THE HEALTHCARE SCIENCE LEADERSHIP JOURNAL

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AHCS
Academy for Healthcare Science

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Editorial Board

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EDITORIAL

Have you ever wondered how people in senior leadership positions got there? Every person's journey is different, with the way ahead often unclear and never inevitable. Only one thing is certain – to make a positive difference you need to put in the work

No-one's career journey illustrates this better than that of **Bernie Croal**, current President of the Royal College of Pathologists. He talks about some of the many challenges he has faced and shows his drive and commitment to achieve clinical, scientific and professional change.

In a progressive healthcare system, every person needs leadership development so that they can flourish. **Ruth Thomsen** outlines how the Academy for Healthcare Science is developing a strategy that builds a coherent and integrated approach to leadership for healthcare scientists. She also encourages individuals to see themselves leading positive change.

Organisations also need to invest in new ways of working to survive and develop. **Sharran Grey** describes how her early career prepared her to take advantage of a scheme that fast tracks Biomedical Scientists into Consultant Clinical Scientist roles which complement the work of medical consultants. This illustrates how Modernising Scientific Careers and similar programmes are providing new opportunities for healthcare scientists to expand their horizons and careers.

Many healthcare scientists and most clinicians rely at some point on medical technology when delivering services to patients. **Sarah Jennings** sets out how NHS England tries to identify and resolve medical device issues, ideally before things go wrong. Healthcare scientists are in a unique position to advise other clinical staff on how to purchase, set up, monitor and support devices to keep patients safe.

Medical devices are also important in point of care testing. **Anna Stec** and **Gilbert Wieringa** provide an overview of existing and potential applications and identify important roles healthcare scientists can take to ensure these expanding services are done well.

Widening the medical device theme, **Phil Cosgriff** explores how writing a book about medical device regulation helped him think about ideas to inform potential authors about book writing. He also summarises project management lessons that can be applied to any initiative.

Kip Heath shows the power of individual leadership and diversity in action. From stepping up to take on leadership roles to facing into fears of standing up in front of a crowd, she is an example of someone who has faced into and overcome challenges. She encourages all healthcare scientists to work together and be seen.

How better to illustrate the theme of being seen than in reports in this issue on the **Advancing Healthcare Awards**. Many outstanding individuals work in healthcare science, and they are rightly celebrated. But there are also lots of other healthcare scientists who do outstanding and valuable work and whose contribution is known only to a few. It is time to pull back the curtain and let the world see how much healthcare scientists have to offer.

Finally, this will be my last issue as an editor. Following an application process earlier this year the Academy appointed Jon Flannery and Usman Lula as its two new Journal co-editors. Both are active healthcare scientists already involved in editing professional body journals: Usman in medical physics & clinical engineering, and Jon in neurophysiology. I am delighted that they have been able to make a significant contribution to the production of this issue and look forward to seeing what they will achieve in future editions.

I am very grateful to all those who have been and who are on the Editorial Board for their helpful suggestions and continued involvement; to our many authors for sharing their stories, experiences of and ideas about leadership; to the team at Chamberlain Dunn for their excellent support;. and to Janet Monkman, the staff and Professional Bodies Council at the Academy for enabling this whole project to flourish.

Keith Ison

MY CAREER JOURNEY

Bernie Croal
MB, ChB, BSc Hons,
MSc, MD, FRCP
FRCPath FIBMS,
CSci, EuSpLM

Bernie Croal is an NHS chemical pathologist from Aberdeen. He has had a long career in various leadership roles within NHS Scotland and a number of professional bodies. He is currently President of the Royal College of Pathologists.

What was your earliest leadership experience?

I grew up on a rough council estate in Glasgow, and while that provided me with a wide exposure to life there was also a need for self-taught survival instincts to develop that became part of me. I was fortunate enough to be bright and seemed to develop an organisational brain early on. I was introduced to the British Red Cross at the age of 13, first starting to help at different first aid events then progressing quite quickly to become an instructor in first aid. These experiences gave me the confidence to do more. I became a member of a casualty simulation team, then became heavily involved in a respite facility to give new experiences to seriously disabled kids from care homes – this taught me a lot about the needs of those left behind by society.

What did you learn from this?

My achievements as a teenager showed me that I had organisational skills. I found I could bring people together to create something out of chaos. I learned to start by stepping back to analyse a situation before planning what to do. Also, I quickly discovered the importance of working out how to deal with unintended consequences before they happened. I knew I liked science and was interested in helping people, and these leadership experiences unlocked my desire to make real changes in the world. Life was very different for those I grew up with: by the age of 20, almost two-thirds of the boys in my school class were either dead or in prison. I wanted something else, so I applied to Medical School – a single application to one University – and I got in...

> **"I found I could bring people together to create something out of chaos"**

How did you end up as a chemical pathologist?

I studied physiology and then medicine at Glasgow University. During my medical training I spent time in a clinical chemistry post and realised that in this specialty I could combine my passions for science and medicine, and find opportunities for research. I didn't feel ready to go into a full-time consultant role at the end of my training so spent four years in academia, studying and carrying out Health Services and Public Health research. This provided me with new analytical and organisational skills. I then moved back into clinical practice as an NHS consultant, a role I thought would give me greater influence to make positive changes in how health systems work. Working in the NHS also gave me more opportunities to do practical health services research, which generated evidence to improve things.

Why did you take on leadership roles?

This goes back to my desire to improve outcomes. You need to have power and influence to achieve change, so I sought out management roles. I became a clinical director within my first year of being an NHS consultant, largely because I was becoming frustrated by people not pursuing change for the better. I wanted to do new stuff and shake it up.

What are you leading on at the moment?

After 15 years as a trustee and multiple other leadership roles in the College, other professional bodies and the NHS, I now find myself as President of the Royal College of Pathologists. I have largely put everything else apart from my clinical commitments on hold, to concentrate on this important, albeit voluntary, presidential role. There is a lot to do.

How do you deal with people who resist change?

Wear them down with rational argument and then try to reach a consensus decision! If there is a real clash of opinion over

the interpretation of evidence or choice of strategic direction, then agreement requires compromise. If that is not possible, what you do next depends on your position – sometimes you need to walk away.

I have tried to surround myself with other people who like to air issues openly and make shared decisions. You have to accept that others think differently to you, that you are not necessarily always right, and be prepared to sign up to a group decision. Occasionally though as a leader you have to go with what you feel is right, particularly when a situation is more uncertain. In hindsight, my colleagues and I have probably got most things right but we still on occasion make and learn from mistakes.

Is it difficult to get into leadership positions?

It is easier than ever to move into leadership roles. Many people don't want to take them on, either because they seem onerous and unrewarding or because they see themselves being set up to fail. Of those who do step up, some are not equipped or trained to lead and others volunteer because they fear someone else may come forward who will make their life more difficult. These are all signs of a faulty system.

What has your leadership journey felt like?

I put a lot of time and effort into my leadership roles. I can work from 8am to midnight most days. So being committed and working hard is not difficult for me and is what I choose to do. I am driven by an obsession to organise things so that they work better. This goes right back to my childhood and time at school, even though I was never encouraged to be like that. Seeing a problem and wanting to sort it out is just something I have always done.

People comment that my best attributes are not necessarily scientific or technical but my ability to communicate. I am good at talking to people, bringing them together and getting the best out of them to reach a compromise that works.

What has your career been aiming for?

I don't really have an end point in mind. I have no intention of retiring until health problems stop me working. There are always things to do and needs to address. I want to go where I am most useful and where I feel I am making a difference.

> **" People comment that my best attributes are not necessarily scientific or technical but my ability to communicate "**

What gives you greatest satisfaction as a leader?

Reorganising areas to overcome the challenges they are facing. Many elements have to come together for health services to work effectively and there are many points where we can improve patient and service outcomes. That includes helping professional bodies function as well as they can. I enjoy applying a systematic approach to tackling difficult problems. I also enjoy encouraging those involved to come up with shared solutions.

My ability to achieve change is limited by time and energy. I have learned to focus on doing a few things well and to juggle the rest as best I can. The workplan I have as College President is massive and I have to find other people to collaborate with if I am going to achieve what I want to do. Appropriate delegation is so important.

Has anything made your life more difficult?

