EON WORK INTELLIGENCE · SITUATION ROOM

The Healthcare Situation Room

The device errors that reach patients.

A cinematic, cited catalog of real medical-device use errors — the why, what, and how.

Review deck · EON AI Ventures · 2026 — 3rd EON Situation Room vertical (after Oil & Gas and Aerospace MRO)

Not medical advice · not certified · representative task, not a device IFU

WHY

The device does exactly what it was told. That is the problem.

- The error reaches the patient — a decimal slip, a silenced alarm, a default left unchanged, a connector that fits where it never should. The display confirms the number entered, not the dose delivered.
- It is not rare. From 2005–2009 the FDA received ~56,000 infusion-pump adverse-event reports, prompting 87 recalls (14 Class I). (FDA Infusion Pump Improvement Initiative, 2010)
- It still happens. Infusion-system hazards appear twice on ECRI's Top 10 Health Technology Hazards for 2025 (#8 and #10). (ECRI, 2025)
- The canonical case is fifty years old and still taught. Therac-25 delivered massive radiotherapy overdoses to at least six patients; at least three died. (Leveson & Turner, IEEE Computer, 1993)

The interface is the hazard — and today's human-factors training is a slide deck nobody remembers.

WHY — THE GAP WE FILL

A layer the device library does not have

THE PATIENT-SAFETY PROBLEM

Use error — the human-factors mechanism (wrong units, mode confusion, alarm fatigue, look-alike controls, defeated safeguards) — is the heart of the harm, not a mechanical fault.

The mistake and the consequence are separated in time, so judgment never builds. The Situation Room closes that loop — safely, on real cases.

AUDIENCE — NURSES & CLINICIANS

Built for the point of care first; patient-safety officers and biomed are secondary viewers.

The emotional front door the biomed/CMMS device library never had — and the human-factors taxonomy is ours to author (IEC 62366 / FDA HF), not lifted from the deck.

Patient dignity is absolute: consequence = device / aftermath only. Never the patient. No PHI.

Every number above is cited to a public authority — nothing invented. Where a figure is not public, the card says so.

WHAT

A Netflix-style catalog of real medical-device errors

- Cited — each card carries a plain-language WHAT / WHY / HOW, a severity chip, a device-class chip, and a source-tier chip. Every claim is sourced or flagged “not quantified in public sources.”
- Wired into the 50-class EON Healthcare Living Library — the infusion card opens onto the very Volumetric Infusion Pump (INF-01) it describes.
- The signature no competitor has — “Same task, different device”: identical keystrokes on three pumps produce three different doses. The inconsistency between devices is the hazard.
- Organized the way clinicians think — device/clinical-system shelves + 10 human-factors tags (our “Dirty Dozen”).

30 real situations in the pilot · 50 device classes · 10 human-factors patterns — every card cited or flagged.

WHAT — THE SHELVES

The site map — device shelves, human-factors tags

⟲ **Same Task, Different Device (signature)**	Top 10 — Most Frequent (ECRI-anchored)	The Landmark Cases
Infusion & Medication	Airway & Ventilation	Monitoring & Alarms
Cardiac & Resuscitation	Tubing, Lines & Connections	Energy & the OR
Imaging & Radiation	Behind the Bedside — biomed & reprocessing	Top Picks for You (persona-matched)

THE 10 HUMAN-FACTORS TAGS (our "Dirty Dozen") — on every card: alarm fatigue · mode confusion · wrong units · look-alike controls · default-value error · interruption · workaround / safeguard defeat · misconnection · automation surprise (the display lies) · handoff gap.

Shelves map 1:1 onto the library's 10 device families; the human-factors tags are the use-error spine the library deck does not have.

WHAT — THE CARD

Anatomy of a card

- WHAT / WHY / HOW — the situation, why it matters (standard inline), and the step-by-step of how it unfolds.
- Use-error spine — the human-factors mechanism + 1–3 tags. Decision-1 made explicit on every card.
- Device-class spine — libraryClass + code + family tag (e.g. Volumetric Infusion Pump · INF-01 · INF) linking into the Living Library → 6-layer competence record → future playable mission.
- Source-tier chip — ✓ ECRI / ✓ FDA / ✓ Joint Commission / ✓ established case render green; ⚠️ MAUDE renders amber (“user-submitted report, not an adjudicated finding”).
- Signature fields — siblingDevices[] for the multi-brand “Same task, different device” cards.

THE HONEST-BY-DESIGN FIELDS

quant — is the frequency a real cited number, or “not quantified in public sources”?

gmdn — present but empty (“to-source”). The library prints EON class codes, not GMDN numbers — so we never invent one.

manufacturerNamed — true blocks publish until Dan’s review (compiler-enforced).

notMedicalAdvice — always true → renders the mandatory badge.

HOW

Built honest — cited, gated, and human-free

- Corpus first — every card sourced to a public authority (ECRI, FDA, Joint Commission, IAEA, established investigation) with an openable “read the source” link. No frequency number is asserted without a citation.
- The MAUDE rule — an unverified user-submitted report can never carry a green “verified” stat; it renders amber with the literal caveat.
- Cinematic art pipeline — gemini-3-pro-image posters + clips, each passed through a triple-lens Gemini-vision QA before Dan’s eye.
- The Safety-QA gate — a strict-JSON verdict rejects any asset showing a person / body / hand, blood, PHI, or a real brand logo. Consequence = device & aftermath only.

Rigorous and cited — not a certified training device. No regulatory or clinical credit claimed.

HOW — THE ETHICS GATES

The consequence panel — what is allowed, what is never

✓ ALLOWED — device / aftermath

- The device itself (pump, vent, monitor, defib, C-arm)
- The lying display — a false-normal reading
- A silenced / paused alarm panel; a red alarm bar
- A flatline ECG trace on a monitor
- An empty, stripped, or freshly-remade bed
- A clinical room (ICU / OR / ward) empty of people

✕ FORBIDDEN — never

- Any patient — whole, partial, silhouette, or implied body
- Any blood, wound, or burn on a person
- Any PHI (names, MRNs, DOB, real charts)
- Any real manufacturer logo, model name, or livery
- Anything a clinician would read as depicting a victim
- Gore, distress, or “trauma-porn” framing

Enforced by the Gemini Safety-QA gate on every asset + Dan’s eye. Manufacturers named only where a public authority already names them.

HOW — THE ROADMAP

From cited cards to playable missions

Chunk 1	Schema freeze + 3 sample cards end-to-end — look, voice & ethics line locked.
Chunk 2	30-card pilot corpus — all cited, source URL per card, Safety-QA'd, manufacturer-flag pass.
Chunk 3	Storefront clone — human-free posters, 13 shelves, persona chip, spine chips, "read the source".
Chunk 4	Clips + narration batches — budget-approved, resumable → deploy decision.
Chunk 5	Pitch deck (this deck's sibling) — hospital / ministry pitch with the market "why".
Chunk 6	One staged-consequence mission spec — use-error made playable (infusion wrong-rate: the display lies — catch it or not).

Every chunk = build → adversarial-review → Dan's gate. Nothing paid runs without Dan's per-batch go.

THE 30 SCENARIOS

One slide per card — poster, cited facts, the use error, and its device-class spine. Every poster Safety-QA gated; every number cited or flagged.

LANDMARK CASE

Therac-25 — The Machine That Fired Blind

CRITICAL | CROSS-DEVICE / ENVIRONMENT | HF: automation-surprise, alarm-fatigue, mode-confusion

“The screen said Malfunction 54. He pressed P to proceed. It had already delivered a hundred times the dose.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

A computer-controlled radiotherapy linear accelerator delivered massive radiation overdoses to at least six patients across three clinics. Earlier models had hardware interlocks that physically prevented the high-energy beam from firing without its beam-spreading target in place. The Therac-25 removed them and trusted software alone. A fast edit of the treatment setup could leave the machine in a lethal state while the console reported a routine fault.

HOW IT UNFOLDS

1. The operator selects X-ray (high-energy) mode, then quickly corrects the setup to electron mode.
2. A race condition in the concurrent software leaves the beam at full energy with no target in the path.
3. The console shows only 'Malfunction 54' and 'Treatment pause' — no warning that a massive dose was delivered.
4. Habituated to frequent harmless faults, and told overdoses were impossible, the operator presses P to proceed.
5. The patient receives roughly a hundred times the intended dose; the harm is not visible for hours to weeks.

