NHS Education for Scotland

NES HEALTHCARE SCIENCE
Annual Report 2020 – 2021

We support the
training and development
of **postgraduate scientist staff**
and other **key groups** in the
healthcare science workforce

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Introduction

We support the training and development of postgraduate scientist staff and other key groups in the healthcare science workforce

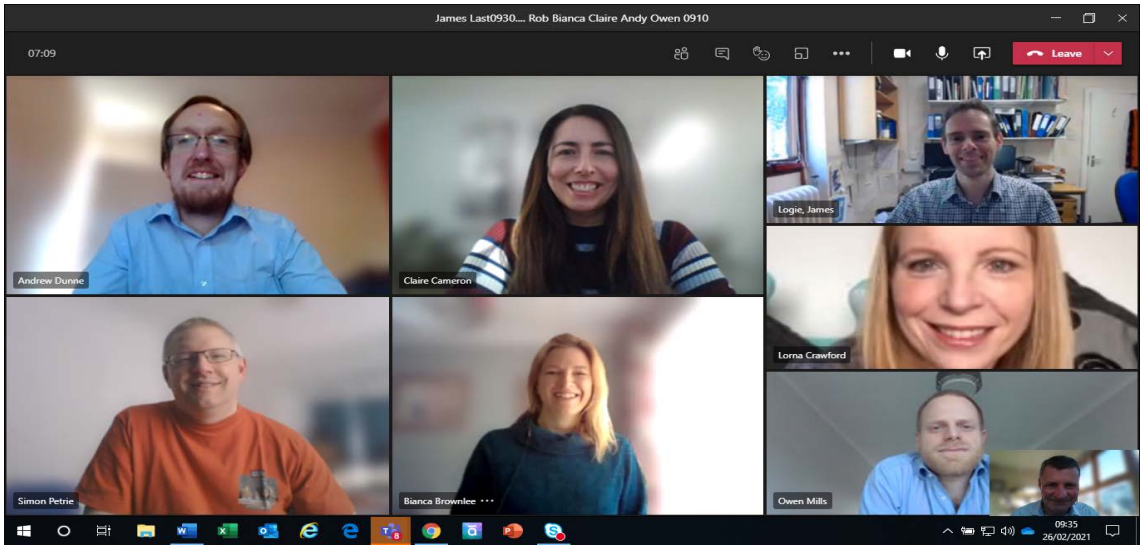
Our Annual Report for 2020-21 covers our three areas of activity:

- we commission Healthcare Science training,
- we quality monitor training, trainees and departments and
- we offer generic CPD both face-to-face and online

The core team here at NES Healthcare Science, act as a national focus for healthcare science education and training. We are here to help you. The Healthcare Science Workforce is the 4th largest clinical-registered group of NHS staff with approximately 7000 staff in post across NHS Scotland. With some 50 sub-specialties, it covers life sciences such as laboratory testing, clinical physiology such as cardiac testing and physical sciences such as medical physics.

The Healthcare Science Workforce
is the
4th largest
clinical-registered group of NHS staff

Meet the 2020-21 NES Healthcare Science core team:



Clockwise from top left: Principal Leads: Andy Dunne, Claire Cameron, James Logie (lwho left NES in March 2021), Lorna Crawford, Owen Mills and Rob Farley (inset, Associate Director), Bianca Brownlee (Principal Lead) and Simon Petrie (Business Support)

Just prior to publication, farewell and good luck to our former NES colleague James Logie , who contributed to the core team for two years as a HCS Principal Lead. James has now returned to service and we would like to pass on our gratitude for all his work with us.

Foreword

2020-21 will be remembered as the “Covid year”. Our workforce has been challenged yet proved adaptable. Ways of working – and training - have undoubtably changed, but our core mission remains as the oversight and support of that training.

Dr Robert Farley
NES Healthcare Science Associate Director

March 2021, as this report is being written, sees us one-year on and still in a restricted pandemic-affected world. How did the limitations affect our NES activity and wider training? What could we not do? What new ways of working did we introduce to support our three areas of activity? What ways of working will we keep when this has passed?

In the main, the Healthcare Science Core Team at NES has always worked remotely. Most of the Team are part-time with NES, so several years ago we decided it was more efficient and convenient for the team (if they preferred) to work from home on “NES-days”. For our team, the switch to full “virtual” collaboration necessitated by the pandemic was seamless. Our in-person engagements have of course been affected, including the class-based courses and national events.

Using our Go-to-Meeting platform, we supported the recruitment of 21 clinical scientist trainees via 120 online interviews. This year saw 1675 applications, up by nearly 50% compared to the previous year and a sad reflection of just how tight the labour market has become. We supported 37 postgraduate bursaries to in-service staff, which was broadly in-line with previous years. In 2020 we supported 21 new start higher specialist consultant scientists following cohort funding from the Scottish Government. The additional grades boosted the number we now track for assurance purposes.

1675
Applications
Increase of nearly
50%

In monitoring the state of training, the key line of enquiry throughout lockdown has been the impact on progression. We had over 200 active trainees, mainly postgraduate but also including 51 practitioner-level clinical physiologists. A multi-profession survey by NES, mid-year, indicated that about 70% of all healthcare science respondents anticipated some impact on their training plans. By the end of the year, a trainee survey by the Core Team indicated that around 10% had ongoing concerns about completion compared to only 2% the previous year. On a case-by-case basis we have agreed minor extensions to support where NES is meeting full trainee costs. However, trainees and supervisors have shown remarkable agility and creativity in redesigning training plans or utilizing redeployments.

So, 73.1% of eligible trainees shared with us their training plans and 89.7% completed a satisfactory ARCP declaration, both of which are sound proxies for assuring training. We have also engaged with training centres and requested a self-declaration of ability to support training. The self-declaration with audit is a proportionate approach to this aspect of assurance. Over 50 centres have completed self-assessment, including a satisfactory audit, by our core team, of sampled evidence. A list of centres completing this assessment is published on our Knowledge Network Healthcare Science Trainees community.

Owing to the pandemic we were obliged to run our trainees' and supervisors' annual event online: very much a learning exercise for us. We framed the event as 9 one-hour sessions throughout one week. Speakers were limited to 10 minutes each to maintain engagement. The Lockdown Stories session was particularly heartening as it revealed the creativity and innovation of our trainees in responding the pandemic, ranging from developing improved PPE, widening responsibility in patient-facing services and in diagnostics.

70%

of all healthcare science respondents anticipated some impact on their training plans

We will surely retain elements of this approach as it was clearly a more inclusive and accessible platform for many of the participants.

It leaves our class-based offer still to fully transform to our virtual way of working. Following a pilot of our ideas, we are formulating a blend of online workshops and individual virtual learning to support trainers. We have assisted several specialty groups publish, on Turas Learn, useful learning material and our offer to service to continue to use the platform remains.

This remarkable year heralded a step change in the way colleagues work and train as the wider pandemic drama played out. There will be positives, but the sadness and pain that this year has seen must be acknowledged.

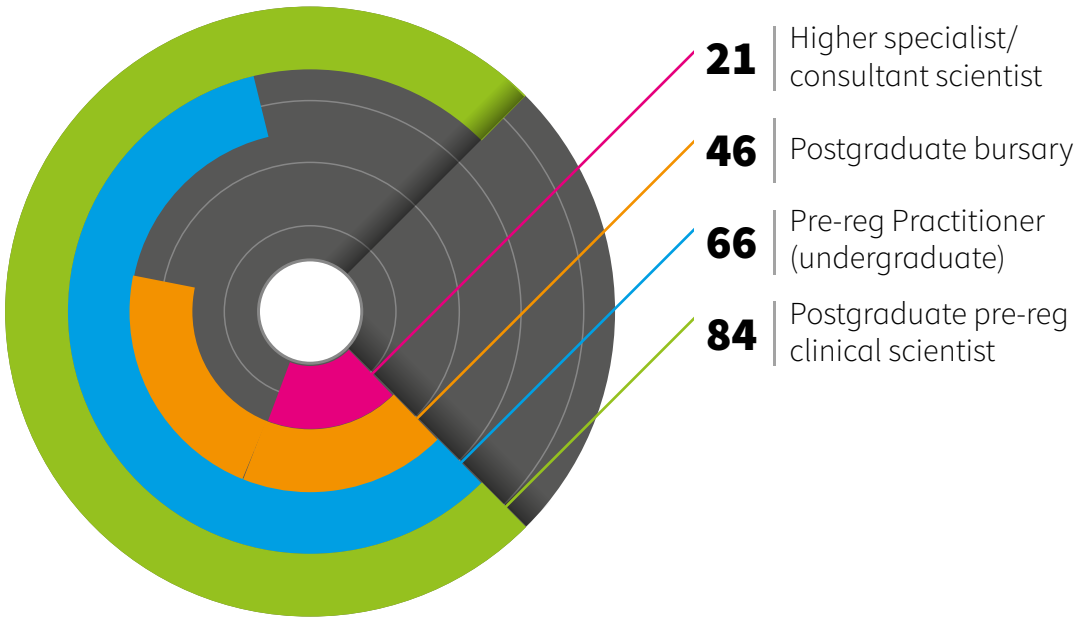
“This **remarkable year** heralded **a step change in the way colleagues work and train**

Healthcare Science Training Commissions

From fully funded trainees to postgraduate bursary awardees, TURAS Training Programme Management (TPM) system tracks specific elements of the workforce in training

Currently 217 active trainees are in the programme in the following broad areas: practitioners (undergraduate level); postgraduate bursary; postgraduate pre-registration clinical scientist, biomedical Scientists undertaking Specialist portfolio and higher specialist/ consultant scientist. With trainee numbers added to TURAS increasing annually as more students apply for NES training numbers.

Training Number community



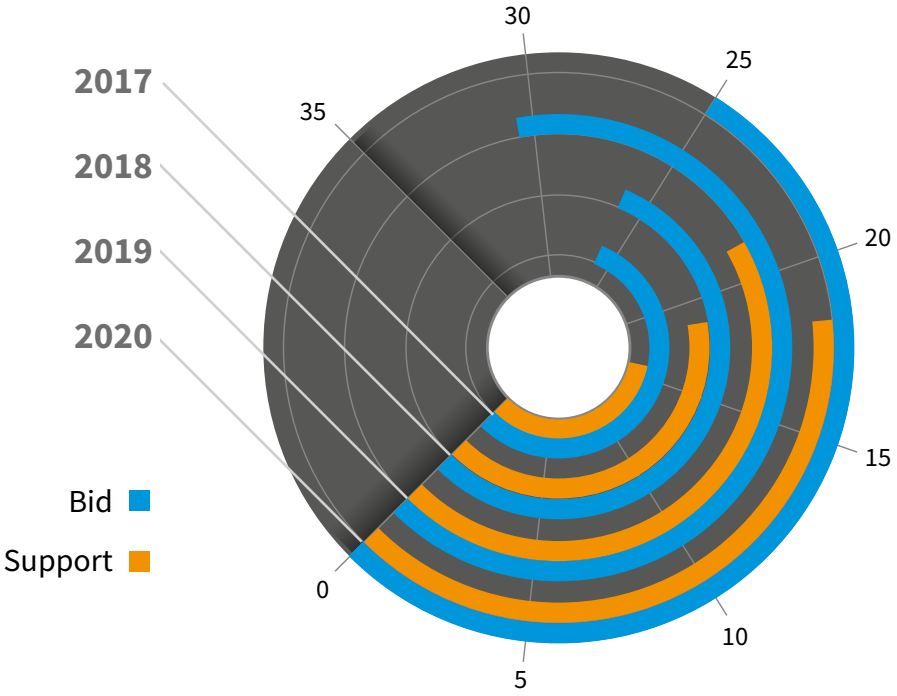
Our Healthcare scientist trainee cohort includes supernumerary Pre-registration Clinical Scientists and Practitioner-level (graduate) staff undertaking advanced-practice scientist development. Training involves either 3-year STP or an equivalent Masters level programme.

Clinical Scientist Training

As at March 2021 we were supporting 84 clinical scientist trainees across 13 specialties. 14 Clinical scientist trainees were on pathways using the Scientist Training programme (STP).

Specifically, in 2020 we were able to support an intake of 18 clinical scientist trainee posts to meet a demand for 25 posts from services' expressions of interest.

Clinical Scientist commissions



Clinical Scientists in Training as of March 2021

Cellular sciences	**1**
Cardiac science	**1**
Immunology	**2**
Reproductive sciences	**5**
Microbiology	**6**
Biochemistry	**12**
Genomic sciences	**24**
Medical Physics & Clinical Engineering	**33**

Higher Specialist Scientist Trainees

For the first time, a further cohort of 21 in-service trainees were supported as higher specialist – consultant scientist trainees. This initiative was funded in September 2020 by Scottish Government following our business case in 2019 originally for 13 posts. Invitations opened to prospective applicants in Sept 2020 with the successful awards distributed in December 2020 for 21 trainees.

These trainees are undertaking programmes of development that mirrors Higher Specialist Scientific Training. Whilst registration as a clinical scientist is not a pre-requisite for this programme, applicants must be at least level 7 of the NHS Scotland career framework for health.

These competitive awards required a clear training plan from the individual and endorsement/support from the employing department. The award is in the form of a training allowance for use by the employing department to facilitate training of the individual over a maximum period of five years.

a further cohort of

21

in-service trainees

were supported as

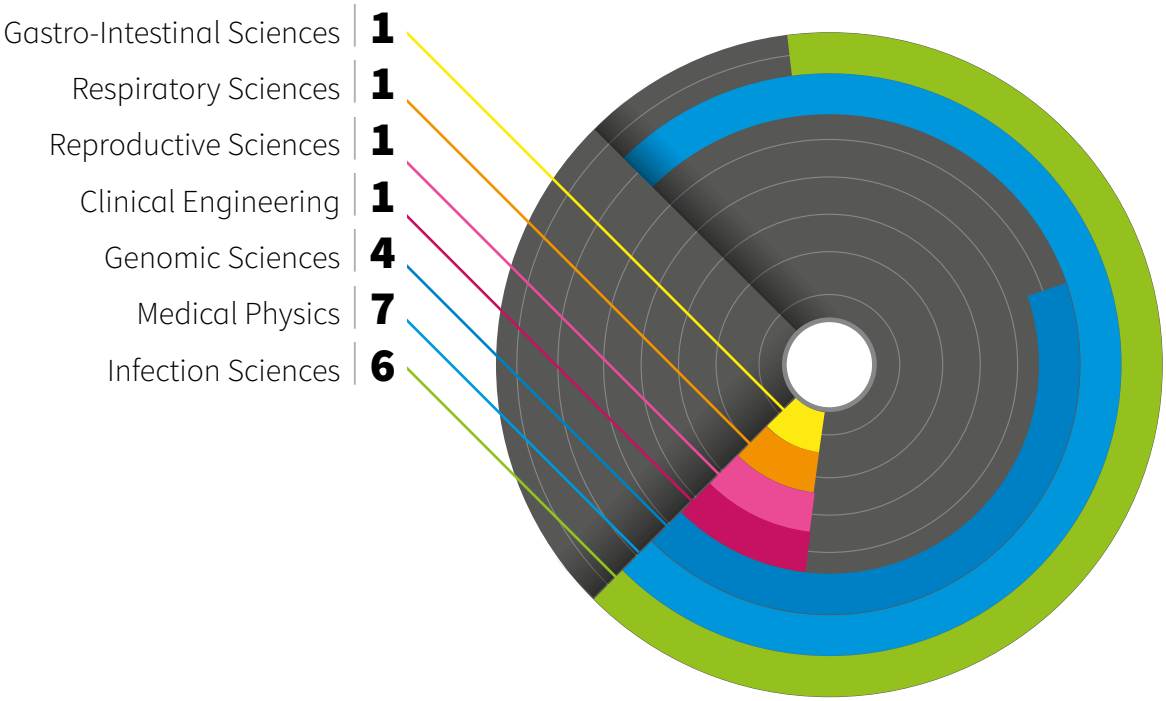
higher specialist – consultant scientist trainees

The plan of development for the consultant trainee must incorporate:

- scientific and clinical **specialism** development
- **research** skills development to doctoral level
- **leadership** and management development.

Training should be aligned with these high-level themes of Higher Specialist Scientific Training for the specialism so that trainees are eligible to apply for HSS equivalence with the Academy for Healthcare Science and potentially join the AHCS HSS Register.

Higher Specialist Scientist cohort 2020



Post–Graduate Bursaries Supported at NES

Annually since 2013, NES supports bursary funding for in-service staff to follow postgraduate/post registration advance-practice development.

Bursaries are competitive awards. Scoring is done by 7–10 independent assessors.

The awards support development across the four pillars of practice – our Common Core List, namely: scientific specialty; safety and improvement; people and leadership; and research.

