

An introduction to the Higher Specialist Scientist Training (HSST)

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HSST is a part-time doctoral level academic programme with work-based learning over 5 years.



University

Professional Doctoral degree programme equivalent in status and challenge to a PhD



Employer

- Workplace based training:
- Practical training and assessment.
 - Contract of employment.

- **Professional Doctorates** have been around in the UK since the early 1990's with the aim of finding novel approaches to integrating professional and academic knowledge.
- **Professional doctorate** degrees are equivalent in status and challenge (Level 8) to a PhD, the holder achieves the title "doctor", but, unlike a PhD, students undertaking a professional doctorate are expected to:
 - "... make a contribution to ***both theory and practice*** in their field, and to develop professional practice by making a contribution to (professional) knowledge." rather than furthering academic pursuits and are therefore more appropriate for those pursuing professional rather than academic careers.

- Common to all is the completion of an original piece of research, usually presented as a thesis, and examined by an expert in the chosen field.
- This relates to real life issues concerned with professional practice and is carried out within the students own organisation.
- Most professional doctorates also include a large taught or directed study element, which is formally assessed. These components frequently include both the teaching of research methods, and also components related to broadening or deepening the students' understanding of the disciplines in which they are researching or providing them with appropriate transferable skills.

“Why wouldn’t you want to do this?” as it is designed to advance an individuals professional practice and further their career with the aim to develop a researching professional.

A collaborative approach

The delivery of the programme is a collaborative approach between the NSHCS, the MAHSE consortium and professional body RCPATH.



The bespoke nature of HSST

- The standard of education and training have been drafted and based on the Academy of Health Care Science's Good Scientific Practice (GSP).
- The School uses an **Annual Review of Progression** to consolidate the evidence each trainee collects to demonstrate their competence to progress. The ARP maps to the Academy's Higher Specialist Scientists Standards of Proficiency
- A flexible programme - adaptable and responsive to the individuals pathway through HSST (while still being mindful of good assessment practice and curriculum alignment)
- Negotiable.
- Self directed and independent learning.
- Experiential and reflective.
- Innovative and engaged with stakeholders and community.
- Present convincing and sufficient evidence of clinical scientific competence at this level.

Unlike the STP...

There are:

- **No** specified competencies
- **No** required numbers or types of work place based assessments
- **No** rotations

So what is there?

- **The standard of education and training has been drafted and based on the Academy of Health Care Science's Good Scientific Practice (GSP).**
- Expected to consistently demonstrate the attitudes and behaviours necessary for the role of a consultant clinical scientist.

KEY Components of HSST

3 key components the programme delivers are;

- Mastery of higher scientific knowledge
- Mastery of higher clinical/scientific competence
- Personal and professional development including leadership, management, teaching, values, and attitudes and behaviours appropriate for higher professional practice

PLUS 4th component

- a requirement for a contribution to innovation or improvement through service delivery, patient safety, care, public communication/outreach and quality management.

Components of the professional doctorate

Section A

Leadership &
Development

Section B

Specialist
Scientific
Clinical
Programme

Section C

Research,
Development
and Innovation
Module:
Research
Project
Module:
Doctoral
Research &
Innovation in
Clinical
Science

MAHSE partner universities will accept a pass in the FRCPATH Part 1 examination in a relevant specialty in place of Section B.

Fellowship of The Royal College of Pathologists will accept the research component in Section C in a relevant specialty as the written option for the FRCPATH Part 2.

- The programme content varies in that it requires that each trainee follows a bespoke training plan agreed and planned in advance with their local workplace supervisor and recorded in an e-portfolio.

TRAINING PLAN

- It requires evidence of workplace learning outcomes appropriate to the Higher Specialist Scientists Standards of Proficiency and referenced to the specialty curriculum.

Bespoke nature of the programme means that the path through the HSST programme can be confusing.

