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Every day, millions of Americans start their morning the same way: with a handful of prescription pills. In fact, nearly a third of all adults take five or more medications regularly. Thanks to advancements in science and technology, doctors have over 10,000 different drugs to choose from when prescribing medications to their patients. The influx of medications available on the market has caused prescription drug use to explode, growing 85% over the last two decades. This alarming trend is exacerbated by the shifting national demographic: a massive number of aging baby boomers, many of whom will soon require senior care. The considerable increase in drug consumption brings with it a growing risk of harm. This white paper examines how doctors and caretakers can use electronic health records (EHRs) to manage medications and mitigate risk in an increasingly drug-dependent world.
Adverse drug events (ADEs): Unexpected medical occurrences that present during treatment with a pharmaceutical product which may or may not be causally related. ADEs can be categorized as preventable and non-preventable and do not always indicate poor quality of care.

Adverse drug reactions (ADRs): Harms directly caused by a drug at normal doses.

Medication errors: Preventable, inappropriate uses of a drug that may or may not result in harm and can occur during prescribing, transcribing, dispensing, administering, adherence or monitoring of a drug.

The U.S. spends $200 billion a year on medication care stemming from improper or unnecessary use of prescription drugs. Meanwhile, medication-related adverse drug events (ADEs) are the most common of all recorded medication errors, the third leading cause of death in America after heart disease and cancer.

What is an ADE—and what is it not?

ADRAs a subset of ADEs, as shown in the chart above.
Seniors face disproportionately high risk of medication complications

There’s no doubt that medications are a critical component of care for the elderly, especially for residents in senior living communities who require ongoing care. Administered correctly, they offer effective treatment for both chronic and acute ailments. Improperly managed medications, however, can cause serious medication-related hazards—and seniors are particularly at risk.

What causes an increased risk of ADEs?

The risk of complications is heightened by the number of medications a patient takes; this is true for anyone on a prescription drug regimen. Elderly patients, especially nursing home residents, who are prescribed more medications than patients in any other setting, are more susceptible to adverse events due to polypharmacy. Generally considered the largest risk factor for ADEs, polypharmacy refers to the simultaneous use of multiple drugs to treat a single ailment or condition. Startlingly, the average senior living resident takes 12-14 medications per day, making them particularly vulnerable to ADEs due to the sheer volume of medications they’re prescribed.

The “prescribing cascade”

If it’s hard to believe that the typical senior living resident takes more than 10 prescription drugs a day, consider the prescribing cascade. The prescribing cascade begins when a drug is prescribed, an adverse drug event occurs, the ADE is misinterpreted as a new medical condition, and another subsequent medication is prescribed to treat the drug-induced condition.

Identifying and suspending prescribing cascades is an important and often overlooked opportunity to improve medication safety in older people.

Senior behaviors exacerbate the risk in other ways, too.

Compounding the already-high risk of ADEs, seniors are much less likely to ask about drug safety compared to younger patients: a recent survey showed only half of seniors say they talk to their doctor about the risks associated with medications, including drug side effects. Senior patients’ failure to inquire about and understand their medications often results in improper consumption. Data from the Department of Health and Human Services indicates that over 50 percent of seniors are non-compliant with prescription drug instructions.
The proof is in the pudding

Knowing older adults take more prescription drugs than any other age group—and that they’re less prone to ask about and understand the risks of the medicines they consume—it’s unsurprising to see they’re twice as likely than younger persons to visit the emergency room due to an ADE and seven times more likely to be hospitalized after an ER visit as a result.

Figure 2. Hospital Stays Complicated by Adverse Drug Events, Distribution by Age

*2008 data analyzed from the Healthcare Cost and Utilization Project, AHRQ

Adults sixty-five and older comprise approximately 35 percent of all inpatient hospital stays but contribute to approximately 53 percent of inpatient stays complicated by ADEs.
Historically, medication management involved reading pill bottles and relying on local pharmacies to flag drug interactions. Prescriptions were often self-administered or administered by family members. But progressively complex health issues, combined with the prevalence of medication use and abuse, necessitate more involved oversight. For residents in senior living communities, the responsibility has largely shifted to healthcare staff—guided by the federal government.

**HITECH and the proliferation of electronic health records (EHRs)**

Motivated, in part, to reduce medical errors, the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 authorized incentive programs for meaningful use of electronic health records (EHRs). As a result, nearly 90% of senior living facilities now employ EHR technology, and the impact of this technology is significant. When health staff have access to complete and accurate records, residents receive better care.10
EHR vs. eMAR. What’s the difference, exactly?

Considering the nomenclature and benefits of these systems are similar, there can be some confusion between the two. But there is an important distinction, especially as it pertains to the way in which each is used in caring for residents and mitigating risk.

**EHR**

Electronic health records, like Yardi EHR, offer a look into the total health of each patient with point-of-care charting that highlights comprehensive resident information, including dietary requirements, insurance information, emergency contacts, vitals and weight, social history and progress notes.

**eMAR**

Electronic medication administration records, such as Yardi eMAR, streamline medication administration by enabling real-time communication between pharmacies, assisted living communities and healthcare staff.

