EMERGENCY MEDICINE ALERT®

An essential monthly update of developments in emergency medicine

From the Publishers of Emergency Medicine Reports™

Thomson American Health Consultants Home Page—http://www.ahcpub.com

CME for Physicians—http://www.cmeweb.com

Observation Safe in Low-Risk, Cocaine-Related Chest Pain

ABSTRACT & COMMENTARY

Source: Weber JE, et al. Validation of a brief observation period for patients with cocaine-associated chest pain. *N Engl J Med* 2003;348:510.

COCAINE USE CAN CAUSE BOTH ACUTE AND CHRONIC CARDIOVASCULAR disease and complications, including acute coronary syndromes such as acute myocardial infarction (AMI) and unstable angina. In fact, nearly one-quarter of all AMIs in patients age 18-45 years are associated with cocaine use. In 2000, cocaine-related complaints accounted for 175,000 emergency department (ED) visits in the United States, 40% of which involved the complaint of chest discomfort. Yet prior studies indicate that patients who present to the ED with cocaine-associated chest pain generally are at low risk for AMI.[1]

In this prospective study, investigators evaluated the safety of a nine- to 12-hour observation period for patients with cocaine-associated chest pain who were at low-to-intermediate risk of cardiovascular events. During a two-year period, 344 ED patients with the chief complaint of chest discomfort were evaluated; each had either a history of cocaine use within the week prior to presenting or positive cocaine metabolites on urine screening. Of these, 42 high-risk patients immediately were admitted to the hospital because of ischemic electrocardiogram (ECG) changes, positive initial cardiac markers, recurrent ischemic chest pain, or hemodyamic instability.

The remaining 302 patients were admitted to a chest pain center for a nine- to 12-hour observation period. Patients with no ischemic changes on continuous ST-segment monitoring and normal troponin-I levels at 0, 3, 6, and 9 hours underwent a functional test (either exercise or pharmacologic stress test) at the discretion of a cardiology consultant prior to discharge.

The primary outcome was death from cardiovascular disease within 30 days. Follow-up was obtained by contacting the patient, relative, friend, or primary physician (300 patients), accessing the National Death Index (two patients), and review of medical records at one year. No cardiovascular deaths occurred within 30 days (there was one death due to trauma and one due to heroin overdose). Four

THOMSON AMERICAN HEALTH CONSULTANTS

INSIDE

patients (1.6% of 256 patients with detailed follow-up information) did suffer a nonfatal AMI within 30 days. In all four cases, patients had continued to use cocaine and all had two or more cardiac risk factors.

Based on their findings, the investigators believe a nine- to 12-hour observation period for patients with cocaine-associated chest discomfort and low-to-intermediate risk for cardiovascular disease is safe in terms of short-term risk for acute coronary syndromes and death.

COMMENTARY BY THEODORE C. CHAN, MD, FACEP

The chronic effects of cocaine include accelerated atherosclerosis, cardiomyopathy, and myocarditis. Acutely, cocaine use can increase myocardial oxygen demand by increasing heart rate and blood pressure, as well as decrease myocardial oxygen delivery by causing coronary vasospasm. Despite these effects, the incidence of AMI in ED patients presenting with cocaine-associated chest discomfort has been reported to be approximately 6%.[2] Determining which patients are at risk and which patients can be safely discharged home is paramount in terms of patient care, medicolegal risk, and efficient use of resources. This study prospectively validated the utility and safety of a nine- to 12-hour observation period for patients who have low risk for significant cardiovascular disease.

A number of points should be kept in mind regarding this study. First, the observation period took place in a dedicated chest pain observation unit in which patients had continuous ECG monitoring, as well as troponin-I levels drawn every three hours. Such care, including prolonged monitoring capabilities, may not be feasible in all EDs. Second, all patients had a cardiology consultation; more than half (158) underwent stress testing, and of those, four underwent subsequent cardiac catheterization prior to discharge. The course of these patients more likely reflects that of a routine chest pain hospitalization as opposed to an observation period.

Finally, the importance of substance abuse education and possible referral for these patients cannot be underemphasized. As the investigators point out, all four cases of nonfatal AMIs occurred in patients who continued to use cocaine. Moreover, one death occurred as a result of an illicit (albeit not cocaine) drug overdose. ❖

References

1. Kushman SO, et al. Cocaine-associated chest pain in a chest pain center. *Am J Cardiol* 2000;85:394.
2. Hollander EJ, et al. Prospective multicenter evaluation of cocaine-associated chest pain. *Acad Emerg Med* 1994;1:330.

