

CT for Pulmonary Embolism

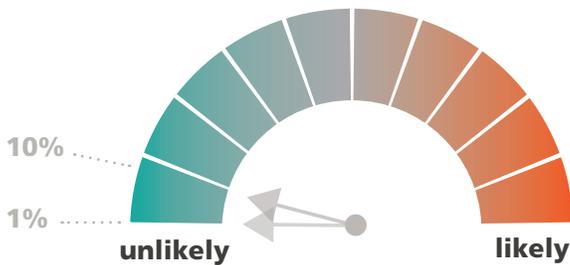
SHOULD I TEST?

1 Will it make a difference?

No patient doesn't want to know	No patient is already on or can't receive anticoagulation	No patient has kidney disease or allergy to dye	Yes take next steps
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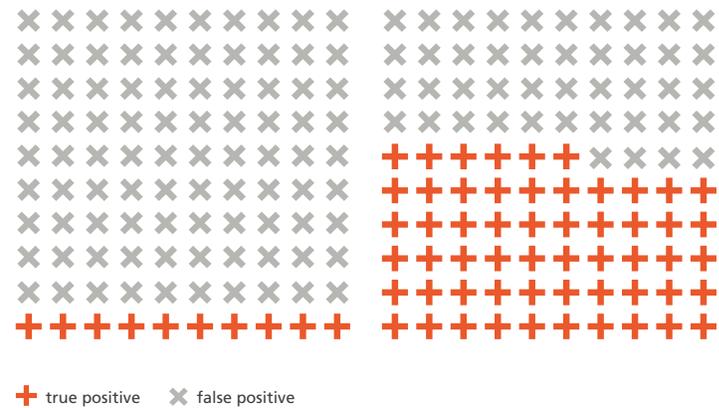
2 What is the chance of disease before testing?

1% PRETEST PROBABILITY patient under 50 no leg swelling surgery normal vital signs	10% PRETEST PROBABILITY patient recently bedridden leg edema shortness of breath
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3 What will a positive result mean?

1% PRETEST PROBABILITY 10% true positive 90% false positive	10% PRETEST PROBABILITY 56% true positive 44% false positive
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4 Decide with patient if testing.

Detects >90% of pulmonary embolism if present

Negative results exclude pulmonary embolism

- 6%** renal injury
- 18%** incidental finding requiring follow-up
- \$260-1800** Patient cost (variable co-pay)
- 3-10%** false positive pulmonary embolism requiring PE RX
- 1/10,000** X-ray causing cancer
- 4%** risk major bleeding with treatment

benefits

harms

D-dimer for DVT or PE

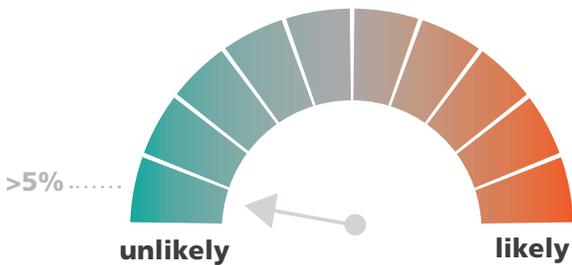
SHOULD I TEST?

1 Will it make a difference?

<p>No patient doesn't want to know</p>	<p>No patient is already on or can't receive anticoagulation</p>	<p>No patient has HIGH risk for DVT—proceed to definitive testing</p>	<p>Yes take next steps</p>
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2 What is the chance of disease before testing?

<5% PRETEST PROBABILITY
patient recently bedridden
leg edema
likely diagnosis of cellulitis



3 What will the results mean at 5% pretest probability?

NEGATIVE <1% risk of DVT 2/1000 will have DVT	POSITIVE 8% true positive 92% false +
<p>— true negative / false negative</p>	<p>+ true positive × false positive</p>

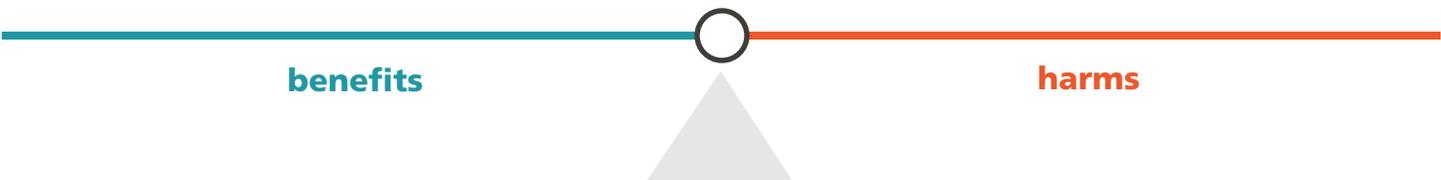
4 Decide with patient if testing.

A negative test generally **"rules out"** pulmonary embolism unless high suspicion prior

Most positive D-dimer tests are **false positive**

A positive test generally leads to **additional tests** or anticoagulation

4% risk major bleeding with PE/DVT treatment



Troponin for heart attack

SHOULD I TEST?

