Rows in medications: 9566

Rows in observations: 12352

Rows in patients: 12352

Rows in allergies: 1528

Rows in conditions: 12165

Rows in immunizations: 10376

Rows in final merged dataset: 12352

A comparison of a graph

Description automatically generated with medium confidence

Epoch 1/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **52s** 61ms/step - accuracy: 0.7354 - loss: 4.6345 - val\_accuracy: 0.7618 - val\_loss: 2.2406

Epoch 2/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **48s** 61ms/step - accuracy: 0.8462 - loss: 2.1599 - val\_accuracy: 0.9019 - val\_loss: 1.8300

Epoch 3/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **51s** 64ms/step - accuracy: 0.8701 - loss: 2.1439 - val\_accuracy: 0.9633 - val\_loss: 1.6680

Epoch 4/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **50s** 64ms/step - accuracy: 0.8869 - loss: 1.9426 - val\_accuracy: 0.9531 - val\_loss: 1.8010

Epoch 5/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **46s** 59ms/step - accuracy: 0.8951 - loss: 1.8610 - val\_accuracy: 0.9674 - val\_loss: 1.5369

Epoch 6/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **47s** 59ms/step - accuracy: 0.8976 - loss: 1.7402 - val\_accuracy: 0.9628 - val\_loss: 1.4751

Epoch 7/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **47s** 59ms/step - accuracy: 0.8967 - loss: 1.6422 - val\_accuracy: 0.9604 - val\_loss: 1.5184

Epoch 8/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **49s** 62ms/step - accuracy: 0.9029 - loss: 1.5872 - val\_accuracy: 0.9555 - val\_loss: 1.5640

Epoch 9/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **53s** 68ms/step - accuracy: 0.9058 - loss: 1.5201 - val\_accuracy: 0.9693 - val\_loss: 1.4296

Epoch 10/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **50s** 63ms/step - accuracy: 0.9052 - loss: 1.4522 - val\_accuracy: 0.9340 - val\_loss: 1.3433

Epoch 11/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **46s** 59ms/step - accuracy: 0.9088 - loss: 1.4102 - val\_accuracy: 0.9644 - val\_loss: 1.2635

Epoch 12/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **50s** 63ms/step - accuracy: 0.9110 - loss: 1.3401 - val\_accuracy: 0.9755 - val\_loss: 1.1668

Epoch 13/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **48s** 60ms/step - accuracy: 0.9152 - loss: 1.3161 - val\_accuracy: 0.9626 - val\_loss: 1.3097

Epoch 14/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **47s** 59ms/step - accuracy: 0.9160 - loss: 1.3168 - val\_accuracy: 0.9633 - val\_loss: 1.1803

Epoch 15/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **47s** 60ms/step - accuracy: 0.9071 - loss: 1.3694 - val\_accuracy: 0.9682 - val\_loss: 1.1936

Epoch 16/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **50s** 63ms/step - accuracy: 0.9125 - loss: 1.2777 - val\_accuracy: 0.9707 - val\_loss: 1.1591

Epoch 17/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **51s** 64ms/step - accuracy: 0.9116 - loss: 1.2714 - val\_accuracy: 0.9647 - val\_loss: 1.2535

Epoch 18/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **49s** 61ms/step - accuracy: 0.9125 - loss: 1.2856 - val\_accuracy: 0.9748 - val\_loss: 1.0823

Epoch 19/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **48s** 61ms/step - accuracy: 0.9120 - loss: 1.2089 - val\_accuracy: 0.9785 - val\_loss: 0.9025

Epoch 20/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **48s** 60ms/step - accuracy: 0.9166 - loss: 1.1191 - val\_accuracy: 0.9653 - val\_loss: 0.9882

Epoch 21/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **48s** 60ms/step - accuracy: 0.9170 - loss: 1.1708 - val\_accuracy: 0.9753 - val\_loss: 0.9979

Epoch 22/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **48s** 60ms/step - accuracy: 0.9150 - loss: 1.1762 - val\_accuracy: 0.9652 - val\_loss: 0.9503

