

## Medical News

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### Frequency and Determinants of Drug Administration Errors in the ICU

van den Bemt and colleagues from The Netherlands conducted a study to identify both the frequency and the determinants of drug administration errors in the intensive care unit (ICU). Administration errors were detected in two Dutch hospitals using the disguised-observation technique (observation of medication administrations by nurses, without revealing the aim of this observation to the nurses). The drug administrations to patients in the ICUs of the hospitals were observed during 5 consecutive days.

A total of 233 medications for 24 patients were observed to be administered (whether ordered or not) or omitted. When wrong time errors were included, 104 administrations with at least 1 error were observed (frequency, 44.6%); when they were excluded, 77 administrations with at least 1 error were observed (frequency, 33.0%). When wrong time errors were included, day of the week (Monday: odds ratio [OR], 2.69; 95% confidence interval [CI<sub>95</sub>], 1.42 to 5.10), time of day (6 to 10 pm: OR, 0.28; CI<sub>95</sub>, 0.10 to 0.78), and drug class (gastrointestinal: OR, 2.94; CI<sub>95</sub>, 1.48 to 5.85; blood: OR, 0.12; CI<sub>95</sub>, 0.03 to 0.54; and cardiovascular: OR, 0.38; CI<sub>95</sub>, 0.16 to 0.90) were associated with the occurrence of errors. When wrong time errors were excluded, day of the week (Monday: OR, 3.14; CI<sub>95</sub>, 1.66 to 5.94), drug class (gastrointestinal: OR, 3.47; CI<sub>95</sub>, 1.76 to 6.82; blood: OR, 0.21; CI<sub>95</sub>, 0.05 to 0.91; and respiratory: OR, 0.22; CI<sub>95</sub>, 0.08 to 0.60), and route of administration (oral by gastric tube: OR, 5.60; CI<sub>95</sub>, 1.70 to 18.49) were associated with the occurrence of errors.

In the hospital without full-time specialized intensive care physicians (which also lacks pharmacy-provided protocols for the preparation of parenteral drugs), more administration errors occurred, both when the investigators included (OR, 5.45; CI<sub>95</sub>, 3.04 to 9.78) and when the investigators excluded (OR, 4.22; CI<sub>95</sub>, 2.36 to 7.54) wrong time errors.

The authors concluded that efforts to reduce drug administration errors in the ICU should be aimed at the risk factors identified in this study. Specifically, focusing on system differences between the two ICUs (eg, the presence or absence of full-time specialized intensive care physicians and the presence or absence of protocols for the preparation of all parenteral drugs) may help reduce sub-optimal drug administration.

FROM: van den Bemt PM, Fijn R, van der Voort PH, Gossen AA, Egberts TC, Brouwers JR. Frequency and determinants of drug administration errors in the intensive care unit. *Crit Care Med* 2002;30:846-850.

### Gastrointestinal Colonization and VRE in a Hemodialysis Unit

The transmission dynamics of vancomycin-resistant enterococci (VRE) and factors contributing to their dissemination are complex. D'Agata and colleagues from Vanderbilt University, Nashville, Tennessee, used mathematical modeling to simulate patterns of dissemination among patients and healthcare workers and to quantify the contribution of specific factors and infection control interventions to the endemic prevalence of VRE in a long-term hemodialysis unit.

The model predicted that (1) an endemic prevalence of 12% would be reached over time, regardless of the number of patients initially colonized; (2) endemicity would be sustained by the constant influx of newly colonized patients discharged from the hospital; (3) the duration of VRE gastrointestinal colonization would have the most impact on the number of secondary cases, increasing the endemic prevalence to a maximum of 70%; and (4) decreasing the patient-to-healthcare worker ratio or improving hand hygiene would decrease the endemic prevalence to 3%.

Decreasing the duration of colonization, limiting hospital acquisition of VRE, and improving compliance with hand hygiene in the hemodialysis unit may decrease the rapidly rising rates of VRE in this patient population.

FROM: D'Agata EM, Horn MA, Webb GF. The impact of persistent gastrointestinal colonization on the transmission dynamics of vancomycin-resistant enterococci. *J Infect Dis* 2002;185:766-773.

### Locally Delivered Polyclonal Antibodies for Abdominal Implant Infections

The increasing clinical incidence and host risk of bio-material-centered infections, as well as the reduced effectiveness of clinically relevant antibiotics to treat such infections, provide compelling reasons to develop new approaches for treating implanted biomaterials in a surgical context. Poelstra and colleagues from the Gristina Institute for Biomedical Research, Herndon, Virginia, describe the direct local delivery of polyclonal human antibodies to abdominal surgical implant sites to reduce infection severity and mortality in a lethal murine model of surgical implant-centered peritoneal infection.

Surgical implant-centered peritonitis was produced in 180 female CF-1 mice by the direct inoculation of surgical-grade polypropylene mesh disks placed in the peritoneal cavity with lethal doses of either methicillin-resistant