



## Level 2A (General CT scanning – Initial training)

<b>Name:</b>	<b>Grade:</b>
<b>Stages 1-6 completed (Date):</b>  i.e. Competent to scan with supervision. Can progress to Stage 7 to scan with an assessor or supervisor and can approve / sign off documentation as appropriate	<b>Training completed (Date):</b>

### Scope

- Form to be used by all radiographers when undertaking training, to gain competence in completing CT QA, tattooing and acquiring non-contrast 3DCT scans.

### Responsibilities

- Radiographers have a responsibility to only carry out tasks which they are being supervised for or have been deemed competent to complete.
- Radiographers are responsible for maintaining knowledge of current procedures. They should discuss any required training or clinical updates e.g. after a rotation or period of absence, with the Pre-treatment Section Manager / Team Leaders, who will determine appropriate training plan and timescales.
- All Radiographers are supervisors for Radiotherapy tasks they are competent to perform within their scope of practice.  
NB 2 B5 Radiographers must only work together if both have completed relevant competencies forms.
- Assessors (Radiographers Band 7 or above) are responsible for assessing an individual's ability and may sign staff off as achieving competencies.
- Supervisors and / or Assessors should sign off or approve any required CT Dynamic Documents and Questionnaires until the Radiographer in training has completed stage 6 and has been deemed competent to scan under direct supervision from an assessor or supervisor.

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<b>Timescales / Review of training</b>
Initial training Timescale: Radiographers are expected to complete Level 2A within 2-3 months if working consistently in CT. This timescale may be amended if the radiographer is working in other areas concurrently. A 2 and 3-month review should take place to ensure training is on schedule.
<b>2-month review by Pre-treatment Section Manager or Team Leader (Signature):</b> _____ <b>(Date):</b> _____ <b>Competencies completed: Yes / No</b> <b>If Yes: Complete page 1</b> <b>If No: Competencies still on schedule to be completed by 3 months: Yes / No (If No – please give reasons and expected timeframe)</b>
<b>3-month review by Pre-treatment Section Manager (Signature):</b> _____ <b>(Date):</b> _____ <b>Competencies completed: Yes / No</b> <b>If Yes: Complete page 1</b> <b>If No: Please give reasons and proposed action and /or timeframes</b>

**Training Stages:** Some stages of training may be started and completed in tandem with each other, whilst others must not start until preceding ones are finished. This is displayed in the table below and throughout the training form.

A	B	C	D	E
<b>Stage 1: Operation of Equipment</b> ➤ Demonstration / Information session ➤ Reading	<b>Stage 3: Daily QA checks</b> ➤ Reading & Observations ➔ Assessed QA check procedure (assisted) ➔ Assessed QA check procedures (unassisted)	<b>Stage 6 Clinical Practice:</b> ➔ 3DCT scanning - Direct supervision ➔ Assessed practice	<b>Stage 7.1: Clinical practice:</b> ➔ Scanning with Assessor  Patient Scans – Without direction	<b>Stage 7.2: Clinical practice:</b> ➔ Scanning with Supervisor  Patient Scans – Without direction
	<b>Stage 5: Clinical Processes – Enhanced functions</b> Demonstration / Information session Confirmation of Vac Bag training			
<b>Stage 2: Tattooing</b> ➤ Observation & Reading    ➔ Assessed practice	<b>Stage 4: Clinical Processes</b> ➤ Observations & Reading ➔ Simulation of scanning processes		<b>Stage 8: CT Quiz</b>	

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## Stage 1: Operation of Equipment

### Stage 1.1: Information / Demonstration Session of CT equipment

A trained CT radiographer will demonstrate the following functions / processes of the CT scanner.

An assessor will observe and assess the Radiographer in training, completing the shutdown procedure.

