Determining Coronary Heart Disease Risk

Role of CACS

Determining Coronary Heart Disease Risk

References

OBJECTIVES

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Cardiovascular Diseases

- <u>Arteriosclerosis</u> Ð loss of elasticity of the arteries; thickening and hardening of artery walls in part, due to atherosclerotic calcification.

- <u>Atherosclerosis</u> Ð process where fatty material is deposited along walls of arteries. This material thickens, hardens, and can eventually block the artery. Atherosclerosis is just one type of Arteriosclerosis.

- Our understanding of the development and progression of atherosclerosis (atherogenesis) is still incomplete

Atherosclerotic Calcification

- ¥ Not Simply Passive Precipitation of Calcium Phosphate Crystals

- ¥ Regulated Process Similar to Bone Formation

- ¥ Occurs when other Aspects of Atherosclerosis are Present

- ¥ Osteocalcin, Osteopontin and mRNA for Bone Morphogenic Protein 2a have been Identified in Calcified Atherosclerotic Lesions
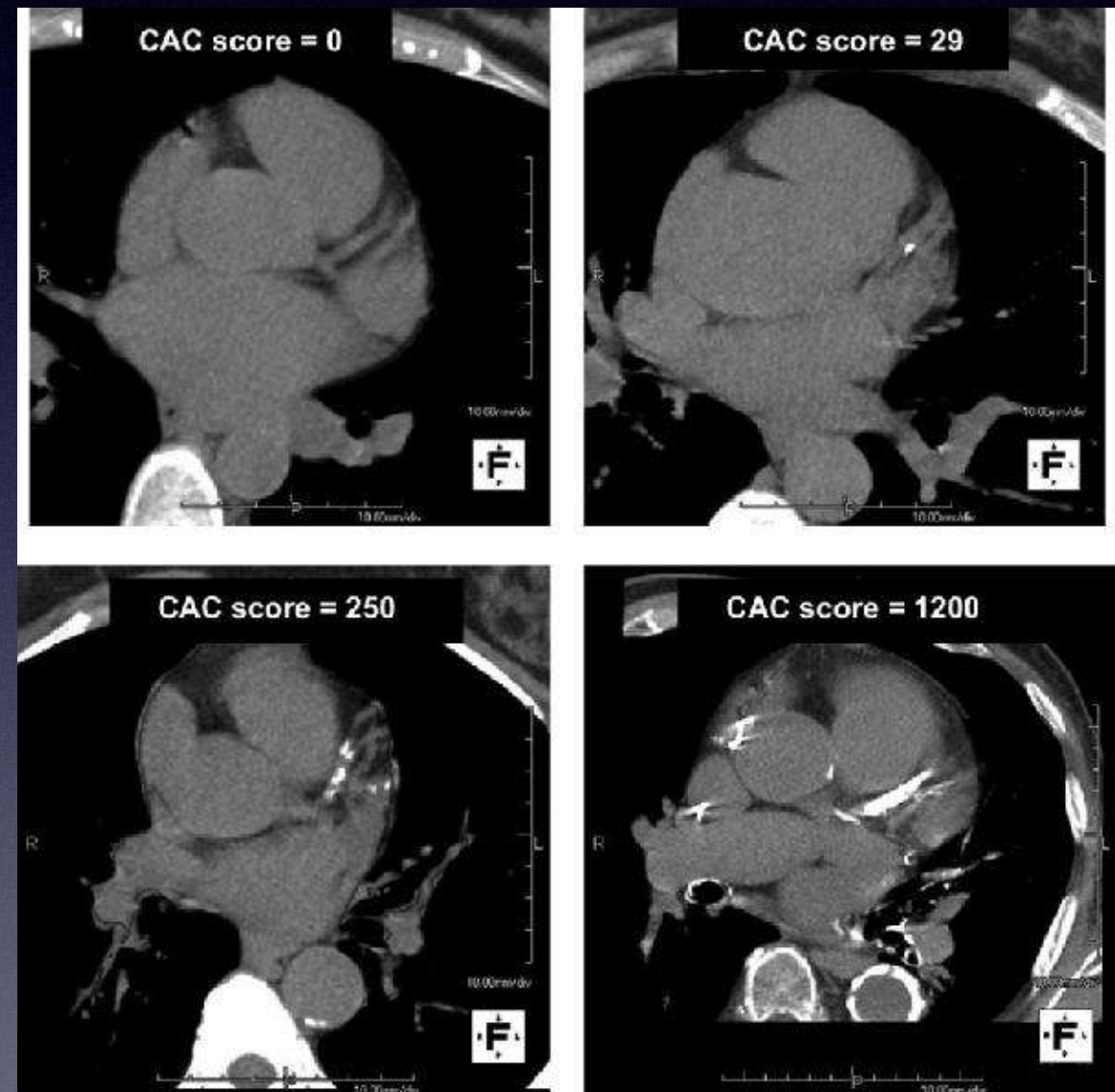
High-risk for future cardiovascular disease?

