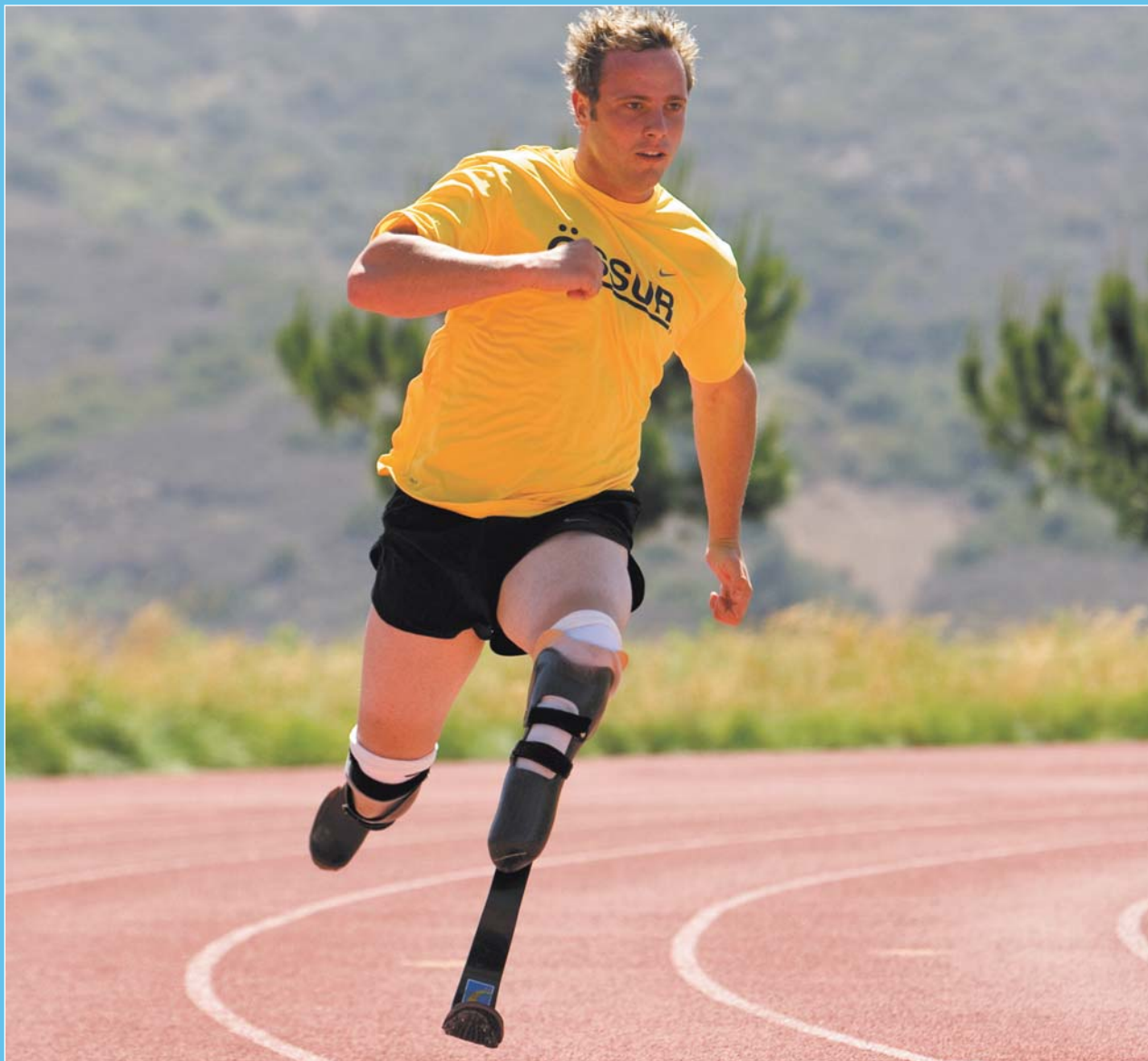


**MEDIA
PLANET**

14 AUGUST 2008

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ADVANCED HEALTHCARE



Photographer: Tim Mantoani. Copyright: Össur.

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ADVANCED HEALTHCARE

A TITLE FROM MEDIAPLANET

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A fistful of dollars

The i-Limb hand has five individually powered digits and won the 2008 Royal Academy of Engineering MacRobert Award - the UK's premier prize for innovation in engineering - for Scottish-based Touch Bionics. Chief executive Stuart Mead on the sky-high barriers British companies still face translating a brilliant idea into a global money-spinner.



▲ Stuart Mead

Recent developments have led to an incredible acceleration in the advancement of healthcare.

In prosthetics revolutionary bionic technologies are already changing the lives of amputees and in the hospitals the use of robots is enabling astonishing results in surgery.

Care facilities are increasingly using technology to treat and monitor patients, while nanotechnology and other progressive approaches promise enhanced treatments for conditions that will hopefully soon be a thing of the past.

At Touch Bionics we have achieved incredible success since launching the i-LIMB hand last year, and hundreds of patients across the world are now benefiting from it.

