CRITICAL APPRAISAL CHECKLIST FOR AN ARTICLE ON DIAGNOSIS OR SCREENING.

Study Design: Cross-sectional study

Adapted from:

Jaeschke R, Guyatt G, Sackett DL. Users' guides to the medical literature. III. How to use an article about a diagnostics test. A. Are the results of the study valid? *JAMA* 1994; 271: 389-391.

Jaeschke R, Guyatt GH, Sackett DL. Users' guides to the medical literature. III. How to use an article about a diagnostics test. B. What are the results and will they help me in caring for my patients? *JAMA* 1994; 271: 703-707.

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IS THIS PAPER WORTH READING?

1. Is this test relevant to my practice?	Yes	Can't tell	No

ARE THE RESULTS OF THIS STUDY VALID?

	Yes	Can't tell	No
2. Was there an independent, blind comparison with a reference ('gold') standard of diagnosis?			
3. Was the diagnostic test evaluated in an appropriate spectrum of subjects (like those to whom it would be offered in practice)?			
4. Was the reference standard applied regardless of the diagnostic test result?			

ARE THE VALID RESULTS OF THIS DIAGNOSTIC STUDY IMPORTANT?

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

Positive predictive value = a/(a+b)

Sensitivity = a/(a+c)

Negative predictive value = d/(c+d)

Specificity = d/(b+d)

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

Pre-test odds = prevalence/(1 - prevalence)

Likelihood ratio for a positive test result = sensitivity / (1 - specificity)

Likelihood ratio for a negative test result = (1 - sensitivity) / specificity

Post-test odds = pre-test odds x likelihood ratio

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

Post-test probability = post-test odds / (post-test odds + 1)

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5. What were the results? Consider • How were the results expressed (sensitivity, specificity, likelihood ratios)?	
6. How precise were the results? • Were the results presented with a range or confidence intervals?	
7. Were likelihood ratios for the test results presented or data necessary for their calculation provided?	

CAN I APPLY THESE VALID, IMPORTANT RESULTS TO MY PATIENT?

8. Will the test be available, affordable, accurate and reliable in my setting? Consider: • Are the patients similar to my patient? • Is the setting similar to my own?	**Yes**	**Can't tell**	**No**
9. If the test isn't available, were the methods for performing the test described in sufficient detail to permit replication?			
10. Can you generate a clinically sensible estimate of your patient's pre-test probablity (e.g. from practice data, clinical judgement or the report itself)?			
11. Will the resulting post-test probabilities affect your management and help your patient? (Could it move you across a test-treatment threshold?)			
12. Would the consequences of the test help this patient?			

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Cross-sectional study A study that examines the relationship between disease (or other health-related characteristics) and other variables of interest as they exist in a defined population at a single point in time.

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.**

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.**
N.B. Sensitivity and specificity are functions of the test itself and do not change with prevalence.

1 - specificity The proportion of false positives.

1 - sensitivity The proportion of false negatives.

Positive predictive value (PPV) The proportion (fraction) of the people who **test positive** (a+b) who **truly have** the disease (a).
N.B. Positive predictive value depends on the prevalence of the disease and will decrease as the disease becomes rarer in the population.

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

Pre-test probability The probability (chance) of a patient having the disease before the diagnostic test is carried out. This is same as the **prevalence** of that disease in a population similar to the patient. It may be estimated from routine data, practice data or clinical judgement.

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). This is the same as the **positive predictive value.**
N.B. By comparing the pre and post-test probabilities, we can see if we are more (post-test probability has increased) or less (post-test probability has decreased) sure of a diagnosis.

Likelihood ratio of a positive test A measure of how much more likely a positive test result is in someone with the disease as compared with someone without the disease. e.g. In a urine glucose test, the LR of a positive result = 32. Thus, a positive result is 32 times more likely to occur in a patient with, as opposed to without, diabetes.

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