Life Sciences

Mandatory

FRCPPath

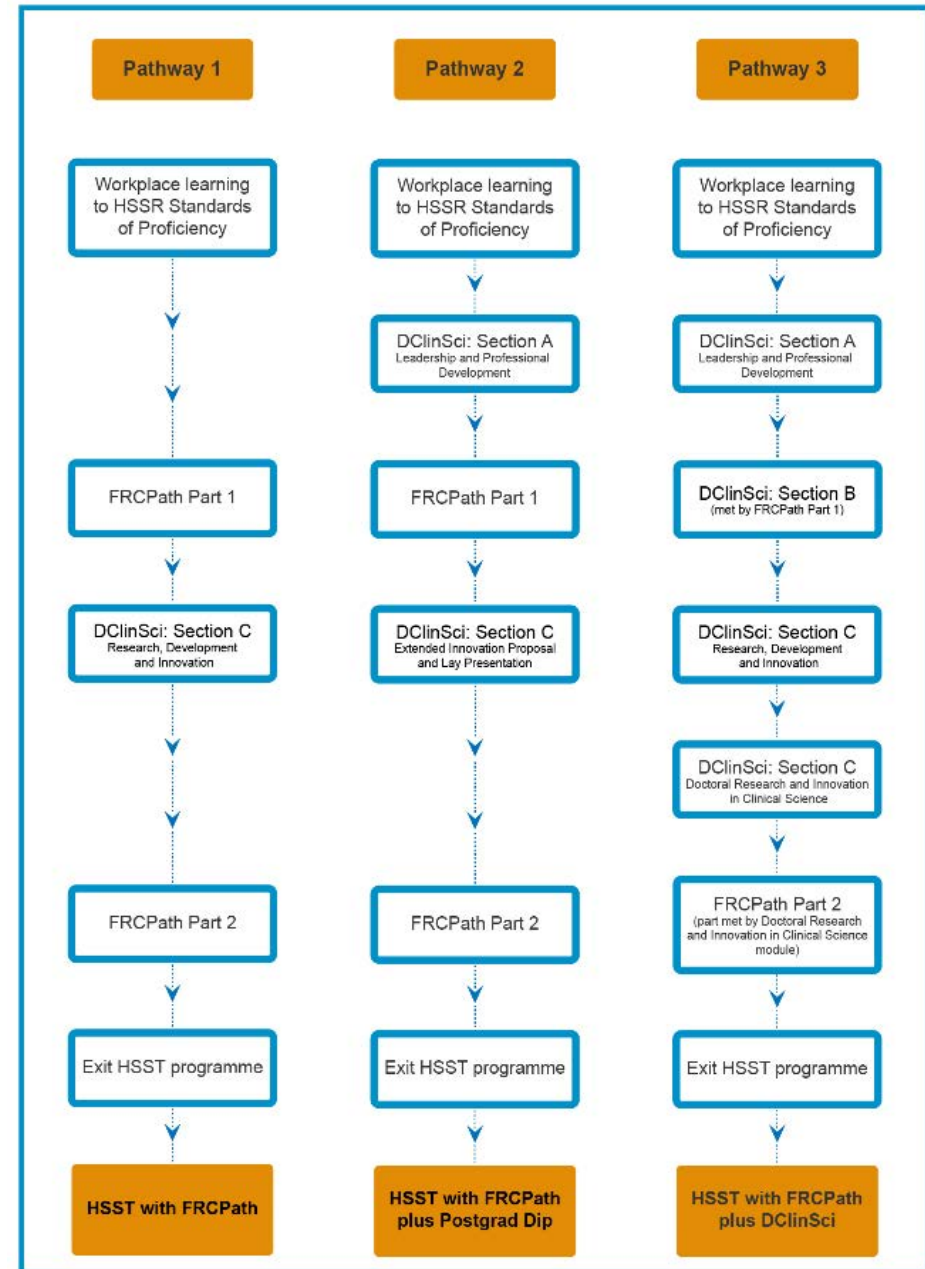
Innovation

Workplace Learning

Optional

PostGradDip

DClinSci

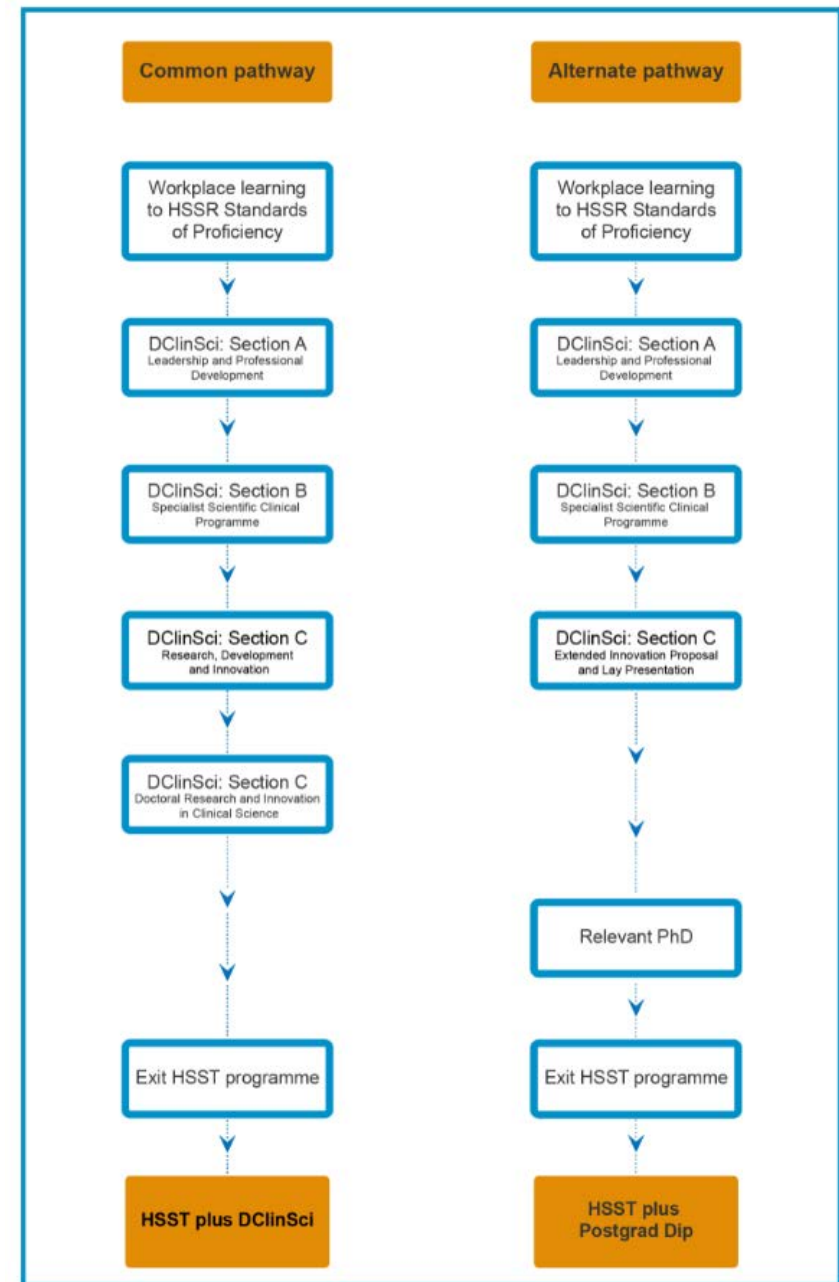


Physical and Physiological Sciences

Mandatory

DClinSci (all Sections unless exempt from research project due to a relevant PhD)

