*Solutions to Address Individual Risk*

# Cardiometabolic Risk Report

Prepared for
**Tony**

Report Date
**08/02/2023**

Ordering Healthcare Provider

## Car•di•o•meta•bol•ic / *adjective*

Concerning both heart disease and metabolic disorders such as diabetes.

This report provides you with information about your cardiometabolic health based on your recent test results and personal information provided. There may be other factors not part of this report that could affect your risk. Talk to your healthcare provider about these results, questions you may have, and actions you can take to improve your cardiometabolic health. The information we provide is not a substitute for shared decision making with your healthcare provider.

Dear Tony,

This report shows **your individual risk** for **heart attack, stroke, and type 2 diabetes.**

**Cardiometabolic risk** refers to the comprehensive group of factors that together impact your risk for heart attack, stroke, and type 2 diabetes.

Assessing your cardiometabolic risk is like putting together a jigsaw puzzle with 40+ interlocking pieces that together determine your risk for developing these costly and deadly conditions.

Some pieces represent common major risk factors such as high blood pressure, high cholesterol, smoking, elevated blood sugar, and family history of early heart attack, stroke, or diabetes.

Other pieces are part of insulin resistance, the metabolic disorder that begins and accelerates the process of vascular disease and diabetes.

Finally, some pieces are risk enhancing factors. These are specific conditions that measurably increase your risk beyond conventional risk factors.

Your cardiometabolic risk is more than simply counting major risk factors or calculating your risk from equations based on large populations. While these are a good starting point, **multiple expert guidelines** advise including **more than 30 additional "risk-enhancing" factors** to determine your personal cardiometabolic risk.

**Precision Health Reports combines your unique clinical information, appropriate test results, and multiple guidelines to produce a report that identifies your personal risk.**

Regardless of where you start, **you can reduce your risk of heart attack, stroke, and diabetes**. Success depends on implementing the diet, exercise, and medication (if needed) appropriate for your personal risk and following your response using tests most reflective of decreased cardiometabolic risk.

Armed with your Precision Health Report, your healthcare team will be able to offer more personalized counseling and treatment recommendations to address your personal risk, as well as track your improvement over time.

We appreciate the opportunity to be a part of your health journey. Let's get started!
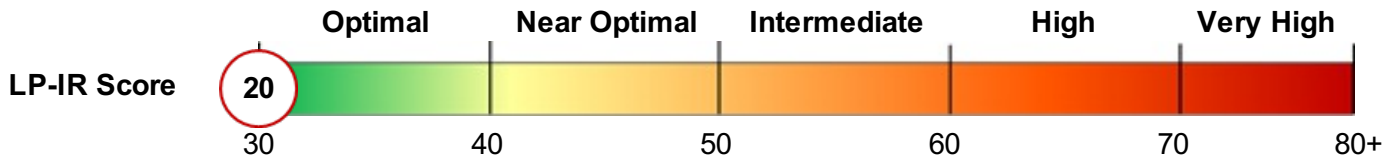
Dr. William Cromwell, MD, FAHA, FNLA
Chief Medical Officer – Precision Health Reports

# Your Cardiometabolic Risk Summary

*(Details for each section are in the following pages)*
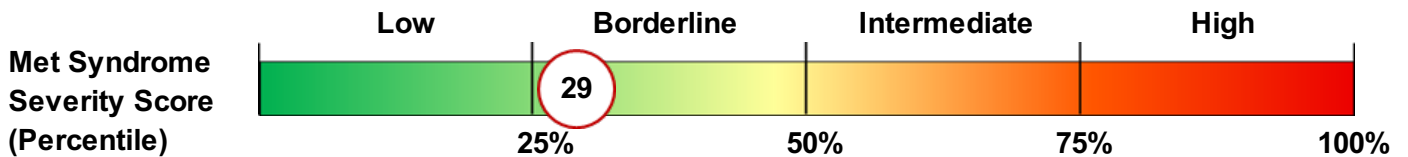
## Your Insulin Resistance—The Common Link

Your Lipoprotein Insulin Resistance Score (LP-IR) shows your gender-specific insulin resistance— the common factor linking metabolic syndrome, type 2 diabetes, and cardiovascular disease. A low value mean you are insulin sensitive (that's ideal), while high scores mean insulin resistant.

| | Optimal | Near Optimal | Intermediate | High | Very High |
|---|---|---|---|---|---|

**LP-IR Score** (20)

30    40    50    60    70    80+

*Learn more about insulin resistance and its impact on you:* https://precisionhealthreports.com/ir-cmr

## Your Metabolic Syndrome Risk

Your Metabolic Syndrome Severity Score is a detailed calculation that accounts for your gender, ethnicity, and clinical factors related to insulin resistance (aka "metabolic syndrome"). This score gives you a comprehensive picture of the severity of your metabolic syndrome related risk.

| | Low | Borderline | Intermediate | High |
|---|---|---|---|---|

**Met Syndrome Severity Score (Percentile)** (29)

25%    50%    75%    100%

## Your Type 2 Diabetes Risk

Your gender-specific risk for developing type 2 diabetes is based on both your fasting glucose and your (LP-IR) score.

