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Rev Dr Mike Kirby
University Lecturer (Radiotherapy Physics)
Directorate of Radiotherapy

Radiotherapy

THE AGE OF RADIOTHERAPY
Radiotherapy can cure cancer
Radiotherapy is cost effective
Radiotherapy is cutting edge

visit to….
LJMU

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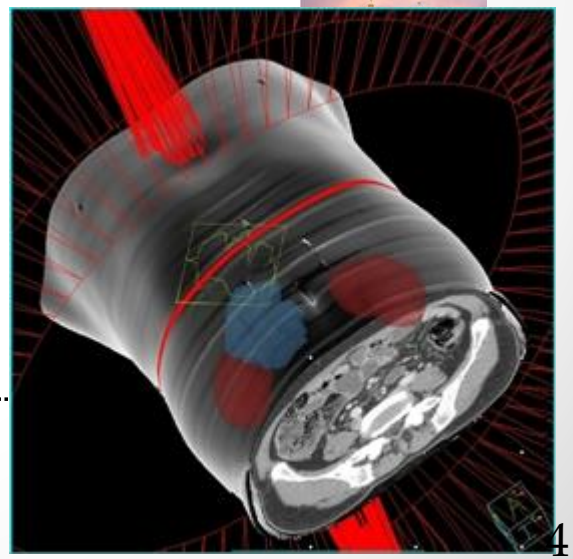
Today

- Talk a little bit about Radiotherapy in general
- The key healthcare professionals involved
- Concentrate on our own course(s)
  - **Postgraduate Diploma in Radiotherapy (2 years fulltime, course);**
    - MSc in Radiotherapy (top-up) 6-12 months part-time after successful completion of PGDip
  - **Registered Qualification to become a Therapeutic Radiographer**
  - **One of the main professions at the centre of caring and treating cancer patients**
  - **Very high employability - 100% from both UG and PG programmes**
  - **Approx 10% national shortfall in therapeutic radiographers; will increase when we start the UK Proton Beam Therapy Service (Manchester and London)**
  - **Therapeutic Radiographers…..at the heart of Saving Patient Lives, day in, day out**

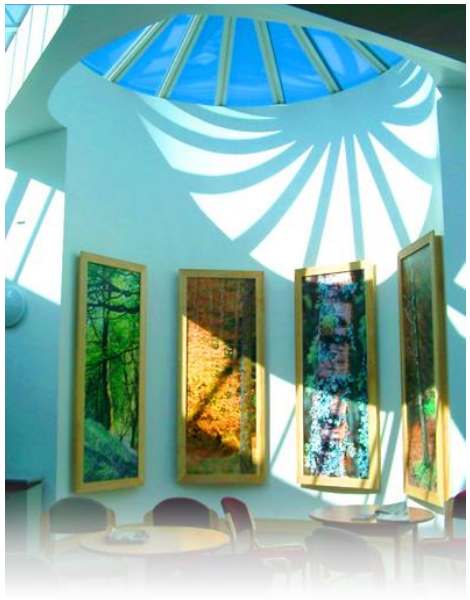
What is Radiotherapy?

- The treatment of cancers with highly targeted high energy X-rays
  - This can cure many tumours
  - It can relieve pain from advanced cancers
- It is one [illegible] effective [illegible] use against cancer



'Treatment of malignant disease using ionising radiation'.

- Staff and equipment found in specialised centres. E.g.
  - **Rosemere Cancer Centre (Preston)**
  - **The Christie (Gr Manchester)**
  - **Clatterbridge Cancer Centre (Merseyside)**
- Treatment on a daily basis for several weeks.
- Use of highly technical equipment and patient support.

