Q1 In which country and city is your centre based ?

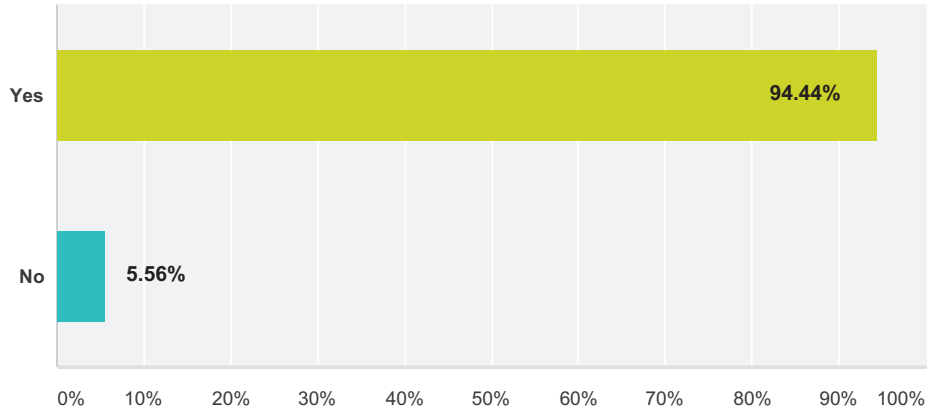
Answered: 36 Skipped: 0

#	Responses	Date
1	Estonia	3/13/2017 5:04 PM
2	Norway	3/13/2017 1:13 PM
3	Sweden	3/12/2017 7:37 PM
4	Georgia	3/11/2017 1:03 PM
5	France	3/11/2017 9:45 AM
6	Spain	3/10/2017 11:08 PM
7	Italy, Bergamo	3/10/2017 10:01 PM
8	Germany	3/10/2017 1:36 PM
9	Sweden	3/10/2017 10:26 AM
10	Maastricht, the Netherlands	3/10/2017 10:09 AM
11	Spain - Alicante	3/10/2017 5:57 AM
12	netherlands	3/9/2017 10:51 PM
13	Poznań	3/8/2017 8:16 PM
14	Poland, Polanica Zdrój	3/3/2017 10:43 AM
15	Poland	2/27/2017 1:35 PM
16	Poland, Toruń	2/25/2017 8:25 PM
17	Italy	2/24/2017 11:42 AM
18	Poland	2/23/2017 2:01 PM
19	Poland	2/23/2017 8:13 AM
20	Poland, Zabrze	2/22/2017 11:29 PM
21	Poland, Wrocław	2/22/2017 4:19 PM
22	Poland	2/22/2017 12:13 PM
23	Leipzig, Germany	2/21/2017 3:07 PM
24	Estonia Tallinn	2/21/2017 12:47 PM
25	Goteborg Sweden	2/21/2017 8:54 AM
26	Germany	2/20/2017 8:02 PM
27	Poland	2/20/2017 1:20 AM
28	Poland, Rzeszow	2/19/2017 11:04 PM
29	CECH REP.	2/18/2017 5:52 PM
30	France	2/18/2017 7:54 AM
31	France Toulouse	2/17/2017 8:06 PM
32	poland	2/17/2017 10:21 AM
33	Conpenhagen, Denmark	2/17/2017 8:58 AM
34	Poland	2/17/2017 6:57 AM

35	MADRID, SPAIN	2/16/2017 11:38 PM
36	Germany	2/16/2017 6:34 PM

Q2 Would you like acknowledgment of your centre in the EP Europace Journal and on the website ?

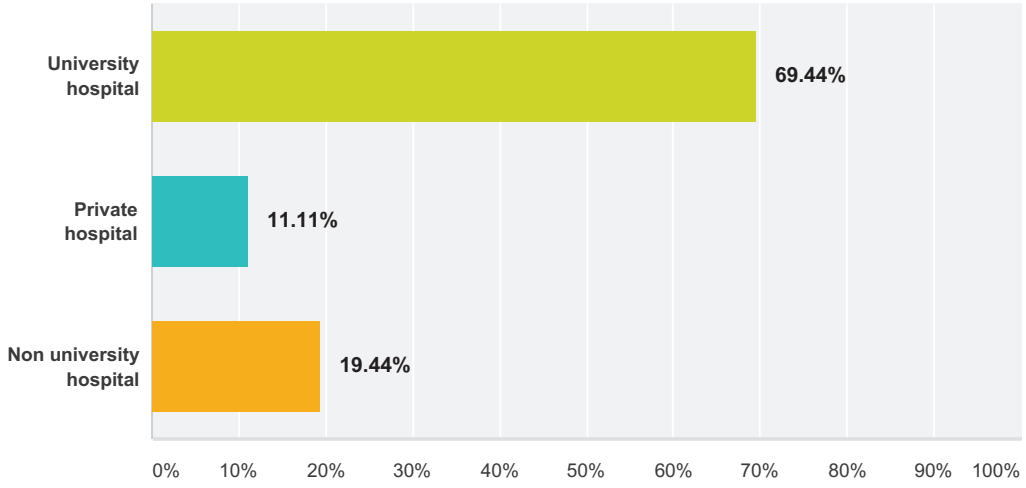
Answered: 36 Skipped: 0



Answer Choices	Responses	
Yes	94.44%	34
No	5.56%	2
Total		36

Q4 What type of institution do you work in ?

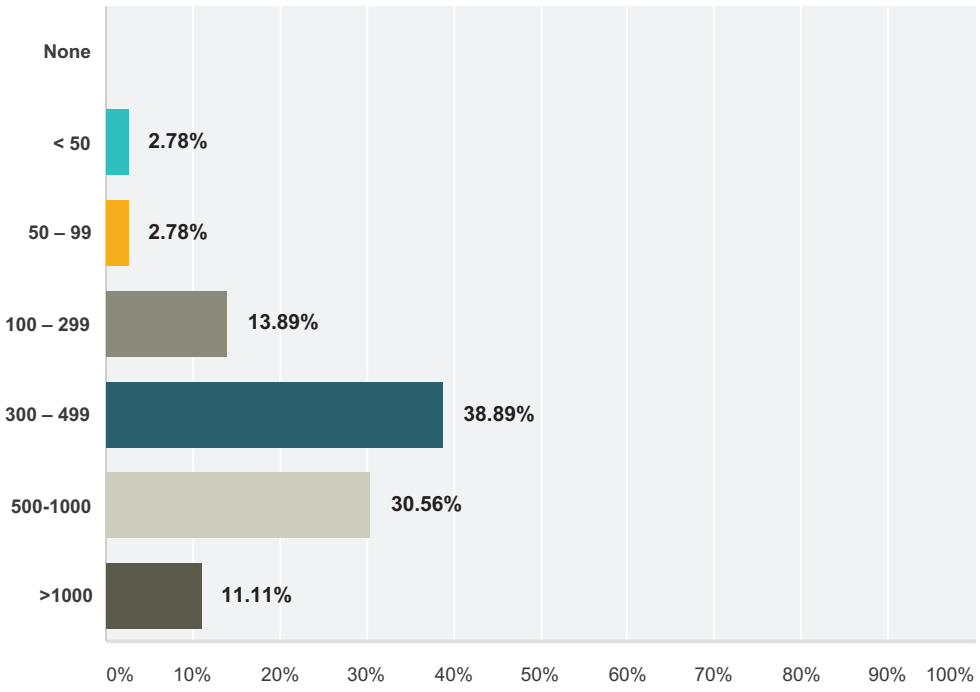
Answered: 36 Skipped: 0



Answer Choices	Responses	
University hospital	**69.44%**	25
Private hospital	**11.11%**	4
Non university hospital	**19.44%**	7
Total		**36**

Q5 How many CIEDs were implanted in your centre during the last 12 months (single answer):