Workplace Learning



Innovation in Clinical Science Project

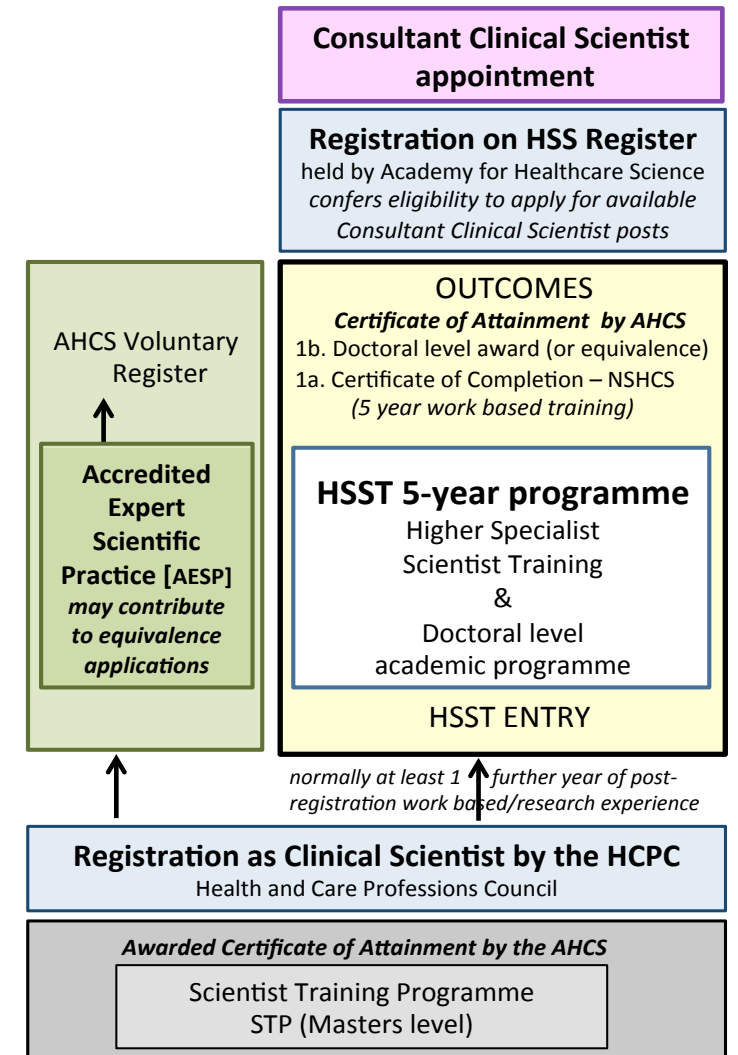
- HSST designed to help you develop as a leader and innovator in healthcare science.
- Need to show evidence of ability to conceive, plan and critically evaluate an idea for innovation.
- Evidence will make valid contribution to your completion of HSST learning outcomes.



Successful Progression

Workplace Evidence

- Regular development and review of a training plan.
- E-portfolio demonstrating the appropriate application of specialty knowledge and skills through the quality and types of evidence and appropriately mapped to the domains of the AHCS Standards of Proficiency for Higher Specialist Scientists and referenced to the learning outcomes of the specialist curriculum.
- Innovation Project (C1).
- IAPS (Physical and Physiological Sciences only).
- Annual Review of Progression.
- A Final Sign Off by Workplace Supervisor.



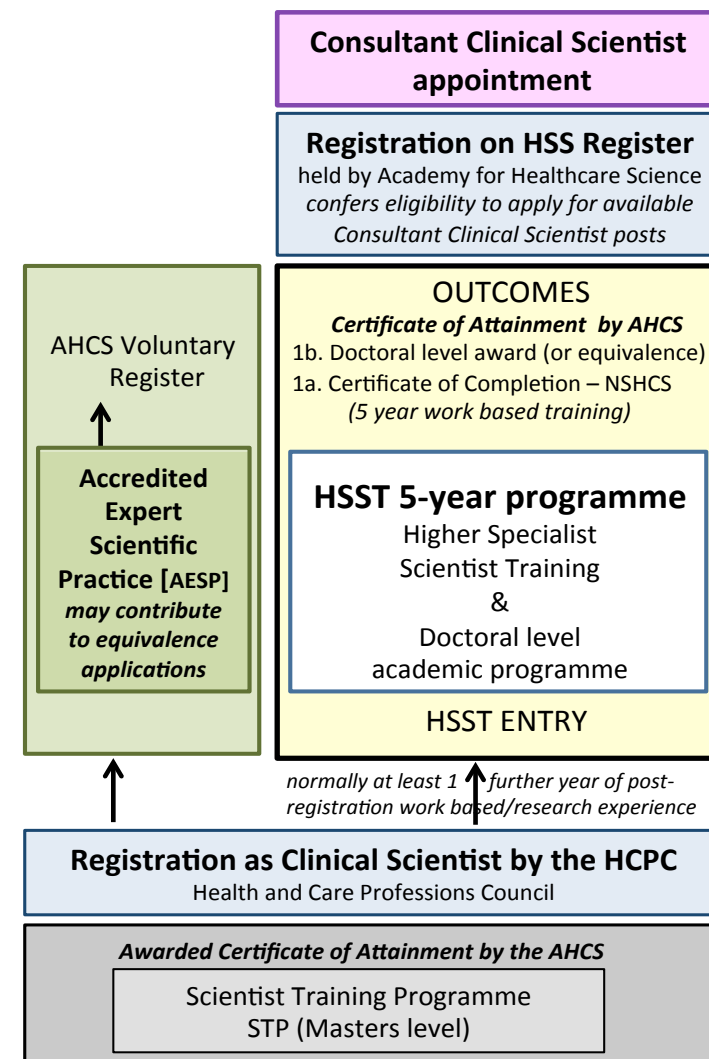
Successful Progression

Professional Evidence

- Royal College of Pathologists (by examination)
- CEng (Clinical Biomedical Engineering only)

