

# Algorithmic Diagnosis of Symptoms and Signs

A Cost-Effective Approach

Fourth  
Edition

**R. Douglas Collins**



Wolters Kluwer

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Edition

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## PREFACE TO THE FOURTH EDITION

When asked to do a fourth edition of this text, I was faced with the question of how to make it even more useful than the third edition.

I believe we have accomplished this by the following additions:

1. Getting the most out of your history and physical examination. Here we added many pearls of wisdom regarding the examination of patients with the most common complaints plus tips to improve your bedside manner.
2. Additional algorithms of symptoms and laboratory tests.
3. Algorithms of diseases that are symptoms of other diseases.
4. Differential diagnostic tables of the most common symptoms encountered in your daily practice of medicine.

Finally, as in any new edition, I have brought all aspects of the text up to date. A word of advice regarding a cost-effective approach: in today's world of the high cost of medical diagnostic procedure, you should order a test only if you believe the results will affect your management of the patient.

I thank my wife Norie for assisting in the preparation of this edition as well as my editors, Rebecca Gaertner and Kristina Oberle, and the staff at Wolters Kluwer for their patience, kindness, and diligence in the production of this work.

R. Douglas Collins, MD, FACP



## PREFACE TO THE FIRST EDITION

The average textbook of medicine is not very useful to the busy practicing physician because all of the information in these texts is catalogued according to specific diseases. Until the physician has a diagnosis, he or she cannot look up diagnostic tests or treatment that would address the patient's problem.

This book applies algorithms to the clinical diagnosis of symptoms and signs. It is aimed at organizing the approach to diagnosis and reducing the cost of a diagnostic workup. To facilitate this procedure, the symptoms and signs are arranged alphabetically. Under a certain symptom or sign, the physician will find not just a list of diseases, but the diseases arranged in an algorithm. At a glance he or she will be able to find what other historical and clinical data is needed, to pin down the diagnosis. Then in the accompanying text, the physician will find the tests to order for a diagnostic workup.

A highlight of this book is a discussion on when to refer to the appropriate specialist. Once a specific diagnosis has been established, the clinician can move on to treatment. I have written this book to provide primary care physicians and specialists with a useful tool in the rapid diagnosis of symptoms and signs that they can use in their offices, in the emergency room, or in the hospital wards.

R. Douglas Collins, MD, FACP



## INTRODUCTION

### HOW TO USE THESE ALGORITHMS

The algorithms presented in these pages are, at the very least, a list of the most common disorders that may cause a given symptom or sign. As such, however, they are not all inclusive. Rare or unusual conditions are excluded; the reader is referred to other treatises of differential diagnosis, such as *French's Index of Differential Diagnosis*, edited by I.A.D. Bouchier, H. Ellis, and P.R. Fleming, and *Handbook of Difficult Diagnosis*, edited by A.A. Louis, for a more complete list of diagnostic possibilities.

The list of diagnostic possibilities is broken down by the presence or absence of additional symptoms and signs. The reader should be aware that any specific patient may not present with an additional symptom necessary for this analysis, and, therefore, the entire list of possibilities must still be entertained. Alternatively, the patient may present with the additional symptom but still have one of the other disorders on the diagnostic tree; therefore, at all times, the clinician should maintain an index of suspicion that the patient could have any one of the disorders listed on the page and not exclude any of the possibilities completely until a positive laboratory, x-ray, or tissue diagnosis is ready. For example:

A 47-year-old white female reported progressive numbness and tingling and weakness of the lower extremities. Examination showed loss of vibratory and position sense in the lower extremities and positive Babinski's sign. A tentative diagnosis of pernicious anemia was made. However, tests for serum B<sub>12</sub> and folic acid were normal. Magnetic resonance imaging (MRI) of the thoracic spine showed a neurofibroma at the T6-7 level.

From this example, one can see that had the clinician not kept an open mind about the entire list of diagnostic possibilities, he or she would not have ordered an MRI of the thoracic spine and would have missed the diagnosis.

