

Switching patients from IV to pill form of drugs could save millions

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(Medical Xpress) -- Switching hospitalized patients able to take medication by mouth from intravenous to pill forms of the same drugs could safely save millions of dollars a year, new Johns Hopkins research suggests.

In a review of computerized records for the year 2010, conducted at The Johns Hopkins Hospital in Baltimore, the researchers estimated savings of more than \$1.1 million in the Department of Medicine alone — not including surgical patients — by swapping out four commonly prescribed IV medications with their oral equivalents. A report on the study is published in the journal *Clinical Therapeutics*.

“Our study looked at just four drugs administered by one department in one hospital in one year and found more than a million dollars in potential savings,” says Brandyn D. Lau, a medical informatics specialist at the Johns Hopkins University School of Medicine and the study’s leader. “Imagine if every hospital took a hard look at substituting oral medications for IV ones whenever possible. We’re talking about an enormous financial impact, with no risk to patients.”

According to the Centers for Medicare and Medicaid Services, roughly 12 percent of U.S. health care expenditures in 2009 — \$293.2 billion — were for medications and nondurable medical products.

Lau says a large-scale switch to oral medications has the potential to not only decrease costs, but also to reduce the need for puncturing veins to

insert intravenous tubes or medications directly, procedures that carry a higher risk of hospital-acquired bloodstream infections, and longer hospital stays. Simple reminders to physicians that their patients may be eligible to switch medication types could yield large savings, the researchers say.

The four medications reviewed in the study were chlorothiazide (a medication used to treat high blood pressure and address fluid retention), voriconazole (an anti-fungal), levetiracetam (to stop seizures) and pantoprazole (for acid reflux). By combing Hopkins' computerized provider order entry (COPE) system, they examined whether patients receiving these drugs intravenously were also prescribed other medications orally or if they were being fed solid meals, another indication that they would likely be able to swallow pills. In 2010, a total of 10,905 doses of the four medications were given by IV to patients admitted through the Department of Medicine. Lau says the drugs are given even more frequently in surgery patients.

The team compared those results with the cost of the various medications. For example, the wholesale cost of a 5-milligram tablet of chlorothiazide is \$1.48. An equivalent dose of the drug given intravenously is \$357.24, more than 200 times as much as the oral version. Pantoprazole, the most commonly administered medication in the study, is \$4.09 per 40-milligram tablet, while a 40-milligram vial is \$144. That medication is often given to patients several times a day. The potential cost savings per patient for the acid reflux medication would be \$680.98, the researchers found.

The researchers note that not all patients are able to switch from the IV form to the oral form of a [drug](#). Diet orders may change, Lau says, or a physician may have a reason for not switching a particular patient to an oral medication. But even a small increase in the conversion of patients from IV to oral medication would have a substantial financial impact due

to the considerable difference in costs between the two forms. Meanwhile, though Lau's research only looked at the wholesale costs of the drugs, there are other costs associated with giving medication by IV that could be reduced if fewer drugs were administered that way, he says.

The researchers chose these four drugs to study because the oral and IV forms are very similar to one another, but many other drugs potentially could also be swapped out for an even greater cost savings.

To implement the swaps, Lau says hospitals with computerized medication systems could add alerts to their programs that would appear when a patient on an IV medication meets eligibility criteria for oral medication intake. Lau cautions, however, that doctors are already bombarded with reminders and it might be best to start with drugs with the highest savings per dose, such as levetiracetam and chlorothiazide.

"There is a danger in over-reminding," Lau says. "Constant reminders may annoy doctors to the point where they stop paying attention. We need to study the best way to get doctors to switch from IV to oral medications."

Education, he says, is another avenue. Teaching doctors that [oral medication](#) is a cheaper alternative to IV may encourage them to make the switch without subjecting them to regular, potentially irritating reminders.

Provided by Johns Hopkins University

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