In 2002 I came down with a mystery illness that has never been properly diagnosed. It gave me a variety of neurological and physical symptoms, including ones similar to long covid. Although less intense now, this long term condition made my life particularly difficult when it started.

By 2005 I realised I had to make a conscious choice whether to submit to my symptoms or get on and do stuff. I started saying "yes" to everything – and that is when I really began to get involved in many external leadership roles. For the next five years my condition significantly limited my abilities but having seen what I could still do motivated me to get on with life. The decision to say yes has been a continuing factor in pushing me to achieve more. It has not been easy at times but I believe I would not have got this far without making such a commitment. After 22 years I have learned how to manage my symptoms – I work hard in a good week, and row back in a bad week.

What has been your most encouraging moment?

Realising that I am where I am on merit, having earned it. I now have the skills to do my job well. It has taken my entire career to get to this level of confidence, although I still suffer from imposter syndrome at times. What has helped me is believing and accepting that I am as good as, if not better, than anyone else when it comes to doing what I do.

LEADERSHIP STRATEGY

Ruth Thomsen is working on building the new Academy for Healthcare Science strategy for Leadership Development. Keith Ison asks her why, and what the strategy is likely to involve.

The NHS already has various leadership development programmes for health and social care staff in England, Scotland, Wales and Northern Ireland. Why does the Academy need a strategy?

The Academy is developing a Healthcare Science (HCS) leadership strategy for two reasons: to raise the profile of healthcare scientists as leaders in the NHS, and to encourage the development of leadership across the HCS workforce.

From the outside this workforce can be seen as small, specialised and complex. The Academy wants to advocate for a different view, focused on the knowledge and leadership value healthcare scientists bring to the NHS. An ability to gather, analyse and use evidence to solve practical problems is an essential part of healthcare science, as is managing risk. These qualities are highly appreciated at senior management and organisational level[1]. The NHS would benefit from bringing healthcare scientists into leadership development programmes at all career stages, as it does with the medical and nursing workforces.

Within HCS there are plenty of individuals who seek to lead and implement change in the interests of patients. Yet the same people can be reluctant to undertake structured leadership development and to step into formal leadership roles. The Academy wants to help healthcare scientists gain leadership skills and prepare them to take up positions of responsibility in order to achieve positive change.

Do any specific issues make it more difficult for healthcare scientists to get into senior NHS leadership positions?

Yes and no! There is a lot of commonality with other groups. An unpublished 2023 study in London interviewed clinical leaders from all professional groups, including Healthcare Science, to understand their paths into leadership. Each person had followed a different course but a common motivator for taking on organisational or system wide leadership roles was to improve patient care and introduce positive change on a larger scale. The need for encouragement and support from peers and mentors was highlighted, as was the value of role models. A lack of structured NHS leadership routes outside the medical profession made it more difficult for other groups to find training and development opportunities.

Ruth Thomsen *is Regional Healthcare Science Lead for NHS London and a former President of the British Academy of Audiology. She has championed many high-profile initiatives and leads nationally on improving paediatric audiology services for children and young people with learning disabilities and autism. She is passionate about leadership (https://www.entandaudiologynews.com/media/32406/entja23-thomsen.pdf).*

However, in my experience healthcare scientists struggle with some particular difficulties including:

- **No high level clinical leadership roles to aspire to:** Imagine a nursing or medical workforce where a career was purely clinical or academic and the highest grade you could reach was head of service. Clinical leadership careers are particularly well recognised in medicine, are recognised in other professions but hardly occur at all in HCS.

- **No one like you advocating for your development needs:** The paucity of healthcare scientists in senior organisational leadership positions makes it unlikely that you will find a supportive and understanding career role model at that level.

- **Having to rely on other professionals to represent you at senior level:** This reduces the visibility of healthcare science and makes it more difficult to get HCS issues on the agenda, especially for specialities that provide services across multiple clinical groups. It can also make establishing and embedding consultant clinical scientist roles more of a challenge.

> " **The NHS would benefit from bringing healthcare scientists into leadership development programmes at all career stages...** "

So how does Healthcare Science release its leadership potential?

It's not just about putting people on courses or giving them certain experiences. A structured approach to leadership is needed across a career lifetime, which is why the Academy is looking at long term ideas. We are thinking about issues such as:

- Specific roles that allow healthcare scientists to both lead and practise at a senior level. How can these be built into future career pathways and organisational structures?

- Establishing a leadership group to coordinate approaches across the four nations.

- Addressing HCS leadership development and delivery at every career stage. Healthcare scientists are sometimes reluctant to engage with and recognise the value of lifelong leadership development, so building confidence early on and providing ongoing support is vital.

- Developing a tool kit that can be applied across healthcare science. Experience shows that learning with those from different backgrounds and specialities opens up new ways of thinking and expands the horizons of those taking part.

- Building networking and relationship skills that equip individuals to identify their allies and influence others.

- Coaching and mentoring support that flexes along with an individual's career and personal needs.

We will also talk to experts in leadership development to understand how best to address this agenda. We have met with practising healthcare scientists to hear their concerns, some of which were:

- Leaders need time to think. Delegating tasks can free up time to lead and help to develop others. Delegation can also highlight where there are gaps in a service that need addressing, opening up opportunities for improvement.

- Talent spotting is vital, whether for technical roles or as mentors and support leads. Talent needs to be backed by suitable development and support.

- Leadership development within healthcare science works well at earlier career stages but individuals need encouragement to apply for and benefit from higher level organisational and national programmes, and from academic courses.

- Senior scientists need support too, particularly when dealing with an unfamiliar area. Finding out what is available and accessing it is an essential skill.

- Learning about project management early in a HCS career is likely to pay dividends later on. It also helps when building and presenting cases for change.

- Self awareness and strategic thinking take time to develop but help individuals work more effectively with senior management and senior clinical leaders. These skills also help with personal resilience.

- Networking and relationship development skills are another area where ongoing development will improve a person's ability to influence and implement change.

> " **It's not just about putting people on courses or giving them certain experiences** "

Do you have any last words?

To flourish, the health system needs leaders from different backgrounds, with varying experiences, knowledge, skills and styles, who are prepared to challenge constructively and work for positive change. Healthcare scientists can be part of building an NHS in which patients get the best treatment and in which they have satisfying and fulfilling careers. The question for each individual is: are you willing to tackle your particular challenge?

Resources

To get a better picture of how some healthcare scientists have developed their careers, you can look at some of the life journeys described in previous editions of this Journal.

More information about leadership opportunities is available on the national leadership provider sites.

England:
https://www.leadershipacademy.nhs.uk/

Scotland:
https://learn.nes.nhs.scot/18217/leadership-and-management-programmes

Wales:
https://heiw.nhs.wales/our-work/leadership/
https://academiwales.gov.wales/

Northern Ireland:
https://leadership.hscni.net/Home/Index

References
1. See an article by Chris Gibson, in the Spring 2023 issue of this Journal, p16: Trust Boards and the Role of a Non-Executive Director.
https://www.ahcs.ac.uk/wp-content/uploads/2024/01/AHCS-Leadership-Journal-Spring-2023-Edition.pdf

CONSULTANT CLINICAL SCIENTIST: MY CAREER PATH IN CLINICAL HAEMATOLOGY

Thirty-seven years ago, I was appointed to a rotational training post in Pathology as a very junior trainee scientist. I loved the work and had fantastic colleagues. I even enjoyed the exams! In the first week I remember thinking that I had found my ideal career and would do it until I retired, but I also felt rather detached from the patient's diagnostic journey. I didn't know it then but that observation was something that would shape my career and my vision for the Clinical Haematology workforce and new ways of working.

My career then progressed through a series of laboratory-based Biomedical Scientist posts which were mainly technical, scientific and managerial. My journey to becoming a Consultant Clinical Scientist began when my work became increasingly patient-facing in response to service need. I felt my contribution would be better recognised professionally through registration as a Clinical Scientist. I obtained the Academy of Healthcare Science (AHCS) Certificate of Equivalence, enabling me to register as a Clinical Scientist with the Health and Care Professions Council, and then joined the Haematology Higher Specialist Scientist Training (HSST) programme. This route offers flexibility to Biomedical Scientists who are developing clinical scientific careers or wishing to pursue HSST. The AHCS Equivalence programme avoids the need for Biomedical Scientists to enter a 3-year Scientist Training Programme (STP) and study for a Clinical Science MSc if they already have an appropriate qualification at masters level and suitable experience equivalent to the STP curriculum and competency assessments.

