

# Improving First Case Start Times in the NORA IR Setting

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# NORA & Challenges

- Usage of non-operating room anesthesia (NORA) has grown in popularity
- This alternative allows for increasingly complex procedures and patients
- Many protocols within the traditional OR do not translate optimally to new interventional suites



# Purpose

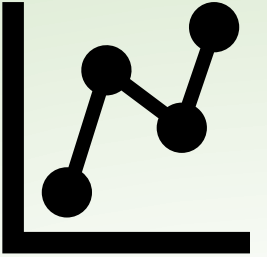
- Efficiency metrics like first case on-time starts can be used to predict inefficiencies in the daily OR schedule
- **Purpose:** Determine efficacy of implementing time-table targets by measuring times of patient arrival into the procedural suite (“wheels in”) and procedural start time (first skin puncture/incision)

# Methods

- October 1, 2022 - April 30, 2023
  - Retrospective study of an interventional radiology case volume and quality metrics
- January 1, 2023
  - New time goals are implemented to help improve on-time first start metrics at this suite
  - Separate two groups: one group undergoing procedures **prior** to implementation of novel time-table targets (2022) versus second group undergoing procedures **after** implementation of novel time-table targets (2023)

5:30 AM	Patient arrives in registration
5:45 AM	Registration complete
5:50 AM	Patient brought to preoperative holding unit
6:00 AM	Preoperative nurse intake and assessment (also including IV start, lab draw, pregnancy test as indicated, etc.) begins
6:55 AM	Radiologist & Anesthesiologist H&Ps/consents complete
7:05 AM	Wheels out of preoperative holding unit
7:10 AM	Wheels in to procedure lab
7:55 AM	Induction of anesthesia and patient positioning on table
8:00 AM	Skin prep, draping, etc.
8:15 AM	Pre-procedure time out and subsequent procedure start

# Methods



- Patient automatically rolled to the room instead of waiting for notification from the radiologist
- Data Analysis
  - Weekend days and holiday weekdays were excluded from analysis
  - Analysis of variance (ANOVA) to evaluate differences between means of 3 groups or more
  - Tukey-Kramer comparisons of the means subsequently used to evaluate groups pairwise
  - Calculations performed in Microsoft Excel with a statistical significance  $p < 0.05$

# Results

- Average patient arrival in the room improved 7:49 to 7:40 AM\*

2022 Dates	Patient in Room	Procedure Start Time
Monday	7:51 AM	8:32 AM
Tuesday	7:53 AM	8:33 AM
Wednesday	7:41 AM	8:26 AM
Thursday	7:52 AM	8:35 AM
Friday	7:48 AM	8:29 AM
Total Average	7:49 AM*	8:31 AM**
<i>Non-Tuesday Total Average<sup>Δ</sup></i>	<i>7:47 AM</i>	<i>8:29 AM</i>

- Average procedure start time improved 8:31 to 8:20 AM\*\*

2023 Dates	Patient in Room	Procedure Start Time
Monday	7:29 AM	8:08 AM
Tuesday	7:52 AM	8:30 AM
Wednesday	7:42 AM	8:21 AM
Thursday	7:43 AM	8:22 AM
Friday	7:35 AM	8:20 AM
Total Average	7:40 AM*	8:20 AM**
<i>Non-Tuesday Total Average<sup>Δ</sup></i>	<i>7:37 AM</i>	<i>8:18 AM</i>

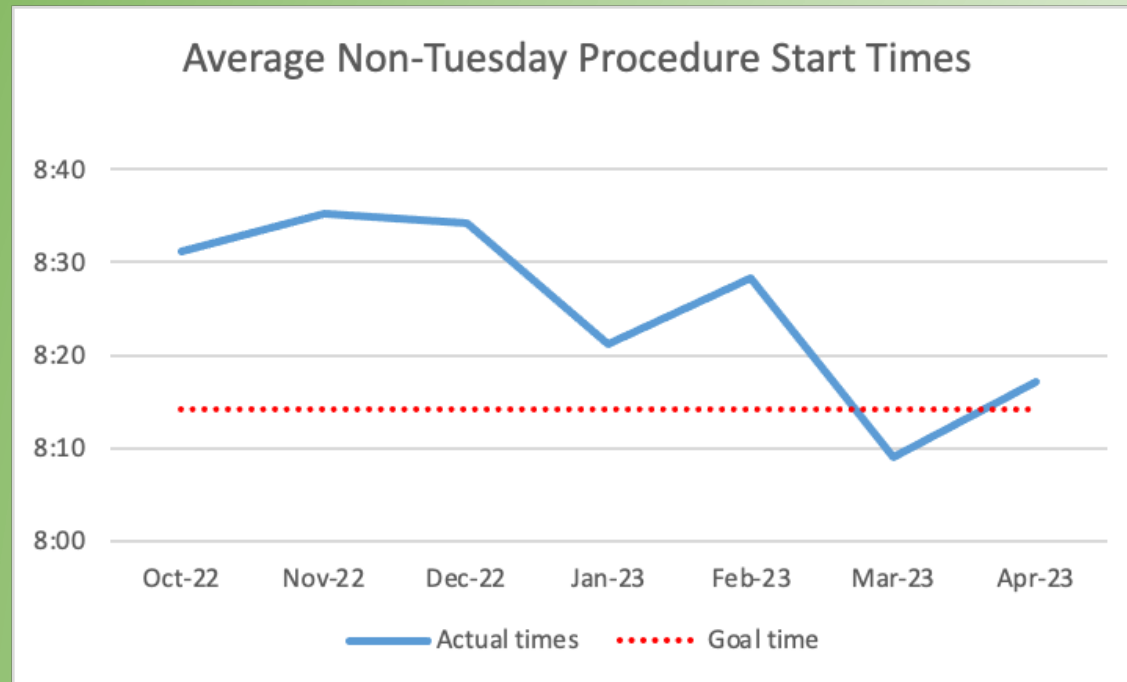
- 212 days elapsed (92 days in 2022, 120 days in 2023)