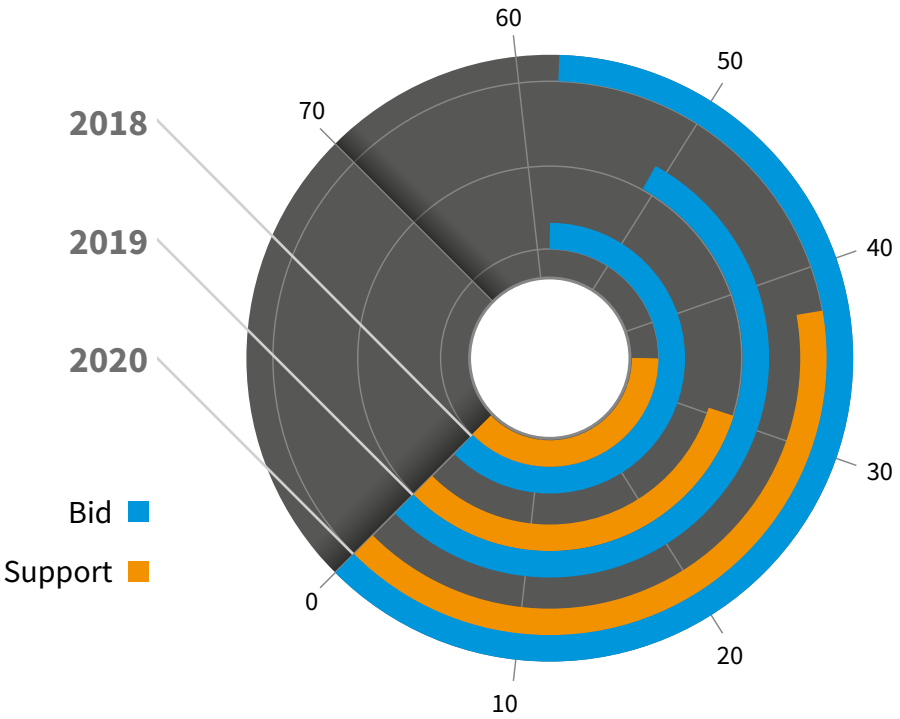
Applicants are:

- Based in a department that is recognised via NES self-assessment as a postgraduate training centre
- HCS Practitioner-level staff and seeking post-registration / postgraduate development

Irrespective of subsequent year's support, candidates retain their National Training Number during their planned programme. Between 30 and 40 are supported each year.

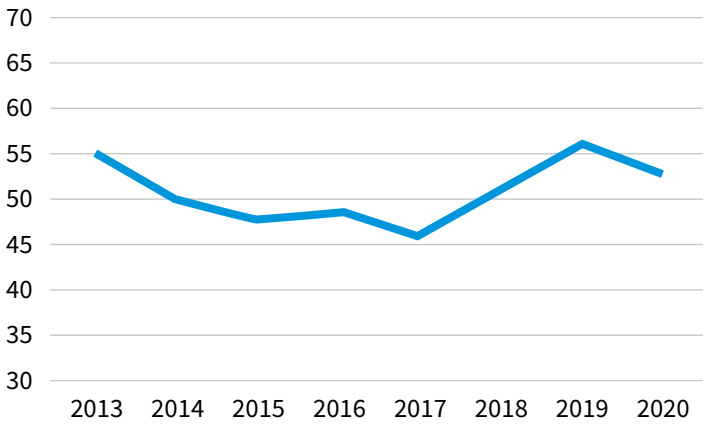
The awards **support development** across the **four pillars of practice**

Bursary support for postgraduate study



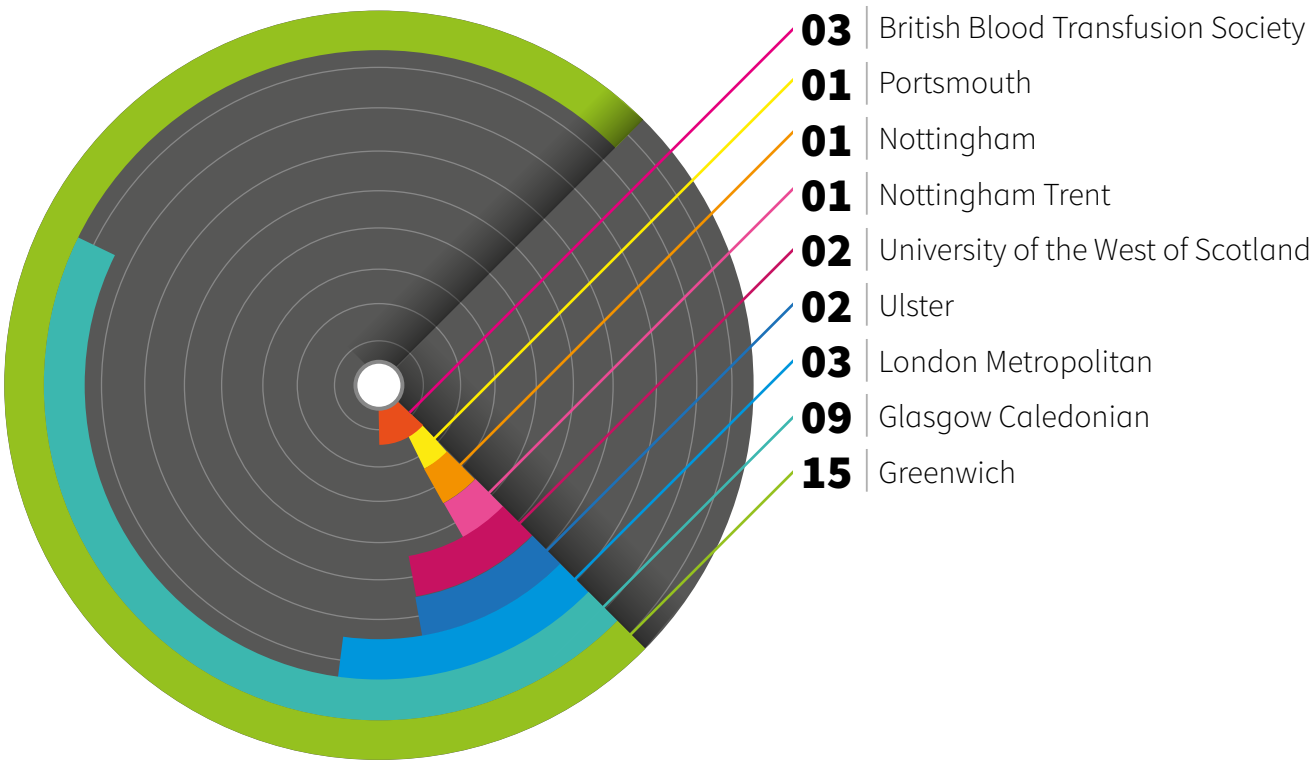
The cut-off level for support varies with the total funds available for the programme, but across many different assessors over the years has remained relative consistent.

% Award Threshold



Providers of academic programmes are largely distance-based and part-time. In 2020 all those awarded support were Biomedical Scientists. This community has a well-established system postgraduate training, well-promoted in Scotland by the training forum. The postgraduate bursaries is open to all specialities in service across Healthcare Science for further education at postgraduate level.

Postgraduate study destinations 2020



NES HCS supported 37 postgraduate bursary awards from 57 bids and currently we are tracking 46 individuals, mainly Biomedical Scientists looking for development towards more senior roles in Life Science disciplines.

Practitioners

Healthcare Science Practitioners are graduate-level registered staff who, in many areas, make up the bedrock of service delivery. Some practitioner staff such as Biomedical Scientists generally undertake a recognised full-time undergraduate programme that include state registration, much like nursing or allied health professionals.

Two practitioner groups that use NHS-employed work-based trainees are clinical technologists and clinical physiologists. Our case studies later describe their respective roles.

Clinical Technologists

In 2020, Scottish Government awarded NES support to sponsor a cohort of 7 supernumerary medical physics clinical technologists to train via their professional body work-base programme. This two-year programme is administered by the Institute of Physics and Engineering in Medicine. The cohort includes nuclear medicine technologists, clinical engineering technologists and radiation protection technologists. Training is over two years and we expect these trainees to join the Register of Clinical Technologists, which is accredited by the Professional Standards Authority.

Modern Apprenticeship Programme

To improve recruitment and to reduce the average workforce age there are now options for recruitment of staff with the Modern Apprenticeship programme in various disciplines in Healthcare Science. Although NES does not directly support this level, such trainees do progress onto HCS Practitioner training. One department that has reported success with this training programme is the Department of Clinical Physics and Bioengineering's (DCPB) Medical Equipment Management (MEM) service in Greater Glasgow and Clyde.

there are now options for recruitment of staff with the **Modern Apprenticeship programme**

MEM recently offered a band 5 technologist modern apprenticeships. Substantive band 5 vacancies are advertised as a 4-year apprenticeship based on the Skills Development Scotland Technician pathway.

The first year is based full-time at college where the apprentices complete a HNC Electronics plus SVQ Level 2 in Performing Engineering Operations. During years 2 and 3 the apprentices attend day release at college and complete a HND Electronics and in the workplace they complete a SVQ Level 3 in Instrumentation. During Years 3 and 4, as Practitioner trainees, they undertake the Institute of Physics and Engineering in Medicine Diploma in Clinical Technology alongside the GG&C SCQF Level 9 customised award in Healthcare Technology Management.

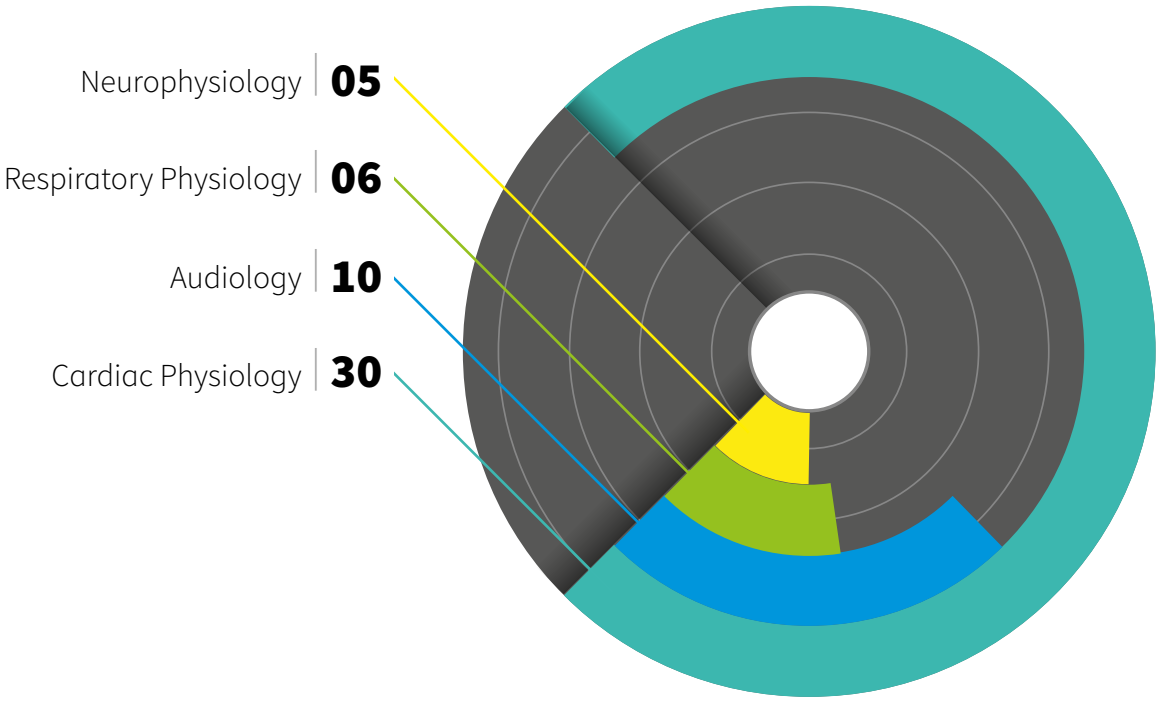
Upon completion of the apprenticeship, the trainees have the technical, scientific and clinical knowledge and skills necessary to perform in a band 5 role and are also eligible to join the Register of Clinical Technologists.

Clinical Physiologists

In 2020 we tracked 51 practitioner-level clinical physiologists. Many are undertaking the part-time clinical physiology programme at Glasgow Caledonian University, which runs biennially. In 2020 there was not an intake, the next is in 2021. Some other in-service trainees are developing competences through in-house arranged programmes of training called “equivalence”. Regardless of pathway, trainees join accredited registers operated by the Academy for Healthcare Science or the Registration Council for Clinical Physiology.

The last annual report indicated Scottish Government’s 2019 intention to fund, specifically, 30 cardiac physiology trainees. The refreshed Workforce Plan includes an intention to continue to do so for the intake in 2021.

Trainee Clinical Physiologists by type
as at March 2021



Pre-registrant involvement during Covid Pandemic

Temporary registration was introduced by regulators such as the Health and Care Profession Council and the Academy for Healthcare Science Shared Temporary Register to assist service in running clinical services – including diagnostics. Throughout 2020 around 70 pre-registration Biomedical Scientists and Clinical Scientists were eligible to be admitted to the HCPC's temporary register. Whilst NES Healthcare Science does not have direct oversight of Biomedical Science undergraduates, we did work with Scottish Government to produce student guidance for both groups, for those joining service under these temporary arrangements. The registers have now closed to all professions except clinical science and biomedical science – with a handful of staff in Scotland still so registered.

Case study

Practitioners Training Programmes with NES support

Eilidh McGowan, Clinical Technologist

During my undergraduate degree in Physics from the University of Strathclyde, I became interested in the medical applications of physics. I first discovered the field of Medical Physics through a talk given by my university's careers service by a Strathclyde alumnus who had recently completed their NES training.

Throughout university, I found I much preferred the hands on, practical aspects of science therefore the role of clinical technologist was perfect for me as it was the right mix of practical and theory work. There is something very satisfying to me to completely dismantle a faulty machine to fault find and have it work upon reassembly.

I applied for my current position which included a two year, NES funded training scheme working towards an IPEM (Institute of Physics and Engineering in Medicine) diploma and an SQA qualification in Medical Equipment Management; both of which required a portfolio to be submitted consisting of reports on types of equipment, case studies, and practical assessments.

The role of the medical physics instrument laboratory is to service and repair most of the hospital's medical equipment. This ranges from small diagnostic tools such as ear thermometers to large life support systems like ventilators.

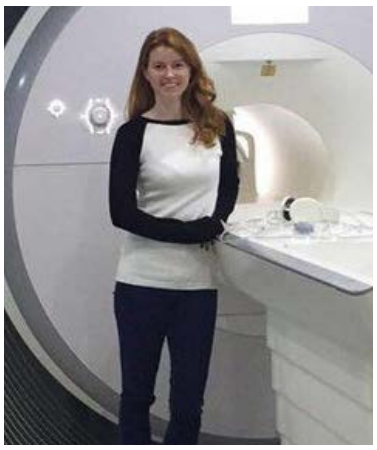
Going forward in my career, I would like to continue learning and working on more equipment and progress towards becoming a specialist clinical technologist.

I am a clinical technologist working in the medical physics instrument laboratory in the Glasgow Royal Infirmary (GRI).

Case study

Supporting Trainee Clinical Scientist Programmes

Jennifer Summersgill, Clinical Scientist



I am a Clinical Scientist working in Magnetic Resonance Imaging Physics.

Upon completing my undergraduate degree in Astrophysics at St Andrews University in 2016 I started researching career opportunities. I was drawn to applications of Physics in healthcare from being a survivor of childhood leukaemia. After graduating I was offered a six-week placement in the Department of Cardiovascular Research at Ninewells Hospital, Dundee, where I analysed the effect of cardiovascular disease on whole-body Magnetic Resonance Imaging (MRI) angiograms. This was my first introduction to Medical Physics, and prior to applying for the training scheme I gained further experience working as a Medical Physics Technician in the University of Dundee Clinical Research Centre. This allowed me to learn about the role of medical physics in research and gave me a better understanding of the role of a Clinical Scientist.

I applied for the NES funded Scottish Medical Physics and Clinical Engineering training scheme in 2017 and was delighted to be successful. The first year involved an MSc in Medical Physics at the University of Aberdeen, comprising of both taught and practical elements. The lectures enabled me to apply my undergraduate physics knowledge to healthcare and medicine, such as radiation physics, as well as learning new subjects such as anatomy and physiology. The final three months involved a research project where I developed a micro-robot to perform dosimetry measurements on phototherapy lamps. This project helped me to improve my practical skills in robotics, scientific writing and understanding of a specialist area.

The second part of my training involved a year of placements in four key areas of Medical Physics; imaging with ionising radiation, radiotherapy, radiation protection and diagnostic radiology, and imaging with non-ionising radiation. Each placement comprised of clinical work applicable to a Clinical Scientist, and I was given a mini research project to carry out in each area. This year was fast paced but I fully enjoyed the rage of activities I had the opportunity to participate in and the experience was key to helping decide which area I would like to specialise in. My progression was assessed through written work and discussions and a portfolio was produced summarising the highlights of each placement.

