

ACE-PREVENTION PAMPHLETS

GENERAL POPULATION RESULTS PAMPHLET 12

COST-EFFECTIVENESS OF DIABETES PREVENTION

1. MAIN MESSAGES

- Screening for pre-diabetes followed by diet & exercise or metformin is cost-effective and should be considered for incorporation into current practice.
- Workforce capacity of dietitians and exercise physiologists to deliver lifestyle change interventions will need to be increased to appropriately support the intervention.

2. BACKGROUND

Diabetes is a leading cause of morbidity and mortality worldwide. In Australia, 9.6% of fatal and non-fatal health loss measured in disability adjusted life years (DALYs) and 12.6% of all deaths are attributed to type 2 diabetes. Pre-diabetes is when an individual has impaired fasting glucose or impaired glucose tolerance but is not yet considered to have diabetes. The aim of this study is to evaluate the cost-effectiveness of a screening program for pre-diabetes followed by treatment with pharmaceutical interventions (acarbose, metformin, orlistat or rosiglitazone) and lifestyle interventions (diet, exercise or diet and exercise combined) in the 2003 Australian population.

3. INTERVENTIONS

We reviewed the diabetes literature to identify a range of interventions that prevent or delay the onset of diabetes in people with pre-diabetes. In order to identify people who have pre-diabetes, a screening program through general practitioners was modelled. The screening program targets people visiting a general practitioner over the age of 45 with at least one risk factor for diabetes (such as age, family history, high BMI, previous gestational diabetes etc) who are invited to undergo a fasting blood glucose test and an oral glucose tolerance test. Those identified with pre-diabetes are then eligible for a preventive intervention.

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PROJECT LEADERS

PROF THEO VOS (UQ)

PROF ROB CARTER (DEAKIN)

PAMPHLET AUTHOR

MELANIE BERTRAM

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From the review process, we selected three pharmaceutical interventions and three lifestyle intervention programs for cost-effectiveness analysis:

- a) **Pharmacotherapy: Acarbose:** A drug treatment that prevents the release of glucose from carbohydrates. Treatment is 100mg three times per day.
- b) **Pharmacotherapy: Metformin:** A drug treatment that lowers the level of glucose in the blood. Treatment is 850mg two times per day.
- c) **Pharmacotherapy: Orlistat:** A drug treatment that prevents the body from absorbing fat from foods. Treatment is 120mg three times per day.
- d) **Lifestyle: Diet:** Involves group counselling by a dietician weekly for one month, monthly for the next three months and three monthly thereafter.
- e) **Lifestyle: Exercise:** Involves group counselling by an exercise physiologist weekly for one month, monthly for the next three months and three monthly thereafter.
- f) **Lifestyle: Diet & Exercise:** Involves group counselling by both a dietician and an exercise physiologist weekly for one month, monthly for the next three months and three monthly thereafter.

4. CHOICE OF COMPARATOR

The comparator to the interventions is current practice. There is currently no systematic screening in place for pre-diabetes in Australia and no pharmaceutical treatments are approved for pre-diabetes on the PBS. In determining the optimum mix of interventions, we assume none of the interventions of interest were currently in place.

5. INTERVENTION COST-EFFECTIVENESS

The interventions predominately fall in the north-east ('health gain at a cost') quadrant of the cost-effectiveness plane (Figure). A combined diet and exercise intervention has a greater probability of being cost-effective than either diet or exercise alone. Metformin has similar cost-effectiveness credentials to the diet and exercise intervention (Table).

Figure: Cost-effectiveness of six diabetes prevention interventions aimed at people aged 45+ illustrated on a cost-effectiveness plane with \$50,000 per DALY threshold line

