URGENT CARE ALERT

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INSIDE

Diagnosis of Lower Limb Deep Venous Thrombosis

ABSTRACT & COMMENTARY

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Dr. Shufeldt reports no financial relationships relevant to this field of study.

Synopsis: *An evaluation of the usefulness of scoring to predict the presence of lower limb deep venous thrombosis.*

Source: Subramaniam RM, et al. Diagnosis of lower limb deep venous thrombosis in emergency department patients: Performance of Hamilton and modified Wells scores. *Ann Emerg Med*. 2006;48:678-685.

THE DIAGNOSIS OF DEEP VENOUS THROMBOSIS (DVT) BY CLINICAL indicators alone is often unreliable. Moreover, untreated DVT can lead to pulmonary embolism, a serious and sometimes fatal complication. The purpose of this study was to compare the sensitivity of 2 clinical grading classifications, the modified Wells score (10 less well-defined and somewhat overlapping components) and the Hamilton score (7 non-overlapping components). (*See Table.*)

Subramaniam and colleagues enrolled 317 patients suspected of having lower limb DVT. Eight patients were excluded from the study for the examiner's failure to order a d-dimer test. Of the 309 patients who met inclusion criteria, 67 (21.7%) had ultrasonic confirmation of a DVT.

Using the Hamilton score, 195 patients were placed in the likely category and 114 were placed in the unlikely category. Of the patients determined to be positive for DVT, 34% had a pretest probability of 'unlikely' using the Hamilton score. Sixty-six percent had a pretest probability of likely. Applying the modified Wells criteria, 25% had a pretest probability of unlikely, and 75% had a pretest probability of likely.

Of the 309 patients studied, 143 (46%) had a negative d-dimer result and 166 (54%) had a positive d-dimer result. Of the 143

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Urgent Care Alert physician editor John Shufeldt, MD, JD, MBA, FACEP, and peer reviewer John Santamaria, MD, FAAP, FACEP, report no financial relationships to companies having ties to this field of study.

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patients in the study with a negative d-dimer result, 135 (94%) had a negative ultrasound finding.

Only one patient was determined to have a DVT who had a negative d-dimer result and an 'unlikely' classification. The authors concluded that combining either the Hamilton criteria or the modified Wells criteria with a negative d-dimer result led to an estimated sensitivity of 99%. Further, the Hamilton criteria were less cumbersome to use since there was less overlap and less operator subjectivity.

■ COMMENTARY

This study is of particular use to urgent care centers that have the availability of d-dimer testing. In patients who the provider believes have low clinical suspicion for a DVT, it can be effectively ruled out by using the Hamilton or modified Wells score along with a negative d-dimer test, thus, saving the time and expense of ordering for a venous Doppler examination. One note of caution: This study enlists a fairly small sample size; consequently, its conclusions may not be representative of a larger patient population.

The Hamilton test, which is arguably easier to apply, performed just as well as the modified Wells score to risk stratify patients with suspected lower extremity venous thrombosis. ■

Table

Hamilton Criteria and Modified Wells Criteria

Hamilton Criteria: (2 points each for #'s 1, 2, 3 and 1 point for #'s 4, 5, 6, 7)

- Plaster immobilization of lower limb
- Active malignancy (within 6 months)
- Strong clinical suspicion without other diagnostic possibilities
- Bed rest (> 3) or recent surgery (within 4 weeks)
- Male
- Calf circumference > 3 cm on affected side
- Erythema

Unlikely versus likely cutoff score 2 or less

Modified Wells Criteria: (1 point each)

- Plaster immobilization of lower limb
- Active malignancy (within 6 months)
- Strong clinical suspicion without other diagnostic possibilities
- Bed rest (> 3) or recent surgery (within 4 weeks)
- Male
- Calf circumference > 3 cm on affected side•
- Erythema
- Localized tenderness along venous distribution
- Entire leg swollen•
- Pitting edema confined to symptomatic leg•
- Collateral superficial veins
- Previously documented DVT
- Alternative diagnosis at least as likely as DVT
- Overlapping criteria

Key:

DVT = deep vein thrombosis

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Seasonal Influenza: Prevention with Vaccines

ABSTRACT & COMMENTARY

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Dr. Beckham reports no financial relationships relevant to this field of study.