Other aspects of the operation of equipment will be assessed in Stages 3 (QA checks) and Stage 4.1.c (Simulation of scan processes)

#### General Safety Information / Overview of Local Rules

- Locking of doors / light indicator
- Radiation signage
- Emergency stop
- In room scanner panel e.g. power cuts
- Quick release of couch
- No escorts

Session taken by:

Date

Annual CT Contingency session: Date of last attendance: \_\_\_\_\_ (see RPS if attendance is > 1 year)

#### Equipment – scanner room

##### CT Scanner

- Gantry controls
- Foot pedals
- Emergency stop
- Quick release of couch

##### Lap Lasers

- Switch on / off
- Charging
- Movement of lasers

Session taken by:

Date

#### CT equipment – control room

- Control Box
- Keyboard shortcuts incl. F1 – online help
- Saving error messages

Session taken by:

Date

Stage 1.1 cont.		
<p><b>Switch on / Cold Tube</b></p> <ul style="list-style-type: none"> <li>➤ CT Switch on procedure</li> <li>➤ RGSC <ul style="list-style-type: none"> <li>▪ Workstation</li> <li>▪ Real time unit (may have been switched off on Fridays)</li> </ul> </li> <li>➤ Overview of morning check- up (<i>will be covered in detail in stage 3</i>)</li> <li>➤ Cold tube procedure</li> </ul>	<p>Session taken by:</p> <p>Date</p>	
<p><b>Switch off</b></p> <ul style="list-style-type: none"> <li>➤ CT Switch off procedure <ul style="list-style-type: none"> <li>▪ Weekly system clean-up and shut down</li> <li>▪ Daily system restart</li> </ul> </li> <li>➤ RGSC switch off</li> <li>➤ Lap Lasers / Oven in CT room</li> </ul>	<p>Session taken by:</p> <p>Date</p>	<p>Daily shut completed by Radiographer</p> <p>Assessor signature:</p> <p>Date:</p>
<p><b>Syngo Acquisition Workspace (Scan / Display Monitor)</b></p> <p>Layout of screens</p> <ul style="list-style-type: none"> <li>➤ Browser <ul style="list-style-type: none"> <li>▪ Scheduler <ul style="list-style-type: none"> <li>- Including action if name does not appear</li> </ul> </li> <li>▪ Database</li> <li>▪ Exporting data</li> </ul> </li> <li>➤ Examination card <ul style="list-style-type: none"> <li>▪ Patient model dialogue box <ul style="list-style-type: none"> <li>- Scan protocols</li> <li>- Adult and Paediatric</li> <li>- Append and replace</li> </ul> </li> <li>▪ Routine tab</li> <li>▪ Scan tab</li> <li>▪ Recon tab</li> <li>▪ Auto-tasking tab</li> </ul> </li> <li>➤ Viewer card <ul style="list-style-type: none"> <li>▪ Graphics</li> </ul> </li> <li>➤ 3D card</li> </ul>		<p>Session taken by:</p> <p>Date</p>

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## Stage 1.1 cont.

### CT Scanning processes (General)

- Scan Process including
  - Protocol selection
  - Checking and amending parameters
    - Patient orientation
    - Tope selection and deletion
    - Field of view (FOV)
    - Start position
- Remove / add contrast to scan protocol – including amending optimisation
- Pausing scan
- “Don’t cancel move”
- Protecting scans

Session taken by:

Date

### CT Scanning processes (Non-routine)

- 2-pins
- Brain with pacemaker
- CNS
- 2 scans for scheduled patient
- Extended CT range
  - Rationale
  - Process
- Reconstruction of images with MAR
  - Rationale
  - Process
- Add and “stitch” additional scans to top and bottom of scan set (*for information only*)

Session taken by:

Date

## 1.2: Mandatory Reading

CT Training Manual (Siemens Technical)

Date read:

*Additional reading / information: Siemens technical manual is also available in Sim1*

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## Stage 2: Tattooing

### Stage 2.1a Observation of tattooing process

Scanned area	Patients Hospital Number	Date of procedure	Radiographers signature	Scanned area	Patients Hospital Number	Radiographers signature	Date of procedure
Breast / Thorax				Pelvis			

### Stage 2.1b Mandatory Reading

COSHH risk assessment No.17 Clinell Alcohol Wipes for skin	<i>Date read:</i>	Poster regarding disposal of clinical waste including pharmaceuticals and sharps	<i>Date read:</i>
COSHH risk assessment No.38 Tattoo Ink	<i>Date read:</i>	Awareness of Trusts procedure for Sharps injuries	<i>Date read:</i>
Risk Assessment 1.88 Sharps in Brachytherapy & Radiotherapy	<i>Date read:</i>	CT Training Manual (Clinical): Pin & Shift technique section	<i>Date read:</i>

### Stage 2.2 Supervised practice

*Complete stages 2.1a and 2.1.b.before carrying out any supervised procedures.*

The radiographer must demonstrate safe practice including adherence to Infection control guidelines and safe disposal of equipment.