High-risk for future cardiovascular disease?

What Is Your Risk of Having CVD ?

¥High Risk : Age > 75 y/o

¥Very Low Risk

Ð Total Cholesterol < 200 (150mg%)

Ð BP <= 120/80 mmhg

Ð No Diabetes

Ð No Smoking

Ð No Premature Family Hx

Ð No Metabolic Syndrome

Metabolic Syndrome

Presence of 3 of 5

Triglycerides (mg/dl)	>= 150
HDL Cholesterol (mg/dl) Men Women	<40 <50
Blood Pressure (mmhg)	>=130/>=85
Fasting Glucose (mg/dl)	>=110
Waist Circumference (in) Men Women	>40 >35

Figure 9.1 Body Mass Index: Are You at a Healthy Weight?

BMI

| | 18.5 | 25 | 30 |

Height*

6' 6"
6' 5"
6' 4"
6' 3"
6' 2"
6' 1"
6' 0"
5' 11"
5' 10"
5' 9"
5' 8"
5' 7"
5' 6"
5' 5"
5' 4"
5' 3"
5' 2"
5' 1"
5' 0"
4' 11"
4' 10"

50   75   100   125   150   175   200   225   250   275

Pounds†

■ **Healthy Weight**   ■ **Overweight**   ■ **Obesity**   * Without shoes.   † Without clothes.

Directions: Find your weight on the bottom of the graph. Go straight up from that point until you come to the line that matches your height. Then use the color code to find your weight group.

➢ BMI of 25 defines the upper boundary of healthy weight
➢ BMI of higher than 25 to 30 defines overweight
➢ BMI of higher than 30 defines obesity

10
Figure 9.1

How Does BMI Relate to Health?

The BMI ranges are based on the effect body weight has on disease and death. As BMI increases, the risk for some disease increases.

Some common conditions related to overweight and obesity include:
¥Premature death
¥Cardiovascular disease
¥High blood pressure
¥Osteoarthritis
¥Some cancers
¥Diabetes

RISK CALCULATORS

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Unit of Measure **US** SI   ⟳ Reset All

> **App should be used for primary prevention patients (those without ASCVD) only.**

Current Age ⓘ *

Age must be between 20-79

Sex *

| Male | Female |

Race *

| White |
| African American |
| Other |

Systolic Blood Pressure (mm Hg) *

Value must be between 90-200

Diastolic Blood Pressure (mm Hg) ○

Value must be between 60-130

Total Cholesterol (mg/dL) *

Value must be between 130 - 320

HDL Cholesterol (mg/dL) *

Value must be between 20 - 100

LDL Cholesterol (mg/dL) ⓘ ○

Value must be between 30-300

History of Diabetes? *

| Yes | No |

Smoker? ⓘ *

| Current ⓘ |
| Former ⓘ |
| Never ⓘ |

Lifetime Risk Calculator only provides lifetime risk estimates for individuals 40 to 59 years of age.

Optimal ASCVD Risk: **7.5%**

Unit of Measure | US | SI | ↻ Reset All

> **App should be used for primary prevention patients (those without ASCVD) only.**

Current Age ⓘ *

66

> ⚠ Lifetime Risk Calculator only provides lifetime risk estimates for individuals 40 to 59 years of age.

Age must be between 20-79

Sex *

| ✔ Male | Female |

Race *

| White |
| ✔ African American |
| Other |

Systolic Blood Pressure (mm Hg) *

145

Value must be between 90-200

Diastolic Blood Pressure (mm Hg) ○

90

Value must be between 60-130

Total Cholesterol (mg/dL) *

220

Value must be between 130 - 320

HDL Cholesterol (mg/dL) *

60

Value must be between 20 - 100

LDL Cholesterol (mg/dL) ⓘ ○

90

Value must be between 30-300

History of Diabetes? *

| Yes | ✔ No |

20.2% High | **Current 10-Year ASCVD Risk**

Lifetime Risk Calculator only provides lifetime risk estimates for individuals 40 to 59 years of age.

