

## Patient Safety Tip of the Week

January 28, 2014

# Is Polypharmacy Always Bad?

Is polypharmacy always bad? That's a question that a group of researchers in the UK have recently challenged ([Payne 2014](#)).

We often consider polypharmacy to be a measure of poor quality. There are clearly reasons why increasing numbers of drugs taken may lead to adverse events. We know that the likelihood of drug-drug interactions increases with the number of medications taken. Also side effects of medications may be additive. For example, taking multiple drugs that have anticholinergic side effects may result in clinical anticholinergic symptoms that would not have occurred with only one drug. Or drugs that may be associated with orthostatic hypotension may have additive effects to make that orthostatic drop in blood pressure symptomatic. And multiple studies have demonstrated that polypharmacy is a risk for unplanned hospitalizations.

But Payne and colleagues ([Payne 2014](#)) have pointed out that most previous studies linking polypharmacy to unplanned hospitalizations have had certain flaws. First, they may have dichotomized variables (i.e. they used "more than x medications" to define polypharmacy vs. no polypharmacy). Second, they often did not take into context the reasons the patients were taking multiple medications or the number of comorbidities. And many were done on select patient populations (eg. only the elderly or nursing home residents).

So they performed a retrospective analysis of patients in Scotland to further study the relationship between medications and hospitalizations. Though it was a retrospective analysis rather than a randomized controlled trial, the study utilized a comprehensive data set on over 180,000 patients from 40 family practices that were representative of the population as a whole, had close to 100% capture of medications prescribed, and linked to a database that stored hospital admission data. Also, rather than dichotomizing the polypharmacy variable, they split the medication variable into a continuum of ranges (eg. none, 1-3, 4-6, 7-9, and 10 or more medications).

Their findings are interesting. Yes, they confirmed that there is a strong correlation overall between the number of drugs taken and the risk of unplanned hospital admission. Patients taking 4-6 medications were more than twice as likely to have an unplanned

admission than those taking 1-3 medications. And those taking 10 or more medications were 6 times more likely to be admitted than those taking 1-3 medications.

But when they factored in comorbidities they found that the strength of the association between number of medications and unplanned admissions was greatly reduced as the number of comorbidities increased. In fact, for the patients with the most comorbidities (6 or more conditions) there was no difference in the risk of unplanned admission between those taking 4-6 medications vs. those taking 1-3 medications. Even for those taking 10 or more medications the risk was only moderately increased (OR 1.5).

They explain their results by noting that many studies on polypharmacy have ignored one very important factor that seems counterintuitive: **underprescribing!** That is, patients on multiple medications may not be taking a medication that is very important for at least one of their underlying conditions. Of course, it may not be truly underprescribing. Rather it may reflect poor compliance, a phenomenon we tend to see increase with the number of medications prescribed. In their study some further data supported their assertion that underprescribing may play a role. Those patients with 6 or more comorbidities who were receiving no medications were more likely to be admitted than those receiving 1-3 medications.

It certainly makes sense. If your patient has CHF, CAD, diabetes, and several other conditions but is not taking those medications shown to reduce hospitalizations and complications from those diseases, they are more likely to be admitted.

The authors therefore caution against the use of “polypharmacy” per se as a quality indicator because it may be misleading. They suggest that measures of inappropriate prescribing (eg. Beers’ list, STOPP list) are likely to be better quality metrics than using total number of medications. In our June 21, 2011 Patient Safety Tip of the Week “[STOPP Using Beers’ List?](#)” we noted the STOPP criteria identified potentially avoidable ADE’s impacting on hospitalization over twice as often as did Beers’ criteria.

We’ve done multiple columns on Beers’ list, the STOPP list, and inappropriate prescribing in the elderly (see the list at the end of today’s column). We are also strong advocates of regular reviews of a patient’s medications (medication therapy management or MTM). See our May 7, 2013 Patient Safety Tip of the Week “[Drug Errors in the Home](#)” for details on MTM. We’ve mentioned multiple times that when we do such reviews on high-risk patients we almost always come away with medication lists that are 1-2 medications shorter (because of therapeutic duplication or medications no longer needed). But the work of Payne and colleagues would suggest we need to add another column to our MTM sheets – one for evidence-based medications that are missing for a condition the patient has!

In our hospitals we’ve already added such a column to our discharge checklists and this has helped hospitals improve their compliance with quality metrics for a variety of P4P programs. But we probably have not kept up to date on our similar MTM lists on the outpatient side.

So is polypharmacy always bad? No, what we really need to strive for is “eupharmacy”.

**Some of our past columns on Beers’ List and Inappropriate Prescribing in the Elderly:**

Patient Safety Tips of the Week:

- January 15, 2008 “[Managing Dangerous Medications in the Elderly](#)”
- October 19, 2010 “[Optimizing Medications in the Elderly](#)”
- September 22, 2009 “[Psychotropic Drugs and Falls in the SNF](#)”
- June 21, 2011 “[STOPP Using Beers’ List?](#)”
- May 7, 2013 “[Drug Errors in the Home](#)”

What’s New in the Patient Safety World columns:

- June 2008 “[Potentially Inappropriate Medication Use in Elderly Hospitalized Patients](#)”
- September 2010 “[Beers List and CPOE](#)”
- December 2011 “[Beers’ Criteria Update in the Works](#)”
- November 2013 “[More on Inappropriate Meds in the Elderly](#)”

**References:**

Payne RA, Abel GA, Avery AJ, et al. Is polypharmacy always hazardous? A retrospective cohort analysis using linked electronic health records from primary and secondary care. *British Journal of Clinical Pharmacology* 2014; 15 January 2014  
<http://onlinelibrary.wiley.com/doi/10.1111/bcp.12292/pdf>



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