THE FACTS — CITED ✓ At least 6 massive overdose accidents, 1985–1987; at least three patients died. (Leveson & Turner, IEEE Computer, 1993) ✓ Doses reached roughly 100× the intended amount (some reports up to 250×). (Therac-25 investigation record)

SOURCE

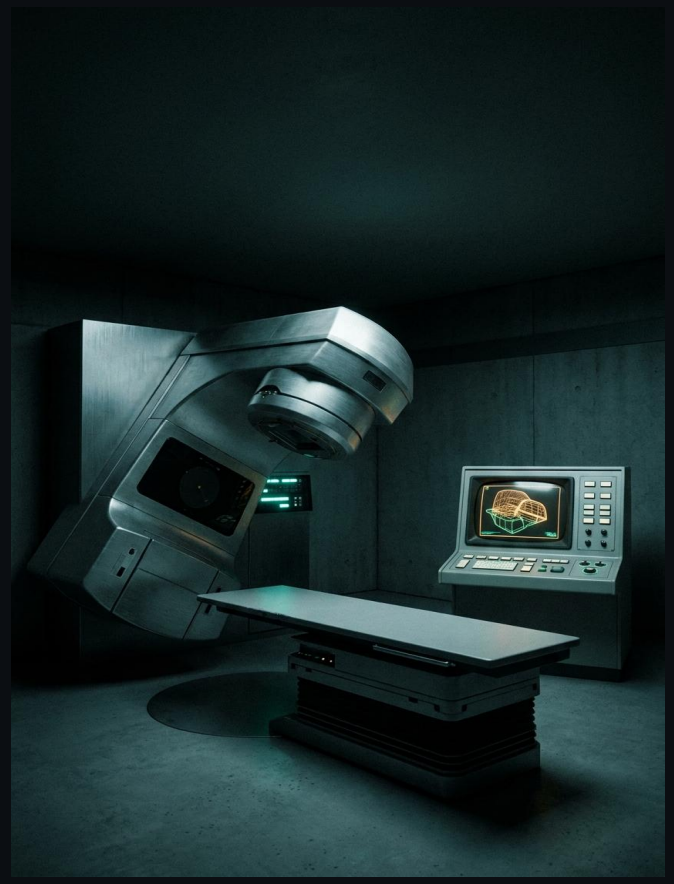
✓ Leveson & Turner, 'An Investigation of the Therac-25 Accidents,' IEEE Computer, 1993

LANDMARK CASE

Panama's Cobalt-60 — When the Blocks Were Entered Wrong

CRITICAL | CROSS-DEVICE / ENVIRONMENT | HF: automation-surprise, wrong-units

“The shielding blocks were digitized as one shape instead of many. The planning computer doubled the time under the beam — and warned no one.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

In 2000–2001 at Panama's National Oncology Institute, a radiotherapy treatment-planning system miscalculated beam-on times for cobalt-60 teletherapy. Staff entered the protective shielding blocks in a way the software did not support — as a single combined shape rather than one block at a time — and the planning system responded by computing treatment times that delivered roughly double the prescribed dose. The console gave no warning that the entry method was invalid.

HOW IT UNFOLDS

1. Clinicians need to shield healthy tissue and enter the blocking-block geometry into the planning system.
2. The blocks are digitized as one combined shape — a method the software did not support.
3. The system computes beam-on times from the invalid geometry and returns roughly double the intended dose.
4. No alert flags the unsupported entry; the plan looks like any other.
5. Patients are treated to the miscalculated times over successive sessions before the pattern is recognized.

THE FACTS — CITED ✓ 28 patients over-exposed at Panama's National Oncology Institute, 2000–2001, at roughly twice the prescribed dose. (IAEA, 2001) ✓ At least 3 deaths were attributed to the overexposure within the IAEA report window (later follow-up counted more delayed deaths). (IAEA, 2001)

SOURCE

✓ IAEA, 'Investigation of an Accidental Exposure of Radiotherapy Patients in Panama' (2001)

LANDMARK CASE

The Radiation Boom — When the Beam-Shaper Was Left Out

CRITICAL | CROSS-DEVICE / ENVIRONMENT | HF: automation-surprise, interruption, mode-confusion

“A software crash mid-programming, a missing beam-shaping filter, and a linac that kept firing to a plan no one had finished.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

The New York Times' 2010 investigation 'The Radiation Boom' documented modern linear-accelerator overdoses in New York hospitals. In one case a computer error during multileaf-collimator programming left the beam misshaped and directed errant radiation over three consecutive days; in another, a linac delivered repeated overdoses because a beam-modulating filter was missing. The consoles did not make the errors obvious to the operators.

HOW IT UNFOLDS

1. A treatment plan is programmed on a modern linac using multileaf-collimator beam shaping.
2. The planning software crashes or is interrupted mid-programming, or a beam-modulating filter is left out.
3. The machine delivers a plan that was never correctly completed.
4. The console shows a routine treatment; the error is not obvious to the operator.
5. The overdose is repeated across successive sessions before it is caught.

THE FACTS — CITED

✓ 133 occasions in New York where beam-shaping / modulating devices were left out or misused, per the NYT investigation. (The New York Times, 2010)

✓ Individual patients received radiation far above plan across multiple sessions before detection. (NYT, 2010)

SOURCE

✓ Walt Bogdanich, 'Radiation Offers New Cures, and Ways to Do Harm,' The New York Times (2010)

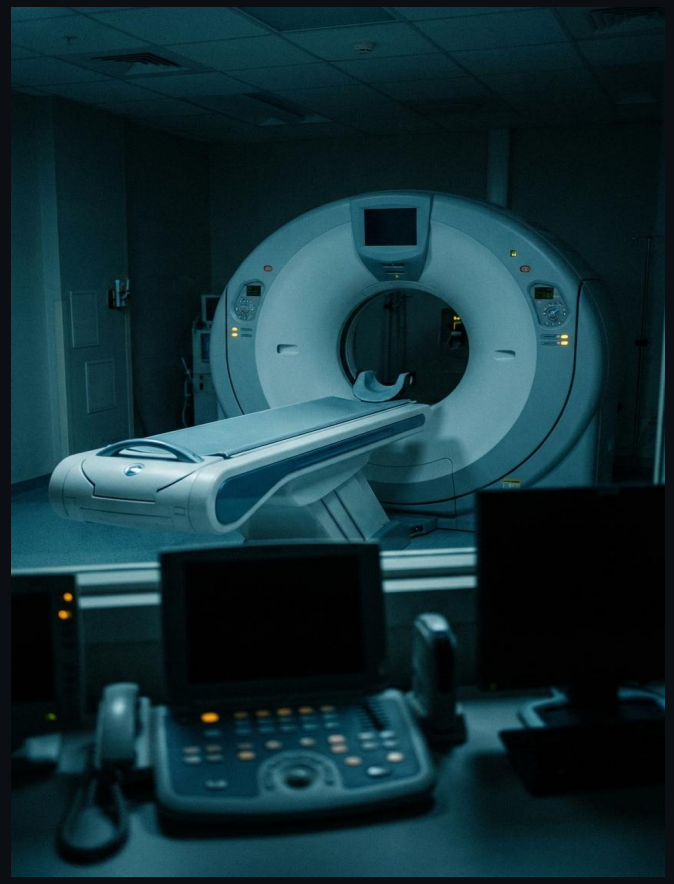
Not medical advice · not certified · representative task, not a device IFU

LANDMARK CASE

The CT Scanner Set Eight Times Too High

CRITICAL | LIBRARY: Computed Tomography Scanner · CT-25 | HF: default-value, automation-surprise

“A stroke-scan protocol was left at the wrong setting. Two hundred and six patients passed through before a report of hair loss revealed it.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Between 2008 and 2009, a major medical center over-radiated 206 patients undergoing CT brain-perfusion scans for suspected stroke. An incorrect scanner protocol setting delivered up to about eight times the expected radiation dose. The error persisted for roughly 18 months and was discovered only when a patient reported hair loss.

HOW IT UNFOLDS

1. A CT brain-perfusion protocol is configured on the scanner console.
2. A protocol / default setting is applied that delivers far more dose than intended.
3. Every subsequent stroke scan uses the same stored setting; the console shows a normal workflow.
4. About 40% of affected patients later experienced patchy hair loss.
5. The pattern surfaces only when a patient reports the hair loss, ~18 months in.

THE FACTS — CITED ✓ 206 patients over-radiated during CT brain-perfusion scans, 2008–2009; up to ~8× the expected dose. (FDA) ✓ FDA attributed the overexposures to an incorrect console setting (user error), not a scanner defect; the review expanded to ~385 patients across several hospitals. (FDA, 2010) ✓ About 40% of affected patients later developed patchy hair loss. (LA Times / Cedars-Sinai review, 2009–2010)

SOURCE

✓ FDA, Initiative to Reduce Unnecessary Radiation Exposure from Medical Imaging (CT brain-perfusion investigation, 2009–2010)

LANDMARK CASE

The Line That Fit Where It Never Should Have

CRITICAL | CROSS-DEVICE / ENVIRONMENT | HF: misconnection, handoff-gap

“An IV bag joined to an epidural line. A feeding tube connected to a vein. The connectors simply fit.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

For decades, the universal Luer connector let functionally different tubing systems — intravenous, epidural / neuraxial, enteral feeding, and respiratory — physically connect to one another. Medication or feed intended for one route was delivered to another, with fatal results, because the parts simply mated.

HOW IT UNFOLDS

1. Multiple tubing systems are in use at the bedside, all built to the same universal Luer taper.
2. A line for one route is picked up and connected to a port meant for another.
3. Nothing physically blocks the wrong connection; it seats and looks normal.
4. Medication or feed is delivered into the wrong route.
5. The error is often recognized only after the patient deteriorates.

THE FACTS — CITED ✓ The Joint Commission issued Sentinel Event Alert #53 on tubing misconnections and the transition to ISO 80369 connector standards. (Joint Commission, 2014) ✓ ISO 80369 introduces route-specific connectors (ENFit for enteral, NRFit for neuraxial) that are mechanically incompatible with IV Luer fittings.