Scanned area	Patients Hospital Number	Assessor's Signature	Date of procedure	Scanned area	Patients Hospital Number	Assessor's Signature	Date of procedure
Breast				Pelvis			
Thorax							

### Stage 2.3 Safe use of Sharps Bins:

The Radiographer must be able to:

	Assessor's Signature	Date
Assemble or demonstrate knowledge of correct procedure for assembling and storing a sharps bin		
Close or demonstrate knowledge of correct procedure for closing and disposal of a sharps bin		

### Stage 2 Confirmation of training

After completion of Stage 2, I have received appropriate training to be competent in tattooing appropriate reference marks

*Radiographers signature / date*

### On completion of training

- Update the training database
- Inform the Pre-treatment Section Manager

*Section Manager's signature*

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## Stage 3: Daily QA checks

NB Stage 1 must be already completed

### Stage 3.1a Mandatory Reading

WI 9.1.20 CT-Sim QA Checks	Date read:	Risk Assessment: Identification of radiation hazard to persons in or adjacent to radiotherapy CT-Sims	Date read:
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### Stage 3.1b Observations - Minimum of 2 observations of Switch on and QA checks

	Date	Radiographer's Signature		Date	Radiographer's Signature
Observation 1			Observation 2		

Stage 3.1a and 3.1b must be completed before moving to Stage 3.2

### Stage 3.2 Supervised completion of Switch-on & QA checks (can be assisted) – Minimum of 2 sessions

	Date	Supervisors signature		Date	Supervisors signature
Day 1			Day 3 optional		
Day 2			Day 4 optional		

Only when they are confident in the process, should the Radiographer ask a CT team leader to assess them completing QA checks on 2 further occasions with no assistance.

### Stage 3.3 Clinical practice assessment – switching on and completing QA checks without assistance – Minimum of 2 sessions

	Date	Assessor's signature		Date	Assessor's signature
Day 1			Day 2		

#### Stage 3 Confirmation of training

After completion of Stage 3, I have received appropriate training to be competent in completing CT QA checks unsupervised

*Radiographers signature / date*

#### On completion of training

- Update the training database
- Inform the Pre-treatment Section Manager

*Section Manager's signature*

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## Stage 4: Clinical processes - observation, reading and scan simulation

NB Stages 4.1a, 4.1b and 4.1c can be completed in tandem

### Stage 4.1a Observations of scan, completion of documentation and encounter

Scanned area	Hospital Number	Date	Radiographer's Signature	Scanned area	Hospital Number	Date	Radiographer's signature
Breast				Spine (T or L)			
Breast				Thorax			
Prostate				Brain, C-spine or Head & Neck			

### Stage 4.1b: Mandatory Reading

QAP 9.1b Procedure for use of Simulator/CT	Date read:	CT Training Manual (Clinical)	Date read:
WI9 1 2b CT Tasks	Date read:	QAP 9.8a Referral back to CT by Radiographers	Date read:
WI 9.1.1e Breast scanning (Free-breathing)	Date read:	Prep information leaflets – prostate, gynae, rectal, bladder, enema	Date read:

Reference books are available in the pre-treatment section. Radiographers are encouraged during training to develop their knowledge on:

- Basic concepts of CT such as image quality and artefacts, image noise and pitch, Hounsfield numbers etc.
- Radiographic and cross sectional anatomy.

**Stage 4.1c Simulation of scanning process (using phantom)**

Radiographer should scan all scenarios with their supervisor or assessor with or without guidance.

The Radiographer should then be assessed repeating the last 3 scenarios without direction.

