Sensitivity

Recall or True Positive Rate

If a patient has a disease
What is the probability the model will predict positive?

$$\text{Sensitivity} = \frac{TP}{TP + FN}$$

Specificity

True Negative Rate

If a patient is normal
What is the probability the model will predict negative?

$$\text{Specificity} = \frac{TN}{TN + FP}$$

False Positive Rate

If a patient is normal
What is the probability the model will predict positive?

$$\text{False Positive Rate} = \frac{FP}{FP + TN}$$

Positive Predictive Value PPV

Precision

If the model predicts positive
What is the probability the patient has the disease?

$$\text{PPV} = \frac{TP}{TP + FP}$$

$$\text{PPV} = \frac{\text{Sensitivity} \times \text{Prevalence}}{\text{Sensitivity} \times \text{Prevalence} + (1 - \text{Specificity}) \times (1 - \text{Prevalence})}$$

Negative Predictive Value NPV

If the model predicts negative
What is the probability the patient is normal?

$$\text{NPV} = \frac{TN}{TN + FN}$$

Prevalence

The probability of having a disease in a population

The probability of being normal is $1 - \text{Prevalence}$

$$\text{Prevalence} = \frac{TP + FN}{TP + TN + FP + FN}$$

$$\text{Prevalence } = \frac{\text{\# Disease Samples}}{\text{\# Samples}}$$

Accuracy

The percent of all measurements that are correct

$$\begin{aligned}\text{Accuracy} = \text{Sensitivity} \times \text{Prevalence} + \\ \text{Specificity} \times (1 - \text{Prevalence})\end{aligned}$$

$$\text{Accuracy} = \frac{TP + TN}{TP + TN + FP + FN}$$