What Your Hospital Can Learn from F1 Racing

A Formula 1 Pit Stop: *2.5 seconds*

Your Operating Room Turnover: *45 minutes*

No, patients are not race cars.

But, both environments depend on something critical: highly trained teams executing complex changeovers under intense time pressure. At an estimated OR cost of $30–$100 per minute, small delays can become major operational losses.

In F1, every second of downtime is engineered out of existence. Roles are pre-assigned, equipment is staged, and not a single motion is wasted. The car stops, the crew moves, the car leaves. The whole exchange happens in the time it takes to read this sentence.

Now picture your OR between cases. The prior patient is wheeled out. Someone goes to find the cleaning supplies. Someone else is tracking down the preference card. The surgeon is asking where the next patient is. The next patient is asking why they've been waiting. Same concept, completely different outcome.

The Tool Nobody Talks About

The methodology that transformed F1 pit stops is called **Single Minute Exchange of Die (SMED)** a concept pioneered by Toyota to reduce machine changeover times to under 10 minutes (hence "single minute," meaning single digits). Most healthcare leaders have never heard of it. The ones who have are quietly using it to run circles around their peers.

SMED has direct application anywhere in healthcare where one process ends and another begins and where that gap between the two is costing you time, money, or outcomes.

Applying SMED: The Five Steps

The process is straightforward:

1. **Map and time** every step with no assumptions just a stopwatch in hand.
2. **Classify** each task as internal (must happen during the window) or external (can happen before or after).
3. **Shift** external tasks out of the window wherever possible.
4. **Optimize** what remains: eliminate redundancies, simplify tasks, define roles, and sequence steps for parallel work rather than serial.
5. **Document and repeat** each cycle should compress the turnover window further.

Applied consistently to OR turnover, we've seen improvements **in excess of 30%**. In a hospital running 8 ORs, that's not a rounding error. That's recovered cases, reduced overtime, and a surgical team that isn't starting every morning already behind. Figure 1 further breaks down how this process can be applied to OR turnover.

The Core Insight

Not every task in a changeover *must* happen during the changeover.

SMED draws a hard line between two categories of work:

- **Internal tasks** — things that can only happen while the system is "down" (terminal cleaning, equipment sterilization, room setup once the prior patient has left)
- **External tasks** — things that *could* happen before or after the window, but are currently happening inside it (fetching supplies, printing paperwork, waiting for a cart that should already have been staged, making calls that could have been made an hour ago)

Most changeover bloat lives in that second category. The work isn't hard, it's just happening at the wrong time.

Where This Shows Up Across Healthcare

OR turnover is the obvious example, but SMED applies anywhere there's a handoff or a transition between one process and the next.

Emergency Department: Door-to-Needle

In stroke care, every minute of delay in administering thrombolytics costs neurons. The door-to-needle benchmark is 45-60 minutes and most EDs still miss it. When you map the process, the bottlenecks are rarely clinical. They're logistical: the pharmacist wasn't notified until the CT came back, the consent form wasn't started during imaging, the IV wasn't placed until the diagnosis was confirmed. Classic internal tasks masquerading as sequential necessities. SMED thinking asks: what can we be doing in parallel right now? In improvement initiatives with clinical and operational teams, we've facilitated **reductions of 40-50%** in door-to-needle times.

