

# CRITICAL CARE ALERT®

*A monthly update of developments in critical care and intensive care medicine*

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## Lung Recruitment Maneuvers Hazardous in Head-Injured Patients

A B S T R A C T & C O M M E N T A R Y

THIS PROSPECTIVE OBSERVATIONAL STUDY FROM AN ICU IN Germany sought to determine the effects of a lung recruitment maneuver on intracranial pressure (ICP), cerebral perfusion pressure (CPP), jugular venous oxygen saturation ( $SJ\bar{O}_2$ ), and arterial-minus-jugular venous lactate content difference (AJDL), in patients with acute brain injury. Bein and colleagues studied 11 patients, aged 33-83 years, with traumatic (5) or nontraumatic (6) acute brain injury and an initial Glasgow Coma Scale score of 4-12 (mean 8). The patients also had impaired arterial oxygenation ( $PaO_2/FIO_2$   $244 \pm 39$  mm Hg); 5 had pneumonia, 3 atelectasis, and 1 "neurogenic" edema. All had ICP and  $SJ\bar{O}_2$  monitors, were ventilated in a pressure-controlled mode (maximum inspiratory pressure 25-30 cm  $H_2O$ , with PEEP 6-12 cm  $H_2O$ ), and were sedated to the point of unresponsiveness to pain. The recruitment maneuver consisted of a 30-second increase in peak inflation pressure to 60 cm  $H_2O$  and then a sustained inspiration at that pressure for another 30 seconds. The procedure was aborted if ICP rose above 25 mm Hg or CPP fell below 50 mm Hg.

The recruitment maneuver caused a fall in mean systemic arterial pressure from  $86 \pm 9$  to  $75 \pm 10$  mm Hg ( $P < 0.01$ ). ICP rose from  $13 \pm 5$  to  $16 \pm 5$  mm Hg ( $P < 0.05$ ), and CPP fell from  $72 \pm 8$  to  $60 \pm 10$  mm Hg ( $P < 0.01$ ). As an index of cerebral metabolism,  $SJ\bar{O}_2$  fell from  $69 \pm 6$  to  $59 \pm 7$  % ( $P < 0.05$ ), although AJDL did not change significantly. Ten minutes after the end of the recruitment maneuver, all measurements had returned to premaneuver levels. (Bein T, et al. Lung recruitment maneuver in patients with cerebral injury: Effects on intracranial pressure and cerebral metabolism. *Intensive Care Med.* 2002;28:554-558.)

**■ COMMENT BY DAVID J. PIERSON, MD**

Acute lung injury is common in patients who are admitted to the ICU after sustaining head trauma or subarachnoid hemorrhage, and when it occurs the clinician (and the patient) are in a difficult situation. This is because current management of these two conditions according to the best available evidence includes directly conflicting strategies. The primary management approach for acute brain

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injury is to control ICP and maintain CPP at all times. Even very brief periods of decreased CPP, whether from a fall in arterial blood pressure or an increase in ICP, have been associated with worsened neurologic outcomes. The prevailing strategy for managing acute lung injury is to minimize lung distension and protect the lung from ventilator-induced lung injury. Allowing arterial PCO<sub>2</sub> to rise (permissive hypercapnia) is considered an acceptable price to pay in carrying out this lung-protective ventilatory strategy. However, because it causes cerebral vasodilation, hypercapnia must be avoided in acute brain injury, making this aspect of lung-protective ventilation contraindicated in this setting.

This study suggests that we should also avoid another currently popular strategy in managing acute lung injury—the use of intermittent sustained inflations to recruit atelectatic areas as part of the “open lung” approach introduced by Lachmann et al.<sup>1,2</sup> Lung recruitment maneuvers are becoming part of routine ventilator management in many ICUs and are currently under intensive study. Such maneuvers increase the amount of

aerated lung in patients with acute lung injury, and typically improve arterial oxygenation as well. Whether their incorporation into an overall protocol for lung-protective ventilation confers any outcome advantage as compared to lung-protective ventilation without such maneuvers (as in the ARDS Network protocol<sup>3</sup>) has not yet been settled. From the findings of this study, however, it would seem wisest to avoid recruitment maneuvers in patients with both acute lung injury and acute traumatic or nontraumatic brain injury. ■

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*Critical Care Alert*, ISSN 1067-9502, is published monthly by American Health Consultants, 3525 Piedmont Rd., NE, Bldg. 6, Suite 400, Atlanta, GA 30305.

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GST Registration Number: R128870672.

Periodicals postage paid at Atlanta, GA.

POSTMASTER: Send address changes to *Critical Care Alert*, P.O. Box 740059, Atlanta, GA 30374.

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Back issues: \$38.

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In order to reveal any potential bias in this publication, and in accordance with Accreditation Council for Continuing Medical Education guidelines, we disclose that Ms. Ball serves as a consultant to Steris Corp, IC Medical, and AMT-Coherent (Canada), is a stockholder of Steris and SLT, and is on the speaker's bureau of AORN. Dr. Hoffman is involved in research with an NIH-funded grant that has no industry support. Dr. Pierson is a consultant to SeQual and Lynntech and is on the speaker's bureau of GlaxoSmithKline, Boehringer-Ingelheim, 3M, and Bayer. Dr. Rubenfeld is a paid consultant to Eli Lilly and has received educational grants from Byk-Gulden and Bayer in his name to the University of Washington. Drs. Baigorri, Durbin, Hess, Johnson, and O'Keefe report no consultant, stockholder, speaker's bureau, research, or other financial relationships with companies having ties to this field of study. Drs. Crawford, Gladwin, Nanavaty, and Takezawa did not return a 2002 financial disclosure form.

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## Routine Thoracentesis in Medical ICU Patients with Pleural Effusions

### ABSTRACT & COMMENTARY

**Synopsis:** In ICU patients with a pleural effusion, thoracentesis is a simple and safe procedure that may provide large benefits in diagnosis, treatment, and even prognosis.

**Source:** Fartoukh M, et al. Clinically documented pleural effusions in medical ICU patients: How useful is routine thoracocentesis? *Chest.* 2002;121:178-184.

FARTOUKH AND COLLEAGUES CARRIED OUT A STUDY to assess the contribution of routine thoracentesis to the etiologic diagnosis and treatment in medical ICU patients with clinically documented pleural effusions. All consecutive patients admitted to 3 medical ICUs within a 1-year period were screened prospectively for physical and radiographic evidence of pleural effusion. When a pleural effusion was detected, thoracentesis was performed. Contraindications to thoracentesis included hemodynamic instability, severe respiratory insufficiency ( $\text{PaO}_2 < 50 \text{ mm Hg}$  on room air), a small effusion, and severe hemostasis alterations (platelets  $< 50 \text{ G/L}$ ,

fibrinogen < 2 g/L, prothrombin < 50% of control, or cephalin-activated time more than twice the control). Age and sex, comorbidity, reasons for medical ICU admission, and clinical characteristics (day of thoracentesis) were collected. Two senior physicians and 1 junior physician made a presumptive diagnosis. Then, the usefulness of thoracentesis was evaluated separately for diagnosis and the treatment changes.

