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INSIDE

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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.

Use of Antibiotics in Hand Injuries

ABSTRACT & COMMENTARY

By John Shufeldt, MD, JD, MBA, FACEP

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Dr. Shufeldt reports no financial relationship to this field of study.

Synopsis: *Examines the use of routine prophylactic antibiotics for with simple hand lacerations.*

Source: Zehtabchi, S. Evidence-based emergency medicine/critically appraised topic. The role of antibiotic prophylaxis for the prevention of infections in patients with simple hand lacerations. *Ann Emerg Med*. 2007;49:682-689

SIMPLE HAND LACERATIONS ARE A COMMON PRESENTING CHIEF complaint in emergency departments. This evidence-based study evaluated the existing data about the utility of prophylactic antibiotic usage in patients with simple hand lacerations. Zehtabchi poses a common scenario about whether or not to use antibiotics in the treatment of a 3.5 cm palmer laceration not involving tendons, vessels, or other deeper structures, and then reviews the available literature using MEDLINE, EMBASE and the Cochrane Library.

A study was initially selected for use if the authors randomly assigned the use of prophylactic antibiotics in patients with simple hand lacerations. A simple or uncomplicated hand laceration was a laceration not caused by human or animal bite or burn, not communicating with a fracture or joint, and not involving extensive soft tissue damage or associated with tendon, nerve, or large vessel occurring below the radiocarpal joint. Outcome was measured by lack of infection, adequate cosmetic appearance, and complete wound healing. The study question was subsequently reformatted to: Do prophylactic antibiotics lower the incidence of hand infections in patients with hand lacerations that are managed by proper cleansing and wound closure, which are closed within 12 hours of the injury and are within the scope of care of ED physician?

After initially identifying more than 100 articles that fit loosely into the search criteria, Zehtabchi ultimately narrowed the review to 3 studies which met the inclusion criteria. Two of the studies used more than

one antibiotic "AB" regimen. The results of the 3 studies were as follow: Study 1 (Grossman, et al). Infection rate in AB group 1.15% and 1.1% in the placebo group, RR was 1.05 (0.09-11.38, 95% CI); Study 2 (Roberts, Teddy). Infection rate in AB group 8.8% and 12.0% in the placebo group, RR was 0.73 (0.37-1.46, 95% CI); Study 3 (Beesley, et al). Infection rate in AB group 1.4% and 1.3% in the placebo group, RR was 1.07 (1.07-16.8, 95% CI).

COMMENTARY

Simple hand lacerations are common presenting complaints in urgent care centers. A crucial component in the treatment of these lacerations is aggressive wound debridement and copious irrigation. This article concludes that the use of prophylactic antibiotics is, at best, controversial in the management of simple hand infections. In 2 of the studies, there was no statistically significant difference between the 2 groups, and in one of the studies, there seemed to be evidence, albeit not statistically significant, that the use of antibiotics decreased the incidence of infection.

So where does that leave us? How do we treat the patient in the aforementioned scenario? The simple answer is to give the patient informed consent. Zebtabchi suggests the following language: "We have closed your laceration after cleaning it and examining it thoroughly. We have determined that you have not done any damage to the special structures that affect your hand function, such as nerves, bones, or ligaments. There is only a small amount of scientific evidence on whether taking antibiotics affects the likelihood of infection and none on whether they influence the visibility of the final scar. The evidence suggests no difference for uncomplicated wounds, a possible benefit in patients whose wounds are contaminated. On the other hand, antibiotics may cause uncomfortable adverse effects, such as diarrhea and rash. Physicians are being asked to decrease the use of antibiotics for conditions in which they are not mandatory because of concern for increasing antibiotic resistance of common bacteria."

The documentation of that paragraph can be as simple as, "The patient was given informed consent about the risks of benefits of using prophylactic antibiotics for hand lacerations. The patient chooses to take antibiotics (or not to take antibiotics), understanding and verbalizing the risks, etc."