SOURCE

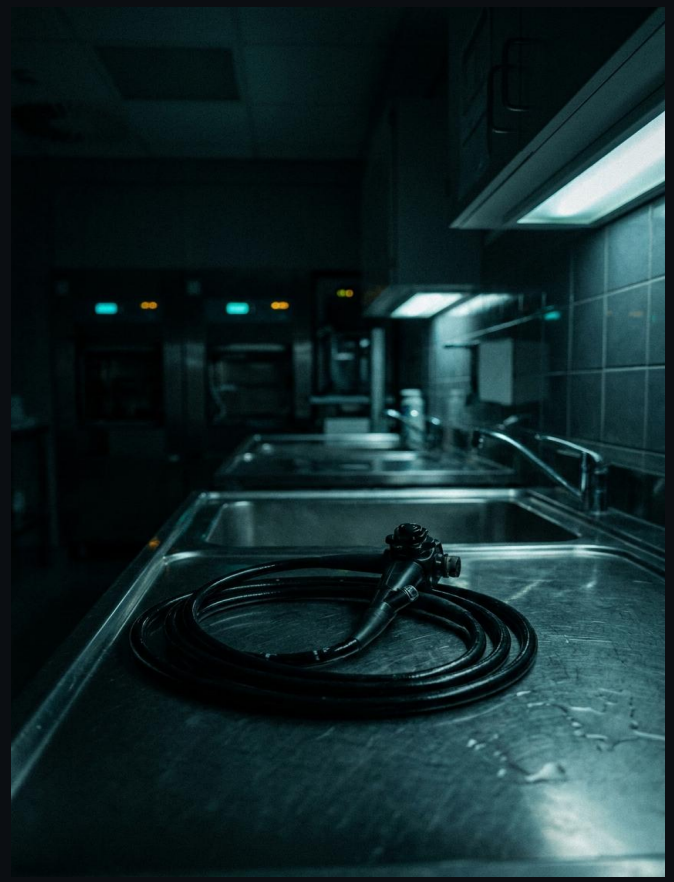
✓ Joint Commission Sentinel Event Alert #53, 'Managing risk during transition to new ISO tubing connector standards' (2014)

LANDMARK CASE

The Scope That Couldn't Be Cleaned

CRITICAL | CROSS-DEVICE / ENVIRONMENT | HF: automation-surprise, handoff-gap

“A crevice at the tip of the scope held bacteria that survived every reprocessing cycle — and moved from patient to patient.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Between 2013 and 2015, outbreaks of drug-resistant 'superbug' (CRE) infections were traced to duodenoscopes — flexible endoscopes used in bile-duct procedures. The movable 'elevator' mechanism at the scope's tip contains microscopic crevices that can trap tissue and bacteria, and effective cleaning could be impossible even when the manufacturer's reprocessing instructions were followed exactly.

HOW IT UNFOLDS

1. A duodenoscope is used, then reprocessed per the manufacturer's cleaning instructions.
2. The elevator channel's crevices retain biological debris that brushing and disinfection cannot fully reach.
3. The scope passes visual and reprocessing checks and returns to service.
4. Resistant organisms carried in the channel transmit to the next patients.
5. The link surfaces only when a cluster of matching resistant infections is investigated.

THE FACTS — CITED ✓ FDA warned in 2015 that duodenoscope design may impede effective reprocessing and ordered postmarket studies of all three US manufacturers. (FDA Safety Communication, 2015) ✓ At one US medical center, up to 179 patients were notified of possible CRE exposure (2014–2015). (Center / news reporting)

SOURCE

✓ FDA, 'Infections Associated with Reprocessed Duodenoscopes' (Safety Communication, 2015)

LANDMARK CASE

The Alarm Nobody Answered

CRITICAL | LIBRARY: Cardiac Telemetry Transmitter · TEL-20 | HF: alarm-fatigue, handoff-gap

“The monitor called out. It had called out so many times before that the room had learned to stop hearing it.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Cardiac monitors and telemetry systems generate a constant stream of alarms, the vast majority of which need no action. When a genuine, life-threatening alarm sounds — or when alarms have been turned down, silenced, or switched off to reduce the noise — it can go unheard. Patients have died while their monitors alarmed unanswered.

HOW IT UNFOLDS

1. A patient on continuous cardiac monitoring generates frequent alarms, most needing no action.
2. Staff, desensitized by the volume, turn alarms down, silence them, or tune them out.
3. A genuine, life-threatening alarm sounds amid the noise.
4. The alarm is not audible where staff are working, or is not recognized as real.
5. A treatable event progresses while the monitor alarms unanswered.

THE FACTS — CITED ✓ 98 alarm-related events reported to the Joint Commission, Jan 2009–June 2012: 80 deaths, 13 permanent loss of function, 5 extended care. (Joint Commission SEA #50, 2013) ✓ An estimated 85–99% of clinical alarm signals do not require intervention, driving alarm fatigue. (Joint Commission SEA #50, 2013)

SOURCE

✓ Joint Commission Sentinel Event Alert #50, 'Medical device alarm safety in hospitals' (2013)

LANDMARK CASE

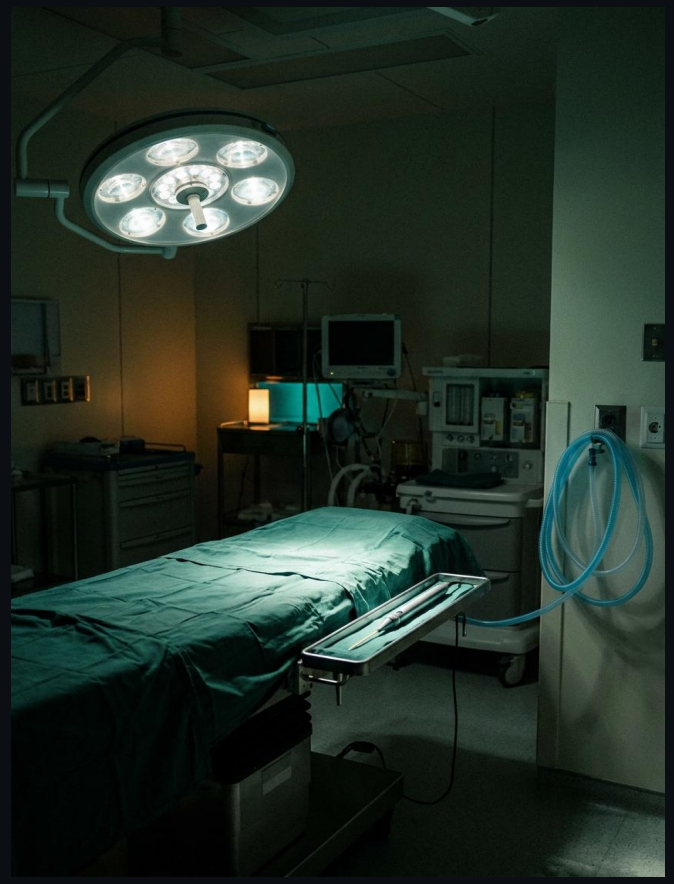
Three Things That Should Never Meet

CRITICAL | CROSS-DEVICE / ENVIRONMENT | HF: workaround, handoff-gap

“Oxygen in the air, alcohol on the skin, a spark from the pencil. The fire triangle completes on the surgical drapes.”

WHAT HAPPENED

A surgical fire needs three elements at once — an oxidizer (an oxygen- or nitrous-enriched surgical field), a fuel (alcohol-based skin prep, drapes, hair), and an ignition source (an electrosurgery pencil, laser, or light source). In an oxygen-enriched field, a routine spark can ignite drapes or prep.



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

HOW IT UNFOLDS

1. Supplemental oxygen pools under the drapes near the surgical site, enriching the local atmosphere.
2. An alcohol-based skin prep is not given full time to dry, leaving flammable vapor.
3. The electrosurgery pencil or another ignition source is activated nearby.
4. The enriched field ignites the drapes or prep in an instant.
5. The fire is on the field before anyone registers what completed the triangle.

THE FACTS — CITED ✓ FDA estimated 550–650 surgical fires occur in the US each year (Safe Use Initiative / Preventing Surgical Fires). (FDA) ✓ ECRI's later estimate, after prevention efforts, is roughly 90–100 surgical fires per year in the US. (ECRI)

SOURCE

✓ FDA Safe Use Initiative — Preventing Surgical Fires (est. 550–650 fires/year)

LANDMARK CASE

Patient-Controlled, Until Someone Else Pressed the Button

CRITICAL | LIBRARY: Patient-Controlled Analgesia Pump · INF-03 | HF: workaround, wrong-units

“The pump was built so an over-sedated patient couldn't dose again. Then a well-meaning hand pressed it for them.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Patient-controlled analgesia (PCA) pumps let patients self-administer opioid within preset limits, on the safety premise that a patient too sedated to be safe is also too sedated to press the button. Programming errors — wrong drug concentration, wrong dose or lockout — and 'PCA by proxy,' where a family member or clinician presses the button for the patient, defeat that safeguard and can cause fatal respiratory depression.

HOW IT UNFOLDS

1. A PCA pump is programmed with drug concentration, demand dose, lockout interval and any background rate.
2. A programming error (wrong concentration or dose) or a stale setting is entered.
3. The safety premise is that only the patient presses the demand button.
4. A family member or clinician presses it for a sedated patient (PCA by proxy), or the misprogrammed pump over-delivers.
5. Opioid accumulates beyond a safe level and respiratory depression sets in.

