OMOP notes processing with Amazon Comprehend Medical

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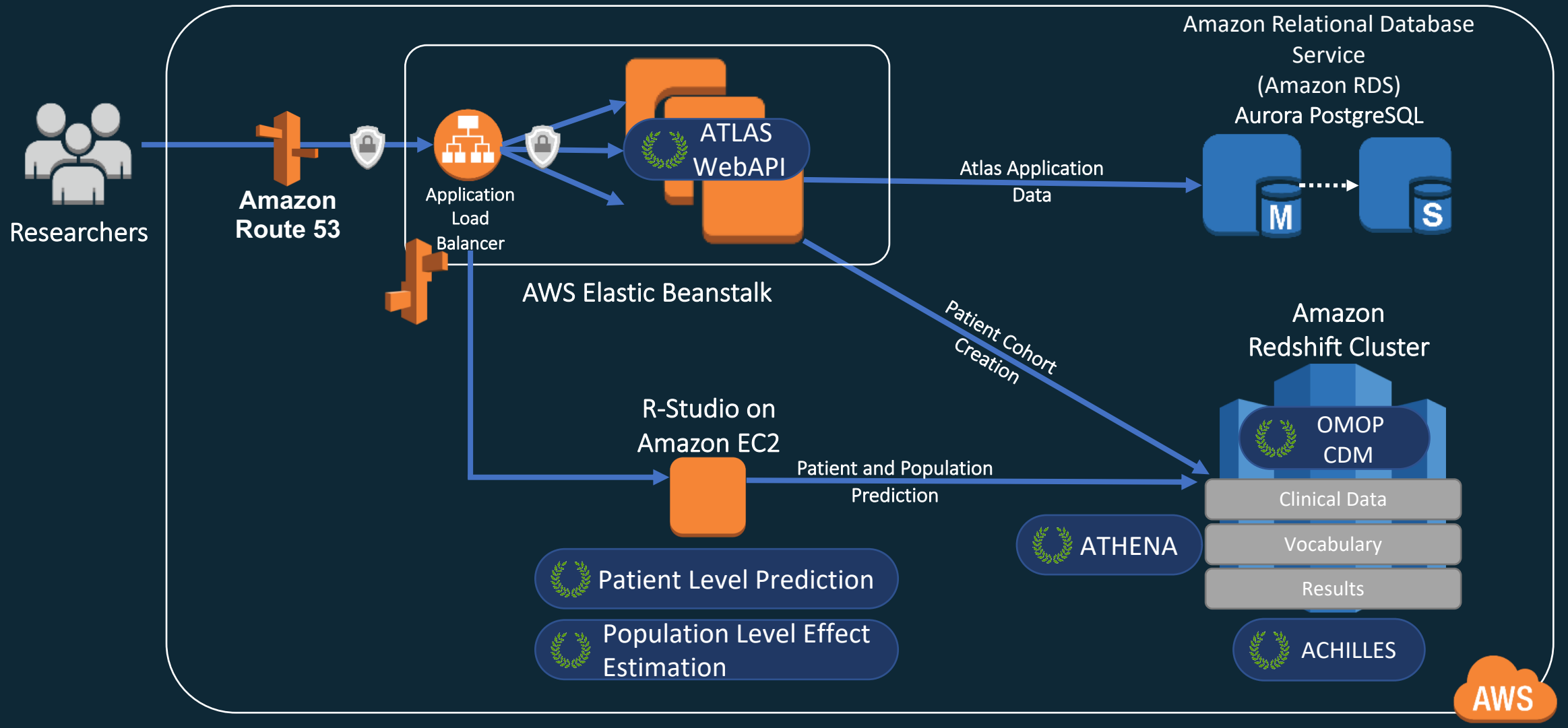
1/29/19

OHDSI on AWS Architecture



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The Amazon AI/ML stack

AI Services

Vision

REKOGNITION IMAGE

REKOGNITION VIDEO

TEXTRACT

Speech

POLLY

TRANSCRIBE

Language

TRANSLATE

COMPREHEND MEDICAL

Chatbots & Contact Centers

LEX

Forecasting

FORECAST

Recommendations

PERSONALIZE

ML Services

AMAZON SAGEMAKER

BUILD

Pre-built algorithms & notebooks

Data labeling (GROUND TRUTH)

Algorithms & models (AWS MARKETPLACE FOR MACHINE LEARNING)

TRAIN

One-click model training & tuning

Optimization (NEO)

Reinforcement learning

DEPLOY

One-click deployment & hosting

ML Frameworks

TensorFlow mxnet PYTORCH Caffe2 Chainer HOROVOD GLUON Keras

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aws

IDENTIFICATION/CHIEF CONCERN:
Ms. [redacted] is a [redacted] yo woman with metastatic breast cancer, she was initially ER pos PR pos HER2 neg but as of [redacted] presented with metastatic disease to her peritoneum and omentum as well as L pleural effusion ER neg, PR neg, HER2 neg. Patient has been on Xeloda then Doxil. She also had a new ER pos PR neg AR neg HER2 neg in her bladder and put on anastrazole. Now with rapidly accumulating ascites switched to nab-paclitaxel and pembrolizumab. Presenting to switch over olaparib and carboplatin

Problem List:
1. Breast Cancer
-diagnosed in 11/08 T2N3c invasive lobular carcinoma with a 3.5 cm L lobular cancer ER pos PR pos HER2 neg with a positive supraclavicular lymph node.
-received neoadjuvant dose dense adriamycin and cytoxan (12/23/08 to 2/7/09) and then received taxol X4 (2/18/09-3/29/09).
- bilateral mastectomy and SLNB with reconstruction 4/27/09. She had no malignancy on the R and L with residual disease 2.5 cm ILC nottingham grade 2 with LCIS, she had 0/11 SLNB positive.
- radiation with concurrent Xeloda (1000 mg BID) and then went on tamoxifen from 9/2009-12/2014 when she was switched to letrozole.
- no evidence of progression until 5/22/2016 when she was found to have abdominal pain and swelling found to have a thickened bladder from peritoneal implants and ascites. Her biopsy showed weak ER pos (2%) PR negative HER2 negative.
- bilateral ureteral stents placed.
- ibrance and faslodex 6/11/16 - 11/20/2016 with stable disease although needing about monthly paracenteses.
- PET on 11/20/16 which showed a large L pleural effusion and small R with multiple bilateral rib mets, R hilar LAD, and extensive omental implants.
- therapy held from 11/20-12/1 to go on a study with androgen inhibitor seviteronel VT-464. While off all therapy for wash out and while waiting for androgen receptor staining she had worsening symptoms, going to requiring paracenteses weekly (she had one on 11-23 and a second on 11-31 with 3.7 L along with a thoracentesis 1.2L). She was found to be AR positive
- thoracentesis 12/6/16 removed 1600 mL found to be malignant (ER neg PR neg HER2 neg) and 12/9/16 paracentesis removed 1500 mL fluid found to be malignant (ER neg PR neg HER2 neg).
- Xeloda 1500 mg BID moved to 7 days on and 7 days off on 4/10 because of hand/foot
- patient presented with dyspnea on the week of 7/21, removed 2L fluid found to be metastatic cancer ER neg PR neg HER2 neg AR neg
- 7/25 had ureteral stents replaced and found 2.5 cm velvety lesion on bladder wall, biopsy ER pos 90% PR neg HER2 neg AR pos most consistent with breast cancer (but not consistent with her primary ILC from 2008)
- Doxil 40 mg/m2 9/4/17 - 12/3/17
- vinorelbine 1/8/18-1/15/18 (admitted with worsening ascites)
- nab-paclitaxel 1/22/18-present, added pembrolizumab on 3/16, but on 4/9 she got urosepsis so abraxane held and on 4/16 got pembrolizumab only
-on admission had pleurex placed for ascites on 1/20/18 but clogged so was removed.
- post menopausal, she had menarche at 15 yo and menopause after chemo at 45 yo. She has G3P2 and had first pregnancy at 27 yo. She took OCPs from 18 yo until her 30s.
- mother had multiple myeloma but no other history of breast, prostate, colon, or ovarian cancer.
- patient states BRCA negative in genetics
2. PNA: cough and dyspnea on first arriving, improved with course of azithromycin 12/5/16-12/10/16
3. Weight loss: patient came in at 53.5 kg, once disease control gained weight to 61.9 kg. Her weight back down to 52.3 kg
4. ARF on 1/22/18, she was admitted on 2/13/18 because creatinine increased 4.25 from 0.9 on 1/22. She had her stents replaced and creatinine now down to 2.6. Creatinine bumped again to 3.95 on 4/9. Chemo held and patient admitted. L stent malpositioned and enterococcus faecalis growing in the urine and port.

