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 bar graph

Description automatically generated

Epoch 1/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **62s** 74ms/step - accuracy: 0.6996 - loss: 4.2683 - val\_accuracy: 0.8383 - val\_loss: 1.6709

Epoch 2/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **48s** 63ms/step - accuracy: 0.8028 - loss: 1.8142 - val\_accuracy: 0.8925 - val\_loss: 1.8350

Epoch 3/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **48s** 62ms/step - accuracy: 0.8335 - loss: 1.9504 - val\_accuracy: 0.7772 - val\_loss: 1.8497

Epoch 4/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **48s** 63ms/step - accuracy: 0.8536 - loss: 1.8505 - val\_accuracy: 0.9305 - val\_loss: 1.7277

Epoch 5/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **48s** 62ms/step - accuracy: 0.8727 - loss: 1.6867 - val\_accuracy: 0.9011 - val\_loss: 1.7668

Epoch 6/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **48s** 63ms/step - accuracy: 0.8762 - loss: 1.6432 - val\_accuracy: 0.9563 - val\_loss: 1.3731

Epoch 7/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **49s** 64ms/step - accuracy: 0.8886 - loss: 1.4877 - val\_accuracy: 0.9476 - val\_loss: 1.4582

Epoch 8/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **48s** 63ms/step - accuracy: 0.8891 - loss: 1.4485 - val\_accuracy: 0.9507 - val\_loss: 1.1470

Epoch 9/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.8920 - loss: 1.3477 - val\_accuracy: 0.9574 - val\_loss: 1.1168

Epoch 10/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.8943 - loss: 1.3037 - val\_accuracy: 0.9582 - val\_loss: 1.1588

Epoch 11/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.8988 - loss: 1.2809 - val\_accuracy: 0.9520 - val\_loss: 1.1679

Epoch 12/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 62ms/step - accuracy: 0.9021 - loss: 1.2211 - val\_accuracy: 0.9363 - val\_loss: 1.1749

Epoch 13/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9017 - loss: 1.2313 - val\_accuracy: 0.9633 - val\_loss: 0.9823

Epoch 14/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9000 - loss: 1.1546 - val\_accuracy: 0.9515 - val\_loss: 0.9951

Epoch 15/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.8981 - loss: 1.1959 - val\_accuracy: 0.9554 - val\_loss: 0.9490

Epoch 16/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9078 - loss: 1.1028 - val\_accuracy: 0.9489 - val\_loss: 0.9378

Epoch 17/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **46s** 61ms/step - accuracy: 0.9043 - loss: 1.0584 - val\_accuracy: 0.9618 - val\_loss: 0.9768

Epoch 18/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **46s** 61ms/step - accuracy: 0.8999 - loss: 1.0561 - val\_accuracy: 0.9124 - val\_loss: 1.0120

Epoch 19/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9029 - loss: 1.0645 - val\_accuracy: 0.9515 - val\_loss: 0.9700

Epoch 20/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9069 - loss: 1.0529 - val\_accuracy: 0.9697 - val\_loss: 0.8581

Epoch 21/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9070 - loss: 0.9741 - val\_accuracy: 0.9048 - val\_loss: 0.9178

Epoch 22/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9012 - loss: 1.0099 - val\_accuracy: 0.9592 - val\_loss: 0.8709

Epoch 23/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9047 - loss: 1.0345 - val\_accuracy: 0.9428 - val\_loss: 0.8256

Epoch 24/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9025 - loss: 0.9708 - val\_accuracy: 0.9663 - val\_loss: 0.7562

Epoch 25/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.8948 - loss: 1.1533 - val\_accuracy: 0.9584 - val\_loss: 0.8520

Epoch 26/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9086 - loss: 0.9674 - val\_accuracy: 0.9607 - val\_loss: 0.8468

Epoch 27/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9016 - loss: 0.9683 - val\_accuracy: 0.9684 - val\_loss: 0.8053

