

## IACC 2023 Case-based discussion (CBD) scenario

<b>Specialty:</b>	<b>Radiotherapy Physics</b>
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### CBD Scenario

<b>CBD Scenario Title</b>	Clinical effect of radiotherapy linac fault									
<b>CBD Scenario Aim</b>	Trainee can demonstrate understanding of basic principles of linear accelerator and describe how key components influence a treatment plan.									
<b>CBD Focus</b> <small>(please provide the codes of the module(s) this scenario addresses)</small>	SPE103:8			SPE157c1:8						
<b>GSP Domains covered</b> <small>(enter X to indicate all that apply)</small>	<b>GSP 1</b>		<b>GSP 2</b>	X	<b>GSP 3</b>	X	<b>GSP 4</b>		<b>GSP 5</b>	
<b>CBD Scenario description</b>	<p>Your department's linac engineer has informed you that there is a potential issue with the ion chamber of one of the linacs and it needs to be replaced.</p> <ul style="list-style-type: none"> <li>• What would be the effect on a clinical treatment plan if this component is faulty?</li> <li>• What tests/measurements would you perform on the linac following the replacement of the ion chamber? <ul style="list-style-type: none"> <li>○ For a new member of staff/trainee where would you suggest they source information about the procedure?</li> </ul> </li> </ul>									
<b>CBD Scenario model answer/ assessor guidance</b> <small>Detailed guidance that will be available for the assessors. Include guidance on what kinds of behaviours, actions, comments should secure a pass. What should the</small>	<p>It is important that assessors recognise that to some extent quality assurance methods will vary across training centres and assessors should use their own clinical judgement in their assessment of the trainee, however, the following guidance should be considered:</p> <ul style="list-style-type: none"> <li>• Effect on treatment plan of a faulty ion chamber is potential for incorrect machine output and dose profile such that treatment delivered may not match that planned within the usual acceptable level of agreement (2-3%). Reply may also include</li> </ul>									

<p>assessor expect to see? Assessors will be asked to plan questions in advance including links to trainee's IACC submission.</p>	<p>the potential of an ion chamber interlock restricting the use of the Linac, therefore not delivering the treatment at all.</p> <ul style="list-style-type: none"> <li>• Replacement of ion chamber may be performed by in-house engineers or by service engineer from manufacturer but responsibility for returning machine to clinical use resides with local physicists.</li> <li>• Usually, replacement of ion chamber will require measurement with water tank (local practice may vary depending on equipment available), ensuring that beam flatness/symmetry and %DD match those taken at time of commissioning and those used to create the beam model in the treatment planning system. Adjustment of some parameters (e.g., gun current, steering) may be required.</li> <li>• <u>Definitive</u> output required, involvement of Medical Physics Expert, independent measurement.</li> <li>• Reset calibration of any daily check devices of beam output/properties.</li> </ul> <p>Trainee should be able to reference local procedures, manufacturer guidance, IPEM81, codes of practice etc. as sources for ensuring that the correct tests/checks are performed.</p>
<p><b>Trainee instructions</b></p> <p>Please include any specific information to be provided to the trainee as part of the CBD scenario</p>	

## Criteria being assessed by this CBD scenario

Aspect	Please indicate if this criterion is being assessed
1. Understands the clinical context of the scenario, including priority setting and testing strategies	X
2. Understands scientific principles of scenario	X
3. Can discuss the relevant procedures involved in the scenario and associated health and safety issues	X
4. Understands and applies the appropriate test validation, IQC, EQA, relevant professional/clinical guidelines	
5. Understands and applies associated IT/bioinformatics and other appropriate resources	

6. Is able to interpret and report patient results and provide appropriate clinical advice	
7. Can discuss the significance of patient results within the clinical context of the referral	
8. Understands the ethical, legal and social implications of the scenario	
9. Is aware of the importance of audit and can use this tool effectively	
10. Output meets accepted laboratory/professional standards	
11. Demonstrates awareness of the limits of responsibility and when to seek advice	
12. Consideration of patient/professionalism	
13. Overall ability to perform	