Long-Term Care Survey Alert

Care Planning: Get Up to Speed On This Medication Safety Threat

A PharmD gives you the inside scoop.

Thomas Lynch, PharmD, BCPS, warned in a presentation at the 2011 American Medical Directors Association annual meeting that "one of the areas where there's a lot of misunderstanding and misconceptions is drug interactions -- in particular, those that involve the Cytochrome P450 system."

Background: The CYP450 enzymes are "essential for elimination or inactivation of drugs and toxins," Lynch said in his talk. "For the human, they are primarily in the liver but ... they are also in the intestine and that can explain some drug interactions," added Lynch, an associate professor at Eastern Virginia Medical School in Norfolk, Va.

In his presentation, Lynch said he was focusing primarily on five different CYP450 enzymes, which are "the ones mostly involved in drug interactions." These are 1A2, 2C9, 2C19, 2D6, and 3A4, according to Lynch's handouts.

Lynch notes that he has "prepared several tables listing common drugs that depend entirely on CYP450 enzymes for metabolism, other common drugs that can block their metabolism and increase plasma drug levels up to five-fold -- and several drugs that can increase drug metabolism leading to therapeutic failure." (See Lynch's presentation handouts on page 20 of this issue.) "By far, blocking metabolism of another drug is the most common form of these types of drug interactions," Lynch noted in his presentation.

"There are pages and pages of drugs that are metabolized by the CYP450 system but I've summarized and narrowed it down to the most important ones," Lynch tells Eli. "If a patient is on one of those drugs (I call them red flag drugs), a physician has to be vigilant when adding another agent," he adds.

"Pharmacists should be catching these drug-drug interactions, too," Lynch stresses.

Heed These 2 Case Examples

In his AMDA talk, Lynch presented the following two case studies:

Case study 1: "A 68 year old woman with chronic schizophrenia [who] has responded best to clozapine (Clozaril), is stable on 300 mg twice daily, and is followed by her psychiatrist," states a PowerPoint slide from Lynch's presentation. "She is also a chronic smoker. She is admitted to the hospital for exacerbation of COPD. After 10 days, the patient is lethargic and drooling profusely. Her psychiatrist checks clozapine and norclozapine levels, which are 1,043 and 432 ng/ml respectively. Clozapine therapy is temporarily discontinued," states the slide.

What occurred in this case, as Lynch and conferees discussed during his presentation, is that the person quit smoking. "When someone goes in the hospital, it's a no smoking zone -- they don't have any choice," Lynch said. Smoking induces the 1A2 enzyme, Lynch had noted earlier in his talk. And "1A2 is responsible for metabolizing clozapine. So that patient on the outside is stabilized on a particular dose as a chronic smoker," Lynch said. "You stop smoking [and] blood levels shoot up. And vice versa when someone comes out of the hospital."

Case study 2: "A 74 year old woman has a history of hypertension and chronic low back pain secondary to a ruptured disk," states Lynch's presentation PowerPoint slide. "Her medications include HCTZ 25 mg daily, amlodipine 10 mg daily, and oxycontin 20 mg twice daily. She develops an upper respiratory infection and is prescribed clarithromycin (Biaxin) 250 mg twice daily. Three days later she is found obtunded, hypotensive, with a respiratory rate of 8 breaths/min," states the slide.

Explanation: "If a patient is taking oxycodone for pain and is prescribed clarithromycin for an infection, clarithromycin

blocks the CYP 3A4 enzyme responsible for metabolizing oxycodone," Lynch tells Eli." Thus, "plasma oxycodone levels will rise, potentially resulting in respiratory failure. The FDA now has a black box warning to avoid that drug interaction," he adds.