

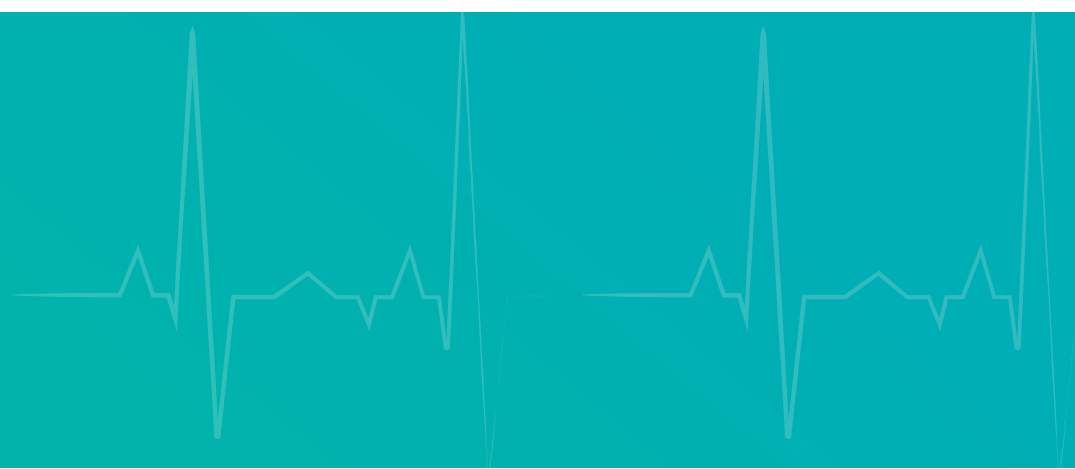


# NLP Assisted Coding

Amanda Potter



# Introduction





**Medical coders translate physician notes into a set of diagnosis and procedure codes. These codes are used to send a claim to the payer for reimbursement**



## Physician Notes

Recorded by physician.



## Transcription

Transcriptionist or voice recognition.



## Claim Coded

Trained coders.