Epoch 28/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9111 - loss: 0.9395 - val\_accuracy: 0.9646 - val\_loss: 0.8266

Epoch 29/50

**764/764** ━━━━━━━━━━━━━━━━━━━━ **47s** 61ms/step - accuracy: 0.9091 - loss: 0.9449 - val\_accuracy: 0.9663 - val\_loss: 0.7774

**239/239** ━━━━━━━━━━━━━━━━━━━━ **3s** 13ms/step - accuracy: 0.9640 - loss: 0.7613

Test Loss: 0.7579391598701477, Test Accuracy: 0.965015709400177

**239/239** ━━━━━━━━━━━━━━━━━━━━ **3s** 11ms/step

Classification Report:

precision recall f1-score support

0 1.00 1.00 1.00 1895

1 0.99 0.95 0.97 1910

2 0.92 0.95 0.94 1908

3 0.95 0.97 0.96 1919

accuracy 0.97 7632

macro avg 0.97 0.97 0.97 7632

weighted avg 0.97 0.97 0.97 7632

A blue squares with white text

Description automatically generated

**78/78** ━━━━━━━━━━━━━━━━━━━━ **1s** 11ms/step - accuracy: 0.9356 - loss: 0.8188

Original Test Loss: 0.8248343467712402, Original Test Accuracy: 0.9320113062858582

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

Original Test Set Classification Report:

precision recall f1-score support

0 0.67 1.00 0.80 2

1 0.97 0.92 0.94 459

2 0.97 0.94 0.96 1901

3 0.48 0.76 0.59 109

accuracy 0.93 2471

macro avg 0.77 0.91 0.82 2471

weighted avg 0.94 0.93 0.94 2471

A graph with a blue square and a blue square

Description automatically generated

Feature Importance (from first layer weights):

BIRTHPLACE\_patients: 0.06636916846036911

DESCRIPTION\_1 ML Morphine Sulfate 5 MG/ML Injection\_medications: 0.06373132020235062

RACE\_patients: 0.06369543075561523

MAIDEN\_patients: 0.05727994814515114

AGE\_patients: 0.052287373691797256

DESCRIPTION\_0.3 ML Enoxaparin sodium 100 MG/ML Prefilled Syringe\_medications: 0.049768369644880295

DESCRIPTION\_1 ML Epinephrine 1 MG/ML Injection\_medications: 0.047137681394815445

DESCRIPTION\_1 ML medroxyprogesterone acetate 150 MG/ML Injection\_medications: 0.045784641057252884

DESCRIPTION\_10 ML Pamidronate Disodium 3 MG/ML Injection\_medications: 0.04511304199695587

DESCRIPTION\_100 ML Epirubicin Hydrochloride 2 MG/ML Injection\_medications: 0.045089349150657654

Top Features Correlated with Labels:

SARS-CoV-2 RNA Pnl Resp NAA+probe\_observations: 0.49384080077656833

Left ventricular Ejection fraction\_observations: 0.33565442276023444

DESCRIPTION\_24 HR metoprolol succinate 100 MG Extended Release Oral Tablet [Toprol]\_medications: 0.2953423866265173

DESCRIPTION\_Furosemide 40 MG Oral Tablet\_medications: 0.2945209702519555

REASONDESCRIPTION\_Chronic congestive heart failure (disorder)\_medications: 0.2825497752029354

AGE\_patients: 0.28186333378899225

Alanine aminotransferase [Enzymatic activity/volume] in Serum or Plasma\_observations: 0.279155030574671

Globulin [Mass/volume] in Serum by calculation\_observations: 0.27772222303908517

Adenovirus A+B+C+D+E DNA [Presence] in Respiratory specimen by NAA with probe detection\_observations: 0.277003888465936

Human metapneumovirus RNA [Presence] in Respiratory specimen by NAA with probe detection\_observations: 0.277003888465936