Developing a Shared Language for Change

Quantifying Clinical Productivity in Anesthesiology

Robert L. Lobato, MD, MS

Why?

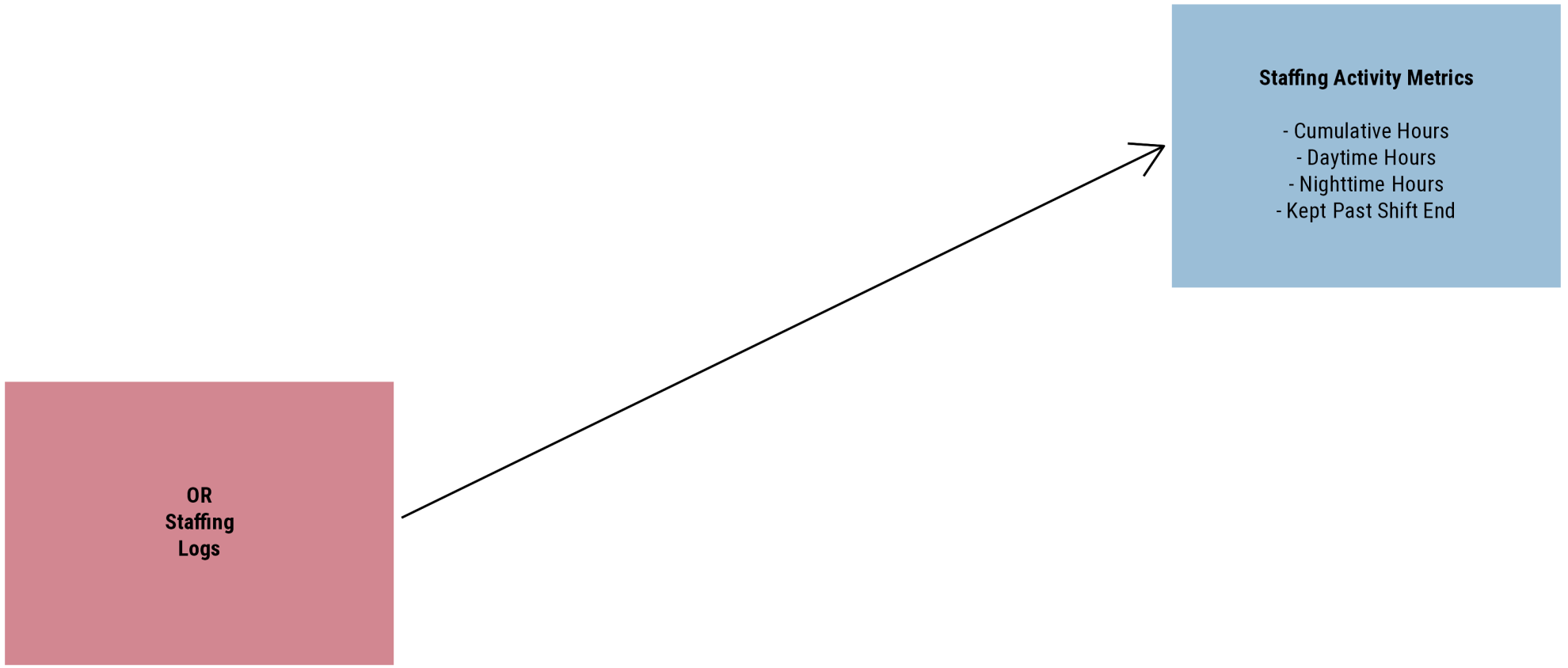