Non-Tuesday averages showed statistically significant improvement<sup>Δ</sup>

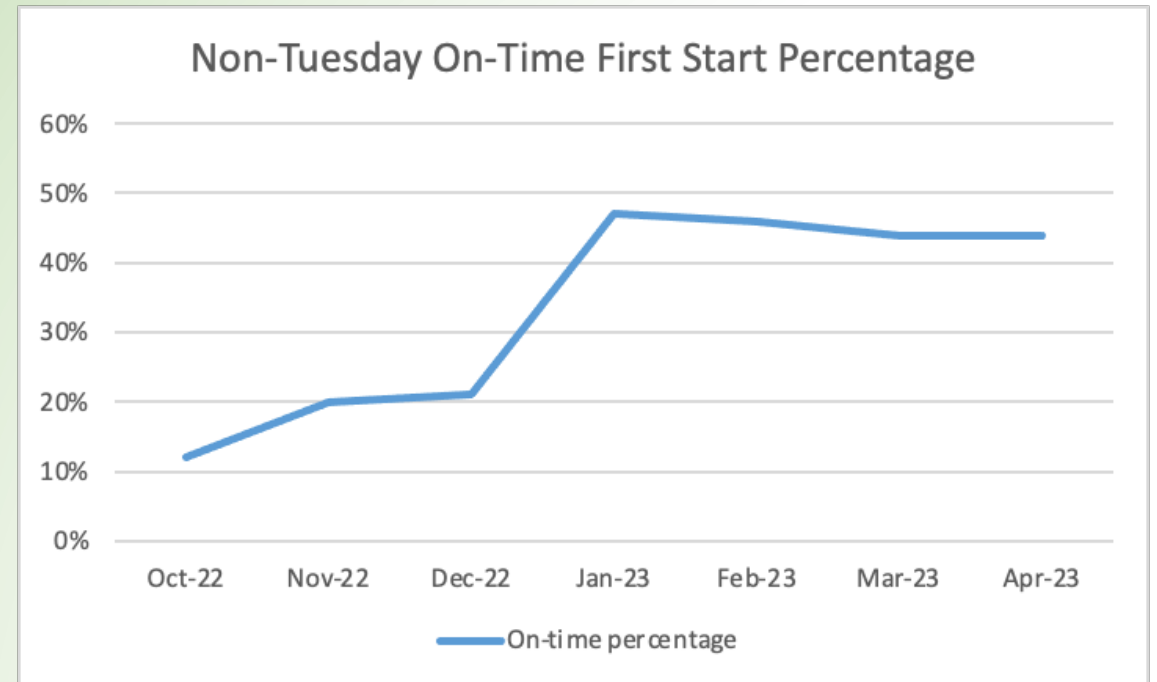
- Tuesday have separate target times than non-Tuesdays (patient in room at 8 AM, procedure start at 9 AM) – significant change noted but no real start time change

# Results

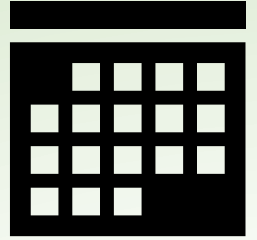
- Procedure start times improve 35% to 58% after implementation ( $p < 0.05$ )



- Non-Tuesday on-time starts improved 17% to 48% ( $p < 0.01$ )



# Conclusions



- Implementing a timeline improved workflow
  - eliminating minor delays (requirement for the proceduralist to call the room to tell the nursing/anesthesia team to bring the patient from the preoperative, eliminating a provider tardiness effect)
- Average 10-minute non-Tuesday weekday improvements in first start times helped contribute to 30-minute average monthly reductions in block time overrun, which helps reduce significant costs across several departments





# Clinical Relevance

- For improvement in first case on-time starts to create a significant impact in the hospital
  - Block overrun must be reduced, leading to overtime costs
  - More cases are performed to produce more revenue
- Increasing number of monthly case counts while decreasing expenses in overtime can create significant financial improvement
- Benefit for patients/access to care



# Limitations / Future Directions

- Most first start procedures were measured on outpatient, which typically have less patient readiness (H&Ps, consents, IVs/labs)
- While there was no statistical significance in this study, varying IR proceduralist punctuality may alter (improve or worsen) average wheels-in times or procedure start times
- Inability to determine source of tardiness of first case start times if there were schedule changes due to software limitations
- **Future Direction:** Developing new OR efficiency metrics that more effectively translate variations in NORA (i.e. site geography, specific equipment needs, etc.) that separate it from the traditional OR