The Star : October 15,2006 DIABETES mellitus (DM) is a chronic disease affecting up to 10% of adult population. There are two types of DM: type 1 and type 2. Type 2 DM comprises more than 95% of DM cases in Asia, including Malaysia. If DM is not well controlled, it can lead to many complications. The high blood glucose levels over a period of time, coupled with the features of metabolic syndrome, cause damage to the blood vessels, which in turn, result in damage to many organs. They include coronary artery disease (heart disease), stroke, poor leg circulation (peripheral vascular disease, PVD), nerve damage (peripheral neuropathy), blindness, kidney failure (nephropathy), and foot ulcers. All sorts of leg problems Diabetic foot ulcer (DFU) is a common disorder, affecting about 3-4% of diabetics. Foot ulcers are the result of a combination of nerve damage (causing sensory loss in the feet), blocked arteries (causing poor leg circulation, PVD) and infection. When there is poor leg circulation, a person's ability to heal wounds and overcome infection is severely compromised, resulting in tissue loss and gangrenous (dead) toes that may require amputation. Poor leg circulation (peripheral vascular disease, PVD) accounts for about 15% of DFU. It is the result of blocked leg arteries at the thigh or below the knee. In the early stage, it causes leg cramps, medically known as "claudication" on walking, and disappears after rest. The walking distance shortens progressively. Many patients blame it on arthritis or "wind". As the disease progresses, it causes pain in the arch or forefoot while at rest or during the night. The foot may become bluish or "cyanotic" when it is lowered, and pallid (pale) when it is elevated. The foot pulses are usually absent. At this stage, it is considered very critical, and the risk of amputating the foot or leg is extremely high. Medically, it is called critical limb ischaemia (CLI). Urgent medical attention is needed to unblock the clogged arteries. In some patients, the poor circulation (limb ischaemia) may present acutely. Acute limb ischaemia needs to be treated urgently to save the limbs. An irreversible gangrene (dead limb) occurs if the foot is already cold, bluish, paralysed and numbed. PVD shares the same disease process as coronary artery disease and stroke. The common predisposing causes are diabetes mellitus, high blood pressure, high cholesterol, smoking, sedentary lifestyle and obesity. In Malaysia, PVD is commonly neglected. This is because of poor awareness among the public and even some doctors. Poor outcome Within three months of presentation of CLI, 9% of the patients run a risk of death, 1% the risk of heart attack , 1% the risk of stroke, 18% a risk of persistent CLI and 12% a risk of amputation. The one-year mortality rate is 21% and the two-year mortality rate is 31.6%. The risk of dying is far higher compared with breast, colon or rectum cancer. The prevalence of amputation is estimated at about 500-1000 per million population. In Malaysia, there are thousands of amputation cases a year. The risk of amputation increases eight times in diabetic foot ulcers. About 85% of the amputees are diabetics. The amputations usually start at the toes. If the circulation remains poor, it is usually followed by ascending amputations at the mid-foot, below the knee and finally, above the knee. 50% of below-the-knee amputations (BKA) will have to be converted to above-the-knee amputations (AKA), if the blocked circulation is not revascularised. The physical trauma and limitation in AKA is extreme. Only less than 20% of the AKA amputees remain independent one year later. Hence, all possibilities should be explored to save limbs. Detection and prevention There are many ways to identify PVD. Early detection makes treatment easy and prevents the need for amputation. Detection of PVD can be done through clinical inspection and examination. One should emphasise the footwear and hygiene of the patient. Look

for foot ulcers, cuts, wounds and skin discolouration (gangrene patch), and avoid corns and sharp nails. Feel for foot pulses regularly. Routine blood tests, follow-up with doctors and being aware of symptoms, such as leg cramps on walking or at rest, are critical. If signs of discolouration or absent pulses are detected, medical attention is required. You should see a doctor and have the following radiological tests performed. &#65533; One is a simple and basic study of the leg arteries, called Ankle-Brachial Index (ABI). ABI is a measure of the blood pressure difference between the arms and the calves. It is a painless procedure, like taking routine blood pressure. However, ABI is not always accurate, especially if the arteries are hardened, typically in chronic diabetes. &#65533; If ABI falls below 0.9, further evaluation of the arteries should be done with colour Doppler ultrasound, CT scan, MRI or catheter angiogram. All of these, except the catheter angiogram, are non-invasive and are painless outpatient investigations. &#65533; Catheter angiogram requires a puncture to be made over the groin artery, followed by inserting a tiny tube up the main artery (aorta) for a detailed study of the lower limb arteries. It is usually reserved for cases with intention to treat.