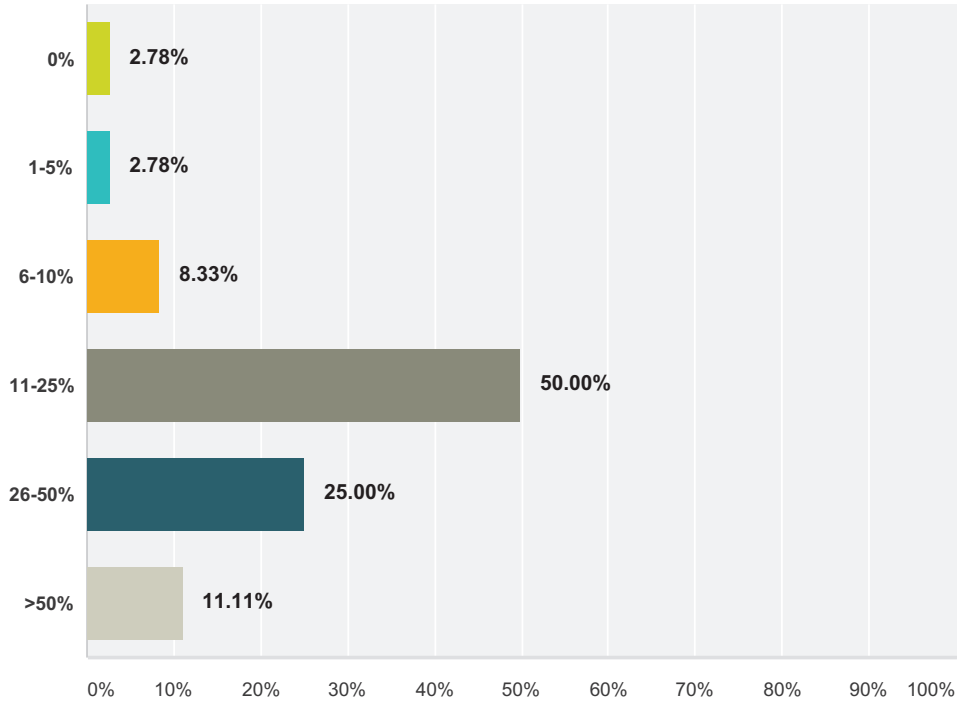
Answered: 36 Skipped: 0



Answer Choices	Responses	
None	0.00%	0
< 50	2.78%	1
50 – 99	2.78%	1
100 – 299	13.89%	5
300 – 499	38.89%	14
500-1000	30.56%	11
>1000	11.11%	4
Total		36

Q6 What is the proportion of ICD among all newly implanted CIEDs in your centre? (single answer):

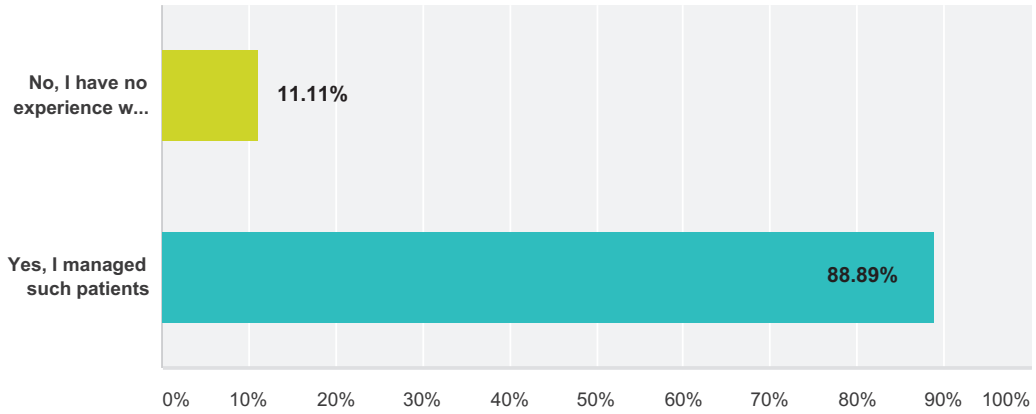
Answered: 36 Skipped: 0



Answer Choices	Responses	
0%	2.78%	1
1-5%	2.78%	1
6-10%	8.33%	3
11-25%	50.00%	18
26-50%	25.00%	9
>50%	11.11%	4
Total		36

Q7 Did you ever manage patients with preexisting cardiovascular disease, who were diagnosed/treated oncologically, or patients with cardiovascular side effects from oncology treatment? (If your answer is “No” – all remaining questions do not concern you)

Answered: 36 Skipped: 0



Answer Choices	Responses	
No, I have no experience with such patients	11.11%	4
Yes, I managed such patients	88.89%	32
Total		36

Q8 Approximately, in what proportion of all your cardiology patients (including patients with CIED) did you notice any cardiovascular complication of treatment for cancer?

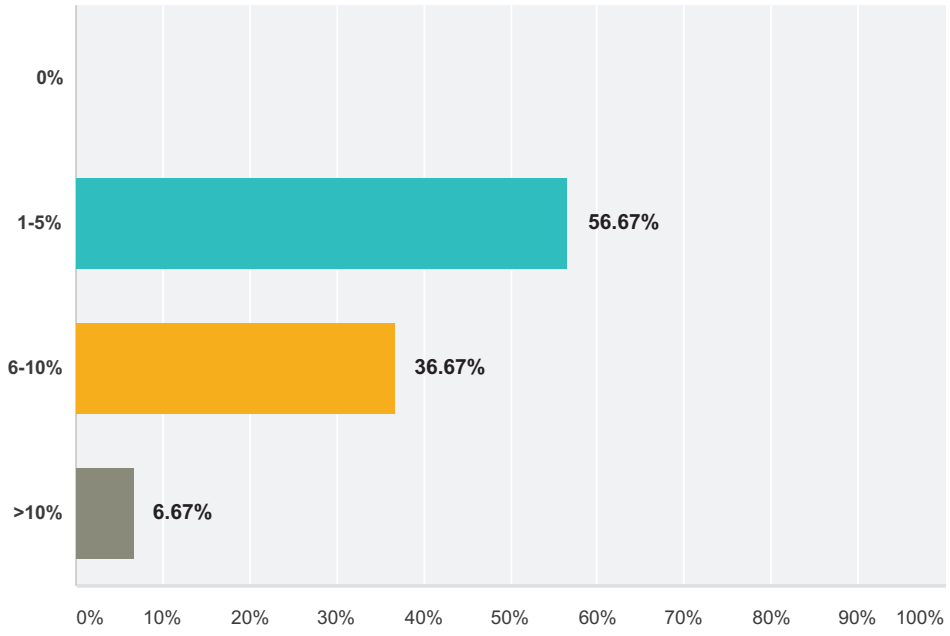
Answered: 0 Skipped: 36

⚠ No matching responses.

Answer Choices	Responses	
0%	**0.00%**	0
1-5%	**0.00%**	0
6-10%	**0.00%**	0
>10%	**0.00%**	0
Total		**0**

Q9 Approximately, what proportion of your cardiology patients (including those with CIED) has been ever diagnosed with any neoplasm?

