ACADEMY FOR HEALTHCARE SCIENCE

PORTFOLIO OF EVIDENCE FOR CERTIFICATE OF EQUIVALENCE

xxxxxxxx

Modality: Respiratory Physiology

Contents

SUMMARY

My career in Respiratory Physiology commenced in September 1994 when I became a student respiratory technician based at the xxxxxx. As part of this training I was enrolled onto a BTEC in Medical Physics and Physiological Measurement and after the first year of training I also commenced an NVQ Level 3 in Respiratory. These qualifications provided me with the background training I required to perform full lung function testing competently and complete my ARTP National Assessment (more recently known as the Part 1 examination).

After qualifying as a Respiratory technician I was enrolled on a four year part time BSc Honours degree in Clinical Science which I successfully graduated with a 2:1 in 2000. During this time I also became the Lead Physiologist (MTO 5^{+++}) for the department under the supervision of xxxxxx, Consultant Clinical Scientist and then subsequently xxxxxx, Consultant Clinical Scientist.

My passion for education and development led to me enrolling on and self funding a Masters degree. I wanted this to be relevant to my role and as there was not a Respiratory Physiology MSc available to me I undertook an MSc in Work based learning.

In 2006 I moved to xxxxxxx to the post of Clinical Service Manager. In this role I am responsible for all investigations performed within the Respiratory Physiology department. During this employment I have developed the department from a small basic department with only a few staff to a large comprehensive department offering the full remit of respiratory and sleep investigations.

I have a passion for education and educating others and have delivered training at many levels, educating student physiologists, nurses and doctors for many years. I regularly present to a variety of audiences on basic and advanced respiratory physiology. I am a member of the National School for Healthcare Science, Honorary Chair of xxxxxx, xxxxxxx Executive Board member and MSC curricula group member. I have also been an external examiner for xxxxxx University and professional body advisor to xxxxx University for respiratory and sleep physiology.

I have had one career break from April 2008 until March 2009 during which time I had my children.

PORTFOLIO

Undergraduate Training

MTO Training (1994-1996)

In September 1994 I was employed as a trainee medical technical officer based at the xxxxx until its closure in July 1995 when we moved to the xxxxxx. During this time academically I undertook a BTEC in medical physics and physiological measurement (MPPM) (Evidence 1) and professionally an NVQ Level 3 in Respiratory Physiology. The NVQ involved assessments of competence within the workplace leading up to the ARTP/BTS National Assessment (more recently known as the Part 1 examination). This taught me the practical skills, competences and limitations of all the major lung function testing techniques.

Clinical Responsibilities

During this time I gained theoretical and practical knowledge through in-house training, becoming competent in the physiological techniques listed below. Competency was assessed as part of the NVQ process (Evidence 2) and the National Assessment was the final summative assessment (Evidence 3).

These techniques included:

Spirometry
Lung volumes via helium dilution and body plethysmography
Single breath carbon monoxide transfer factor
Bronchodilator reversibility studies using inhaled and nebuliser therapy
6 and 12 minute walking tests
Assessment for nebuliser provision

The underpinning knowledge required to undertake the ARTP national assessment was achieved by attendance at the ARTP National Assessment short course in Basic Respiratory Physiology at Bristol Royal Infirmary and through departmental training.

Conferences

During this period of training I attended the ARTP Workshop meeting on the Lung Function Guidelines at the Birmingham National Exhibition Centre. This meeting was as a result of the publication of the ARTP/BTS Guidelines for the Measurement of Respiratory Function in1994 (Evidence 4).

Basic Grade MTO (1996-2000)

On completion of my two year training post I obtained a substantive position in my training department. I was employed as an MTO 1 in September 1996 and then gained a promotion to MTO 2 in August 1997. In February of 1999 I successfully applied for the department's chief technician post and gained an MTO4 position. At this point I was operationally responsible for the management of the department at the xxxxx with direction from a Clinical Scientist. My further training and development was supervised by xxxxxxx, Consultant Clinical Scientist.

Education and training

In 1996 I enrolled on a BSc Hons Clinical Science (Respiratory) at xxxxxx and graduated with a 2:1 in 2000. My final year dissertation looked at the use of impulse oscillometry in the assessment of bronchodilator response in patients with COPD and emphysema due to alpha$_1$ antitrypsin deficiency (Evidence 5).

As a training department we regularly trained Physiologists undertaking the BSc Clinical Physiology degree at Wolverhampton University. Part of the training required the students to be assessed within the workplace and therefore I undertook the City and Guilds D32 and D33 Work based assessor award (Evidence 6).

Courses

During this period of ongoing training I attended courses to develop my underpinning knowledge and skills and these included:

ARTP methacholine challenge testing, theory and practical session at Warwick University in 1997
ARTP/BTS Nasal intermittent positive pressure ventilation course at North Staffordshire Hospital Trust in 1997 (Evidence 7).
Management course for Medical Physics and Physiological Measurement staff at UHB NHS Trust 1998

Conferences

During this period of ongoing training and development I attended the following conferences:-

<u>ARTP</u>

I attended the annual conference in;

Leicester June 1996
Liverpool 1996
January 1998 (25th Anniversary Meeting)
Doncaster 1999

I also attended the ARTP/BTS lung function guidelines workshop held at the NEC Birmingham in March 1995 following the launch of the ARTP/BTS professional guidelines.