Audiences for Productivity Metrics

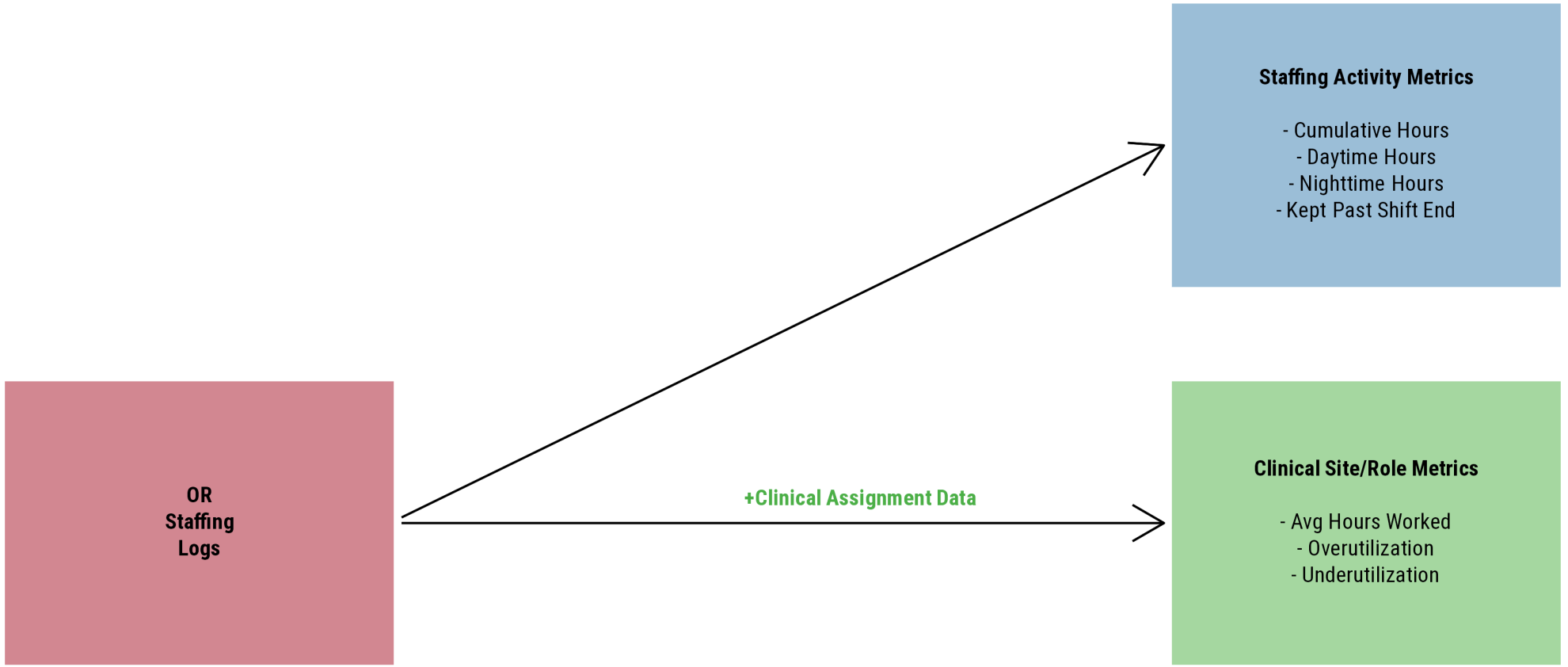
1. Health System Stakeholders (C-suite Executives)