Emergency Medicine Alert, ISSN 1075-6914, is published monthly by Thomson American Health Consultants, 3525 Piedmont Rd., NE, Bldg. 6, Suite 400, Atlanta, GA 30305.

Vice President and Group Publisher: Brenda Mooney.
Editorial Group Head: Valerie Loner.
Managing Editor: Allison Mechem.
Marketing Manager: Schandale Kornegay.

GST Registration Number: R128870672.

Periodicals postage paid at Atlanta GA 30304. **POSTMASTER:** Send address changes to ***Emergency Medicine Alert***, P.O. Box 740059, Atlanta, GA 30374.

Back issues: $44. One to nine additional copies, $212 each; 10 to 20 additional copies, $159 each.

Subscriber Information

Customer Service: 1-800-688-2421

Customer Service E-Mail Address: customerservice@ahcpub.com

Editorial E-Mail Address: allison.mechem@ahcpub.com

World-Wide Web: http://www.ahcpub.com

Subscription Prices

United States: $265 per year (Resident rate: $132.50)
Canada: $295 per year plus GST (Resident rate: $147.50)
Elsewhere: $295 per year (Resident rate: $147.50)

Accreditation

Thomson American Health Consultants (AHC) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. This CME activity was planned and produced in accordance with ACCME Essentials.

Thomson American Health Consultants designates this continuing medical education activity for up to 20 hours in category 1 credit toward the AMA Physician's Recognition Award. Each physician should only claim those hours of credit that he/she actually spent in the educational activity.

Emergency Medicine Alert also is approved by the American College of Emergency Physicians for 20 hours of ACEP category 1 credit.

Emergency Medicine Alert has been approved by the American Academy of Family Physicians as having educational content acceptable for Prescribed credit hours. This volume has been approved for up to 20 Prescribed credit hours. Term of approval covers issues published within one year from the beginning distribution date of June 2001. Credit may be claimed for one year from the date of this issue. **For CME credit, add $50.**

THOMSON
AMERICAN HEALTH CONSULTANTS

Questions & Comments

Please call **Allison Mechem,** Managing Editor, at (404) 262-5589, between 8:00 a.m. and 5:00 p.m. ET, Monday-Friday.

Conflict of Interest Disclosure

To reveal any potential bias in this publication, and in accordance with Accreditation Council for Continuing Medical Education guidelines, Drs. Harrigan (editor), Abbuhl, Chan, Felz, Hamilton, Perron, and Ufberg have reported no relationships with companies having ties to the field of study covered by this CME program. Dr. Grauer is sole proprietor of KG/EKG Press. Dr. Karras has reported that he is a consultant for Bayer Pharmaceuticals; consultant, speaker and researcher for Aventis Pharma; and a researcher for Bristol-Myers Squibb and Sepracor Inc. Dr. Brady is on the speaker's bureau for Genentech.

Should Trauma Intubations Be Performed in the Field?

ABSTRACT & COMMENTARY

Source: Bochicchio GV, et al. Endotracheal intubation in the field does not improve outcome in trauma patients who present without an acutely lethal brain injury. *J Trauma Inj Infect Crit Care* 2003;54:307-311.

Recent studies have questioned the value of prehospital intubation, demonstrating equivalent or better outcomes in patients receiving bag-valve-mask ventilation until intubation upon arrival at the hospital. Most of these studies were retrospective, with the exception of a recent large, prospective, randomized trial that

did not demonstrate any increase in survival among children intubated in the out-of hospital setting.[1]

This study prospectively evaluated whether prehospital intubation improved outcome among adult patients with non-lethal traumatic brain injury. One hundred ninety-one consecutive adult trauma patients over one year at Maryland Shock Trauma center were included if they had non-lethal (death within 48 hours) traumatic brain injury, Glasgow Coma Scale score (GCS) of 8 or below, and head abbreviated injury scale (HAIS) score of 3 or higher. Patients were excluded if death occurred within 48 hours or if they were kept alive for transplant purposes; failed field intubation or had greater than two attempts in the field; had prolonged field extrication times; or if they were transferred from an outside institution. Patients were stratified by whether they were intubated in the field or the trauma center. Major outcomes measured were death, incidence of pneumonia, hospital length of stay, intensive care unit (ICU) length of stay, and ventilator days.