More recently the HSST programme has been opened to senior and suitably qualified Biomedical Scientists without their needing to re-register with the HCPC as a Clinical Scientist[1]. I think that the type of professional registration should reflect the focus and remit of the post-HSST target consultant role. In Clinical Haematology we felt that Clinical Scientist registration was more appropriate, due to the highly clinical and patient-facing nature of the roles in HSST grades and as a Consultant. This may not be the case for HSST and Consultant Biomedical Scientists whose role may be entirely laboratory-based.

The Consultant Clinical Scientist (CCS) is still a rarity in Laboratory Haematology (Pathology) and is rarer still in Clinical

Sharran Grey *OBE DClinSci FRCPath FAHCS FBBTS is a Consultant Clinical Scientist in Clinical Haematology at the Lancashire and South Cumbria Tertiary Haematology Centre in Blackpool.*

> " **CCS roles are great opportunities for talented and motivated senior scientists** „

Haematology where posts like mine may sit in a medical specialty while also providing some senior clinical input into Laboratory Haematology. The emphasis of my CCS role is working in the Haematology Diagnostic Clinic. Several years ago, I set up a clinic for new patient referrals to Clinical Haematology, to investigate abnormalities of blood count and for investigation of blood clotting disorders. I soon discovered that 80% of those patients could be discharged back to their GP because they either had a non-haematological problem or a mild haematology condition that could be managed in primary care. The other 20% have a primary haematological diagnosis and I refer these to my medical consultant colleagues for a management decision (Fig. 1).

Fig 1: Haematology Diagnostic Clinic Outcomes
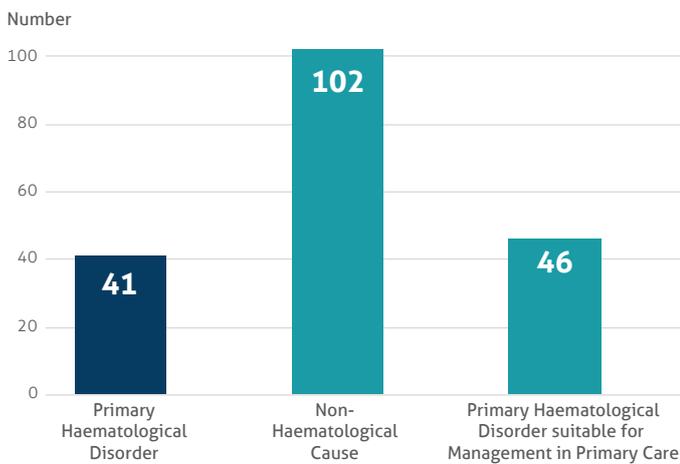
Approximately 80% of patients were discharged back to the GP with advice. The remainder were transferred to a medical consultant haematologist for a management decision

Once the patient is on an established treatment plan, they are then transferred to the care of an Advanced Clinical Practitioner for monitoring and follow-up. The Clinical Nurse Specialist acts as an advocate and provides pastoral support to the patient. This has been a very successful multi-professional workforce model (Fig. 2).

We have shared our positive experience with the British Society for Haematology and the Royal College of Pathologists as an example of how CCS posts can help to address long-standing recruitment and retention problems within the medical consultant workforce in Clinical Haematology. A CCS is well placed to undertake diagnostic clinics and take leadership roles such as lead consultant for blood transfusion or haemostasis/thrombosis, laboratory director and training and clinical supervisor roles. This releases time from medical consultant job plans, supports new patient referrals and reduces patient waits. It has been instrumental in achieving this revised workforce plan.

Investment and planning are required to fully realise the benefits of CCS roles. As Haematology is a very diverse specialism, it is critically important that the HSST programme and CCS training plan reflect the target consultant role in terms of scientific, clinical and leadership responsibilities. This must be determined from the outset, including the areas of practice and whether these are predominantly laboratory, clinical, or have elements of both.

CCS roles are great opportunities for talented and motivated senior scientists. Effective deployment of these roles requires vision and investment, not only in terms of organisational workforce strategy but also with the provision of medical and scientific consultant expertise to support clinical and leadership training, as well as high quality mentorship. I believe this multi-professional approach is essential for a secure and sustainable future for clinical haematology services. We are at a critical moment where change and modernisation are urgently required.

I am privileged to have had the opportunity throughout my career to pursue innovations that have led to positive change for patients and colleagues and I am grateful to those who

Fig 2: Target Patient Workflow
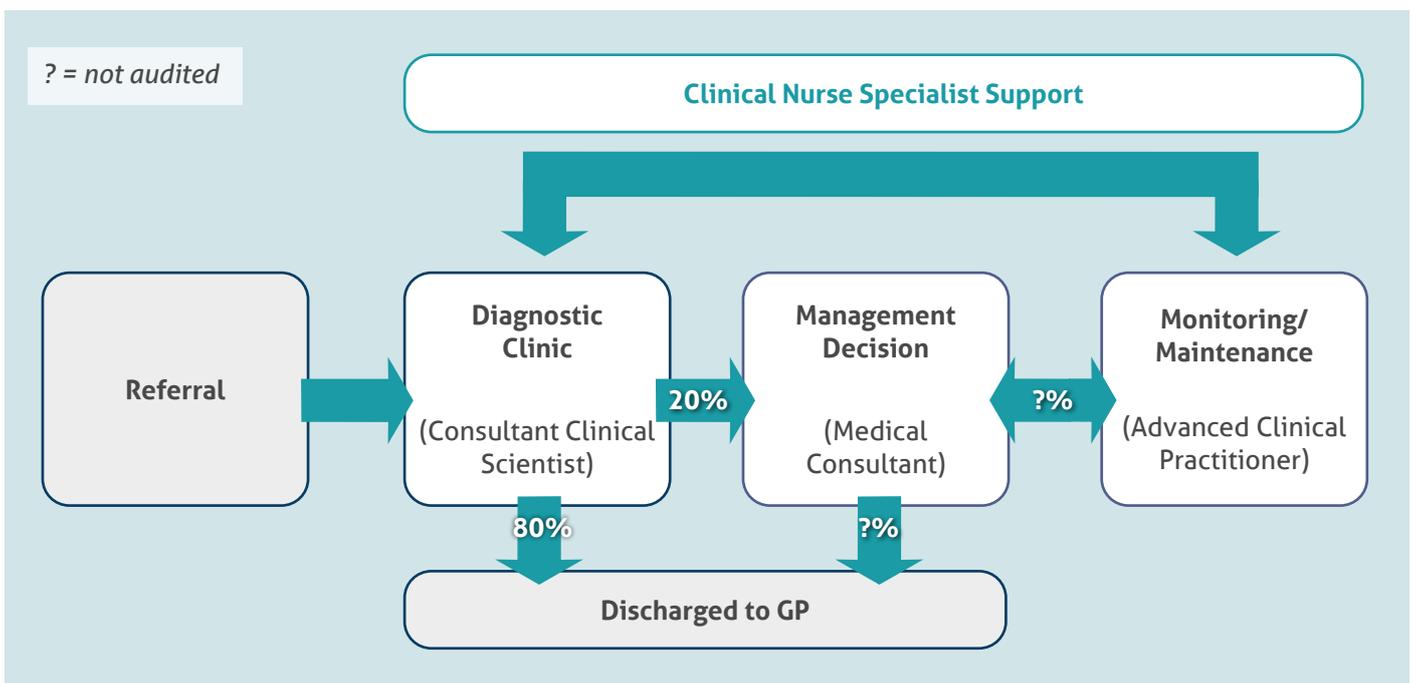
gave me the trust and freedom to deliver it. I am passionate about practice-based research that provides solutions to real-life problems. My doctoral research was on accelerated red cell transfusion for selected patients. This brought real benefits to transfusion-dependent patients, shortening transfusion therapy sessions and helping nursing colleagues support more patients in their own homes. I was a winner of the Chief Scientific Officer's Healthcare Science Awards in 2017 for this research. I also designed a red cell dosage calculator to reduce the risk of inappropriate and over-transfusion. This is now available to all NHS organisations as UKCA-marked decision support software, following a very productive collaboration between NHS colleagues and a software developer in the private sector.

