Supplementary material for Dahele et al. Stereotactic body radiotherapy: A survey of contemporary practice in six selected European countries, Acta Oncol, 2015;54:1237–41.

Supplementary Appendix. Questions sent to participating centers

Background

1. Is your institution an academic or non-academic center?
2. Is your institution a public or private center?
3. Is your institution primarily 'for profit' or 'not for profit'?
4. Is your institution part of a comprehensive cancer center?
5. Approximately what size population does your institution serve?
6. Approximately how many new patients a year are treated with radiotherapy in your institution?
7. How many treatment machines (linear accelerators) are there in your institution?
8. What is the number of accredited radiation oncologists in your institution?
9. What is the number of accredited medical physicists in your institution?
10. What is the number of accredited radiographers in your institution?
11. How many treatment centers that perform SBRT are operated by your institution?

History of SBRT at your institution

12. When did your institution begin SBRT?
13. What were the biggest challenges that your institution had to overcome before starting SBRT?
14. What treatment location did your institution begin SBRT with?
15. Did you start SBRT within a prospective trial?
16. Did your institution practice cranial stereotactic radiotherapy / radiosurgery prior to starting SBRT?
17. What tumors do you currently treat with SBRT at your institution?
18. Approximately how many lung SBRT patients has your institution treated so far?
19. Approximately how many non-lung SBRT patients has your institution treated so far?
20. Does your group think that SBRT should be limited to experienced/high volume centers?
21. Does your group think a minimum number of patients/year should be treated with SBRT to ensure proficiency?
22. What in your group's opinion is the minimum number of patients/year that need to be treated with SBRT to ensure a center's proficiency?

23. Are there national SBRT guidelines in your country?
24. Do you have to submit data on your SBRT practice to a national audit?
25. Are all SBRT plans peer-reviewed before treatment?
26. Do you track SBRT outcomes including toxicity?
27. How do you do this?

Lung SBRT at your institution

28. Do you prescribe dose to a point, isodose surrounding the target or DVH parameter (e.g. D95)?
29. Do SBRT plans at your institution typically have a heterogeneous or homogeneous dose distribution within the PTV?
30. If a heterogeneous PTV dose is used, what is the maximum dose allowed within the PTV (as a percentage of the prescription dose)?
31. Do you treat primary (early stage) non-small cell lung cancer (NSCLC) with SBRT?
32. Do you treat primary NSCLC with SBRT without having histopathological confirmation?
33. Do you require whole-body FDG-PET/CT staging prior to SBRT for primary NSCLC?
34. Do you routinely perform EBUS/EUS staging for the mediastinum in patients with primary NSCLC?
35. Do you treat centrally located primary NSCLC with SBRT (within 2cm of central mediastinal structures)?
36. Do you use multiple risk-adapted fractionation schemes for primary NSCLC?
37. What are the number of fractions you use in SBRT for primary NSCLC? If multiple fractionations are used please select all of them.
38. What size fraction doses do you use in SBRT for primary NSCLC? If multiple dose-fractionation schedules are used please indicate all fraction doses.
39. Do you treat pulmonary metastases with SBRT at your institution?
40. What is the maximum number of pulmonary metastases that you will consider treating with SBRT in the same treatment episode (can be treated sequentially or concurrently)?
41. Do you routinely perform FDG PET/CT for follow-up?

Evidence for SBRT

42. Does your institution feel that there is enough evidence to support SBRT outside clinical trials for: primary NSCLC?
43. Does your institution feel that there is enough evidence to support SBRT outside clinical trials for: pulmonary metastases?
44. Does your institution feel that there is enough evidence to support SBRT outside clinical trials for: primary liver cancer?
45. Does your institution feel that there is enough evidence to support SBRT outside clinical trials for: liver metastases?
46. Does your institution feel that there is enough evidence to support SBRT outside clinical trials for: spinal metastases?
47. Does your institution feel that there is enough evidence to support SBRT outside clinical trials for: re-irradiation of spinal metastases?
48. Does your institution feel that there is enough evidence to support SBRT outside clinical trials for: prostate cancer?
49. Does your institution currently have SBRT trials open?
50. Does your department have an established SBRT research program?
51. If you answered yes to question 60 then what was the number of PubMed publications in 2011?
52. What SBRT trials would your institution most like to see?
53. Is your center a member of an SBRT research consortium?

SBRT resources: Staff

54. How many radiation oncologists perform SBRT at your institution?
55. How many physicists are significantly involved in your SBRT program?
56. How many radiographers are significantly involved in your SBRT program?
57. Who routinely performs SBRT treatment planning in your institution?
58. Who performs the QA measurements for SBRT?
59. Which staff groups need to be present during SBRT delivery?
60. Who performs routine patient follow up?

SBRT resources: Equipment

61. Do you routinely use a dedicated immobilization system for SBRT?
62. Do you routinely use respiratory correlated 4D-CT imaging for SBRT treatment planning of moving tumors (e.g. lung and liver)?