For many companies now making waves with new technology in the health market, the road is a long and arduous one.

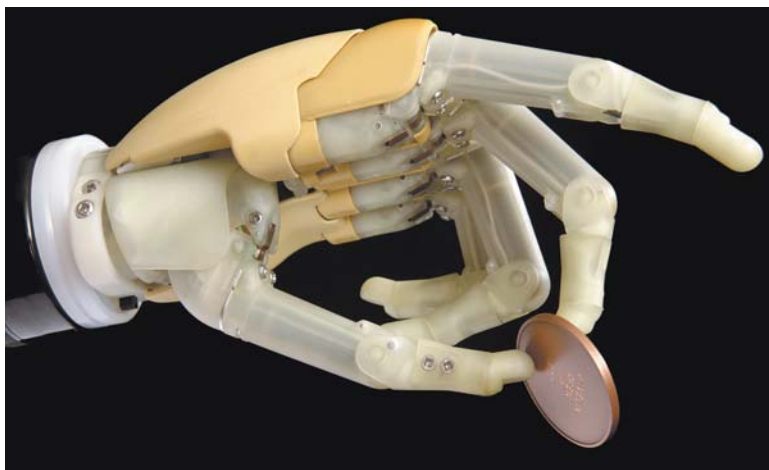
The primary challenge faced by most is the transition of a new technology from its research and development phase into a real-world, commercially successful product.

Companies developing technology for the healthcare sector face a significant first hurdle in raising the funding that is usually required to bring a product to market - a process now further complicated by reduced investor confidence.

But funding is not only a concern at the R&D stage - there is also a big issue over how these new technologies will be supported in the market.

Whether they are taken-up by national health systems or covered by private medical insurance plans.

Patient and clinical acceptance is the key step along the road to success for a compa-



▲ The i-Limb won this year's top UK award for engineering

ny seeking to access the healthcare market.

Any company can find early adopters, but how long will it take for the wider majority to make the move towards a new technology?

Many firms have successfully answered these questions and are now making waves on the international stage with technologies and products like the i-LIMB hand that are truly making a difference to peoples' lives.

The most successful, high-growth technology companies secure their success by ensuring they provide unparalleled customer support and product availability to the best organisations in their field.

And this needs to be achieved wherever they are in the world - today's major clinical centres are not only located in the big western cities as they once used to

be - new and strong economies beckon.

With the right levels of investment and a global willingness to drive innovation beyond R&D and into real world applications, the rewards of next generation healthcare will benefit us all.

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Dawn of Cybermen

We have always been bionic creatures, says Tom Rowland, but now the distinction between man and machine is being blurred in dramatic new ways.

Bionics can be defined neatly as the use of technology to boost, amplify, augment, improve or mend the human body and we have had bionic tendencies ever since the first cavemen picked up a rock and turned it into a stomach-comforting calorie booster by cracking a nut. The mobile phone improves the power of the ear, binoculars amplify the eye.

Since the dawn of time bionics has been changing the way we experience the world, opening up our windows of sensory perception just another crack. When combined with advances in microelectronics, tissue engineering and drug synthesis it might one day blow those windows out of their frames.

There is cause for greater optimism than the science fiction writers of a previous generation could muster. Dr Who's Cybermen are mindless automata, ant-

like clones devoid of individuality.

In Aldous Huxley's 1931 classic *Brave New World* people are part of a totalitarian state, free from war, hatred, poverty, disease, and pain.

The mentally challenged Epsilons, who do the most menial jobs are out of their heads on the pleasure-giving drug Soma for the entirety of their leisure time.

But it does not have to be like that. Many of the developments we report on in this report modify the brain's electrical signaling to have a dramatic impact on the surrounding world but so far there is no evidence of the human will becoming subjugated as a result.

In fact the reverse is the case; the technology turns out to be just a sophisticated crutch that helps release and expand the human mind.

A bionic arm that works just by the power of thought because surgeons have painstakingly connected nerves that were left in the stump after an amputation to some muscles in the chest. As the muscles twitch a pressure-sensitive pad picks up the movements and a microprocessor translates them into digitised instructions that are then passed to servomotors that control movement.

A bionic hand so sophisticated that the fingers move independently and when covered with the latest artificial skins work to manipulate objects with dexterity as well as looking like the real thing.

We can manipulate the electrical signals going to the brain as well as those coming from it.

The synthesis of a new generation of pain killers in the wake of pioneering work by British researchers into selective sodium



▲ Jesse Sullivan had his arms burned when he came into contact with a high voltage cable. Now he has been fitted with the latest bionic replacements.


channel blockers should allow us to more effectively filter the electrical signals going back to the brain within the next few years.

No longer will the only options for many in pain be short acting, mind-numbing pharmaceuticals every bit as addictive and pernicious as Huxley's Soma.

In their place will be more gentle filters that allow the subtleties of touch, hot and cool to flow on, free-

ing the mind from the irritating constraints of the body.

