

# Chest Pain Syndromes and Patient Management

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TOHS and EOCS 2016

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Associate Professor of Medicine



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# Chest Pain Syndromes and Patient **Engagement**

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# Conflicts

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None to declare

# Objectives

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1. Discuss the role of patient engagement in the management of suspected ACS.
2. Summarize the evidence supporting shared decision making in the management of suspected ACS.
3. Reflect on what role shared decision making might play in your own practice.



# A Characteristic Case

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42F presents to ED with RSCP: pressure-like sensation lasting 90 minutes, resolved spontaneously

PMH includes GERD, on PPI

Unremarkable physical examination

ECG normal

Trop at presentation and at 3h normal



# The Facts

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Chest pain is the second most common reason patients present to the ED (8 million visits per year in US)

25% of all hospital admissions, including many very low-risk patients admitted for observation and advanced cardiac testing



# The Costs

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- Ionizing radiation
- False-positive results
- Unnecessary procedures
- Hospital overcrowding
- Billions of dollars each year (incl. 3-10 billion USD spent annually for patients found not to have cardiac disease!)



# What to do with our patient?

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“Classic history:” admit, treat as NSTEMI/ACS/unstable angina and cath

“Concerning history:” admit for further non-invasive investigation

“The troponin is reassuring:” send home, with outpatient follow-up and testing

“The troponin rules out ACS:” send home, no follow-up required





# Risk Scoring

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- TIMI
- GRACE
- HEART
- Vancouver
- PRETestConsultACS (Kline et al)

# Risk Scoring

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TIMI



GRACE



HEART



Vancouver



PRETestConsultACS (Kline et al)



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# HEART Score

	+2	1	0
<b>H</b> istory (suspicious?)	Highly	Moderately	Slightly
<b>E</b> CG	Significant ST depressions	Non-specific repol abnormalities	Normal
<b>A</b> ge	>65	45-65	<45
<b>R</b> isk factors	$\geq 3$ or athero	1-2	0
<b>T</b> roponin (at presentation)	$\geq 3 \times \text{ULN}$	1-3xULN	$< 1 \times \text{ULN}$

# HEART Outcomes

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	0-3 Points	4+ Points
6-Week MACE rate	0.9-1.7%	$\geq 12\%$
Risk	Low	High
Disposition	Discharge	Admit

# Back to the Bedside!

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## Keywords:

1. Decision Aid
2. Shared Decision Making
3. Patient-Centered Care
4. Patient Engagement

# Chest Pain Choice

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Erik P. Hess (Mayo Clinic), Ian Stiell  
(uOttawa and TOH) et al.

Plan for a chest pain-specific decision aid  
first laid out in 2010

*Circ Cardiovasc Qual Outcomes.*  
2012;5:251-259

Late-breaking clinic trial at ACC 2016



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# Chest Pain Choice (2016)

## What's Next?

Prepared for: \_\_\_\_\_

### 1 Your Chest Pain Diagnosis

Your initial test results are **NEGATIVE for a heart attack**. These included:

- **Blood tests** to look for an enzyme called troponin that is released when the heart muscle is damaged. Additional troponin tests may be done to monitor you for heart attack during your emergency visit.
- **An electrocardiogram** to check whether your heart is getting enough oxygen and blood.

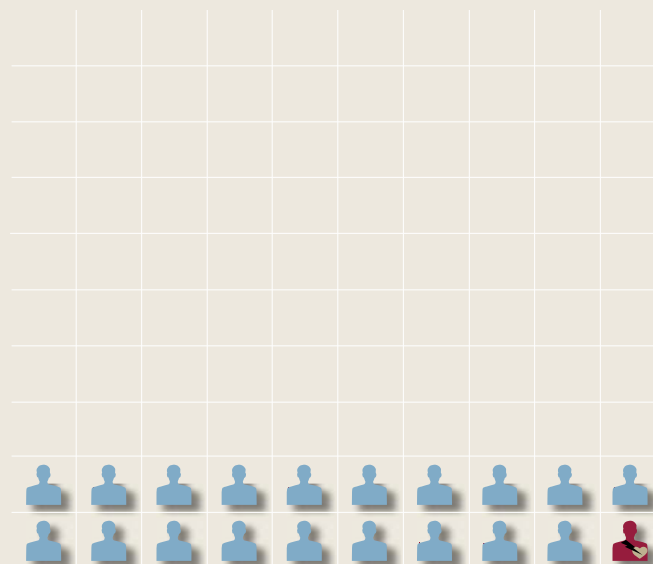
The chest pain you are experiencing today may be a warning sign of a **FUTURE** heart attack.