| | Low | Moderate | High | Very High |
|---|---|---|---|---|

**8-Year Diabetes Risk (Percent)** (2)

10%    15%    25%
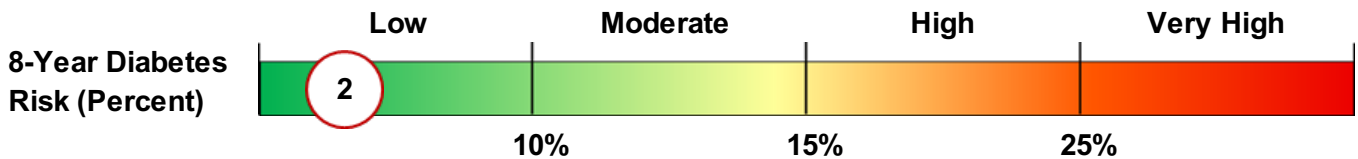
## Your Overall Cardiovascular Risk (Heart Attack, Stroke)

Your individual risk for a cardiovascular event (heart attack or stroke) is a combination of your calculated risk and any of 30+ guideline defined Risk Enhancing Factors.

| | Low | Moderate | High | Very High |
|---|---|---|---|---|

**Overall CV Risk** (X)
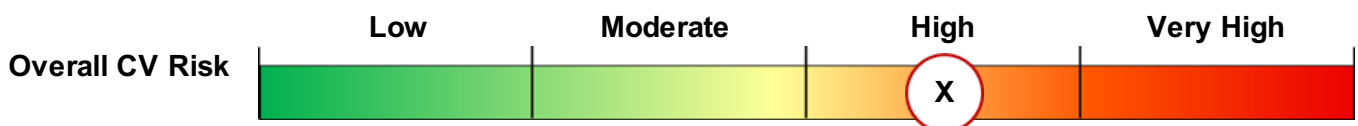
# Your Metabolic Risk Details

## Insulin Resistance Status

| | **Insulin Sensitive** | | | | | | **Insulin Resistant** |

**NMR LP-IR Score**   ⬤ **20**

30    40    50    60    70    80+

The LP-IR Score is derived from several lipoprotein markers of insulin resistance.[1] The higher your LP-IR score, and the greater your insulin resistance,[2] the higher risk for type 2 diabetes.[3-6]

## Insulin Resistance Syndrome ("Metabolic Syndrome")

Several insulin resistance factors cluster together to increase your risk for type 2 diabetes, heart attack, and stroke.[7] This cluster of factors is termed the **Insulin Resistance Syndrome** or Metabolic Syndrome.[8]
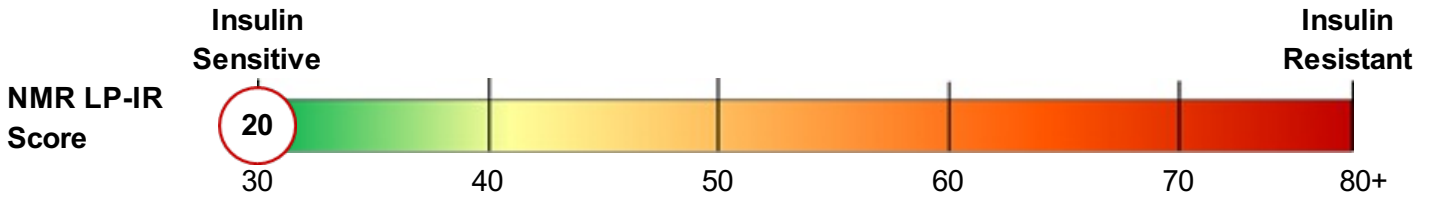
Metabolic syndrome is present if you have 3 or more Metabolic Syndrome criteria (shaded yellow) below.

Additional syndrome factors, elevated inflammation (GlycA) and high atherogenic particle number (Apo B), further increase your risk and are shaded red if they meet the high-risk criteria listed below.

| Metabolic Syndrome Factors for Your Gender & Ethnicity | Criteria | Your Value |
|---|---|---|
| **1. Waist Measurement (inches)** | > 40 | 38 |
| **2. Blood Pressure (mmHg)*** | | |
| Systolic Pressure <u>or</u> | ≥ 130 | 112 |
| Diastolic Pressure | ≥ 85 | 78 |
| **3. Fasting Glucose (mg/dL)*** | ≥ 100 | 85 |
| **4. Triglycerides (mg/dL)*** | ≥ 150 | 88 |
| **5. HDL Cholesterol (mg/dL)*** | < 40 | 56 |

\* or on drug treatment for these factors

**You have 0 of 5 Metabolic Syndrome Criteria**

**Insulin Resistance Syndrome**
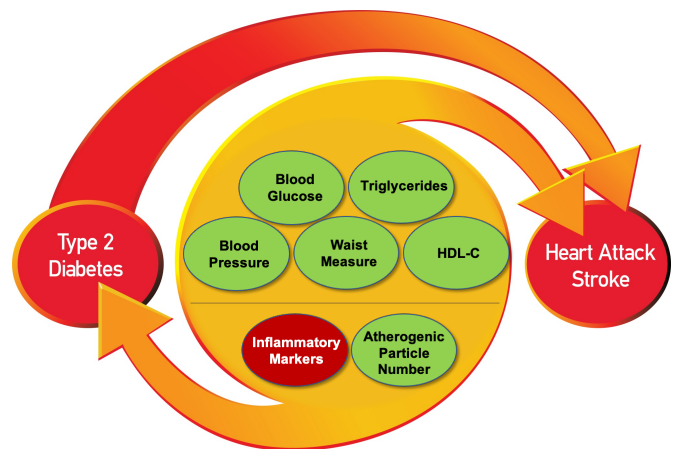
### Additional High-Risk Syndrome Factors

| | Criteria | Your Value | |
|---|---|---|---|
| Inflammation GlycA (umol/L) | > 400 | 409 | https://bit.ly/Glyc_A |
| Atherogenic Particle Number Apo B (mg/dL) | > 110 | 77 | https://bit.ly/LDL-P |