Unfortunately, the jury is still out on the use of prophylactic antibiotics in simple hand lacerations. Until a definitive answer is determined through a randomized, placebo-controlled study, we are left with basing our treatment on individual practices, provider experience, and patient concerns. However, at the end of the day, the use of evidence-based practice, along with adequate informed consent, remains the Holy Grail of state-of-the-art, cost-conscious, "defensive" medicine and should continue to guide our practice patterns. ■

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Work-Related Eye Injuries and Illnesses

ABSTRACT & COMMENTARY

By René J. Beckham, MD

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

Synopsis: *Overview of prevention and treatment of work-related eye injuries and illnesses.*

Source: Peate, WF. Work-related eye injuries and illnesses. *Am Fam Physician*. 2007;75:1017-1022.

There are more than 65,000 work-related eye injuries and illnesses each year in the United States.[1] This is troublesome not only because of the morbidity and disability associated with it for the employees, but the effect of the high absenteeism on the employer groups as well. The reality of it is that over

90% of these injuries could have been prevented with proper eye protection.[2]

Urgent care clinics must be prepared for these injuries when they present to minimize the morbidity and disability. The most important part of preparation is to have a well stocked eye tray and to complete and document an initial visual acuity exam for future comparison.

Eye Tray :

Medications

- Short acting mydriatic agent (eg, tropicamide)
- Topical anesthetic (eg, proparacaine, tetracaine)
- Topical antibiotics (eg, bacitracin, erythromycin ointments are preferred)

Materials

- Basin to catch water irrigation
- Cobalt-blue filtered light and fluorescein dye
- Cotton-tipped swabs for foreign body exam and removal
- Diluted sodium hypochlorite spray to disinfect work surfaces
- IV drip tubing with 1 liter isotonic saline and ph paper for chemical burns
- Ophthalmoscope
- 18 gauge hypodermic needle for foreign body and rust rings
- Sterile water

Diagnosis and Management

Corneal abrasions

This usually occurs after a trauma to the eye where there has been a foreign body rubbing or scratching the eye. Common symptoms include pain, tearing, blinking, blurry vision, or pain with movement. The exam should be preceded by instilling topical anesthetic to decrease discomfort, then evaluating for a foreign body with eyelid eversion using a cotton swab. The abrasion can then be diagnosed using fluorescein dye and a blue filtered light. Studies have shown that eye patching does not increase healing or decrease discomfort, and often increases pain for patients.[3-5] The treatment, therefore, consists of topical antibiotic ointment or drops and oral pain medication. The patient will need referral to an ophthalmologist only if healing does not occur over the following 3 days or there remains evidence of infection.

Foreign Bodies

After instilling a topical anesthetic, evaluation should be performed with a saline-soaked cotton swab and should include eversion of the eyelid. An eye wash can remove minor irritants such as soot. A foreign body which is deeper in the cornea, or a rust ring, can be removed with an 18-gauge needle and a slit lamp. If these tools are not available, or this can not be accomplished easily, the patient should be referred to an ophthalmologist.

Blunt Trauma

This can cause more serious injury such as bleeding into the retina, anterior chamber, or vitreous. It can also cause eyelid lacerations involving the eyelid margins, or there may be penetrating injuries associated the trauma. Traumatic mydriasis is caused by a concussive blow to the glob or orbit and should not be confused with a "blown" pupil caused by a third cranial nerve palsy. Any of these more serious injuries should be referred to a specialist.

Chemical Burn

Ocular chemical burns make up a significant percentage of work-related eye injuries[6] and require rapid treatment. The initial treatment is irrigation with one liter of saline over one to 2 hours and prompt referral to an ophthalmologist.[7] Litmus or pH paper can be used and when it is near neutral,[6-8] the irrigation can be discontinued.

Conjunctivitis

Allergic conjunctivitis is most commonly caused by a stimulus at work. Patients may have other allergy type symptoms with it, and their symptoms improve when they are outside of work. Patients can go through more specific allergy testing if this is suspected and be treated with topical mast-cell stabilizers or antihistamines.

Work place instructions must be given when any worker is diagnosed with infectious conjunctivitis. These include frequent hand washing, no shared towels, and disinfecting all work surfaces. Those with bacterial conjunctivitis should be treated with topical antibiotics and off work 5-7 days, or until the discharge clears, while those with viral conjunctivitis should not return to work until 7-10 days after the onset of symptoms.[8]

Prevention

The Occupational Safety and Health Administration (OSHA) mandates employers provide workers with adequate eye protection.[9] This includes well-fitting,

indirectly-vented goggles or a full-face respirator to prevent exposure to chemical and caustic hazard. When a chemical exposure occurs in those with contact lenses, irrigation should be started immediately and the contact lens removed as soon as possible.

