

Supplementary Table S3. Risk priority number (RPN) scores by team members

					Doctor	> 10 years physicists				1-5 years physicists				< 1 year physicist			
	Sub-process	Failure mode	Failure mode cause	Potential failure effects	VS	KB	RG	EJ	Avg.	RC	EI	BS	EH	SM	JH	Avg.	VB
1	Installation and calibration of source	Source stick out	Malfunction afterloader (Flexitron)	Radiation exposure to engineer		4	7	10		10	28	7	36	14	16		20
2		Source integrity compromised	Malfunction of source and/or the cable	Radiation contamination exposure to engineer and environment		8	7	20		60	28	21	27	8	32		30
3		Source alignment	Incorrect source alignment	Position uncertainty in dose distribution		54	64	96		32	27	45	54	42	48		168
4		Dwell time calibration	Incorrect dwell time	Underdose/Overdose		27	16	32		32	27	45	36	72	60		126
5		Incorrect RAKR measurement	Incorrect factors	Underdose/Overdose		36	7	72		36	81	48	36	84	30		54
6			Incorrect temperature and air pressure	Underdose/Overdose		60	18	96		108	75	54	18	16	4		150
7			Fault in measuring equipment	Underdose/Overdose		36	32	72		54	81	24	42	81	32		90
8		Incorrect source information in TPS	Incorrect source type	Incorrect dose distribution		36	7	48		36	72	20	28	18	8		60
9		Incorrect transfer of RAKR to TPS	Incorrect data transfer	Underdose/Overdose		18	14	160		54	72	36	28	28	8		60
10		Incorrect decay correction from source certification	Calculation error (e.g., incorrect decay calculation equation)	Underdose/Overdose		18	5	48		36	54	36	10	20	4		54
11	Insertion	Staffing	Theatre or anesthetist/Nursing/Dr availability	Unable to proceed if alternatives are not suitable	40	36	40	6		12	16	96	16	12	105		270

12		Patient identification	Wrong patient	Unintended insertion	10	20	27	40		10	48	20	18	20	6		60
13		Applicator placement	Applicator unavailable	Unable to proceed if alternatives are not suitable	10	27	120	18		8	20	120	36	12	72		90
14			Incorrect applicator choice	Underdose	20	72	20	72		210	168	80	80	16	36		192
15			Different applicator recorded	Incorrect dose distribution	64	64	42	24		112	324	80	30	112	28		168
16			Applicator not connected correctly	Position uncertainty in dose distribution	18	96	36	48		140	108	90	24	20	54		224
17			Sub-optimal insertion	Incorrect dose distribution, Underdose/Overdose	12	84	56	48		54	98	392	80	100	84		168
18			Perforation of uterus	Incorrect dose distribution, Underdose/Overdose	9	32	70	72		144	160	80	96	40	6		128
19		Patient transfer	Applicator shift	Incorrect dose distribution	3	240	24	80		245	180	210	144	192	162		54
20		Patient recovery	Patient changes position	Trauma	3	175	12	120		252	56	120	84	192	54		84
21	Imaging	Patient transfer	Applicator shift	Incorrect dose distribution		240	21	80		245	180	210	100	4	162		336
22		Patient identification	Wrong patient	Unintended imaging	10	20	6	40		40	48	8	12	4	8		36
23		Imaging	Incorrect patient orientation	Incorrect dose reporting		120	24	72		48	12	27	30	10	16		9
24			Incorrect imaging acquisition	Imaging insufficient to plan		120	30	48		128	21	40	10	24	90		80
25			Incorrect or missing marker wires	Incorrect applicator reconstruction		120	56	36		36	144	60	8	36	60		126
26			Poor image quality	Incorrect applicator reconstruction/ Poor fusion/Incorrect voluming		120	108	18		80	49	63	24	60	27		112

