

**Questionnaire:** Radiographers' perceptions on the challenges and new technologies for organs at risk (OARs) contouring.

Please note that filling in and submitting the following questionnaire constitutes consent.

**Section A: General information on experience and qualifications.**

1. Please indicate the qualifications you have in radiography.

* B. Sc in therapeutic radiography
* B. Sc in radiography (Both diagnostic and therapeutic radiography)
* B. Sc in diagnostic radiography (This questionnaire does not apply to you)
* Other radiography qualification (please specify) \_\_\_\_\_\_\_\_\_

1. Have you completed any post-graduate courses related to contouring in radiotherapy?

* Yes, please specify\_\_\_\_\_\_\_\_\_\_\_\_
* No

1. Please indicate your current role as a radiographer.

* I used to work in a radiotherapy department, but I’m now working in diagnostic radiography
* I am currently working in a radiotherapy department
* I have no experience working in a radiotherapy department

1. Please indicate the years of experience you have working in radiotherapy.

* <2 years
* 2-5 years
* 5-10 years
* 10-15 years
* 15-20 years
* >20 years

1. Please indicate your level of experience contouring organs at risk for radiotherapy planning.

* I have no contouring experience whatsoever
* I contoured OAR only as part of my undergraduate programme
* <2 years of working experience
* 2-5 years of working experience
* 5-10 years of working experience
* 10-15 years of working experience
* 15-20 years of working experience
* >20 years of working experiencet

1. How often are you assigned contouring tasks at your department?

* Never
* Every day
* Almost every day
* Occasionally
* Rarely

**Section B: Evaluation of the challenges encountered by radiographers during the contouring of OAR.**

1. Rate the level of difficulty encountered when delineating the following OARs.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Not Difficult | Slightly Difficult | Somewhat Difficult | Difficult | Very Difficult |
| Rectum |  |  |  |  |  |
| Bladder |  |  |  |  |  |
| Small Bowel |  |  |  |  |  |
| Heart |  |  |  |  |  |
| Lungs |  |  |  |  |  |
| Body Outline |  |  |  |  |  |
| Spinal Cord |  |  |  |  |  |
| Penile Bulb |  |  |  |  |  |
| Oesophagus |  |  |  |  |  |
| Brachial Plexus |  |  |  |  |  |

1. To what extent do you agree or disagree with the following statements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| Time allowed by management to contour OAR is sufficient |  |  |  |  |  |
| Radiographers contouring OARs are often distracted with other duties. |  |  |  |  |  |
| Manual contouring of OAR is a very laborious, time-consuming process |  |  |  |  |  |
| The current protocols available for contouring OAR in the department are sufficiently detailed |  |  |  |  |  |
| I find the contouring of OAR to be extremely subjective |  |  |  |  |  |
| I find the software used to contour OAR at our department suitable for the task |  |  |  |  |  |
| I find it difficult to cope with the long screen time required to perform the contouring. |  |  |  |  |  |
| I feel that I have sufficient training to contour OARs |  |  |  |  |  |
| I feel that I have enough experience to contour OARs |  |  |  |  |  |
| The CT images are of sufficient quality to contour OAR. |  |  |  |  |  |

**Section C: Methods used to contour OARs.**

1. Please indicate which methods you use for contouring OARs (Select all that apply)

* Fully manual
* Manual with semi-automatic tools based on texture, greyscale, or organ shape.
* Fully automated contouring software

**Section D: Perceptions on the use of automated contouring software for OARs**

1. To what extent do you agree or disagree with these statements related to the use of atlas-based (ABAS) software for contouring OAR?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| ABAS is too laborious to train, and it is therefore not used clinically |  |  |  |  |  |
| It is not accurate enough and requires a lot of manual editing |  |  |  |  |  |
| I’m very concerned about data protection issues |  |  |  |  |  |
| I do not know how to use it |  |  |  |  |  |

11a. Have you got any experience using deep learning algorithm software for contouring OAR?

* Yes, please specify\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* No
* I have no knowledge about it.

11b. If yes, how do you rate your experience?

* Excellent experience
* The software has potential
* Very poor experience

Please provide a justification for your answer.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Section E: Evaluate techniques that could facilitate the contouring process for OARs**

1. To what extent do you agree/disagree with these statements with regard to methods that could be used to facilitate the contouring of OARs?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| Provision of courses on OARs contouring |  |  |  |  |  |
| Provision of regular feedback on my contours by a clinical oncologist or multidisciplinary team (Peer-review) |  |  |  |  |  |
| Training on the use of AI contouring software |  |  |  |  |  |
| Implementation of better protocols |  |  |  |  |  |
| Purchasing automated contouring software |  |  |  |  |  |
| Increased staff rotation to maintain clinical competency |  |  |  |  |  |
| Others (Please Specify) |  | | | | |