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Reconsidering the application of systems thinking in healthcare: the RaDonda Vaught case

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Editor—After being found guilty of criminally negligent homicide for a fatal medication accident, former Vanderbilt University Medical Center (VUMC) nurse RaDonda Vaught spoke out, '*I do not work in a vacuum. I work in a healthcare system*.'[1] Vaught incorrectly administered vecuronium, instead of Versed® (midazolam) as ordered, without patient monitoring, and immediately reported the error. VUMC fired her, negotiated a family settlement, failed to disclose the error, and reported natural cause of death. Years later, an anonymous tip prompted a criminal investigation and trial. The prosecution argued for Vaught's negligence in issuing an override and failure to recognise different medications, whereas the defence argued that systemic factors contributed.

VUMC encouraged adherence to physician orders, even though they omitted patient monitoring in this case, which should be standard practice after midazolam administration. Overrides to the automatic dispensing cabinet (ADC) were encouraged to circumvent delays even though no effective systems were in place to prevent or detect the accidental selection, removal, and administration of medications obtained via override.[2] VUMC subsequently removed vecuronium from the medications capable of being obtained via override; implemented wristband barcoding and second nurse verification of medications in radiology; required entering 'PARA' in ADCs for paralytics; and implemented new patient monitoring policies for vecuronium. VUMC's fixes were only for case-relevant medications and departments despite prevalent issues throughout the organisation. Despite evidence

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that administrators failed to implement safe medication practices, no administrators faced repercussions.

Criminalisation of medical accidents leaves clinicians scared to report systemic causes and contributors to bad outcomes, removing a foundational pillar of patient safety. Vaught's conviction also demonstrates deep misperceptions amongst the public, legal, and medical communities that ignore more than 80 years of safety science, reflective of ongoing difficulty in acknowledging the complexity of safety in clinical work. Nurses across the USA, including those from our own hospital, have voiced their fear of being left unprotected and set up for failure by the US healthcare system.[3,4] The conception of accidents as being easily avoided through greater attention, trying harder, or adherence to rules, is a naïve reductionist concept, serving only immediate purposes, and is still the dominant view of safety. There is not just a legal problem, but a wider systemic failure to understand and embrace what we know about safety within complex systems.

Since the recognition of the frequency and ubiquity of medical accidents,[5] healthcare systems across the globe have sought to apply what has been termed a 'systems approach', based on the principle that accidents are not brought about by bad people, but by systems-of-work that have been poorly configured to support human activity. Work systems are constantly flexing in response to ever-changing productivity, financial, environmental, social, political, regulatory, and personal demands, and are dependent upon people working within them to adapt their behaviours, sometimes in violation of previous rules.[6] This complex, adaptive view of safety is especially salient in healthcare, where patient-centred care requires constant adaptation, whereas the goals of health, longevity, and quality of life are ultimately unachievable given finite resources and the natural limitations of human existence.[7]

Reinterpreting the events from this systems safety perspective, Vaught worked within a system that required trade-offs between safety and other aspects of system performance. This, ultimately, is what led her to administer the wrong medication inadvertently, killing Charlene Murphy. As the unit 'help all' nurse and preceptor, Vaught was responsible for the lives of several patients in coordination with uncommunicative staff while training an orientee.[8–12] Vaught administered the incorrect medication to Murphy in an unfamiliar environment without barcode or second nurse verification or access to electronic health records, and experienced technical difficulties and organisational pressures to circumvent delays by overriding the ADC rather than confirming with pharmacy, within a culture dependent on physician orders, even if they were incorrect in their omission of patient monitoring.[2,8–12] There were many contributors to this incident; and thus, there are many ways it could have been avoided. To blame only one individual will perpetuate problems, rather than lead to any resolution.

There remains a vast systematic misapplication of systems safety approaches in healthcare. Safety is often viewed as 'common sense' with simplistic narratives around standardisation, strict protocol and checklist adherence, and teamwork training based on cursory references to other industries. Despite interest in clinical decision making and support literature, how clinicians *actually* make decisions and where they seek trustworthy information to execute

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decisions, has rarely been explored. Clinicians can identify clinical failings, but do not always have the skills to acknowledge or identify the role played by bad design. Human-focused attributions such as 'cognitive bias' and 'situational awareness failure' can hide deeper systemic origins of these phenomena.[13] Some clinicians state outright that they do not believe in systems thinking and it is completely unnecessary. This systemic lack of systems thinking sets up clinicians to fail at every level within healthcare systems, and ultimately made the Vaught conviction inevitable.

RaDonda Vaught did not come to work that day to deliberately contribute to Charlene Murphy's death, but was set up to fail by a system that allowed a fatal mistake to happen. Nurse Janie Garner responded thoughtfully to the Vaught case: '*There are two kinds of nurses. [Those] who assume they would never make a mistake … because they don't realize they could. And …. the ones who know this could happen, any day, no matter how careful they are*'.[14] Simplistic views of 'error', where only bad people make mistakes, are still endemic across the global health system, yet must be challenged and changed. Although this case appears to be a miscarriage of justice, hopefully it will lead to better consideration and utilisation of systems thinking in healthcare and increased clinician and safety scientist collaboration. It is up to us to learn from this case and collaboratively redesign the healthcare system from inside out, with a systems perspective, especially in non-operating theatre environments as highlighted by this case.[15,16]

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