Optimal ASCVD Risk: **7.5%**

Smoker? ⓘ *

Current ⓘ
Former ⓘ
✔ Never ⓘ

On Hypertension Treatment? ⓘ *

✔ Yes	No

On a Statin? ⓘ ○

✔ Yes	No

On Aspirin Therapy? ⓘ ○

Yes	✔ No

Do you want to refine current risk estimation using data from a previous visit? ⓘ ○

Yes	✔ No

Determine Therapy Impact ⊘

View Advice ⊘

For more information about the inputs and calculations used in this app, see "Terms and Concepts" in the Resources tab below.

**10-year risk for ASCVD is categorized as:

Low-risk (<5%)

Borderline risk (5% to 7.4%)

Intermediate risk (7.5% to 19.9%)

High risk (≥20%)

20.2% High   **Current 10-Year ASCVD Risk***

Lifetime Risk Calculator only provides lifetime risk estimates for individuals 40 to 59 years of age.   Optimal ASCVD Risk: **7.5%**

Project Risk Reduction by Therapy

↻ Reset

❯ **View Advice Summary for this Patient**

Projected 10-Year ASCVD Risk

10.0% with Statin Therapy, BP Medication, Aspirin Therapy

| Quit Smoking ⓘ | Start/Intensify Statin ⓘ |
| Start/Add Blood Pressure Medication(s) ⓘ | Start/continue aspirin therapy ⓘ |

Projected 10-Year ASCVD Risk

10.0% with Statin Therapy, BP Medication, Aspirin Therapy

| Quit Smoking ⓘ | Start/Intensify Statin ⓘ |
| Start/Add Blood Pressure Medication(s) ⓘ | Start/continue aspirin therapy ⓘ |

Treatment Advice*

❯ **LDL-C Management (for this Patient)**

❯ **Blood Pressure Management (for this Patient)**

❯ **Tobacco Cessation (for this Patient)**

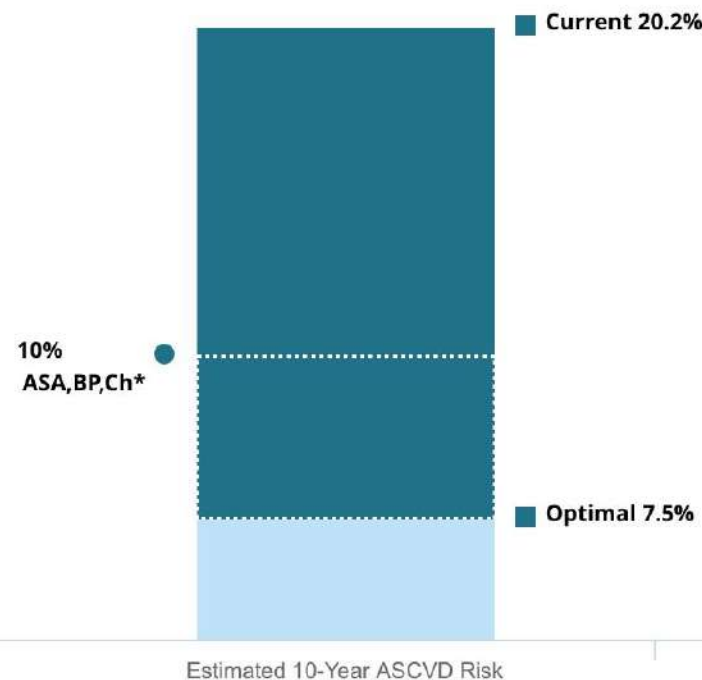❯ **Diabetes Mellitus Management (General)**

❯ **Lifestyle Recommendations (General)**

❯ **Aspirin Use Recommendations (for this Patient)**

❯ **Therapy Safety Information (General)**

ASCVD Risk Profile

10-yr risk for first ASCVD event is:
HIGH

■ Current 20.2%

10%
ASA,BP,Ch*

■ Optimal 7.5%

Estimated 10-Year ASCVD Risk

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Reynolds Risk Score
Calculating Heart and Stroke Risk for Women and Men

If you are healthy and without diabetes, the Reynolds Risk Score is designed to predict your risk of having a future heart attack, stroke, or other major heart disease in the next 10 years.

In addition to your age, blood pressure, cholesterol levels and whether you currently smoke, the Reynolds Risk Score uses information from two other risk factors, a blood test called hsCRP (a measure of inflammation) and whether or not either of your parents had a heart attack before they reached age 60 (a measure of genetic risk). To calculate your risk, fill in the information below with your most recent values. **Click here** for help filling the information.

