

Supplemental Figure 2. Survey sent to practicing radiation oncologists.

Heart-sparing Techniques in Radiation Therapy for Breast Cancer

Thank you for your interest in our survey! Our aim is to assess national trends in heart-sparing techniques for breast irradiation. Your answers are very important to us. The survey should take no more than 5 minutes to complete, and you may skip any question you wish not to answer. At the end of the survey, you will be given the option to enter your email address for a chance to win one of ten Starbucks gift cards. Your email address will not be used for any other purpose. We thank you for your time.

Heart-sparing Techniques in Radiation Therapy for Breast Cancer

1. How many years have you been practicing (following residency training)?

- 1-5
- 6-10
- 11-15
- >15

2. Did you complete your radiation oncology training in the US?

- Yes
- No

3. In what type of setting do you treat the majority of **your** breast cancer patients?

- Academic site (main campus)
- Academic site (satellite campus)
- Private practice
- Government hospital (VA medical center)

4. What proportion of your clinical time is devoted to treating breast cancer patients?

- <10%
- 11-25%
- 26-50%
- The majority of my time

5. What sort of planning constraints on the heart do you use for left-sided breast cancer patients? Please check all that apply.

- | | |
|---|---|
| <input type="checkbox"/> Mean heart dose | <input type="checkbox"/> No constraints |
| <input type="checkbox"/> Max heart dose | <input type="checkbox"/> The heart is not contoured |
| <input type="checkbox"/> Volumetric constraint (e.g. V25 Gy <10%) | |

6. Do you provide breast cancer radiation treatment with either prone positioning or deep-inspiration breath hold?

Yes

No

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7. How often do you use heart-sparing techniques for left-sided breast cancer patients?

- <25% of all left-sided breast cancer patients
- 26-50% of all left-sided breast cancer patients
- 51-75% of all left-sided breast cancer patients
- 76-100% of all left-sided breast cancer patients

8. Which technique(s) do you currently use to decrease cardiac dose during localized left-sided radiation therapy for breast cancer? For each technique that you use, please specify the approximate percentage of time you use it.

	0%	1-25%	26-50%	51-75%	76-100%
Inverse planned intensity modulated radiation therapy (IMRT)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deep inspiration breath hold (DIBH)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prone positioning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heart blocking in supine patients without DIBH	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Proton therapy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. If you utilize deep inspiration breath hold, which technique do you use? Please check all that apply.

- Elekta Active Breathing Coordinator (ABC) Vision RT/Align RT
- Varian Real-time Positioning Management (RPM) Anzai respiratory belt
- Other (please specify)

10. Which modality of radiation treatment planning do you use for **deep inspiration breath hold**? Please check all that apply.

- 2-D radiation treatment Prone positioning
- 3-D conformal radiation treatment (including field-in-field) I do not use deep inspiration breath hold
- Intensity modulated radiation therapy (IMRT)

11. If you utilize deep inspiration breath hold for left-sided patients, in which patients do you utilize the technique? For each group, please specify approximately what percentage of time you utilize the technique.

	0%	1-25%	26-50%	51-75%	76-100%
Left-sided whole breast/chest wall alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Left-sided whole breast/chest wall and regional lymph nodes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. For left-sided patients undergoing regional nodal irradiation, how often do you include internal mammary nodes?

0%	1-25%	26-50%	51-75%	76-100%
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. What factors are used to determine when deep inspiration breath hold is used in left-sided patients? Please check all that apply.

- | | |
|---|---|
| <input type="checkbox"/> Body habitus | <input type="checkbox"/> Patient age |
| <input type="checkbox"/> Breast size | <input type="checkbox"/> Patient comorbidities |
| <input type="checkbox"/> Cardiac to chest wall distance | <input type="checkbox"/> Patient tolerance to technique |
| <input type="checkbox"/> Other (please specify) | |

14. Do you utilize deep inspiration breath hold for right-sided patients?

- Yes
- No

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15. Why do you use deep inspiration breath hold in right-sided patients? Please check all that apply.

Heart sparing

Lung sparing

Liver sparing

Motion management

Other (please specify)

16. If you utilize deep inspiration breath hold for right-sided patients, in which patients do you utilize the technique? For each group, please specify the approximate percentage of time you utilize the technique.

	0%	1-25%	26-50%	51-75%	76-100%
Right-sided whole breast/chest wall alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right-sided whole breast/call wall and regional lymph nodes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. If you do not use deep inspiration breath hold, what reasons are there for not using this technique?

Please check all that apply.

- Not familiar with the technique
- Lack of reimbursement for increased workload required to use this technique
- Lack of facilities that allow and accommodate deep inspiration breath hold at my location(s)
- Cost to patient
- Increased planning and treatment time
- Other (please specify)

18. If your institution does not have a facility to allow for deep inspiration breath hold, do you refer patients to other institutions?

- Yes
- No

19. Please enter any comments or concerns.

20. Please enter your email address if you would like to be included in a drawing for a Starbucks gift card.

Thank you for your time and effort in completing our survey. We truly appreciate it.