REVIEW OF SYSTEMS:
Ms. Doe has not had any fevers since day 2 of her admission but has severe fatigue. She is very fatigued and came in a wheelchair. She has had rapid accumulation of her ascites and is very distended therefore not eating well. She also is having continued shortness of breath and has difficulty walking to the bathroom. Nephrostomy tubes are draining, R bag clear yellow L bag slightly darker but mostly clear. No pain in her back, no CVA tenderness. No chills or coughs. Complete review of systems otherwise negative in detail. Patient is ECOG performance status 2.

Current Concerns:
Ms. Doe Mauch reports severe fatigue. She reports improved breathing but is still having trouble walking around the house and to the bathroom. She did not get blood in the hospital and contine to drop. She also has abdominal distention from her ascites. She is frustrated because she was feeling well until she had the chemo held. She is also worried about the chemo making her feel fatigued and not able to live her life. She does understand the poor prognosis but wants to keep trying.

Allergies
No Known Medication Allergies

Home Medications
calcium carbonate 1000 mg daily
fish oil 1000 mg daily
multivitamin
compazine 10 mg q6h prn nausea
anastrazole 1 mg daily

[redacted] woman of [redacted]

Demographics
- Geography
- Gender
- Age
- Health history

Disease indicators
- Anatomy
- Symptoms
- Diagnosis
- Treatment
- Test Name
- Test Result

Rx
- Medication Name
- Strength
- Route
- Frequency

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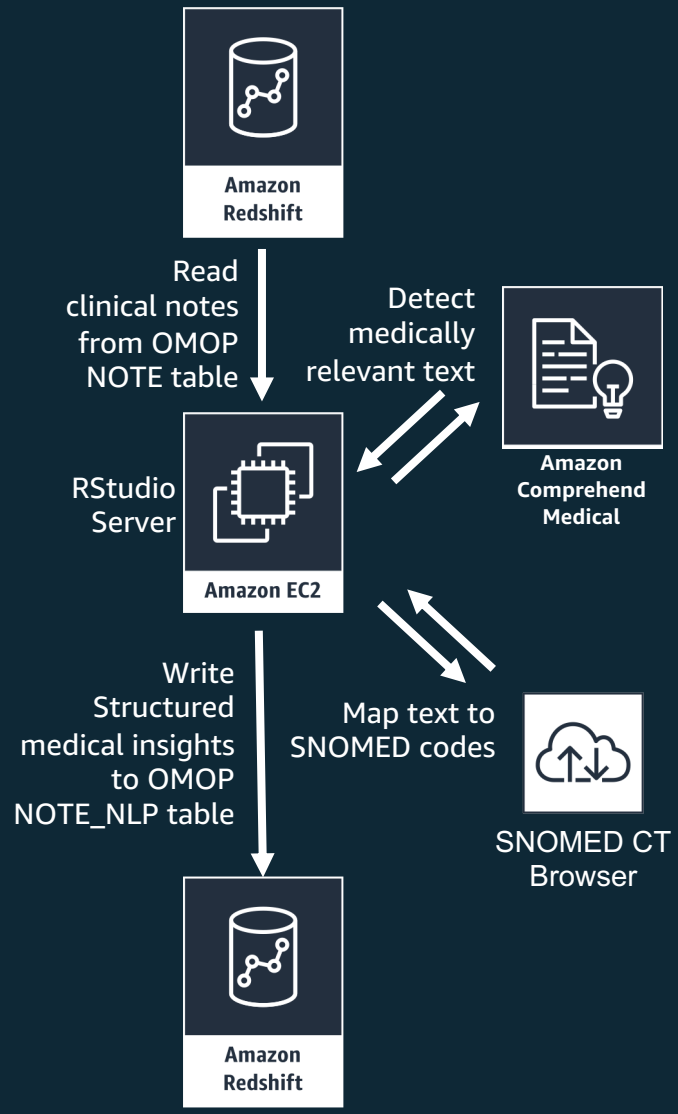
Amazon Comprehend Medical

Gain insights from clinical notes

- Read clinical notes from the OMOP NOTE table.
- Extract structured insights like medication, procedures, symptoms, tests, and diagnoses.
- Map these insights to SNOMED and then to an OMOP Standard Concept.
- Write these insights into the OMOP NOTE_NLP table.



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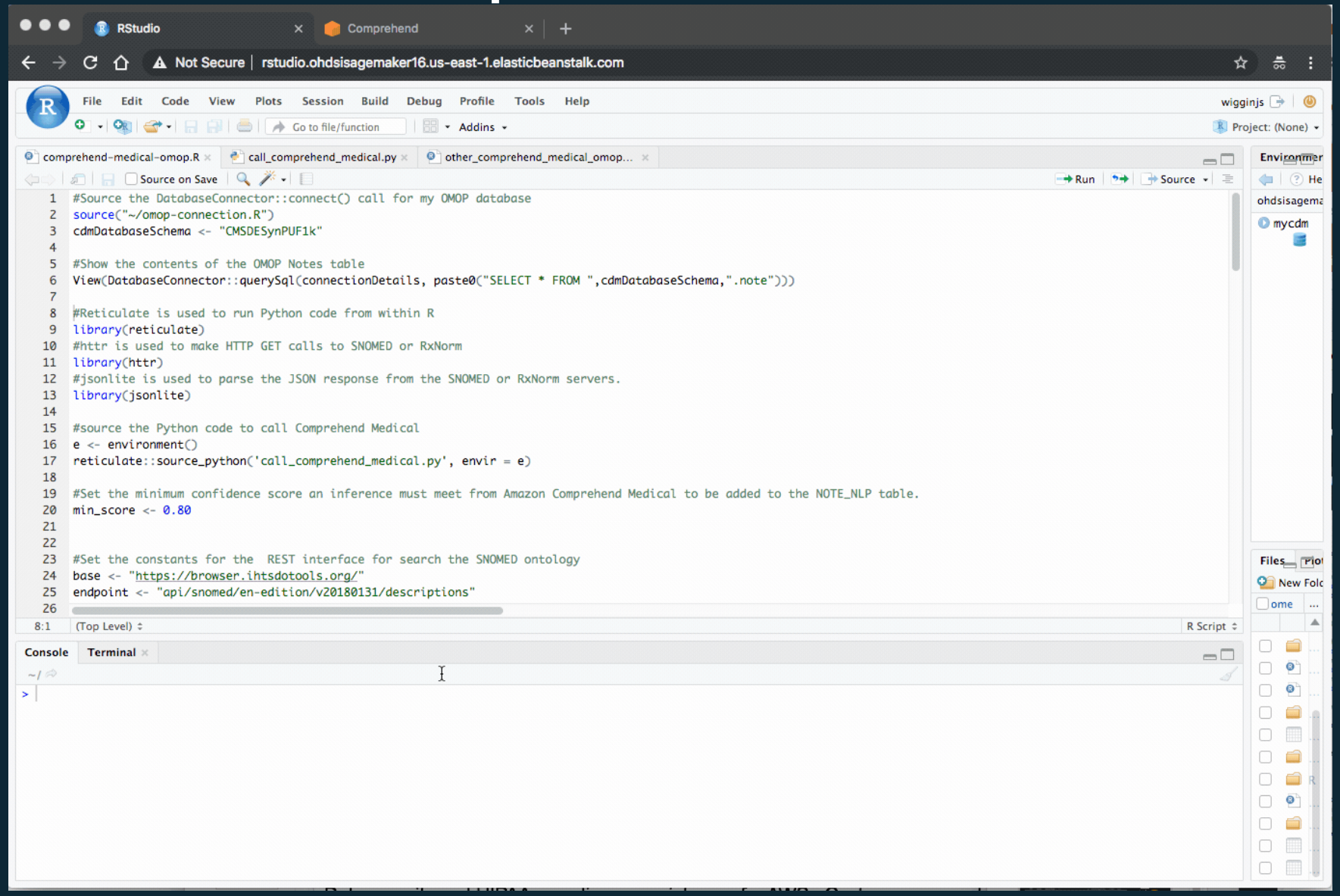