Oscar Pistorius, the 21-year-old South African double-amputee sprinter who runs with the aid of carbon-fibre prosthetic legs may have failed by two seconds in his bid to qualify for the Olympics in Beijing, but the way is open for him to compete against able bodied athletes in London in 2012.



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How Heather Mills keeps her other leg looking so natural

Advances in high definition silicone coverings have made vast improvements in the cosmetic look of artificial limbs and now the ex-model has set up “Heather’s Cosmesis” – a business to make high quality styling available to others.

The tragedy of losing or being born without a limb has to some extent been mitigated by the massive advances in bio-engineering and electronic controls of the last few years which make normal living easier but a prosthetic addition used to look artificial no matter how the owner tried to disguise it.

That no longer has to be the case. Heather Mills, the ex-wife of Sir Paul McCartney, was knocked over by a police motorcyclist in 1993 and had to have her left leg amputated below the knee.

Now the former model has established an association with a Ringwood based company, Dorset Orthopaedic, which aims to help

other amputees who need a prosthesis but would like it to look as natural as possible.

Dorset Orthopaedic has developed a service to produce custom-made coverings for an artificial limb that are sculpted to match the contra lateral side of the patient and blend with the surrounding skin tissue.

The product called “Heather’s Cosmesis” aims to give the amputee a semi-customised, realistic-looking limb. The idea is that can be ordered from anywhere in the world.

The high definition silicone covers are designed to fit over an existing prosthesis and come in a single

“Heather’s Cosmesis aims to give the amputee a semi-customised, realistic looking limb for around £1,650”

colour that is matched nearest to the patient’s skin tone from one of 25 colour swatches.

“Unlike many off-the-shelf pull on covers, the Heather’s Cosmesis is individually crafted, giving attention to the foot detail”, explains Bob Watts, managing director of Dorset Orthopaedic.

The price of Heather’s Cosmesis is £2,000 and is only offered to below knee clients.

Dorset Orthopaedic has provided limbs for Heather Mills since 1993.

“We find that many of our clients gain a huge psychological boost having the knowledge that the focus will no longer be on

their artificial limb, as quite often you cannot tell the difference”, said Bob Watts.

“Heather wanted silicone covers to be more accessible to amputees. We have developed a semi-bespoke silicone cover with our silicone technicians which can be purchased in 25 different skin tones as an ‘off-the-shelf’ product, making it more affordable”, he said.

Heather’s Cosmesis is not totally custom made and is not designed to exactly match a patient’s real leg.

“We will endeavour to match the Cosmesis as closely as we can to the pictures you supply us with”, said Mr. Watts.



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“Give me five” – the new bionic limbs that respond to thought, move more naturally and can even feel sensation

Bionic arms that can sense pressure, temperature and pain and move when the brain commands are under development with teams from the UK and the US producing spectacular results. By Tom Rowland.

The world of advanced prosthetics has been making progress at a breathtakingly fast pace in the last year.

Both the man and woman in this picture can sense pressure and pain as if their missing upper limbs were still present because surgeons were able to move nerves left behind from their arms to the skin close to their breastbones.

Claudia Mitchell 28 is a former US Marine and she lost her arm in a motorcycle accident. She was recently fitted with the world's most advanced artificial arm at the Rehabilitation Institute of Chicago.

Here she is performing a high five handshake with Jesse Sullivan, a 61 year old, who lost his arms in an electrical burn in 2001.

A pressure pad close to the relocated nerves transmits electrical signals to the brain so both can feel sensations just as though they had come from their phantom limbs.

The goal is to make artificial limbs that can accurately reproduce feeling.

This is only possible because

even years after amputees lose their limbs the peripheral nerves in their arms are often still capable of receiving electrical control signals from the brain, signals that origi-

“A new perspective on spare-part surgery. A single screw releases fingers that require servicing”

nally would have told the muscles in the hand how to contract and move. By placing electrodes near these nerves it is possible to decipher the brain's intentions and apply them to motors in a prosthetic limb.

To generate sensations an electrical signal is applied to nerves in the forearm that were originally used to relay sensation signals from the hand to the brain.

Sensors could be placed in a prosthetic hand to measure contact forces and temperatures while a microprocessor turns the data into a stream of electrical impulses that the brain decodes as the feelings the skin of the lost limb would have felt.

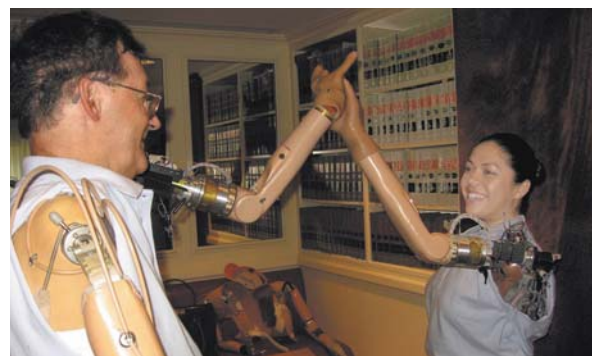
This year the world's first bionic hand won Britain's top technology prize.

The i-LIMB is a prosthetic device with five individually powered digits. It won this year's Mac Robert award from The Royal Academy of Engineering.