During the study, 41% of patients were intubated in the field and 59% were intubated immediately at admission by a dedicated trauma anesthesiologist. Ninety-two percent of the patients sustained blunt trauma, and approximately two-thirds of patients arrived by air transport. There were no significant differences between the two groups in terms of age, injury severity score (ISS), GCS, and HAIS. There was no significant difference in frequency or distribution of non-cranial operations between the two groups. However, a significant increase in dispatch-to-arrival time was noted in the field intubation group.

Patients intubated in the field had significantly longer ICU and hospital lengths of stay. Also, field-intubated patients had more mean ventilator days (14.7 vs 10.4) and a greater incidence of pneumonia (49% vs 32%). The mortality rate of patients intubated in the prehospital setting also was greater (23% vs 14%, p = 0.05). This yields a relative risk of 1.53 for the development of pneumonia and a relative risk of 1.85 for death in the field-intubated group when compared to the hospital-intubated group. Patients intubated in the field also were more likely to have died due to respiratory related complications (61% vs 29%).

The authors conclude that patients with acute nonlethal traumatic brain injury have greater morbidity and mortality when intubated in the prehospital setting. They concede that there may be a subset of patients who would benefit from prehospital airway management, and that a large, prospective, randomized trial is necessary to determine which, if any, patients should be intubated in the field.

COMMENTARY BY JACOB W. UFBERG, MD

This paper adds to a small but growing body of data that does not support field intubation under usual circumstances (reasonable transport times and distances). It is unclear why patients intubated in the field do worse, but I would speculate that there is some relation to increased scene and transport times and perhaps an increase in the incidence of aspiration (as evidenced by more pneumonia and more respiratory deaths) among patients intubated in the field.

It is hard to accept this paper at face value. When field vs. hospital intubation is not randomized, we must assume that there was a reason why certain patients were, or were not, intubated in the field despite the similarities in ISS and HAIS (imperfect scoring systems). Perhaps these patients appeared to be more critically ill and did worse due to some factor that escaped the authors' data analysis. However, the results of this study are quite intriguing, and further display the need for a large, randomized, prospective, outcomes-based look at the value of out-of-hospital intubation. ❖

Reference

1. Gausche M, et al. Effect of out-of-hospital pediatric endotracheal intubation on survival and neurological outcome: A controlled clinical trial. *JAMA* 2000;283:783-790.

Does High-Dose Continuous Albuterol Therapy Improve Outcome in the ED?

ABSTRACT & COMMENTARY

Source: Stein J, et al. A randomized, controlled double-blind trial of usual-dose versus high-dose albuterol via continuous nebulization in patients with acute bronchospasm. *Acad Emerg Med* 2003;10:31-36.

THIS RANDOMIZED, DOUBLE-BLINDED TRIAL COMPARED the efficacy of albuterol delivered by continuous nebulization at 7.5 mg/hr (usual-dose therapy) and 15 mg/hr (high-dose therapy). Adult patients were eligible for enrollment if they presented to the emergency department (ED) complaining of acute bronchospasm and had peak expiratory flow rates less than 75% of predicted values. All participants received prednisone 60 mg (or methylprednisolone 125 mg IV) and nebulized ipratropium bromide at 1 mg/hr. Nebulized albuterol was delivered continuously until the symptoms resolved, the patient was intubated, or three hours elapsed, whichever came first. The primary outcome variable was change in peak flow rate over time.

One hundred-eighteen patients were included in the analysis. Baseline characteristics of the usual-dose and high-dose groups were comparable. The mean improvement in one-hour peak flow in the usual-dose group was

51 L/min, which did not differ significantly from the 45 L/min change in the high-dose group. Rates of hospitalization were similar in the two groups (71% and 65%, respectively), as were dyspnea scores, patient satisfaction scores, and time to disposition. Vital sign changes and rates of adverse events were similarly without statistical difference. The authors conclude that ED patients with moderately severe bronchospasm do not significantly benefit from high-dose continuous albuterol therapy.