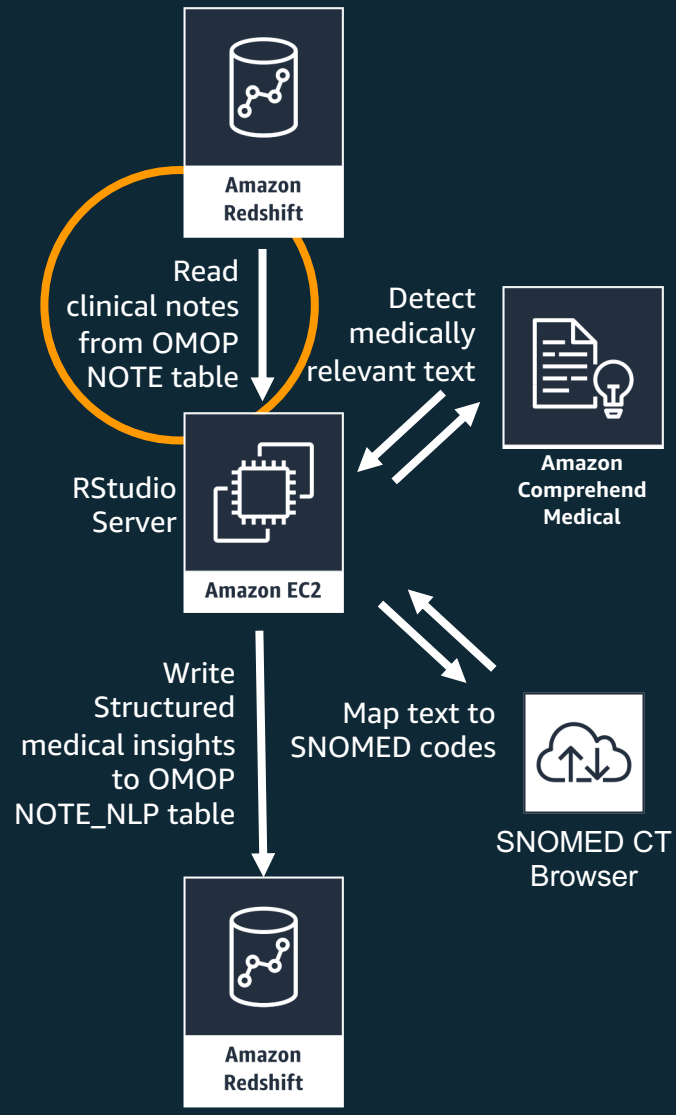

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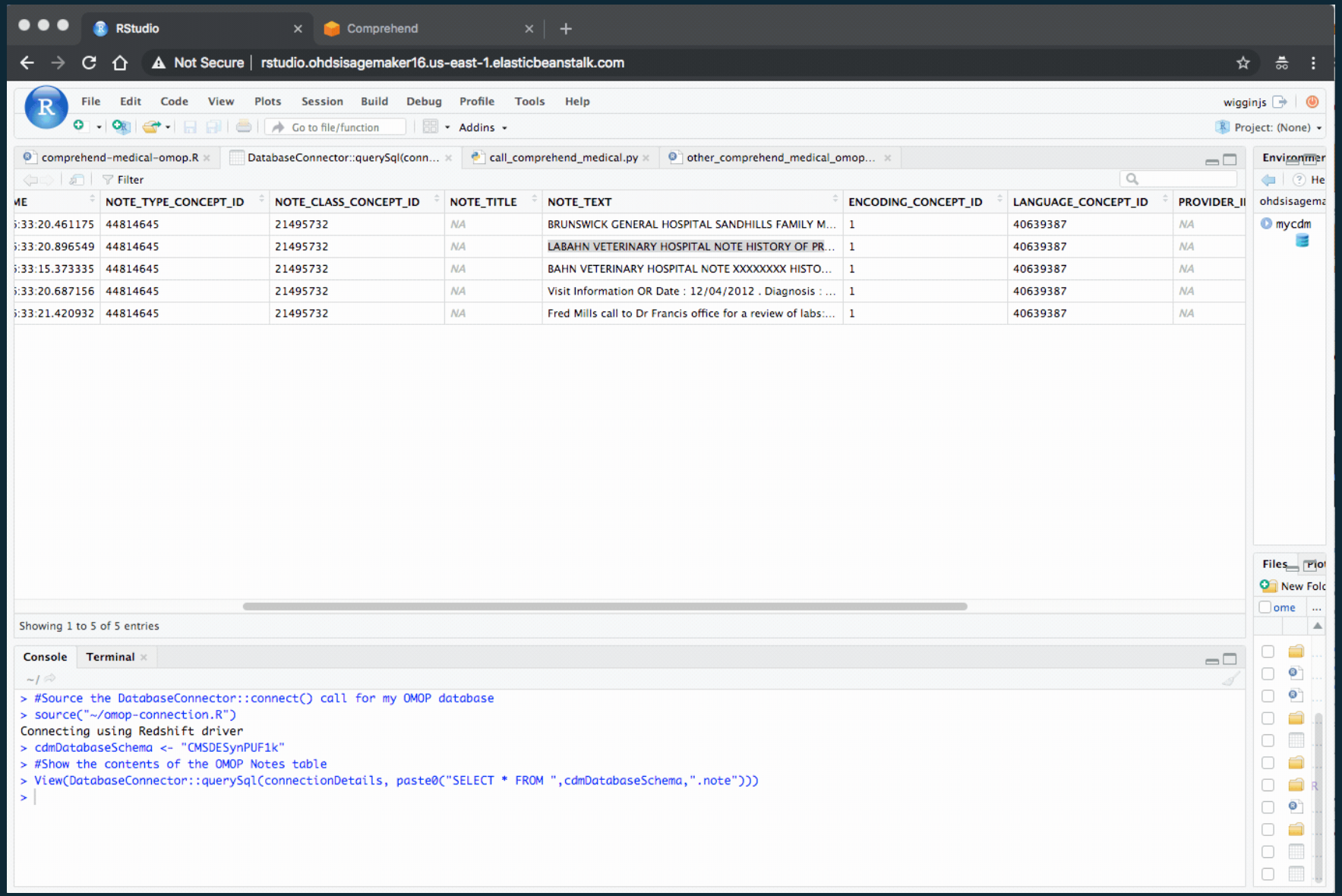