Finally, the text accompanying each algorithm contains valuable information on how to approach the patient with each presenting symptom and sign and how to proceed with the diagnostic workup. For example:

A 35-year-old white female presents to the emergency room with acute abdominal pain and diffuse tenderness and rebound.



The text on acute abdominal pain shows that the routine diagnostic tests are a flat and upright plate of the abdomen, a complete blood cell count, urinalysis, amylase, and chemistry panel. Most clinicians would remember to order these tests without referring to this handbook. However, some clinicians might forget to order a chest x-ray or electrocardiogram and pregnancy test. Furthermore, there are additional tests to order in case the routine tests are unrevealing. The clinician is reminded to order x-ray contrast studies and ultrasound of the gallbladder and pelvis, and he or she is reminded to do a peritoneal tap to diagnose a ruptured ectopic pregnancy.

Most of the time, this little handbook will not present anything new to the experienced diagnostician. However, the materials presented here will jog the memory and help the diagnostician proceed with a thorough workup.



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# Part 1

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## Getting the Most out of Your History and Physical Examination



## GETTING THE MOST OUT OF YOUR HISTORY AND PHYSICAL EXAMINATION

The main body of this chapter has been designed to get the most out of your history and physical examination in the shortest period of time. If you are like most busy primary care clinicians you are seeing 25 to 40 or more patients in a day. Not long ago, I was covering an Urgent Care practice in Palm Desert California and saw 37 patients in one 8-hour day. In this section, we will address the techniques of performing a history and physical examination like you have never witnessed before.

In medical school, you learned to methodically take your patients' history beginning with the development of the chief complaint, following that with the review of system and medical, family, and social history. Then after having the patient undress and properly draped and placed on the exam table, you perform your physical examination methodically from head to toe, gathering all the necessary information you need to make a diagnosis.

Thereafter, you sit down and add up the positive findings and develop a list of possible diagnoses that could explain the patient's chief complaints and proceed with your workup or treatment plan. This whole process could take an hour or more and in my opinion is putting the cart before the horse! How can you see 25 to 40 patients in an 8-hour day with this methodology?

Here is a cost-effective approach that will save you time and the patient money! But before we discuss this approach, I want to discuss something which you have probably never had a formal discussion about in your training or read in any medical text book. That is *bedside manner*.

First, make sure you are properly dressed. Street clothes or jeans should be replaced by an appropriate clean uniform, a shirt and tie or at least covered with a lab coat. Make sure you don't have bad breath or a bad body odor. I keep a bottle of Benaca spray and an aftershave lotion handy at all times, so I can freshen up when needed.

Greet the patient with a warm smile and an energetic "Hello!" Introduce yourself properly if it's the first time you have seen them. Never act like you're in a hurry! The patient wants to know you care about him/her, so you must do everything you can to convince him/her that you do! Not just about his/her illness, but about him/her as a person. The patient needs to feel that he/she is the only patient you've got! To



accomplish this, sit down and address his/her problem eye ball to eye ball, if possible. This is why I like to have two chairs at least in the examination room. Standing over a patient who is sitting or lying down on the exam table while you are doing your interview is a no–no in my opinion!

When you are talking to the patient maintaining as continuous eye contact as possible is axiomatic. Spending all your time looking at the computer or your notes conveys the impression that you care more about your records than them.

Do all you can to convey your compassion about their illness! A warm “I’m so sorry you’ve had to suffer” at the right time is a God-send to the patient and an integral part of therapy. Perhaps you’re the first person they’ve encountered who cares or even believes they are suffering.

Again, your *examination* of the patient needs to be slow, deliberate, and gentle. Explain what you are doing and when possible convey the results of the examination of each part. When you’re done with the history and physical examination, tell them what you believe is wrong and what you’re going to do about it.

Besides writing a prescription, write down a list of instructions they need to do themselves if appropriate. If you simply give them verbal orders, they may forget! For the most common disorders I encounter in my practice, I have typed copies of instructions that I give to the patient and explain each thing on the list I want them to do.