## Metabolic Syndrome Severity Score https://bit.ly/MetSynSS

The Metabolic Syndrome Severity Score assesses the clinical impact of your metabolic syndrome factors.[9,10] The higher the score, the greater your metabolic syndrome-related risk for type 2 diabetes,[11-13] heart attack, and stroke.[13-16] **This score can be significantly improved with diet and exercise**.

| | Low | Borderline | Intermediate | High |

**Met Syndrome Severity Score (Percentile)**   ⬤ **29**

25%    50%    75%    100%
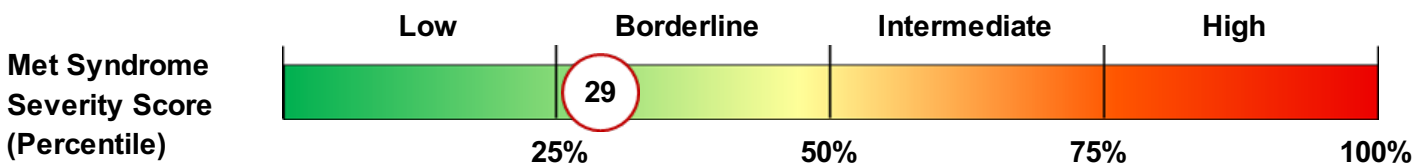
# Your Diabetes Risk Details

## Glycemic status

**Hemoglobin A1C (percent)**

| | Normal | Pre-Diabetes | Diabetes |
|---|---|---|---|

**5.2**

4        5.6        6.4        9

## NMR Lipoprotein Insulin Resistance Score (LP-IR)

**LP-IR Score**

| Optimal | Near Optimal | Intermediate | High | Very High |
|---|---|---|---|---|

**20**

30    40    50    60    70    80+
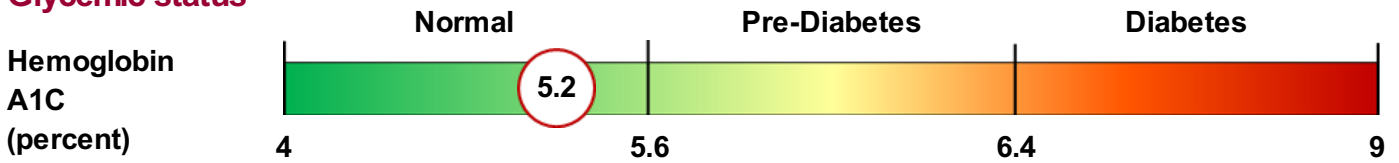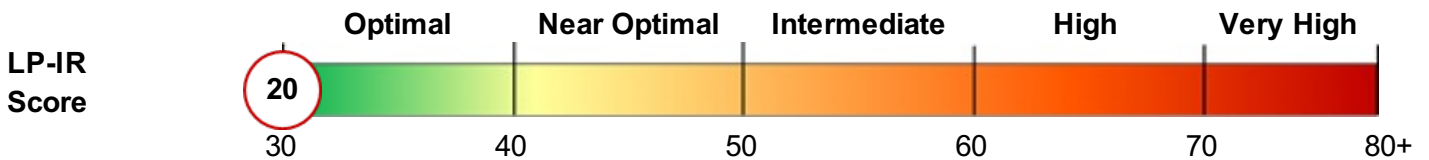
## Your Diabetes Status*

While elevated glucose and elevated LP-IR score are both associated with risk of type 2 diabetes, your probability of developing diabetes depends on both your LP-IR Score and fasting glucose level.[3,4,6]



