JOURNAL OF GENERAL PRACTICE NURSING

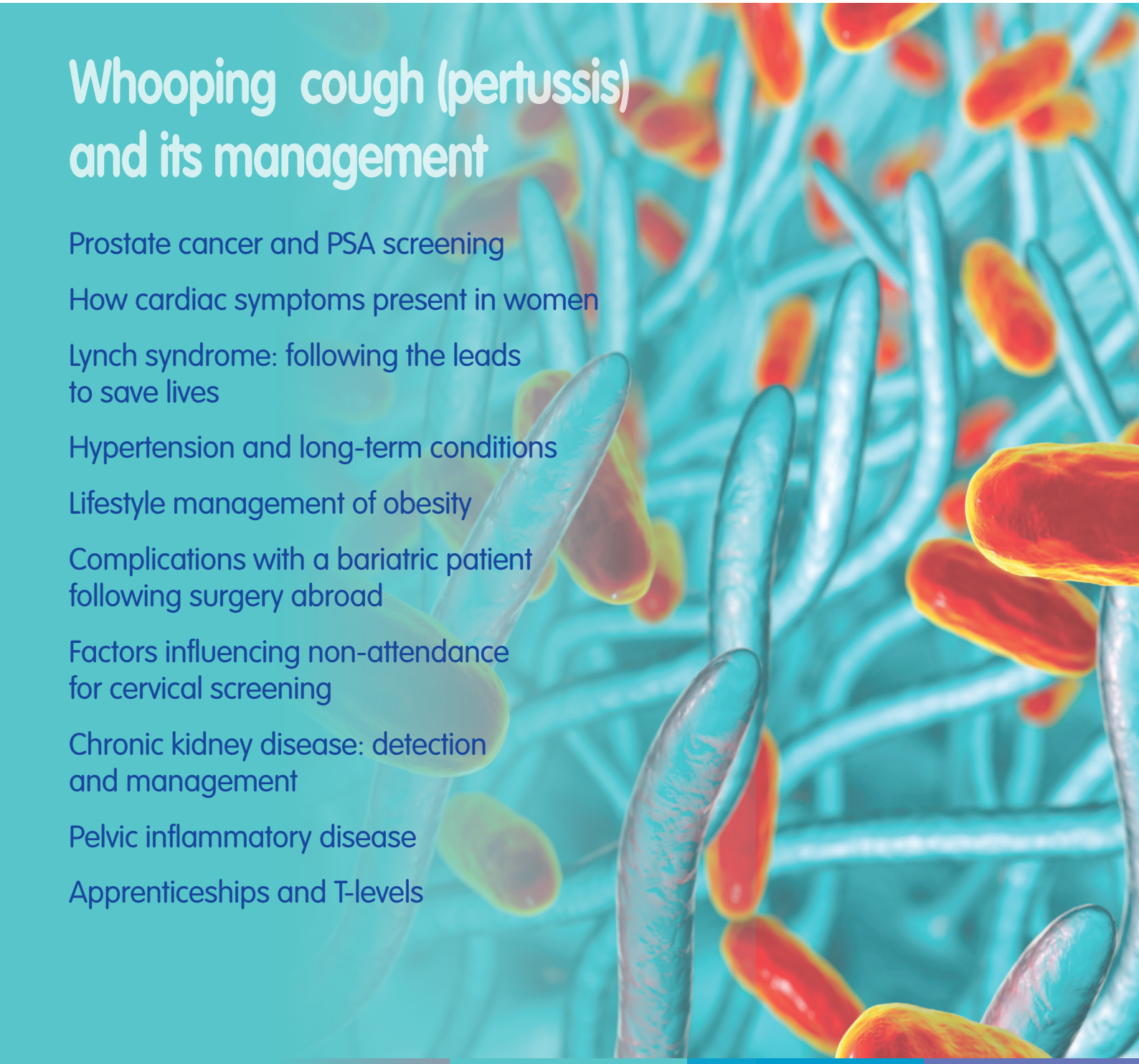
GPN

Promoting practice to improve patient health and quality of life

Volume 10
Number 2
June 2024

www.journalofpracticenursing.co.uk

Whooping cough (pertussis) and its management



Prostate cancer and PSA screening

How cardiac symptoms present in women

Lynch syndrome: following the leads to save lives

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Complications with a bariatric patient following surgery abroad

Factors influencing non-attendance for cervical screening

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Contents

Managing director
Alec O'Dare
alec@woundcarepeople.com

Editor-in-chief
Jaqui Walker, advanced nurse practitioner; lead general practice nurse, Falkirk, Scotland

Editor/publisher
Binkie Mais
binkie@jcn.co.uk

Sales and marketing executive
Ed Clews
ed.clews@jcn.co.uk
017985 731016

Unit G, Wixford Park, George's Elm Lane, Bidford on Avon, Alcester B50 4JS

ISSN 2057-6021

t: +44(0) 1789 582000
e: binkie@jcn.co.uk
w: www.gpnursing.com

Published bi-monthly and distributed free of charge to general practice nurses based at primary care locations throughout the United Kingdom. Also available on subscription.

Institutional/overseas subscription rates:
United Kingdom: £160.00
Overseas: £295.00

UK subscription rates:
Four issues per year: £60

Printed in England by Blackmore Limited

Photograph on front:
Kateryna Kon/Shutterstock

To comment on any of the articles in GPN, or if you have ideas of your own for an article, please contact: binkie@jcn.co.uk

Sharing expertise and clinical practice

Our garden is in full bloom, and we have had a lovely spell of sunny weather. We were even treated to the northern lights above our house last week— worth being woken up for at 1.00am! It's not just the garden and the weather I feel excited about, the first in our podcast series is now live, 'Heart failure in primary care — role of GPNs' (www.journalofpracticenursing.co.uk/course/heart-failure-in-primary-care-role-of-gpns/details) and you can join my colleague Susan and I as we sit down for a 'coffee break' chat about heart failure, admittedly half an hour is more than I normally get for a coffee break! However, making this time to sit and talk was hugely beneficial, and I learnt so much that now helps in practice. I hope you can make the time to watch it and please share what you found useful and any ideas for future discussion on this GPN community platform.

Another area that I still need knowledge of is the delivery of vaccination programmes. Judith Harford's timely article however has helped me update on identifying pertussis infection and my role in helping to address vaccine hesitancy and promote vaccine uptake to help safeguard our local populations.

This issue's 'Practice matters' piece looks at prostate-specific antigen (PSA) testing. A complex area that is often seen by our patients as a straightforward screening test. I am grateful that my two brothers have shared their very different stories of PSA testing and highlighted the importance of PSA interpretation and guidance for the man's onward journey. I recently had a man in his 50s ask me to add PSA onto some routine bloods. I said, of course, but explained that I wanted to spend a little time outlining the pros and cons of the test first. He was fine with this, and I hope he listened and understood, although suspect his drive to have the test because his friend had recently had a prostate cancer diagnosis was going to influence the end decision whatever we discussed first. PSA testing needs to be considered not in isolation but along with information gathered from history-taking, current symptoms and perhaps a rectal examination from a suitably skilled clinician. It can be hard to help people understand why it isn't just a routine screening test.

I found it helpful to read the first part of our 'Monitoring matters' series written by Callum Metcalfe-O'Shea, ANP and professional lead for long-term conditions at the RCN. He helps place blood pressure management within the disease trajectories of various long-term conditions, including diabetes, chronic obstructive pulmonary disease, asthma, rheumatology and inflammatory bowel disease, with some excellent practice points to help inspire quality improvement projects. I also benefitted from reading the informative article by Margaret Perry on pelvic inflammatory disease, especially around differential diagnosis and management.

These are just a few of my highlights, why not take a look for yourself at the range of articles and information and please let us know what you would like to read, view, or talk about so that we can continue to strengthen this community.

Jaqui Walker, editor-in-chief

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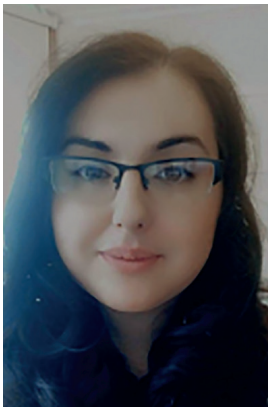
My passion for education has given me such an amazing general practice nursing career. To be invited to become a member of the editorial team for the *Journal of General Practice Nursing* provides the opportunity to contribute to a journal with high standards and vision. Education is what drives good clinical practice; the characteristic adaptability and resilience demonstrated by staff is founded on sound principles. It is a privilege to be part of the editorial board, contributing to the strategic commitment of enabling access to educational material, which is contemporary, relevant and valued.

Julie Lennon

It is a privilege to be invited to join the editorial board. I have been nursing for 30 years and in general practice for over 16 years. The change in general practice is nothing short of amazing. I am currently working in a dual ANP/GPN role which I am passionate about and proud of the way we can make a difference to our patients' lives. My love of chronic disease management pushed me into finding a dual role where I can utilise all my skills, sometimes in every consultation. I am also a keen supporter of new GPNs embarking on their careers, and this journal is a fantastic tool to learning. I love reading the articles and look forward to recapping, updating and broadening my knowledge in other areas.

Susan Brown



I am delighted to have been invited to represent the *Journal of General Practice Nursing* editorial board. It is a privilege to review and contribute to the work of our incredible colleagues and authors. As a primary care pharmacist, I work closely and collaboratively with experienced general practice nurses (GPNs) and understand and appreciate the dedication, compassion and diverse skill mix GPNs bring to the multidisciplinary team. In these uncertain times, when the challenges and pressures faced in primary care and the health service as a whole are unprecedented, it has never been more imperative for us to keep up to date with current best practice and to be proactive in developing interprofessional relationships to support the delivery of high-quality patient care. I feel the journal is an excellent resource to promote evidence-based, person-centred care across the multidisciplinary team, and I look forward to supporting the up and coming content.

Caroline McIntyre

I am thrilled to join the editorial board. I am passionate about improving quality of care across primary care. I enjoy acting as a change agent in general practice to improve patients' experiences and always strive to ensure that high quality, person-centred care is achieved. I am excited to be able to share ideas and discuss topics imperative to our role with like-minded healthcare professionals.

Cheryl Crawford

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Prostate cancer and PSA screening

From my experience of working in general practice, this is a common presentation for many patients concerned about men's health. Due to the effective campaigning and advertising around the condition, it is good to see more men approach healthcare professionals to discuss any symptoms and seek further understanding of the tests involved. GPNs are often the gatekeeper for patients, so having awareness and understanding of prostate cancer symptoms can prompt appropriate testing and, where required, referrals. It is important that GPNs understand how to communicate effectively the process of testing, and this article will support them to begin those discussions around this important condition.

Callum Metcalfe-O'Shea
UK professional lead for long-term conditions, Royal College of Nursing

What most people are looking for when they visit their general practice is certainty. They might want to know the exact cause of their chronic pain, or precisely how long it might take for statins to bring down their cholesterol levels, or any number of other questions.

While much of the work of practice staff might include elements of… let's call it guestimation… ('Come back in a couple of weeks and we'll see how you're getting on…'), advances in healthcare technology increasingly mean that we are able to give people the certainty they're after. For example, new research shows that the accuracy of bowel cancer detection approaches 100% if a faecal immunochemical test (FIT) is carried out twice rather than once ('Double testing better at identifying bowel cancer'— www.ed.ac.uk). Similarly, a new type of blood test that could help thousands of people receive targeted lung cancer treatment is currently being trialled by the NHS ('Thousands more lung cancer patients to get innovative blood test as part of NHS pilot'— www.england.nhs.uk).

Such advances often lead to calls for more widespread cancer screening, but while this may seem like a laudable aim, a recent study from the *Journal of the American Medical Association* (JAMA) and carried out by researchers from the UK's Bristol, Oxford and Cambridge universities shows that when it comes to identifying some cancers — in this case prostate cancer in men — the use of screening is not always as straightforward as it seems ('Screening with a PSA test has a small impact on prostate cancer deaths but leads to overdiagnosis'— www.bristol.ac.uk).

THE SCIENCE

First, let's look at some facts. Prostate cancer affects a small walnut-sized gland, which sits at the base of the bladder surrounding the urethra and grows larger with age. The prostate produces a protein known as PSA (prostate-specific antigen) that helps to liquefy the semen, aiding in its mobility and function and promoting healthy fertilisation.

The majority of prostate cancers develop in the prostate's peripheral gland cells and are known as acinar adenocarcinomas. Cell proliferation takes place near the rectum, which is why prostate growth can be detected by a digital rectal examination (DRE). Many of these cancers grow slowly and are not likely to spread. However, other forms of prostate cancer such as ductal adenocarcinoma of the prostate (affecting the cells that line the ducts of the prostate) and squamous cell carcinoma of the prostate (affecting the flat cells that cover the prostate) can progress more quickly ('What is prostate cancer?'— www.cancerresearchuk.org).

CRUNCHING THE NUMBERS

Prostate cancer is the most common form of male cancer with approximately one in eight men contracting the disease, which primarily affects those over 50 years of age. It is also a major cause of death and disability, with over 12,000 deaths each year in the UK.

That's not the only piece of bad news, with the rates of prostate cancer set to double globally to 2.9 million by 2040, and deaths rising by up to 85%. This is primarily because men are living for longer, which might sound like a good thing. However, because the main risks for prostate cancer are unavoidable — primarily being over 50 and having a family history — this means that it will be impossible to prevent a huge rise in cases through lifestyle changes such as diet ('Prostate cancer cases worldwide likely to double by 2040, analysis finds'— www.theguardian.com).

TESTING TIMES

Given these stark figures, the obvious conclusion is that any test that can identify prostate cancer must be a good thing, right? Unfortunately, it's not as simple as that.

What an apt time for this article to be published with the increased interest in this topic. It provides a valuable recap of the prostate, explores the reasons behind PSA testing, and highlights why it's not just a one-test approach. In my practice, we go through phases of increased requests for PSA and I always ask the patient their reasons for asking. It may be out of curiosity, a friend or family member may have had prostate problems, or it may be that they actually have urinary symptoms and have been burying their head in the sand. As the article states, GPNs are in the ideal position to pick up on their reasons and concerns and it is important to be able to discuss it with them quickly and succinctly. When you're in a busy clinic, it may be appropriate to offer a PSA to be added onto your blood request, but it is important to remember no vigorous exercise, sex or anal sex prior to the blood test (Prostate Cancer UK, 2023). Depending on the patient's rationale for the test, it may be more appropriate to ask them to make another appointment for DRE. I support the list of symptoms mentioned, I find that completing an IPSS (International Prostate Symptom Score) can help identify where the problems are and fill in another part of the jigsaw. These can easily be found online, and while they still have their limitations (no mention of urgency incontinence), it is still an excellent record of baseline symptoms. Combined with a PSA and DRE, this will give a more accurate picture of whether the symptoms are something to worry about or not.

This article highlights the possibilities for those nurses who do not have the current skills to perform a DRE, as potentially another area for personal development. If the expected increase in prostate cancer comes to fruition, we are in an ideal place to expedite assessments.

Susan Brown
Advanced nurse practitioner/general practice nurse, Alba Medical Group, Bannockburn Health Centre

Three years ago I was having some blood tests done for another reason and I asked if I could have a PSA test added to these. I had noticed a slight increase in the number of times I wanted to wee but thought that this was just part of the normal aging process and had not been unduly concerned. My PSA was elevated to three times the upper limit of normal. It turns out that my GP had also got a slightly high result on a previous blood sample three years earlier, although I had been told that this was 'normal' when I asked at the time. I sought help from medical colleagues and underwent a magnetic resonance imaging (MRI) scan followed by a guided biopsy procedure. Around 20% of my prostate gland was taken over by tumour. I sought multiple opinions as to what to do next, many of which were conflicting. Being a medical professional, I made the decision myself to undergo radical prostatectomy (complete removal of the prostate gland). The procedure was done laparoscopically by a robot and a highly experienced surgeon. I was in hospital just two days and back doing online meetings on day three. Two years later my PSA level was unrecordable. I have to be a little careful when I sneeze and cough, but otherwise have not had any lasting bad consequences of the operation. For me, removal of all tumour, giving me a reasonable confidence that I was free of cancer, was the right decision.

David Wheeler
Patient

One of the main screening tools for prostate cancer is the PSA blood test (a small amount of PSA is found in the blood and semen), the theory being that the chances of having prostate cancer rise along with the PSA level. However, there is no specific cut-off point that can identify without doubt if a man has prostate cancer and the tests are unreliable, potentially suggesting prostate cancer when none exists (false-positive). Furthermore, some men with normal PSA levels may have prostate cancer (false-negative), resulting in missed cases ('PSA testing' — www.nhs.uk).

WHY IS PSA TESTING CONTROVERSIAL?

Prostate cancer is an unusual disease because not all cases are harmful. And while some cases can be fatal, many will have no impact whatsoever on a man's life. Also, treatments for prostate cancer can have serious side-effects, such as incontinence or erectile dysfunction. If PSA tests were to be used for screening, many cases might be identified earlier and some lives would be saved, but many more men would undergo tests, biopsies and treatments only to discover that they either didn't have cancer, or that their cancer was benign ('Why

Back in 2011, my GP suggested a PSA test after a 'finger up the bottom' initial investigation. I was 53 with no prostate cancer symptoms, although my GP thought it seemed a bit large. It came back as 3ng/ml which he thought a bit borderline so sent me for a transrectal ultrasound (TRUS) biopsy. This showed an enlarged prostate and a low grade tumour (Gleason 3+3=6) in 1/8 of the scores. I was put on 'active surveillance', which meant six monthly PSA tests (no change over the years), three magnetic resonance imaging (MRI) scans, a template biopsy (no malignancy shown) and daily finasteride (10mg), but no further action has been required. I'm now on 'supported self-management and PSA tracking'.

My experience of the whole process was that I felt slight pressure by one or two consultants to have a laparoscopic prostatectomy which I think would have been unnecessary and a bit 'over-kill' considering that the tiny tumour has been described as a so-called pussy cat rather than a tiger.

I feel I've been lucky that I didn't opt for an early invasive operation and have been happy with regular PSA testing to date. I'm puzzled as to why the MRI scan was not done before the TRUS biopsy (so the operator would know where to aim!) and continue to take finasteride with no side-effects.

I was lucky to have a GP willing to do the initial examination up my bottom and then send me for a PSA test. Although this eventually produced a worrying diagnosis at the time, I'm also fortunate to have gone on to active surveillance rather than any of the more invasive options.

Bob Wheeler
Patient

don't we invite all men for a prostate cancer test?'— prostatecanceruk.org).

So, PSA testing is controversial and currently there is no routine screening programme for prostate cancer in the UK, primarily because it has not been proved that the benefits outweigh the risks. The recent JAMA study has found that some tests may even lead to overdiagnosis and even miss early detection of some aggressive cancers ('Screening with a PSA test has a small impact on prostate cancer deaths but leads to overdiagnosis'— www.bristol.ac.uk).

Lead author of the report, Professor Richard Martin from the University of Bristol, said: 'Our studies have been measuring the effectiveness of the PSA test with hundreds of thousands of men for 15 years. The key takeaway is that the small reduction in prostate cancer deaths by using the test to screen healthy men does not outweigh the potential harms.'

IF PSA TESTING IS NOT THE ANSWER — WHAT IS?

According to the JAMA study, while rolling-out screening for prostate cancer may not be the answer, researchers are attempting to improve the early detection of the disease. Trials include faster diagnosis of aggressive strains with blood, urine or genetic tests that mean they will be identified sooner. Another piece of research, the large-scale STAMPEDE trial, is also attempting to assess the efficacy of new treatments for men affected by high-risk prostate cancers, with results so far showing that various combinations of anti-cancer drugs may be able to control prostate cancer growth ('About STAMPEDE'— www.stampedetrial.org).

According to a report in *The Guardian*, the key is to identify those 15% of men who have aggressive cancer so that they can be better targeted with treatment ('Study offers hope in identifying high-risk prostate cancer patients'— www.theguardian.com).

WHAT IS THE GPN'S ROLE?

Asking busy GPNs to be experts on the identification of prostate cancer alongside all their other tasks may not be realistic. But there are still measures they can take to ensure that they offer men the best care possible. For example, a working knowledge of the common symptoms will assist them to alert colleagues to at-risk patients. Symptoms of prostate cancer include:

- Needing to urinate more frequently, often at night
- Needing to rush to the toilet
- Taking a long time to urinate
- Weak flow
- Feeling that the bladder is not fully emptied
- Blood in the urine or semen

('Symptoms: prostate cancer'— www.nhs.uk).

Similarly, knowing who their local cancer clinical nurse specialist is can be a simple way for GPNs to ensure that any man diagnosed with prostate cancer is referred for the appropriate nursing care package. This may include a holistic needs assessment, lifestyle advice such as smoking cessation, treatment of side-effects, and prescribing of medicines to control symptoms ('A professional development framework for specialist prostate cancer nursing'— prostatecanceruk.org).

GPNs are also ideally placed to educate men with prostate cancer and their families on the symptoms and treatment, screen for any adverse effects of treatment, and coordinate the patient's care with the multidisciplinary team ('Nursing

The impact of having a diagnosis of cancer is private and individual for each person. Friends, relatives and colleagues who have shared their experiences use terms like relief, because they knew all the time, despair, because they are afraid of death and dying — two very different subjects and worry for the family and the effect the diagnosis may have on them.

Raising awareness of prostate cancer can be initiated in primary care. Understanding how the prostate changes as part of aging is helpful for the person presenting. Conversations could begin with recognising symptoms and unravelling the differences between benign prostatic hyperplasia/hypertrophy (BPH), where the prostate gland is enlarged but not cancerous, prostatitis, acute bacterial or chronic bacterial and chronic prostatitis, sometimes referred to as chronic pelvic pain syndrome (National Institute of Ageing [NIA], 2020; www.nia.nih.gov/health/prostate-health/prostate-problems).

We are all familiar with education as a process and not an event, so educating people born as male of the symptoms of prostate enlargement or infection, such as dysuria, hesitancy is important. Urgency, nocturia or changes in the appearance of the urine, including frank haematuria, require investigation. It is also vital to recognise the transgender population, fostering a safe environment for discussions to begin about prostate awareness and enabling the conversation to develop sensitively from a position of trust. Transgender and gender non-conforming (TGNC) are at an increased risk of suicide and self-harm (Lin et al, 2021). Findings from Watkinson et al (2024) confirm transgender, non-binary and gender diverse people face discrimination and barriers to healthcare services. As primary care clinicians, we should be cognisant of the potential impact of prostate symptoms from more diverse populations, and how emotionally, physically and psychologically they may impact overall health and wellbeing. Facilitating access to appropriate healthcare amenities to ensure a timely discussion and referral is critical for health equality. There cannot be any discrimination for access to appropriate care.

Julie Lennon
Advanced nurse practitioner/general practice nurse, Aultbea and Gairloch Medical Practice; NES Education supervisor/advisor; Queen's Nurse

implications of recent changes in management practices for metastatic prostate cancer' — www.sciencedirect.com). This can include observing for the adverse effects of treatment, such as sexual dysfunction, loss of libido, impotence and urinary incontinence.

It is also important for GPNs to remember that among their caseloads, men of black African or Caribbean origin are more likely to develop prostate cancer ('Discussion with a named nurse specialist' — www.nice.org.uk).

Finally, there is growing recognition of the essential role primary care teams and nurses have in supporting men with prostate cancer, primarily because of the regular contact that they have with these patients through their management of long-term conditions ('The role of the practice nurse in cancer care reviews' — www.practicenursing.com). This is reflected in programmes such as active surveillance for the management of men with low-stage, low-risk prostate cancer, which aims to avoid unnecessary over-treatment of clinically insignificant prostate cancer. It involves nurses monitoring regular tests such as PSA blood tests, digital rectal examinations, and prostate biopsies to ensure the patient's cancer is not growing ('Nurse-led active surveillance for prostate cancer is safe, effective and associated with high rates of patient satisfaction' — ecancer.org).

So, while full screening may not yet be available for men at risk of prostate cancer, GPNs can help to manage their risk and provide evidence-based care for those unlucky enough to develop the disease. In an uncertain world, knowing that there is someone to turn to, and who understands their disease, might just be enough to make a difference... GPN

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As prostate cancer is so common, GPNs and ANPs are likely to know both patients, relatives or friends with the condition. Although GPNs may not be the first point of contact for diagnosing possible prostate cancer, it is really important that they are well informed and able to advise patients about symptoms and explain the role of PSA testing.