Synopsis: *Overview of prevention and treatment for influenza type A and B with inactive and live vaccines and antiviral medications.*

Source: Targonski P, et al. Seasonal influenza: Prevention with influenza vaccines. Medscape 2006 Available at: www.medscape.com/viewprogram/6047.

EACH YEAR THERE ARE 20,000 TO 40,000 DEATHS and up to 300,000 hospitalizations secondary to

acute respiratory tract infections associated with influenza.[1] Those at the highest risk for morbidity and mortality are elderly (65 years and older) adults, adults, and children with chronic health problems, and children age 6 months to 59 months.[2] The usual months of influenza outbreak are October through May.

The recommendations regarding which strains of influenza A and B should be targeted in the upcoming year's vaccines are made the preceding February by the US Food and Drug Administration. These decisions are based on the new strains of viruses that may occur secondary to antigenic changes. The Centers for Disease Control and Prevention (CDC) then makes recommendations annually for prevention and treatment of the influenza outbreak.

There are 2 types of vaccines available to prevent influenza A and B. The first is the trivalent inactivated vaccine, or the flu shot, which has been recommended since 1963. Because it contains only inactivated and purified virus, it does not cause any influenza symptoms in patients who receive it. The CDC recommends giving the vaccine in the months of October and November; however, it can be given at any time throughout the influenza season. This vaccine does not prevent all patients from developing symptoms, but it can prevent hospitalizations and death in 70%-90% of healthy adults[3] and 60%-80% in elderly debilitated patients.[1] This lower effectiveness is presumed secondary to the blunted immune response to the vaccination in this population.

The less commonly utilized vaccine is the cold-adapted live attenuated intranasal vaccine. Although in the right population this form of vaccine is quite effective, its exact mechanism of protection is not clearly understood. Because it is a live virus, there is a chance of developing mild influenza symptoms after vaccination. Unlike the inactivated injected vaccine, this live vaccine is not recommended for those patients who may be immunocompromised, pregnant, or who have chronic pulmonary or cardiovascular conditions.

The second line of prevention and treatment of viral influenza are the antiviral agents. One class, the adamantanes, is not currently recommended as treatment for 2 reasons: influenza virus has developed a resistance to it over the past 3 years and it is only active against influenza A. The N-inhibitors include the medications oseltamivir and zanamivir, which are active against influenza A and B. These medications will decrease the duration of symptoms by 1-2 days in uncomplicated patients if they are started within 2 days of the onset of symptoms, and they may decrease the morbidity and mortality in high-risk patients. Both medications should be continued for 5 days when they are given for treatment; however, oseltamivir is approved for anyone older than 1 year, and zanamivir is only approved for patients older than 7 years.

The role of antiviral medications in prevention is secondary to vaccines; however, they can be given prophylactically in certain settings. During influenza outbreaks, they can be given to patients who have already been vaccinated or to those who are vaccinated at the time of the outbreak. For this purpose, they should be continued for a 2-week course at a dose of one time per day instead of 2 times per day, as in the treatment dosing.[4]

COMMENTARY

Despite the continued effort to educate patients and health care workers regarding the importance of influenza vaccine and treatment, our vaccination rates remain low.[5] Surprisingly, one of the groups with the lowest vaccination rates is health care workers.[6] Increasing the vaccination rate throughout the population will significantly affect the morbidity and mortality in the elderly population and will positively affect the healthy population by decreasing days missed from work and school by illness.[2] The medical community needs to improve its process of implementing influenza vaccination protocols to capture more patients, and it should improve utilization of antiviral medications when a patient presents with possible influenza symptoms. ■

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MRSA: More Common Than You Think

ABSTRACT & COMMENTARY

By Donna Woods, DO

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Dr. Woods reports no financial relationships relevant to this field of study.