Graph: 8-Year Estimated Diabetic Risk (Percent) vs. Glucose (mg/dL). Legend: Maximum LP-IR Score (red line), Minimum LP-IR Score (green line). Risk bands labeled Very High Risk, High Risk, Moderate Risk, Low Risk. Marker shows 2%. X-axis: 70, 100, 125 with Normal, Pre-Diabetes, Diabetes ranges.
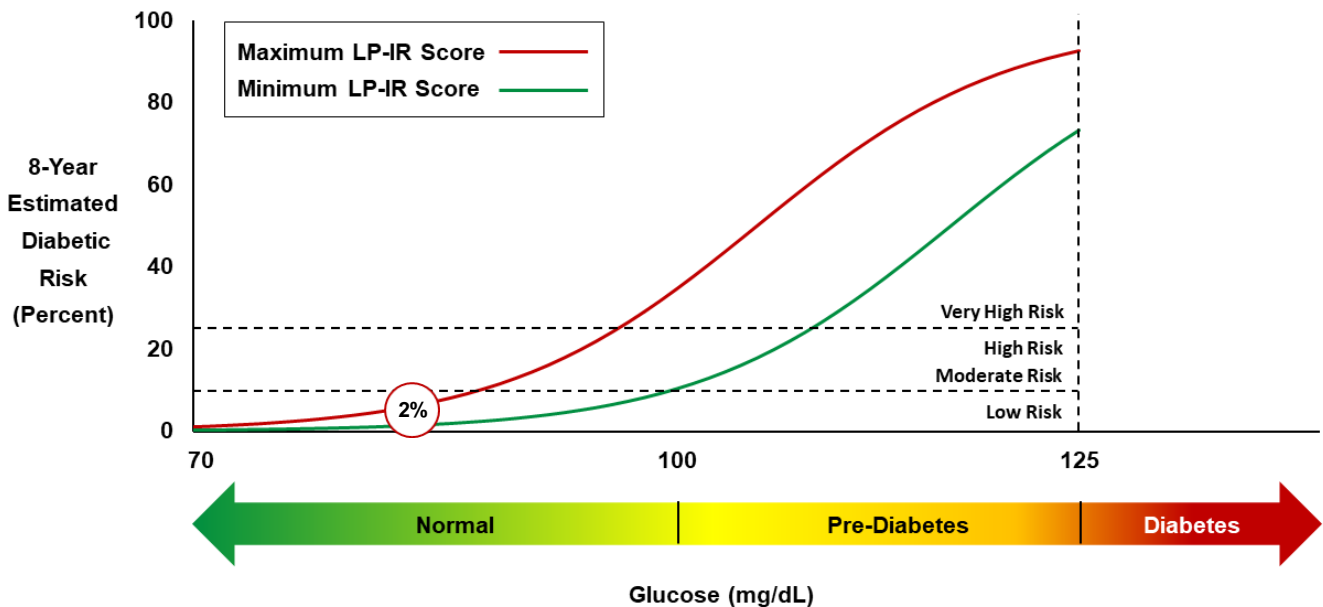
## Your Diabetes Risk Is Modifiable

Diet and lifestyle modification can significantly improve your diabetes risk.

The most important modifiable factor in preventing development of diabetes is insulin resistance.

**As you lower your LP-IR score, diabetic risk decreases at any glucose level.**

\* Based on data from the Multi-Ethnic Study of Atherosclerosis

# Your Cardiovascular Risk Details

## Guideline Calculated Cardiovascular Risk

The American College of Cardiology (ACC) Pooled Cohort Equation is based on age, gender, race, total cholesterol, HDL cholesterol, diabetes, blood pressure, smoking status, and medications (high blood pressure, statins, aspirin) in individuals with no history of cardiovascular events.[17] https://mayocl.in/3b7wK5T



**10 Year Risk (Percent)** — Low | Borderline | Intermediate | High; value 0.4; thresholds 5%, 7.5%, 20%

**Lifetime Risk (Percent)** — Optimal | Not Optimal | High; value 5; thresholds 5%, 36%, ≥46%

## Clinical Factors That Further Enhance Your Cardiovascular Risk

**Elevated CAC Score 56.6 (92% at age 41)**          **Obstructive Sleep Apnea**

**High GlycA (≥ 400 umol/L)**

## Your Cardiovascular Risk (Cardiovascular Risk Plus Risk Enhancing Factors)
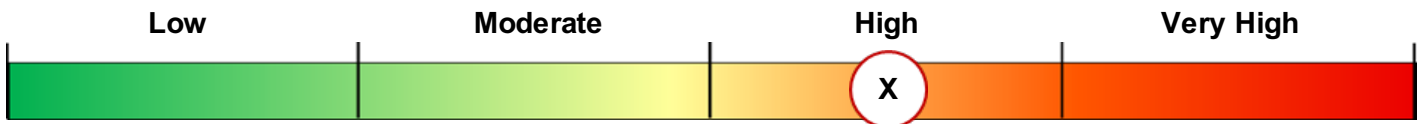


Low | Moderate | High | Very High — marker X at High

Your individual risk for a cardiovascular event (Heart Attack or Stroke) is a combination of your calculated risk and the presence of clinical factors that enhance your risk.[17]
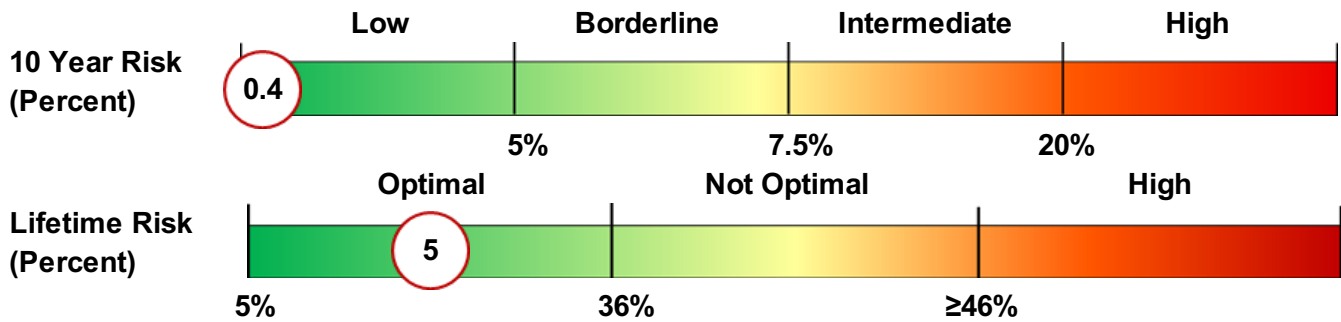
## Your Personalized Lipoprotein Management Goals to Improve Your Risk Scores

| Atherogenic Cholesterol Test | Your Baseline Values | Your Current Values | Threshold Goal (Value to stay below to reduce your CV risk - the lower, the better) |
|---|---|---|---|
| **LDL-C (mg/dL)** | 69 | 69 | **< 34 \*\*** |
| **Non HDL-C (mg/dL)** | 86 | 86 | **< 64** |

| Atherogenic Particle Number Test * | Your Baseline Values | Your Current Values | Threshold Goal (Value to stay below to reduce your CV risk - the lower, the better) |
|---|---|---|---|
| **ApoB mg/dL** | 77 | 77 | **< 38 \*\*** |