Additional tests<sup>1</sup> may include:

- **A stress test** which views blood flow to your heart at rest and under stress.
- **A coronary CT angiogram** which takes pictures of the arteries in your heart to check for a blockage in the flow of blood.

<sup>1</sup>Stress test options include nuclear stress testing, ultrasound stress testing, or exercise ECG (electrocardiogram) stress testing. Nuclear stress testing and coronary CT angiography include exposure to radiation which has been shown to be related to increased cancer risk over a lifetime. Your doctor can help you explore which option may be best for you.

<sup>2</sup>• Age  
• Gender  
• Race  
• If chest pain is made worse when manual pressure is applied to the chest area  
• If there is a history of coronary artery disease  
• If the chest pain causes perspiration  
• Findings on electrocardiograms (electronic tracings of the heart)  
• Initial cardiac troponin result



# 1. Your Chest Pain Diagnosis

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Your initial test results are **NEGATIVE for a heart attack**. These included:

- Blood tests: (an enzyme called troponin)
- An electrocardiogram

The chest pain that you are experiencing today may be a warning sign of a **FUTURE** heart attack.





## 2. What You Can Do

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Examining your risk will allow you and your clinician to decide together whether or not you should have additional heart testing.

Additional tests may include:

- A stress test\*
- A CCTA\*

(Radiation and cancer risk are specifically mentioned)

# 3. Your Personal Risk Evaluation

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Your risk of having a heart attack or pre-heart attack within the next 45 days can be determined by comparing you to people with similar factors who also came to the ED with chest pain.

# CPC 2012

## What's Next?

Prepared for: \_\_\_\_\_

### 1 Your Chest Pain Diagnosis

Our initial evaluation has NOT shown any evidence of a heart attack. This conclusion is based on a blood test (to look for troponins — enzymes that are released when the heart muscle is damaged) and an electrocardiogram (to check that your heart is getting enough oxygen and blood). Over the next five hours, two additional blood tests (troponins) will be taken to definitively rule out a heart attack.

However, even if these tests do confirm our diagnosis, your chest pain may indicate possible warning signs of a FUTURE heart attack.

### 2 Further Tests

A STRESS TEST EVALUATION may more precisely determine if your heart is functioning correctly by viewing blood flow to your heart while at rest and under stress.

Examining your risk will help you to determine whether you would like to have a stress test now or would like assistance in making a clinic appointment.<sup>1</sup>

<sup>1</sup>Stress test options include nuclear stress testing, ultrasound stress testing, and exercise ECG (electrocardiogram) stress testing. Nuclear stress testing includes exposure to radiation which has been shown to be related to increased cancer risk over a lifetime. Your doctor can help you explore which option may be best for you.

### 3 Your Personal Risk Evaluation

Your risk of having a heart attack or of having a pre-heart attack diagnosis within the next 45 days can be determined by comparing you to people with similar factors<sup>2</sup> who also came to the Emergency Department with chest pain.

### 4 Would You Like to Have a Stress Test Now or Make an Appointment?

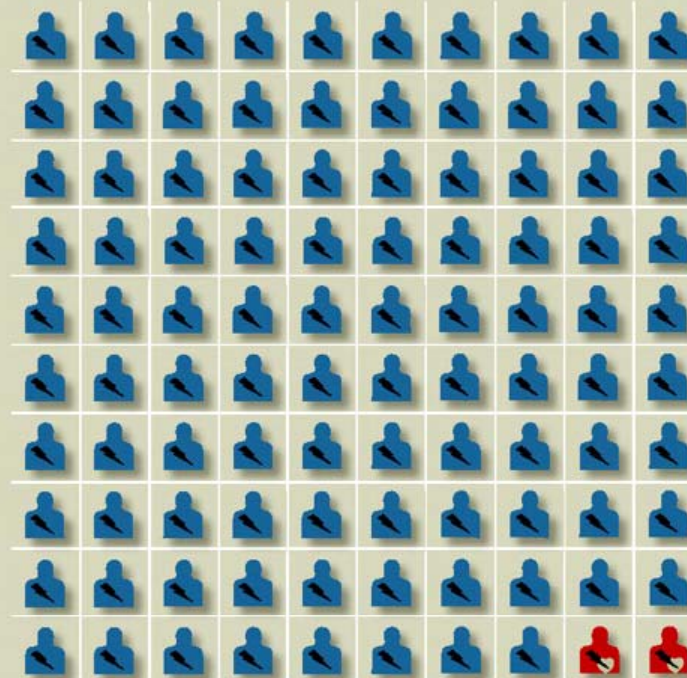
- I would like to be admitted to the observation unit to have an urgent cardiac stress test. I realize that this could add to the cost of my evaluation and lengthen my emergency stay.
- I would like to be seen by a Mayo Clinic heart doctor within 24-72 hours and would like assistance in scheduling this appointment.
- I would like to schedule an appointment on my own to consult with my primary care physician.
- I would like my emergency department doctor to make this decision for me.