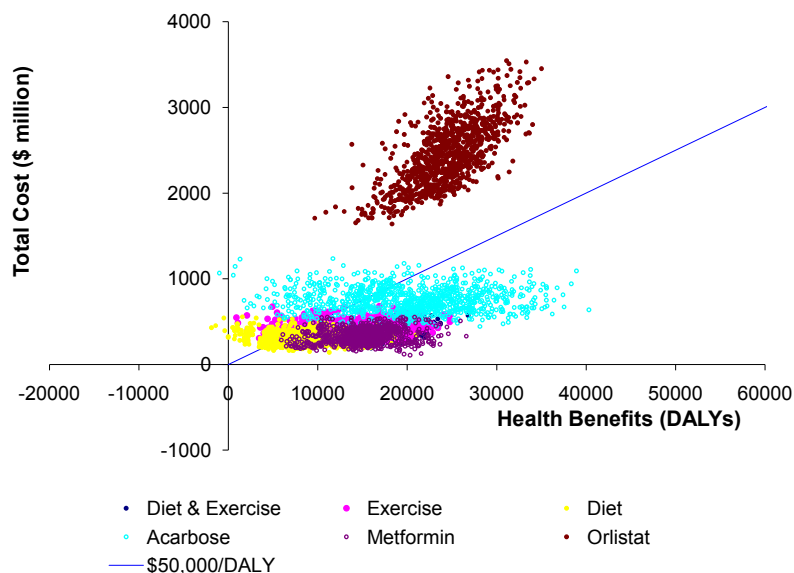


Table: Cost-effectiveness ratios and probability of being cost-effective for the six diabetes prevention interventions when compared to current practice

Intervention	Average CER (\$/DALY Averted)	Uncertainty interval
Diet & exercise	\$23,000	\$19,000-\$35,000
Metformin	\$22,000	\$17,000-\$36,000
Exercise	\$30,000	\$23,000-\$89,000
Acarbose	\$37,000	\$25,000-\$134,000
Diet	\$38,000	\$23,000-\$148,000
Orlistat	\$100,000	\$94,000-\$130,000

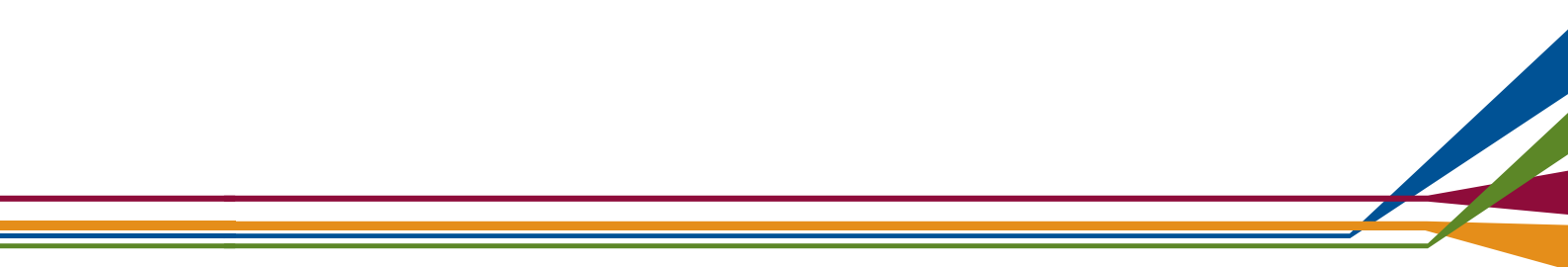
A combined diet & exercise intervention or metformin are the most cost-effective interventions. An incremental analysis of adding the two interventions together did not indicate cost-effectiveness, with an ICER of \$67,000 per DALY to add diet & exercise to metformin.

6. CONCLUSIONS

Screening for pre-diabetes followed by diet & exercise or metformin is cost-effective and should be considered for incorporation into current practice. Workforce capacity of dietitians and exercise physiologists to deliver lifestyle change interventions will need to be increased to appropriately support the intervention.

7. ACE-PREVENTION

To aid priority setting in prevention, the Assessing Cost-Effectiveness in Prevention Project (ACE-Prevention) applies standardised evaluation methods to assess the cost-effectiveness of 100 to 150 preventive interventions, taking a health sector perspective. This information is intended to help decision makers move resources from less efficient current practices to more efficient preventive action resulting in greater health gain for the same outlay.



ACE–PREVENTION PAMPHLETS

PAMPHLETS IN THIS SERIES

Methods:

- A. The ACE-Prevention project
- B. ACE approach to priority setting
- C. Key assumptions underlying the economic analysis
- D. Interpretation of ACE-Prevention cost-effectiveness results
- E. Indigenous Health Service Delivery

Overall results

1. League table
2. Combined effects

General population results

1. Adult depression
2. Alcohol
3. Blood pressure and cholesterol lowering
4. Cannabis
5. Cervical cancer screening, Sunsmart and PSA screening
6. Childhood mental disorders
7. Fruit and vegetables
8. HIV
9. Obesity
10. Osteoporosis
11. Physical activity
12. Pre diabetes screening
13. Psychosis
14. Renal replacement therapy, screening and early treatment of chronic kidney disease
15. Salt
16. Suicide prevention
17. Tobacco

Indigenous population results

1. Cardiovascular disease prevention
2. Diabetes prevention
3. Screening and early treatment of chronic kidney disease