Academic Evidence

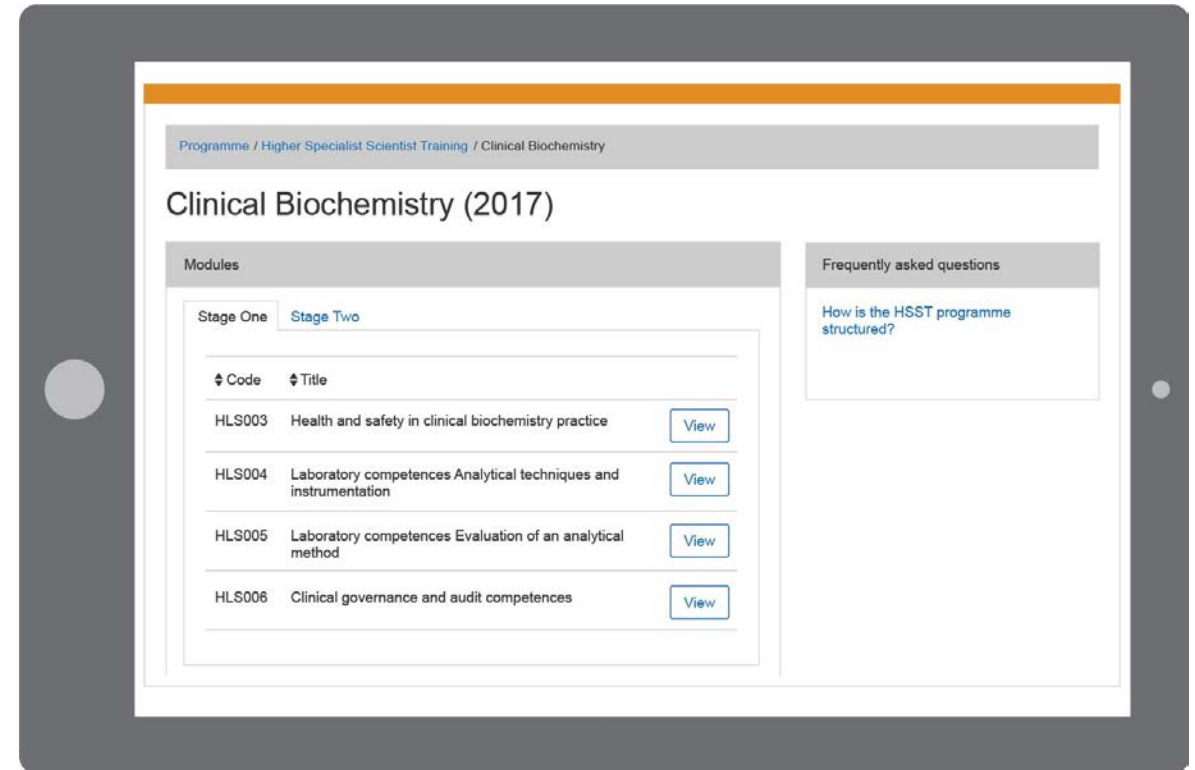
- DClinSci or Postgrad Diploma
- A relevant PhD (as C2 exemption criteria)



The Curriculum Library

Module information includes:

- Module objective.
- Knowledge and understanding that the trainee will need to demonstrate.
- Required technical and clinical skills.



<https://curriculum.nshcs.org.uk>

Final thoughts on HSST

- HSST bespoke training at highest level – learning and assessment cannot be prescriptive
- No fixed guidance on ‘what’ or ‘how much’
- Trainee is responsible for gathering and recording evidence of their progress towards readiness to practice at level of CCS
- HSST is not pass or fail – evidence is either convincing or not yet convincing

