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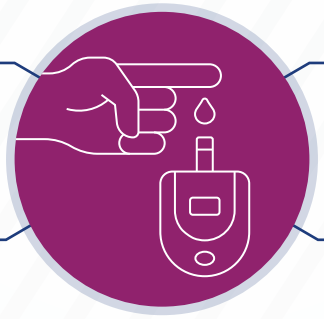
Managing Diabetes and Its Cardiometabolic Links

An overview of diabetes-related complications, young-onset diabetes, and pre-diabetes

Prevalence of diabetes and its links to cardiometabolic disease

A chronic disease marked by high concentrations of blood glucose

Abnormal β-cell functions can affect insulin production leading to diabetes



Diabetes[1,2]

Type 1 diabetes is an autoimmune disease characterised by immune-mediated destruction of β-cells

Type 2 diabetes results from an interaction between lifestyle factors and underlying genetic risk

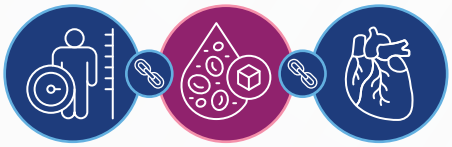
From **1990** to **2021**, the global age-standardised prevalence of diabetes increased by 90.5%[1]

In **2019**, 460 million people had diabetes[1]

In **2021**[3]
- 537 million people worldwide had diabetes
- US$966 billion was spent on diabetes-related health expenditures globally

By **2045**, the total costs incurred towards treatment of diabetes are estimated to be US$1 trillion[3]

By **2050**, the number of people with diabetes is expected to increase by 59.7%, resulting in 1.31 billion people living with diabetes[1]



Links between body mass index (BMI), diabetes, and cardiovascular disease[1]

- Obesity is a key risk factor for type 2 diabetes
- Type 2 diabetes is a major risk factor for ischemic heart disease and stroke

Prevention and management of diabetes involves[1]**:**

- Limiting the risk factors for type 2 diabetes
- Increasing access to treatment
- Enhancing the healthcare infrastructure
- Early identification of type 1 diabetes by screening

Early diagnosis of diabetes and timely visits to healthcare providers combined with appropriate pharmaceutical therapies can improve treatment outcomes[4,5]

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Prevalence of diabetes in the Asia-Pacific region and diabetes-associated cardiometabolic disease

Obesity

Increased adiposity or fat accumulation is linked to a wide range of chronic diseases including type 2 diabetes[6]

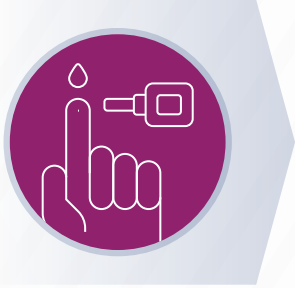
Strategies to manage obesity[6–9]

Lifestyle measures such as[6]:
- Healthy diet
- Regular exercise
- Adequate sleep

Bariatric surgery can be utilised for severe forms of obesity[9]

Pharmacotherapeutic approaches to[7,8]:
- Decrease cardiovascular risks
- Promote weight loss

Medications approved for weight loss:
- Lipase inhibitors
- Dual agonist for the glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic polypeptide receptors
- GLP-1 receptor agonists



Type 2 diabetes[6,10]

- Asia is an epicentre of the type 2 diabetes epidemic[6]
- China and India contribute to the majority of patients with diabetes in Asia. As of 2013, China's diabetes prevalence stood at 10.9%, compared to India's 7.3% in 2017[6]
- There is an alarming trend of type 2 diabetes in adolescents and young adults in South-East Asia and the Western Pacific regions[10]

The rising prevalence of type 2 diabetes in Asia can be linked to various genetic, epigenetic, and environmental factors[6,11,12]

- Development of diabetes at a younger age (5–10 years earlier) and with a lower BMI when compared to Caucasians
- Higher insulin resistance due to increased visceral fat accumulation
- Predisposition to impaired secretion of insulin
- β-cell dysfunction (impaired insulin secretion from normal β-cells) or β-cell exhaustion (impaired insulin secretion due to chronic β-cell stress)

Complications of diabetes[6,13]

⚠ Cardiovascular complications are a major cause of morbidity and mortality for patients with diabetes[6]

⚠ Patients with type 2 diabetes, especially those from Asian countries have[13]:
- Higher risk of stroke and renal complications
- Lower risk of major coronary events and peripheral vascular disease

The widespread differences in culture and economic status of individuals in the Asia-Pacific region demand a coordinated approach to effectively address the challenges of diabetes and associated cardiometabolic risks[6]

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Trends in the incidence and mortality of diabetes[14]

Increased life expectancy in older adult patients with diabetes is attributable to:
- Advances in diagnostics
- Medical devices
- Pharmacotherapeutic drugs

Patients with young-onset diabetes are more likely to experience diabetes-related complications and premature death

Type 2 diabetes affecting young adults in Asia[14–16]

The incidence of young-onset type 2 diabetes is significantly higher in Asians than in the European White population[14]

Young-onset type 2 diabetes has a higher lifetime risk of developing diabetes-related complications due to[14]:
- Longer exposure to disease
- Poor control of glucose levels in the blood
- Metabolic risk factors like obesity

Rapid loss of β-cell function in patients with young-onset type 2 diabetes contributes to poor patient outcomes[15]

Patients with young-onset type 2 diabetes are characterised by[14,16]:
- Five-fold higher risk of mortality
- Slower uptake of organ-protective drugs like statins and renin-angiotensin system inhibitors

Key individual risk factors for patients across different age groups[14]

Hypertension in young adults

Chronic kidney disease (CKD) in older adults

Diabetes management in older adults with CKD should focus on the use of safer antihyperglycaemic medications, close monitoring, and personalised care plans

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Pre-diabetes[17–21]

Pre-diabetes is the clinical condition where blood glucose levels are elevated but do not meet the minimum threshold to be considered diabetes[17]

Clinical criteria for pre-diabetes[18]:
- Fasting blood glucose levels: 6.1–6.9 mmol/L
- Glycated haemoglobin (HbA1c) levels: 6.0–6.4%
- 2-hour blood glucose levels: ≥7.8 and <11.1 mmol/L

~70% of people with pre-diabetes can progress to diabetes during their lifetime[17]

Lifestyle interventions reduce the risk of progression to type 2 diabetes by 58%[5]

Pre-diabetes is associated with higher risks of complications of diabetes like cardiovascular diseases, neuropathy, and nephropathy[19]

Healthy diet and exercise regimens monitored by lifestyle coaches can increase the overall life expectancy and minimise diabetes-related complications[5, 20, 21]

Knowledge, attitude, and practice (KAP) surveys aid in gauging the awareness of the public, patients with diabetes, and healthcare professionals (HCPs) about lifestyle interventions[17]

KAP measures for the prevention of pre-diabetes[17]:
- Disseminating knowledge and education for management of pre-diabetes
- Increasing the accessibility of lifestyle management programs
- Providing practical skills to manage pre-diabetes
- Improving resources for lifestyle management
- Training of HCPs in pre-diabetes management approaches

Multifaceted efforts involving patients with diabetes, the public, and HCPs can be effective for the prevention and management of pre-diabetes[17]

Key messages

- **Lifestyle interventions such as a healthy diet and exercise regimen are important for the prevention and management of diabetes**
- **Raising awareness and education on various risk factors that cause diabetes and associated cardiovascular complications can prove to be beneficial**
- **Coordinated efforts of patients with diabetes, HCPs, and the public is critical for the effective management of diabetes**

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