

DIABETES AND KIDNEY DISEASE

Diabetes is the most common cause of chronic kidney failure in Singapore. It accounts for up to **50%** of new patients with end stage kidney failure. As there is no definite cure as yet for diabetes, prevention of kidney related complications is crucial.



? What is Diabetes Mellitus?

Diabetes Mellitus, or simply called “diabetes”, is a disease where the body is unable to make insulin or unable to properly use the insulin secreted from the pancreas, resulting in sugar buildup in the blood. Insulin is the hormone that regulates the amount of sugar in the blood.

There are two types of diabetes:

Insulin Dependent Diabetes Mellitus (IDDM) or Type 1

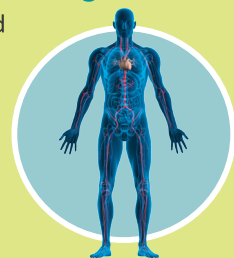
Usually occurs in children, also known as “juvenile diabetes”. The pancreas produces little or no insulin. People in this group require daily insulin injection.

Non-Insulin Dependent Diabetes Mellitus (NIDDM) or Type 2

Usually occurs in persons over 40 years old, also known as “adult onset diabetes”. The pancreas produces insulin but the body is unable to use it properly. Blood sugar can be controlled by diet and/or medicine, although some may require insulin.

How does diabetes affect your body?

Uncontrolled blood sugar levels in the blood cause changes and damages the blood vessels. This affects not only blood vessels in the kidneys, but also blood vessels in other organs such as the eyes, skin, nerves, intestines, muscles and the heart. Both large and small vessels are affected. It is common to find patients who have longstanding diabetes to require amputation of a leg because of insufficient blood supply and infection of the limb.



What does diabetes do to the kidneys?

In diabetic kidney disease, the glomeruli are affected. The glomerulus (plural: Glomeruli) is a ball of blood vessels, which act as the filtering units in the kidney. Early involvement shows up as leakage of protein in the urine. In medical terms, this is called “proteinuria”. As proteinuria becomes more severe, functions of the kidney such as balance of salt and water become deranged causing salt and

water retention. The patient will then notice some weight gain and swelling especially in the face in the mornings and legs later in the day. In more advanced stages, the kidney filters become totally destroyed leading to a state of kidney failure.

Diabetes may also damage nerves. This may cause difficulty in emptying the bladder as this depends on intact reflexes from the nerves and coordination between the nerves and muscles of the bladder. The pressure from an overfull bladder can ‘push’ urine backwards towards the kidneys causing injury. If urine remains for a long time in the bladder because of incomplete emptying, one may get a urine infection.

What are the signs of kidney disease in patients with diabetes?

Early stages of kidney involvement without kidney failure are characterized by:



When kidney failure sets in, other signs become evident:

- ▶ Water retention becoming more resistant to medication
- ▶ Poor appetite, nausea and vomiting
- ▶ High level of urea and creatinine in blood
- ▶ Weakness and paleness from anemia
- ▶ Itching

What can patients with diabetes do to lower risk of kidney damage?

- ▶ Good control of diabetes by a combination of a diabetic diet and medication if necessary
- ▶ Good control of blood pressure
- ▶ Regular follow up to monitor if the control is adequate

If kidney involvement has already been diagnosed, does this mean I have kidney failure?

No, kidney function is normal at first. It takes a few years before early involvement leads to kidney failure. While there is no cure, there is time to slow down the process with treatment.

KIDNEY FUNCTION

NORMAL

TAKES A FEW YEARS BEFORE EARLY INVOLVEMENT LEADS TO KIDNEY FAILURE

FAILURE

What specific measures can be taken to delay the progression to kidney failure?

Diet

Maintain a special diabetic diet. Further dietary modifications may be necessary especially with respect to salt, amount of fluid consumed and potassium.



Your doctor will advise you on your fluid allowance and diet restriction. The dietitian will help you to plan your diet according to the stages or severity of the disease process.

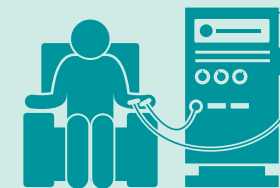
Medications

Anti-hypertensive medications are often needed for blood pressure control. Angiotensin converting enzyme inhibitors (ACE inhibitors) and Angiotensin receptor blockers (ARB) are special categories of anti-hypertensive medications that can reduce protein leakage.



Diuretics may be added to encourage more urine production to control fluid retention.

Close monitoring of the blood sugar level is necessary and this often leads to the adjustment of dosage or change in anti-diabetic medicine to maintain good blood sugar level control.



Will dialysis be needed if the diabetic patient starts to have kidney failure?

Dialysis is not required in early kidney failure. It will be needed only in advanced kidney failure when the state of “end stage kidney failure” is reached. Generally, this means that the kidneys are functioning at less than 10% of its original capacity. The progression of kidney failure from its early stage to advanced stage can be delayed with drugs and proper dietary restrictions. Hence, it is important that a diabetic patient maintain close follow-up with his or her doctor.

If your doctor has informed you that you will require dialysis soon, you should also discuss the option of a kidney transplant instead of long-term dialysis treatment.