Using advanced electronic and mechanical techniques and manufactured with high-strength plastics, the lightweight hand is the first of a new generation of prosthetics.

The Duke of Edinburgh presented the Touch Bionics team with a £50,000 prize and a gold medal.

The i-LIMB hand is controlled by a control system that uses a tradi-



▲ Former Marine Claudia Mitchell greets Jesse Sullivan. Rehabilitation Institute of Chicago

tional two-input myoelectric (muscle signal) to open and close the hand's life-like fingers.

Myoelectric controls utilise the electrical signal generated by the muscles in the remaining portion of the patient's limb. Electrodes that sit on the surface of the skin pick up this signal.

Existing users of basic myoelectric prosthetic hands are able to quickly adapt to the system and can master the device's new functionality within minutes. For new patients, the i-LIMB hand offers a

prosthetic solution that has never before been available.

The modular construction of the i-LIMB hand means that each individually powered finger can be quickly removed by simply removing one screw. This means that a prosthetist can easily swap out fingers that require servicing and patients can return to their everyday lives after a short clinic visit. Traditional devices would have to be returned to the manufacturer, often leaving the patient without a hand for many weeks.

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ADVANCED HEALTHCARE Cochlear implants

Little girl can hear properly thanks to double ear implants

A girl of four who became deaf can hear again and enjoy laughing with friends and her pet rabbit thanks to bionic ears.
By Tom Rowland.

Grace Weightman could not hear at all for two years after being struck down with a form of meningitis which obliterated her cochlea but the extent of her deafness turned out to be fortunate; the NHS could not argue that future new treatment could be compromised by radical surgery now.

The implants cost up to £40,000 for a full course of treatment and the NHS rations most children to just one implant, arguing that operating on two ears now shuts off options for improved treatment in

the future, says her father, William.

"All children who are deaf should be able to get bilateral implants. It makes such a difference but we only got them after a hard fight because our daughter had not been born deaf," he the pressure group 2ears2hear estimates that it would cost £6.9 million a year to give double implants to all children presenting with profound deafness and £25 million to upgrade all patients.

"I know that if Grace does not have one microphone for a

"In the UK 5% of children are offered implants in both ears compared to 100% in the US, Canada and Spain"



few days it makes about a 40 per cent loss in her hearing. The NHS is denying other children the right to hear with both ears," he said.

Only about five per cent of children implanted in Britain get the bilateral option; in Canada, the US and Spain it is 100 per cent.

It would cost £6.9 million a year to give double implants to all children presenting with pro-

found deafness and £25 million to upgrade all patients, says Jason Broekhuizen from the campaigning group 2ears2hear.

Parents Catherine and William own a farm at Houghton Le Spring, near Sunderland. Because of Grace's affliction they started a children's centre "Down at the Farm".

We wanted to create an environment where Grace and other children like her were happy and comfortable", said her father.

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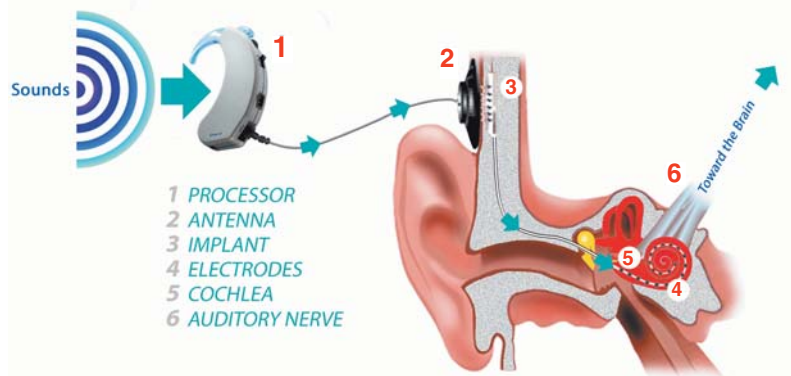


Hear now. And always



Cochlear™

Four companies, Advanced Bionics, Cochlear Europe, MED-EL and Neurelec, make cochlear implants. We survey developments.



▲How they work

Unlike hearing aids, which amplify sound, cochlear implants consist of two parts, one to pick up sound through an external microphone located behind the ear {1} and transmit sound as a radio signal via an antenna {2} to an implanted receiver {3}. Electrodes {4} then stimulate auditory nerves {6} bypassing the normal hearing pathway. {Picture: Neurelec}

ADVANCED BIONICS

The quality of the hearing sensation depends on the quality of the processor and the software – the algorithms used to analyse speech,” says Tiziano Caldera Sales Director UK of Advanced Bionics.

HiRes Fidelity 120 is Advanced Bionics’s a new sound processing option designed to improve hearing in challenging listening environments such as in noisy restaurants or on telephones and to enhance appreciation of music.

It is designed to increase spectral resolution from as few as 12 spectral bands in conventional implants to as many as 120 spectral bands by providing a power source for each implanted electrode.

The firm’s Harmony implant comes with a single switch so the microphone automatically distinguishes between environments with high background noise and quieter ones.