SOURCE

✓ AHRQ PSNet — Patient-Controlled Analgesia and PCA-by-proxy (ISMP-informed)

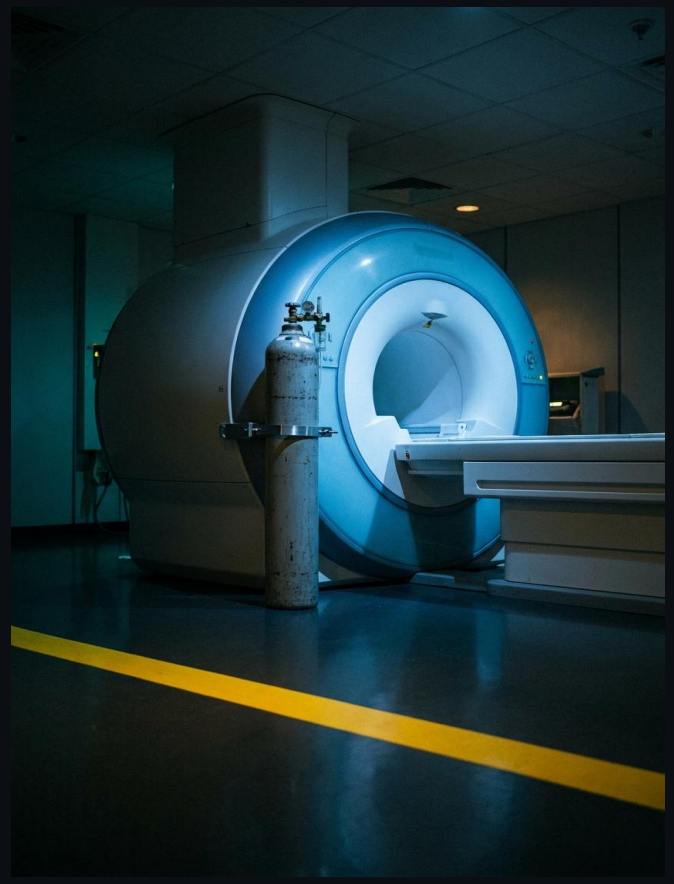
THE FACTS — CITED ✓ ISMP identifies PCA programming errors and 'PCA by proxy' (someone other than the patient pressing the demand button) as causes of oversedation. (ISMP / AHRQ PSNet) ✓ PCA requires programming of concentration, demand dose, lockout interval and background rate — each a discrete error opportunity. (AHRQ PSNet)

LANDMARK CASE

The Oxygen Cylinder That Flew

CRITICAL | LIBRARY: Magnetic Resonance Imaging Scanner · MRI-26 | HF: workaround, handoff-gap

“The wall oxygen had failed, so a steel tank came into the room. The magnet is always on.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

An MRI scanner's superconducting magnet is always on, even between scans, and will pull any ferromagnetic (steel / iron) object into the bore with enormous force. In 2001 at a New York medical center, a steel portable oxygen cylinder — brought in after the piped oxygen failed — was pulled into the scanner and struck a sedated six-year-old undergoing a follow-up scan.

HOW IT UNFOLDS

1. The MRI suite's piped oxygen supply fails during a scan.
2. Staff bring a portable oxygen source into the room to continue.
3. The portable cylinder is ferromagnetic steel, not an MR-safe alternative.
4. The always-on magnet seizes the cylinder and accelerates it toward the bore.
5. The cylinder reaches the bore before anyone can intervene — a fatal ferromagnetic-projectile incident.

THE FACTS — CITED ✓ In 2001, a fatal ferromagnetic-projectile incident at a New York MRI suite — a steel oxygen cylinder pulled into the bore during a young child's scan — became the landmark MR-safety case. (Contemporaneous reporting) ✓ The MRI magnet is always energized; ferromagnetic-projectile events drove the ACR's MR-safety zoning and screening standards.

SOURCE

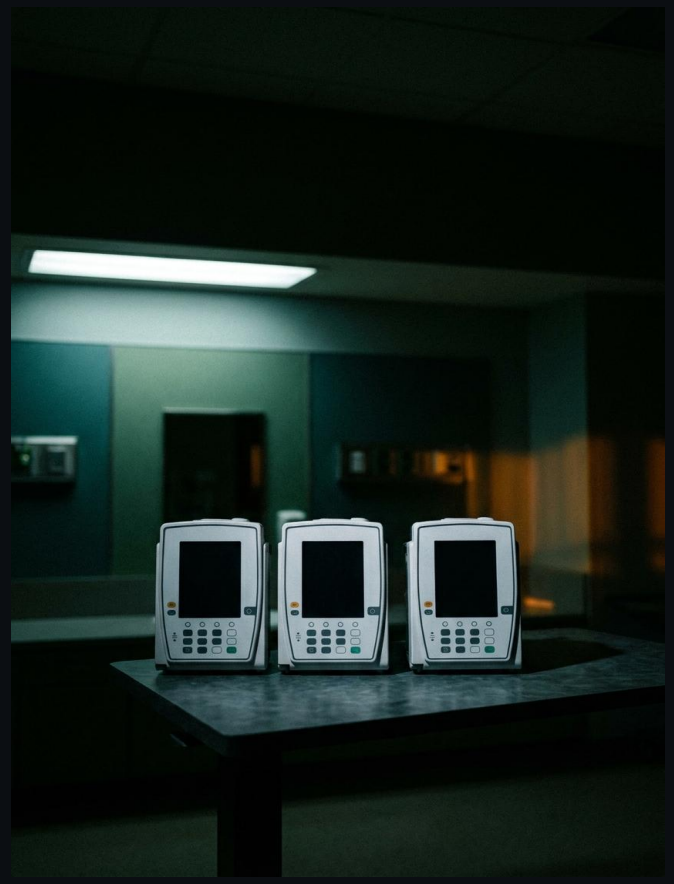
✓ CBS News (2001), 'Boy Killed in Freak MRI Accident'

⟲ SAME TASK, DIFFERENT DEVICE

Same Infusion, Three Pumps — the Interface Is the Hazard

HIGH | LIBRARY: Volumetric Infusion Pump · INF-01 | HF: look-alike, wrong-units, mode-confusion

“The order was identical. On Pump A it's mL per hour. On Pump B it's milligrams per kilo. On Pump C there's no limit at all.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

The same medication order is programmed on three different infusion pumps stocked in the same hospital. The screens, units, button labels, and safety limits differ between them — so identical keystrokes produce different doses, and a nurse who floats between units carries the wrong mental model from the last pump they used. The interface itself becomes the hazard.

HOW IT UNFOLDS

1. Pump A: dose entered as mL/h, drug library ON, hard maximum enforced.
2. Pump B: dose entered as mg/kg/h, drug library optional, soft limits only.
3. Pump C: free-text rate, no drug library, no hard maximum.
4. The clinician enters the 'same' numbers learned on the last pump.
5. One input, three different delivered doses — and only one of them is right.

THE FACTS — CITED ✓ FDA names user-interface issues among the most common infusion-pump problem types. (FDA Infusion Pump Improvement Initiative, 2010) ✓ Standardizing pump fleets and drug libraries is a recurring ECRI/AAMI safety recommendation.

SOURCE
✓ FDA White Paper: Infusion Pump Improvement Initiative (2010); ECRI/AAMI standardization guidance

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

SOURCE
✓ 'Comparative usability of manual defibrillators — a human factors study,' Resuscitation Plus (2024)

⟲ SAME TASK, DIFFERENT DEVICE

Same Shock, Different Defibrillator — the Interface Is the Hazard

HIGH | LIBRARY: Defibrillator/Monitor · DEF-18 | HF: look-alike, mode-confusion, default-value

“Same emergency, same clinician. But this defib's energy default, mode dial, and shock button are all somewhere else.”

WHAT HAPPENED

Two defibrillator / monitors stocked in the same hospital differ in energy defaults, mode selection (manual vs AED, sync vs defib), button placement, and even labels for the same function. A clinician who moves between models in a crisis carries the wrong mental model — the difference between devices becomes the hazard in the seconds that matter.

HOW IT UNFOLDS

1. Defib A: biphasic, one energy default, a physical mode dial, shock button front-right.
2. Defib B: a different energy default, a touchscreen mode workflow, shock button elsewhere.
3. Defib C: entering AED mode first requires exiting pacing mode — a hidden step.
4. The clinician acts on the layout learned from the last device used.
5. Same intended shock, different delivered action — decided by which model was grabbed.

THE FACTS — CITED ✓ Across four manual defibrillators, operator 'assistances' needed for the same tasks ranged from 16 to 63 — a ~4× spread in interface difficulty. (Resuscitation Plus, 2024) ✓ Energy defaults differ by waveform (e.g., monophasic ~360 J vs biphasic ~200 J), so identical dial actions on different devices deliver different energy. (resuscitation guidelines)

INFUSION & MEDICATION

The Pump That Delivered Ten Times the Dose

CRITICAL | LIBRARY: Volumetric Infusion Pump · INF-01 | HF: wrong-units, automation-surprise, default-value

“The screen said 5. The line ran at 50. Nobody could see the difference.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

A clinician programs an IV infusion pump. A decimal slip, a wrong unit, or an unclamped secondary line means the pump delivers far more — or far less — than intended. The display faithfully confirms the number that was entered, not the dose actually reaching the patient.

HOW IT UNFOLDS

1. The order is dose-based; the pump wants a rate — the units have to be converted in the nurse's head.
2. A decimal or field slip enters 50 where 5 was meant, or mg where mcg was meant.
3. Smart-pump drug-library limits are off, in 'basic mode', or overridden under time pressure.
4. The pump runs exactly as programmed; the screen shows the entered number and looks normal.
5. The error surfaces late — as an occlusion alarm, an empty bag, or a change in the patient's condition.

THE FACTS — CITED

✓ ~56,000 infusion-pump adverse-event reports to FDA, 2005–2009; 87 recalls, 14 Class I. (FDA Infusion Pump Improvement Initiative, 2010) ✓ Infusion-system hazards appear twice on ECRI's Top 10 Health Technology Hazards for 2025 (#8 and #10). (ECRI, 2025)

SOURCE

✓ FDA White Paper: Infusion Pump Improvement Initiative (2010)

INFUSION & MEDICATION

Milligrams, Micrograms, Millilitres — One Keypad

CRITICAL | LIBRARY: Volumetric Infusion Pump · INF-01 | HF: wrong-units, automation-surprise

“The order was in milligrams an hour. The pump was in millilitres an hour. Ten times, and it looked identical.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Infusion orders come in weight-based units (mg, mcg, mg/kg/h) but pumps often run in volume-based rate (mL/h), forcing a conversion in the clinician's head. Entering the dose in the wrong unit — mg for mcg, or a mg/h order as mL/h — produces tenfold-class errors that the display faithfully confirms.