I have also held several local, regional, and national leadership roles including Laboratory Director/Clinical Lead, Transfusion Medicine Consultant, HSST training lead, and Lancashire & South Cumbria Pathology Network Discipline lead. I am also a Clinical Lecturer at Manchester Metropolitan University, a Royal College of Pathologists examiner for Blood Transfusion, and a Working Expert for the Transfusion-Associated Circulatory Overload with the Serious Hazards of Transfusion Haemovigilance scheme. It was a great honour to receive an OBE in 2021 for services to blood transfusion and patient care. Blood transfusion is a life-saving therapy and part of the backbone of a hospital as so many patients rely on it to get them through surgery, trauma, childbirth, chemotherapy, and many other medical conditions. A blood transfusion starts with the blood donor and ends with the patient, and I am part of a huge multi-professional team supporting that process.

Everything I do and the decisions I make start with the patient. This is true whether this has been for research and innovation, the services I am responsible for or my service to individual patients in my care. None of this is possible without the amazing people who I work with across the NHS and beyond. It is an honour and a privilege for my individual contribution to be recognised and to be a role-model for my profession as a Clinical Scientist, and to be part of our wonderful NHS.

> ❝ **Everything I do and the decisions I make start with the patient** ❞

Writing this article has been an opportunity to reflect on what matters most to me in my day-to-day job and in my longer-term approach to personal and service development. Personal behaviours and values are of utmost professional importance. Be passionate, compassionate, committed, diligent, and engender trust. Have courage to be innovative, unconventional, and push boundaries. Choose good role models and widen your networks to include people outside your area of practice and from different backgrounds. This can be a surprising source of ideas, support, and collaborative opportunities. Give colleagues the freedom and support to flourish. Curating a career that embraces this engenders a culture of clinical excellence and compassionate patient-focussed care. I have had the privilege of working with some extraordinarily talented professionals and leaders. I would not be writing this article without them. It is now my time and place to ensure I am doing the same for the next generation.

References
1. Biomedical Scientists are a HCPC registered profession. The HCPC also regulates Clinical Scientists from additional Life Science professions.

Figure 3: Sharran Grey receiving her OBE for services to Blood Transfusion & Patient Care from (the then) HRH Prince of Wales on 01.02.2022

CELEBRATING SUCCESS

The Academy for Healthcare Science sponsored two awards in this year's Advancing Healthcare Awards. These were presented at a ceremony in London on 26 April, hosted by Eamonn Holmes OBE. Here Alison Dunn from Chamberlain Dunn, organisers of the Awards, summarises the work of the winners of the two awards sponsored by the Academy.

The award for innovative practice to enhance patient safety was won by the Clinical Engineering R&D Team at the Northern Care Alliance NHS Foundation Trust for their project to bring new 3D printing and visualization methods to clinical practice for difficult airway planning.

They developed and introduced new methods involving medical imaging, computer design and 3D printing into clinical practice in a collaboration between anaesthetists, ENT surgeons and clinical engineers. This initiative has improved patient safety and reduced risks of complication and adverse events for patients with difficult airways.

The Airway Innovation Group (AIG) is a collaboration dedicated to developing new techniques and devices to improve care for patients with complex and difficult airways. A difficult airway is where the patient has complications which make it difficult to provide oxygen during operations. If the anaesthetic team cannot provide oxygen, either through a mask or through a tube inserted into the airway, then the operation may need to be stopped or not be attempted in the first place, as the risks to the patient may be too great.

The team developed a set of new methods and instruments specifically for patients with difficult airways and have moved this into routine clinical service within the Northern Care Alliance, a world-first for such a service. This effective clinical workflow turns medical images into 3D printed planning models that surgical teams use to simulate procedures and create patient-specific 3D printed guides that facilitate safe intubation.

The judges saw this as having enormous potential to be used widely for patients with difficult airways, and an excellent example of multidisciplinary team working, with lots of scope for adoption across the UK.

The second award sponsored by the Academy for Healthcare Science was to recognise emerging leaders in healthcare science.

It was won by Adam Marzetti, Senior Chief Cardiac Physiologist, East Kent Hospitals University

Adam Marzetti, Senior Chief Cardiac Physiologist, East Kent Hospitals University NHS Foundation Trust

NHS Foundation Trust who founded a non-physician ILR implanter/explanter service and implanters courses across the UK and Ireland. His leadership is promoting cost-effective practices and reduces patient waiting times. Engaging with various hospital departments, he fostered team collaboration and sharing of best practice, impacting service users, organisations, and healthcare efficiency. Currently completing the Higher Specialist Scientist Training programme, his innovative approach in initiating this service demonstrates effective leadership, addressing the needs of service users, organisations, and ensuring cost-effective practices.

He has used his experience to lead an implanters course, extending training to other hospitals in the UK and Ireland. This includes teaching about the design and set-up of the service and potential problems. He supports trainees all the way from consenting to the practical implant technique, mentoring trainees through their first implants and enabling them to start services in their own Trusts.

This helps to encourage consistency of services, aids in the adoption of non-physician services and encourages the sharing of skills. He also teaches cardiology based medical techniques, such as maintaining temporary pacing and intraaortic balloon pump systems.

The judges chose Adam as their winner as an emerging leader because he showed strong motivation and collaboration, both in developing his own career and the development of his team, along with an awareness of cost-effectiveness and the importance of sharing best practice.

For further information go to www.ahawards.co.uk

The Clinical Engineering R&D Team at the Northern Care Alliance

SAFER MEDICAL DEVICES USE: WHAT DO WE NEED TO DO?

My background

I am a registered graduate nurse with interests in safety and medical devices. After working in A&E and primary care/NHS 111 service posts, I became a medical equipment sister, a role linking equipment purchasing, clinical users and device management. I worked within my hospital's clinical engineering department helping to resolve equipment problems and support device procurement. I realised that kit was not always managed properly by clinical users, so I also supported medical equipment education and training across the trust. In addition, I completed training to be an NHS decontamination lead and learnt about point of care testing. I then moved to my current post in NHS England's National Patient Safety Team.

My role

The National Patient Safety Team receives over two million incident reports a year, as local incident reports are automatically uploaded into the national database[1]. All incidents reported as causing severe harm or death are reviewed for evidence of new and unrecognised patient safety issues. Once identified, similar incidents at all harm levels are identified and undergo a thematic review. Insights from other sources such as coroners' reports and from professional bodies and Royal Colleges are also reviewed, to decide whether system wide action is needed.

I provide patient safety-related advice and guidance for medical devices across the NHS in England. Where incidents involve a medical device, I look at the equipment involved to see what it does and how it works. I then review who the users are, what support they get in terms of training and manufacturer instructions and seek to understand how they use the device. Consideration is given to the patient groups it is used with and the pathways and environments it features in. It is also important to take account of what else is happening when the device is being used. Understanding safety science and human factors is an important aspect and the majority of the team have relevant post-graduate qualifications to support this. We look at what actions might

Sarah Jennings *is the National Patient Safety Clinical Lead for medical devices in NHS England. She works as part of the Advice and Guidance team developing mitigations and strategies in response to new and under recognised patient safety issues involving medical devices.*

prevent adverse events happening again and engage with subject matter experts to gather additional feedback. A key question to ask is whether a device is really needed or if its use can be eliminated, as this is the strongest barrier to ensure the identified issue does not reoccur.

Eliminating unnecessary devices

Many hospitals were built with both air and oxygen outlets mounted on the wall near each patient's bedside. Repeated incidents occurred when staff, working under pressure, had connected a patient to the wrong outlet and patients ended up breathing air instead of oxygen. Despite better labelling and colour coding of connections, this simple error continued to be made. After a lot of work with professional groups, looking at outlet use and different scenarios to ask, 'What would happen if...?', It was decided to issue a National Patient Safety Alert instructing hospitals to discontinue the use of wall-mounted air flow meters[2].

I liaise frequently with the Medicines and Healthcare products Regulatory Agency (MHRA) about regulatory issues and with professional networks about specific safety concerns. I work with pharmacy colleagues and the Medicines Safety Team, as many medical devices are used in conjunction with medicines. I work with individual NHS organisations, the Medical Device Safety Officer (MDSO) network and a number of stakeholders including The National Association of Medical Device Educators and Trainers (NAMDET) to raise awareness of medical device safety issues and help organisations find guidance on medical device management.