Of 1351 patients admitted during the study period, 113 patients had physical and radiographic evidence of pleural effusion. Thoracentesis was performed in 82 patients without contraindications to the technique. The mean time from admission to thoracentesis was 2 days (range, 0-6 days). Respiratory failure was the most common reason for medical ICU admission of these patients (median  $\text{PaO}_2/\text{FiO}_2$  186 mm Hg), and 60% of them were receiving mechanical ventilation at the time of thoracentesis, 42% requiring positive end-expiratory pressure of 5 cm  $\text{H}_2\text{O}$  or more. Pneumothorax occurred in 6 patients (7%), including 5 patients with mechanical ventilation, all with a favorable outcome after drainage. No other complications were reported.

Pleural effusions were classified as transudates or exudates according to Light's criteria. The causes of pleural effusions are shown in Table 1.

The thoracentesis-based diagnosis was different from the presumptive diagnosis in 37 patients (45.1%). Twenty-seven out of 37 patients received a change in treatment based on the findings of thoracentesis. Moreover, 9 patients received a change in treatment attributable to the thoracentesis although their diagnosis remained unchanged. Patients in whom thoracentesis was useful had a trend toward a shorter ICU stay and a lower mortality rate (see Table 2). What is more, neither clinical nor laboratory parameters predicted the usefulness of routine thoracentesis in critically ill patients with pleural effusions.

## ■ COMMENT BY FRANCISCO BAIGORRI, MD

The same research group previously published a survey of the opinions of French intensivists regarding pleural effusions in ICU patients (Azolulay E, et al. *J Crit Care*. 2001;16:98-101). In that survey, only 15.5% of the physicians who returned the questionnaire reported that they systematically performed exploratory thoracentesis on the sole basis of the presence of pleural effusion in an ICU patient, irrespective of the clinical context. Notably, in the opinion of these physicians, infection was more frequently listed as a cause of pleural effusions.

The study by Fartoukh et al confirms that infection is the main cause of pleural effusion detected by physical and radiographic findings in this population. Moreover, they claimed that routine thoracentesis provided the correct diagnosis in 8 cases of pleural empyema for which the presumptive cause was a parapneumonic effusion, pulmonary embolism, hemothorax, or surgery. It is obvious to everyone that diagnosing infectious effusions is important to improve the treatment and prognosis as the results of the Fartoukh's study suggest.

In the survey of the opinions of French intensivists physicians who systematically performed exploratory thoracentesis were more likely to describe the procedure as noninvasive.<sup>1</sup> The results of the study we are reviewing also show that thoracentesis is a safe procedure. Moreover, the feasibility and safety of thoracentesis can be even higher when aided by ultrasound.<sup>2</sup> No complications were reported in mechanically ventilated patients when thoracentesis was performed assisted by ultrasound.

Thus, there is no big argument against routine thoracentesis in medical ICU patients with clinically documented pleural effusions. It remains to be seen whether this recommendation might be applied to small effusions only detected by using other diagnostic tools such as ultrasound or CT. Nevertheless, as Fartoukh et al say,

**Table 1**  
**Causes of Pleural Effusions in Medical ICU Patients**

Classification of pleural effusion	Patients # (%)	Causes of pleural effusions	#
Transudate	20 (24.4%)	Fluid overload	16
Noninfectious exudate	27 (32.9%)	Hypoalbuminemia	4
Infectious exudate	35 (42.7%)	Malignancy	10
		Pulmonary embolism	4
		Postoperative	4
		Hemothorax	4
		Pancreatitis	2
		Unknown	3
		Parapneumonic	21
		Empyema	14

**Table 2**
**Patient Outcomes  
in Relation to Thoracentesis Results**

	Thoracentesis		
	Useful	Nonuseful	P
ICU stay (days)*	10 (6-16)	14 (7-23)	0.11
Mortality rate (%)	30	40	0.16
* Medians (quartiles)			

there are no data to suggest that small effusions detected by ultrasound are qualitatively different from those detected clinically. ■

**References**

- Azolulay E, et al. *J Crit Care*. 2001;16:98-101.
- Lichtenstein D, et al. *Intensive Care Med*. 1999;25: 955-958.

worker exposure, physicians, nurses, and respiratory therapists who had exposure to these patients were identified. In univariate analysis, patients with *S marcescens* were more likely to have received fentanyl, particularly a continuous infusion, and the median days of infusion and median total dose were higher compared to controls. For the majority of cases (65%), the positive blood culture was collected while they were receiving fentanyl or within 24 hours of receiving a fentanyl infusion.

In multivariate analysis, only receipt of a continuous fentanyl infusion and receipt of care from 2 respiratory therapists were independent risk factors. Independent of this investigation, a report was filed by a nurse in the surgical ICU who witnessed one of these therapists manipulating IV infusions. The therapist agreed to hair sample testing and the test was positive for fentanyl. Employment was terminated and no additional cases were reported.

**■ COMMENT BY LESLIE A. HOFFMAN, RN, PhD**

Surveillance of nosocomial infections was recognized to be a major component of infection control in the late 1970s. Surveillance includes continuous monitoring of different infections or microorganisms to detect outbreaks that require specific and emergency measures. Using these principles, Ostrowsky and colleagues were able to trace the source of contamination to an unexpected source. Estimates based on the 1991 National Household Survey on Drug Abuse indicate that 4.2% of hospital workers acknowledge current use of illicit drugs and 8.9% report prior use of such drugs. Clues that might suggest drug use include mood swings, unexplained behavior or absences, repeated health problems, marital discord, bizarre working hours, medical errors, and arrests for driving under the influence of alcohol. Health care providers commonly hesitate to confront a colleague who appears to be in trouble with drugs or alcohol. By doing so, they facilitate the addict's denial and enable the drug use to continue.

In this investigation, hair testing documented fentanyl abuse by the implicated health care worker. Hair testing offers the potential of detecting drug use over a longer period than a blood or urine sample. A 10-13 cm (4-5 inch) sample of hair can provide evidence of drug use for as long as 10 months previously since hair grows about 1 cm (0.4 inches) per month. Ostrowsky et al hypothesized that reuse of needles to remove fentanyl or replacement of fentanyl with contaminated liquid may have led to inadvertent contamination with *S marcescens*. A hospital official presented the case to the area district attorney who, implausibly, refused to pursue legal action because of insufficient evidence. ■

## Bacteremia Traced to Illicit Narcotic Use by Health Care Worker

**ABSTRACT & COMMENTARY**

**Synopsis:** A health care worker caused an outbreak of 26 cases of *Serratia marcescens* bacteremia in a surgical ICU to contamination of parenteral fentanyl infusions during illicit narcotic use.