As already explained, PSA testing is not specific enough to use as an isolated diagnostic screening tool. Recently, there has also been debate about the validity of rectal examinations to assist with prostate cancer referrals. A more targeted, diagnostic approach using MRIs seems to be the way forward. The 'Transform Trial' (https://prostatecanceruk.org/research/transform-trial), which is currently underway, will hopefully direct the most appropriate way to identify the highly aggressive prostate cancers and target the best treatment options in the future.

Random PSA tests should be discouraged without counselling patients as to the pros and cons of testing. Prostate Cancer UK have a useful guide to share with patients to help them see the risks and benefits of testing (https://prostatecanceruk.org/media/chepmhpz/psa-blood-test-pros-and-cons-final.pdf). The NICE position statement on PSA testing is also well worth reading to support GPNs in advising patients (https://prostatecanceruk.org/for-health-professionals/guidelines/interim-position-on-the-psa-blood-test-in-asymptomatic-men).

One of the simplest things that GPNs can do is to make the prostate cancer symptoms assessment leaflet (https://shop.prostatecanceruk.org/know-your-prostate) available at reception, in men's toilets or waiting areas, so that men or their partners might take one home. You might even consider a targeted information focus to raise awareness in the higher risk groups, such as men over 50, men over 45 with black or mixed ethnicity or with a family history of cancer. NHS England's Direct Enhanced Services provide some financial incentives to support early diagnosis of prostate cancer.

It is also helpful to gain an understanding of the hormone treatments which are used in the management of prostate cancer. Knowing the potential side-effects of hormones, such as hot flushes and loss of libido, can be useful if patients ask about them. Be aware of other new red flag symptoms, such as increased tiredness, weight loss or back pain, which patients may report, as these may be indications of cancer spread.

Jenny Aston
Advanced nurse practitioner; Royal College of General Practitioners (RCGP) AHP/nurse representative

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Heart charity urges GPNs to be alert to symptoms of heart disease

Understanding how cardiac symptoms present in women

In the UK, approximately 1.5 million individuals aged 65 or older are believed to be affected by heart valve diseases, such as aortic stenosis and mitral regurgitation. Projections indicate that this figure will double by 2046 and soar to 3.3 million by 2056. This is due to an ageing population (British Heart Foundation [BHF], 2018).

In primary care settings, there is a concerning trend: a significant number of patients do not report heart issues. This is particularly troubling with heart valve disease (HVD), where symptoms may be mild even in severe cases, leading to underdiagnosis.

Studies reveal a startling reality: those who do experience cardiac symptoms may have them dismissed as typical signs of ageing. This is something that appears to affect female patients even more.

WOMEN AND CARDIAC ISSUES

Heart disease is one of the UK's leading causes of death and the most common cause of premature death. There are currently 3.6 million women currently affected, killing more than twice as many women than breast cancer (BHF, 2024). It is estimated that more than 30,000 women are admitted to hospitals in the UK annually due to heart attacks (BHF, 2018). Remarkably, the occurrence of heart attacks among women is still frequently characterised as 'unexpected' by healthcare professionals.

Dr Jonathan Byrne, UK lead of the UK's Valve for Life programme; consultant cardiologist, King's College Hospital

"The risk of heart disease in women is frequently underestimated, stemming from the misunderstanding that females are inherently 'protected' against cardiovascular disease.

The risk of heart disease in women is frequently underestimated, stemming from the misunderstanding that females are inherently 'protected' against cardiovascular disease (Maas and Appelman, 2010). Women are 50% more likely to be misdiagnosed after a heart attack, and they often face delays in referral for diagnostic testing compared to men (Wilkinson et al, 2018).

SCREENING TO DETECT CARDIAC ISSUES

In honour of International Women's Day on 8th March 2024, Valve for Life and Medtronic partnered to organise a heart truck to stop in London to raise awareness of heart valve disease. The day was a success — a total of 122 women (and 49 men!) had their hearts checked, first by a stethoscope and then followed by an echocardiogram. Nine people had a (previously undiagnosed) cardiac condition detected such as aortic stenosis and mitral regurgitation.

This initiative was designed to detect women who might be unaware of their vulnerability to heart valve disease, as symptoms of this condition are not always readily apparent. But, heart valve disease can be perilous. Take aortic stenosis, for example, if left untreated, it can prove fatal within a few years of diagnosis.

In general practice, nurses can support the work of Valve for Life and other heart charities by being mindful of the common and less common symptoms of cardiac problems (*Table 1*). A simple stethoscope check at the GP practice is the ideal next step if a general practice nurse (GPN) thinks that the patient's symptoms could be due to an undiagnosed cardiac issue.

GENDER HEART GAP: WHY ARE WOMEN'S CARDIAC PROBLEMS MISSED?

In numerous instances, female patients have presented at A&E with symptoms resembling a heart attack, yet their diagnosis was delayed compared to male counterparts. Initially, their symptoms were often misattributed to other causes (Vogel et al, 2021). This misdiagnosis stems partly from the prevailing perception that heart attacks primarily affect middle-aged men. It is imperative that both the public and healthcare professionals recognise symptoms of valvular heart disease, i.e. breathlessness, fatigue, chest pain, and blackouts.

Evidence shows that women are also less often referred for interventions than men, such as aortic valve replacement (AVR) or TAVI (transcatheter aortic valve implantation) and at a later stage of disease (Cramariuc et al, 2022). On average, they wait three months longer than men for treatment (Rice et al, 2023). AVR and TAVI are life-saving procedures for symptomatic severe aortic stenosis, relieving symptoms, increasing life expectancy, and improving quality of life.

It is well-documented (Rice et al, 2023) that women frequently encounter similar cardiac symptoms as men, yet unconscious biases may play a role in the evident disparities observed in the acknowledgment, diagnosis, and management of cardiovascular disease in women. Women are susceptible to less well recognised cardiac conditions, such as low gradient severe aortic stenosis and spontaneous coronary artery dissection, underscoring the importance of thorough evaluation and appropriate treatment for these conditions. GPN

Table 1: Common and less common symptoms of cardiac problems to look out for when speaking to patients (British Heart Foundation, 2024)

Common symptoms	Less common symptoms
■ Chest pain ■ Shortness of breath ■ Coughing or wheezing ■ Swelling in the legs, ankles or feet ■ Poor blood supply to extremities ■ Fatigue ■ Fast or uneven heartbeat (palpitations)	■ Chest pain does not always centre on the heart — it can radiate to the jaw and neck pain ■ Nausea and bloating. Women in particular often describe this kind of discomfort, which can include vomiting, before they feel chest pain ■ Overall fatigue ■ Sleep apnea — this temporary collapse of an airway puts a halt to breathing during sleep and has been linked to high blood pressure and an increased risk of heart attack

> **"It is imperative that both the public and healthcare professionals recognise symptoms of valvular heart disease, i.e. breathlessness, fatigue, chest pain, and blackouts.**

Patient story

An 86-year-old woman had been experiencing chronic chest pains and shortness of breath for some time but had always brushed them aside. Despite her active lifestyle, she never considered the possibility of any heart issues. A few years ago, during a visit to a male GP, she was informed of visible signs of angina, but it was considered non-concerning. Angina, a symptom of coronary artery disease, arises when arteries carrying blood to the heart become narrowed or blocked due to conditions like atherosclerosis or blood clots. Following an unexpected heart attack, an echocardiogram also diagnosed valve disease — severe aortic stenosis. She was referred for treatment and eventually had an aortic valve replacement almost a year later.

Now, resuming her daily routine and cherishing time with her family, the 86-year-old urges everyone to heed the body's warnings, recognise symptoms, and remain vigilant.

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The importance of identifying Lynch syndrome

Lynch syndrome: following the leads to save lives

Research shows that there could be up to 200,000 people in the UK with Lynch syndrome, but 95% of them do not know that they have it because of a lack of testing (Bowel Cancer UK, 2023). As healthcare professionals, it is vital to follow the evidence to determine who may be affected by Lynch syndrome in order that they can have appropriate screening to decrease their risk of bowel cancer. Those leads are largely found in two ways; through testing those with bowel cancer to see if they have Lynch syndrome so that their relatives can be tested to see if they have also inherited the condition, this is done in secondary care. The second is found through identifying individuals with what are termed 'high risk' family histories so that they can be tested for Lynch syndrome. This can be achieved in primary or secondary care.

WHAT IS LYNCH SYNDROME?

Lynch syndrome is an inherited genetic condition. It is caused by a germline pathogenic variant in one of four DNA mismatch repair (MMR) genes: MLH1, MSH2, MSH6 and PMS2. Pathogenic variant in another non-MMR gene, known as EPCAM, can also cause Lynch syndrome (NHS England, 2021). MMR genes encode proteins and are involved in recognising and repairing errors in DNA sequence, which occur when DNA is replicated during cell division. Variants in MMR genes can lead to failure to repair DNA errors. A child who has a parent with a pathogenic variant has a 50% chance of inheriting that variant. About half of all people with Lynch syndrome develop colorectal cancer (NHS England, 2021). It is also responsible for other cancers, including endometrial, gastric, small bowel, urothelial and brain cancers. Lynch syndrome is estimated to cause 3% of all bowel cancers annually in the UK, with many of them occurring in those under the age of 50 (NHS England, 2021).

Claire Coughlan, clinical lead, Bowel Cancer UK

"It is important that people with Lynch syndrome have regular colonoscopies to reduce their risk of developing polyps.

NICE GUIDANCE FOR DETECTION OF LYNCH SYNDROME

Since 2017, the National Institute for Health and Care Excellence (NICE) has recommended that all people diagnosed with colorectal cancer are tested for Lynch syndrome using immunohistochemistry or microsatellite instability testing (NICE, 2017). In October 2020, NICE also recommended that all people diagnosed with endometrial cancer are tested for Lynch syndrome using immunohistochemistry.

The Lynch syndrome pathway can be split into four stages (NHS England, 2021):

- Stage 1: Initial tumour testing:
  - 1. Biopsy taken and cancer diagnosed
  - 2. Test tumour using immunohistochemistry or microsatellite instability
- Stage 2: Germline testing:
  - 3. Test suggests cancer could be caused by Lynch syndrome
  - 4. If not already done, consent to perform germline testing
  - 5. Perform germline testing
- Stage 3: Management of index:
  - 6. If Lynch syndrome is confirmed, communicate results to patient and refer to genetics service
  - 7. Agree a screening and management plan and refer to relevant services
- Stage 4: Cascade testing:
  - 8. Cascade testing of at-risk family members.

At present, the number of patients being tested for Lynch syndrome at point of colorectal cancer diagnosis varies greatly from trust to trust (NHS England, 2021). Cancer Alliances across England have put in place plans to improve this.

WHY IS TESTING FOR LYNCH SYNDROME SO IMPORTANT?

It is important that people with Lynch syndrome have regular colonoscopies to reduce their risk of developing polyps. Bowel

cancers occur in people with Lynch syndrome by developing through an accelerated adenoma to carcinoma sequence (Jacobs et al, 2014: Edwards and Monahan, 2022).

A colonoscopy is a test that looks inside the bowel for cancer and polyps. If detected early enough, polyps can be removed at the time of the colonoscopy so that they never get the chance to progress into cancers.

UK guidelines for those with proven Lynch syndrome recommend colonoscopy surveillance every two years (Edwards and Monahan, 2022).

Surveillance colonoscopies for those with confirmed Lynch syndrome are now organised and delivered by the national Bowel Cancer Screening Programme in England so they can receive the same high quality screening programme as the eligible asymptomatic population (Bowel Cancer UK, 2023).

In addition to surveillance, there is now good evidence that the taking of aspirin in those with Lynch syndrome significantly reduces incidence of colorectal cancer (Edwards and Monahan, 2022). NICE introduced this recommendation in 2020, with the caution that this should be following clinical consultation (NICE, 2020).

HOW CAN WE HELP WHEN WORKING IN PRIMARY CARE?

Identifying those that may have Lynch syndrome but are unaware, and therefore not benefitting from surveillance, can genuinely save lives. So, when talking to patients, it is important to take the opportunity to ask about family history. There are some red flags to remember — the easiest way is through the three, two, one rule.

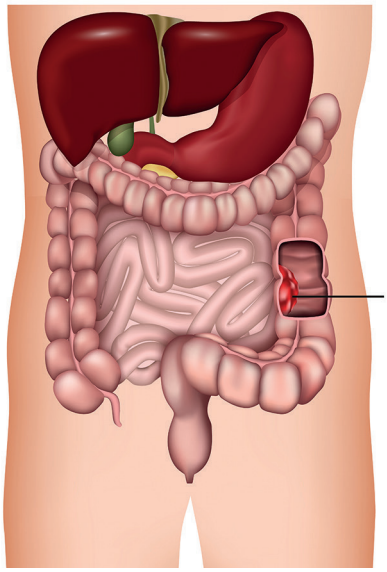
Are there three affected relatives with bowel cancer or Lynch-associated cancers, across two generations, with at least one person affected under the age of 50? (Muller et al, 2019).

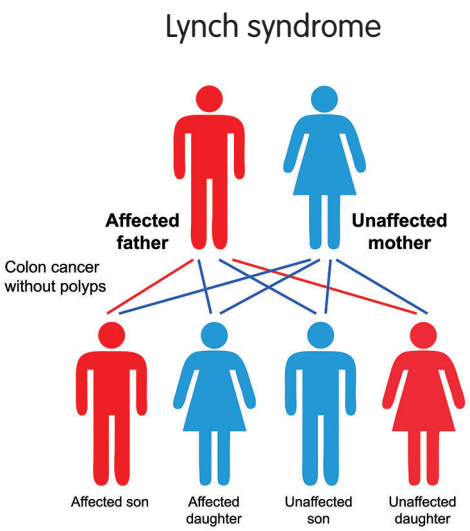
If you identify a family history such as that described by the three, two, one rule, it is vital that the patient, should they agree, be referred to a local genetics service or family history clinic so that genetic testing and appropriate surveillance can be arranged.

The challenge of identifying those affected by Lynch syndrome for those working in both primary and secondary care in order to save lives cannot be underestimated. What is clear though, is that the availability of guidance and pathways described above and the tireless work of healthcare professionals involved provide a clear opportunity for those working in primary and secondary care to make a difference. GPN

Lynch syndrome's associated cancers:

- Bowel
- Endometrial
- Ovarian
- Stomach
- Pancreas
- Ureter or renal pelvis
- Biliary tract
- Brain
- Bladder
- Sebaceous gland adenomas.





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Prevalence of hypertension is increasing in combination with the rise of long-term conditions

Hypertension and long-term conditions

In the first part of our **Monitoring matters** series, Callum Metcalfe-O'Shea, advanced nurse practitioner and UK professional lead for long-term conditions, Royal College of Nursing (RCN), looks at recognising, diagnosing and managing hypertension in relation to long-term conditions.

For the purpose of this article, the long-term conditions covered in relation to hypertension are diabetes, asthma/chronic obstructive pulmonary disease (COPD), autoimmune rheumatic diseases and inflammatory bowel disease (Crohn's/colitis), which for general practice nurses (GPNs) are often managed routinely in daily practice. This article not only explores why monitoring is required while reviewing the diagnosis of hypertension and long-term conditions, but also considers the impact on existing disease trajectories. In addition, both pharmacological and non-pharmacological measures are discussed for patient-centred care.

The NHS Data Model and Dictionary (NHS Digital Data, 2023) identify a long-term condition as:

> *A health problem that requires ongoing management over a period of years or decades and is one that cannot currently be cured but can be controlled with the use of medication and/or other therapies.*

Long-term condition management goes far wider than the proposed definition, and often requires specialised training and skills to support the biopsychosocial aspects of managing ongoing years of care (Williams and Law, 2018). Additionally, it should be noted that long-term conditions can also be called chronic disease management and/or long-term health reviews (NHS Digital Data, 2023), and previous data indicate increased caseloads with evidence in 2018 that over 50% of consultations in primary care were related to long-term condition management (Williams and Law, 2018).

From these definitions and figures alone, monitoring inevitably requires GPN input to support patient needs and ensure that active prevention and treatment are available for patients at least annually (Coulter et al, 2013).

Long-term condition management goes far wider than the proposed definition, and often requires specialised training and skills to support the biopsychosocial aspects of managing ongoing years of care.

While hypertension does not fit the traditional definition of a long-term condition, many patients often live for years with undiagnosed high blood pressure and even with pharmacological support still require monitoring and input (Tapela et al, 2021). Hypertension is one of the leading preventable cardiovascular risk factors among the patient population, responsible for over half of all strokes and ischaemic events (Tapela et al, 2021). The National Institute for Health and Care Excellence (NICE, 2023) identifies through a clear algorithm for diagnosing and management that should a patient present with a blood pressure reading of >140/90mmHg, this should instigate further clinic or home testing to establish if consistently raised. Once this testing has been completed and found an average above 140/90mmHg, this would lead to a diagnosis of hypertension (NICE, 2023). NICE (2023) states that:

- Stage 1 hypertension is 'clinic blood pressure ranging from 140/90mmHg to 159/99mmHg and subsequent ambulatory daytime average or home blood pressure average ranging from 135/85mmHg to 149/94mmHg'
- Stage 2 is defined as: 'clinic blood pressure of 160/100mmHg or higher but less than 180/120mmHg and subsequent ambulatory daytime average or home blood pressure average of 150/95mmHg or higher'.

However, many different parameters exist for diagnosis, dependent on underlying factors outside the scope of this article — however, NICE (2023) guidance contains all the relevant algorithms to support GPNs in primary care.

WHY IS MONITORING BLOOD PRESSURE AND LONG-TERM CONDITIONS IMPORTANT?

As part of the Quality Outcome Framework (QOF) and NICE (2023) guidance, patients presenting with particular long-term conditions require an annual blood pressure (BP) check, including diabetes, stroke, cardiovascular disease, such as ischaemic heart disease, and mental health conditions, such as schizophrenia (NICE, 2023). For GPNs, this is a common part of practice and being able to educate and support patients with hypertension is key for reducing preventable complications (Leong et al, 2021).

Evidence from clinical trials indicates that lowering blood pressure can reduce the incidence of stroke by 35–40%, myocardial infarction (MI) by 20–25%, and heart failure by 50% (Tapela et al, 2021).

Thus, monitoring clearly matters in reducing risk and preventing fatal complications (Leong et al, 2021). GPNs are often best placed to deliver vital education and management, including reducing alcohol, stopping smoking, maintaining a healthy weight and leading a healthy lifestyle, due to therapeutic relationships built up with patients over time (Leong et al, 2021).

Additionally, many medications used for blood pressure treatment also require annual measurement of renal function (NICE, 2023). Therefore, annual blood tests should take place and include at least urea and electrolytes (U&E), liver function depending on other medications such as statins, cholesterol to review if statins are required to support cholesterol reduction and, in some cases, blood sugar if an increased risk is expected (NICE, 2023). A urine sample to measure for kidney damage via the albumin:creatinine ratio (ACR) is also required annually (NICE, 2023).

Many different treatments exist for blood pressure management, both pharmacological and non-pharmacological. Non-pharmacological measures include the need to increase exercise, reduce caffeine intake, smoking cessation, reduce alcohol intake and maintaining a healthy weight (NICE, 2023) — all of which are familiar to GPNs in their health education roles.

Pharmacological measures however can differ, and the recommended algorithm from NICE (2023) clearly identifies the parameters for prescribing (www.nice.org.uk/guidance/ng136/resources/visual-summary-pdf-6899919517).

Practice points

Are you aware of current blood pressure targets for your different population cohorts? Make a list of the common long-term conditions and blood pressure ranges for adequate control.

“GPNs are often best placed to deliver vital education and management, including reducing alcohol, stopping smoking, maintaining a healthy weight and leading a healthy lifestyle, due to therapeutic relationships built up with patients over time.

GPNs should always work within their scope of practice and, if non-prescribers, ensure access to a prescriber is available for support and guidance around medication concerns (Royal College of Nursing [RCN], 2014).

Evidence strongly supports that GPNs ensure that their knowledge of blood pressure targets and current treatment options are up-to-date and evidence-based to support high quality patient care (Tapela et al, 2021).

DIABETES AND HYPERTENSION

Long-term conditions are on the rise, and it is estimated that by 2035 two-thirds of adults over the age of 65 will have two or more and 17% will have four or more (Department of Health and Social Care, 2023). This is a shocking statistic and identifies how GPNs are crucial for prevention and management of hypertension, particularly in those with multiple long-term conditions (Leong et al, 2021). Type 2 diabetes and hypertension often occur alongside one another. This is not coincidental, but rather due to shared aspects of pathophysiology (Petrie et al, 2018). Indeed, data indicate that up to 85% of patients with type 2 diabetes may have diagnosed or undiagnosed hypertension (Petrie et al, 2018), a ticking time bomb waiting to explode resulting in potentially fatal outcomes.

The reason for the link can be attributed to the fact that chronic hyperglycaemia and insulin resistance can initiate vascular compromise through oxidate stress and inflammation (Petrie et al, 2018). This inevitably increases the chance of atherosclerosis (fat deposits in the arteries), which subsequently cause an increase in blood pressure (Petrie et al, 2018). The risks posed by this sudden increase in blood pressure, particularly if it remains undetected, are both microvascular and macrovascular complications that can cause stroke, kidney disease and coronary heart disease (Petrie et al, 2018).

GPNs understand that many common non-pharmacological treatments for diabetes, such as an active healthy lifestyle, smoking cessation, reducing alcohol intake and maintaining a healthy weight will support lowering blood pressure further (Petrie et al, 2018). In terms of pharmacological measures, as per NICE (2023) guidance, use of an angiotensin-converting enzyme inhibitor (ACEi) or angiotensin receptor blocker (ARB) are first-line. This is because ACEi/ARBs reduce albuminurea and slow the progression of diabetic nephropathy,

Practice points

How confident are you in discussing medications with patients? What knowledge do you need to improve to help provide appropriate patient education?

supporting reduction in micro-vascular complications (Strauss et al, 2023).

However, GPNs need to be aware that different parameters exist for type 2 diabetes patients dependent on underlying conditions, including (NICE, 2023):

- Type 2 diabetes without nephropathy, retinopathy or have cerebrovascular disease (which includes stroke) <140/80mmHg
- Type 2 diabetes with nephropathy, retinopathy or have cerebrovascular disease (which includes stroke) <130/80mmHg.

Therefore, measuring blood pressure in type 2 diabetes is vital for reduction of long-term complications and improving patient outcomes (Tapela et al, 2021). GPNs should be aware of the different parameters and reasons for first-line drug recommendations to help support patient education and management (Tapela et al, 2021).

HYPERTENSION AND COPD/ASTHMA

Respiratory disease again has associations with increased risks of hypertension, mainly due to the combining factors of respiratory distress, inflammation and long-term stress exposure that can increase probability of hypertension in conditions such as asthma and COPD (Zolotareva et al, 2019).

In patients with asthma, frequent 'attacks' contributing to inflammation can cause blood pressure to rise (Zolotareva et al, 2019). COPD often arises from tobacco intake, which inherently increases the risk of hypertension. Additionally, the inflammatory processes within COPD can further exacerbate this risk (Kim et al, 2017). With both conditions, frequent steroid use may increase the risk of type 2 diabetes through insulin resistance mechanisms, thus leading to rises in rates of hypertension diagnosis (Zolotareva et al, 2019).

While no official targets are provided by QOF for COPD and asthma BP management, as per NICE (2023), GPNs should aim to support patients to achieve a target of below 140/80mmHg (unless they have another long-term condition that may require use of a different parameter).

Pharmacological treatment should follow the NICE (2023) algorithm, although this may not start with an ACEi/ARB, which inevitably may be required in the process for hypertension management. Evidence has identified how the use of ACEi in patients with asthma can increase airway hyperresponsiveness causing symptom worsening (Morales et al, 2021). Therefore, this needs to be considered with caution initially. However, patients who may have an intolerance or adversion to the ACEi can be switched to an ARB to support respiratory management (Morales et al, 2021). ACEi/ARBs for COPD, however, have shown promising improvements for both hypertension and respiratory symptoms, as the renin system can be linked to inflammation in the airways, thus inhibiting this can lower blood pressure and reduce exacerbations (Vasileiadis et al, 2018).