# Coding Errors are Expensive

Errors in coding cost hospitals millions

- Claims Denials
- Incorrect base rate used for reimbursement

# Coding Errors are Expensive

## Denied claims

- Average \$25 to reprocess
- 50-65% of denied claims are never worked



# The Data

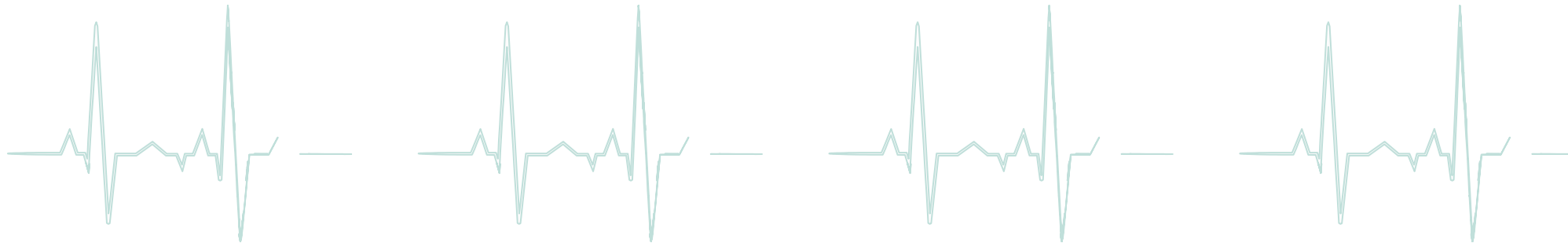


# The Data

Data set from MIT

MIMIC-III