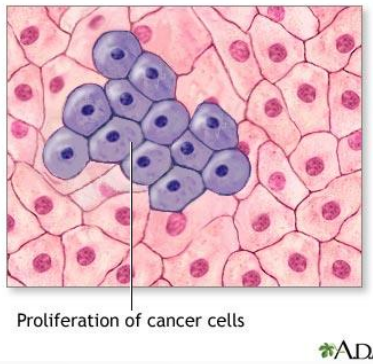


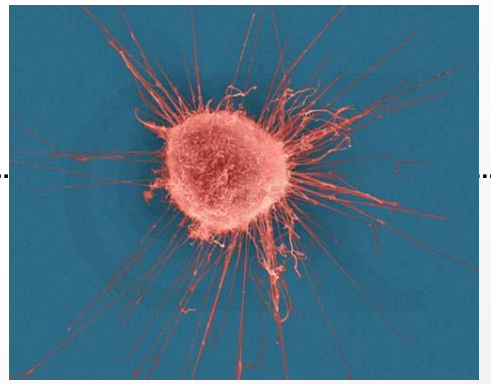
Rosemere Cancer Centre Preston

Cancer

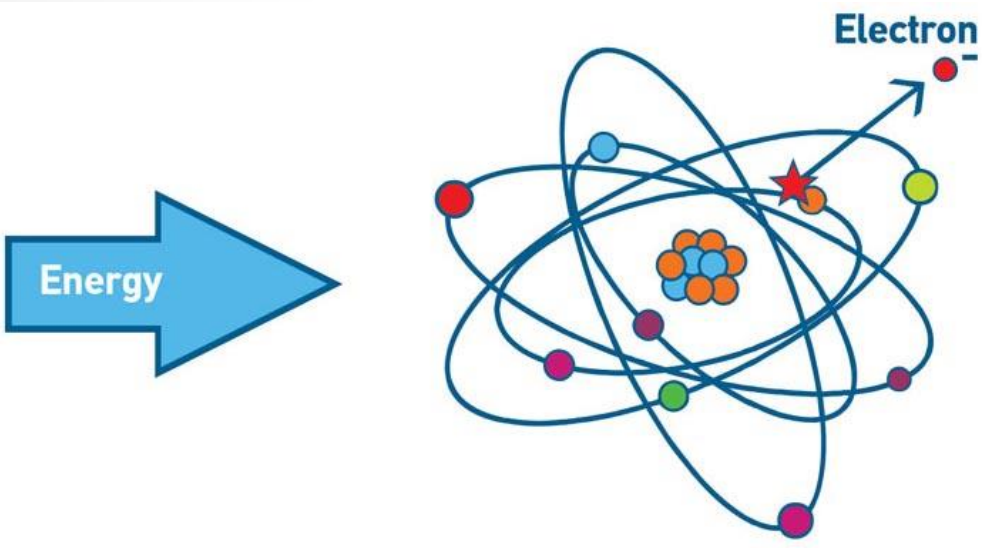
- Cancer is not just one disease but many diseases.
- Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues.
- Cancer cells can spread to other parts of the body through the blood and lymph systems.
- There are more than 100 different types of cancer.
- Most cancers are named for the organ or type of cell in which they start.

  (Cancer that begins in the colon is called colon cancer)





Ionising Radiation



radiation with enough energy so that during an interaction with an atom, it can remove tightly bound electrons from the orbit of an atom, causing the atom to become charged or ionized

How does Radiotherapy Work?

- Radiation damages every cell it passes through
  - Normal cells recover from the damage
  - Cancer cells can't

- We aim several focused beams at the cancer to ensure it has a high enough dose to kill it
  - The beams are planned carefully
  - The beams are aimed to sub-millimetre precision

How is Radiotherapy Used?

- Patients attend for daily treatment at the radiation oncology centres for up to 7 weeks

- Each treatment takes about 15 minutes

- The treatment causes a range of side effects that require monitoring and care

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The Patient!

https://www.macmillan.org.uk/information-and-support/treating/radiotherapy

Radiotherapy - who's involved?

- Clinical Oncologists - Doctors
  - **Degree in Medicine**
  - Significant number of years post qualification training in general and specialist registrar role
  - Up to Consultant Level, Medical Directors etc.
  - Doctors who diagnose and prescribe a patient's treatment

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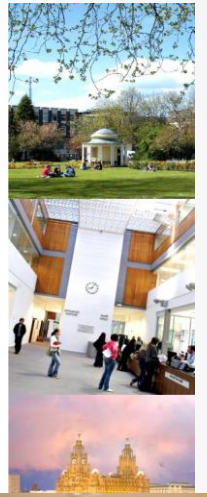
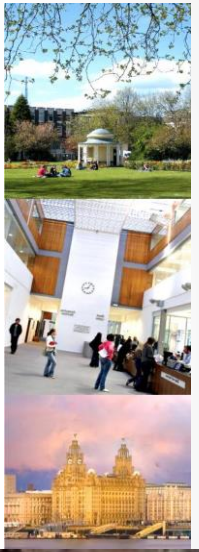
Radiotherapy - who's involved?

