



# Designing a Real-time Radiology Workflow Monitoring Tool for Overnight Residents

Michael Cohen

## Paging Doctor....

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- Put yourself in the shoes of a radiology resident
- Physician - training to be a Radiologist
- Responsible for reading all cases that come in overnight

# Programming in Radiology



## We Work 1-1

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- 1-1 with residents to design systems to assist in visualizing patient information
- Takeaway
  - Importance of data visualization in appropriate patient care and staffing
  - Specifically prevent diagnostic and communication errors

## Things to Take into Account

- Used in radiology reading room
  - Darker colors are necessary
- Be able to react to a large influx of patients
  - Live updating



## Overnight Stats

580  
RVUs

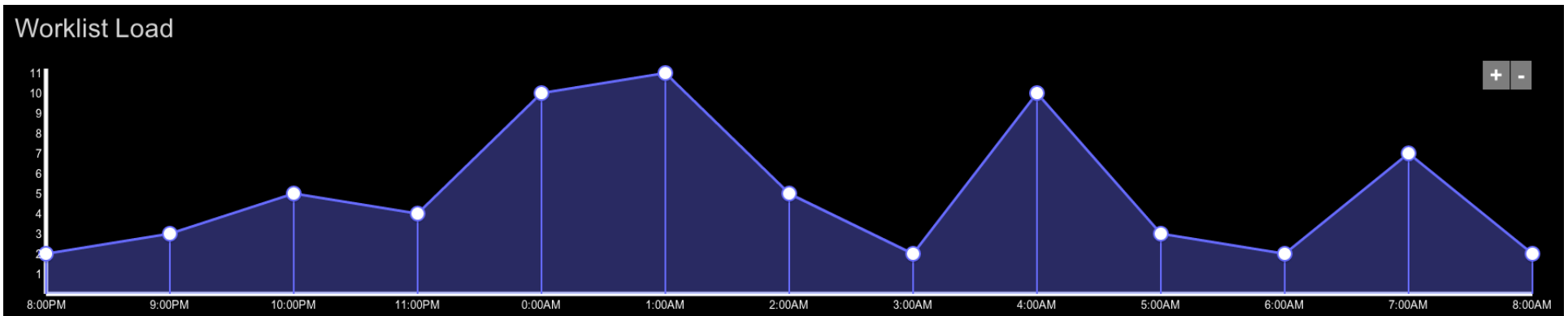
580  
Other

A line chart with a dark blue background and a light blue line. The x-axis represents time from 8:00 PM to 8:00 AM in one-hour increments. The y-axis represents the number of people, ranging from 0 to 11. The chart shows a peak of 11 people at 1:00 AM and another peak of 10 people at 4:00 AM. The area under the line is filled with a dark blue color.