63. Do you use any of the following methods for reducing tumor motion?
64. What treatment planning system do you use for SBRT?
65. Are all of your SBRT plans heterogeneity corrected?
66. What is your preferred delivery method for SBRT?
67. What MLC leaf width(s) do you use for SBRT (mm)?
68. Do you routinely deliver SBRT on a machine with dedicated image-guidance capabilities?
69. What image guidance technologies are used for SBRT treatments in your center?
70. Do you routinely correct errors in six degrees of freedom using a robotic couch for all types of SBRT?
71. Do you routinely use implanted fiducial markers?
72. Do you routinely use an intra-fractional patient monitoring system?
73. What QA method(s) do you use for your SBRT treatment plans?
74. What is your typical gamma evaluation threshold for SBRT plans?
75. Do you have a 4D phantom capable of simulating respiratory motion?

SBRT resources: Time

76. What is the typical patient turn-around time between planning CT and start of SBRT for NSCLC (days)?
77. About how long does it take your institution to plan a 'straightforward' peripheral lung SBRT patient (time includes importing CT images into planning system, contouring, treatment planning and checking the plan, in hours)?
78. About how long does it take your institution to QA/measure a typical lung SBRT plan (minutes)?
79. About how long would it take to deliver a typical peripheral lung SBRT fraction (from patient entering treatment room to leaving, in minutes)?
80. How long is a typical treatment slot scheduled for lung SBRT in your center (minutes)?

SBRT resources: Knowledge and training

81. Does your department have a standardized approach to implementing advanced radiotherapy techniques and technologies?
82. How did your team acquire the necessary knowledge for SBRT?
83. Do you have institutional SBRT protocols for each tumor site that you treat?

84. Do you have class-solutions for lung SBRT treatment planning?
85. Is your center collaborating with other institutions to deliver SBRT?
86. Are radiation oncology training programs in your country expected to provide formal experience in SBRT?
87. Would you like to see specific types of educational programs available for SBRT?
88. What would have helped you implement SBRT faster and more efficiently?
89. Has your SBRT program been externally audited?

SBRT resources: Financial

90. Did your institution need extra funding specifically to implement SBRT?
91. Who reimburses you for your SBRT costs?
92. Have there been any problems obtaining reimbursement for SBRT?
93. What is included in your SBRT tariff?
94. Who needs to be present at the time of treatment to claim the SBRT billing tariff?

95. Does the tariff vary with the number of fractions (for example: does single fraction SBRT cost as much as a 3 fraction SBRT schedule)?
96. Does the SBRT tariff specify the definition of SBRT (for example: must include on-line IGRT, no more than 5 fractions...etc)?
97. How much do you get reimbursed for a typical lung SBRT treatment course (in Euros)?
98. How does this compare to a conventionally fractionated IMRT lung treatment such as 33x2Gy delivered with daily planar or volumetric IGRT (for example: how many times more expensive is a course of lung SBRT than a course conventionally fractionated lung IMRT)?
99. If you treat multiple tumors do you charge per tumor?

Miscellaneous

100. Do you want to clarify any responses?
101. Do you want to make any additional comments?

Supplementary Table I. SBRT staff and time resources.

SBRT resources: Staff	England	Netherlands	Belgium	Denmark	Germany	Austria
How many radiation oncologists perform SBRT at your institution?	m = 8	m = 4	m = 3	m = 3	m = 3	3
How many physicists are significantly involved in your SBRT program?	m = 4	m = 3	m = 3	m = 4	m = 3	4
How many radiographers are significantly involved in your SBRT program?	m = 4	n = 5/6; m = 16	m = 2	m = 5	m = 5	5
Who routinely performs SBRT treatment planning in your institution?	Phys = 5; RTT = 5; RO = 1	RTT = 6; Phys = 1	Phys = 2; RO = 1	Phys = 2; RTT = 1; RO = 1	Phys = 10; RO = 4; RTT = 3	RTT; Phys
Who performs the QA measurements for SBRT?	Phys = 8; RTT = 1	PA = 3; Phys = 3	Phys = 2	Phys = 3	Phys = 10; RTT = 2; PA = 1	Phys
Which staff groups need to be present during SBRT delivery?	RTT = 8; RO = 4; Phys = 2	RTT = 6; RO = 2; Phys = 1	RTT = 2; RO = 2; Phys = 2	RTT = 2; Phys = 2; RO = 1	RTT = 10; RO = 9; Phys = 5	RTT; RO; Phys
Who performs routine patient follow up?	RO = 8	RO = 6	RO = 2	RO = 3	RO = 10	RO
SBRT resources: Time						
What is the typical patient turn-around time between planning CT and start of SBRT for NSCLC (days)?	m = 9.5 (3–15)	m = 7.5 (4–14)	m = 7 (7)	m = 6.5 (6–7)	m = 5.5 (3–7)	4
About how long does it take your institution to plan a ‘straightforward’ peripheral lung SBRT patient (time includes importing CT images into planning system, contouring, treatment planning and checking the plan, in hours)?	n = 7/8; m = 8 (4–14)	m = 5 (3–10)	m = 5 (5)	m = 5 (3–8)	m = 4 (1.5–8)	3
About how long does it take your institution to QA/measure a typical lung SBRT plan (minutes)?	n = 5/8; m = 66 (0–120)	m = 40 (0–60)	m = 135 (30–240)	m = 18 (10–30)	n = 8/10 ^a ; m = 26 (0–60)	30
About how long would it take to deliver a typical peripheral lung SBRT fraction (from patient entering treatment room to leaving, in minutes)?	m = 50 (25–120)	m = 25 (15–35)	m = 40 (30–50)	m = 35 (30–40)	m = 25 (10–40)	25

m, mean; n, number responding out of the total number of centers; Phys, physicist; PA, physics assistant; RO, radiation oncologist; RTT, radiation therapist/radiographer; SBRT, stereotactic body radiotherapy.