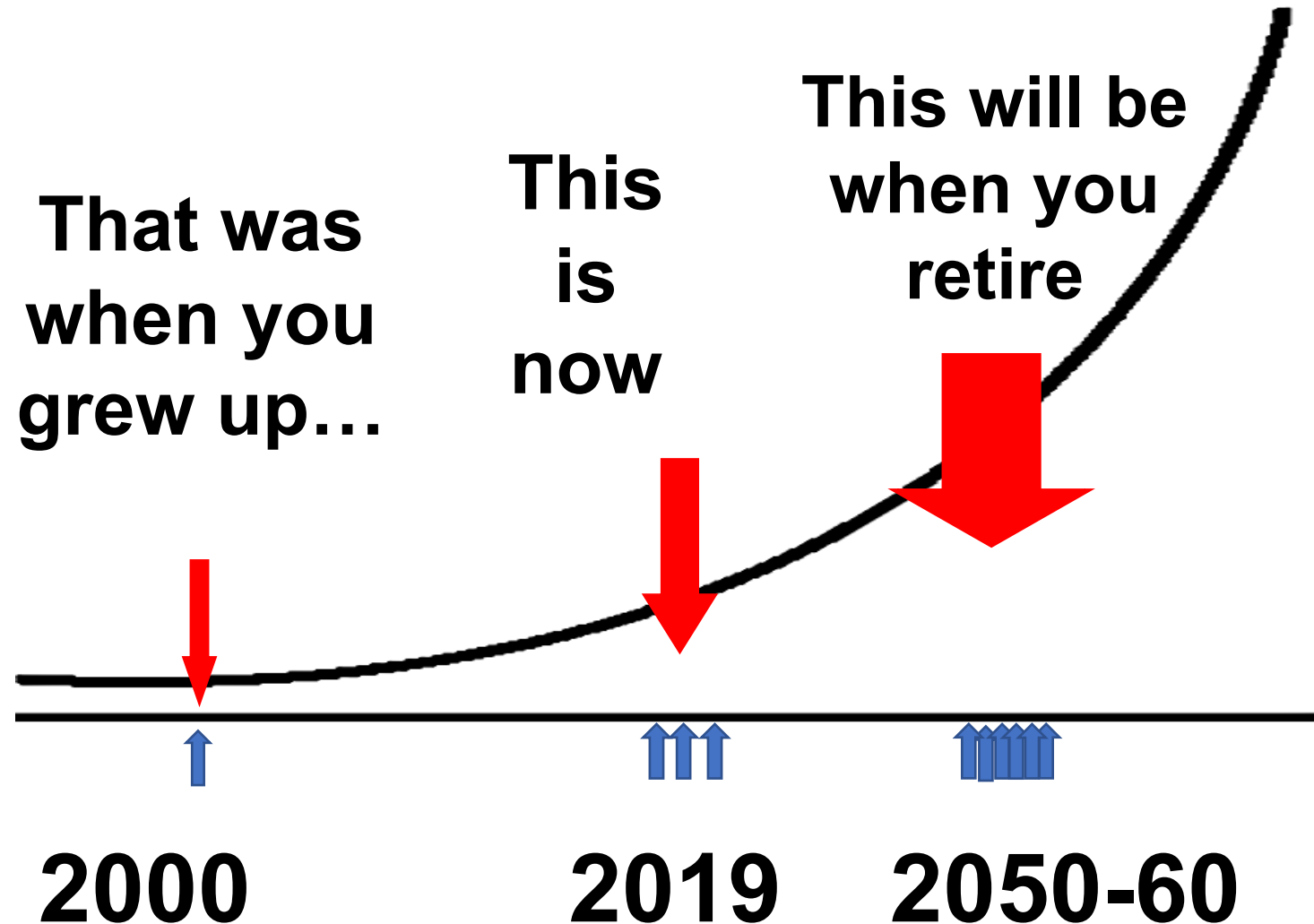
Final thoughts on HSST

- Aim is to build a rich, detailed portfolio of evidence of each individual's achievements and competence at a higher scientific level
- Be innovative and creative in development of learning plans and gathering evidence of competency
- Be efficient - don't duplicate efforts (make use of *naturally occurring evidence* and evidence for DCLinSci or RCPATH).

Healthcare Scientists

- hugely diverse and highly skilled workforce
- leading-edge technology e.g.
 - PET, MRI,
 - advanced laboratory diagnostics, i.e. Are proteins working? Are cells functioning?
 - the genomic revolution
 - medical equipment management.
- patient-facing e.g.
 - POCT.
 - diagnosis and treatment of hearing disorders
 - calibration of pacemakers
 - wheelchair modification
 - telemedicine