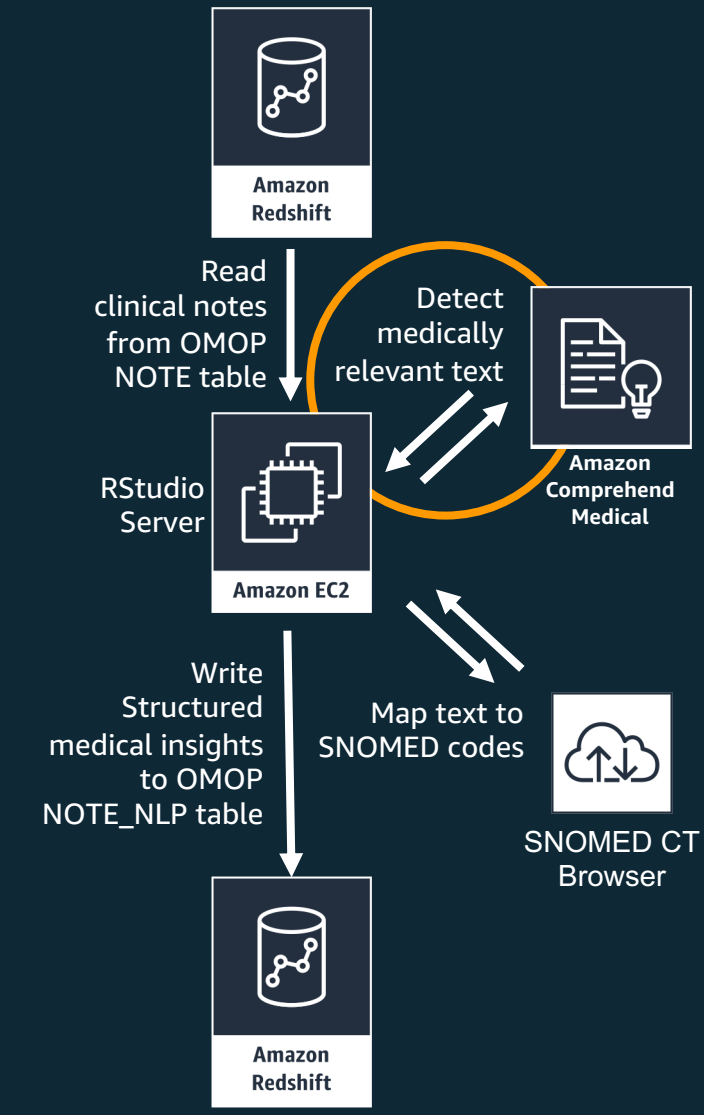

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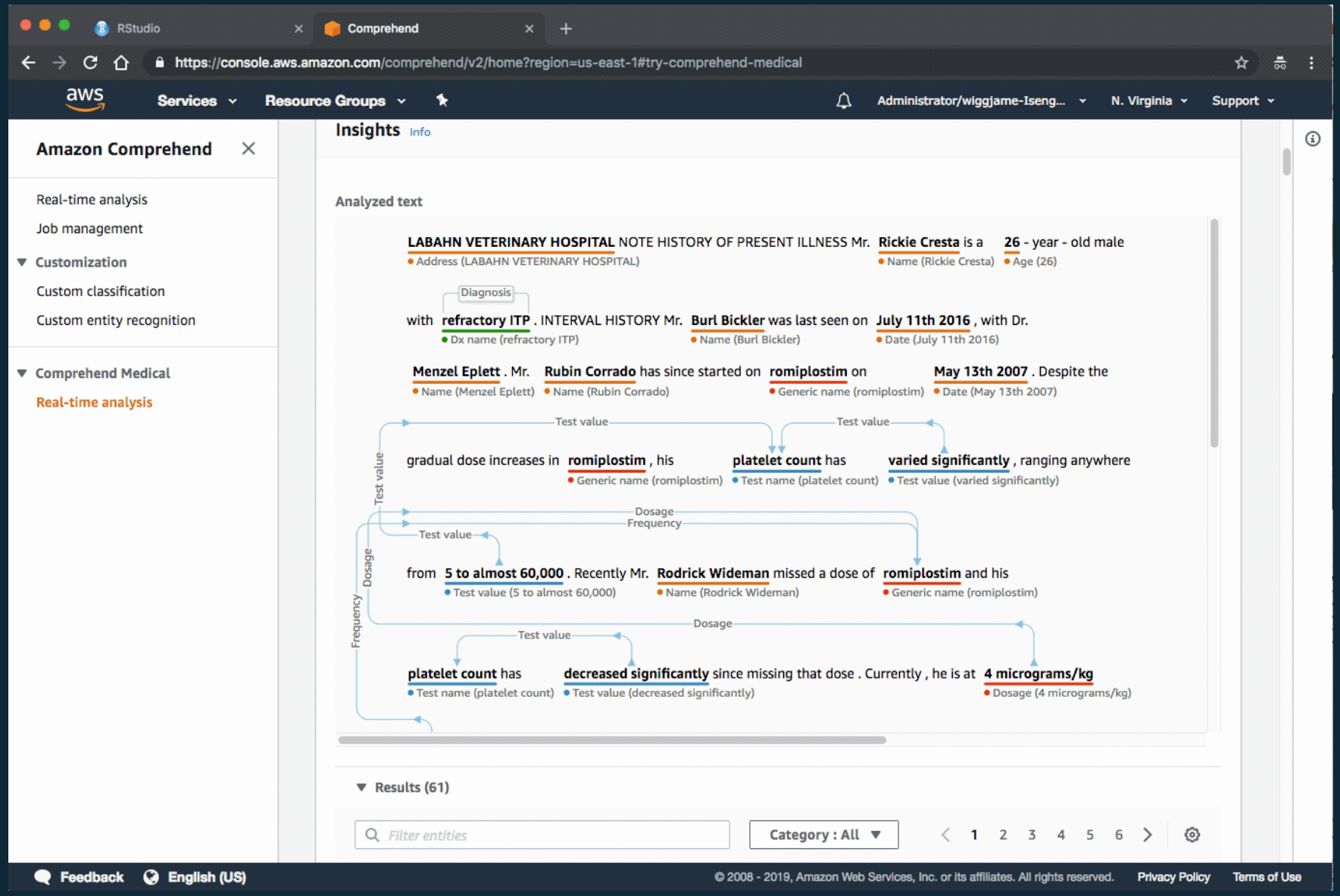