HOW IT UNFOLDS

1. A weight-based order (mg, mcg, mg/kg/h) must be converted to the pump's rate units.
2. The clinician enters the dose in the wrong unit, or a dose as a volume rate.
3. The pump computes a delivery from the units it was given.
4. The display confirms the entered number and looks normal.
5. A tenfold-class over- or under-dose runs until it is caught.

THE FACTS — CITED ✓ ISMP documents a hydromorphone order written in mg/h but programmed in mL/h delivering ~10× the intended dose. (ISMP, 2020) ✓ ISMP documents a nitroglycerin order in mcg/min programmed as mcg/kg/min delivering ~60× the intended dose. (ISMP, 2020)

SOURCE

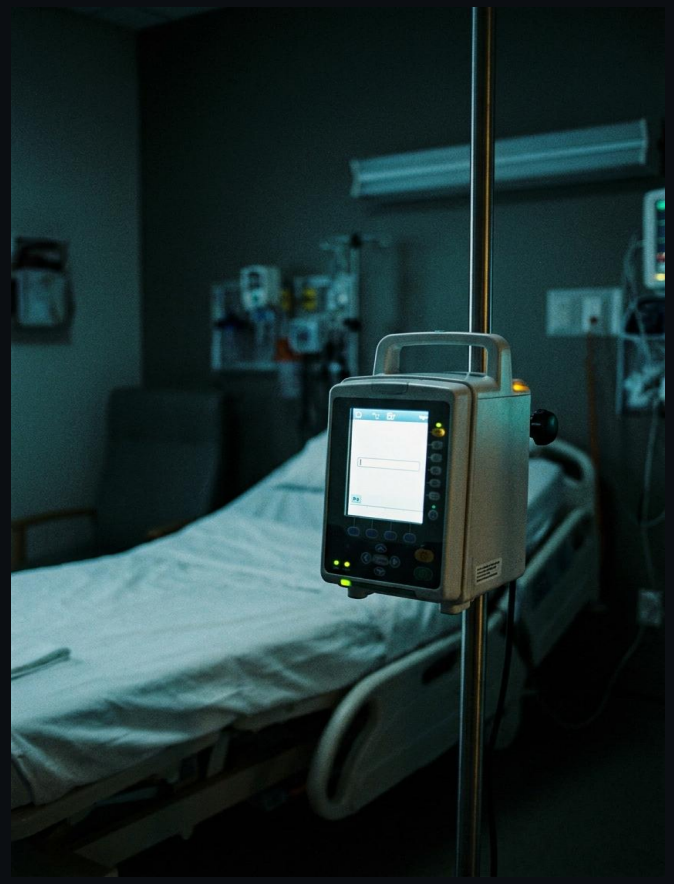
✓ ISMP, Guidelines for Optimizing Safe Implementation and Use of Smart Infusion Pumps (2020)

INFUSION & MEDICATION

The Default That Was Never Meant for This Patient

HIGH | LIBRARY: Volumetric Infusion Pump · INF-01 | HF: default-value, automation-surprise

“The weight on the screen was an average adult's. The dose built itself on a number nobody had changed.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Smart pumps calculate weight-based doses from an entered patient weight — and often show a default value (a standard adult weight) that the clinician is expected to overwrite. If the default or a stale value is left in place, every weight-based dose is computed from the wrong number.

HOW IT UNFOLDS

1. A weight-based infusion is set up on a smart pump.
2. The pump displays a default patient weight, expecting the user to overwrite it.
3. The default or a stale value is left unchanged.
4. The pump computes the dose from a weight that does not belong to this patient.
5. The screen looks normal while the delivered dose is wrong.

THE FACTS — CITED ✓ Smart pumps display a default patient weight that must be actively overwritten; accuracy depends on the user catching a stale value. (ISMP, 2020) ✓ Errors in entered patient parameters (weight, height) feed directly into weight-based dose calculations. (ISMP, 2020)

SOURCE

✓ ISMP, Guidelines for Optimizing Safe Implementation and Use of Smart Infusion Pumps (2020)

INFUSION & MEDICATION

Start Was Next to Power

HIGH | LIBRARY: Volumetric Infusion Pump · INF-01 | HF: look-alike, interruption

“One key begins the infusion. The key beside it turns the pump off. They look the same in a hurry.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Device controls placed side by side — a 'Start Infusion' key next to a 'Power' key, a bolus control next to a rate control, near-identical buttons and screens — invite the wrong action under time pressure. The design itself induces the error.

HOW IT UNFOLDS

1. A pump places critical controls adjacent to one another, or uses near-identical buttons and screens.
2. Under time pressure or distraction, the clinician reaches for one control and actuates its neighbor.
3. The wrong action is taken — the pump is powered off instead of started, or a bolus given instead of a rate change.
4. Nothing about the layout flags the mistake.
5. The error is realized only when the expected outcome does not occur.

THE FACTS — CITED ✓ FDA documents infusion-pump designs placing a 'Start Infusion' key next to the 'Power' key, so a user may switch the pump off instead of starting the infusion. (FDA) ✓ FDA calls for 'prevention through design' — designing out error-inducing control layouts, validated by human-factors testing. (FDA)

SOURCE

✓ FDA, White Paper: Infusion Pump Improvement Initiative (2010)

INFUSION & MEDICATION

Pulled Away at the Worst Keystroke

HIGH | LIBRARY: Volumetric Infusion Pump · INF-01 | HF: interruption, handoff-gap

“The pump was half-programmed when the call came. She came back sure she'd finished.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Programming an infusion is a multi-step sequence. An interruption mid-task — a question, an alarm elsewhere, a phone call — can leave a pump half-set, or the clinician returning to the wrong step, believing the task was completed.

HOW IT UNFOLDS

1. A clinician begins a multi-step infusion-programming sequence.
2. An interruption — a question, another alarm, a phone call — breaks the task.
3. The pump is left half-set, or the clinician returns to the wrong step.
4. The task is believed complete when it is not.
5. The half-programmed infusion runs, or a step is missed entirely.

THE FACTS — CITED

✓ Each interruption was associated with a 12.1% increase in procedural failures and a 12.7% increase in clinical errors. (Westbrook et al., Arch Intern Med, 2010) ✓ Risk of a major medication error rose from 2.3% with no interruptions to 4.7% with four; interruptions occurred in 53.1% of administrations. (Westbrook et al., 2010)

SOURCE

✓ Westbrook JI et al., 'Association of Interruptions With an Increased Risk and Severity of Medication Administration Errors,' Arch Intern Med (2010)

INFUSION & MEDICATION

Basic Mode — Where the Limits Don't Live

HIGH | LIBRARY: Volumetric Infusion Pump · INF-01 | HF: workaround, default-value

“The drug library would have caught it. Someone chose the mode without the library to save a minute.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

SOURCE
✓ Joint Commission Sentinel Event Alert #63, 'Optimizing smart infusion pump safety with DERS' (2021)

WHAT HAPPENED

Smart pumps carry a dose-error-reduction system (DERS) — a drug library with hard and soft dose limits. Programming in 'basic' or non-DERS mode, or bypassing drug selection, skips those limits entirely, so a dangerous dose meets no guardrail.

HOW IT UNFOLDS

1. A smart pump offers a drug library (DERS) with dose limits and a basic / non-DERS mode without them.
2. Under time pressure, the clinician selects basic mode or skips drug selection.
3. The dose limits that would flag an unsafe entry are bypassed.
4. A dangerous dose is programmed with no guardrail to catch it.
5. The pump delivers exactly what was entered.

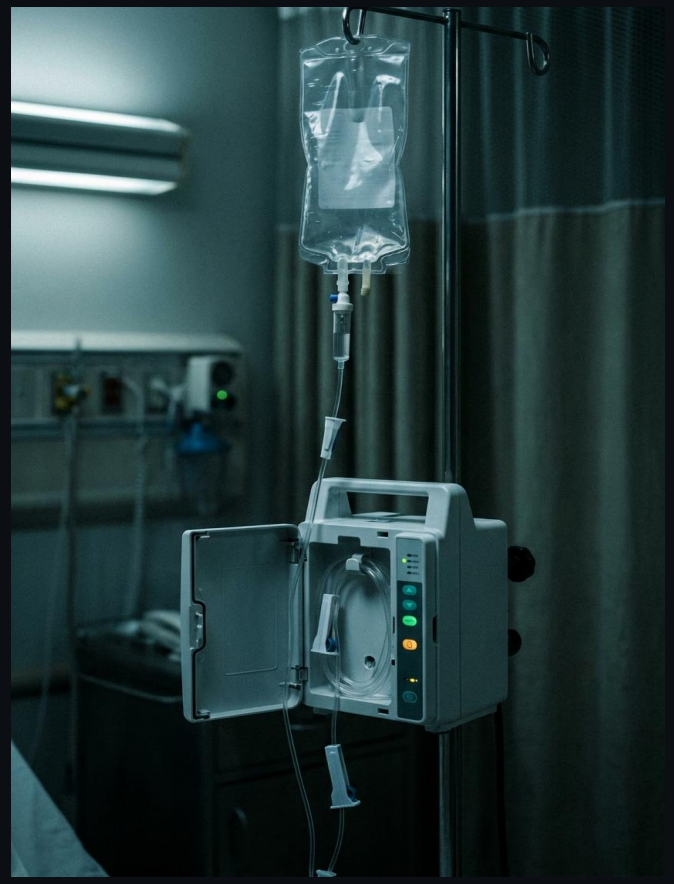
THE FACTS — CITED ✓ Bypassing the pump or drug library accounted for ~10% of infusion-administration errors / policy violations. (Joint Commission SEA #63, 2021) ✓ ISMP recommends organizations achieve >95% DERS (drug-library) compliance for all infusions. (ISMP)

INFUSION & MEDICATION

The Clamp That Wasn't Closed

CRITICAL | LIBRARY: Volumetric Infusion Pump · INF-01 | HF: workaround, automation-surprise

“The set came out of the pump with the clamp still open. Gravity delivered the whole bag.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

An IV set under gravity can free-flow — empty into the patient uncontrolled — if it is removed from the pump without the manual clamp closed and without a working anti-free-flow safeguard. Modern sets add anti-free-flow clamps precisely because this hazard proved fatal.