&#65533; Treatment options&#65533; Treatment of PVD will depend on the severity of the blocked arteries. &#65533; In general, the mainstay of treatment is intensive medical treatment in controlling underlying pre-disposing factors. &#65533; These include optimal control of high blood pressure, blood sugar and cholesterol, weight reduction, quitting smoking and starting on anti-platelet (blood thinning) agents, such as aspirin. Physical exercise, especially brisk walking, at least 30 minutes twice a week is necessary. Brisk walking is essential in encouraging more circulation to bypass the blocked arteries. &#65533; In more severe or critical cases, some form of procedure must be done to improve the blood circulation down the feet. The conventional approach involves a bypass surgery, connecting a new tube (graft) between the arteries in the pelvis or groin, down to the knee or ankle. In the long term, the bypass remains open in 65% to 70% of cases.&#65533; In chronic diabetes, the occlusion usually occurs below the knee. These arteries are very small (less than 3mm diameter) and are usually extensively diseased. Bypass surgery is frequently not feasible because of poor downstream flow or blockage. &#65533; A relatively new subspecialty in medicine, called interventional radiology or endovascular therapy, has developed in the last 15 years. New miniature devices have been invented and can be used to treat these cases when the surgery is not feasible. &#65533; A procedure called angioplasty, using balloons and wires, can be done to unblock the diseased arteries. This procedure is usually performed by interventional radiologists. The success rate is better for small arteries below the knee. However, it may not be workable if the disease is too severe, late or too heavily calcified. &#65533; The limb salvage rate using angioplasty is quite favourable, especially in cases when surgery is not an option. The limb salvage rate is in the range of 70% in one year. &#65533; In patients who present with toe or foot gangrene, revascularisation with an angioplasty or bypass surgery can be performed first, before any form of amputation or debridement. This can ensure enough blood circulation reaches the foot and toes, and improve wound healing after the removal of the dead tissue.&#65533; In the critically ischaemic limbs, amputation is frequently inevitable. &#65533; Poor leg circulation is a dangerous disease. Proper screening, quitting smoking, walking exercise, anti-platelet medications and early intervention before gangrene sets in can save limbs and lives. &#65533; There are many options for treatment. The earlier it is discovered, the better your choices are. Angioplasty or endovascular therapy should be considered prior to surgery in appropriate candidates. If you are at risk or have symptoms of poor leg circulation, you need to consult a doctor to have the arteries checked. &#65533;

Remember: if your leg hurts when you walk, it isn't always arthritis! Seek medical attention and keep the "feet for life". If you need more information, visit the following websites: Society of Interventional Radiology, USA
<u>www.sirweb.org/patPub/pvdPad.shtml</u> Cardiovascular and Interventional Radiological Society of Europe
<u>www.cirse.org/index.php?pid=93</u> The University of Texas Health Science Centre
<u>www.uth.tmc.edu/anes/wound/critical_ischemia.htm</u> Family Doctor
<u>http://familydoctor.org/008.xml</u> Mayo Clinic
<u>www.mayoclinic.com/health/peripheral-arterial-disease/DS00537</u> College of Radiology, Academy of Medicine Malaysia
<u>www.radiologymalaysia.org</u> Endovascular & Interventional NeuroRadiology
<u>www.einr.org</u> This article is contributed by The Star Health & Ageing Panel, which comprises a group of panellists who are not just opinion leaders in their respective fields of medical expertise, but have wide experience in medical health education for the public. The members of the panel include: Datuk Prof Dr Tan Hui Meng, consultant urologist; Dr Yap Piang Kian, consultant endocrinologist; Dr Azhari Rosman, consultant cardiologist; A/Prof Dr Philip Poi, consultant geriatrician; Dr Hew Fen Lee, consultant endocrinologist; Prof Dr Low Wah Yun, psychologist; Dr Nor Ashikin Mokhtar, consultant obstetrician and gynaecologist; Dr Lee Moon Keen, consultant neurologist; Dr Ting Hoon Chin, consultant dermatologist; Assoc Prof Khoo Ee Ming, primary care physician. For more information, e-mail <u>starhealth@thestar.com.my</u> The Star Health & Ageing Advisory Panel provides this information for educational and communication purposes only and it should not be construed as personal medical advice. Information published in this article is not intended to replace, supplant or augment a consultation with a health professional regarding the reader's own medical care. The Star Health & Ageing Advisory Panel disclaims any and all liability for injury or other damages that could result from use of the information obtained from this article.