**Source:** Ostrowsky BE, et al. *Serratia marcescens* bacteremia traced to an infused narcotic. *N Engl J Med*. 2002;346:1529-1537.

OVER A 3-MONTH PERIOD, 9 CASES OF *Serratia marcescens* bacteremia were detected in the surgical ICU of a 455-bed tertiary care facility. Because of the rarity of this infection and the similar antimicrobial-susceptibility patterns of the isolates, the latter were sent for genotyping. When the genotype could not be determined, the specimens were sent to the Centers for Disease Control and Prevention (CDC) for further analysis. Over the next 4 months, 17 more patients acquired *S marcescens* bacteremia and the CDC was invited to assist in identifying the source.

Surgical ICU patients with bacteremia during the epidemic period (case patients) were compared with randomly selected controls (patients who stayed in the surgical ICU for > 48 hours during the epidemic period without acquiring bacteremia). To assess health care

## Special Feature

# Fever in the ICU: More Questions Than Answers

By Karen L. Johnson, RN, PhD, CCRN

HAVE YOU NOTICED THAT THERE ARE SOME CRITICALLY ill patients who seem to get "better" once we stop treating them? Sometimes in spite of all our technology, formulas, and invasive monitoring . . . less is better? It's a phenomenon I have called "therapeutic neglect." And it may be that therapeutic neglect is the most effective treatment for fever in the non-brain injured critically ill adult patient. This article reviews what we know about fever, how to evaluate it, and how to manage it. Unfortunately, at the conclusion of this review, you will have more questions than answers.

### What is Fever?

Fever has been defined as a "state of elevated core temperature, which is often, but not necessarily, part of the defensive response of multi-cellular organisms (host) to the invasion of live (microorganisms) or inanimate matter recognized as pathogenic or alien by the host."<sup>1</sup> Fever is a component of the febrile response. Clinically, fever has been defined as a temperature greater than 38.3°C (101°F).<sup>2</sup> The febrile response is a complex physiologic response that involves activation of the immune and neuroendocrine systems. The increase in body temperature that occurs during fever (hyperpyrexia) must be distinguished from hyperthermia.

Hyperthermia and hyperpyrexia are different conditions. Hyperthermia is the result of hypothalamic injury or excessive environmental heat and a loss of compensatory cooling responses. Hyperthermia involves dysfunction of thermoregulatory ability. In hyperpyrexia, thermoregulatory responses remain intact, although body temperature is maintained at a higher level.

Humans maintain a fairly constant internal temperature (36.2-37.8°C). Any deviation from this range prompts physiologic warming or cooling mechanisms. Thermal balance is accomplished by a thermoregulatory control loop. Receptors, distributed throughout the body, receive and integrate thermal inputs from internal and external stressors. These inputs are sent via ascending pathways to the hypothalamus. In the hypothalamus is a "thermostatic comparer" region that detects deviations from the set point range. Any deviation triggers cooling/warming responses to correct the deviation.

Fever appears to run a dynamic course of 3 distinct phases beginning with the rapid production of heat.<sup>3</sup> The initial phase is the "chill phase." The sensed discrepancy between existing temperature and the new set point makes the febrile patient complain that he or she "feels cold." Chills may be present. The second phase is the "plateau phase." Here, warming responses have driven central temperatures to a new set point range. Now normal thermoregulation is maintained at a higher temperature. The third phase, "defervescence," occurs as diaphoresis and flushing promote heat loss through evaporation and radiation. The hypothalamus then resets to euthermic levels.

### What is the Pathogenesis of Fever?

Cytokines play a key role in the pathogenesis of fever. The primary cytokines involved include tumor necrosis factor (TNF-alpha), and interleukins one and six (IL-1, IL-6). These cytokines bind to specific receptor and results in the liberation of arachidonic acid as substrate for the cyclo-oxygenase pathway. Prostaglandin E-2 diffuses across the blood brain barrier and decreases the firing rate of warm sensitive neurons, which leads to responses designed to decrease heat loss and increase heat production.<sup>4</sup>

Questions about the risks and benefits of fever have generated much controversy. There is the argument (based on what we know in the animal kingdom) that fever may be beneficial. Most reptiles, mammals, amphibians, and fish have been shown to manifest fever in response to a microorganism challenge. This has been viewed as evidence that fever is an adaptive response because the metabolic increase in body temperature, which accompanies the febrile response, would not have evolved and been preserved unless fever had some net benefit to the host.<sup>5</sup> Increased body temperature has been shown to enhance the resistance of animals to infection.<sup>6</sup> Elevated temperatures have also been shown to enhance immune function including antibody production, T-cell activation, production of cytokines, and enhanced neutrophil and macrophage function.<sup>4</sup> The benefits of fever must be considered in conjunction with known adverse effects, particularly the effect of increased metabolic rate. This is especially important in critically ill patients who are already metabolically taxed. Oxygen consumption has been shown to increase by 10% per degree Celsius.<sup>7</sup>

### How Should Fever be Evaluated in the ICU?

In many ICUs, a newly elevated temperature in a patient triggers an automatic order set, which includes multiple diagnostic tests that are time consuming and

expensive (*see Table 1*). In an era when use of hospital resources is under intense scrutiny, it is appropriate to assess how such fevers should be evaluated in a prudent and cost-effective manner. Recognizing this need, a task force with members from the American College of Critical Care Medicine, Society of Critical Care Medicine, and the Infectious Disease Society of America developed the “Practice parameters for evaluating new fevers in the ICU,” which have been published elsewhere.<sup>2</sup> The parameters were developed with the goals of promoting rational consumption of resources and promoting an efficient evaluation of onset of new fever in critically ill patients.

### **When Should Fevers be Treated?**

There is a strong tendency to treat fever as an abnormal pathologic condition that should be corrected as soon as possible.<sup>8</sup> Choices to intervene aggressively should be made with the individual patient’s physiologic status in mind. In patients who have compromised cardiac, pulmonary, or neurologic systems, the metabolic costs of fevers may outweigh potential benefits.<sup>3,8,9</sup> The following recommendations have been made for patients without brain injury: 1) Do not treat mild temperature elevations up to 39°C. There are few detrimental effects and the immune system may be enhanced with mild temperature elevations; 2) Do treat high fevers (> 39°C) or rigors and shivering.<sup>3,8,9</sup> Most papers reviewed by Holtzclaw<sup>3</sup> agreed that fevers ≥ 40°C do not enhance the immune process and should be avoided.

