Screening for Medical Problems in Patients with Upper Extremity Signs and Symptoms

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ABSTRACT: Narrative review: Hand therapists must be able to identify signs and symptoms of systemic disease that can mimic integumentary, neuromuscular, or musculoskeletal dysfunction evaluated and treated within their scope of practice. Pneumonia, complications of pacemakers, liver disease, kidney stones, ectopic pregnancy, and myocardial ischemia are only a few examples of problems and systemic diseases that can cause shoulder or upper extremity signs or symptoms. A screening model is presented for use by therapists in all practice settings. Information gathered is combined with results from the objective evaluation in making a treatment-versus-referral decision. Knowing the risk factors for various illnesses, diseases, and conditions will help guide the therapist in knowing when to screen for specific problems. Recognizing red flag histories, signs, and symptoms will also alert the therapist to the need for additional questions. Clues to screening and tips for physician referral are offered.

Level of Evidence: 5.

INTRODUCTION TO MEDICAL SCREENING FOR THE HAND THERAPIST

It is the therapist’s responsibility to make sure that each patient is an appropriate candidate for hand or upper extremity therapy. To be as cost effective as possible, we must determine what biomechanical, neuromuscular, or musculoskeletal problem is present and then treat the human movement system as specifically as possible. As part of this process, the therapist may need to screen for medical disease. Hand therapists must be able to identify signs and symptoms of systemic disease that can mimic neuromuscular or musculoskeletal dysfunction. Pneumonia, complications of pacemakers, liver disease, kidney stones, ectopic pregnancy, and myocardial ischemia are only a few examples of problems and systemic diseases that can cause shoulder or upper extremity signs or symptoms (Table 1).

In some situations such as primary care or direct access, hand therapists are the first contact that patient/clients seek, particularly for care of musculoskeletal dysfunction of the upper quadrant. This makes it critical that the therapist is well versed in determining when and how referral to a physician (or other appropriate health-care professional) is necessary. Each individual case must be reviewed carefully.

The purpose of this article was to discuss why medical screening is necessary for the hand therapist, describe aspects of the screening process, and review when and how to refer patients when it is warranted. A screening model proposed by Goodman and Snyder is presented for use by therapists in all practice settings (see Box 1). The model incorporates pertinent aspects of the screening process such as patient and family health history, identification of red flag signs and symptoms, and a review of systems. The information gathered from this decision-making process can point to the presence of a potential systemic problem or pathology other than what the person was referred for.

Clinical decisions must be based on the best evidence available. Whenever possible, the clinical basis for diagnosis, prognosis, and intervention must
TABLE 1. Systemic Causes of Shoulder Pain

<table>
<thead>
<tr>
<th>Neck</th>
<th>Chest/Trunk</th>
<th>Abdomen</th>
<th>Systemic Disease</th>
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<tbody>
<tr>
<td>Bone tumors</td>
<td>Angina/myocardial infarct</td>
<td>Diaphragmatic irritation (peptic ulcer, gallbladder</td>
<td>Collagen vascular disease</td>
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<td></td>
<td></td>
<td>disease, hiatal hernia, diaphragmatic hernia,</td>
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<td></td>
<td>ruptured ectopic pregnancy, pancreatic disease,</td>
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<td></td>
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<td>kidney disease)</td>
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<tr>
<td>Cervical cord tumors</td>
<td>Aortic aneurysm</td>
<td>Dissecting aortic aneurysm</td>
<td>Diabetes mellitus (adhesive capsulitis)</td>
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<tr>
<td>Metastases to cervical nodes</td>
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<td></td>
<td>Gout</td>
</tr>
<tr>
<td>Thoracic outlet syndrome</td>
<td>Bacterial endocarditis</td>
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<td>Hemophilia</td>
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<td></td>
<td>Breast disease (cancer, mastodynia)</td>
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<td>Intensive care unit (immobility)</td>
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<td></td>
<td>Empyema and lung abscess</td>
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<td>Rheumatic disease</td>
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<td></td>
<td>Herpes zoster (shingles)</td>
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<td>Sickle cell disease</td>
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<td></td>
<td>Hiatal hernia</td>
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<td></td>
<td>Lung caner</td>
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<td></td>
<td>Metastases in thoracic spine, axilla, mediastinum</td>
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<td></td>
<td>Myocardial ischemia</td>
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<tr>
<td></td>
<td>Pacemaker (complications)</td>
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<td></td>
<td>Pancoast’s tumor</td>
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<tr>
<td></td>
<td>Pericarditis</td>
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<tr>
<td></td>
<td>Pneumonia</td>
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<tr>
<td></td>
<td>Pneumothorax</td>
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<td></td>
<td>Post-coronary artery bypass graft</td>
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<tr>
<td></td>
<td>Pulmonary embolism</td>
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<td></td>
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<tr>
<td></td>
<td>Pulmonary tuberculosis</td>
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Shoulder pain may be referred from the neck, chest (thorax or thoracic spine), and abdomen and from systemic diseases. The above have been diagnosed as having the onset or origin of presenting symptoms in the shoulder.

come from a valid and reliable body of evidence referred to as evidence-based practice. However, it should be noted that many of the referred pain patterns and current knowledge we have about this topic are based on consensus and expert opinion. Our current understanding of medical conditions that can present initially as musculoskeletal problems has been a part of the basic training of medical doctors for decades. Current evidence that these patterns continue to occur in the population at large is being reported in the form of case reports at the present time (see references 1-7). Each therapist must develop the skills necessary to continually assimilate, evaluate, and make the best use of evidence when screening individuals for medical disease.

REASONS TO SCREEN

Direct Access

The need to screen for medical disease was first raised as an issue in response to direct access legislation. Direct access is the right of the public to obtain examination, evaluation, and intervention from a licensed physical or occupational therapist without previous examination by, or referral from, a physician, gatekeeper, or other practitioner. Even without direct access, clients can present with yellow (caution) or red (warning) flags that signal a need for re-evaluation by a medical specialist. The methods and clinical decision-making model for screening presented in this issue remain the same with or without direct access and in all the practice settings. The following reasons probably comprise a far greater priority.

Quicker and Sicker

“Quicker” refers to how health-care delivery has changed in the last ten years to combat the rising costs of health care. Hospital inpatients are discharged much faster today than they were even ten years ago. Outpatient surgery is much more common, with same-day discharge for procedures that would have required a seven- to ten-day hospitalization in the past. The therapist must be alert to signs of postoperative complications and exacerbation of acute illness in these individuals who have been given early release from the hospital.

“Sicker” refers to the fact that patients in acute care, rehabilitation, or outpatient settings with any orthopedic or neurologic problems may have a past medical history of cancer or a current personal history of diabetes, liver disease, thyroid condition, peptic ulcer, and/or other conditions or diseases. The number of people with at least one chronic disease or disability is reaching epidemic proportions. According to the National Institute on Aging, 979% of adults over 70 years of age have at least one of seven potentially disabling chronic conditions (arthritis, hypertension, heart disease, diabetes, respiratory diseases, stroke, and cancer). The presence of multiple comorbidities emphasizes the need to view the whole person and not just the upper extremity in question.

