

## Recommendations for the Medical Physics support of a Diagnostic Radiology & Radiation Protection Service

The European Federation of Organisations for Medical Physics (EFOMP) and the European Commission (EC) both have guidelines for Medical Physics support which have been validated through IPEM National Office workforce surveys to be a good recommendation, as such IPEM are not currently developing their own calculations, though we have collated the calculations into the table below to help calculate how many staff you are recommended to have according to EFOMP and the EC.

<b>Equipment dependent factors</b>	<b>QA frequency</b>	<b>number of systems</b>	<b>Rpt174 MPS WTE</b>	<b>Rpt174 MPE WTE</b>	<b>EFOMP MP WTE</b>	<b>comments</b>	<b>Rpt174 MPS WTE</b>	<b>Rpt174 MPE WTE</b>	<b>EFOMP MPS WTE</b>
CT	0	0	0.00	0.00	0.00	- Enter the number of imaging systems supported by your physics service. Do not list items not covered by your service i.e. MV imagers in radiotherapy may be supported by the radiotherapy physics team only.			
SPECT/PET CT	1	6	0.18	0.06	0.12				
Digital mammography	0.5	38	2.66	0.76	1.52				
General radiographic room (CR)	2	20	0.60	0.20	0.10	- Amend the QA frequency for different modalities as per your physics service e.g.			
General radiographic room (DR, assuming 2 detectors)	1	40	2.80	0.88	0.40				
Mobile radiographic system (CR)	2	20	0.40	0.08	0.04				
Mobile radiographic system (DR, assuming 1 detector)	1	40	1.60	0.40	0.16	- 0.5 for digital mammography tested every 6 months			
Fixed fluoro (general purpose fluoroscopy e.g. Ba studies)	1	11	0.44	0.11	0.11				
Fixed interventional (cardiac catheter laboratory, angiography)	1	15	0.60	0.15	0.30	- 2 for dental systems tested every two years			
Mobile C arm fluoroscopy systems	1	46	1.38	0.28	0.18				
CR readers or individual DR detectors not included above	1	41	0.82	0.16	0.16	For modalities not listed, use professional judgement and allocate			
Dental systems (intra oral, OPG)	2	23	0.23	0.05	0.02				

CBCT dental systems	1	3	0.06	0.01	0.01	<i>to the most appropriate line, considering frequency and level of input required by the physics service.</i>	
Dexa scanners	1	5	0.05	0.01	0.01		
Reporting monitors (per workstation/monitor pair)	2	150	0.45	0.08	0.08		
Specimen cabinet	1	8	0.02	0.00	0.01		<i>For additional DR detectors, list under the CR reader row.</i>
kV imaging in RT (on board linac imaging)	1	6	0.24	0.06	0.06		
Planning CT scanners	1	2	0.12	0.04	0.08		
MV imagers in radiotherapy	1	0	0.00	0.00	0.00		
other integrated radiotherapy imaging equipment (e.g. tomotherapy/stereotactic imaging)	1	1	0.01	0.00	0.00		
<b>TOTAL</b>							
<b><u>Patient dependent factors</u></b>							
	<b><u># per year</u></b>						
Patient dosimetry in IR or CCL	1000		0.60	0.30	0.30	<i>estimated annual workload per room</i>	
Estimation of skin dosimetry and follow up	10		0.00	0.00	0.01	<i># of high skin dose calculations carried out by medical physics per year</i>	
Patient dosimetry in CT	1000		0.00	0.00	0.00	<i>estimated annual workload per CT scanner.</i>	
Risk assessments for pregnant patients	0		0.01	0.01	0.01	<i># risk assessment performed by physics for pregnant patients per year</i>	
<b>TOTAL</b>							
<b><u>Staffing for Rad Prot services (scale accordingly)</u></b>							
	<b><u># departments</u></b>						
per radiology dept. (3CT, 10 x-ray rooms (rad/fluoro/mammo))	7				0.35	<i># clinical departments supported by medical physics e.g. radiology, cardiology etc. Scale accordingly for different sized departments. E.g. 5CT</i>	
per cardiology department (with cardiac cath lab)	6				0.30		

per NM department (4 major imaging units)	1			0.10	<i>and 15 fixed x-ray rooms = 1.5 departments. 8 linacs = 2 radiotherapy departments</i>
per RT department (4 linacs)	2			0.10	
<b><u>Dosimetry and incidents</u></b>					
staff dosimetry	1100			0.11	<i>enter no. of staff issued radiation dosimeters across all organisations supported by physics service</i>
staff/patient exposure incident evaluation	300			0.15	<i>enter number of incidents per annum</i>
staff/patient over exposure incident evaluation (dose calculation)	50			0.25	<i>enter number of over exposure incidents per annum investigated by physics</i>
<b><u>Medical Physics Service dependent factors</u></b>					
Ongoing service development	1			0.20	<i>enter number of physics services</i>
clinical governance including ongoing audits and QMS support				0.20	<i>factors are calculated per physics service</i>
practical radiation protection support				0.10	
management of scientific service				0.10	
Test protocol development		0.20	0.08	0.08	
<b><u>Research and training dependent factors</u></b>					
education and training of staff within service (CPD per physicist)	8			0.20	<i># individuals in team (scientist or technologist)</i>
R&D including clinical research (per clinical department)	1			0.20	<i># clinical departments carrying out research e.g. radiology, cardiology</i>
deliver internal training (per trainee)	1	0.30	0.20	0.20	<i># PTP, STP, HSST (or equivalent) trainees per annum</i>

education and training within service (per department)	15			0.60	# clinical departments supported e.g. radiology, cardiology	
clinical trials with trial specific QA requirements (per trial)	1			0.10	# trials with specific QA per annum	
<b>Further equipment factors</b>						
Equipment specification (per procurement)	7	0.07	0.05	0.07	# procurements per annum with physics involvement	
Equipment acceptance testing (per procurement)	20	0.40	0.20	0.20	# acceptance tests per annum	
Rad Prot advice for new installations (per installation)	10	0.10	0.05	0.10	# new installations per annum	
Practical Rad Prot support (per service)	15	1.50	0.75	0.75	# clinical departments supported e.g. radiology, cardiology	
<b>Further Research and Training dependent factors</b>						
Lead MPE assessment for research ethics committee (per project)	3	0.01	0.01	0.01	# per annum	
Local MPE review of approved research studies (per project)	50	0.10	0.10	0.10	# per annum	
deliver external training courses (per trainee)	300	0.30	0.21	0.21	# trainees e.g. RP/IRMER updates, non medical referrer training, RP training etc.	
Deliver academic teaching (per attendee)		0.00	0.00	0.00	e.g. teaching on MSc courses or FRCR	
Carry out research led by the service (per project)	1	0.20	0.08	0.08	# per annum	
Support provided to external research projects (per project)	2	0.06	0.04	0.04	# per annum	

## Summary

## **Medical Physics staffing level recommended by EU report 174**

Medical Physics service overall WTE  
MPE component of medical physics  
service WTE



## **Medical Physics staffing level recommended by EFOMP**

Medical Physics service experienced band  
7 and above WTE



(EFOMP acknowledges that the additional number of staff could be equal to or up to two times the number of experienced medical physicists)

