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SCREENING FOR CORONARY ARTERY DISEASE IN SYNCOPE

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"You can make statistics say anything you want, 14 percent of all people know this"

--Homer Simpson

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Screening

Strategy used in a population to identify the possible presence of an as-yet-undiagnosed disease in individuals without signs or symptoms.

Designed to detect disease early and impact on prognosis.

Screening interventions are not designed to be diagnostic, and often have significant rates of both false positive and false negative results.

Universal screening involves screening of all individuals in a certain category (for example, all children of a certain age).

Case finding involves screening a smaller group of people based on the presence of risk factors (for example, because a family member has been diagnosed with a hereditary disease).

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Wilson Criteria

- The condition should be an important health problem.
- The natural history of the condition should be understood.
- There should be a recognisable latent or early symptomatic stage
- There should be a test that is easy to perform and interpret, acceptable, accurate, reliable, sensitive and specific.
- There should be an accepted treatment recognised for the disease.
- Treatment should be more effective if started early.
- There should be a policy on who should be treated.
- Diagnosis and treatment should be cost-effective.
- Case-finding should be a continuous process.

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Modified Wilson Criteria

- The screening programme should respond to a recognized need.
- The objectives of screening should be defined at the outset.
- There should be a defined target population.
- There should be scientific evidence of screening programme effectiveness.
- The programme should integrate education, testing, clinical services and programme management.
- There should be quality assurance, with mechanisms to minimize potential risks of screening.
- The programme should ensure informed choice, confidentiality and respect for autonomy.
- The programme should promote equity and access to screening for the entire target population.
- Programme evaluation should be planned from the outset.
- The overall benefits of screening should outweigh the harm.

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Characteristics of a Good Test

- Acceptable.
- Repeatable.
- Sensitive.
- Specific.
- Simple - quick and easy to interpret.

Negative Impact

Misdiagnosis, false positive.

Overdiagnosis, anxiety caused by prolonging knowledge of an illness without any improvement in outcome.

False negative.

Cost.

Potentially unnecessary invasive testing.

Creating a false sense of security.

Lead Time Bias

If we diagnosed the disease earlier with screening the survival time from diagnosis is longer; but longevity has not been prolonged, and there will be added anxiety as the patient must live with knowledge of the disease .

Length Time Bias

Many screening tests involve the detection of cancers. It is often hypothesized that slower-growing tumours have a better prognoses. Screening is more likely to detect slower-growing tumours (due to longer pre-clinical sojourn time), which may be less deadly. Thus screening may tend to detect cancers that would not have killed the patient or even been detected prior to death from other causes.

Overdiagnosis

Occurs when people with harmless abnormalities are counted as "lives saved" by the screening, rather than as "healthy people needlessly harmed by overdiagnosis.

Syncope

Coronary disease is a rare cause of syncope.

Many patients with syncope have coronary disease.

Coronary angiography is not recommended (ESC).

Percutaneous intervention has not been shown to reduce syncope.

Universal screening highly unlikely to be effective.

Case finding may have a role.

Risk Factors

Hypertension.

Hyperlipidaemia.

Diabetes Mellitus.

Smoking.

Family History.

Risk Factors

Obesity.

Age.

Male sex.

Premature menopause.

Chronic Inflammation.

hsCRP.

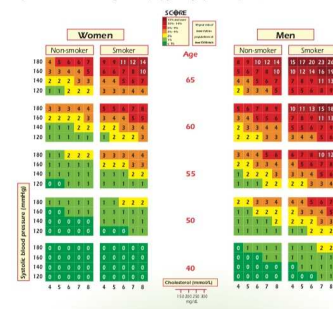## Heartscore

Free downloadable tool from ESC.

Enter DOB, Sex, BP, Chol, Smoking status

Calculates percentage risk of an event in 10 years.

Diabetics and those with advanced CKD automatically included in very high risk.

SCORE - European Low Risk Chart

Cardiac Investigation

Biochemical   BNP.

Troponin.

Inflammatory Markers.

ECG.

CXR.

Cardiac Investigation

Functional   EST.

DSE.

SPECT CT.

Cardiac MRI.

Pressure Wire.

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Cardiac Investigation
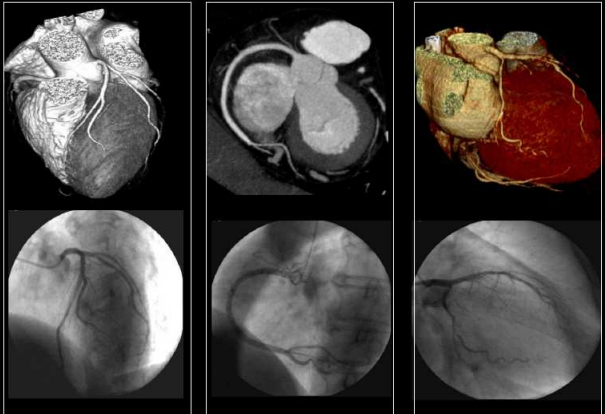
Anatomic   ECHO.

