

From Resistance to Precision: AI's Path to Surgical Transition

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Description

AI-driven analytics was introduced via an AI platform (2024–Present). Initial barriers included outdated networking closets, constrained Wi-Fi scalability, and staff skepticism about surveillance. Reframing AI as a support tool paired with transparent education, built trust and engagement that lead to process improvement projects.

Background

Operating room (OR) efficiency remains a key driver of surgical throughput, patient satisfaction, and financial performance. At AdventHealth Celebration, efforts to modernize the perioperative environment revealed a complex intersection between **technology limitations** and **cultural resistance**.

Before AI integration, the OR relied on manual documentation and physical environment auditing for data. Traditional manual documentation often masked the root causes of delays, while a culture of caution around surveillance technologies hindered innovation.

In June 2024, the team launched an initiative using **AI-driven analytics through a partnership with an AI platform** to identify workflow inefficiencies and enhance real-time decision-making. Early phases focused on infrastructure upgrades, data validation, and staff engagement to ensure technology served as a **support tool, not a monitoring system**.

This project highlights how combining **data transparency, cross-disciplinary collaboration, and AI-enabled insights** transformed the OR's performance and culture. This led to achieving measurable gains in **on-time starts, projects to assist in turn-overs, and staff adaptation** within one year.

References

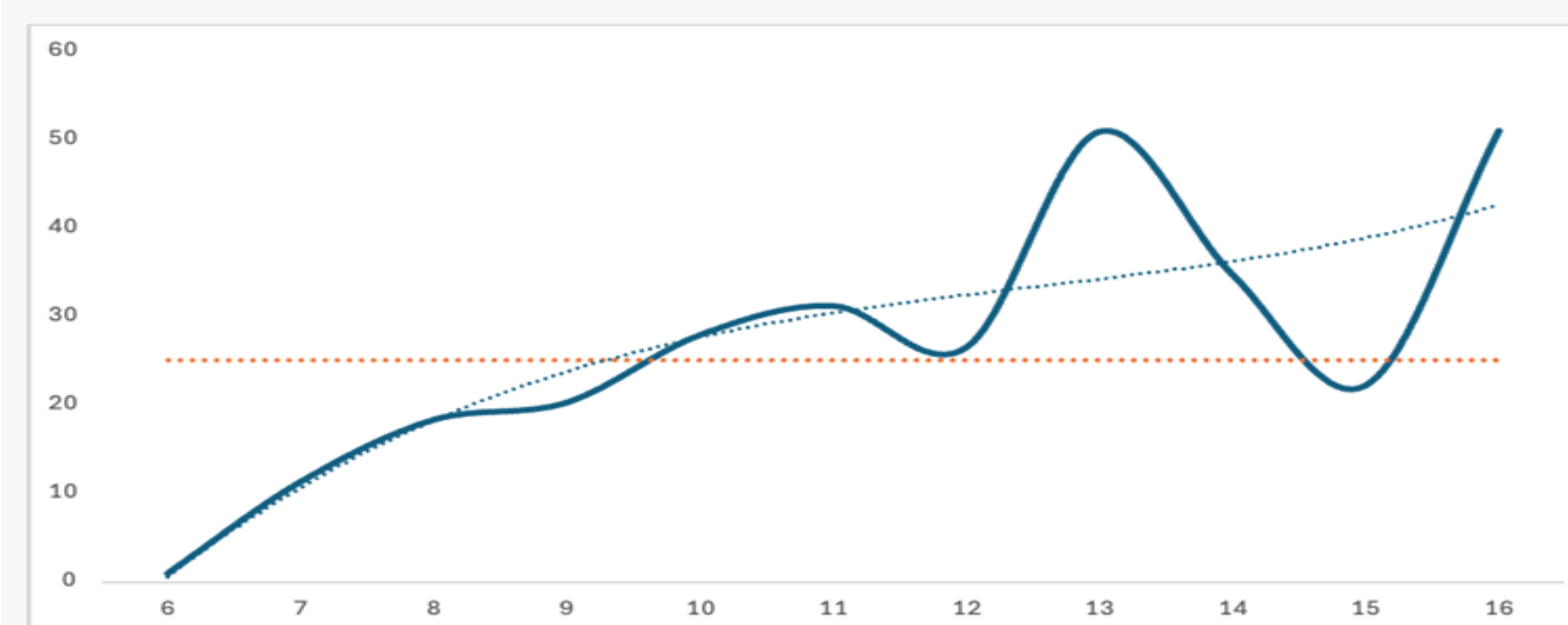
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Delays Reasons Percentage