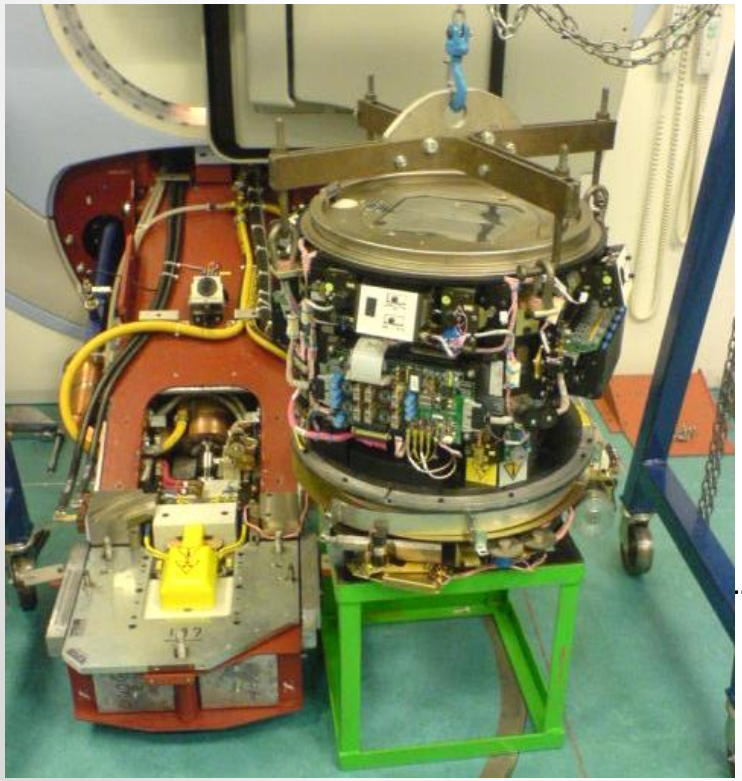
- Physicists (www.ipem.ac.uk)
  - Physicists – **Degree in Physics** or similar Physical Science
  - Profession associated with all the science behind Radiotherapy
  - National Centralised Recruitment Process into training posts
    - 3 year, fixed term NHS employment contract
    - Academic and on-the-job training
  - Includes MSc and training sufficient to be HCPC registered

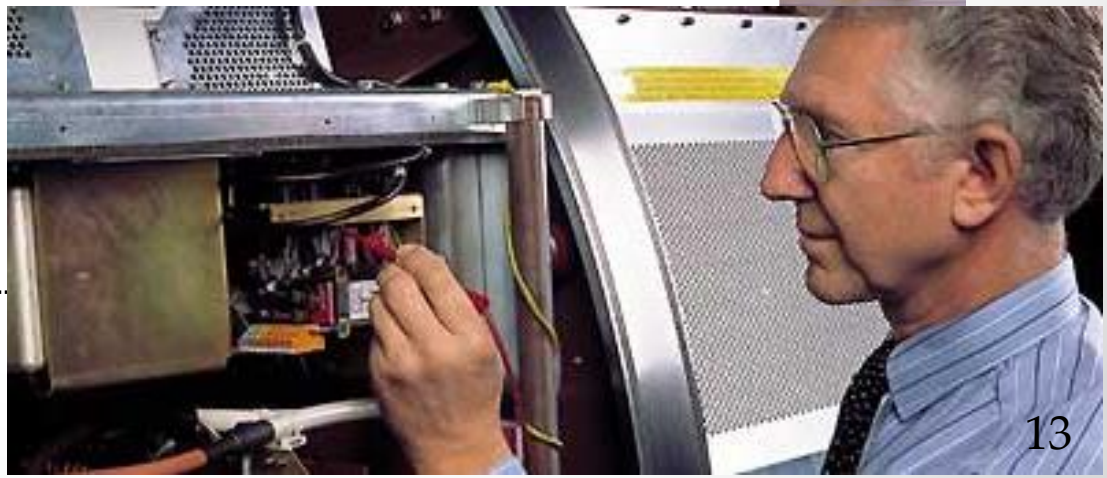


Radiotherapy - who's involved?

- Electronic Engineers and Technicians
  - Key group who maintain and service all multi-million pound radiotherapy equipment. Usually **electronics or similar degree/HNC** – considerable on the job equipment training







Radiotherapy - who's involved?

- Therapeutic Radiographers
  - Clinical Care and Management of the Patient = involved at all stages of the patient journey for Radiotherapy
  - Maximum amount of patient care and patient involvement
    - See and care for patients day to day
  - Developing Roles
    - Clinical Audit and Research; whilst treating patients – just where R and D is needed
    - Masters – now a career requirement for higher roles
    - Doctorate Level Qualifications
    - Department and Business Management in the NHS

Who makes a good Therapeutic Radiographer?

Patient care

Technology

Compassionate
Team worker
Calm

Excellent communication skills.

Daily Treatment (Delivery)

- May see 40+ patients/ day
- Work as a team
- Need to treat the patient accurately and promptly, but with care and compassion
- Professional under pressure