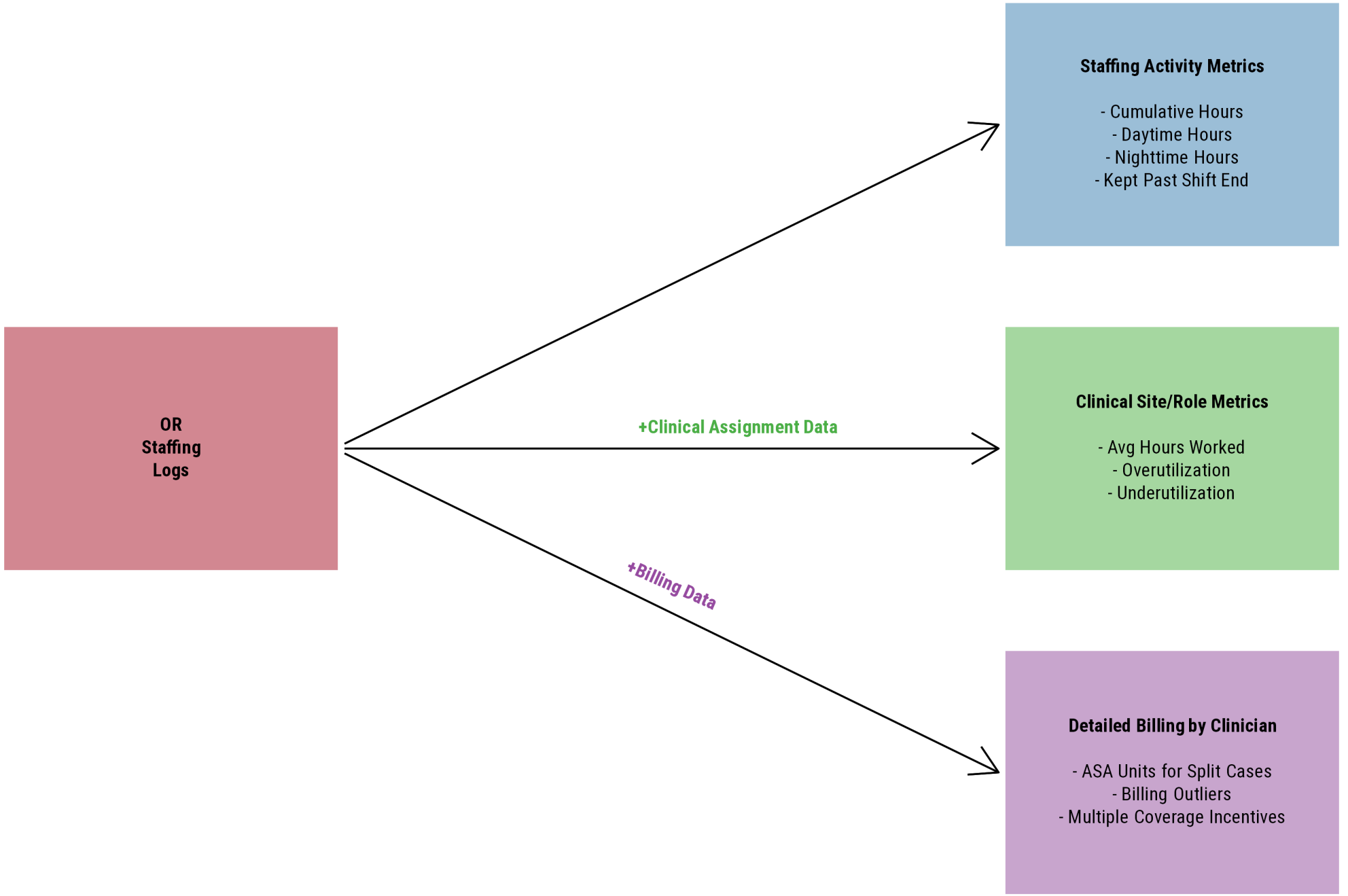
2. Departmental Operations (Staffing and Compensation)

3. Faculty and staff seeking "fairness" in distribution of work and/or pay

Data Source: Epic Case Staffing Logs


Staffing Activity Metrics
- Cumulative Hours
- Daytime Hours
- Nighttime Hours
- Kept Past Shift End
OR
Staffing
Logs


Staffing Activity Metrics
- Cumulative Hours
- Daytime Hours
- Nighttime Hours
- Kept Past Shift End
OR
Staffing
Logs
+Clinical Assignment Data
Clinical Site/Role Metrics
- Avg Hours Worked
- Overutilization
- Underutilization


OR
Staffing
Logs
Staffing Activity Metrics
- Cumulative Hours
- Daytime Hours
- Nighttime Hours
- Kept Past Shift End
+Clinical Assignment Data
Clinical Site/Role Metrics
- Avg Hours Worked
- Overutilization
- Underutilization
+Billing Data
Detailed Billing by Clinician
- ASA Units for Split Cases
- Billing Outliers
- Multiple Coverage Incentives

What do these staffing logs look like?

This is one anesthesiologist's clinical activity for a single 24-hour call day

Friday daytime cases until 18:23, then called back in for a bedside nerve catheter between 02:37 and 04:17