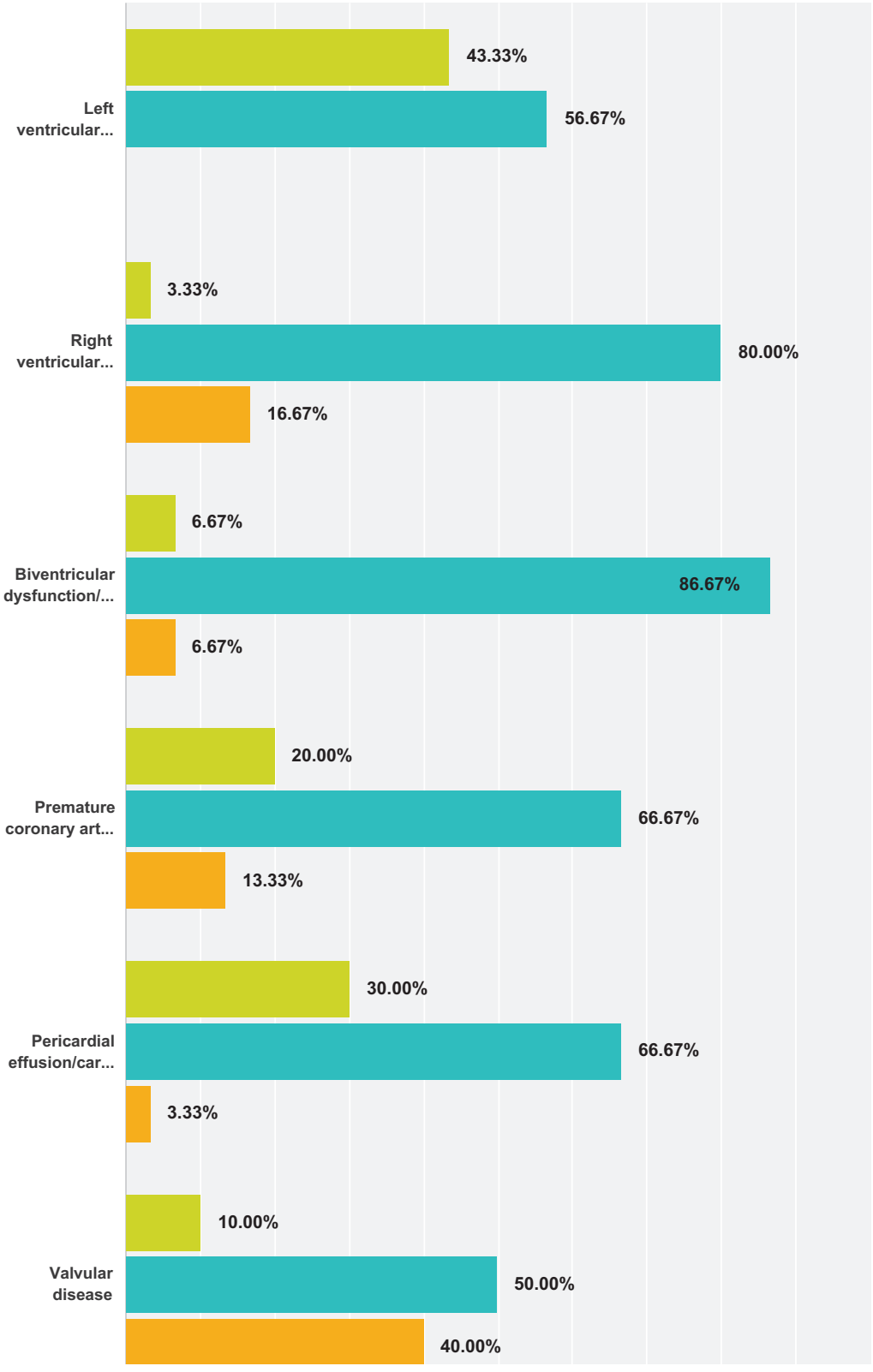
Answered: 30 Skipped: 6

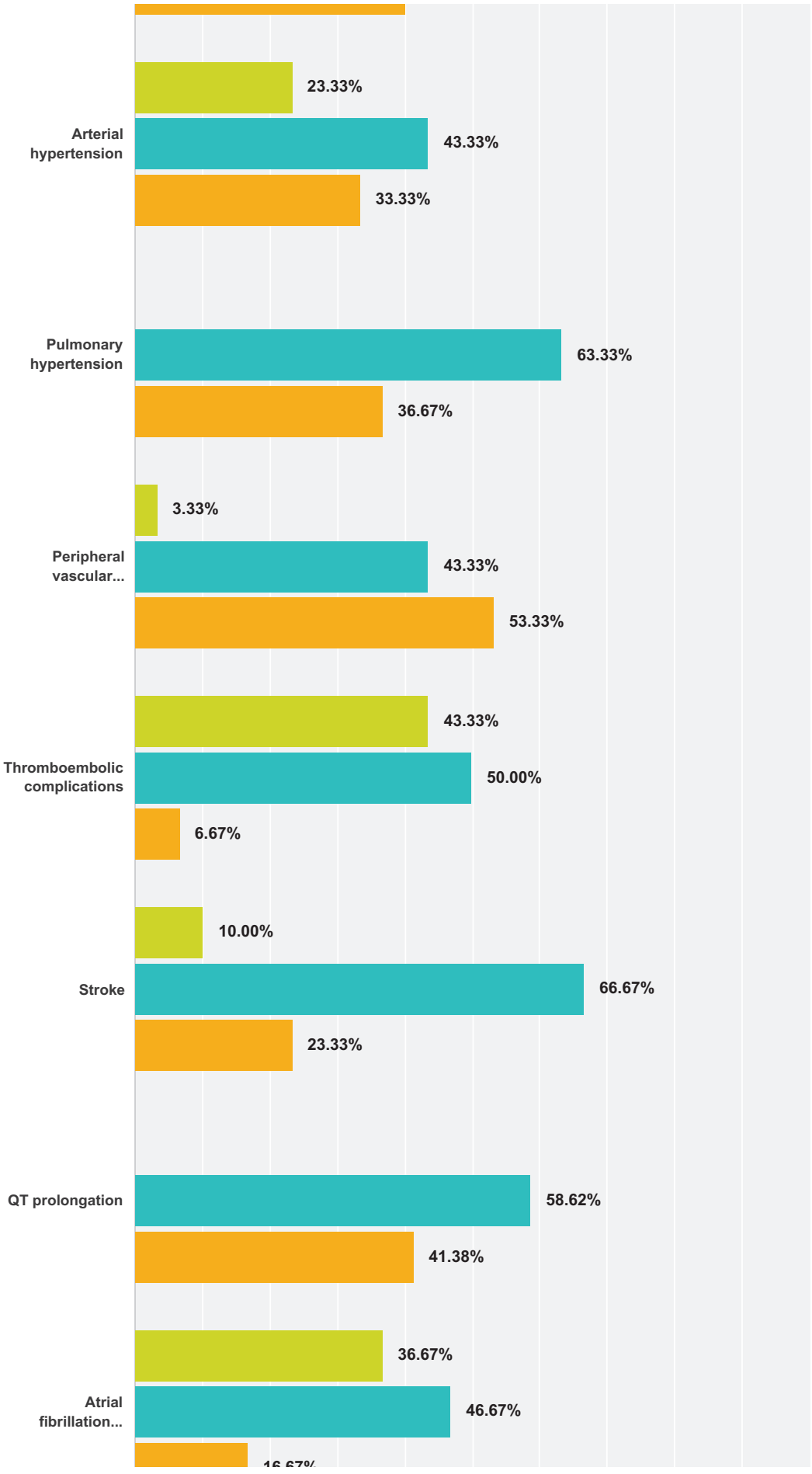


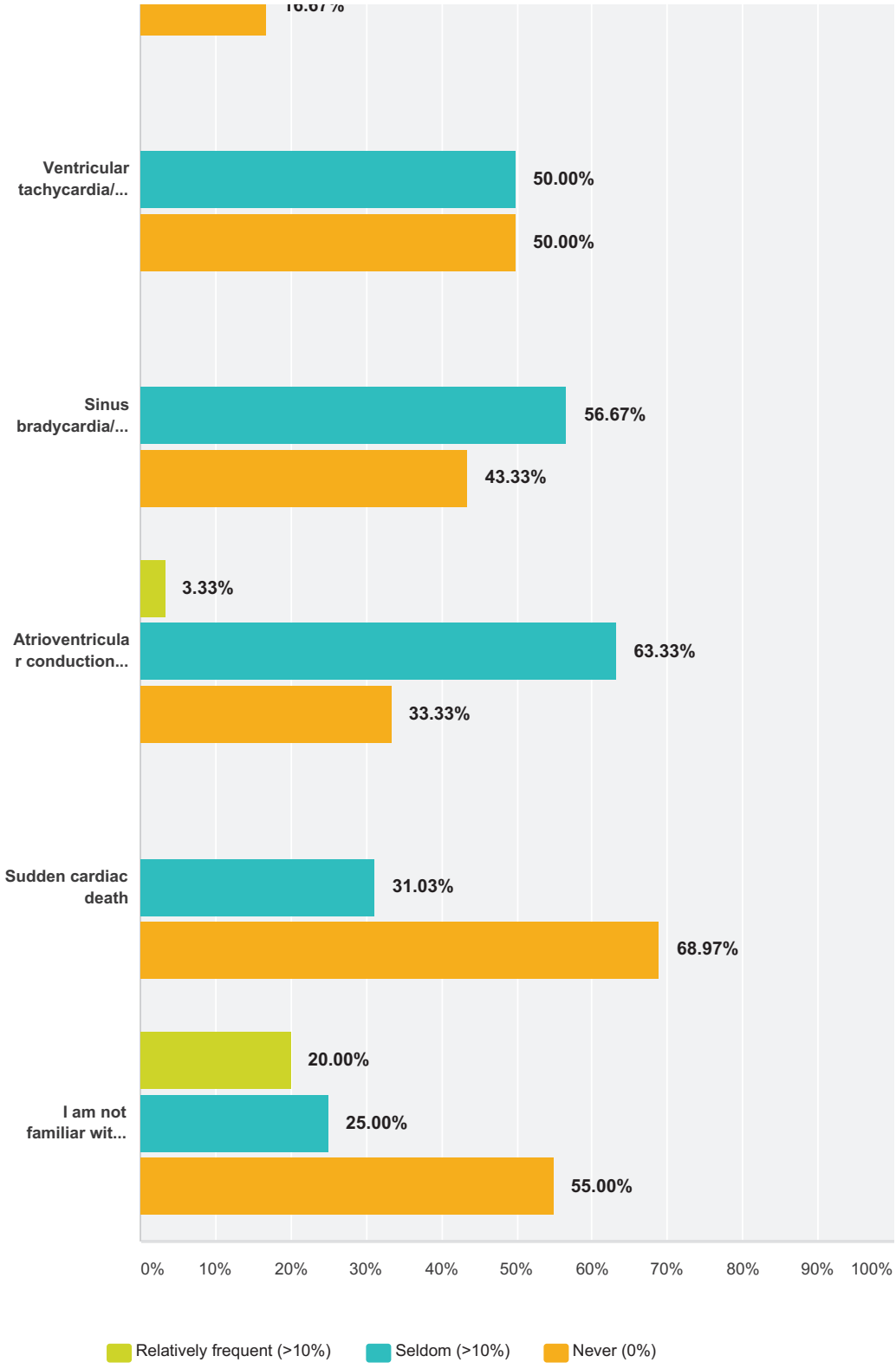
Answer Choices	Responses	
0%	0.00%	0
1-5%	56.67%	17
6-10%	36.67%	11
>10%	6.67%	2
Total		30

Q10 Which cardiovascular complications have you encountered in all your cardiology patients (including CIED-patients) due to anticancer treatment ? (multiple answers)

Answered: 30 Skipped: 6




23.33%
Arterial hypertension
43.33%
33.33%
Pulmonary hypertension
63.33%
36.67%
3.33%
Peripheral vascular...
43.33%
53.33%
43.33%
Thromboembolic complications
50.00%
6.67%
10.00%
Stroke
66.67%
23.33%
QT prolongation
58.62%
41.38%
36.67%
Atrial fibrillation...
46.67%

