



from the Automation Expert
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DECISION-SUPPORT INFUSION DEVICES: SAFETY IN IV ADMINISTRATION

I'VE BEEN THINKING ABOUT MOUNTAIN ROADS, touchdowns, and the administration of infusion therapy.

Mountain Roads

Fifty years ago, my dad drove our family up—and I mean up—the Colorado Rockies' Pikes Peak road in our brand-new '55 Plymouth. The



narrow pavement barely hugged the mountain, and my seat (behind shotgun) provided a clear view of the drop-off to the right. I'll never forget how it took my breath away. But I can't remember if guardrails stood between us and the eternal abyss. I asked my dad if guardrails were along the edge, and he said, "If they were, we didn't try them out."

Of course, cars can crash through guardrails. Nevertheless, they make it easier to stay in a safe space and harder to go over the edge.

The goal is to make it easier for these health care professionals to do right and harder for them to do wrong.

Touchdowns

A few weeks ago, I sat next to an airplane pilot deadheading on a cross-country flight. "When a plane gently touches down," I asked, "who should we thank for the smooth landing—the pilot or the computer?"

To my surprise, he replied, "The pilot, 99.9 times out of a hundred." He added that while a computer could do it, pilots elect to land planes themselves to keep their skills sharp.

Most of the time, the computer flies the ship. Nevertheless, two or three sober and well-rested pilots scan the sometimes unfriendly skies with their 20/20 eyes.

The pilot next to me explained that computers were never intended to replace pilots. He likened the computers to safety nets which make it harder for pilots to make mistakes, like forgetting to lower landing gears or dropping altitude too quickly.

Administration of Infusion Therapy

When caregivers navigate the medication-use process, some areas present higher risks than others. Here is a generally accepted, rough summary of the research on where medication errors occur:

- 39% at the point of ordering
- 11% in transcribing
- 12% in distribution and dispensing
- 38% at the point of administration

While pharmacists, nurses, patients, family members, or information systems catch half the errors in the first three categories before medications reach patients, only 2% of administration errors are intercepted. This means that for every 100 medication errors in the first three categories, a total of 31 actually reach patients, while 37 reach patients in the latter category.

Furthermore, 60% of harmful errors in the final category involve IV infusion. Administering the right dose of the right drug at the right rate and flow for the appropriate duration is nothing short of complex. Accidentally entering 5 on an infusion pump instead of .5 means ten times the appropriate dose will be administered, too often resulting in what a Denver newspaper columnist called "death by decimal."

Hospitals are fortifying safeguards at the point of care, and infusion technology is becoming more intelligent. The new category of decision-support infusion devices has been coined "smart pumps." Interdisciplinary committees determine the right rules, which in turn are programmed into the pumps. When a caregiver programs one of these pumps, software

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tests the reasonableness of the order. If it fails, a warning or "stop" is issued, and a mistake is avoided—sometimes protecting the caregiver from losing his job and the patient from losing her life.

We are not ready to call these decision-support infusion devices "genius pumps," but their intelligence is increasing by the month. However, no one pretends that these pumps will eliminate the need for well-trained, cautious, alert caregivers. The goal is to make it easier for these health care professionals to do right and harder for them to do wrong.

On page 16 of this issue, you will find an insightful article by my colleague Doris Nessim, which will serve as a compass to help you navigate your way through the decision process when selecting from today's more intelligent pumps. In this article you will be introduced to products from companies committed to providing safety nets and guardrails by infusing more intelligence into their IV pumps.

For anyone concerned about medication safety, it's smart to remain informed about these increasingly intelligent pumps. **R&P**

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