\* The greatest reduction in cardiovascular risk occurs with reduction of particle number.[20-22] The lower the particle number attained, and the longer low particle number is maintained, the greater the reduction in cardiovascular risk.[21,22]

\*\* For your risk category, the threshold goal is the lower of two guideline-recommended numbers – the recommended percent reduction from baseline, OR the recommended absolute value.[18,29-30]

**Name: Tony** [REDACTED]

**Date of Birth:** [REDACTED]   **Age: 41**

**Report Date: 08/02/2023**

**Gender: Male**

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# Additional Topics for Discussion with Your Provider

## Learn More about Reading Your Cardiometabolic Risk Assessment Report

https://precisionhealthreports.com/understanding-your-cardiometabolic-risk-report

## Your Systemic Inflammation is High (GlycA ≥ 400 umol/L)

GlycA is a very sensitive and stable biomarker that reflects the level of inflammation throughout your body. GlycA is significantly predictive of risk for cardiovascular events and diabetes. Learn more about GlycA and your potential next steps at: https://precisionhealthreports.com/high-glyca

## References cited throughout this report may be found at:

https://precisionhealthreports.com/cmr-references

# Your Comprehensive Tracking Charts & Additional Information

**NOTE:** Several topics marked with (link) will take you to additional useful information about the topic.

For off line use, this QR code will take you to a reference page with all topics covered in this report.



Learn More

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# Metabolic Risk Tracking

## Metabolic Syndrome Factors

| Test | Date | Waist (inches) | Systolic BP (mm/Hg) | Diastolic BP (mm/Hg) | Glucose (mg/dL) | Triglycerides (mg/dL) | HDL Cholesterol (mg/dL) |
|---|---|---|---|---|---|---|---|
| 1 | 08/02/2023 | 38 | 112 | 78 | 85 | 88 | 56 |

Individual metabolic syndrome factors meeting criteria are highlighted in yellow.

## Metabolic Syndrome Severity Score, Inflammation (GlycA)



| Low Risk | < 25 % | < 400 umol/L |
|---|---|---|

The Metabolic Syndrome Severity Score assesses the clinical impact of your metabolic syndrome factors.[9-10] The higher the score, the greater your metabolic syndrome-related risk for type 2 diabetes,[11-13] heart attack, and stroke.[13-16] You can significantly improve this score with proper diet and exercise.

# Diabetes Risk Tracking

| Test | Date | Hemoglobin A1C (Percent) | Fasting Glucose (mg/dL) | LP-IR Score | Estimated 8 Year Diabetic Risk (Percent) | Risk |
|------|------|--------------------------|--------------------------|-------------|------------------------------------------|------|
| 1 | 08/02/2023 | 5.2 | 85 | 20 | 2 | LOW |
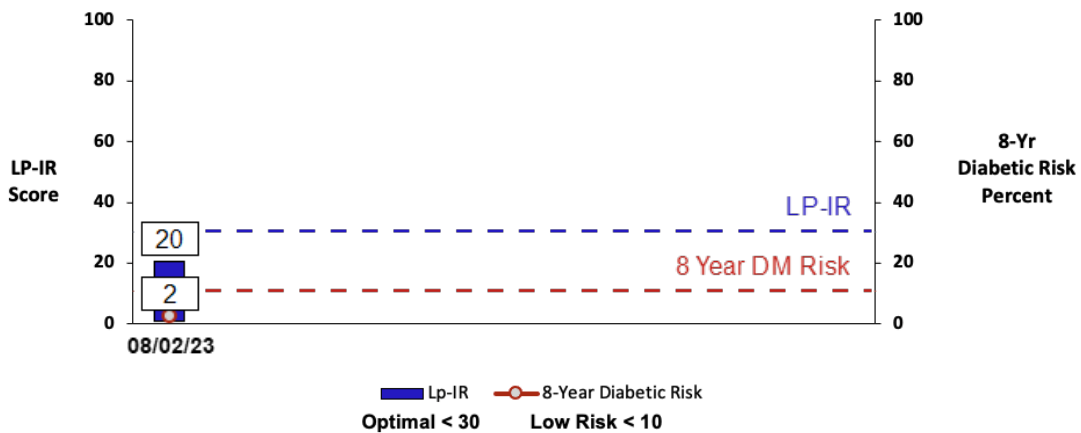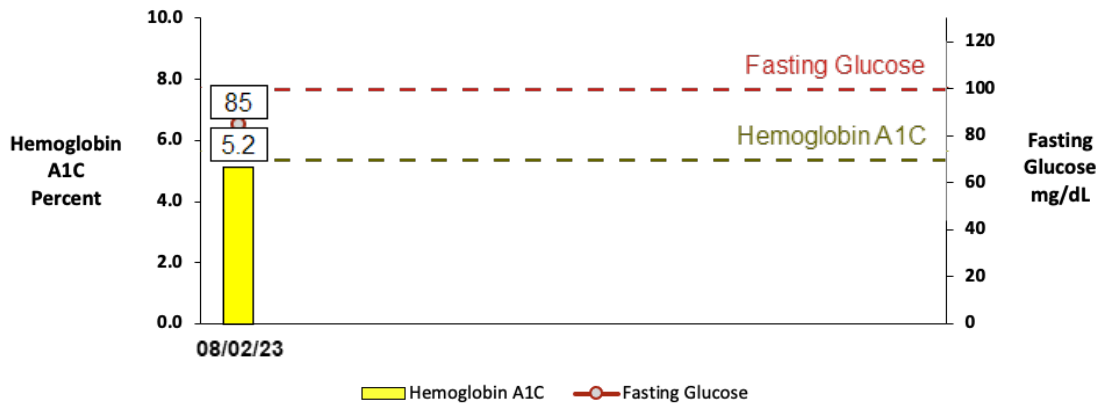


