Diagnosis.

Results of diagnostic tests.

How good is the test, i.e. is it sensitive and specific?

Will it help you reach a diagnosis, i.e. will it change our minds from what we thought before the test (the "pre-test" probability) to what we think afterwards (the "post-test" probability).

Do the results make a condition more or less "likely"?

Two by two table.

		Result of gold standard test	
		Disease present a + c	Disease absent b + d
Result of diagnostic (or screening) test	Test positive a + b	True positive a	False positive b
	Test negative c + d	False negative c	True negative d

Two by two table
(version for printing).

		Result of gold standard test	
		Disease present a + c	Disease absent b + d
Result of diagnostic (or screening) test	Test positive a + b	True positive a	False positive b
	Test negative c + d	False negative c	True negative d

Sensitivity.

The proportion (fraction) of those people who **really have** the disease (a+c) who are correctly identified as such (a). i.e. the **true positives**.

From two by two table:

Sensitivity = a/(a+c).

Specificity.

The proportion (fraction) of those people **who really do not have** the disease (b+d) who are correctly identified as such (d). i.e. the **true negatives.**

From two by two table:

Specificity = d/(b+d).

Likelihood ratio of a positive test.

The probability of a **positive** test result when the patient **has** the disease compared to a patient without the disease.

Likelihood ratio of a positive test = sensitivity / (1 - specificity).

Likelihood ratio of a negative test.

The probability of a **negative** test result when the patient **does not** have the disease compared to a patient with the disease.

Likelihood ratio of a negative test = (1 - sensitivity) / specificity.

Accuracy.

The proportion of **all** tests that gave a **correct** result. i.e. the true positives and true negatives as a proportion of all tests.

From the two by two table:

Accuracy = (a + d)/ (a + b +c +d).

Pre-test probability.

The probability of a patient having a disease before the diagnostic test is carried out.

The pre-test probability is the same as the **prevalence** of that disease in a population similar to the patient.

From the two by two table:

Pre-test probability (prevalence) = (a+c)/(a+b+c+d).

Post-test probability.

After running the diagnostic test, the post-test probability of the patient having the disease is the number of people who **truly** have the disease (a) as a proportion of those who **tested positive** (a+b).

From the two by two table:

Post-test probability = a/(a+b).

Positive predictive value.

The proportion (fraction) of the people who **test positive** (a+b) who **truly have** the disease (a).

From two by two table:

Positive predictive value = a/(a+b).

Negative predictive value.

The proportion of people who **test negative** (b+d) who **truly do not have** the disease (d).

From two by two table:

Negative predictive value = d/(c+d).