

## Appropriate Pharmacotherapy in the Elderly

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Today, approximately 40% of adults aged 65 and older report being on five or more daily medications. Almost 30% of all elder hospitalizations are related to some type of medication misadventure and approximately 15% of all adverse drug reactions occur in elderly patients. Polypharmacy is a continuing problem in the elderly and only seems to be getting worse as the elderly population grows along with the number of drugs approved by the US Food and Drug Administration (FDA) in addition to the growing number of over-the-counter drugs and/or vitamins and herbal supplements. These numbers are staggering today and may get worse in the future [1-4].

It has been estimated that by 2050, 20% of the population in the United States will be defined as elderly. It has also been postulated that the number of elderly patients 85-years of age and older will increase substantially over the next several decades. The result of this substantial increase in the elderly population is the utilization of more medications to treat a wide variety of ailments common to elderly patients [1-4].

Essentially, inappropriate medication use in the elderly has become an epidemic and one way to improve how medications are utilized in the elderly is to establish some "prescribing rules" for healthcare providers. These providers include physicians, physician assistants, nurse practitioners, nurses and pharmacists. Basically anyone who shares a part of the prescribing process may benefit from reviewing these rules. These rules are not new, unique or groundbreaking but instead are based on common-sense principles that should be used by all prescribers for all patients. These rules are especially appropriate in the elderly because they are so susceptible to drug-related problems [5,6].

These rules were written by me and have been published in detail in the *Southern Medical Journal* as a two-part series. An abridged version of these rules is presented below.

### Rule 1: Know the Patient and Use the Patient's Most Current Medical Record

Many of these rules are basic common sense and this one is especially so. That being said, prescribing any medication without thoroughly knowing a patient's medical background is hazardous and in the elderly even more so. Because elderly patients can be quite sensitive to a drug's effects, it is always prudent to review and understand the patient's medical background and current medical profile before drugs are prescribed. Obviously, in emergency situations this may not always be possible [5].

### Rule 2: Follow the Tenets of Evidence-Based Medicine, But Understand the Limitations of the Evidence

A current definition of evidence-based medicine (EBM) is a systematic approach to clinical problem solving which allows the integration of the best available research evidence with clinical expertise and patient values [7]. EBM should guide a practitioner's decision making process but the practitioner must realize that there may be a paucity of evidence when it comes to drug utilization and dosing in elderly patients. Pharmaceutical companies do not always conduct drug studies in elderly patients so the practitioner may have very little information to utilize as a guide in drug dosing or

medication monitoring. Because elderly patients generally have several co-morbidities and are on several medications, there may also be little information regarding drug-drug or drug-disease interactions. For this information, the practitioner is encouraged to research a particular drug before prescribing it to an older patient and use the best information available. It is always advisable to start with a low dose of an unfamiliar drug and titrate to response or adverse effects [5].

### Rule 3: Understand the Potential Pharmacokinetic and Pharmacodynamic Changes that can Occur in Older Adult Patients and Use this Specific Patient Information to Make Prudent Prescribing Decisions

Needless to say this rule is extremely important for ensuring safe and effective drug therapy in elderly patients. There are specific changes in the aging process that alter how drugs are absorbed, distributed, metabolized and cleared. Not recognizing these changes will greatly increase the potential for drug induced problems in elderly patients. Aging appears to have a minimal effect on the absorption of drugs. How certain drugs are distributed in the body may be affected as the body ages simply because protein binding characteristics can change. Considerable variation in hepatic drug metabolism may occur as the body ages, which usually necessitates the reduction of drug dose in the elderly. Unfortunately, there is no precise formula to utilize which can calculate a drug dose based on a particular hepatic parameter. Therefore, for those drugs that undergo hepatic transformation, healthcare providers must start with a much lower dose and titrate up based on efficacy and side effects. Medications (and active metabolites) cleared via the kidney are greatly affected by the aging process as glomerular filtration rate (GFR) is greatly reduced as one ages. Unlike hepatically metabolized drugs, GFR can be calculated and this estimation can be utilized to calculate appropriate drug doses [5,8].

The pharmacodynamics of a particular drug may also be affected by age although this change may be quite subjective. The way the body responds to certain drugs may be altered because of changes in receptor binding, alterations in enzymatic response and other subtle changes in body function. The effects should be noted as drug therapy is considered [5].

### Rule 4: Recognize and Investigate Patient Factors that may Contribute to Medication Problems

These patient-focus factors may be quite significant when drug therapy is considered.