### **How Should Fevers be Treated?**

Almost all ICU patients who become febrile are treated with an antipyretic and an external cooling method to render the patient afebrile.<sup>4</sup> Antipyretics affect the hypothalamic set point, although their precise mechanism of action is not fully understood. It is thought that antipyretic therapy with cyclooxygenase inhibitor drugs (ASA, acetaminophen, NSAIDs) prevents the conversion of arachidonic acid to Prostaglandin E-2 and Thromboxane A-2. If decisions are made to treat fever, based on physiologic knowl-

edge, the treatment of choice should be prostaglandin inhibitors such as antipyretic drugs to alter brain regulation.<sup>10</sup> But there are more questions than answers with regard to the use of these drugs in the treatment of fever. How well are antipyretics absorbed in the gut of critically ill febrile patients? Which type of antipyretic is most effective for treating fever? Which route of administration is most effective?

In an extensive review of the literature on fever related interventions, Henker<sup>11</sup> found the following: 1) fever is known to alter gastrointestinal motility, and changes in motility have additional effects on the pharmacokinetics of antipyretics such as acetaminophen; 2) there are no published reports of studies that have compared the effects of various antipyretics on fever in the critically ill adult; and 3) no comparison of the route of administration of antipyretics in critically ill adults has been reported.

### **What is the Most Effective Method of External Cooling?**

External cooling methods are interventions aimed at promoting heat loss through a variety of means (*see Table 2*). The application of exogenous cooling for treatment of fever is frequently at the discretion of nurses.<sup>12</sup> O’Donnell et al<sup>13</sup> found that 74% of all hypothermia units requested from central supply during a 1-year period were requested by critical care units. However, only 15% of the patients had a physician order for the cooling blanket. Communication between physicians making diagnostic decisions and the nurses administering cooling interventions is imperative.<sup>3</sup>

Hypothermia blankets are frequently used in ICU patients with febrile episodes. Two studies have demonstrated that hypothermia blankets were no more effective in cooling patients than antipyretics alone.<sup>13,14</sup> Rainer and colleagues<sup>15</sup> found that oxygen consumption rose 35-40% during hypothermia blanket therapy for febrile subjects. Henker<sup>11</sup> concluded that there continue to be more questions than answers with regard to the use of hypothermia units: 1) Where should the cooling blanket be placed (under the patient vs over the patient)?; and 2) At what temperature should one set the hypothermia unit? No reports of studies that compared

**Table 1**  
**Typical Costs Associated with Fever Evaluation**

Test	Costs
Blood cultures (× 2)	\$50
Urine culture & sensitivity	\$19
Sputum culture & sensitivity	\$28
Wound culture & sensitivity	\$19
Portable chest x-ray	\$75
Total	\$191

**Table 2**  
**External Cooling Interventions**

Intervention	Method of Heat Loss
Sponge Bath	Evaporative
Ice packs, cooling blankets	Conductive
Fan	Convective
Skin exposure	Radiation

the effectiveness of anterior vs. posterior placement were found. We have long believed that placing the blanket under the patient increases body surface area in contact with the cooling blanket. But we have also been concerned that the cold blanket and its vasoconstricting action on the peripheral skin of the sacral region predispose the patient to sacral decubitus formation. What is the incidence of sacral decubitus formation in patients on hypothermia units?

At what temperature should the hypothermia unit be set? Many nurses believe the hypothermia unit should be placed at the lowest temperature possible in an effort to bring down the patient's temperature. The effects of 4 cooling blanket temperatures (7.2°C, 12.8°C, 18.3°C, 23.9°C) on the rate of temperature decrease was evaluated and found to have no difference in the amount of time required to decrease temperature.<sup>16</sup>

Sponge baths cause evaporation. Several early studies demonstrated that sponge baths were no more effective in lowering body temperature than antipyretics alone.<sup>14,17</sup> However, a more recent study reported that the application of a sponging protocol (cloths plunged into ice water and placed on most of the body surface and changed every 15-30 min) resulted in decreased temperature (mean 39.1°C to 37.1°C;  $P < 0.0001$ ), a decrease in energy expenditure (mean 2034 mL/min to 1791 mL/min;  $P < 0.004$ ) and decreased oxygen consumption by 12%.<sup>9</sup> Large prospective studies using randomization procedures are needed to more fully evaluate the effects of sponge baths on the febrile response.

Nurses often use ice packs, which are placed on the groin or axilla to promote the loss of heat by conduction. Despite the widespread use of ice packs, there have been no studies of their efficacy. Despite widespread use of fans, there are no studies that document their effectiveness in cooling febrile patients.

So to answer the question, of which if any of these external-cooling measures is most effective, one must ask, are any of these measures effective at all? In a recent study on the effect of external cooling, Gozzoli and colleagues<sup>9</sup> found that fever resolved within 24 hours with or without external cooling. Physiologically, it is counter-productive to use external cooling measures because they go against the body's compensatory mechanisms. Externally cooling the body without changing the regulatory set point in the hypothalamus will lead to the generation of heat through shivering. External cooling should not be considered for conventional treatment of fever in the critically ill adult patient, but it should be reserved for cases in which it is necessary to reduce fever and metabolic demand in patients who are resistant to antipyretic drugs.<sup>9,10</sup>

## More Questions

Think about the treatment of fever in your own practice. How is fever defined? How are fevers evaluated? When are fevers treated? How are fevers treated? Do you use antipyretics? By what route are they given? Are they effective? Do you use external cooling measures? If so, which ones? Is there good communication between the physicians and nurses as to the selection of these interventions? Does your institution use hypothermia blankets? Are they placed over or under the patient? At what temperature is the blanket set? Do the nurses use ice packs, sponge baths, and/or fans? Do any of these measures really work to decrease fever and oxygen consumption? Like many clinical situations in the ICU, we have multiple fancy gadgets to get data, but we're not sure how to act on the data. Once again, we're left with more questions than answers. ■

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- c. always despite the presence of severe respiratory insufficiency or severe alterations of the hemostasis.  
d. on a routine basis in the absence of contraindications.  
e. only when an infectious effusion is suspected.

**23. Evidence of drug use involving fentanyl will be positive for the longest interval when tested using which of the following specimens?**

- a. Blood
- b. Urine
- c. Hair
- d. Saliva
- e. Stool

**24. The proportion of hospital workers who anonymously acknowledge current illicit drug use is closest to which of the following?**

- a. 0.5%
- b. 2%
- c. 4%
- d. 12%
- e. 23%

**25. Fever is:**

- a. the same as hyperthermia.
- b. a loss of thermoregulatory function.
- c. a loss of compensatory cooling mechanisms.
- d. body temperature maintained at a higher level.

**26. The best treatment for external cooling for fever is:**

- a. hypothermia unit.
- b. sponge baths.
- c. fan.
- d. not known.