Again, GPNs need to be aware of the medications involved in managing both hypertension and respiratory disease to support patient care and education.

HYPERTENSION AND RHEUMATOLOGY CONDITIONS

Patients with autoimmune rheumatic diseases such as systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), and psoriatic arthritis/psoriasis (PsA) have prominent immune system dysfunction as well as high rates of hypertension (Taylor et al, 2019). This link is due to an increase in the C-reactive protein (inflammatory marker) in the blood which can ultimately lead to hypertension (Taylor et al, 2019). Additionally, it is thought that the physical injury of the vessel wall in response to increased pressure may be an important event in developing hypertension with autoimmune rheumatic disease (Taylor et al, 2019).

In essence, the main concepts linked to increased hypertension rates among this patient population are through inflammation causing impaired vascular relaxation, retention of renal sodium increasing blood pressure, and increased sympathetic nervous system stimulation (Taylor et al, 2019).

Additionally, use of steroids within this patient population can increase the risk of hypertension and that of type 2 diabetes — a known risk factor impacting on hypertension rates (Taylor et al, 2019).

NICE (2023) algorithm for treatment can be used for this patient cohort, however evidence does suggest that for SLE, in particular, more trials may be needed to consider the explicit use of ACEi/ARBs for both SLE and hypertension treatment (Wolf and Ryan, 2019). However, due to the complications of hypertension, GPNs need to follow appropriate pharmacological and non-pharmacological treatment measures as per NICE (2023) (Wolf and Ryan, 2019).

HYPERTENSION AND INFLAMMATORY BOWEL DISEASE (IBD)

Inflammatory bowel diseases (IBDs) impact normal digestive function and can manifest far beyond the gastrointestinal tract (Burisch, 2023). Extra intestinal conditions affect up to half of all patients with

Practice points

What education do you provide to patients with respiratory disease and hypertension? Think how the conditions link and what information would support your patients.

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Practice points

How aware are you of the auto-immune rheumatic diseases? Create a checklist you may need to consider when reviewing these patients.

IBD and include a broad range of chronic diseases that share the pathophysiology with IBD, including hypertension (Burisch, 2023).

The evidence behind this indicates that patients with IBD are at increased risk due to systemic inflammation that is involved in atherosclerosis, and that systemic inflammation increases the risk of inflammatory events, which can be alleviated by anti-inflammatory treatment (He et al, 2023). Hypertension is an early and common manifestation of atherosclerosis and various cardiovascular events and thus increases the risk for patients with IBD (He et al, 2023).

Again for GPNs, the common concern is the use of steroids as immunomodulators, with the previous described link to increased risk of hypertension and other long-term conditions such as type 2 diabetes (Burisch, 2023). GPNs again should follow NICE (2023) guidance for managing hypertension with support from specialist IBD practitioners as required (Burisch, 2023).

CONCLUSION

Overall, the prevalence of hypertension is increasing in combination with the development of long-term conditions. GPNs should be aware of the different pathophysiology, parameters and treatment options in long-term conditions, and this has been discussed in terms of patients with type 2 diabetes, respiratory diseases, autoimmune rheumatic diseases and IBD respectively. Many other long-term conditions not discussed here will also have increased risk of hypertension, therefore GPNs need to ensure that they are familiar with NICE (2023) guidance to support evidence-based care.

GPNs are well placed to manage patients with multiple long-term conditions, and need to consider both pharmacological and non-pharmacological treatments available.

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Practice points

What is your understanding of IBD? Reflect upon your patient population and the commons signs/symptoms associated with IBD.

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Lifestyle management of obesity in primary care

Obesity rates have skyrocketed globally over the last few decades. Obesity presents a public health emergency because of its numerous associated comorbidities. Waist-to-height ratio is a useful add-on to body mass index (BMI) to quantify health risks and monitor progress. The causes of obesity are complex and they necessitate a degree of empathy from healthcare professionals caring for those with the condition. Researchers believe that the obesity epidemic will not begin to improve without significant governmental policy changes. Many weight loss diets exist, but no diet stands out as more favourable at the one-year follow-up mark, as maintenance of the weight lost is uncommon. This article discusses the physiology of weight changes, emphasising the crucial role of energy balance. Energy density is a useful concept for patients to understand to help identify foods which will fill them up and help facilitate a reduced energy intake. Protein and fibre are also highlighted as focus nutrients. Exercise is important for various reasons, but on its own will not usually lead to weight loss. Sleep is an often neglected yet important factor to consider in obesity management.

KEY WORDS:

- Obesity
- Dietary management
- Physical activity
- Sleep
- Empathy

Patrick Ward-Ongley
Oncology specialist dietitian,
Salisbury NHS Foundation Trust

The World Health Organization (WHO, 2024) defines obesity as a chronic complex disease defined by excessive fat deposits that can impair health. Obesity was declared a global epidemic by the WHO in 1997; worldwide the prevalence continues to skyrocket (Hruby and Hu, 2015). In 2021 to 2022, 25.9% of adults in England were estimated to be living with obesity (Office for Health Improvement and Disparities, 2023), whereas in 1980, only 6% of men and 9% of women had obesity (UK Health Security Agency [UKHSA], 2021).

Obesity presents a major public health crisis as it has many comorbidities, including (Ansari et al, 2020):

- Cardiovascular disease
- Chronic kidney disease
- Type 2 diabetes
- Polycystic ovary syndrome
- Hypertension
- Dyslipidaemia
- Cancer
- Sleep apnea
- Non-alcoholic fatty liver disease
- Gastro-oesophageal reflux disease
- Diverticular disease
- Osteoarthritis
- Depression.

Obesity is diagnosed by using an individual's weight and height to calculate the body mass index (BMI), a surrogate marker of fat mass (National Institute for Health and Care Excellence [NICE], 2023). The different BMI categories are listed in *Table 1*. BMI is calculated by taking an individual's weight in kilograms and dividing it by their height in metres twice (i.e. weight divided by height squared). For example, an individual weighing 70kg, with a height of 1.75m, would have a BMI of 22.86kg/m^2. A body of research suggests there is a J-shaped relationship between BMI and morbidity/mortality risk, meaning that both a low and high BMI are associated with increased risk, with a lower risk 'sweet spot' in the middle (Tchernof and Després, 2013).

Despite its common usage, BMI has significant limitations as a tool to categorise or classify an individual's fat-related health risks. First and foremost, it cannot differentiate between lean body mass and fat mass; that is, a person can have a high BMI but still have a very low fat mass and vice versa (Nuttall, 2015). Furthermore, it does not differentiate between the notably harmful visceral (intra-abdominal) and ectopic (intra-organ) fat stores, and the more benign subcutaneous (just beneath the skin) fat stores (Taylor, 2020). By using BMI, one must rely on the assumption that

Table 1: BMI categorisations (NICE, 2023)

BMI	BMI category
Less than 18.5kg/m^2	Underweight
25–29.9kg/m^2	Overweight
18.5–24.9kg/m^2	Healthy weight
30–34.9kg/m^2	Class I obesity
35–39.9kg/m^2	Class II obesity
Greater than 39.9kg/m^2	Class III obesity

Note: People with a South Asian, Chinese, other Asian, Middle Eastern, Black African or African-Carribean family background are prone to storing adipose tissue more centrally, and hence have lower BMI thresholds for overweight and obesity, at 23–27.4kg/m2 and 27.5kg/m^2 or above, respectfully

adipose tissue is distributed evenly over the body, which does not account for individual differences in regional body fat deposition (Tchernof and Després, 2013). Thus, BMI in isolation is not able to comprehensively assess an individual's disease risk (Gibson and Ashwell, 2020).

Waist-to-height ratio (WHtR) appears to be a better indicator of cardiometabolic risk, as it correlates more closely with visceral adiposity than BMI (Gibson and Ashwell, 2020). WHtR is calculated by dividing waist circumference in cm by height in cm. For example, an individual with a waist circumference of 84cm, with a height of 175cm, would have a WHtR of 0.48. In a draft guideline, NICE (2022) has suggested that the public keep the size of their waist to less than half of their height (i.e. a WHtR of <0.5) to reduce cardiometabolic risk. Thus, WHtR is a useful monitoring tool to use in addition to, or, where the patient prefers, instead of BMI.

HOW AND WHY OBESITY DEVELOPS — A CAUSE FOR EMPATHY

While often considered a straightforward subject, the aetiology of obesity is nevertheless incredibly complex, with biological, psychological and environmental factors all playing a role (McGowan, 2016).

Obesity which can be completely attributed to an individual's genetics (i.e. monogenic obesity) is rare, accounting for <5% of cases (Huvenne et al, 2016). Nonetheless, in individuals with obesity, genetics account for a staggering 60–80% of the variability in body weight (Bouchard, 2021). The role of genetics in obesity first became evident in the 1970s when Börjeson (1976) studied the body weight of 40 identical and 61 non-identical (fraternal) twins. The genetically identical twins were found to have similar body weights, whereas non-identical twins had more divergent weights, leading to the conclusion that genetic factors 'apparently play a decisive role in the origin of obesity'. Thus, if someone has obesity, it is more likely than not that they have a genetic predisposition.

Not only has food become more accessible in the last few decades, much of it is now also very palatable and hence highly rewarding to the brain due to enhanced food processing (Guyenet and Schwartz, 2012). Ultra-processed foods (UPFs; *Table 2*) are now the main UK dietary energy source, and they appear to be a major driver of the obesity epidemic (Dicken et al, 2024). Many UPFs are capable of overwhelming the brain's ability to regulate energy intake, promoting over-consumption, especially in those with a genetic susceptibility (Guyenet and Schwartz, 2012).

Despite increasing energy intakes in the Western world over the last few decades, physical activity levels have significantly declined (Speakman et al, 2023). This is because of increasing car use and screen time, as well as more sedentary jobs becoming the norm.

An individual's psychological state can have an immense impact on food choice and subsequent changes in weight. For example, individuals with childhood trauma are at an increased risk of developing adult obesity, as food can be used as a maladaptive coping mechanism (Offer et al, 2022). Depression appears to be both a cause and consequence of weight gain (Zhang, 2021). Mental health is therefore an important factor to consider and treat, where necessary.

An ancient survival mechanism of the brain involves decreasing the body's energy expenditure and upregulating hunger signals when it detects an energy deficit (Schwartz et al., 2017). Even if one is obese, the brain still focuses on preventing starvation, making weight loss maintenance difficult.

Thus, the cause of obesity is often complex and it cannot simply be assumed that the individual with obesity is just lazy or lacking in willpower (Grannell et al, 2021). Telling people with obesity to simply 'eat less, move more' is often ineffective because of such complexities (Guyenet and Schwartz, 2012; Tremblett et al, 2023). An understanding of this promotes empathy among healthcare professionals, which inevitably benefits the therapeutic relationship between patients with obesity and

Table 2: Ultra-processed foods, definition and examples (Grinshpan et al, 2023; Dicken and Batterham, 2024)

Definition	Examples
Products derived from foods and additives, undergoing multiple industrial processes to create the final product, classically utilising added sugars, oils and salt, and often with an unnaturally long shelf-life	■ Mass-produced packaged breads ■ Various breakfast cereals ■ Processed meats (bacon, sausages, ham, salami etc) ■ Breaded/battered meat or fish ■ Pizzas, pies and burgers ■ Instant noodles ■ Crisps and shop-bought chips ■ Biscuits, pastries and cakes ■ Chocolate ■ Ice cream ■ Soft drinks

their clinician (Auckburally et al, 2021).

The multifaceted nature of obesity requires an equally comprehensive response. Many researchers believe that the obesity epidemic will not begin to improve until we radically alter the environment in which we live, through political change (Berry, 2020; Temple, 2023).

THE PHYSIOLOGY OF FAT GAIN AND LOSS

Fat stores are in a state of flux throughout the day, with fat being stored and oxidised (or 'burned') simultaneously. At a fundamental level, fat gain occurs when fat storage exceeds fat oxidation over a given period. Ultimately, this fat balance is controlled by the overall energy (calorie) balance, which is the total energy intake versus the total energy expenditure (*Table 3*; Hall et al, 2011). When energy balance is positive, meaning there has been a greater energy intake compared to energy expenditure, bodily energy stores increase, predominantly through the accretion of fat stores. The opposite is true when in a negative energy balance. Technically, fat is lost through excretion of carbon dioxide from the lungs (Meerman and Brown, 2014).

Subcutaneous fat tissue acts as a 'metabolic sink' that stores excess fats through fat cell hyperplasia and hypertrophy, protecting lean visceral organs like the heart, kidney, liver and pancreas from unwanted fat deposition (Ansari et al, 2020). However, when subcutaneous fat tissue capacity is exceeded, hypertrophied fat cells rupture, allowing fats to be deposited within and around the aforementioned visceral organs, where they disrupt function and induce inflammation (Ansari et al, 2020).

Myths pertaining to carbohydrate intake and fat storage are particularly prevalent (Blaak et al, 2021). In the author's experience, it is often stated that carbohydrates are inherently fattening as they increase insulin levels. Nonetheless, metabolic ward studies, the most tightly controlled of all dietary studies, have reliably demonstrated that it is predominantly the energy balance which determines changes in fat mass, rather than carbohydrate intake per se (Hall et al, 2015).

Table 3: Dietary sources of energy versus the components of energy expenditure which form the total daily energy expenditure (Chung et al, 2018)

Dietary sources of energy	Components of energy expenditure
Fat (9kcal per gram)	Resting metabolic rate (energy expended at rest to sustain the body's core functions)
Alcohol (7kcal per gram)	Physical activity-related energy expenditure
Carbohydrate (4kcal per gram)	Diet-induced thermogenesis (energy expended from the digestion, absorption and storage of food)
Protein (4kcal per gram)	

Thus, the question isn't whether reducing energy intake facilitates weight loss, but instead how one can create and sustain an energy deficit which is sufficient to reduce body weight closer to the ideal.

DIETARY MANAGEMENT OF OBESITY

Patients often want to know which diet is best for weight loss. The reality is that there is no one-size-fits-all approach; a diet that works well for one individual may not work at all well for another (Chao et al, 2021). The most crucial matter is finding an agreeable way of reducing energy intake, which is sustainable for long enough to reach the desired weight, with a plan for lifelong weight maintenance (i.e. not rebounding back to the old habits which caused the weight gain in the first place).

Many diet plans exist, such as low carb/ketogenic, Mediterranean, low fat, or intermittent fasting. Typically, when these diets are compared in research, the degree of average weight loss tends to be similar between groups (Ge et al, 2020). An exception to this is in very low calorie diets, often consisting of <800kcal/day from shakes and/or soups +/- non-starchy vegetables. These diets in particular are associated with dramatic weight losses, although remain prone to post-diet weight regain (Bray et al, 2018). In support of very low calorie diets, NHS England (2023) is rolling out its 'path to remission programme' to individuals with type 2 diabetes, to promote rapid weight loss and remission of their diabetes.

A common myth pertaining to weight management is that individuals must aim to lose weight slowly rather than rapidly, otherwise they have a greater chance of weight regain. On the contrary, those that lose weight more rapidly in the initial stages tend to have greater long-term weight loss maintenance (Bays et al, 2022). If an individual wants to lose weight rapidly, this can be encouraged, although, of course, the older and more frail an individual becomes, the less appropriate this may be.

Protein should be a particular nutrient of focus when looking to reduce fat mass. There is a growing evidence base for the protein leverage hypothesis, which suggests that diets with a high proportion of protein drive reduced consumption of carbohydrate and fat (and thus provide less energy, facilitating weight loss), as the human body appears to have a particularly strong appetite for protein (Raubenheimer and Simpson, 2023). It is therefore often sensible for patients to ensure that they include a lean protein source at most, if not all, mealtimes (*Table 4*). Protein powders can be used by patients who for whatever reason struggle to obtain an adequate protein intake from regular food. Whey protein in particular may help to facilitate improvements in body composition (Sepandi et al, 2022)

A high protein intake also helps to maintain muscle mass while in an energy deficit, which is important for frailty prevention and weight loss maintenance (Moon and Koh, 2020). Numerically, a diet can be considered

high protein when it provides 1.2–1.6g/kg protein per day (Phillips et al, 2016).

Fibre is another nutrient of particular interest. Fibre supports weight loss by (Hall et al, 2019; Akhlaghi, 2024):

- Decreasing appetite, via gastric distension, delayed gastric emptying and by stimulating appetite-reducing gut hormones
- Decreasing the absorption of other ingested nutrients, reducing energy uptake (for each gram of fibre consumed, absorbed energy in a mixed diet reduces by ~7kcal).

Importantly, fibre also positively modulates the comorbidities of obesity, such as type 2 diabetes, hypertension and dyslipidaemia (Deehan et al, 2024). Guidelines suggest a fibre intake of at least 25g per day (McKeown et al, 2022), which can be a simple, yet helpful goal for patients to strive for. See *Table 5* for dietary sources of fibre.

The concept of energy density (the amount of calories per gram of food) is important for patients with obesity to understand. Foods with a high water content have a low energy density, whereas foods containing high proportions of fat/carbohydrate have a high energy density. The volume of food we eat is an important factor in determining how full we feel, therefore a plate filled with low energy density foods (like fruit, vegetables and lean meats/fish), despite not providing many calories, can still be similarly filling as an equally full plate containing high energy density foods (fatty meats, chips, pasta etc) which provides much more calories (Klos et al, 2023). Notably, whole fruits and vegetables are often >90% water by weight, which is why they are particularly useful to emphasise within the diet (Bays et al, 2022).

It is worth considering that in dietary trials where weight loss success is demonstrated, participants are often given weekly support with a dietitian to ensure adherence (Hebert et al, 2016). In primary care, this is unlikely to be feasible in at least the majority of practices. Furthermore, dieters tend to gradually put the weight they lost back on (Hall and Kahan, 2018). It is both demoralising and unhealthy for individuals to cycle their weight up and down; after all, weight cycling can induce sarcopenia which causes frailty and a reduced quality of life (Rossi et al, 2019). Before suggesting to someone with obesity to start a restrictive diet, it is pertinent to ask, are you likely to do them more harm than good, given the likelihood for such diets to result in weight regain? In most cases, the author suspects primary care clinicians will have a more meaningful impact on their patients with obesity by providing a non-judgmental ear, helping them establish their reasons for losing weight, providing accountability, appropriately signposting to resources, and being able to discuss energy density and high fibre/protein foods to aid appetite management and optimise health.

Table 4: Lean protein sources (Public Health England [PHE], 2014)

Protein source	Protein per 100g*
Protein powder (whey, soy or pea)	~60–90g
50% reduced fat cheddar cheese	~30g
Fish and seafood	~15–25g
Chicken, turkey, 5–10% fat beef/lamb mince, beef steak (excluding ribeye), 30–50% reduced fat sausages (grilled), bacon medallions, pork loin	~20g
Quorn mince/chicken pieces	13–14g
Eggs	~13g (100g is approximately two medium eggs)
Tofu; legumes (beans, chickpeas, lentils)	~7–11g
Low fat Greek yoghurt, quark, soft cheese, and cottage cheese	~10g
* Raw/uncooked unless otherwise stated	

Table 5: Dietary sources of fibre (PHE, 2014)

Food	Fibre per 100g
Bran sticks, bran flakes, Weetabix™, Shredded Wheat™	~10–25g
Nuts*	~4–12g
Legumes (beans, chickpeas, lentils)*; Quorn™* chicken/mince, peas	~5–10g
Oats	~8g
Wholemeal flour products (bread, rolls, pitta), wholewheat pasta (cooked)	~5–7g
Cruciferous vegetables (broccoli, cabbage, Brussel's sprouts etc)	~4g
Brown rice; root vegetables (carrots, parsnips, onion etc); new/baby potatoes** and sweet potato with skin; asparagus, spinach	~2g
Berries, apple, orange, pear, kiwi, banana***, cucumber, tomato, lettuce	~1–2g
*Also a source of protein. **New/baby potatoes are considered a source of fibre, whereas regular potatoes like baking potatoes are not, as they contain less fibre and more kcal. ***Slighty unripe bananas contain more fibre (in the form of'resistant starch') compared to fully ripe bananas	

PHYSICAL ACTIVITY AND OBESITY

Given the role of energy balance in the control of body weight, it would be reasonable to assume that by increasing energy expenditure through physical activity, one could expect to lose weight. Paradoxically, increasing physical activity levels (in isolation) often does not result in weight loss. This is likely due to a compensatory increase in food intake and a decrease in energy expenditure following exercise, which may essentially cancel out the energy expended from the bout of exercise (Gonzalez et al, 2023).

Despite the typical lack of effectiveness in increasing physical activity to induce weight loss, physical activity remains an important aspect of a holistic approach to weight loss. When weight is lost in sedentary individuals, a proportion of it will inevitably come from muscle mass. Exercise can help to minimise

these losses (Martin-Rincon et al, 2019). Minimising muscle loss will in turn help to keep the basal metabolic rate as high as possible in the long term, as muscle is highly metabolically active, and will reduce the risk of sarcopenia (Colleluori and Villareal, 2021). Resistance training in particular is most effective for maintaining, or increasing, muscle mass, although a combination of resistance and aerobic training is optimal for overall health (Paluch et al, 2024).

SLEEP AND OBESITY

An often overlooked area in the lifestyle management of obesity is that of sleep. Insufficient sleep, defined as <7 hours sleep per night, unfavourably alters levels of appetite hormones and increases cravings for highly palatable, energy-dense UPFs, often increasing energy intake by >250kcal/day compared to when sleep is adequate (Chaput et al, 2023).

Patients with obesity should be encouraged to reach recommended sleep values and consider sleep hygiene. Where insomnia exists, it should be treated as a priority as part of the obesity management plan.

CONCLUSION

Obesity is a growing public health challenge in the UK and around the world, strongly linked to our evolving (food) environment. The aetiology of obesity often involves a complex interplay between genetics, environment and psychology; understanding this warrants an empathic approach. Many nutritional myths exist pertaining to obesity, nonetheless energy balance, over and above anything else, remains a key driving force in determining changes in body weight. Many different weight loss diets exist, all of which are able to initiate weight loss, although none are immune to the high rates of weight regain as time progresses. Fibre and protein can be emphasised as nutrients likely to help with appetite control and other important markers of health. Physical activity should be encouraged for those with obesity, not because it will cause weight loss, but because it supports muscle retention, making future weight loss maintenance easier. Insufficient sleep appears to play an important role in food choice and energy intake and it should be considered as part of the patient's obesity management plan. GPN

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Whooping cough (pertussis) and its management

Whooping cough, also known as pertussis, continues to pose a significant threat to public health, particularly impacting infants and children with its devastating effects. The current outbreak has reignited concerns about the resurgence of this highly contagious disease and the importance of vaccination in preventing its spread. Indeed, at the time of writing, UK Health Security Agency (UKHSA, 2024a) data showed that in the first quarter of 2024 there were 2793 cases of whooping cough in England, three times as many cases than in the whole of 2023, with the very sad deaths of five infants. This article delves into the history of whooping cough, exploring its origins, transmission dynamics, and the evolution of vaccination programmes. By examining past outbreaks and vaccination strategies, this article aims to understand the challenges posed by pertussis and the critical role that vaccination plays in controlling its spread. From the introduction of whole-cell pertussis vaccines in the 1950s to the development of acellular vaccines in the 1980s, the article traces the progress of vaccination efforts and their impact on disease control. Through an analysis of current outbreak data and vaccination trends, it assesses the effectiveness of existing vaccination programmes and explores strategies for enhancing vaccine coverage to mitigate the resurgence of whooping cough outbreaks.

KEY WORDS:

- Whooping cough
- Re-emergence
- Vaccination programmes
- Management
- Safety netting

Judith Harford
Paediatric nurse practitioner, Adam Practice, Poole, Dorset

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WHAT IS WHOOPING COUGH?

Whooping cough is a highly infectious, statutorily notifiable disease caused by infection with the Bordetulla pertussis bacteria, a gram negative cocco-bacillus that is only found in the human respiratory tract which causes intense coughing, although the mechanism for causing the cough is unclear (Hiramutsu et al, 2022). It is transmitted by coughing and respiratory secretions, with symptoms in infected persons occurring seven to 10 days after incubation, although can be as long as six to 20 days (Gopal et al, 2019). Classic presentation of the disease is the so-called '100-day cough' — a long lasting productive cough characterised by paroxysms of coughing with inspiratory 'whoop' and post-tussive vomiting (BMJ Best Practice, 2023). It is particularly dangerous in the first six months of life, causing infants to become extremely unwell and often requiring hospitalisation (Smout et al, 2024).

