How to interpret 5-year probability of Diabetes Complications

+ **Different combinations of risk factors and complications in a person can give rise to different likelihoods for future diabetes complications in 5 years time.**

+ **Some of these risk factors can be modified by lifestyle changes or medications, which may increase or reduce future risk for these diabetes complications.**

+ **Predictors for these diabetes complications include:**

  1. **Coronary heart disease (CHD)**
     Age, gender, non-HDL-cholesterol, smoking, albuminuria, eGFR and duration of diabetes.

  2. **End stage renal disease**
     Albuminuria and haematocrit.

  3. **Stroke**
     Age, albuminuria, history of CHD and HbA₁c.

  4. **Heart failure**
     Age, albuminuria, haemoglobin, HbA₁c, history of CHD and BMI.

+ **Since many of the risk factors are modifiable, a high risk subject (category 3 or 4) may still have low probability for future diabetes complications if his/her modifiable risk factors are well controlled.**

+ **A low risk subject (category 1 or 2) may still have high probability for future diabetes complications if he/she has multiple risk factors, especially albuminuria and low haemoglobin or low haematocrit.**

Asia Diabetes Foundation (ADF)

ADF is a charitable organisation with a mission to conduct pragmatic research using a multidisciplinary approach, augmented by the latest technologies, to promote informed decision-making in order to enhance the sustainability, affordability and accessibility of chronic care.

JADE Program is a web-based disease management tool, designed by ADF, to empower people with diabetes and care providers to proactively manage diabetes. The JADE Portal is an integrated disease management system providing:

+ **Individualized risk predictions.**

+ **Care protocols and treatment recommendations.**

+ **Practical tips to empower self management to facilitate shared decision-making between people with diabetes and their care providers.**

References:

i.   Stamler J et al. Diabetes Care. 16:434-444, 1993
ii.   Haffner SM et al. NEJM. 339:229-234, 1998
iii.   Yang X et al. Diabetes Care. 30:65-70, 2007
iv.   Yang X et al. Diabetologia. 50:1348-1350, 2007
v.   Gaede P et al. NEJM. 358:580-591, 2008
vi.   Yang X et al. Am J Cardiol. 101:596-601, 2008
vii.   Yang X et al. Arch Intern Med. 168:451-457, 2008
viii. Yang X et al. Cardiovasc Diabetol. 7:9, 2008
ix.   Chan J et al. Diabet Med. 26:693-699, 2009
x.   Chan JC et al. Diabetes Care. 32:977-982, 2009
xi.   Ko GT et al. BMC Med Inform Decis Mak. 10:26, 2010
xii.   So WY et al. J Diabetes. 3:109-118, 2011
xiii. Chan JC et al. JAMA Internal Medicine. 174:972-981, 2014
xiv.   Tutino G et al. Diabetic Med. 34:440-450, 2017

亞洲糖尿病基金會
Asia Diabetes Foundation

JOINT ASIA DIABETES EVALUATION (JADE) PROGRAM

RISK STRATIFICATION ENGINE

The need for risk categorization

+ A person with diabetes has a 2-3 fold higher risk for cardiovascular and kidney disease compared to a person without diabetes of same age, gender and ethnicity living in same area.

+ Each person with diabetes has a unique risk profile based on his/her genetic makeup, external factors and interventions, which can change over time.

+ The purpose of risk categorization is to help doctors or healthcare professionals and people with diabetes start a dialogue, make informed decisions, individualize treatment goals and formulate a management plan.

Background of the JADE Program risk equations

+ The Hong Kong Diabetes Registry, established since 1995, with more than eight thousand Chinese people with type 2 diabetes followed up for an average of 5.5 years, and approximately 20% suffered at least one major diabetes complication.

+ In this ongoing registry, these data were analysed on an anonymous basis and identified patterns of risk factors which predict diabetes complications with 70-90% accuracy.

+ Using this analysis, JADE stratified people with diabetes into 4 categories associated with increasing risk of heart disease, stroke, peripheral vascular disease or kidney failure in 5 years time.