COMMENTARY BY DAVID J. KARRAS, MD

Trials of asthma therapy in ED patients often find no intergroup differences unless the study is restricted to more severely ill patients. Prior investigations studying continuous vs. intermittent beta-agonist therapy, anticholinergic inhalers, and magnesium have typically found no difference in outcomes unless the study (or subgroup analysis) looked specifically at patients with severe asthma exacerbations. A reasonable conclusion is that it is difficult to significantly improve outcomes by fine-tuning therapy in patients with mild or moderately severe asthma. Patients with severe disease exacerbations are more likely to benefit from more intense medical therapy, but unfortunately, practical considerations make this group very difficult to study.

This study is unusually nonselective in including all ED patients with acute bronchospastic exacerbations—enrollment criteria that invariably included patients with chronic obstructive lung disease as well as those with asthma. These diseases differ in their responsiveness to bronchodilators and other therapies. Failure to detect a benefit to high-dose beta-agonist therapy may be attributable to heterogeneity of the study group. The authors did not attempt to perform a separate analysis of patients with a history of asthma, or of those with more severe bronchospasm. The 70% hospitalization rate is strikingly high and further suggests that this was not a group comprised primarily of patients with asthma. ❖

Special Feature

CDC Update: Smallpox and Vaccinia Vaccine Redux

By Richard J. Hamilton, MD, FAAEM, ABMT

Introduction

The Centers for Disease Control and Prevention (CDC) currently is releasing a large number of doses of vaccinia to health departments across the United States to vaccinate health care workers and emergency responders against smallpox, a disease that in theory has been eradicated from the planet. Why? Concerns regarding stockpiles of smallpox virus and bioterrorism have prompted health officials in the United States to vaccinate as a preventive measure. Think a smallpox attack couldn't happen because it's been contained in high-level laboratories? Remember, the anthrax attacks of 2001 may have been perpetrated by someone with access to laboratory stocks of *Bacillus anthracis.*

In the waning years of the smallpox epidemic, only at-risk contacts of a patient with smallpox were vaccinated—so-called "ring vaccination." That strategy will be used now only if a recognized outbreak occurs. In a new strategy, U.S. government public health officials want hospitals to develop immunized smallpox health care teams that are capable of providing immediate care for a patient with the condition. Primary vaccination is needed for a great number of health care workers. For those who have been vaccinated previously, revaccination is required because immunity wanes after 10 years. Those who have been vaccinatedtwice may have some immunity for more than 30 years, but this may protect only against fatal forms of the disease.

Since you may be asked to volunteer to be a member of your hospital's smallpox team, a thorough and informed understanding of vaccinia is important to all emergency physicians and those who staff emergency departments (EDs). The goal of this brief essay is to provide a quick overview of the Smallpox Pre-Event Vaccination Program that the CDC and Department of Health and Human Services currently are undertaking. It is not meant to substitute for the exhaustive training that is available online from these agencies.

Background

The vaccinia vaccine is a live virus that multiplies in the superficial layers of the skin. It is an extremely rare orthopox virus of unclear origins. When introduced into the epidermis, it causes a small local infection that renders cross-immunity to smallpox (variola). Remember, the vaccine does not contain the actual variola virus. This method of vaccination is, in essence, little changed from Jenner's 1798 demonstration that cowpox conferred cross-immunity to smallpox. In fact, the word "vaccination" is derived from Jenner's description of this process in his work—"an inquiry into the cause and effects of the Variolae Vaccinae, a disease known by the name of cowpox."

Response to Vaccination

A successful vaccination is referred to as a "take," which begins with the formation of a papule 3-4 days after immunization. Days 5-6 bring surrounding erythema and a depression of the papule. In addition, the

patient begins to experience fever, malaise, myalgia, soreness at the vaccination site, and local lymphadenopathy. Gradually, the lesion forms a pustule, and by the second week has scabbed. The scab detaches at the end of third week.

Care of the vaccine site is extremely important for health care workers, in particular. The vaccination site must remain covered and should not be touched, scratched, or rubbed, despite the fact that it often becomes itchy. In addition, a policy should be developed to avoid person-to-person contact with individuals who have a contraindication to receiving vaccinia. *(See Table 1.)* This does not preclude working as a health care worker, but assumes fastidious attention to prevention of spread. The site should be covered with gauze and a semi-occlusive dressing, such as an adhesive bandage or paper tape. A long-sleeved shirt and work uniform (e.g., lab coat) must be worn at all times. All materials in contact with the vaccine site should be considered highly infectious.

