Developing Medicine's digital medical resource scripts and sources – General medicine

How can Artificial Intelligence be used to benefit the health of people in developing countries?

It is now widely accepted that Artificial Intelligence, if used responsibly and ethically, can significantly improve healthcare for patients. AI's adoption by some of the world's leading healthcare systems, such as the National Health Service in the United Kingdom, shows how far we have come. We see patients in the United Kingdom already receiving the benefits of AI as it analyses chest and heart scans to provide early warnings for conditions like heart disease and Type 2 diabetes. And we expect to see AI put to more uses in developed healthcare systems very soon.

But however much potential AI has to improve healthcare in developed countries, we believe that its responsible and ethical use has even **more** potential in developing countries. That is because the opportunities to improve healthcare systems in the developing world are far greater and the extent to which AI can improve health outcomes is far broader. And that is especially because developing countries are now also experiencing the burden of chronic conditions like diabetes and heart disease.

The problem though is that the use of AI in healthcare is frequently only considered and studied in developing country contexts. Comparatively little research is being conducted into

how AI systems can be adapted to **developing countries**. This concerns us because we believe that, as things stand, AI might widen the gap between the healthcare systems of developing and developed countries even further. We don't want this to happen. We want to make sure that AI is used responsibly and ethically for the benefit of people in developing countries as well.

For those reasons, we have studied emerging AI healthcare technologies and will continue to do so. We have seen that most of the emerging technologies provide early warnings about diseases, diagnoses and risks. This makes us think that the use of AI to improve healthcare in the developing world will often require its combination with **targeted digital medical resources**. By this we mean, digital medical information that provides patients with information about those particular diseases, diagnoses and risks.

And that is why we have been producing free targeted digital medical resources in 18 local languages. These resources are intended to complement emerging AI healthcare technologies. You can find these resources on our channel and on our website:

- Diabetic eye disease digital medical resources to complement AI systems that predict diabetic retinopathy using eye scans.
- Diabetes digital medical resources to complement AI systems that predict diabetes based on heart scans.
- Gestational diabetes digital medical resources to complement AI systems that predict that condition from blood tests.
- Blood pressure digital medical resources to complement AI systems that predict heart disease from chest scans.

We will continue this work as more AI healthcare technologies emerge. Everything we do will be for free. So join us now in developing medicine. Subscribe to our channel and visit us at developingmedicine.org.

Why do diabetics often have foot problems? How can diabetics reduce the risk of those problems?

People with diabetes often have foot problems. This is because diabetes damages the nerves that give us the sensation of touch or feeling. Our feet are normally one of the first parts of the body to be affected and so people with diabetes often lose the capacity to feel with their feet. This means that if they cut their feet, or burn their feet, or injure their feet in any way, they may not realise. They also often don't realise when one of those wounds becomes infected. This can lead to very serious problems. It is not unusual for people with diabetes to have toes amputated, feet amputated or even half a leg amputated because of an infected wound. A serious infection can also threaten a person's life, especially when that person also has poorly controlled diabetes.

Sadly, we have seen many people disabled in this way because they did not properly look after their feet. For this reason, we would like to provide the following advice to anyone who has been diagnosed with diabetes:

- Firstly, regularly inspect your feet. Make sure you look carefully between your toes and on your soles. If you find it difficult to see the soles of your feet, use a small mirror or ask a family member or friend to help you. Look for any cuts, cracks or any corns. If you find any, it is important that you keep them as clean and dry as possible.
- Secondly, ensure that your toenails are carefully trimmed so they do not cut into your skin.
- Thirdly, try to use comfortable shoes that do not cut into your skin or restrict the blood flow in any way. Also, try to use comfortable, loose socks.
- Fourthly, do not walk anywhere barefooted. In particular, do not walk on surfaces like concrete or sun which may be hot.
- Fifthly, if you have calluses on your feet, do not try to remove them yourself. It is likely that they will become infected if you do. Try to see a health professional instead.

- Sixthly, if you think you might have an infected wound on your feet, try to see a healthcare professional as soon as possible. Signs of infection are redness around the skin, pus and increased pain.

If you follow these rules, you are likely to avoid the serious consequences of amputation and disability that have affected the lives of many diabetics.