<u>BTS</u>

I attended the Winter Meeting of the British Thoracic Society in 1999 presenting a poster entitled ‘xxxxxxxx’ (Evidence 8).

<u>ERS</u>

Following the completion of my final year dissertation project for my BSc, I submitted two abstracts to the European Respiratory Society conference in Florence in September 2000.
The abstract entitled ‘xxxxxxxxx’ was accepted as a poster presentation (Evidence 9). The abstract entitled ‘xxxxxxxxx’ (Evidence 10) was accepted as an oral presentation within one of the main symposia of the conference.

Presentations

I started presenting early in my career delivering presentations on basic measurements such as spirometry e.g. in March 1998 I gave a lecture and practical session on spirometry at an Allen and Hanbury’s nurse study day on COPD. In 1999 I was delivering lectures on full lung function testing and basic interpretation to students undertaking the BTEC in medical physics and physiological measurement.

Postgraduate Training

Service Manager xxxxxxx (2000-2006)

I spent my time at xxxxxxxx working as the operational manager of the xxxxxxx and during this time I was managed by two different Consultant Clinical Scientists, firstly xxxxxx and subsequently xxxxxxx.

I was responsible for the day to day operation of the lung function department, which included being responsible for the day to day performance of both routine and specialist tests undertaken in the department by all staff. During this time I was fully competent in the following investigations:

Routine lung function testing

Full lung function testing, body plethysmography, reversibility studies and their interpretation.

Specialised investigations

Lung mechanics, impulse oscillometry, challenge testing, flight assessments, antibiotic assessments, lignocaine delivery for chronic cough, ear lobe and arterial blood gas analysis, long term oxygen assessments, muscle function studies, assessment for NIV in the acute and domiciliary settings.

Exercise testing

Full cardiopulmonary exercise testing, field based exercise tests, exercise induced bronchospasm and assessments of exercise desaturation.

Sleep Investigations

Domiciliary sleep screening, nasal CPAP trials, transcutaneous carbon dioxide measurements and VisiLab sleep studies.

Management responsibilities

I had specific responsibilities for the department's health and safety. I was responsible for the generation and implementation of test policies and procedures, stock ordering, production of monthly statistics, monitoring of equipment performance and service contracts. As the operational manager I was responsible for the staff and for their development and undertook staff appraisals.

In July 2001 I was accepted on to the RCCP register (Evidence 75).

Clinical Service Manager xxxxxxxxx (2006 to present day)

I moved to the xxxxxxxxxxx as the Lead Respiratory Physiologist (Band 7) in July 2006. I made the decision to move roles as I had been in my current department since a trainee and was lucky to have always been in a fully comprehensive respiratory physiology department. I felt that I needed to challenge myself and

wanted to be able to use my experience to develop and expand a department. Moving to xxxxxxxxxxxx provided me with an ideal opportunity.

In July 2006 the respiratory physiology department at xxxxxxxxxxxx was about to move into a new PFI building and as part of this move the Respiratory Department had been given significantly more space. When I arrived at the department it was a basic respiratory investigation department performing full lung function testing, ear lobe capillary gases, basic overnight oximetry and reversibility studies. There was a cardiopulmonary exercise testing system however this had never been used.

As part of the PFI we had significantly more equipment which included two full testing kits, a challenge testing system, a cardiopulmonary exercise testing system with treadmill, a full polysomnography system and multichannel sleep study equipment. As we were about to move it was the perfect opportunity to discuss equipment that I felt had been missed from the department specification and with this I also managed to procure a body plethysmograph and a cycle ergometer. ***(Paragraph 1)***

I have been able to use my experience of working at xxxxxxxxxx to develop the department and the staff within it (see Service Developments). We now offer a full range of respiratory and sleep diagnostic and therapeutic services that would be expected of a University teaching hospital. In 2007, in conjunction with my group manager, my job description was reviewed and updated and I successfully attained a Band 8a Clinical Service Manager position. ***(Paragraph 2)***

As the Clinical Service Lead my role includes;

Management responsibilities
As the department manager I am responsible for 12 members of staff across three sites (xxxxxxxxxxxx, xxxxxxxxxxxxx, xxxxxxxxxxx). This includes managing the workload and rotas, appraisals of staff, monitoring absences, disciplinary procedures, responsibility for health and safety, incident reporting and risk assessment (Evidence 11), development of job descriptions and person specifications, budget responsibility (Evidence 12) stock control and workload statistics. ***(Paragraph 3)***

Clinical responsibilities
Clinically I am responsible for ensuring safe working practices within the department, including adhering to infection control procedures and ensuring that all equipment is safe and fit for use (electrical safety, annual service contracts, calibration, verification and quality assurance). I perform the full range of diagnostic and therapeutic investigations provided by the department to ensure skills are maintained.
I am also responsible for co-ordination and management of the respiratory physiology component of clinical trial studies undertaken within the Trust (Evidence 13).
I am solely responsible for the technical and clinical interpretation of all investigations (exception full polysomnography) undertaken by the department (Evidence 14, 15, 16, 17).
(Paragraph 4)