Referral without Appraisal

Clients may obtain a signed prescription for hand therapy from their primary care physician or other health-care provider, based on similar past complaints of musculoskeletal symptoms, without actually being examined by the physician. In the screening process, always ask anyone who provides a signed prescription:

- Did you actually see the physician (chiropractor, dentist, nurse practitioner, physician assistant)?
- Did the doctor examine you?

Additionally, hand therapists frequently receive referrals from specialized orthopedic or plastic surgeons whose emphasis is on the musculoskeletal upper extremity problem. The hand surgeon may not immediately recognize the underlying systemic disease or assumes that the referring primary care physician has ruled out other causes of the upper extremity symptoms.

Progression of Time and Disease

Given enough time, a disease process will eventually progress and get worse. Symptoms may become more readily apparent or more easily clustered. The therapist also spends a significantly greater amount of time with the individual and is more likely to hear reports of symptoms that were not discussed with the physician. In such cases, the alert therapist may be the first to ask the patient/client pertinent questions to determine the presence of underlying symptoms requiring medical referral. The therapist can provide an essential service in referring patients with a previously unrecognized systemic illness, not related to their upper extremity problem, for early diagnosis and treatment. Familiarity with risk factors for various diseases, illnesses, and conditions is an important tool for early recognition in the screening process.
RED AND YELLOW FLAGS

A large part of the screening process is identifying yellow or red flag histories, signs, and symptoms. A yellow flag is a cautionary or warning symptom that signals “slow down” and think about the need for screening. A red flag symptom requires immediate attention, either to pursue further screening questions and/or tests, or to make an appropriate referral.

Under evidence- and consensus-based medicine, relying on a red flag checklist based on the history has proved to be a very safe way to avoid missing the presence of serious disorders. When serious conditions have been missed, it is not for lack of special investigations but for lack of adequate and thorough attention to clues in the history.

The presence of any yellow or red flags elicited during the screening interview or observed during the physical examination should prompt the therapist to consider the need for further tests and questions. The presence of a single flag is not usually the cause for immediate medical attention. Each cautionary or warning flag must be viewed in the context of the whole person given the age, gender, past medical history, known risk factors, medication use, and current clinical presentation of that individual. When a cluster of three or more flags is present, referral to another practitioner should be considered, especially if there are associated risk factors present at the same time.

Symptoms of any kind that present bilaterally (e.g., pain, rash, nodules, skin pigmentation changes, numbness, tingling) and constitutional symptoms always raise a red flag for concern and further investigation. Constitutional symptoms refer to a constellation of signs and symptoms that indicate the presence of a systemic illness. These symptoms include fever, unexplained perspiration (sweats) nausea, fatigue, pallor, vomiting, diarrhea, weight loss, dizziness, and fainting. They are not specific to any one bodily system; however, presence of one or more of these core signs and symptoms signals the need for further screening.

As you look over the various potential systemic causes of shoulder pain listed in Table 1, think about the most common risk factors and red flag histories you might see with each of these conditions. For example, a history of any kind of cancer is always a red flag. Breast and lung cancer are the two most common types of cancer to metastasize to the shoulder. Heart disease can cause shoulder pain, but it usually occurs in an age-specific population. Anyone older than 50 years, postmenopausal women, and anyone with a first generation family history of heart disease is at increased risk for symptomatic heart disease. Alternately, although atherosclerosis has been demonstrated in the blood vessels of children, teens, and young adults, they are rarely symptomatic unless some other heart anomaly is present. Hypertension, diabetes, and hyperlipidemia are other red flag histories associated with cardiac-related shoulder pain. Of course, a history of angina, heart attack, angiography, stent or pacemaker placement, and coronary artery bypass graft (CABG), or other cardiac procedure is also a yellow (caution) flag to alert the therapist of the potential need for further medical screening.

Knowledge of pathologic conditions, illnesses, and diseases helps the therapist navigate the screening process. For example, pulmonary tuberculosis (TB) is a possible cause of shoulder pain. Risk factors for this disease include health-care workers, the homeless population, prison inmates, immunocompromised individuals (e.g., transplant recipients, long-term use of immunosuppressants, anyone treated for long-term rheumatoid arthritis, or received chemotherapy for cancer), older adults (over 65 years), immigrants from areas where TB is endemic, injection drug users, and individuals who are malnourished for any reason (e.g., eating disorders, alcoholism, drug users, cachexia). In a case such as TB, there will usually be other associated signs and symptoms such as fever, sweats, and cough.

SCREENING MODEL

The Goodman/Snyder screening model is one way to conduct a screening evaluation and is outlined in Box 1. By using these decision-making tools, the therapist will be able to identify chief and secondary problems, identify information that is inconsistent with the presenting complaint, recognize noncontributory information, generate a working hypothesis regarding possible causes of complaints, and determine whether referral or consultation is indicated.

The patient can complete a health history questionnaire (independently or with assistance by a relative or staff member), before the initial evaluation. The therapist then peruses the questionnaire for any risk factors or red flags that should be followed up in the interview. A well-developed questionnaire will reveal the patient’s clinical presentation and the presence of any associated signs and symptoms that alert the evaluator to the need for more specific screening questions and provocative tests. In the review of systems, therapists gather all the information from the interview and physical examination and look for clusters of signs and symptoms that either indicate that the dysfunction can be treated within our scope of practice or reveal systemic involvement that should be referred out. Each of the screening model steps will be described in detail in the remainder of this article.
The importance of history taking cannot be emphasized enough. Physicians cite a shortage of time as the most common reason to skip the history, yet history taking is the essential key to a correct diagnosis. One example of a standard intake form to complete the personal/family history is provided (Figure 1). Such a questionnaire can be generated

**Past Medical History (Personal or Family)**

The importance of history taking cannot be emphasized enough. Physicians cite a shortage of time as the most common reason to skip the history, yet history taking is the essential key to a correct diagnosis. One example of a standard intake form to complete the personal/family history is provided (Figure 1). Such a questionnaire can be generated
by each clinic to meet its own needs and assures a thorough and consistent approach.

The types of data generated from the history can include general demographics such as age, gender, race/ethnicity, education, and occupation. Medication use and medical/surgical history, in addition to information from the patient’s psychosocial history such as family situation, health habits, and living environment may provide insight into the client’s clinical presentation and overall needs. The reasons to ask specific items on the intake form will be covered in the following sections.