Sources: *NHS (UK), Complications: Peripheral neuropathy*, *NHS (UK) Looking after your diabetic foot ulcer to reduce the risk of amputation*, *WHO, Prevention and management of diabetic foot problems*

The benefits of controlling blood sugar

Diabetes is one of the most common diseases in the world. The most usual type of diabetes is “type 2” diabetes, which is caused by consuming foods and drinks that are high in sugars. These are foods like chips, biscuits, cakes and drinks like colas and other sweet, fizzy drinks. Unfortunately, people are being diagnosed with type 2 diabetes at a higher rate and at a younger age because they eat too many of these foods and drink too many of these drinks. They then suffer the effects of diabetes, such as problems with their eyes, heart, kidneys and feet. These problems are often serious and can lead to disability and death, particularly if people do not do anything about their diabetes.

But the good news is that it is possible to put your type 2 diabetes into “remission”. By “remission” we mean that it is possible to keep your blood sugars in the normal range without taking medication. The key to this is to lose weight by eating only low calorie foods. Avoid eating things like chips, biscuits and cakes. Also avoid drinking sweet fizzy drinks like coca-cola. Even juices can be high in sugars. Try drinking cold water instead. It can be hard to do this at first, but after a couple of weeks you will find that you do not miss these foods and drinks.

If you do these things, you may find that your diabetes is in "remission" and that you can save yourself the time and expense of diabetes medications. Or if you have not yet started taking diabetes medications, doing these things may save you having to do so. However, you should not make these decisions yourself. You should discuss these issues with the healthcare professional who is treating your diabetes.

Sources: *NHS (UK), NHS Type 2 Diabetes Path to Remission Programme*, *Diabetes UK, Type 2 Diabetes Remission*, *The Lancet (Valabhji et al), Early findings from the NHS Type 2 Diabetes Path to Remission Programme: a prospective evaluation of real-world implementation*

Why does high blood pressure matter? How may it be reduced?

High blood pressure is sometimes called a "silent killer". It usually does not cause any symptoms itself, but it can cause significant damage to your vital organs such as your eyes, your heart and your kidneys. Most people who have heart attacks usually also have high blood pressure because it damages the vessels that supply blood to your heart muscle. Many people do not know this until it is too late.

For these reasons, if you have been told that you have high blood pressure, do not ignore it. In another video, we have shown how you can correctly monitor your blood pressure at home. The ideal reading should be 120/80. When these numbers go up to 130/90 or above, a person is considered to have high blood pressure. It may be that you also need to take medications in these situations – you should talk to a healthcare professional about this. However, there are also things that you can do yourself to reduce your blood pressure:

- Firstly, reduce the salt in your diet. Salt increases the amount of water that we carry in our blood and so increases blood pressure. By not using salt in your cooking or at the table, you can make a real difference to your blood pressure readings.
- Secondly, try to lose weight. Reducing fats and sugars in your diet will help you lose weight and will also reduce your blood pressure.

- Thirdly, exercise regularly. This does not need to be intense exercise. Just by walking for half an hour a day, you can burn calories, lose weight and so reduce your blood pressure.
- Fourthly, stress is known to cause high blood pressure. It can be difficult to avoid stressful factors, but when you make big personal, professional or financial decisions in your life, consider how they might affect your blood pressure.

If your blood pressure remains elevated despite following these rules and despite taking medications, you should seek advice from a healthcare professional.

Sources: *NHS (UK), Check your blood pressure reading*, *NHS (UK), High blood pressure*, *WHO, Hypertension*

What is diabetic eye disease?

People with diabetes often experience problems with their vision. This is because high blood sugar damages the arteries that carry blood to the part of the eye that transmits what we see. This part of the eye is called the retina and so the condition is known as diabetic retinopathy. It normally takes some years for this condition to affect your sight because the retina is damaged gradually by high blood sugar. Sadly, many diabetics lose some or all of their vision because of this condition.

However, if you are diabetic, there are things that you can do to stop this occurring to you:

- Firstly and most importantly, ensure that your diabetes is well managed. In another video, we have explained how you can reduce your blood sugar levels by following an appropriate diet. However, if you have been prescribed diabetic medications by a healthcare professional, make sure that you take those medications. Regularly monitor your blood sugar levels to make sure that these dietary measures and medications are controlling your blood sugar levels.