Gender	⚪ Male ⚪ Female
Age	[____] Years (Maximum age must be 80)
ⓘ **Do you currently smoke?**	⚪ Yes ⚪ No
ⓘ **Systolic Blood Pressure (SBP)**	[____] mm/Hg
ⓘ **Total Cholesterol**	[____] mg/DL (or) [____] mmol/L
ⓘ **HDL or "Good" Cholesterol**	[____] mg/DL (or) [____] mmol/L
ⓘ **High Sensitivity C-Reactive Protein (hsCRP)**	[____] mg/L
ⓘ **Did your Mother or Father have a heart attack before age 60 ?**	⚪ Yes ⚪ No

(Calculate 10 year risk)

Reynolds Risk Score
Calculating Heart and Stroke Risk for Women and Men

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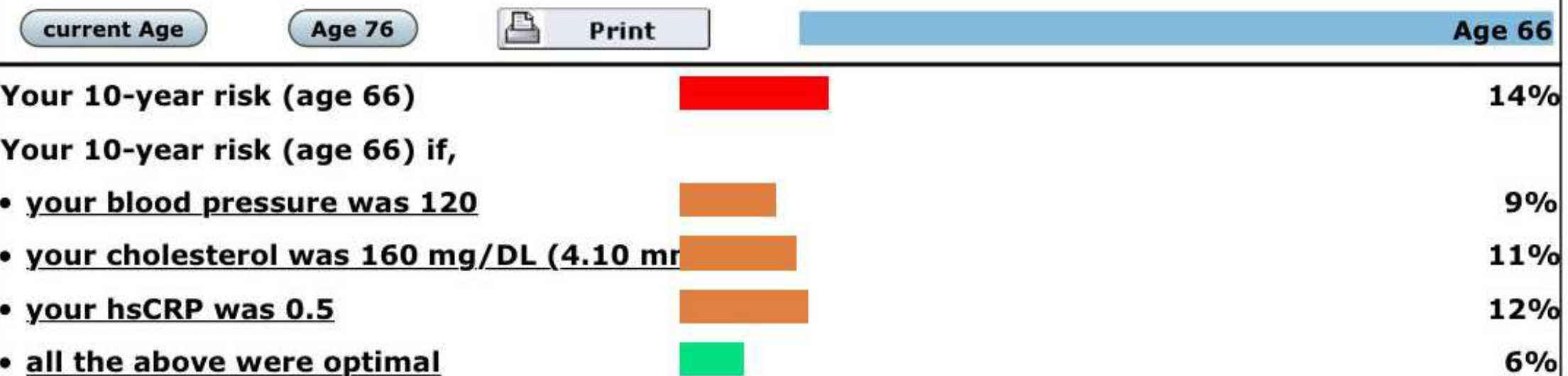|	
Gender	⦿ Male ◯ Female
Age	66 Years (Maximum age must be 80)
i **Do you currently smoke?**	◯ Yes ⦿ No
i **Systolic Blood Pressure (SBP)**	145 mm/Hg
i **Total Cholesterol**	220 mg/DL (or) [ ] mmol/L
i **HDL or "Good" Cholesterol**	60 mg/DL (or) [ ] mmol/L
i **High Sensitivity C-Reactive Protein (hsCRP)**	2 mg/L
i **Did your Mother or Father have a heart attack before age 60 ?**	◯ Yes ⦿ No

(Calculate 10 year risk)

As shown in the graph below, at Age 66, your chance of having a heart attack, stroke, or other heart disease event at some point in the next 10-years is 14 percent. This risk is approximately 2 times higher than that of a Man the same age who has optimal levels of all modifiable risk factors.

| current Age | Age 76 | 🖨 Print | | Age 66 |

Your 10-year risk (age 66)		14%
Your 10-year risk (age 66) if,		
• your blood pressure was 120		9%
• your cholesterol was 160 mg/DL (4.10 mm		11%
• your hsCRP was 0.5		12%
• all the above were optimal		6%

The graph above also compares your risk to that of a Man of age 66 who has optimal levels for all modifiable risk factors, and shows what your risk would be if you improved your individual risk factors. For young Man , risk may appear to be low over the next 10-years, yet can be very high over a lifetime. Thus, to see what your risk would be as you get older if your risk factors remain the same, click on the buttons above.

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Mayo Clinic Shared Decision Making National Resource Center

Cardiovascular Primary Prevention Choice

Statin/Aspirin Choice Decision Aid

The risk reductions attributed to statins and decision aids come from systematic reviews of randomized trials of primary prevention of coronary events with statins (25-30% reduction in risk of coronary events) and aspirin (15-20% reduction in coronary events).