### Age

Increasing age is the most common primary risk factor for disease, illness, and comorbidities. It is the

<table>
<thead>
<tr>
<th>Personal History</th>
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<tbody>
<tr>
<td>Have you ever had:</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Anemia</td>
<td></td>
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<tr>
<td>Epilepsy/seizures</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Fibromyalgia/myofascial pain syndrome</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Hepatitis/spaundice</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Joint replacement</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Parkinson’s disease</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Polio/postpolio</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Skin problems</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Urinary incontinence (dribbling, leaking)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>For women:</td>
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<tr>
<td>History of endometriosis</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>History of pelvic inflammatory disease</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Are you pregnant?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Any trouble with leaking or dribbling urine?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Number of pregnancies</td>
<td></td>
<td>Number of live births</td>
</tr>
<tr>
<td>Have you ever had a miscarriage-abortion?</td>
<td>Yes</td>
<td>No</td>
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<table>
<thead>
<tr>
<th>General Health</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. I would rate my health as [circle one]:</td>
<td>Excellent</td>
<td>Good</td>
<td>Fair</td>
<td>Poor</td>
</tr>
<tr>
<td>2. Are you taking any prescription or over-the-counter medications?</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>If yes, please list:</td>
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<tr>
<td>3. Are you taking any nutritional supplements (any kind, including vitamins)</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>4. Have you had any illnesses within the last 3 weeks [e.g., colds, influenza, bladder or kidney infection]?</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>If yes, have you had this before in the last 3 months?</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>5. Have you noticed any lumps or thickening of skin or muscle anywhere on your body?</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>6. Do you have any sores that have not healed or any changes in size, shape, or color of a wart or mole?</td>
<td>Yes</td>
<td>No</td>
<td></td>
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</tr>
<tr>
<td>7. Have you had any unexplained weight gain or loss in the last month?</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>8. Do you smoke or chew tobacco?</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>If yes, how many packs/pipes/pouches sticks a day?</td>
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<tr>
<td>How many months or years?</td>
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<td>9. I used to smoke/chew but I quit</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>If yes, what pack or amount/day</td>
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<tr>
<td>Year quit</td>
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<td></td>
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<tr>
<td>10. I would like to quit smoking/using tobacco</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>11. How much alcohol do you drink in the course of a week? [one drink is equal to 1 beer, 1 glass of wine or 1 shot of hard liquor]</td>
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<tr>
<td>12. Do you use recreational or street drugs (marijuana, cocaine, crack, meth, amphetamines, or others)?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
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<tr>
<td>If yes, what, how much, how often?</td>
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<tr>
<td>13. How much caffeine do you consume daily (including soft drinks, coffee, tea, or chocolate)?</td>
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<td>14. Are you on any special diet?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
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<tr>
<td>15. Do you have (or have you recently had) any of these problems?</td>
<td></td>
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**FIGURE 1. (Continued)**
number one risk factor for cancer. Dementia, which occurs most commonly in the older adult, increases the risk of falls with resultant brain injuries and fractures. (These topics will be discussed in greater detail in articles later in this Special Issue.) Age-related changes in metabolism increase the risk for drug accumulation in older adults. Older adults are more sensitive to both the therapeutic and toxic effects of many drugs, especially analgesics. In addition, older clients take a disproportionate number of medications, predisposing them to adverse drug reactions.14

Because the "weakest links" with aging are so often the brain, lower urinary tract, or cardiovascular or musculoskeletal system, the following symptoms may be signals of a systemic disease but are not specific to any one pathologic process.
• Acute confusion
• Depression
• Falling
• Incontinence
• Syncope

Gender

Men and women with the same disease may experience a different age at onset, clinical presentation, and response to treatment. According to the Health Resources and Services Administration, women today are more likely than men to die of heart disease.\textsuperscript{15} Sixty-two percent of American women are overweight and 33% are obese. Ten times as many women die of heart disease and stroke as they do of breast cancer (about \(\frac{1}{2}\) million every year in the United States for heart disease compared with about 41,000 from breast cancer).\textsuperscript{16} More women die of heart disease each year in the United States than the combined deaths from the next seven causes of death in women.\textsuperscript{17,18} A woman with significant family history of heart disease presenting with shoulder, upper back, or jaw pain, must be screened for possible cardiovascular involvement. The most common cancer deaths among women in 2008 were lung (26%), breast (15%), and colon/rectum (9%).\textsuperscript{16}

In an awkward twist of reverse gender bias, many men are not receiving intervention for osteoporosis. In fact, the overall prevalence of osteoporosis among men of all the ages remains unknown, with ranges from 20% to 36% reported in the literature.\textsuperscript{19} Men have a higher mortality rate after osteoporosis-related fracture (e.g., wrist, hip, vertebral) compared with women.\textsuperscript{20,21} Thirty percent of older men who suffer a hip fracture will die within a year of that fracture—double the rate for older women. Only 1.1% of the men brought to the hospital for a serious fracture ever receive a bone density test to evaluate their overall risk. Only 1–5% of men discharged from the hospital after hip fracture are treated for osteoporosis. This is compared with 27% or more for women.\textsuperscript{22,23} Keeping this information in mind and watching for risk factors of osteoporosis can guide the therapist in recognizing the need to screen for osteoporosis in both men and women.

Race and Ethnicity

Despite tremendous advances and improved public health in America, noncaucasian racial/ethnic groups (e.g., Native Americans, Asian, Hispanic or Latino, Black/African American) are medically underserved and suffer higher levels of illness, premature death, and disability. These include cancer, heart disease and stroke, diabetes, infant mortality, and HIV and AIDS.\textsuperscript{24} Racial/ethnic minorities living in rural areas may be at greater risk when health-care access is limited.\textsuperscript{25} For example, Native Americans living on reservations may benefit from many services for free that might not be available in other areas, whereas city-dwelling (urban) Native Americans are more likely than the general population to die from diabetes, alcohol-related causes, lung cancer, liver disease, pneumonia, and influenza.\textsuperscript{26} Black men have a higher risk factor for hypertension and heart disease than white men. Black women have 250% higher incidence with twice the mortality of white women for cervical cancer. Black women are also more likely to die of pneumonia, influenza, diabetes, and liver disease. Scientists and epidemiologists ask if this could be the result of socioeconomic factors such as later detection. Perhaps, the lack of health insurance prevents adequate screening and surveillance.

Mexican Americans are the largest minority group in the United States. Stroke prevention and early intervention are important in this group because of their high risk. Mexican Americans ages 45–59 years are twice as likely, and those in their 60s and early 70s are 60% more likely to have a stroke than their non-Hispanic counterparts. Family history of stroke or transient ischemic attack is a red flag in this population.\textsuperscript{27} Of all the cases of TB reported in the United States over the last ten years, almost 80% were in racial/ethnic minorities.\textsuperscript{28} The therapist must remember to look for these race-based factors when conducting a risk factor assessment.

General Health

Self-assessed health is a strong and independent predictor of mortality and morbidity. People who rate their health as “poor” are four to five times more likely to die than those who rate their health as “excellent.”\textsuperscript{29,30} Self-assessed health is also a strong predictor of functional limitation.\textsuperscript{31} The therapist should consider it as a red flag anytime a client chooses “poor” to describe his or her overall health.

Recent Infections

Recent bacterial or viral infections of any kind are always a red flag (e.g., sinusitis, urinary tract infection, upper respiratory infection, hepatitis, streptococcus, staphylococcus), especially when followed by neurologic symptoms, joint pain, or back pain. Reports of cyclical, recurrent colds, infections, or “the flu” may be an extension of a chronic health pattern of systemic illness. Further questioning may reveal recurrent influenza-like symptoms associated with headaches and musculoskeletal complaints. These complaints could originate with medical
problems, such as endocarditis (a bacterial infection of the heart), bowel obstruction, or pleuropulmonary disorders, which should be ruled out by a physician.