Speed of change is increasing

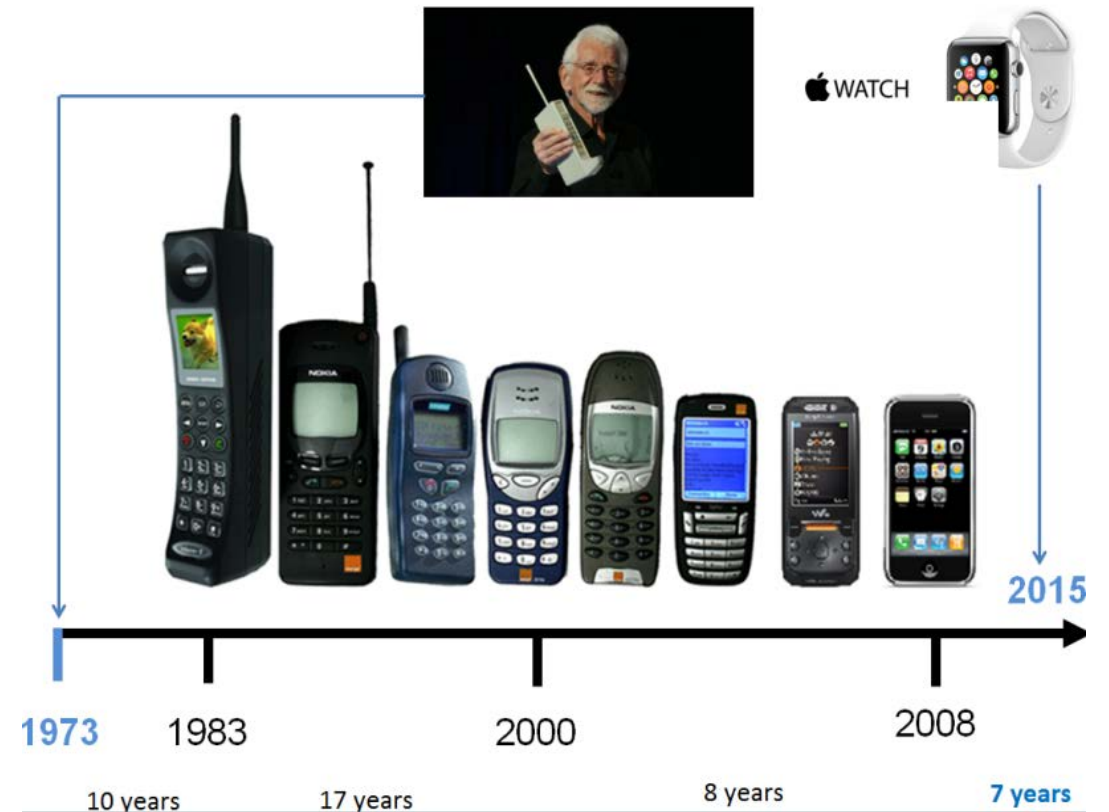
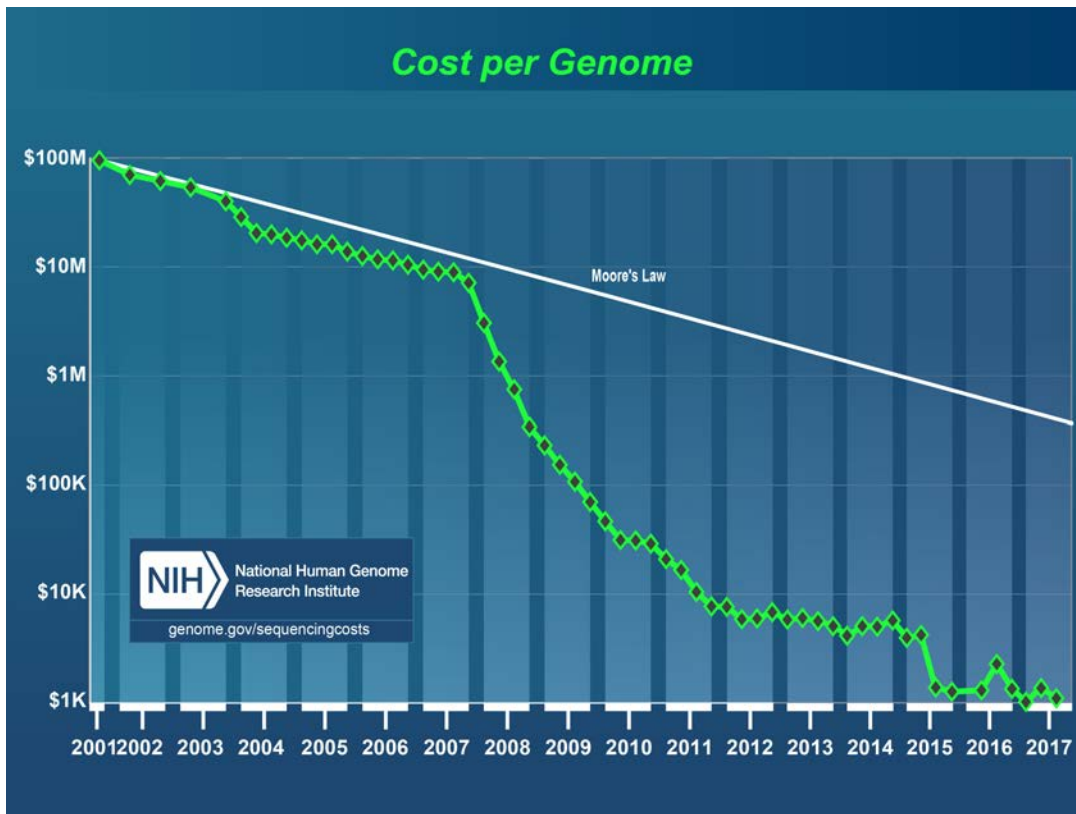


Changing healthcare

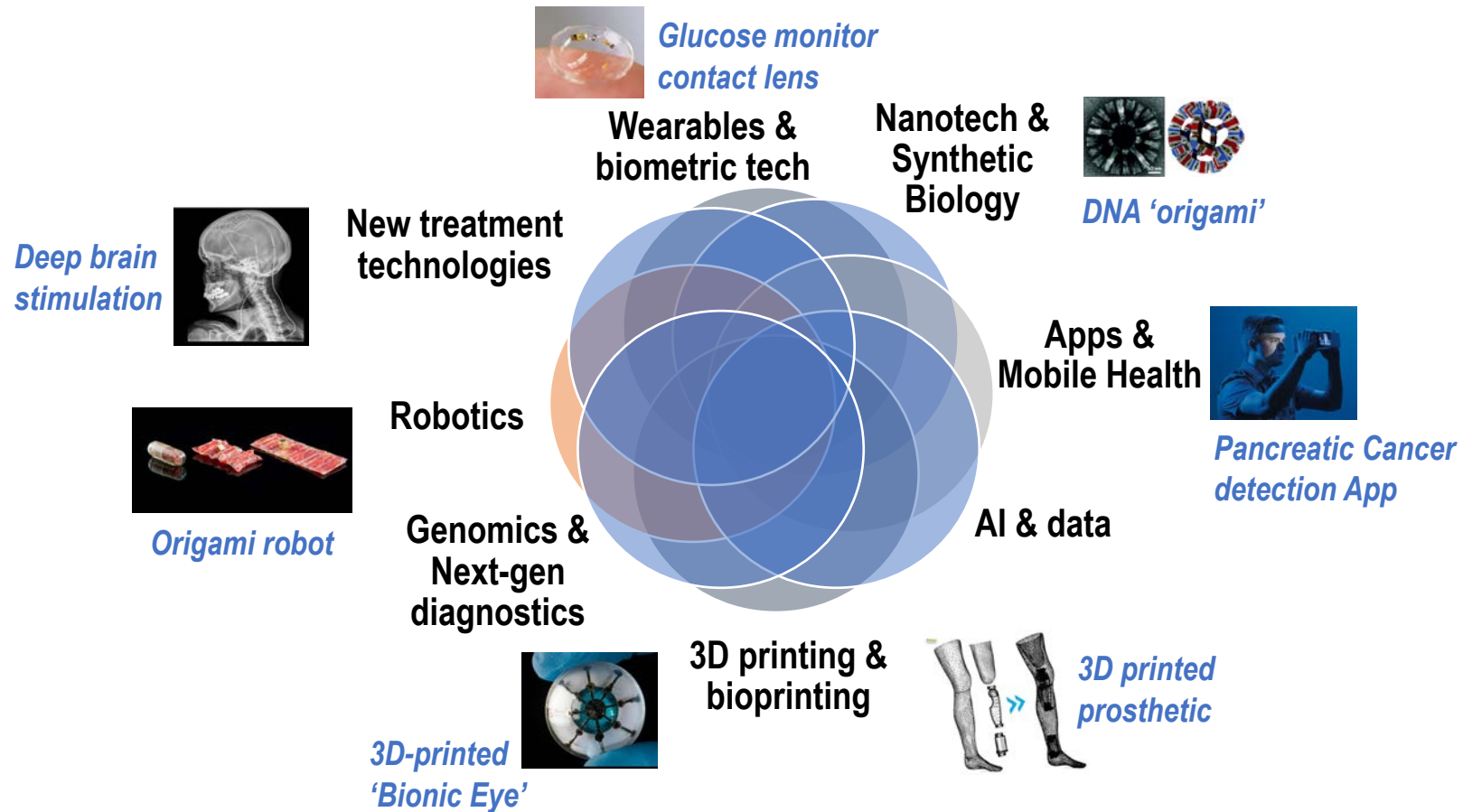
Healthcare delivery will be vastly different in future