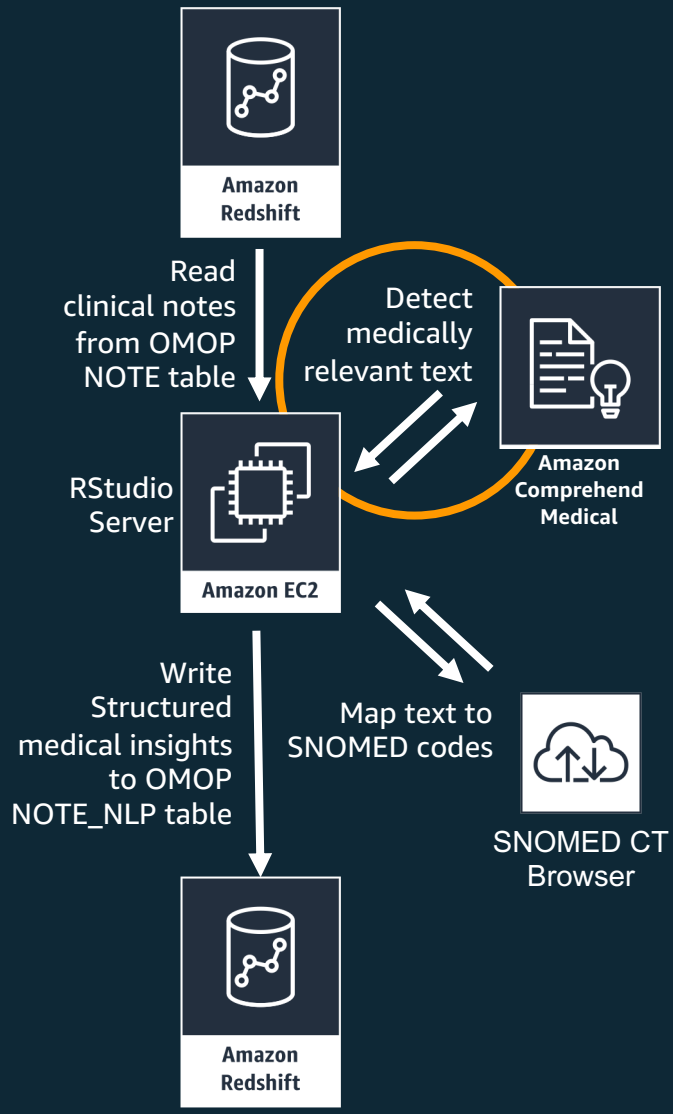

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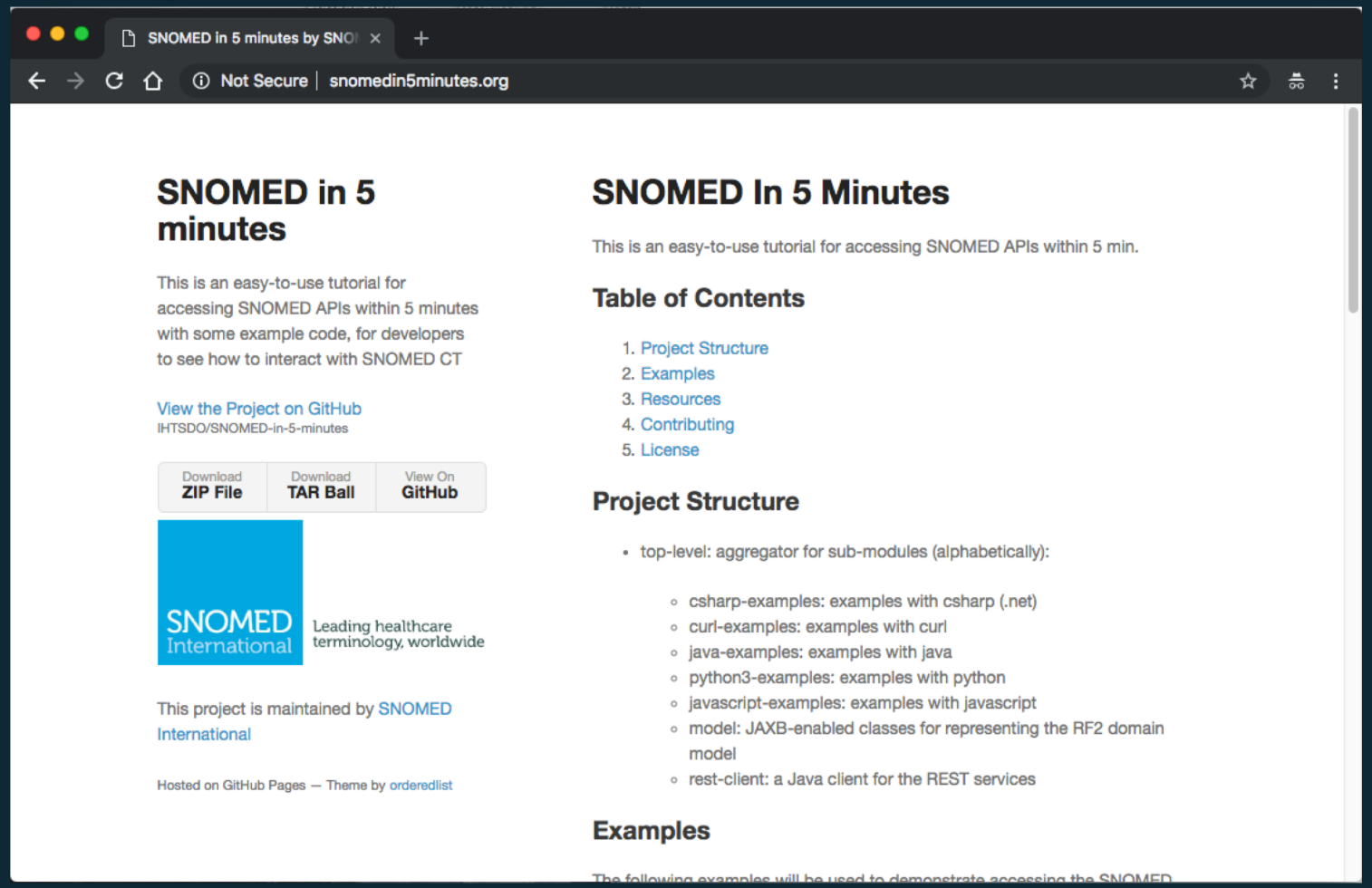