**Past History of Cancer**

A previous history of any kind of cancer is always a red flag. The therapist must be alert to any indication of cancer recurrence. The mnemonic caution is a useful guide: Change in bowel or bladder habits, A sore that does not heal in six weeks, Unusual bleeding or discharge, Thickening or lump in the breast or elsewhere, Indigestion or difficulty swallowing, Obvious change in a wart or mole, Nagging cough or hoarseness.

Understanding common patterns of cancer metastases can be helpful. For example, breast, lung, thyroid, and bone cancer often spread to the neck, shoulder, and/or upper quarter. Dissemination can occur by local invasion, direct extension, or via the lymphatics or blood circulation.

When watching for signs of cancer or cancer recurrence, look for changes in appetite and unexplained weight gain/loss, sudden onset of diabetes, hyperthyroidism, or depression. Weight loss significant for neoplasm would be a 10% loss of total body weight over a four-week period unrelated to any intentional diet or fasting. Weight gain/loss does not always correlate with appetite. For example, weight gain associated with neoplasm may be accompanied by appetite loss, whereas weight loss associated with hyperthyroidism may be accompanied by increased appetite.

A significant, unexplained weight gain can be caused by cancer but also congestive heart failure or hypothyroidism. The person with musculoskeletal pain who, despite reduced work levels and decreased activity, experiences unexplained weight loss demonstrates a key “red flag” symptom.

**Substance Abuse**

Public health officials tell us that alcohol and other drug use and abuse is the number one health problem in the United States. Addictions (especially alcohol) have reached epidemic proportions in this country. Yet, it is largely ignored and often goes untreated. Alcohol and other drugs are commonly used to self-medicate mental illness (especially depression), pain, learning disabilities, sleep disorders, personality disorders, job strain, and the effects of posttraumatic stress disorder. Substance abuse increases the likelihood of delayed wound healing and injecting substances can additionally result in soft-tissue infections. Other than tobacco, alcohol is the most dominant addictive agent in the United States. One in 13 adults meets the diagnostic criteria for alcoholism and alcohol abuse defined as:

- More than 14 alcoholic drinks/wk (men); more than four drinks on any day
- More than seven alcoholic drinks/wk (women); more than three drinks on any day
- One drink is equal to one 12 oz beer, one 5 oz glass of wine, or 1.5 oz of hard liquor.

Prolonged use of excessive alcohol may affect bone metabolism, resulting in reduced bone formation, disruption of the balance between bone formation and resorption, and incomplete mineralization. Alcoholics are often malnourished, which exacerbates the direct effects of alcohol on bones. Alcohol-induced osteoporosis (the predominant bone condition in most people with cirrhosis) may progress for years without any obvious symptoms. Therapists may also see alcoholic polyneuropathy, alcoholic myopathy, nontraumatic hip osteonecrosis, injuries from falls, and stroke from heavy alcohol use. In fact, alcohol-related problems often mimic signs and symptoms associated with aging, such as falls or memory loss.

Individuals who report high amounts of alcohol on the standard intake form or demonstrate other signs of alcohol intoxication (behavior or odor) should be screened further. The World Health Organization advocates using the Alcohol Use Disorders Identification Test. In hospitals and outpatient settings in the United States, the most commonly used include the Short Michigan
Alcoholism Screening Test (SMAST)\textsuperscript{39} and the CAGE questionnaire. The SMAST has a geriatric version (MAST-G) available online at \url{http://consultgerin.org/uploads/File/trythis/issue17.pdf} (assessed 09/16/09).

The CAGE questionnaire helps clients unwilling or unable to recognize a problem with alcohol, although it is possible for a person to answer “no” to all of the CAGE questions and still be drinking heavily and at risk for alcohol dependence. The specificity of this test is high for assessing alcohol abuse pretraumatic and posttraumatic brain injury.\textsuperscript{40}

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**Box 2. Red Flag Findings in the Clinical Presentation**

- No known cause, unknown etiology, insidious onset.
- Presence of symptoms that are unrelieved by therapist’s intervention is a red flag.
- Intervention does not change the clinical picture; client may get worse.
- Presence of symptoms that get better after therapy but then get worse again is also a red flag indicating the need to screen further.
- Significant weight loss/gain without effort (more than 10% of the client’s body weight in 10–21 days).
- Gradual, progressive, or cyclical presentation of symptoms (worse/better/worse).
- Unrelieved by rest or change in position (no position is comfortable).
- Failure to produce symptom relief with previously effective techniques (e.g., positional change, rest, or application of heat).
- Symptoms seem out of proportion to the injury.
- Symptoms persist beyond the expected time for that condition.
- Unable to alter (provoke, reproduce, alleviate, eliminate, aggravate) the symptoms during exam.
- Does not fit the expected mechanical or neuromusculoskeletal pattern.
- No discernible pattern of symptoms.
- A growing mass (painless or painful) is a tumor until proved otherwise; a hematoma should decrease (not increase) in size with time.
- Bilateral symptoms (e.g., numbness/tingling, burning, edema, clubbing or other nail bed changes, weakness, skin rash, lesions, or pigmentation changes).
- Change in muscle tone or range of motion for individuals with neurologic conditions (e.g., cerebral palsy, spinal cord injury, traumatic brain injury, multiple sclerosis).

**Pain Pattern**

- Back or shoulder pain (most common location of referred pain; other areas can be affected as well, but these two areas signal a particular need to take a second look).
- Pain accompanied by full and painless range of motion.
- Pain that is not consistent with emotional or psychologic overlay (screening tests for emotional overlay are negative).
- Night pain (constant and intense; rated 7 or above on a scale from 0 to 10).
- Symptoms (especially pain) are constant and intense (ask anyone with “constant” pain: Are you having this pain right now?).
- Pain made worse by activity and relieved by rest (e.g., cardiac: upper quadrant pain with the use of the lower extremities while upper extremities are inactive).
- Pain described as throbbing (vascular), knifelike, boring, or deep aching.
- Pain that is poorly localized.
- Pattern of coming and going like spasms, colicky.
- Pain accompanied by signs and symptoms associated with a specific viscera or system (e.g., gastrointestinal, genitourinary, gynecologic, cardiac, pulmonary, endocrine).
- Change in musculoskeletal symptoms with food intake or increased pain with medication use (immediately up to several hours later).
Box 3. Review of Systems*

When conducting a general review of systems, ask the client about the presence of any other problems anywhere else in the body. Depending on the client’s answer you may want to prompt him or her about any of the following common signs and symptoms associated with each system:

**General Questions**
- Fever, chills, sweating (constitutional symptoms)
- Appetite loss, nausea, vomiting (constitutional symptoms)
- Fatigue, malaise, weakness (constitutional symptoms)
- Excessive, unexplained weight gain, or loss
- Vital signs: blood pressure, temperature, pulse, respirations
- Insomnia
- Irritability
- Hoarseness or change in voice, frequent or prolonged sore throat
- Dizziness, falls

**Integumentary (Include Skin, Hair, and Nails)**
- Recent rashes, nodules, or other skin changes
- Unusual hair loss or breakage
- Increased hair growth (hirsutism)
- Nail bed changes
- Itching (pruritus)

