

Improving Decision Making: OR Space Allocation

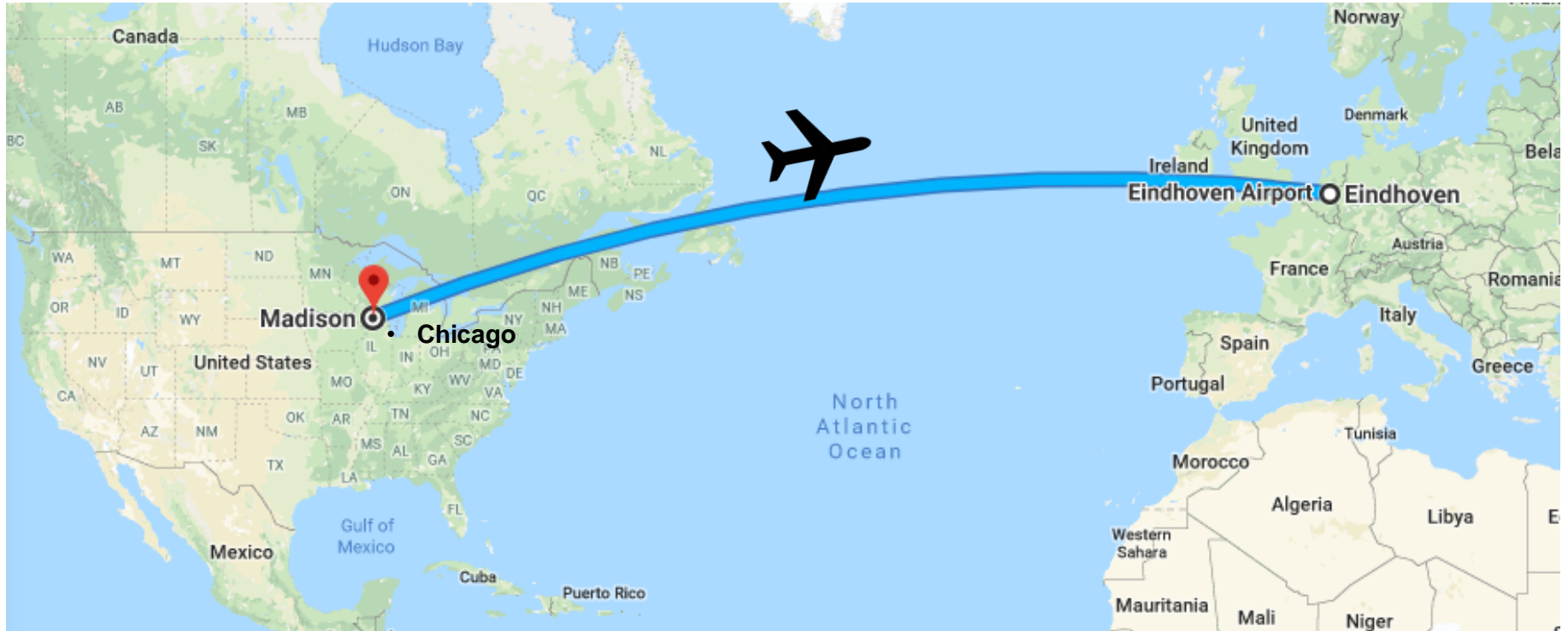
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Nursing Informatics Specialist

Surgical Operations



Decision Needed - How to best allocate operating room space for unscheduled (urgent & emergent) surgical cases added to the schedule

Madison



- City in Wisconsin located in midwestern United States
- 240 km Northwest of Chicago
- 6,700 km Southeast of Eindhoven

Madison



- Wisconsin State Capital
- Consistently ranked as a Best Place to Live in the US
- Site of a Major Research University
- High Tech Industry and High Performance Computing

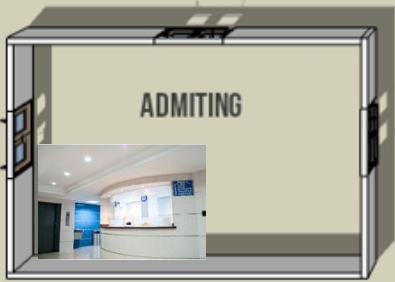
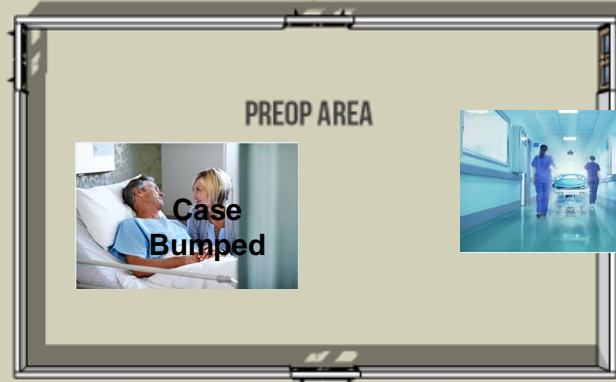
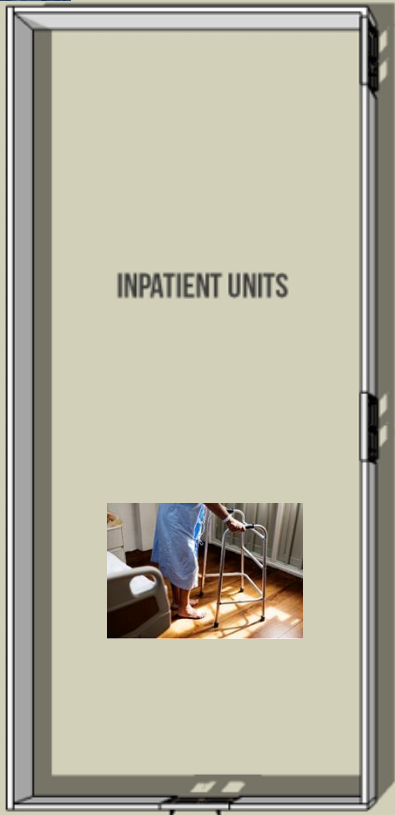
UW Health