- Genomics revolution
- Data and technology avalanche

Healthcare Scientists are at the Centre of this change



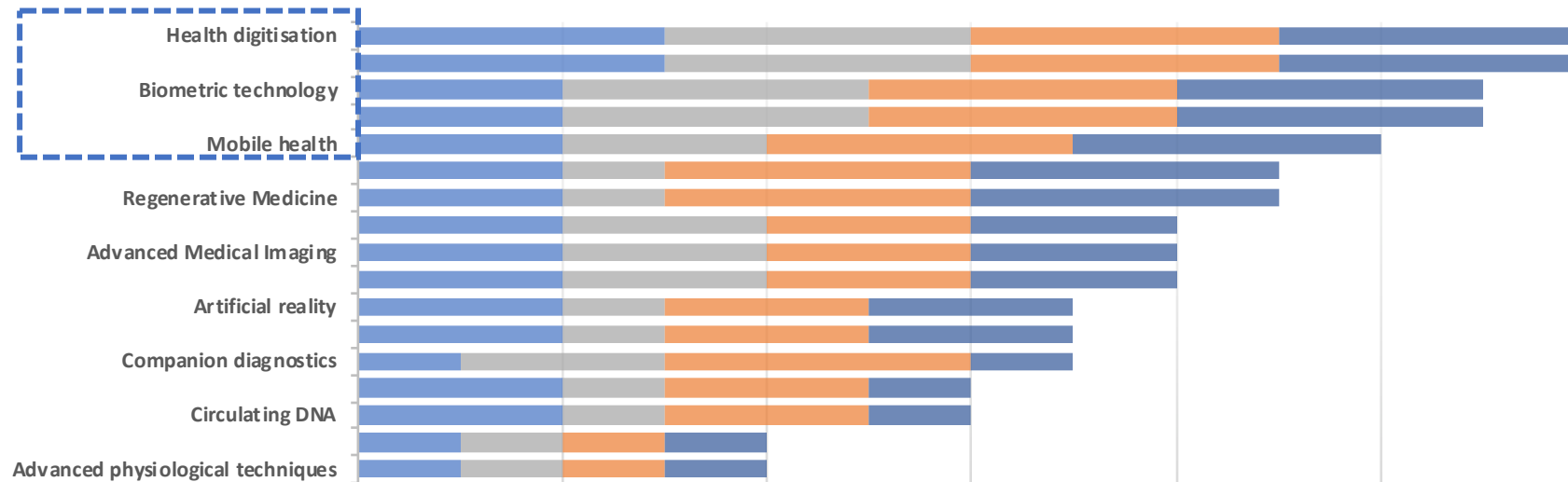
Scientific advance transforming healthcare



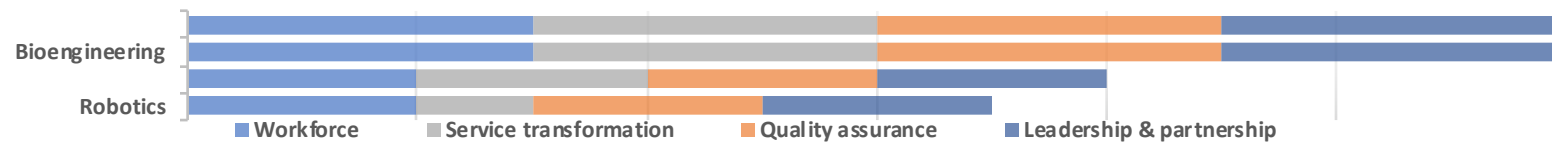
Evaluating the consequences of technological change



Clinical impact in next 10 years



Clinical impact in >10 years

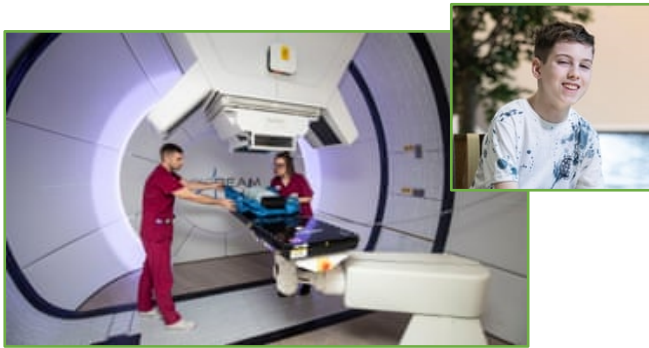


Delivering advance now: HCS at the forefront of care



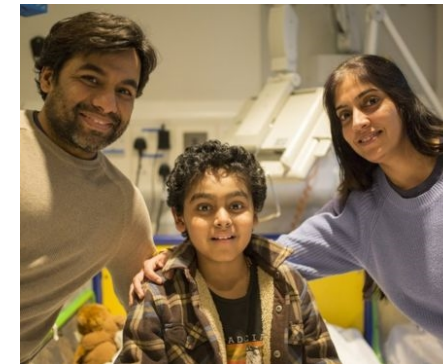
Healthcare Science has been at the centre of major service developments in 2018