**Musculoskeletal/Neurologic**
- Joint pain, redness, warmth, swelling, stiffness, deformity
- Frequent or severe headaches
- Vision or hearing changes
- Vertigo
- Paresthesias (numbness, tingling, “pins and needles” sensation)
- Change in muscle tone
- Weakness; atrophy
- Abnormal deep tendon (or other) reflexes
- Problems with coordination or balance; falling
- Involuntary movements; tremors
- Radicular pain
- Seizures or loss of consciousness
- Memory loss
- Paralysis
- Mood swings; hallucinations

**Rheumatologic**
- Presence/location of joint swelling
- Muscle pain, weakness
- Skin rashes
- Reaction to sunlight
- Raynaud’s phenomenon
- Nail bed changes

**Cardiovascular**
- Chest pain or sense of heaviness or discomfort
- Palpitations
- Limb pain during activity (claudication; cramps, limping)
- Discolored or painful feet; swelling of hands and feet
- Pulsating or throbbing pain anywhere, but especially in the back or abdomen
- Peripheral edema; nocturia
- Sudden weight gain; unable to fasten waist band or belt, unable to wear regular shoes
- Persistent cough
- Fatigue, dyspnea, orthopnea, syncope
- High or low blood pressure, unusual pulses
• Differences in blood pressure from side to side with position change (10 mm Hg or more; increase or decrease/diastolic or systolic; associated symptoms: dizziness, headache, nausea, vomiting, diaphoresis, heart palpitations, increased primary pain, or symptoms)

• Positive findings on auscultation

**Pulmonary**
• Cough, hoarseness
• Sputum, hemoptysis
• Shortness of breath (dyspnea, orthopnea); altered breathing (e.g., wheezing, pursed-lip breathing)
• Night sweats; sweats anytime
• Pleural pain
• Cyanosis, clubbing
• Positive findings on auscultation (e.g., friction rub, unexpected breath sounds)

**Psychologic**
• Sleep disturbance
• Stress levels
• Fatigue, psychomotor agitation
• Changes in personal habits, appetite
• Depression, confusion, anxiety
• Irritability, mood changes

**Gastrointestinal**
• Abdominal pain
• Indigestion; heartburn
• Difficulty in swallowing
• Nausea/vomiting; loss of appetite
• Diarrhea or constipation
• Change in stools; change in bowel habits
• Fecal incontinence
• Rectal bleeding; blood in stool; blood in vomit
• Skin rash followed by joint pain (Crohn’s disease)

**Hepatic/Biliary**
• Change in taste/smell
• Anorexia
• Feeling of abdominal fullness, ascites
• Asterixis (muscle tremors)
• Change in urine color (dark, cola-colored)
• Light-colored stools
• Change in skin color (yellow, green)
• Skin changes (rash, itching, purpura, spider angiomas, palmar erythema)

**Hematologic**
• Skin color or nail bed changes
• Bleeding: nose, gums, easy bruising, melena
• Hemarthrosis, muscle hemorrhage, hematoma
• Fatigue, dyspnea, weakness
• Rapid pulse, palpitations
• Confusion, irritability
• Headache

**Genitourinary**
• Reduced stream, decreased output
• Burning or bleeding during urination; change in urine color
• Urinary incontinence, dribbling
• Impotence, pain with intercourse
• Hesitation, urgency
• Nocturia, frequency
• Dysuria (painful or difficult urination)
• Testicular pain or swelling
• Genital lesions
• Penile or vaginal discharge
• Impotence (males) or other sexual difficulty (males or females)
• Infertility (males or females)
• Flank pain

**Gynecologic**
• Irregular menses, amenorrhea, menopause
• Pain with menses or intercourse
• Vaginal discharge, vaginal itching
• Surgical procedures
• Pregnancy, birth, miscarriage, and abortion histories
• Spotting, bleeding especially for the postmenopausal woman 12 months after last period (without hormone replacement therapy)

**Endocrine**
• Hair and nail changes
• Change in appetite, unexplained weight change
• Fruity breath odor
• Temperature intolerance, hot flashes, diaphoresis (unexplained perspiration)
• Heart palpitations, tachycardia
• Headaches
• Low urine output, absence of perspiration
• Cramps
• Edema, polyuria, polydipsia, polyphagia
• Unexplained weakness, fatigue, paresthesia
• Carpal/tarsal tunnel syndrome
• Periarthritis, adhesive capsulitis
• Joint or muscle pain (arthralgia, myalgia), trigger points
• Prolonged deep tendon reflexes
• Sleep disturbance

**Cancer**
• Constant, intense pain, especially bone pain at night
• Unexplained weight loss (10% of body weight in 10–14 days); most clients in pain are inactive and gain weight
• Loss of appetite
• Excessive fatigue
• Unusual lump(s), thickening, change in a lump or mole, sore that does not heal; other unusual skin lesions or rash
• Unusual or prolonged bleeding or discharge anywhere
• Change in bowel or bladder habits
• Chronic cough or hoarseness, change in voice
• Rapid onset of digital clubbing (10–14 days)
• (Proximal) muscle weakness, especially when accompanied by change in one or more deep tendon reflexes

**Immunologic**
• Skin or nail bed changes
• Fever or other constitutional symptoms (especially recurrent or cyclical symptoms)
• Lymph node changes (tenderness, enlargement)
• Anaphylactic reaction
• Symptoms of muscle or joint involvement (pain, swelling, stiffness, weakness)
• Sleep disturbance
people in denial to accept that a problem exists. Two or more “yes” answers indicate a problem with alcohol; intervention is likely needed.

Risk factors for opioid misuse in people with chronic pain include family or personal history of substance abuse or previous alcohol or other drug rehabilitation, young age, history of criminal activity or legal problems (including driving under the influence [or DUIs]), risk-taking or thrill-seeking behaviors, heavy tobacco use, and history of severe depression or anxiety. Physicians and clinical psychologists may use one of the several tools (e.g., Current Opioid Misuse Measure, Screener and Opioid Assessment for Patients in Pain) to screen for risk of opioid misuse.

**Tobacco Use**

As health-care providers, the therapist has an important obligation to screen for tobacco use and incorporate smoking cessation education into the therapy plan of care whenever possible. The American Cancer Society publishes a chart (and pamphlet for distribution) of the benefits of smoking cessation starting from 20 minutes since the last cigarette until 15 years later. This information can be accessed online. Client education includes a review of the physiologic effects of tobacco. Tobacco is well documented in its ability to cause peripheral vasoconstriction and delayed wound healing. Nicotine stimulates the heart to beat faster, narrows the blood vessels, reduces the supply of oxygen to the heart and other organs, and increases the chances of developing blood clots.

**Caffeine**

Caffeine is a substance with specific physiologic (stimulant) effects. Caffeine ingested in toxic amounts has many effects, including nervousness, irritability, agitation, sensory disturbances, tachypnea (rapid breathing), heart palpitations (strong, fast, or irregular heartbeat), nausea, urinary frequency, diarrhea, and fatigue.