Now, to the techniques of a *rapid history and physical* examination. Before you begin asking questions or examining the patient, formulate a list of possible diagnoses in your mind based on the chief complaint. Then you will ask questions to rule in or rule out each possibility! With this technique, your history and physical examination will be more meaningful and enjoyable rather than the “robotic” method you learned in medical school.

I use the mnemonic *MINT* (M—malformation, I—inflammation, N—neoplasm, T—trauma) to formulate a list of possibilities in many cases, but you can use any mnemonic that suits you. Another way to form a list of possibilities is to visualize the anatomy of the area where the chief complaint is located. For example, if the patient is complaining of chest pain, you would visualize skin (abscess, herpes zoster, etc.), ribs (fracture, costochondritis, etc.), pleura (pleurisy), pericardium (pericarditis), heart and blood vessels (myocardial infarction, coronary insufficiency, dissecting aneurysm, etc.), lungs (pneumonia, pulmonary infarct, etc.), esophagus (reflux esophagitis, etc.), thoracic spine (herniated disk, fracture, osteoarthritis, etc.), and nerves (radiculopathy, herpes zoster,

etc.).

Now, you will eliminate some of these on your history and physical examination. Then, you will be left with the ones you need to evaluate with your diagnostic workup or you can immediately treat without a workup.

Now, with the above techniques in mind, let's apply them to the most common complaints you encounter daily in your primary care practice.

## **ACUTE ABDOMINAL PAIN**

The author recommends using anatomy to formulate your lists of possibilities before you see the patient. Only the commonest causes will be dealt with here:

1. Gastroenteritis
2. Appendicitis
3. Cholecystitis
4. Peptic ulcer
5. Pancreatitis
6. Diverticulitis
7. Intestinal obstruction
8. Perforated viscus
9. Ectopic pregnancy
10. Pelvic inflammatory disease (PID)
11. Reflux esophagitis
12. Myocardial infarction
13. Renal calculus
14. Hepatitis

With these possibilities in mind, you will begin your interview by asking for the location of the pain. If it's right upper quadrant (RUQ), consider cholecystitis or duodenal ulcer. If it's epigastric, consider the possibility of pancreatitis, gastric ulcer, reflux esophagitis, and myocardial infarction. Pain in the right lower quadrant brings up the possibility of appendicitis, ectopic pregnancy, and PID, whereas pain in the left lower quadrant suggests diverticulitis, ectopic pregnancy, and PID. Diffuse abdominal pain is consistent with gastroenteritis and peritonitis either primary or secondary to a ruptured viscus (ruptured peptic ulcer, etc.). Diffuse abdominal pain also suggests intestinal obstruction. Next, determine if the pain is constant (cholecystitis, appendicitis, diverticulitis, etc.) or intermittent (biliary colic, renal colic, intestinal obstruction).