**Your risk of developing diabetes depends on your LP-IR score and glucose levels.[4,6]**

**Lifestyle interventions producing weight loss and increased insulin sensitivity have been shown to significantly lower LP-IR scores, improve insulin sensitivity, lower glucose, and are associated with preventing or delaying the onset of type 2 diabetes.[23-28]**

# Atherogenic Lipoprotein Tracking

| Test | Date | LDL-C (mg/dL) | | Non HDL-C (mg/dL) | | ApoB (mg/dL) | |
|------|------|-------|------|-------|------|-------|------|
| | | Value | Goal | Value | Goal | Value | Goal |
| 1 | 08/02/2023 | 69 | 34 | 86 | 64 | 77 | 38 |



Threshold Goal    < 34 mg/dL    < 64 mg/dL



Threshold Goal    < 38 nmol/L
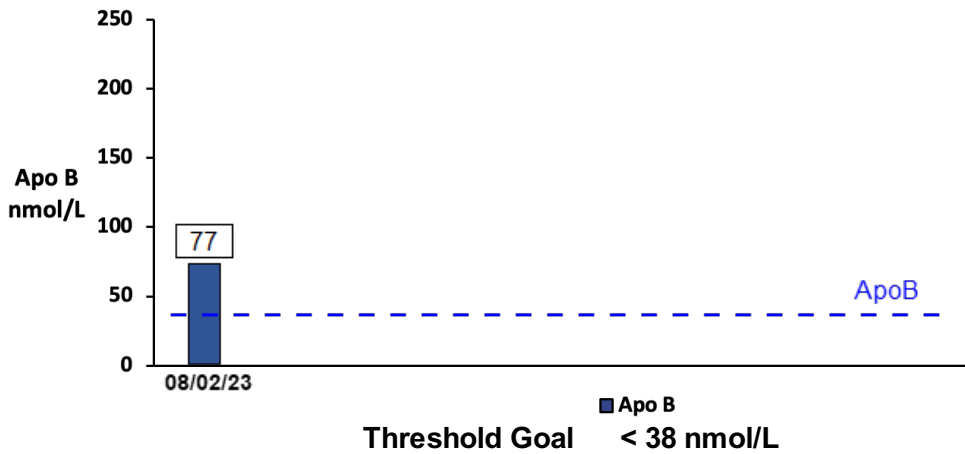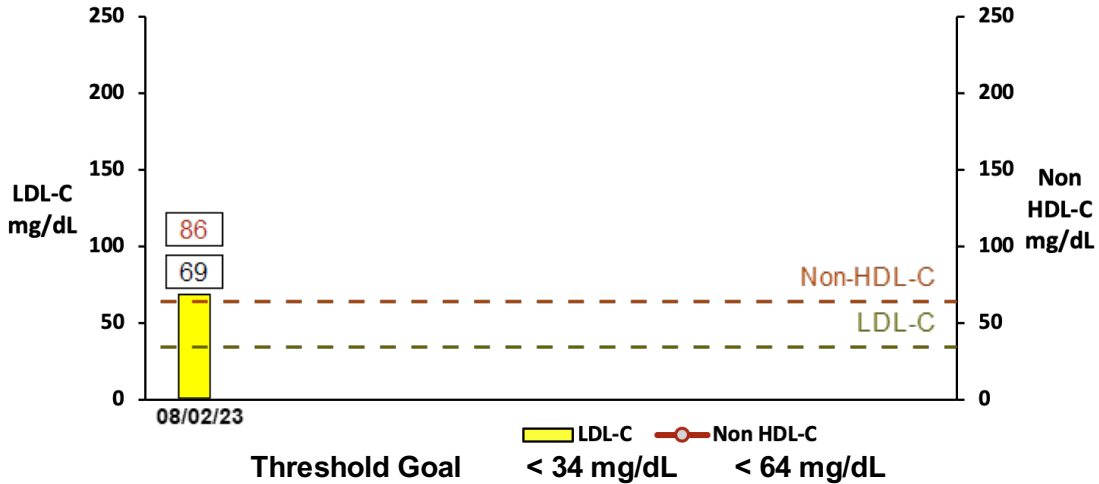
The greatest reduction in cardiovascular risk occurs with reduction of ApoB[20-22]

The lower the particle number attained, and the longer low particle number is maintained, the greater the reduction in cardiovascular risk.[21,22]

**Name: Tony** ▨

**Date of Birth:** ▨     **Age: 41**

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**Report Date: 08/02/2023**

**Gender: Male**

# Information Provided from the Pre-Assessment Survey

**Height:** 66 inches    **Weight:** 185 lbs    **Waist:** 38 inches    **BMI:** 29.9    **Blood Pressure:** 112 / 78
**Ethnicity / Race:** White