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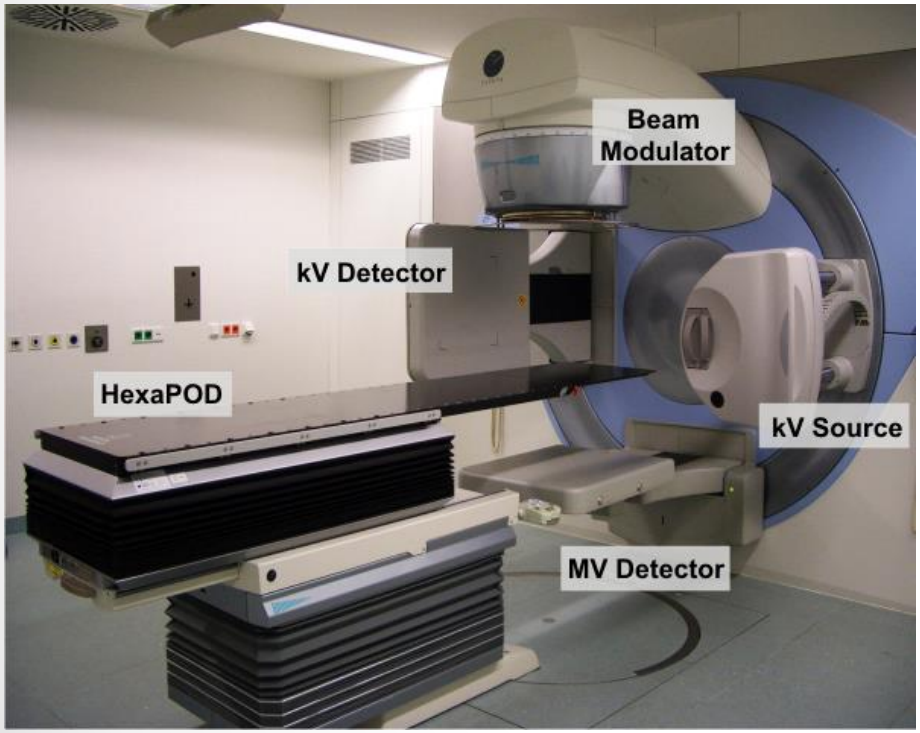
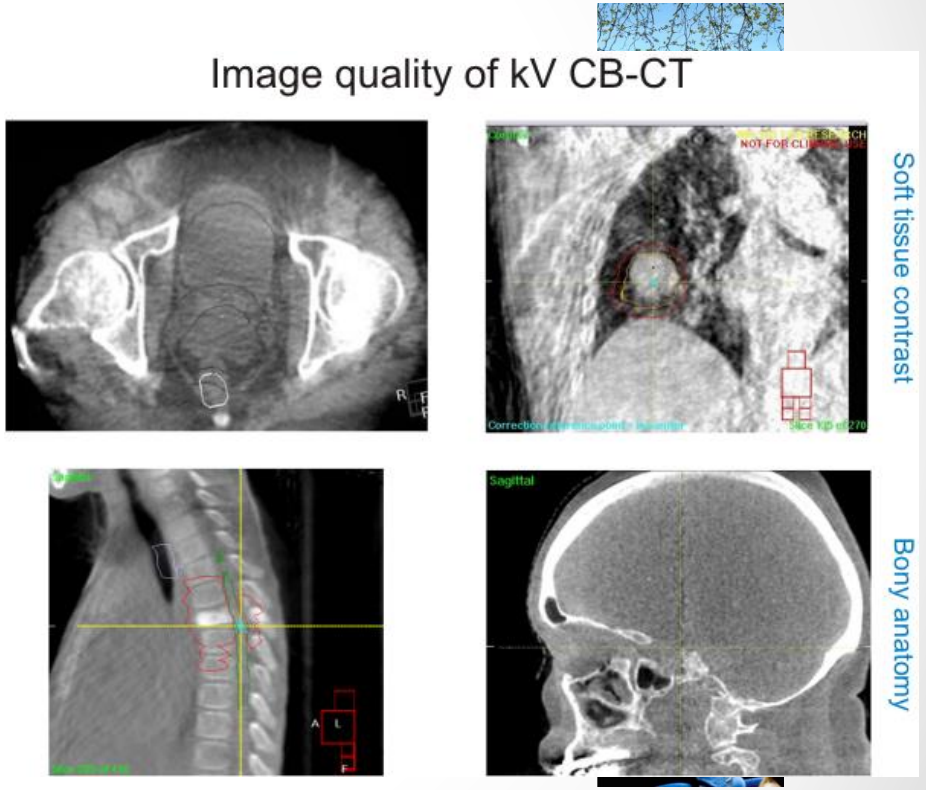
Verification





Decision making

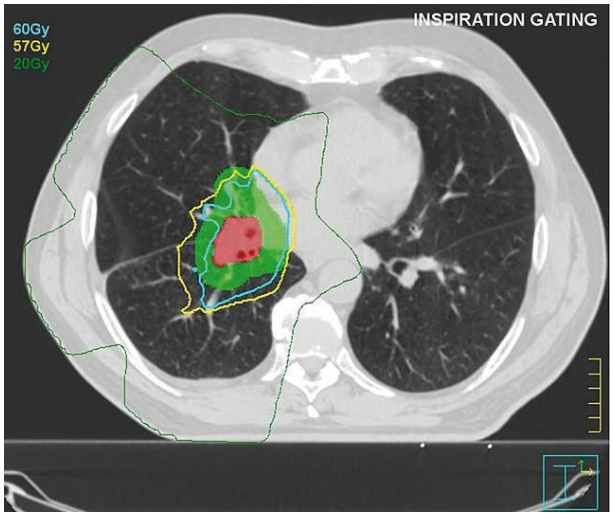
Patient Support

(medical and psychosocial issues)