I chose my specialism field of MRI where I spent the final 18 months of my training. All my work was mapped to a training plan to ensure I met the required competencies. This period allowed me to be involved with a variety of clinical and research activity applicable to the department and I enjoyed having the opportunity to become an integral member of the MRI team whilst gaining more in-depth knowledge in my specialist area of choice.

Half way through my specialism training the COVID pandemic hit. This had a small impact on my training as clinical work was reduced during the first lockdown, however I had fantastic support from my supervisors and I quickly caught up on time lost once restrictions were lifted. Although COVID impacted part of my training it also gave me experience in other areas, such as MRI safety testing of PPE and assessing new technologies that I otherwise wouldn't have had.

I also undertook an innovation project where I developed an app for MRI safety assessments of medical implants. This project allowed me to further develop my research skills and the results were presented at a national meeting.

> Although **COVID impacted part of my training** it also gave me **experience in other areas**

Throughout each stage of my training I was encouraged to attend conferences which gave me confidence in presenting my work and expanded my knowledge of the research occurring in other centres and disciplines.

At the end of my specialist training I produced a portfolio detailing the knowledge and skills I had developed throughout my career. My knowledge and understanding of the role of a clinical scientist was assessed though a VIVA in March 2021. I was successful in the completion of this and I was awarded my certificate of training, making me eligible to apply for HCPC registration as a Clinical Scientist.

Following my training I am now working as a Clinical Scientist in MRI. The NES training scheme has given me a strong foundation and confidence in my skills as a Clinical Scientist. I am very grateful to NES for providing such an opportunity to expand my education and work with such a variety of equipment in multiple departments. My job is now as varied and interesting as my training placement and I very much look forward to my future career as a Clinical Scientist.

> “The **NES training scheme** has given me a **strong foundation** and **confidence in my skills**

Case study

Supporting Trainee Clinical Scientist Programmes

Clodagh Duffy, Clinical Scientist.

Glasgow Centre for Ophthalmic Research/Medical Devices Unit, NHS Greater Glasgow and Clyde

At university I studied Biomedical Engineering and I was lucky enough to start working for the NHS just after I graduated in 2016.

I took a post as a clinical technologist based at the Beatson Cancer Centre in Glasgow and it confirmed that I enjoyed working with both scientists and patients. I worked here for a year and then applied for the NES funded Scottish Medical Physics and Clinical Engineering training scheme in 2017.

It was a competitive process, however I was delighted to have been offered a place as a rehabilitation engineering trainee based at the Southeast Mobility and Rehabilitation Technology (SMART) Centre in Edinburgh.

My first year involved taking a fully funded MSc at the University of Strathclyde, after which I began my "foundation year" which included four rotations in clinical engineering – rehabilitation engineering, clinical measurement and ICT, device risk and governance and device design and development, across various hospitals in NHS Lothian.

Each of the placements gave me an opportunity to gain experience in different aspects of patient care; I developed my practical skills and undertook my own projects including research-based projects.

The role was very 'hands on' – it involved working with a variety of patients and I enjoyed the patient-facing aspect. It involved both taking clinics at the hospital and visiting patient homes. I was also involved in gait analysis which required knowledge in motion capture technology, and my role included calibrating and operating the equipment during the assessment as well as assisting the physiotherapists.

I produced a portfolio of my work to demonstrate my work from each placement and this was assessed along with a viva at the end of my foundation year.

I then began my "specialism year" – which is actually 18 months of training in the area I would specialise in as a clinical scientist. I began this training in September 2018, however in January 2020 I was offered a substantive post in NHS GG&C. This post was a Clinical Measurement and Development specialism, and I began training in visual electrophysiology, a type of diagnostic measurement which requires recording small electrical signals from the eyes and brain following a visual stimulus. This was a challenge to begin with, but I thoroughly enjoyed the work and couldn't wait to learn more.

My role also involves working at the Medical Devices Unit to design and develop specialised medical devices specifically for use within NHS GG&C. This team works under a quality management system to progress through each stage of the device development process. I work with consultants, clinical and technical staff and my colleagues to achieve a fully developed medical device which can be used in clinical service. One of my projects was part of a three month innovation project – this work was linked to the COVID-19 response and was presented at several regional meetings.

All of the skills I developed were linked to competencies from my training plans and at the end of my training I produced a portfolio detailing examples of my work, from university through to specialism training. I was then invited to a viva were I completed the assessment, and when I passed I was then able to apply for HCPC registration to allow me to be a Clinical Scientist.

> "Each of the placements gave me an opportunity to **gain experience** in different aspects of **patient care**

The teams I have worked with were extremely busy however always had time to answer my questions. Without the support and patience of my colleagues from both NHS Lothian and NHS GG&C I would not be the Clinical Scientist I am today.

I feel that I will be continuously learning and adapting in my new role and will probably continue to ask questions from my colleagues! I am looking forward to my career as a Clinical Scientist and hope that I too can help future trainees.

“I am looking forward to my **career** as a **Clinical Scientist** and hope that I too can **help future trainees**

Case study

NES Postgraduate Bursaries supported MSc Degree Programme

Kimberly Munro, Specialist Biomedical Scientist, Medical Microbiology, NHS Fife

I work full-time as a Specialist Biomedical Scientist in the NHS Fife Medical Microbiology Department at Victoria Hospital, Kirkcaldy.

The Road So Far

In 2009, I graduated from Edinburgh Napier University with an Honours Degree in Biomedical Science and a beautiful 6-month-old baby girl. Straight away I began working as a trainee Biomedical Scientist in the Virology Laboratory at Ninewells Hospital in Dundee.

As my young family bloomed, I progressed from trainee Biomedical Scientist to Specialist Biomedical Scientist. I realised to progress my career, I would need to broaden my knowledge, skills and experience, but to secure a promotion to Senior Biomedical Scientist, I would require further development.

With the guidance and support from my colleague, Keren Fairly, I completed my IBMS Specialist Diploma in Virology and began my MSc degree in Biomedical Science at the University of Greenwich through distance learning. However, I quickly realised I needed to gain experience in other aspects of Microbiology, such as Bacteriology and Parasitology.

With encouragement from my colleagues at NHS Tayside and my family, I applied for a post as a Specialist Biomedical Scientist in the Medical Microbiology Department at Victoria Hospital in 2019.

My new role has developed in response to my learning needs and newfound skills and knowledge. Initially, I was in the role as a trainee again as I learned to perform Bacteriology diagnostic testing enabling me to participate in the on-call shift rotation.

However, the COVID-19 pandemic disrupted my training, and my skills in Virology were required as the “anchor” for the Serology section. This involved training staff to perform serological testing on the Liaison XL analyser and DS2 analyser, managing and developing internal quality controls for the serology section, problem-solving and trouble-shooting issues and overall ensuring that NHS Fife can continue to provide a Serology service throughout the pandemic.

Working towards my MSc Degree

The Biomedical Science MSc Degree from the University of Greenwich is a flexible course, which is comprised of 12 week intense clinical or managerial modules chosen by the student. Completion of each module achieves 30 credits, which can be put towards gaining the MSc degree with the final research project providing 60 credits. The modules are specifically tailored for laboratory staff to gain the knowledge and skills to become leaders and managers.

During the last two years, I’ve taken a combination of clinical and managerial modules. The Nucleic Acid module enhanced my knowledge of molecular diagnostics, not just those used to detect infectious viruses, but also those that are designed for the detection of genetic diseases. I enjoyed the challenges set by this module including delivering a power point presentation on the use of Sanger sequencing to identify mutations within the Hepatitis B virus that contributes to antiviral resistance. The Antibiotics module supported my learning in Bacteriology and tied in with my learning of antibiotic susceptibility patterns of antibiotic resistant bacteria. The Quality Systems Management and Managing Learning and Development in Healthcare modules aided with my learning of managerial duties and what this entailed. The Quality Systems Management module also tied in with my learning of the quality management system in Medical

“**modules** are specifically tailored for laboratory staff to **gain the knowledge** and skills to become **leaders and managers**

Microbiology. These modules provided a perspective on the duties performed by senior Biomedical Scientists and their ability to juggle performing managerial tasks and bench work. Using the skills and knowledge gained from completing my IBMS Specialist Diploma in Virology and the MSc modules listed previously, supported entirely by NES funding, I completed my final project, aimed at determining the effectiveness of performing Hepatitis C antigen testing within NHS Fife. At present, I am awaiting my final results.

Critical Role of NES Funding

The Medical Microbiology Department in NHS Fife, continually strives to develop the workforce to ensure that the users and patients of NHS Fife consistently receive a high quality service. Currently, there are 7 members of staff undertaking higher level qualifications with the department also supporting members of staff graded at a band 5 and below. Hence, NES funding is vital to allow those that undertake an MSc degree and other managerial and training qualifications during the current financial climate and the ongoing pandemic. Without funding from NES, I would not have been able to continue and complete the Biomedical Science MSc course with the University of Greenwich, that I started when I was in my previous post.

Appreciation of Support

As a single parent, I want to show my children that they have choices, one being a career and a family, even if following that career does require further studies and gaining further qualifications. Without funding from NES this would not have been possible. Also, without the support and guidance of the Medical Microbiology Management team and my colleagues in NHS Fife, I would not have been able to complete my MSc degree and continue with developing considerable skills and expertise in a new discipline at the same time.

> “I want to show my **children** that they have **choices**

Case study

NES supporting Healthcare Science Higher Specialist trainees

Vicky Ritchie, Clinical Physiologist, Gastroenterology, NHS Grampian.

Following several years of post-graduate study, including an MSc (Research) degree, I obtained Accreditation as an Independent Practitioner in GI Physiology from our professional body, The Association of GI Physiologists.

I perform diagnostic tests related to a diverse range of clinical diseases and provide reports and advice to referring consultants in relation to these. Over my career, I have introduced numerous investigations to the trust to enhance and expand service provision. I have also had the opportunity to present my research and clinical audit work at international conferences.

I lead the service and have responsibility for its delivery and performance. In 2017 I undertook the "Train the Trainer" and "Refreshing Leadership" courses delivered by NES in order to maintain and develop my skills in these areas.

I am passionate about Healthcare Science roles within the trust and their inclusion in providing professional advice to shape the trust's strategies for the future. I became the chair of the trust Healthcare Science forum in August 2020 and have been working with the workforce to raise the profile of Healthcare Sciences both within the trust and with the public. I have also established a short life working group in partnership with our Finance Director to advise the board of key issues and potential solutions to sustainability of our most vulnerable services.

I have worked for NHS Grampian as a Clinical Physiologist in Gastroenterology since graduating with my BSc Biomedical Sciences (Physiology) degree in 2003.

In seeking to attain benchmark status in my profession, I sought to undertake STP equivalence in order to prove equivalence to the STP training programme and gain Registration as a Clinical Scientist with the HCPC. I was fortunate to be supported by NES to undertake the Academy of Healthcare Science STP equivalence route application and will undertake my viva exam for this in June.

I have always aspired to become a Consultant Clinical Scientist. I was delighted to be awarded support from NES to undertake HSST equivalence through the Academy of Healthcare Science in order to achieve this goal.

The support from NES will be used to plug gaps in my knowledge and skills in order to apply for an HSST equivalence certificate. On registering as a Consultant Clinical Scientist, I will be able to apply for consultant jobs within my discipline. This will allow me to provide leadership within my discipline to continue to improve and develop services through research an innovation. It will also allow me to be eligible for senior leadership and director roles within Healthcare science.

> “I was fortunate to be **supported by NES** to undertake the **Academy of Healthcare Science STP equivalence route application**

Assurance and Monitoring of training in Scotland

Oversight of Trainees, trainers and training environments (centres and departmenst) is an important role for NES Healthcare science. Our Purpose in undertaking quality monitoring is to provide assurance that training is secure and safe — and that it will produce the right calibre of Healthcare Scientists

On behalf of NHS Scotland, NES Healthcare Science monitors workplace training via departmental self-assessment, training group reviews and progression monitoring of individual Healthcare scientist trainees. We do so to assure the state of training, in the same way that medical and other professions' training is centrally tracked.

We work with The Academy for Healthcare Science and the National School for Healthcare Science to help assure clinical scientist training, such as those on Scientist Training Programme. However, our interest extends across healthcare science and the shared common attributes that all scientific staff, regardless of type, should seek to achieve.

Our approach is designed to foster partnership and improvement. Our assurance process is traceable to HCPC standards of education and training as a benchmark for all aspects of healthcare science training.

So, for trainee clinical scientists, other postgraduate-level trainees and practitioner staff, the principles are good-practice are the same and help cement the identity of our scientific workforce.

Our approach is designed to foster **partnership** and **improvement**

We assure the state of training with a continuous cycle of Quality Monitoring Processes, comprising:

- Tracking Trainees in using our Turas Training Programme Management database – all such trainees have a National Training Number
- Requesting of trainees an outline Training Plan submission
- Inviting trainees to report their Annual Review of Competency Progression (ARCP)
- Requesting of supervisors and trainers a resume
- Inviting Training Centres to complete a short self-assessment on preparedness, followed by an audit of a sample of their evidence
- Inviting supervisors and trainees to respond to annual confidential surveys.

Training Programme Management: Tracking our trainees

Using TURAS TPM, we track trainees issued with a National Training Number (NTN). These may be: on admission into NHS employment as a trainee; following a bursary award or; commencement on a training pathway following a training plan submission.

A key role of NES is to assure our employer, NHS in Scotland, that training is secure with consistency of approach across the workforce. The role is in line with the NES vision of a skilled and sustainable workforce for a healthier Scotland.

NES does this for Healthcare Science and for other key clinical groups, such as Medicine, Dentistry, Nursing and Psychology. A developing role of for NES in Healthcare Science is workforce analytics and planning. The diverse nature of Healthcare Science disciplines fragments the tracking of training, so need to know who and where our scientific workforce trainees are.

Regardless of the healthcare science discipline or profession, a national oversight offers opportunities for improvement and sharing good practice. In supporting trainers, the principles of managing new trainees and supporting those in difficulty are common.

Our guidance document on how to obtain a training number is available on our Knowledge Network.

The diverse nature of **Healthcare Science** disciplines fragments the **tracking of training**

Training Centre Recognition

Our quality monitoring of training centres serves to assure that standards of Healthcare Scientist training are consistent across healthcare science disciplines. Poor quality training can be a proxy for unsafe clinical practise, so our activity also has a patient safety thread.

Training centre self-assessment is an important component of our assurance role. Our approach, established in 2016, aligns with Scotland's Quality Assessment tool 2010 for NMAHPs, and with HCPC standards of Education and Training. In October 2020, we commenced our four-yearly cycle for training centre recognition. This built on our past work and includes more recent departments, such as those training the Clinical Physiology cohort.

New process for 2020

For this cycle, we refined the assurance process using a streamlined and less bureaucratic approach. We consulted our Advisory group about this in early 2020. We engaged with The National School for Healthcare Science who are conducting a similar programme of centre recognition. Our process involves a revised self-declaration form:

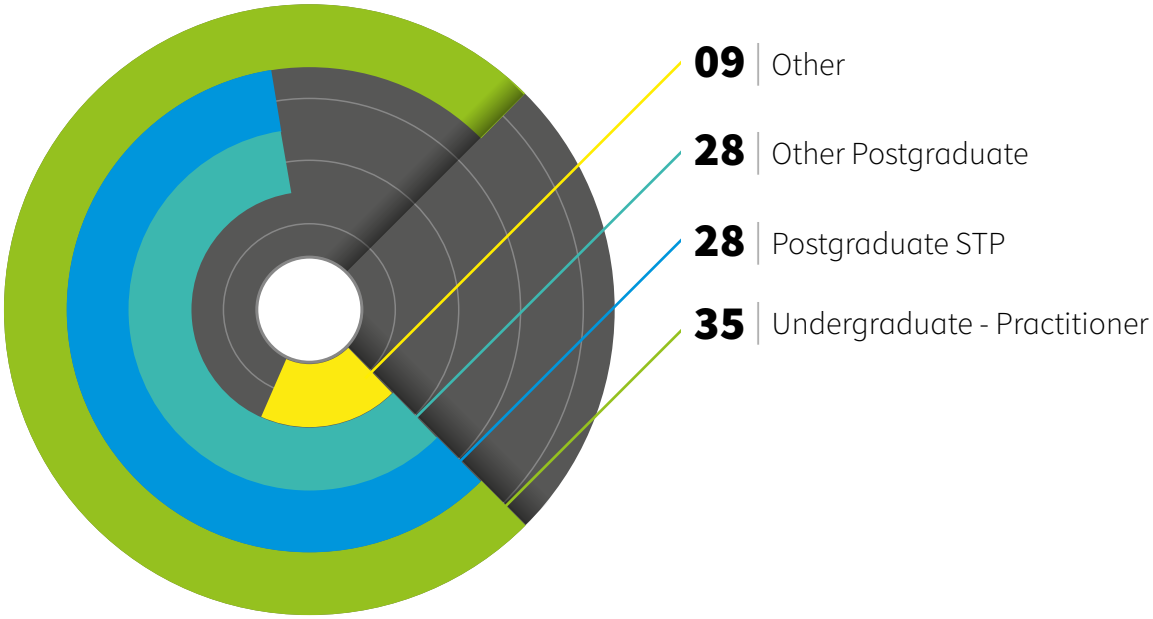
1. Centres self-declare whether they meet, approach, or do not meet each of the individual standards of education and training. They also describe the evidence that they could give to confirm this.
2. NES requests sample evidence to verify the declaration.
3. Centres submit evidence.
4. NES checks the evidence matches the standards in question, if not a further dialogue follows.
5. NES issues recognition certificates to departments and adds centre to our published list.