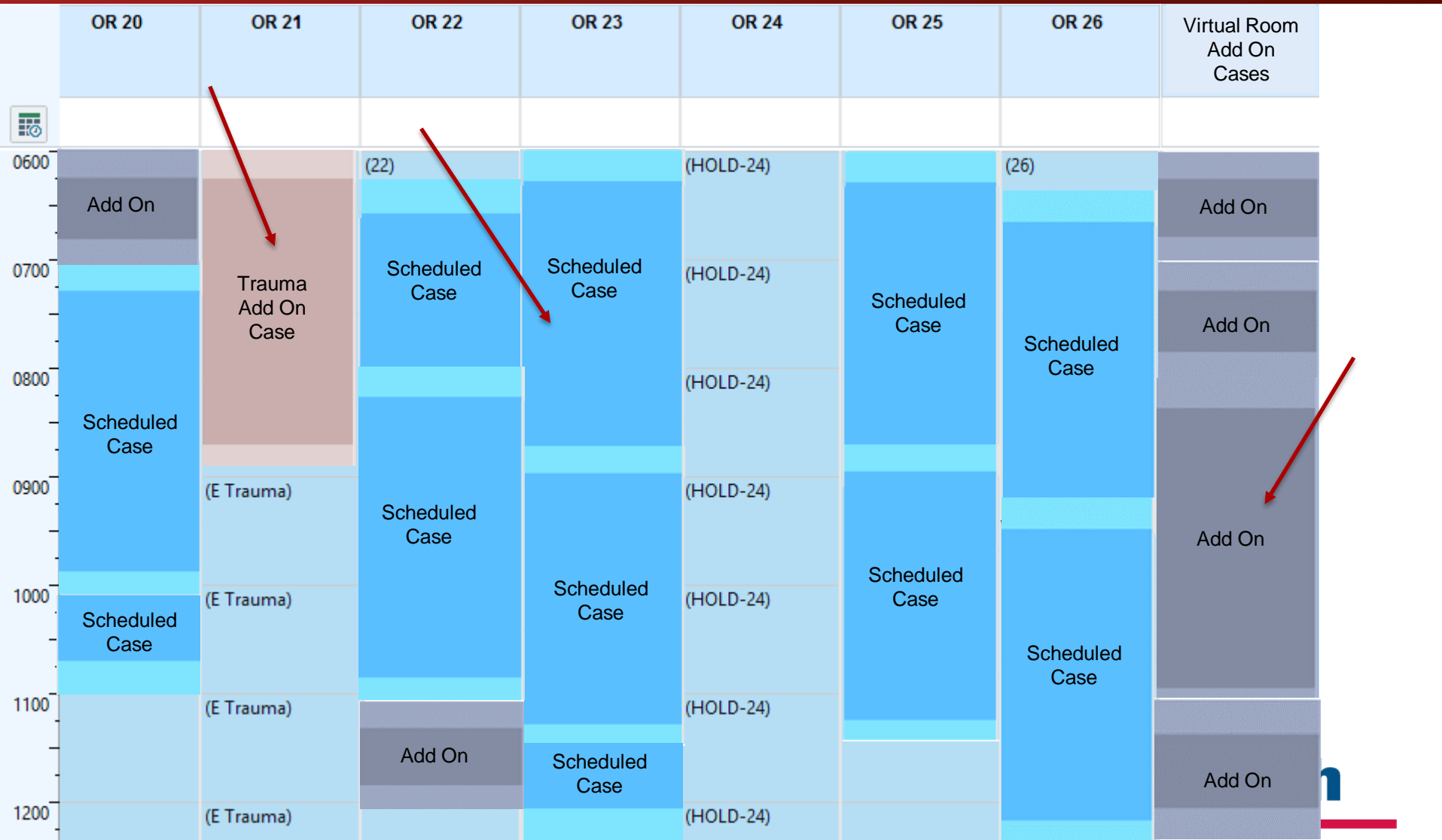
Academic Health System associated with the University of Wisconsin-Madison

Nursing Informatics Specialist

- Clinical Nursing
- Information Systems Implementation
- Computer Science
- Nursing Informatics



How This Looks on the OR Schedule



Restaurant Analogy



- Customers with Reservations can be seated without waiting
- Some Customers without Reservations can be seated at table reserved for Walk in Customers
- Some Customers without Reservations need to wait for a table to open up
- Some Customers without Reservations are turned away

Review of Problem/Question

2 new operating rooms will create additional time, space & resources for add on cases

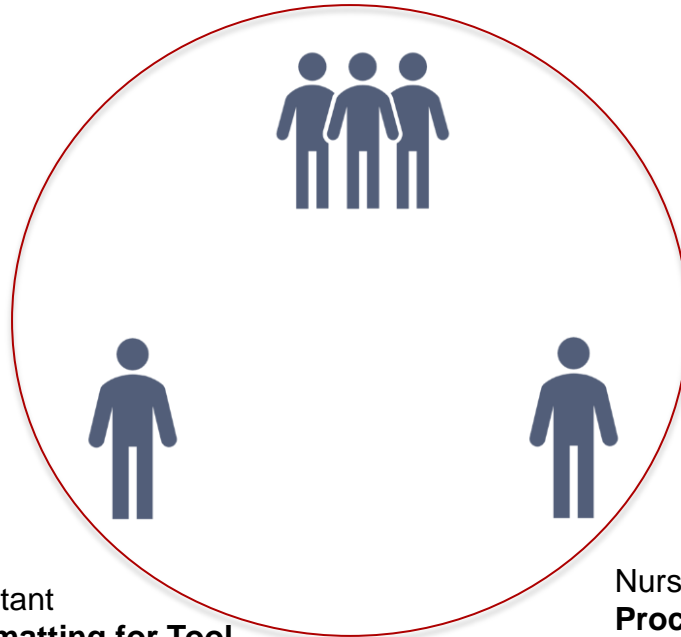
Some specialty services already have space allocated for add on cases

Neurosurgery has made a case for all available new space and is in line to receive it, however, Peripheral Vascular also voicing a need

How to best allocate operating room space for unscheduled surgical cases added to the schedule

How the Project was Organized (Team & Resources)

Director Surgical Services Nursing
Director Perioperative Services Anesthesia
Director of Surgical Operations (Surgeon Group)
Process Owners (sponsors)



Senior Analytics Consultant
Data Extraction & Formatting for Tool

Nursing Informatics Specialist
**Process Mining Analysis &
Project Management**



Reference Group



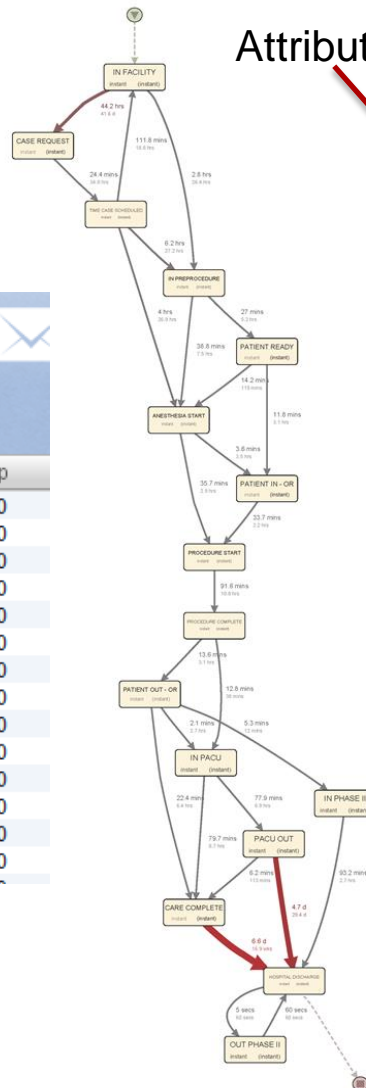
Fluxicon Support

Questions to Answer to Help in Decision Making

- How many Add-On Cases without Dedicated Hold Rooms?
- How are these broken out by specialty service and day?
- What are the higher volume specialty services and weekdays?
- How are patients moving through the perioperative process / are we meeting our internal performance metrics?