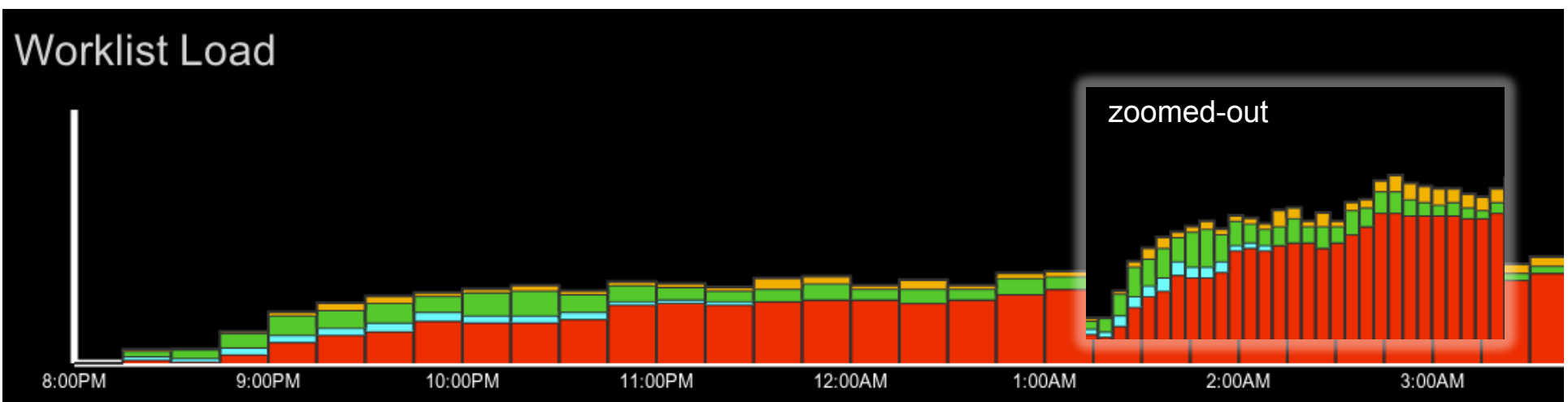
Time	Number of People
8:00 PM	2
9:00 PM	3
10:00 PM	5
11:00 PM	4
0:00 AM	10
1:00 AM	11
2:00 AM	5
3:00 AM	2
4:00 AM	10
5:00 AM	3
6:00 AM	2
7:00 AM	7
8:00 AM	2