<sup>2</sup>• Age  
• Gender  
• Race  
• If chest pain is made worse when manual pressure is applied to the chest area  
• If there is a history of coronary artery disease  
• If the chest pain causes perspiration  
• Findings on electrocardiograms (electronic tracings of the heart)  
• Initial cardiac troponin T result

Of every 100 people with factors like yours who came to the emergency department with chest pain...



2 had a heart attack or a pre-heart attack diagnosis within 45 days of their emergency department visit, 98 did not.



# 4. Would You Prefer...

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... to have additional heart testing during this emergency visit or decide later at an outpatient appointment?

# Four Options: 1

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- I would like to have a stress test or CCTA during my emergency visit.**

I realize that this may increase the cost of my care and/or lengthen my stay.

# Four Options: 2

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- I would like to be seen by a heart doctor within 24-72 hours and would like assistance in scheduling this appointment.**

# Four Options: 3

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- I would like to schedule an appointment on my own to consult with my primary care physician.**

# Four Options: 4

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- I would like my Emergency Department doctor to make this decision for me.**



# Chest Pain Choice CCQO 2012

Outcome	Decision Aid Patients (n=101)	Usual Care Patients (n=103)	P value or mean diff (95% CI)
Knowledge (correct answers out of 7)*	3.6	3.0	0.67 (0.34-1.0)
Engagement in decision making (OPTION score)	26.6	7.0	19.6 (1.6-21.6)
Admission for stress testing	58%	77%	P<0.0001

\* Primary outcome

NB: 30-day MACE = 0 in both arms (although 1 MI in DA arm?!)



# Chest Pain Choice ACC 2016

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## Objective

To test the effectiveness of Chest Pain Choice in a pragmatic multicenter trial

# Patients

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## Inclusion

Adults with chest pain considered for admission for stress testing or CCTA

## Exclusion

Ischemic ECG  
Elevated troponin  
Known CAD  
Cocaine within 72h  
Unable to comply