Additional accessories such as mobile phone adaptors, rechargeable batteries and the in-the-ear microphone “T-Mic” provide high comfort for the users.

Cochlear implants **ADVANCED HEALTHCARE**

COCHLEAR EUROPE

The Nucleus Freedom from Cochlear Europe uses ‘intelligent’ digital sound technology designed to behave in much the same way as natural hearing, allowing recipients to focus on the sounds that are most important to them.

It offers continuous enhancements and advanced customisable features. The modular design accommodates all ages and lifestyles.

New “SmartSound” software unique to the Nucleus Freedom provides better hearing in even more day-to-day situations.

SmartSound2 can adapt to the different listening situations in the same way natural hearing does.

The Nucleus Freedom is a splash- and sweat-resistant processor, delivering improved confidence for wet situations.

Amanda Whiffin, general manager Cochlear UK says: “Cochlear is the global leader in implantable hearing solutions. We in the UK provide the tools to hear and the inspiration to explore the world of sound. Our passion, creativity and innovation is what enables the Nucleus Cochlear Implant system and the Baha to deliver sound to more than 100,000 in over 100 countries worldwide. Cochlear’s promise – Hear now. And always – articulates our lifetime commitment.”

MED-EL

Founded in 1989, MED-EL today is a fast growing medical device enterprise offering pioneering technologies and the broadest range of hearing implant systems.

These systems and a variety of system components provide for selecting the best possible solution for individual cases of hearing loss: The Maestro cochlear implant system including FineHearing, the advanced sound processing technology; the first fully integrated system for combined electric acoustic stimulation (EAS); and the unique Vibrant Soundbridge middle ear implant system featuring the smallest audio processor available.

With FineHearing MED-EL offers novel sound processing technology that, for the first time, is able to process the fine details of sound.

“These advanced technologies allow users of our Maestro system to experience a more natural and rich hearing experience than ever before” explains Cassandra Brown, Managing Director of MED-EL UK.

“Even challenging situations such as listening to music or conversations with a lot of background noise are no longer a hurdle.”

NEURELEC

Neurelec’s system has a very low power consumption which is a huge asset argues Guillaume Rosanis, r&d electronics manager at Neurelec cochlear implants.

Average battery life is four days with the Digi SP processor, longer than other brands, he claims.

The implant, Digisonic SP, is ceramic so all the components can be fitted inside a single housing. If a metal housing is used then the receiver coil has to be located separately to ensure uninterrupted reception from the processor.

Surgery is more simple. The entire device is secured with two screws without extensive drilling into the skull being required and there is a claimed saving of 30 per cent in surgery time.

The end product is claimed to be the lightest and smallest processor on the market: only 12 grams in weight and 9 mm thick.

The most exciting future progress should be the development of a new fully implantable technology that dispenses entirely with the external microphone. It will pick up power on a daily basis when the patient puts a charging device near their ear.

Better Hearing in the REAL WORLD



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ADVANCED HEALTHCARE Pain relief

Boy who walked on hot coals leads the way to improved pain management

Scientists are developing drugs that mimic a gene mutation that blocks pain and are confident that new types of pain-busting drugs that act with minimal side effects will soon be available. By Tom Rowland.

A young street busker from Pakistan who could walk on hot coals and drive stakes through his limbs without seeming to feel any discomfort led scientists to a genetic discovery that may soon revolutionise the treatment of pain.

Professor Geoffrey Woods at Cambridge University began studying the child to understand why he was unable to feel pain but was otherwise completely healthy. He died aged 13 from injuries sustained while playing with friends.

Researchers looked at his relatives and found that some had experienced no pain at any time in their lives although they bore the scars associated with excruciating

trauma; many had fractured bones while some were missing the front of their tongues after biting themselves.

Using this information Dr Woods identified a rare mutation in a single sodium channel gene, which disrupts the flow of sodium ions in specific nerve fibres that sense damage.

Other families across the world have also now been added to this list

Neurological tests on the families revealed they responded normally to touch, temperature, tickling and pressure and had no signs of nerve disease.

With the sodium channel blocked the electrical nerve sig-

nals are unable to get through and the brain remains undisturbed. A second related sodium channel is also necessary for many pain sensations, and selective blockers of this channel are already in clinical trials.

"We have now got compounds that block these two channels and are extremely good analgesics in animal models. It is fast moving and exciting," said Professor John Wood of University College London.

His team has now managed to block one specific sodium channel so that all of the inflammatory pain and mechanical pain are removed but the response to heat remains normal.

We have known for some time that sodium channel blockers are good pain-killers, but side effects have limited their usefulness.

"Sodium channels are not part of the central nervous system and can be neutralised without side effects Professor John Wood of University College London"



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Pain relief

ADVANCED HEALTHCARE

However, drugs that specifically act on the two sodium channels found on damage sensing nerve cells have been given far easier targets, he explained.

"I hope it is going to be a real turning point in pain treatment," he said.

Because the sodium channels are not a part of the central nervous system they can be neutralised without the side effects associated with more conventional channel blockers, which may even become lethal as the dose is increased.