Policy and service development
I am responsible for the generation and implementation of Respiratory Physiology protocols and standard operating procedures (Evidence 18) I am also responsible for the development and implementation of new techniques and for liaising with commissioners with regard to service development (Evidence 19). ***(Paragraph 5)***

Teaching and training
I am responsible for the teaching, training and development of all physiology staff within the department including regional trainees and PTP and STP students (Evidence 20, 21). This involves assessing, teaching and participating in CPD sessions (Evidence 22) I am also responsible for planning, co-ordinating and implementing respiratory physiology teaching to a broad range of healthcare workers including nurses, junior doctors and specialist registrars (Evidence 23). ***(Paragraph 6)***

Professional responsibilities
These responsibilities include, to participate in continued professional development (Evidence 24, 25) and to actively pursue involvement with relevant professional bodies and teaching organisations. ***(Paragraph 7)***

Clinical governance and audit
I am responsible for the performance development reviews of all staff employed within the respiratory physiology department and also participate in the 360 appraisals of Consultant Respiratory Physician colleagues. I have responsibility for clinical audit within the department (Evidence 26) and for the development and implementation of procedures and protocols. ***(Paragraph 8)***

Further Education, Training and Development

During the course of my career I have undertaken further qualifications and attended courses for professional development purposes.

Qualifications

Whilst working at xxxxxxxxxxx I was able to enrol on an Institute of Healthcare Management qualification. This Certificate in Managing Health and Social Care (Evidence 27) was essential in developing my skills and understanding of management in the health system.

I completed my Masters degree in 2007 (Evidence 28) with my final year project looking at the development of a service development proposal. I chose the development of the cardiopulmonary exercise service within my department (see service developments section). I was able to use my Post graduate certificate in Managing in Health and Social Care as accreditation of prior learning (APL) for my MSc which shortened the duration of my course. ***(Paragraph 9)***

Courses

Since qualifying as a Respiratory Physiologist, I have undertaken several training courses that were appropriate for my continued professional development and the development of new skills. These courses included:

M&K update Arterial blood sampling course 2002 (Evidence 29)
Attendance on this course allowed me to gain experience and the underpinning theory required to undertake arterial blood gas measurements in the work place. Following this training course I underwent a period of supervised training within the workplace before being assessed as competent by the Respiratory Consultants.

I specifically wanted to attend the ERS School Postgraduate course on Lung diffusion measurements in diseases, 2004 (Evidence 30). The theory of gas transfer measurements has always been of interest to me and indeed I enjoy teaching gas transfer to student physiologists and medics. This course was a wonderful opportunity with amazing speakers and gave me the opportunity to hear presentations with regard to influence of different diseases on the measurement of gas transfer. I still use the material from this course in my teaching and training today.

AVAPS in the Respiratory Department, Philips Respironics 2009 (Evidence 31)

ARTP Cardiopulmonary Exercise Testing course 2010 (Evidence 32). I attended this course to ensure that my exercise test reporting skills were up to date and evidence based.

As a healthcare practitioner who undertakes research it is essential to have an understanding of the research processes, rules and regulations and therefore in 2011, and again in 2013, I undertook the Good Clinical Practice (GCP) certificate (Evidence 33).

Awards

BTS/Schering Plough ERS Travel Fellowship 2001

In 2002 I was awarded a BLF/Allen and Hanbury's ERS Travel Fellowship to the European Respiratory Society conference in Stockholm. (Evidence 34)

In 2011 I was runner up in the Advancing Healthcare Awards, Chief Scientific Officers Award for Leadership (Evidence 35). This award was for the implementation and subsequent impact of cardiopulmonary exercise testing at xxxxxxxxxxxx for the assessment of patients for AAA surgery which saw dramatic improvements in mortality.

Conferences and Presentations

ARTP

During this period of my career I have attended many ARTP annual conferences as an invited speaker and as session Chair. Below is a list of the conferences attended and my role at the conference.

Daventry 2000 - Speaker
At this conference I delivered a poster presentation on 'xxxxxxxxxxxxxxxxxxxx'.

Blackpool 2002 - Speaker
Speaker in plenary session delivering a presentation on impulse oscillometry.

Stratford upon Avon 2003 - Delegate

Telford 2004 – Speaker
Spoken presentation entitled 'Advances in Respiratory Measurement' (Evidence 36, 37)

Glasgow 2005 – Speaker
Delivered a workshop on 'xxxxxxxxxxxxxx'

Brighton 2006 - Chair
Chaired plenary session entitled 'xxxxxxxxxxxxx'

Glasgow 2007 - Delegate

Hinckley 2008 – Speaker
Spoken presentation in junior session on 'xxxxxxxxxxxxxx' (Evidence 38)

Hinckley 2009 - Delegate

Heathrow 2010 - Chair
Chaired the Junior Session entitled 'xxxxxxxxxxxxxxxxxxxxxxx' (Evidence 39)

Glasgow 2011 - Chair
Chaired Plenary session entitled 'xxxxxxxxxxxxxxxxxx'

Hinckley 2012 - Speaker and plenary session chair
Chaired plenary session on xxxxxxxxxxxxxxxxxx
Spoken presentation titled 'xxxxxxxxxxxxxxxxxxxxxx'.