A national survey of doctors offers important evidence\(^{11}\)

- 94% of providers report that EHR makes records readily available at point of care
- 88% report that EHR produces clinical benefits for the practice
- 75% of providers report that EHR allows them to deliver better patient care
Using electronic systems to mitigate errors

Computer monitoring systems that reduce medication errors, like Yardi EHR, can prevent anywhere from 28% to 95% of ADEs.\textsuperscript{12}

**Yardi EHR reduces the risk of errors with:**

- Electronic medication and treatment administration records
- Configurable resident assessments and care plans
- Real-time staff notifications with resident care updates
- Incident and accident tracking and analysis
- Behavior management tracking
- Wound care tracking
- Easy assignment of incident follow-up procedures based on role
- Ability for caregivers to work online and offline, with automatic syncing

Computerized medication order entry programs, like Yardi eMAR, have the potential to prevent an estimated 84% of dose, frequency and route errors.\textsuperscript{13}

**Yardi eMAR minimizes medication mismanagement by offering:**

- Single-click electronic refill requests and drug inventory tracking
- Advanced drug database intelligence for medication lookup and order entry auto population
- Efficient physician cycle approval through secure, online, third-party logins
- Intuitive workflows and reminders for staff
- Automated alerts for missed medications or excessive use of PRN drugs by a patient
- Multidirectional communication with leading pharmacy software systems
- Compatibility with barcode scanning systems
- Online staff training and continuing education
What kind of medication errors are most common?

An FDA study shows that 1.3 million people are injured each year from medication errors—and almost half of the fatal medication errors occurred in people over the age of 60.14

These are the three most common types:

1. **Improper dosing of medicine**
   
   With aging, there are changes in the way the body absorbs, distributes, metabolizes and excretes medications (a study known as pharmacokinetics—or what the body does with a drug). For that reason, extra care must be taken in determining drug doses for older adults.

2. **Administration of an incorrect drug**
   
   Prescription medications often have names that are easily mixed up. To minimize confusion between drug names that look or sound alike, the FDA reviews about 300 drug names a year before they are marketed—and about one-third of the names that drug companies propose are rejected.

3. **Incorrect route of administration**
   
   There are more than fifteen ways to administer medication. The implications of each should be understood as the route chosen has an impact on how that drug is absorbed, whether the patient gains any clinical benefit and whether they suffer any adverse effects.
Why do most errors occur?

There are many factors that may influence medication errors. They can be grouped into several categories:

### Human factors
- Lack of training or experience
- Inadequate drug knowledge
- Inadequate knowledge of the patient
- Overworked or fatigued caregivers
- Poor communication—with patients, other caregivers or pharmacy staff
- Literacy, language barriers and other personal factors
- Complexity of the condition, including high-risk medications and polypharmacy

### Environmental factors
- Workload and time pressures
- Distractions and interruptions
- Lack of standardized protocols and procedures
- Insufficient resources
- Lack of accurate patient records

### Pharmaceutical factors
- Improper labeling or packaging issues
- Confusing medication nomenclature
- Calculation, compounding and drug preparation errors
The complete clinical package

The benefits of electronic health records go beyond medication management and mitigating the risk of medical errors. Yardi EHR offers next-generation point-of-care charting and clinical intelligence, enabling staff to collaborate and coordinate care like never before.

More benefits of Yardi EHR:

 ✓ **Increased revenue**

Yardi EHR reduces the overall cost of ownership thanks to higher resident retention, more accurate care assessments and proper billing.

 ✓ **Reduced exposure to litigation**

Protect your organization and reduce your exposure to potential legal fees with proactive resident care management and properly documented service plans and service records.

 ✓ **Unsurpassed patient privacy**

Built-in comprehensive safeguards and controls, in compliance with HIPAA Privacy Rule and Security Rule best practice recommendations, along with data encryption, SOX-compliant controls and multi-tiered security protocols, ensure data is secure and protected against virus and malware attacks.

 ✓ **Expanded executive oversight**

Advanced clinical reporting, detailed analytics and instant access to financial data ensures financial decisions are based on the realities of clinical care.

 ✓ **Improved resident engagement**

Residents and their families can get involved in the care plan, thanks to self-service portals that allow residents to request appointments, check lab results and set reminders for services like flu shots.

 ✓ **Increased personalization**

The demands on caregivers can lead to one-size-fits-all treatment. Increased efficiencies allow staff to spend more time with patients—and less time tending to administrative tasks—resulting in more customized care.
The future of EHRs

It's undeniable that technology is changing the traditional senior living model. As staff and residents become more tech-savvy, the impact of technology will continue to transform the landscape. Here are just a few ways EHRs may evolve in the coming years.

**Comparative treatment**

When it comes to creating a regimen for residents with complex conditions, doctors can look forward to comparative treatment, where they can search for other patients with a similar health chart to see how they respond to a course of care before deciding how to proceed.

**Machine learning**

Building on comparative care, machine learning—getting computers to act without being explicitly programmed—will allow staff to predict optimal service plans and outcomes. Machine learning can also streamline EHR use: as the system learns how staff interact with the software, it will reduce time spent navigating throughout the platform, reducing burnout.

**Increased pharmacy precision**

EHRs (and eMARs) will go beyond simply storing and sharing information—they’ll actually compute data. This ability to calculate treatment regimens with precision—taking into account residents’ height, fluctuating weight, and diet—promotes more accurate medication dosing and care plans.

**Hands-free, voice recognition**

While current EHRs offer a superior alternative to handwritten charts, caregivers are still required to input significant amounts of patient data. Innovative technologies, such as natural language processing, will allow staff to more quickly transcribe information.

**Telehealth**

The opportunities to deliver care virtually are significant. Remote appointments will allow for outpatient care and more convenient continuous oversight for inpatient residents at a lower cost.
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