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[The commentator responds:]

John Miller highlights an important diagnostic challenge. If fever and an acute confusional state are the only presenting signs, when is urinary infection the cause of clinical deterioration in elderly residents of nursing homes? In this situation, although a positive urine culture is necessary to diagnose a urinary infection, it is not sufficient. At any given time as many as 50% of residents without symptoms have a positive urine culture, usually with pyuria, and a positive culture has a low predictive value for symptomatic urinary infection.[1] Unfortunately, in the absence of localizing genitourinary findings such as costovertebral angle tenderness or hematuria, the relatively small proportion of these episodes that are due to urinary infection in the noncatheterized resident cannot be differentiated from episodes due to other causes.[2] In the face of this uncertainty, the practitioner must base the treatment decision for each episode on his or her clinical judgement. The management issue here is not the treatment of asymptomatic bacteriuria, but the diagnosis of symptomatic urinary infection and the lack of specificity of that diagnosis.

A major plea of my commentary is that physicians acknowledge this diagnostic uncertainty and consider a management approach of observation for residents who have only mild or moderate symptoms.[3] In patients who are seriously ill, empiric antimicrobial therapy is certainly appropriate, given the diagnostic limitations. However, further systematic evaluation of diagnostic and management strategies in this population is necessary to identify optimal approaches to care.

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Patient-controlled analgesia

Patient-controlled analgesia (PCA) is a computer-based medical technology now used extensively in Canada to treat postoperative pain. A typical PCA machine contains an embedded microcomputer programmed to give, for instance, 1 mg of morphine intravenously every time the patient pushes a button on the end of a cable. To prevent excessive drug administration, the onboard computer ignores further patient demands until a lockout period (usually set for 5–10 minutes) has passed.

Recently, the Institute for Safe Medication Practices reported that a patient had received a lethal morphine overdose while connected to the Abbott Lifecare 4100 PCA Plus II machine.[1] This machine is easily misprogrammed by caregivers, who must manually enter the PCA parameters, and it needs a more sensible and forgiving user interface.[2] A number of patients have received opiate overdoses as a result of PCA errors: insertion of a 5 mg/mL morphine cartridge when the machine is expecting a 1 mg/mL concentration, or acceptance of the default (initial) drug concentration when the correct action is to scroll up to the correct value, among other errors.[3,4]

In 1997, ECRI documented 3 deaths that occurred while patients were connected to the Lifecare 4100.[5] In at least 2 of the cases, the alleged reasons for the deaths were the same. In the mode of operation in use, when nurses program the drug concentration the Lifecare 4100 display shows a particular concentration (e.g., 0.1 mg/mL). Nurses can either accept this initially displayed value or modify it using the arrow controls. The critical flaw in the design is that in this situation the Lifecare 4100 offers the minimal drug concentration as the initial choice. If nurses mistakenly accept the initially displayed minimal value (e.g., 0.1 mg/mL) instead of changing it to the correct (and higher) value (e.g., 2.0 mg/mL), the machine will "think" that the drug is less concentrated than it really is. As a result, it will pump more liquid, and thus more narcotic, into the patient than is desired.

The purpose of this letter is to warn clinicians of continuing fatal drug overdoses from the Abbott Lifecare 4100 PCA Plus II machine. If you use this machine, please contact your risk management officer and your biomedical engineering department for advice. Fortunately, Abbott is not the only supplier of PCA machines.

We have informed American and Canadian regulatory authorities; they are, of course, now studying the problem.

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[A representative from Abbott Laboratories Inc. responds:]

Patient-controlled analgesia (PCA), introduced by Abbott 17 years ago, inaugurated a new standard for the safe management of pain by simplifying the