

# Choosing Diagnostic Tests Wisely

## Objective

To choose testing strategies wisely so as to efficiently reach a diagnosis, in a manner that compassionately benefits the patient, and avoids unnecessary costs.

## Practice Points

**Table 1. Questions To Ask When Considering Testing**

1)	Will the results change what I am going to do?	If not, do not test!
2)	Am I confident that my diagnosis is very likely or that alternate diagnoses are unlikely?	If yes to both, do not test!
3)	Do the risks of the test outweigh the benefits?	If yes, do not test!

*An example of 1 is doing a CT scan of the lumbar region in a patient with low back pain/sciatica for less than 3 months who you will not refer to a specialist.*

*An example of 2 is ordering an ANA test in a patient who you believe has osteoarthritis of the knee.*

*An example of 3 is ordering CT scans, with the attendant risk of cancer from radiation, in patients who do not have red flags for serious disease.*

- **Sensitive Tests** are good at ruling out conditions (Table 2). If the test is negative, one can be reassured that a particular diagnosis is not present. However, sensitive tests may have a high False Positive rate, suggesting disease is present when it is not.
- **Specific Tests** are good at ruling in conditions (Table 2). If the test is positive, one can be reassured that a particular diagnosis is present. Specific tests may have a high False Negative rate, suggesting disease is absent when it is actually present.
- **Positive Predictive Value** provides the probability a patient with a positive test actually has the disease.
- **Negative Predictive Value** provides the probability a patient with a negative test does not have the disease.

**Table 2. Assessment of Diagnostic Tests**

	Disease Present			
	Yes	No	Total	
New Test	Positive	True Positive a	b False Positive	a + b
	Negative	False Negative c	d True Negative	c + d
Total	a + c	b + d		

Sensitivity:  $a/(a+c)$   
Specificity:  $d/(b+d)$

Positive predictive value:  $a/(a+b)$   
Negative predictive value:  $d/(c+d)$

- Often there is a trade-off between sensitivity and specificity.
- Some tests are not specifically associated with a given diagnosis and may need to be interpreted in context.
- Tests may be done in groups at the same time or sequentially.

## Conclusions

1. Over testing can lead to false positive results which can lead to additional testing and or concern on the part of the patient.
2. Good screening tests should be sensitive with a reasonably low false positive rate.