

## PREVENTING DIABETES: THE IMPACT OF LIFESTYLE INTERVENTION AND METFORMIN

QUALITY OF EVIDENCE: HIGH



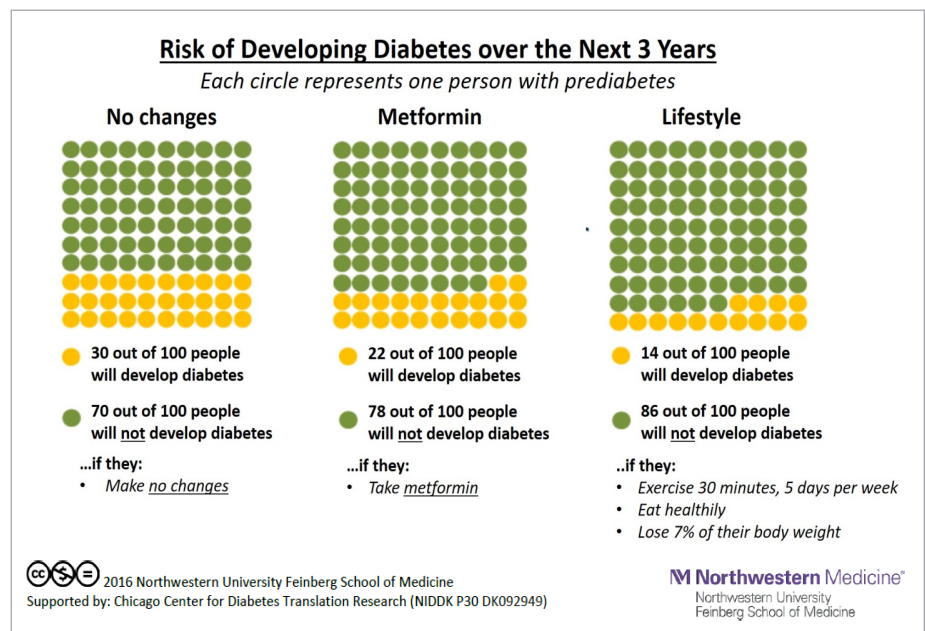
### Why is this important?

Over 86 million adults in the United States have prediabetes. Without intervention, up to 30% of these people will develop type 2 diabetes within five years and 70% will develop type 2 diabetes over their lifetimes.

### Facts

In the Diabetes Prevention Program (DPP)<sup>1</sup>, 3,234 patients with prediabetes defined as an impaired fasting glucose (95-125 mg/dL) and impaired glucose tolerance (2-hour post prandial glucose 140-199 mg/dL) were randomized to placebo, metformin (850 mg twice daily), or a structured, intensive lifestyle-modification program. The lifestyle modification program had two principal goals: (1) 150 minutes of moderate physical activity per week and (2) a 7% weight loss from baseline. Average follow-up was 2.8 years, and the study was terminated 1 year early for meeting the pre-defined primary endpoint of a significantly lower diabetes incidence. Key findings from the DPP were:

- Reduced incidence of type 2 diabetes:** Compared with placebo, the intensive lifestyle intervention decreased diabetes incidence by 58% (95% Confidence Interval (CI) 48-66%). The corresponding relative risk reduction for metformin was 31% (95% CI 17-43%). (see figure below)
- Weight loss:** In the intensive lifestyle intervention group, the mean weight loss was 5.6 kg, which was significantly greater than the 0.1kg observed in the placebo group and the 2.1 kg observed in the metformin group. Weight loss was the strongest predictor of preventing diabetes with both interventions.<sup>2,3</sup>
- In the 15 years since completion of the DPP, a sustained 27% decrease in diabetes incidence was observed in those originally randomized to the intensive lifestyle intervention and an 18% reduction in those randomized to metformin compared with placebo.<sup>4</sup>



## THE BOTTOM LINE

In patients with prediabetes, both intensive lifestyle interventions and treatment with metformin can prevent or delay the development of type 2 diabetes; however, structured lifestyle interventions targeting 7% weight loss and at least 150 minutes of physical activity a week are most effective. The effects of diabetes prevention efforts are durable, lasting up to 15 years.

**PATIENT BOTTOM LINE:** If you have prediabetes, you can help prevent diabetes by participating in a CDC-approved diabetes prevention program focused on weight loss and exercise.

## Quality of Evidence

(Adapted from Guyatt G BMJ, 26 April 2008)

This refers to the degree to which the findings of this study are likely to be free of bias.

⊕ ⊕ ⊕ ⊕	High
⊕ ⊕ ⊕ ○	Moderate
⊕ ⊕ ○ ○	Low
⊕ ○ ○ ○	Very low

### Tips for Discussion of Results with Patients

- Structured, intensive lifestyle interventions targeting weight loss and physical activity are more effective than metformin in preventing progression from prediabetes to diabetes, though both are more effective than no intervention.
- The off-label use of Metformin is most effective at reducing diabetes incidence in patients under age 45, those with morbid obesity (BMI $\geq$ 35 kg/m<sup>2</sup>), those with higher fasting plasma glucose values (110-125 mg/dL), and women with a history of gestational diabetes.<sup>1</sup>
- The intensive lifestyle intervention has been adapted for delivery in community settings and shown to be effective.<sup>5</sup> Intensive lifestyle intervention programs approved by the CDC's National Diabetes Prevention Program Network are reimbursed by Medicare and available at over 1,200 delivery sites nationwide, including many YMCAs. Approved programs can be found at: [https://nccd.cdc.gov/DDT\\_DPRP/Registry.aspx](https://nccd.cdc.gov/DDT_DPRP/Registry.aspx).

## References

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3. Lachin JM, Christophi CA, Edelstein SL, et al. Factors associated with diabetes onset during metformin versus placebo therapy in the diabetes prevention program. *Diabetes*. 2007;56(4):1153-9.
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The Bottom Line summaries reflect the expertise and opinions of the SGIM EBM Task Force as of the date of release of this summary.



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