The selective blockers should hit the pain without interfering with other systems in the body.

Other clusters of pain-free families who are in every other respect completely normal have been found in Canada and Japan and the UK

"Pain-free but otherwise normal humans provide perfect validation data in terms of making these new drugs" said Dr. Wood.

This is because researchers can see in advance that people with the blocked sodium channels will not suffer adverse side effects.

"The genetics has been done over the last 10 to 15 years and the drug companies have followed up. It is very positive and optimistic," he said.

The first selective sodium-channel blocking drugs would be targeted at inflammatory

pain and should start to become available after phase 3 clinical trials in two

to three years time he said. Drugs targeted against the channels lost in pain-free humans are a few years behind this, as safety issues are rigorously addressed.

To go from the gene to drugs so quickly required both curiosity-drive research and the transnational activity of drug companies said Professor Wood.

"These studies, pioneered by Geoffrey Woods should soon have an important impact on our health and quality of life," he said.

“Discovering pain free families means researchers can see in advance that people with blocked sodium channels will not suffer adverse side effects”



Ears in miniature

Hearing devices are getting smaller and neater



▲ Cochlear Europe

▲ MED-EL

PULSARci100 and SONATAti100



▲ Oticon
Epoq

► Advanced Bionics
Helix



Keeping your blood sugar in control

Technology is improving care of people with diabetes.

A blood glucose test is a way of checking the level of glucose in the blood and is highly important in helping people with diabetes manage their condition.

People with Type I diabetes, and increasing numbers with Type II diabetes, use insulin to control their glucose levels and many are now using continuous pumps to deliver the insulin. These people may self-test anywhere from four to ten times per day. The important thing is to get good, accurate readings to avoid unnecessary hypo- and hyperglycaemic episodes.

Traditionally, self testing of blood glucose is carried out by pricking the finger tip to draw blood and then placing the sample on a chemical strip that either changes colour, or changes in its elec-

“Improved technology for measuring blood glucose is rapidly changing the standards of care for all people with diabetes”

trical characteristics and is then measured by a meter.

Improved technology for measuring blood glucose is rapidly changing the standards of care for all people with diabetes. There are several methods of blood glucose testing currently available.



WaveSense is a suite of patented biosensor technologies that uniquely employ Dynamic Electrochemistry to provide accurate glucose readings. WaveSense sends

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One swallow can make a summer

A Yorkshire company that pioneered developments in plastic tubes and cups used for care after operations on the head and neck has found huge new markets helping stroke victims and the elderly.

Bionic products do not have to be ultra-high technology to have a dramatic impact on the quality of people's lives.

Swallowing safely after suffering a stroke or other neurological problems is vital if food and fluid is to be prevented from entering the trachea.

If they do get down this vital airway then the lungs can get compromised; over a period of time

patients can become prone to pneumonia and that in turn can kill.

Many elderly stroke victims and others with chronic conditions just fade away while the professionals and staff in nursing homes shrug and point out their advancing age. But it does not have to be that way.

There are simple devices available that can halt the lethal lung infection before it gets a hold.

"So long as the carers are aware, there are devices that can reduce to a minimum the risk of aspiration and premature death," said Michael Eaton, head of marketing at Kapitex, which is based in Wetherby.

Many of the products were developed in response to coping with the problems patients had in the aftermath of neck surgery when managing their airways becomes key to keeping them alive.

"Tracheostomy is a holding procedure to make sure a patient can get good respiration while all other things are being managed," he says.

While it is in place keeping swallowed liquids out of the lungs is important.

But the plastic devices can be easily used to help other patients with problems swallowing.

"We have developed a range of drinking vessels and motor rehabilitation products that give physiotherapy to the mouth," said Mr Eaton.



▲ Specialist cups which do not require head movement

"If you do not manage an acute problem properly then you might not live for it to become a chronic one," he points out.

Many of the problems are manifested in people in nursing homes where carers may not know that simple solutions are available.

The cups are specially shaped to prevent tilting the head back. If the epiglottis fails to react quickly

the airway is not shut in time and people cough and choke. Over a period of time fluid builds up in the lung while the patient becomes reluctant to drink, leading to dehydration.

Chewy Tubes are simple but innovative oral motor devices designed to provide a resilient, non-food, chewable surface for practicing biting and chewing skills.



▲ Chewies help in rehabilitation

Safe drinking for those with swallowing difficulties

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Provale™ Cup

Uniquely, the Provale Cup delivers a set amount of fluid each time the cup is tipped. This important feature ensures a controlled delivery for those with swallowing difficulties.



Dysphagia Cup

The new and improved design Kapitex Dysphagia Cup is shaped to allow sufficient nose clearance - to empty contents without having to tilt the head back.



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Ducking diabetes - a strategy for longer life

The incidence of diabetes is exploding and 75 per cent of people with it die from galloping forms of heart disease - yet in some diabetes is avoidable and in others pilot studies have shown that help is at hand ...if it is caught early.