Hinckley 2013 - Chair
Chaired simultaneous session entitled 'xxxxxxxxxxxxxxx'

ARTP/ARTI

Dublin 2005 - Delegate

ERS

Berlin 2001 – Poster discussion (Evidence 40)
Stockholm 2002 – Poster discussion (Evidence 41)
Vienna 2003 - Chair of Thematic Poster session and Poster discussion (Evidence 42)
Glasgow 2004 and European Respiratory Primary Care Conference
Munich 2006

BTS

Manchester Summer meeting 2002 – Speaker
At this meeting I was invited to deliver a presentation within the joint ARTP/BTS session on spirometry and maximal flow volume curves (Evidence 43)

Winter meeting 2002
Winter meeting 2005
Winter meeting 2011 Thematic and poster presentation
Winter meeting 2012 Thematic poster presentation (Evidence 44)

ATS

Seattle 2003

Midlands Thoracic Society

Coventry 2007 Spoken presentation on Cardiopulmonary exercise testing
Telford 2011 Spoken presentation entitled 'Cardiopulmonary exercise testing: Practical applications in clinical practice (Evidence 45)

Service development

I have been responsible for the development of the Respiratory Physiology and Sleep services at xxxxxxxxxxxxx since my appointment in 2006. There has been a significant increase in the range of investigations provided by the department and also the number of investigations performed (Evidence 46)

Cardiopulmonary exercise testing

My final years MSc project was on service development. At this time I had moved to xxxxxxxxxx and it was apparent that there had been little exercise testing performed previously and yet we had new purpose built facilities. Due to this and a personal interest in exercise testing I decided to look at developing the departments exercise service as my project.

Whilst researching the use of exercise testing it became apparent that surgical fitness was a developing area. Coincidently at the same time an Intensivist came to the department to discuss the use exercise testing for the same purpose. This

relationship proved vital to the development of the service and my competency in CPET (Evidence 47). His knowledge of ITU and which patients fared worst and my research into the subject led to us arranging a meeting with the vascular department. Mortality from AAA surgery at our Trust between 2004 and 2007 was poor with the Trust amongst the worst few hospitals in the country (mortality rate for open AAA 14.3% versus expected 5.2%) ***(Paragraph 10)***

Some of our issues with mortality were attributed to surgical selection which was seriously lacking with pretty much an all comers attitude. I arranged meetings with the general management and operational director and presented the option to undertake a pilot exercise service for patients due to undertake AAA surgery. This was agreed to with the plan to be for a six month pilot and then a review of its impact.

The success of this service led to a runner up award at the AHA awards (Evidence 35 & 48) as discussed previously. Data from this service has also recently been published, see publications list.

Mannitol challenge

I was responsible for the introduction of mannitol challenge testing in the department. This required me to put a proposal to the pharmacy department detailing the evidence for its use, limitations and test procedure in order for it to be listed on the Trusts Formulary. ***(Paragraph 11)***

Comprehensive sleep assessment and treatment service

In 2006, on my appointment, the department did not have a sleep service. Patients suspected as having sleep disordered breathing were sent for testing by a private company and were having to purchase their own CPAP machines. Since 2006, in conjunction with the Sleep Physician, I have dramatically developed the sleep service which now undertakes overnight oximetry, multi channel sleep studies and full polysomnography. Treatment is also provided with autotitrating CPAPs and auto server devices where required. In order to develop the service, the budget has had to be significantly increased and this has been achieved through my negotiations with general managers, accountants and the relevant PCTs (as it was at the time). xxxxxxxxx sleep service covers the whole of xxxxxxxxx as well as taking referrals from further afield. Currently we look after 1400 patients on CPAP therapy (Evidence 49).

In addition to assessment and treatment for sleep disordered breathing, I have been able to obtain funding and equipment for approximately 20 patients to be treated with non invasive ventilation. This is in advance of a full development of a domiciliary ventilation service (see below). I personally assess these patients, treat them and follow them up in a ventilation clinic.
(Paragraph 12)

Home oxygen and assessment service

I am responsible for the home oxygen assessment and review service for both xxxxxxxxxxxxxx. This includes ensuring that all patients are assessed appropriately, receive follow up appointments, review concordance reports, ensuring all patients are assessed prior to discharge from xxxxxxxx with home oxygen and provide monthly reports to the Clinical Commissioning Groups. ***(Paragraph 13)***

As a new service, I was responsible for development of the service proposal, discussions with the PCT and finance departments, designing implementation plans (Evidence 50), purchasing relevant equipment and recruiting appropriate staff. I was also able to implement a CQUIN with the PCT which will give the Trust a share of the financial gains (Evidence 51) from the service if we deliver on our objectives. ***(Paragraph 14)***