ICU patients at Beth Israel  
Deaconess Medical Center  
2001-2012

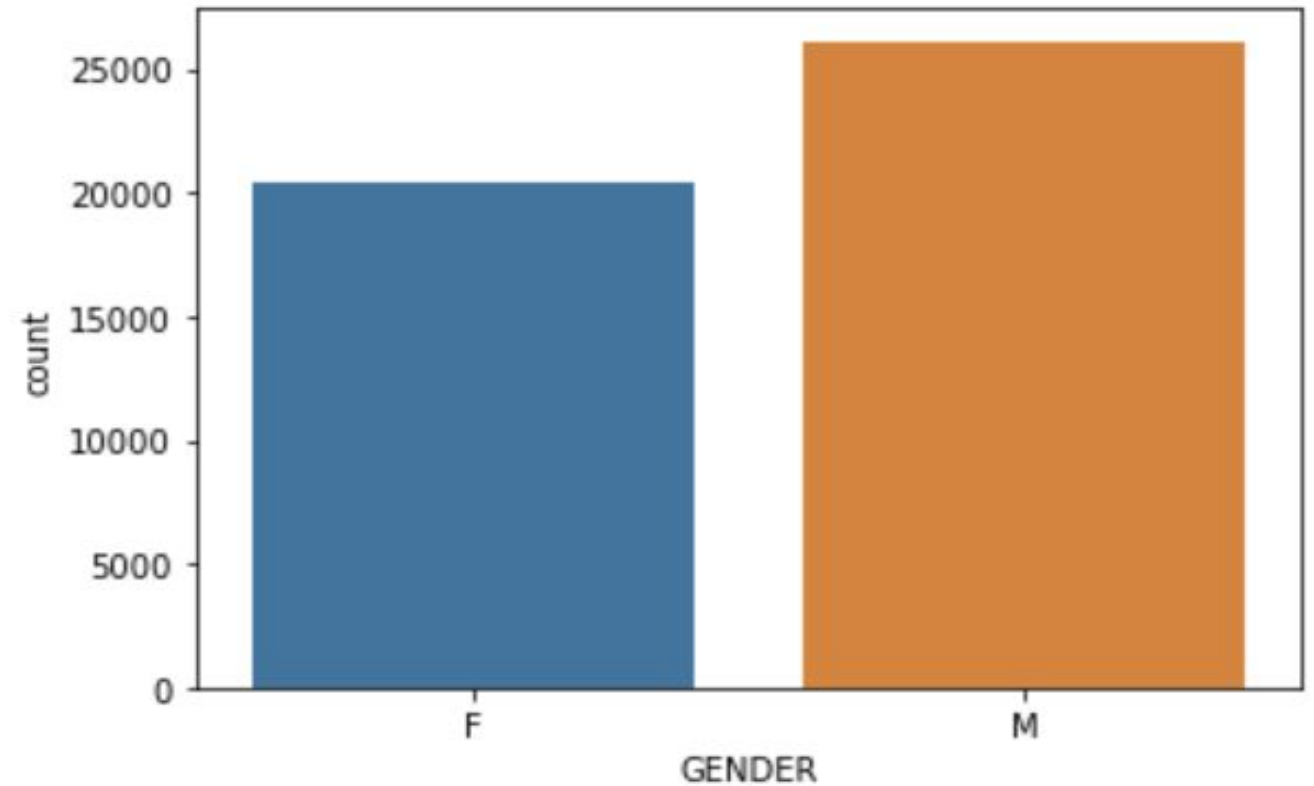




# Patient Data

Over 40K  
individual patients

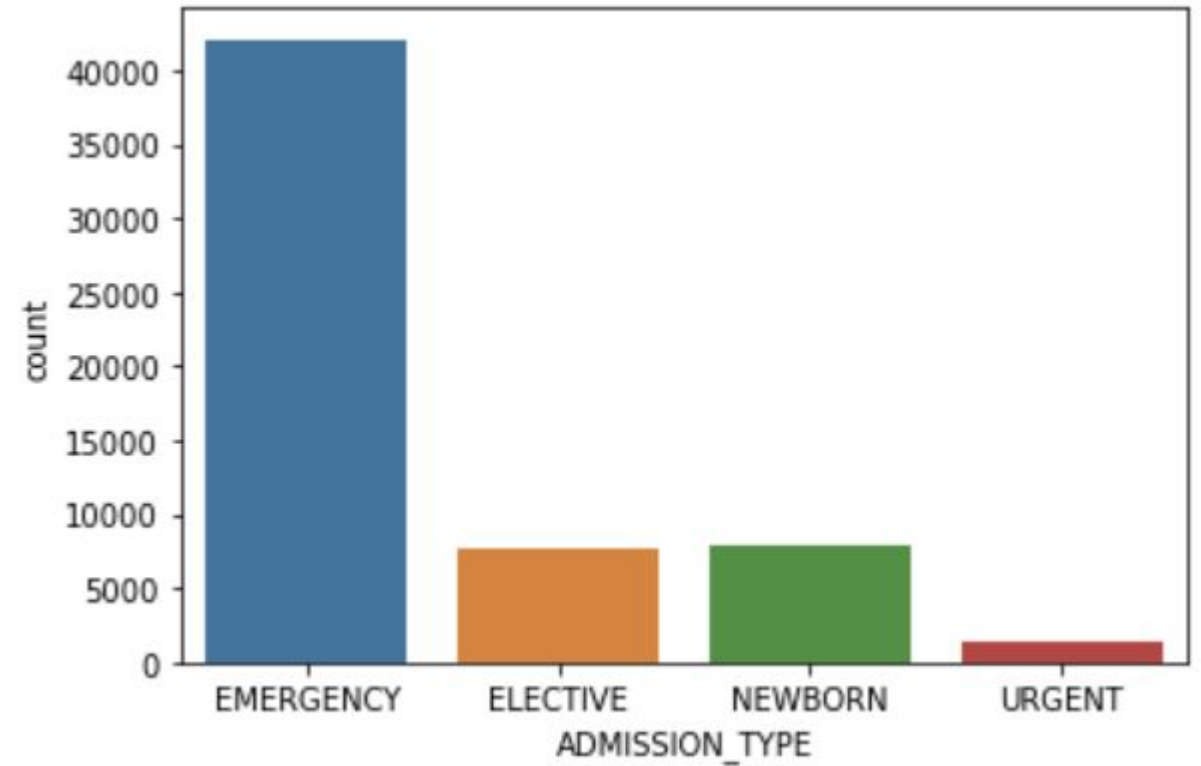
Count of Male/Female patients



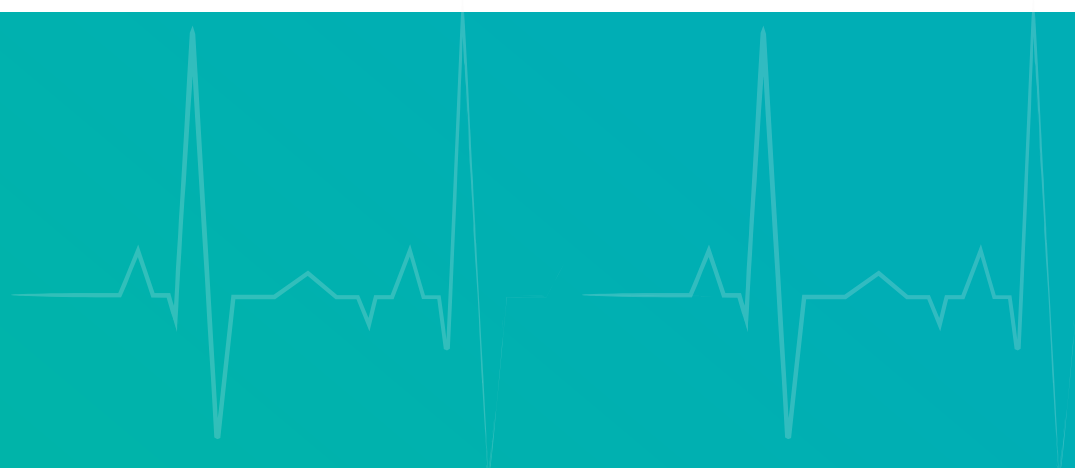
# Patient Data

Majority admitted through the ED

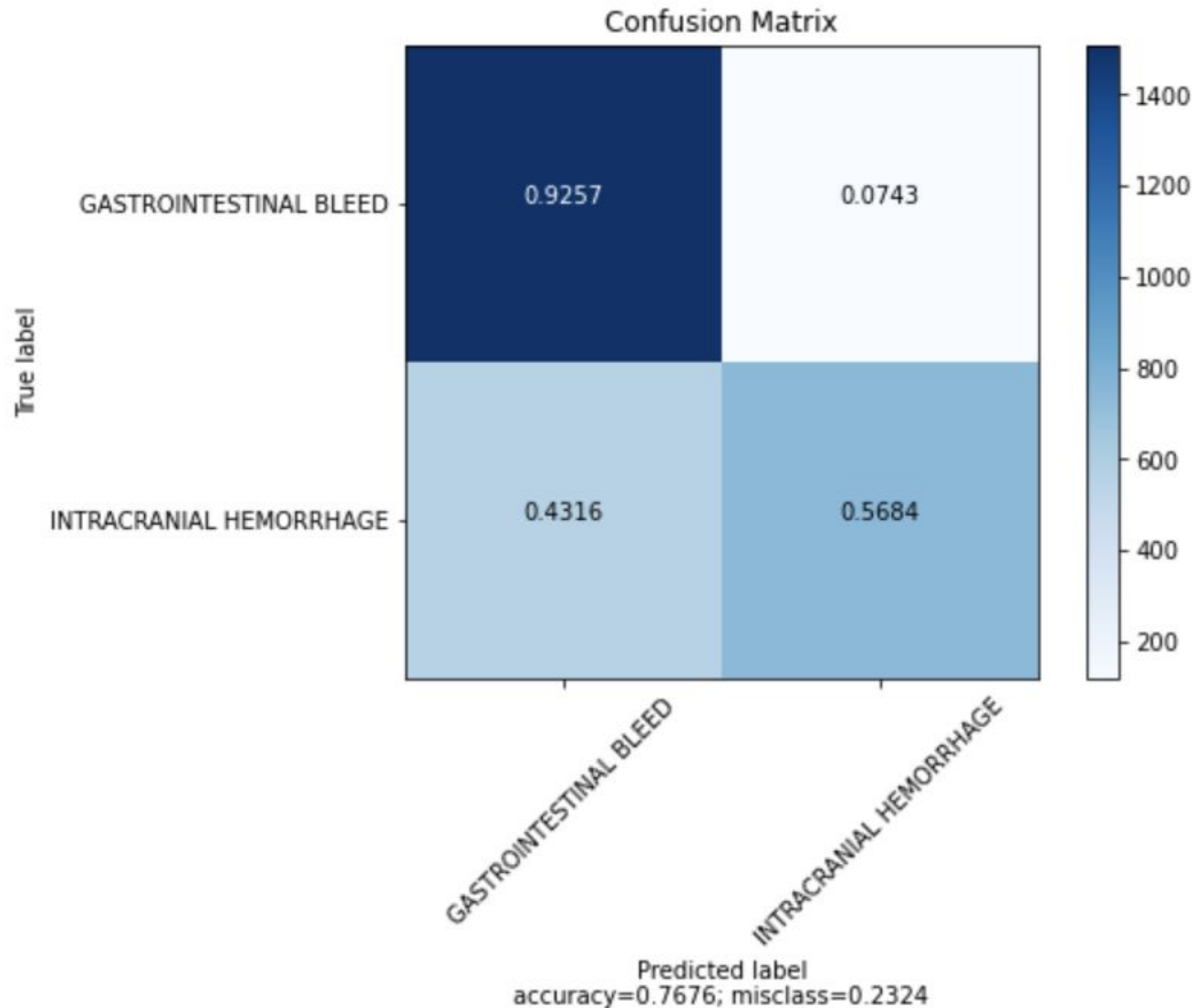