Disease progression goes through three stages (Lauria et al, 2022):

- Catarrhal stage: this lasts for one to two weeks with non-specific symptoms similar to other upper respiratory tract infections. During this phase, the coughing gradually becomes worse and due to the similarity with other illnesses often gets missed as pertussis. This is the most treatable phase, but whooping cough is not usually confirmed until too late
- Paroxysmal stage (three to five weeks): spontaneous coughing bouts occur, often being worse at night, and can lead to complications such as apnoea and pneumonia. The classic 'whooping' that occurs as sufferers try to catch their breath is seen in 80% of vaccinated people, but may be less obvious in those that are vaccinated Coughing can be violent and lead to vomiting, especially in children
- Convalescent stage: this can last for weeks or months, over which time there is a gradual resolution of symptoms.

DIAGNOSING PERTUSSIS INFECTION

Diagnosing pertussis can be undertaken using various methods, each with its own advantages and limitations. The three main diagnostic approaches include culture, polymerase chain reaction (PCR), and serology, each offering pros and cons.

Culture remains the gold standard for diagnosing pertussis, involving the isolation of the bacterium from

respiratory specimens, specifically collected from the nasopharynx (Decker and Edwards, 2021). However, timely sampling is crucial as bacterial load decreases over time and therefore must be undertaken within 21 days of onset of coughing. Culture testing allows for antibiotic susceptibility testing and strain typing, aiding in both clinical management and national surveillance efforts. Nevertheless, culture testing may take up to seven days to yield results, and the window for sampling may be missed in the early stages of the disease due to the similarity of symptoms with other upper respiratory tract infections initially (van der Zee et al, 2015).

PCR testing has gained popularity due to its rapid turnaround time and high sensitivity. Similar to culture, nasopharyngeal sampling is required, with early sampling maximising detection rates. PCR testing can detect DNA from dead bacteria, enabling testing even after antibiotic initiation. However, PCR is less specific than culture, as it can only detect the presence of Bordetella bacteria in general, rather than specifically identifying Bordetella pertussis. Nonetheless, PCR results can often be obtained on the same day, facilitating timely diagnosis and treatment initiation (van der Zee et al, 2015; Decker and Edwards, 2021).

Serology, measuring immunoglobulin G (IgG) antibodies against pertussis toxin in serum or oral fluid, offers an alternative approach for diagnosing pertussis, especially in later stages of the disease when antibody levels have risen. However, serology requires the patient to have been symptomatic for at least 14 days to allow for antibody development, thereby shortening the window available to start antibiotic treatment. False-negative results may occur if samples are taken too early, while false positives can arise in individuals recently vaccinated against pertussis, as antibody levels following either disease or vaccination may remain high for up to a year. Oral fluid sampling may be more acceptable, particularly in children, although it requires a sufficient volume of oral fluid for accurate testing and requires the sample to be taken over two minutes to ensure sufficient quantity for testing (van der Zee et al, 2015). Although this may be difficult for younger children, it remains preferable to blood sampling and is therefore largely reserved for children aged two to 16 years (see *Figure 1* for timing of testing).

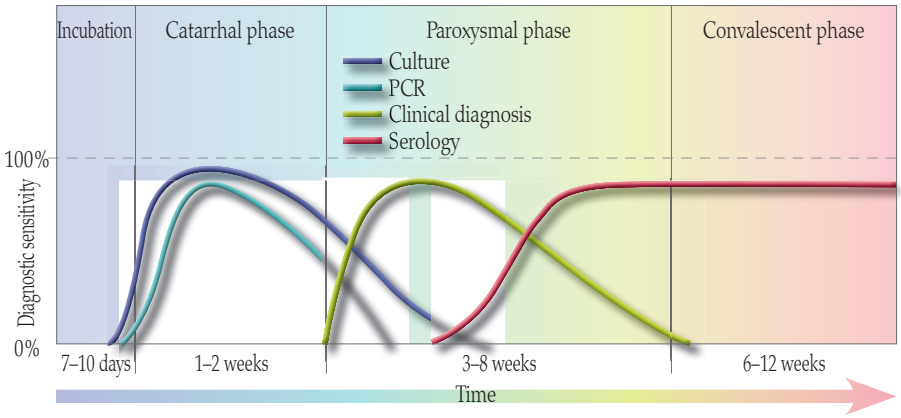

FIGURE 1.
Timing of testing (adapted from Gopal et al, 2019).

COMPLICATIONS OF WHOOPING COUGH

Whooping cough poses significant health risks beyond the distress it inflicts on individuals. Apnoeic episodes, with or without accompanying cough, can manifest, underscoring the severity of the condition (Kandeil et al, 2020). Moreover, patients afflicted with whooping cough may progress to pneumonia, a complication often associated with pulmonary hypertension, potentially necessitating interventions such as intermittent positive pressure ventilation (IPPV) or extracorporeal membrane oxygenation (ECMO) (Berger et al, 2017). Furthermore, the infection is frequently accompanied by a marked elevation in leukocyte count, predisposing some individuals to needing leukofiltration or exchange therapies (Carbonetti, 2016).

In severe cases, complications may escalate to seizures, encephalopathy, hypoxia, cardiac failure, multi-organ failure, and ultimately, fatality (Decker and Edwards, 2021). Thus, understanding the clinical manifestations and potential complications of whooping cough is crucial for effective management and prevention of adverse outcomes. With no effective treatment or cure for pertussis, the disease is extremely difficult to manage and vaccination remains the primary tool for controlling it (UK Health Security Agency [UKHSA], 2024b).

RE-EMERGENCE OF DISEASE

The re-emergence of pertussis, or whooping cough, serves as a stark reminder of the complexities surrounding vaccine acceptance and the potential consequences of vaccine hesitancy. Historically, pertussis was a devastating affliction on populations, particularly infants, before the introduction of widespread vaccination in the 1950s. Large-scale epidemics occurred every few years, resulting in hundreds of infant deaths and significant morbidity within communities.

The advent of whole-cell pertussis vaccines marked a turning point in the battle against this disease. Following widespread vaccination efforts, there was a remarkable decline in pertussis cases, with incidence dropping 100- to 200-fold (Decker and Edwards, 2021). This success continued until the 1970s when concerns regarding vaccine safety emerged. Similar to the later mumps, measles and rubella (MMR) vaccine controversy, a paediatrician falsely linked the pertussis vaccine to neurodevelopmental problems (Baker, 2003). Despite subsequent research disproving these claims, the damage to public confidence had been done, leading to a decline in vaccine coverage (Baker, 2003).

The repercussions of this decline in vaccine uptake were profound. In the UK, there were three significant whooping cough epidemics in the 1980s, resulting in large-scale hospitalisations and deaths (Baker, 2003). Alarmingly, in parts of northern Europe and Japan, the pertussis vaccine was suspended or significantly decreased (Cherry, 2019; Szwejser-Zawislak et al, 2022).

However, efforts to regain control over pertussis gradually gained momentum. The introduction of an accelerated vaccine schedule, administered at two, three, and four months of age, played a pivotal role in reining in the disease. Through targeted vaccination campaigns and public health interventions, pertussis cases were gradually brought back to low rates (Campbell et al, 2012).

The development of acellular pertussis (aP) vaccines in the 1980s and 1990s represented a significant advancement in the fight against whooping cough. Compared to the whole-cell pertussis vaccines previously in use, aP vaccines showed promising results in terms of both efficacy and safety (Campbell et al, 2012).

One key advantage of aP vaccines was their reduced reactogenicity, meaning that they caused fewer adverse reactions compared to whole-cell vaccines (Dewan et al, 2020). This was particularly important in enhancing vaccine acceptance among the public and healthcare providers. Additionally, the development of aP vaccines coincided with a period when whole-cell pertussis vaccines became unavailable. This, coupled with the situation in Northern Europe, inadvertently facilitated the conduct of efficacy studies for aP vaccines, as researchers could compare the performance of aP vaccines against a backdrop of low vaccination coverage (Szwejser-Zawislak et al, 2022).

Moreover, aP vaccines demonstrated more consistent efficacy compared to whole-cell vaccines, which exhibited variable effectiveness. This consistency in efficacy further supported the adoption of aP vaccines as a viable alternative for pertussis prevention (Szwejser-Zawislak et al, 2022).

However, despite the initial success and widespread adoption of aP vaccines, concerns emerged regarding the duration of vaccine-induced immunity. Studies indicated that the protection conferred by aP vaccines waned more rapidly compared to whole-cell vaccines (DeAngelis et al, 2016). By 2012, there was a gradual uptick in the number of pertussis cases reported, particularly among adolescents and young adults whose vaccine protection was diminishing (Klein et al, 2012).

MATERNAL VACCINATION PROGRAMME

The implementation of the maternal pertussis vaccination programme marked a crucial milestone in combating whooping cough outbreaks and protecting vulnerable infants. In response to the 2012 whooping cough outbreak, which tragically resulted in 14 infant deaths, the Joint Committee on Vaccination and Immunisation (JCVI) introduced a programme offering diphtheria, tetanus, and pertussis (DTaP) vaccination to pregnant women from 16 weeks' gestation onwards.

Research has shown that the efficacy of the maternal pertussis vaccine is optimised when administered between 20 and 32 weeks of gestation (Amirthalingam et al, 2014). Subsequent case control studies have consistently demonstrated the remarkable effectiveness of this vaccination strategy in preventing whooping cough in newborns before they are eligible for their own vaccinations, with efficacy exceeding 90% protection against fatal outcomes (Donegan et al, 2014).

The impact of the maternal vaccination programme has been profound, estimated to prevent between 1400 to 4300 infant hospitalisations and 41 to 170 infant deaths (Amirthalingam et al, 2016). However, despite these significant gains, pertussis continues to circulate, posing ongoing challenges to public health.

One contributing factor to the persistence of pertussis outbreaks is the waning immunity conferred by current vaccines over time, coupled with declining vaccination rates. The coverage of maternal pertussis vaccination has seen a decline, particularly post-pandemic, with rates dropping from over 70% to under 60% (Healy, 2016). Similarly, rates of uptake of the infant vaccination programme has also dropped: as of September 2023, 92.9% of two year olds had completed their 6-in-1 vaccinations (diphtheria, tetanus, acellular pertussis, hib, hepatitis B and inactivated polio vaccine [DTaP/Hib/HepB/IPV]), compared with 96.3% in March 2014 (Smout et al, 2024). Risk factors associated with poor uptake of the vaccine include social deprivation, lower maternal age, and multiple pregnancies, hence public health strategies need to focus on solutions to address reasons for decline in these areas (Walker et al, 2021).

Moreover, challenges in data capture and delivery logistics, particularly in the sharing of care between primary and secondary healthcare settings, may contribute to suboptimal vaccination coverage. In the author's clinical opinion, this highlights the importance of streamlining vaccination delivery pathways and improving data recording systems to ensure comprehensive coverage.

CURRENT OUTBREAK

Recent data from the UK indicate a concerning resurgence of pertussis cases, including in the nought to three-month age group, who are most at risk of severe complications and mortality. From December 2023 to January 2024, there was a doubling of cases, and case numbers have continued to rise since (UKHSA, 2024a). In the first two months of 2024, there were 1468 confirmed (laboratory tested) cases compared to 858 in the whole of 2023 including, sadly, the death of an infant in the last quarter of 2023 (UKHSA, 2024a).

MANAGEMENT OF WHOOPING COUGH INFECTION

Management of whooping cough infection primarily revolves around supportive care, as there is currently no cure for the disease. Hospitalisation may be necessary, especially in cases where complications such as pneumonia, respiratory failure, feeding difficulties, or seizures arise. Early intensive care management is recommended in such instances to mitigate the severity of complications and improve patient outcomes (National Institute for Health and Care Excellence [NICE], 2024).

Unfortunately, there is no effective treatment specifically targeting the characteristic cough associated with whooping cough. While antimicrobial therapy, traditionally using macrolides such as erythromycin, can alleviate symptoms if administered within the first week of symptom onset, their efficacy diminishes thereafter (Kuchar et al, 2016). The main focus of antibiotic treatment is the reduction in duration of shedding and infectiousness of the disease, thereby aiding in preventing its transmission within the community (Zhang et al, 2014).

Despite their utility, macrolides like erythromycin have limitations, including poor tolerability and unsuitability for infants under one month of age due to potential adverse effects (Kuchar et al, 2016). To address these drawbacks, newer macrolides such as azithromycin and clarithromycin have been introduced. These medications offer advantages, such as a longer half-life and shorter duration of therapy, necessitating less frequent dosing and consequently better tolerability (Langley et al, 2004). In cases where macrolides are contraindicated, alternative treatments such as co-trimoxazole may be considered (NICE, 2024).

To control the current whooping cough outbreak in the UK, a comprehensive approach is therefore needed. This includes (UKHSA, 2024b):

- Enhancing surveillance for early case detection
- Implementing targeted vaccination campaigns for high-risk groups like infants and pregnant women
- Promoting vaccine education to address hesitancy.

As discussed, administering antibiotic prophylaxis to close contacts and enforcing isolation measures can limit transmission.

“Research has demonstrated the effectiveness of the vaccine schedule in conferring immunity against whooping cough... .

EFFICACY OF VACCINE SCHEDULE

The efficacy of the pertussis vaccine underscores the vital role vaccines play in preventing and controlling whooping cough outbreaks. In the UK, the pertussis vaccine is routinely administered as part of the 6-in-1 vaccination series at eight, 12, and 16 weeks of age. Timely vaccination is crucial for maximising protection against pertussis.

Research has demonstrated the effectiveness of the vaccine schedule in conferring immunity against whooping cough (Schwartz et al, 2016). In infants aged nine weeks to under six months, there is a progressive increase in protection following each dose of the vaccine. After one dose, there is a 62% rate of protection, which increases to 85% after two doses, and reaches 95% after three doses (Schwartz et al, 2016). Additionally, the pre-school booster dose administered at three years and four months aims to address waning vaccine efficacy and further boost protection. This booster has been shown to increase protection by 46%, reinforcing the importance of maintaining vaccination schedules (Trotter et al, 2008).

Furthermore, extensive safety monitoring has consistently demonstrated the excellent safety profile of pertussis vaccines. Data from studies such as those conducted by Daley et al (2014) provide reassurance regarding the safety of pertussis vaccination, further supporting its widespread use and inclusion in national immunisation programmes.

Given their central role in vaccination campaigns, general practice nurses (GPNs) play a crucial role in promoting vaccine uptake and combatting vaccine hesitancy. Healthcare professionals are widely regarded as trustworthy sources of information, making them key influencers in shaping public perception and attitudes towards vaccination. In the author’s clinical experience, by providing accurate information, addressing concerns, and fostering trust, healthcare professionals can help mitigate misinformation and increase confidence in vaccination programmes.

PREVENTING DISEASE SPREAD

Given the limited benefit of chemoprophylaxis, the UKHSA (2024b) has set out guidelines for antibiotic prophylaxis to restrict treatment only for those close contacts where:

- The onset of the disease in the index case is within 21 days
- There is a close contact in one of the priority groups (*Table 2*).

For these individuals, sampling must take account of the optimum sampling windows as previously set out. Where onset of disease is not known, or not given, it is reasonable to assume that it is too late to take immediate public health action and, as such, focus should be on priority cases where onset of symptoms is known and infection confirmed. If the onset is more than 21 days or confirmed by oral fluid swab or serology with no date of onset, UKHSA (2024b) recommends:

- Sharing link to information: www.gov.uk/government/publications/whooping-cough-diagnosis-information
- Arrange oral fluid kit to be sent if aged two to <17 years, not otherwise confirmed and no pertussis-vaccine in last year.

SAFETY NETTING

Safety netting is a critical component in the management of whooping cough cases and their contacts, aiming to ensure (Jones et al, 2019):

- Early recognition of symptoms
- Prompt healthcare seeking
- Appropriate preventive measures.

Safety netting provides guidance and support to individuals at risk of pertussis, emphasising the importance of vigilance and proactive healthcare engagement. Several key aspects highlight the importance of safety netting in pertussis management. First, safety netting encourages individuals who have been in contact with confirmed pertussis cases to be vigilant for symptoms suggestive of the disease, such as prolonged coughing fits, especially if accompanied by a characteristic whooping sound or post-cough vomiting. Early recognition of symptoms prompts individuals to seek healthcare advice quickly, facilitating timely diagnosis, treatment, and implementation of preventive measures to reduce transmission (NICE, 2024).

This subsequently helps with provision of timely antibiotic prophylaxis — vulnerable individuals identified as close contacts of confirmed pertussis cases may be recommended antibiotic prophylaxis to prevent secondary transmission. Safety netting ensures that contacts are aware of this recommendation and understand the importance of completing the prescribed course of antibiotics, even in the absence of symptoms, to reduce the risk of developing and spreading pertussis (Smout et al, 2024).

Lastly, safety netting serves as a platform to reinforce the importance of vaccination in pertussis prevention. Individuals are reminded of the benefits of vaccination in reducing the risk of pertussis infection, severity of illness, and transmission within the community. This includes encouraging vaccination of eligible individuals according to national immunisation schedules and catch-up opportunities for those who may have missed or delayed vaccination (NHS England, 2024).

Table 1: Priority groups (UKHSA, 2024a)

Priority group 1: individuals at increased risk of severe complications ('vulnerable')	Priority group 2 : individuals at increased risk of transmitting to 'vulnerable' individuals in 'group 1' if they have pertussis
A. Unimmunised infants (born at 32 weeks or less) less than two months of age regardless of maternal vaccine status	A. Pregnant women who have reached 32 weeks' gestation but have not yet received a pertussis-containing vaccine in this pregnancy
B. Unimmunised infants (born at more than 32 weeks) less than two months of age whose mothers did not receive maternal pertussis vaccine after 16 weeks and at least two weeks before delivery	B. Healthcare workers working with infants (as defined in a, b or c above and pregnant women
C. Infants aged between two months and under one year of age who are unimmunised or partially immunised (less than three doses of DTaP/IPV/Hib/HepB) regardless of maternal vaccine status	C. People whose work involves regular, close or prolonged contact with infants as defined in a, b or c above
	D. People who share a household with an infant as defined in 'vulnerable' infants in a, b or c above

CONCLUSION

The current outbreak of whooping cough highlights the necessity of maintaining high vaccine coverage rates to prevent the resurgence of diseases like pertussis. Pertussis infection poses significant dangers, particularly for infants under three months of age who are at heightened risk of severe complications, hospitalisation, and even death. Managing pertussis infection is challenging as there is no cure, and treatment mainly focuses on supportive care, again highlighting the importance of vaccination.

General practice nurses are at the forefront of providing public health information about vaccination. They play a pivotal role in promoting vaccine uptake, addressing vaccine hesitancy, and combating misinformation. Their trusted position in the community allows them to provide accurate information, address concerns, and encourage vaccination among individuals of all ages, including infants and pregnant women, and therefore play a vital role in educating the public and promoting vaccine uptake to safeguard public health. GPN

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Key points

- Whooping cough, also known as pertussis, continues to pose a significant threat to public health, particularly impacting infants and children with its devastating effects.
- The three main diagnostic approaches include culture, polymerase chain reaction (PCR), and serology, each offering pros and cons.
- With no effective treatment or cure for pertussis, the disease is extremely difficult to manage and vaccination remains the primary tool for controlling it.
- One contributing factor to the persistence of pertussis outbreaks is the waning immunity conferred by current vaccines over time, coupled with declining vaccination rates.
- Safety netting is a critical component in the management of whooping cough cases and their contacts.
- The current outbreak of whooping cough highlights the necessity of maintaining high vaccine coverage rates to prevent the resurgence of diseases like pertussis.
- General practice nurses are at the forefront of providing public health information about vaccination.

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Complications with a bariatric patient following surgery abroad

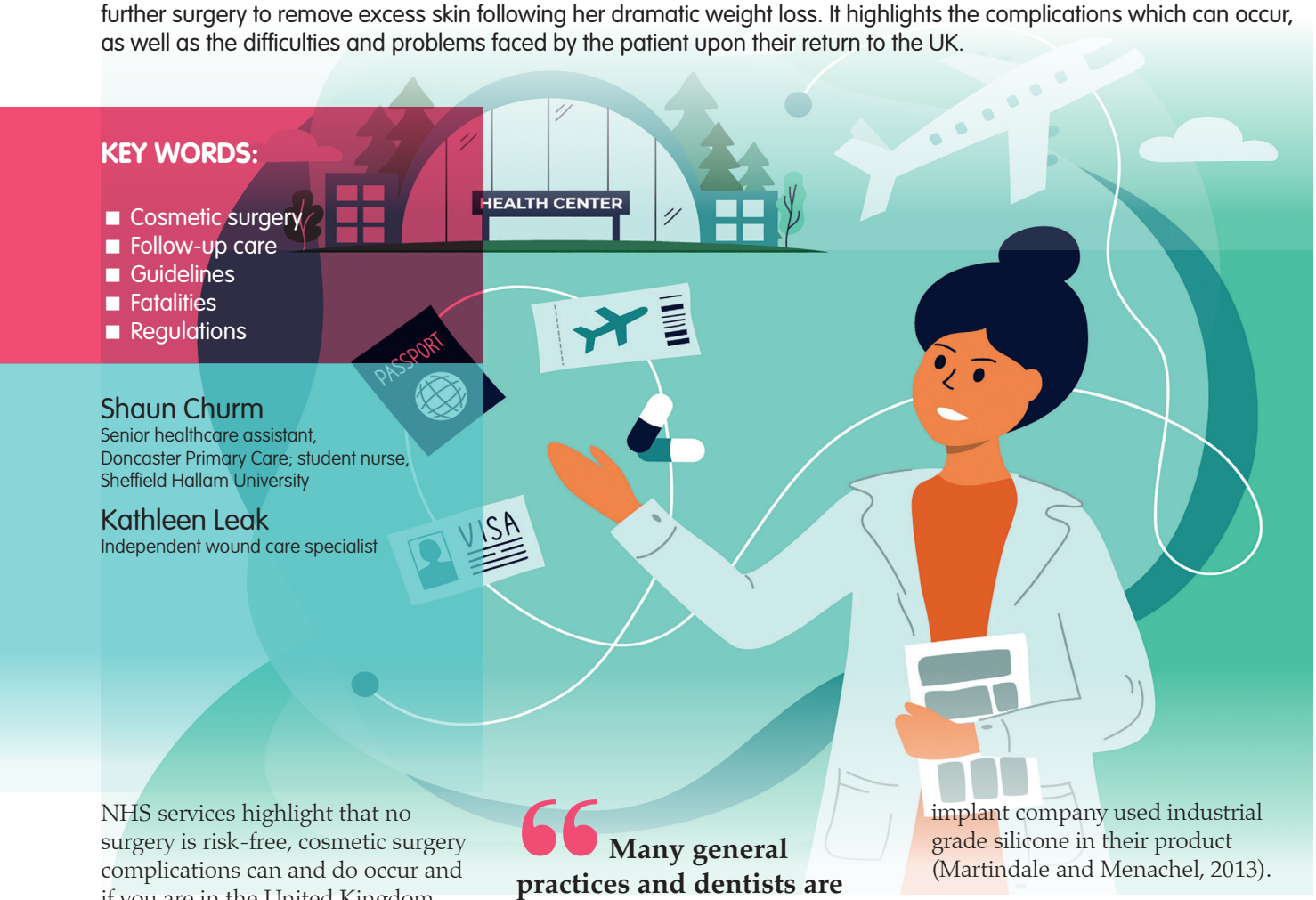
Aesthetic tourism has increased exponentially since the lockdowns as a result of the Coronovirus pandemic. People seeking cosmetic procedures or surgeries often opt to travel abroad for various reasons, including cost-effectiveness, availability of advanced technologies, and sometimes a desire for privacy. However, the incidence of problem wounds experienced by medical tourists on returning to the United Kingdom has become a major cause for concern. This article discusses the experiences of a patient who had bariatric surgery abroad with no complications who then decided to have further surgery to remove excess skin following her dramatic weight loss. It highlights the complications which can occur, as well as the difficulties and problems faced by the patient upon their return to the UK.