Excessive ingestion of caffeine has been linked with problems with sleep, dizziness, restlessness, headaches, muscle tension, and intestinal disorders. Caffeine may enhance the client’s perception of pain. Pain levels can be reduced dramatically by reducing the daily intake of caffeine. Caffeine can also cause vasoconstriction of the blood vessels of the hands, which further impedes healing and recovery after upper extremity injuries or surgery.

In large doses, caffeine is a stressor, but the abrupt withdrawal from caffeine can be equally stressful. Withdrawal from caffeine induces a syndrome of headaches, lethargy, fatigue, poor concentration, nausea, impaired psychomotor performance, and emotional instability, which begins within 12–24 hours and lasts about one week. Anyone seeking to break free from caffeine dependence should do so gradually over a week’s time or more.

**Sleep-related History**

Sleep patterns are valuable indicators of underlying physiologic and psychologic disease processes. Physical problems that result in pain, increased urination, shortness of breath, changes in body temperature, perspiration, or side effects of medications are just a few causes of sleep disruption. Any factor precipitating sleep deprivation can contribute to an increase in the frequency, intensity, or duration of a client’s symptoms.

Fever and night sweats are characteristic signs of systemic disease. Night sweats occur as a result of a gradual increase in body temperature followed by a sudden drop in temperature. This change in body temperature can be related to pathologic changes in immunologic, neurologic, or endocrine function.

Be aware that many people, especially women, experience sweats associated with menopause, poor room ventilation, or too many clothes and covers used at night. Sweats can also occur in the

### TABLE 2. General Neurological Signs and Symptoms

<table>
<thead>
<tr>
<th>General</th>
<th>Cervical Myelopathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Confusion/increased confusion (most common in older adults)</td>
<td>• Wide-based spastic gait</td>
</tr>
<tr>
<td>• Depression</td>
<td>• Clumsy hands</td>
</tr>
<tr>
<td>• Irritability</td>
<td>• Visible change in handwriting</td>
</tr>
<tr>
<td>• Drowsiness/laziness/sleepiness</td>
<td>• Difficulty manipulating buttons or handling coins</td>
</tr>
<tr>
<td>• Blurred vision</td>
<td>• Hyperreflexia</td>
</tr>
<tr>
<td>• Headache</td>
<td>• Positive Babinski test</td>
</tr>
<tr>
<td>• Balance/coordination problems</td>
<td>• Positive Hoffman sign (flexion of the thumb tip with tapping/flicking of the end of the third or fourth finger)</td>
</tr>
<tr>
<td>• Weakness</td>
<td>• Lhermitte’s sign (electric shock-like sensation down the spine, arms, legs with neck flexion/extension)</td>
</tr>
<tr>
<td>• Change in memory</td>
<td>• Urinary retention followed by overflow incontinence (severe myelopathy)</td>
</tr>
<tr>
<td>• Change in muscle tone for individual with previously diagnosed neurologic condition</td>
<td></td>
</tr>
</tbody>
</table>
neutropenic client after chemotherapy or as a side effect of other medications such as some antidepressants, sedatives, and analgesics. Sweats (present day and night) can be associated with medical problems such as TB, autoimmune diseases, and malignancies.[45]

An isolated experience of sweats is not as significant as intermittent but ongoing sweats in the presence of risk factors for any of these conditions or in the presence of other constitutional symptoms. Assess vital signs in the client reporting sweats, especially when other symptoms are present and/or the client reports shoulder pain of unknown cause.

Pain at night can be a major sleep disrupter and is usually perceived as being more intense because of the lack of external distracting activity. It is very important to ask the client about the night pain pattern. If the client is awakened from a deep sleep by pain in any location that is unrelated to a physical trauma and is unaffected by a change in position, this may be a sign of serious systemic disease, particularly cancer.

**Risk Factor Assessment**

Some of the more common risk factors for systemic disease include obesity, tobacco use, sedentary lifestyle, alcohol or other substance abuse, overseas travel, exposure to radiation, multiple sexual partners, age, and occupation. Specific risk factors for each bodily system will be covered in more detail in subsequent articles in this special issue. Educating people about their risk factors is a key element in risk factor reduction. Identifying risk factors may guide the therapist in making a medical referral sooner than would otherwise seem necessary.

**Clinical Presentation**

In the medical model, clients are often assessed from head to toe. The doctor, physician assistant, nurse, or nurse practitioner starts with inspection, followed by percussion and palpation, and finally by auscultation. In a screening assessment, the therapist may not need to perform a complete head-to-toe
Box 4. Special Questions to Ask: Shoulder and Upper Extremity

General Systemic
- Does your pain ever wake you at night from a sound sleep? (Cancer)
  - Can you find any way to relieve the pain and get back to sleep?
    - If yes, how? (Cancer: pain is usually intense and constant; nothing relieves it or
      if relief is obtained in any way, over time pain gets progressively worse)
- Since the beginning of your shoulder problem, have you had any unusual perspiration for
  no apparent reason, sweats, or fever?
- Have you had any unusual fatigue (more than usual with no change in lifestyle), joint pain
  in other joints, or general malaise? (Rheumatic disease)
- Have you sustained any injuries in the last week during a sports activity, car accident, etc?
  (Ruptured spleen associated with pain in the left shoulder: positive Kehr’s sign)
- For the therapist: Has the client had a laparoscopy in the last 24–48 hours? (Left shoulder
  pain: positive Kehr’s sign)

Cardiac
- Have you recently (ever) had a heart attack? (Referred pain via viscerosomatic zones)
- Do you ever notice sweating, nausea, or chest pain when the pain in your shoulder occurs?
- Have you noticed your shoulder pain increasing with exertion that does not necessarily cause you to use
  your shoulder (e.g., climbing stairs, stationary bicycle)?
- Do(es) your mouth, jaw, or teeth ever hurt when your shoulder is bothering you? (Angina)
- For the client with known angina: Does your shoulder pain go away when you take nitro-glycerin?
  (Ask about the effect of taking antacids/acid-relieving drugs for women.)

Pulmonary
- Have you been treated recently for a lung problem (or think you have
  any lung or respiratory problems)?
- Do you currently have a cough?
  - If yes, is this a smoker’s cough?
  - If no, how long has this been present?
    - Is this a productive cough (can you bring up sputum), and is the sputum
      yellow, green, black, or tinged with blood?
    - Does coughing bring on your shoulder pain (or make it worse)?
- Do you ever have shortness of breath, have trouble catching your breath, or feel breathless?
- Does your shoulder pain increase when you cough, laugh, or take a deep breath?
- Do you have any chest pain?
- What effect does lying down or resting have on your shoulder pain? (In the supine or recumbent position,
  a pulmonary problem may be made worse, whereas a musculoskeletal problem may be relieved; on the
  other hand, pulmonary pain may be relieved when the client lies on the affected side, which diminishes
  the movement of that side of the chest.)