Since the commencement of this service in October 2012 I have developed the oxygen service within the Trust further. I was responsible for the implementation of a Trust oxygen group and Chair these meetings (Evidence 52). I have also met with senior Trust personnel to request them to agree that an oxygen alert can be put onto the Trusts clinical records system identifying patients at risk from Type 2 respiratory failure with the aim of preventing them from having high flow oxygen delivered on arrival to A&E (Evidence 53). We are also in discussion with the local ambulance service to have the same information put onto their databases. We have also been responsible for the development of a palliative care oxygen procedure which has been agreed by the Trust Palliative Care Consultant. ***(Paragraph 15)***

I have successfully implemented a Trust wide electronic referral system for all patients that require oxygen prior to discharge. This now means that only staff from the respiratory physiology can order oxygen for patients being discharged from the Trust (exception weekends). This ensures that oxygen is only ordered for patients that have been formally assessed for its suitability. ***(Paragraph 16)***

Domiciliary non-invasive ventilation

I have recently played a large part in the development of the Trusts service development proposal for domiciliary non invasive ventilation. I have planned the service and how it will be delivered by my team (Evidence 54). Consequently I have been responsible for the decisions with regards to staffing and equipment requirements. As this proposal has now been accepted by the Trusts planning unit, I am now completing recruitment forms and writing job descriptions and person specifications for the roles (Evidence 55). I am also evaluating equipment and obtaining quotations in advance of purchase. ***(Paragraph 17)***

Comprehensive interpretation service

Prior to my appointment all test results left the physiology department unreported. Since my arrival I have implemented a comprehensive interpretation service and I am responsible for the interpretation of all respiratory and exercise investigations performed in the department. I am competent in the interpretation of all oxygen and

sleep investigations (exception full polysomnography) however routinely these roles are delegated to the heads of these service areas. ***(Paragraph 18)***

Patients

I have written and implemented standard operating procedures for all investigations and treatment undertaken in the Respiratory Physiology department (Evidence 18). In addition we have designed and implemented patient information leaflets (Evidence 56) for all investigations as well as patient focused information boards detailing all staff within the department and their roles and leaflet stands for information relating to tests/diseases/support groups. ***(Paragraph 19)***

As a department we welcome patient feedback at any time however twice a year we proactively encourage all patients attending the department over the course of a week, to complete feedback forms (Evidence 57). Any complaints with regard to the department or its staff are dealt with appropriately and in a timely fashion. As the head of department it is my responsibility to provide a response to any complaints (Evidence 58). We have also implemented a patient support group for those patients being treated with CPAP. Our first event had over 200 people attend and received excellent feedback (Evidence 59). ***(Paragraph 20)***

Other Responsibilities

Trust

Attendance at monthly group operational management meetings as lead for a service
Teaching and assessing spirometry and ear lobe capillary competencies within the Trust
Member of point of care testing committee
Member of motor neurone disease multidisciplinary team
(Paragraph 21)

Professional

Chair of xxxxxxxx Committee 2013 onwards
Chair of xxxxxxxxx 2009 - 2013
Member of xxxxxxxxxxxxx Committee 2004 onwards
Member of National School of Healthcare Science Themed Board 2012 onwards
Professional Body Moderator for University xxxxxxxxxxx
Lecturer and internal verifier for xxxxxxxxxxxxxx University
Reaccredited xxxxxxxxxxx University
Member of Modernising Scientific Careers respiratory development group (Evidence 60)
(Paragraph 22)

Past roles
Professional body moderator and external examiner for xxxxxxxxxxx University

Teaching

I have been involved in teaching and training of a whole remit of healthcare professionals for many years. This began in 1998 when I started to train and develop more junior physiology staff and led to me undertaking my D32/33 assessor's qualification.
As my career has progressed, and my role in education developed further, I have been involved in teaching and training student physiologists, nurse (both primary and secondary care), GP's (Evidence 61) medical students, Respiratory Physicians and Physicians from other specialities (Evidence 62). ***(Paragraph 23)***

I have been involved in the inception and development of training courses for example I was responsible for the development and implementation of the xxxxxxxxxxxxxxxxx in 2006 (Evidence 63, 64) and this course continues to run annually with the next course scheduled to occur in May 2014. More recently I have designed and implemented the new xxxxxxx examinations and the associated xxxxx course with feedback on the course indicating that it was a well received course (Evidence 65, 66). ***(Paragraph 24)***

Research Activity

During my working experience I have been involved in a significant amount of research, particularly during my time at the xxxxxxxxxxxxxx. This research has involved local audit, dissertation projects of my own and supervision of student's projects, national and international research trials. More recently I am involved in a large QUIC study looking at the quantification of interstitial lung disease on CT and comparison to conventional investigations such as lung function. ***(Paragraph 25)***

Abstracts

1 – 16

(Paragraph 26)

Texts

1 - 3

Papers

1 – 2

Modality: Respiratory Candidate: xxxxxx

Good Scientific Practice Portfolio Mapping Template

Any one piece of evidence can be used in support of more than one domain or subdomain but it is expected that more than one piece of evidence will be submitted per domain.

