PERSPECTIVE

LESS IS MORE

The Dangers of Ignoring the Beers Criteria—The Prescribing Cascade

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You may be at work on a Friday afternoon thinking about which brew pub you are going to visit after work or over the weekend, a pub where the list of beers may be pages long. You might spend several minutes perusing the characteristics and provenance of each beer and thinking about which beer(s) you are going to try. Are you thinking more about these kinds of beers than about Beers List medications? The Beers Criteria for Potentially Inappropriate Medication Use in Older Adults, commonly referred to as the Beers List, is a list of medications that should be avoided or used with caution in adults 65 years or older. It was originally published in 1991 and has been updated every 3 years since 2011, most recently in January 2019.[1] While other lists of medications that may be problematic in elderly patients have been published, the Beers Criteria is the best known and most commonly used.

My 87-year-old mother was recently seen in a hospital emergency department (ED) for pain in her back and buttocks after a fall she had 2 weeks earlier. She was diagnosed with sciatica and given prescriptions for a short course of prednisone and baclofen and sent home. Three days later, she developed delirium, necessitating another trip to the ED and a subsequent admission to the hospital. Her mental status returned to baseline 2 days later and she was discharged home. The final diagnosis was drug-induced delirium. A few weeks later, she returned to the ED complaining of stomach pain. She was given prescriptions for an antibiotic and a proton-pump inhibitor and asked to follow up with a gastroenterologist. Within a month, she developed severe diarrhea of several days' duration, and again returned to the ED, where this time she was given a prescription for dicyclomine. Two days after beginning this new drug regimen, she again became delirious and was readmitted to the hospital for several days. She was subjected to multiple laboratory tests and imaging studies, the results of which were all normal. Thankfully, she was again discharged home.

Review of my mother's case highlights separate but associated problems: likely misdiagnoses and inappropriate prescribing of medications. Diagnostic errors led to the use of prescription drugs that were not indicated and caused my mother further harm. In retrospect, I believe the pain in her back and buttocks was the result of local trauma from the prior fall, not sciatica. Her stomach pain was likely secondary to taking prednisone, not something that in and of itself would necessitate a referral to a specialist. The diarrhea she developed was probably related to the course of antibiotic therapy, though test results for *Clostridium difficile* infection were negative.

Misdiagnosis is common, with rates estimated to be in the range of 15% to 20%,[2,3] with contributing factors running the gamut from individual cognitive error to health system issues. Emergency medicine physicians in particular are often forced to make critically important diagnostic decisions in short order and with little context, often with suboptimal patient history. Diagnostic errors lead to delays in appropriate treatment and add substantially to health care costs. Most importantly, misdiagnosis can and does lead to various types of harm, often in the form of a prescribing cascade where an initial prescription medication is taken, an adverse drug reaction (ADR) occurs, and treatment is begun with yet another usually unnecessary drug.[4]

I am a clinical pharmacist working in a hospital-associated medical clinic. All of my patients 65 years or older are carefully screened for Beers List medications. Approximately 10% to 30% of hospital visits in older adults can be attributed to ADRs,[5] and they have been described as 1 of the top 5 greatest threats to the health of the elderly population.[6] Beers List medications play a large role in these ADRs. This problem has been previously discussed in *JAMA Internal Medicine*.[7] It should be noted that the Beers Criteria is a list of potentially inappropriate medications, and the inclusion of a drug on this list does not mean that it should never be used in elderly patients. The list is meant to be a guideline for identifying medications for which the risks may outweigh the benefits in older patients. The prescriber's clinical judgement of each individual patient's needs should always be considered.

In my mother's case, the prescribing cascade led to the use of several unnecessary and potentially dangerous medications. The muscle relaxer and prednisone led to her first incidence of delirium. Prednisone likely led to the gastrointestinal issues, and the antibiotic likely led to the diarrhea, which led to the prescribing of dicyclomine, which led to the second incidence of delirium. A Beers List medication such as dicyclomine should never have been prescribed to an 87-year-old patient with a recent history of drug-induced delirium, yet it was. I asked my mother's primary care physician if her medical record could be flagged to prevent Beers List medications from being prescribed, but I was told that this was not possible. In both my clinical and now personal experience, we are not doing nearly enough to prevent these types of avoidable ADRs. I see elderly patients every week who have been prescribed a Beers List medication.

More vigilance is needed to prevent this type of harm for our elderly population. As with most issues

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regarding patient safety, a single solution is unlikely. Education of medical professionals about Beers List medications is important and should continue, but it has been at best marginally effective, and it alone is not adequate. The problem of inappropriate prescribing in elderly patients presents an excellent opportunity for interprofessional cooperation among physicians, pharmacists, nurses, and other clinicians. Every elderly patient taking multiple prescription medications should be screened for potentially harmful medications and drug interactions. Physicians must be willing to deprescribe medications that are inappropriate, even if they did not originally prescribe them. Emergency department–based clinical pharmacists can contribute to the critically important task of screening and preventing ADRs, and should be more widely utilized. Geriatricians can be invaluable resources in this regard, yet there are simply too few of them. They could, however, partner with pharmacists and other health care professionals in the design of systems that would minimize the prescribing of potentially inappropriate medications. At a minimum, warning alert flags could be used in electronic medical records that require an override before a Beers List medication could be ordered for an elderly patient. Alert fatigue from often minor multiple warning messages to pharmacists and physicians is a problem that needs to be addressed, because it may contribute to the more important warnings being missed.

We were fortunate. My mother's cognition returned to her baseline. I have instructed all family members and her primary care physician that no Beers List medications are to be prescribed unless absolutely necessary. How many family members without a medical background are caring for their elderly loved ones and are unaware of this problem? They do not know about Beers List medications. They rely on medical professionals like us to recognize and protect them from preventable ADRs, as we are trained to do. We can and must do better.

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1. 2019 American Geriatrics Society Beers Criteria® Update Expert Panel. American Geriatrics Society 2019 Updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *J Am Geriatr Soc*. 2019. doi:10.1111/jgs.15767

2. Graber ML. The incidence of diagnostic error in medicine. *BMJ Qual Saf*. 2013;22(suppl 2):ii21-ii27. doi:10.1136/bmjqs-2012-001615

3. Singh H, Meyer AN, Thomas EJ. The frequency of diagnostic errors in outpatient care: estimations from three large observational studies involving US adult populations. *BMJ Qual Saf*. 2014;23(9):727-731. doi:10.1136/bmjqs-2013-002627

4. Rochon PA. Drug Prescribing for Older Adults. UpToDate, Inc website. https://www.uptodate.com/contents/drug-prescribing-for-older-adults. Accessed on February 27, 2019.

5. Parameswaran Nair N, Chalmers L, Peterson GM, Bereznicki BJ, Castelino RL, Bereznicki LR. Hospitalization in older patients due to adverse drug reactions—the need for a prediction tool. *Clin Interv Aging*. 2016;11:497-505. doi:10.2147/CIA.S99097

6. Ammerman CA, Simpkins BA, Warman N, Downs TN. Potentially inappropriate medications in older adults: deprescribing with a clinical pharmacist. *J Am Geriatr Soc*. 2019;67(1):115-118. doi:10.1111/jgs.15623

7. Brennan-Taylor MK. Mom, you have to trust me. *JAMA Intern Med*. 2015;175(9):1441. doi:10.1001/jamainternmed.2015.3659