Scanning protocol	Date	Scanning with Direction	Date	Scanning without direction
		Supervisor's or Assessor's Signature		Assessor's Signature
3DCT protocol (e.g. palliative or pelvis)				
Breast 3DCT protocol				
3DCT with control				
3DCT with control - Process if only topogram and control acquired				
3DCT with control including repeating a control scan				
Reposition phantom after initial topogram and complete remainder of scan				
3DCT scan when prosthetic identified after initial topogram				

uncontrolled docu

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**NB: Stage 6 may be started along with Stage 5**

**Stage 5: Clinical processes (enhanced functions / processes)**

<b>Stage 5.1 Information / Demonstration session</b>	
<ul style="list-style-type: none"> <li>➤ Understanding of Scanner features               <ul style="list-style-type: none"> <li>➤ CareDose 4D – “off” and “semi”                   <ul style="list-style-type: none"> <li>– removing / adding contrast to protocol</li> </ul> </li> <li>➤ Safire</li> <li>➤ Dose profile                   <ul style="list-style-type: none"> <li>– Meanings of green / yellow</li> <li>– Actions</li> </ul> </li> <li>➤ Kernels (not to be changed) / Direct density</li> <li>➤ Fast planning</li> <li>➤ Dose-shield for helical scans</li> </ul> </li> </ul>	Session taken by:  Date:
<b>Further suggested Reading (non-mandatory)</b>	
Radiographers can register with PEP Siemens for on-line learning resources @ <a href="https://pep.siemens-info.com/en-us">https://pep.siemens-info.com/en-us</a>	
<i>Configure and Dose Care KV</i>	<i>Enable and use Safire (Siemens Job Aid)</i>
<i>Direct density and technical principles and implications for Radiotherapy</i>	

<b>Stage 5.2 Scanning with Vac bags</b>	
<p>Radiographer should attend a training session that includes:</p> <ul style="list-style-type: none"> <li>• Awareness of range of Vac bags available</li> <li>• Considerations when selecting most appropriate bag</li> <li>• Checking condition of Vac bag</li> <li>• Positioning of Vac bag appropriately           <ul style="list-style-type: none"> <li>- even distribution of pellets</li> <li>- moulding around fixable points / objects etc</li> </ul> </li> <li>• Connecting and disconnecting the Vac bag to and from the vacuum pump</li> <li>• Labelling of bag</li> </ul> <p><b>Following the training, the Radiographer should have signed the “Record of training form” provided by the trainer to indicate that they have received training in the use of vac bags and feel competent in preparing them to immobilise patients for radiotherapy.</b></p>	Attended training on _____(date)  Radiographers signature:  _____

## Stage 6: Clinical Practice - Working with 2 trained CT Radiographers i.e. direct supervision from Operators 1 & 2

**Pre-requisite:** Stages 1, 2 and 4 must be completed

This section requires a minimum of 10 scans under direct supervision of Operator 1 and / or Operator 2 (grade B6 or above)

A variety of scanned areas should be included. All dynamic documents and questionnaires must be signed by the trained operators

Advice / direction may be given by the supervisor / assessors, however the assessor must be satisfied during scan 9 and 10 that the radiographer can progress to stage 7.

\*\* Radiographer must be observed / assessed in giving patient instructions. \*\*\* Last two recorded scans must be with an assessor.

	Date	Patient Hospital No	Scanned Area	Radiographer as Operator 1 or 2	Supervisor's Signature	or Assessor's Signature
1			**	1	N/A	**
2						
3						
4						
5						
6						
7						
8						
9				2	N/A	***
10				1	N/A	***

### **Stages 1-6 Confirmation of training**

After completion of Stages 1-6, I have received appropriate training to scan safely under supervision with an assessor / supervisor as appropriate

Radiographers signature / date

### **Stages 1-6 Confirmation of training**

\_\_\_\_\_ has completed stages 1-6 and has demonstrated safe practice so can proceed to Stage 7a where they can scan with an assessor and sign off or approve appropriate documentation

Assessor's signature / date

### **On completion of Stages 1-6**

Update the training database  Inform Pre-treatment Section Manager

Section Manager's signature

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## Stage 7: Clinical Practice - Scanning under supervision but without direction

Sections 1-6 must be completed before starting Stage 7 and should only be started when the radiographer is confident with scanning and completing CT documentation

The radiographer should work as Operator 1 for the scans listed in the table below, with the exception of those labelled as **RAD 2** when they should work as Operator 2.