Synopsis: *Methicillin-resistant Staphylococcus aureus (MRSA) is common in patients presenting to the emergency department with cellulitis or abscess. All MRSA isolates were sensitive to rifampin and bactrim.*

Source: Moran G, et al. Methicillin-resistant *S. aureus* infections among patients in the emergency department. *N Engl J Med*. 2006:355:666-674.

This prospective study on the prevalence of CA-MRSA (community-acquired methicillin-resistant *Staphylococcus aureus*) in skin infections examined in cultures from 422 patients treated in university-affiliated emergency departments in 11 US cities. Patients were at least 18 years old and had a diagnosis of abscess, wound infection, or cellulitis, with purulent drainage for less than one week duration. Swabs were obtained and sent to hospital laboratories for culture and sensitivities, and then forwarded to the CDC for further genetic characterization. Specifically, genes for the production of the Panton-Valentine Leukocidin (PVL), (a cytotoxin that may serve as a virulence factor and is associated with CA-MRSA abscesses and necrotizing pneumonia) and SCCmec (a gene complex that confers methicillin resistance) were examined.

S. aureus was isolated in 76% (320/422) of patients, and MRSA was isolated in 59% (249/422) of patients. When analyzed by each individual hospital, the prevalence of MRSA ranged from 15%-74%. MRSA was found to be the most common infecting organism in 10 of 11 hospitals. Other types of bacteria isolated included methicillin-susceptible *S. aureus* (MSSA) (17%), coag-negative staphylococcus (3%), streptococcus (7%), and *Proteus mirabilis* (1%). Polymicrobial infections were identified in 31 patients, 10 of which contained MRSA. No organism was identified in 38 patients.

All MRSA isolates in this study were sensitive to bactrim and rifampin. Most strains showed in-vitro sensitivity to clindamycin (95%), 92% were sensitive to tetracyclines, 60% were sensitive to fluoroquinolones, and 7% were sensitive to erythromycin.

Type IV SCCmec (which is characteristic of CA-MRSA) and genes for PVL were isolated in 98% of MRSA samples.

Using multivariate logistic-regression analysis, the following characteristics were associated with an increased risk of having MRSA: taking an antibiotic in the past month, having an abscess, reporting a spider bite, having a history of MRSA infection, and close contact with a person with similar infection. Having an underlying illness and racial classification of 'other' were actually associated with a decreased risk of having MRSA in this study, compared with other bacteria.

Complete treatment information was available in 96% of the patients. An incision and drainage (I+D) and antibiotic were administered to 66% of patients; 10% received antibiotics alone, 19% received I+D alone, and 5% received neither I+D nor antibiotic therapy.

In 57% (100/175) of patients who were treated with an antibiotic, the prescribed therapy was not in concordance with culture and sensitivity results. Despite this finding, no significant differences in outcome were found at a follow-up of 15-21 days between patients with MRSA and patients with other types of bacteremia. Case-finding audits revealed that only 42% of eligible patients were enrolled. Unenrolled patients were found to have similar characteristics (eg, age, sex, and ethnicity) to those enrolled, and MRSA was isolated in 57% of unenrolled patients.

COMMENTARY

It is not surprising that this study demonstrates that the incidence of CA-MRSA is rising. Prior to 2000, reports of CA-MRSA were rare. Only 3% of cultures from skin and soft-tissue infections submitted to laboratories in Minnesota contained MRSA.[1] Numerous studies during the past 6 years have demonstrated an increase in MRSA.[2-4]

What is striking about these results is that CA-MRSA was the most common organism isolated. These results were not associated with independent outbreaks, and the results were fairly consistent at 10 of 11 sites. This information is compelling because the use of empiric antibiotics in this setting should be directed at covering 'the most common bug.' Often, an anti-staphylococcal β-lactam is prescribed as a first-line treatment, but this study suggests that this may not be the most appropriate choice of therapy.