	qgenda_schedule_day	shift_start	anesthesia_record_epic_id	staff_start	staff_end	primary_procedure_name
1	2023-08-18 00:00:00.000	2023-08-18 07:00:00.000	64654050	2023-08-18 15:14:00.000	2023-08-18 16:38:00.000	ESWL WITHOUT CYSTOSCOPY
2	2023-08-18 00:00:00.000	2023-08-18 07:00:00.000	64653517	2023-08-18 15:24:00.000	2023-08-18 16:54:00.000	MR BRAIN WO CON
3	2023-08-18 00:00:00.000	2023-08-18 07:00:00.000	64637437	2023-08-18 16:34:00.000	2023-08-18 16:54:00.000	IMPLANT PPM NEW - BIVENTRICULAR
4	2023-08-18 00:00:00.000	2023-08-18 07:00:00.000	64619115	2023-08-18 17:07:00.000	2023-08-18 17:28:00.000	LARYNGOSCOPY-MICRO DIRECT
5	2023-08-18 00:00:00.000	2023-08-18 07:00:00.000	64662016	2023-08-18 17:06:00.000	2023-08-18 17:46:00.000	CYSTOSCOPY WITH FULGERATION
6	2023-08-18 00:00:00.000	2023-08-18 07:00:00.000	64632390	2023-08-18 16:54:00.000	2023-08-18 18:01:00.000	IRRIGATION AND DEBRIDEMENT (I&D)-CRANIAL
7	2023-08-18 00:00:00.000	2023-08-18 07:00:00.000	64617628	2023-08-18 16:54:00.000	2023-08-18 18:03:00.000	EXPLORATORY LAPAROTOMY
8	2023-08-18 00:00:00.000	2023-08-18 07:00:00.000	NULL	2023-08-18 16:00:00.000	2023-08-18 18:23:00.000	clock in/clock out event
9	2023-08-18 00:00:00.000	2023-08-18 07:00:00.000	NULL	2023-08-19 02:27:00.000	2023-08-19 04:17:00.000	clock in/clock out event

Generating Productivity Metrics

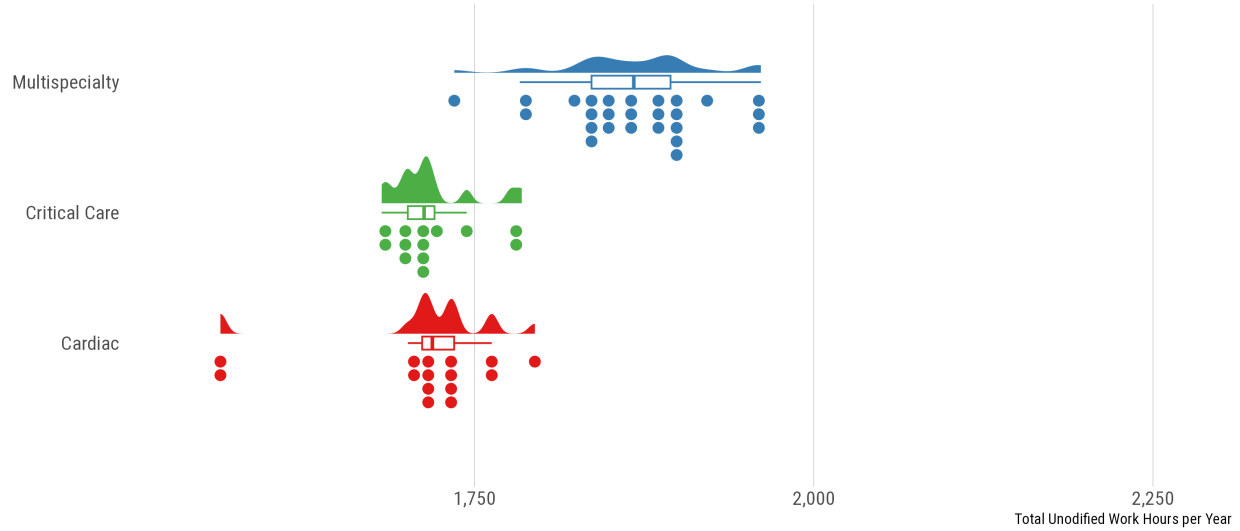
These cases can be reassembled to generate summaries of clinical work

In this case, daytime hours worked, weekend hours worked, and total "modified" hours worked during the entire 24-hour clinical assignment