I also provide a patient safety perspective on various BSI committees and draw attention to points they might not be aware of when considering clinical applications. This gives me an opportunity to influence the development of national standards affecting medical devices.

Agreeing what to do after an adverse safety event usually involves a lot of background investigation and discussion between clinical users, device specialists, professional bodies, and manufacturers. I lead workstreams and facilitate such discussions. If the identified issue meets the criteria, and constructive actions can be developed, a National Patient Safety Alert[3] (NatPSA) is developed to reduce the risk of death or disability. Proposed actions within a NatPSA are shared and discussed with an external advisory group[4] to ensure they are SMART[5]. Alternatively, I work with partner organisations including Royal Colleges to develop guidance that can be issued to their members.

" A key question to ask is whether a device is really needed or if its use can be eliminated... "

National strategy

The NHS England Patient Safety Strategy[6] was first published in 2019. It requires every NHS organisation to have strong patient safety systems and a positive safety culture. This includes appointing a Patient Safety Specialist (PSS)[7] who should work closely with Medical Device Safety Officers (MDSOs)[8] and clinical engineering services on medical device issues.

Various networks exist to support individuals in these roles, but detailed job responsibilities can vary between organisations. Neither PSSs or MDSOs have a defined professional structure or formal training for the role. To improve this situation, there is now a National Patient Safety Syllabus[9] with training materials open to all NHS staff, part of creating a safety-focused culture. Further training for Board members will also be offered. The aim is to professionalise patient safety as a unique skill set, regardless of the professional background of those who sit in patient safety roles.

Another requirement of the Patient Safety Strategy is the introduction of the Patient Safety Incident Response Framework[10]. This format for incident review following reported events and harm supports wider learning. There are a number of tools available to assist with implementation of the PSIRF, and the development of a safety culture and safety systems[11].

What could improve patient safety around medical devices?

1) The NHS could be better at sharing what it knows about medical devices and their use across the whole health system.

This requires collaboration within and across organisations, Integrated Care Systems (ICSs) and Regions. It is not just about solving problems – improved ways of working could also be shared and implemented more widely.

It is important to flag up issues as they arise. NHS staff, patients and carers do not use the MHRA's Yellow Card reporting scheme as much as they could do to report concerns about medical equipment. Improved Yellow Card[12] reporting can provide valuable safety signals for the regulator to act on, which in conjunction with our safety insights can be a formidable force to elicit change.

Similarly, better transparency of post market surveillance from manufacturers and regulators would improve decision making in organisations that are procuring and using devices.

Wider national collaboration across professional clinical networks and Medical Royal Colleges can also prompt stakeholders to review their practice, find ways to improve, share learning and issue appropriate guidance.
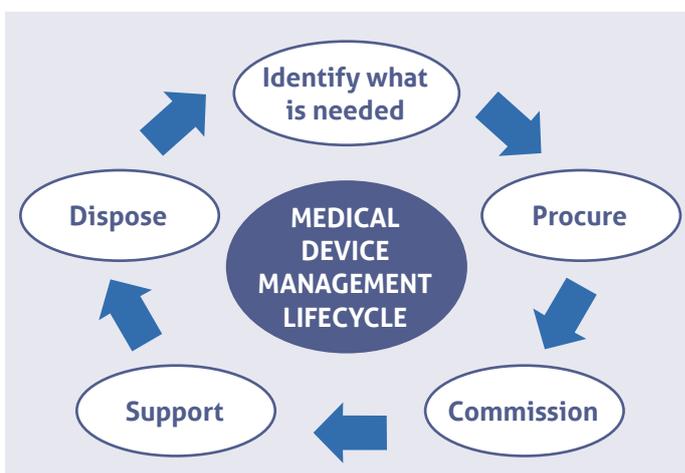

Figure 1: The Medical Device Lifecycle

Who should develop a device specification?

A collaborative approach is needed between clinicians, healthcare scientists, and medical device and procurement experts to find equipment that can do what is needed. MDSOs can help to plan how a device will fit into the clinical pathway and identify potential risks, ameliorations, or unintended consequences. Decontamination specialists advise on safe reuse and clinical engineers on technical aspects and device support systems.

2) Safety aspects need to be considered at every stage of a medical device's lifecycle.

Safety starts at the beginning when a clinical need has been identified. Thought must be applied to what is needed, how it will be used and what might go wrong. Detailed specifications of what is required can then be drawn up to evaluate potential devices before purchase. This includes considering how a device will be used and decontaminated, assessing risks and ways to reduce them, and planning how device use will be traced (Figure 1).

From a regulatory perspective, a CE or UKCA mark shows that a device meets basic requirements. It does not mean that a device is suitable or safe to use in all situations and settings. Only a full evaluation will show whether equipment safely meets the needs of a particular patient or user group within a specific clinical pathway. Risks can also arise when devices are taken into a new environment without proper evaluation – see the Case Study Box on page 15.

3) Organisations should proactively reduce risk.

Some safety problems and risks could be foreseen or picked up early, given appropriate resources. Subsequent operational changes could then limit their impact.

Reducing reliance on organisational memory is vitally important for future safety. To support this, the hierarchy
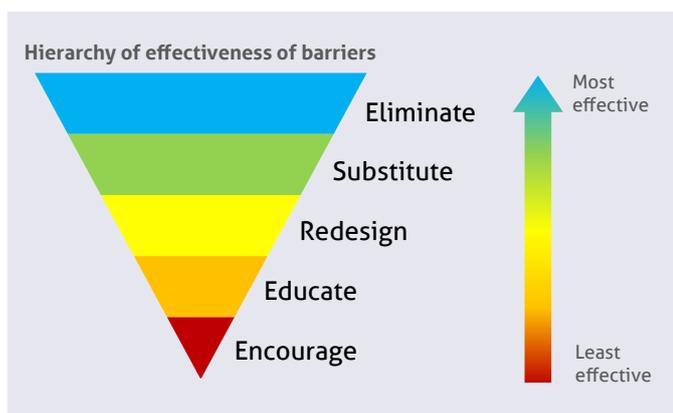

Figure 2: The Hierarchy of Intervention

> **" It is easy to assume a problem is caused by human error ,,**

of interventions (Figure 2) is a useful tool to see how underlying problems can be partly or wholly eliminated. Encouragement and education to act consistently can be backed up with *people-focused* interventions such as rules, reminders and checklists, whereas redesign and substitution/elimination involve *systemic* actions such as simplification, standardisation, automation and constrained behaviour.

4) Redesigning systems and devices can improve patient safety.

Clinical engineers can support the review of equipment-related incidents, such as the implications of factory default settings in different user environments or appropriateness of alarm settings for particular patient groups. Clinical engineers are the professional group in the NHS best equipped to liaise with manufacturers over technical and regulatory details and with MDSOs and clinical staff over the implications for device use in practice, often working in collaboration with other healthcare science groups.

It is easy to assume a problem is caused by human error. Most errors however have multiple causes. When seen repeatedly, system or device redesign can often reduce both the frequency and the potential for harm of a particular error.

Manufacturers are often unaware of all the ways in which their equipment is used in practice. One of my roles is to share such insights with the MHRA and manufacturers and to act as an 'ethical conscience' to utilise this knowledge of 'Work as done' to push manufacturers to tweak equipment design and

Device redesign can reduce errors

Bladder irrigation catheters have three ports. One inflates or deflates a balloon that holds the catheter in place. A larger one allows urine and blood clots to flow out of the bladder and a smaller port allows saline to be injected to flush out the bladder post-operatively. Ports are generally not labelled as input or output which means sometimes staff misconnect the lines to the wrong port. Bladder drainage through the smaller input port can in some cases result in blockage from a blood clot, which could lead to a ruptured bladder if not picked up quickly. The potential for misconnection can be exacerbated by other factors such as a shortage of staff familiar with irrigation procedures and devices, and patients having procedures outside specialist urology wards due to bed pressures. Not every error can be designed out. However, improving irrigation catheter design with clear directional marking may reduce the likelihood of mistakes happening. We are currently working with a wide range of manufacturers, relevant clinical bodies, the MHRA and BSI to enable this.