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- Elderly patients commonly have several healthcare providers due to numerous co-morbidities.
- Elderly patients may shop at more than one pharmacy.
- They may have changes in cognition making it difficult to understand proper directions regarding medication use and administration.
- They may have several caregivers responsible for patient care.
- The elderly may have cost of living issues.
- They may have other social or environmental issues which may affect pharmacotherapy treatment plans.

The bottom line is, there may be many issues in elderly patients which can affect how and why medication treatment plans are not followed accordingly. The healthcare provider must anticipate these issues as pharmacotherapy treatment plans are implemented and assessed [5].

### **Rule 5: Avoid the Prescribing Cascade, if Possible**

The “prescribing cascade” is generally defined as using medications to treat the side effects of other prescribed medications or over-the-counter (OTC) drugs. These medication side effects may also be misinterpreted as a sign of another illness which may then be treated with even more medications. The “prescribing cascade” is very common in elderly patients. The key is recognizing a potential “prescribing cascade” and establishing a treatment plan, more appropriate for a particular patient. This “prescribing cascade” is also more prevalent in those patients who have several healthcare providers [5].

### **Rule 6: Prescribe and Recommend Only those Medications/Drug Classes for which you have a thorough Understanding of the Pharmacology**

This rule is also based on common sense but, like the others, it needs to be emphasized. Regarding elderly patients, understanding which drugs or drug classes are most appropriate to prescribe (or avoid) is critical. Be aware of the results of those important studies conducted in elderly patients, which might provide important information about utilizing one particular drug/drug class over another. Be aware of important adverse drug reactions or drug interactions that are reported in elderly patients. As new drugs are approved by the FDA review the data as it pertains to the elderly before prescribing. The utilization of tools like the *Beers Criteria* or the *STOPP* (Screening Tool of Older Persons’ potentially inappropriate Prescriptions) and *START* (Screening Tool to Alert doctors to Right Treatment) guidelines which identify potentially high risk, dangerous drugs in elderly patients is also quite useful [6,9-11].

### **Rule 7: Identify, Anticipate, and Monitor Potential Drug Interactions before they become a Problem**

Because elderly patients are usually taking more daily medications compared to the rest of the population and because of the pharmacokinetic changes that occur in the aging process, drug interactions are a common occurrence in the elderly and may lead to adverse drug reactions. Drug interactions are not completely avoidable; however, knowing which drugs/drug classes have the greatest potential to interact with other drugs can guide the healthcare provider in prescribing the safest drugs. If a drug interaction is possible, then a plan should be formulated when the drug is prescribed as to how that

potential interaction should be monitored. In this way, drug interactions are handled prospectively rather than retrospectively [6].

### **Rule 8: Establish a Monitoring Plan for each Medication Prescribed for both Efficacy and Toxicity**

Health care providers should continually assess and re-assess the pharmacotherapy plan for all patients. This begins with a current medical history, which should include all current medications including OTC drugs, vitamins, and herbal or dietary products. It must also include allergy history and any other pertinent drug-related information. For each medication, practitioners should assess reason for use, dosage assessment for that specific patient, adverse effects, monitoring parameters, and any other information specific for that patient. This other information might include cost issues, patient compliance, education issues etc [6].

### **Rule 9: Properly Counsel Patients/Caregivers on all of the Patient’s Medications and Ensure that the Patient Understands the Pharmacotherapy Plan**

Educating patients and caregivers on the pharmacotherapy plan is imperative. Even if Rules 1-8 are followed appropriately, patients and/or caregivers who do not understand the treatment plan will likely not respond to treatment. This can take time and effort, but patients who understand and comprehend their pharmacotherapy plan are more likely to be compliant and have fewer adverse drug reactions or other medication related issues. Other healthcare providers can re-emphasize the plan but the education should start with the prescriber. Written materials can be used to help educate but generally these only work in conjunction with thorough patient counseling by the healthcare provider [6].

### **Rule 10: Assess and Address Compliance Issues**

As the pharmacotherapy plan for a specific patient is continually re-assessed, compliance issues must also be re-assessed frequently. As Medicare and insurance coverage change often, the cost and payment issues for a patient’s drug regimen can also change. This can be a major cause of compliance problems and must frequently be discussed with patients. Compliance may also be affected by a patient’s reduced cognition. Family problems, caregiver issues and many other patient-related problems can all affect compliance. These issues must continually be re-assessed at each visit [6].

The reader is encouraged to review the detailed presentation of each of these rules published as a two-part series in the Southern Medical Journal [5,6]. The ten rules described above should be followed not just in the elderly but in all patients. Because the elderly are so susceptible to drug related problems, these rules are even more critical. Not all drug related problems can be avoided but if practitioners follow these simple rules, patients are sure to lead happier and healthier lives.

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