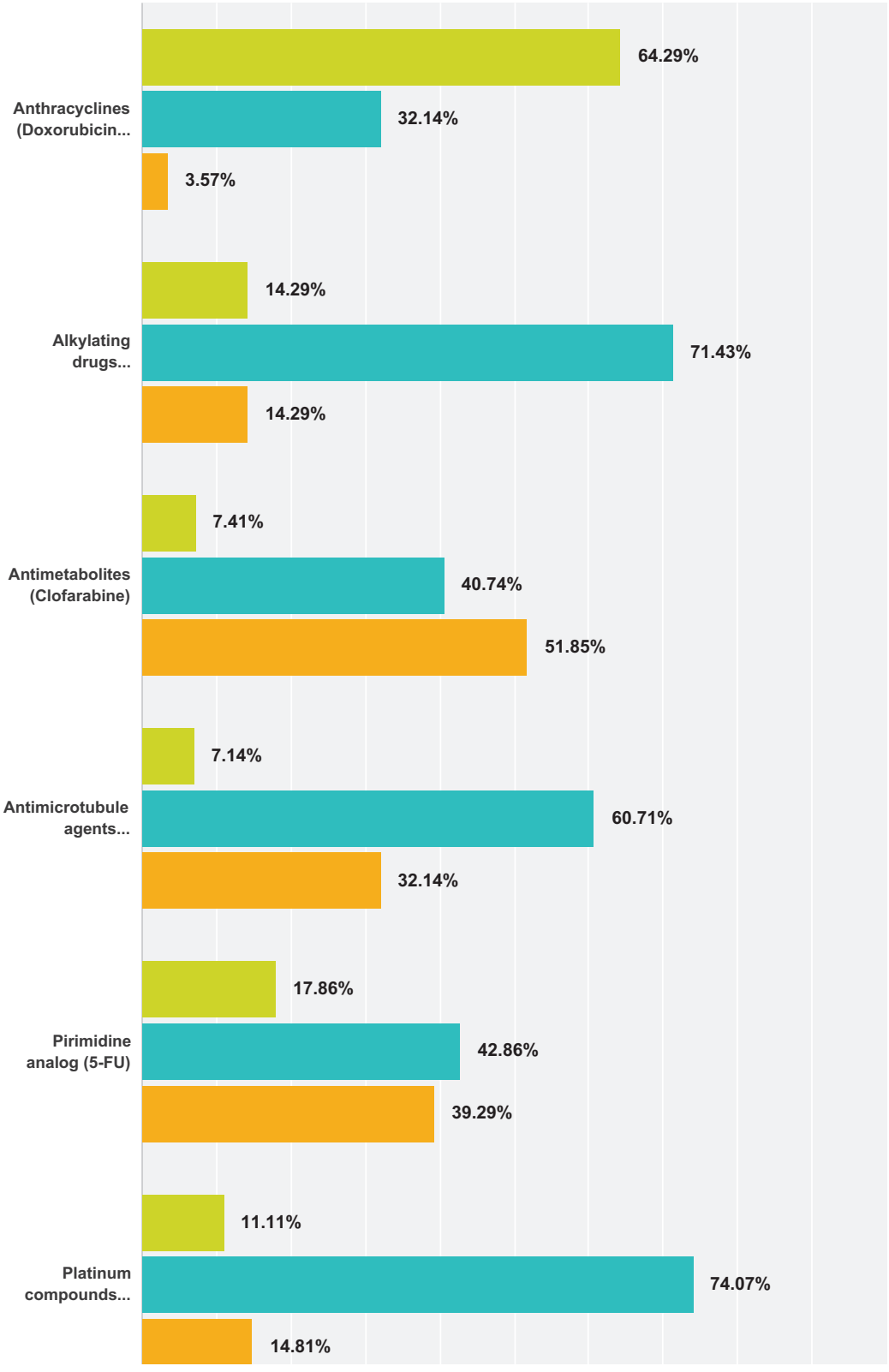


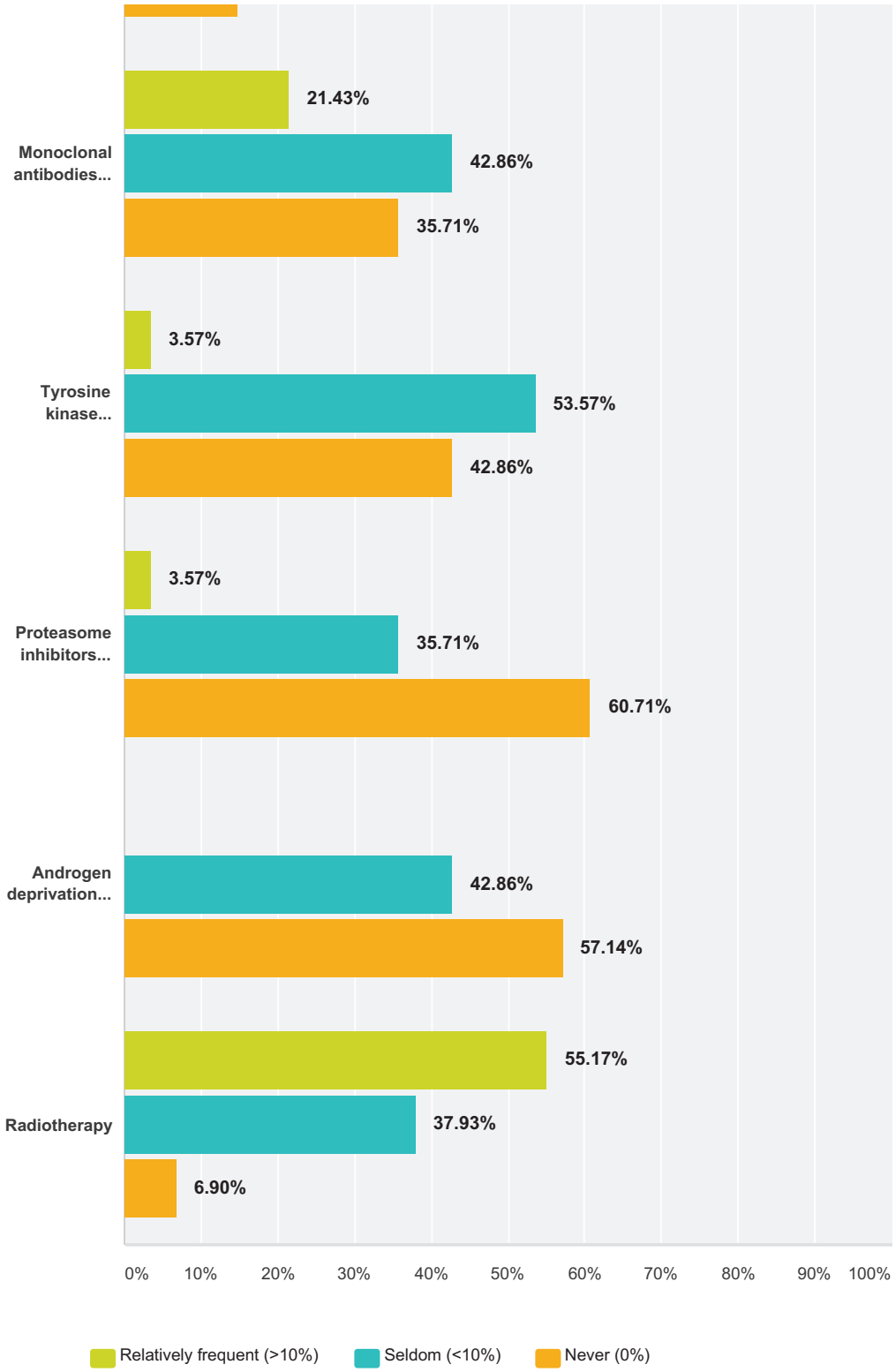
	Relatively frequent (>10%)	Seldom (>10%)	Never (0%)	Total
Left ventricular dysfunction/heart failure	**43.33%** 13	**56.67%** 17	**0.00%** 0	30
Right ventricular dysfunction/heart failure	**3.33%** 1	**80.00%** 24	**16.67%** 5	30

Biventricular dysfunction/heart failure	**6.67%** 2	**86.67%** 26	**6.67%** 2	30
Premature coronary artery disease	**20.00%** 6	**66.67%** 20	**13.33%** 4	30
Pericardial effusion/cardiac tamponade	**30.00%** 9	**66.67%** 20	**3.33%** 1	30
Valvular disease	**10.00%** 3	**50.00%** 15	**40.00%** 12	30
Arterial hypertension	**23.33%** 7	**43.33%** 13	**33.33%** 10	30
Pulmonary hypertension	**0.00%** 0	**63.33%** 19	**36.67%** 11	30
Peripheral vascular disease	**3.33%** 1	**43.33%** 13	**53.33%** 16	30
Thromboembolic complications	**43.33%** 13	**50.00%** 15	**6.67%** 2	30
Stroke	**10.00%** 3	**66.67%** 20	**23.33%** 7	30
QT prolongation	**0.00%** 0	**58.62%** 17	**41.38%** 12	29
Atrial fibrillation/flutter	**36.67%** 11	**46.67%** 14	**16.67%** 5	30
Ventricular tachycardia/fibrillation	**0.00%** 0	**50.00%** 15	**50.00%** 15	30
Sinus bradycardia/sinus node dysfunction	**0.00%** 0	**56.67%** 17	**43.33%** 13	30
Atrioventricular conduction disturbances	**3.33%** 1	**63.33%** 19	**33.33%** 10	30
Sudden cardiac death	**0.00%** 0	**31.03%** 9	**68.97%** 20	29
I am not familiar with anti-cancer drug treatments	**20.00%** 4	**25.00%** 5	**55.00%** 11	20

Q11 The agents used for treatment of cancer most commonly associated with complications in all your cardiology patients, include (multiple answers):