BY DR AKHIL KAPUR, CONSULTANT INTERVENTIONAL CARDIOLOGIST, THE LONDON CHEST HOSPITAL, BARTS AND THE LONDON NHS TRUST

The second half of the twentieth-century saw heart disease become the number one killer in the UK.

The good news is that over the last few years it has been on the decline. This appears to be mainly driven by a reduction in people smoking.

But the battle has by no means been won because this decline is on the verge of being reversed by the huge explosion of diabetes that is not only on its way but is now upon us.

This is important because diabetes leads to heart disease in most of those that develop it.

This development has been driven

by two lifestyle changes that themselves are taking on epidemic proportions. These are higher calorie intakes leading to widespread obesity and low calorie output states that follow the adoption of sedentary lifestyles.

This has occurred despite the proliferation of advice that informs our eating, particularly what we should eat to stay healthy.

There is a vast array of diets to choose from. Gyms and exercise classes seem to be popping up everywhere. Despite all of this Type 2 diabetes is on the rise and could reach 4 million by the end of the decade.

It is not only here that this is happening. The rest of the developed world such as the USA and Germany are witnessing similar problems. But the problem is increasing at literally an exponential rate in emerging economies such as India, China and Russia - compounded by the fact that in these countries smoking is also on the rise.

In the general population in this country 33 per cent of people die from heart disease but in people with diabetes this rises to a massive 75 per cent.

Diabetes is inextricably linked to obesity. Body mass index relates height to weight and is one way of

measuring obesity. A level of below 25 is considered normal and one above 30 is obese.

It is well established that a woman with a low body mass index of 20 has a virtually zero chance of developing type 2 diabetes in her lifetime but a woman with a body mass index of 35 has a 90 per cent chance of developing this condition.

Type 2 diabetes is a potentially preventable condition. This has been borne out by several studies in which lifestyle changes that included healthy eating, weight reduction and exercise (example = DPP diabetes prevention programme) were

applied to prevent its development.

Prevention using lifestyle modification has been shown to be superior to even medical intervention such as the taking of medication by those at risk.

Obesity and its consequences frequently enter the political arena. Only recently did David Cameron weigh in with his opinion that it was time for people to take some responsibility for their own health rather than letting things happen to them and depending on the state to sort out the consequences.

One thing is certain: when it comes to type 2 diabetes prevention is infinitely better than cure. In fact



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Diabetes

ADVANCED HEALTHCARE



no cure exists for this condition and at present there is no prospect of one either.

Even so it is clear that the government does have a part to play. People cannot be dictated to when making lifestyle choices. But it is possible to assist them in making the right choices.

The recent proposal for access to free swimming for everyone over retirement age is a welcome development that contrasts with previous policies that have resulted in the selling off of school playing fields.

Better food labelling has also helped.

But what can be done for those in whom prevention is no longer possible?

There are initiatives that can help. At least one million people - the so-called missing million - in this country are believed to have undiagnosed diabetes.

A programme of identifying these patients early would aid better management of their condition. Picking up heart disease earlier in patients with diabetes would also

reap tremendous rewards. This is because heart disease in patients with diabetes is on average more aggressive than in those without diabetes.

Until recently these patients were studied together with all other heart disease patients even though it is recognised that there are features of heart disease in patients with diabetes that set them apart from other heart disease patients.

They suffer from a more aggressive disease process and from rapid progression of their disease and it is argued that they should therefore be more aggressively managed.

More recently there has been a move to study these patients separately so that treatment can be better tailored to them.

Dedicated studies and trials looking specifically at these patients are now under way and one such study in which the United Kingdom led the way will be presented at the European Society of Cardiology in September.

This study is called the CARDia (Coronary Artery Revascularisation in Diabetes) Trial and will help determine which is the best form of treatment, either bypass surgery or coronary angioplasty

and stenting, for patients who have diabetes and widespread coronary disease which would previously have required surgery.

The United Kingdom is leading in other ways. Local initiatives are often the catalyst for the adoption of more widespread programmes. In a deprived part of East London one such initiative has already started. The borough of Newham has the highest rate of death from coronary disease in the country.

It is also considered to be the capital of diabetes in Europe. A dedicated clinic has been set up within the cardiology department of Newham University NHS Trust for patients who have diabetic coronary disease.

The purpose of this is to diagnose these patients earlier and once diagnosed treat them aggressively. Catching these patients early has huge potential benefits.

If left undiagnosed diabetic coronary disease will present acutely more often, that is, with heart attacks and even death than it does with a non-acute presentation to a GP or cardiologist which is how most other coronary disease presents.

Diabetic coronary disease is more difficult to diagnose because patients do not always feel chest pain.

Running a clinic like this affords the opportunity of seeing patients with diabetes who the clinic and their GPs believe are at high risk of heart disease.

Catching them early therefore allows the clinic to institute earlier proven treatments that they know will reduce their long-term risk thereby reducing their chances of having a heart attack.

If necessary the patients can be fast tracked to diagnostic interventions to detect their coronary disease and then if necessary on to operative procedures such as percutaneous coronary angioplasty and stenting which can relieve their coronary narrowings and blockages.