**27. Which of the following cytokines plays a key role in the pathogenesis of fever?**

- a. Interleukin-1
- b. Interleukin-6
- c. Tumor Necrosis Factor (alpha)
- d. All of the above

## CME/CE Objectives

After reading each issue of *Critical Care Alert*, readers will be able to do the following:

- Identify the particular clinical, legal, or scientific issues related to critical care.
- Describe how those issues affect nurses, health care workers, hospitals, or the health care industry in general.
- Cite solutions to the problems associated with those issues.

## In Future Issues:

### CVP and Bladder Pressure During PSV

# CRITICAL CARE *Plus*

*EXPANDING YOUR FOCUS IN INTENSIVE CARE*

## Withdrawing Life-Sustaining Support Calls for Clear Protocols

*Family education, consensus essential to successful process*

*By Julie Crawshaw, Editor, CRC Plus*

**B**ECAUSE WITHDRAWING OR WITHHOLDING LIFE-SUSTAINING SUPPORT IN THE ICU IS THE LEADING CAUSE OF ICU deaths, both practices call for well thought out protocols, says Gordon Rubenfeld, MD, MSc. Rubenfeld, who is assistant professor of medicine in the Division of Pulmonary and Critical Care at the University of Washington in Seattle, notes that though the legal and procedural issues surrounding the decision to withdraw support are well-documented, scant attention has been paid to the actual procedures this requires.

One reason may be that the very clear process and outcomes measures available for other types of in-hospital care don't exist for end-of-life ICU care. "We don't have validated tools for measuring end-of-life care or the quality of death and dying," Rubenfeld says. "Obviously, you can't use "live or die" as a measurement for end-of-life care."

Stepped withdrawal from full life-sustaining support to no support is commonplace, Rubenfeld notes, but the practice needs to be dispassionately examined because it's more often done for the clinicians benefit than for the welfare of the patient and family members.

"I don't think there's anything wrong with stepped withdrawal per se, but the data suggest that it happens to make the doctors and nurses feel better," Rubenfeld says. "I think we clinicians are actually negotiating with ourselves during that step-down process. We don't want to feel like we're giving up, and when we remove support gradually we lose that feeling that the decision we make leads to the patient's death."

Many critical care clinicians feel more comfortable withholding life-sustaining measures than withdrawing them. Rubenfeld says he frequently hears physicians argue that they use stepped withdrawal to make family members feel better, yet some of the orders physicians issue are very strange, such as orders not to add a second blood pressure medication, Rubenfeld observes.

"It's difficult to imagine a lay family member saying it's okay for the patient to be on one blood pressure medication but not two. However, it's a very common thing for doctors to do because we don't want to say "no blood pressure-raising medicine" but we also don't want to go so far as to add a second one."

To counter this, Rubenfeld advocates talking with the patient's family about the goals of care overall but not discussing specific treatments. "It's our job to operationalize those goals and we need to look at our own practices and biases very, very carefully and not allow those to drive our decision-making," he says.

Joanne Lynn, MD, president of Americans for Better Care of the Dying and director of the RAND Center to Improve Care of the Dying, agrees that it's difficult to know whether reducing and withdrawing life-sustaining measures in steps will help the patient's family.

"It may or may not be more merciful to give the family a little time to pull themselves together, to hold Mom in their arms once more or they may find it heartless and cruel to extend the time," she says. "Maybe that's where the stepwise process makes a little bit of sense because people need to think about it a little bit."

Lynn adds that in addition to not succumbing to their own biases, ICU clinicians must be aware of the many ways in which family members communicate their feelings. “It’s communication on a very deep level, really understanding what people are feeling, all their ambivalences,” Lynn notes.

She adds that sometimes communication is much more in the body language and whether the family still finds it possible to visit. Awaiting clear communication may appear to be a stepwise reduction in support when in fact physicians don’t have the permission they need to proceed, as when family members spend a few hours with the patient in order to gain clarity.

### **Communication Problems Can be Preempted**

The transition from cure to comfort has a different trajectory for each patient, Rubenfeld observes, but many communication problems can be pre-empted by educating family about what death looks like. Most modern Westerners are almost completely insulated from the process and—thanks to television—most are also conditioned to expect that dying is a quick and quiet process in which it appears the patient is merely going to sleep.

“My experience is that we need to explain to family members that they are likely to see signs they would normally interpret as manifestations of discomfort but that those are actually part of the normal dying process,” Rubenfeld says.

Families also need to understand that the purpose of doctors and nurses in end-of-life care is to make patients as comfortable as possible, but not to speed up the natural course of events. He outlines the principles of withdrawing life support as:

1. The goal of withdrawing life-sustaining treatments is to remove treatments that are no longer desired or do not provide comfort to the patient.
2. The withholding of life-sustaining treatments is morally and legally equivalent to their withdrawal.
3. Actions with the sole goal of hastening death are morally and legally problematic.
4. Any treatment can be withheld or withdrawn.
5. Withdrawal of life-sustaining treatment is a medical procedure.
6. Corollary to 1 and 2: when circumstances justify withholding an indicated life-sustaining treatment, strong consideration should be given to withdrawing current life-sustaining treatments.

Rubenfeld emphasizes the importance of distinguishing palliative care for patients who are dying in general from palliative care for patients who are dying in the ICU. He points out that there’s a very robust body of

data indicating pain treatment is inadequate in acute care hospitals but far less evidence that such problems exist in the ICU.

There is, however, evidence that physicians don’t listen carefully enough to requests by patients and surrogates and that many patients receive overly aggressive end-of-life care. The best evidence came from a study done more than five years ago, which Rubenfeld says needs to be updated.

Family members and surrogates who want the ICU team to do more than is medically warranted pose another problem and they often need reassurance that everything that could have been done was in fact done.

### **Consensus is Important Even When Agreement Isn’t Reached**

Though there is substantial data showing that coordinated care delivers better outcomes in end-of-life care, a difference of opinion about exactly when life-sustaining support should be removed remains common, Rubenfeld notes, with nurses frequently reaching the conclusion that it’s time to withdraw life support well before physicians do.

Even when consensus is not reachable, Rubenfeld says the process of trying to reach it is important for all concerned because it provides a forum for releasing thoughts and feelings. However, he strongly cautions against talking with the patient’s family before strong disagreements are resolved.

“If nurses and doctors can’t work together to deliver good ICU care in general, they’ll have a much tougher time agreeing on end-of-life care,” Rubenfeld warns. “Everything depends on the culture of the hospital.”

If consensus on withdrawing life-sustaining support can’t be reached, Rubenfeld advocates finding a mediator. “Ethics committees do a lot of this,” he says. “They less frequently tell people what’s ethical than they help negotiate agreement, either between members of the team or members of the team and the family.”

This is especially true in hospitals with “fractured” ICU care in units that lack a lead intensivist. Such ICUs may have a cardiologist, pulmonologist, nephrologist, infectious disease physician, and surgeon who are caring for different pieces of the patient but haven’t talked with each other about the big picture.