# Patients

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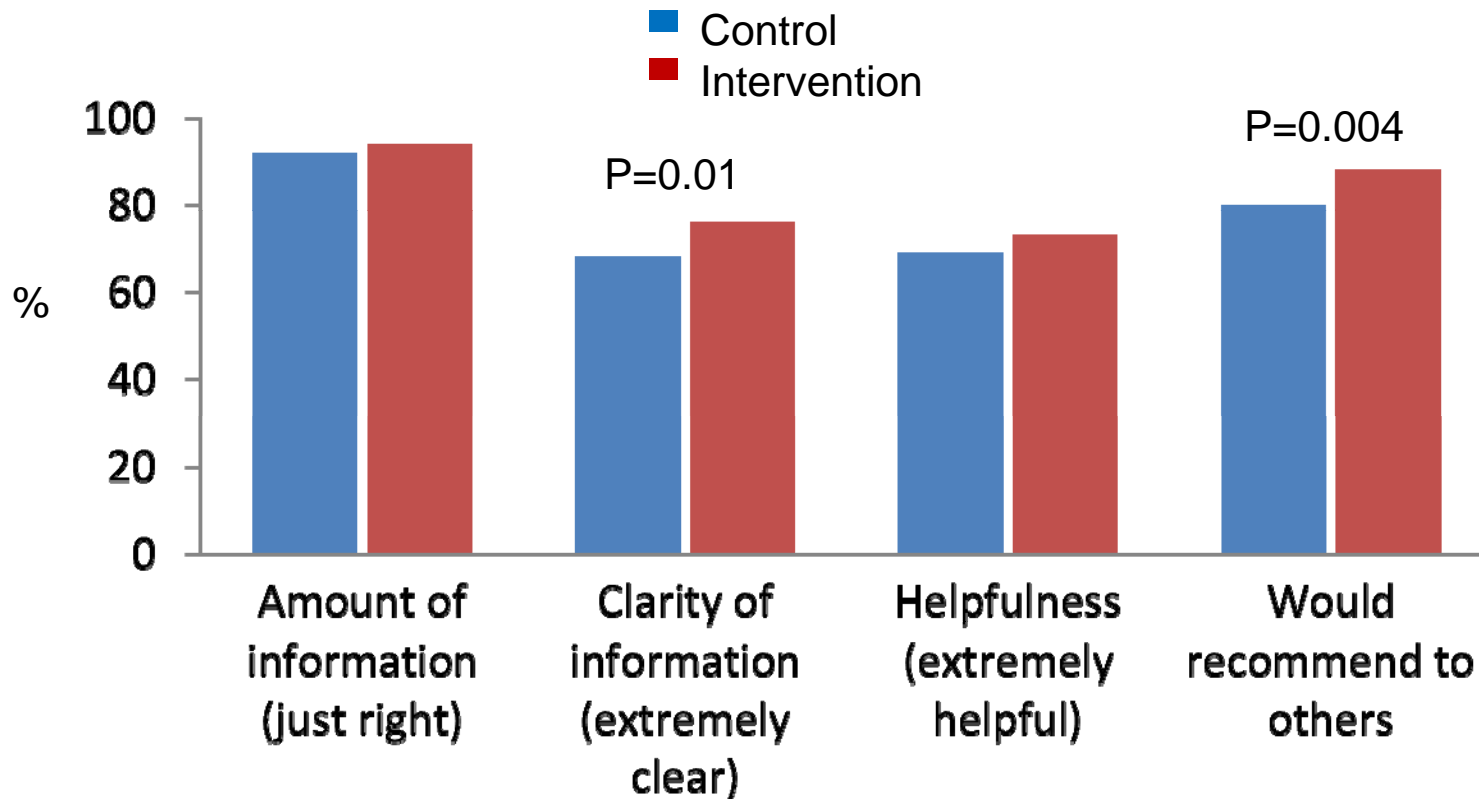
Variable	Intervention (n=447)	Control (n=451)
Mean age	50.0	50.6
Female	56.7%	58%
Pre-test probability of ACS	3.6%	3.8%

# Results

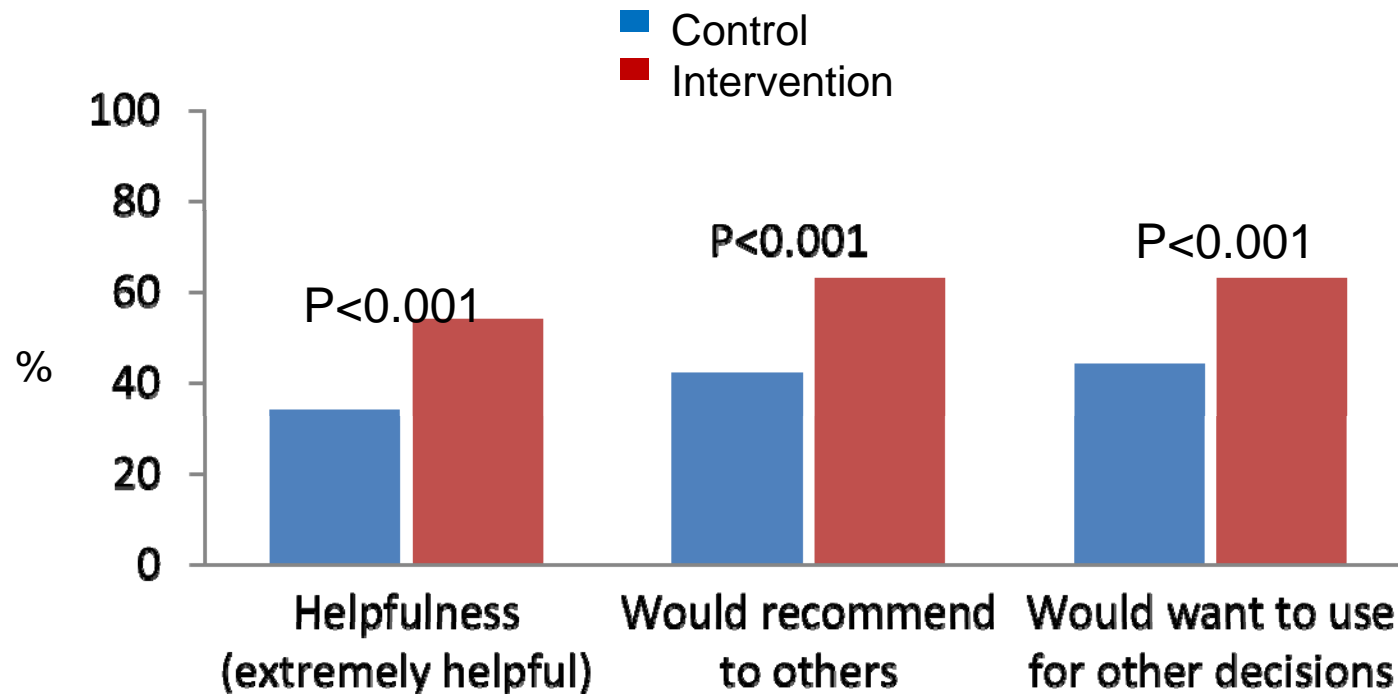
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Variable	Intervention (n=447)	Control (n=451)	P value
Knowledge [Mean (SD)]	4.23 (1.54)	3.56 (1.50)	<0.001
Engagement (OPTION scale)	18	8	<0.001