KEY WORDS:

- Cosmetic surgery
- Follow-up care
- Guidelines
- Fatalities
- Regulations

Shaun Churm
Senior healthcare assistant,
Doncaster Primary Care; student nurse,
Sheffield Hallam University

Kathleen Leak
Independent wound care specialist



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NHS services highlight that no surgery is risk-free, cosmetic surgery complications can and do occur and if you are in the United Kingdom it is the surgeon's responsibility to provide follow-up treatment. However, many overseas clinics do not provide this service or have a contact within the United Kingdom.

Many general practices and dentists are questioning whose duty it is to give aftercare to patients who travel abroad for surgery, especially where no communication has been sent to healthcare professionals about procedures performed and follow-up care provided (NHS, 2024).

It has been highlighted that these patients should perhaps be referred to the private sector, as it is perceived to be unfair to expect local services to 'pick up the tab' for aftercare and be responsible for providing advice in the event of a surgery which has gone wrong (NHS, 2024).

> **Many general practices and dentists are questioning whose duty it is to give aftercare to patients who travel abroad for surgery... .**

Cosmetic surgery was thrown into the limelight by the PIP (poly implant prostheses) breast implant scandal, with global outrage after the French implant company used industrial grade silicone in their product (Martindale and Menachel, 2013).

The number of patients seeking cosmetic procedures abroad has recently been highlighted due to the corresponding growing number of patients seeking help with complications upon their return to the United Kingdom.

In 2022, it was noted that USA and Brazil have the highest number of procedures being performed — the USA 7.3 million with Brazil second with 2.7 million (Yang, 2024). This was seen to differ around the world with demographic and cultural differences. Australia and the United Kingdom have

the highest number of women going abroad for breast surgery, while Chinese and Asian cultures concentrate on eyelid, nose and jaw surgery, many visiting South Korea heightening the theory that these are becoming the 'beauty norms' in some generations (Yang, 2024).

In an ITVx report (August 2023), reporters using data from the British Association of Aesthetic Plastic Surgeons (BAAPS) showed that within the last three years the number of people seeking cosmetic surgery abroad has risen by 94%, with 75% of these going to Turkey. The BAAPS' data also revealed that there was a corresponding increase in the number of people returning to the UK with complications, such as wound healing issues and even life-threatening sepsis. Indeed, there are many case reports of complications with the BAAPS quoting figures of premature deaths due to complications of these surgeries (BAAPS, 2023). Estimates for the cost to the NHS for treating these is at £1.7 million, with many consultants expecting this figure to be much higher (ITVx news, 2023).

Data from BAAPS showed negligence claims concerning breast surgery, facelifts, eyelid operations, nose reductions, and weight-loss procedures account for 80% of claims stemming from cosmetic surgery abroad.

In 2017, Farid et al (2019) looked at motivational factors and underlying reasons to go abroad by conducting a review of patients from January 2013 to August 2017 who returned to the UK with complications as a result of overseas surgery. Their findings highlighted that this was mostly women with a mean age of 36 years who chose this option due to cost and friends' recommendations. Their conclusion was that an international consensus (regarding aftercare for complications) is needed.

The National Institute for Health and Care Excellence (NICE) has raised serious concerns about the lack of regulations in aesthetic tourism and the dearth of patient follow-up, especially in gluteal augmentation cases which can have major complications, such as surgical site infections (SSIs) and haematoma, leading to wound breakdown (Troughton et al, 2018). It is felt by many GPs and surgeons that an international consensus to regulate surgical practices abroad is crucial for patient protection (Troughton et al, 2018).

"The BAAPS' data also revealed that there was a corresponding increase in the number of people returning to the UK with complications, such as wound healing issues and even life-threatening sepsis.

CASE REPORT

This female, obese patient in her late 40s with a body mass index (BMI) of over 40 (before surgery) had bariatric surgery abroad with no complications. As a result of her good experience, at the recommendation of a friend she decided six months later to go abroad again for a 360 abdominoplasty after her dramatic weight loss of 15 stone. She was led to believe that she would be allowed home within a short period (one to two weeks) following surgery.

However, a few days after the surgery, having not seen her surgeon since the operation, the suturing gave way mid-lower back while she was in the rest room. The only clinic personnel present were domestic staff who went and sought help. She was initially told that this was her fault and had happened because her buttocks were too heavy causing the skin to split.

Following this dehiscence, she underwent four visits to theatre, two of which involved skin grafting and in total she had 11 pints of blood transfused. None of these visits to theatre resolved the situation and she was still left with a large gaping wound. Following these failed surgeries, the patient underwent daily, sometimes twice daily, negative pressure wound therapy (NPWT) dressing changes with the nurses debriding the wound with a scalpel at each dressing change. She was told that they needed to perform this as she was a slow healer. No nutritional support, supplements or dietary advice was given, despite having previously had bariatric surgery.

Due to the continued inpatient stay and treatment and lack of dignity and privacy during dressing changes, the patient became depressed and to cover the costs her family had to remortgage their properties.

A short visit (i.e. the initial surgery for which she was away for less than a week) turned into a six-month nightmare for the patient and her family, as no aftercare could initially be secured within the UK.

Background

Initially, problems were encountered in getting her home with the surgeon refusing to sign the fit to fly certificate and wanting further payments for her continued care. When discharge papers were finally signed, she was given no information with regard to the treatment she had received or the continuing care she required. This made it difficult for a local GP practice to accept her case, as she had multiple problems and a non-healing wound but with no medical notes as to what had transpired or treatment given. The local hospital

Practice points

- Is an international consensus required to regulate overseas surgical practice?
- Should patients be advised to take out private insurance?
- Should the role of social media to promote medical tourism be regulated?
- Should patients be advised to do due diligence before accepting treatment abroad?

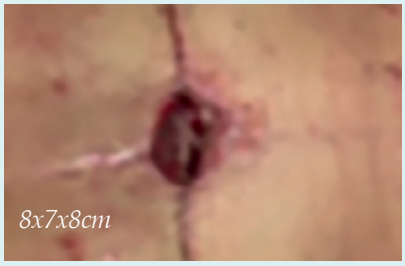

Figure 1.
Multiple small pieces to pack not advisable as was process used abroad. Guidelines advise using one larger piece to pack.

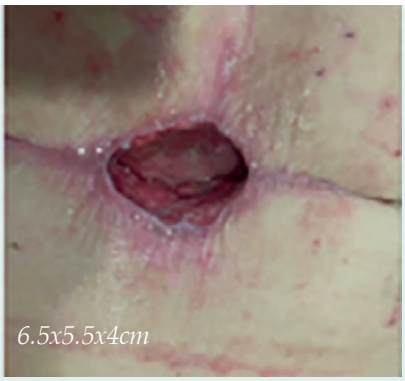

Figure 2.
Improvement after one week in UK.

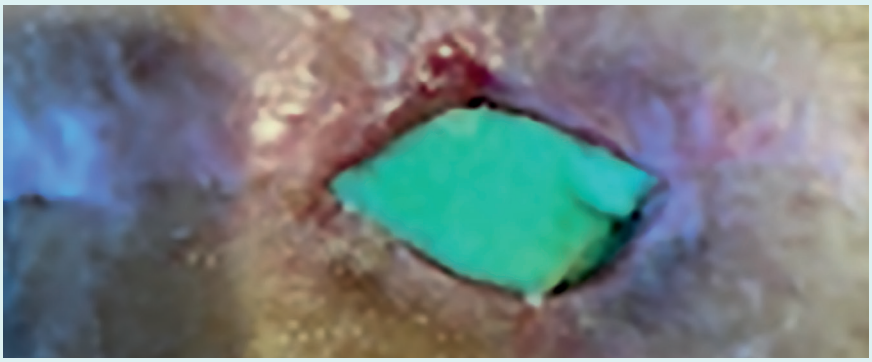

Figure 3.
Cavity wound reducing in size.

Figure 4.
Depth decreased, hybrid dressing used.

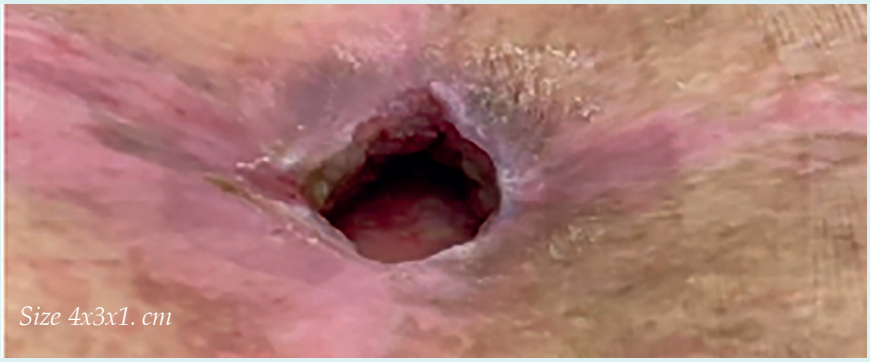

Figure 5.
Healthy periwound skin: wound and exudate volume reduced before visit to tissue viability team.

trust was also unwilling to take over the management of this case.

However, although the local GP was not happy to oversee this wound he was in full agreement with and supported an independent private team to manage the wound at home voluntarily while a tissue viability referral was made — a four to six-week wait.

Initial assessment

Following full holistic assessment of the patient and her wound by the independent team who had a wound care specialist, NPWT was administered twice weekly at a pressure setting of -125mmHg. Two pieces of green foam were used initially, reducing to one piece as the wound decreased in size after three weeks.

At the initial assessment, the wound measured 8cm wide x 7cm length x 8cm deep. The skin surrounding the cavity was sensitive due to the frequent removal of dressings. A hydrocolloid dressing was used as a border around the cavity to obtain a good seal and to protect the surrounding skin. The GP had prescribed antibiotics at the patient's request due to the odour, but on assessment there were no clinical signs of infection and the consensus was that the odour was due to anaerobes and so a silver-donating dressing was applied under the foam to reduce the anaerobe bacterial count and eliminate the odour.

Initially, exudate volume was heavy and 1100ml large canisters were needed to manage the fluid. Advice was also given with regard to nutrition and supplements required to aid healing and replace vitamins depleted due to the bariatric surgery, plus the excess exudate. The patient was also advised to mobilise and do gentle exercise.

Although she was familiar with NPWT having had it abroad, she was used to having the dressings changed once or twice a day. It took a while for her to become comfortable with having the dressing changes twice a week as

per European guidelines (Apelqvist et al, 2017). A full explanation was given about the mode of action of NPWT and how it helped wound healing by promoting a healthy wound bed while also managing the exudate being produced.

The patient also found the use of a single piece of foam difficult to accept as previously multiple small pieces of foam had been packed into the cavity — it would appear that there was no count in count out methodology used, as seen in *Figure 1*. Thus, during the initial assessment by the independent team, the cavity was thoroughly examined before starting packing to ensure that no pieces had remained.

Progress

A 60% reduction in the size of the cavity wound and a decrease in exudate volume was seen within three weeks which, in turn, led to an improvement in the patient's quality of life and the psychological impact of having a chronic wound. This was apparent in her improved health and mood and she felt secure and started going out shopping and doing some normal things for the first time in six months.

Dressings were continued on a twice weekly basis for a further four weeks, after which, due to the reduction in the size and depth of the wound, a one-piece hybrid dressing could be used, which was gentle on the surrounding skin.

At six weeks, the NPWT was stopped and the cavity wound, which was now shallow (the depth of the wound had reduced to 1–2cm), redressed with a simple filler before her care was taken over by the local tissue viability team.

Results

Following European guidelines (Apelqvist et al, 2017), the cavity was packed and NPWT was applied and changed twice weekly. No extra debridement was necessary and the wound decreased in size with the exudate volume being controlled, which instantly improved patient quality of life. The relief upon the patient and family was noted by all.

The condition of the periwound skin also improved with the hydrocolloid dressing.

Treatment was continued by the independent team until a referral could be picked up by the local tissue viability team, who had a four- to six-week wait. This happened once the NPWT had been removed and simple packing applied. The local tissue viability team at that time agreed that the patient did not need further management and left her care with the general practice nurse (GPN) and family.

Immediately treatment began the patient reported less pain and her mood instantly improved from being at home with her family and feeling secure.

DISCUSSION

Since travel restrictions have been lifted after Covid-19 lockdowns, aesthetic tourism has increased, in part due to lower costs. Google 2024 quotes cost-savings of 40–80% with clinics within a few hours of the UK — clinics in Lithuania and Czech Republic have been quoting their procedural costs as 70% below UK prices (www.nordesthetics.com/en/plastic-surgery-lithuania/). It is common practice for patients to fill in a screening form and have an online interview with the consultant and then not see the surgeon until the day of their operation. Postoperatively, many of these patients are allowed to fly home after one week with no extra precautions to reduce the risk of, for example, deep vein thrombosis (DVT).

The case report discussed here highlights not only the problems encountered by a patient and their family, but also for healthcare providers who have these patients thrust upon them with no information and no clear guidance.

The NHS does have advice and support on its website before making decisions to travel abroad for surgery (NHS, 2024). However, if complications occur upon return, there appears to be no clear guidance. In the authors' clinical opinion, this needs addressing as many complications can be life-threatening.

The pump and all material for this case study were kindly donated by Genadyne USA and Creed UK.

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Factors influencing non-attendance for cervical screening: a literature review

Cervical screening checks the health of the cervix and can help to prevent and identify cervical cancer early to enable treatment to start. However, nearly a third of women are currently not participating in the screening programme so there is a strategic drive to increase this. To support an increase in uptake of smear tests, it is important to be aware of reasons why people do not attend. This literature review was undertaken to explore reasons why women do not participate in the cervical screening programme in the United Kingdom. Twelve studies were included in the review and thematic analysis was undertaken. The three themes identified were embarrassment and pain, knowledge, and health beliefs. Healthcare professionals, such as general practice nurses (GPNs), should be aware of potential factors which may prohibit attendance in order to encourage and increase engagement with the screening programme.

KEY WORDS:

- Cervical cancer
- Screening
- Vaccinations
- Knowledge
- Experience

Kathryn Richards
General practice nurse, Liverpool

Helen Marshall
Lecturer, University of Liverpool; Queen's Nurse; district nurse

Photograph: fizkes/Shutterstock

The cervix is part of the female reproductive system and forms the entrance to the uterus from the vagina (Tortora and Derrickson, 2017). Cervical cancer is caused by abnormal cells in the lining of the cervix growing in an uncontrolled way and eventually forming a tumour (Cancer Research UK, 2020). It is the 14th most common cancer in females in the United Kingdom (UK), with around 3,200 new cases and 800 deaths annually (Cancer Research UK, 2021). It is the fourth most common cancer among women globally, with 90% of deaths occurring in low- and middle-income countries (World Health Organization [WHO], 2022a). As physical symptoms of cervical cancer predominantly become apparent when the condition is advanced and potentially untreatable, it is imperative that early screening is accessed when available (WHO, 2022b). In the UK alone, it is estimated that the national cervical screening programme saves around 5,000 premature deaths from cervical cancer each year (NHS, 2023). However, between 2021 and 2022, only 69.9% of 25–64-year-old eligible individuals were screened (NHS Digital, 2022). This is lower than the recognised 80% threshold which a screening programme aims to achieve (Public Health England [PHE], 2021).

In the UK, screening is currently offered to women aged 25–49 every three years and to women aged 50–64 every five years. The screening test, known as a smear test, involves a specimen of cellular material being taken from the cervix, for examination by a cytologist (Dimech et al, 2020). The primary cause of cervical abnormalities and cancer is infection with high-risk strains of human papillomavirus [HPV] (Dimech et al, 2020; Royal College of Nursing [RCN], 2020). HPV is transmitted through any

skin-to-skin contact of the genital area; often the virus causes no symptoms (WHO, 2022a). If HPV is detected, the sample will undergo cytological assessment for pre-cancerous cellular changes (Dimech et al, 2020). Screening can detect a problem before any symptoms are present, for example while the cell changes are at the latent stage, before becoming cancerous.

The HPV vaccination has been implemented as a primary intervention measure since 2008, routinely offered to boys and girls aged 12–13 years old at secondary school or in community clinics with the aim of reducing the chance of contracting the virus (UK Health Security Agency, 2022; NHS, 2023). HPV vaccines stimulate the body to produce antibodies that, in future encounters with HPV, bind to the virus and prevent it from infecting cells (National Cancer Institute, 2021). For the pre-HPV vaccine cohort, who have not been exposed to the benefits of the vaccine, cervical screening remains the predominant means of prevention, and inadequate participation presents a significant risk factor for the development of cervical cancer (Castañón et al, 2017).

A literature review was undertaken by the authors with the following question: what factors influence non-attendance to cervical screening in the UK?

SEARCH STRATEGY

Three databases were searched; OVID Medline, Scopus, and the Cumulative Index of Nursing and Allied Health Literature (CINAHL). Search terms included 'cervical screen*', 'smear test*', 'cervical screening process', and 'cervical smear*', 'decision', 'attend*', 'barriers', 'experience*', and 'uptake'. Truncation and Boolean operators were used to add focus and further refine the search. This search focused on research specifically in the UK, published from 2017 and available in English. Duplicates were removed and titles and abstracts were screened. Overall, 12 papers were selected for final review, which were appraised for quality. Details of this process are illustrated using a PRISMA (2021) flow chart (*Figure 1*). Thematic analysis was conducted to identify and critically summarise insightful findings across the papers (Vaismoradi et al, 2013; Nowell et al, 2017; Polit and Beck, 2021). Three themes were identified:

- Embarrassment and pain
- Knowledge
- Health beliefs.

"Screening can detect a problem before any symptoms are present, for example while the cell changes are at the latent stage, before becoming cancerous.

EMBARRASSMENT AND PAIN

Embarrassment and pain are significant factors which prohibit women from attending a cervical screening invitation (Bennett et al, 2018; Marlow et al, 2018a; Marlow et al, 2019; Wilding et al, 2020; Nelson et al, 2021; Bravington et al, 2022; Groves and Brooks, 2022; Judah et al, 2022; Brook-Rowland and Finlay, 2023). A previous unpleasant or painful experience, or the potential for this to occur, was cited as a reason to stop or not attend at all (Marlow et al, 2018a; Marlow et al, 2019).

This included pain during the procedure, insertion of speculum and overall embarrassment and being self-conscious about their bodily appearance. Bravington et al (2022) and Marlow et al (2019) specifically identify pain from speculum insertion after menopause was a contributory factor for non-attendance due to psychological distress linked to previous or anticipated pain (Bravington et al, 2022). However, practitioners who have knowledge around the effects of menopause and adjust their approach to the procedure can reduce pain, thus encouraging attendance (Bravington et al, 2022). Yet, these negative aspects of screening were offset with the health benefits of identifying cervical cancer sooner and in turn receiving treatment (Marlow et al, 2019; Wilding et al 2020).

Reflective points

- How can you, as a healthcare professional, promote the cervical screening programme as part of your health promotion role as a qualified nurse?
- Would you be able to answer questions regarding this procedure in order to increase knowledge among women and to address any pre-conceived perceptions?
- Do you think education of the screening programme should be increased in schools to encourage participation when women are invited to be screened?

Brook-Rowland and Finlay (2023) explored influences on the likelihood of screening uptake in 11 women aged 18–24, who were yet to attend a screening appointment, using semi-structured face-to-face interviews. All participants cited embarrassment and negative thoughts towards body image were due to comparison with others on social media. Furthermore, embarrassment due to a potential body smell while having the procedure undertaken was worrying for participants (Brook-Rowland and Finlay, 2023).

Embarrassment is echoed by Groves and Brooks (2022) from 16 women in the 18–24 age range. Similarly, Marlow et al (2018a) also found that older women reported an increased need for privacy. In contrast, other participants discussed feeling more socially and physically comfortable with the screening process, with reduced embarrassment often attributed to childbirth (Marlow et al, 2018a; Nelson et al, 2021).

Self-esteem with one's own body

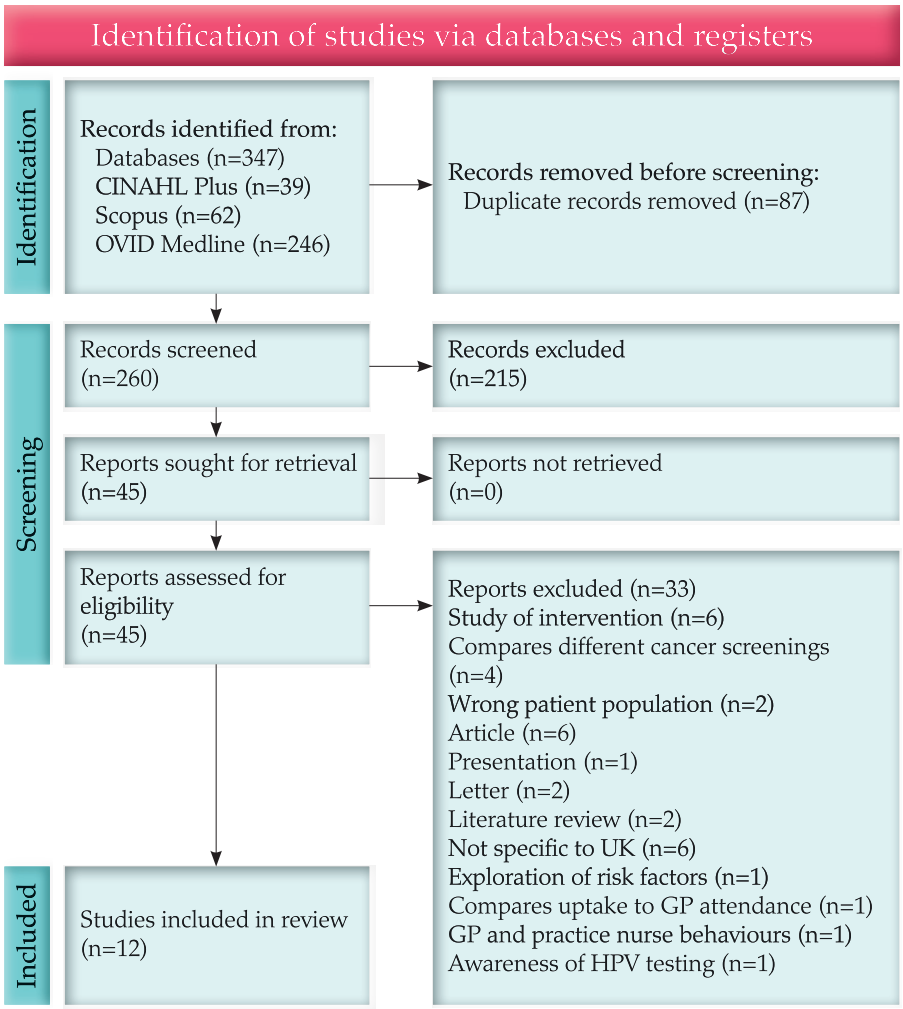

Figure 1.
PRISMA flow diagram.

appears to be a notable factor across the age ranges in relation to cervical screening.

KNOWLEDGE

The literature concludes that limited knowledge of cervical cancer and screening is a known barrier to attendance at cervical screening appointments (Marlow et al, 2017; Marlow et al, 2019; Wilding et al, 2020; Nelson et al, 2021; Groves and Brooks, 2022; Brook-Rowland and Finlay, 2023). Groves and Brooks (2022) used asynchronous email interviews to explore the influences on the likelihood of cervical screening uptake of 16 female undergraduate students aged 18–24 years, yet to receive a cervical screening invitation to attend. Interviews spanned 22 days, as one question was sent every three days via email. Anxiety was a common worry, which included the invasive nature of the procedure, waiting for results and being fearful of the unknown (Groves and Brooks, 2022). Marlow et al (2018a) echo this and conclude that the unknown was also a concern, with an additional caveat that participants who perceived their risk as minimal, devalued and minimised their need to be screened.