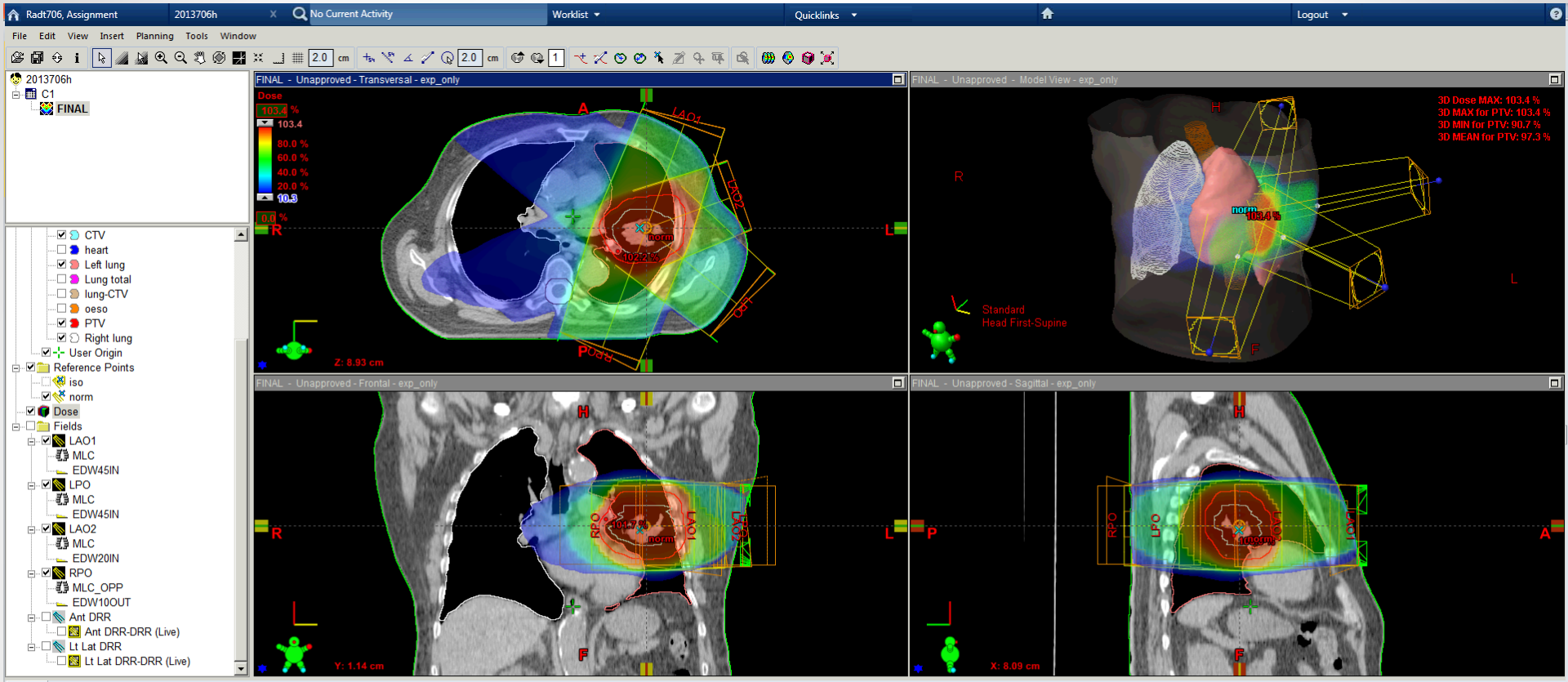
- Combines high technology equipment and patient contact
- First line patient care and contact for most patients
- High degree of satisfaction within the role

http://www.christie.nhs.uk/patients-and-visitors/your-treatment-and-care/treatments/radiotherapy/

Computerised Treatment Planning



University of Liverpool Students



Group	Field ID	Technique	Machine/Energy	MLC	Field Weight	Scale	Gantry Rtn [deg]	Coll Rtn [deg]	Couch Rtn [deg]	Wedge	Field X [cm]	X1 [cm]	X2 [cm]	Field Y [cm]	Y1 [cm]	Y2 [cm]	X [cm]	Y [cm]	Z [cm]	SSD [cm]	MU	Ref. D [Gy]
☑	LAO1	STATIC-I	Varian 2100C/D - 6X	Static	0.260	IEC61217	20.0	90.0	0.0	EDW45IN	10.0	-4.9	+5.1	10.6	-5.0	+5.6	8.03	1.21	8.89	88.9	104	1.010
☑	LPO	STATIC-I	Varian 2100C/D - 6X	Static	0.260	IEC61217	130.0	270.0	0.0	EDW45IN	10.0	-5.1	+4.9	11.3	-6.0	+5.3	8.03	1.21	8.89	88.0	125	1.257
☑	LAO2	STATIC-I	Varian 2100C/D - 6X	Static	0.260	IEC61217	70.0	0.0	0.0	EDW20IN	9.0	-4.4	+4.6	10.0	-4.9	+5.1	8.03	1.21	8.89	91.3	90	1.010
☑	RPO	STATIC-I	Varian 2100C/D - 6X	Static	0.220	IEC61217	200.0	90.0	0.0	EDW10OUT	10.0	-4.9	+5.1	10.8	-5.8	+5.0	8.03	1.21	8.89	87.0	75	0.982
☑	Ant DRR	STATIC-I	Varian 2100C/D - 6X		0.000	IEC61217	0.0	90.0	0.0	None	14.0	-1.0	+13.0	12.0	-1.0	+11.0	8.03	1.21	8.89	87.6		
☑	Lt Lat DRR	STATIC-I	Varian 2100C/D - 6X		0.000	IEC61217	90.0	90.0	0.0	None	13.0	-1.0	+12.0	13.0	-4.0	+9.0	8.03	1.21	8.89	89.4		