CASE STUDY

In April 2020 the NHS issued a Patient Safety Alert[13] about the interruption of high flow nasal oxygen (HFNO) to patients undergoing transfers. HFNO devices were originally developed for use in high dependency in-patient settings. However, benefits of therapy led to front door use in Emergency departments where internal hospital transfers would ultimately be needed. HFNO devices were predominantly designed with a short-term battery backup so that patients could be moved a short distance, such as across a ward, meaning that staff had become used to unplugging devices whilst moving patients. If the short-term battery backup becomes exhausted and pressurised oxygen can no longer be supplied, patients have to be put on lower flow rate oxygen through a mask, a sudden change to which they may not respond well. This can lead to respiratory problems and even respiratory arrest unless patients are stabilised before transfer.

The root cause of this problem is a changed clinical pathway – moving patients on high flow oxygen longer distances to get to an in-patient setting within a hospital – without a corresponding change in device capability. Some hospitals have tried to get round the problem by connecting high flow units to battery-run power supplies but that creates a need to manage yet another type of support equipment.

The NHS Patient Safety Team helped identify underlying issues and worked with NHS staff to clarify clinical needs. They produced a Patient Safety Alert that recommends labelling devices without a transport mode as vulnerable to even brief interruptions in mains supply. Manufacturers are now developing units with integral batteries that can support longer periods of high oxygen flow without a mains electrical connection. This will allow organisations to add this requirement when tendering for units to be used in longer transfers.

make other improvements that support reliable usability and patient safety.

Even simple changes can take a lot of time to work out, as every possible mode of use and all possible unintended consequences should be considered before embarking on regulatory approval or asking for use variations. Much work with numerous stakeholders goes on behind the scenes, including evaluating different prototypes, design ideas and revised protocols.

5) Healthcare scientists and medical device safety

Healthcare scientists have important insights into technology and how it is used. They are also natural innovators due to the unique nature of their role and understanding of how systems work. Widespread adoption of a patient safety culture opens up opportunities for them to use technology to support and improve patient safety across the whole NHS.

Why does the NHS put up with device problems? If medical devices were cars, there would be many more device recalls than there actually are. A culture of working around problems rather than eliminating them is partly to blame. Healthcare scientists can take a lead in introducing a stronger patient safety culture for the NHS's medical devices.

There is expertise at every point of a medical device lifecycle. Effective collaboration between healthcare scientists, MDSOs, procurement leads, clinicians, PSSs and patients as primary users, is essential in developing a strong safety culture.

Good practice can be identified, shared through a variety of networks, and adopted widely to support all those working with medical devices.

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3. https://www.england.nhs.uk/patient-safety/patient-safety-insight/patient-safety-alerts/#NaPSRAP
4. The National Patient Safety Response Advisory Panel: see NatPSA link above.
5. The SMART acronym stands for Specific, Measurable, Achievable, Relevant and Time-related.
6. https://www.england.nhs.uk/patient-safety/the-nhs-patient-safety-strategy/
7. https://www.england.nhs.uk/patient-safety/patient-safety-involvement/patient-safety-specialists/
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11. NHS England – A just culture guide: https://www.england.nhs.uk/patient-safety/patient-safetyculture/a-just-culture-guide/
12. https://yellowcard.mhra.gov.uk/
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LEADING THE CHARGE:
HEALTHCARE SCIENTISTS AT THE POINT OF CARE

Anna Stec is a Clinical Engineer specialising in medical device risk management and governance. She is currently a Senior Project Manager for Scan4Safety in the Digital Clinical Safety Programme at NHS England and previously worked as a Healthcare Science Fellow on the implementation of test and treat in community point of care services.

Gilbert Wieringa is a retired consultant clinical biochemist. His major interest has been the promotion of point of care testing as a vehicle for achieving enhanced clinical, financial and organisational outcomes.

Many healthcare scientists work with diagnostic systems and tests, helping to provide patient results on a daily basis. But what happens when those tests move outside a controlled environment and into non-clinical settings? How can results be reliable when the person undertaking a test may not fully understand the equipment or the potential errors? And who will decide what equipment to use, and make sure quality control and servicing are carried out?

Healthcare scientists have an essential role to play in delivering effective, safe and evidence-based Point of Care Testing (POCT). They have expertise in all relevant areas, from managing equipment and quality monitoring through to the handling of patient data.

This article gives examples where Point of Care Testing (POCT)[1] is already improving healthcare. It also identifies opportunities where healthcare scientists can step into system-wide leadership roles to help deliver POCT and manage it well.

Setting the scene

In 2019 NHS England's Long Term Plan[2] made a commitment to shift away from a hospital-based model towards a more community-centred approach. It set out changes intended to improve clinical outcomes for multiple health conditions and identified actions that the NHS, individuals, companies, communities and national government can take in a 'shared responsibility for health'. This includes giving patients access to more personalised, digitally-enabled care and performing

Table 1 – Examples of POCT applications in healthcare science

POCT technology	Application
Life Sciences	
One or more of HbA1c, Cholesterol, HDL-cholesterol, LDL-cholesterol, glucose	Diagnosis and monitoring of diabetes, monitoring cardiovascular disease
Urinalysis	Detection of urinary tract infection
C-reactive protein	Detection and monitoring of inflammation
Brain Natriuretic Peptide (BNP) & NTproBNP	Detection of heart failure
Troponins	Ruling out of myocardial infarction
Viral antigens e.g. Covid-19	Self-detection of infection, case finding
International Normalised Ratio (INR)	Testing blood clotting times for patients on anti-coagulants
D-dimer	Detection of pulmonary embolism and deep vein thrombosis
Carbon monoxide	Supporting smoking cessation services
MRSA	Pre-admission detection of infectious disease
Chlamydia	Confidential self-diagnosis of sexually transmitted disease
Drugs of Abuse	Monitoring compliance with treatment
Full blood counts, Haematocrit	Differential diagnosis of anaemia
Urea and Electrolytes	Assessment of fluid homeostasis, monitoring renal profile
Genetic testing, genomics	Personalised healthcare

Physiological measurements	
12 lead ECGs	Detection of acute coronary syndrome, heart failure, cardiac arrhythmias
Portable ECGs	Self-detection of cardiac arrhythmias
Non-invasive blood pressure monitoring	Hypertension case finding, blood pressure checks
Oxygen saturation/Oximetry, peak flow measurements, blood gases	Assessing people with breathing difficulties
Spirometry, peak flow measurements	Lung function testing; self-management of Chronic Obstructive Pulmonary Disease (COPD), asthma, cystic fibrosis, idiopathic pulmonary fibrosis
Advanced lung testing	Gas transfer testing, lung volumes, mouth pressures, Field exercise tests
Sleep apnoea studies	Home sleep screeners and home sleep studies
Fractional expired nitrous oxide	Detection of active airway inflammation in asthma monitoring
Forced oscillometry technique	Assessment of airway obstruction and lung inhomogeneity
Portable ultrasonography	Vascular flow
Physical sciences	
Ultrasound imaging, specialised X-ray and MR imaging systems	Rapid/direct clinician access to patient imaging, bone density measurements

more diagnostic procedures outside hospital settings. Similar strategies are being pursued by the UK's Devolved Administrations.

Examples of current POCT applications are presented in *Table 1* above. These technologies are developing rapidly. Many are used in primary and community locations: *Table 2* lists some of these. Such settings present unique challenges, including how to integrate POCT results into remote clinical systems and manage patient data securely. Successful services need staff who are up to date with best practice and clinical leaders who understand POCT technology and the demands and risks involved in its management.

Table 2 – Some settings where POCT technology is in use

- Urgent Treatment Centres
- Supermarkets
- Community diagnostic hubs
- Home (self-testing)
- Community clinics
- Industrial medical centres
- Community pharmacies
- Mobile units
- GP surgeries
- Polyclinics, diagnostic centres
- Health centres
- Sexual health/GUM clinics
- Emergency service vehicles
- Residential and care homes (fire, police, ambulance)
- Prisons

> "**Successful services need staff who are up to date with best practice and clinical leaders who understand POCT technology and the demands and risks involved in its management**"

The role of the healthcare scientist in POCT

The introduction or review of POCT systems provides key opportunities for healthcare scientists to take a lead, whether in selecting and managing the technology or when making sure effective services are provided.

A resource to help with this is set out in *Table 3*. It presents a set of topics aimed at supporting discussions with current or future POCT users and providers, including Integrated Care System commissioners.

To complement this, the following paragraphs explore specific leadership opportunities for healthcare scientists at different stages of a POCT project.