Although the incidence of complications from I+D is

low, and complete resolution of an abscess is usually possible with I+D alone,[5-8] there are many instances where the standard of care suggests empiric antibiotics should be prescribed. Tintinalli's *Emergency Medicine* textbook suggests that "in patients with diabetes, alcoholism, or other underlying immunocompromising illnesses, or in those on immunosuppressant medications such as steroids or chemotherapeutics, the threshold of antibiotic use should be much lower. Furthermore, patients who present with signs of systemic disease such as fever and chills and those with cellulitis extending beyond the abscess borders also should be considered for antibiotic therapy."[9] This text also suggests that infections on the hands and face be treated more aggressively due to their higher morbidity rate.[9]

Bacteremia associated with I+D of an abscess is also controversial. One study showed bacteremia in 11 of 30 patients who underwent I+D of abscesses.[10] In another study, blood cultures were obtained at 2 minutes and 10 minutes after an I+D, and none of them were positive.[11] Ultimately, the American Heart Association recommends treating patients with structural heart disease with endocarditis prophylaxis. Such prophylaxis in the past usually consisted of an anti-staph β-lactam (or vancomycin if a known MRSA infection). Perhaps the initial choice of antibiotics in this setting also should be revisited.

Finding a balance between evidence-based medicine and the standard of care in this arena remains a challenge. Due to the multitude of factors that affect these decisions, and the lack of clear guidelines on antibiotic use in this setting, clinical judgment is relied on heavily. When an antibiotic is considered — for either treatment of an abscess or endocarditis prophylaxis for an I+D — anti-staph β-lactams should not be the first line of therapy because they would not be active against what seems to be the 'most common bug' in this setting. ■

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A Part of the Solution: Reducing Medical Errors in Urgent Care

ABSTRACT & COMMENTARY

By Scott C. Elston, MD

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Dr. Elston reports no financial relationships relevant to this field of study.

Synopsis: *Authors reviewed 181 malpractice claims alleging injury from missed or delayed diagnosis. The most common missed diagnosis was cancer (breast and colorectal). The most common causes were failure to order appropriate tests and inadequate follow-up care.*

Source: Gandi TK, et al. Missed and delayed diagnoses in the ambulatory setting: A study of closed malpractice claims. *Ann Intern Med*. 2006;145;488-496.

In a retrospective study of 181 closed malpractice claims, reviewers determined that the most

common causes of missed or delayed diagnosis involved multiple factors — including but not limited to — knowledge and process errors. The majority involved both. Reportedly, 59% of the errors resulted in serious harm, and 30% resulted in death. Fifty-nine percent of these claims involved the diagnosis of cancer (mostly breast [24%] and colorectal [7%]). The most common breakdowns in the diagnostic process were failure to order appropriate diagnostic tests (55%), failure to create a proper follow-up plan (45%), failure to obtain adequate medical history or perform adequate physical examination (42%), and incorrect interpretation of diagnostic tests (37%). A median of 3 process breakdowns occurred per error, and 2 or more were involved in 43% of the cases. Missed cancer diagnoses were more likely to involve diagnostic tests being performed and/or interpreted incorrectly; missed noncancer diagnoses were more likely to involve delays by patients in seeking care, inadequate history or physical examination, and failure to refer.

The most common explanation for physicians not to order appropriate test(s) was seemingly lack of knowledge. The main reasons for inadequate follow-up plans were that none was thought necessary by the physician, an inappropriate interval was chosen, or poor documentation of the plan. While cognitive factors were linked to virtually all diagnostic errors, they were usually accompanied by communication factors, patient-related factors, or other system factors (eg, handoffs).