Data Extracted Based on Problem

Case ID	Activity	Complete Timestamp
1 Case 1	IN FACILITY	2016/08/18 16:21:00.000
2 Case 1	CASE REQUEST	2016/08/18 20:33:00.000
3 Case 1	TIME CASE SCHEDULED	2016/08/18 20:42:00.000
4 Case 1	ANESTHESIA START	2016/08/18 21:41:00.000
5 Case 1	IN PREPROCEDURE	2016/08/18 21:47:00.000
6 Case 1	PATIENT IN - OR	2016/08/18 21:47:00.000
7 Case 1	PATIENT READY	2016/08/18 21:47:00.000
8 Case 1	PROCEDURE START	2016/08/19 00:00:00.000
9 Case 1	PROCEDURE COMPLETE	2016/08/19 04:30:00.000
10 Case 1	PATIENT OUT - OR	2016/08/19 04:46:00.000
11 Case 1	CARE COMPLETE	2016/08/19 04:50:00.000
12 Case 1	HOSPITAL DISCHARGE	2016/09/02 13:18:00.000
13 Case 2	IN FACILITY	2016/08/12 12:51:00.000
14 Case 2	CASE REQUEST	2016/08/12 17:09:00.000



Attributes

SURGEON	Resource attribute	CASE_CLASSIFICATION	Other attribute
OR_SERVICE	Resource attribute	CASE_TYPE	Other attribute
LOGIC_TRAUMA_FLAG	Resource attribute	ADMIT_TYPE	Other attribute
PRIM_PROC_NAME	Other attribute	ADMIT_SOURCE	Other attribute
SURG_DATE	Other attribute	ASA_RATING	Other attribute
WEEK_DAY	Other attribute	CANC_COMMENTS	Other attribute
OR_ROOM	Other attribute	CANCEL_RSN	Other attribute
TRAUMA_FLAG	Other attribute	CANCEL_DT	Other attribute
ADD_ON_CASE_YN	Other attribute	DELAY_COMMENTS	Other attribute
ADD_ON_LOGIC_YES_NO	Other attribute	DELAY_RSN	Other attribute
ZE_FLAG	Other attribute	BUMPED_CASE_YN	Other attribute
REQ_PROC_DT	Other attribute		
SURG_AVAIL	Other attribute		
PAT_CLASS	Other attribute		
TRANS_FROM_LOC	Other attribute		

Narrowing the Dataset

Filtering for Add On cases - Included only those cases that met the Add On Logic Criteria

The screenshot displays a user interface for filtering data. On the left, an 'Active filters' sidebar shows a filter named 'Attribute' with the description 'Removes events by attribute'. Below this is a dashed box with the text 'click to add filter...'. The main panel is titled 'Attribute' and includes a close button (X). It contains a 'Filter by:' dropdown menu set to 'ADD_ON_LOGIC_'. Underneath, the 'Filtering mode:' section has three radio buttons: 'Keep selected' (which is selected), 'Mandatory', and 'Forbidden'. A descriptive note states: 'This filter removes all events that do not have one of the selected values.' On the right, a list of 'Event values: (1 of 2 selected)' is shown, with 'NO' and 'YES' options. The 'YES' option is selected and highlighted in blue.

Filtering for Add On Cases without Dedicated Hold Rooms

Not Classified as a Trauma Case or one of the Services or Surgeons that have Dedicated Hold Rooms

Attribute
Removes events by attribute

Filter by: LOGIC_TRAUMA_ ▾

Filtering mode:
 Keep selected
 Mandatory
 Forbidden

Event value	
<input type="checkbox"/>	N
<input checked="" type="checkbox"/>	Y

Attribute
Removes events by attribute

Filter by: OR_SERVICE ▾

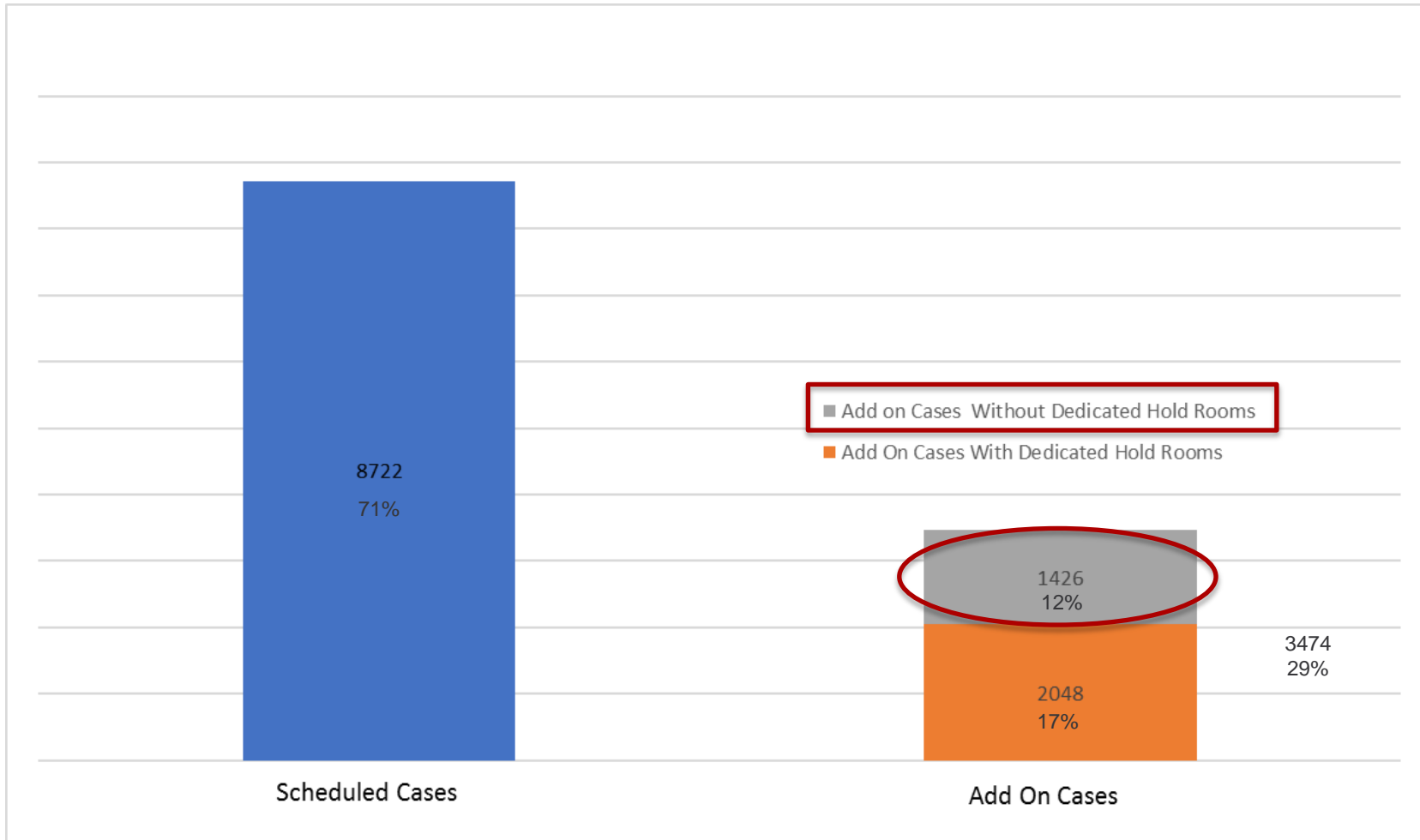
Filtering mode:
 Keep selected
 Mandatory
 Forbidden