The fear and uncertainty of what to expect during a cervical screening appointment is highlighted as a concern for those in the pre-screening age group (Groves and Brooks, 2022; Brook-Rowland and Finlay, 2023). Lack of information in the school setting has resulted in women not feeling educated about cervical cancer or screening, and being reliant on others as a primary source of information (Groves and Brooks, 2022; Brook-Rowland and Finlay, 2023). For instance, talk between mothers and daughters, friends and family, provided a forum for information exchange and encouraged screening (Marlow et al, 2019; Nelson et al, 2021; Bravington et al, 2022). Such conversations were particularly important for women from ethnic minority backgrounds after receiving their first invitation letter, and was attributed to there being no formal screening programme in their country of birth (Marlow et al, 2019). Contrastingly, Brooke-Rowland and Finlay (2023) found that this topic would not be discussed in friendship groups.

A lack of knowledge regarding sexual behaviour and the link to cervical cancer is known to be a reason for non-attendance, with people thinking reduced sexual behaviour lowers the risk (Bennett et al, 2018). However, it has been suggested that it can take between 10 and 20 years for cervical cancer to develop from an HPV infection (Burd, 2003), so a woman's current sexual behaviour does not necessarily reflect her current risk (Bennett et al, 2018).

There were varying views on whether age increased or decreased risk, and the relevance of cervical screening after the age of 50 years. Some women reported feeling more vulnerable with age, while others reported feeling that their risk declines with age (Marlow et al, 2019; Bravington et al, 2022; Wilding, 2022). This highlights the importance of correct knowledge of risk factors in order to make an informed choice with regards to attendance at cervical screening appointments.

HEALTH BELIEFS

An individual's health beliefs are impacted by their level of knowledge, such as awareness and perception of their risk (Marlow et al, 2017; Bennett et al, 2018; Marlow et al, 2018a; Marlow et al, 2018b; Marlow et al, 2019; Wilding et al, 2020; Nelson et al, 2021; Bravington et al, 2022; Groves and Brooks, 2022; Wilding et al, 2022). Consequently, whether women attend cervical screening appointments offered to them is affected by knowledge of risk factors, and therefore perception of risk.

There was a variation of health

beliefs identified in the literature, such as having a predisposition due to family history of cancer (Marlow et al, 2019), having multiple sexual partners, too much sex, or having sex at a young age could increase the risk of cervical cancer (Marlow et al, 2019; Groves and Brooks, 2022).

Wilding et al (2022) conducted online surveys with 500 women aged 25–64 to investigate the impact of sociodemographic factors on cervical cancer screening intention. They found intention to be screened was lowest in the 50 plus age group (Wilding et al, 2022). These findings are supported by Bennett et al (2018) and Marlow et al (2017) who reported a correlation between older age and screening being seen as a low priority. However, Marlow et al (2018a) noted that older women in their study reflected on how an accumulation of health conditions as they age contributed to a reappraisal of their health and provided a greater incentive to care for it, with focus shifting from potential pain to potential consequences of not being screened. Wilding et al (2020) concur as 20–25% of 194 participants reported that screening brought them peace of mind, followed by fear of cancer and perceived risk, including a desire to minimise risk.

Marlow et al (2019) explored barriers to cervical screening among 38 women aged 50–64 years old from hard-to-reach groups by holding six focus groups. Two of the groups were in English, one was Sylheti and one was in Arabic/Somali. A lack of knowledge about cervical cancer was a clear barrier cited by many of the women in the study, particularly noting that cervical screening was not carried out in their countries of birth and they were not clear what the screening process was actually aiming to do (Marlow et al, 2019). Furthermore, Marlow et al (2019) found that some women believed cervical cancer was not treatable and therefore would prefer not to know if they had it. Three participants in one focus group cited that it was seen as shameful and as a result of someone who has 'done bad things' (Marlow et al, 2019). The presence of cultural health beliefs, which can be influenced by knowledge and the perception of risk, has been shown to have a correlation with cervical screening engagement (Marlow et al, 2017; Bennett et al, 2018; Marlow et al, 2018a; Marlow et al, 2018b; Marlow et al, 2019; Wilding et al, 2020; Nelson et al, 2021; Bravington et al, 2022; Groves and Brooks, 2022; Wilding et al, 2022).

Box 1 Implications for practice

This literature review explored factors which can impede attendance at cervical screening appointments. In the UK, most cervical screening takes place in the primary care setting and is performed by general practice nurses (Mackie, 2017; WHO, 2020). It is important that healthcare professionals, particularly in the primary care setting, understand aspects which can influence a person's decision to attend a cervical screening appointment. Screening has been proven to save lives, so increasing participation via education, support, and dissemination of current knowledge, should be a priority of primary care providers.

"The presence of cultural health beliefs, which can be influenced by knowledge and the perception of risk, has been shown to have a correlation with cervical screening engagement.

CONCLUSION

This literature review explored potential reasons why individuals do not attend a cervical screening appointment by reviewing current research. It was found that embarrassment and pain, a lack of knowledge, and a person's health beliefs can impact on their decision to attend a screening appointment. It demonstrates how multi-level factors influence behaviour, but that awareness of these factors can influence targeted interventions by primary care providers, including general practice nurses, with the aim of increasing cervical screening uptake. GPN

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Key points

- Cervical cancer is the fourth most common cancer in women globally and the 14th most common in the UK.
- The national cervical screening programme in the UK, if accessed, is proven to save lives via | early detection.
- Embarrassment and pain, a lack of knowledge and health beliefs women possess are known barriers which prohibit them from attending cervical screening appointments.
- Fear and uncertainty of what to expect during a cervical screening appointment is highlighted as a concern for those in the pre-screening age group.
- It is important that healthcare professionals in the primary care setting, where smear tests are predominantly performed, are aware of known barriers in order to encourage attendance to the national screening programme.

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Chronic kidney disease: detection and management for GPNs

Chronic kidney disease (CKD) is an ongoing decline of renal function which may progress quite rapidly or develop slowly over many years. Due to the nature of the disease, it is linked to cardiovascular disease (CVD) and a host of symptoms, comorbidities, high mortality and reduced quality of life. The majority of CKD patients will be identified in primary care. Once diagnosed, patients are likely to become increasingly frequent attenders within general practice. It is therefore useful to have an overview of the disease process and the multifaceted care needs of this specific patient group. General practice nurses (GPNs) are vital members of the multidisciplinary team (MDT) who are well-placed to identify, monitor and provide ongoing support for the CKD patient.

KEY WORDS:

- Chronic kidney disease
- Diagnosis
- High-risk patient groups
- Treatment options
- Referrals

Christine Catley

Renal research nurse, Broomfield Hospital, Mid and South Essex NHS Foundation Trust

FACTS AND FIGURES

The kidneys are a pair of fist-sized organs situated in the lower back. Each kidney contains approximately 1,000,000 filtering units known as 'nephrons'. Over the course of 24 hours, healthy kidneys filter approximately 180 litres of plasma to extract waste, toxins and excess water. This is all excreted via the production of approximately two litres of urine per day, which drains continually to the bladder via the ureters (Kriz and Elger, 2024). However, urine production is just one of the many roles of this multi-tasking organ. The kidney also secretes erythropoietin and regulates blood pressure, bone metabolism, acid-base balance, fluid control and electrolyte balance. Unfortunately, when the kidneys fail, so do all these vital processes leading to serious conditions such as renal anaemia, cardiovascular disease (CVD), mineral bone disorder, metabolic acidosis and hyperkalaemia, to name but a few (Bailey and Unwin, 2024).

The single most common cause of chronic kidney disease (CKD) in the UK is diabetes. In 2021, 31.3% of adults commencing renal replacement therapy, or 'RRT' (i.e. dialysis or kidney transplantation), had diabetes as the primary cause of renal failure. This was followed by glomerulonephritis as the primary cause at 13.3% (diseases which destroy the filtering process) (UK Renal Registry, 2023). Other primary causes were hypertension at 6.8%, pyelonephritis (kidney infection) at 4.9%, polycystic kidney disease (6.4%), and renal vascular disease (4.6%). Other causes, including nephrotoxic agents (e.g. non-steroidal anti-inflammatory drugs [NSAIDs], such as ibuprofen or diclofenac), structural renal tract impairment (e.g. malignancy or enlarged prostate) and recurrent urinary stones were 17.6% (UK Renal Registry, 2023). However, the actual cause of CKD can frequently be unknown (as was the case for 15.1% of patients starting RRT in 2021) (UK Renal Registry, 2023).

CKD describes kidneys which have lost their normal level of function for longer than 90 days (Kidney Disease Improving Global Outcomes [KDIGO] guidelines, 2013). It is a common, progressive and life-long illness which is categorised into five stages (*Figure 1*). CKD is incurable and can be difficult to spot in the early stages when the patient is often asymptomatic. In fact, symptoms may only present when two-thirds of the total kidney function has already been lost. Due to the various bodily processes controlled by the kidney, multiple health issues such as those mentioned above can gradually develop and worsen. The additional symptoms of uraemia, such as tiredness, headaches, itching, nausea, vomiting, oedema and loss of appetite can also develop if the patient develops CKD stage 5. In the absence of appropriate management, CKD is potentially life-threatening (KDIGO, 2013).

It is estimated that 3.5 million people in the UK have moderate-to-severe CKD, which is categorised as stages 3 to 5 (Kidney Care UK, 2023). During these mid- to latter-stages, patients are also likely to be living with comorbidities such as diabetes, hypertension and CVD, which will increase in severity as the renal function declines (UK Kidney Association, 2017).

CKD also carries a heavy financial burden. In 2023, the total cost of kidney disease to the UK economy was estimated at £7 billion. This includes £6.4 billion in direct costs to the NHS; approximately 3.2% of the £197 billion total NHS spending across the four nations. It also includes £372 million productivity loss for people living with kidney failure and the people who care for them, and £225 million in dialysis transport costs (Kidney Research UK, 2023).

TESTS TO DIAGNOSE CKD

Indicators of CKD may be identified through blood tests or urinalysis at any time. When interpreting the

Prognosis of CKD by GFR and albuminuria categories (KDIGO, 2013)				Persistent albuminuria categories: description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30mg/g <3mg/mmol	30–300mg/g 3–30mg/mmol	>300mg/g >30mg/mmol
GFR categories (ml/min/1.73m²) Description and range	G1	Normal or high	≥90			
	G2	Mildly decreased	60–89			
	G3a	Mildly to moderately decreased	45–59			
	G3b	Moderately to severely decreased	30–44			
	G4	Severely decreased	15–29			
	G5	Kidney failure	<15			

FIGURE 1.
Prognosis of CKD by GFR and albuminuria categories (adapted from KDIGO, 2013). Green = low risk; yellow = moderately increased risk; orange = high risk; pink = very high risk.

results of a urinalysis, it is important to remember that the presence of haematuria and/or proteinuria (urinary blood or protein) should not be assumed to solely indicate a urinary tract infection (UTI). This is especially true for a patient with hypertension or urinalysis results with an absence of urinary leucocytes and nitrites (it is therefore important that the reagent stick has indictors for these). Of course, the presence of a UTI should be excluded through the urine sample being sent to the lab for culture. Blood or protein could point to more serious conditions such as an intrinsic renal disease, e.g. glomerulonephritis (Carter et al, 2006).

To confirm CKD, the KDIGO guidelines (2013) recommend that the following two tests are performed on at least two separate occasions, separated by a minimum of 90 days. Either of the following must be present for more than three months for CKD to be diagnosed:

- A glomerular filtration rate (GFR) of less than 60
- An albumin/creatinine ratio (ACR) of more than 30mg/g, or other markers of kidney damage (see below).

The estimated glomerular filtration rate (eGFR)

This is calculated from a blood test and is an estimate of how well the blood is being filtered by the kidneys. The formula recommended by NICE (2021a) for use in clinical laboratories is the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) creatinine equation to estimate GFR in adults, using creatinine assays. CKD-EPI generally provides more accurate estimates of GFR, particularly in patients with higher levels of kidney function (i.e. eGFR >60ml/min/1.73 m^2).

An eGFR over 90ml/min/1.73m^2 of body surface area is considered normal unless there is other evidence of kidney disease (UK Kidney Association, 2017). CKD is indicated by a GFR of less than 60ml/min/1.73m^2 persisting for more than three months. This represents less than half the normal level of a healthy young adult. This calculation can be thought of as a percentage of normal kidney function. For example, a GFR of less than 60ml/min/1.73m^2 means that less than 60% of kidney function remains.

Creatinine measurement can alter due to various reasons. Therefore, the blood sample should be taken from a non-fasted patient who should not have eaten meat for 12 hours before the test. Blood should be processed within 12 hours of collection.

It should be noted that the GFR may be less reliable in certain situations (e.g. acute kidney injury [AKI] — previously known as 'acute renal failure'), pregnancy, oedematous states, large muscle mass, malnourished patients or amputees, and has not been well validated in certain ethnic groups (e.g. in people of Asian or African family origin). Also, to avoid AKI being classified as CKD, the serum creatinine should be looked at with caution in patients who have no previous blood results. An eGFR result of less than 60ml/min/1.73 m^2 should be confirmed in a person not previously tested by repeating the test within two weeks (NICE, 2021a).

Urine albumin/creatinine ratio (ACR)

Albuminuria describes an increase of albumin excreted within the urine. An increased ACR has been shown to be an independent risk factor associated with diabetes, CKD, CVD, hypertension, venous thromboembolism and all-cause mortality (Mahmoodi et al, 2009). Albumin is a protein present in large amounts in the blood. If the nephrons have been damaged (often seen in diabetes), albumin is able to leak from the blood into the urine and is detected through an ACR test (NHS, 2022a).

This just requires an early morning urine sample to be sent to the lab to calculate the urinary albumin concentration in relation to the dilution of creatinine. It is highly sensitive and detects urinary protein in early disease that could not otherwise be picked up by urinalysis (NICE, 2021a). The ACR provides an estimate of the amount of albumin excreted within 24 hours without the need for a 24-hour urine collection. Urinary excretion of abnormal quantities of albumin for more than three months, with or without a decrease in GFR, is diagnostic of CKD (KDIGO, 2013).

As mentioned above, there are other markers of CKD:

- Urine sediment abnormalities
- Electrolyte and other abnormalities due to tubular disorders
- Abnormalities detected by histology
- Structural abnormalities detected by imaging
- History of kidney transplantation.

The GFR and ACR allow the stage of CKD to be categorised and indicate the patient's risk of outcomes such as CKD progression, cardiovascular events and all-cause mortality. An increased ACR in combination with a decreased GFR multiplies the risk of adverse outcomes (NICE, 2021a).

CKD AND COMPLICATIONS

There are many complications which arise during the progression of CKD. A couple of examples which can occur fairly early on are renal anaemia and CKD-mineral and bone disorder (CKD-MBD).

Anaemia

Renal anaemia is an important and common complication of CKD, plus it is yet another symptom of CKD for the patient to cope with. Reduced circulating oxygen can lead to increased cardiac output, left ventricular hypertrophy, reduced cognition and concentration, reduced libido and reduced immune responsiveness. Severe renal anaemia is uncommon before CKD stage 3b, but it will start to increase in line with declining GFR (UK Kidney Association, 2017). However, anaemia is both potentially reversible and controllable with the correct treatment, which can reduce cardiovascular complications and improve quality of life.

NICE (2021a) recommends that adult CKD patients should be

investigated and have their anaemia managed if:

- Their haemoglobin (Hb) level falls to 110g/litre or less
- They develop symptoms attributable to anaemia (such as tiredness, shortness of breath, lethargy and palpitations).

The most common cause of anaemia in CKD is that of reduced erythropoietin production. As mentioned earlier, this is an important function of the kidney. Erythropoietin is a hormone which stimulates the production of red blood cells (erythropoiesis) within the bone marrow. This can be corrected through an injectable, man-made form of erythropoietin known as an ESA (erythropoietin-stimulating agent). Roxadustat is now an alternative to ESAs. It is a relatively new oral treatment and belongs to a class of drugs called hypoxia-inducible factor prolyl hydroxylase inhibitors (HIF-PHIs). Roxadustat works by mimicking the body's response to hypoxia, which stimulates erythropoiesis and increases red blood cell production (NICE, 2022). However, another issue for CKD patients is that of iron deficiency, which must be corrected before any ESA is administered.

Iron deficiency can be due to a combination of the poor dietary iron-absorption of CKD patients, multiple blood tests, low-grade gastrointestinal bleeding, or for those on dialysis, blood left in the dialysis circuit. Alternatively, the body's iron stores may be normal, but the supply from the stores is inadequate to sustain the demands of the bone marrow (Wish, 2006). Replacement iron is generally given intravenously rather than orally for patients with CKD. This is a controversial subject, but there is evidence of the haemoglobin response being greater with intravenous versus oral iron (O'Lone, 2019).

Blood transfusions are avoided due to a greater risk of complications, especially for patients who would potentially hope to be considered to receive a donor organ. This is to improve the patient's suitability and outcomes in kidney transplantation due to reduced human leukocyte antigen (HLA) sensitisation.

CKD-mineral and bone disorder (CKD-MBD)

CKD-MBD is a frequent complication in which the patient's bones can become thin and weak due to deteriorating renal function. Without treatment, the patient will experience bone pain and an increased risk of fractures. The kidneys play a central role in the homeostasis of calcium and phosphate through the processes of secretion and reabsorption of these ions in the nephrons. Effective absorption of calcium from the gut is also controlled by the kidneys' ability to convert vitamin D into its most active form (Dring and Hipkiss, 2015).

"Although CKD will remain stable in many patients, in a growing number it will progress towards end-stage renal failure (CKD stage 5). These patients are then faced with the decision of what happens next.

Low serum calcium levels trigger the release of parathyroid hormone (PTH) from the parathyroid glands, which prompts the bones to release their calcium to achieve homeostasis. Over time, the parathyroid glands will enlarge and excrete greater amounts of PTH than is actually required, causing even more calcium to be leeched from the bones. The serum calcium level is also dictated by the phosphate level. As serum phosphate rises, serum calcium decreases leading to an increase in PTH secretion and further calcium loss from the bones.

In addition to contributing to the weakening of the bones, elevated serum phosphate increases the already heavy burden of CVD in CKD. Raised phosphate levels lead to the deposit of calcium phosphate salts in valvular and vascular tissue. These deposits result in the calcification and stiffening of blood vessels. This greatly increases the patient's risk of suffering cardiovascular events (Lau et al, 2010).

Some CKD patients may find that a low-phosphate diet alone is sufficient, while others will be prescribed 'phosphate binder' medication. This is taken at mealtimes and prevents the absorption of phosphate in the gut. The patient may also be prescribed vitamin D medication in one of its various forms. In some cases, calcimimetic medication may be appropriate. This drug mimics calcium at the PTH receptor, which will then assume that the serum calcium level is normal and further PTH secretion will be reduced (Blaine et al, 2015).

CKD AT STAGE 5

Although CKD will remain stable in many patients, in a growing number it will progress towards end-stage renal failure (CKD stage 5) (Hashmi et al, 2023). These patients are then faced with the decision of what happens next. The renal multidisciplinary team (MDT) can provide support and information to the patient regarding the options of dialysis, transplantation or conservative management.

Dialysis

In 2021, just under 69,500 UK adults were on a form of kidney replacement treatment. That year, close to 7,700 people started dialysis. While an effective treatment, dialysis does not fully replace kidney function and does not cure the underlying disease. It may take place by one of two methods, namely haemodialysis or peritoneal dialysis (UK Renal Registry, 2023).

Haemodialysis (HD)

Toxins, waste products and excess fluid are removed from the patient generally three times a week via a haemodialysis machine in hospital over roughly four hours. Should the patient dialyse at home, this is likely to involve five sessions a week. During dialysis, the patient's blood undergoes a continuous cycle of being removed from the body,

passed through a filter and returned to the patient.

Access to the blood may be via a permacath sited in the upper chest or via an arterio-venous fistula (AVF). An AVF is the surgical connection of an artery to a vein and is generally in the patient's arm. Blood from the artery then travels directly into that vein, causing it to become bigger and firmer. In some cases, an artificial tube is grafted to make the connection between artery and vein. Over time, it will be possible to put two dialysis needles into the enlarged vein or graft. This allows blood to be removed from the body through one needle, passed through the HD machine and returned to the patient via the second needle.

Peritoneal dialysis (PD)

PD uses the body's own potential peritoneal cavity and peritoneal membrane as an internal dialysis system. Patients dialyse at home (under the care of specialist renal nurses) by instilling clean dialysis fluid (dialysate) into this cavity via a specialist abdominal catheter. Over a set period of time, toxins, waste products and excess fluid move from the patient's blood into the dialysate via osmosis, diffusion and convection. When the prescribed time period has elapsed, the now waste-filled dialysate is drained away and replaced with fresh dialysate. This fluid 'exchange' process can either be performed manually (continuous ambulatory peritoneal dialysis, 'CAPD') or by machine (automated peritoneal dialysis, 'APD').

Revalidation Alert

Having read this article, reflect on:

- Your knowledge of tests to diagnose chronic kidney disease (CKD)
- Your inderstanding of who should be tested for CKD
- When a patient should be referred for specialist input
- The lifestyle advice you provide to patients with CKD.

Then, upload the article to the free GPN revalidation e-portfolio as evidence of your continued learning: www.journalofpracticenursing.co.uk/revalidation

Transplantation

This is the donation of a healthy kidney from either a living or deceased donor to another person with little or no kidney function. Bearing in mind the serious comorbidities associated with CKD, not all patients will be healthy enough to undergo transplant surgery. Around one in three people with kidney failure is suitable for a transplant. Transplantation may occur before the need for dialysis has arrived or after the point where dialysis is established. Powerful anti-rejection medication must be taken for life to prevent the kidney being rejected by the recipient's immune system (NHS, 2022b).

Conservative management

Conservative medical management focuses on providing kidney supportive care to promote quality of life without pursuing dialysis or transplantation. Treatment relies on the patient following dietary and medication controls as an outpatient. The aim is to preserve renal function, manage symptoms and enhance quality of life for as long as possible, but the overall decline cannot be stopped. Conservative management is best delivered through a multidisciplinary collaboration between the patient, family and primary, secondary and tertiary services (Schell et al, 2023).

In the author's clinical experience, some patients may feel that dialysis is too heavy a burden in light of their age, frailty, or comorbidities and will choose to have their symptoms managed in this way. Also, in some cases, initiating dialysis would not necessarily lead to any longer survival.

WHO SHOULD BE TESTED FOR CKD?

To identify CKD at the earliest opportunity, NICE (2021a) recommends that patients in the following high-risk groups should have their GFR and ACR screened. (*Figure 2*):

- Diabetes — the largest cause of CKD and GFR testing at least annually is recommended. This would need to be increased if the patient's CKD shows progression. Good glycaemic control is essential
- Hypertension — patients may be unaware of the link between CKD and high blood pressure and home blood pressure monitoring is useful. ACE inhibitors (ACEis) or angiotensin receptor blockers (ARBs) are often the initial antihypertensive drugs of choice:
  - For those diagnosed with CKD, aim to keep the systolic blood pressure below 140mmHg (target range 120–139mmHg) and the diastolic blood pressure below 90mmHg. For patients with CKD and diabetes, and those with an ACR of 70mg/mmol or more, aim to keep the systolic blood pressure below 130mmHg (target range 120–129mmHg) and the diastolic blood pressure below 80mmHg
  - Salt restriction and guidance on healthy diet and smoking cessation would be appropriate
- Patients who have experienced AKI
- CVD (ischaemic heart disease, chronic heart failure, peripheral vascular disease or cerebral vascular disease)
- Structural renal tract disease, recurrent renal calculi or prostatic hypertrophy
- Multisystem diseases with potential kidney involvement, e.g. systemic lupus
- Family history of end-stage kidney disease (CKD stage 5) or hereditary kidney disease, e.g. polycystic kidney disease
- Opportunistic detection of haematuria or proteinuria (as above, protein in the urine must not be assumed to relate only to a UTI)
- Patients on certain medications:
  - NICE (2021a) also recommended that the GFR should be checked at

least annually in people prescribed drugs known to be nephrotoxic, such as calcineurin inhibitors (for example, cyclosporin or tacrolimus), lithium and long-term doses of non-steroidal anti-inflammatory drugs
- Metformin should be avoided in CKD stages G4 and G5 (UKKA, 2017)
- Should the patient have albuminuria and is started on an ACEi or ARB, it is important to check that their potassium level is in range before, and two weeks after, to assess for any worsening renal function.

Depending upon the results of these tests, the GP may decide to offer a patient with lower urinary tract symptoms further treatment, including a renal ultrasound.

WHO SHOULD BE REFERRED TO A NEPHROLOGIST?

