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## SECTION 3

# Prevention Approaches

Multiple factors may contribute to ADEs that occur in inpatient, outpatient, and other health care settings (e.g., long-term care facilities, group homes), or during care transitions. The delivery of safe health care depends on the creation of a reliable health care system that considers systems, organizational, technical, provider, and patient factors that may contribute to harm.

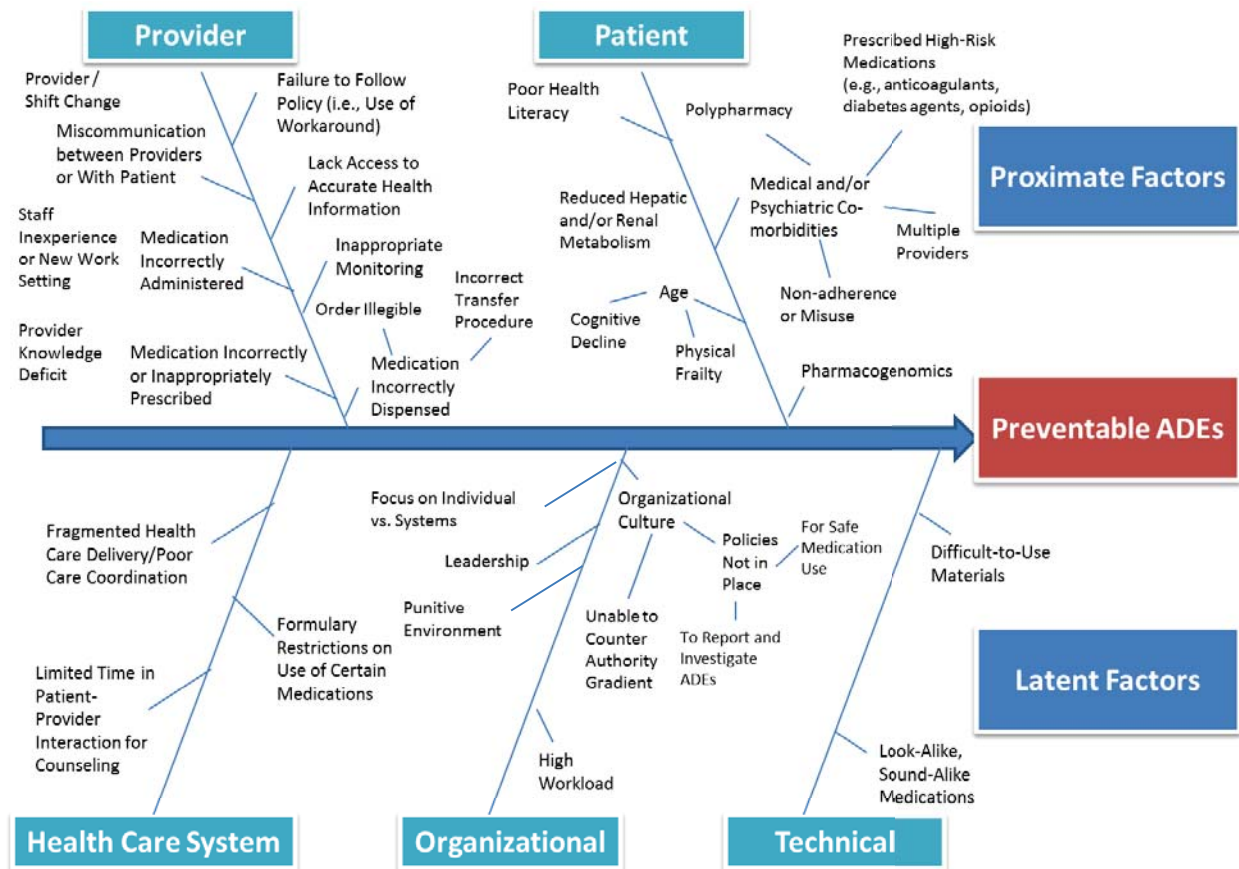
### Key Determinants of Preventable ADEs

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The Joint Commission patient safety event taxonomy model helps to potentially identify key determinants of ADEs [1]. This model categorizes root causes of patient safety events into proximate (e.g., human) and latent (e.g., organizational and system) factors.