# Measuring Case Volume

Initial – dotted line graph, lines not good assumption



Final – stacked bar graph by modality, bar graph is more accurate description



## Modalities Legend

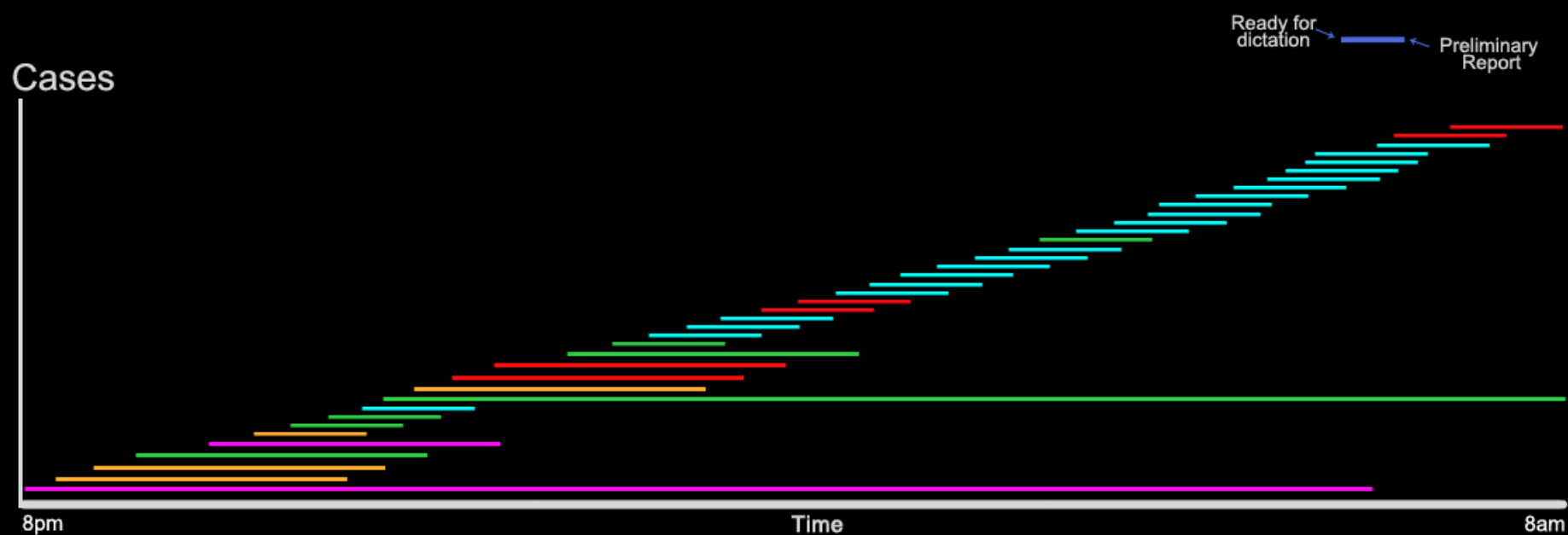
10  
CT ED

7  
CT IM

10  
US

50  
XRAY

2  
OTHER





# Overnight Case Dashboard

## Unread Studies

**Audrie Bucknell**  
Modality: Ultrasound Acc: 1231233213

**Rhonda Miller**  
Modality: Body MR Acc: 1231233213

**William Burke**  
Modality: Plain film Acc: 1231233213

## Critical Findings Dashboard

Currently Reading

### Jonathon Wagner Black

#### Critical Findings Notes

Called Dr. Norton in Peds with no success, also tried Dr. Sparrow.

Add Patient to Pending Critical Findings

## Pending Critical Findings

**Richard Wallace** Acc:12131232  
Imp: Aortic bleed out eminent...

**River Stone** Acc:12131232 Signed  
Imp: Fracture of the femur is...  
Note: Called Dr. Marty Blatt

**Ilana Goldberg** Acc:12131232 Signed  
Imp: Nondisplaced fracture lateral  
tibial plateau, moderate join...

## Night Blog

Can't believe we lost power for 15min

Post

★★★★★  
Unrated Nights (0)

Rate Night



**Anthony**  
Computer just crashed

03:00am



**Anthony**  
So tired, just had a coffee

02:15am

## Night Blog

FL procedure took longer than expected

Post



Unrated Nights (0)

Rate Night



**Anthony**

Computer just crashed

03:00am

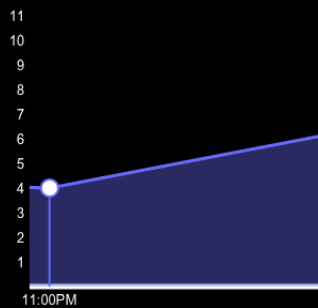


**Anthony**

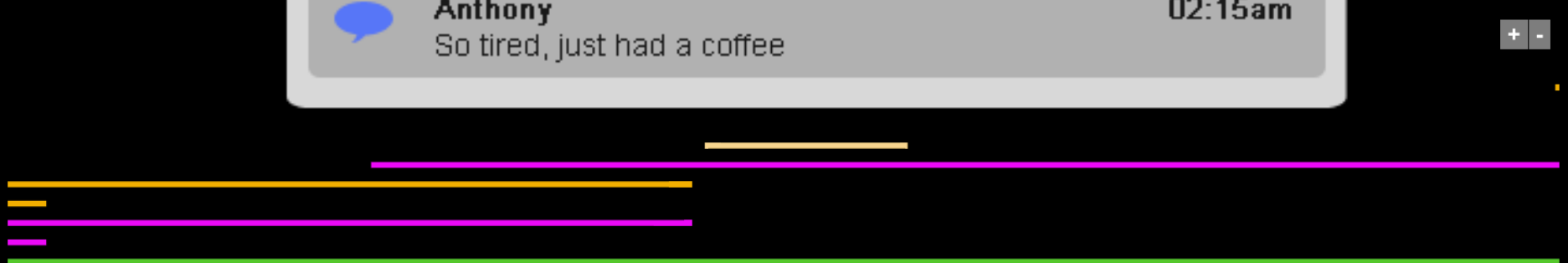
So tired, just had a coffee

02:15am

## Worklist Load



## Cases



11:00PM

0:00AM

1:00AM

## Summary

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- Protect patients from harmful diagnostic errors by visualizing workload which can be immediately acted upon
  - Adding additional staffing during times of need
  - Retrospective analysis to optimize workflow
  - Triaging patients appropriately
  - Narrative reports of system failures
  - Calibrating expectations for residents