Gastrointestinal
- Have you ever had an ulcer?
  - If yes, when? Do you still have any pain from your ulcer?
    - Have you noticed any association between when you eat and when your
      symptoms increase or decrease?
- Does eating relieve your pain? (Duodenal or pyloric ulcer)
  - How soon is the pain relieved after eating?
- Does eating aggravate your pain? (Gastric ulcer, gallbladder inflammation)
- Does your pain occur one to three hours after eating or between meals? (Duodenal or pyloric ulcers,
  gallstones)
- For the client taking NSAIDs: Does your shoulder pain increase two to four hours after taking your
  NSAIDs? If the client does not know, ask him or her to pay attention for the next few days to the response
  of shoulder symptoms after taking the medication.
- Have you ever had gallstones?
physical assessment. If the initial observations, history, screening questions, and screening tests are negative, move on to the next step. In most situations, it is advised to assess the musculoskeletal area and system above and below the area of complaint. When screening for systemic origins of clinical signs and symptoms, the therapist first scans the area(s) that directly relate to history and clinical presentation. For example, a shoulder problem can be caused by a problem in the stomach, heart, liver/biliary, lungs, spleen, kidneys, and ovaries (ectopic pregnancy) (Figure 2). Only the physical assessment tests related to these areas would be assessed. And these often can be narrowed down by the history, gender, age, presence of risk factors, and associated signs and symptoms linked to a specific system.

Clinical presentation including pain patterns and pain types is the next part of the decision-making process. Specific pain patterns corresponding to the various bodily systems are provided in subsequent articles of this issue of the Journal of Hand Therapy. Additionally, a summary of key red flag findings related to clinical presentation and associated with systemic illness is listed in Box 2.

• Do you have a feeling of fullness after only one or two bites of food? *(Early satiety: stomach and duodenum or gallbladder)*
• Have you had any nausea, vomiting, difficulty in swallowing, loss of appetite, or heartburn since the shoulder started bothering you?

**Gynecologic**
• Have you ever had a breast implant, mastectomy, or other breast surgery? *(Altered lymph drainage, scar tissue)*
• Have you ever had a tubal or ectopic pregnancy?
• Have you ever been diagnosed with endometriosis?
• Have you missed your last period? *(Ectopic pregnancy, endometriosis; blood in the peritoneum irritates diaphragm causing referred pain)*
• Are you having any spotting or irregular bleeding?
• Have you had any spontaneous or induced abortions recently? *(Blood in peritoneum irritating diaphragm)*
• Have you recently had a baby? *(Excessive muscle tension during birth)*
  If yes: Are you breastfeeding with the infant supported on pillows?
  Do you have a breast discharge, or have you had mastitis?

**Urologic**
• Have you had any recent kidney infections, tumors, or kidney stones? *(Pressure from kidney on diaphragm referred to shoulder)*

**Trauma**
• Have you been in a fight or been assaulted?
• Have you ever been pulled by the arm, pushed against the wall, or thrown by the arm?
  If the answer is “Yes” and the history relates to the current episode of symptoms, then the therapist may need to conduct a more complete screening interview related to domestic violence and assault.

*Cluster of three to four or more lasting longer than one month.


Monitoring vital signs is a quick and easy aspect of screening for medical conditions of the cardiovascular and pulmonary systems. The therapist should look at pulse, blood pressure, and respiratory rate, as well as, observe what effect increased respiratory movements have on upper quarter symptoms.

**Associated Signs and Symptoms**

Because therapists spend a considerable amount of time investigating pain, it is easy to remain focused exclusively on this symptom when clients might otherwise bring to the forefront other important problems. Thus, the therapist is encouraged to become accustomed to using the word “symptoms” instead of “pain” when interviewing the client.

The therapist can identify the presence of associated signs and symptoms by asking:

• Are there any symptoms of any kind anywhere else in your body that we have not talked about yet?
• Alternately: Are there any symptoms or problems anywhere else in your body that may not be related to your current problem?
This approach to questioning progress (or lack of progress) may help you see a systemic pattern sooner than later. The patient/client may not see a connection between shoulder pain and blood in the urine from kidney impairment or blood in the stools from chronic nonsteroidal antiinflammatory (NSAID) use. The individual with shoulder or upper extremity pain from a cardiac source usually has some other associated symptoms, and, in most cases, the client does not see the link. If the therapist does not ask, the client does not offer the extra information.

Each system has a typical set of core signs and symptoms associated with impairment of that system. These are listed in Box 3, with more specific indicators of neurologic involvement and cervical myelopathy presented in Table 2. These associated warning signs alert the informed therapist of the need for further questioning and possible medical referral.

**Review of Systems**

In the screening process, a Review of Systems should be done after conducting an interview, performing an assessment of the pain type and/or pain patterns, and reviewing the clinical presentation. The therapist reviews all of the data collected (past medical history, risk factors, clinical presentation including red flags and associated signs and symptoms) and looks for any characteristics of systemic disease. Any identified clusters of associated signs and symptoms are reviewed to search for a potential pattern that will identify the underlying system(s) involved (see Box 3). Perhaps, the therapist observes dry skin, brittle nails, cold or heat intolerance, excessive hair loss, and realizes these signs could be pointing to an endocrine problem. At the very least, the therapist recognizes that the clinical presentation is not something within the musculoskeletal or neuromuscular systems.

The Review of Systems looks beyond the primary problem that brought the client to the therapist in the first place. It gives an overview of the “whole person,” and guides the therapist in choosing appropriate tests and measures.46 The therapist is not responsible for identifying the specific pathologic disease underlying the clinical signs and symptoms present. However, the alert therapist who classifies groups of signs and symptoms in a review of systems will be more likely to recognize a problem outside his or her scope of practice and be equipped to communicate this unusual presentation to the physician.

**THE SHOULDER IS UNIQUE**

Differential diagnosis of shoulder pain is sometimes especially difficult because any pain that is felt in the shoulder often affects the joint as though the pain were originating in the joint.47 Esophageal, pericardial (or other myocardial diseases), aortic dissection, diaphragmatic irritation from thoracic or abdominal diseases, and breast disease all can appear as unilateral shoulder pain (Figure 3). Even if exacerbated by shoulder movement or if there are objective findings at the shoulder,48 upper quadrant pain with any of the following components should be approached as a manifestation of systemic visceral illness.

- Pleuritic component (e.g., cough, reproduction, or increase in symptoms with respiratory movements)
- Exacerbation by recumbency
- Coincident diaphoresis (cardiac)
- Any associated gastrointestinal signs and symptoms (e.g., nausea, vomiting, abdominal pain or distention, belching, diarrhea)
- Exacerbation by exertion unrelated to shoulder movement (cardiac)
- Associated urologic signs and symptoms (e.g., blood in urine, painful or frequent urination, and unusual change in urine color).

Additionally, follow-up questions presented in Box 4 may also be used to help the therapist determine when shoulder symptomatology is not musculoskeletal in nature.

**FIGURE 4.** Irritation of the peritoneal (outside) or pleura (inside) surface of the central area of the diaphragm can refer sharp pain to the upper trapezius muscle, neck, and supraclavicular fossa. The pain pattern is ipsilateral to the area of irritation. Irritation to the peripheral portion of the diaphragm can refer sharp pain to the ipsilateral costal margins and lumbar region (not shown). (Goodman CC, Snyder TE: Differential Diagnosis for Physical Therapists: Screening for Referral, 4/e. Philadelphia, W.B. Saunders [Elsevier], 2007. Used with permission.)
“Frozen shoulder,” or adhesive capsulitis, can be associated with conditions such as diabetes mellitus, hyperthyroidism, ischemic heart disease, infection, and lung diseases (TB, emphysema, chronic bronchitis, Pancoast’s tumors) 49. Shoulder pain (unilateral or bilateral) progressing to adhesive capsulitis can occur six to nine months after a CABG. Similarly, anyone immobile in the intensive care unit or after pacemaker placement can experience loss of shoulder motion without a history of precipitating trauma, resulting in adhesive capsulitis.