CTCA.

Invasive Angiogram.

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Right Tool for the Job?

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CT Cor Angio

Murphy RT, Garcia M, in Topol EJ. Textbook of Cardiovascular Medicine 2006
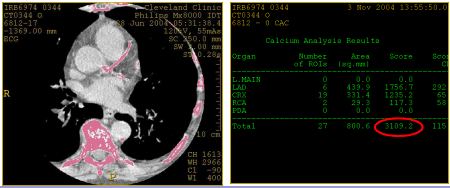

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Two Questions

Screening for CV Disease in asymptomatic patients; Ca score.

Diagnostic tool for chest pain; full Cardiac CT with contrast.

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Prognostic Role of *Calcium scoring*

- Coronary Artery Calcium Score (CACS)
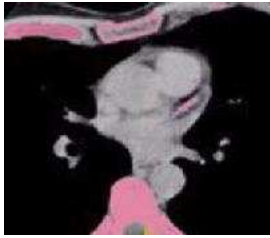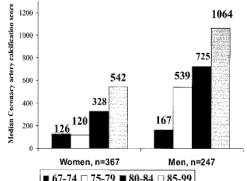 - Low radiation (0.8-4mSv)
  - No iodine contrast

Calcium Scoring

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….. rises with age
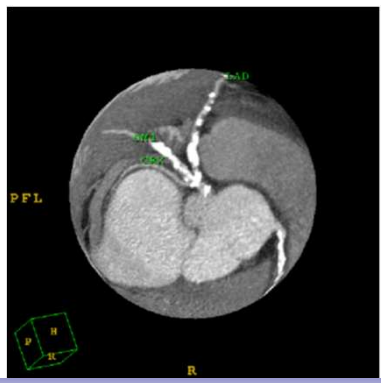
Figure 2. Median CAC scores in men and women by age group.

Newman, AB et Circulation 2001

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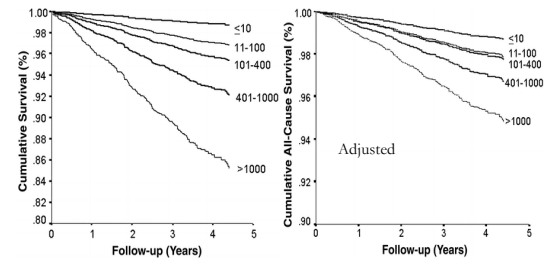59 yo male, "lone afib" no chest pain

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Calcium Scoring and survival

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10,377 asymptomatic individuals
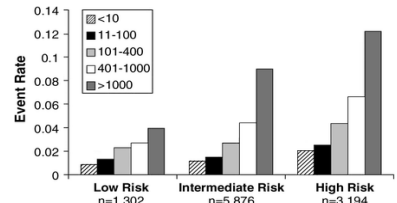
Leslee J. Shaw, Paolo Raggi et al, Radiology July 2003

Additive to clinical risk

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- Framingham risk (from low to high) according to baseline calcium score.

- Event rate is predicted mortality at 5 years.

Leslee J. Shaw, Paolo Raggi et al, Radiology July 2003

MESA Study

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- Framingham vs Reynolds, vs Ca Score

- N = 5140.

- 3 year follow up.

- Ca score better than IMT, but only 2.1 HR for each SD of a log Ca score SD.

Arch Int Med 2008;168:1333-9.

Therapeutic Potential

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Can direct pharmaco-therapeutics.

If CAC > 100, NNT for polypill 18-20 patients.

If CAC 0, NNT was 81-130.

JACC 2014;63:434-43, Bittencourt et al

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- **"the power of zero"**

- If Ca score 0- 5 year risk of mortality is 0.5%

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Current Guidelines

Class IIa for asymptomatic individuals at intermediate risk (10-20%).

(reclassifies 16% as high risk, and 39% as low risk).

Class IIb for low risk (6-10%).

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Summary

Screening has pros and cons.

Screening for coronary disease seems a good idea.

Probably best performed with a combinatation of clinical risk and ca scoring.

Currently no good data to guide us in syncope.

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"Heart Team"
(MDT Meeting with Cardiothoracic Surgeons and Cardiologists)

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Thank You

"The art of medicine consists in amusing the patient while nature cures the disease."

--Voltaire
French author, humanist, rationalist, & satirist (1694 - 1778)

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*"Good judgement comes from experience,
and experience comes from bad
judgement."*

-Lillehei

Quotation

- Eminence is making the same mistake with increasing confidence over an impressive number of years.

- Used at SJH rounds

**Thank you for your attention.
Be careful out there!**

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Anomolus Coronary Artery