Attribute
Removes events by attribute

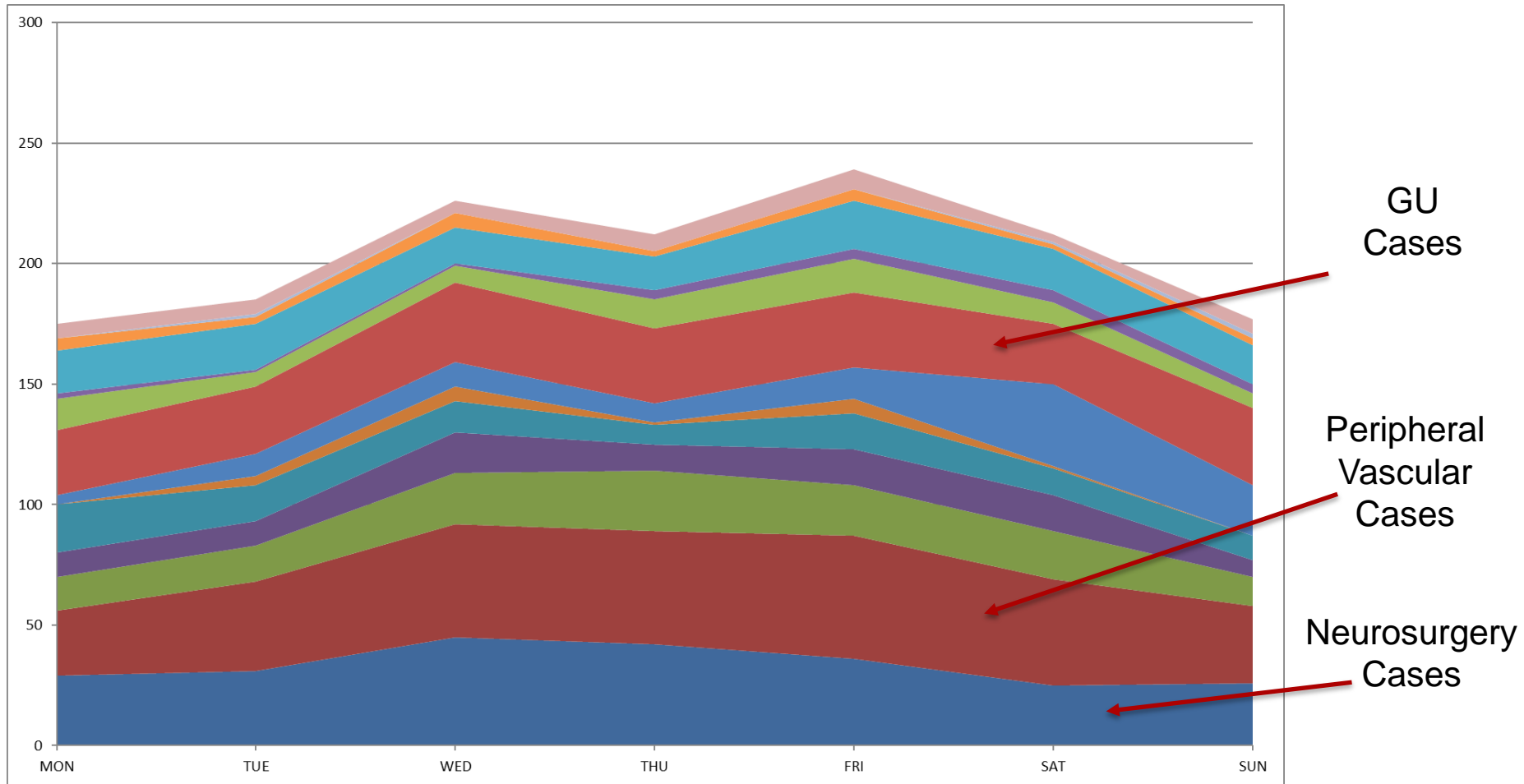
Filter by: SURGEON ▾

Filtering mode:
 Keep selected
 Mandatory
 Forbidden

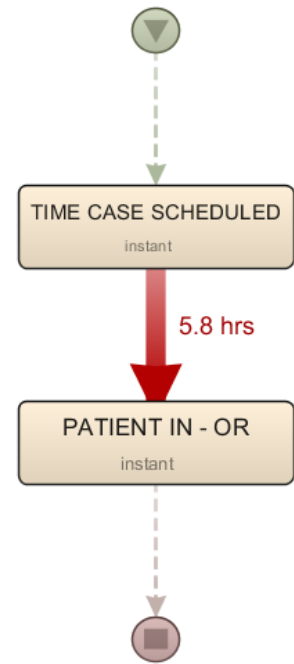
