

Working through some examples

The Intern calls from the ED

- *“Mrs. Triglioni is here. I know you are concerned about a Pulmonary Embolism but she is allergic to contrast. We sent her for a VQ scan and we will call when the results are back.”*
- You quickly consult the Internet and find an article that says that sensitivity and specificity of VQ scanning are about 77% and 97%, respectively.

Quiz 4.5: Make a commitment!

- What will you do if the test comes back positive?
 1. Start treatment for a pulmonary embolism
 2. Obtain additional tests

Quiz 4.6

- What will you do if the test comes back negative?
 1. Send her home with reassurance
 2. Obtain additional tests
 3. Start treatment

Mrs. Triglioni: Clinically Tier 1 (80%)

Specificity 97% Sensitivity 77%		Disease		Post Test Probability
		Present	Absent	
Test Results	Positive	A = 616	B = 6	Of disease: $A \div (A + B)$ PPV=99%
	Negative	C = 184	D = 194	Of Health: $D \div (D + C)$ NPV= 51%
		E = 800	F = 200	E + F = 1000

PRETEST

Very likely

Likely

Uncertain

Unlikely

Very unlikely

Pre test probability of 80%

Mrs. Triglioni: Tier I then tested

Specificity: 97%
Sensitivity: 77%

		Disease		
		Present	Absent	Post Test Probability
Test Results	POS	A = 616	B = 6	Of disease: $A \div (A + B)$ PPV=99%
	NEG	C = 184	D = 194	Of Health: $D \div (D + C)$ NPV= 51%
		E = 800	F = 200	E + F = 1000

(+) Test →

PRETEST →

(-) Test →

Very likely

Likely

Uncertain

Unlikely

Very unlikely

49% of those with a negative test will still have disease!!!

The intern calls ...

- *Good news, the V/Q scan is low probability. She doesn't have a pulmonary embolus. We are going to send her home with some analgesics and have her follow up with you in the morning.*

Quiz 4.7

- Your Response:

1. Good Job! Tell her to call the office first thing in the morning.
2. Good Job! Tell her to follow up next week as scheduled.
3. Thanks for the update. Let's review her case and rethink your conclusion. First, let's start her on treatment while we get another test.

Likely diagnosis, specific test

- A high specificity test can help rule in a Tier 1: likely diagnosis--**SPIN: Spec-Pos-Rule IN**.
- In a patient with a high pre test probability of disease (a Tier 1: likely or very likely diagnosis), a **negative test is as likely to be a false negative** as a true negative.
 - Therefore, a negative test can't rule out a diagnosis, only decrease your certainty.

What if Mrs. Garcia had a V/Q Scan? < 10% by Wells

Specificity: 97%

Sensitivity: 77%

		Disease		
		Present	Absent	
Test Results	Positive	A= 77	B= 27	$A \div (A + B)$ PPV=74%
	Negative	C= 23	D= 873	$D \div (D + C)$ NPV= 97%
		100	900	1000

Pre test probability of 10%

Specificity of test is 97% $\rightarrow D/(D+B)$

Sensitivity of test is 77% $\rightarrow A/(A+C)$

PRETEST

Very likely

Likely

Uncertain

Unlikely

Very unlikely

Mrs. Garcia, Tier 1E, <10% Pretest Probability

Specificity: 97% Sensitivity: 77%		Disease		Post Test Probability
		Present	Absent	
Test Results	POS	A= 77	B= 27	Of Disease $A \div (A + B)$ PPV=74%
	NEG	C= 23	D= 873	Of Health $D \div (D + C)$ NPV= 97%
		100	800	1000

(+) Test

Very likely

Likely

Uncertain

Unlikely

3% of patients with a negative test will have the disease

PRETEST
(-) Test

Very unlikely

Unlikely diagnosis, specific test

- When a diagnosis is **unlikely**, a positive test, even if specificity is high, doesn't confirm the diagnosis. It only increases the likelihood from unlikely to uncertain.
- When a diagnosis is **unlikely**, a negative test, further decreases the likelihood.