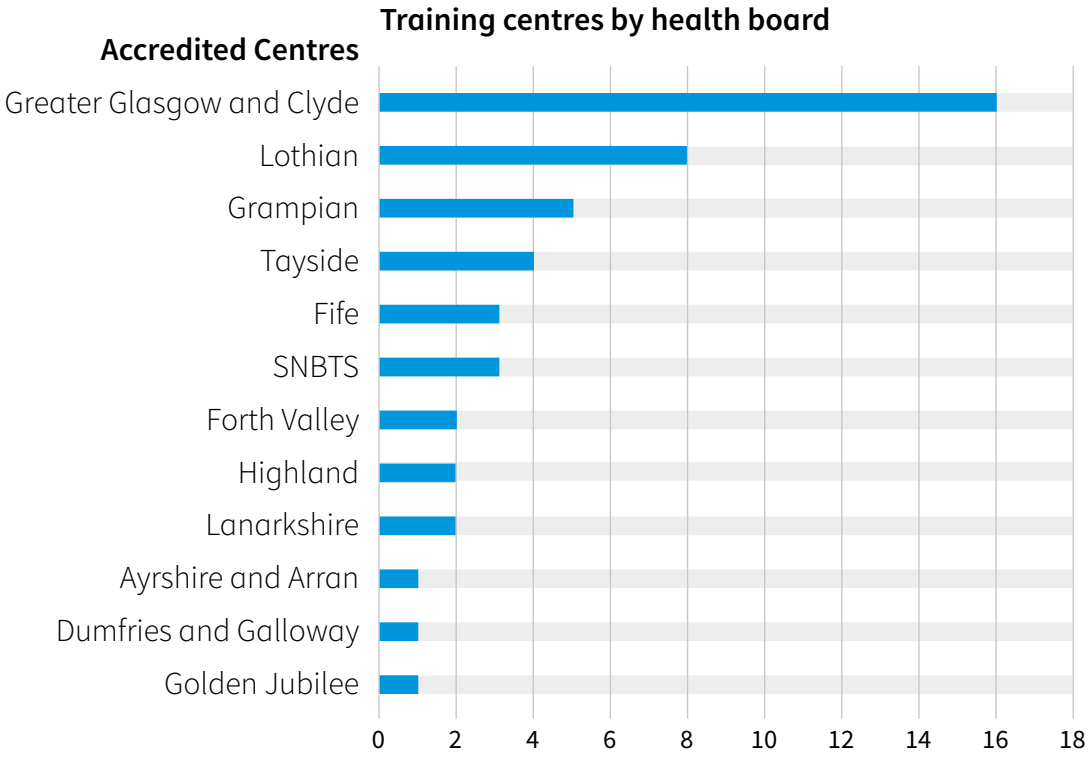
Training centre self-assessment is an **important** component of our **assurance role**

We are confident that it gives the assurance required; our confidence reflects the support training centres have given in terms of their engagement with our work. Guidance is published on our Knowledge Network, and in the "NES Healthcare Science: training centre self-assessment" e-learning module on Turas Learn.

Results

Number of departments supporting each type of training

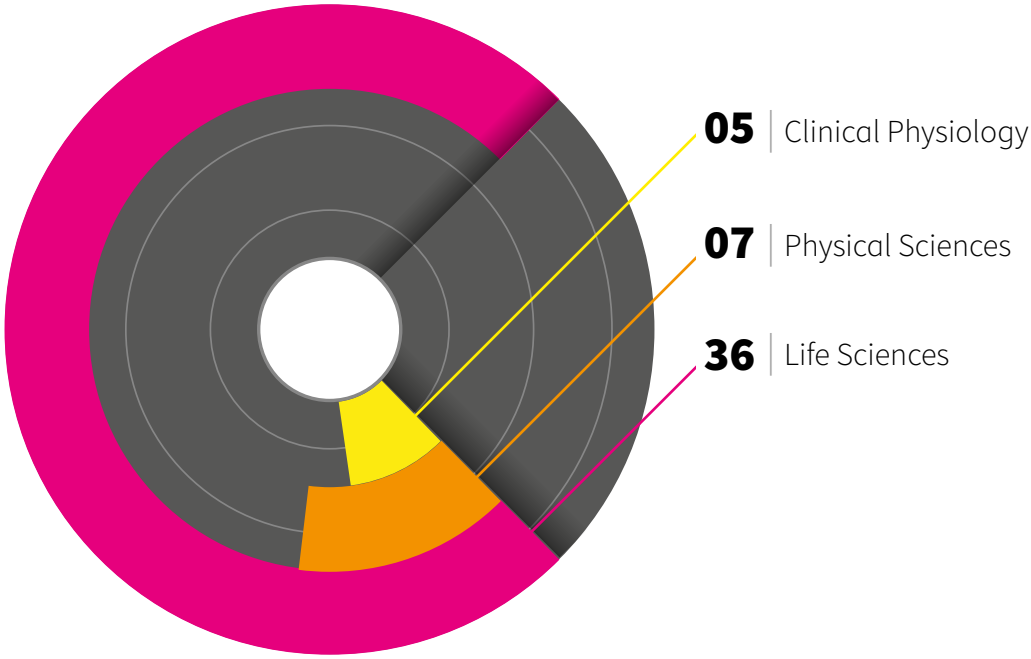




As of 16 April 2021, 51 training centres from 12 health boards have successfully completed self-assessment. Comparisons with the 2016 round show our training centres continue to evolve, with some newly recognised training centres, some changes to the declared scope of centres' training, and centres amalgamating. Early feedback from centres that have completed self-assessment confirms the streamlined process is more time-efficient than in 2016. An up-to-date list of training centres who have completed self-assessment is published on our Knowledge Network page.

Our offer for training centre recognition is ongoing and we invite all centres to participate If you are currently supporting trainees. Details available on our Knowledge Network.

Self-Assessed Training Centres by healthcare Science Theme



Progression of training

We monitor Annual Review of Competency Progression to help assure training and offer support to trainees.

Annual Review of Competency Progression

Our QA Monitoring processes advocate that all trainees who have been in post for one year or longer are required to submit an Annual Review of Competency Progression (ARCP).

This process (ARCP) has now been running since 2017. Completion of the appropriate Quality Assurance processes are requested for all National Training Number holders, irrespective of whether they are currently receiving funding from NHS Education for Scotland.

All trainees and supervisors are recorded on our Turas Programme Management system and are contacted to inform them of requirements. Guidance is provided surrounding both processes.

Trainees received reminders throughout the processes up until February 2021. The core team has worked hard to engage with initial non-responders; this perseverance has yielded the dividend of an excellent return rate, for which the team is grateful.

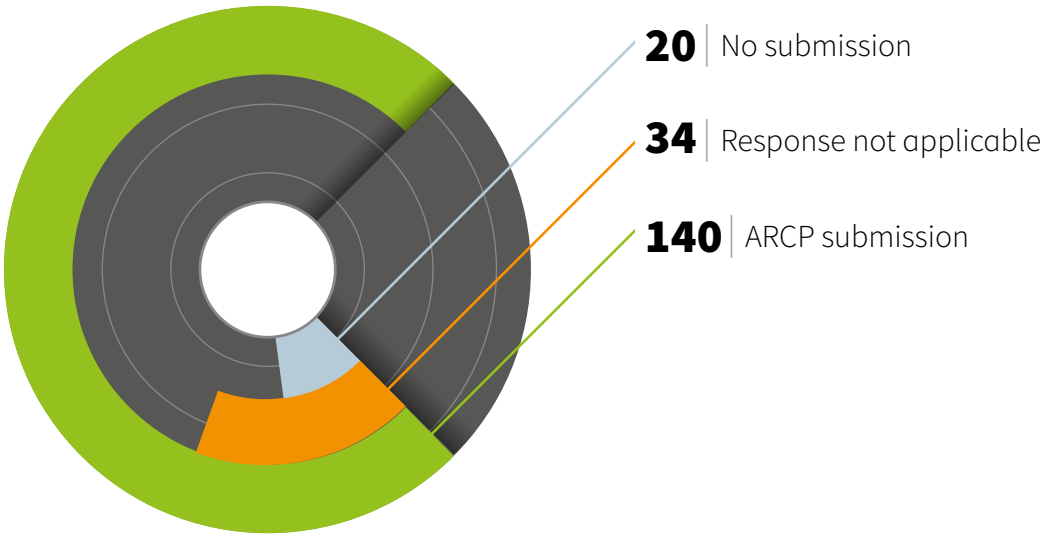
ARCP and Training Plan receipts for 2020 were cross-referenced to previous Centre Recognition and Trainer Resume submissions to ensure training accreditation was in place and training supervisors were appropriately trained.

Completion of the appropriate **Quality Assurance processes** are requested for **all National Training Number holders**

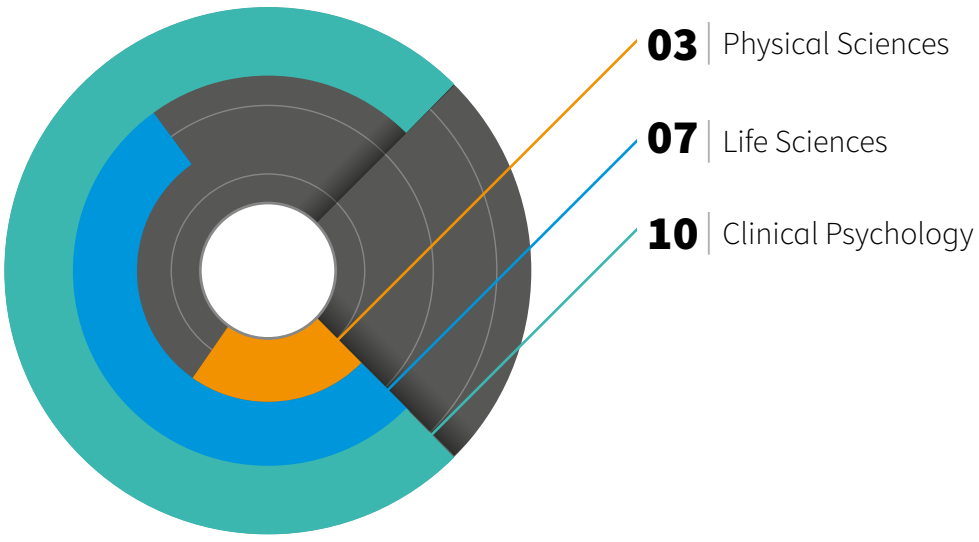
Annual Review of Competency Progression Requests 2020

In total 194 requests for Annual Review of Competency Progression reports were submitted. All responses were gathered within the Microsoft Forms app within Microsoft Office 365. A response rate of 89.7% was achieved including submissions, and non-submissions with acceptable reasoning. Only 20 did not respond, of which 10 were Clinical Physiologists. All ARCP responses have been updated on the Turas TPM system.

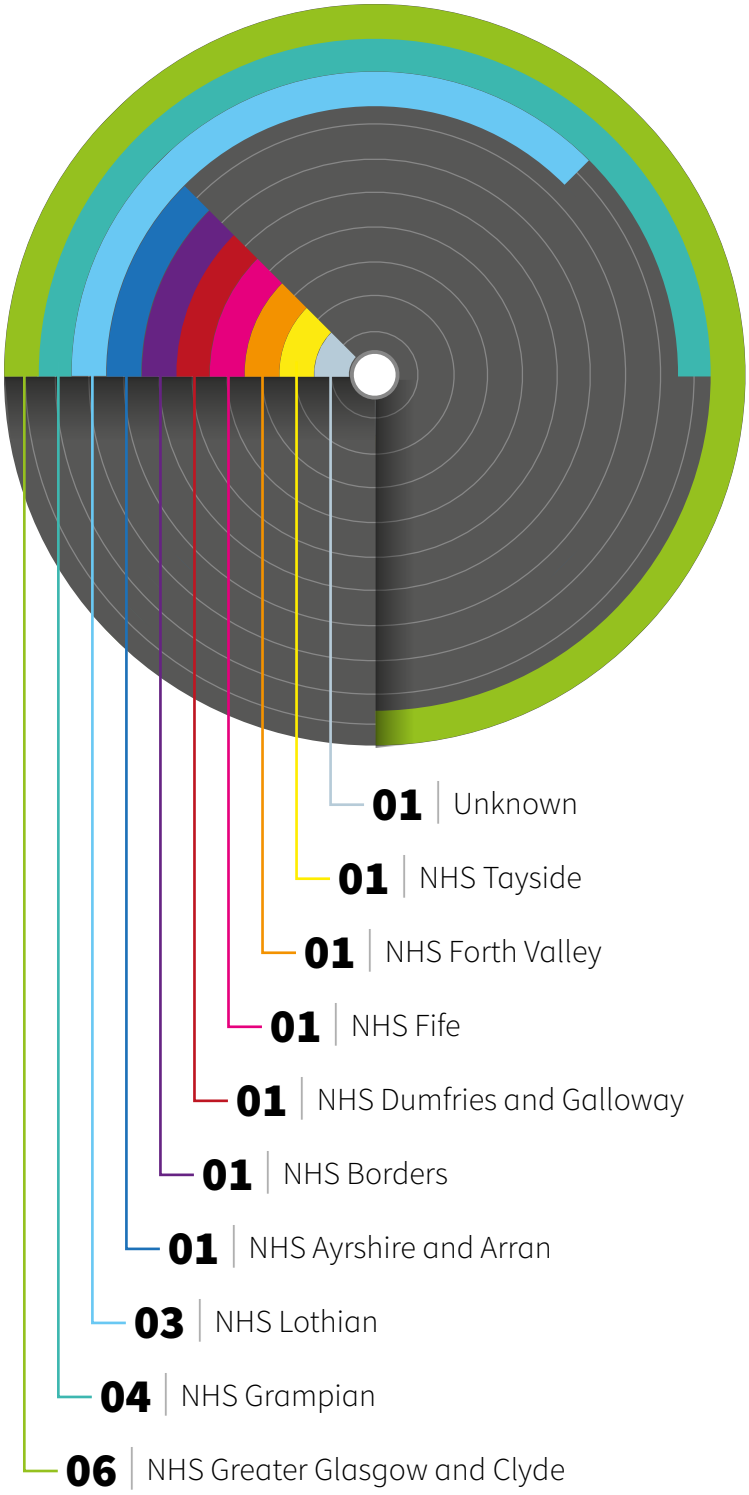
ARCP Total Submission



ARCP Non-responders by Discipline



ARCP Non-responders by Health Board



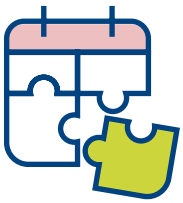
Training Plans

Training Plans for all registered NTN trainees

Annual Training Plan requests (example represented in the figure below) form part of our role in assuring high quality training programmes across Scotland which is essential to maintain standards of training across all disciplines to ensure patient safety. Absence of a training plan can lead to unstructured training and potentially problems with training progression. We do invite trainees to report concerns via confidential Trainee (and supervisor) surveys, but early planning can mitigate these difficulties.

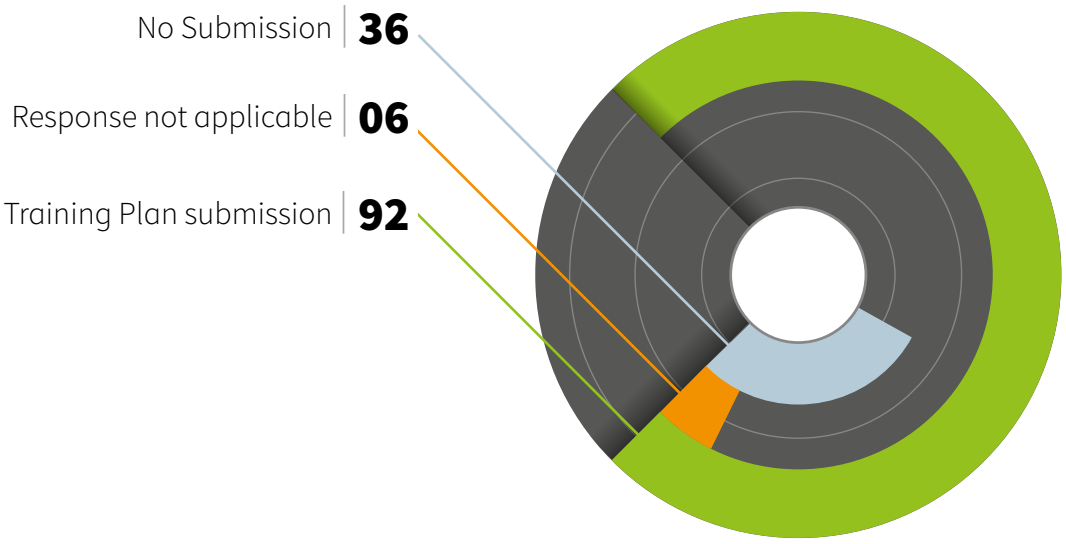
Training Plans are invited from the trainee and supervisor together and returned to NES within two months into each training year. An agreed training plan with the trainee provides structure and clarity for their training programme and development.