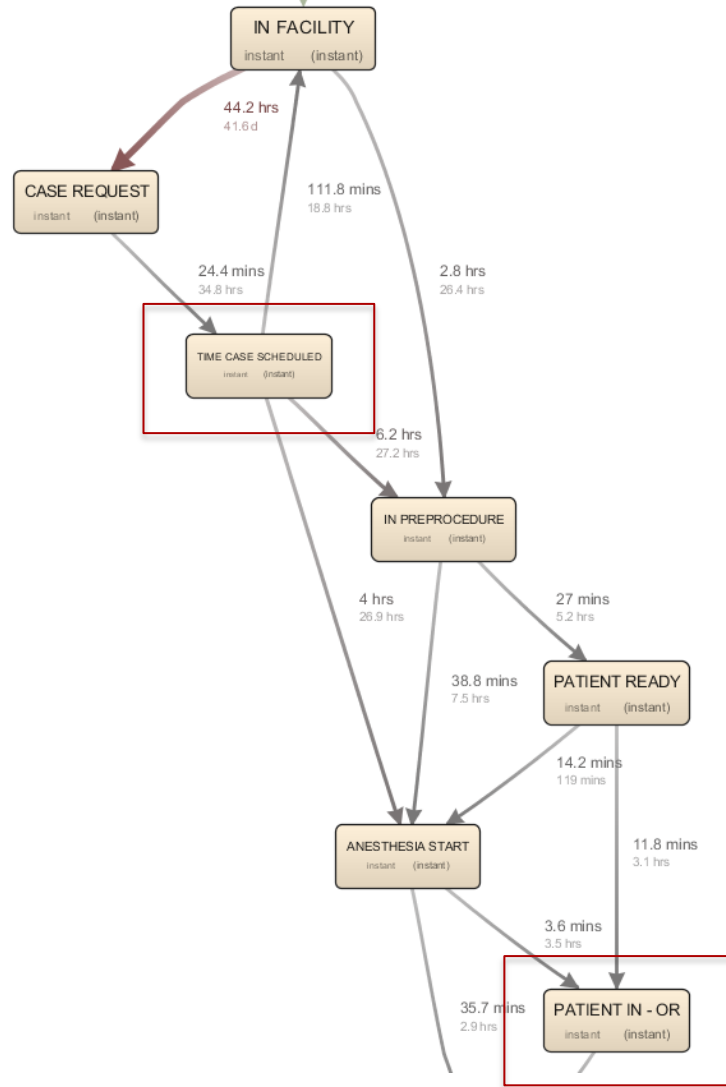
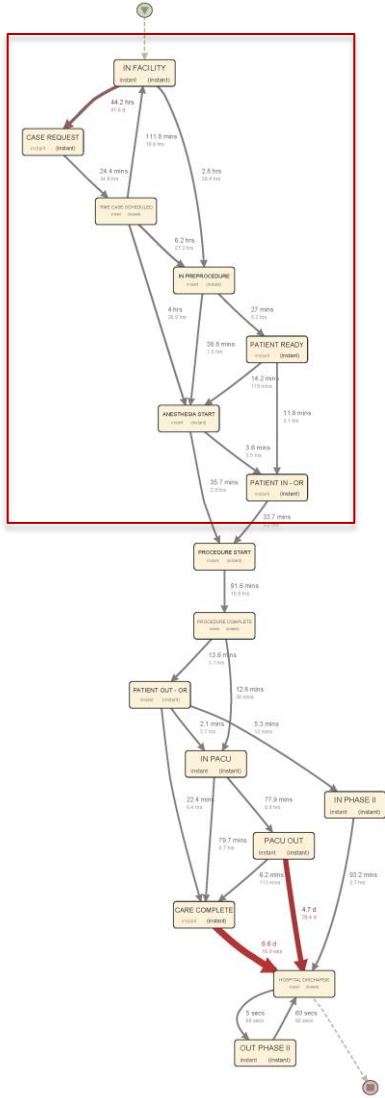
Overall Case Distribution



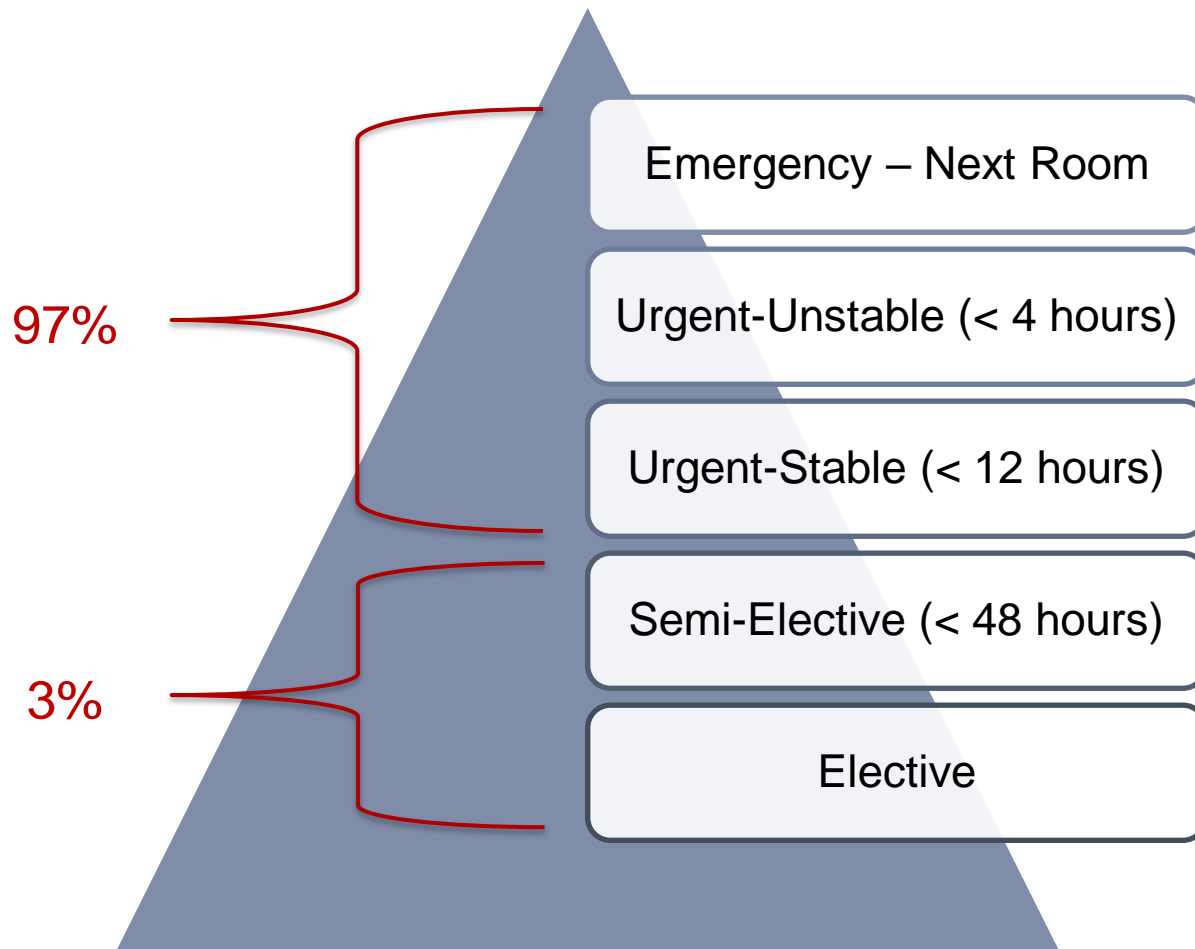
All Add On Cases without Dedicated Hold Rooms By Service & Weekday



