1. Introduction

IPEM is increasingly concerned about supply of scientists and technologists in radiotherapy physics, and believes that a workforce crisis may be developing. This statement sets out the background to our concerns and proposes some solutions. We believe that urgent action is needed to address significant threats to the future of the service.

In 2014, IPEM carried out a census of the radiotherapy physics and engineering workforce. This census was sent to 66 radiotherapy centres in the UK (counting satellite centres separately), of which 56 replied. Two small private centres were not identified prior to inviting responses, so were not given the opportunity to respond. Since 2014 two satellite centres have opened, and a planned large centre has started recruiting bringing the current number of radiotherapy centres employing radiotherapy physics scientists and practitioners to 71. Staff already recruited to work in the two satellite centres which have opened since the census date were reported alongside staff at the corresponding base centre, so in effect responses were received from 56 of the 68 radiotherapy centres treating patients in 2014.

This census identified:

- 58.5 WTE Clinical Scientist vacancies (9.3% vacancy rate)
- 35 WTE Physics Practitioner vacancies (9.4% vacancy rate)
- 29.5 WTE Engineering Practitioner vacancies (8.7% vacancy rate)

The large majority of UK radiotherapy centres are in England (59, of which 49 responded), with 5 (of which 3 responded) in Scotland, 3 (of which all 3 responded) in Wales and one (which responded) in Northern Ireland.

The Clinical Scientist workforce developed a large shortfall in the form of unfilled vacancies in the current establishment (caused by service expansion and leavers) over the period 2007-2014.

- Fortuitously, this shortfall has been partly redressed by a larger (96) than usual (average 40 over 2007-2013) out-turn of newly trained staff in 2014,
resulting from the change from a 4-year to a 3-year training programme. This larger out turn will not take place again

- Projections show that, if the rate of service expansion and leavers is maintained, the following scenarios are likely.
  - If training places are limited by training capacity to 2014 levels, a shortfall will open up again.
  - If training places are increased in line with commissioned places, and training capacity is available to fulfil commissioned places, supply will meet demand by 2020-2021, provided demand does not increase further.
  - If demand increases by as little as 10% then a large shortfall will rapidly open up.

The introduction of new radiotherapy techniques, particularly proton beam therapy, and the move towards extended hours working, means that a 10% increase in demand is probably a conservative assumption.

The availability of newly-qualified Clinical Scientists does not address the difficulty in filling posts requiring experienced members of staff. However, recruitment of early career scientists may allow promotion of more experienced staff into senior positions, provided sufficient vacancies are filled.

The shortfall in the Physics and Engineering Practitioner (Technologist) workforce has also been accruing for some time.

- 30 Physics Practitioners are anticipated to qualify from the Cumbria Graduate Diploma by 2016, with 10 exiting in 2015 and 20 in 2016. However, many are likely to be already employed in substantive posts and unavailable to fill the identified vacancies.
- The IPEM Technologist Training Scheme is providing a small number of qualified staff.
- Practitioner Training Programme degree courses are not attracting students (with the exception of the radiotherapy physics programme at the University of Swansea where places are commissioned and funded by the Welsh Government).

Those qualifying through the IPEM training scheme will be unavailable to fill the vacancies identified in the 2014 census, as the scheme involves training while employed in an established position. It is likely that the current shortage will be redressed by 2018, with the
Cumbria Graduate Diploma route now available for a further 20 new recruits starting in 2015 (exiting 2017), and a further 20 anticipated to start in 2016 (exiting 2018), providing 40 in total in addition to the 30 qualified via this route by 2016. Not all of the vacancies identified are at entry-level, but the availability of early-career staff may allow more experienced staff to move into higher-level positions. However, since demand is anticipated to continue to grow, projections show that an even larger shortfall will be created by 2018, unless adequate additional training provision is in place.

The very small number (<5, more probably 2) of qualified Radiation Engineering Practitioners anticipated to exit annually from the sole PTP provider at the University of Bradford is insufficient to redress the 29.5 WTE shortfall, either now or in the future. The shortage of training for Radiation Engineers remains an extreme cause for concern.

2. Our Position

We are concerned that the pipeline of trained staff to provide physics support to radiotherapy services is only just adequate for the current service, and inadequate for the planned service expansions.

We note and welcome the increase in the number of STP commissioned places, and the introduction of radiotherapy-specific places. However, we are concerned that the available training capacity may not be able to support these increased commissions. There has been a national decline in numbers across all HCS STP for the past 3 years, with a 4.8% decline in final places from 2014 to 2015. There is evidence that some commissions have been withdrawn due to shortfalls in training capacity.

We welcome the expansion of the graduate diploma programme at the University of Cumbria, but if this is not to continue past the 2016 intake we are concerned about the future pipeline for physics technologists.

We are extremely concerned that there is effectively no pipeline of trained staff to provide engineering support to radiotherapy.

We note that the Practitioner Training Programme is not attracting students, and that review in order to provide attractive training options is urgently required.
3. Recommendations

It is clear that additional STP training places are required, both in England and in Northern Ireland, which in turn requires additional funding from Health Education England (HEE) via the LETBs, and from the Department of Health in Northern Ireland, for salary, support and fees. In Scotland and Wales, Scientist training has fulfilled local needs in recent years, but there are concerns that it will no longer continue to do so, especially with on-going vacancy problems in England and Northern Ireland.

An urgent review of the PTP training model is also needed, as this is not meeting needs in any of the four countries, although Wales is training sufficient Radiotherapy Physics Practitioners, no UK country is training enough Radiation Engineering Practitioners.

Options could include the following.

- Funding for trainers, to allow departments to provide extra supervision and assessment for STP trainees within the workplace for both the radiotherapy specialist placements and the preceding rotational placements, thus addressing the problem with capacity in training centres,
- Extra resource for external training advisors to regularly assess training, which would free up departmental time from competency assessments.
- Identifying and resourcing specialist centres and individuals who can provide work-based workshops or courses within the ‘pinch’ areas that currently restrict STP training capacity e.g. brachytherapy and ICT within the radiotherapy physics specialism, INIR within the rotational modules. Such models already exist within some consortia, but extra resource would need to be made available for both the provision of this training and assessment and for the additional accommodation and travel costs incurred by trainees.
- Changing the current structure of STP to reduce the dependency of the overall training package in radiotherapy physics on capacity in niche areas of medical physics.
- Expanding the number of PTP-compliant courses, to provide better geographical spread of work placements, together with funding to attract students. The Welsh Government funds places at Swansea University for students from Wales to undertake Radiotherapy Physics PTP degrees. The funded places are always filled and the university has further capacity to accept students from, the other UK countries if relevant funding is available.
• Considering distance learning and part-time options to enable locally-recruited students to complete training in-service. It is clear that the current PTP degree programmes are not proving sufficiently attractive to students to meet workforce need.
• Rapidly implementing apprenticeship programmes to provide support staff below clinical technologist/practitioner level who could undertake more routine work, and providing a PTP-compliant route for in-service progress of these staff to technologist/practitioner roles.

IPEM will continue to maintain and develop its own clinical technologist training scheme as an alternative training route at practitioner level, and to support ACS Route 2 as an alternative training mechanism at clinical scientist level. IPEM is eager to work with HEE and other agencies to help address these serious problems.

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Approved by Trustees

This document has been prepared and published on behalf of the Institute of Physics and Engineering in Medicine (IPEM) to set out its position on this topic.

For further or updated information, please see the IPEM website at www.ipem.ac.uk.

If you have any questions about this statement, please email office@ipem.ac.uk