In total 134 requests for 2020 Training Plans were submitted. A response rate of 73.1% was achieved including submissions, and non-submissions with acceptable reasoning. 36 did not respond.

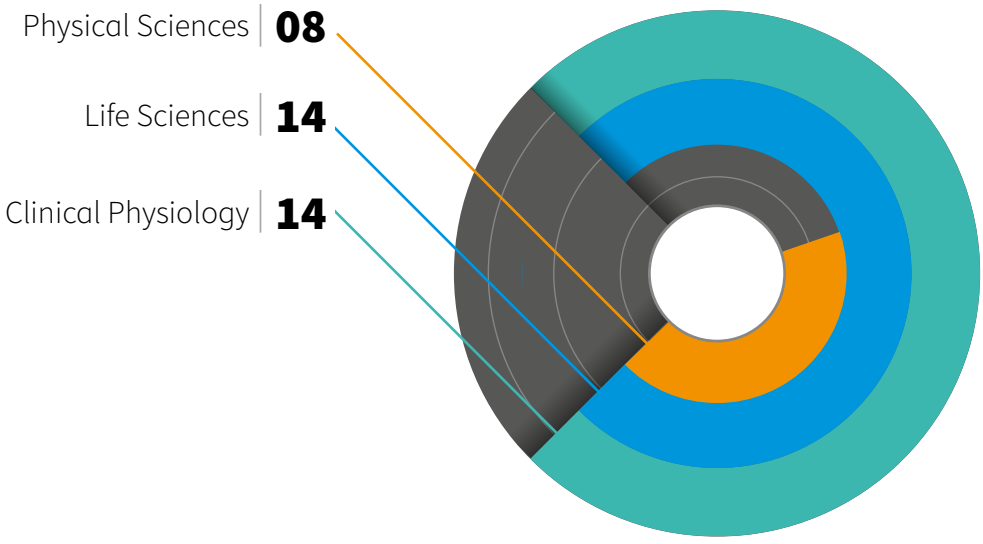


Annual Training Plan
requests form part of our role in assuring
high quality training programmes
across Scotland

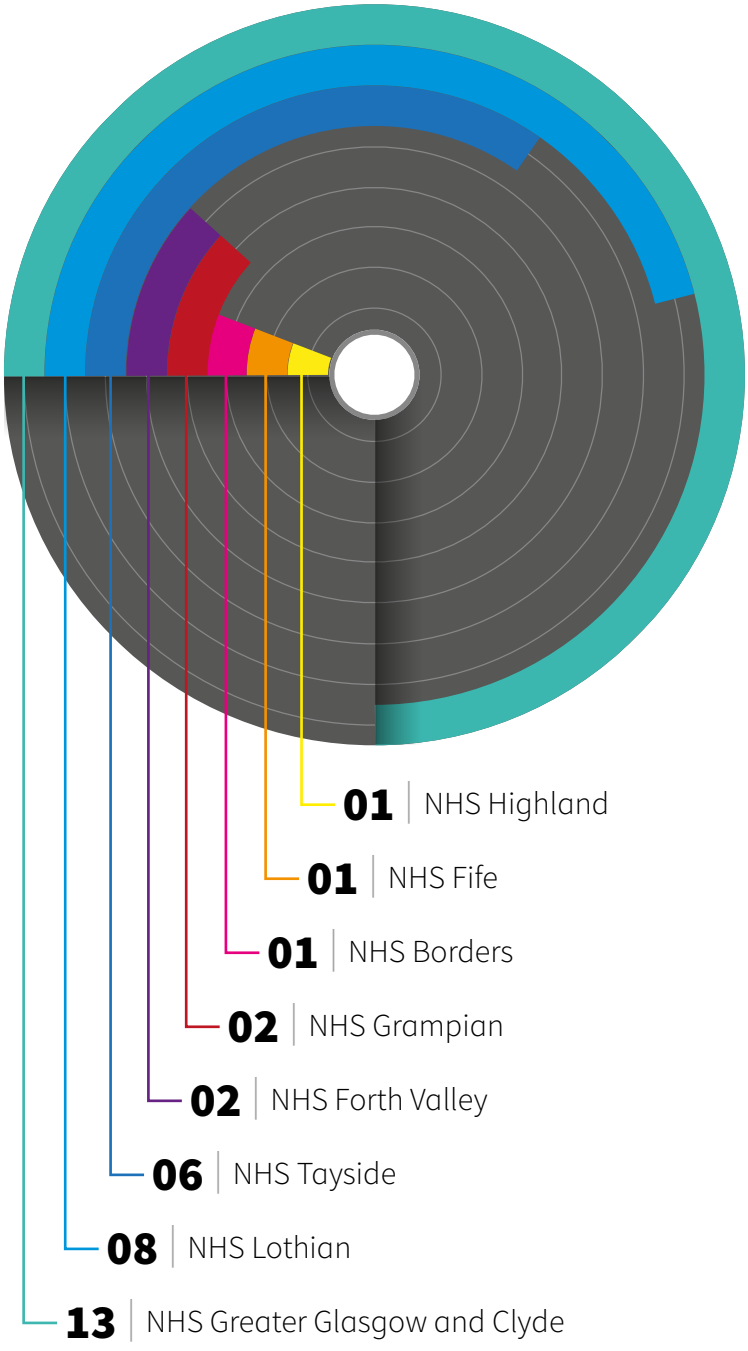
Training Plan Total Submission



Training Plan Non-responders by Discipline

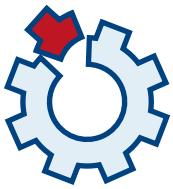


Training Plan Non-responders by Health Board



An overall response rate for the two Quality Monitoring processes represented here of 83% is good result. However, for the 17% of trainees, the absence of a training plan can lead to unstructured training and potentially problems with training progression. Our interest is to ensure a well-defined plan with clear outcomes and responsibilities

While the response rate of ARCP returns remained strong, there was a noticeable decline in Training Plan submission from 2019. We expect this is explained by the COVID-19 pandemic and the impact that had on both trainees and supervisors, with some being re-deployed or having increased pressure to carry out other duties. In addition to this some health boards migrated across to the new nhs.scot e-mail extension and this caused us some issues being able reliably contact individuals. Individuals can contact us via our generic mailbox HCS@nes.scot.nhs.uk to be added to our circulation list.



the absence of a
training plan
can lead to
unstructured training
and potentially
problems with
training progression

Feedback and Annual Surveys

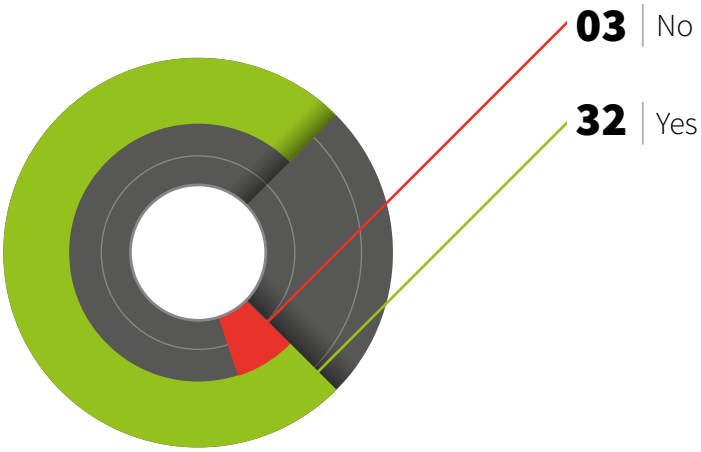
Individual postgraduate scientist trainees and supervisors are also invited to respond to our annual surveys.

Healthcare Science Training: Exit Destination and Feedback 2020

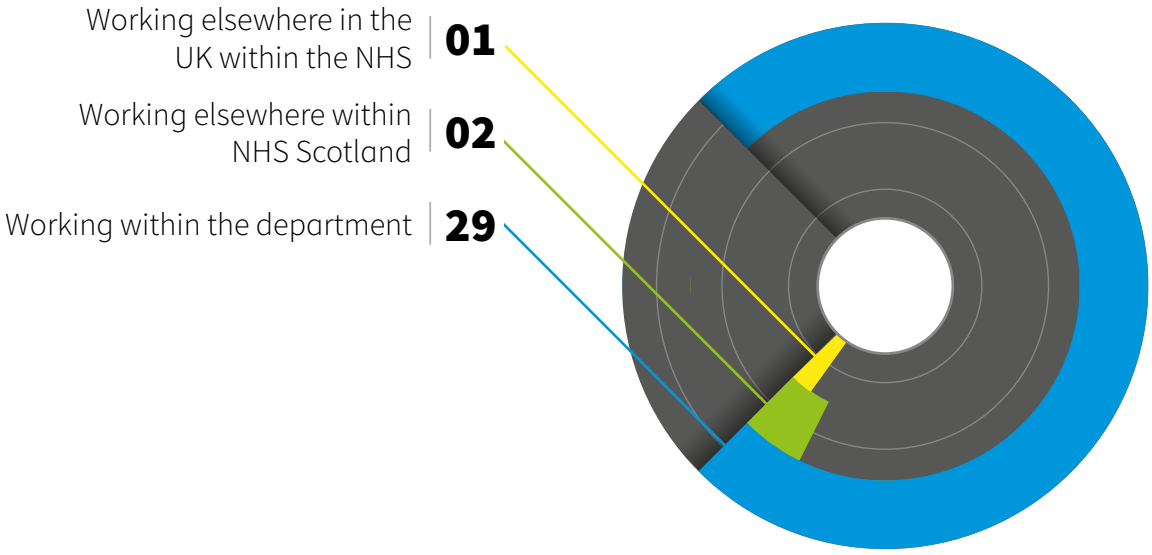
This was sent out to 62 eligible trainees, and their supervisors, who were identified from Turas TPM as being due to complete between the end of August 2019 and the end of 2020.

The overall response rate was 42/62 (68%). Taking into consideration duplication of responses, undelivered emails or extensions to training this represents an acceptable/good response rate

Did the trainee complete their training programme as expected?



Following completion, where is the trainee now?

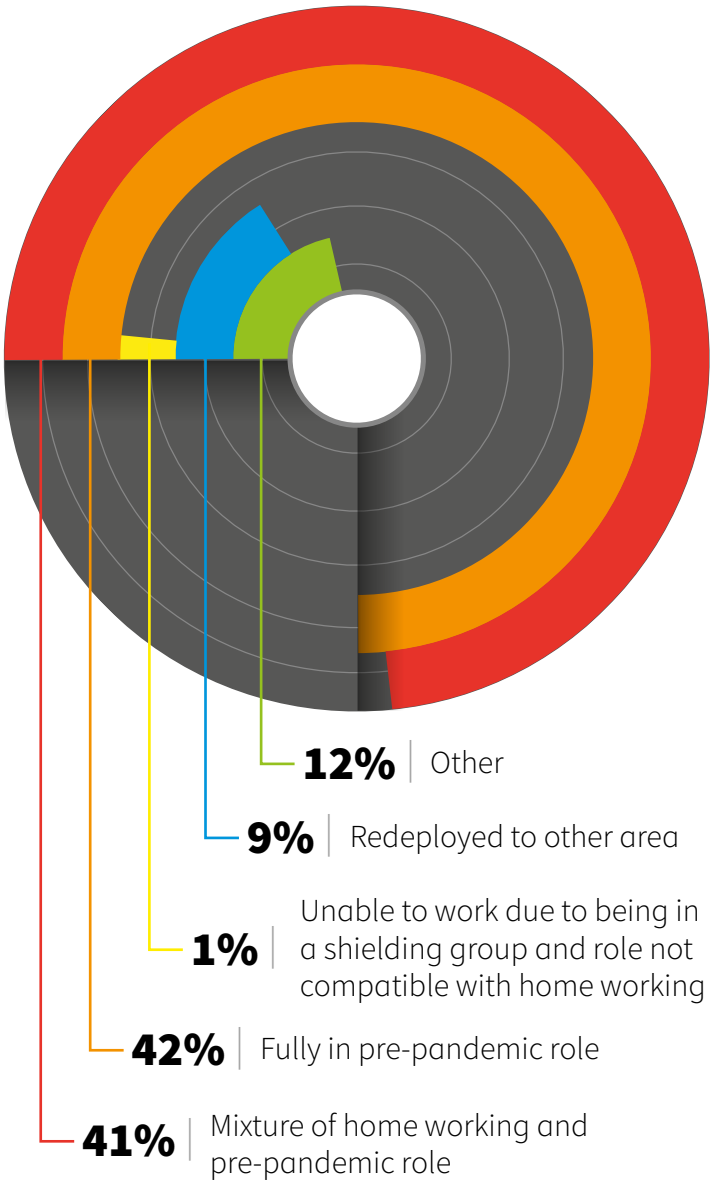


COVID-19 Survey Feedback

In April/May 2020 a survey was sent to NES-supported trainees across all healthcare professions in Scotland to determine the impact that COVID-19 was having on their training. For Healthcare Science all trainees in receipt of a National Training Number (NTN) were invited to respond. This survey was completed by 125 out of 176 postgraduate healthcare scientist trainees, achieving a response rate of 71% which was one of the best across the different professions.

The results clearly indicated that a large percentage experienced a significant change to their working situation, with over half (51%) either being redeployed to another area or having to do a mixture of both home working and carrying out their pre-pandemic role.

Were you able to continue to work during the COVID-19 pandemic?

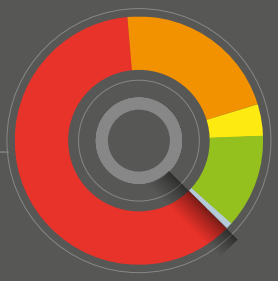


Responding trainees also indicated that COVID-19 impacted their ability to carry out certain tasks. Most notably the following were reported to be impacted to great extent:

- Ability to attend face-to-face courses (61%)
- Ability to undertake practical training elements (46%)
- Ability to undertake rotational training visits (44%)

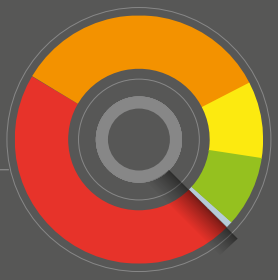
To what extent have the following aspects of your training been impacted by COVID-19?

Ability to attend face-to-face courses



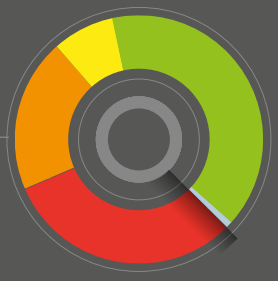
61% To great extent
22% Somewhat
04% Very little
13% Not at all
01% No answer

Ability to undertake practical training elements (DOPS, CBD, shadowing, research projects etc)



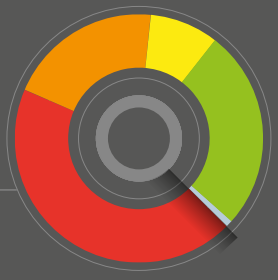
46% To great extent
34% Somewhat
10% Very little
09% Not at all
01% No answer

Ability to undertake professional examinations



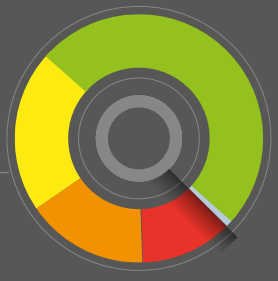
31% To great extent
20% Somewhat
08% Very little
40% Not at all
01% No answer

Ability to undertake rotational training and visits to other departments/ hospitals



44% To great extent
20% Somewhat
09% Very little
26% Not at all
01% No answer

Access to educational resources e.g. documents, textbooks, software



12% To great extent
16% Somewhat
22% Very little
50% Not at all
01% No answer

The results from this survey formed a baseline which subsequent results from a follow-up survey sent out in April 2021 can be compared with.