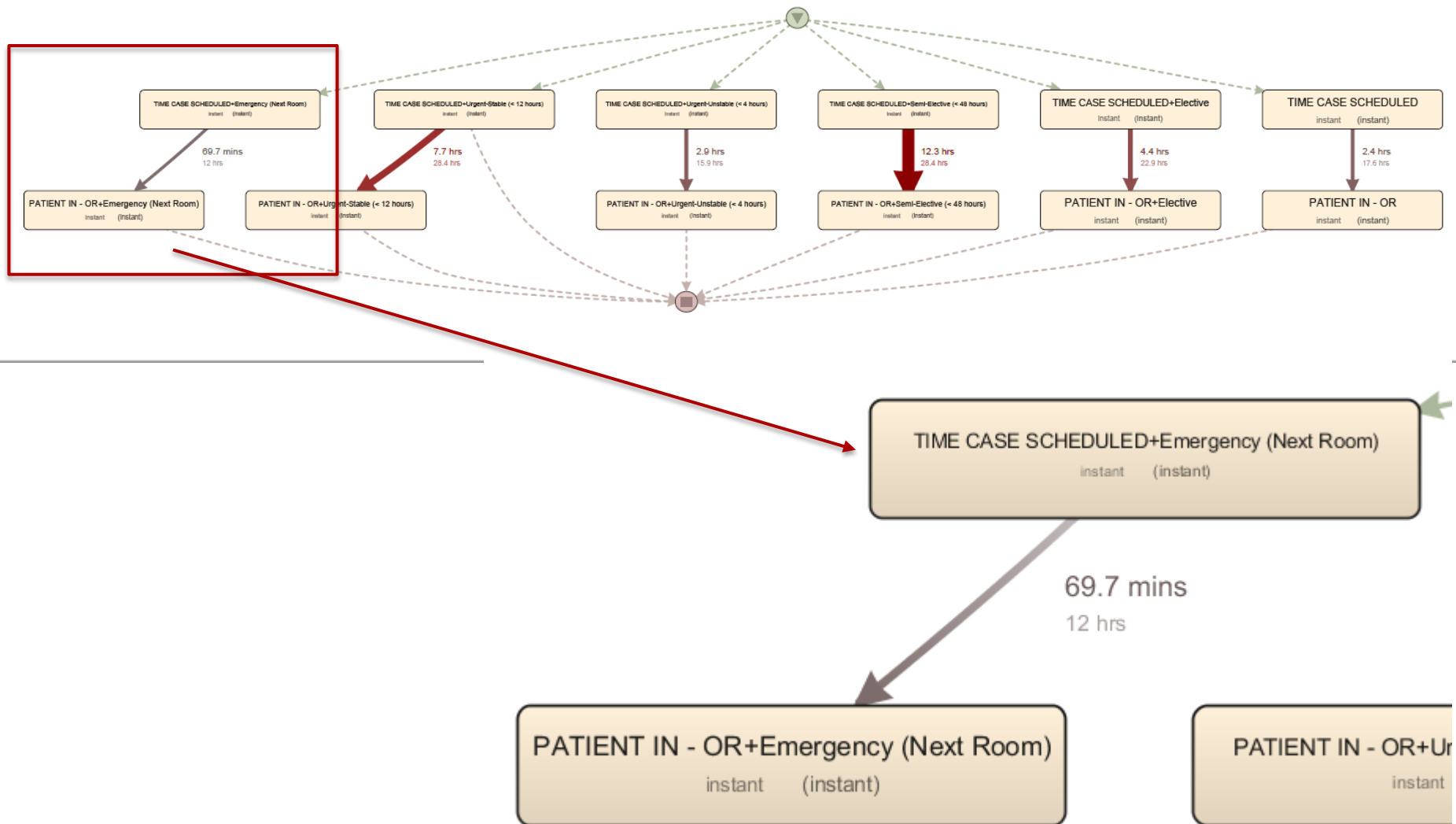
Flow of All Add On Cases without Dedicated Hold Rooms