The **risk reduction** in coronary events with fixed standard dose statins (atorvastatin 10 mg, simvastatin 40 mg, pravastatin 40 mg, rosuvastatin 5 mg) has been stable for years and was recently documented in a systematic review to be 25%, with high dose statins (2-3 times standard dose) adding about 15% relative risk reduction (i.e., 40% risk reduction).

Low-dose aspirin can reduce coronary events by about 20-25% and can impact the risk and outcomes of colon cancer and other cancers.
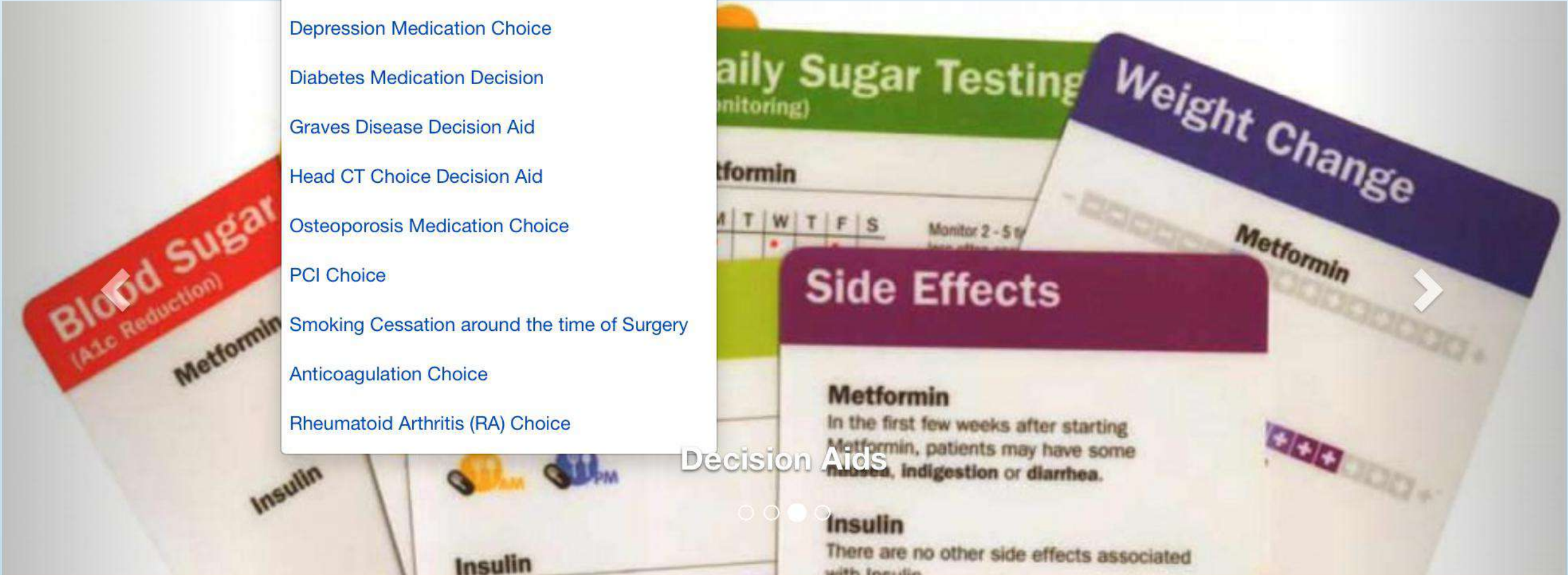
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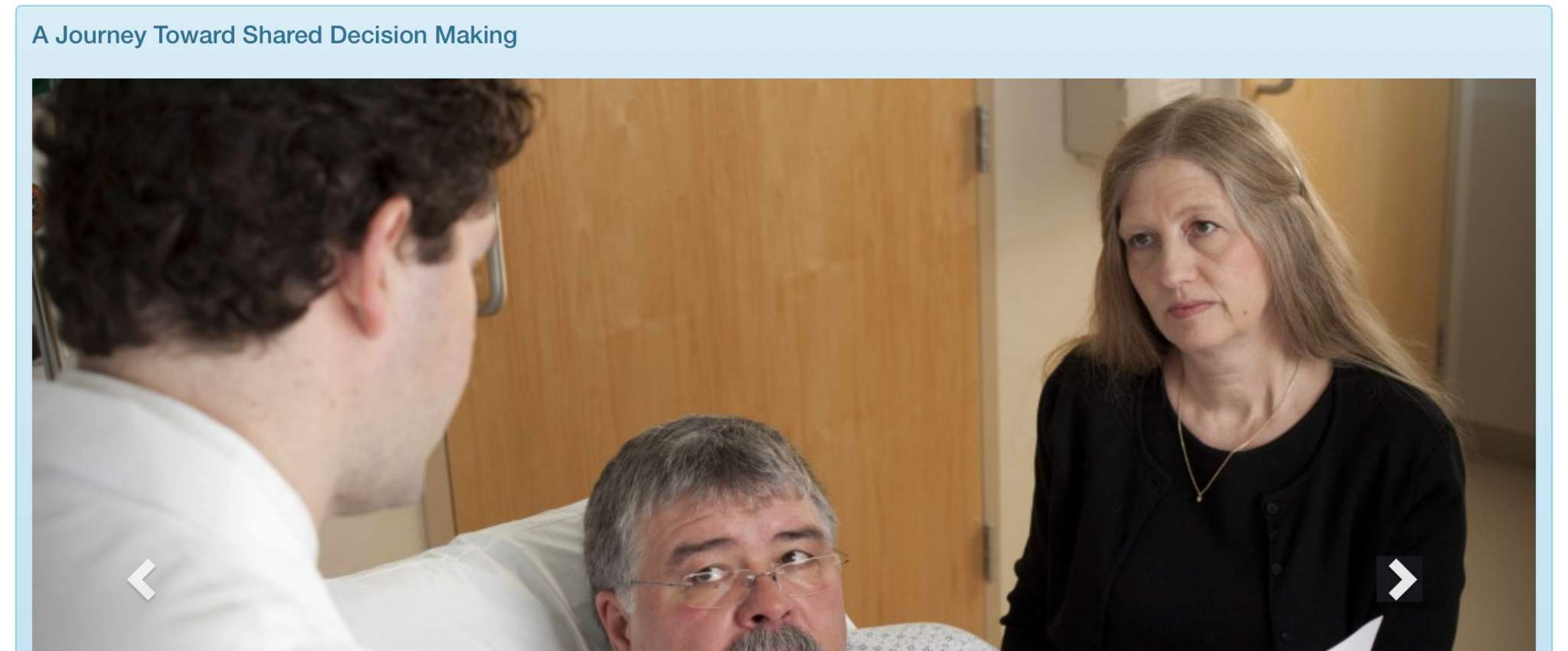
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Cardiovascular Primary Prevention Choice