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Virtual Environment for RadioTherapy (VERT)

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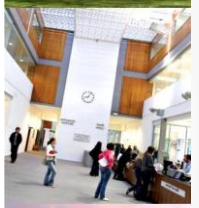

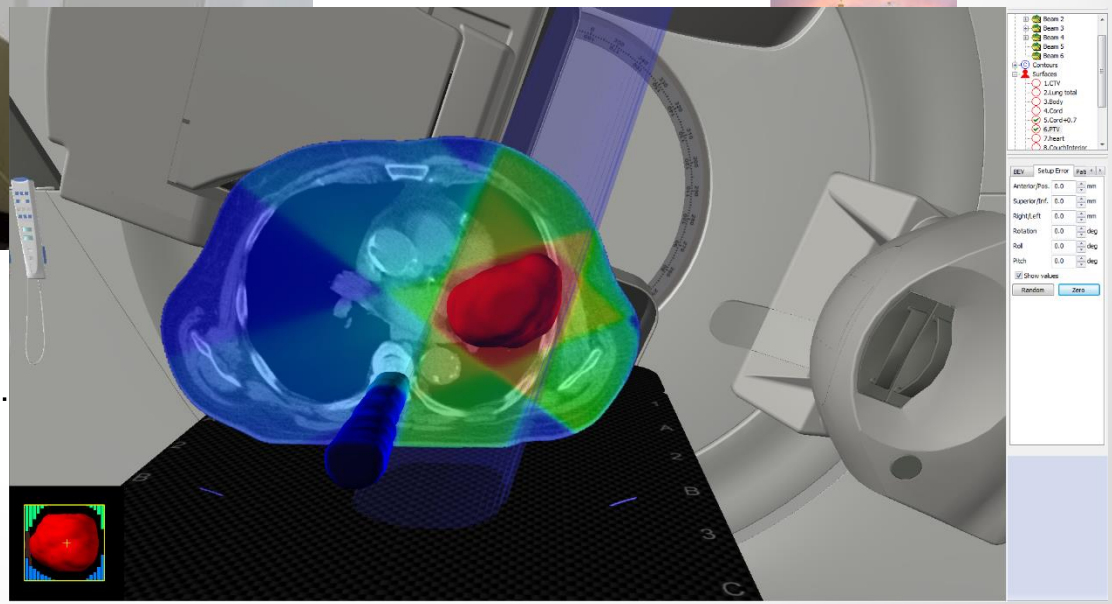

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Radiotherapy as a career?

- Opportunities to work in multi-professional teams
- Respected by society
- Good working conditions
- Registered autonomous professional
- Role development opportunities
- Lots of Radiographer led services
- UK trained Radiographers are the best!

hcpc health & care professions council

THE SOCIETY AND COLLEGE OF RADIOGRAPHERS

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Outline of the Programme

- **PG Diploma in Radiotherapy**
  - **Fulltime, 2 year programme; Registered Qualification**
- **MSc Radiotherapy (top-up)**
  - **6 – 12 months part-time; flexible starting point from the end of the PGDip (Dissertation format)**
- PGDip Entrance Requirements 2:I and above in appropriate Science
- 50% Academic, 50% in clinical placement
- Studies include:

  Anatomy, physiology, radiation science and technology, communication skills, oncology, health promotion and education, research methods.
- https://www.youtube.com/watch?v=jbjnOO-t154 (Student views - Look at the clip from 7 min onwards)

Fees….see leaflet

- NHS Bursaries – now stopped by Govt (6th Feb 2018)
  - **PGDIP:** From Aug 2018; "….students will access loans from the Student Loan Company…..They will have access to the Learning Support Fund, administered by the NHS Business Services Authority (https://www.nhsbsa.nhs.uk/student-services), for support whilst attending clinical placements," as our current students do.
  - Fees for 2018/19 (Jan 2019 intake) – lowered to £9,250 per year + living costs; available through SLC
  - **MSc:** Single module fee of £2,500. Often part costs come from the employee's NHS Trust or are fully funded (e.g. NHS Lothian)
- See..
  - https://www.gov.uk/government/publications/healthcare-education-funding-for-postgraduate-and-dental-students/healthcare-education-funding-for-postgraduate-and-dental-students
  - http://www.thefundingclinic.org.uk/a-mature-student/

Attendance Pattern e.g.