Table 1. Contraindications for Routine Non-Emergency Vaccine Use (Vaccination or Revaccination)

- Allergy to any component of the vaccine, including polymyxin B sulfate, dihydrostreptomycin sulfate, chlortetracycline hydrochloride, and neomycin sulfate.
- Infants < 18 months of age.
- Individuals of any age with eczema or past history of eczema or for those whose household contacts have eczema, other acute, chronic, or exfoliative skin conditions, (e.g., atopic dermatitis, wounds, burns, impetigo, or Varicella zoster).
- Persons of any age receiving therapy with systemic corticosteroids at certain doses (e.g., ≥ 2 mg/kg body weight or ≥ 20 mg/day of prednisone for ≥ 2 weeks), or immunosuppressive drugs (e.g., alkylating agents, antimetabolites), or radiation. Household contacts of such persons should not be vaccinated.
- Individuals with congenital or acquired deficiencies of the immune system, including individuals infected with the human immunodeficiency virus (HIV). Household contacts of such persons should not be vaccinated.
- Individuals with immunosuppression (e.g., leukemia, lymphomas of any type, generalized malignancy, solid organ transplantation, hematopoietic stem cell transplantation, cellular or humoral immunity disorders, agammaglobulinemia, or other malignant neoplasms affecting the bone marrow or lymphatic systems), or household contacts of such individuals.[2]
- During pregnancy, suspected pregnancy, or to household contacts of pregnant women.

Source: Package Insert—Dryvax (Smallpox Vaccine, Dried, Calf Lymph Type) Wyeth Laboratories, Inc.

Contagion and Spread after Vaccination

Perhaps the most common concern, especially for health care workers who continue to care for patients, is inadvertent inoculation. This takes the form of inoculation to other skin sites (autoinoculation) and to other persons (secondary inoculation). The primary mechanism s for preventing inadvertent inoculation are hygiene and appropriate care of the vaccine site. The urge to scratch, handle, or examine the site must be avoided, as surface virus is transferred easily to the hands and to fomites. This concern, and the implications of a health care worker accidentally transferring vaccinia to an at-risk patient, has severely limited the enthusiasm with which hospitals have accepted the CDC's pre-event immunization strategy. For many hospitals, the risk/benefit ratio of participating is favorable only when there is evidence that smallpox is more than an intangible threat. Nonetheless, the issue must be resolved, as many military reservists who work in hospitals are being vaccinated regardless of the hospital's policy. According to the Advisory Committee on Immunization Practice, administrative leave is not required routinely for newly vaccinated health care personnel unless they become ill, have extensive skin lesions, or are unable to comply with infection-control precautions. In general, prior experience demonstrates that secondary inoculation largely is a result of the close contact seen in household members, and is unlikely to occur in the health care setting.[1]

Fortunately, Section 304 of the Homeland Security Act, which was enacted on Jan. 24, 2003, protects manufacturers of smallpox vaccine and those health care entities that would administer the vaccine from potential liability for involvement in a federal smallpox vaccination campaign. Section 304 provides an exclusive remedy against the United States for injury or death attributable to "smallpox countermeasures" (e.g., smallpox vaccine, other substances used to treat or prevent smallpox, or vaccinia immune globulin [VIG]). This means that no claim for liability for injury or death attributable to a smallpox countermeasure could be brought against entities or individuals covered by Section 304's protections. This includes institutions and individuals who participate in the smallpox immunization program. For individuals and institutions seeking further guidance, the CDC smallpox website at http://www.bt.cdc.gov/agent/smallpox/vaccination/section-304-qa.asp addresses these liability issues.

Table 2. Contraindications for Emergency Vaccine Use (Vaccination or Revaccination)

- There are no absolute contraindications regarding vaccination of a person with a high-risk exposure to smallpox.
- Persons at greatest risk for experiencing serious vaccination complications are often those at greatest risk for death from smallpox.
- *If a relative contraindication to vaccination exists, the risk for experiencing serious vaccination complications must be weighed against the risks for experiencing a potentially fatal smallpox infection.*

Source: Package Insert—Dryvax (Smallpox Vaccine, Dried, Calf Lymph Type) Wyeth Laboratories, Inc.