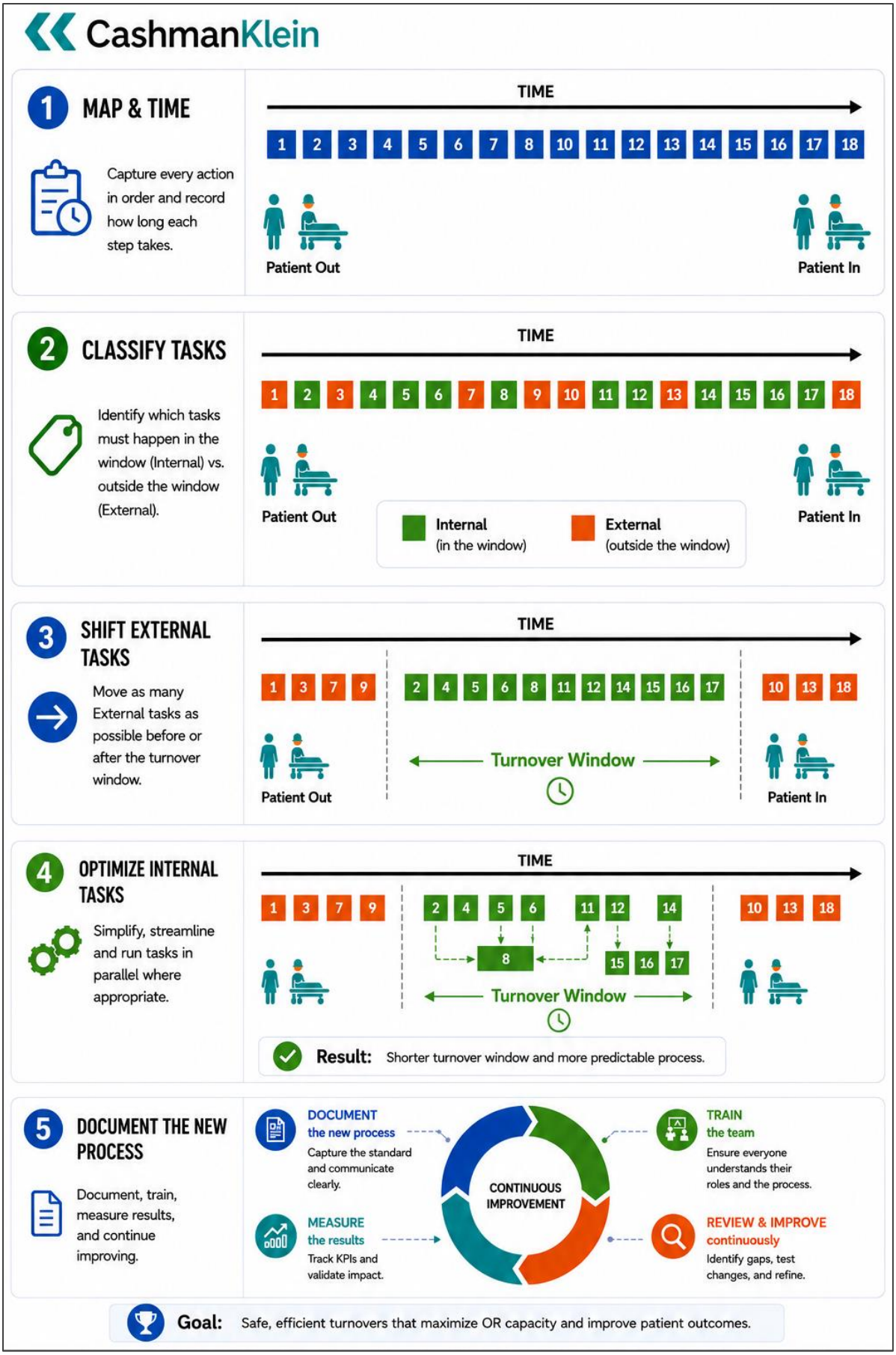
Inpatient Discharge

Discharge is one of the most studied and least-solved problems in hospital operations. A patient is clinically ready to leave at 10am. They leave at 3pm. The bed stays dirty until 4pm. The next admission waits in the ED until 8pm. Why? Because the prescription wasn't sent until rounds ended, the transport wasn't ordered until the prescription was ready, and the family wasn't called until the transport was confirmed. Every step was internal when most of them could have been external. Discharge planning that starts on Day 1 of admission not Day 3 is SMED applied upstream. Across engagements, we have helped teams increase their pre-noon discharges by **over 50%** through detailed analysis and application of changeover techniques.

Primary Care: Office Wait Times

The average patient waits 26 minutes past their appointment time before seeing a provider. In most practices, rooming, vitals, paperwork, and chief complaint documentation happen after the patient arrives to the exam room. Pre-visit planning, pre-populated intake, nurse protocol initiation before the physician enters these are all external tasks that have been left internal by default, not by design. Across the US only 4% of healthcare spending goes toward primary care. As more states move towards incentivizing primary care expenditure targets of 10-15%, patient flow in the outpatient setting will move from an **accepted inefficiency to a financial necessity.**

Figure 1. Single Minute Exchange of Die (SMED) Applied to OR Turnover



Why It Works and Why It's Hard

SMED works because it forces specificity. It's not "let's improve turnover." It's "who is responsible for staging the back table, and at what point before the case ends does that happen?" That level of clarity is uncomfortable for organizations used to operating on institutional habits and informal heroics. In today's margin environment, hospitals cannot afford hidden downtime.

It's also hard because the gains require coordination across roles that don't report to the same person. In the OR, that means surgeons, anesthesia, nursing, EVS, and materials. In the ED, it means physicians, pharmacy, radiology, and nursing all moving on the same clock. That's a change management problem as much as a process problem and it's why SMED initiatives that skip the observation phase, ignore the human element, and go straight to solutions tend to fail.

Conclusion

Healthcare organizations do not lack hardworking people. They lack operational systems intentionally designed to support those people. The best F1 teams don't win because their crew works harder. They win because every movement has been studied, tested, and refined. Hospitals and their patients deserve the same level of operational excellence. In healthcare, every minute matters but every person does too. By applying SMED principles to their processes hospitals can significantly improve efficiency, reduce delays, and enhance both patient outcomes and staff satisfaction.

At Cashman Klein, we help healthcare organizations uncover hidden inefficiencies, redesign critical workflows, and build systems that improve both performance and the human experience of care.

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