Leadership and Strategy:
Healthcare scientists are well placed to lead the adoption and integration of innovative technologies, including POCT. Introducing new ideas across an organisation or wider health system involves identifying allies and setting shared objectives that align with broader NHS goals, such as better patient care and improved efficiency. Evidence will also be needed of positive impacts on patient outcomes and long-term benefit. Subsequent leadership challenges include dealing with resource limitations, stakeholder resistance and logistical constraints. Addressing such challenges requires innovative thinking, effective evidence gathering, persuasive and persistent communication, and diligent stakeholder management.

Implementation of POCT Technologies:

Successful introduction of POCT technologies depends on the thorough evaluation and evidence-based selection of appropriate devices. Input from healthcare scientists is essential. Their evidence gathering can also signpost improvements in clinical workflow and find measures leading to enhanced diagnostic capability and improved patient management at the point of care.

Medical Device Management:

Healthcare scientists understand the technology their POCT services use and any associated device risks. They can take a lead in proactively scanning technical and logistical developments, incident reports and regulatory changes to help prevent adverse events, and in keeping devices operating effectively and safely.

Governance and Compliance:

Governance for POCT services can be complicated. Healthcare scientists must work with different professional groups to ensure broad oversight and accountability. Frameworks must be comprehensive and include regular review and reporting of both technical and procedural compliance.

Training and Development:

Since staff (and patients) must be competent to use POCT technologies, healthcare scientists have an opportunity to offer and promote regular training and updates to other groups on technology use and management, and to set up systems to monitor individual training status.

Future Trends and Innovations:

Healthcare scientists naturally investigate emerging trends and innovations to accelerate improvements in healthcare. Their leadership challenge is to foster a culture of innovation and the exploration of new ideas and technologies, and to drive promising POCT initiatives to the forefront of their organisation's strategic plan.

Collaboration and Stakeholder Engagement:

Successful collaborations, such as partnerships with academic institutions or technology companies, often lead to significant innovation and service improvement. Healthcare scientists work closely with other healthcare professionals, industry experts, and arm's-length bodies to champion the use of advanced technologies and develop robust governance practices. They also have expertise in integrating NHS and independent sector capabilities.

Conclusion

Healthcare scientists are ideally placed to lead Point of Care Testing project implementation and oversight. They have an expert understanding of medical device governance, risk management and mitigation, and insights into the contributions and limitations of point of care technologies.

As POCT continues to develop it provides opportunities for healthcare scientists to embrace leadership roles that

Table 3 – Factors to consider when planning POCT services

Developing a case: clinical and service impact

Reasons for starting a POCT-led service:
- A/E and hospital admission avoidance, informed triaging decisions
- Improved results turnaround
- Faster, more confident decision making
- Reduced number of patient journeys ('One stop'), access to more remote locations
- Enhanced patient satisfaction/experience
- Greater patient involvement in their care, empowered self management
- Better patient compliance with treatment, faster optimisation
- Guided antibiotic prescribing, support for antimicrobial stewardship
- Enhanced clinical outcomes
- Enabling new ways of working
- Reduced patient sample volume needs, reduced episodes of pre and post analytical errors
- Enhanced financial outcomes

Reasons for not starting a POCT-led service:
- Costs do not translate to longer term benefits
- Lack of evidence for the technology
- Lack of evidence of clinical application
- The environmental infrastructure (space, power, water, temperature control) does not meet location and technology requirements
- Insufficient human resource availability and competency

Technology selection

Issues to take into account:
- Evidence base for the proposed technology (manufacturer data, literature reviews)
- Ease of use, size, space/environment needs
- Interfacing capability to laboratory/electronic health records
- Results comparability with central laboratory/parallel testing
- Avoiding duplication of technologies, minimising number of different platforms
- Capacity for current and projected workloads
- Capital purchase versus leasing/reagent rental options
- Running costs (technology, staffing, liability insurance/indemnity etc)

Training and support

Issues to consider:
- Responsibility for delivering training/certification of competencies
- Ensuring right test for right condition/disease
- Ensuring safe and appropriate sample taking
- Interpretation of results, action to be taken on results, understanding limitations of results

- Responsibility for maintenance and troubleshooting
- Service contract options
- Record keeping/storage of results
- Management of reagents/kits, quality assurance materials, and consumables
- Provision of training manuals, standard operating procedures (SOPs)
- Assigning individual responsibilities
- Availability of a CPD programme for staff delivering the service

Quality assurance

Issues to consider:
- Ensuring appropriate Internal Quality Control tests are available
- Establishing a policy for test frequency and actions to be taken on acceptable or unacceptable results
- Ensuring External Quality Assurance schemes are fit for point of care purposes
- Regular review of QA results to assess test performance and/or operator competency

Governance and Compliance

The infrastructure should ensure:
- Regular audit of the service
- That technology is appropriate and certified, e.g. UKCA or CE-marked
- A POCT Committee establishes and oversees an operational and quality management system compatible with relevant ISO standards (eg 15189:2022 for laboratory tests)
- That the service has or is working towards UKAS accreditation under a relevant scheme
- That IT connectivity supports sharing of results with existing electronic heath records

Health and safety

As a minimum, ensure policy and practice meets guidance and legislation for:
- Infection Control
- Management of clinical waste including sharps
- Environmental controls and sustainability
- Decontamination
- Decommissioning equipment
- Adverse incident reporting

involve strategy development, operational implementation, compliance oversight, and the fostering of a culture of continuous learning and collaboration across health and healthcare providers

By embracing these challenges and stepping into POCT leadership roles, healthcare scientists can make a profound impact on the quality and efficiency of healthcare and help achieve global excellence.

Relevant guidance:

1 Point of care testing in community pharmacies guide, NHS England, January 2022: https://www.england.nhs.uk/primary-care/pharmacy/point-of-care-testing/

2 Guidance on managing medical equipment within virtual wards (including Hospital at Home), NHS England, March 2024: https://www.england.nhs.uk/long-read/guidance-on-managing-medical-equipment-within-virtual-wards-including-hospital-at-home/

3 Management and use of IVD point of care test devices – Guidance, MHRA, February 2021: https://www.gov.uk/government/publications/in-vitro-diagnostic-point-of-care-test-devices/management-and-use-of-ivd-point-of-care-test-devices

4 Digital Clinical Safety Strategy, NHS England, September 2021: https://transform.england.nhs.uk/key-tools-and-info/digital-clinical-safety-strategy/

5 Clinical risk management standards, NHS England (Digital), July 2020: https://digital.nhs.uk/services/clinical-safety/clinical-risk-management-standards

6 Point of Care Testing: National Strategic guidance for at Point of Need Testing, May 2023: https://www.rcpath.org; https://www.labmed.org.uk; https://www.ibms.org

7 Point-of-care testing (POCT) accreditation, December 2022: https://ukas.com/accreditation/standards/poct/

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2. https://www.england.nhs.uk/publication/the-nhs-long-term-plan/

ARE LEADERSHIP SKILLS USEFUL WHEN WRITING A BOOK?

Some consider authors to be leaders *by definition* but how relevant are general leadership principles to the process of writing a book? This article briefly discusses some of the issues and challenges and how leadership skills can be brought to bear. In our case the number of professional relationships was small but the fact that the project spanned more than two years meant that some key leadership attributes such as perseverance and dedication were particularly important.

How did the book come about?

The background to the book is an example of how 'one thing can lead to another' in the publishing world, based on previous collaborations and reputation. Back in 2018 I was approached to co-author a chapter on medical device regulations for book on MATLAB® programming in diagnostic radiology[1]. The book was well received and one of the editors suggested to the publisher that I be asked to expand my chapter into a full book. I was duly contacted and willingly agreed to do it.

I could have taken on the whole project myself but as I am retired I wanted to collaborate with someone currently working at the 'coalface'. Matt Memmott and I met when he was a clinical scientist trainee in Lincoln and have remained in touch since he moved to a senior nuclear medicine position in Manchester. We recently collaborated on a few successful publication projects so have an established working relationship.

My only concern was persuading him to do it! Like all clinical scientists, Matt is extremely busy so I wasn't sure whether he would have enough time for this project. However after a fair amount of persuasion, encouragement, and a few follow-up emails he agreed.

Having much more spare time than Matt I was happy to be lead author and do most of the time-consuming background research and initial drafting. Matt agreed to draft chapters within his particular area of expertise.