Fold increase in complication rate

	2.8	4.7	8.6
Risk Level	2	3	4
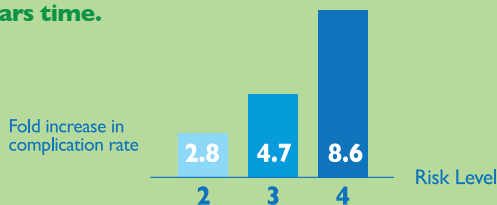
+ All risk categories and 5-year probabilities of diabetes complications are based on results from the last available comprehensive assessment recorded in the JADE Portal.

Risk Categories

+ Using data collected during the baseline and annual comprehensive assessments, the JADE Portal estimates the 5-year probability of different diabetes complications based on different combinations of modifiable and non-modifiable risk factors.

+ Based on these predictions and other risk factors, people with diabetes are grouped into different categories with recommended treatment targets, follow up intervals and frequency of monitoring.

Risk category	4	3	2	1
Cardiovascular disease and/or renal failure	Yes	No	No	No
Renal impairment (estimated glomerular filtration rate, eGFR ,ml/min/1.73m²)	Severe (<15 or dialysis)	Moderate (15-60)	Mild (60-90)	Normal (≥90)
Risk factors	Not applicable	At least 3	2	0-1
Future risk for complications based on risk scores	Very High	High	Moderate	Low
Recommended number of medical reviews per year	Doctors and people with diabetes are encouraged to discuss and formulate a mutually agreeable management plan. Frequent contacts with doctors or healthcare professionals are often needed at diagnosis or if control worsens for education and treatment adjustment. Once stable, most subjects can be reviewed every 2-4 months. At least 6-12 monthly medical reviews are recommended for low risk subjects due to possible silent deterioration.			
Recommended interval for comprehensive assessments	Every 12-18 months especially for subjects with irregular contacts with doctors or healthcare professionals.			

· Risk factors include body mass index (BMI), waist circumference, smoking, lipids, HbA_{1c}, retinopathy (early damage to blood vessels supplying the eye retina), albuminuria (protein in urine), abnormal foot examination including abnormal blood supply and neuropathy (early damage to nerve fibres).

· The presence of cardiovascular-renal complications puts subjects in risk category 4 irrespective of other risk factors or future risk for diabetes complications.

· Subjects in risk category 2 or 3 have either renal impairment and/or multiple risk factors and/or increased future risk for diabetes complications based on risk scores.

· Subjects in risk category 1 have no complications, normal renal function and low risk for future diabetes complications based on risk scores.
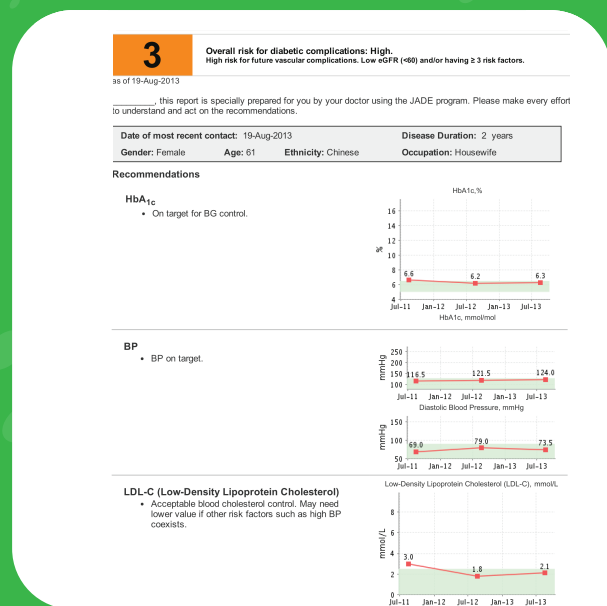
Sample of individualized patient report by the JADE Portal

ASIA DIABETES FOUNDATION

Unit 3, 17/F, Metropole Square, 2 On Yiu Street, Shatin, N.T., Hong Kong

📞 (852) 2637 6624

www.adf.org.hk

2018/06