COMMENTARY

Despite the continued efforts in the workplace to implement safety precautions, there is a significant rate of occupational eye injuries and illnesses. The urgent care clinic is a logical location for many of these ocular urgencies to present, and each clinic needs to be prepared to treat them efficiently and quickly to prevent future morbidity and disability. It is also clear that the physicians need to know their abilities and limitations in treating these injuries, and refer to an ophthalmologist when necessary. ■

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A Shot in the Leg Could Save a Life

ABSTRACT & COMMENTARY

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

Synopsis: *Risk reduction entails confirmation of the trigger, discussion of avoidance of the relevant allergen, a written individualized emergency anaphylaxis action plan, and education of supervising adults with regard to recognition and treatment of anaphylaxis.*

Source: Sicherer SH, et al. Self-injectable epinephrine for first-aid management of anaphylaxis. *Pediatrics*. 2007;119: 638-646.

Concern about the potentially lethal effects of anaphylaxis center around respiratory compromise and cardiovascular collapse. Rapidly administered epinephrine by intramuscular injection in the vastus lateralis muscle is the most commonly accepted, as well as the best initial treatment. Failure to administer epinephrine promptly is one of the 3 factors associated with fatal anaphylaxis; the others being preexisting asthma and the adolescent age group. Although inhaled selective B_2 adrenergic agonists (in children with known preexisting asthma) and oral H_1 antihistamines are used as adjunctive agents, they will not relieve upper airway edema or shock and do not replace the indication for epinephrine.

The recommended dose of epinephrine for anaphylaxis is 0.01 mg/kg, up to 0.30 mg SQ or IM. The risks of prescribing an epinephrine syringe, ampule, and needle include overdosing, underdosing, and slower administration. Epinephrine autoinjectors are only available as 0.15 mg (EpiPen Jr.) and 0.30 mg (EpiPen) unit doses, which may not correspond to the recommended epinephrine doses based on per kilogram calculations. Due to the ease of use and predictable dosing compared to using a syringe and needle, Sicherer and colleagues recommend using the autoinjectors. They recommend using the autoinjector containing 0.15 mg of epinephrine for children weighing 10 to 25 kg and the autoinjector containing 0.30 mg of epinephrine for children weighing more than 25 kg.

Prescription of an epinephrine autoinjector is primari-

ly indicated for those having a previous episode of anaphylaxis with respiratory or cardiovascular compromise, or a child who has experienced generalized acute urticaria following an insect sting. With the decision to prescribe an epinephrine autoinjector comes the responsibility to educate the patient and family regarding appropriate circumstances to dose the epinephrine, proper administration technique, and the need for prompt physician evaluation after epinephrine administration. Immediately after dosing the intramuscular epinephrine, it is important to call 911 for rapid medical evaluation and transport to an emergency facility. Also, it is important to maintain these medications within their expiration periods.

COMMENTARY

There are relatively few opportunities in medical practice to save lives so quickly and predictably as when using epinephrine to treat life-threatening anaphylaxis. Even more remarkably, the physician can exert this impact without being present at the time of the antigenic stimulus by properly equipping and educating the child and family.

The decision to use an autoinjector for IM administration of epinephrine, rather than a syringe and needle, is well founded. One only need compare the potential for error between the use of the autoinjector and needle/syringe. There is a predictable variant from recommended dosing when using the autoinjector. This is far preferable to the potentially more extreme and unpredictable dosing errors that occur when drawing up epinephrine into a syringe.

Admirably, Sicherer et al recommend the prescription of autoinjectors not only for children who have had respiratory or cardiovascular collapse associated with anaphylaxis but also those with generalized urticaria following an insect sting. Although not mentioned in this article, the child having generalized urticaria following food ingestion is also at risk. As a practical matter, it is prudent to supply the patient with multiple autoinjectors to meet his lifestyle needs. Most commonly a total of 3: one for home, one for school/work, and one for the car or purse.