## DYSURIA

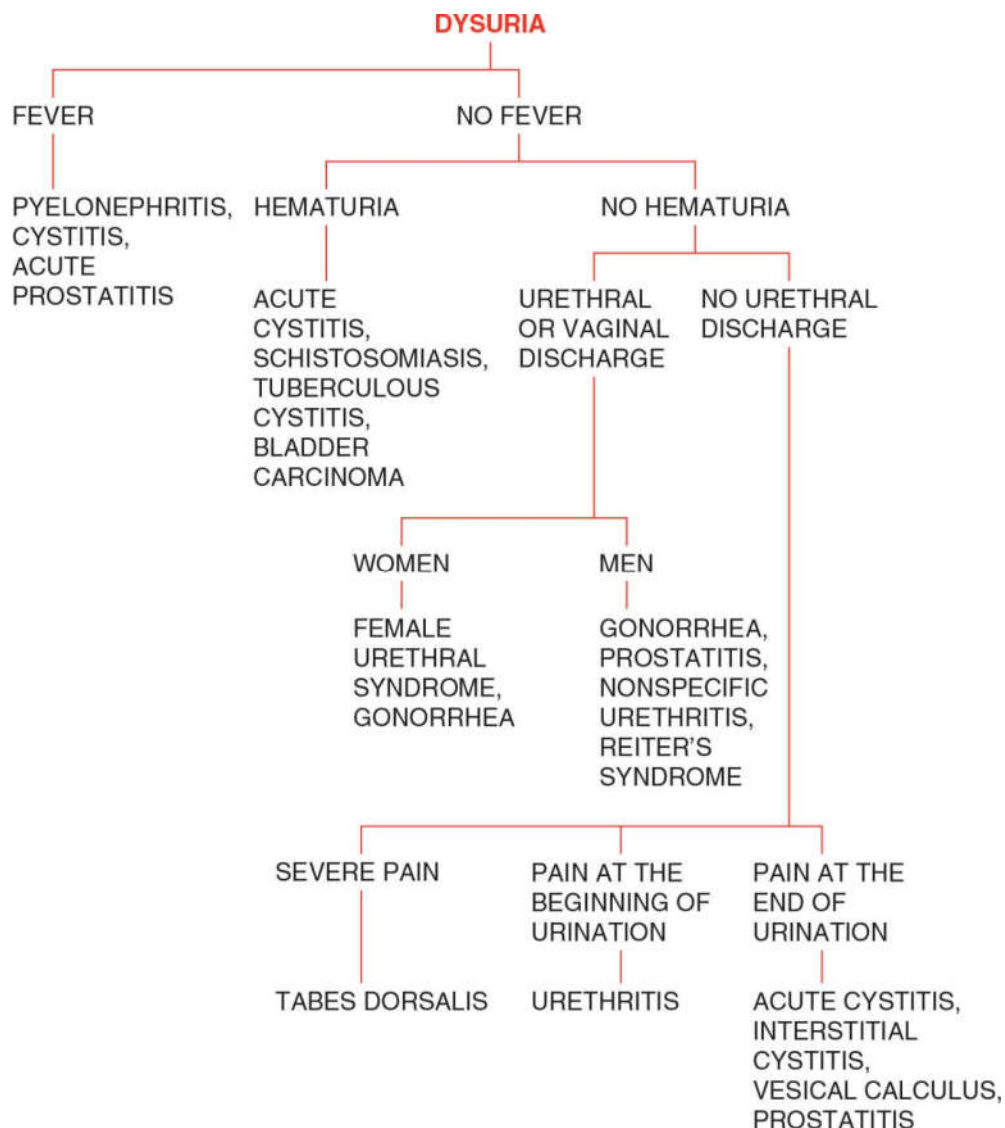
### ASK THE FOLLOWING QUESTIONS:

- 1. Is there fever?** A significant fever would suggest either pyelonephritis, particularly in females, or acute prostatitis in males.
- 2. Is the urine grossly bloody or are there a significant number of red cells on microscopic examination?** Grossly bloody urine in a young female should suggest acute cystitis, particularly if she has just returned from a honeymoon. In older patients it may indicate bladder carcinoma, but generally these patients have blood in their urine before they develop dysuria. Really significant blood in the urine may also indicate schistosomiasis or tuberculous cystitis. Dysuria and hematuria can occur in renal or vesicular calculi as well.
- 3. Is there a urethral or vaginal discharge?** If either of these signs is present, one must consider that the patient may have gonorrhea until proven otherwise. Repeated negative smears and cultures for gonococcus should suggest that the patient may have female urethral syndrome or nonspecific urethritis because of Chlamydia.
- 4. Are there systemic symptoms?** If there are systemic symptoms, one must consider the possibility of Reiter's syndrome or collagen disease. One should not forget that systemic symptoms of arthritis and rash may also be present in gonorrhea.
- 5. Is the pain very severe?** Severe pain, particularly a need to stay close to the restroom so one can empty one's bladder, may indicate tabes dorsalis, although this condition is rarely seen today.