Examples of abdominal disorders that can produce shoulder pain include ectopic pregnancy, laparoscopic surgery complication, spleen, and renal disease. A ruptured ectopic pregnancy with abdominal hemorrhage can produce left shoulder pain in a woman of childbearing age. The therapist may have to ask if the woman is sexually active and if there has been a recent history of missed menses or recent unexplained bleeding. During a laparoscopic procedure, air is introduced into the peritoneum to expand the area and move the abdominal contents out of the way. Residual gas present postoperatively can put pressure on the diaphragm and refer pain to the shoulder (Figure 4). Left shoulder pain can also occur from damage to or rupture of the spleen. In either of the latter cases, the resultant left shoulder pain is referred to as Kehr’s sign. Likewise distention of the renal capsule from kidney disorders can cause pain to the ipsilateral shoulder. Urologic symptoms are usually present; however, the client may not recognize the connection between painful urination and shoulder pain.

In a busy clinic, prioritizing system screening in patients with shoulder (or other) disorders may be necessary. Consider the postmenopausal woman with primary family history of heart disease who presents with shoulder pain that occurs 3–4 minutes after starting an activity and is accompanied by unexplained perspiration. This individual should be assessed for cardiac involvement. Or think about the 45-year-old mother of five children who presents with scapular pain that is worse after she eats. A cardiac assessment may not be as important as a scan for signs and symptoms associated with the gallbladder or biliary system.

**PHYSICIAN REFERRAL**

Medical consultation or referral is required when no apparent movement dysfunction, causative factors, or syndrome can be identified and/or the findings are not consistent with a neuromuscular or musculoskeletal problem. The therapist should keep in mind that referral from a physician, may be part of the medical differential diagnosis. In other words, sometimes the physician sends a patient/client to physical or occupational therapy “to see if it will help.” The therapist is not always aware of the physician’s intent in this regard. Having this information helps the therapist avoid sending the patient right back to the physician without providing the complete information needed.

The hallmark of professionalism in any health-care practitioner is the ability to understand the limits of his or her professional knowledge. The therapist, either on reaching the limit of his or her knowledge or on reaching the limits prescribed by the client’s condition, should refer the patient/client to the appropriate personnel. In this way, the therapist will work within the scope of his or her level of skill, knowledge, and practical experience.

Knowing how to refer the client or how to notify the physician of important findings is not always clear. When the hand therapist identifies signs and symptoms that point to a separate or additional medical problem that is unrelated to the upper extremity impairment, do you send the client back to the referring physician (i.e., hand surgeon) or refer him or her to a primary care physician? If the patient was sent by a physician, contact with the referral source is generally the best first option—usually by telephone. Do not assume that what you are seeing is what the physician saw or that the physician “missed” something. Report the observed signs and ask for their thoughts on how to handle the situation. When the client has come to the hand therapist without a medical referral, the patient/client should be referred to a primary care physician (his/her own if the client has one).

Whether or not the client follows up with a medical practitioner, the therapist is urged to document subjective and objective findings carefully, as well as the recommendation made for medical follow-up. The therapist should make every effort to get the therapy records to the consulting physician. When providing written documentation, a short paragraph of clinical findings and intervention is followed by a list of concerns, perhaps with the following remarks, “These do not seem consistent with a neuromuscular or musculoskeletal problem (choose the most appropriate phrase for the client or name the medical diagnosis, e.g., carpal tunnel syndrome).” Then, follow-up with one of two questions/comments:

- What do you think? or
- Please advise.

**CONCLUSION**

Although medical conditions can cause pain, dysfunction, and impairment of many areas of the body, the most common viscogenic referral location in the upper extremity is the shoulder. The patient/client’s history, presenting pain pattern, and possible
associated signs and symptoms must be reviewed along with results from the objective evaluation in making a treatment-versus-referral decision. Knowing the risk factors for various illnesses, diseases, and conditions will help guide the therapist in knowing when to screen for specific problems.

In the screening process, there are a few steps that should not be omitted. First, pay attention to the patient’s past medical history. Second, have the patient complete a body pain chart. Review this for any patient’s past medical history. First, pay attention to the patient complete a body pain chart. Review this for any patient’s past medical history. Third, always ask if there are any symptoms of any kind anywhere else in the body that you have not already talked about. Do not just ask about pain. Review current and recently taken medications. Review the Special Questions listed in Box 4. It is not necessary to ask each patient/client all the questions. But a quick review of the list can help the clinician focus the screening approach and ask pertinent questions that might aid in the decision-making process. And finally, take vital signs.

Each case will require individual thought and action. In some cases, it will be necessary to refer the patient/client to another health-care professional. In some situations, there may be clear indications that direct intervention by the therapist can proceed. And sometimes, treatment and referral are both necessary.

Using the five-step decision-making model provided in Box 1 will serve as a reminder of the most important steps to take and factors to consider in medical screening. If someone fails to improve with treatment, gets better and then worse, or just gets worse, the treatment protocol may not be in error. Certainly, the first steps are to confirm your understanding of the clinical presentation, repeat appropriate exams, and review selected intervention(s), but also consider the possibility of a systemic or viscerogenic origin of symptoms. Use the screening tools outlined in this issue to evaluate each individual client.

Additional study on the part of the clinician may be needed to enable the therapist to screen more effectively for other contributing or causal factors for musculoskeletal disorders such as domestic violence, adverse drug effects, occupational exposures, and eating disorders. Screening for these variables is beyond the scope of this article.

REFERENCES


JHT Read for Credit
Quiz: Article # 150

Record your answers on the Return Answer Form found on the tear-out coupon at the back of this issue. There is only one best answer for each question.

#1. A critical result of medical system reviewing/screening is to be able to make a
   a. provisional medical diagnosis
   b. definitive medical diagnosis
   c. treatment vs referral decision
   d. plan of treatment

#2. A handy pneumonic for cancer screening is the term
   a. CAUTION
   b. RED FLAG
   c. BEWARE
   d. LOOK OUT

#3. Pain originating from the peritoneal region (e.g. from the diaphragm) and referred to the point of the shoulder is known as
   a. Mennells sign
   b. Maitlands sign
   c. Kleinerts sign
   d. Kehrs sign

#4. Which pathology typically does NOT give rise to referred pain down the medial aspect of the arm and into the ulnar digits
   a. cardiac
   b. breast
   c. pleuropulmonary
   d. aortic aneurysm

#5. The most common viscogenic referral location in the upper extremity is the
   a. elbow
   b. shoulder
   c. little finger
   d. thumb

When submitting to the HTCC for re-certification, please batch your JHT RFC certificates in groups of 3 or more to get full credit.