- Secondly, deal with any other condition that may damage your eyes. The two most common of these are high blood pressure and high cholesterol. Both of these conditions will combine with high blood sugar levels to cause damage to the retina's arteries. In another video, we have explained how you can reduce your blood pressure and cholesterol through dietary and lifestyle changes. If you smoke or vape, you should also try to stop, or at least reduce how much you consume.
- Thirdly, if you have diabetes and are able to have your eyes checked by an eye doctor, take the opportunity to have them checked. This is because diabetic retinopathy can sometimes occur in people even if their blood sugar, blood pressure and cholesterol are well controlled.

In all cases, a person's vision can be saved by taking these measures sooner rather than later.

Sources: *NHS, Diabetic retinopathy*, *NHS, Diabetic eye screening*, *WHO, Promoting diabetic retinopathy screening*

What is diabetic kidney disease?

Diabetes is one of the main causes of kidney failure. This is because high blood sugar levels damage the arteries that carry blood to our kidneys. They then stop doing their job of filtering our blood. That is why people with badly damaged kidneys may need to go on renal dialysis or may even require a kidney transplant. However, both those options are expensive and may not be available to you.

But there are things that all diabetics can do to minimise these risks:

- Firstly and most importantly, ensure that your blood sugar is well controlled. In another video, we have explained how you can reduce your blood sugar levels by following an appropriate diet. However, if you have been prescribed diabetic medications by a healthcare professional, make sure that you take those

medications. Regularly monitor your blood sugar levels to ensure that these dietary measures and medications are controlling your blood sugar.

- Secondly, avoid medications that may damage your kidneys, unless they have been prescribed by a doctor who is aware of your diabetes. In particular, you should carefully consider any other medicine you take, such as anti-inflammatory medicines like ibuprofen. These medicines can damage your kidneys, so only take them on the advice of your treating doctor. You should also carefully research the effects of any traditional medicines or gym supplements that you take. Avoid self-prescribing medicines and avoid taking advice about medicines from anyone who is not medically qualified.
- Thirdly, deal with any other condition that may damage the arteries that carry blood to the kidneys. The two most important of these are high blood pressure and high cholesterol. In another video, we have explained how you can reduce your blood pressure and cholesterol through dietary and lifestyle changes. If you smoke or vape, you should also try to stop, or at least reduce how much you smoke or vape.

Doing these things sooner rather than later will significantly decrease the chances of your diabetes progressing into serious kidney failure.

Sources: *NHS, Kidneys*, *NHS, Chronic Kidney Disease*, *NHS, Imperial College Healthcare, Renal diabetes*, *CDC, Chronic Kidney Disease*

How to reduce the risk of urinary tract infections

The urinary tract carries urine from our bladder to our external genitalia. Urinary tract infections most frequently occur when bacteria from faeces enters the tract. This occurs most commonly in females because the urinary tract is closer to the source of that bacteria. However, these infections can also occur in men, especially older men who use catheters or who are bedbound.

In young healthy people, urinary tract infections are usually not serious but can be painful, embarrassing and can cause fever and sickness. However, in older people, and people with other medical conditions, urinary tract infections can be serious and sometimes fatal. It is common for elderly people to be admitted to hospital for urinary tract infections.

There are some things you can do to try to minimise the risk of urinary tract infections:

- Firstly, keep your genital area as clean as possible. When you wipe yourself after going to the toilet, wipe from the front to the back and not from the back to the front. Also, wash the area thoroughly after sexual intercourse. In relation to elderly people or people who are unable to look after themselves, make sure that their nappies or incontinence pads are regularly changed.
- Secondly, drink water regularly so that you often flush out your bladder. Do not rush when you urinate. Try to ensure that your bladder is fully empty each time you go to the toilet.
- Thirdly, do not use scented soaps for cleaning your genital area. Also try to avoid using tight, synthetic underwear made of materials such as nylon.
- Fourthly, conditions such as diabetes will increase the chances of you having urinary tract infections and also their severity. If you have diabetes, try to ensure that your blood sugar levels are well controlled.

Sources: *NHS, Urinary tract infections (UTIs)*, *NHS Inform, Urinary tract infection (UTI)*, *WHO, Urinary Tract Infections in Infants and Children in Developing Countries in the Context of IMCI*

How can the risk of nail infections be reduced? How can nail infections be treated?