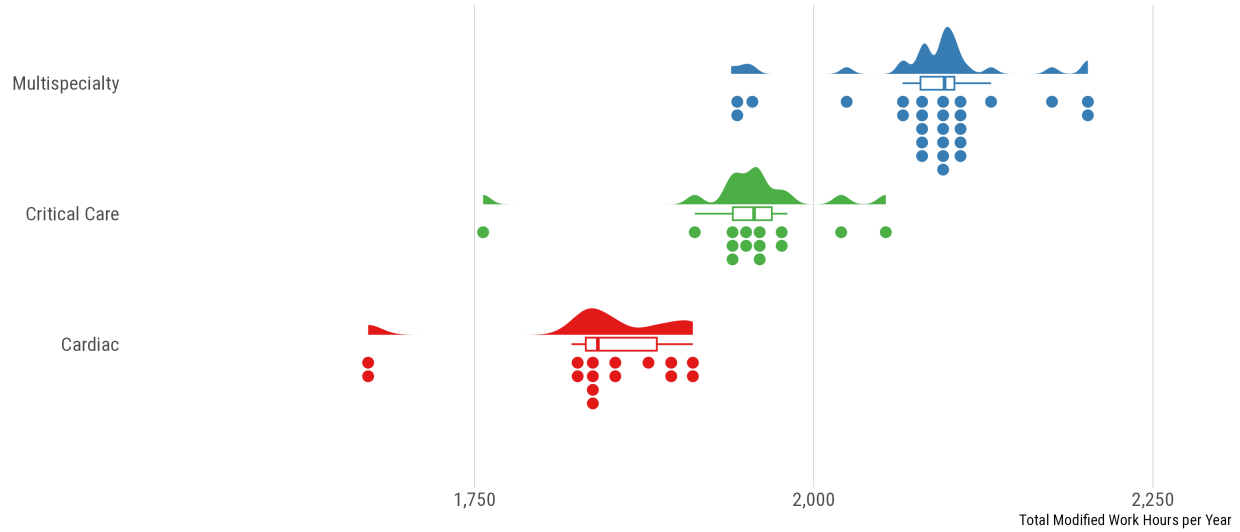
	qgenda_schedule_day	role	day_of_week	role_activity_hours	weekday_work_hours	weekend_work_hours	evening_work_hours	weeknight_work_hours	modified_work_hours
1	2023-08-18 00:00:00.000	APS	Friday	13.21	9	4.21666666666667	0	0	15.325

Example: Staff Activity Metrics Across Faculty

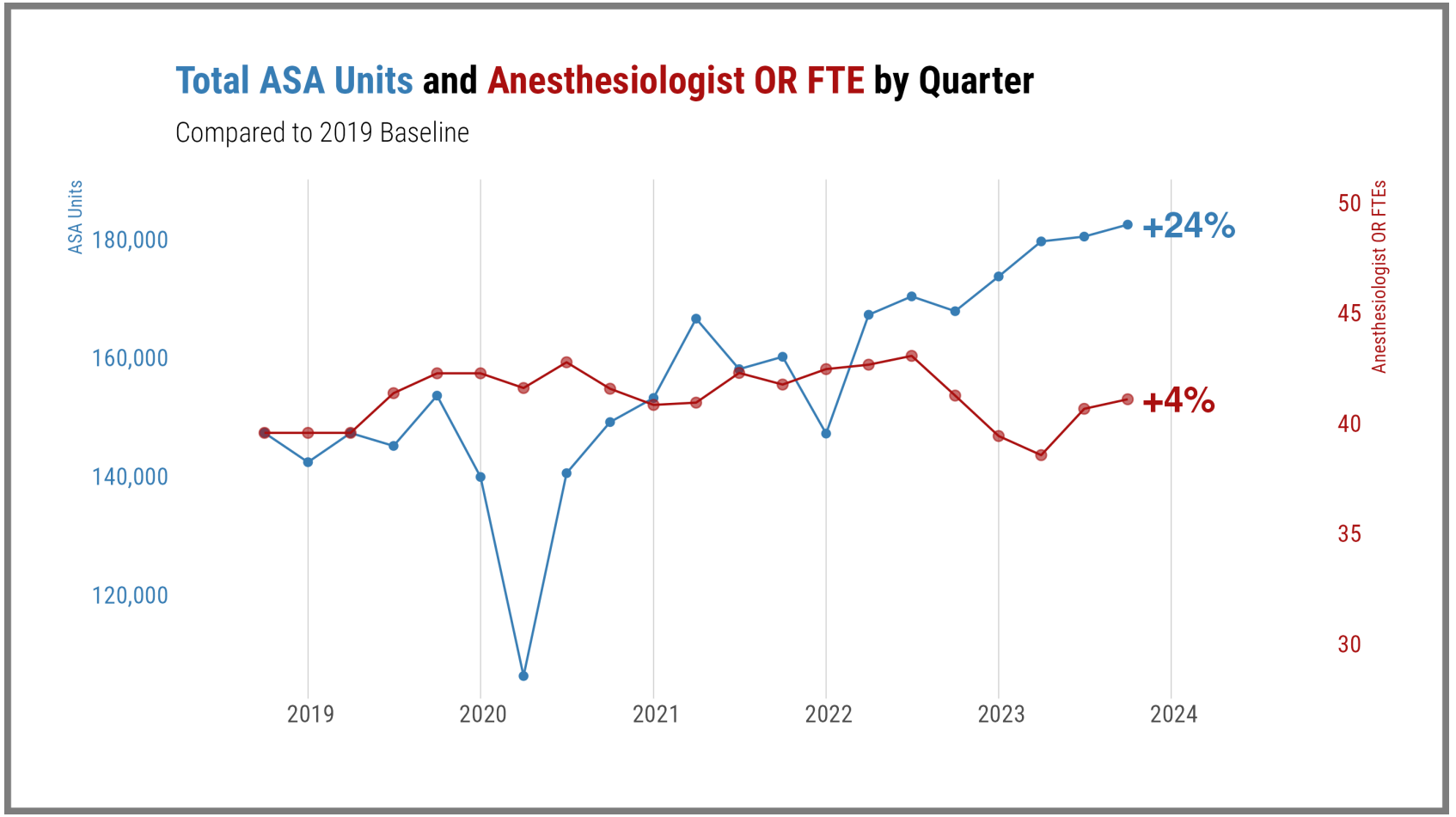
AY2023 Total Unmodified Work Hours by Clinical Division