Answered: 30 Skipped: 6



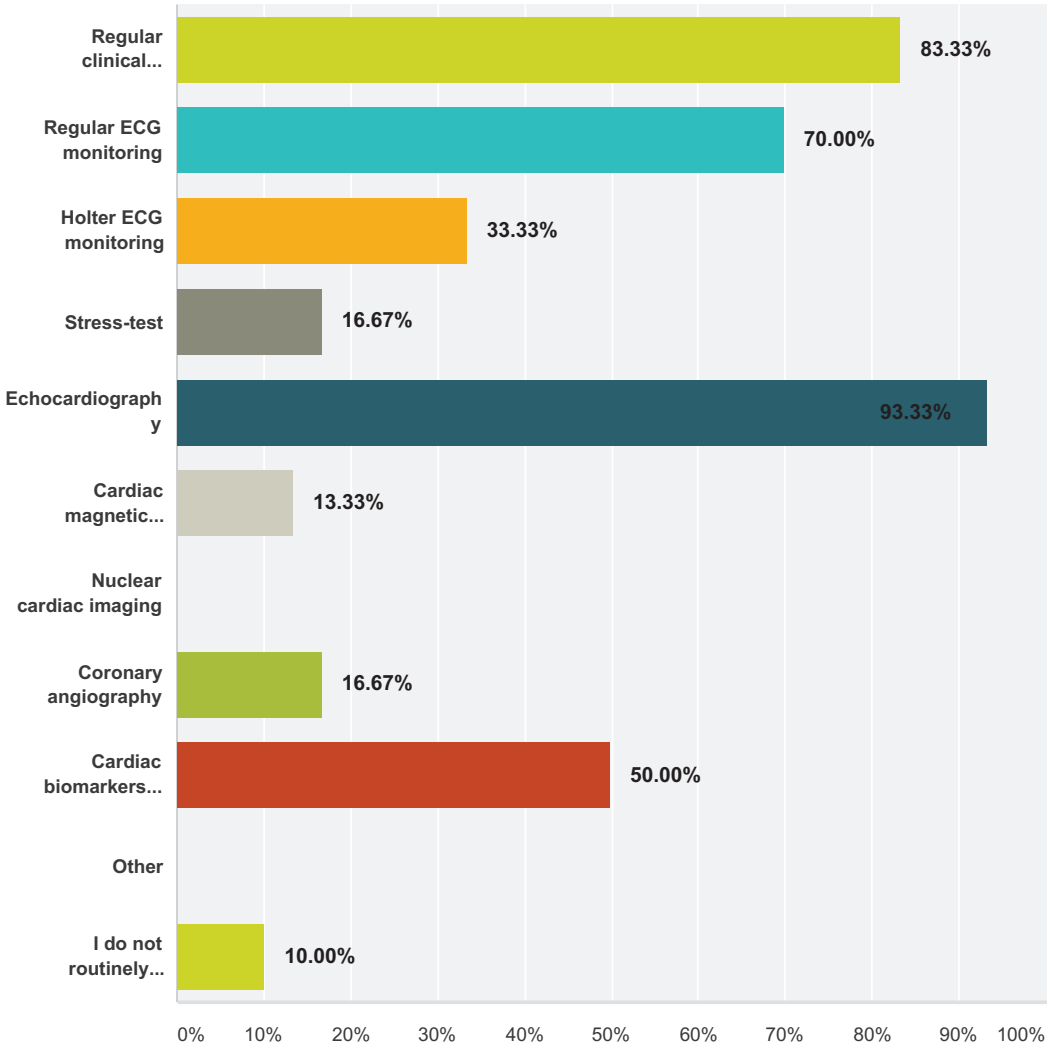


	Relatively frequent (>10%)	Seldom (<10%)	Never (0%)	Total
Anthracyclines (Doxorubicin, Idarubucin, Mitoxanthone)	**64.29%** 18	**32.14%** 9	**3.57%** 1	28
Alkylating drugs (Cyclophosphamide)	**14.29%** 4	**71.43%** 20	**14.29%** 4	28

Antimetabolites (Clofarabine)	**7.41%** 2	**40.74%** 11	**51.85%** 14	27
Antimicrotubule agents (Paclitaxel)	**7.14%** 2	**60.71%** 17	**32.14%** 9	28
Pirimidine analog (5-FU)	**17.86%** 5	**42.86%** 12	**39.29%** 11	28
Platinum compounds (Cisplatin)	**11.11%** 3	**74.07%** 20	**14.81%** 4	27
Monoclonal antibodies (Trastuzumab, Bevacizumab)	**21.43%** 6	**42.86%** 12	**35.71%** 10	28
Tyrosine kinase inhibitors (Imatinib, Sunitinib)	**3.57%** 1	**53.57%** 15	**42.86%** 12	28
Proteasome inhibitors (Bortezomib, Carfilzomib)	**3.57%** 1	**35.71%** 10	**60.71%** 17	28
Androgen deprivation therapy (Bicalutamide)	**0.00%** 0	**42.86%** 12	**57.14%** 16	28
Radiotherapy	**55.17%** 16	**37.93%** 11	**6.90%** 2	29

Q12 What methods do you use to screen cancer-treated patients for cardiac toxicity (multiple answers):

Answered: 30 Skipped: 6

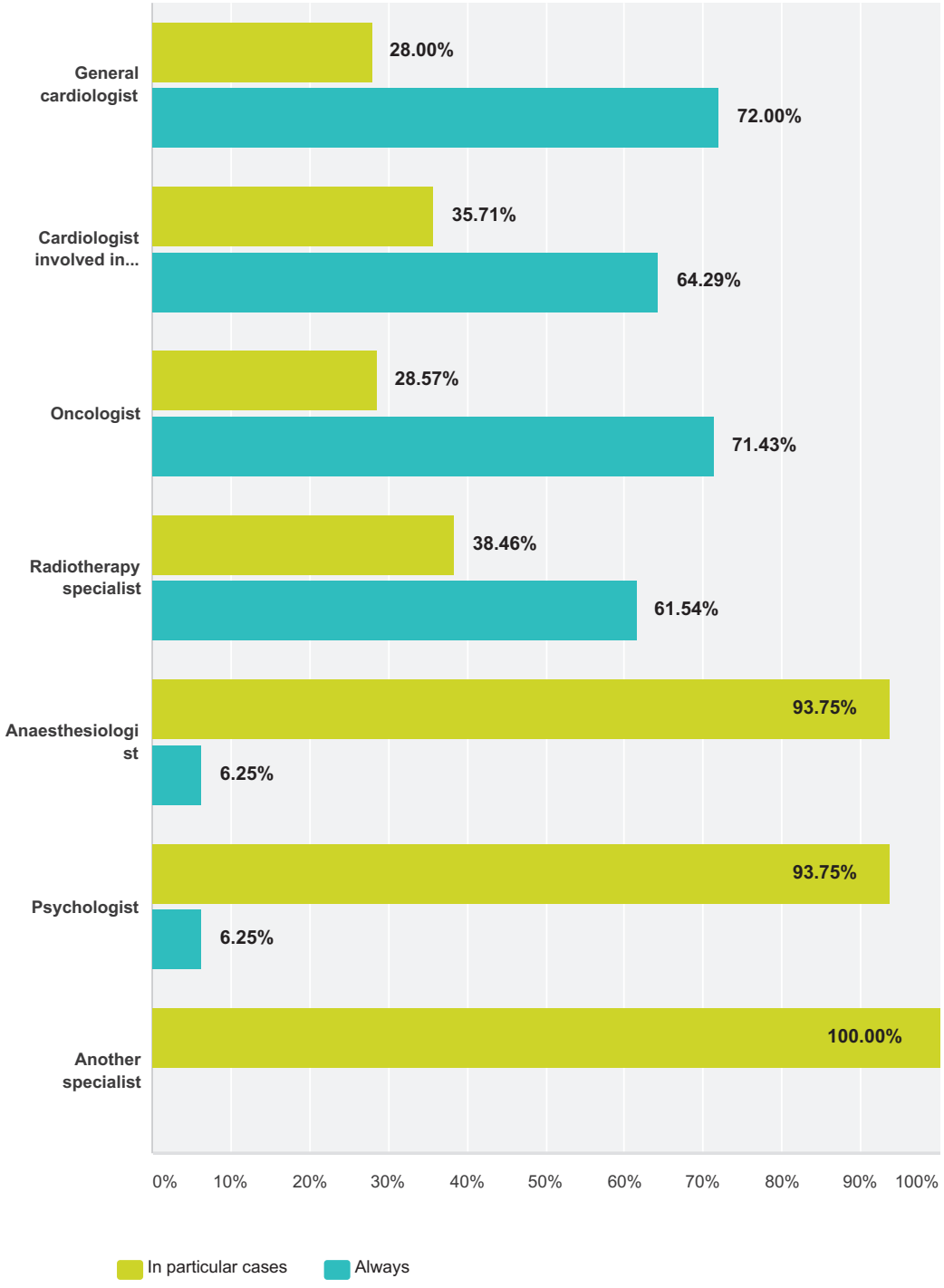


Answer Choices	Responses	
Regular clinical follow-up	**83.33%**	25
Regular ECG monitoring	**70.00%**	21
Holter ECG monitoring	**33.33%**	10
Stress-test	**16.67%**	5
Echocardiography	**93.33%**	28
Cardiac magnetic resonance	**13.33%**	4
Nuclear cardiac imaging	**0.00%**	0
Coronary angiography	**16.67%**	5

Cardiac biomarkers (troponins, BNP, NT-proBNP)	**50.00%**	15
Other	**0.00%**	0
I do not routinely screen my patients for treatment-induced cardiotoxicity	**10.00%**	3
Total Respondents: 30		

Q13 Which of the following specialists are involved in cardiovascular assessment (including calculation of risk for CIED) of your CIED patient planned for thoracic radiotherapy of cancer: (please, select all that apply)