HOW IT UNFOLDS

1. An IV set is loaded in a pump with the drug reservoir hanging above the patient.
2. The set is removed from the pump without closing the manual roller / slide clamp.
3. The anti-free-flow safeguard is absent, defeated, or fails to engage.
4. Gravity drives the fluid down the open line uncontrolled.
5. The reservoir empties into the patient far faster than intended.

THE FACTS — CITED ✓ ISMP advises closing the roller / slide clamp on tubing between pump and patient whenever a pump is attached but not running, as a free-flow safeguard. (ISMP) ✓ A documented case: a set removed from a pump without closing the manual clamp free-flowed ~35× the prescribed amount, with a fatal outcome. (FDA-cited case)

SOURCE

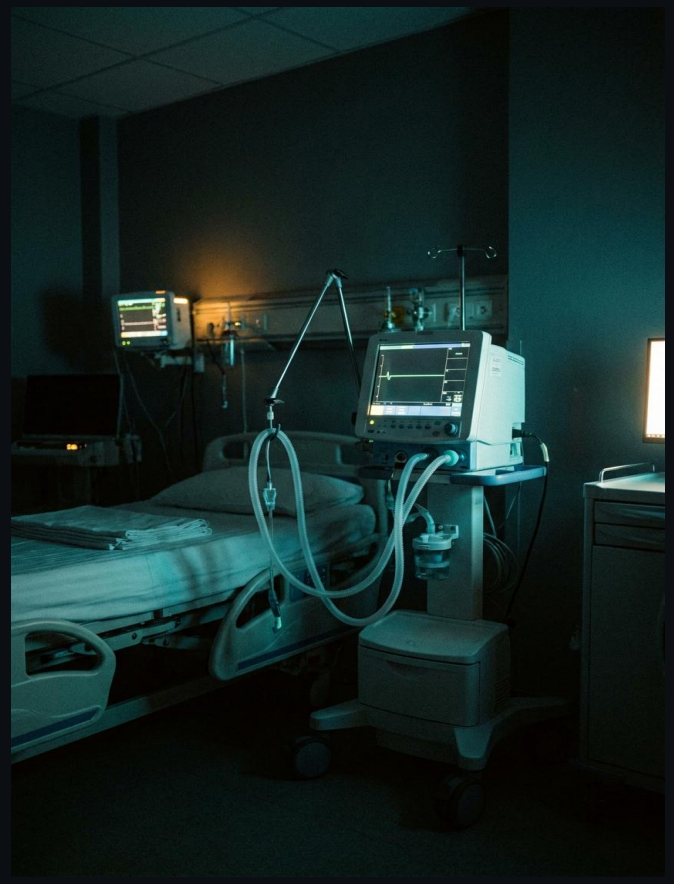
✓ ISMP, Guidelines for Optimizing Safe Implementation and Use of Smart Infusion Pumps (free-flow clamp guidance, 2020)

AIRWAY & VENTILATION

The Breath That Stopped and the Alarm That Didn't Reach

CRITICAL | LIBRARY: ICU Mechanical Ventilator · VEN-06 | HF: alarm-fatigue, default-value, handoff-gap

“The circuit came apart. The low-pressure alarm was set wrong, or too quiet, or already acknowledged.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

An ICU ventilator depends on its alarms — low-pressure / disconnect, apnea, low minute-volume — to announce when a patient is no longer being ventilated. If those alarms are mis-set, set too low, silenced, or not audible where staff are, a breathing-circuit disconnection can go unnoticed.

HOW IT UNFOLDS

1. A patient is mechanically ventilated with alarms intended to catch loss of ventilation.
2. Low-pressure / disconnect, apnea, or low-minute-volume alarms are mis-set, set too low, or muted.
3. The breathing circuit disconnects or the patient is no longer effectively ventilated.
4. The alarm does not fire, or is not audible where staff are working.
5. The disconnection is discovered late, after hypoxia has begun.

THE FACTS — CITED

✓ 'Improperly set ventilator alarms put patients at risk for hypoxic brain injury or death' ranked #4 on ECRI's 2019 Top 10 Health Technology Hazards. (ECRI, 2019) ✓ ECRI attributes ventilator alarm harm largely to alarm setting and response, not device malfunction. (ECRI, 2019)

SOURCE

✓ ECRI, 2019 Top 10 Health Technology Hazards: Executive Brief (#4 ventilator alarms)

AIRWAY & VENTILATION

The Machine Was On. It Just Wasn't Breathing for Anyone.

CRITICAL | LIBRARY: Anesthesia Workstation · ANE-07 | HF: mode-confusion, automation-surprise

“Standby looks like ready. The screen glows, the numbers sit there — and no gas moves.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Anesthesia workstations and ventilators have modes — standby, bag / manual, monitoring — in which the device appears powered and normal but delivers no mechanical ventilation. A clinician who believes the machine is ventilating, when it is in standby or bag mode, can leave a patient unventilated.

HOW IT UNFOLDS

1. An anesthesia workstation or ventilator is powered on and shows a normal display.
2. The device is in standby, bag / manual, or a monitoring mode that provides no mechanical ventilation.
3. The clinician believes the machine is ventilating the patient.
4. Non-standard mode names and layouts deepen the mismatch between belief and reality.
5. The patient is not being ventilated by a machine that looks active.

THE FACTS — CITED

✓ Anesthesia machines do not automatically start mechanical ventilation; in bag / standby modes the device provides no ventilatory support. (APSF / ASA guidance) ✓ Ventilation mode and control terminology is not standardized across ventilators and workstations. (APSF)

SOURCE

✓ APSF (Anesthesia Patient Safety Foundation) — anesthesia machine checkout guidance

MONITORING & ALARMS

The Hazard That Keeps Topping the List

HIGH | LIBRARY: Multiparameter Patient Monitor · MON-11 | HF: alarm-fatigue, default-value

“Year after year, the most-flagged danger in the hospital isn't a broken device. It's the alarm you stopped hearing.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Alarm-related hazards — too many alarms, default limits set too wide or too narrow, alarms silenced or not audible where staff work — have topped or near-topped ECRI's annual Health Technology Hazards list for years. On a busy unit the sheer volume of signals is itself the danger.

HOW IT UNFOLDS

1. A unit runs many monitored patients, each generating frequent alarms.
2. Default alarm limits are left wide (or set dangerously low) rather than tailored to the patient.
3. Staff, saturated by the volume, downgrade or silence alarms to work.
4. A meaningful alarm is missed in the noise, or a poorly set limit fails to fire.
5. The gap surfaces only when a patient deteriorates unnoticed.

THE FACTS — CITED ✓ 'Dangerously low default alarm limits on anesthesia units' is #6 on ECRI's 2025 Top 10 Health Technology Hazards. (ECRI, 2025) ✓ Alarm hazards have repeatedly appeared at or near the top of ECRI's annual list; an estimated 85–99% of alarm signals need no intervention. (ECRI; Joint Commission)

SOURCE

✓ ECRI, Top 10 Health Technology Hazards for 2025

MONITORING & ALARMS

Two Minutes of Silence That Never Ended

CRITICAL | LIBRARY: Multiparameter Patient Monitor · MON-11 | HF: alarm-fatigue, interruption, handoff-gap

“The alarm was paused to stop the noise for a moment. The moment didn't end.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Monitors let staff pause or silence alarms briefly — to reposition a patient, draw blood, or stop a nuisance alarm. If the pause is not un-paused, or the alarm is switched off and forgotten, the monitor watches in silence when it matters.

HOW IT UNFOLDS

1. A clinician pauses or silences a monitor alarm to perform a task or quiet a nuisance alarm.
2. The task ends but the alarm is not un-paused, or it is switched off and forgotten.
3. An interruption or handoff carries the clinician away before the alarm is restored.
4. A genuine, life-threatening change occurs.
5. The monitor detects it but does not sound where staff can hear.

THE FACTS — CITED

✓ In 36 of 98 alarm-related sentinel events, alarm signals were inappropriately turned off — the largest contributing-factor category. (Joint Commission SEA #50, 2013) ✓ The same 98 events included 80 deaths, Jan 2009–June 2012. (Joint Commission SEA #50, 2013)

SOURCE

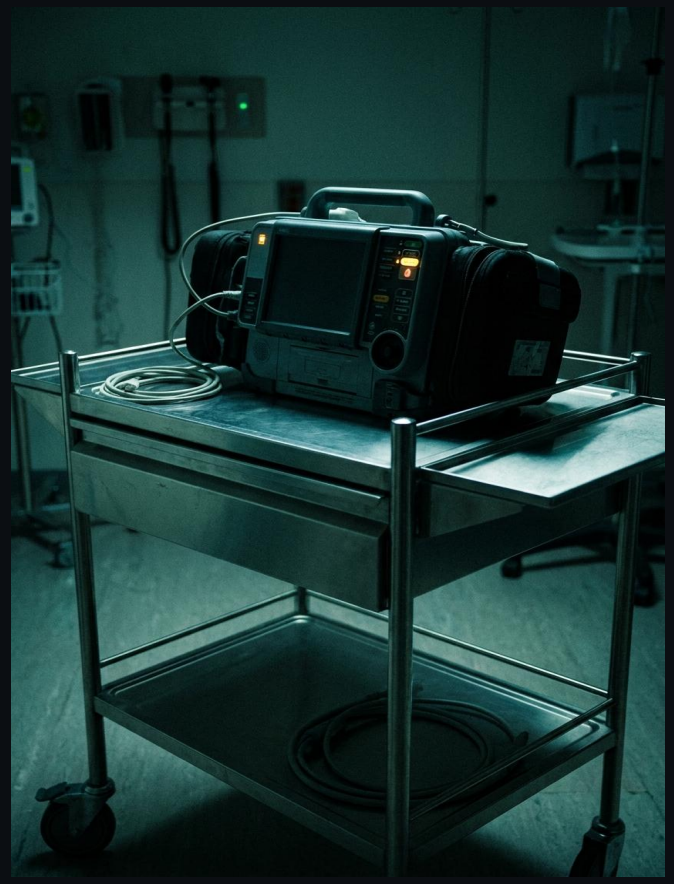
✓ Joint Commission Sentinel Event Alert #50, 'Medical device alarm safety in hospitals' (2013)