Good Scientific Practice Standard	Indicate the page numbers/section in your Portfolio which demonstrate achievement of this Standard
Domain 1: Professional Practice	
1.1 Professional Practice	
1.1.1 Make the patient your first concern	Paragraphs 4, 5, 13, 15, 16, 19, 20 Evidence 56, 57, 59
1.1.2 Exercise your professional duty of care	Paragraphs 4, 5, 8, 9, 10, 15, 16, 20 Evidence 18, 19, 28, 57, 59
1.1.3 Work within the agreed scope of practice for lawful, safe and effective healthcare science	Paragraphs 4, 5, 8, 10, 13, 15 Evidence 18, 19, 26, 53
1.1.4 Keep your professional, scientific, technical knowledge and skills up to date	Paragraphs 7, 9 Evidence 1, 2, 3, 4, 5, 7, 24, 25, 27, 28, 29, 30, 31, 32, 33
1.1.5 Engage fully in evidence based practice	Paragraphs 10, 11, 23 Evidence 32, 33, 40, 41, 42, 44
1.1.6 Draw on appropriate skills and knowledge in order to make professional judgments	Paragraphs 1, 4, 5, 8, 10, 11, 12, 13, 15, 17, 18 Evidence 14, 15, 16, 17
1.1.7 Work within the limits of your personal competence	Evidence 47, 71, 72
1.1.8 Act without delay on concerns raised by patients or carers or if you have good reason to believe that you or a colleague may be putting people at risk	Evidence 57, 58, 59
1.1.9 Never discriminate unfairly against patients, carers or colleagues	Evidence 47, 66, 71
1.1.10 Treat each patient as an individual, respect their dignity and confidentiality and uphold the rights, values and autonomy of every service user, including their role in the diagnostic and therapeutic process and in maintaining health and well-being.	Paragraphs 19, 20 Evidence 73
1.1.11 Respond constructively to the outcome of audit, appraisals and performance reviews, undertaking further training where necessary	Paragraphs 19, 20 Evidence 57, 58, 59

1.2 Probity	
1.2.1 Make sure that your conduct at all times justifies the trust of patients, carers and colleagues and maintains the public's trust in the scientific profession	Evidence 47, 66, 71
1.2.2 Inform the appropriate regulatory body without delay if, at any time, you have accepted a caution, been charged with or found guilty of a criminal offence, or if any finding has been made against you as a result of fitness to practice procedures, or if you are suspended from a scientific post, or if you have any restrictions placed on your scientific, clinical or technical practice	Evidence 75
1.2.3 Be open, honest and act with integrity at all times, including but not limited to: writing reports, signing documents, providing information about your qualifications, experience, and position in the scientific community, and providing written and verbal information to any formal enquiry or litigation, including that relating to the limits of your scientific knowledge and experience	Evidence 47, 62, 66, 71
1.2.4 Take all reasonable steps to verify information in reports and documents, including research	Evidence 33, 47, 62, 71
1.2.5 Work within the Standards of Conduct, Performance and Ethics set by your profession	Evidence 71, 72, 74, 75
1.3 Working with colleagues	
1.3.1 Work with other professionals, support staff, service users, carers and relatives in the ways that best serve patients' interests	Evidence 52, 57, 59, 62, 70, 71, 73, 74
1.3.2 Work effectively as a member of a multi-disciplinary team	Evidence 62, 71, 73, 74
1.3.3 Consult and take advice from colleagues where appropriate	Evidence 71, 74
1.3.4 Be readily accessible when you are on duty	Evidence 62, 71
1.3.5 Respect the skills and contributions of your colleagues	Evidence 71, 74
1.3.6 Participate in regular reviews of team performance.	Paragraph 3 Evidence 52, 57, 70
1.4 **Training and developing others**	
1.4.1 Contribute to the education and training of colleagues	Paragraphs 6, 23, 24, 25, 61, 62, Evidence 6, 23, 36, 37, 38, 43, 45, 61, 62
1.4.2 If you have responsibilities for teaching, develop the skills, attitudes and practices of a competent teacher	Paragraphs 23 Evidence 61, 62, 63, 64, 65, 66