Onychomycosis is an infection of the nail that causes discoloration, thickening and separation from the nail bed. It can cause discomfort, pain and embarrassment. Without treatment, it can lead to long term damage to your nails and the nail bed. Only in rare cases

does onychomycosis cause serious problems. But sometimes it can lead to conditions such as cellulitis, osteomyelitis and sepsis. These can be serious problems for older people or people with weakened immune systems.

Onychomycosis can infect both fingernails and toenails. But toenail infections are much more common. There are several things that you can do to minimse the risk of these infections:

- Firstly, avoid wearing tight, closed toe shoes, particularly if you have had nail infections in the past. If you do wear closed toe shoes, wear cotton socks to increase the airflow. Also ensure that your feet are dry before you put on your shoes and socks.
- Secondly, do not share nail clippers, even if you think that other people who use them do not have a problem with infections. This is because some people may not be affected by infections even though they carry the infection.
- Thirdly, if you have had a problem with nail infections in the past, consider disinfecting your shoes with alcohol. Also, try to leave your shoes in the sun when you are not wearing them.
- Fourthly, avoid washing your feet in public toilets and public change rooms. Ensure nail salons and podiatrists that you attend are properly licensed.

If you do have a nail infection, there are steps that you can take to treat it.

- You can get ointments to treat the infection from pharmacies. These commonly contain substances like ciclopirox or efinaconazole which act against fungal infections.
- Clean and dry the area before applying the ointment. Then apply the ointment evenly over the nail surface. The ointment will treat the contaminated part and help healthy nail re-grow. Ideally cover the ointment with a gauze strip to reduce its evaporation.

- The ideal time to do this is before bed so that the area has at least 6 hours to heal before you wear shoes again. In the morning, ensure that you discard the gauze strip.
- Once you've started the treatment, you need to be serious about applying the ointment daily for at least a week.

If you do not see improvement in the affected area after this process, you should see a qualified healthcare professional. You should also see a qualified healthcare professional if you develop redness around the area, you see pus or if you feel significantly increased pain or fever.

Sources: *NHS, Fungal nail infection*, *NHS, Nail problems*, *NHS Inform, Fungal nail infection*, *CDC, Clinical Overview of Ringworm and Fungal Nail Infections*

Six common symptoms of breast cancer

Sadly, breast cancer continues to be a major source of illness and death amongst women around the world. According to the World Health Organisation, around 1 in 12 women will be diagnosed with breast cancer in their lifetime. Thankfully however, breast cancer is usually treatable, especially if it is detected early. For that reason, we discuss 6 common symptoms of breast cancer in this video. If you think you may have one of these symptoms, it does not necessarily mean that you have breast cancer, but you should try to see your healthcare professional as soon as possible.

Firstly, regularly check for lumps or swellings in your breasts, chest and armpits. Lumps and swellings may be caused by several conditions other than breast cancer, but it is important to let a healthcare professional check for you.

Secondly, notice any changes in the skin of your breasts. Two common types of skin changes associated with breast cancer are dimpling (which may look like orange peel) or redness. Both these changes may be harder to see on darker skin.

Thirdly, be aware of any unexplained changes in the size or shape of one or both breasts.

Fourthly, check for any nipple discharge (assuming you are not pregnant or breastfeeding). In particular, pay attention to nipple discharge which may have blood in it.

Fifthly, notice any change in the shape or appearance of your nipple. Two common symptoms of breast cancer are a nipple turning inwards or a nipple with a rash on it.

Sixthly, do not ignore pain in your breast or armpit which does not go away. Breast pain that comes and goes is usually not a symptom of breast cancer. However, persistent pain should be discussed with your health professional.

We assure you again that having any of these symptoms does not necessarily mean that you have breast cancer. And we emphasise that breast cancer is most often treatable, especially if it is detected early. For this reason, we encourage you to regularly examine your breasts and discuss any concerns you have with your health professional.

Finally, we are making this video in 18 different languages and it will be available for free at developingmedicine.org and on our social media, so please share it with friends and family. Thank you.

Sources: WHO, *Breast cancer*, NHS, *Symptoms of breast cancer in women*