The radiographer should complete the scan and / or associated tasks as per relevant protocols without direction.

The assessor / supervisor should confirm that the radiographer, without direction, has completed or checked

- adequate patient preparation (see CTCF Level 2c for oral contrast),
- appropriate patient positioning
- setting of required scanning levels / slice thickness / slice interval
- completion of required documentation

Assessors in addition should assess that the radiographer has demonstrated reasonable knowledge of relevant anatomy

- For Stage 7.1a, the other operator will be a CT trained Radiographer, graded B7 or above, who will assess the radiographer carrying out the scan and any associated tasks  
Stage 7.1b lists scans that often require IV contrast or do not occur on a regular basis. If the procedures do occur whilst the radiographer is in training, then they should scan the patients with their assessor as per Stage 7.1a, otherwise the radiographers should read any relevant WI's and then discuss the scanning procedures with the assessor – this should include any particular prep / scanning levels / patient positioning specific to the site.

Radiographers may be able to progress on to Stage 7.2 prior to fully completing Stage 7.1. This will be determined by the Assessor and/or Section Manager.

- For Stage 7.2, the other operator will be a CT trained Radiographer, graded B6 or above, who will supervise the radiographer carrying out the scan and any associated tasks

If Stage 7.2 is to start before Stage 7.1 is fully completed, the assessor or Section Manager must complete the following table stating which specific scan protocols the radiographer has been assessed to have completed satisfactorily and can now scan with a supervisor.

Date	Scan protocols that can be scanned with Supervisor	Assessor / Section Manager signature

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<b>Stage 7.1a Scanning with Assessor</b>				
Scan protocol	Further details (i.e. Site or any issues during scan e.g. poor rectal prep / position)	Hosp No	Date	Assessors Signature
Breast (FB)				
Prostate				
Bladder				
Gynae				
Gynae Brachy verification				
Palliative GI				
Palliative Brain				
SRS Brain				
Head & Neck				
Spine (Cervical – upper thoracic)				
Spine (Thoracic)				
Spine (Lumbar - Sacral)				
Upper extremity				
Lower extremity with extremity board				
Breast (FB) <b>RAD 2</b>				
Prostate <b>RAD 2</b>				
Brain or H&N <b>RAD 2</b>				
Palliative Lung <b>RAD 2</b>				
<b>Stage 7.1 b Scanning with assessor or Demonstrate knowledge of process to Assessor</b>				
Palliative with 2 reference points **				
Gynae & PA nodes **				
Bladder Adaptive **				
Upper GI **				
Spleen **				
Cranio-spinal **				

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Stage 7.2: Scanning with Supervisor				
Scan protocol	Further details (e.g. Site or any issues during scan (e.g. poor rectal prep / position))	Hosp No	Date	Supervisors signature
Breast (FB)				
Prostate				
Gynae Brachy verification				
Lower GI				
Brain (palliative or radical)				
Head & Neck				
Palliative Lung				
Palliative Pelvis				
Spine (Cervical or upper Thoracic)				
Spine (Mid – Lower Thoracic)				
Spine (Lumbar - Sacral)				
Lower extremity				
Upper extremity				

<b>Stage 7 Confirmation of training</b>	<i>Radiographers signature / date</i>
After completion of Stage 7, I have received appropriate training to be competent in completing 3DCT CT scans unsupervised	<input style="width: 100%;" type="text"/>

<b>Stage 7 On completion of training</b>	<i>Section Manager's signature:</i>
<ul style="list-style-type: none"> <li>- Update the training database <input type="checkbox"/></li> <li>- Inform the Pre-treatment Section Manager <input type="checkbox"/></li> </ul>	<input style="width: 100%;" type="text"/>

Stage 8: Understanding of CT physics and technology – Quiz	
See pre-treatment Section Manager for further information. This section does not prevent the radiographer obtaining competence for scanning.	
CT Quiz: Assessors Signature _____	Date: _____

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