Most CKD patients can be managed effectively within the community. NICE guidelines (2021a) recommend early referral of certain patients to nephrologists to preserve residual renal function and slow disease progression.

Those in the following groups definitely require specialist assessment but will benefit greatly from ongoing support from general practice nurses (GPNs) and a shared-care approach:

- A symptomatic patient with a GFR less than 30ml/min/1.73 m^2, with or without diabetes. This would not include those patients receiving end-of-life care
- ACR 70mg/mmol or more, unless known to be caused by diabetes and already appropriately treated
- ACR 30mg/mmol or more (ACR category A3), together with haematuria (a possibility of glomerulonephritis)
- A sustained decrease in GFR of 25% or more, and a change in GFR category or sustained decrease in GFR of 15ml/min/1.73 m^2 or more within 12 months. NICE (2021a) recommended that a minimum of three GFR estimations should be obtained over a period of not less than 90 days to establish this. If the patient has a low baseline GFR, repeat the GFR within two weeks to exclude causes of acute deterioration of renal function, e.g. AKI or recently commencing on anti-hypertensives, such as ACEis, ARBs or a direct renin inhibitor
- Patients with hypertension that remain poorly controlled despite the use of at least four antihypertensive drugs at therapeutic doses
- Known or suspected rare or genetic causes of CKD
- Suspected renal artery stenosis (NICE, 2021a).

Glomerular filtration rate (GFR) (ml/min/1.73cm²), description and stage of CKD	Albumin/creatinine ratio (ACR) results & description		
	<3mg/mmol <30mg/g (Normal/ mildly raised)	3–30mg/mmol 30–300mg/g (Moderately increased)	>30mg/mmol >300mg/g (Severely increased)
GFR ≥90 (Normal/high) CKD stage1	≤1	1	≥1
GFR 60–89 (Mild reduction) CKD stage 2	≤1	1	≥1
GFR 45–59 (Mild/moderate reduction) CKD stage 3a	1	1	2
GFR 30-44 (Moderate/severe reduction) CKD stage 3b	≤2	2	≥2
GFR 15–29 (Severe reduction) CKD stage 4	2	2	3
GFR <15 (Kidney failure) CKD stage 5	4	≥4	≥4

FIGURE 2.
The recommended number of times per year that the GFR should be checked for every CKD patient and also for those at risk of developing CKD. Based upon GFR and ACR results (adapted from NICE, 2021a).

Healthcare professionals can use the Kidney Failure Risk Equation (KFRE) which uses the age, sex, ACR and GFR of patients with CKD stage 3a to 5 to predict the risk of them needing either dialysis or a kidney transplant within the next two and five years (Major et al, 2020). This is a valuable tool for primary care colleagues to plan treatment and guide referrals to secondary care. Please visit: https://kidneyfailurerisk.com/

It is crucial for nephrologists to investigate and diagnose the cause of CKD in patients referred to them. Specific treatments are often tailored based on the underlying condition contributing to CKD. In addition to addressing the specific cause, nephrologists commonly recommend treatments aimed at slowing the progression of CKD. These may include:

- The use of ACE inhibitors and ARBs which have been shown to slow the progression of CKD
- The removal and avoidance of nephrotoxic medications
- Increasingly, the use of sodium-glucose cotransporter-2 inhibitors (SGLT2 inhibitors). These are oral treatments used in patients with and without diabetes to slow the progression of CKD. SGLT2 inhibitors have shown efficacy in reducing the risk of kidney failure and cardiovascular events in patients with CKD (NICE, 2021b).

Moreover, NICE now also recommends a new treatment for diabetic nephropathy called Finerenone, a selective mineralocorticoid receptor antagonist. Finerenone is recommended as an

Patient perspective: update

My previous perspective written in 2016 ended with a message of hope linked to advances in medication and the development of research programmes (Catley, 2016: 49). In recent times, I have become part of a research study related to vitamin D medications based on a perception that basic vitamin D doses may be just as effective in the protection of bones as more advanced ones such as 'Fultium D'. Latterly, I have also signed up to a nationwide programme aimed at liver function in relation to CKD. Both of these have provided me with relevant information to enhance my first-hand knowledge of my condition.

I have come to understand that in matters relating to CKD5 knowledge is indeed power, as it helps the individual to take control of their treatment and by listening to their body recognise changes which can be addressed through the renal nursing staff and allocated consultant. Essentially, it becomes a 'team' relationship and a source of both comfort and strength to cope, because the path I have chosen, haemodialysis (HD) via an arterio-venous fistula (AVF) is not without its tribulations.

Historically, my year of severe change took place in 2019 when my spring consultation revealed a marked deterioration in my kidney efficiency, entering a direction towards just 10% heralding CKD stage 5. As my consultant quaintly put it, 'CKD5 is commonly referred to as – end of life'.

I can remember saying, 'and the good news is?' to which he commenced an introduction to my choice list. While I was considered an ideal candidate for a kidney transplant, my private life had been dealt a double blow with the death of my twin brother on 23rd February as a result of complications with his polycystic kidney disease (PKD) and the sudden and totally unexpected death of my wife on 8th March. This left me on the one hand extremely anxious regarding a transplant, and on the other, very much aware of my single status which would require nursing care for many months while the transplant took shape. In the circumstances, I chose the dialysis route and started my referral to the renal unit at Chelmsford's Broomfield Hospital.

As mentioned in my earlier perspective, I took part in a worldwide ADPKD research study between October 2013 and September 2014 at the Helen Rollason Research Centre at Broomfield Hospital. This proved invaluable as their medical staff are all related directly to the renal unit in Chelmsford, so I was already comfortable with them. What followed was a combination of explanatory literature and multiple tests to establish my suitability for the proposed treatment. At this stage I was fairly relaxed about the pre-dialysis programme and accepted that I was to undergo a local anaesthetic operation to secure a fistula in my lower arm just above my wrist. That operation took place in the third quarter of 2019 but it failed. This did not unduly worry me, as I had been warned that the chances of success in that part of the body often failed. In truth, I knew the moment the operation ended that it had not worked as the fistula had no 'thrill'. I was then referred to another surgeon who entered just below the elbow in early January 2020 and it was an immediate success with an extremely strong 'thrill', which thankfully remains to this day. So, it seemed happy days were in order and I got myself ready to start the treatment.

In March 2020 the pandemic was in full swing and along with the rest of those classified as extremely clinically vulnerable (ECV) I was absolutely terrified. Not only were we totally isolated in our homes, but in my case, I was due to start a treatment which was totally alien to me in a unit closely situated to the A&E at Broomfield Hospital treating rapacious Covid infections with very little protective clothing available and no antibody medication in sight.

This was the background to the start of my dialysis treatment, initially set for three times a week via a haemodialysis machine over a four-hour period. This was really all that I knew and nothing can properly prepare you for those initial treatments. Because the renal unit is off limits for anyone who is not physically receiving treatment, the first experience is that of arriving in a unit comprising 20 beds in three bays and an additional three beds in separate 'isolation' bays, utilised in the event of individual risk of infection, e.g. Covid positive. Each bed is situated next to a dialysis machine operated by clinically trained nursing staff who are allocated to at least three individual patients per session. There are three sessions every day, morning, afternoon and twilight for six days every week excluding Sunday. In the case of Chelmsford, this equates to an average 360 sessions per week. Privacy is a luxury only afforded to those in 'isolation', but you soon get used to sharing the accommodation with your fellow dialysis guests.

There is little time to become acquainted with anyone apart from your nursing staff in the early days and their dedicated training is the key to getting you through the initial trauma. The enduring memory I have of those early days is the care and professionalism of the senior nurse, who I later named my 'fistula queen'. She administered my first injections, which comprised two needle insertions into the fistula which through the passage of time becomes both bigger and firmer, hence the Latin definition of a fistula meaning 'pipe'. By virtue of my fistula only having been created four months before my first session, it was described by my nurse as 'young', which can be literally translated as 'extremely tender' and required two applications of pain killer to alleviate the trauma associated with each of the needles as they were applied. Basically, a local anaesthetic spray was applied just before the needle insertion to compliment a numbing cream (EMLA), which had to be applied to your upper arm in your home one hour before each treatment and held in place by cling film.

I do not propose to make light of this baptism of fire because that is the best description I can give. It is a rite of passage each patient must undergo and is often accompanied by fainting and the application of oxygen to restore blood pressure to acceptable levels. If it is any comfort to you as reader of this, my darling wife used to say that I had a very low threshold of pain and this proved to be correct. Having said that, I came through the initial ordeal with the support and care of the nursing staff who, in the four years I have been on dialysis, have never exhibited any uncalled for emotion when tackling the daily challenges they face, dealing with each situation calmly and with recourse to their specialist training. I defy anyone to apply those needles with the gentle precision that they do, again and again.

My 'fistula queen' repeatedly assured me that in the midst of each of those early sessions that it would get better and she proved to be right, so much so that I now receive the needles without the administration of any pain killers. The fistula is strong and I regularly receive checks by a hospital consultant to monitor it and this is backed up by similar checks in the renal unit itself.

All of us are encouraged to take control of our individual sessions by performing a routine which starts with the weighing machine to compare your current weight against your allocated dry weight level (in my case 84.2kg), and this is used to devise how much needs to be taken off by deducting it by your dry weight plus 0.5kg. For example, my weight for my most recent session was 87.00 less 84.2 plus 0.5=3.3kg to be removed. This reading is entered in the machine together with the time allocated by the renal unit, which in my case is 4½ hours, twice in every week on Tuesday and Friday afternoons. You can also test your blood pressure (BP) and pulse from the equipment attached to your dialysis machine and this is entered onto your file chart for that session. The BP reading dictates if you can complete your session without further readings or, subject to the judgement of your renal nurse, the apparatus remains strapped to the arm opposite your fistula for readings every 30 minutes. While this occurred frequently in my early days, it is unusual at the present time.

During your treatment the arm with the needles in it remains completely still and rests on a pillow on the arm of the bed. Your other arm and hand is free to move to allow you to read, drink the tea provided with biscuits part way through, and to adjust the comfort levels on the bed, and be available to activate the alarm button attached to the bed arm. The length of the session may seem interminable to the uninitiated but, in practice, most of us learn to sleep for much of the time and in my case it is not unusual (apologies to Tom Jones) to sleep for the majority of the time. At the end of the session the needles are individually removed to allow you to apply pressure with gauze and plaster to the puncture points until they can be safely strapped without bleeding and then you conduct a final BP 'standing' reading and closing weight before leaving the unit.

I must be realistic when assessing my future treatment and I am currently enjoying just two sessions each week with an extended time of 4½ hours for each visit. I have come to accept that Tuesday and Friday involve up to eight hours away from home but the positive is that I can enjoy my weekends and travel on short escapes in the countryside. I can also drive and exercise by walking every day, but the gradual deterioration dictated by CKD will eventually place me on three-day a week sessions. In the meantime, I maintain a rapport with my consultant who fully appreciates our mutual aim to stave off the move to three times a week. Much depends on my level of water release/retention which I monitor very carefully.

I treat each day as a living gift to be savoured and in this context my 'fistula queen' is firmly of the view that a positive mental attitude goes a long way to keeping the CKD condition in check. In tandem, the care and support provided by my renal nurses imparts a sense of wellbeing. My advice is to constantly listen to your body and to cultivate a partnership with your renal consultant who, in my case, never ceases to amaze me.

January, 2024

John Gardiner receives haemodialysis under the care of the renal team at Broomfield Hospital, Mid and South Essex NHS Foundation Trust

option for treating stage 3 and 4 CKD (with albuminuria) associated with type 2 diabetes in adults. This recommendation is based on evidence showing its effectiveness in slowing the progression of diabetic nephropathy (NICE, 2023).

FREQUENCY OF REVIEWS

Once a baseline GFR and ACR have been established, NICE then provides further guidance as to the frequency of reviews for CKD patients (*Figure 2*).

"CKD has an impact not only on every system of the body, but also the individual's quality of life.

These reviews offer the chance to assess and manage the patient's CKD and CV risks. During these reviews, GPNs can detect early CKD and monitor the progression of established renal disease. Basic monitoring should include:

- Blood tests for renal function (serum creatinine, urea, sodium and potassium), GFR, full blood count (FBC), cholesterol and glucose
- Urine test for ACR
- Assess for symptoms of CKD, e.g. oedema, anaemia
- Blood pressure and weight. Both reduced eGFR and albuminuria are markers of cardiovascular risk which should be documented. However, the most important aspect of management is blood pressure control

- Medication review to check for nephrotoxic drugs such as the long-term use of NSAIDs. Always ensure that the patient is prescribed the correct renal dose in line with the eGFR for all new and existing medications
- Advice can also be offered regarding diet, lifestyle, alcohol intake and smoking cessation.

CONCLUSION

CKD has an impact not only on every system of the body, but also the individual's quality of life. The complications of renal disease lead to greater morbidity, mortality and financial cost. Early detection of CKD in high-risk groups is key, potentially reducing the risk of complications and even delaying progression by following a controlled plan of management and interventions. GPNs are experienced members of the MDT with the skills required to identify, manage and support this patient group. Factors linked to the progression of CKD are frequently the same as those of CVD. By continuing to target the modifiable risk factors in both groups, GPNs will not only be instrumental in reducing CVD in patients with CKD, but will also slow or potentially prevent renal disease reaching stage 5. GPN

The data reported here has been supplied by the UK Renal Registry (UKRR) of the UK Kidney Association. The interpretation and reporting of these data are the responsibility of the author and should not be seen as an official policy or interpretation of the UKRR or the UK Kidney Association.

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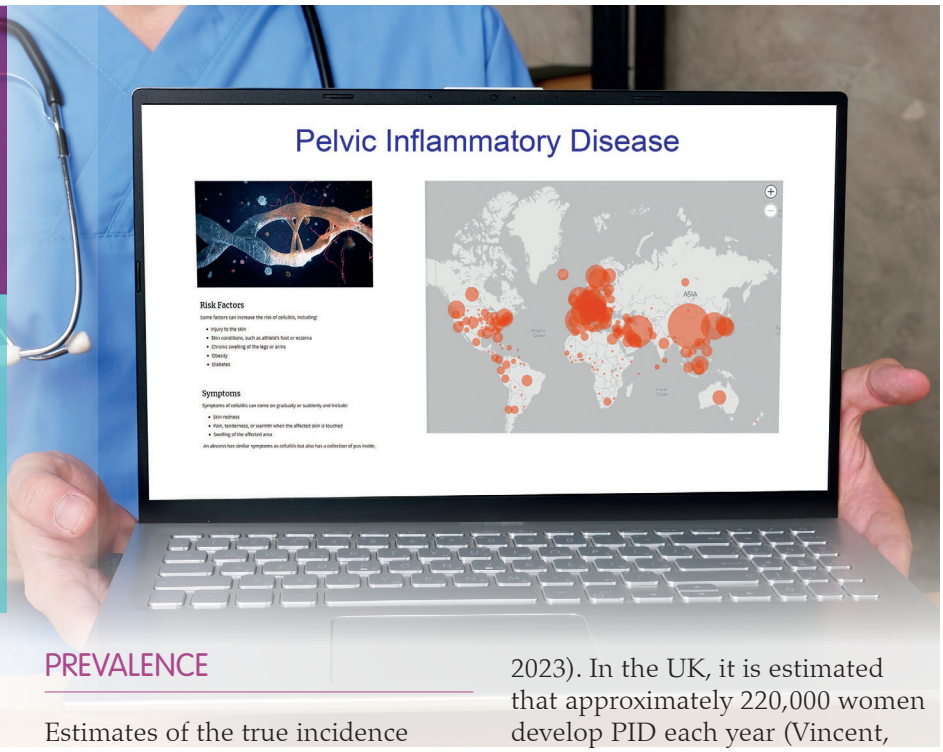
Pelvic inflammatory disease: an overview

Pelvic inflammatory disease (PID) is a common condition, occurring around the world and in varying degrees of severity. Diagnosis and treatment place a burden on health services and economies on a global scale. The disease, if left untreated, can lead to several complications, some of which can have long-lasting effects and a huge impact on the woman's health and quality of life. This article gives an overview of signs and symptoms, treatment and complications, with a view to helping nurses and non-medical prescribers make an impact on outcomes for women affected by this unpleasant disease.

KEY WORDS:

- Pelvic inflammatory disease
- Signs and symptoms
- Diagnosis
- Management
- Complications

Margaret Perry
Locum advanced nurse practitioner



Photograph: Yuriy K/Shutterstock

Pelvic inflammatory disease (PID) is defined as an inflammation of the upper genital tract due to an infection in women, affecting the uterus, fallopian tubes, and/or ovaries (Jennings and Krywko, 2023). It is reported to be a common condition, affecting women around the world. Signs and symptoms can have variable degrees of severity, ranging from mild to more severe, or in some women the disease can be asymptomatic. It is most common in young women. If treatment is delayed for any reason, complications can occur. Some of these can be long term and have an impact on the women's health and wellbeing and be particularly distressing for the woman affected. This article gives nurses and non-medical prescribers more confidence in recognising and treating this unpleasant disease with the view to preventing complications and improving quality of life.

PREVALENCE

Estimates of the true incidence of PID are difficult to determine accurately as subclinical disease is not always identified and the diagnosis may be missed (Dayan, 2006). However, current statistics indicate that globally the prevalence of PID has increased over the past three decades and as a result the disease has placed an increased substantial burden on health economies worldwide over this period (He et al, 2023).

Data extracted from the global burden of disease study 2019 found that the highest rates of PID per 100,000 population for reproductive-aged women were observed in Western and Central Sub-Saharan Africa and Australasia, while the lowest rates were observed in Southeast Asia, Western Europe, and East Asia (He et al, 2023). In the UK, it is estimated that approximately 220,000 women develop PID each year (Vincent, 2023). It is most common in women aged between 15 and 24 years and is thought to affect between 4% and 12% of women in this age group at some time during these years (Vincent, 2023).

Red Flags

- Prevalence of PID has increased over the past three decades
- In the UK it is estimated that approximately 220,000 women develop PID each year
- It is most common in women aged between 15 and 24 years
- The disease places a substantial burden on health services and economies on a global scale.

PATHOPHYSIOLOGY

Most cases of PID occur in two stages. The first being acquisition of a vaginal or cervical infection, the second involving direct ascent of microorganisms upwards towards the upper genital tract, causing infection and inflammation of these structures (Tough De Sapri, 2021). The exact mechanism by which microorganisms ascend from the lower genital tract remains poorly understood. Once the infection has spread, the patient develops salpingitis (infection of the fallopian tubes), endometritis (inflammation of the endometrium), which tend to occur together (Goje, 2023). Alongside these processes, there is oophoritis (inflammation of an ovary), parametritis (infection of the connective tissue which is adjacent to the uterus), and in some cases, a tubo-ovarian abscess and/or pelvic peritonitis may also develop (GP Notebook, 2021).

CAUSES

PID is almost always a sexually transmitted infection (STI) (National Institute for Health and Care Excellence [NICE], 2023). The most common causative organisms are (British Association for Sexual Health and HIV [BASHH], 2019):

- *Chlamydia trachomatis* accounting for 4–35% of cases and *Neisseria gonorrhoeae* accounting for 2–3% of cases
- *Mycoplasma genitalium* has been found to be associated with infection of the upper genital tract in women and is reported to also be a common cause of PID
- Organisms which are normally found in the vaginal flora (such as anaerobes, *Gardnerella vaginalis*, haemophilus influenza, and gram-negative rods, and *Streptococcus agalactiae*) have also been implicated
- In older women with PID, *N. gonorrhoeae* and *C. trachomatis* are less likely causative organisms.

PATHOGEN NEGATIVE PID

There are some instances when PID has not been caused by a STI. The vagina normally has harmless bacteria, which do not usually cause problems and are not transmitted to sexual partners. However, there are circumstances which may lead to the development of PID, often after insertion of an intrauterine contraceptive device (IUD) or having a baby (McKechnie, 2023).

RISK FACTORS

These are generally factors associated with the individual's sexual behaviour and include (NICE, 2023):

- Early age of first sexual intercourse
- Recent new partner (within the last three months)
- Multiple sexual partners
- Young age (below 25 years of age)
- History of previous STI in the woman or her partner.

Other risk factors relate to an interruption of the normal cervical barrier or defence mechanism (*Table 1*).

SIGNS AND SYMPTOMS

Signs and symptoms can be variable, ranging to relatively mild with a gradual onset (or in some cases no symptoms at all), or more severe, developing quite quickly over the course of a few days. Women with mild or no symptoms may be at risk of the infection progressing before it is diagnosed and treated. PID due to *N. gonorrhoeae* is usually more acute and causes more severe symptoms than that due to *C. trachomatis*, which can be indolent (Goje, 2023). PID due to *M. genitalium* infection, like that due to *C. trachomatis*, is also mild (Goje, 2023).

Lower abdominal pain in the pelvic area is the most common symptom (Vincent, 2023). Women may also experience painful intercourse, low back pain, fever, chills, nausea or vomiting and painful urination (Gersch, 2020). There may be an abnormal vaginal discharge, yellow or green in colour, which may have an unpleasant odour (Gersch, 2020). Abnormal vaginal bleeding occurs in one in four cases (Vincent, 2023) and this may take the form of irregular menstrual periods, or longer lasting periods, spotting, and cramps occurring throughout the month (Gersch, 2020).

Table 1: Additional risk factors for PID (BASHH, 2019)

■ Recent termination of pregnancy
■ Insertion of an intrauterine device (IUD) within the past 4–6 weeks, especially in women with preexisting chlamydia or gonorrhoea infection
■ Hysterosalpingography (X-ray examination of the uterus and fallopian tubes)
■ Recent *in vitro* fertilisation and intrauterine insemination

DIAGNOSIS

There is no single test to confirm the diagnosis of PID, therefore a high index of suspicion, and a thorough history and examination are needed to help clinicians make a diagnosis. NICE guidance advises that diagnosis and initiation of treatment should not be delayed while waiting for results of laboratory tests and negative test results do not rule out a diagnosis of PID (NICE, 2023).

History

Information relating to pain, vaginal discharge, dysmenorrhoea, and any abnormal vaginal bleeding should be explored.

Examination

The woman may have a fever and mild tachycardia. There is likely to be bilateral lower abdominal tenderness, rebound tenderness and guarding may be elicited. If there is right upper quadrant tenderness, Fitz-Hugh-Curtis syndrome should be suspected (Kochar, 2015). This is a rare

Red Flags

- PID is usually associated with a sexually transmitted infection
- *Chlamydia trachomatis* accounts for 4–35% of cases and *Neisseria gonorrhoeae* for 2–3 % of cases in younger women
- *C. trachomatis* and *N. gonorrhoeae* are less common causes in older women
- Pathogen negative PID is also possible as a result of other causes (e.g. insertion of IUD).

complication of PID involving liver capsule inflammation leading to the creation of adhesions (GP Notebook, 2018). Vaginal examination may reveal cervical or vaginal mucopurulent discharge (NICE, 2023).

Investigations

These should include (Tidy, 2021):

- Cervical swabs for chlamydia and gonorrhoea — a positive result supports the diagnosis of PID, but if negative the disease cannot be excluded
- High vaginal swabs (HVS) to exclude other infections such as candida, trichomoniasis and bacterial vaginosis (BV)
- Blood tests, including erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), full blood count (FBC) and liver function tests (LFTs). These tests are all non-specific but raised ESR, CRP and leucocytes are suggestive of PID. Abnormal LFTs may be found in acute cases or may suggest Fitz-Hugh-Curtis syndrome
- A pregnancy test should also be offered to all fertile women to exclude the possibility of ectopic pregnancy.

Other investigations are shown in *Table 2*.

DIFFERENTIAL DIAGNOSIS

Absence of some of the typical symptoms when evaluating women should alert clinicians to the possibility of an alternative cause, as outlined below (Curry et al, 2019).

Endometriosis

The patient may complain of having dull cramping pelvic pain, often having persisted for several months and additional symptoms of dysmenorrhoea and intermenstrual bleeding, and may also cause painful intercourse

Endometritis

This can be acute or chronic. In the acute form, there is pelvic pain, fever, and vaginal discharge. Chronic is associated with spotting, pelvic pain and leukorrhea.

Appendicitis

Vomiting, anorexia, fever, and pain in the right iliac fossa can occur.