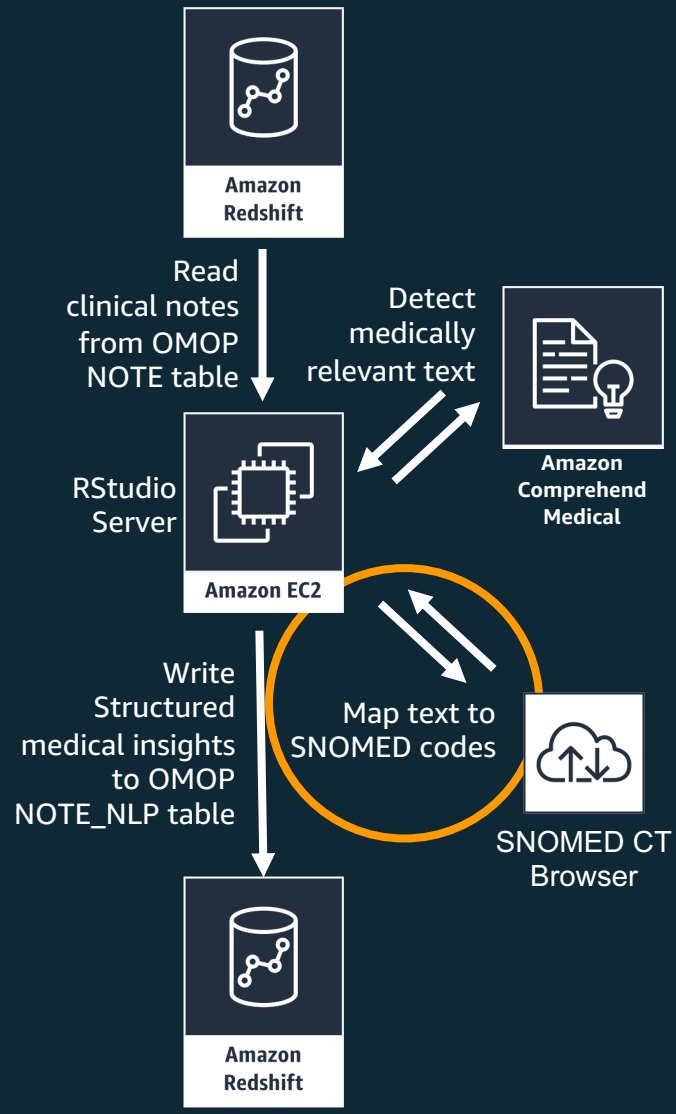

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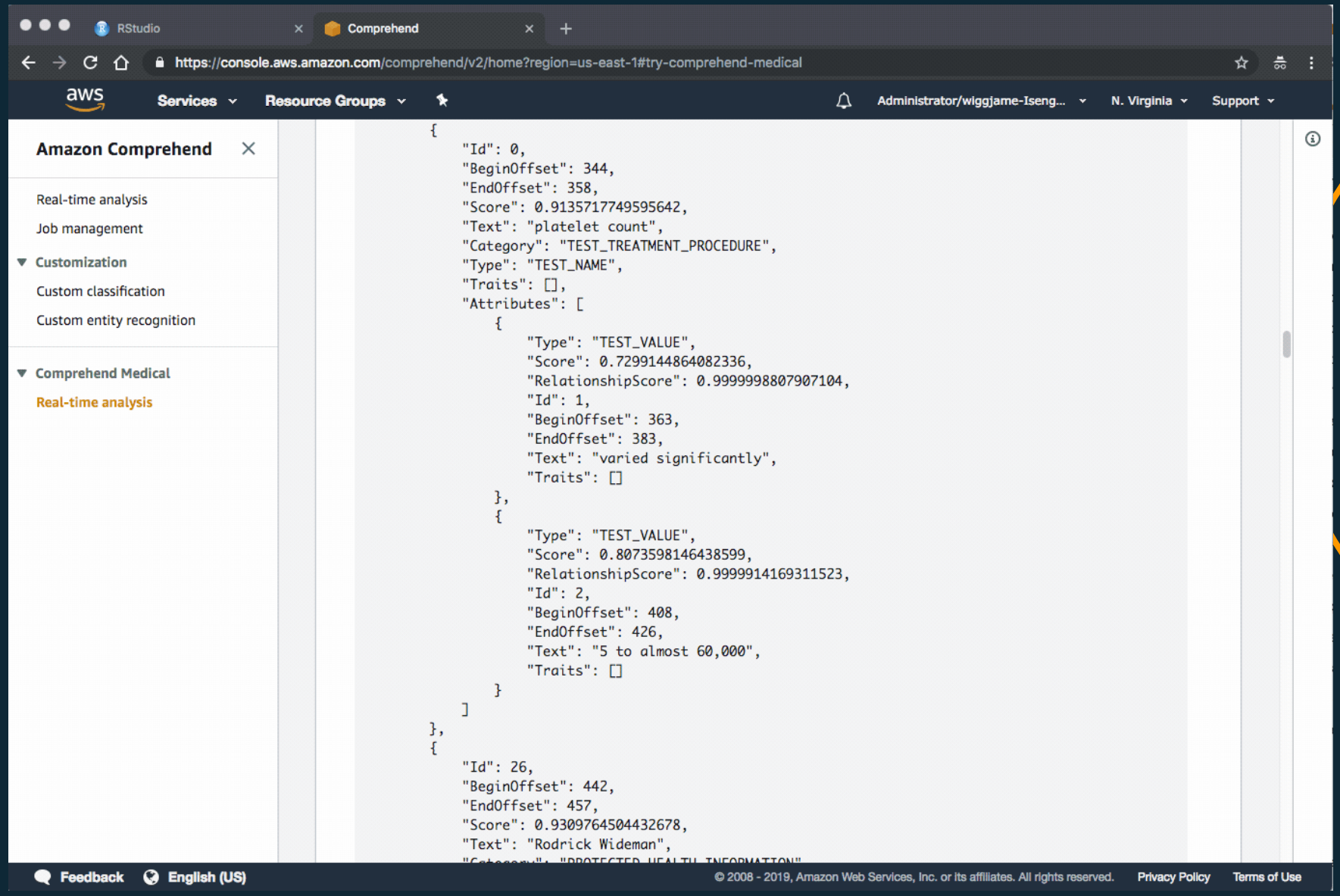