PGDip Year 1 - 2015		PGDip Year 2 - 2016	
Semester 2		Semester 2	
19-Jan	INDUCTION	25-Jan	PLACEMENT
26-Jan	UNIVERSITY	01-Feb	PLACEMENT
02-Feb	UNIVERSITY	08-Feb	PLACEMENT
09-Feb	UNIVERSITY	15-Feb	PLACEMENT
16-Feb	UNIVERSITY	22-Feb	PLACEMENT
23-Feb	UNIVERSITY	29-Feb	UNIVERSITY
02-Mar	UNIVERSITY	07-Mar	UNIVERSITY
09-Mar	UNIVERSITY	14-Mar	UNIVERSITY
16-Mar	READING WEEK	21-Mar	UNIVERSITY
23-Mar	PLACEMENT	28-Mar	UNIVERSITY
30-Mar	PLACEMENT	04-Apr	UNIVERSITY
06-Apr	PLACEMENT	11-Apr	HOLIDAY
13-Apr	PLACEMENT	18-Apr	UNIVERSITY
20-Apr	PLACEMENT	25-Apr	UNIVERSITY
27-Apr	PLACEMENT	02-May	UNIVERSITY
04-May	PLACEMENT	09-May	UNIVERSITY
11-May	PLACEMENT	16-May	UNIVERSITY
18-May	UNIVERSITY	23-May	UNIVERSITY
25-May	UNIVERSITY	30-May	REVISION
01-Jun	UNIVERSITY	06-Jun	ASSESSMENT
08-Jun	UNIVERSITY	13-Jun	HOLIDAY
15-Jun	REVISION	20-Jun	HOLIDAY
22-Jun	ASSESSMENT	27-Jun	PLACEMENT
29-Jun	HOLIDAY	04-Jul	PLACEMENT
06-Jul	HOLIDAY	11-Jul	PLACEMENT
13-Jul	HOLIDAY	18-Jul	PLACEMENT

Programme Structure

- 2 Introductory Modules at level 6
- 7 Modules at level 7
- Mixture of Science and Clinical Studies
- 120 credits – full **PG Diploma (Pass, Merit or Distinction)**
- After qualifying, therapeutic radiographers can undertake a 60 credit, dissertation to gain the **MSc in Radiotherapy**

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Programme Specification PG

The programme is modular and all modules are **MANDATORY** i.e. must be passed. The programme includes two level 6 modules (to the value of 30 credits) and seven level 7 (to the value of 90 credits) **(Table 2)**. The modules follow five themes:

1. Fundamental knowledge and skills underpinning radiotherapy practice
2. Science for radiotherapy
3. Clinical radiotherapy: theory & practice
4. Complex and challenging issues in radiotherapy
5. Professional practice studies

Table 2: Modules in each year

Year	Session	Module code	Module Title	Module level	Module Credit	Total Credit
One	Semester 2	RADT622	Fundamentals of science for radiotherapy	6	10	30
		RADT625	Fundamentals of professional, radiotherapy & oncology studies	6	20	
	Semester 1	RADT711	Clinical radiotherapy: theory & practice 1	7	20	30
		RADT712	Science for radiotherapy 1	7	10	
				Level 6 Level 7	30 30	60
Two	Semester 2	RADT722	Science for radiotherapy 2	7	10	30
		RADT723	Clinical radiotherapy: theory & practice 2	7	30	
	Semester 1	RADT713	Science for radiotherapy 3	7	10	30
		RADT714	Clinical radiotherapy: theory & practice 3	7	15	
		RADT715	Professional practice	7	5	
				Level 7	60	120
	Exit award		PGCert in Radiation Science*	Level 6 Level 7	15 45	60
	Exit award		PGDip in Radiotherapy	Level 6 Level 7	30 90	120

* This award does not provide eligibility to apply for HCPC registration.

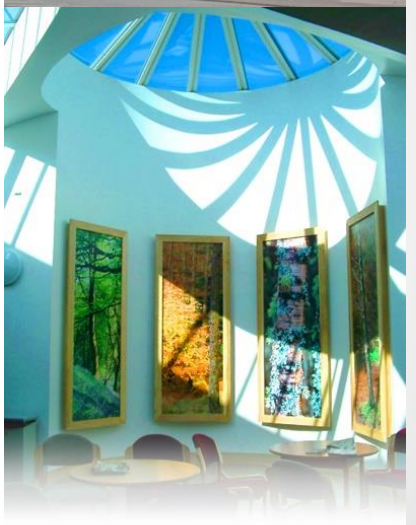
Delivery and Assessment

- Delivery
  - Wide range of methods
  - Traditional Lectures, Tutorials, Seminars
  - Problems and practical computer classes (using state of the art VERT suite and real-world RT computer software)
  - PBL, IPE, Small group work
  - Self-directed Learning

- Assessment
  - Wide range of methods – allowing students to demonstrate achievement of learning outcomes in many different ways
  - Unseen written exams
  - Seen written exams
  - Written and computer based assignments
  - Group and individual presentations
    - Oral and Poster
  - **Continuous Clinical skills assessment – final Observed Clinical Assessment on a number of patients**

Clinical Training…… second to none!