1.4.3 Ensure that junior colleagues and students are properly supervised	Paragraphs 6, 23, 25 Evidence 20, 21, 22, 23
1.4.4 Support colleagues who have difficulties with performance, conduct or health	Paragraph 3
1.4.5 Share information with colleagues to protect patient safety	Paragraphs 3, 4, 14 Evidence 11
1.4.6 Provide work-based development for colleagues to enhance/improve skills and knowledge	Paragraphs 6, 8, 25 Evidence 22, 62
Domain 2: Scientific Practice	
2.1 Scientific Practice	
2.1.1 Develop investigative strategies/procedures/processes that take account of relevant clinical and other sources of information	Paragraphs 2, 5, 10, 11, 12, 13, 14, 15, 16, 17, 19 Evidence 46, 47, 54
2.1.2 Provide scientific advice to ensure the safe and effective delivery of services	Paragraphs 3, 4, 5, 8, 11, 12, 13, 14, 15, 16, 17 Evidence 26, 62
2.1.3 Undertake scientific investigations using qualitative and quantitative methods to aid the screening, diagnosis, prognosis, monitoring and/or treatment of health and disorders appropriate to the discipline	Paragraphs 2, 12, 13 Evidence 1, 2, 3, 8, 31, 32
2.1.4 Investigate and monitor disease processes and normal states	Paragraphs 4, 10, 11, 12, 13, 14, 15, 16, 18 Evidence 1, 2, 3, 14, 15, 16, 17, 29, 32,
2.1.5 Provide clear reports using appropriate methods of analysing, summarising and displaying information	Paragraph 18 Evidence 14, 15, 16, 17, 62, 73
2.1.6 Critically evaluate data, draw conclusions from it , formulate actions and recommend further investigations where appropriate	Paragraphs 4, 10, 11, 14, 15, 18 Evidence 14, 15, 16, 17, 48, 62, 73
2.2 Technical Practice	
2.2.1 Provide technical advice to ensure the safe and effective delivery of services	Paragraphs 1, 2, 3, 4, 11, 12, 14, 15, 16 Evidence 48, 50, 53
2.2.2 Plan, take part in and act on the outcome of regular and systematic audit	Paragraph 8, 25, 26 Evidence 26
2.2.3 Work within the principles and practice of instruments, equipment and methodology used in the relevant scope of practice	Paragraph 5 Evidence 1, 2, 3, 18
2.2.4 Demonstrate practical skills in the essentials of measurement, data generation and analysis	Paragraphs 4, 8, 18, 26 Evidence 2, 3, 5, 8, 9, 28
2.2.5 Assess and evaluate new technologies prior to their routine use	Paragraphs 10, 11, 26 Evidence 5, 9, 10
2.2.6 Identify and manage sources of risk in the workplace, including specimens, raw materials, clinical and special waste, equipment, radiation and electricity.	Paragraphs 3, 4, 5 Evidence 18

2.2.7 Apply principles of good practice in health and safety to all aspects of the workplace	Paragraphs 3, 4, 5 Evidence 18
2.2.8 Apply correct methods of disinfection, sterilisation and decontamination and deal with waste and spillages correctly.	Evidence 18
2.2.9 Demonstrate appropriate level of skill in the use of information and communications technology	Evidence 14, 15, 16, 17, 19
2.3 Quality	
2.3.1 Set, maintain and apply quality standards, control and assurance techniques for interventions across all clinical, scientific and technological activities	Paragraphs 3, 4, 5 Evidence 18
2.3.2 Make judgements on the effectiveness of processes and procedures	Paragraphs 4, 10, 11 Evidence 5, 8, 9, 18, 26
2.3.3 Participate in quality assurance programmes	Paragraph 4 Evidence 18
2.3.4 Maintain an effective audit trail and work towards continuous improvement	Paragraphs 3, 4, 5 Evidence 18, 24, 25, 26
Domain 3: Clinical Practice	
3.1 Clinical Practice	
3.1.1 Ensure that you and the staff you supervise understand the need for and obtain relevant consent before undertaking any investigation, examination, provision of treatment, or involvement of patients and carers in teaching or research	Evidence 18, 33
3.1.2 Ensure that you and the staff you supervise maintain confidentiality of patient information and records in line with published guidance	Paragraph 4 Evidence 18
3.1.3 Ensure that you and your staff understand the wider clinical consequences of decisions made on your actions or advice	Paragraphs 4, 5 Evidence 18
3.1.4 Demonstrate expertise in the wider clinical situation that applies to patients who present in your discipline	Paragraph 21 Evidence 14, 15, 16, 17, 19, 62, 73
3.1.5 Maintain up to date knowledge of the clinical evidence base that underpins the services that you provide and/or supervise and ensure that these services are in line with the best clinical evidence	Paragraph 5, 10, 11, 12, 13, 14, 15, 16, 17, 18 Evidence 19, 24, 25, 30, 31, 32, 36, 37
3.1.6 Plan and determine the range of clinical/scientific investigations or products required to meet diagnostic, therapeutic, rehabilitative or treatment needs of patients, taking account of the complete clinical picture	Paragraph 4, 5, 11, 12, 13, 15, 17, 18 Evidence 14, 15, 16, 17, 19, 48
3.1.7 Plan and agree investigative strategies and clinical protocols for the optimal diagnosis, monitoring and therapy of patients with a range of disorders	Paragraph 4, 5 Evidence 14, 15, 16, 17, 19, 48