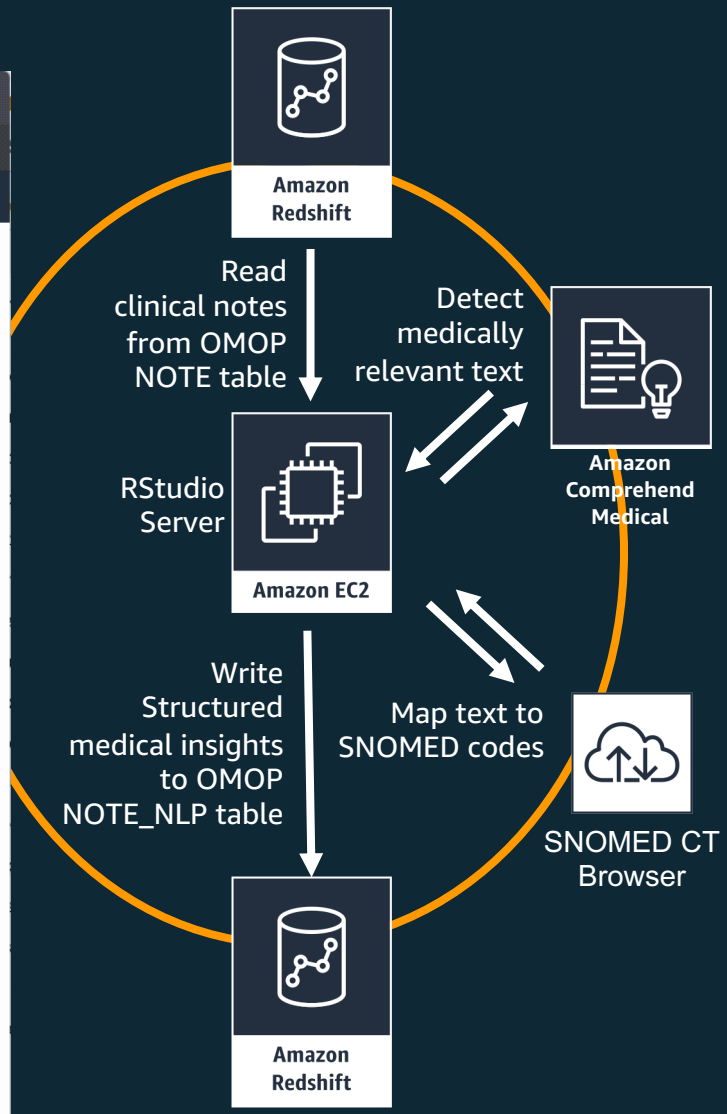

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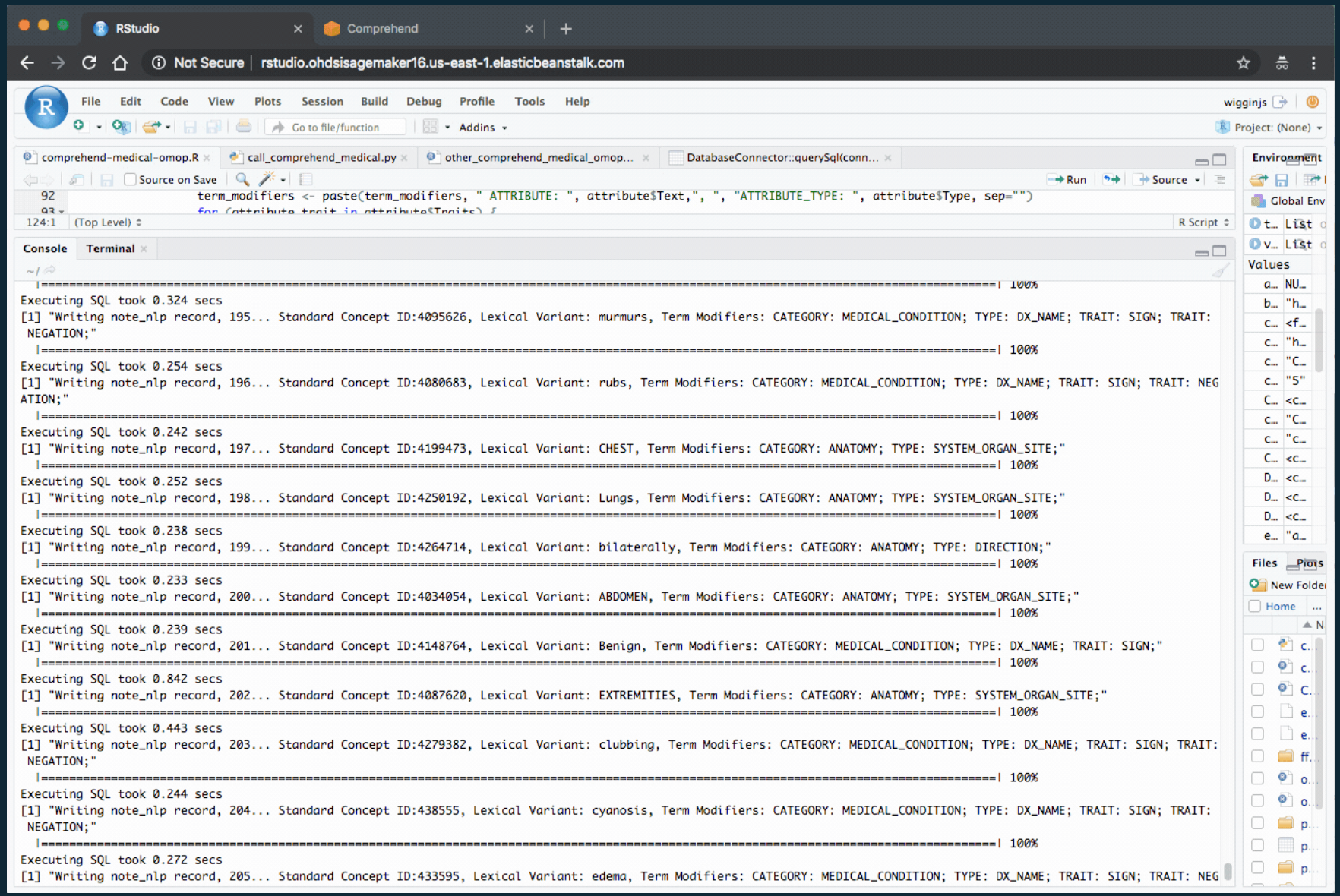

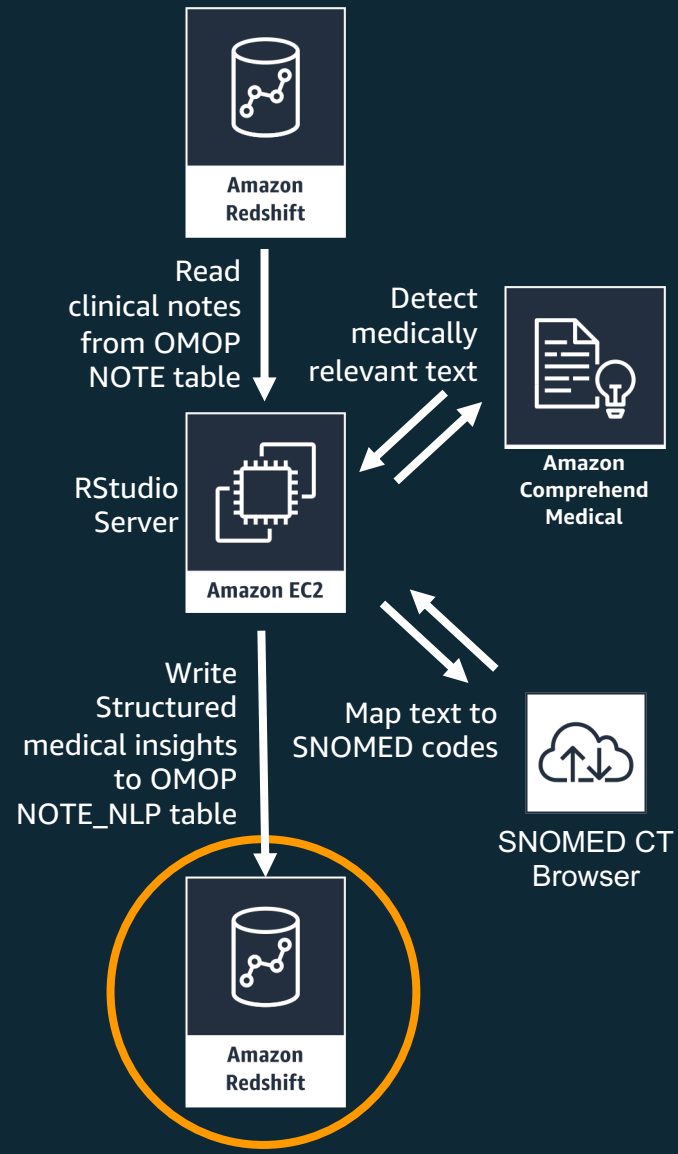

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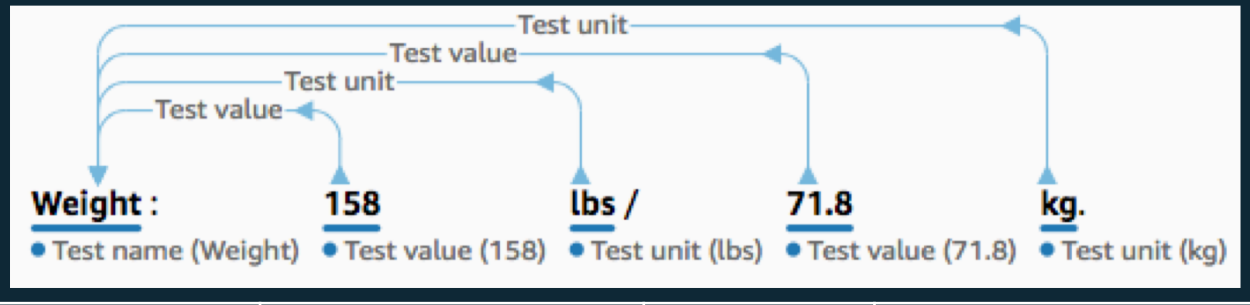

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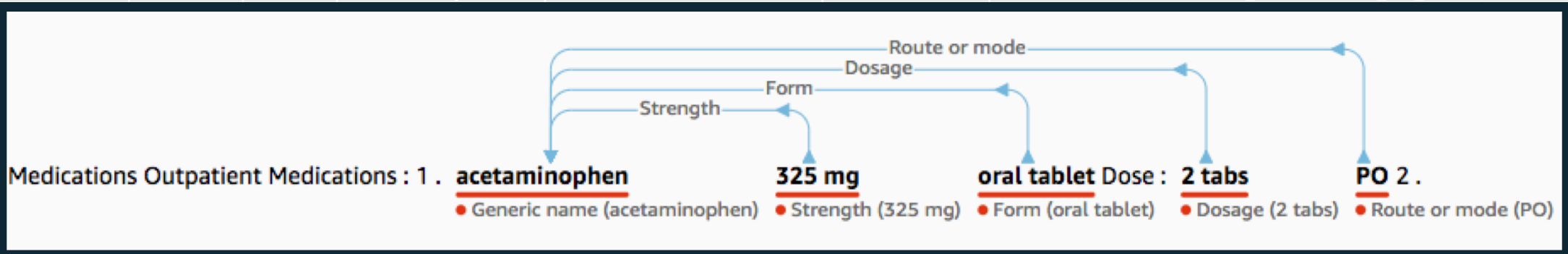
58	3	705	acetaminophen	4306040	Amazon Comprehend Medical	CATEGORY: MEDICATION; TYPE: GENERIC_NAME; ATTRIBUTE: 325 mg, ATTRIBUTE_TYPE: STRENGTH; ATTRIBUTE: oral tablet, ATTRIBUTE_TYPE: FORM; ATTRIBUTE: 2 tabs, ATTRIBUTE_TYPE: DOSAGE; ATTRIBUTE: PO, ATTRIBUTE_TYPE: ROUTE_OR_MODE;