A publisher sets the overall timescale and page limit, so the lead author must organise things to comply with these requirements. I put all the tasks into a Gantt chart and we agreed on the division of labour and approximate timescales.

The publisher appoints a senior Editorial Assistant (EA) to be the main point of author contact. The EA will want to see

Philip S Cosgriff *is a retired medical physicist.*

evidence of content being produced at various check points and will be in regular contact to make sure that things remain on track. We were very lucky as our EA was a pleasure to work with. The book was finally published in March 2024[2].

Leadership styles useful in project management

What works in leadership will depend on context and situation, and can be specific to an organization or industry[3]. For example, the company mantra 'Move fast and break things' may have worked well for Mark Zuckerburg at *Facebook* but is not a management style that would be well received in a Neurosurgical Unit.

I have mentioned the importance of persuasion and encouragement in the process of getting this project off the ground. Many other well-known leadership attributes such as enthusiasm, motivation, persistence and compromise were involved at some point during this project, often during difficult times when it looked like it might stall. Indeed most elements associated with good leadership[4] are useful when organising a large project, especially when the team is large and/or geographically distributed.

Our book was ambitious in scope, covering EU, UK *and* US regulations. We knew from the start that staying within the specified page count would be a challenge. About halfway through the project it became clear that the number of chapters, sub-chapters, illustrations and other content would exceed the planned figure. We told the publisher and provided a couple of options, supported by a mini business case. Our preference was to increase the page count by about 20% to include sufficient detail on each topic. This request was agreed by the Commissioning Editor and removed a lot of pressure, as chopping out 20% of the draft content would have involved difficult decisions and a lot of editing. I like to think that this agreed expansion was based on the excellent relationship that had been built up with the publisher over the previous year.

> " **What works in leadership will depend on context and situation, and can be specific to an organization or industry** "

Looking back, one of our few regrets with the project was not keeping an accurate record of the time we spent on it. Collectively Matt and I estimate we spent about 1,000 hours over a two year period, which obviously represents a huge commitment and emphasises the crucial importance of enthusiasm and commitment. Put simply, you will never complete a project like this unless the main participants share those attributes.

Communication is the glue that makes this all work. Good communication skills are essential for leaders and book editors alike, both *what* is said and *how* it is transmitted. Routine information can be sent electronically but when making important decisions there is no substitute for speaking directly to your colleagues. This is best done in person or by phone if necessary. Many poor leaders hide behind emails or social media channels, naively thinking that simply sending an instruction will make something happen. Good managers however use electronic communication to *confirm* what was agreed during a 'proper' discussion.

In summary, good leadership is undoubtedly important but a leader is nothing without a good team. When Sir Richard Branson was once asked in a radio interview about the key to his success, he famously replied, "Appoint the right people. That's it".

Learning from this publication project

1 Keep the project team as small as possible.

2 Do your market research. What is already out there?

3 Spend sufficient time on planning, including options and contingencies.

4 Get input from potential users/readers if possible.

5 Agree the roles and responsibilities of the main participants.

6 Agree the detailed division of labour and associated timescales, at least for the first six months.

7 Space work out evenly. Committing a set number of hours *every* week is better than working solidly for a whole week and then not coming back to it for a month.

8 Revise the project plan as needed, subject to any external constraints.

9 Always send a confirmatory email when things are discussed or agreed verbally.

10 Use a shared repository such as Google docs for all project documents and implement a system of version control.

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OUT OF SIGHT, OUT OF MIND: HOW DO WE RAISE THE PROFILE OF NON-PATIENT FACING HEALTHCARE SCIENTISTS?

I'll never forget the first time I worked with a patient. It was twenty years ago and I was a catering assistant in a nursing home. Most of the time the job involved making cups of tea and washing up but on this day the home was so short-staffed that staff were being redeployed, and I was sent to help with lunch.

What that actually meant was that I was handed a tray of food, directed to a patient's room and told to feed them. To make the situation more complicated the patient was in the later stages of dementia and visually impaired. And they deserved considerably more dignity than could be given by an untrained teenage member of staff who was terrified of unplanned social interactions at the best of times. We got through lunch – I'm not going to call it a success – and it showed me the importance of staff training on patient safety and dignity. It also hammered home that I did not want a patient facing role so when I left school I joined the NHS as a trainee biomedical scientist, a job that let me support patients without ever meeting them.

It was over a decade before I ended up working close to patients again. In December 2013 two-year old Emile Ouamouno died in Guéckédou, Guinea and is believed to be the index patient of the first Ebola Virus Disease outbreak in West Africa. This outbreak went on to cause over 11,000 deaths[1]. I volunteered to join one of the laboratory teams sent to support the response and after a week of Novel and Dangerous Pathogen training at Porton Down I worked in an Ebola Treatment Centre in Port Loko, Sierra Leone.

Our multi-national team of laboratory scientists included biomedical scientists from the UK and was responsible for

Kip Heath *is a Biomedical Scientist in Virology and Immunology, Clinical Scientist in Microbiology, Science Communicator and occasional professional Stand-Up Comedian. [Photo Credit: Steve Cross]*

processing samples from the Ebola Treatment Centre. Most of this work was testing blood samples from new patients to confirm whether they were infected with Ebola virus. We also tested swab samples from anyone who had died in the surrounding districts in the previous 24 hours so that public health teams could track community infections. A hatch between the laboratory and patient wards (the 'Red Zone') put laboratory staff in direct contact with clinical teams and patient treatment.

As part of the legacy work, my team was responsible for training local medical scientists in Ebola PCR to help support any future outbreaks in the area. In return they invited us to tour their hospital and laboratory. For the first time in my healthcare science career, I was able to engage with multi-disciplinary teams and see the direct impact of pathology in patient settings.

Port Loko Ebola Treatment Centre

Kip processing samples for Ebola virus PCR

As a life scientist who has spent most of her career in laboratory-based roles, I am proud of the impact that healthcare scientists can have on patients' lives without seeing them day to day. I'm autistic and strongly introverted so having a role where I can support patient care from behind the scenes of the hospital has generally worked out well for me.

But is it enough? It's estimated that healthcare scientists contribute to 80% of the diagnoses made on the NHS, and that 95% of patient pathways require access to pathology services. The overwhelming majority of staff in these services are healthcare scientists and yet we are still a relatively unknown profession[2].

Doctors and nurses are the most visible and publicly supported part of the NHS. Time and time again we see media articles that highlight their contribution without reference to all the other vital professions that keep the NHS going, and this can be detrimental to healthcare scientists when it comes to opportunities and funding[3,4].

If our better-known patient-facing colleagues cannot champion us and the wide media coverage of COVID-19 testing during the pandemic has not improved public awareness of healthcare science, then how do we change that narrative and make our roles equally well-known? Because let's be honest, if we don't do it then no-one else will.

The most recent Public Attitudes to Science report shows that on the whole scientists aren't seen as good communicators or as putting enough effort into engaging with the public[5]. That's not to say that all healthcare scientists fall into this group, as there are fantastic healthcare science public engagement projects taking place every year. It is also easy to see that, when services are stretched, clinical work will take priority over everything else.

But I do believe there are things we can do, and arguably things we must do, if we want to support our current services and encourage young people to select healthcare science careers.

Sometimes it's a struggle to find the confidence for public engagement! [Photo Credit: Steve Cross]

First, we can consider the communities that we target. Much careers engagement work is aimed at secondary school students even though there is evidence that stereotypes influencing career choices can develop in children as young as six[6]. This demonstrates the importance of working with younger children too.

We can also collaborate, not only to centralise our resources and ease the burden across multiple clinical services but also to share our strengths. There are many life scientists like myself who are terrified at the thought of patient interaction but we can work with physiologist and other healthcare science colleagues for whom it is more natural. This would also help the workforce follow Wellcome Trust guidance to 'build a stronger sense of common identity', making it easier to share goals and develop collaborations between healthcare scientists from different specialisms and backgrounds[7].

> **It is also easy to see that, when services are stretched, clinical work will take priority over everything else**

In summary, my belief is that we should come together as a healthcare science workforce to utilise our diverse skill sets and raise the profile of all our careers. Otherwise we might have more autistic introverts who take the drastic step of tackling their fear of public speaking by trying their hand at comedy.

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