Sicherer et al emphasize the need for the medical home to always prescribe epinephrine in the context of an anaphylaxis emergency action plan developed in consultation with the patient and family. The urgent care physician needs to determine his ability to provide these services or be sure the child will receive prompt follow-up by a primary care physician. ■

Minor Head Injury — The CHIP Prediction Rule

ABSTRACT & COMMENTARY

By Scott C. Elston, MD

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

Synopsis: *Prediction rules for patients with minor head injury suggest that the use of computed tomography (CT) may be limited to certain patients at risk for intracranial complications. These rules apply only to patients with a history of loss of consciousness, which is frequently absent. These authors propose a highly sensitive CHIP (CT in Head Injury Patients) prediction rule for the selective use in patients with minor head injury with or without loss of consciousness.*

Source: Smits, M et al. Predicting intracranial traumatic findings on computed tomography in patients with minor head injury: The CHIP prediction rule. *Ann Intern Med*. 2007;146:397-405.

MINOR HEAD INJURY IS ONE OF THE MOST COMMON injuries seen in Western emergency departments, with an estimated incidence of 100-300 per 100,000 people. Patients with minor head injury include those with blunt injury to the head who have a normal or minimally altered level of consciousness on presentation in the emergency department, that is a Glasgow Coma Scale (GCS) of 13 to 15, and a maximum loss of consciousness of 15 minutes, post-traumatic amnesia for 60 minutes, or both.

Existing prediction rules to guide selected use of CT after minor head injury were developed in patients whose injury caused loss of consciousness. In the CT in Head Injury Patients (CHIP) study, Smits and colleagues prospectively evaluated 3181 adults with minor head injury regardless of whether it was associated with loss of consciousness. A prediction rule based on such factors as age, GCS score, skull fracture, and post traumatic vomiting, amnesia, or seizure successfully identified in patients who had intracranial findings on CT or who required neurosurgical intervention.

Intracranial complications after minor head injury are infrequent but commonly require in-hospital observation, and occasionally require neurosurgical intervention. The imaging procedure of choice for reliable, rapid

diagnosis of intracranial complications is computed tomography. Because most patients with minor head injury do not show traumatic abnormalities on CT, it seems inefficient to scan all patients with minor head injury to exclude intracranial complications. Of the published prediction rules for selective use of CT in patients with minor head injury, the New Orleans Criteria (NOC) and the Canadian CT Head Rule (CCHR) have been externally validated. Researchers in internal and external validations studies have shown that both rules identify 100% of patients requiring neurosurgical intervention, and most patients with traumatic intracranial findings on CT. The external validation studies, however, yielded lower specificities than the development studies. The originally reported specificities were probably too optimistic because of their partial derivation from data sets that were also used for the model development. Also, in both studies, researchers included only a subset of patients with minor head injury. Most notably, the researchers developed the NOC and the CCHR for patients with minor head injury who have a history of loss of consciousness or amnesia, which many of these patients presenting the emergency departments do not have. Generalizability of the NOC and the CCHR is therefore limited.

Smits et al aimed to develop a widely applicable and easy-to-implement prediction rule for the selective use of CT in all patients with minor head injury with or without a history of loss of consciousness. The highly sensitive CHIP prediction rule (see below) for the use of CT in patients with minor head injury may be applicable to a large proportion of patients presenting to the emergency departments.

Simple prediction model for intracranial traumatic computed tomography findings in patients with minor head injury:

A CT is indicated in the presence of one major criterion:
- Pedestrian or cyclist vs vehicle
- Ejected from vehicle
- Vomiting
- Post-traumatic amnesia > 4 hours
- Clinical signs of skull fracture
- GCS < 15
- GCS deterioration > 2 points (hour after presentation)
- Use of anticoagulant therapy
- Post-traumatic seizure
- Age > 60 years

A CT is indicated in the presence of at least 2 minor criterion:
- Fall from any elevation
- Persistent anterograde amnesia
- Post-traumatic amnesia of 2-4 hours
- Contusion of the skull
- Neurologic deficit
- Loss of consciousness
- GCS deterioration of one point (hour after presentation)
- Age 40-60 years

Increasingly, physicians use prediction rules as decision rules; that is, they now frequently use predicted probabilities of an outcome in the decision making process. A prediction rule should be used as an aid in the decision making process, but should never replace clinical judgment. If clinical suspicion is high, a CT is indicated regardless of the prediction rule.