27		Imaging export	Incorrect or lost data transfer	Unable to plan		30	10	9		8	12	10	8	3	2		48
28		Imaging import	Incorrect or lost data transfer	Unable to plan		30	10	9		8	14	10	8	3	2		48
29		Co-registration and fusion	Fusion of images from different patients	Incorrect dose distribution/Incorrect dose reporting		80	24	144		40	64	10	24	9	18		180
30			Incorrect fusion	Incorrect dose distribution/Incorrect dose reporting		200	28	120		128	96	120	42	30	40		175
31	Treatment planning	Voluming	Incorrect target volume delineation	Incorrect dose distribution, Underdose/Overdose	32	42	180	80		120	160	168	36	20	84		441
32			Incorrect margin applied	Incorrect dose distribution, Underdose/Overdose	27	42	54	144		60	160	54	72	24	36		144
33			Incorrect organ at risk delineation	Incorrect dose distribution, Underdose/Overdose	20	42	63	80		120	96	140	90	20	24		441
34			Accidental contour change after Dr delineation	Incorrect dose distribution, Underdose/Overdose		112	48	96		175	108	70	30	24	48		140
35		Planning	Co-ordinate system origin	Incorrect dose reporting		32	24	16		128	36	36	45	40	24		96
36			Incorrect applicator reconstruction	Incorrect dose distribution, Underdose/Overdose		32	28	192		128	72	42	45	28	42		120
37			Incorrect needle reconstruction	Incorrect dose distribution, Underdose/Overdose		32	63	324		175	180	120	60	20	112		180
38			Equipment documentation incorrect (needle labeling error)	Incorrect dose distribution, Underdose/Overdose		126	56	432		96	270	144	48	216	96		162
39			Error in optimization	Incorrect dose distribution, Underdose/Overdose		32	42	96		128	144	60	24	28	40		90
40			Incorrect data transfer	Incorrect dose distribution, Underdose/Overdose		32	12	81		54	90	80	8	30	36		162
41			Incorrect dose calculation	Incorrect dose distribution, Underdose/Overdose		32	14	30		54	108	40	18	12	72		48

42			Incorrect prescription	Underdose/Overdose		32	7	135		36	108	20	32	48	18		72
43		Plan review	DVH mismatch with EQD ₂ Gy spreadsheet	Incorrect dose reporting		8	24	216		32	343	240	12	90	16		224
44		Checking	Missed from checking	Incorrect dose distribution, Underdose/Overdose		32	70	9		32	0	20	60	32	0		32
45			Incorrect or failed independent dose check	Incorrect dose distribution, Underdose/Overdose		12	24	30		36	36	45	24	45	8		28
46		Plan export	Incorrect or lost data transfer	Unable to treat		36	18	9		9	20	10	6	6	4		72
47	Treatment delivery	Plan import	Incorrect or lost data transfer	Unable to treat		36	18	9		9	20	10	6	6	4		72
48		Treatment preparation	Decay calculated incorrectly	Incorrect dose distribution, Underdose/Overdose		36	14	27		105	81	60	3	40	16		80
49		Patient transfer	Applicator shift	Incorrect dose distribution	7	240	36	350		336	192	210	45	320	405		441
50		Patient identification	Wrong patient	Unintended treatment		20	10	40		60	72	20	10	20	18		40
51		Patient setup	Organ at risk change	Incorrect dose distribution, Overdose	84	160	315	490		448	210	280	75	40	324		490
52			Incorrect connection to applicator or afterloader	Incorrect dose distribution, Underdose/Overdose		90	63	162		9	18	30	24	48	48		63
53		Treatment	Unable to deliver treatment	No treatment delivered	15	36	8	30		24	15	30	8	15	6		36
54		Treatment	Unreviewed plan or incorrect plan delivered	Patient treated with Dr plan approval		90	84	270		126	54	60	10	10	72		162
55			Partial treatment delivery	Incorrect dose distribution, Underdose	15	28	32	18		48	72	54	24	3	6		72
56			Source stick	Incorrect dose distribution, Underdose/Overdose, unintended radiation exposure to the patient and staff	10	6	10	10		10	36	20	9	10	36		20