### DIAGNOSTIC WORKUP

Obviously, a urinalysis and Gram's stain of the unspun urine should be done in all cases. A dipstick test is often negative and the only way to rule out a UTI with certainty is to look at a drop of urine under the microscope! The author can't count the number of times he has picked up a UTI this way. If this is positive, treatment can be initiated. Urine cultures are only necessary for resistant or repeated episodes. I also recommend a urethral smear and a vaginal smear and culture if sufficient material can be obtained. This may mean massaging the prostate for an adequate specimen. Even four white cells per high-powered field on a urethral smear probably indicate urethritis. Cultures for both gonorrhea and Chlamydia should be done. DNA probe testing has become a useful tool in

detecting Chlamydia and gonorrhoea. In persistent cases of dysuria, a helical CT scan, ultrasonography, and a cystoscopy must be done. In children, a voiding cystogram is essential. An urologist needs to be consulted before ordering these tests. Blood cultures should be done in cases of acute pyelonephritis. Cultures for anaerobic bacilli and tuberculosis may be necessary in persistent pyuria. It should go without saying that a rectal and vaginal examination should be done in all cases. However, this is frequently neglected. A therapeutic trial of antibiotics is useful. In particular, a course of ciprofloxacin is useful in diagnosing prostatitis



**Table 07: Dyspnea**



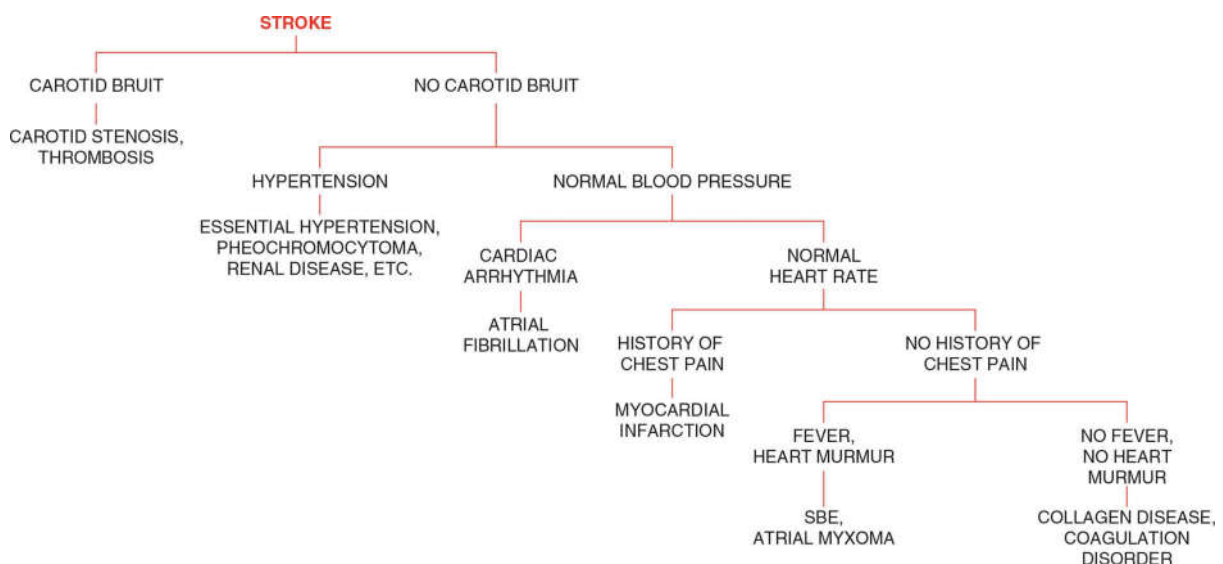
## STROKE

### ASK THE FOLLOWING QUESTIONS:

1. **Is there a carotid bruit?** This would arouse suspicion for a carotid thrombosis, stenosis, or plaque.
2. **Is there hypertension?** In addition to essential hypertension, one should look for secondary causes such as renal and adrenal causes of hypertension.
3. **Is there a cardiac arrhythmia?** Look for atrial fibrillation, atrial myxoma, and cardiomyopathy.
4. **Is there a history of chest pain?** Look for a myocardial infarction.
5. **Is there fever, heart murmur, splinter hemorrhages, or emboli elsewhere?** Look for SBE and atrial myxoma.