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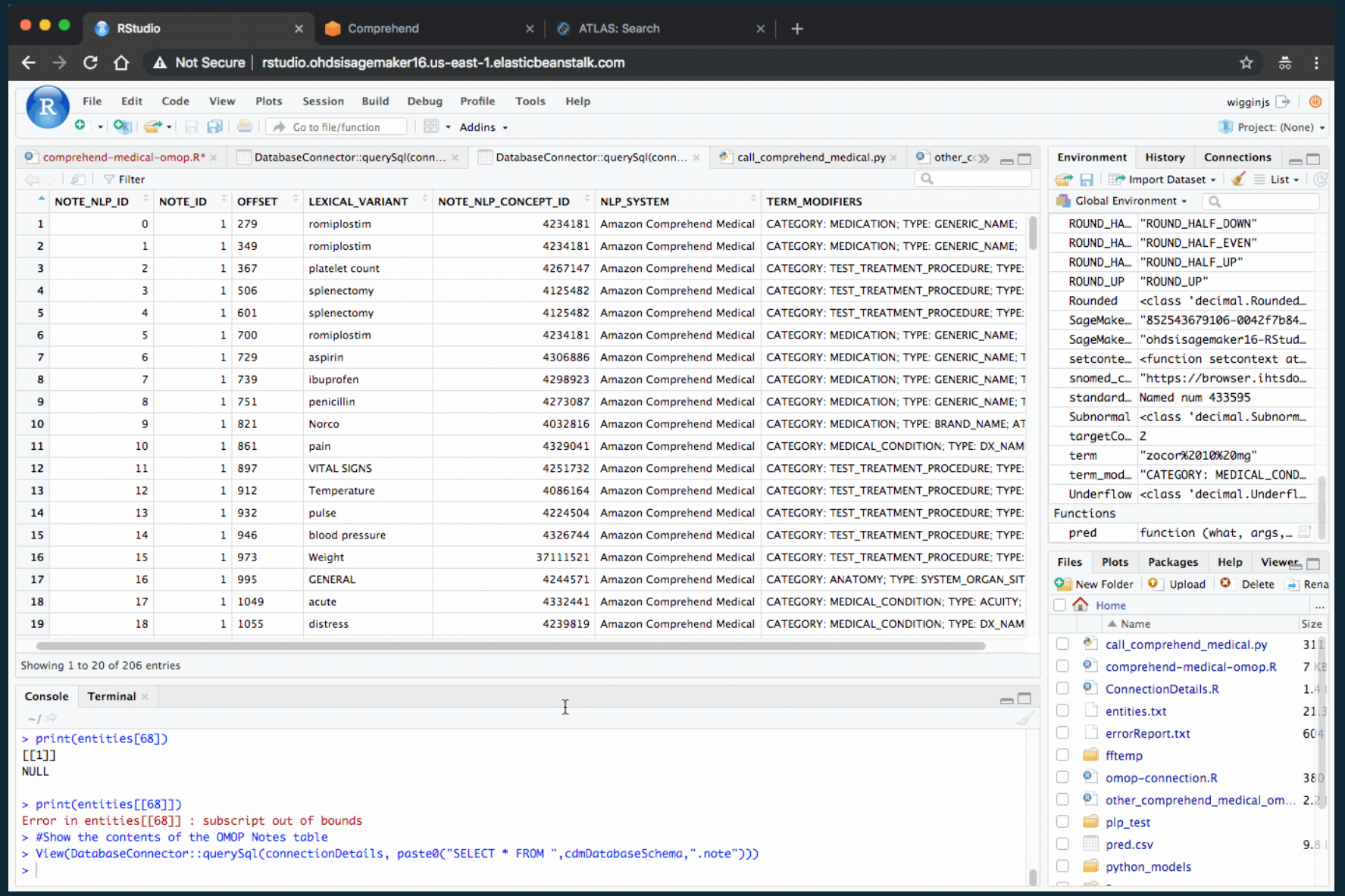

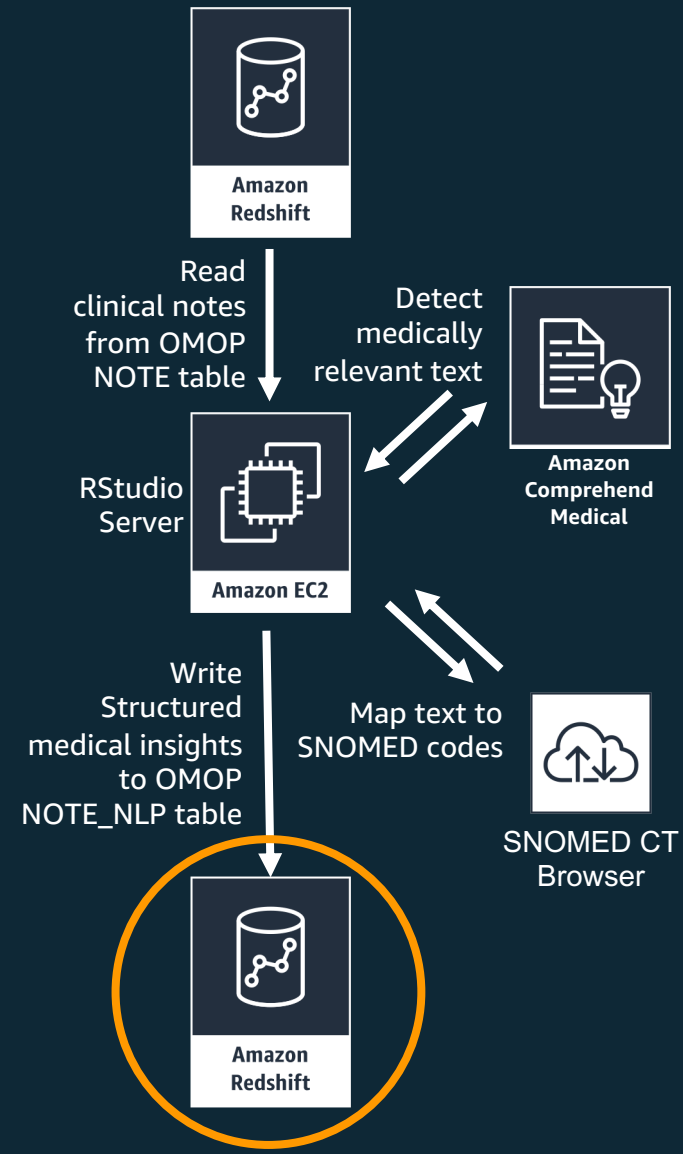

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Thank you!

OMOP notes processing with Amazon Comprehend Medical:
https://github.com/JamesSWiggins/omop-notes-amazon-comprehend-medical

OHDSI on AWS Architecture:
https://github.com/JamesSWiggins/ohdsi-cfn

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