“The surgeon may think things are okay because his operation was a success while the nephrologist thinks they are terrible because the kidneys are doing poorly,” Rubenfeld says. “You need to have someone quarterbacking the team.”

David H. Beyda, MD, Chief and medical director of

the Pediatric Critical Care department at Phoenix (AZ) Children's Hospital, says that once the family and medical team have agreed that any further medical/therapeutic interventions are futile, they proceed rapidly to withdrawing all support except for pain and sedation medications.

As far as the family is concerned, Beyda says, there should never be an issue with them "coming to terms" with the process. "We spend a lot of time discussing the process, its ramifications, the changes they expect to see, their feelings, what support they have, and their involvement in it," Beyda says.

### **Withdrawing Support Calls for Specific Protocols**

Rubenfeld and his colleagues have drawn up specific protocols for withdrawing life-sustaining support. He emphasizes the need to explain to family members what is being removed and why, and suggests that withdrawing life-sustaining support is a medical procedure that calls for the same levels of training and skills as in other components of critical care, including informed consent and documentation.

Here are the process steps he recommends for creating the appropriate setting and monitoring:

- Separate the patient from the commotion of the ICU by moving the patient to a separate area or to an isolated room. In open units, curtains should be closed.
- Turn off monitors, and, if possible, remove them from the room. Remove electrocardiographic leads, pulse oximeter and hemodynamic monitoring catheters. There is no point in monitoring physiologic parameters when the data generated will not alter care. Families attending the dying patient can become preoccupied with irrelevant numbers and waveforms instead of focusing their attention on the patient. Removing monitors also eliminates the alarms that would sound as patients die. Intensive nursing care supplemented by physical examination of the patient for blood pressure, pulse and respiratory rate is sufficient to identify manifestations of suffering and to determine when death occurs. We feel that removing patients from electronic monitoring is an essential step in the transition from curative to comfort care. Unfortunately, it is extremely difficult for clinicians to give up this technologic tether precisely because this step symbolizes the break from the physiologic monitoring that identifies the ICU.
- Remove all tubes, lines and drains if this can be done without significant discomfort. Catheters

may be left in place if removal would lead to painful obstruction, for example, of Foley catheters or biliary drains. Intravenous access should be maintained to administer analgesic medication. Remove unused intravenous pumps, resuscitation carts and other mobile technology from the room.

- Liberalize visitation to the extent that it does not interfere with the delivery of care to other patients. Children should be allowed to visit if their parents approve.

- Do not obtain further laboratory or imaging studies.

As feedback has come in about the procedures and processes he advocates, it has become discouragingly evident to Rubenfeld that he's preaching to the choir. Most of those who attend the talks he and other members of his department give, or read the book they've written, are clearly only a small percentage of critical care clinicians.

"The challenge is how to get people who don't attend or read to engage in this process," Rubenfeld says. "Frankly, I don't know how to do that."

Rubenfeld says that if he could give only one piece of advice about end-of-life decision-making, it would be this: Unless clinicians sometimes withdraw or continue life support when they wouldn't want it done that way for themselves, they are probably not fully engaging in a discussion with the family members and surrogates.

"It's hard to imagine that families would always want what an ICU physician would want," he says. "If you only find yourself withdrawing or continuing life support when you fully agree with doing it, there's some problem with the surrogate decision-making that's happening. I'm not saying this should happen frequently, or that it should never be the case that you withdraw life support when you strongly feel that it shouldn't be withdrawn. But from time to time there should be a case where you think 'This is what I would want, but I can understand how someone else would want it.'" ■

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3. For more information, contact Gordon Rubenfeld (206) 731-3356; Joanne Lynn (703) 413-1100 ext 5457; or David H. Beyda (602) 546-1784.

# Nine Ways to Improve Care of ED 'Hold' Patients

Tell ED nurses what you need

By Staci Kusterbeck

**W**HEN AN ICU NURSE RECEIVED A REPORT ON AN emergency department (ED) patient who had lost consciousness and fallen, she learned that the man had used the bathroom and walked around in the ED and that the CT scan of his head was negative. However, the ICU nurse then asked the ED nurse if the patient had X-rays to clear his spine and discovered that he had not. The X-rays revealed a fracture, which resulted in the man being transferred to the neurology unit.

This scenario shows the importance of ED and critical care nurses working together to improve care, says Katherine Blee, RN, MSN, CNA, CCRN, nurse manager of the coronary care unit, medical ICU and surgical ICU at Jerry L. Pettis Memorial VA Medical Center in Loma Linda, CA.

Caring for critical care patients in the ED often results in conflicts between ED and ICU nurses, Blee acknowledges. "But there is a lot you can do to make things easier for yourself, the patient, and the critical-care nurse who will receive the patient," she says.

Here are nine issues some critical care nurses ask their ED colleagues to consider in the transfer process:

1. Provide a time estimate for when the patient will be brought upstairs. This time estimate will help the ICU nurse plan the care of other patients and ensures that the assigned nurse is present when the patient arrives, says Blee.
2. Draw labs in the ED. If an IV is started in the ED, Blee says to check with the physician for needed labs and draw them if possible.
3. Place a gown on the patient. With a gown, the patient can be placed in bed directly from the gurney without having to undress.
4. Check that property inventory sheets are complete and accurate. Blee recalls an incident in which a homeless patient claimed he had brought in \$1,000 with him, but no money was listed on the property sheet. Nursing staff had doubts, but a search of the ED uncovered a paper bag with \$1,000 and other belongings stuffed under a sink, she says. She explains that during the time of the patient's admission, the ED staff were busy, placed his belongings in a cabinet, and forgot to transport

them with the patient.

5. If possible, place IV catheters in a nonantecubital area. A catheter in this site is very uncomfortable for patients, says Blee. "We often have to change the site within a few hours of the patient arriving to the unit," she adds. The antecubital often is used for an IV site because lab draws can be done in conjunction with the placement of the catheter, she explains. "However, if a large-gauge catheter is not needed, please start the IV in the lower-arm forearm areas if possible," says Blee.
6. Bring a defibrillator when transporting patients. For patient safety, Blee advises that a defibrillator always should travel with a critically ill patient, along with a mask/Ambu bag.
7. If possible, leave IV pumps with the patient in ICU. Blee has received patients with medications infusing, only to have the ED nurse take the pumps upon leaving the unit. The problem is that critical care medications are infusing without the control of a pump, until one is brought up from sterile processing, she explains. "This can be a long delay," she says.
8. Don't hesitate to ask for help. If you feel that you are unprepared in a particular situation, you should say so, urges Janice Piazza, RN, MSN, MBA, director of consulting services for VHA, a nationwide network of community-owned health care systems, and a former critical-care nurse and manager at Ochsner Clinic Foundation, Memorial Hospital, and Tulane Medical Center, all based in New Orleans. Piazza recommends saying, "I need some help in managing this patient" or "I have no experience in caring for a patient with this diagnosis." Talk to critical care nurses to formulate a plan for how support will be provided, she says. For example, Piazza suggests having an ICU nurse come to the ED to help manage the patient.
9. Place allergy bands while the patient is still in the ED. When an agitated patient at Blee's facility was admitted from the ED, ICU nurses had no idea the patient was allergic to lorazepam (Ativan). "Admitting orders were not yet written for this patient. The only place the allergy was noted was in the physician progress notes," she says. "Consequently, the patient was given Ativan and had an adverse reaction."