Count of patients by Admission Type



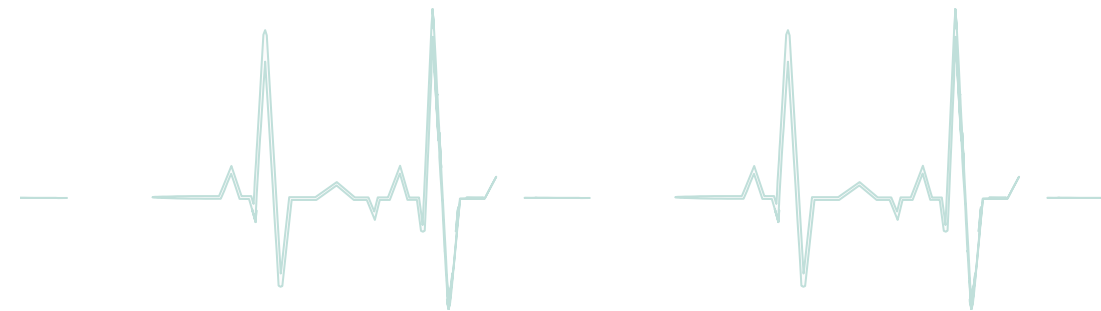
# The Model



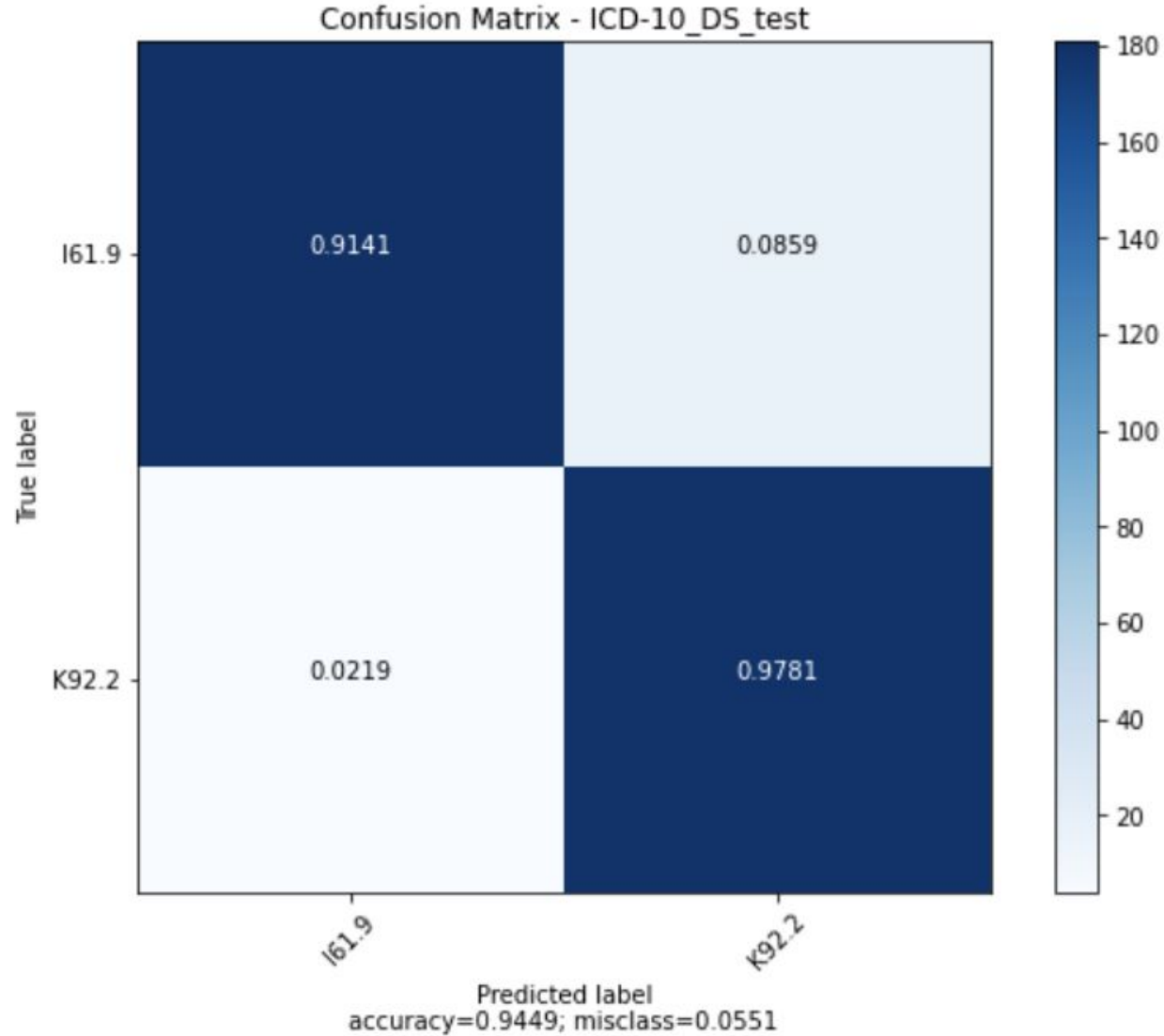
# First Simple Model



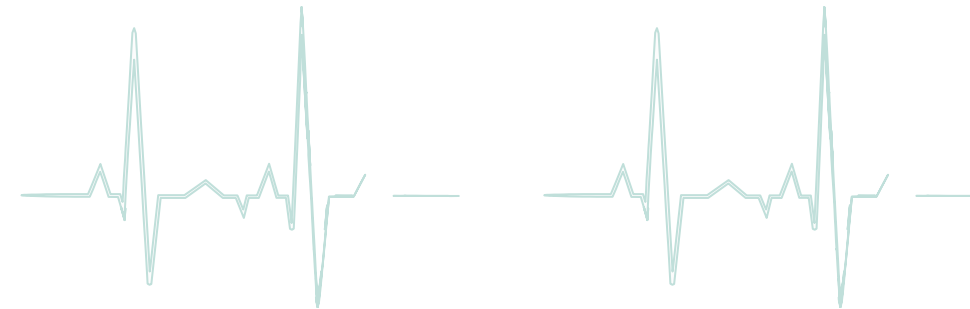
- Chose 2 diagnoses
- Count vectorization
- Lemmatized
- 500 features
- Accuracy = .77



# Final Model



- Chose 2 ICD-10 codes
- Count vectorization