| Year 2025 | | | January | February | March | April | May | June | July | August | September | October | November |
|----------------------------|------------|------------------------|---------|----------|-------|-------|-----|------|------|--------|-----------|---------|----------|
| YTD Delayed Cases | | 662 | 78 | 67 | 57 | 50 | 46 | 45 | 60 | 68 | 71 | 69 | 51 |
| Top Delay Reasons | Percentage | YTD Delay Contribution | | | | | | | | | | | |
| Surgeon - Related | 35.35% | 234 | 25 | 28 | 21 | 23 | 12 | 19 | 22 | 26 | 21 | 24 | 13 |
| Anesthesia - Related | 18.88% | 125 | 9 | 11 | 10 | 10 | 18 | 10 | 14 | 8 | 13 | 13 | 9 |
| OR - Related | 13.90% | 92 | 8 | 11 | 7 | 3 | 4 | 5 | 10 | 13 | 12 | 10 | 9 |
| Patient - Related | 12.69% | 84 | 10 | 8 | 7 | 3 | 3 | 4 | 5 | 15 | 11 | 8 | 10 |
| No Delay Reason Documented | 10.73% | 71 | 18 | 4 | 4 | 8 | 8 | 4 | 7 | 0 | 7 | 5 | 6 |
| Preop Nurse - Related | 5.59% | 37 | 7 | 5 | 2 | 3 | 0 | 1 | 2 | 6 | 2 | 6 | 3 |
| Facility - Related | 2.72% | 18 | 1 | 0 | 6 | 0 | 1 | 2 | 0 | 0 | 4 | 3 | 1 |
| Pharmacy - Related | 0.15% | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

| MONTHLY TREND | |
|---------------|--------------|
| Last Year | 2024 = 64.8% |
| 2025 | FCOTS (76%) |
| Year to Date | 71.78% |
| Jan-25 | 61% |
| Feb-25 | 64% |
| Mar-25 | 72% |
| Apr-25 | 78.45% |
| May-25 | 78.85% |
| Jun-25 | 75.78% |
| Jul-25 | 72.21% |
| Aug-25 | 68.85% |
| Sep-25 | 67.03% |
| Oct-25 | 72.77% |
| Nov-25 | 76.75% |

Turnover Time versus Hour of Surgery



>70%

of turnover variation can be explained by hour of the day of wheels_out by procedure

Turnover Time by Day of Week and Hour of Day



A heatmap of turnover time by Day of Week and Hour of Day demonstrates that turnover time tends to increase over the course of the day.

The linear regression of turnover time versus hour of day yields a coefficient of **3.24**.

In other words, for every hour later in the work day a surgery starts, turnover time increases by **3.24 minutes** on average.

This could be indicative of compounding delays across the course of the day.

Strategies

1. **Infrastructure and Technology**
 - Network upgrades, AI analytics platform
2. **Documentation and Readiness Reform**
 - Preprocedural readiness sheet, PAT chart audits
3. **Cultural and Behavioral Change**
 - Reframe AI as a support tool, Educate for peer support, Real-time escalation process with T-Minus protocol
4. **Communication and Coordination**
 - Huddle stakeholders daily, Start time reminders, coordination of potential bottlenecks
5. **Continuous Data Monitoring and Feedback**
 - Share physician score cards, Visual Dashboard of steaks holder performance, Unit Practice Council Review.

Outcome

Implementation of targeted process improvements, accountability strategies, and AI-driven analytics led to a **measurable and sustained improvement in surgical on-time starts**.

- **On-time start performance increased from 61.87% to 78%** within three months of intervention, exceeding the organizational benchmark of 76% for the **first time in over three years**.
- AI analytics also identified **midday turnover as the peak delay period**, leading to the development of a **“Parallel Processing” lunch relief model** that **decreased the standard deviation by 11.32 min**.
- Staff engagement improved significantly following education sessions that reframed AI as a **support tool for workflow transparency and team collaboration**, reducing early resistance to the technology.

This initiative demonstrates that combining **real-time analytics, staff empowerment, and process standardization** can effectively overcome infrastructure and cultural barriers; transforming resistance into precision and achieving sustained operational excellence in the perioperative environment.

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