(For more information contact Katherine Blee at (909) 825-7084 ext. 2377, or e-mail: Katherine.Blee@med.va.gov; and Janice Piazza, at (504) 483-2330, e-mail jpiazza@vha.com.) ■

*Stacy Kusterbeck is a CRC Plus contributing writer.*

# PHARMACOLOGY WATCH

## No Shortage in Sight for Tetanus-Diphtheria Vaccine

The number of vaccine shortages has been unprecedented in the last year, but at least one vaccine, tetanus-diphtheria (Td), is back in full production. The Centers for Disease Control and Prevention (CDC) has announced that they are removing restrictions on the Td booster. Despite the fact that there is only one manufacturer of the vaccine, supplies are large enough to resume routine vaccination. The news is also good for childhood vaccines that have been in short supply, including MMR, varicella, and PCV-7 (pneumococcal) vaccine. All are expected to be in full supply by the end of the year.

### **Cholesterol-Lowering Therapy OK for Seniors**

What to do with the 75-year-old patient with a cholesterol of 300, but no history of heart disease? Primary prevention studies have shown a benefit for treatment of younger patients, but there have been few studies of primary prevention studies in the elderly. Now data from the Cardiovascular Health Study of patients age 65 or older suggest that cholesterol-lowering therapy is useful in older patients as well. After nearly 7.5 years of follow-up, elderly patients with elevated cholesterol levels clearly benefited from cholesterol-lowering treatment. Compared with no drug therapy, statin use was associated with a decreased risk of cardiovascular events (multivariate hazard ratio [HR], 0.44; 95% CI, 0.27-0.71) and all-cause mortality (HR, 0.56; 95% CI, 0.36-0.8). This translates into a relative risk reduction of 56% of incident cardiovascular events and a 44% reduction in all-cause mortality. This was a prospective study, as pointed out in an accompanying editorial; however, it does add to the body of medical literature that suggests that the recent National Cholesterol Education Program (NCEP) guidelines should apply to those aged 65 or older (*Arch Intern Med.* 2002;162:1395-1400; editorial 1329-1331).

### **Beta-Blockers and CABG Patients**

Preoperative beta-blockers have been shown to reduce operative complications and mortality in noncardiac surgery, and now 2 studies confirm the importance of beta blockade in patients undergoing coronary artery bypass grafting (CABG). In a large observational analysis of more than 600,000 patients undergoing CABG, preoperative beta-blocker therapy was associated with a small but consistent survival benefit in all patients except those with a preoperative left ventricular ejection fraction of less than 30% (*JAMA*. 2002;287:2221-2227). The most common postoperative complication of CABG is atrial fibrillation. A recent meta-analysis compares beta-blockers, sotalol, amiodarone, and biatrial pacing to prevent atrial fibrillation after heart surgery. All 4 modalities were effective (odds ratio compared to placebo—beta-blockers 0.39, sotalol 0.35, amiodarone 0.48, biatrial pacing 0.46). Each of the 4 drug modalities also significantly reduced length of stay. Significantly, beta-blockers, which are safe and easily administered were as effective as other treatment modalities (*Circulation*. 2002;106:75-80).

### **Asthma Sufferers: Use Clarithromycin**

Asthmatics with evidence of infection with *Mycoplasma pneumoniae* or *Chlamydia pneumoniae* ben-

This supplement was written by William T. Elliott, MD, FACP, Chair, Formulary Committee, Kaiser Permanente, California Division; Assistant Clinical Professor of Medicine, University of California-San Francisco. Telephone: (404) 262-5517. E-mail: robin.mason@ahcpub.com. In order to reveal any potential bias in this publication, we disclose that Dr. Elliott reports no consultant, stockholder, speaker's bureau, research, or other financial relationships with companies having ties to this field of study.

efit from a 6-week course of the macrolide antibiotic clarithromycin, according to a new study. In 55 patients with stable asthma in the Denver community, 31 were found to have evidence of mycoplasma or chlamydia infections by PCR and culture. All 55 patients were randomly assigned to treatment with either placebo or clarithromycin 500 mg p.o. b.i.d. 6 weeks. Patients who were PCR-positive and received clarithromycin were found to have a significant improvement in FEV<sub>1</sub> (2.50 pretreatment, 2.69 post-treatment;  $P = 0.05$ ), while those who were PCR negative and those who did not receive antibiotic showed no change (*Chest*. 2002; 121:1782-1788). In a related study, Turkish researchers administered azithromycin 250 mg twice weekly to a group of 11 asthmatics for 8 weeks. No change in FEV<sub>1</sub> was noted, but patients had a marked reduction in bronchial hyperresponsiveness as measured by histamine challenge tests. These patients were not evaluated for evidence of infection prior to initiating therapy (*J Asthma*. 2002;39:181-185).

### **Good News: Antibiotic Use in Children Down**

Meanwhile, efforts by the CDC and others to curb the use of antibiotics in children seem to have paid off. Researchers compared antibiotic prescription rates from 1999-2000 to data from 1989-1990. The number of prescriptions per 1000 individuals age 15 and younger decreased from 838 to 503 a decade later ( $P < 0.001$ ). Prescriptions per 1000 office visits also fell during the same period of time (*JAMA*. 2002;287:3096-3102).

### **Linezolid Successful in Treatment of MRSA**

Methicillin-resistant *Staphylococcus aureus* (MRSA), the bane of hospitals coast-to-coast, is effectively treated with linezolid. Previously vancomycin has been the standard of care for treating MRSA. A new study compares linezolid with vancomycin in 460 patients with known or suspected MRSA infections. Patients were treated with either linezolid 600 mg twice daily (n= 240) or vancomycin 1 g twice daily (n = 220) for 7-28 days. Clinical cure rates and microbiological success rates were similar for both groups, and both regimens were well tolerated with similar rates of adverse events. It is suggestive that linezolid is a reasonable alternative to vancomycin for MRSA infections and adds the additional option of oral therapy (*Clin Infect Dis*. 2002;34:1481-1490). The study is timely, as the CDC has reported the first isolate of fully vancomycin resistant *S aureus* in a Michigan man. Several cases of intermediate vancomycin-resistant staph have been reported, but

this represents the first case of full resistance (*Morb Mortal Wkly Rep MMWR*. 2002;51:565-567).

