

## Supplementary Material 1: Survey questionnaire

### Automation in radiotherapy planning:

Please find below a survey on staff perception of the effects of automation in radiotherapy. We request that this survey be completed by all radiation therapists, medical physicists and radiation oncologists. This survey will be used to gain an understanding of staff perception of the effects of automation in radiotherapy planning in Australia. The results from this Australian survey will provide a snapshot of current penetration of automation into the clinic and will capture the attitude of the staff using it. All responses will be kept confidential. It is intended that the deidentified results from this survey will be presented and published in peer reviewed literature. All participation is voluntary, and participants can withdraw at any time. Consent will be considered as given upon submission of completed survey form. It is anticipated that the survey will take less than 10 minutes to complete.

1. What generation do you identify with?
  - Generation Z (1996 and later)
  - Generation Y (1977 – 1995)
  - Generation X (1965 – 1976)
  - Baby Boomers (1964 and before)
  
2. Do you work in a public or private organisation?
  - Public
  - Private
  - Both
  
3. Do you work in a metropolitan or regional hospital?
  - Metropolitan
  - Regional
  - Both
  
4. What is your profession?
  - Radiation therapist
  - Radiation Oncologist
  - Medical Physicist
  - Other (Please specify)
  
5. How many years have you been working in this professional role since qualification?
  - Less than 5 years
  - 5-10 years
  - 11-20 years
  - More than 20 years
  
6. Are you in a managerial role (e.g. senior, section manager, director etc)?
  - Yes
  - No

7. For the following planning tasks, please indicate the level of automation in your department. Select all that apply.

	Manual	Somewhat automated	Automated with manual tuning	Automated ('single click')	Unsure
Image registration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OAR contouring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Target contouring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Planning volume contouring (e.g. ring structures etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan parameter setup (e.g. segment size, minimum MU etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beam placement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan optimisation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dose reporting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan checking/quality assurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plan & image transfer to Record & Verify System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Machine pre-treatment QA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Which of the following automated planning tasks does your department plan to pursue in the next 2 years? Select all that apply.

- Image registration
- OAR contouring
- Target contouring
- Planning volume contouring
- Plan parameter setup
- Beam placement
- Plan Optimisation
- Dose reporting
- Plan checking/Quality assurance
- Plan & image transfer to Record & Verify System
- Machine pre-treatment QA
- Other (please specify)

9. In your opinion, how important is it to automate planning processes?

- Very important
- Important
- Moderately important
- Slightly important
- Not important

10. In your opinion, how will planning process automation affect your work group in the following area? (\*Planning refers to activities specific to your work group, e.g. RO: target delineation, RT: plan optimisation, MP: plan checking)

	Will improve	Will decrease	No change
Work output and productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of planning*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consistency of planning*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Staff focus on patient care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. In your opinion, how will planning process automation affect systematic and random errors?

	Will increase	Will decrease	No change
Systematic errors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Random/human errors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Which of the following describes your attitude toward planning process automation?

- Will reduce job satisfaction
- Will increase job satisfaction
- Will not impact job satisfaction

13. How do you perceive the automation of the planning process will impact on jobs? Select all that apply.

- I feel automation will eliminate jobs
- I feel automation will change the primary tasks of certain jobs (If selected, go to Q13a)
- I feel automation will allow me to do the remaining components of my job more effectively
- I don't think automation will have an impact on jobs
- I am not at all concerned with automation

14. In your role, do you feel empowered to drive decisions about implementing automated planning processes, if you wanted to?

- Definitely
- Very probably
- Probably
- Probably not
- Definitely not

15. Please respond to the following statements.

- i) Automation will provide only positive benefits for your department.
  - Strongly agree
  - Agree
  - Undecided
  - Disagree
  - Strongly disagree
  
- ii) Your department is already too over-reliant on automation.
  - Strongly agree
  - Agree
  - Undecided
  - Disagree
  - Strongly disagree
  
- iii) Automation will cause a loss of understanding of general underlying principles of radiotherapy.
  - Strongly agree
  - Agree
  - Undecided
  - Disagree
  - Strongly disagree
  
- iv) Current staff training and educational tools provided by your department are sufficient to ensure staff do not lose understanding of general underlying principles of radiotherapy.
  - Strongly agree
  - Agree
  - Undecided
  - Disagree
  - Strongly disagree

16. Automation will allow staff to pursue new tasks or roles/role expansion?

- Yes
- No

17. What tasks/roles would you like to pursue?

- Learning new skills
- Research and development activities
- Being involved in implementation processes
- Increased patient care focus
- Other (please specify)