**Reported Blood Pressure History:** No
     On Blood Pressure Medication: No

**Reported Glucose History: Borderline / Prediabetes**
     Diabetes During Pregnancy: No
     On Glucose Lowering Medication: No
     Parental Family History Diabetes: No
     Evidence of Possible Diabetic Organ Damage:
         Diabetic Eye Disease: No
         Diabetic Kidney Disease: No
         Urine Protein Elevation: No
         Nerve Damage / Symptoms (numbness, pain): No

**Reported Smoking History:**
     Do You Currently Smoke: No
     Did You Previously Smoke: No

**Reported Cardiovascular History:**
     ANY Artery Blockage: No
     ANY Abnormal Test for Artery Blockage:
         Coronary Artery Calcium: **Performed, CAC Score 56.6 (92%) at Age 41**
         Coronary CT Angiogram: Not Performed
         Carotid Ultrasound (CIMT, Duplex): Not Performed
         Ankle Brachial Index: Not Performed
         Ultrasound or Angiogram Leg Arteries: Not Performed
         Coronary Angiogram: Not Performed
         Carotid Angiogram: Not Performed
     ANY Worsening of Artery Blockage on Follow Up Testing: No
     Symptomatic Cardiovascular Disease:
         Angina: No
         Unstable Angina: No          Dates:
         Claudication: No
         TIA: No
         Stroke: No          Dates:
         Heart Attack: No          Dates:
         Silent Heart Attack: No
         Coronary Angioplasty/Stent: No          Dates:
         Coronary Artery Bypass Surgery: No          Dates:
         Peripheral Artery (Leg) Surgery: No          Dates:
         Carotid (Neck) Artery Stent / Surgery: No          Dates:
     Family History Premature ASCVD (Male age < 55; Female age < 65): No

**PRECISION**
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**Name: Tony** ▮▮▮▮

**Date of Birth:** ▮▮▮▮    **Age: 41**

**Report Date: 08/02/2023**

**Gender: Male**

**Reported Lipid / Lipoprotein History:**

Highest LDL Cholesterol: **between 160-189 mg/dL**

Have You Been Diagnosed with Familial Hypercholesterolemia (FH): No

Have You Had a Positive DNA Test for FH: No

Possible FH Physical Findings:

Achilles Tendon Thickening: **Unknown**

Tendon Xanthomas: **Unknown**

Corneal Arcus Before Age 45: **Unknown**

Relative Diagnosed with FH: **Unknown**

Family History – FH Characteristics:

Adult (> 18 years) LDL-C > 190 mg/dL: **Unknown**

Child (< 18 years) LDL-C > 160 mg/dL: **Unknown**

Achilles Tendon Thickening: **Unknown**

Tendon Xanthomas: **Unknown**

Corneal Arcus Before Age 45: **Unknown**

Current Lipid Medications Taken

LDL Lowering Medicine: No

Statin: No

HDL Raising Medicine: No

Triglyceride Lowering Medicine: No

**Reported Additional Risk Enhancing Factor History:**

Do You Have a History of ANY of The Following Conditions?

Metabolic Syndrome: No

Chronic Kidney Disease (stage 3 or 4): No

Congestive Heart Failure: No

Atrial Fibrillation: No

Non-alcoholic Fatty Liver Disease: No

Aortic Aneurysm: No

Left Ventricular Hypertrophy: No

Obstructive Sleep Apnea: **Yes**

Psoriasis: No

Rheumatoid Arthritis: No

Ankylosing Spondylitis: No

HIV / AIDS: No

Systemic Lupus Erythematosus: No

History of Preeclampsia or Eclampsia During Pregnancy: No

History of Menopause Before Age 40: No

Erectile Dysfunction: No

Have You Ever Had a Positive Diagnosis for COVID19: **Yes**

| Date Collected: **03/15/2023** | Date Received: **03/15/2023** | Date Reported: **03/16/2023** | Fasting: **Yes** |
|---|---|---|---|

Ordered Items: **Lipid Panel+ApoB+IR; Hemoglobin A1c; Lipoprotein (a); GlycA; Glucose; Drawing Fee**

Date Collected: **03/15/2023**

## Lipid Panel+ApoB+IR

| Test | Current Result and Flag | Previous Result and Date | Units | Reference Interval |
|---|---|---|---|---|
| Cholesterol, Total [A, 01] | 142 | | mg/dL | 100-199 |
| Triglycerides [A, 01] | 88 | | mg/dL | 0-149 |
| HDL-C [A, 01] | 56 | | mg/dL | >39 |
| Non-HDL Cholesterol [01] | 86 | | mg/dL | 0-129 |
| LDL-C (NIH Calc) [01] | 69 | | mg/dL | 0-99 |

```
                                    Optimal          <   100
                                    Above optimal   100 - 129
                                    Borderline      130 - 159
                                    High            160 - 189
                                    Very high         >   189
```

| | | | | |
|---|---|---|---|---|
| Apolipoprotein B [01] | 77 | | mg/dL | <90 |

```
                                    Desirable          < 90
                                    Borderline High   90 -  99
                                    High             100 - 130
                                    Very High           >130
          -------------------------------------------------
                    ASCVD RISK          THERAPEUTIC TARGET
                     CATEGORY             APO B (mg/dL)
               Very High Risk       <80 (if extreme risk <70)
               High Risk            <90
               Moderate Risk        <90
```