COMMENTARY

With the use of such reliable tools, as well as solid clinical skills/judgment (as always), urgent care centers/providers can safely evaluate and treat a large percentage of patients with minor head injuries. Certainly, select patients will still require CT (and observation), and these patients may be best served by the emergency departments. However, we now can be more selective and confident in our referrals. This serves to further alleviate the burden on the over-crowded emergency departments and provide a safe and convenient alternative for much of this patient population, thus conserving the "higher end" medical resources for those patients more likely to benefit.

Also, giving the patients or guardians informed consent about the risks and benefits, from either obtaining or not obtaining a CT scan, is of paramount importance, and the documentation of the informed consent should by included in the medical record. ■

Cardiovascular Approach to the Preparticipation Physical

ABSTRACT & COMMENTARY

By Matt Shores MD

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Dr. Shores reports no financial relationship relevant to this field of study.

Synopsis: *A discussion on the importance of cardiovascular screening in the preparticipation evaluation and a review on the consensus guidelines.*

Source: Giese EA, et al. The athletic preparticipation evaluation: Cardiovascular assessment. *Am Fam Physician*. 2007; 75:1008-1014

EACH YEAR, THOUSANDS, LIKELY HUNDREDS OF THOUsands, of athletes present to their physicians for

preparticipation physicals. In this review article written for the *American Family Physician*, Giese and colleagues focus on the most critical aspect of the preparticipation physical, the cardiovascular assessment. Giese et al use solid evidence rating C recommendations for the approach to the cardiovascular assessment, including the athlete's history, the family history, and the physical exam, particularly auscultation of murmurs. The article details which direction the history and physical should lead and when to seek further work-up as red flags present themselves. Approximately one in 200,000 young athletes suffer a sudden cardiac death annually. The purpose of the cardiovascular assessment in the preparticipation physical is to catch some of these sudden deaths before they occur. Among the leading offenders are hypertrophic cardiomyopathy and coronary artery anomalies. A detailed history and a focused physical exam can help sift through some these risk factors.

Attaining a thorough history from the athlete is essential. In fact, a thorough history may very well be considered the most important aspect of the preparticipation evaluation. The athlete's parents should be encouraged to get involved in filling in the patient's history, as often times the parents will have a much more fundamental knowledge of the family history and the patient's personal medical history. It is important to determine an accurate family history. A family history that reveals family members with heart problems, sudden death, or death before the age of 50 may be an indication that a further work-up is necessary. A brief screening for family members with a history of Marfan syndrome may also prove beneficial. Parents may also contribute to the patient's personal medical history. Any history of heart murmurs or elevated blood pressure at previous doctor visits should be investigated in depth. Finally, completing the history should involve a review of any symptoms the athlete has experienced in the past while participating in various activities.

As the patient begins to describe various symptoms that they may have experienced in the past during an activity, close attention should be paid to "red flag" symptoms. Any description of syncope in the past should definitely be worked-up further to evaluate for a structural cardiac defect. In addition, if an athlete describes chest pain with exertion, then further investigation looking for an outflow tract obstruction or coronary artery anomalies may be indicated. An athlete that has experienced palpitations may have an arrhythmia and a work-up including an ECG, electrolytes, and thyroid studies may be beneficial. Finally, athletes that detail dyspnea on exertion are a little more difficult to approach, as this description may simply represent poor conditioning, or it may underlie a more serious problem such as primary pulmonary hypertension, anemia, or exercise-induced asthma; ultimately, the decision in which direction to head must be made clinically.