AY2023 Total Modified Work Hours by Clinical Division



Adjusting Workload Balance



Interesting Use Case when Combined with Other OR Event Timestamps:

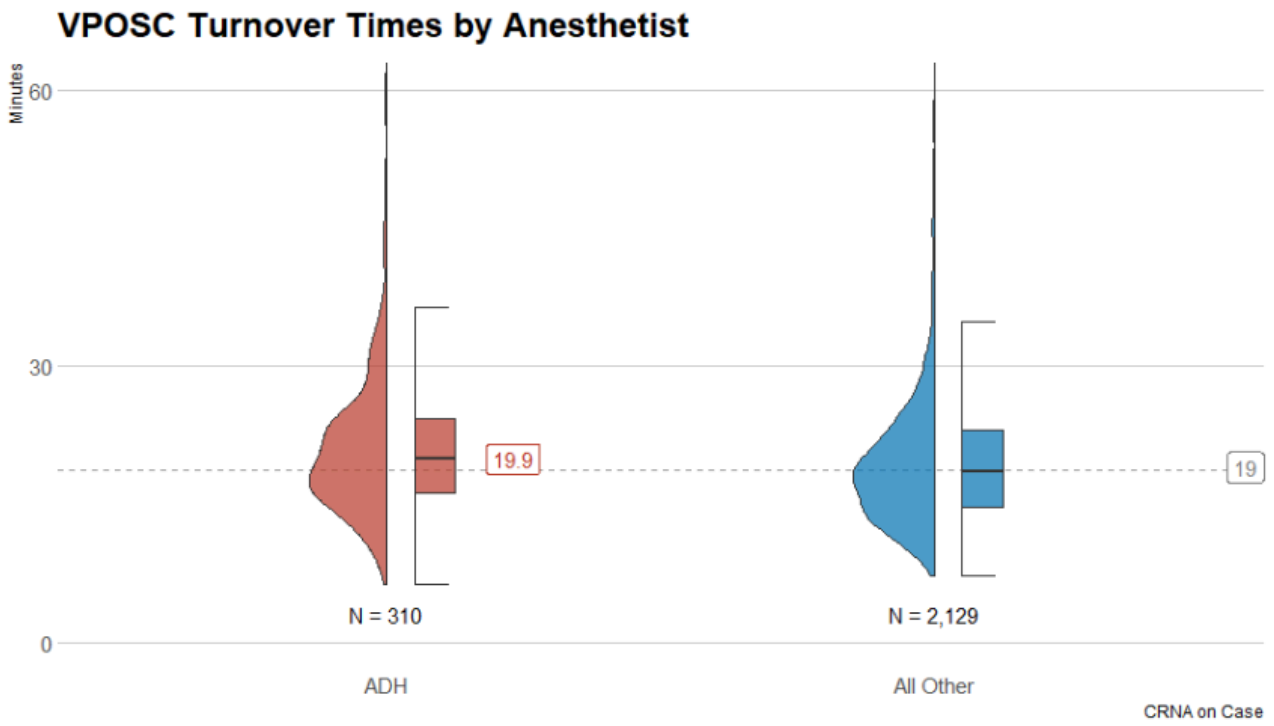
CRNA Turnover Times Complaint

VP Surgical Operations Reporting

July 01, 2023 through April 24, 2024

Same-Surgeon Turnover Times

Consecutive cases involving the same surgeon in the same OR.

