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Potassium: Still a Very Dangerous Drug

As required by Health-General Article, §19-304, Annotated Code of Maryland, the Office of Health Care Quality receives Root Cause Analyses (RCAs) from all Maryland hospitals for any adverse event resulting in death or serious disability. From July 1, 2004 through June 30, 2005, OHCQ received and reviewed over 100 RCAs.

These sad events are almost always of a kind that could happen in any hospital. Thus, OHCQ is aware of the potential teaching value of certain events. Periodically, the OHCQ distributes a description of an event to all Maryland hospitals to initiate a dialogue within the hospital. Please distribute this alert to appropriate staff.

The Case

A middle-aged patient was admitted to a hospital for persistent nausea and diarrhea. Because of dehydration, the patient was administered intravenous fluid with potassium at a rate of 150 cc/hr. On admission, the physician ordered a serum potassium and it was 3.5 mEq/L. Fluids (with the potassium) were continued for the next 48 hours because of persistence of nausea. On the second day after admission, the serum potassium rose to 4.8 mEq/l.

On the third hospital day, the patient appeared much improved; however, a serum potassium drawn by the laboratory early in the morning was reported to the floor via phone from the laboratory as 7.1mEq/l (normal = 3.5 – 6.5 mEq/l). When this result was given to the nurse, the laboratory technician opined that the specimen was “contaminated.” A repeat STAT test was ordered. The repeat specimen was drawn at 8:30 a.m. and was logged into the laboratory at 10:00 a.m. At 10:00 a.m., the physician discontinued the

IV fluid that contained potassium. At 11:22 a.m., the floor was notified that the potassium was 8.3 mEq/l. At 11:52 a.m., more than 3 hours after the first blood result was known, the patient lost consciousness and coded. The attending physician arrived during the resuscitation effort. The patient was pronounced dead about 5 hours after the code occurred.

Discussion

A number of systems failed in this unfortunate case. If this incident occurred in your hospital, what questions would you ask? Have you looked at this issue recently to prevent any similar occurrence?

OHCQ staff discussed this case at length and asked the following questions:

1. When an IV infusion containing potassium is given to a patient over several days, should an automatic stop order be instituted pending an assessment?
2. When the nursing staff receives a lab result showing hyperkalemia, what is the hospital’s protocol to ensure an immediate assessment of the patient and any appropriate intervention?
3. If the nurse, physician or lab technician believes that a specimen is contaminated, should this “assumption” change the vigilance that is exerted by staff insofar as the continued IV infusion is concerned?
4. When a life-threatening laboratory value is found, should the laboratory call the attending physician as well as the nurse? This procedure might apply with hyperkalemia and hypoglycemia,

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Potassium: Still a Very Dangerous Drug *Continued*

and other tests as determined by the hospital medical staff.

5. Is there a procedure to handle STAT tests? Is this procedure audited to determine appropriate response times, including the length of time for the specimen to be obtained and length of time for the result to be transmitted?
6. Is there a protocol for a nurse to call a physician, such as a house physician or a rapid response team, if there is not an appropriate response by the attending physician regarding a dangerous laboratory value, or any other life-threatening situation? Is laboratory and nursing staff performance in dealing with STAT situations periodically audited?
7. Does the laboratory document show how quickly it

returns stat values, and to whom? Is there an audit of how these values are acted upon?

8. Is the list of “panic” lab values reviewed periodically and updated?

How would your hospital fare in dealing with a patient like this one, receiving a potentially dangerous drug while there is laboratory evidence of a potentially serious problem?

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