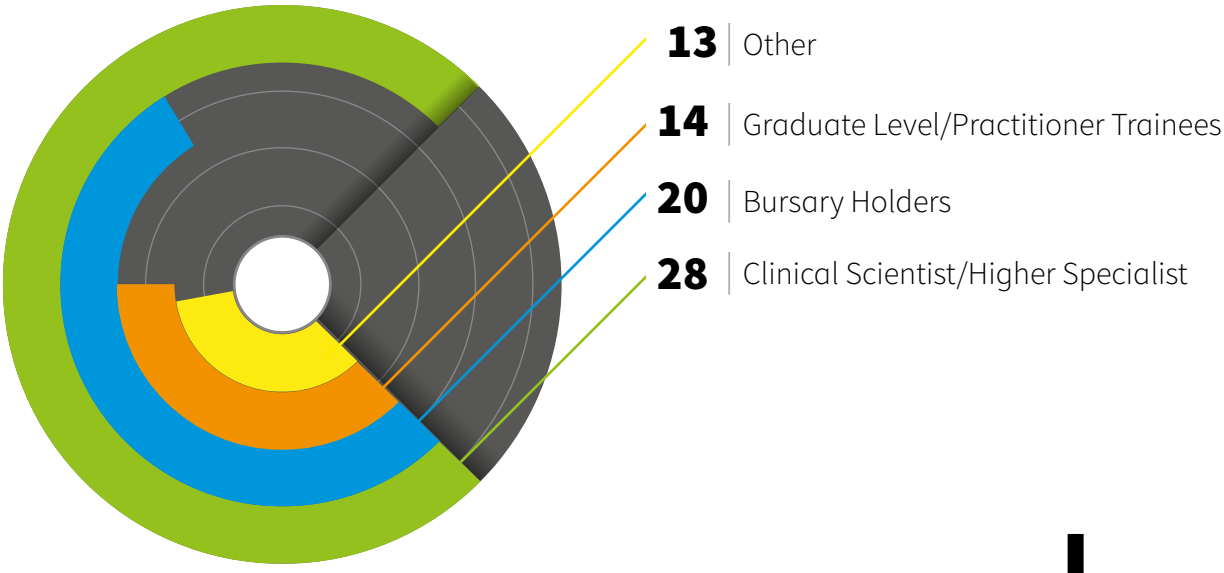
Trainee's Feedback Survey 2020

Every year we contact our individual postgraduate scientist trainees and their supervisors and invite them to respond to our annual surveys, as an opportunity for our Healthcare Science community to give us confidential feedback. Questions are related to quality of training in relation to our monitoring processes which provide reassurance that training is going according to plan.

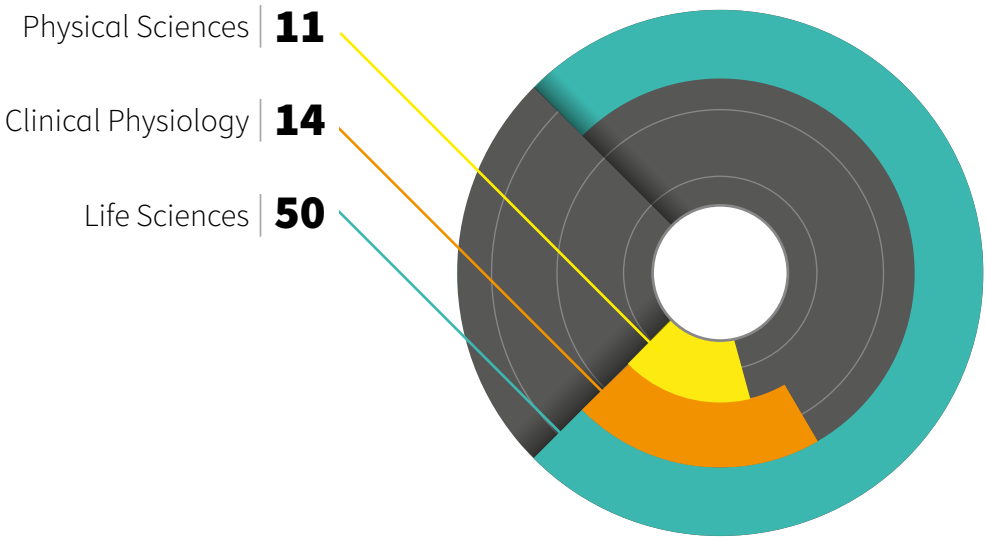
Trainee's Feedback 2020

Our NES 2020 trainee survey involved all trainees in receipt of a NES National Training Number (NTN), and was completed by 75 out of 239 Trainees, i.e. 31% responding. The breakdown of trainees by level/career stage and discipline are shown in the graphs below. Our surveys complement the training plan and ARCP cycle as a tool used to gauge the state of training. The response rate reflects the nature of a voluntary survey (unlike mandatory training plans and ARCPs).

Trainees by Level/Career Stage



Trainees by Discipline

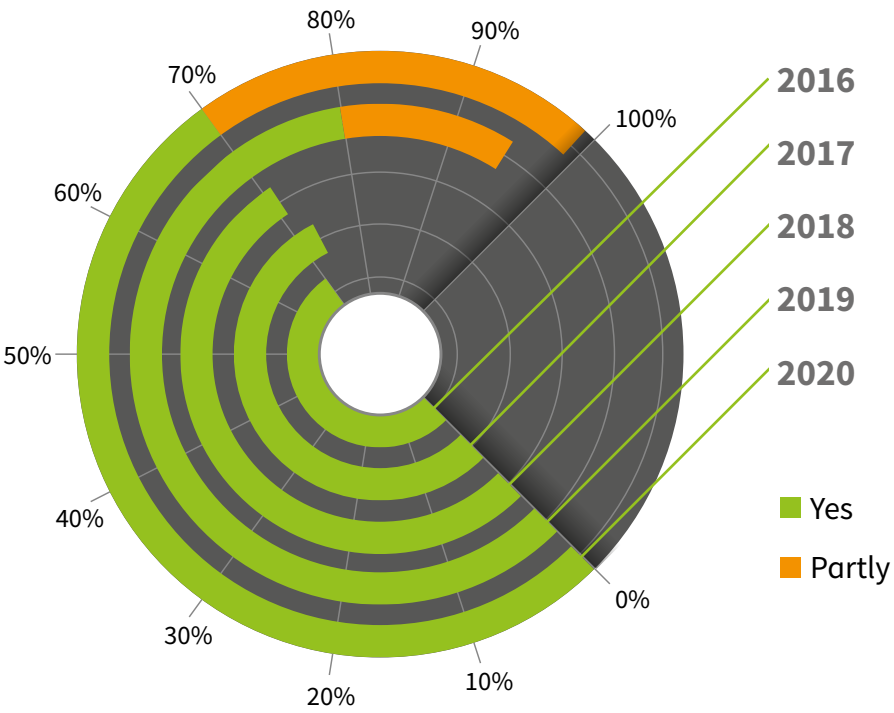


All trainees and supervisors are contacted and asked to provide the NES HCS team with an agreed training plan each year.

We encourage any trainee who does not feel they have an agreed training plan to contact us. This year only 1.3% of respondents reported that they did not have a clear and agreed training plan at the time of survey (Nov-Dec 2020).

Encouragingly this is a decrease from last year, when 4.3% reported that they had no training plan. However, 6.7% of respondents reported that their progress was not documented and signed off, and the same percentage did not believe that their level of feedback and supervision in the workplace was sufficient.

Do you have a clear and agreed training plan?



The number of respondents who reported that they did not have an ARCP or formal review has increased from 10.1% in 2019 to 28% in 2020. Whilst this is a disappointing decline from last year it is likely it can be largely attributed to the COVID-19 pandemic and the impact that had on both trainees and supervisors. However, we will be further investigating the possible reasons for this and looking at any possible ways we can help to improve this.

The Trainee's Last Word

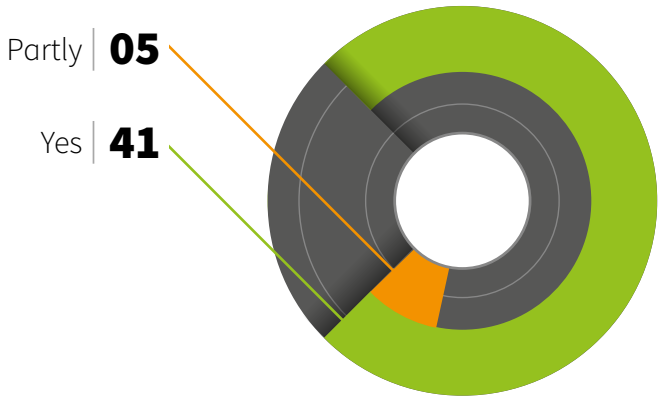
"Annual review would usually have happened by now but has been delayed due to Covid-19…"

Supervisor's Feedback Survey 2020

Our annual survey to supervisors received a response rate of 43% (46 out of 108 invited), comprised of 63% from Life Sciences, 17.4% from Physical Sciences and 19.5% from Physiological Sciences.

Feedback from previous surveys informed us that respondents wanted clearer guidance on support for Quality Assurance in training. In 2019 we updated our guidance on how to develop a training plan with working examples. This has proven beneficial with year-on-year increases of supervisors reporting that putting a training plan in place is straight-forward, 97.8% in 2020 compared to 89% in 2019 and 82% in 2018. More importantly all respondents this year reported having at least a partially clear and agreed training in place with their trainee(s).

Do you have a clear and agreed training plan with your trainee(s)?

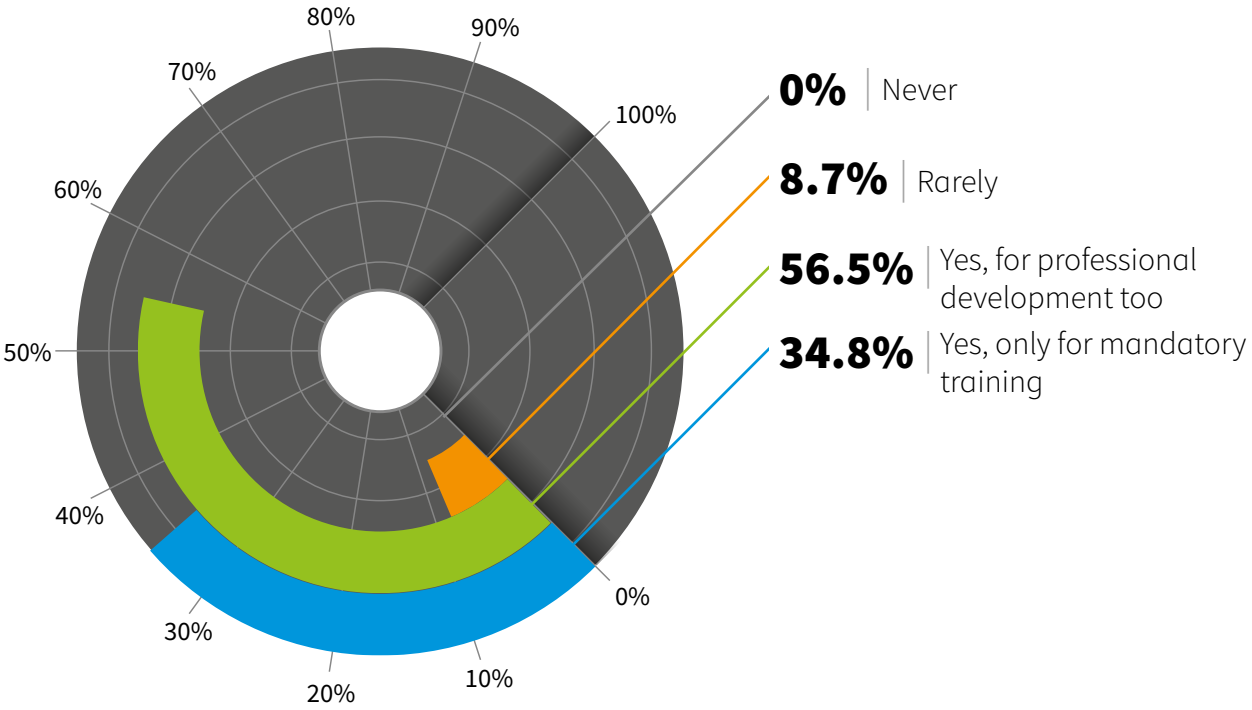


Our Common Core List describes attributes that postgraduate level scientists should strive to develop irrespective of pathway or specialism. It is slightly disappointing to note that there has been a slight decline in the percentage of responding supervisors sighted on the Common Core List (82.6% in 2020 compared to 85.7% in 2019, although this remains higher than 79% in 2018).

Have you used e-learning resources in the last year?

We were very encouraged to find the majority (56.5%) of respondents indicated they used e-learning resources for professional development, in addition to mandatory training, in the last year. This is likely because face-to-face learning was suspended due to the COVID-19 pandemic, therefore people finding themselves engaging with e-learning more than before.

This is something we aim to take advantage of, by offering a wider range of e-learning resources on our Turas Learn platform.



The Supervisor's last word

"It would be great to get the NES Trainees in Difficulty course back up and running. I found that course helpful as a supervisor, and I'd really like to encourage other people in my department to attend."

Last word from NES

"The HCS core team has tried very hard over the past year to maintain lines of communication and offer continued support to both trainees and supervisors, despite the difficulties presented by the COVID-19 pandemic. We are pleased our surveys indicated that progression of training had continued despite some delays and setbacks.

This is further reinforced by the strong level of engagement with our quality assurance processes. However, there are clear opportunities for improvement in terms of offering a wider range of e-learning resources. We are in the process of redesigning existing training courses into virtual platforms to accommodate the current situation."

CPD and Learning

Our CPD offer is designed to underpin our assurance work and to enable the wider HCS community share specific learning resources on our national TURAS Learn platform.

NES Resources – The Knowledge Network communities site

The Knowledge Network site is our principal site for Healthcare Science information for trainees and supervisors.

On it, we include content about training pathways and NES quality monitoring of that training. Resources from our previous trainees' and supervisors' events can also be found there. During 2020, the NES HCS team added details of our self-assessed training centres and specific information for Higher Specialist Scientists.

Welcome Pack for Trainees

A variety of resources of information are available on the Knowledge Network including a trainee handbook that describes the training process, responsibilities and details of NES's role in supporting training progress through Quality monitoring. All new trainees registered with a National Training number are issued with this handbook at the start of their training for useful resources and information.

Special Measures guide

NES Guidance and resources available when there is difficulty in training.

Our quality monitoring of training progression provides assurances that training is continuing to a satisfactory manner. Our Special Measures Guide outlines our approach to cases where either trainees, supervisors or training departments cannot demonstrate satisfactory attainment or maintenance of training standards.

Two primary objectives of Special Measures are to

- ensure patient safety, both in the immediate practice placement and later likely performance of an individual whose training experience has been compromised.
- ensure progression, both for the well-being of the individual trainee and the return on investment of public funds in NHS training.

The Special Measures Guide underpins our quality assurance role. We very rarely "visit" or "enquire", but when we do it is help solve a problem. The ultimate sanction if the training centre is a root cause is an alert to the Board about the state of training. Ultimately, potential future placements would be discouraged or not directly funded. This is in line with other Health care professions.

Special Measures Guidance is arranged thus:

- Trainees in difficulty
- Supervisor performance / availability
- Department-level concerns. With each referencing Adverse indicators
- Root cause
- Special measures: action / remediation / outcome

The Special Measures guide is available on the Knowledge Network.

The **Special Measures Guide** underpins our **quality assurance role**

CPD Short Courses and additional learning

Our Train the Trainer course provides supervisors with key concepts, principles and techniques of training and learning to aid the design, delivery, and evaluation in their department.

Our Trainees in Difficulty course explores why training difficulties arise and the principles underpinning the HCS trainer role. It explores the link with NES Quality Monitoring of training. We share good practice and improvement strategies to ensure resolution of difficulties and to enhance trainee and trainer experience.

Our Leadership Preparation course supports Leadership development of health care science staff is a key component of professional development. Wherever possible we have utilised generic training to support the future leaders during their career progression.

The pandemic curtailed our face-to-face courses, so during 2020 we commenced redesign of them for online participation. Many thanks to those within the Healthcare Science community who helped us to pilot an online offering in December 2020. Our offer in 2021 will be a combination of e-learning and online seminar sessions. Based on our experience with the pilot and with our online trainee event in February 2021, it is unlikely that we will stop the online approach once the pandemic eases.

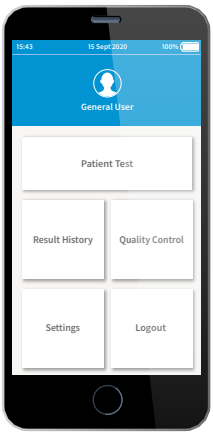
The **pandemic** curtailed our face-to-face courses, so during 2020 we commenced redesign of them for **online participation**

E-Learning on TURAS Learn – support to authors

We continue to support professional groups to share their e-learning across Scotland. We produce e-learning modules based on the group's specialist material, assure it and host it on our learning management system: Turas Learn. Recently added in 2020-21, were resources for virtual reality filming, radiation protection, and magnetic resonance imaging safety. Notably with National Services Scotland, we helped convert paper-based training for a new laboratory Covid-19 test to enable convenient Scotland-wide training at short notice.

To accelerate development and use os new material as quickly as possible, most future modules will consist of narrated presentations and a web-based multiple-choice test, the latter affording a record of engagement with the learning material. In whatever format, a local training solution may have wider application, so our support for this is to aid spread and improvement, whilst allowing traceability and record of learning. We are here to help.

Lumira DX Training resources on Turas Learn.



Details of how to develop e-Learning on Turas are available as a short how-to resource on our HCS Turas site.