As part of a continuous quality improvement approach to health care, The Joint Commission requires a root cause analysis to investigate factors that contribute to a sentinel event [2]. The fishbone diagram in **Figure 6** presents selected proximate and latent determinants of preventable ADEs. The literature suggests that ADEs in all health care settings may arise from a combination of patient, provider, and health care system factors. Although the key determinants presented in Figure 6 may not be implicated in all health care settings or patient situations, they should be considered in root cause analyses, as any one of the determinants may lead to an ADE.

Figure 6. Fishbone Diagram: Select Determinants of Preventable Adverse Drug Events



Proximate factors that contribute to ADEs include those that involve the patient and/or provider. Considering the patient-centered care approach supported by the National Quality Strategy, it is important to note patient factors that may contribute to ADEs. A number of proximate factors place older adults at particular risk for ADEs. For example, altered pharmacokinetics, use of multiple medications, and potential for medication mismanagement due to cognitive decline or physical frailty contribute to ADEs in older adults [3, 4, 5]. Patients with multiple chronic conditions are also more likely to be prescribed more than five medications, many of which may be high-risk medications and increase the risk of drug–drug interactions [3]. Older adults also frequently have multiple providers, which may result in uncoordinated or poorly coordinated care [5]. In addition, older adults are at increased risk for nonadherence or misuse of medications [6, 7].

Other proximate factors that contribute to individual/patient risk of ADEs include inherited factors and health literacy. Inherited factors can affect the kinetics and dynamics of numerous drugs and may include genetic variation in genes for drug-metabolizing enzymes, drug receptors, and drug transporters,

which have been associated with individual variability in the toxicity of drugs [8]. Poor health literacy also has been implicated as a contributing factor to ADEs [6].

Provider factors that may contribute to ADEs involve physicians, pharmacists, nurses, and caregivers who are certified to administer medication. As indicated in **Figure 6**, these may include errors in medication prescribing, dispensing, or administration [6, 7, 9, 10].

Once proximate factors are identified, emphasis should be on system-related factors that may have contributed to the ADE [3, 6, 10, 11]. Latent key determinants that may contribute to ADEs are systemic, organizational, or technical. Systemic factors may include failure to incorporate key health literacy principles [12], limited provider time to adequately explain information [6], poor coordination of care [7, 13], or formulary restriction on use of certain types of medications (particularly opioids) [14]. Organizational factors include those involving the institutional patient safety culture, leadership, and high provider workload [2, 3, 9]. Lastly, technical factors are those related to medical product design and include materials or medications that look similar, or materials that are difficult to use [2].

Organizations may use this model of key determinants of ADEs to ensure that patient, provider, technical, organizational, and systemic factors are considered in efforts to prevent ADEs. Organizations may conduct a careful root cause analysis of ADEs that identifies underlying causes and potential targets for intervention, with the goal of preventing their recurrence. By determining and verifying probable causal pathways that led to the adverse drug event, root cause analysis allows organizations to identify appropriate corrective and/or preventive actions, as well as to encourage the development of a culture of safety. Implementing such quality improvement initiatives is in direct support of the National Quality Strategy, which strives to make health care safer for all Americans.

## **Affordable Care Act—Health Care Delivery Models**

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Several innovative health care delivery models authorized in the Affordable Care Act are crucial to improving the sustainability of the health care system, reducing costs, and improving quality of care for patients. Models that potentially can be leveraged to further target high-priority ADEs include: patient-centered medical homes (PCMHs), Accountable Care Organizations (ACOs), and team-based health care. Summaries of these models can be found in **Appendix C**.

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