3.1.8 Ensure that detailed clinical assessments are undertaken and recorded using appropriate techniques and equipment and that the outcomes of these investigations are reviewed regularly with users of the service	Evidence 15, 16, 17, 19, 62, 71, 73
3.1.9 Ensure the provision of expert interpretation of complex and or specialist data across your discipline in the context of clinical questions posed	Paragraph 4, 12 Evidence 15, 16, 17, 19, 71
3.1.10 Undertake and record a detailed clinical assessment using appropriate techniques and equipment	Evidence 15, 16, 17, 19
3.1.11 Provide specialised clinical investigation and/or analysis appropriate to your discipline	Paragraph 4, 10, 12, 13, 14, 15, 16, 17 Evidence 14, 15, 16, 17, 19, 46
3.1.12 Provide interpretation of complex and/or specialist data in the context of the clinical question posed	Evidence 16, 17, 19, 62
3.1.13 Provide clinical advice based on results obtained, including a diagnostic or therapeutic opinion for further action to be taken by the individual directly responsible for the care of the patient	Evidence 62, 73
3.1.14 Provide expert clinical advice to stakeholders in order to optimise the efficiency and effectiveness of clinical investigation of individuals and groups of patients	Paragraph 5, 12, 13, 14, 17 Evidence 54, 74
3.1.15 Prioritise the delivery of investigations, services or treatment based on clinical need of patients	Paragraph 3
3.1.16 Represent your discipline in multidisciplinary clinical meetings to discuss patient outcomes and the appropriateness of services provided	Paragraph 21
3.1.17 Ensure that regular and systematic clinical audit is undertaken and be responsible for modifying services based on audit findings.	Paragraph 8 Evidence 26
3.2 Investigation and reporting	
3.2.1 Plan and conduct scientific, technical, diagnostic, monitoring, treatment and therapeutic procedures with professional skill and ensuring the safety of patients, the public and staff	Paragraphs 3, 4, 5
3.2.2 Perform investigations and procedures/design products to assist with the management, diagnosis, treatment, rehabilitation or planning in relation to the range of patient conditions/equipment within a specialist scope of practice	Paragraphs 3, 4, 5 Evidence 15, 16, 17, 19
3.2.3 Monitor and report on progress of patient conditions/use of technology and the need for further interventions.	Evidence 14, 15, 16, 17, 19
3.2.4 Interpret and report on a range of investigations or procedures associated with the management of patient conditions/equipment	Evidence 14, 15, 16, 17, 19

Domain 4: Research, Development and Innovation	
4.1 Research, Development and Innovation	
4.1.1 Search and critically appraise scientific literature and other sources of information	Paragraphs 10, 11, 14, 17, 23 Evidence 5, 9, 10, 28, 54
4.1.2 Engage in evidence-based practice, participate in audit procedures and critically search for, appraise and identify innovative approaches to practice and delivery of healthcare	Paragraphs 10, 11, 12, 13, 14, 15, 16, 17, 18 Evidence 26, 35, 44, 48
4.1.3 Apply a range of research methodologies and initiate and participate in collaborative research	Paragraphs 23, 24 Evidence 33, 68, 69
4.1.4 Manage research and development within a governance framework	Paragraph 4 Evidence 33
4.1.5 Develop, evaluate, validate and verify new scientific, technical, diagnostic, monitoring, treatment and therapeutic procedures and, where indicated by the evidence, adapt and embed them in routine practice	Paragraphs 10, 14, 15 Evidence 8, 9, 10, 35, 44, 48, 68, 69
4.1.6 Evaluate research and other available evidence to inform own practice in order to ensure that it remains at the leading edge of innovation.	Paragraphs 5, 7, 10, 11 Evidence 5, 18, 28
4.1.7 Interpret data in the prevailing clinical context	Evidence 5, 8, 9, 10, 28, 35, 36, 37, 40, 41
4.1.8 Perform experimental work, produce and present results	Evidence 8, 9, 10, 34, 36, 37, 40, 41, 42, 44, 45
4.1.9 Present data, research findings and innovative approaches to practice to peers in appropriate forms	Evidence 8, 9, 10, 34, 36, 37, 40, 41, 42, 44, 45
4.1.10 Support the wider healthcare team in the spread and adoption of innovative technologies and practice	Paragraphs 10, 11, 14, 15, 17 Evidence 35, 48, 53, 54
Domain 5: Clinical Leadership	
5.1 Leadership	
5.1.1 Maintain responsibility when delegating healthcare activities and provide support as needed	Paragraph 3
5.1.2 Respect the skills and contributions of your colleagues	Evidence 71, 74
5.1.3 Protect patients from risk or harm presented by another person's conduct, performance or health	Paragraph 3
5.1.4 Treat your colleagues fairly and with respect	Evidence 71, 74
5.1.5 Make suitable arrangements to ensure that roles and responsibilities are covered when you are absent, including handover at sufficient level of detail to competent colleagues	Paragraph 3 Evidence 70

5.1.6 Ensure that patients, carers and colleagues understand the role and responsibilities of each member of the team	Paragraphs 19, 20 Evidence 57, 59, 70
5.1.7 Ensure that systems are in place through which colleagues can raise concerns and take steps to act on those concerns if justified	Paragraph 8 Evidence 70
5.1.8 Ensure regular reviews of team performance and take steps to develop and strengthen the team	Paragraph 8 Evidence 70
5.1.9 Take steps to remedy any deficiencies in team performance	Paragraphs 3, 4, 8, 20 Evidence 57, 58
5.1.10 Refer patients to appropriate health professionals	Evidence 14, 62, 73
5.1.11 Identify and take appropriate action to meet the development needs of those for whom you have management, supervision or training responsibilities	Paragraph 6 Evidence 3, 6, 20, 21, 22, 23
5.1.12 Act as an ambassador for the Healthcare Science community	Paragraphs 7, 22