

Patient Safety Tip of the Week

January 13, 2015 More on Numeracy

Low health literacy is an issue well known to impact health outcomes. For years when we talked about health literacy we focused on reading levels and reading comprehension. But in our What's New in the Patient Safety World columns for June 2012 "[Parents' Math Ability Matters](#)" and November 2014 "[Out-of-Hospital Pediatric Medication Errors](#)" we noted a study ([AAP 2012](#)) that showed that parents' mathematics skills, independent of reading skills, may play a big role in some pediatric medication errors. The study ([Marrese 2012](#)) showed parents with math skills at the third grade level or below were five times more likely to measure the wrong dose of medication for their child than those with skills at the sixth grade level or higher. While about a third of the parents had low reading skills, 83% had poor "**numeracy**" skills, with 27% having skills at or below the third grade level. Parents with low numeracy may especially prone to make errors in tasks requiring dose measurement or measurement conversions.

The study highlighted the need to address numeracy skills of parents when communicating medication instructions. They also provided as an example having providers review and give parents pictures of dosing instruments filled to the correct amount for that prescription.

We suspected the same issues likely apply to adult medication errors as well. Now a new study in adults has demonstrated similar findings. Wong and colleagues assessed health literacy and numeracy in patients attending rural and urban rheumatologic practices in Australia ([Wong 2014](#)). The study utilized two validated and widely accepted tools for evaluation of health literacy plus a new practical tool that has not yet been validated. Word recognition was assessed using the Rapid Estimate of Adult Literacy in Medicine (**REALM**). Comprehension was assessed using the Test of Functional Health Literacy in Adults (**TOFHLA**). Practical comprehension and numeracy were then assessed by asking patients to follow prescribing instructions for 5 common rheumatology medications (they refer to this new tool as the "**Rheumatology Literacy Guide**").

The investigators, somewhat to their surprise, found no statistically significant difference between the rural and urban populations. REALM scores indicated 15% of patients overall had a reading level \leq Grade 8 whereas 8% had marginal or inadequate functional health literacy as assessed by the TOFHLA.

However, most strikingly, they found significant proportions of the patient populations that incorrectly followed prescribing instructions for 2 drug regimens commonly prescribed for rheumatology patients. Dosing instructions for ibuprofen and methotrexate were incorrectly understood by 32% and 21% of patients, respectively.

That, of course, is of considerable concern particularly since methotrexate errors can result in serious adverse patient outcomes (see our What's New in the Patient Safety World columns for July 2010 "[Methotrexate Overdose Due to Prescribing Error](#)" and July 2011 "[More Problems With Methotrexate](#)").

The methotrexate question was "MTX and folic acid are used to treat rheumatoid arthritis. MTX comes in 10 mg tablets and folic acid in 0.5 mg tablets. A usual dose of MTX is 10 mg once a week and folic acid 0.5 mg once a day. Please count out how many of each tablet you would need for 1 week."

The ibuprofen question was "Ibuprofen is a common anti-inflammatory medication. It is called a non-steroidal anti-inflammatory or NSAID. A common adverse effect is indigestion. It therefore needs to be taken just after a meal. Ibuprofen comes in 200 mg tablets. A common dose is 400 mg twice per day. How many tablets of ibuprofen per day is that?"

The patients handled instructions for the other three regimens (tramadol, prednisone, and alendronate) much better.

The two standardized validated tools were not very good at predicting who would err on the methotrexate or ibuprofen tasks.

The authors recommend the following strategies to address poor health literacy:

- assessing baseline patient understanding of their condition before providing information
- use of plain language rather than medical jargon
- emphasizing <3 main points that are repeated several times during the consultation
- use of "teach back" (asking patients to explain or demonstrate what they have been told)

They also refer us to the [Health Literacy Universal Precautions Toolkit](#) developed for AHRQ by the North Carolina Network Consortium and others.

Wong et al. also stress that patients are often **embarrassed** about their ability to understand instructions and often overestimate their reading ability. In fact, some potential study subjects may have declined participation because of such embarrassment. So problems with health literacy and numeracy may, in fact, be underestimated.

They found risk factors for low health literacy that are similar to those found in the literature: male gender, non-English primary language, lack of university education, and lack of employment. Interestingly, they also found an association between low health literacy and low use of the Internet.

But don't let education level fool you. In our May 7, 2013 Patient Safety Tip of the Week "[Drug Errors in the Home](#)" we described the considerable difficulty even well-educated patients had following some prescription regimens.

Therefore, use of the "**teach back**" technique is very important in ensuring that all patients or their caregivers really understand the instructions and correct dosing of medications. "Teach back" does require an investment of time. Practices often find that use of specially trained physician extenders may be useful in this regard. Hospitals often use pharmacists in this role. Anecdotally, we have found that patients are more willing to admit their difficulties following instructions to someone other than the physician, whether that person is a nurse, PA, NP, or pharmacist. In fact, we actually most often find out about such difficulties from our receptionists and other front office staff who deal with our patients frequently.

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