- **The Christie (Manchester), Clatterbridge Cancer Centre (Liverpool), Rosemere Cancer Centre (Preston)**
- From the biggest in Europe (Christie), those among the cutting edge of research and development (Christie and Clatterbridge) and at the leading edge of implementing and developing technology and techniques for the benefit of most of their patients (Rosemere, Clatterbridge and Christie)



Practice Placement Sites

1. Rosemere Cancer Centre, Preston

2. The Christie, Manchester

3. Clatterbridge Cancer Centre, Wirral

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Entrance and Selection Criteria

- See the hand-outs – entry criteria and key dates
- See our website
  - http://www.liv.ac.uk/study/postgraduate/taught/diploma-in-radiotherapy/overview/
- 2:I and above Science degree
  - Physical, Life, Health Sciences
  - Social Sciences/Sports Sciences possible, but must have science background/A levels (A2 Level – Grade B min)
- Strong Application, references, personal statement, completed clinical visit
  - Full completion needed for the offer of a place

Clinical Visit

- Not work experience
- ½ a day.
- Ensures knowledge of the profession.
- Completed form sent to the admissions secretary.

- Hand-out on clinical contacts in Preston, Manchester and Liverpool

Where do our students come from? Where do they go?

- Each year, a number from LJMU ~ 20% of intake
- Universities across UK, BSc, MRes, MPhys, MSc, PhD
- Physics
- Chemistry
- Biology, Biochemistry
- Physiology, Psychology
- Forensics
- Genetics
- Sociology
- Physiotherapy
- Pharmacology

- **ALL** employed as Therapeutic Radiographers
  - Within 1 – 2 months
  - Usually BEFORE course finishes!
- Departments around the country
  - Manchester, Liverpool, Preston, London, Leeds, Newcastle, Cambridge, Oxford, Sheffield
- Radiographers employable around the world, in industry and teaching

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LJMU Interest…..

- …..and now studying on the course!
- Jan 2016 intake
  - 9 LJMU graduates were invited for interview;
  - 7 offered places;
  - 6 started out of the total cohort of 24…….25% of the group!
- Jan 2017 intake
  - 8 LJMU graduates were invited for interview;
  - 5 offered places and started out of the total cohort of 24……20% of the group!
  - 2 were offered, and accepted, places on our BSc course
- Jan 2018 intake
  - 5 LJMU applications; 4 were offered places and started the course….18% of the group!

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Visit a Radiotherapy Department

- ***Contact Pete Bridge or Cath Gordon for guidance….***
  - ***Pete.bridge@Liverpool.ac.uk***
  - ***cgordon@Liverpool.ac.uk***
- ***Clatterbridge Cancer Centre, Wirral –*** *wendi.heathcock@clatterbridgecc.nhs.uk*
- ***Rosemere Cancer Centre, Preston –*** *gillian.clarkson@lthtr.nhs.uk*
- ***The Christie, Manchester -*** *Laura.mcgirr@christie.nhs.uk*
- *Racheal.bennett@christie.nhs.uk*

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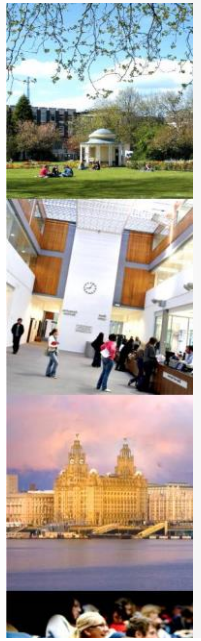
What next…for entry January 2019?

Get in touch, come and visit, learn more from us…..

Admissions Tutor, Pete Bridge pete.bridge@Liverpool.ac.uk

Director of Studies, Cath Gordon cgordon@Liverpool.ac.uk



PG Dip taster Days

Wednesdays 14th March and 25th April 2018 (1-4pm)

https://www.liverpool.ac.uk/study/postgraduate/radiotherapy-taster-sessions/

CLOSING DATE FOR APPLICATIONS – Tues 1st May, 2018

Selection Days

Wednesday 16th May, Thursday 24th May 2018

Admissions Unit,
School of Health Sciences

http://www.liv.ac.uk/study/postgraduate/taught/diploma-in-radiotherapy/overview/

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Career Prospects

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The future for Therapeutic Radiographers is bright!

.....as it is for our patients too

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Inspiring
Friendly
Ambitious
Original
Global

Thank you for your attention!