All Add On Cases Are Not the Same Urgency

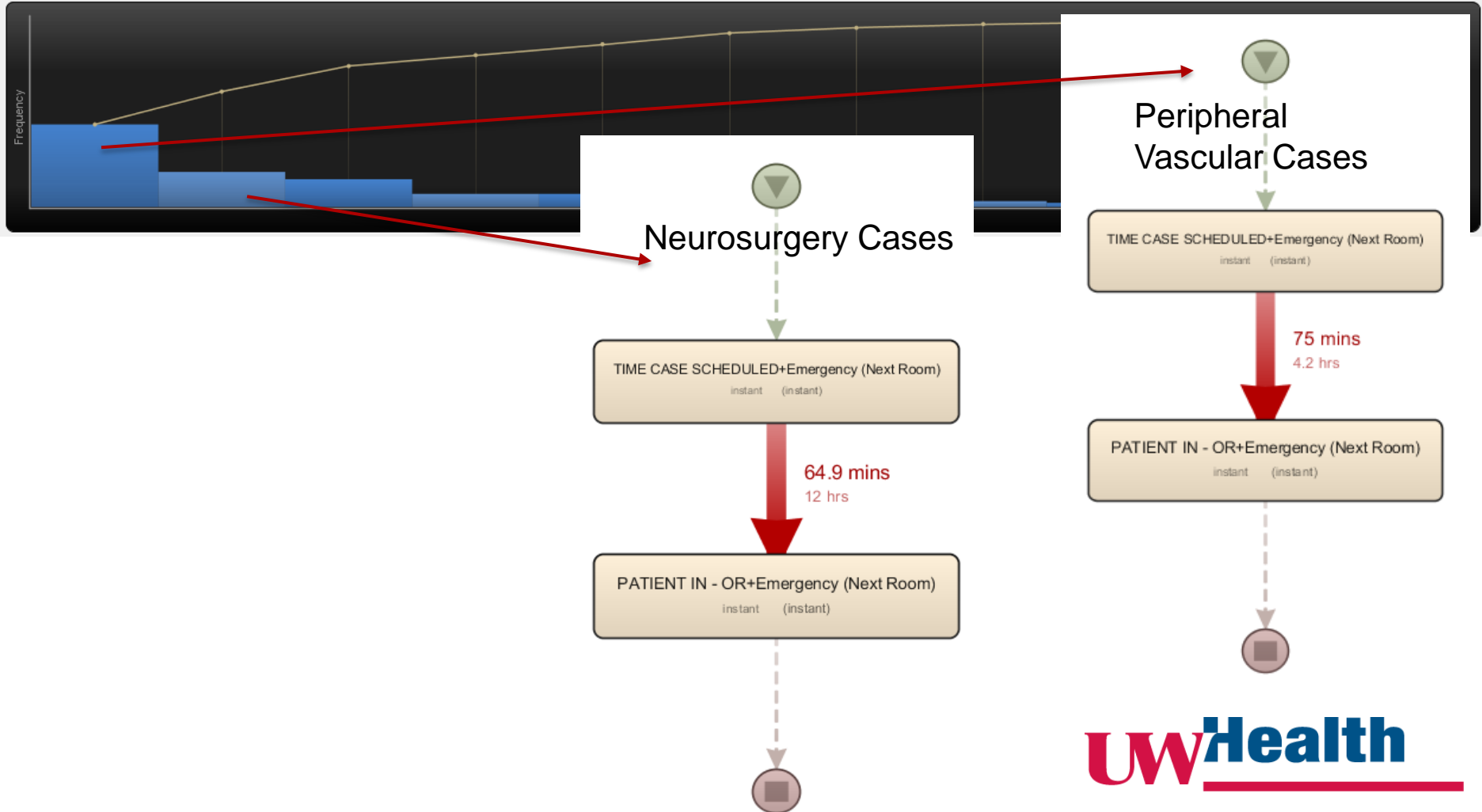


Flow of All Add On Cases without Dedicated Hold Rooms by Case Type/Priority

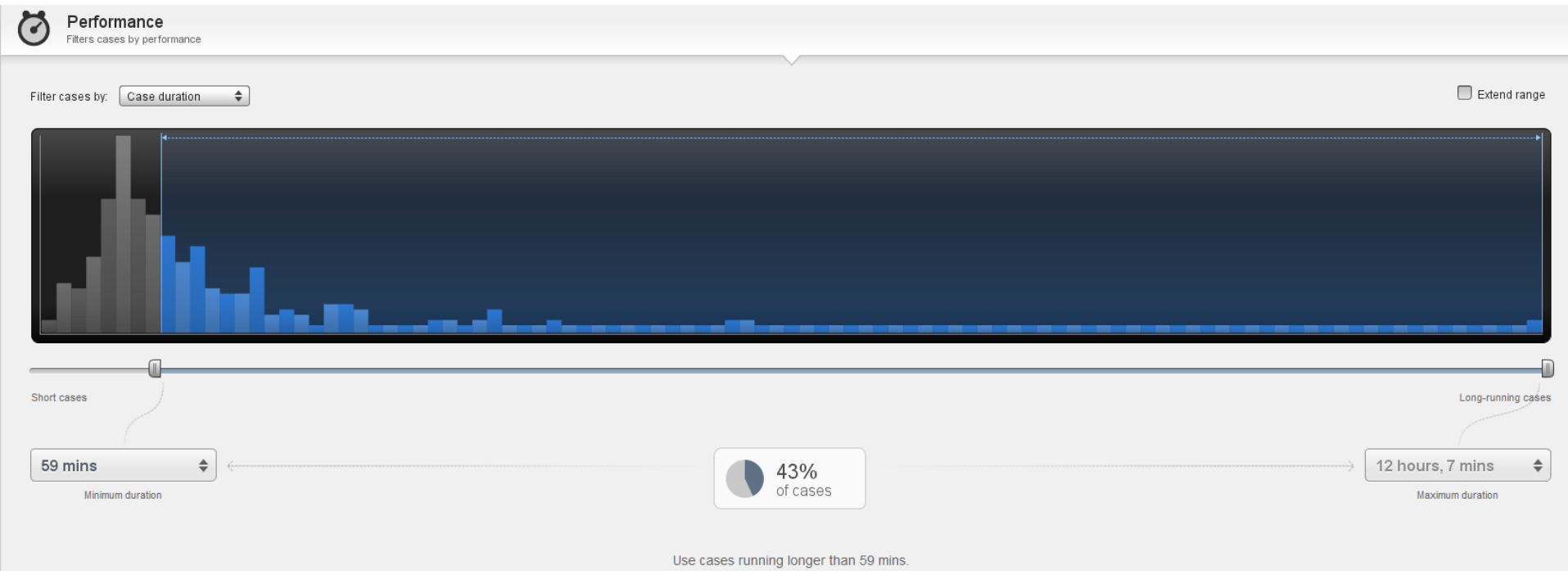


Neurosurgery vs Peripheral Vascular Surgery Emergency Cases

OR_SERVICE
Other attribute

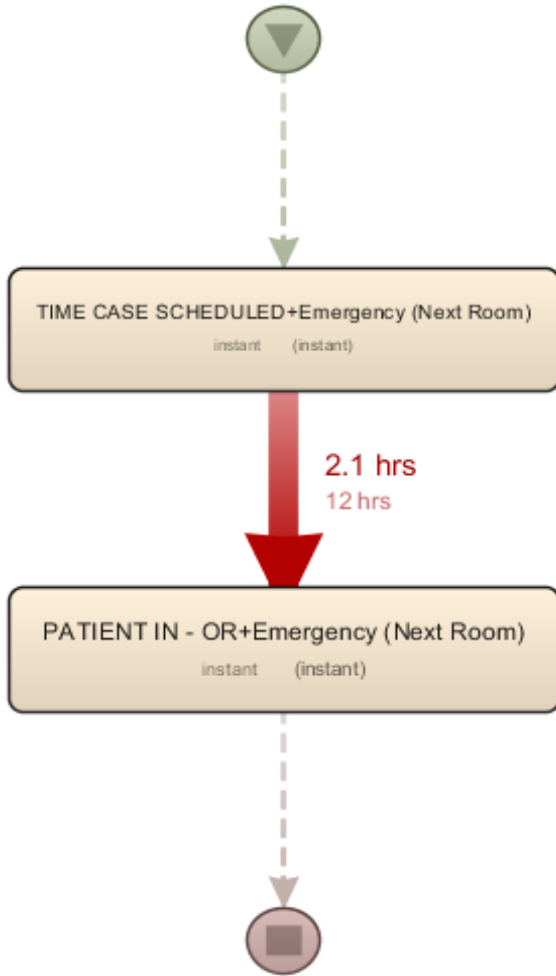


Emergency Cases > 1 hour to OR

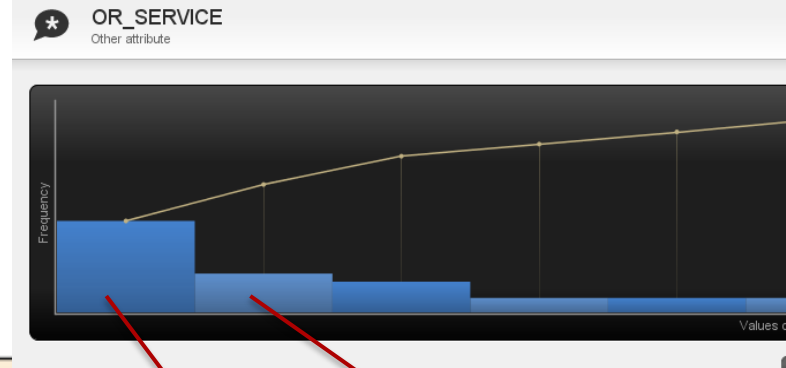
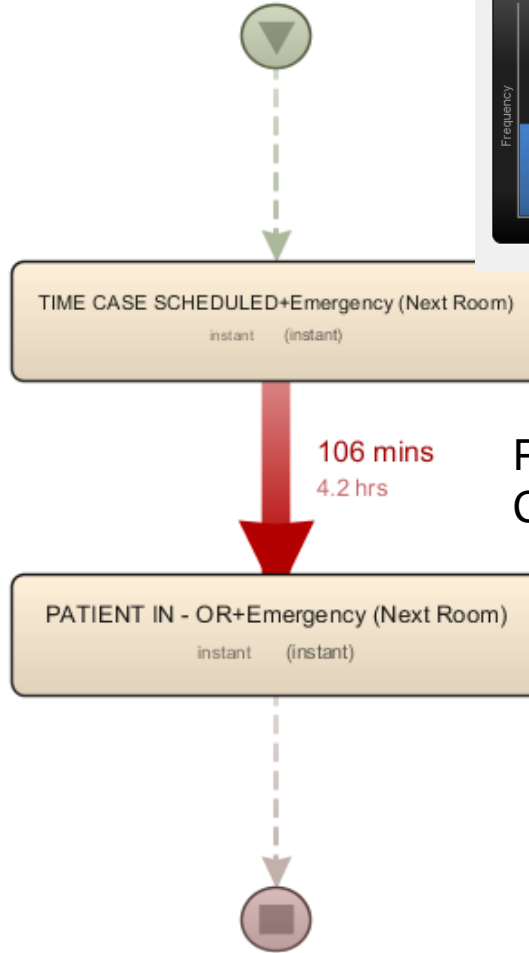


Neurosurgery vs Peripheral Vascular Surgery Emergency Cases > 1 hour to OR

Neurosurgery Cases



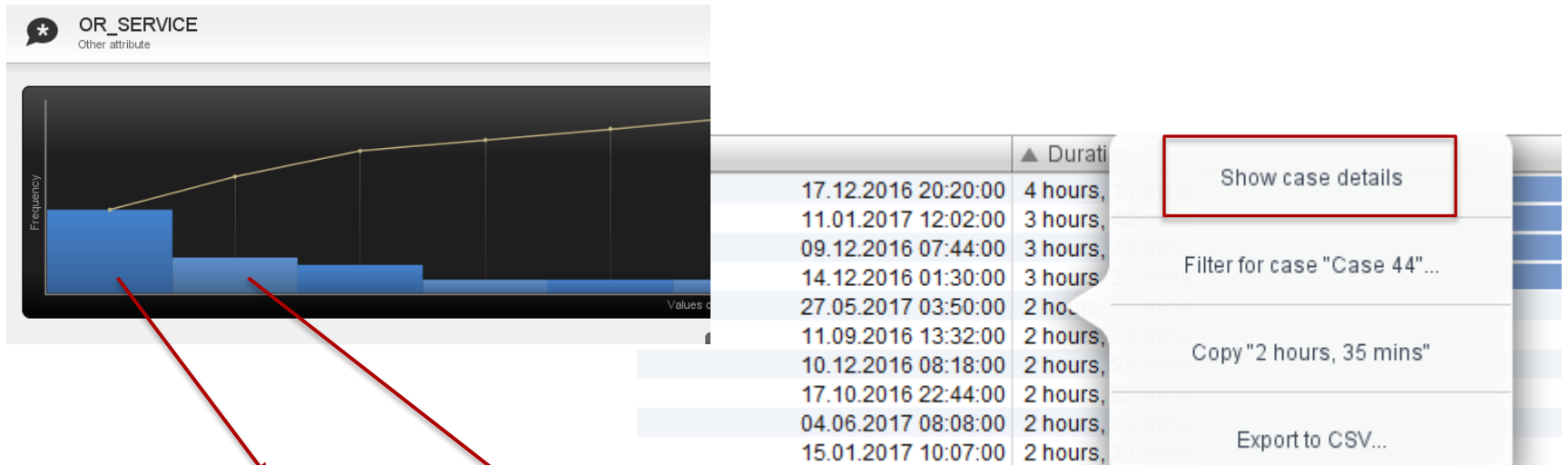
Peripheral Vascular Cases



Peripheral Vascular Cases

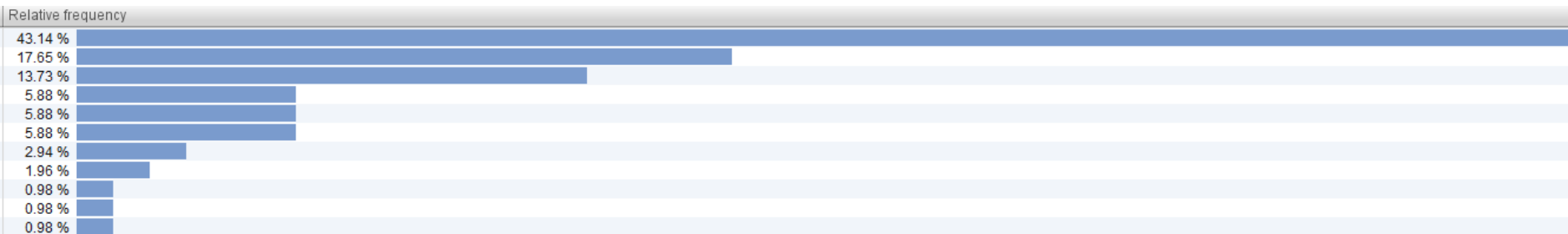
Neurosurgery Cases

Neurosurgery vs Peripheral Vascular Surgery Emergency Cases > 1 hour to OR



Peripheral Vascular
Cases

Neurosurgery Cases



Outcome

- Space and equipment allocated for both Peripheral Vascular and Neurosurgery
- Decision made differently

Value of Process Mining

- Reduced the political / emotional components
- Visualization that the tool enabled helped build more confidence in the data & more easily told the story
- Without process mining analysis the discussion to make the case would not have been possible

Early Obstacles

- Lengthy review process
- Timely access to data
- Lack of active sponsorship
- Invite everyone and hope something worthwhile happens

How We Succeeded

- Surgical services leadership sponsorship
- Selected a project with manageable complexity and a valued outcome
- Organized team specifically for this project

Questions