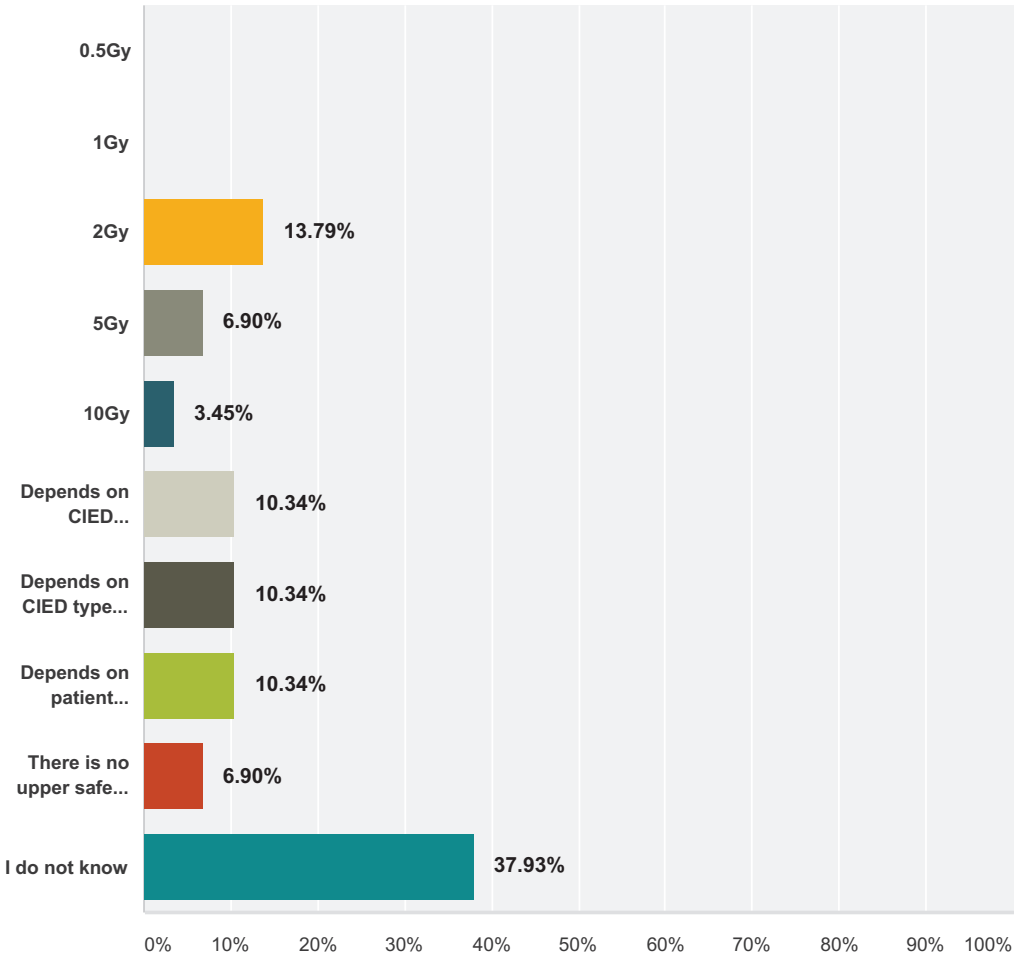
Answered: 29 Skipped: 7



	In particular cases	Always	Total
General cardiologist	**28.00%** 7	**72.00%** 18	25
Cardiologist involved in CIED implantation and check-up	**35.71%** 10	**64.29%** 18	28
Oncologist	**28.57%** 8	**71.43%** 20	28
Radiotherapy specialist	**38.46%** 10	**61.54%** 16	26
Anaesthesiologist	**93.75%** 15	**6.25%** 1	16
Psychologist	**93.75%** 15	**6.25%** 1	16
Another specialist	**100.00%** 14	**0.00%** 0	14

Q14 In CIED patient undergoing radiotherapy for cancer, what is your recommended upper safety limit for the cumulative dose received by CIED:

Answered: 29 Skipped: 7

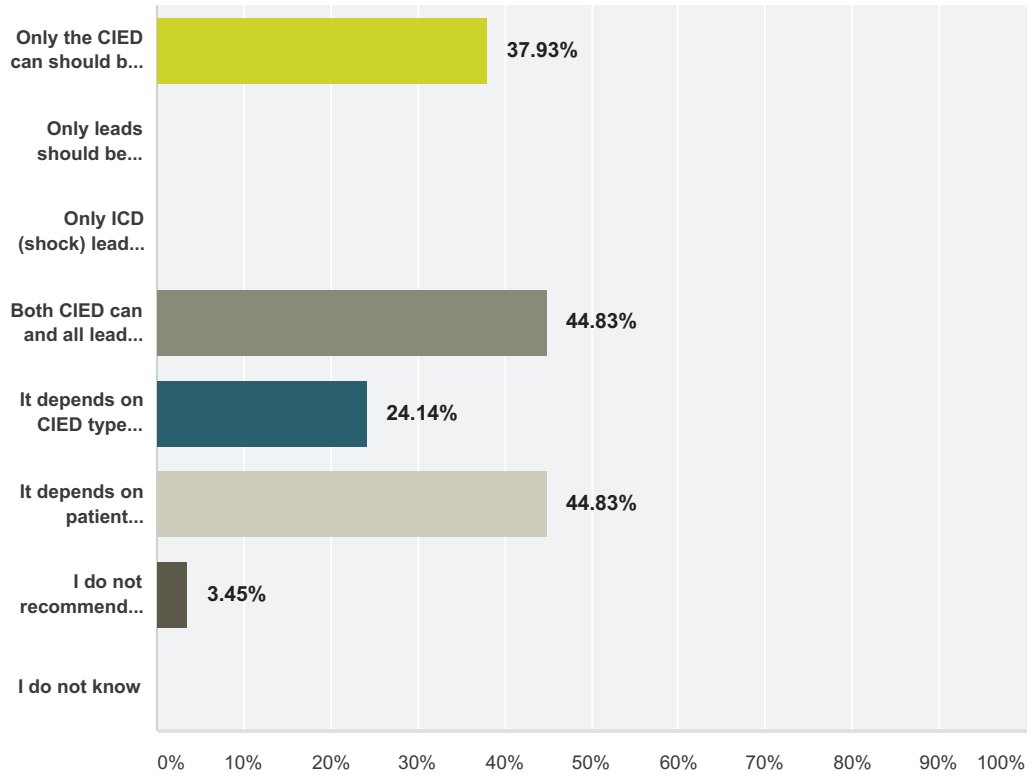


Answer Choices	Responses	
0.5Gy	0.00%	0
1Gy	0.00%	0
2Gy	13.79%	4
5Gy	6.90%	2
10Gy	3.45%	1
Depends on CIED manufacturer (different for different manufacturers)	10.34%	3
Depends on CIED type (pacemaker or ICD or CRT-P or CRT-D)	10.34%	3
Depends on patient characteristics	10.34%	3
There is no upper safe limit, all patients are to be treated in the same way, regardless of the dose	6.90%	2

I do not know	**37.93%**	11
Total		**29**

Q15 When you recommend avoidance of direct irradiation of the CIED during radiotherapy, you recommend that (multiple answers):