> **Absence of some of the typical symptoms when evaluating women should alert clinicians to the possibility of an alternative cause.**

Ovarian cysts

These can be asymptomatic but may also present with pain during menstruation, dyschezia (problems passing stools), dysuria and dyspareunia (painful intercourse).

Ovarian cyst, rupture, or torsion

There is acute onset of severe unilateral pain.

Ectopic pregnancy

Missed periods and positive pregnancy test with unilateral pelvic pain are symptoms.

Tubo-ovarian abscess

This presents with fever, pelvic mass on examination, and unilateral pelvic pain.

Table 2: Additional investigations for PID (Tidy, 2021; NICE, 2023)

Investigation	Additional information
Urinalysis	To exclude urinary tract infection (UTI)
Ultrasound scan	This is of limited value in uncomplicated PID but may be useful to exclude other conditions such as an abscess. Doppler ultrasound can be useful in detecting increased blood flow associated with PID, but cannot differentiate between PID and other causes of increased vascularity such as endometriosis
Magnetic resonance imaging (MRI) or computed tomography (CT) scanning	These are not routinely used but may be useful in differentiating PID from other conditions
Laparoscopy	Offers direct visualisation of the fallopian tubes, but is not used routinely because of the invasive nature of the procedure

Red Flags

- Symptoms vary in severity and can be mild or severe
- PID due to *N. gonorrhoeae* is usually more acute and causes more severe symptoms than that due to *C. trachomatis*
- There is no single test to confirm the diagnosis
- Treatment should not be delayed while awaiting results.

Ureteral calculus

Patients will experience fever, nausea and vomiting, dysuria, nocturia and haematuria, with abdominal, pelvic or flank pain.

Urinary tract infection (UTI)

Frequency, dysuria, haematuria and nocturia, with mid or bilateral pelvic pain can occur.

TREATMENT AND MANAGEMENT

There may be some cases where admission to hospital is necessary, or alternatively specialist advice may be needed. Advice for clinicians is shown in *Table 3*. Inpatient treatment is with intravenous (IV) antibiotics, which are usually continued for 48 hours until improvement is seen and then the patient is switched to oral antibiotics. Clinicians can refer to the BASHH guidelines for further information on antibiotic regimens given in secondary care (BASHH, 2019).

If admission to hospital is not needed, treatment should not be delayed until results are received as this increases the risk of developing long-term complications (see below). Patients are prescribed a combination of antibiotics (*Table 4*) to ensure adequate coverage for the organisms identified.

CONTACT TRACING

This is an important part of the management of PID if spread of the disease is to be avoided. Abstinence from any unprotected intercourse

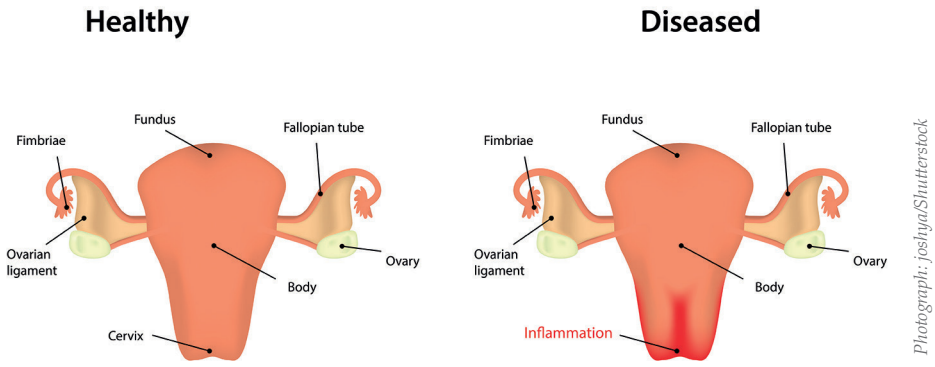
is advisable until the patient and their partner have completed the recommended course of treatment. Ideally, screening for other STIs should be undertaken and preferably at a genitourinary medicine (GUM) clinic. Sexual partners should be treated for chlamydial infection (even if test results are negative) and all sexual partners within the previous six months, or the most recent partners if there have been no other sexual contacts within the last six months should be notified and offered screening (Tidy, 2021). If the sexual partner is unwilling or unable to attend a specialist clinic, they should be prescribed a broad-spectrum antibiotic (e.g. doxycycline 100mg twice daily for one week) (BASHH, 2019).

COMPLICATIONS

A delay in diagnosis and treatment is associated with poorer outcomes and increases the risk of complications, some of which may be long term. Long-term complications are less likely to develop if treatment is started within two to three days of onset of symptoms, although this may not always be possible (Vincent, 2023). Women who have repeated bouts of PID or severe episodes are at greater risk of problems and there are several possible options, as follows.

Tubal infertility

Infertility can occur as a result of damage to the fallopian tubes and loss of the ciliary epithelial cells and occlusion of the tube (Jennings and Krywko, 2023). With each repeated episode of PID, the risk of permanent tubal damage and infertility increases four- to six-fold; from 8% after one episode, to nearly 20% after two episodes, and 40% after three or more episodes (Dayan, 2006).



Photograph: joshya/Shutterstock

Figure 1.
Pelvic inflammatory disease.

Statistics suggest that infertility in women with a history of PID is more likely to occur if:

- Chlamydia is the infectious cause
- There has been a delay in treatment
- The patient has had recurrent or severe episodes

(Jennings and Krywko, 2023).

Ectopic pregnancy

The increased risk for ectopic pregnancy following PID is also related to damage to the fallopian tubes. The rate of ectopic pregnancy following PID is estimated to be approximately 7.8%, while the ectopic rate in the absence of PID is 1.3% (Jennings and Krywko, 2023).

Preterm labour

As well as increasing the risk of ectopic pregnancy, Huang et al (2019) reported a higher risk of preterm labour among women with PID.

Chronic pelvic pain

An estimated 25% of women may develop chronic pain (Jennings and Krywko, 2023). The pain is thought to be related to inflammation, scarring, and adhesions from the infectious process. Recurrent PID is regarded as the strongest predictor of the risk of developing chronic pelvic pain related to PID (Jennings and Krywko, 2023).

Tubo-ovarian abscess

Tubo-ovarian abscess is a complex and severe complication found in 15–34% of patients with PID (Brunham et al, 2015). Several risk factors for the development of tubo-ovarian abscess in patients with PID have been identified, and these are similar to those for PID and include young age, multiple sexual partners, sexually transmitted infections, such as chlamydia and gonorrhoea infections, uterine instrumentation, interruption of the cervical barrier, hysterosalpingography, hysteroscopy, and *in vitro* fertilisation (IVF) (Kairys and Roepke, 2023).

Fitz-Hugh-Curtis syndrome

This is a very rare complication and is characterised by right upper quadrant pain and is more common in women with PID caused by chlamydial infection (NICE, 2023).

Ovarian cancer

There has been interest in the possibility of an increased risk of ovarian cancer in women with a history of PID. Zhou et al (2017) reported a positive association between the two conditions with a more pronounced occurrence among Asian women. Rasmussen et al (2017) concluded that there is an increased risk of borderline ovarian tumours, particularly among women who have had multiple episodes of

Table 3: Indications for hospital admission or seeking specialist advice (NICE, 2023)

Indications for hospital admission	Indications for seeking specialist advice
Diagnosis is unclear	The woman is human immunodeficiency virus (HIV) positive
The woman is very unwell and there is concern she may have a complication such as peritonitis or a tubo-ovarian abscess	There is an IUD *in situ* and actinomyces-like organisms have been reported on cervical cytology results (liaise with microbiology and gynaecology teams to discuss management and the need for further investigations)
The woman is currently pregnant or ectopic pregnancy is suspected	There is uncertainty about clinical management. Can discuss with genitourinary medicine (GUM) clinic if there is doubt as to whether admission is needed or not

Table 4: Antibiotic treatment of PID (BASHH, 2019)

Information	Medications
Prescribed if the risk of gonococcal infection is high Metronidazole is included to improve coverage for anaerobic bacteria	IM ceftriaxone 500mg (single dose) followed by oral doxycycline 100mg twice daily plus metronidazole 400mg twice daily for 14 days
First line if the risk of gonorrhoea is low	IM ceftriaxone 500mg (single dose) followed by oral doxycycline 100mg twice daily plus metronidazole 400mg twice daily for 14 days
Second line if the risk of gonorrhoea is low	Oral ofloxacin 40mg twice daily plus oral metronidazole 400mg twice daily for 14 days Or: Levofloxacin 500mg once daily plus oral metronidazole twice daily for 14 days Or: Oral moxifloxacin 400mg once daily for 14 days

PID, although they suggested that the link remains uncertain and requires further investigation.

PREVENTING PID

The use of condoms may reduce the risk of spread of STIs. The chlamydia screening programme offers opportunistic screening to young women with the aim of reducing reinfection and transmission and raising awareness of good sexual health practices (UK Health Security Agency, 2023), with the hope that these measures will impact on incidence of PID.

CONCLUSION

PID is a common condition affecting women around the world. Signs and symptoms vary widely in their severity, ranging from mild to severe and in some cases may be asymptomatic. If untreated or poorly treated, the problem can result in complications, some of which are potentially serious with long-term effects. Nurses and non-medical prescribers have an important part to play in health promotion and can offer advice on good sexual health practices and also educate young women on the potential benefits of chlamydia screening.

Early diagnosis and intervention are key to improving outcomes and it is hoped that this article has increased confidence in nurses and non-medical prescribers, enabling them to implement treatment, reduce the risk of complications, and improve quality of life for women affected by this potentially serious condition. **GPN**

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Apprenticeships and T-levels: an alternative pathway into health care

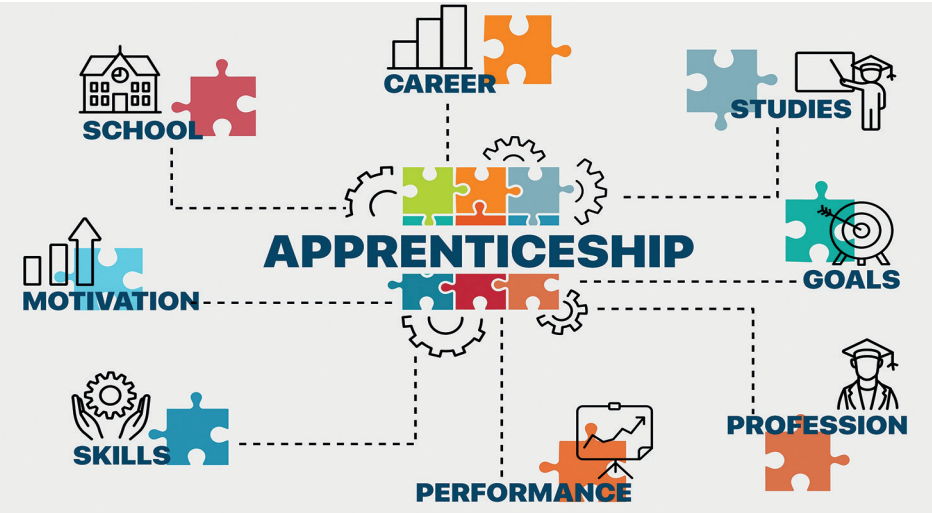
This article explores Northamptonshire Healthcare Foundation Trust's (NHFT's) innovative approach to addressing workforce challenges in the healthcare sector through apprenticeships and T-levels. NHFT offers various apprenticeship opportunities, ranging from entry-level healthcare support roles to pre-registration and post-registration nursing across different specialties. The article also looks at NHFT's collaborations with local educational institutions and primary care training hubs to provide pathways for individuals who transitioned from different careers into nursing through apprenticeships. Additionally, the introduction of T-levels offers younger people practical experience in health care alongside classroom learning, opening pathways into nursing careers. The benefits of apprenticeships in providing financial support, practical experience, and career progression are highlighted. Overall, these alternative pathways play a crucial role in developing and retaining local healthcare professionals, addressing workforce challenges and reducing reliance on international recruitment.

KEY WORDS:

- Apprenticeships
- T-levels
- Community nursing
- General practice nursing
- Workforce challenges

Lisa Gammon

Apprentice lead, professional practice education and training team, Northamptonshire Healthcare Foundation Trust (NHFT)



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Northamptonshire Healthcare Foundation Trust (NHFT) is part of the 'Best of Both Worlds' recruitment campaign focused on attracting and retaining nurses to work in the county. The trust is taking a fresh approach to developing nurses through apprenticeships and training programmes, offering an alternative to the traditional university route.

NHFT is an integrated community services and mental health trust, providing physical, mental health and speciality services in inpatient settings, out in the community and prisons. The trust has been rated as outstanding by the Care Quality Commission (CQC) and is the third mental health trust in the country to receive this rating (www.cqc.org.uk/provider/RP1).

NHFT provides apprenticeship opportunities for all levels, from entry-level healthcare support workers to pre-registration and post-registration nursing across all branches (mental health, learning disabilities, adult nursing and children's nursing). These opportunities encompass various aspects of the nursing profession, as well as managerial, non-clinical, and corporate roles.

NHFT also supports apprenticeships into GP practices through their close collaboration with the Northamptonshire primary care training hub — an example of working in partnership to bring healthcare professionals together to provide community-based prevention programmes and joined up health and care treatment and support for patients where they live.

APPRENTICESHIP ROUTES INTO COMMUNITY NURSING

NHFT actively promotes apprenticeship routes, including university programmes and registered nurse degree apprenticeships. Many community teams prefer the registered nurse degree apprenticeship (RNDA), a four-year pathway combining hands-on placement work with theoretical study, as it helps to recruit and develop people from the local community, who are likely to remain working locally after qualifying.

The registered nurse apprenticeship programme is experiencing significant growth, with over 70 participants at NHFT. It is open to internal staff, including healthcare support workers or qualified nurse associates who receive support from the trust. This programme has a 98% retention rate, making it a compelling option for aspiring nurses.

Here, two community nurses tell their stories.

Age is no barrier

One successful apprentice is 56-year-old Julie Twiner, who works in adult community nursing services and became a registered nursing associate and then went on to complete her registered general nurse 'top up' apprenticeship leading to her current RGN registration. She is now working as part of the Wellingborough locality district nursing team at NHFT.

Julie had wanted to become a midwife since she saw her niece being born over 30 years ago. To gain some healthcare experience, Julie worked as a healthcare assistant for 15 hours a week at Favell House, a centre supporting people with neurological difficulties in Northampton. Julie applied to study midwifery but was not successful. However, she realised she loved her healthcare assistant work and was happy. When Favell House closed, Julie moved into a community role in Wellingborough, where she developed nursing skills including taking blood, doing bandages, and giving insulin injections. Here, her colleagues encouraged her to apply for a nursing associate apprenticeship course through the Open University. Julie loved the course as she was able to work and learn at the same time. She said at times it was challenging however, her commitment and determination meant she 'sailed through' first time. The experience inspired her to do a top-up course to become a registered band 5 nurse.

Julie said, 'I am proud of my achievement. Doing an apprenticeship enabled me to work and study at the same time and I am grateful to my colleagues for encouraging me. They saw my potential and supported me throughout. I had to work hard and manage my time effectively, but the apprenticeship allowed me to progress in the role I was already doing without the financial hardship of studying full-time. I would recommend apprenticeships to anyone interested in a nursing career whatever their age. I ended up going to university at the same time as my daughter, so it is never too late to learn.'

From graphic designer to community nurse

Another apprentice is Sarah Pratt, a community nurse at NHFT who spent the first 10 years of her working life as a graphic designer. Sarah had always wanted to follow in her grandmother's footsteps and train as a nurse. In her early 30s, Sarah decided to work as a carer to gain some experience in health care. She loved the experience and decided to become a healthcare assistant at NHFT before later applying for a nursing degree.

One year into her degree, the nursing apprenticeship course launched, providing students like Sarah with the opportunity to train as a nurse over four years and work at the same time, with the fees paid. Sarah describes the experience as 'brilliant' from a financial perspective and for learning and development.

She said, 'I was already working and building my skills and experience while studying. The apprenticeship offered the perfect mix of working and studying. For two days I had my own caseload, I spent two days as a student and then I also had a study day. It was hard work, but I could fit the studying into my lifestyle.

'I have been qualified now for two years. As a community nurse, I feel privileged to go into people's homes and care for them. I love my role and now I mentor other apprentices. I have been in their shoes, so I know how they feel. I plan to continue training and developing my skills in the future too.'

New opportunities for school leavers at NHFT

One of the latest training developments for younger people is the introduction of T-levels, a vocational qualification aimed at 16–19-year-olds focused more on practical subjects than academic ones.

This new type of technical qualification provides students with a blend of classroom learning and on the job experience. One T-level is the equivalent to three 'A' levels and the programme has been designed to give people the skills they need to access a range of careers, including those in health care.

NHFT is embracing T-levels to develop their future workforce. The two-year programme is run in collaboration with a local college in South Northamptonshire and offers students an opportunity to gain practical work experience while learning the fundamentals of nursing.

Instead of formal assessments, T-level students work closely with healthcare workers or nursing associate apprentices, who act as mentors ensuring that they gain practical knowledge and continuous career development.

Students can also engage with specialised teams, such as infection control or community care teams, to broaden their skills and knowledge. By the second year, students have enough knowledge to apply and join the staff bank and start to earn money.

T-level graduates also have a clear pathway into nursing, with their qualifications mapped to UCAS points, which means that they have the potential for university entry if this is the pathway they choose. Alongside apprenticeships, T-levels are opening healthcare careers to younger people, no matter what their age or experience.

Apprenticeship routes into primary care

The 3Sixty Care Partnership is also facilitating apprenticeships into GP practices across Northamptonshire. Here two general practice nurses (GPNs) talk about how they got into nursing via the apprenticeship route.

From a career in fashion to nursing

Lydia Marks, 36 years old, recently qualified as a GPN at King Edward Road Surgery in Northampton. Lydia had not originally wanted to become a nurse. She did a degree in fashion but decided it was not the career for her.

Lydia started working as a care assistant at a care home. She loved it and regularly liaised with the local GP practice, King Edward Road

Practice point

The 3Sixty Care Partnership is a unique joint venture between a federation of 27 GP practices in Kettering, Corby and Wellingborough and East Northamptonshire and Northamptonshire Healthcare NHS Foundation Trust that aims to bring health and care professionals together to provide community-based prevention programmes and joined up health and care treatment and support for patients where they live.

Surgery, which set her on her nursing pathway.

Lydia saw a healthcare support worker role advertised at the practice and successfully applied. It was a great foundation in health care and later, with the support of the practice, she decided to train to become a nurse. In 2018 she started a nursing associate apprenticeship at the University of Northampton (UON).

Lydia was able to combine her training with her work at the practice, spending one week each month at university and the rest at the surgery. She also had to complete over 700 hours working in district and community nursing settings throughout the county.

After finishing the course, Lydia was eager to top up and become a registered nurse. At the time the only option was to join the third year of a nursing degree at UON full-time, which she could not afford to do, as they were not offering the top-up apprenticeship.

She waited a year but found the registered nurse degree top-up apprenticeship with the Open University that enabled her to work part-time while studying and she has now qualified.

Lydia said, 'It has been quite a journey, but the GP practice was amazing. From day one they encouraged me to pursue a nursing career and supported me every step of the way.

'My fees were paid, and I earned a salary throughout, which enabled me to complete the apprenticeship. I could not have afforded to go back to university full-time, especially after already having done a degree. The benefits have not just been financial though, I have grown in confidence.

'I would not have been as confident a nurse if I had come straight through university from school. I benefitted from working with patients and really understanding the role. For mature people, the apprenticeship route is a great option; you learn on the job and gain a qualification while earning money. It has also enabled me to stay and work locally. No two days are the same in nursing and there is something new to learn, which I find exciting.

'I am still developing my skills. I am doing a childhood immunisation and vaccination course, and will do a contraception course next, plus possibly the non-medical prescribing and minor illness courses. The opportunities are endless.'

Dr Mahmood Kausar is the senior partner at King Edward Road Surgery whom Lydia first met when she was working at the care home. He and his practice partners fully supported her and truly value the apprenticeship route for training GP nurses.

Dr Kausar said, 'We saw Lydia's potential and encouraged her to do her nurse training. We are a training practice for GPs, and it is in our ethos to develop our staff. We didn't have a vacancy for a nurse but created the role for Lydia as she had the skills and compassion to become a great nurse.

'We are proud of her and call her our superstar. Our experience supporting Lydia through the apprenticeship is one we would willingly do again with the right person. We want to encourage local people to train and want to attract the best talent in Northamptonshire.'

Achieving a nursing dream

Kirsty Dodd also followed the apprenticeship route into GP nursing, and in February 2020 was one of the first GP healthcare support workers to join the Open University apprentice nurse associate programme. This provided her with a springboard to achieve her goal of becoming a registered nurse.

Kirsty joined Parklands Surgery in Rushden in 2015 and demonstrated she had the passion and commitment to become a nurse. As a parent with a young family, the traditional full-time university route was not an option. The apprenticeship provided Kirsty with the opportunity to combine academic learning with working in the practice, developing her clinical skills and knowledge.

Kirsty successfully completed the programme in 2022 and became a registered nurse associate. Her career success continued and enabled her to join the registered nurse degree top-up apprenticeship (RNDA) with the Open University, with the aim of becoming a registered nurse in 2024.

Kirsty said, 'At first, I did not really understand how an apprenticeship worked, but this has worked for me. It is not an easy option, but I have learnt so much.'

The practice and colleagues have been hugely supportive. Mandy Hack, practice manager at Parklands Surgery said, 'We could see the potential in Kirsty to upskill from a healthcare support worker to become a GPN and the apprenticeship pathway has enabled us to support her development.'

CONCLUSION

In Northamptonshire, T-levels and the wide range of apprenticeship routes into health care are providing exciting opportunities for individuals of all backgrounds. The focus on mentoring, skill development, and a supportive learning environment ensures that people are well-prepared for their future careers. In the author's experience, these routes are crucial for developing and retaining local healthcare support workers and nurses, and are helping to address workforce challenges and reducing the reliance on international recruitment. GPN

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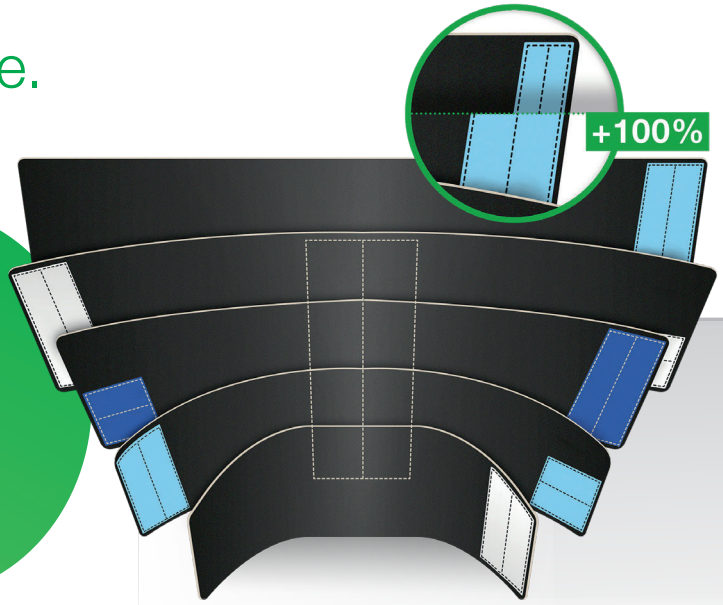

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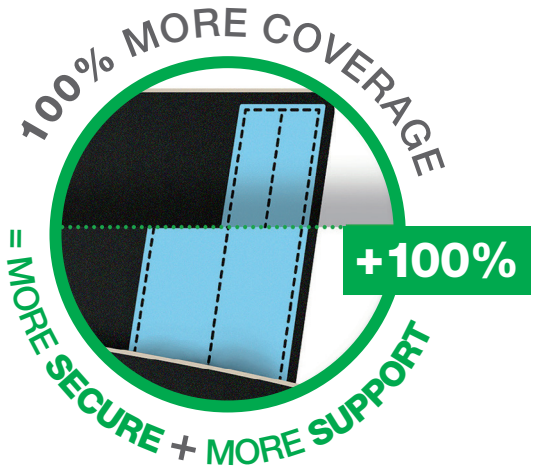

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