^a One additional center reported that QA/measurements took 2 days – this has not been included in the figure in the table since it was sufficiently different from the other values to wonder whether it was referring to the same process.

Supplementary Table II. Issues relating to knowledge and training for SBRT.

SBRT resources: Knowledge and training	England	Netherlands	Belgium	Denmark	Germany	Austria
Does your department have a standardized approach to implementing advanced radiotherapy techniques and technologies?	Y = 6; N = 2	Y = 5; N = 1	Y = 1; N = 1	N = 2; Y = 1	N = 8; Y = 2	N
How did your team acquire the necessary knowledge for SBRT?	Site = 7; Ind = 4; EANmtg = 3; EANteach = 2; Sym = 2	Site = 6; Sym = 2; Self-study = 1; EANteach = 1; Contact with experts = 1	EANmtg = 2; EANteach = 1; Site = 1; Sym = 1; Ind = 1	Site = 2; EANmtg = 1; EANteach = 1; Ind = 1	Sym = 6; Site = 5; EANmtg = 4; EANteach = 3; Ind = 3	
Do you have institutional SBRT protocols for each tumor site that you treat?	Y = 8	Y = 6	Y = 2	Y = 3	Y = 9; N = 1	
Do you have class-solutions for lung SBRT treatment planning?	Y = 6; N = 2	Y = 5; N = 1	Y = 1; N = 1	Y = 2; N = 1	Y = 6; N = 4	N
Is your center collaborating with other institutions to deliver SBRT?	Y = 6; N = 2	Y = 4; N = 2	Y = 1; N = 1	Y = 2; N = 1	Y = 5; N = 5	N
Are radiation oncology training programs in your country expected to provide formal experience in SBRT?	n = 7/8; N = 7	Y = 3; N = 2	Y = 1; N = 1	N = 2; Y = 1	N = 6; Y = 3	N
Would you like to see specific types of educational programs available for SBRT?	Y = 8	Y = 5; N = 1	Y = 2; N = 0	Y = 3	Y = 10	Y
Has your SBRT program been externally audited?	N = 5; Y = 3	Y = 5; N = 1	Y = 1; N = 1	N = 3	Y = 5; N = 4	N

EANmtg, ESTRO/ASTRO/National meetings; EANteach, ESTRO/ASTRO/National teaching courses; Ind, industry; n, number responding out of the total number of centers; N, no; SBRT, stereotactic body radiotherapy; Site, Site visit; Sym, SBRT symposium; Y, yes.

Supplementary Table III. SBRT equipment.

SBRT resources: Equipment	England	Netherlands	Belgium	Denmark	Germany	Austria
Do you routinely use a dedicated immobilization system for SBRT?	N = 5; Y = 3	N = 3; Y = 3	N = 1; Y = 1	Y = 2; N = 1	Y = 9; N = 1	Y
Are all of your SBRT plans heterogeneity corrected?	n = 7/8; Y = 6; N = 1	Y = 5; N = 1	Y = 2	Y = 3	n = 9/10; Y = 9	Y
Do you routinely correct errors in six degrees of freedom using a robotic couch for all types of SBRT?	Y = 4; N = 4	Y = 2; N = 4	Y = 1; N = 1	N = 3	N = 7; Y = 1; Sel = 2	Y
Do you routinely use implanted fiducial markers?	N = 4; Y = 2; Sel = 2	N = 5; Sel = 1	Y = 1; N = 1	Y = 1; N = 1; Sel = 1	N = 8; Y = 1; Sel = 1	N
Do you routinely use an intra-fractional patient monitoring system?	Y = 5; N = 3	N = 4; Y = 1; MachDep = 1	Y = 2	N = 2; Y = 1	N = 9; Y = 1	N
What is your typical gamma evaluation threshold for SBRT plans?	3%/3 mm = 2; 3%/1 mm = 2; 2%/2 mm = 1; 2%/1 mm = 1; Other = 1	3%/3 mm = 2; 3%/2 mm = 1; 3%/1 mm = 1; Other = 1	3%/3 mm = 1	2.5%/2.5 mm = 1	3%/3 mm = 6; 3%/2 mm = 1; Other = 1	3%/3 mm

Mach Dep, machine dependent; N, no; QA, quality assurance; SBRT, stereotactic body radiotherapy; Sel, selective; Y, yes.