NES Healthcare Science events 2020-21

Healthcare Science Trainees and Supervisors Virtual Event (1 - 5 February 2021)

Is National Oversight of training important?

Why NES provides National Oversight of HCS training, Robert Farley

Our national event in February 2021 was run online over one week as a series of one-hour webinar sessions. Speakers included some of our emergent scientists still in training as well as colleagues deeper into their careers advancing their practice and supporting training. The programme focused on NES's overarching role in assuring training across Scotland and colleagues' role in the Covid response.

Our event still offered the opportunity to showcase poster work by trainees. Only 7 were submitted this year, significantly lower than in a "normal " year, but reflecting the disturbance to training.

Poster Competition Winners

Undoubtedly training was impacted by the COVID-19 pandemic during 2020 which presented with unforeseen challenges. We encouraged trainees to tell us their unique experiences, conveying the changes faced as a trainee scientist, highlighting the challenges this presented but more importantly the innovative ways in which they were overcame. Three prizes were awarded, summarised below.

Winner: Sarah Francis

Medical Device Governance in a Pandemic: A Chest Drain Modification for Patients with Pneumothorax, Suspected or Confirmed Infected with COVID-19

I am a Trainee Clinical Scientist specialising in Clinical Measurement and Development in NHSGGC. When COVID-19 emerged, my Foundation Year rotations were put on hold and I was re-deployed to the Medical Devices Unit (MDU, West Glasgow Ambulatory Care Hospital, NHSGGC) to work on emerging projects related to the virus. One such project involved addressing the concern that the expulsion of droplet particles from a chest drain bottle could lead to the transmission of COVID-19.

MDU engineers performed an experiment which confirmed that the addition of an anti-viral filter to the outlet valve of a chest drain bottle could significantly reduce the expulsion of COVID-19 sized particles into the environment. To use the anti-viral filter in clinical practice, NHSGGC's requirements for off-label use of a medical device had to be satisfied. I was part of a small team which performed essential safety testing and gathered the necessary technical documentation for product release under the MDU's in-house ISO13485 Quality Management System.

My contribution also included developing an Instructions for Use document which guides clinicians on preparing and using the chest drain filter modification and liaising with colleagues at the Radionuclide Dispensary to assemble batches of filter connectors using aseptic techniques. Over 100 of these filter connectors have been delivered to the QEUH for use in the Accident and Emergency department and the Acute Receiving Unit, and the Instructions for Use have been approved by the COVID-19 Tactical Group and are used to guide clinical practice across NHSGGC.

Runner up: Rachel Jackson

PPE Manufacture in a Pandemic: The Development of a Reusable Visor

I am a Trainee Clinical Scientist working in Rehabilitation Engineering. The COVID-19 pandemic resulted in a highly publicised shortage of appropriate personal protective equipment (PPE) for medical staff due to the unexpected and unplanned high usage of disposable PPE. These factors resulted in a large increase in single-use plastic waste and improper use of disposable items, including reusing single-use articles.

Following work carried out by a visor testing group within the Medical Devices Unit in NHS Greater Glasgow and Clyde, the need for a low-cost reusable visor was identified to reduce pressure on health boards in obtaining large volumes of disposable visors. In liaison with infection control and chief nursing staff, user requirements were established for a reusable visor.

Several companies released open-source visor designs to aid international PPE manufacturing efforts. One design, by Prusa Printers, was particularly effective and this was modified to suit the reusable requirements.

One significant change was in recommended manufacturing process from 3D printed to injection moulded to enable visors to be produced in much larger numbers, to a higher quality and in a shorter time frame. In compliance with quality management systems, design acceptance tests were created, performed, and documented.

A production line was set up at West Glasgow Ambulatory Care Hospital and members of the Department of Clinical Physics and Bioengineering were enlisted to help. Within 3 days, around 4000 visors were assembled and packaged to be sent to clinical areas.

However unforeseen the circumstances were, this project was a great learning experience. I was able to further develop my design and development skills and gained a greater knowledge of materials and chemical compatibilities.

I also was able to create user documentation in compliance with quality management systems and gather user feedback. All these skills will be very beneficial as I progress through my career as a clinical engineer.

Runner up: Charlotte Lamb

Is there an association between morula timing and duration on the pregnancy outcome from single blastocyst transfer cycles?

Measuring the timing and duration of embryo developmental events is being increasingly used by scientists to select the most optimal blastocyst stage embryo (day 5) for transfer back into the patient in assisted reproductive treatment.

There is limited and conflicting research regarding the relationship between the timing and duration of the morula stage (day 4) of development with subsequent pregnancy potential of blastocysts. This retrospective case-control study aimed to determine if the timing or duration of the morula stage was different in blastocysts that resulted in positive or negative clinical pregnancy.

The time to morula formation and morula duration were determined for 411 blastocysts using data obtained from time-lapse incubation technology. The mean time to morula and morula duration were not found to be significantly different between blastocysts resulting in positive or negative clinical pregnancy.

The distribution of values for morula timing and duration of blastocysts resulting in positive and negative clinical pregnancy were also very similar. In conclusion, assessing the timing and duration of the morula stage is unlikely to be an effective tool for routinely identifying blastocysts with a higher pregnancy potential within the Edinburgh Fertility Centre patient population.

Feedback and attendance data from our February 2021 event

- 115 registered and attended
- 14 registered and did not attend any sessions which is on par with an 'in person' event - normally about 10% don't attend despite registering
- 2 registered but cancelled
- 40% of attendees were Trainees, 43% as Supervisors and 17% recorded as not applicable.

Evaluation Survey Feedback from attendees – last words...

"The duplication of the panels in different days was a brilliant idea. The talks from other trainees were both interesting and useful, as well as the ones from the supervisors"

"Excellent conference and something I wouldn't have managed to attend face to face I really enjoyed the virtual format Thanks."

"Some technical issues led to some sessions being difficult to follow. That all being said - well done for putting it on virtually."

Celebrating success in Healthcare Science

Recognition of our Healthcare Scientist colleagues.

We would like to say a massive thank you and recognition to all our NHS colleagues for the extraordinary work they do every day supporting patients and the tirelessly efforts faced adapting services supported throughout the pandemic.

During these unprecedented challenging times many Healthcare scientists were at the front line or behind the scenes fighting the corona virus.

From the clinical engineers adapting ventilators, the technicians modifying PPE for safe protection from the virus for our patients/staff to the clinical scientists and biomedical scientists in the laboratories developing and performing COVID testing.

This has been a year like no other. Here are some of the stories of the collaboration from various departments and organisations to support patient services during these challenging times of the pandemic and recognition from award nominations.

Pauline Paul,

Consultant Maxillofacial Prosthetist/Clinical Scientist (Reconstructive Science).Oral Facial Laboratory, University Hospital Crosshouse NHS Ayrshire & Arran.

I lead a multi-specialised laboratory service compiled of a team of six staff. In our normal working day (pre COVID -19) we directly provide scientific and advisory services to a variety of patients affected by cancer or other conditions of the face, head and neck for their rehabilitation by restoration utilising implants, splints, active/passive appliances and prostheses. However due to Covid 19 some of our work was put on hold and we were unable to run our out patients clinics.

At the beginning of the pandemic it became very quickly apparent that there would be a shortage of PPE visors. I contacted colleagues across Scotland and England and we quickly realised that that we could do something to help our frontline staff in these very trying times. We could supplement PPE visors locally as patient numbers increased by using 3D printers we had in the workplace. The 3D printer process we currently have within our laboratory limits the number of visors able to be printed to 10 per day so we knew we had to up our game to meet demand. Again with communication with other lab managers south of the border we decided on a way forward.

We sourced materials from Orthotics and Occupational Therapy to start the process then the Oral Facial team, after producing a few prototypes, set up a production line to make and assemble single use visors in large volumes.

Whilst researching the best materials to use and waiting on deliveries, local businesses got in touch and donated materials and our production jumped to 200-300 per day.

Our team linked up with various companies to produce larger numbers of reusable visors frames. A colleague at Queen Elizabeth Hospital in Glasgow set up a link to East Ayrshire Council and local schools who pulled together thirty 3D printers working out of a hub situated within two of the schools to produce the visors frames.

Our team worked a 7 day week assembly and production line supported by a variety of hospital staff including a great team from Audiology and administration staff whose normal working pattern had been disrupted due to Covid 19. The teams, at the peak of production, produced 700-800 single use visors each day. These went through quality control from a health & safety and clinical representatives to make sure they were fit for purpose.

A special thanks must go to the head of Crosshouse hospital theatre stores who was amazing throughout the full process. Over the course of a few weeks our department completely changed and I am so proud of our team who made it such a success.

The generosity of local businesses was phenomenal and we can't thank them enough. The support they gave the frontline workers in acute services and in the community was amazing.

> "we quickly realised that that we could **do something to help our frontline staff** in these very **trying times**

Scottish Knowledge Exchange Awards 2020-21

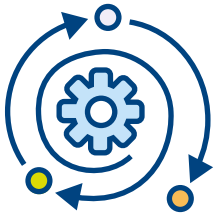
This event promotes the key role that innovation can play, especially in these challenging times for business, in building sustainable economic growth and increasing productivity.

A total of 24 different nominees across eight categories, each dedicated to highlighting a different way that business and academia have shared expertise between each other.

Congratulations to our colleagues in NHS Scotland/NHS Lothian Life Sciences Laboratories for their nomination in the Covid-19 Collaborative Response category for their collaboration with the academic team that set up an end-to-end NHS Scotland testing node to detect SARS-COV-2 using a RT-PCR based test to expand the national testing capacity

The Moredun-SRUC academic partnership collaborated with NHS Scotland to design and validate the use of sample pooling with the objective of further increasing testing capacity and improving the efficient use of scarce reagents and test consumables.

The new testing node developed through this partnership is a great example of One Health in action bringing together people working in both public and veterinary health and the sharing of knowledge and ideas.



This event promotes
the key role
that
innovation
can play

Ewan Eddie, Clinical Scientist, Head of Scientific Services for Photobiology, NHS Tayside

The NHS Research Scotland (NRS) Career Researcher Fellowship

Ewan moved to the Photobiology Unit in August 2015, taking up the position of Head of Scientific Services for Photobiology and became Lead Clinician for Photonet, the National Managed Clinical Network for UV Phototherapy, in 2019.

The Photobiology Unit has a strong focus on research and development for improving patient care and, along with colleagues both from within and outside of the Photobiology Unit, Ewan has been involved in more than £7.5 million of successful research grant applications. Although closely involved in clinical research, this was often as a collaborator and rarely as research lead due to a lack of dedicated time for this purpose.

The NHS Research Scotland (NRS) Career Researcher Fellowship from the Chief Scientists Office will enable Ewan to spend dedicated time on a program of research topics that have been identified as being of high importance to not just Photobiology but also to public health.

The 3-year Fellowship will investigate the efficacy and safety of far-UVC as a potential modality to disinfect the air and surfaces against viruses, including SARS-CoV-2, and drug-resistant bacteria. Ewan will also be investigating the use of natural daylight as a de-sensitisation treatment for Polymorphic Light Eruption (PLE), a common light activated skin condition.

AHA Esteem awards 2020 Nominations

The Advancing Healthcare Awards recognise and celebrate the work of allied health professionals, healthcare scientists and those who work alongside them in support roles, leading innovative healthcare practice across the UK.

Many of our colleagues were among the list of successful nominations. The nomination summary content listed below is taken directly from the AHA website.

Alison Anderson, Mortuary Services Manager and the Mortuary Services Team, NHS Lothian

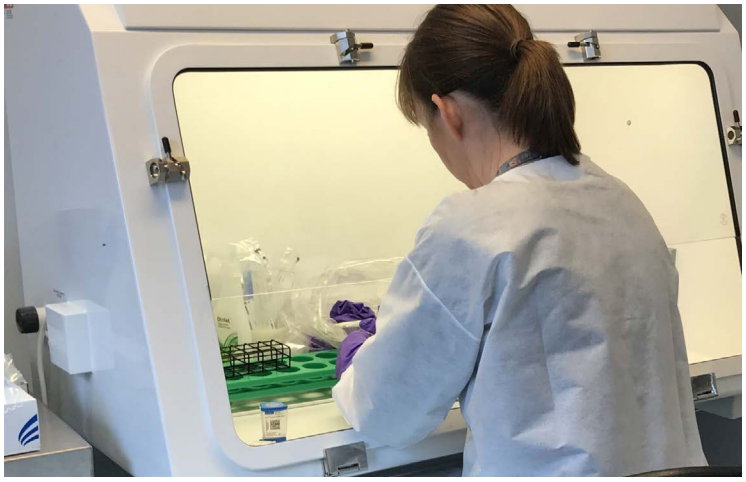
Nominator David Dorward, consultant histopathologist and senior clinical research fellow, says the pandemic has caused unprecedented challenges in many areas of the hospital but with a rising death toll, the NHS Lothian hospital mortuary service has been placed under significant pressure. This has principally been through a substantially increased workload, a need to rapidly increase body storage capacity, altered working practices, and the challenges of staff absence.

Not only have the whole team risen to tackle the tasks successfully but they have also recognised and responded to the need to establish and run a high-risk COVID-19 post-mortem service.

A joint programme of work between NHS Lothian and the University of Edinburgh has established a COVID-19 post-mortem programme to deliver detailed post-mortem examinations on patients who have died from the disease.

This is both to provide families with more information about the death of their loved one but also to help clinicians and scientists understand more about COVID-19. This work could not have been undertaken without the cheerful willingness of the whole mortuary team to voluntarily take on an additional workload, being willing to work out of hours both late into the evening and over weekends as well as the additional risk of working for long periods of time in a high infection risk environment. Their professionalism, enthusiasm, and determination to work within the broader clinical and scientific team to help both individual families and the larger clinical and research community during this challenging time has been a privilege to be part of.

Caroline Thompson, section manager, and the microbiology lab team of biomedical scientists and MLAs, NHS Borders



The team has worked tremendously hard during the pandemic to continue to provide a routine service and introduce two different systems for COVID-19 PCR testing. We previously had little experience in PCR testing but have, with the support of colleagues in Lothian, introduced both a rapid test and a batch test.

It has been very challenging for a small lab in a rural district general hospital to introduce new equipment and verify it to required standards whilst still maintaining a routine service.

The team have worked hard with loads of enthusiasm and a solid commitment to providing a service which best meets the needs of clinicians enabling a quick turnaround time so that patients and infection control can be better managed. We have changed our working pattern and introduced an extended working day in response to clinical feedback. We are in the process of recruiting and training additional support staff to allow us to maintain this service long-term and respond to changes in national testing programmes.

Microbiology biomedical scientists, NHS Forth Valley

Elan Tsarfati, consultant microbiologist, nominated Elizabeth Kilgour, microbiology laboratory manager and her team. 'This is an opportunity for us, microbiology consultants and laboratory management staff, to appreciate and praise our microbiology biomedical scientists. Each and every BMS in this photograph is playing a fundamental role in the laboratory diagnosis of COVID-19.

Only weeks from gaining UKAS accreditation, this team stood ready to take on a completely new virus using an equally new PCR. Without fail, our team answered the call to duty by validating and starting COVID PCR tests in record time.

They've adapted their working hours – seeing less of their families and loved ones – to increase testing as demand increases.

What a team! We salute them for their professionalism which shines brightly, every day. We're endlessly impressed by their energy and enthusiasm in all that they do and want their contribution to the COVID-19 pandemic recognised beyond the laboratory. Congratulations and our deepest thanks go out to each and every one of them.'

Karen Ritchie, senior biomedical scientist, NHS Fife

Nominator Ken Campbell, blood sciences services manager, says that since the start of the COVID-19 outbreak, Karen has worked tirelessly to help her colleagues and to enhance the diagnostic laboratory service. In addition to volunteering to help cover shifts and provide support in the Core Lab, and overseeing and supporting the Point of Care blood gas analysers, she has also retrained to operate serology analysers thus releasing microbiology colleagues who have tested positive, and to process samples which are being collected as part of a wider enhanced surveillance of Covid-19 in Scotland.

While these developments have been a team effort, Karen has done much of the groundwork often working in her own time to minimise disruption to the routine work of the department.

SMART Services,
Edinburgh Health and
Social Care Partnership

For the team, Michael Dolan, head of assistive technology says that this team have pooled their resources, knowledge and skills to support front-line teams by becoming the PPE Distribution Hub (including professional advisory service) for Edinburgh Health and Social Care Partnership (EHSCP) as well as mass producers (1800 per day) of visors to a wide range of NHS Lothian, EHSCP and carers across the system.

Promoting Healthcare Science

The Healthcare Scientist communities promoting the professions across Scotland.

Meet the Expert: Skills Development Scotland with our HCS NES team - clinical biochemist James and bioengineer Andy

Meet the Expert is a live video session run by My World of Work, where experts discuss their roles and offer tips to young people considering a similar career. In the session, young people can ask questions and gain insight into the expert's work.

NHSScotland healthcare scientists James, a clinical biochemist, and Andy, a bioengineer, spoke about their work at a recent session which is posted as a YouTube link available on the NHS Scotland Careers website.