First high energy proton beam patients treated in NHS facility



First children treated using personalised CAR-T immunotherapy for leukaemia

NHS Genomic Medicine Service launches – for consistent & equitable care for 55m population



INVENTION

EVALUATION

ADOPTION

DIFFUSION

The world of NHS change



Precision and Personalised Medicine

Now

- 'One size fits all' treatment based on **symptoms**
- Organ/ **speciality** organisation of services and professions
- **Limited** use of genomic/molecular markers
- Diagnostic & other clinical **data not linked**

**'One size fits all'
treatments &
intervention**

2020?

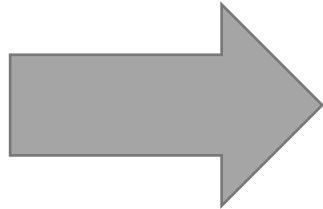
- New taxonomy of medicine based on underlying **cause** & personal **response**
- Comprehensive **linked** diagnostics to give full picture
- **Tailored therapies** for better outcomes
- **Integrated** clinical services taking a '**whole body**' approach

**Individually-tailored
approach**

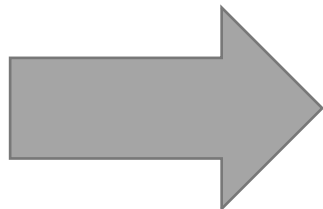
Technology alone is not enough to transform care



Effective adoption and delivery of new technologies for patient benefit is both a **hearts and minds** exercise – it requires a rethinking of ways of working and can't just be layered on top of existing practice



**Ensuring
the technology is
enabled**



**Ensuring existing
working practices
have been rethought
and respecified**

Recognising the HCS impact across major health conditions

The Long Term Plan identifies a range of areas across major disease areas where healthcare science specialisms have an impact on improving outcomes

Cancer

- Rapid diagnostic centres
- Extended use of genomics & molecular diagnostics
- Personalised screening
- More imaging capacity
- Improved radiotherapy

Cardiovascular disease

- Early detection
- Targeted screening (inc FH testing)
- Multidisciplinary management in primary care
- Improving access to Echo

Stroke care

- Further reconfiguration of services with cross-profession competencies, e.g. Mechanical Thrombectomy
- New tech e.g. CT perfusion scans & AI interpretation of imaging

Respiratory disease

- Earlier diagnosis & detection
- Improved spirometry testing & interpretation
- Supporting pneumonia care

Diabetes

- New tech eg flash glucose monitors & continuous monitoring

Maternity & children

- Preventing pre-term birth inc cardiotocography
- Improving critical care
- Whole genome sequencing for paediatric cancer
- Improving clinical trial participation
- Paediatric long term condition support

Adult Mental Health

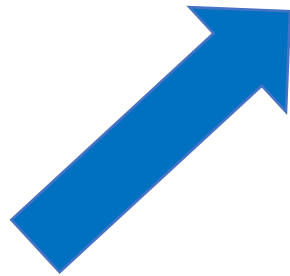
- Support to diagnose & identify physical health conditions

Senior Healthcare Scientists are more and more becoming custodians of vital healthcare data for patients.

Before I finish, let me tell you a story, it happens to be about me!



Immunology





What I did **NOT** Know

- Quality Control /UKAS
- Logistics of testing 100,0s of samples
- Complexity of Tests
- Need for robust and reproducibility
- Didn't understand language of clinicians
- Didn't understand language of managers
- Didn't know how to manage clinical teams
- Didn't understand financial constraints
- Didn't understand patient fears

Did not have FRCPath
Did all scientific technical work
Did **not** authorise results
Were not Consultants
DID NOT LEAD

Laboratory Led by Medical Doctors



Had less time for clinical work



What I **Found** was

What to do!



Find a Way to become a consultant
Scientist to lead the department

Allow Medical Staff more clinical
time

WHAT I did to be able to Lead

- Built a team around me.. Of junior scientists /researchers .
- Started to do what our medical colleagues didn't do.
- Used our science skills to develop scientific tests for patients.
- Collaborated with Industry, hospitals, universities.
- Taught in Universities, Oxford, Oxford Brookes and beyond.
- Wrote research grants and applied for money.
- WORKED for the FRCPath.
- Worked with my professional body/Royal college.
- **Worked with my medical colleagues who helped me enormously.**

WHAT I did to be able to Lead

Scientific Niche that had not been there before
... in that department



**Laboratory Led by Healthcare
Scientist Consultants**



- DO have FRCPath
- DO all scientific technical work
- DO authorise results
- DO train to be Consultant Scientists
- DO LEAD**



**Work Closely and
effectively with the
clinical team.**

**Who have more time
for patients**

5 years from now...



5 years from now...the iceberg illusion



Tips for success

- Be collaborative
- Talk to one another: Social Media/Facebook **
- Talk to the School: Twitter /facebook
- Seek out Trust Lead Scientists, Departmental Educational Leads
- Seek out Alumni of the programme
- BE PREPARED: to be a pioneer!
- Contact University/ NSHCS for ideas, help, support
- EXPECT CHALLENGES !

Final FINAL.....thoughts

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