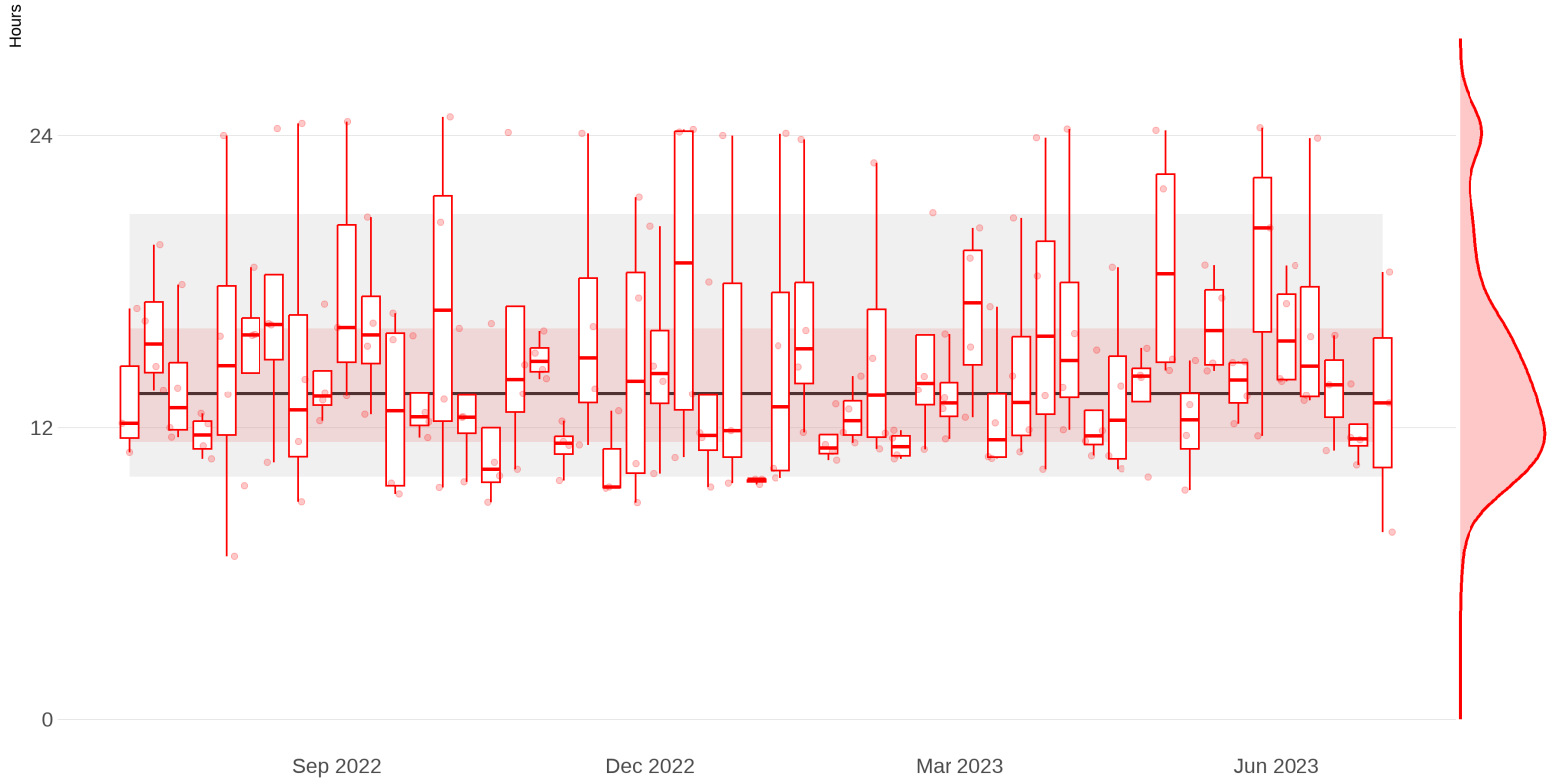


Adding information about a Clinical Role/ Clinical Assignment can provide further insight