There is pilot data from this clinic which confirms that risk is being reduced in these patients. These data are also being presented at the European Society of Cardiology this September and if this clinic proves successful there is a plan to roll this out to other high risk areas in a bid to protect and hopefully save more lives.

Show You Care with Boston Scientific in the global fight against diabetes.

World Diabetes Day is a worldwide campaign under the umbrella of the **United Nations** orchestrated by the **International Diabetes Federation**, an alliance of over 200 diabetes associations in over 160 countries.

Boston Scientific is pleased to support this crucial healthcare initiative as part of its global mission to find new ways to help clinicians improve patients' lives. This includes building awareness of Coronary Artery Disease among patients with Diabetes and referral physicians and encouraging Interventional Cardiologists to screen their patients for Diabetes when considering treatment.



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UN Resolution 61/225 on December 20th 2006 designated November 14th as United Nations World Diabetes Day to be observed every year starting in 2007.

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Hearing

No more whistledown the wind in your ear

Of the one million hearing aids fitted each year in the UK roughly 750,000 are done through the NHS but the products available on the NHS lag significantly in terms of both the technology levels and style.

While the NHS is still supplying hearing aids that sit behind the ear with a tube that attaches to a mould that is in the ear, the private sector has powered ahead with more aesthetically pleasing designs that fit within the ear canal. These are currently the primary resource of the independent dispensers.

With aids costing an average of £1,000 per ear they can seem expensive compared to other high technology consumer items such as a mobile phone which has many more functions.

Innovative designs however take a long time to drop in price because of the conservative procurement policies inside the NHS, argue manufacturers.

Hearing aid sales volumes are not large enough to bring down prices quickly, says Neil Pottinger of manufacturers Starkey.

"Over the last eight years the primary change has been the change from analogue to digital hearing aids. We have the best feedback cancellation system in

the market," says Mr. Pottinger.

"Under normal and correct fitting procedures feedback has ceased to be an issue while our directional system quickly allows users in a busy environment with lots of background noise to identify the sound they want to be listening to and nullify the surrounding sounds," he says.



▲ The Zon; a new generation of ultra-miniaturised hearing aids that allow in peripheral sound

The new Zon hearing aid is even smaller and sits inside the ear canal without blocking all other acoustic inputs. It is also claimed to be more comfortable to wear because the unit does not clog the entire canal.

"Recent innovations in hearing aid technology are helping to change the picture from foggy to 'sharp' for many people with hearing loss," argues Mariska Alexander of Oticon.

"The Oticon Epoq, the first hearing solution with wireless connectivity, has added an exciting new dimension to the way people with hearing loss can process the 'sea of sounds' they encounter in daily life," she said.

Unlike traditional hearing aids, a pair of Epoq hearing devices continuously "communicates" with each other wirelessly to support the brain's proper interpretation of various sounds in the environment. The result is a unique spatial awareness – a 360° hearing experience – that makes it possible for Epoq users to more easily navigate in complex and changing sound environments.

Epoq improves an individual's ability to determine where sounds are coming from and at the same time, makes sounds much clearer and more comfortable. Because

HEARING HISTORICAL ECHOES

Hearing aids are one of the longest-serving applications of bionics.

In 1588 the writer Giovanni Battista Porta, reported that healers fashioned 'hearing aids' of wood, shaped like the ears of animals known for acute hearing – as if some of that natural, animal ability would rub off on the hard-of-hearing.

Ear-trumpets featuring elongated tubes with a funnel-shaped end, were commented on by Francis Bacon in 1627.

In 1898 the first commercial hearing aid, called a 'carbon-type', was produced in the U.S. by the Dictograph Company.

Thomas Edison became technically deaf in his teens and he patented the 'carbon-transmitter', which translated sound into electrical signals.

Alexander Graham Bell, invented the telephone while working to invent a hearing aid.

In 1899, the Akouphone Company produced the first practical electric hearing aid using the carbon-transmitter and a microphone with a battery. It retailed for \$400 and needed its own table.

By 1952, the first transistor hearing aids were developed. These hybrids featured both vacuum tubes and a transistor. They were much smaller.

By the 1960's the transistor allowed hearing aid designers to create 'over-the-ear' or 'behind-the-ear' models.

Later features like directional microphones, and integrated circuitry helped users to distinguish between speech and background noises.

Tiny batteries for 'in-the-canal' aids with analog sound-systems that were almost completely hidden from view were also developed.

In the 1980's, with the introduction of lithium batteries, hearing aids went digital.

Epoq users don't have to concentrate so intently when listening or talking, they report feeling more confident and at ease especially in difficult listening situations.

"They also tell us that they have more energy to socialise and to engage in situations and activities they previously avoided," she said

Epoq's wireless connectivity cre-

ates another outstanding benefit for people with hearing loss. With the addition of the Streamer, a sleek companion device, Epoq functions like a wireless headset, streaming conversation from mobile phones, televisions, MP3 players and other Bluetooth-enabled devices directly into both ears for interference-free listening.



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