### **SSRIs Relieve Dizziness in Psychiatric Patients**

General internists and family practitioners will be delighted to learn that selective serotonin reuptake inhibitors (SSRIs) have been shown to effectively relieve dizziness in patients with psychiatric symptoms, a common office complaint. A group of 60 patients at University of Pennsylvania with psychogenic dizziness, dizziness due to a neurologic condition (with psychiatric symptoms), or idiopathic dizziness were treated with an SSRI for at least 20 weeks. Two thirds of patients had been treated previously with either meclizine or a benzodiazepine. Twenty-five percent of the patients did not tolerate SSRIs. Of those who finished at least 20 weeks of therapy, 84% improved substantially with no difference between patients with major psychiatric disorders and those with lesser psychiatric symptoms. Patients with peripheral vestibular conditions and migraine also improved with SSRIs (*Arch Otolaryngol Head Neck Surg*. 2002;128:554-560).

### **DEET-Based Mosquito Repellents Just in Time for Vacation**

Just in time for summer vacation, the *New England Journal of Medicine* has published a report showing that DEET-based mosquito repellents are superior to non-DEET-based repellants. DEET is the most common compound found in commercial insect repellents. Recently, several botanical repellents have come on the market as well as 3 repellent-impregnated wristbands. These were tested against DEET containing repellents as well as one other chemical repellent containing IR3535. The worst performers were the wristbands, which offered no protection. The IR 3535-based repellents offer minimal protection while the soybean oil-based botanical repellents work for an average of 95 minutes. In comparison, the formulation containing 23.8% DEET offers complete protection for more than 300 minutes (*N Engl J Med*. 2002;347:13-18).

### **FDA Actions**

Risedronate (Actonel), P&G Pharmaceuticals' bisphosphonate for the treatment of osteoporosis, has been approved in a 35 mg once-a-week form. The drug has been available as a 5-mg daily tablet. As with other bisphosphonates, the drug needs to be taken 30 minutes before meals, and patients must remain upright for at least 30 minutes following administration. ■

# PHARMACOLOGY WATCH

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Asthmatics with evidence of infection with *Mycoplasma pneumoniae* or *Chlamydia pneumoniae* ben-

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efit from a 6-week course of the macrolide antibiotic clarithromycin, according to a new study. In 55 patients with stable asthma in the Denver community, 31 were found to have evidence of mycoplasma or chlamydia infections by PCR and culture. All 55 patients were randomly assigned to treatment with either placebo or clarithromycin 500 mg p.o. b.i.d. 6 weeks. Patients who were PCR-positive and received clarithromycin were found to have a significant improvement in FEV<sub>1</sub> (2.50 pretreatment, 2.69 post-treatment;  $P = 0.05$ ), while those who were PCR negative and those who did not receive antibiotic showed no change (*Chest*. 2002; 121:1782-1788). In a related study, Turkish researchers administered azithromycin 250 mg twice weekly to a group of 11 asthmatics for 8 weeks. No change in FEV<sub>1</sub> was noted, but patients had a marked reduction in bronchial hyperresponsiveness as measured by histamine challenge tests. These patients were not evaluated for evidence of infection prior to initiating therapy (*J Asthma*. 2002;39:181-185).

### **Good News: Antibiotic Use in Children Down**

Meanwhile, efforts by the CDC and others to curb the use of antibiotics in children seem to have paid off. Researchers compared antibiotic prescription rates from 1999-2000 to data from 1989-1990. The number of prescriptions per 1000 individuals age 15 and younger decreased from 838 to 503 a decade later ( $P < 0.001$ ). Prescriptions per 1000 office visits also fell during the same period of time (*JAMA*. 2002;287:3096-3102).

### **Linezolid Successful in Treatment of MRSA**

Methicillin-resistant *Staphylococcus aureus* (MRSA), the bane of hospitals coast-to-coast, is effectively treated with linezolid. Previously vancomycin has been the standard of care for treating MRSA. A new study compares linezolid with vancomycin in 460 patients with known or suspected MRSA infections. Patients were treated with either linezolid 600 mg twice daily (n= 240) or vancomycin 1 g twice daily (n = 220) for 7-28 days. Clinical cure rates and microbiological success rates were similar for both groups, and both regimens were well tolerated with similar rates of adverse events. It is suggestive that linezolid is a reasonable alternative to vancomycin for MRSA infections and adds the additional option of oral therapy (*Clin Infect Dis*. 2002;34:1481-1490). The study is timely, as the CDC has reported the first isolate of fully vancomycin resistant *S aureus* in a Michigan man. Several cases of intermediate vancomycin-resistant staph have been reported, but

this represents the first case of full resistance (*Morb Mortal Wkly Rep MMWR*. 2002;51:565-567).

### **SSRIs Relieve Dizziness in Psychiatric Patients**

General internists and family practitioners will be delighted to learn that selective serotonin reuptake inhibitors (SSRIs) have been shown to effectively relieve dizziness in patients with psychiatric symptoms, a common office complaint. A group of 60 patients at University of Pennsylvania with psychogenic dizziness, dizziness due to a neurologic condition (with psychiatric symptoms), or idiopathic dizziness were treated with an SSRI for at least 20 weeks. Two thirds of patients had been treated previously with either meclizine or a benzodiazepine. Twenty-five percent of the patients did not tolerate SSRIs. Of those who finished at least 20 weeks of therapy, 84% improved substantially with no difference between patients with major psychiatric disorders and those with lesser psychiatric symptoms. Patients with peripheral vestibular conditions and migraine also improved with SSRIs (*Arch Otolaryngol Head Neck Surg*. 2002;128:554-560).

### **DEET-Based Mosquito Repellents Just in Time for Vacation**

Just in time for summer vacation, the *New England Journal of Medicine* has published a report showing that DEET-based mosquito repellents are superior to non-DEET-based repellants. DEET is the most common compound found in commercial insect repellents. Recently, several botanical repellents have come on the market as well as 3 repellent-impregnated wristbands. These were tested against DEET containing repellents as well as one other chemical repellent containing IR3535. The worst performers were the wristbands, which offered no protection. The IR 3535-based repellents offer minimal protection while the soybean oil-based botanical repellents work for an average of 95 minutes. In comparison, the formulation containing 23.8% DEET offers complete protection for more than 300 minutes (*N Engl J Med*. 2002;347:13-18).

### **FDA Actions**

Risedronate (Actonel), P&G Pharmaceuticals' bisphosphonate for the treatment of osteoporosis, has been approved in a 35 mg once-a-week form. The drug has been available as a 5-mg daily tablet. As with other bisphosphonates, the drug needs to be taken 30 minutes before meals, and patients must remain upright for at least 30 minutes following administration. ■