This was posted as a Live session on 26 November 2020 with engagement of:

- 308 pupils
- 14 schools

Video views are also available on the NHS careers website – the recording of the session has had 270 views on YouTube. A blog post about the session was also produced. It includes a link to the YouTube video.

Healthcare Science Week: 5 March – 14 March 2021

Healthcare Science Week is an annual event. It provides the opportunity to raise awareness of the many different healthcare science careers across clinical physiology, life sciences and physical sciences.

This year, Healthcare Science Week was between 5 and 14 March 2021. Martin Bryce and The NHSScotland Careers content team looked for opportunities to help promote the various careers in Healthcare Science.

Campaign planning and content development

Due to the Covid-19 pandemic, the team were unable to meet colleagues face-to-face to record video interviews or take photos as we would normally. Therefore, they needed to find different ways to produce authentic and engaging content that would:

- help to promote a range of healthcare science roles
- allow healthcare science colleagues to tell their career stories
- drive traffic to the NHSScotland Careers website

Podcast series

At the planning stage, the team reached out to the NHSScotland healthcare science community to ask for volunteers and received a good response with recording 10 episodes using Microsoft Teams.

The following NHSScotland Boards were represented:

- NHS Education for Scotland
- NHS Greater Glasgow and Clyde
- NHS Highland
- NHS Lothian

Healthcare Science Week provides the opportunity to raise awareness of the many different **healthcare science careers**

Other types of content

Although promoting the podcast series was the priority during Healthcare Science Week, other methods of promotion were:

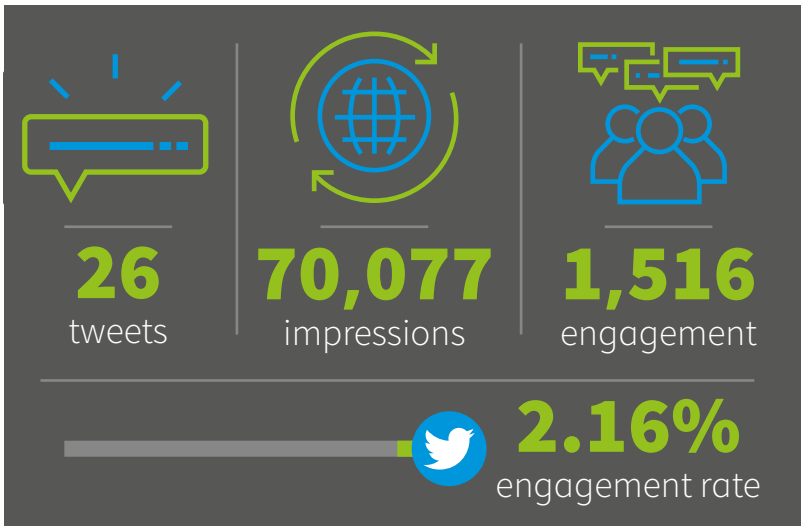
- inviting healthcare science colleagues to send user-generated content, including photos of them holding a placard describing why they love working in healthcare science including engagement from the HCS NES team on twitter.

- advertised Modern Apprenticeship vacancies in NHS Lothian and NHS Greater Glasgow and Clyde
- promoted a range of healthcare science job profile pages to raise awareness

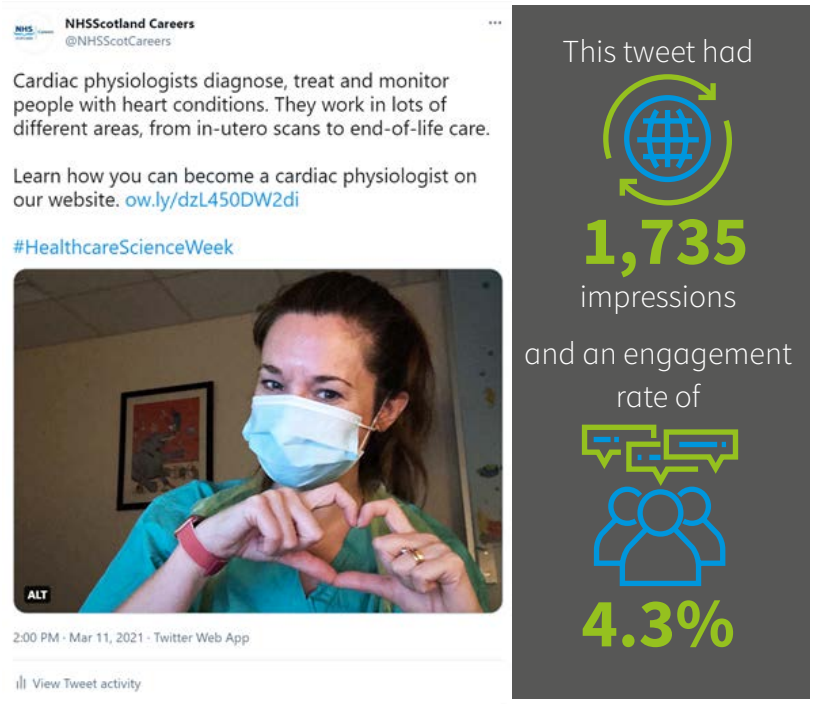
Social media campaign performance

NHSScotland careers uses the following social media platforms. Channel selection is based on target audience and key messages.

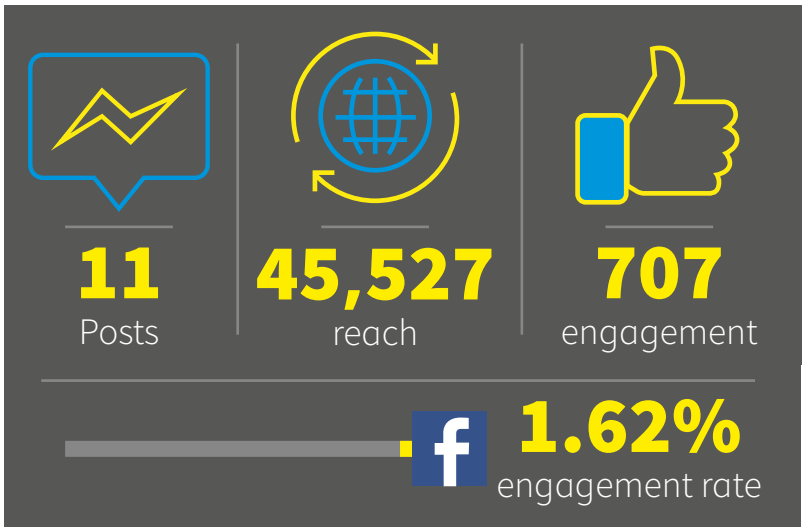
Twitter



Top tweet:

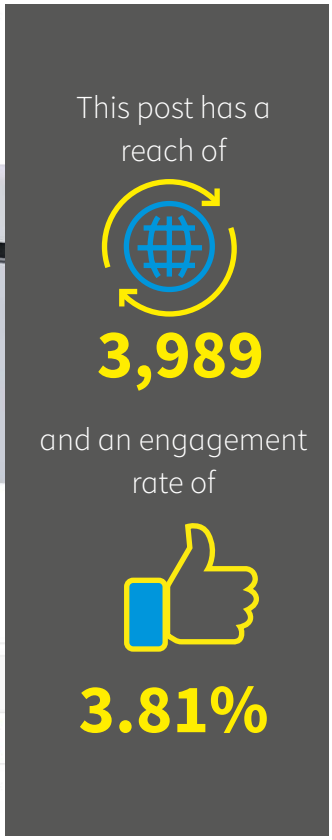


Facebook



Top posts

Careers in Healthcare Podcast



NES Healthcare Science Advisory Group

NES has an Advisory Group to act as a key stakeholder group on a range of HCS education and training matters.

Members review and critique NES Healthcare Science activity, and highlight workforce priorities. The group comprises of representatives from the three healthcare science strands, education sector, workforce and government stakeholders

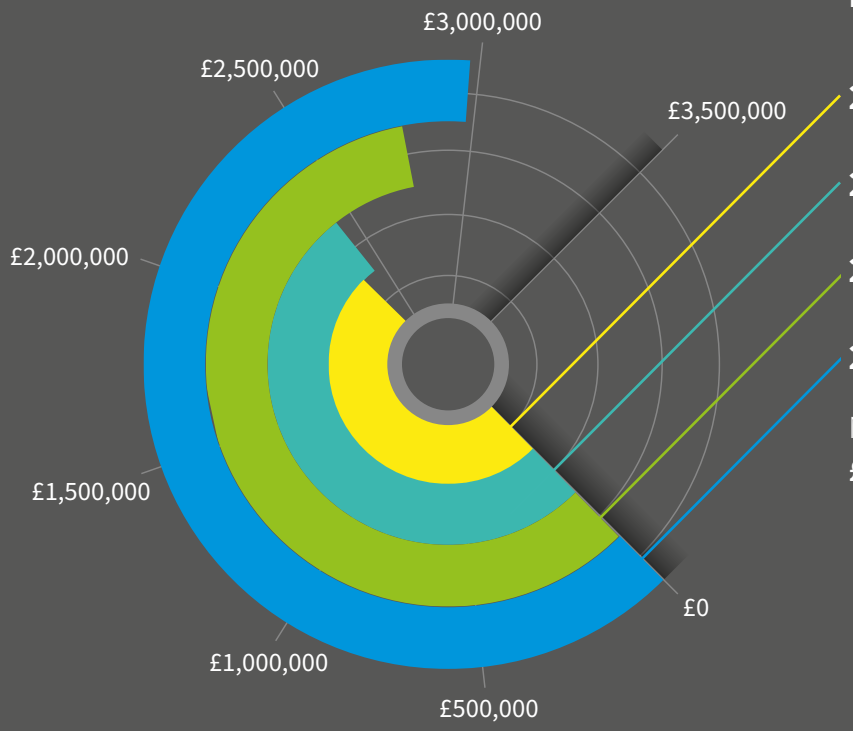
The Advisory Group has not formally met during this pandemic year. However, some members contributed to a pilot of our trainers' workshop that was in development. We anticipate a virtual restart of the group once lockdown eases.

Our advisory group membership, meetings and minutes are available on our NES website.

Members
review and critique
NES Healthcare Science activity, and highlight
workforce priorities

Financial Summary

NES HCS March 2020 – April 2021.



NES Healthcare Science expenditure

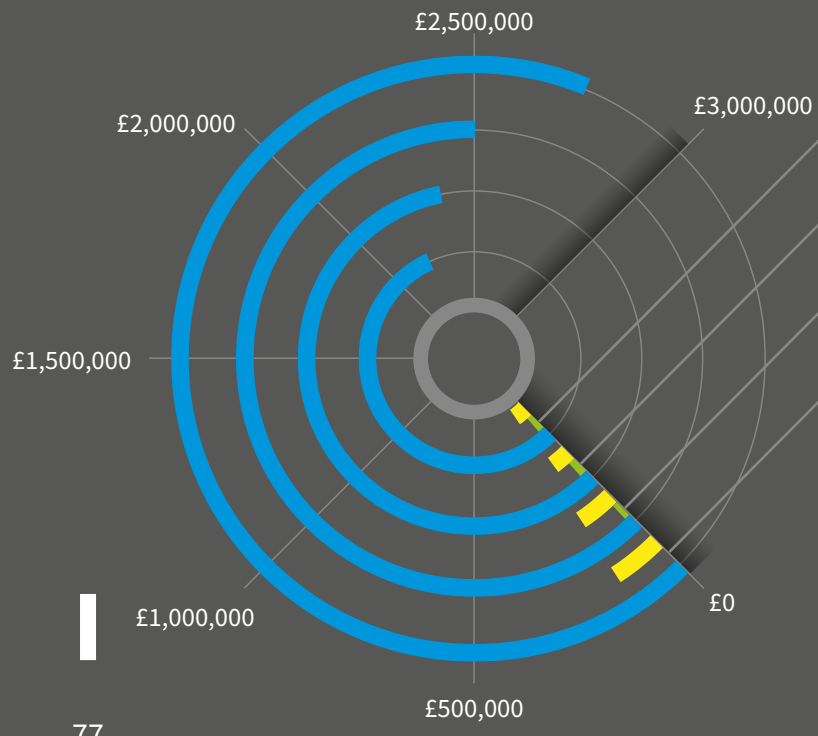
2017/18

2018/19

2019/20

2020/21

Net expenditure 2020-21
£2,987,694



Recent spending distribution

2017/18

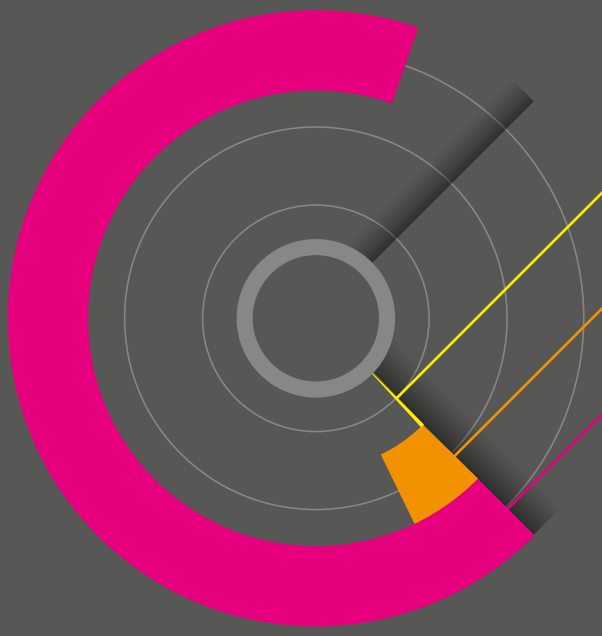
2018/19

2019/20

2020/21

- Trainee costs
- NES training and events
- NES salaries and running costs

*Training and events spending were depressed owing to the pandemic



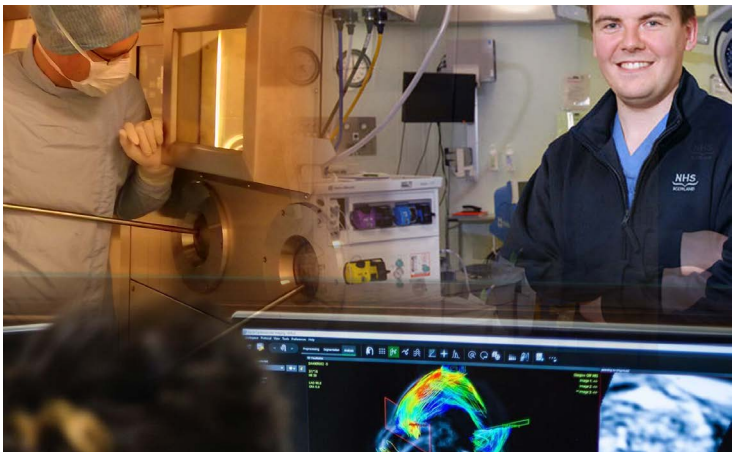
Distribution of spend 2020 - 2021

0.1% | NES training and events

07% | NES salaries and running costs

91% | Trainee costs

2020-21 Objectives



These build upon previous years and include:

- To review and improve our centre self-assessments for the next cycle of training accreditation
- Continue to development our CPD offer through e-Learning opportunities for the HCS community on Turas Learn — Healthcare Science e-Learning site.
- Revision of our established face-to-face training to an online offer.
- Continue to support and monitor the quality of training in the Healthcare Scientist workforce as it evolves.

These objectives comprise both normal “ongoing” business and a recognition that in 2021-22 we anticipate a phase of remobilisation and renewal of our NHS. The Covid pandemic has challenged the healthcare science workforce in many ways. All branches of our community have risen to that challenge and made a vital contribution to the wider healthcare team. This exceptional year has delayed, altered and refocussed training. Trainees will reflect on their experiences and, hopefully, draw from them the many positive and exceptional development opportunities that this period has presented.

Acronyms 2020-21

ACS	Association of Clinical Scientists
AHCS	Academy for Healthcare Science
ARCP	Annual Review of Competency Progression
CCL	Common Core List
GSP	Good Scientific Practice
HCPC	Health and Care Professions Council
HCS	Healthcare Science
HEE	Health Education England
HEIW	Health Education and Improvement Wales
HSS(T)	Higher Scientific Specialist (Training)
IBMS	Institute of Biomedical Science
IPEM	Institute of Physics and Engineering in Medicine
MLA	Medical Laboratory Assistant
NES	NHS Education for Scotland
NSHCS	National School for Healthcare Science
NTN	National Training Number
OSFA	Objective Final Structured Assessment
OLLD	NES Organisational Learning and Leadership Development
PTP	Practitioner Training Programme (graduate-level)
SG	Scottish Government
STP	Scientist Training Programme (Postgraduate level)
TPM	Training Programme Management
TURAS	NES app that includes TPM

Alternative Formats

This resource may be made available, in full or summary form, in alternative formats and community languages. Please contact us on **0131 656 3200** or e-mail: **altformats@nes.scot.nhs.uk** to discuss how we can best meet your requirements.

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