CARDIAC & RESUSCITATION

Charged, Charted, and Not Actually Ready

CRITICAL | LIBRARY: Defibrillator/Monitor · DEF-18 | HF: default-value, handoff-gap

“The code is called. The battery is dead, the pads expired, the self-test failed weeks ago.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

SOURCE
✓ FDA final order requiring premarket approval for AED systems (Federal Register, 2015) / External Defibrillator Improvement Initiative

WHAT HAPPENED

A defibrillator or AED only helps if it is ready the instant it is needed. Dead or failing batteries, expired or missing electrode pads, failed self-tests, and deferred maintenance mean the device cannot analyze the rhythm or deliver a shock when a patient arrests.

HOW IT UNFOLDS

1. A defibrillator or AED sits on the crash cart or wall, presumed ready.
2. Readiness tasks lapse — battery, pads, self-test, or maintenance are missed across shifts.
3. A patient arrests and the device is pulled to the bedside.
4. The device cannot analyze the rhythm or charge and deliver.
5. Precious minutes are lost before an alternative is found.

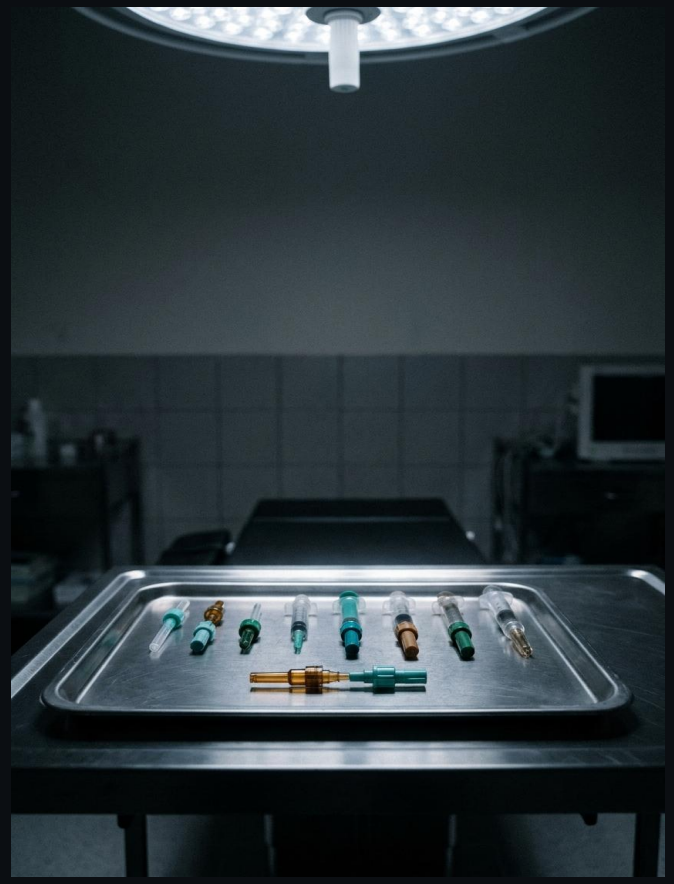
THE FACTS — CITED ✓ FDA issued a 2015 final order requiring AED systems to undergo premarket approval with readiness-focused controls, following widespread failures. (FDA, 2015) ✓ FDA received approximately 45,000 adverse-event reports tied to external defibrillator failures, 2005–2012, with dozens of recalls. (FDA)

TUBING, LINES & CONNECTIONS

One Connector for Systems That Should Never Mix

HIGH | CROSS-DEVICE / ENVIRONMENT | HF: misconnection, look-alike

“IV, epidural, enteral, respiratory — all built to the same little taper. So all able to join by mistake.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

SOURCE
✓ ECRI, Top 10 Health Technology Hazards for 2026 (#5 misconnections)

WHAT HAPPENED

The universal Luer connector became so standard that tubing for entirely different routes could physically connect. ISO 80369 replaces it with route-specific connectors that cannot mate across systems (ENFit for enteral, NRFit for neuraxial), but adoption is gradual, so the misconnection hazard persists.

HOW IT UNFOLDS

1. Multiple tubing and syringe systems are in use, some still built to the universal Luer taper.
2. Route-specific connectors (ENFit, NRFit) are only partially adopted across the facility.
3. A syringe or line for one route is connected to a port meant for another.
4. The compatible-enough fitting seats without a physical barrier.
5. The wrong-route delivery is recognized only after it reaches the patient.

THE FACTS — CITED ✓ 'Misconnections of syringes or tubing to patient lines' is #5 on ECRI's 2026 Top 10 Health Technology Hazards. (ECRI, 2026) ✓ ISO 80369 defines route-specific connectors (ENFit, NRFit) mechanically incompatible with IV Luer fittings; FDA has issued mitigation guidance.

ENERGY & THE OR

The Stapler That Opened the Line It Closed

HIGH | CROSS-DEVICE / ENVIRONMENT | HF: look-alike, automation-surprise

“Thirty-two thousand malfunction reports in seven years. The stapler fires, misfires, or lets go.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Surgical staplers cut and seal tissue in one action. When a stapler malfunctions — misfiring, failing to form staples, or applying the wrong staple size to tissue — or is used on tissue too thick or thin, the staple line can fail, causing bleeding or leakage. FDA found the reporting had understated the problem.

HOW IT UNFOLDS

1. A surgical stapler is loaded and fired to cut and seal tissue in one action.
2. The device misfires, fails to form staples, or the wrong staple size is used for the tissue thickness.
3. The staple line does not hold.
4. Bleeding or leakage follows, sometimes recognized only after closing.
5. Under-reporting through a summary pathway had masked how often this happened.

THE FACTS — CITED ✓ FDA reported >41,000 medical device reports for surgical staplers / implantable staples, Jan 2011–March 2018: 366 deaths, >9,000 serious injuries, >32,000 malfunctions. (FDA, 2019) ✓ FDA acted to reclassify surgical staplers for internal use from Class I to Class II with special controls. (FDA)

SOURCE

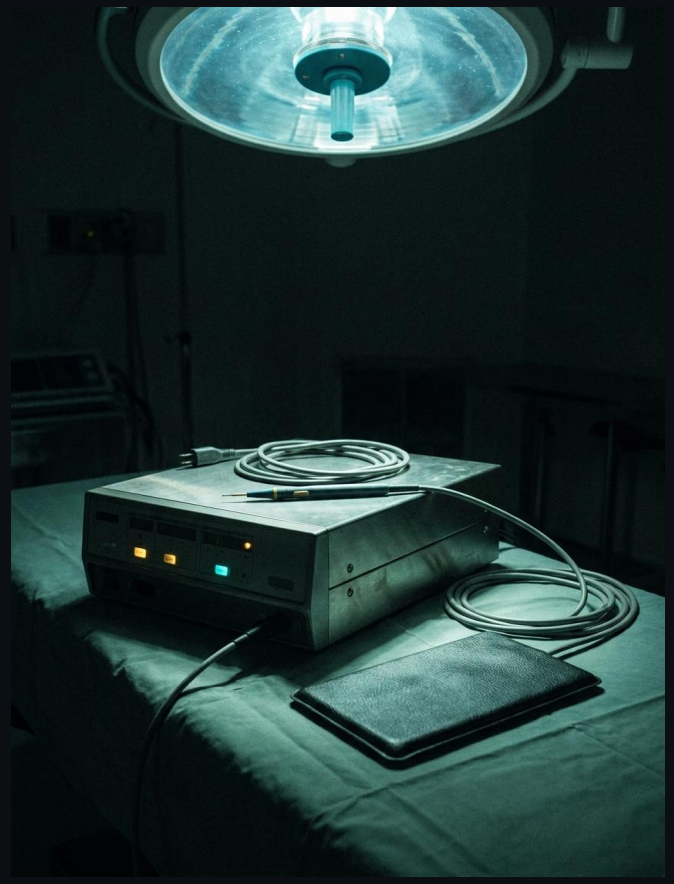
✓ FDA, 'FDA takes steps to help reduce risks associated with surgical staplers and implantable staples' (2019)

ENERGY & THE OR

The Burn Far From the Blade

HIGH | LIBRARY: Electrosurgical Generator (ESU) · ESU-32 | HF: look-alike, automation-surprise

“The current has to leave the body somewhere. When the return pad lifts, it leaves through a burn.”



✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Monopolar electrosurgery sends radiofrequency current through the patient to a return (dispersive) electrode pad. If the pad is poorly placed, partially lifted, or too small for the patient, current can concentrate at the return site and burn it — and stray energy from capacitive coupling or insulation failure can burn tissue far from the surgical field.