Adverse Reactions to the Vaccine

There are several adverse reactions to vaccinia. Some are considered variants of normal and others, though rare, are extremely serious. One extreme, but normal reaction is a large vaccination reaction known as a "robust take" (RT). This is defined as a reaction greater than 7.5 cm in diameter at the site of inoculation, and occurs in approximately 10% of first-time vaccines. An RT easily is confused with cellulitis and is best differentiated by noting the time of onset and clinical course. An RT occurs 8-10 days post-vaccination, improves within 72 hours of peak symptoms, and does not progress clinically. In contrast, secondary bacterial infections typically occur within five days of vaccination and progress if not treated. The presence of fever is not a helpful differentiating characteristic. When an RT is suspected, management includes daily observation, patient education, rest of the affected limb, use of oral non-aspirin analgesia, and antihistamines. Salves, creams, or ointments, including topical steroids or antibacterial medications, should not be applied to the vaccination site.[2]

There are other, less common reactions to the vaccine that are within the range of normal and occur in 5% of recipients. These include lesions that are satellites of the main take area, lymphangitis from the site to regional nodes, regional lymphadenopathy, dramatic local edema at the site, and intense erythema. The last complication probably represents a viral cellulitis, and is difficult to distinguish from bacterial cellulitis. All these reactions require no specific treatment.[2]

Of greatest concern are the reactions that are more serious and potentially can be debilitating or fatal. These reactions are extremely rare and must be minimized by screening individuals for contraindications such as immunosuppression, eczema or atopic dermatitis (active or resolved), inflammatory eye diseases, pregnancy, or other contraindications *(see Table 1)*; reconsideration of these should follow in the event of a smallpox emergency. *(See Table 2.)*

Serious Adverse Reactions

Some serious adverse reactions to the vaccination include:

Generalized vaccinia—Characterized by a disseminated rash and occurs 6-9 days after first-time vaccination. Treatment with VIG is reserved for severe cases and patients who are immunocompromised;

Eczema vaccinatum—Occurs among persons with a history of atopic dermatitis (eczema), regardless of disease severity or activity. It has a predilection for areas of previous atopic dermatitis lesions. These patients often are severely ill and require VIG;

Progressive vaccinia—an often fatal complication among persons with immunodeficiencies, it is characterized by painless progressive necrosis at the vaccination site with or without metastases to distant sites (e.g., skin, bones, and other viscera). Intensive care and VIG are required to improve the chance for survival;

Erythema multiforme—common 1-2 weeks after vaccination. These are benign lesions that do not progress. Full-blown Stevens-Johnson Syndrome is rare but serious. Diagnosis is by typical rash seen in temporal association with primary vaccination. When this reaction takes on a vesicular or pustular form it is necessary to distinguish these from generalized vaccinia or inoculation vaccinia by observing their progression over several days;

Central nervous system disease—includes post-vaccinial encephalopathy (PVE) and post-vaccinial encephalomyelitis (or encephalitis) (PVEM). These are not believed to be a result of replicating vaccinia virus and are diagnoses of exclusion. They may represent an autoimmune process. No specific therapy exists for PVE or PVEM; and

Fetal vaccinia—the result of transmission of vaccinia to the fetus; this generally results in spontaneous abortion.

The good news for those who have received the vaccine in the past is that the overall rate of complications, including the most serious ones, is reduced by an order of magnitude.[3]

Conclusions

While the pre-event immunization of health care workers currently is underway, participation has been hampered severely by the complex and intimidating chance for adverse outcomes. The decision to participate is still an individual one. A clear understanding of the contraindications and complications is critical to informed participation in this program. Smallpox currently is a finite but real threat. Preparing for it with deliberate caution is the prudent public health approach.[4] ❖

References

1. Centers for Disease Control and Prevention. Recommendations for using smallpox vaccine in a pre-event vaccination program—Supplemental recommendations

of the Advisory Committee on Immunization Practices (ACIP) and the Healthcare Infection Control Practices Advisory Committee (HICPAC). *MMWR Morb Mortal Wkly Rep* 2003:52 (Dispatch);1-16.
2. Centers for Disease Control and Prevention. Smallpox vaccination and adverse reactions. Guidance for clinicians. *MMWR Morb Mortal Wkly Rep* Dispatch 2003:52 (RR-4):1-28.
3. Lane JM, et al. Complications of smallpox vaccination, 1968: Results of ten statewide surveys. *J Infect Dis* 1970;122:303-309.
4. Drazen JM. Perspective: Smallpox and bioterrorism. *N Engl J Med* 2002; 346:1263-1264.