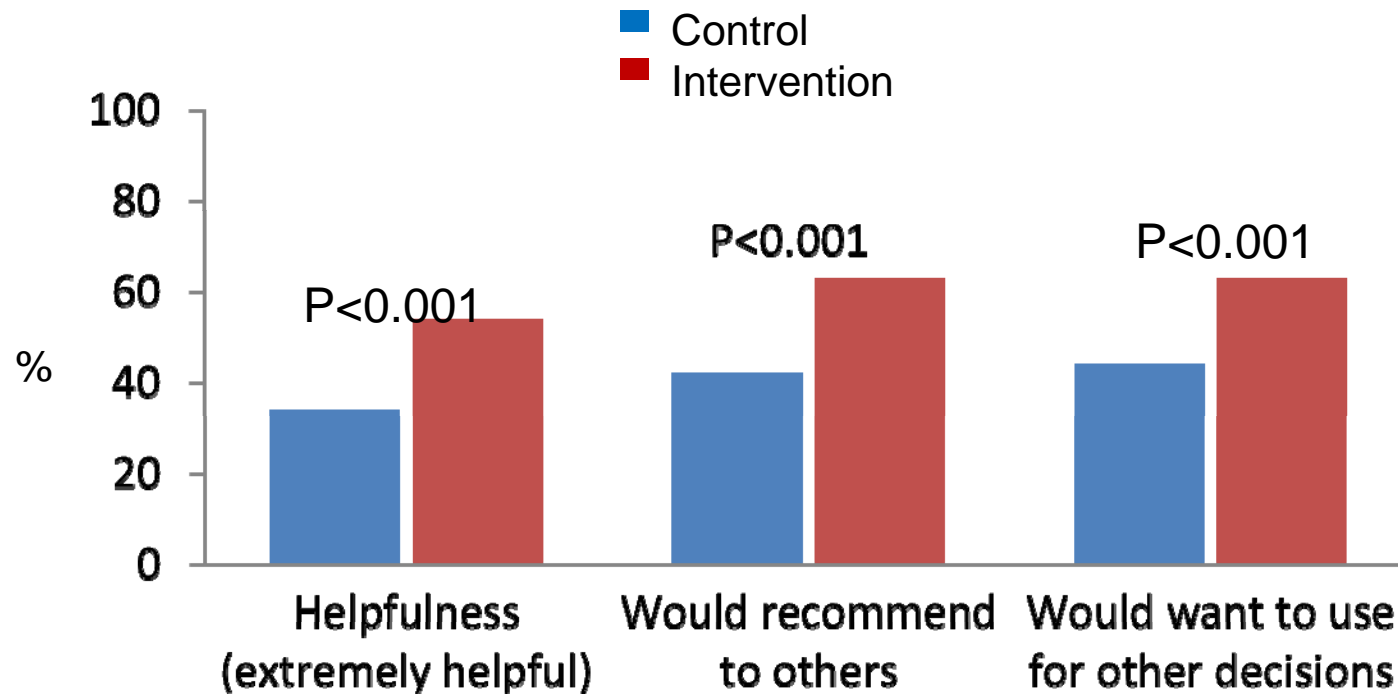
# Decision Aid Patient Acceptability



# Decision Aid MD Acceptability



# Decision Aid MD Acceptability

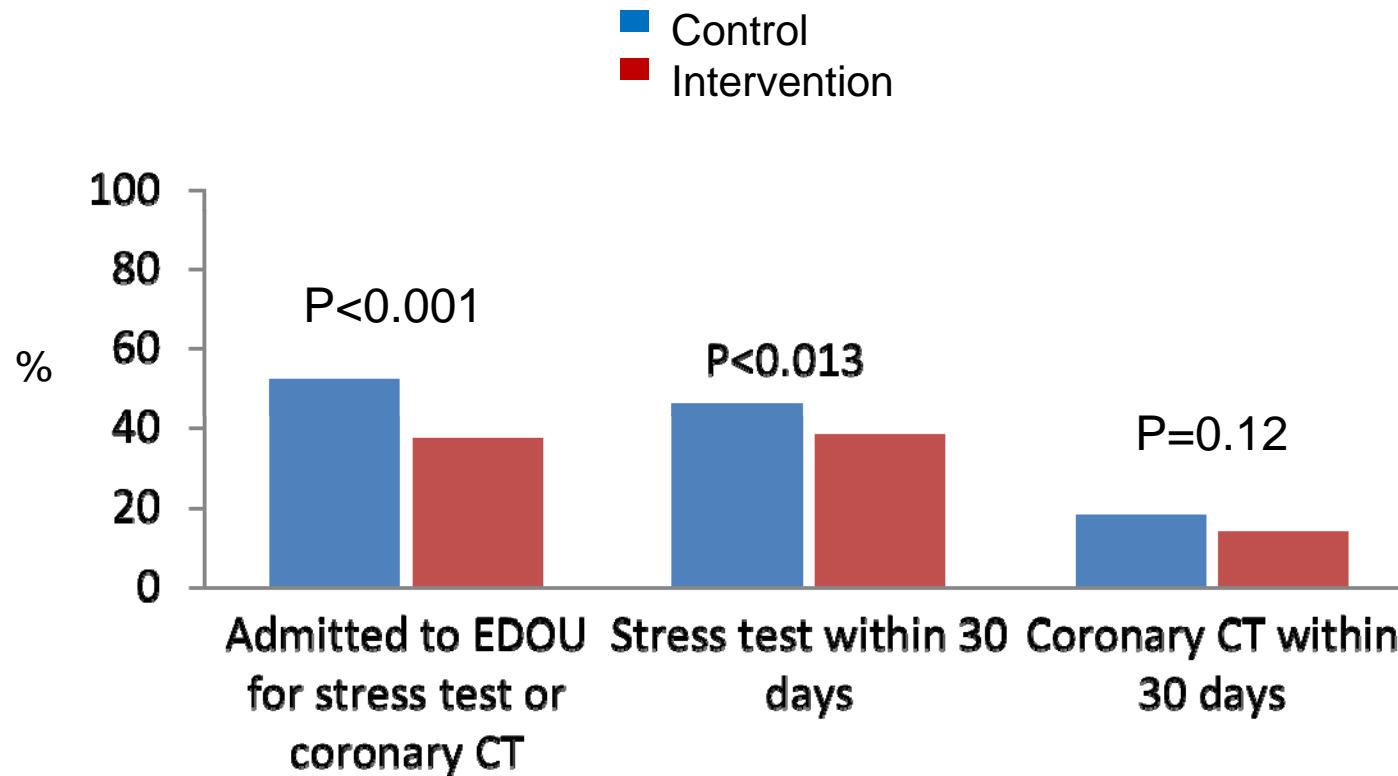


NB: Duration of consultation with CPC was less than 90 secs longer.





# Resource Use



# Safety

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Variable	Intervention	Control	P value
Revascularization	7 (2%)	4 (1%)	0.37
MI	4 (1%)	1 (0%)	1.0
Death	0 (0%)	0 (0%)	1.0
MACE within 30d post discharge	1 (0%)	0 (0%)	1.0



# Conclusions

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1. Chest Pain Choice increased patient knowledge and engagement
2. It was acceptable to both patients and clinicians
3. It decreased resource use, safely

Next step: implementation

# Back to our Case

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42F presents to ED with RSCP: pressure-like sensation lasting 90 minutes, resolved spontaneously

PMH includes GERD, on PPI

Unremarkable physical examination

ECG normal

Trop at presentation and at 3h normal



# Shared Decision

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The patient was presented with the following fact: her chance of having MACE in the next 45 days is less than 2%.

She was keen to be seen by a cardiologist as an outpatient.

Follow-up testing by CCTA documented normal coronaries.



# Questions to Ponder

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1. Are we willing to sacrifice a small amount of safety in favour of a large amount of efficacy?
2. Will the impact of shared decision making be different (i.e. less) in Canada?

# Thank you

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