Example: Cardiac Call Assignment Metrics

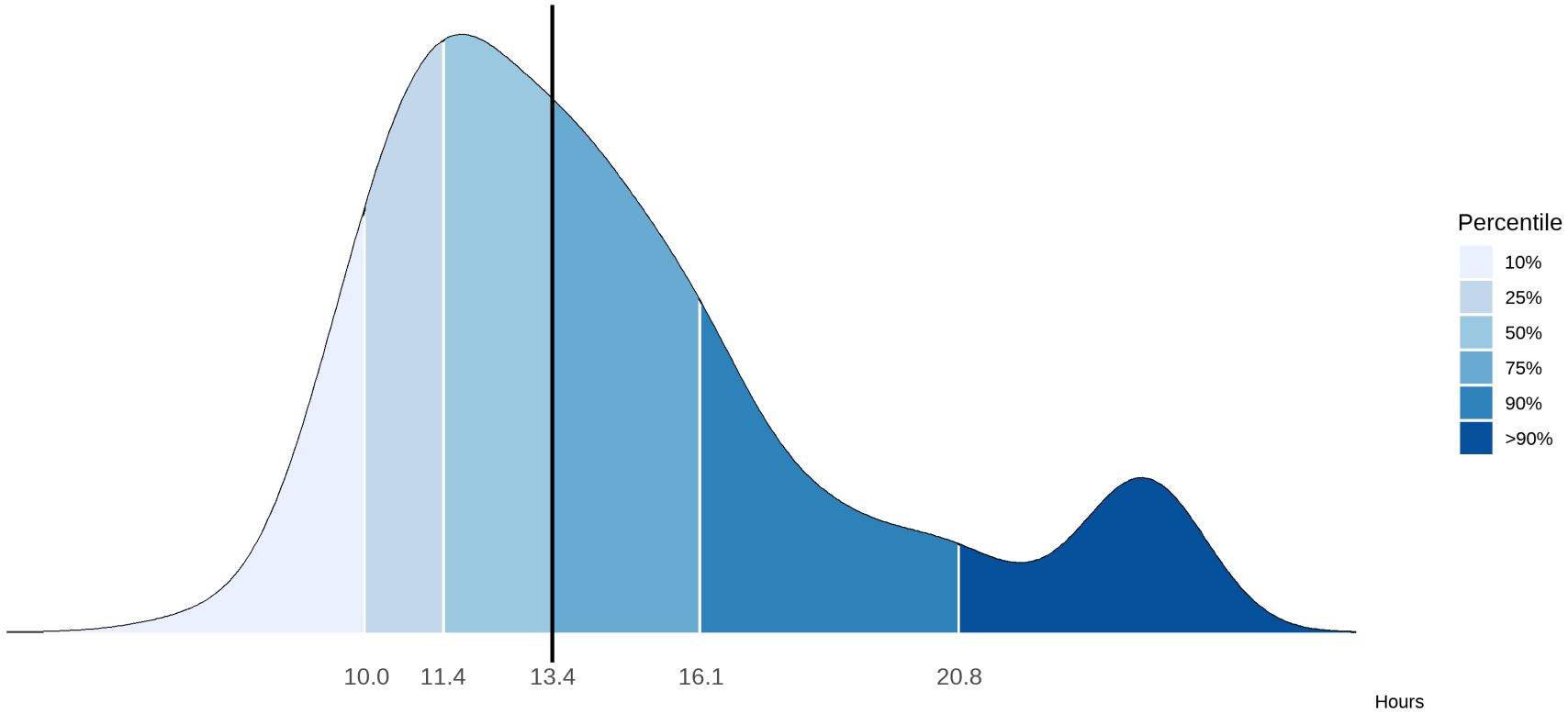
Assignment Lengths for Weekday Roles (n = 204)

MD-CT: overall median 13.4 hours [11.4, 16.1]
90th percentile: 20.8 hours



Taken from Last Case End Time or Clock-Out Time, Whichever is Later
Black Line Reflects the Overall Median for Role
Shaded Band Represents the Overall Interquartile Range
Gray Band Extends From 10th to 90th Percentile

CT1 Weekday Assignment Length Density Plot



Top 3 Benefits of Productivity Metrics

1. Clarifying expectations among stakeholders (i.e., how much "work" is expected for a given clinical FTE)

2. Increased Trust through Transparency

3. Shared Language for Implementing Change

Thank you!