

Adverse drug reactions in the era of multi-morbidity and polypharmacy

Dear Sir,

We read with great interest the article by Sam *et al.*^[1] on the incidence and types of adverse drug events (ADEs) at a major academic medical center. We congratulate the authors for their very timely and valuable contribution to the area of patient safety. Medication errors are becoming more common in the era of increasingly prevalent multi-morbidity and polypharmacy as the overall age of the global population increases in a demographic megatrend never before seen by humanity.^[2-4] As Sam *et al.*^[1] pointed out, medication errors constitute a significant proportion of healthcare-associated adverse events. Although the authors categorize ADEs by primary disorder, type of occurrence, and frequency of IHI triggers, they do not provide specific causative risk factors behind the corresponding ADEs.^[1] The authors do, however, go on to discuss specific risk factors for drug-related adverse events, as compiled from various literature sources. Among many factors, they cite patient age, cardiovascular disease, low patient compliance, and polypharmacy as potential contributors.^[1] Polypharmacy by itself may play an important role as a risk factor for ADEs, as pointed out by the authors, due to altered pharmacokinetics, pharmacodynamics, and potential drug-drug interactions among the most frail and thus most susceptible patients.^[1,3]

As healthcare institutions and systems around the world cope with the demographic realities and the inherent increase in complexity of chronic medical treatments, the focus must shift to educating healthcare practitioners, optimizing the use of error-reduction technologies, and increasing the awareness of the nature and the magnitude of the problem at hand.^[5,6] In addition to the realization that polypharmacy creates a fertile environment for medical error and serious adverse events,^[3] one must also realize that polypharmacy itself is an indirect measure of patient frailty, especially when combined with objective assessment of all associated comorbidities.^[7] Initiatives such as “medication reconciliation” must be embraced in order to better track and prevent potential drug-drug interactions. In addition to increased institutional and health system collaboration, as well as enhanced education regarding ADE identification, prevention, reporting, and better educational programs that focus on polypharmacy reduction must be aggressively supported (especially in the more frail populations).^[8]

As the global community embarks on arguably one of the most ambitious undertakings in its history - reduction, and then elimination of iatrogenic complications and never events – we must unite in a “zero tolerance” approach toward attitudes unfavorable to a culture of safety.^[5] Our ability to actively

engage in self-reflection and self-improvement is predicated on the willingness to examine our own performance in this critical domain of healthcare delivery. The IHI Global Trigger Tool provides an excellent platform to achieve this objective and is a major reason why the report by Sam *et al.*^[1] is so impactful – it provides a much needed, realistic starting point that many institutions have not yet established. Once this initial step is taken, what follows is a long, painstaking, but ultimately very rewarding path of institutional, and systemic culture change.

In order for such far-reaching systemic change to be effective, it must actively involve all levels of the organization from top leadership to “front line” personnel.^[5] Although mutual respect and professionalism must be maintained in all team interactions, organizations must embrace the concept that when it comes to patient safety, organizational hierarchy must take a secondary role to reporting, tracking, and constructively addressing medical errors. Within this context, it must be realized that the majority of errors are not attributable to a single individual or a singular event and are more likely to be due to a confluence of multiple factors at multiple steps of the healthcare delivery process.^[5,9] Consequently, we strongly encourage the investigative team to further examine their data from the perspective of polypharmacy, multi-morbidity, organizational processes, and team performance measures as potential determinants of risk for ADEs.

We again congratulate Sam *et al.*^[1] for their valuable contribution. It is hoped that an honest and constructive discourse on improving patient safety can take place worldwide, with active participation and support of patients, healthcare professionals, institutional leaders, government officials, and global health organizations.

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Conflicts of interest

There are no conflicts of interest.

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