HOW IT UNFOLDS

1. A monopolar electrosurgery circuit is set up with an active electrode and a return pad.
2. The return pad is poorly placed, partially lifted, or undersized for the patient.
3. Current concentrates at the compromised return site, or stray energy escapes via capacitive coupling or insulation failure.
4. Heat builds at a point far from where the surgeon is working.
5. A burn is discovered at the return site or an unexpected location.

THE FACTS — CITED ✓ Contact-quality-monitoring return electrodes and active-electrode monitoring are recommended to prevent return-site and stray-energy burns. (AORN) ✓ Capacitive coupling and insulation failure can deliver stray energy to tissue outside the surgeon's view. (AORN / surgical-energy literature)

SOURCE

✓ AORN Guideline for the Safe Use of Surgical Energy Devices (2026 update)

IMAGING & RADIATION

The Dose You Can't Feel Adding Up

HIGH | LIBRARY: Computed Tomography Scanner · CT-25 | HF: automation-surprise, default-value

“No alarm sounds for radiation. The skin dose from a long fluoroscopy builds silently, scan after scan.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

CT and fluoroscopy deliver ionizing radiation that patients cannot feel. Long or repeated fluoroscopy can exceed the threshold for skin injury, and cumulative CT dose adds up across a patient's care — yet the hazard is invisible in the moment and depends on operators tracking and limiting dose.

HOW IT UNFOLDS

1. A patient undergoes CT or an extended fluoroscopy-guided procedure.
2. Radiation dose accumulates with time-on and repeat exposures, imperceptible to patient and team.
3. Without device dose-tracking and alerts, peak skin dose or cumulative dose is not flagged.
4. A prolonged case can exceed the threshold for radiation skin injury.
5. The effect appears later, as a delayed skin reaction, not during the procedure.

THE FACTS — CITED ✓ FDA's Initiative to Reduce Unnecessary Radiation Exposure targets CT, fluoroscopy and nuclear medicine, seeking dose display, recording, and alerts. (FDA, 2010) ✓ Prolonged or repeated fluoroscopy can exceed the threshold for radiation skin injury. (FDA)

SOURCE

✓ FDA, Initiative to Reduce Unnecessary Radiation Exposure from Medical Imaging (2010)

BEHIND THE BEDSIDE

Clean on the Outside, Not on the Inside

HIGH | CROSS-DEVICE / ENVIRONMENT | HF: workaround, handoff-gap

“The scope looked ready. Inside a channel too narrow to see, the last patient was still there.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Flexible endoscopes have long, narrow internal channels that must be meticulously cleaned and high-level-disinfected between patients. When steps are rushed, instructions are inadequate, or the design resists cleaning, residual contamination remains and can transmit infection — even on a scope that passed inspection.

HOW IT UNFOLDS

1. A flexible endoscope is returned to the reprocessing area after use.
2. Cleaning and high-level disinfection steps are rushed, or the instructions are ambiguous or hard to follow.
3. Narrow internal channels retain biological debris that inspection cannot see.
4. The scope passes checks and returns to service appearing ready.
5. Residual contamination can transmit infection to the next patient.

SOURCE

✓ ECRI, Top 10 Health Technology Hazards for 2026 (#7 inadequate device cleaning instructions)

THE FACTS — CITED ✓ 'Inadequate device cleaning instructions' is #7 on ECRI's 2026 Top 10 Health Technology Hazards. (ECRI, 2026) ✓ FDA-ordered post-outbreak surveillance found higher-than-expected contamination on reprocessed duodenoscopes. (FDA)

BEHIND THE BEDSIDE

The Shortcut Through Sterile

HIGH | LIBRARY: Steam Sterilizer (Autoclave) · AUT-37 | HF: workaround, handoff-gap

“Flash it, it's urgent. The drying step gets skipped, and a wet pack carries what it should have killed.”

✓ QA-passed poster (Gemini triple-lens: subject + style + safety) — Dan taste gate pending

WHAT HAPPENED

Steam sterilization and high-level disinfection have exacting cycle, drying, and monitoring steps. Immediate-use ('flash') sterilization is meant only for genuine urgencies, not to compensate for too few instruments. Skipped drying (wet packs), shortened cycles, and convenience flashing compromise sterility and have caused infections.

HOW IT UNFOLDS

1. An instrument set is needed sooner than the standard sterilization cycle allows.
2. Immediate-use ('flash') sterilization is used for convenience, not a genuine urgency.
3. Drying or monitoring steps are shortened; a wet or under-processed set results.
4. The set is returned to service appearing sterile.
5. Compromised sterility can lead to a postoperative infection.

SOURCE

✓ ECRI, Top 10 Health Technology Hazards for 2026 (#10 water quality during sterilization); AAMI ST79

THE FACTS — CITED ✓ 'Poor water quality during instrument sterilization' is #10 on ECRI's 2026 Top 10 Health Technology Hazards. (ECRI, 2026) ✓ AAMI ST79 restricts immediate-use ('flash') steam sterilization to urgent needs, not to offset insufficient instrument inventory. (AAMI ST79)

WHERE THIS IS GOING

From the front door to Field IQ

1 · Learn the danger

The Situation Room — the cited catalog of how real devices fail, made unforgettable, so clinicians want to build the competence rather than being made to.

2 · Live it

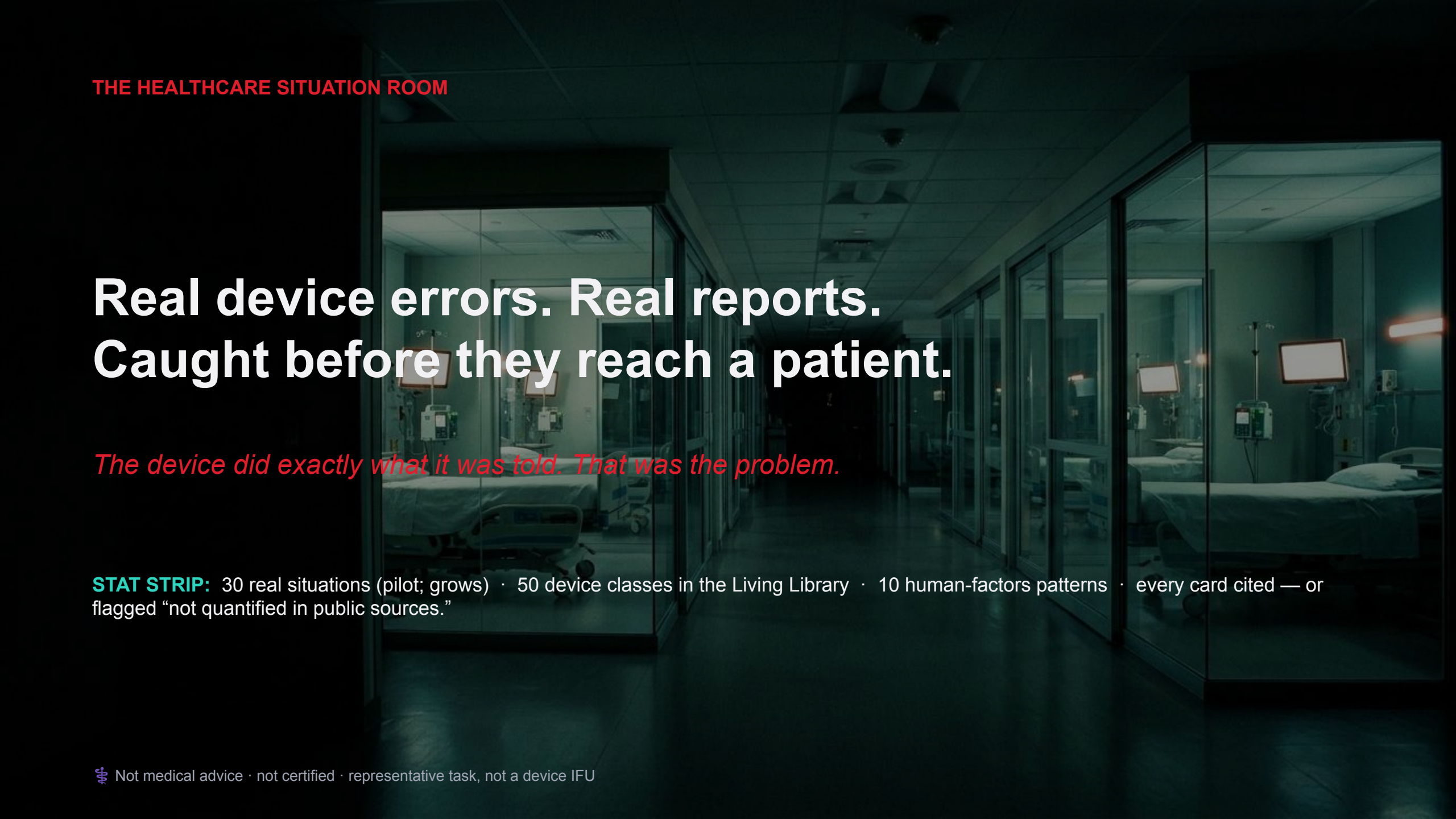
EON Live + Genesis Universal — step into the room, program the pump, read the alarm, catch the error where the consequence is real but the patient is not.

3 · Field IQ

In the field, point a phone — eventually a body cam — at a device: it recognizes the machine, runs an intelligent visual checklist like a test pilot, asks the control questions, advises how that device usually fails, and documents every step so the work can never be questioned.

Recognize · checklist · coach · document — at the moment a clinician touches a machine that can cause harm. That is the difference between a training product and a category.

The Situation Room is how the journey begins — by making people care.



THE HEALTHCARE SITUATION ROOM

Real device errors. Real reports. Caught before they reach a patient.

The device did exactly what it was told. That was the problem.

STAT STRIP: 30 real situations (pilot; grows) · 50 device classes in the Living Library · 10 human-factors patterns · every card cited — or flagged “not quantified in public sources.”