Physician CME

28. Based on the study by Weber et al, ED patients who present with cocaine-associated chest discomfort safely can be discharged home after a:
a. negative troponin-I level six hours after the onset of symptoms.
b. normal pharmacologic stress test.
c. 9-12 hour chest pain unit observation period with evaluation.
d. normal cardiac catheterization study.

29. The approximate rate of acute myocardial infarction in patients with cocaine-related chest pain is:
a. 6%.
b. 10%.
c. 15%.
d. 22%.

30. Patients with non-lethal head trauma who were intubated in the field had which of the following?
a. Lower mortality rates
b. Lower incidence of pneumonia
c. Lower incidence of respiratory death
d. More ventilator and ICU days

31. In unselected ED patients with bronchospasm, higher doses of albuterol (15 mg/hr) delivered by continuous nebulization resulted in which of the following outcomes when compared to standard doses of albuterol (7.5 mg/hr)?
a. Increased adverse events
b. More rapid improvement in peak flow values
c. Significantly lower hospitalization rates
d. No meaningful benefit or detriment

32. Contraindications to the vaccinia vaccine include all of the following *except*:
a. allergy to any component of the vaccine, including polymyxin B sulfate, dihydrostreptomycin sulfate, chlortetracycline hydrochloride, and neomycin sulfate.
b. eczema or past history of eczema.
c. therapy with systemic corticosteroids or immunosuppressive drugs, or congenital or acquired deficiencies of the immune system, including HIV.
d. household contacts with any of the following: persons with eczema or past history of eczema; persons receiving therapy with systemic corticosteroids or immunosuppressive drugs; or persons with acquired deficiencies of the immune system, including HIV.
e. prior vaccination with vaccinia vaccine.

33. Which of the following is *not* a recognized adverse reaction to vaccinia vaccine?
a. Satellite lesions
b. Regional lymphadenopathy, or lymphangitis from the site to regional nodes
c. Osteomyelitis
d. Dramatic local edema at the site, and intense erythema

34. Which of the following is *inconsistent* with the adverse reaction to vaccinia termed a "robust take?"
a. Febrile illness easily confused with cellulitis
b. Occurrence 8-10 days post-vaccination
c. Improvement within 72 hours of peak symptoms
d. Progression to encephalitis

35. When a robust take to vaccinia vaccine is suspected, management includes which of the following?
a. Daily observation and rest of the affected limb
b. Aspirin
c. Prednisone
d. Topical steroids or antibacterial medications

CME Objectives

To help physicians:
- Summarize the most recent significant emergency medicine-related studies;
- Discuss up-to-date information on all aspects of emergency medicine, including new drugs, techniques, equipment, trials, studies, books, teaching aids, and other information pertinent to emergency department care; and
- Evaluate the credibility of published data and recommendations.

Answer key:

28. c	30. d	32. e	34. d
29. a	31. d	33. c	35. a

CME Instructions

Physicians participate in this continuing medical education program by reading the articles, using the provided references for further research, and studying the questions at the end of the issue. Participants should select what they believe to be the correct answers, then refer to the list of correct answers to test their knowledge.

To clarify confusion surrounding any questions answered incorrectly, please consult the source material. After completing this activity, *you must complete the evaluation form that will be provided at the end of the semester and return it in the reply envelope provided to receive a certificate of completion.* When your evaluation is received, a certificate will be mailed to you.

ECG Review

1° AV Block in Lead V_1?

