

# What are evidence-based interventions for prevention of diabetes in obese at-risk adults?

Authors: Christopher C Walheim, Enis Sakirgil, M.D.  
In His Image Family Medicine Residency, Tulsa OK

## Question

Is type II diabetes mellitus (DM) inevitable for our obese, prediabetic patients? 25% of prediabetics develop diabetes in 3-5 years<sup>1</sup>. Obese patients are further at risk.

What evidence-based interventions can we employ to prevent diabetes in our obese at-risk adult patients?

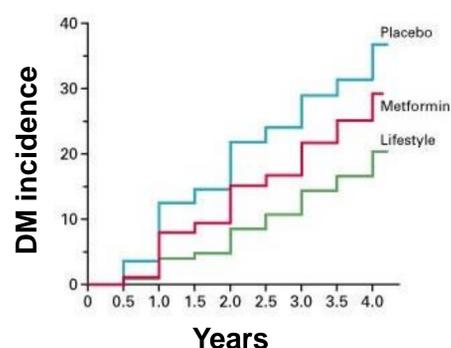
## Evidence-based Answer

- **Intensive, multimodal lifestyle interventions** offering ongoing patient support with target weight loss  $\geq 7\%$  (SOR B; 1 RTC)
- **Metformin** (SOR B; 1 RCT)
- **Bariatric surgery** (i.e., gastric banding, bypass, vertical-banded gastroplasty; SOR B; 1 prospective cohort study)

## Data Review

### Evidence for multimodal lifestyle intervention and for metformin

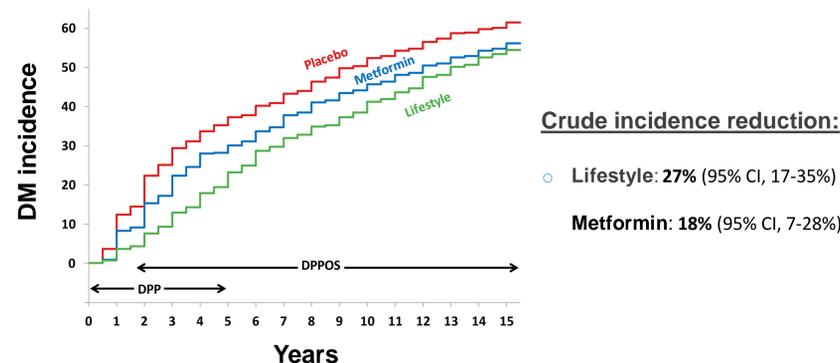
The Diabetes Prevention Program (DPP)<sup>2</sup>



Crude incidence reduction:

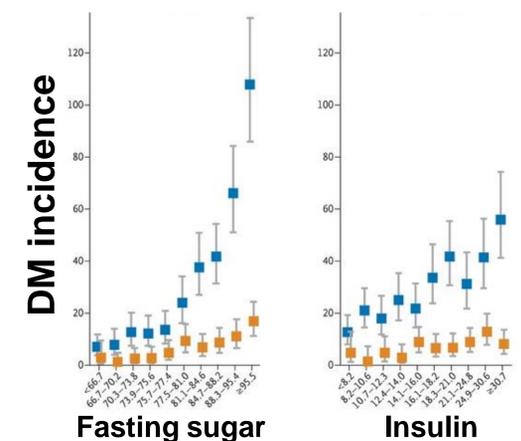
- Lifestyle: 58% (95% CI, 48-66%)
- Metformin: 31% (95% CI, 17-43%)

### The Diabetes Prevention Program Long-term Follow-up<sup>3</sup>



Crude incidence reduction:

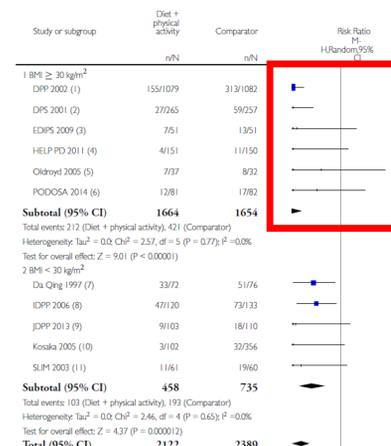
- Lifestyle: 27% (95% CI, 17-35%)
- Metformin: 18% (95% CI, 7-28%)



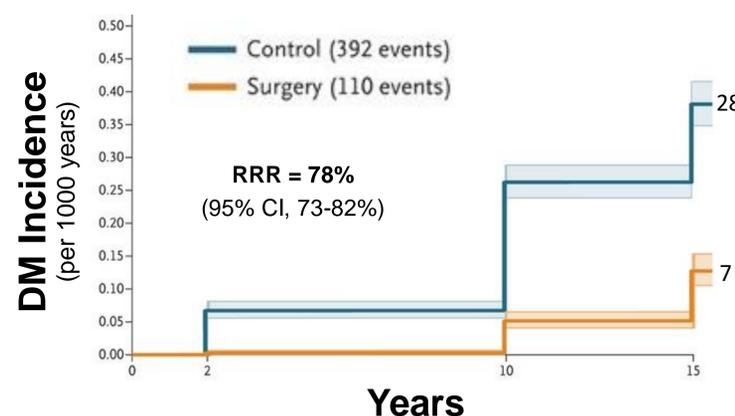
As baseline parameters of **diabetes risk increase**, effect of surgery becomes **more pronounced**

### Lifestyle Interventions: A Cochrane Review<sup>4</sup>

- Meta-analysis isolating incidence of DM in obese individuals from multiple RCTs
- Lifestyle intervention vs no intervention
- 50% reduction with lifestyle changes



### Evidence for Bariatric Surgery The Swedish Obese Subjects (SOS) study<sup>5</sup>



RRR = 78%  
(95% CI, 73-82%)

## Summary

- **Intense multimodal lifestyle intervention** (not merely provider giving lifestyle advice) is supported by the best data
- **Metformin** may be a helpful alternative when lifestyle interventions are not feasible
- **Bariatric surgery** may be the most effective intervention available, but is more risky and supported by lower quality data

## References

1. McCulloch, D, Robertson, R. P. Risk factors for type 2 diabetes mellitus. UpToDate. Current through May 2019.
2. Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 2002;346:393-403. [STEP 2]
3. Diabetes Prevention Program Research Group. Long-term effects of lifestyle intervention or metformin on diabetes development and microvascular complications: the DPP Outcomes Study. Lancet Diabetes Endocrinol. (Author's Manuscript) 2015;3(11):866-875. [STEP 2]
4. Hemmingsen B, et al. Diet, physical activity or both for prevention or delay of type 2 diabetes mellitus and its associated complications in people at increased risk of developing type 2 diabetes mellitus. Cochrane Database of Systematic Reviews 2017, Issue 12. Art. No.: CD003054. DOI: 10.1002/14651858.CD003054.pub4.
5. Lena MS, et al. Bariatric surgery and prevention of type 2 diabetes in Swedish obese subjects. N Engl J Med. 2012;367:695-704. [STEP 3]