Chest Pain Choice

Depression Medication Choice

Diabetes Medication Decision

Graves Disease Decision Aid

Head CT Choice Decision Aid

Osteoporosis Medication Choice

PCI Choice

Smoking Cessation around the time of Surgery

Anticoagulation Choice

Rheumatoid Arthritis (RA) Choice

A Journey Toward Share

Decision Aids

MAYO CLINIC **Statin Choice**
Decision Aid

EN   FR   ES
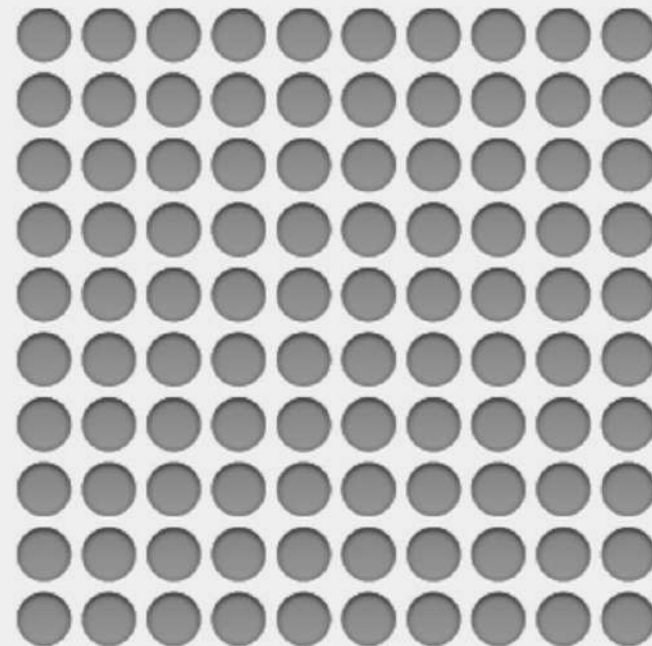
Welcome to the **Statin Choice** Decision Aid.

This tool will help you and your doctor discuss how want to reduce your risk for heart attacks.