Epoch 23/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **47s** 60ms/step - accuracy: 0.9124 - loss: 1.1474 - val\_accuracy: 0.9726 - val\_loss: 0.9545

Epoch 24/50

**790/790** ━━━━━━━━━━━━━━━━━━━━ **47s** 59ms/step - accuracy: 0.9178 - loss: 1.1309 - val\_accuracy: 0.9759 - val\_loss: 1.0549

**247/247** ━━━━━━━━━━━━━━━━━━━━ **3s** 11ms/step - accuracy: 0.9725 - loss: 0.9119

Test Loss: 0.9079349637031555, Test Accuracy: 0.9756869673728943

**247/247** ━━━━━━━━━━━━━━━━━━━━ **2s** 9ms/step

Classification Report:

precision recall f1-score support

0 1.00 1.00 1.00 1930

1 0.98 0.96 0.97 1954

2 0.96 0.95 0.96 2000

3 0.97 1.00 0.98 2013

accuracy 0.98 7897

macro avg 0.98 0.98 0.98 7897

weighted avg 0.98 0.98 0.98 7897

A diagram of a confusion matrix

Description automatically generated with medium confidence

**78/78** ━━━━━━━━━━━━━━━━━━━━ **1s** 11ms/step - accuracy: 0.9455 - loss: 0.9647

Original Test Loss: 0.9752718210220337, Original Test Accuracy: 0.9417240023612976

**78/78** ━━━━━━━━━━━━━━━━━━━━ **1s** 9ms/step

Original Test Set Classification Report:

precision recall f1-score support

0 0.67 1.00 0.80 2

1 0.91 0.91 0.91 459

2 0.98 0.95 0.96 1989

3 0.24 1.00 0.39 21

accuracy 0.94 2471

macro avg 0.70 0.97 0.77 2471

weighted avg 0.96 0.94 0.95 2471

A graph with a blue square and a blue square

Description automatically generated

Feature Importance (from first layer weights):

DESCRIPTION\_0.3 ML Enoxaparin sodium 100 MG/ML Prefilled Syringe\_medications: 0.07029033452272415

DESCRIPTION\_10 ML Fentanyl 0.05 MG/ML Injection\_medications: 0.06503886729478836

DESCRIPTION\_1 ML medroxyPROGESTERone acetate 150 MG/ML Injection\_medications: 0.0552569180727005

DESCRIPTION\_10 ML Furosemide 10 MG/ML Injection\_medications: 0.05239966884255409

DESCRIPTION\_1 ML Vasopressin (USP) 20 UNT/ML Injection\_medications: 0.05124391242861748

DESCRIPTION\_1 ML Epinephrine 1 MG/ML Injection\_medications: 0.049697145819664

DESCRIPTION\_1 ML medroxyprogesterone acetate 150 MG/ML Injection\_medications: 0.047056812793016434

MAIDEN\_patients: 0.04659789428114891

FIRST\_patients: 0.045492783188819885

DESCRIPTION\_0.25 ML Leuprolide Acetate 30 MG/ML Prefilled Syringe\_medications: 0.045375775545835495

Top Features Correlated with Labels:

SARS-CoV-2 RNA Pnl Resp NAA+probe\_observations: 0.5277358757284363

Left ventricular Ejection fraction\_observations: 0.3586959745497916

Lymph nodes with isolated tumor cells [#] in Cancer specimen by Light microscopy\_observations: nan

QALY\_observations: 0.36621203626921994

Protein [Mass/volume] in Serum or Plasma\_observations: 0.3493546862169459

DESCRIPTION\_24 HR metoprolol succinate 100 MG Extended Release Oral Tablet [Toprol]\_medications: 0.3142762473478534

DESCRIPTION\_Furosemide 40 MG Oral Tablet\_medications: 0.30989858376634144

REASONDESCRIPTION\_Chronic congestive heart failure (disorder)\_medications: 0.30194458639546135

Alanine aminotransferase [Enzymatic activity/volume] in Serum or Plasma\_observations: 0.2888776814099395

Adenovirus A+B+C+D+E DNA [Presence] in Respiratory specimen by NAA with probe detection\_observations: 0.2879238353865799