device are accessed the same way as on the web, however, you are limited to one screen instead of three columns.

You can use the Table of Contents to look at calculators classified into categories.

You can also click on the calculator icon on the navigation bar to jump to the alphabetical listing of all calculators.

Below is the same IADL calculator as shown on the web version on the previous page.

Click the little calculator icon to open the tool which will score your results.

Images are from the iPhone version of PEPID.
I. ANATOMIC

A. NEUROVASCULAR EQUATIONS
   Cerebral Perfusion Pressure
   See also NEUROLOGIC SCORES

B. EYES, EARS, NOSE AND THROAT EQUATIONS
   Graves' Ophthalmopathy Clinical Activity Score
   Centor Criteria Score (Modified)

C. CARDIOVASCULAR EQUATIONS
   WORK INDEX
      Cardiac Work Index
      Left
      Right
      Ventricular Stroke Work Index
      Left
      Right
   VASCULAR RESISTANCE
      Pulmo Vasc Resistance
      Pulmo Vasc Resistance Index
      Systemic Vasc Resistance
      Systemic Vasc Resistance Index

   PRESSURES
      Coronary Perfusion Pressure
      Mean Arterial Pressure
      Mean Pulmo Arterial Pressure
      Pulse Pressure / Product

   OTHER
      Cardiac Index
      Cardiac Output:
         Fick Equation
         Physiologic
      Coronary Heart Disease Risk Factor Score (Female)
      Coronary Heart Disease Predictor Score (Male)
      Duke Treadmill Score
      Ejection Fraction
      H.E.A.R.T. Score
      Qs(Qt) (Shunt, Fraction)
      QT Interval Correction
      Stroke Volume
      Stroke Volume Index

D. INFECTION
   MEDS Score

E. RESPIRATORY EQUATIONS
   Asthma Severity Score
   Asthma Control Score (Adults)
   Asthma Score (Peds 4 - 11 yo)
   Capacities & Ventilations
   Centor Criteria Score (Modified)
   Oxygen Calculations
   PERC Score
   Westley Croup Score
   C.U.R.B. 65 Score
   C.A.T. Score

F. GASTROINTESTINAL
   Alvarado Acute Appendicitis Score
   BISAP Score
   Rockall GI bleeding Score
   Glasgow-Blatchford Upper GI Bleeding Score
   Glasgow Pancreatitis Prognostic Criteria
   Balthazar Pancreatitis CT Severity

H. CAPACITIES & VENTILATIONS
   Alveolar Ventilation
   Bohr Equation
   Dead Space
   Enghoff Equation
   Lung Volumes
   Minute Ventilation
   Respiratory Exchange Ratio
   Tidal Volume

I. OXYGEN CALCULATIONS
   A-a Gradient
   Arterial-Venous O2 Content Diff.
   O2 Capacity
   O2 Consumption
   O2 Consumption Index
   O2 Content
   Arterial
   Capillary
   Mixed Venous
   O2 Delivery
   O2 Delivery Index
   O2 Extraction Rate
   O2 Tension
   Alveolar
   Inspired

G. OTHER
   Barometric Pressure
   ABG
   Carbon Dioxide Production
   Disease Activity Scale
   Dynamic Compliance
   Heparin Dosing Weight - Based
   Static Compliance
   Peak Flow

II. RENAL & ELECTROLYTE EQUATIONS
   A. RENAL FUNCTIONS
      Body Water Losses
      Urinary
      Fecal
      Insensate
      Water Losses in Hypernatremia
      Creatinine Clearance / For ED
      Fractional Excretion
      Potassium
      Sodium
      Glomerular Filtration Rate
      Bjornsson
      Cockcroft
      Counahan-Barratt
      Gates
      Hull
      Jelliffe
      Mawer
      MDRD
      Schwartz
      Shull
      Traub
      Zhazali-Barratt
      Filtration Fraction
      Nitrogen
      Balance
      Urine Loss
      Potassium
      Urine, Corrected
      Transtubular
B. ELECTROLYTES
Anion Gap
Bicarbonate Deficit
Calcium
  Corrected
  Protein-Bound
Osmolality, Calculated
Osmolar Gap
Potassium: Total Body
Sodium
  Corrected
  Deficit
Hypernatremia Management
Water Losses in Hypernatremia

C. ACID BASE
ABG Analysis
Respiratory Acidosis
  Compensation
  Acute
  Chronic
Winter's Formula
Respiratory Alkalosis
  Compensation
  Acute
  Chronic
PCO2 Compensation Expected
Metabolic Acidosis
Metabolic Alkalosis
Henderson-Hasselbalch Equation
Hydrogen Concentration (Kassirer-Bleich Equation)

D. OTHER
AST/ ALT Ratio
Blood Alcohol Level
  Calculated
  Predicted
  Mass of Pure Ethanol Consumed
Colloid-Oncotic Pressure
HIV Drug Adjustments
Iron Deficit
Low Density Lipoprotein, Cholesterol
Phenytoin Corrected

III. METABOLIC EQUATIONS
A. FLUID COMPARTMENTS
Body Fluid Compartments
Body Water Deficit
Free Water Deficit
Total Body Solutes

B. WEIGHT & MASSES
Body Weight
  Adjusted
  Ideal
  Ideal (Hamwi Method)
Lean Body Weight
Body Mass
  Body Mass Index (BMI)
  Adult
  Pediatric
Lean Body Mass
Body Surface Area
  DuBois & DuBois
  Gehan & George
  Mosteller

C. ENERGY
Energy Expenditure
  Basal
  Total
Caloric Requirements
  Non-Protein
  Protein
Basal Metabolic Rate
ABG Analysis
Glucose / HbA1C Converter