COMMENTARY

Gandi and colleagues suggest the use of systems interventions and, specifically, the use of the electronic medical record (EMR), with built-in triggers to certain diagnostics given particular complaints/findings, as one possible step toward a reduction of errors. This is certainly likely to be helpful when EMRs become more widespread and sophisticated; however, a more immediate intervention is obviously needed. This intervention will likely remain important in reducing this serious problem, particularly in the fast-paced environment of urgent care. Having comprehensive, efficient, and effective standard operating procedures is a must. However, having staff and providers who are familiar — as well as compliant — is obviously vital to successful implementation. Process errors — as well as knowledge errors — can be reduced to a minimum only with stabilization of the work force and medical staff. Frequent turnover and use of part time/temporary or agency personnel reduces the likelihood that any system — no matter how good — can or will be followed. In the past, many urgent care facilities have been staffed in a chaotic, haphazard fashion, thus, introducing multiple personalities and practice styles that frequently cannot be assessed until after the fact. By stabilizing the clinic staff and medical staff, and creating a standard routine schedule for them, one can then begin the education process regarding operating procedures, as well as medical education issues. This strategy also may be helpful when addressing the issue of follow-up/patient-related factors, and a patient-physician relationship can be fostered. Additionally, by utilizing easy-to-follow systems with built-in safety measures at multiple levels, one can help to reduce/eliminate communication and/or follow-up errors, as well as referral oversights. Use of equally clear standing orders and clinical practice guidelines, along with group and individual educational programs, can likewise assist in reducing the knowledge gap.

As urgent care assumes more of an integral (and recognizable) part of the health care delivery system, practitioners must work to improve and preserve the highest possible quality of care for patients and maintain urgent care's integrity and reputation in the industry. To achieve this goal requires ongoing efforts toward streamlined processes and procedures, and an effort toward stabilization, organization, and education of staff members. ■

Antibiotics for Acute Purulent Rhinitis? 'S not a Good Idea

ABSTRACT & COMMENTARY

By Allan J. Wilke, MD

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Dr. Wilke reports no financial relationships relevant to this field of study.

Synopsis: *Antibiotics may improve acute purulent rhinitis at the cost of gastrointestinal upset and rash.*

Source: Arroll B, et al. Are antibiotics effective for acute purulent rhinitis? Systematic review and meta-analysis of placebo controlled randomised trials. *BMJ*. 2006;333: 279-282.

Purulent nasal discharge is a common sign in the common cold and acute sinusitis. It is also a key

trigger for prescription of antibiotics.[1,2] Arroll and colleagues report their systemic review and meta-analysis of studies of the use of antibiotics in acute purulent rhinitis. They searched Medline, EMBASE, and the Cochrane controlled trials register and included controlled trials that studied purulent rhinitis, nasopharyngitis, common cold, and sinusitis where the study groups received an antibiotic and the control groups received a placebo. Acute was defined as less than 10 days. They found 5 papers that examined purulent rhinitis and 2 that examined rhinitis, but did not specify whether it was clear or cloudy. Several different antibiotics were studied: demethylchlortetracycline (demeclocycline, Declomycin® and others), amoxicillin (Amoxil® and others), co-trimoxazole (trimethoprim/sulfamethoxazole, Bactrim® and others), and cephalexin (Keflex® and others).

Pooling the data, there was a significant benefit from antibiotics with a relative risk of 1.21 (95% confidence interval, 1.09-1.34, number needed to treat 8). Looking at adverse effects (primarily vomiting, diarrhea, abdominal pain, and rash), the pooled relative risk was 1.46 (95% CI, 1.10-1.94). The number needed to harm was 7.

COMMENTARY

Eight men walk into a physician's office with green-yellow gunk coming out of their noses. We could treat all of them and, statistically, one of them might get better. On the other hand, at least one might suffer from an adverse side effect. What's a prudent physician to do?

Last year, Arroll et al published a systemic review of antibiotics for the common cold and acute purulent rhinitis.[3] In it they concluded that the evidence of benefit with use of antibiotics for upper respiratory tract infections is too weak to recommend it, but the evidence in acute rhinitis, purulent or clear, was stronger. Since antibiotics can cause significant adverse effects, they did not recommend their routine use. A Cochrane Review of chronic (ie, 10 days or greater) purulent nasal discharge in children[4] concluded that when there was radiographic evidence of sinusitis, antibiotics provided modest short-term help. The number needed to treat was 8.