By Ken Grauer, MD

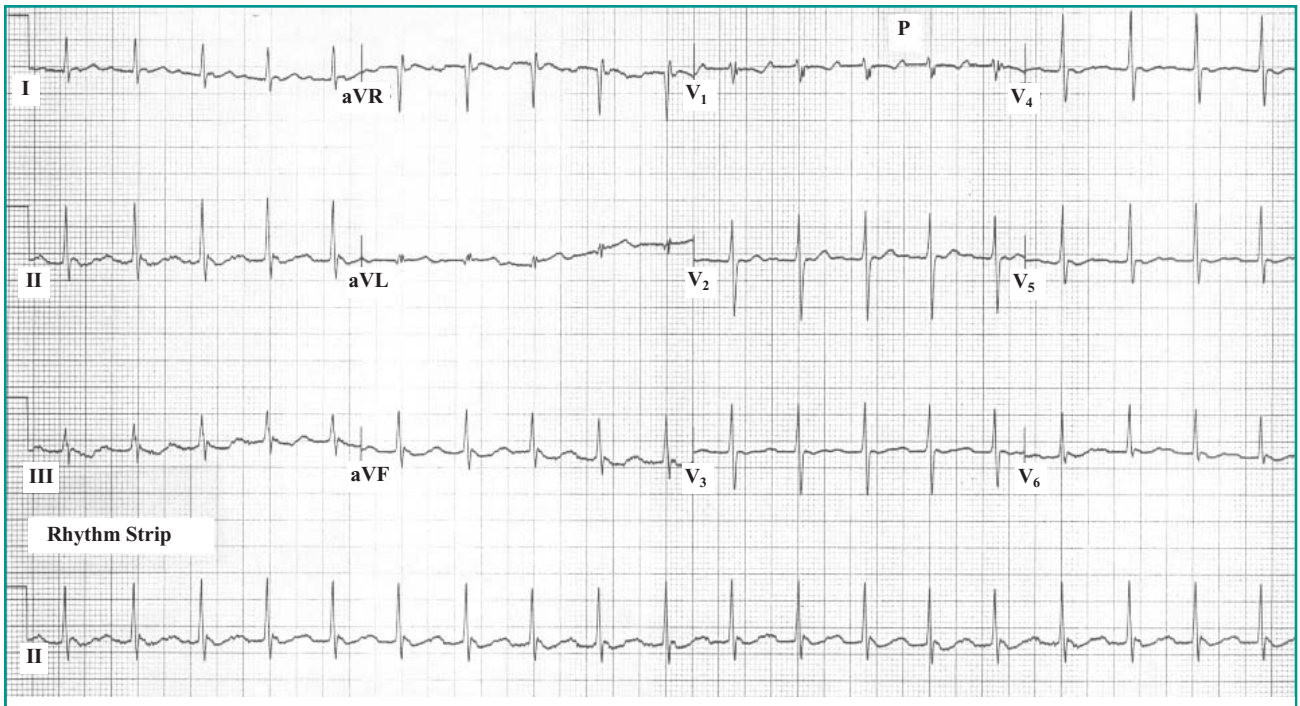

Figure. 12-lead ECG obtained from an 87-year-old man who was thought to be in sinus tachycardia with 1° AV block.

Clinical Scenario: The 12-lead ECG shown in the Figure was obtained from an 87-year-old man who was thought to be in sinus tachycardia with 1° AV block. Would you agree with this assessment of the rhythm?

Interpretation: The rhythm strip at the bottom of the tracing clearly shows the arrhythmia to be a regular supraventricular (*narrow-complex*) tachycardia at a rate of just under 120 beats/minute. It is tempting to say that the rhythm is sinus tachycardia with 1° (first degree) AV block, based on the presence of a seemingly prolonged PR interval in lead V_1. However, this is not the correct interpretation of this rhythm.

In general, 1° AV block uncommonly is seen in the presence of sinus tachycardia. On the contrary, much of the time when a prolonged PR interval is thought to be seen with a tachycardic rhythm, a mechanism *other than* sinus rhythm will be the cause of this finding. This is especially true when lead II fails to show a clearly defined upright P wave. Such is the case for the Figure shown here. Thus, a second clue that the mechanism of this rhythm is unlikely to be sinus is seen in lead II, which shows no more than a poorly defined broadened and low amplitude positive deflection at the midpoint of the R-R interval. Although one cannot exclude the possibility that a sinus conducting P wave could be hidden within this low amplitude deflection, an alternative etiology for the rhythm is much more likely. Stepping back from the tracing provides the next clue—in the form of a subtle *sawtooth* pattern in the lead II rhythm strip (as well as in the other inferior leads). In further support of our theory that the rhythm in the Figure is atrial flutter is the ECG appearance in lead I, which shows a small rounded hump at the beginning of the ST segment, as well as an additional small, rounded, upright deflection preceding each QRS complex. Use of calipers allows one to walk out a consistent interval between each of these rounded deflections in lead I at a rate of 240/minute. Although the atrial rate of flutter activity in adults is most commonly closer to 300/minute, treatment with an antiarrhythmic drug may slow the atrial rate and produce flutter with 2:1 AV conduction at a ventricular rate of 120/minute, as shown here. ❖

In Future Issues:

Will You Recognize Malaria?