Let's get started

Caution: This application is for use exclusively during the clinical encounter with your clinician

Learn how to embed Statin Choice in my EMR/Organization

Credits & Contacts

Privacy policy (Updated May, 2018) Terms and conditions of use policy (Updated February 6,

LEGAL CONDITIONS AND TERMS OF USE APPLICABLE TO ALL USERS OF THIS SITE. ANY USE OF THIS SITE CONSTIT
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Current Risk

×

Select Risk Calculator

ACC/AHA ASCVD   Framingham   **Reynolds**

The availability of high sensitivity CRP suggests the use of this algorithm. ×

Notes   Document   Benefits vs Downsides according to my personal health information

Age	66	
Gender	**M** F	
Smoker	Yes **No**	
Diabetes	Yes **No**	
Parental history of MI	Yes **No**	

Conv. Unit   SI Unit

Systolic Blood Pressure	145	mmHg
HDL Cholesterol	60	mg/dL
Total Cholesterol	220	mg/dL
High Sensitivity CRP	2	mg/L

Select Current Intervention

Statins ● No   ○ Std Dose   ○ High Dose

Current Risk | **Intervention** | Issues | Notes | Document

Benefits vs Downsides according to my personal health information
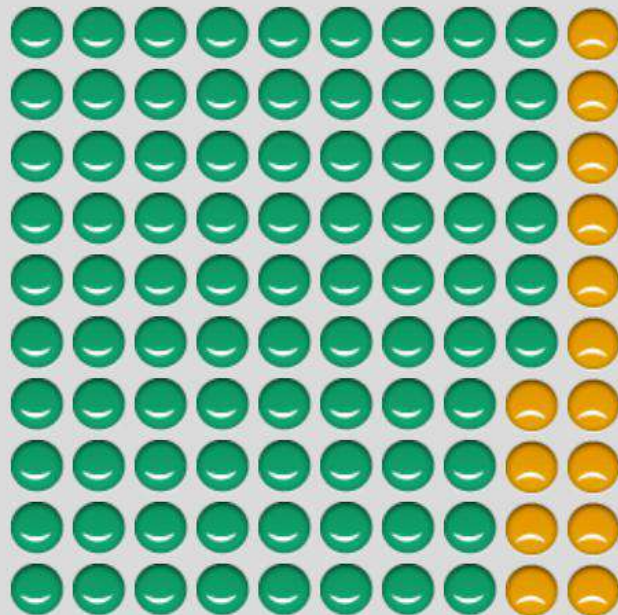Using **Reynolds** Risk Calculator

2. Select Intervention

Current Risk
of having a heart attack

Risk for 100 people like you who **do not** medicate for heart problems
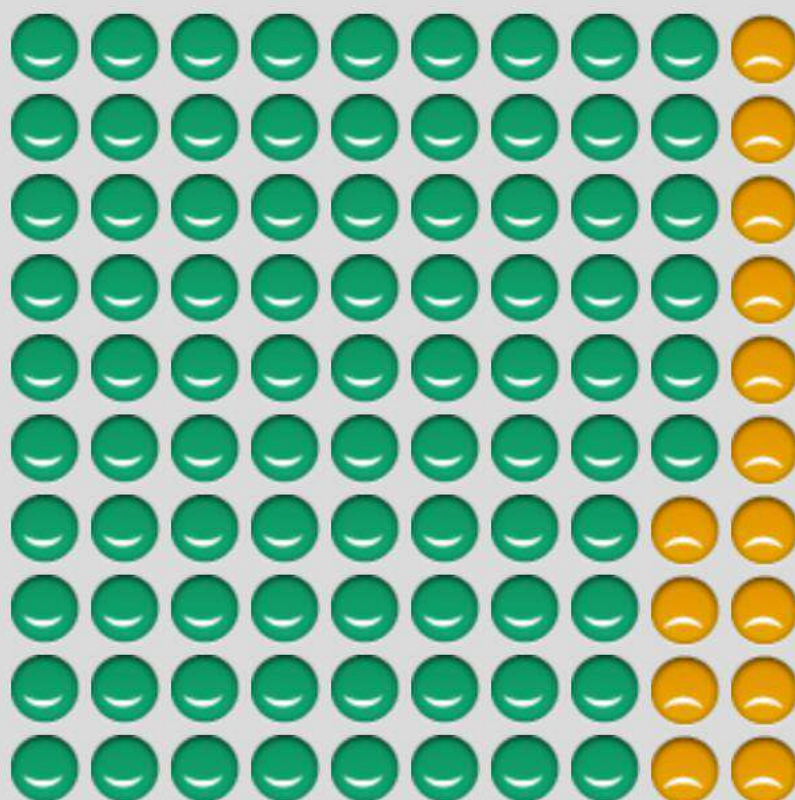
⚠ *No alternative intervention was selected*