Back to our prudent physician. The first step should be a discussion with the patient about the probable efficacy and the probable harm associated with use of antibiotics. Watchful waiting is appropriate. If *something* must be done, consideration should be given to nasal hypertonic saline irrigation. It is effective in acute sinusitis[5] and well tolerated.[6] ■

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Shingles: More Tools Now with New Vaccine

ABSTRACT & COMMENTARY

By John Shufeldt, MD, JD, MBA, FACEP

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Dr. Shufeldt reports no financial relationships relevant to this field of study.

Synopsis: *An overview of the treatment of shingles with the goal to reduce the incidence of postherpetic neuralgia.*

Source: Weinberg J. Shingles: More tools now. *Cortland Forum* 2006;11:40-41.

The incidence of herpes zoster (HZ) from varicella-zoster virus lying dormant in the sensory ganglia is 10%-20%. However, for patients 85 years and older, the incidence is reported to be as high as 50%. A goal in treatment is to prevent the occurrence of postherpetic neuralgia (PHN). Individuals who are more likely to develop the sequela of PHN are those with chronic fatigue syndrome, sleep disorders, immunocompromised states, and the elderly population.

HZ has a classic prodromal stage of a burning pain or

itching, followed by the eruption of a unilateral maculopapular to vesicular rash confined to one or 2 dermatomes. The patient also may experience a viral-like syndrome consisting of fever and malaise. The rash evolves over the span of 7-10 days, and the lesions disappear within 2-3 weeks. Treatment options include famciclovir and valacyclovir, and should be started within 3 days after outbreak of the lesions. It is important to note that treatment with antiviral medications does not prevent PHN; however, it does reduce viral shedding time and the median duration of PHN by approximately 2 months.[1]

A new live attenuated vaccine, Zoster Vaccine Live (Zostavax®), is available. Zostavax has been shown to reduce the overall incidence of HZ when compared with the control group, as well as decrease the incidence of PHN. Zostavax is recommended prophylactically for adults aged 60 years and older. The vaccine has been shown to decrease the incidence of both HZ and PHN, but is not indicated for treatment of either HZ or PHN. The vaccine is not recommended for patients who have had HZ within the last 10 years. The dosage is 0.65 mL administered in the upper arm. Of note, some patients developed a herpes zoster-like rash at the injection site.

COMMENTARY

Patients who present to an urgent care center who are older than 60 years and who have not had herpes zoster within the last 10 years can be offered the vaccine. Anyone who has had a herpes zoster infection in the past knows that this ounce of prevention *is* worth more than the pound of cure! ■

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CME Objectives

The objectives of *Urgent Care Alert* are to:

• quickly recognize or increase index of suspicion for specific conditions;

• apply state-of-the-art therapeutic techniques to treat patients with particular problems;

• identify both common and rare complications that may occur. ■

CME Questions

1. Patients with a low clinical suspicion for a deep vein thrombosis can be effectively ruled out by using either the Hamilton Score or Modified Wells Score systems.

   A. True
   B. False

2. In the study by Moran and colleagues, research on methicillin-resistant *Staphylococcus aureus* infections, all isolates were shown to be sensitive to:

   A. bactrim
   B. rifampin
   C. bactrim and rifampin
   D. neither

3. In the study by Gandi and colleagues of malpractice claims, the single most common breakdown in the diagnostic process was:

   A. failure to create a proper follow-up plan
   B. failure to obtain an adequate medical history
   C. incorrect interpretation of diagnostic tests

4. In treating herpes zoster, patients who are more likely to develop the sequela of PHN are:

   A. patients with chronic fatigue syndrome
   B. patients with sleep disorders
   C. patients with immunocompromised states
   D. the elderly population
   E. all of the above

Answers: 1. (a); 2. (c); 3. (a); 4. (e)

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Physicians participate in this CME program by reading the issue, using the references for research, and studying the questions. Participants should select what they believe to be the correct answers, then refer to the answer key to test their knowledge. To clarify confusion on any questions answered incorrectly, consult the source material. After completing the semester's activity, participants must complete the evaluation form provided at the end of each semester (June and December) and return it in the reply envelope to receive a letter of credit. When your evaluation is received, a letter of credit will be mailed to you. ■