

BOSTON HEART DIAGNOSTICS

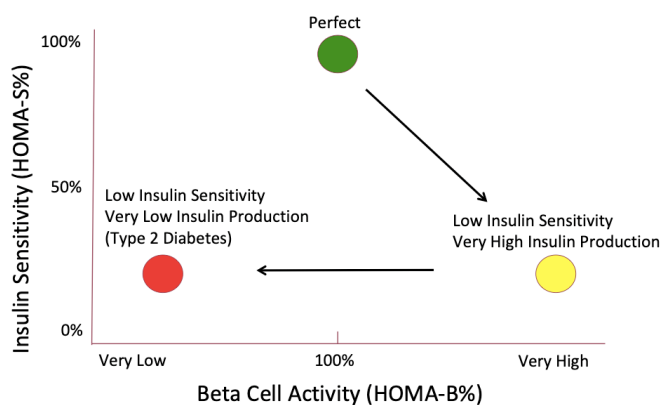
Beta Cell Function and Risk Index

The **Beta Cell Function and Risk Index** is a calculation designed to give insights into beta cell function. It allows clinicians to assess baseline beta cell function, consider treatment options, and follow changes over time.

IMPROVING BETA CELL FUNCTION CAN PREVENT OR DELAY TYPE 2 DIABETES

PROGRESSIVE BETA CELL FAILURE

- In patients with chronic insulin resistance (low HOMA-S), beta cell activity can be very high (increased HOMA-B) in order to stabilize glucose levels.
- Over time, beta cells can become progressively impaired, potentially resulting in prediabetes followed by type 2 diabetes. While HOMA-S levels remain low, HOMA-B levels gradually go from high to low as beta cell activity deteriorates.
- If HOMA-B levels are very low, then supplemental insulin may be needed due to loss of beta cell function.
- There are multiple treatment strategies for slowing or reversing progressive beta cell dysfunction, prediabetes, and type 2 diabetes.⁴⁻⁸

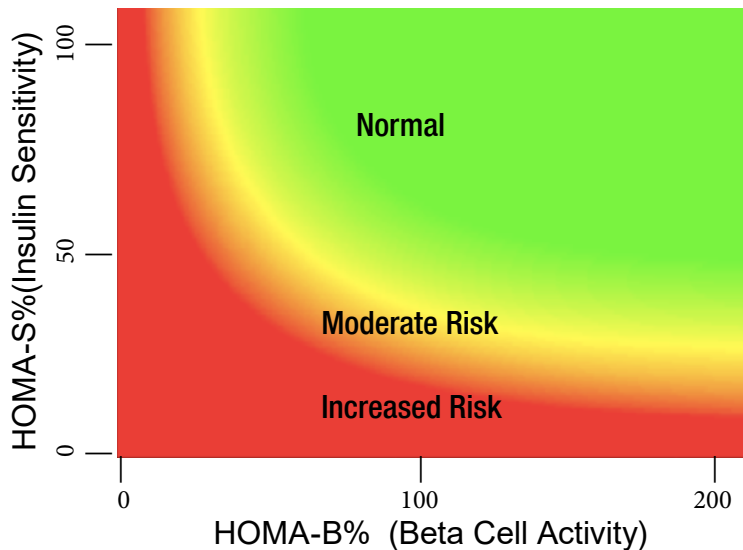


84.7%
of people
with prediabetes
don't know they
have it ⁹

ABOUT BETA CELL FUNCTION AND RISK INDEX

- Beta cells in the pancreas secrete insulin to regulate blood glucose levels.
- The Homeostasis Model Assessment can be used to estimate Beta Cell Function (HOMA-B), Insulin Sensitivity (HOMA-S) and Insulin Resistance (HOMA-IR). These are calculations based on the relationship between fasting insulin and glucose.¹⁻³
- Clinical decision-making can be facilitated by characterizing a patient's beta cell activity after accounting for the degree of insulin sensitivity.
- The Boston Heart Beta Cell Function & Risk Index is a tool for patient engagement and motivation

QUANTIFYING BETA CELL FUNCTION AND RISK



For any specific level of insulin sensitivity, patients with known diabetes tend to have relatively weak beta cell response compared to those with normal glucose metabolism. Patients with prediabetes fall in between.

For example, a HOMA-B of 100% would be normal for an individual with normal insulin sensitivity (HOMA-S = 100%), but would be abnormally low for an individual with low insulin sensitivity (HOMA-S = 25%), consistent with the point where prediabetes progresses to type 2 diabetes.

ORDERING AND REPORTING

Ordering Information

- The order code is 408C (includes Insulin, Glucose, HOMA-IR, HOMA-S, HOMA-B, Beta Cell Function and Risk Score).

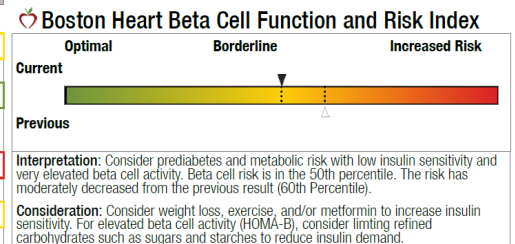
Reporting

- The Beta Cell Function and Risk Index will be reported to the right of the Metabolic section of the lab report.
- To facilitate clinical interpretation, the Boston Heart Laboratory report provides the HOMA-IR, HOMA-S, HOMA-B values, and a sliding scale with a percentile risk index value between 0 and 100.
- Interpretations provide commentary regarding the degree of metabolic risk, insulin sensitivity, and beta cell activity. Treatment considerations include lifestyle modification (weight loss, exercise, limitation of refined carbohydrates), and evidence-based medication options when indicated.
- Follow-up test results indicate the degree and direction of change since the last assessment.

| Test Name | Optimal | Borderline | Increased Risk | Footnotes | Previous Results 03.27.20 |
|--------------------------|---------|------------|-------------------|-----------|------------------------------|
| Metabolic Tests | | | | | |
| HbA1c | | 5.7 | | | 5.8 |
| | <5.7 | 5.7-6.4 | >6.4 % | | |
| Glucose ² | 89 | | | | 86 |
| | 70-99 | 100-125 | <70 or >125 mg/dL | | |
| Insulin ³ | | | 16 | 9 | 20 |
| | <10 | 10-15 | >15 µU/mL | | |
| Glycated Protein | | 211 | | | 242 |
| | <200 | 200-250 | >250 µmol/L | | |
| Adiponectin ¹ | 16.3 | | | | 13.2 |
| | >10 | 7-10 | <7 µg/mL | | |
| HOMA-IR | | | 3.5 | | 4.2 |
| | <2 | 2-3 | >3 | | |
| HOMA-S | | | 28.4 | | 23.5 |
| | >50.0 | 33.3-50.0 | <33.3 | | |
| HOMA-B | | 222 | | | 313 |
| | | | % | | |

Interpretation: BORDERLINE HbA1c indicates prediabetes as established by the ADA. Prediabetes is a major risk factor for metabolic syndrome and has been associated with increased risk of developing diabetes, hyperlipidemia, hypertension and CVD. **Based on the HbA1c value, the estimated Average Glucose (eAG) is 120 mg/dL which includes the non-fasting state.**

Consideration: Consider encouraging dietary modification supported by education and consider glucose lowering and/or insulin sensitizing medications. If indicated encourage weight reduction, smoking cessation, increased activity and control blood pressure.



References

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