| | | | | |
|---|---|---|---|---|
| Insulin Resistance/Diab. Risk [01] | | | | |
| Large VLDL-P [A, 01] | <0.8 | | nmol/L | <=2.7 |
| Small LDL-P [A, 01] | 267 | | nmol/L | <=527 |
| Large HDL-P [A, 01] | 7.2 | | umol/L | >=4.8 |
| VLDL Size [A, 01] | 42.6 | | nm | <=46.6 |
| LDL Size [A, 01] | 20.8 | | nm | >=20.8 |
| HDL Size [A, 01] | 9.4 | | nm | >=9.2 |
| Insulin Resistance Score [01] | | | | |
| LP-IR Score [A, 01] | <25 | | | <=45 |

```
          -------------------------------------------------
                  INSULIN RESISTANCE / DIABETES RISK MARKERS
                  <--Insulin Sensitive      Insulin Resistant-->
                      Percentile in Reference Population
          Large VLDL-P    Low      25th    50th    75th    High
                          <0.9     0.9     2.7     6.9     >6.9
          Small LDL-P     Low      25th    50th    75th    High
                          <117     117     527     839     >839
          Large HDL-P     High     75th    50th    25th    Low
                          >7.3     7.3     4.8     3.1     <3.1
          VLDL Size       Small    25th    50th    75th    Large
                          <42.4    42.4    46.6    52.5    >52.5
          LDL Size        Large    75th    50th    25th    Small
                          >21.2    21.2    20.8    20.4    <20.4
          HDL Size        Large    75th    50th    25th    Small
```

Patient ID:
Specimen ID:

DOB:
Age: **41**
Sex: **Male**

**Patient Report**
Account Number:
Ordering Physician:

labcorp

Date Collected: **03/15/2023**

## Lipid Panel+ApoB+IR (Cont.)

```
                              >9.6    9.6     9.2     8.9    <8.9
          Insulin Resistance Score
          LP-IR SCORE          Low     25th    50th    75th    High
                              <27     27      45      63     >63

          ------------------------------------------------------
```

| Comment: 01 | |
|---|---|
| | LP-IR Score is inaccurate if patient is non-fasting. The LP-IR score is a laboratory developed index that has been associated with insulin resistance and diabetes risk and should be used as one component of a physician's clinical assessment. |

## Hemoglobin A1c

| Test | Current Result and Flag | Previous Result and Date | Units | Reference Interval |
|---|---|---|---|---|
| Hemoglobin A1c 01 | 5.2 | | % | 4.8-5.6 |
| Please Note: 01 | Prediabetes: 5.7 - 6.4<br>Diabetes: >6.4<br>Glycemic control for adults with diabetes: <7.0 | | | |

## Lipoprotein (a)

| Test | Current Result and Flag | Previous Result and Date | Units | Reference Interval |
|---|---|---|---|---|
| Lipoprotein (a) 01 | <8.4 | | nmol/L | <75.0 |
| | **Results verified by repeat testing**<br>Note:  Values greater than or equal to 75.0 nmol/L may indicate an independent risk factor for CHD, but must be evaluated with caution when applied to non-Caucasian populations due to the influence of genetic factors on Lp(a) across ethnicities. | | | |

## GlycA

| Test | Current Result and Flag | Previous Result and Date | Units | Reference Interval |
|---|---|---|---|---|
| ▲ **GlycA** A, 01 | **409**          **High** | | umol/L | <400 |
| | GlycA Medical Decision Limit:<br>    Low Risk          <400<br>    High Risk         >or=400 | | | |

## Glucose

| Test | Current Result and Flag | Previous Result and Date | Units | Reference Interval |
|---|---|---|---|---|
| Glucose 01 | 85 | | mg/dL | 70-99 |

**Disclaimer**

The Previous Result is listed for the most recent test performed by Labcorp in the past 5 years where there is sufficient patient demographic data to match the result to the patient. Results from certain tests are excluded from the Previous Result display.

**Icon Legend**

▲ Out of Reference Range     ■ Critical or Alert

**Comments**

A: This test was developed and its performance characteristics determined by Labcorp. It has not been cleared or approved by the Food and Drug Administration.

**Performing Labs**

01: BN - Labcorp Burlington 1447 York Court, Burlington, NC, 27215-3361 Dir: Sanjai Nagendra, MD

For Inquiries, the physician may contact Branch: 800-762-4344 Lab: 800-762-4344

| Patient Details | Physician Details | Specimen Details |
|---|---|---|
| ▮▮▮▮▮ | ▮▮▮▮▮ | Specimen ID: ▮▮▮▮▮ |
| | ▮▮▮▮▮ | Control ID: ▮▮▮▮▮ |
| | ▮▮▮▮▮ | Alternate Control Number: ▮▮▮▮▮ |
| Phone: | ▮▮▮▮▮ | Date Collected: ▮▮▮▮▮ |
| Date of Birth: ▮▮▮▮▮ | | Date Received: ▮▮▮▮▮ |
| Age: **41** | Phone: ▮▮▮▮▮ | Date Entered: ▮▮▮▮▮ |
| Sex: **Male** | Account Number: ▮▮▮▮▮ | Date Reported: ▮▮▮▮▮ |
| Patient ID: | Physician ID: | |
| Alternate Patient ID: | NPI: ▮▮▮▮▮ | |