1 Will it make a difference?

<p>No if already have plan</p>	<p>No if patient doesn't want treatment</p>	<p>Yes take next steps</p>
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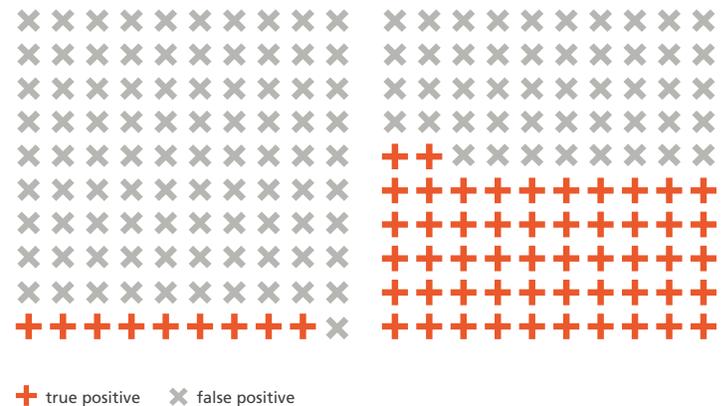
2 What is the chance of disease before testing?

<p>5% PRETEST PROBABILITY man 40–50 years old non-specific chest pain</p>	<p>1% PRETEST PROBABILITY woman <40 years old non-specific chest pain</p>
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3 What will a positive result mean?

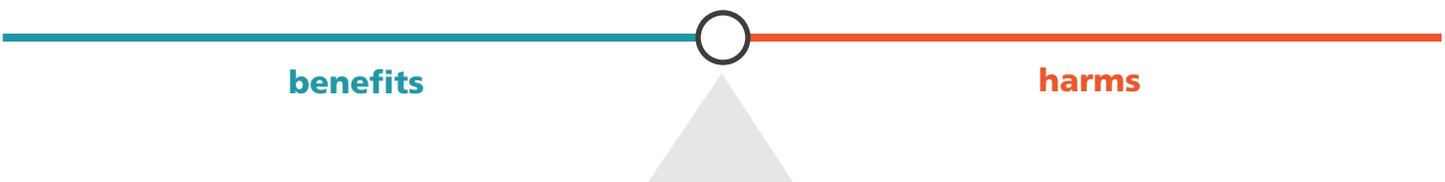
<p>1% PRETEST PROBABILITY 9% true positive 91% false positive</p>	<p>10% PRETEST PROBABILITY 52% true positive 48% false positive</p>
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4 Decide with patient if testing.

Identifies **99%** of heart attacks
Treatment of heart attack is **beneficial**

False positives common if used indiscriminately
Positives lead to treatment, even if false positive—
aspirin, blood thinners etc.
Positives lead to stress tests and/or angiogram
which can result in **adverse events** and **patient costs**
for observation status



HIV test to diagnose HIV

SHOULD I TEST?

1 Will it make a difference?

No
if already have plan

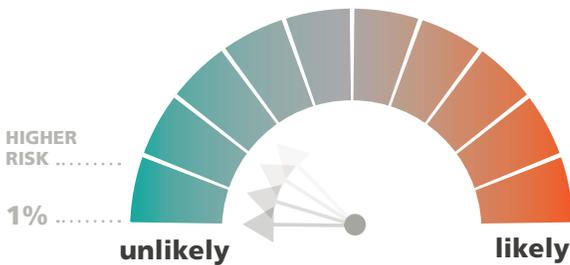
No
if patient doesn't want treatment

Yes
take next steps

2 What is the chance of disease before testing?

1% PRETEST PROBABILITY
general population

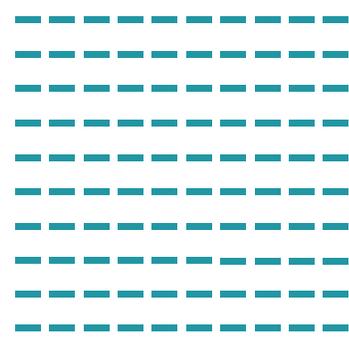
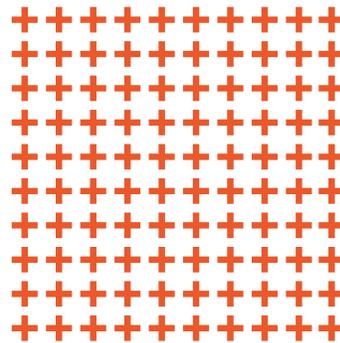
HIGHER RISK
men who have sex with men
intravenous drug users
high risk sexual activities



3 What will a positive or negative result mean?

1% PRETEST PROBABILITY
99.99% true positive
<1/1000 false positive

1% PRETEST PROBABILITY
99.99% true negative
<1/1000 false negative



+ true positive x false positive - true negative / false negative

4 Decide with patient if testing.

Very **accurate test**—almost always identifies HIV if present and excludes HIV when negative

Treatment of HIV is **highly effective**

Can lead to **psychological stress** or **stigma**—make sure patient ready and consents to testing

Can miss **acute HIV**, consider RNA test if concern for acute HIV