Over 10 years

14 people will have a heart attack

86 people will have no heart attack

MAYO CLINIC **Statin Choice** Decision Aid

Current Risk	Intervention	Issues	Notes	Document

3. View Issues

Benefits vs Downsides according to my personal health information
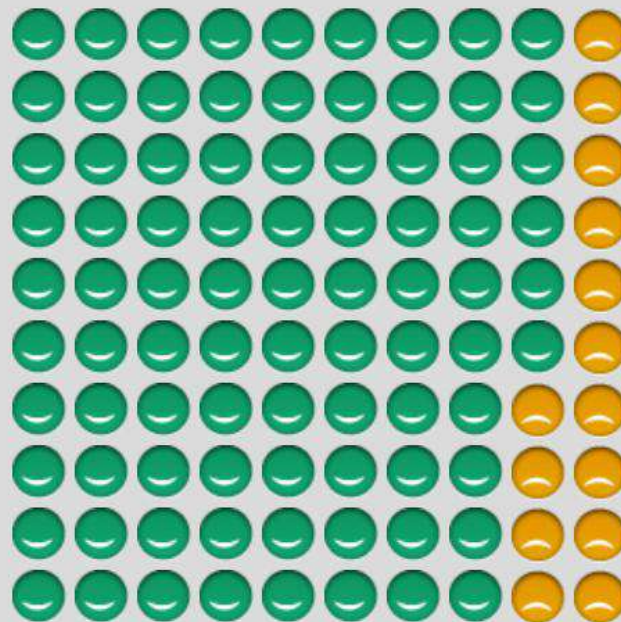
Using **Reynolds** Risk Calculator

Current Risk
of having a heart attack

Risk for 100 people like you who **do not** medicate for heart problems

Over 10 years

14 people will have a heart attack

86 people will have no heart attack

Future Risk
of having a heart attack

Risk for 100 people like you who do take **standard dose statins**

Over 10 years

11 people will have a heart attack

86 people will have no heart attack

3 people will be saved from a heart attack by taking medicine

Learn how to embed Statin Choice in my EMR/Organization

Credits & Contacts

MAYO CLINIC **Statin Choice** Decision Aid

Current Risk | Intervention | **Issues** | Notes | Document

Benefits vs Downsides according to my personal health information
Using **Reynolds** Risk Calculator

3. View Issues

Current Risk
of having a heart attack

Risk for 100 people like you who **do not** medicate for heart problems

Over 10 years

14 people will have a heart attack

86 people will have no heart attack
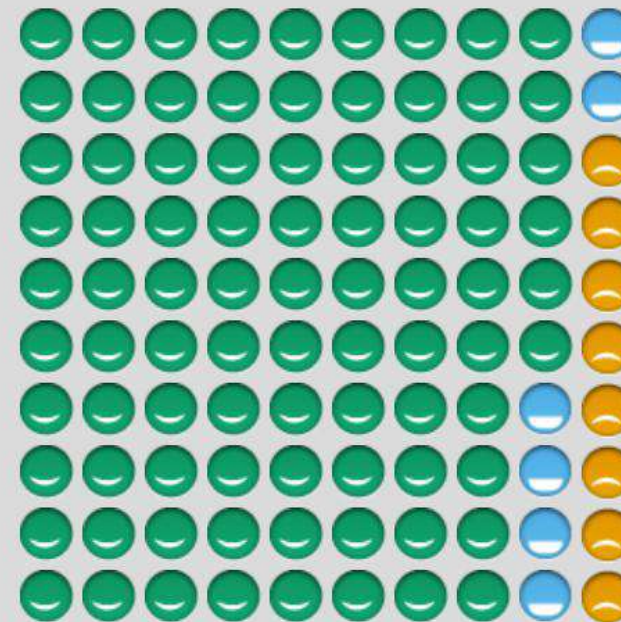
Future Risk
of having a heart attack

Risk for 100 people like you who do take **high dose statins**

Over 10 years

8 people will have a heart attack

86 people will have no heart attack

6 people will be saved from a heart attack by taking medicine

Learn how to embed Statin Choice in my EMR/Organization

Statin Choice
Decision Aid

Current Risk | Intervention | Issues | Notes | Document

Benefits vs Downsides according to my personal health information

Using **Reynolds** Risk Calculator

Current Risk

Cost

Side Effects

Future Risk