- Lemmatized
- 500 features
- Accuracy = .95

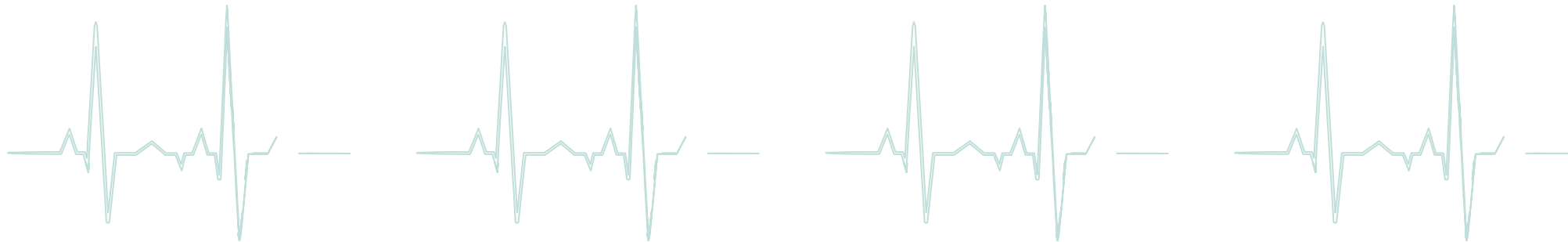


# Evaluation and Next Steps

A teal-colored horizontal band at the bottom of the slide. It features a white ECG (heart rate) line graphic that starts on the left, has a small peak, then a very tall, sharp peak, followed by several smaller peaks and valleys. The line continues across the band towards the right.

# Recommendations/Next Steps

- Proof of concept, NLP can be used to capture codes accurately
- Add additional diagnosis codes - medical coding is not binary
- Add in DRG - much lost revenue from incorrect DRG codes, specifically not capturing CC/MCC



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## Contact