The cardiovascular portion of the preparticipation physical exam may be broken down into 4 components: blood pressure, evaluation of radial and femoral pulses, a dynamic cardiac auscultation, and finally an evaluation for Marfan syndrome. Elevated blood pressure may be classified as prehypertension (BP 90%-95%), stage 1 hypertension (BP 95%-99%), or stage 2 hypertension (BP >99%). Athletes with prehypertension may be cleared for full participation and should have BP rechecked in 6 months. An athlete with stage 1 hypertension may be cleared for participation (except power lifting), but 2 follow-up visits should occur to recheck blood pressure (1-2 weeks after the initial visit). Patients with stage 2 hypertension should be restricted from participation until the hypertension is under control. Included in the physical exam should be a close examination of radial and femoral pulses; both pulses should be palpated at the same time to evaluate for the possibility of coarctation of the aorta. Dynamic auscultation of the heart refers to a thorough evaluation of heart sounds, including examination using Valsalva maneuvers and/or having the patient go from a squat to standing position. If a murmur is noted, it should be described by its timing, location, character, and intensity. If a murmur becomes louder or longer during a Valsalva maneuver or when the patient returns to standing position from a squat, then further evaluation may be necessary to evaluate for hypertrophic cardiomyopathy or mitral valve prolapse. Finally, a brief screening for Marfan syndrome concludes the cardiac portion of the preparticipation physical. If a male athlete is taller than 6 feet or a female athlete is taller than 5 feet 10 inches, and these athletes possess 2 other characteristics of Marfan syndrome, then further work-up is indicated.

COMMENTARY:

Although most athletes receive their annual preparticipation physical from their primary care physician or school's team physician. As we all know, many young healthy athletes don't have a primary care physician or their school doesn't have a team physician. Oftentimes, these athletes present to an urgent care to get their last minute sports physical taken care of so they can start practice. Typically the institution the athlete intends on participating for supplies a template form for the preparticipation physical. Often this form contains a "yes or no" history section and brief check box physical exam section. It becomes the

responsibility of the physician to determine what is important and to do it in a timely manner. This cardiovascular assessment article in the *American Family Physician* does a solid job of breaking down the cardiovascular assessment and focusing on what is important in a young athlete.

Essentially, the starting point in locating any risk factors for sudden death in a young athlete is a detailed personal and family history (evidence rating C). Any athlete with a history of "red flag" symptoms such as syncope or chest pain while participating in an activity should be restricted from play until further evaluation has been completed (evidence rating C). Once a detailed history has been taken, the cardiovascular physical exam should start with blood pressure. Athletes with stage 2 hypertension (BP > 99% or adults, that is > 18-years-old, with >160/100) should be restricted until their blood pressure is controlled (evidence rating C). Routine screening with tests such as ECG, Echo, or treadmill stress tests are not recommended for all athletes (evidence rating C). However, patients that present with physical exam findings such as a murmur that gets louder with a Valsalva maneuver should be further evaluated to rule out HOCM or mitral valve prolapse (evidence rating C).

Ultimately, the physician is the last line of defense for young healthy athletes that have a life-threatening cardiac abnormality that may later become unmasked when participating in a high-demand activity. A few simple questions, coupled with few quick cardiovascular exam tools, can help assure that these young healthy athletes do not become one of the sudden cardiac deaths that occur each year. ■

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CME Questions

18. Which of the following murmurs in an athlete's preparticipation physical exam would require further work-up and evaluation.

a. a murmur that becomes softer with squatting
b. a murmur that becomes louder with a Valsalva maneuver
c. a murmur that becomes louder when standing from a squatting position
d. murmurs a, b, and c would all need further evaluation

19. *True or False*. ECGs should be performed on all athletes presenting for a preparticipation physical?

20. An 18-year-old high school senior presents for a preparticipation physical and has a blood pressure of 162/104. What is the appropriate management?

a. clear to participate in activities but patient must return in 2 weeks for a repeat blood pressure check
b. clear to participate in activities but patient must follow-up in 6 months for a repeat blood pressure check
c. patient must be restricted from participating in activities until the blood pressure is well controlled
d. patient may participate in any activity except power lifting

21. *True or False*. Antibiotics are a substitute for thorough irrigation in simple hand lacerations.

22. A 34-year-old patient presents with acute eye pain after using a power sander without protective eyewear. Evaluation and treatment includes all of the following except:

a. Visual patch
b. Oral pain medication if a corneal abrasion is identified.
c. Ophthamological consult if a corneal ulcer is identified
d. Topical pain medication.

Answers: 18. (d); 19. False; 20. (c); 21. False; 22. (d)

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; and

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