IV. HEMATOLOGIC EQUATIONS
Absolute Neutrophil Count
Blood Volume
  Factor VIII Dosage
  Factor IX Dosage
Mean Corpuscular
  Hemoglobin
  Hemoglobin Concentration
Volume
Reticulocyte
  Percent
  Corrected
Absolute Count
Albumin
  Serum-Ascites Albumin Gradient
  Glycosylated Hemoglobin
HbA1C to Glucose

V. PEDIATRIC EQUATIONS
APGAR
Alvarado Acute Appendicitis Score
Asthma Severity Score
Croup Score
Glasgow Coma Scale
Maintenance Fluids
Peak Flows
Pediatric Risk Indicator
Pediatric Trauma Score
Peds & Adolescent BMI Percentiles
Rochester Criteria
Strep Pharyngitis Probability
Systolic Blood Pressure
Water Losses
Yale Observation Scale

VI. CONVERSION EQUATIONS
Weight
Distance
Volume
Temperature
Pressure
SI Units Conversion
Glucocorticoid Converter
Narcotic Equianalgesic Dosing
Phenytoin Corrected

VII. SCORES
A. Global Assessment Scores
Activities of Daily Living (ADLs)
  Barthel Index of ADLs
  Katz Index of ADLs
Lawton Physical-Self Maintenance Scale
Instrumental Activities of Daily Living (IADLs)
Drug/ Alcohol use
  Alcohol Use Disorders Identification Test (AUDIT)
  AUDIT-C
  Brief Michigan Alcoholism Test
  CAGE Questionnaire
Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar)
CRAFFT Questionnaire
Maddrey Discriminant Function
Opioid Risk Tool
PEPID Calculators ...continued

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Other Calculators

The availability of calculators exceeds the need. Most of the resources mentioned previously attempt to address the calculator needs of all specialties. As mentioned, many resources license and provide standard calculators created by MedCalc 3000. Others, like Essential Evidence Plus and PEPID, create their own. Skyscape includes Archimedes calculators with their Medical Library app. Some curate select calculators and provide links to those tools like Pediatric Care Online, listed below.

There is one free app that is worth mentioning. QxMD Calculate creates a nice set of 150 calculators in their free app. Their calculators are very easy to use.
Pediatric Care Online

Pediatric Care Online, a product of The American Academy of Pediatrics (AAP), integrates many different pediatric decision support resources for quick access both online and on the mobile device. The web site has many more resources than the mobile device version.

- Point-of-Care Quick Reference – Over 240 select topics taken from the AAP Textbook of Pediatric Care outlined for quick retrieval of information
- The new AAP Textbook of Pediatric Care – Over 3000 pages of detailed information and recommendations
- Bright Futures – Comprehensive health supervision guidelines to help make the most of well-child visits
- Red Book Content – Detailed information from the AAP Red Book on over 200 childhood infectious diseases
- Interactive Periodicity Schedule – Interactive chart providing preventive screening and recommended actions for each well-child visit
- Clinical Calculators—calibrated for pediatrics, such as BMI
- Signs & Symptoms Search – Quickly suggests diagnoses based on selected signs and symptoms
- Patient Handouts - Hundreds of patient handouts with easy to read explanations for many conditions and procedures
- Forms & Tools - Hundreds of resources to help screen, track, and record clinical information
- Algorithms — Decision support for a number of pediatric conditions. See sample next page

Look under Tools for decision support tools.
The Interactive Periodicity Tables are extremely useful for identifying items included in well child care at each age. This tool is on the Mobile device as well as

This sample algorithm from the web site maps the decision tree of a pediatric patient with Otitis Media. These flow charts are huge and can be printed out and put on the wall in an exam room.
There are three handy resources that provide information about diagnostic testing: Access Medicine online and mobile, PEPID Online and mobile, and the Lab tab in Epocrates Essentials on the Mobile device. These are similar in that they include information on each test to include a basic description, reference range, how to interpret the test, prep and collection methods, and the cost of the test.

**Access Medicine’s Dx Test**

Featuring the content of *Pocket Guide to Diagnostic Tests*, 6th ed., by Diana Nicoll, Stephen J. McPhee, Michael Pignone, and Chuanyi Mark Lu, this resource has the largest number and type of diagnostic test provided. It includes imaging tests, microbiology cultures, as well as diagnostic algorithms.
PEPID Lab Manual

PEPID contains an excellent lab manual both online and on the Mobile device. Use the Lab icon or table of contents to go to the Lab Manual Index and find the test.

iPhone version of Creatinine
Epocrates Essentials Lab Tab

Epocrates Lab provides only laboratory test information, but they include Panels, which the students, unfamiliar with what is on a specific panel, find very useful. You can look up a test by name or look up the panel and pick tests from the list of tests on the panel. Included in the content on each test under Basics is a list of panels in which this test is normally included. Cost information is very specific including the cost of both the individual test and the various panels it is in. The ICD-9 codes for those diseases for which most payers will cover the lab test are provided under the Cost/Billing section.

You can also Browse the Lab by Panel Types to see the labs in each panel.

Exercise for Practice

A basic metabolic panel reveals that a 30 year old man suffering from bipolar disorder has a serum calcium level of 10.9 mg/dL. He is taking lithium and valproate. Could his medications be a factor?

Search or browse specimen type or panels

Interpretation is linked to the Rx drug monographs and Dx disease reference sections of Essentials Click on the > symbol to bring up a page containing interpretation for that Dx. Use button at top to go Back.

Under Cost/Billing are Commonly Associated ICD-9 codes to help in coding for ordering the labs.