You may visit these websites for more information:

<http://www.kdf.org.sg>

<http://www.davita.com>

<http://www.uptodate.com/patients/index.html>

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糖尿病和肾病

在新加坡，糖尿病是引发慢性肾功能衰竭最常见的病原之一。据统计，在末期肾衰竭的新增病例中，有**50%**是糖尿病患者。由于糖尿病仍无法根治，因此预防肾脏并发症至关重要。



什么是糖尿病？

糖尿病是一种因身体的胰岛素(insulin)分泌不足，或无法充分运用胰腺所分泌的胰岛素而促使血糖含量升高的疾病。胰岛素是维持血液中葡萄糖含量的激素。

糖尿病可分两型

胰岛素依赖型糖尿病（Ⅰ型）

通常发生在孩童身上，又称幼年型糖尿病。这型患者的胰腺只能分泌极少量或无法分泌胰岛素，所以必须每天注射胰岛素剂。

非胰岛素依赖型糖尿病（Ⅱ型）

通常在40岁以后发病，又称成年型糖尿病。这型患者的胰腺可分泌胰岛素，但无法被身体善用。患者可通过调节饮食和/或口服药物来控制血糖含量，有些则可能需要注射胰岛素剂。

糖尿病如何影响身体？

未受控制的血糖含量会导致血管损坏引发病变。不仅是肾血管，全身无论大小的血管包括其他的器官，如眼睛、皮肤、神经、肠、肌肉和心脏都会受到影响。此外，由于血液循环不良和受到感染而被迫截肢的情况，在长期患有糖尿病的人士中也是很常见的。



糖尿病如何损害肾脏？

肾小球受糖尿病的损害是最明显的。肾小球是由微血管卷曲而成的球形组织，是肾脏中的过滤单位。尿液出现泄漏的蛋白质是肾脏初期受损的迹象，医学上称之为蛋白尿。当蛋白尿的情况逐渐加剧，扰乱肾脏的正常运作，如对水和盐的调节失衡，造成水钠滞留，患者会发现体重增加和出现浮肿

的现象，尤其是晨起的脸部及午后的脚部。若病情进一步恶化，肾脏的过滤单位就会完全受损，导致肾功能衰竭。

糖尿病也会损坏神经，当膀胱的肌肉与神经之间的协调和神经的反射功能失常，患者就会有排尿的困难，尿滞留的压力会促使尿液逆流到肾脏造成伤害。尿液因无法完全排出而长时间蓄留在膀胱内，也会导致尿路感染。

糖尿病患者会有哪些肾病症状？

当肾功能还未衰竭，肾脏在初期受损时会有以下症状：



当肾功能衰竭，其他症状会更明显：

- ▶ 水滞留使身体对药物越加抗拒
- ▶ 食欲减退、作呕、呕吐
- ▶ 血液中含有高量的肌酐和尿素
- ▶ 贫血造成的脸色苍白和体虚
- ▶ 皮肤发痒

糖尿病患者如何预防肾脏受损？

以下几点可降低肾脏受损的风险：

- ▶ 通过饮食控制及药物治疗良好地控制血糖含量
- ▶ 良好的血压控制
- ▶ 定期复诊确保疾病控制良好

如果证实肾脏已受到了损坏，是否意味肾功能已经衰竭？

不是。 肾功能在受损的初期仍可以正常运作，它需要几年的时间才会发展到衰竭的状态。虽然这病症无法治愈，但可以通过治疗延缓病情的恶化。

肾功能

正常 → 需要几年的时间才会发展到衰竭的状态 → 衰竭

有什么方法可以延缓肾衰竭的进度？

饮食

继续遵行营养师为你专设的糖尿病饮食控制方案。可能需要进一步加强饮食的控制，尤其是盐分、钾质和水分的摄入。

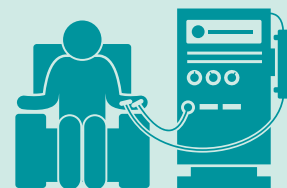
你的主治医生会向你建议每日的饮水量及饮食限制。营养师也会根据疾病发展的程度或严重性为你设计食谱。

药物

许多时候控制高血压是需要服用抗高血压药物。血管紧张素转换酶抑制剂(ACE inhibitors)和血管紧张素阻滞剂(ARB)是两种能减少蛋白出漏的抗高血压药物。

利尿剂也可促进尿液的生产，减少水分在体内的滞留。

此外，密切监测血糖含量是有必要的，这有助于对药物或剂量的及时调整，以保持良好的血糖含量控制。



糖尿病患者的肾功能若开始衰竭，是否就需要开始洗肾？

初期的肾衰竭是不需要透析治疗的。只有当肾衰竭的程度到达了末期才需要开始洗肾，这通常是在肾功能只剩下10%的时候。肾功能的衰竭从初期到末期的进度可通过药物治疗和适当的饮食控制来延缓。因此，定期复诊对糖尿病患者是非常重要的。

如果医生认为你将需要开始洗肾，你也应同时与医生讨论肾移植的可能性，以取代长期透析治疗。

欲知更多，可浏览以下网页：

<http://www.kdf.org.sg>
<http://www.davita.com>
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