

BEYOND LOWERING BLOOD GLUCOSE

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Exercise is extremely safe and effective in managing diabetes and its complications. Despite the emphasis on exercise as the key element in the management for Type 2 diabetes, the level of physical activity among those with diabetes is still low.

Many individuals with Type 2 diabetes still think that exercise is just a blood sugar lowering tool. They feel that as long as they take their medication regularly, eat the right food, and have their blood glucose levels under control, they will be fine.

The benefits of exercise in diabetes per se go beyond blood glucose lowering effects. It can help increase blood sugar tolerance and sensitivity at rest and reduce the risks of diabetes related diseases such as heart disease.

Statistics from the MOH of

Singapore (Figure 1) website show that heart-related diseases are the main causes of mortality in Singapore from 2012 to 2014, and data from the National Diabetes Education Program (NDEP) shows that 65% of those with diabetes died because of heart disease.

Both heart disease and inactivity mortality can be prevented through physical activity.

The two most common barriers that prevent people with diabetes from regular exercise are the fear of going into hypoglycaemia and rising blood glucose after exercise.

With a better understanding of acute exercise effects in Type 2 diabetes and following the simple recommended guidelines on Page 26, exercise can be safe, effective and enjoyable.

PRINCIPAL CAUSES OF DEATH

	2012	2013	2014
◀ Total No. of Deaths	18,481	18,938	19,393
◀ % of Total Deaths			
1. Cancer [ICD10 : C00-C97]	30.1	30.5	29.4
2. Pneumonia [ICD10 : J12-J18]	16.8	18.5	19.0
3. Ischaemic heart diseases [ICD10 : I20-I25]	16.1	15.5	16.0
4. Cerebrovascular diseases (including stroke) [ICD10 : I60-I69]	9.3	8.9	8.4
5. External causes of morbidity and mortality [ICD10 : V01-Y89]	5.6	4.9	4.7
6. Hypertensive diseases (including hypertensive heart disease) [ICD10 : I10-I15]	2.8	3.1	3.6
7. Urinary tract infection [ICD10 : N39.0]	2.4	2.6	2.6
8. Nephritis, nephrotic syndrome & nephrosis [ICD10 : N00-N07, N17-N19, N25-N27]	2.4	2.4	2.0
9. Other heart diseases [ICD10 : I00-I09, I26-I51]	1.9	2.0	1.9
10. Chronic obstructive lung disease [ICD10 : J40-J44]	2.1	1.6	1.8

Notes:

- The Mortality Tabulation List of the International Classification of Diseases - Tenth Revision has replaced the Ninth Revision as the adopted code set for the derivation of causes of death w.e.f Year 2012.
- For data prior to Year 2012, refer to http://www.moh.gov.sg/content/moh_web/home/statistics/Health_Facts_Singapore/Principal_Causes_of_Death.html
- Refers to the top 10 principal causes of death only

Figure 1. 10 main causes of death in Singapore from 2012 to 2014

The following are some recommended actions to be taken before, during and after a workout to avoid adverse exercise effects. Visit your doctor to consult him on the type of physical activity you are going to do before embarking on any exercise program. Check with your certified health-care providers if you are facing difficulties, or having doubts about your blood glucose levels response to the exercises you are performing.

BLOOD GLUCOSE LEVELS	SCENARIO	ACTION
<3.9mmol/l	Before workout	Take snack Wait for 15 to 30 minutes before re-SMBG Proceed with activity once BG is between 5.6 & 16.7mmol/l
<3.9mmol/l	During or after workout	Take snack Wait for 15 to 30 minutes before re-SMBG - Avoid future physical activity before bed due to the risk of delayed post-exercise hypoglycaemia during sleep - Check with doctor, might need to adjust medication
3.9 to 5.5 mmol/l	Last meal >2 hours ago before workout	Take snack Wait for 15 to 30 minutes before re-SMBG Proceed with activity once BG is between 5.6- & 6.7mmol/l
3.9 to 5.5 mmol/l	Last meal <1 hour before workout	Wait for another 15-30 minutes before re-SMBG Proceed with activity once BG is between 5.6-16.7mmol/l
3.9 to 5.5 mmol/l	After 60 minutes of moderately intense activity or 30-45 minutes of intense activity	Take snack wait for 15 minutes before re-SMBG Proceed with activity once BG is between 5.6 & 16.7mmol/l
5.6 to 16.6 mmol/l	Within range before workout	Proceed with activity.
5.6 to 16.6 mmol/l	BG raises but still within range after workout	Wait 1 to 1.5 hour & re-SMBG -If BG remain elevated, lower intensity of activity on next workout -If BG return to normal range, continue with same intensity on next workout -If BG drops below 3.9 mmol/l, take snack, avoid future physical activity before bed due to the risk of delayed post-exercise hypoglycaemia during sleep
>16.6 mmol/l	On oral medications and feeling well	Proceed with light to moderate activity & re-SMBG after 10 to 15 minutes of activity If BG rises : stop activity If BG drops : continue
>16.6 mmol/l	On insulin or not feeling well	Go to doctor to check for ketones. Avoid activity.

SMBG : Self-monitoring of blood glucose

BG : Blood glucose