### DIAGNOSTIC WORKUP

A CBC, erythrocyte sedimentation rate, chemistry panel, cardiac troponins, serial cardiac enzymes, serial blood cultures, serial EKGs, and chest x-ray. Ultrasonography studies of the carotids and heart, and a CT scan of the brain are essential. A neurologist and cardiologist need to be consulted. A coagulation profile needs to be done, especially if tissue plasminogen activator therapy is contemplated.





### Suggested Orders for the Workup of Common Symptoms

The author wants to emphasize that these orders are only suggestions and not meant to be just automatically copied onto the order sheet in the hospital or office. Rather, the clinician should select the orders most appropriate, à la carte to fit the individual patient.

These orders are divided into those that can be cost effective for the primary care provider without the help of a consultant and those that should be ordered only after consultation with a specialist. It is almost always cheaper to consult a specialist before ordering a CT scan, MRIs, and other expensive diagnostic tests. For example, you should not order an MRI of the brain in a patient with headache and no focal neurologic signs, without consulting a neurologist first.

#### Abdominal Pain, Acute

##### A. Initial Workup

1. CBC
2. Urinalysis
3. Chemistry panel
4. Sedimentation rate
5. Serum amylase and lipase
6. Pregnancy test
7. Flat plate of abdomen and upright
8. Chest x-ray
9. ECG

##### B. Expanded Workup

1. Consultation with a surgeon or gastroenterologist
2. Gallbladder ultrasonography
3. HIDA scan
4. CT scan of the abdomen with contrast
5. Lateral decubitus films
6. Serial cardiac enzymes
7. Peritoneal tap
8. Double enema
9. Gastroscopy
10. Laparoscopy
11. Gallium scan
12. Exploratory laparotomy





### The Laboratory Workup of Disease

#### A

**Abortion, threatened:** Serum B–human chorionic gonadotropin (hCG), serum progesterone levels, urine, hCG, pregnanediol, sonogram

**Achalasia:** Barium swallow, Mecholyl test, esophagoscopy, esophageal manometry

**Acoustic neuroma:** Skull x-ray, computed tomography (CT) scan, posterior fossa myelogram, magnetic resonance imaging (MRI)

**Acquired immunodeficiency syndrome (AIDS):** Human immunodeficiency virus (HIV) antibody titer, enzyme-linked immunosorbent assay (ELISA), western blot, viral load, CD4 count

**Acromegaly:** Skull x-ray, CT scan, serum growth hormone, MRI

**Actinomycosis:** Smear for sulfur granules, culture skin lesions

**Addison disease:** Serum cortisol before and after corticotrophin, antiadrenal antibodies, CT scan of abdomen, metyrapone test

**Adrenogenital syndrome:** Serum cortisol, hydroxyprogesterone, 11-deoxycortisol, urine 17-ketosteroids and pregnanetriol, dexamethasone suppression test, CT scan of the abdomen

**Adult respiratory distress syndrome:** Chest x-ray, CT scan of the chest, sputum culture, blood culture, Swan–Ganz catheterization, arterial blood gases (ABGs)

**Agammaglobulinemia:** Serum electrophoresis and immunoelectrophoresis, blood type, lymph node biopsy, B-lymphocyte and T-lymphocyte counts

**Agranulocytosis, idiopathic:** Complete blood count (CBC), bone marrow examination, spleen scan

**AIDS:** See Acquired immunodeficiency syndrome

**Albright syndrome:** X-ray of long bones, bone biopsy

**Alcaptonuria:** Urinary homogentisic acid, x-ray of spine

**Alcoholism:** Blood alcohol level, liver function tests, liver biopsy

**Aldosteronism, primary:** Electrolytes before and after spironolactone, plasma renin, plasma aldosterone, 24-hour urine aldosterone, CT scan, exploratory laparotomy

**Allergic rhinitis:** Nasal smear for eosinophils, serum immunoglobulin E (IgE) antibody, radioallergosorbent test (RAST), skin test

**Alveolar proteinosis:** Luteinizing hormone (LH), sputum for periodic acid–Schiff–positive material (PSP), lung biopsy

**Alzheimer disease:** CT scan or MRI, genetic testing