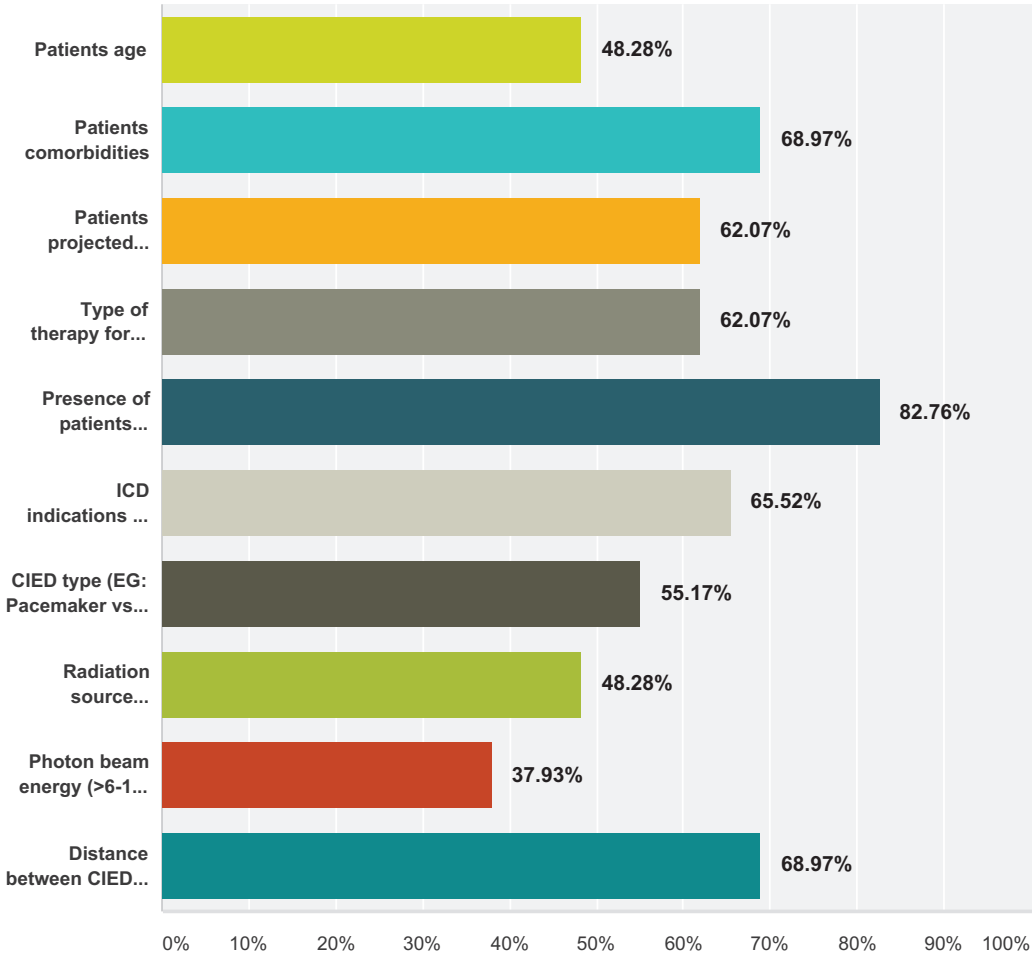
Answered: 29 Skipped: 7



Answer Choices	Responses	
Only the CIED can should be protected against direct irradiation	**37.93%**	11
Only leads should be protected	**0.00%**	0
Only ICD (shock) leads should be protected	**0.00%**	0
Both CIED can and all leads must not be placed in direct therapy beam	**44.83%**	13
It depends on CIED type (pacemaker or ICD or CRT-P or CRT-D)	**24.14%**	7
It depends on patient characteristics	**44.83%**	13
I do not recommend avoidance of CIED direct irradiation at all	**3.45%**	1
I do not know	**0.00%**	0
Total Respondents: 29		

Q16 When assessing radiation-associated risk in patient with CIED (risk of radiation-induced device damage/dysfunction), what of the following do you take into consideration (multiple answers):

Answered: 29 Skipped: 7

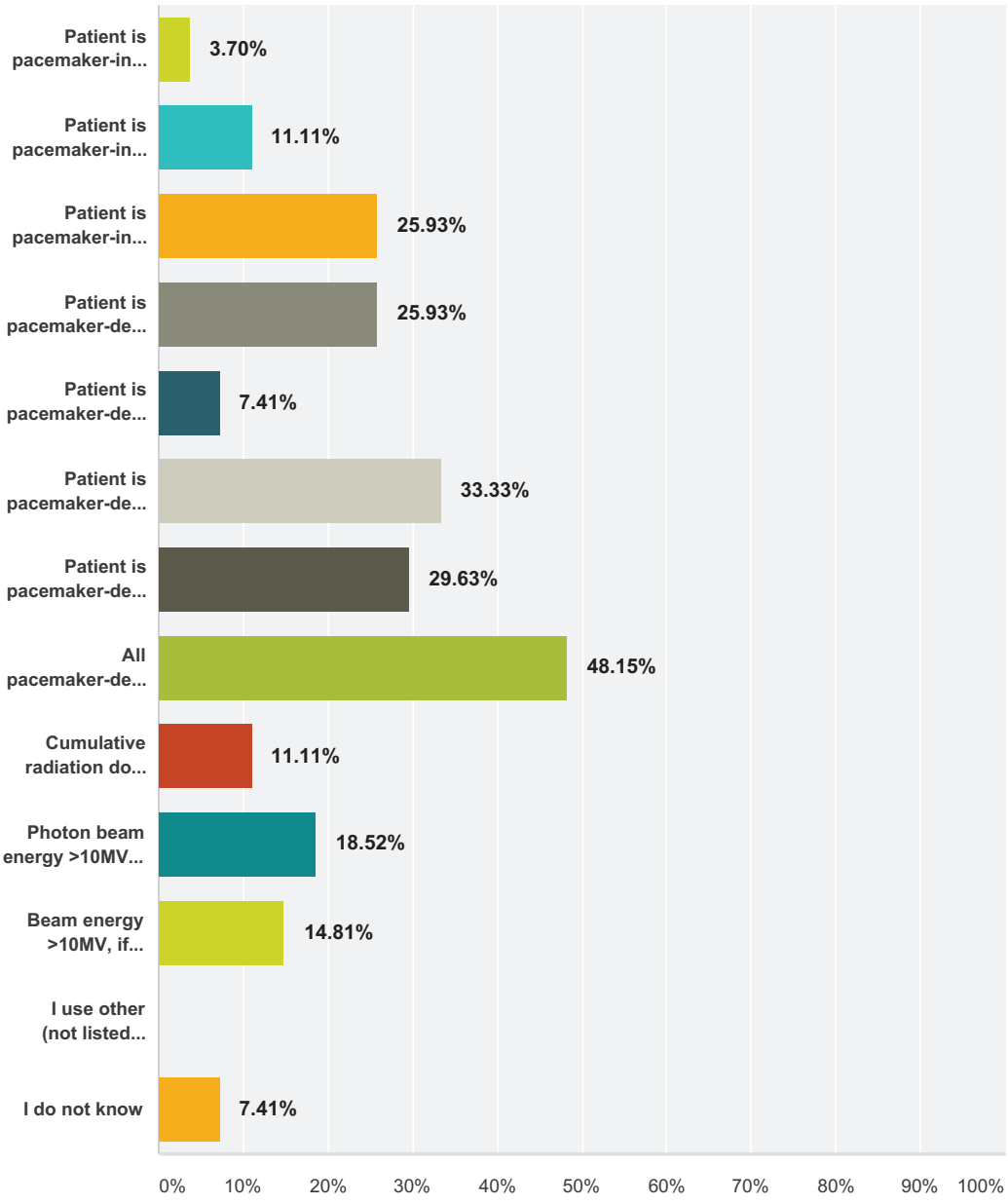


Answer Choices	Responses	
Patients age	48.28%	14
Patients comorbidities	68.97%	20
Patients projected survival	62.07%	18
Type of therapy for cancer: radical- or palliative	62.07%	18
Presence of patients pacemaker-dependency	82.76%	24
ICD indications (in cases of ICD/CRT-D patients) - primary vs. secondary prevention of sudden cardiac death	65.52%	19
CIED type (EG: Pacemaker vs CRT)	55.17%	16
Radiation source (betatron, linear accelerator, etc)	48.28%	14

Photon beam energy (>6-10MV or less)	**37.93%**	11
Distance between CIED and radiotherapy treatment beam	**68.97%**	20
Total Respondents: 29		

Q17 Regarding assessment of radiotherapy-associated risk in pacemaker patients, you would consider that your patient is at high-risk if (multiple answers):

Answered: 27 Skipped: 9

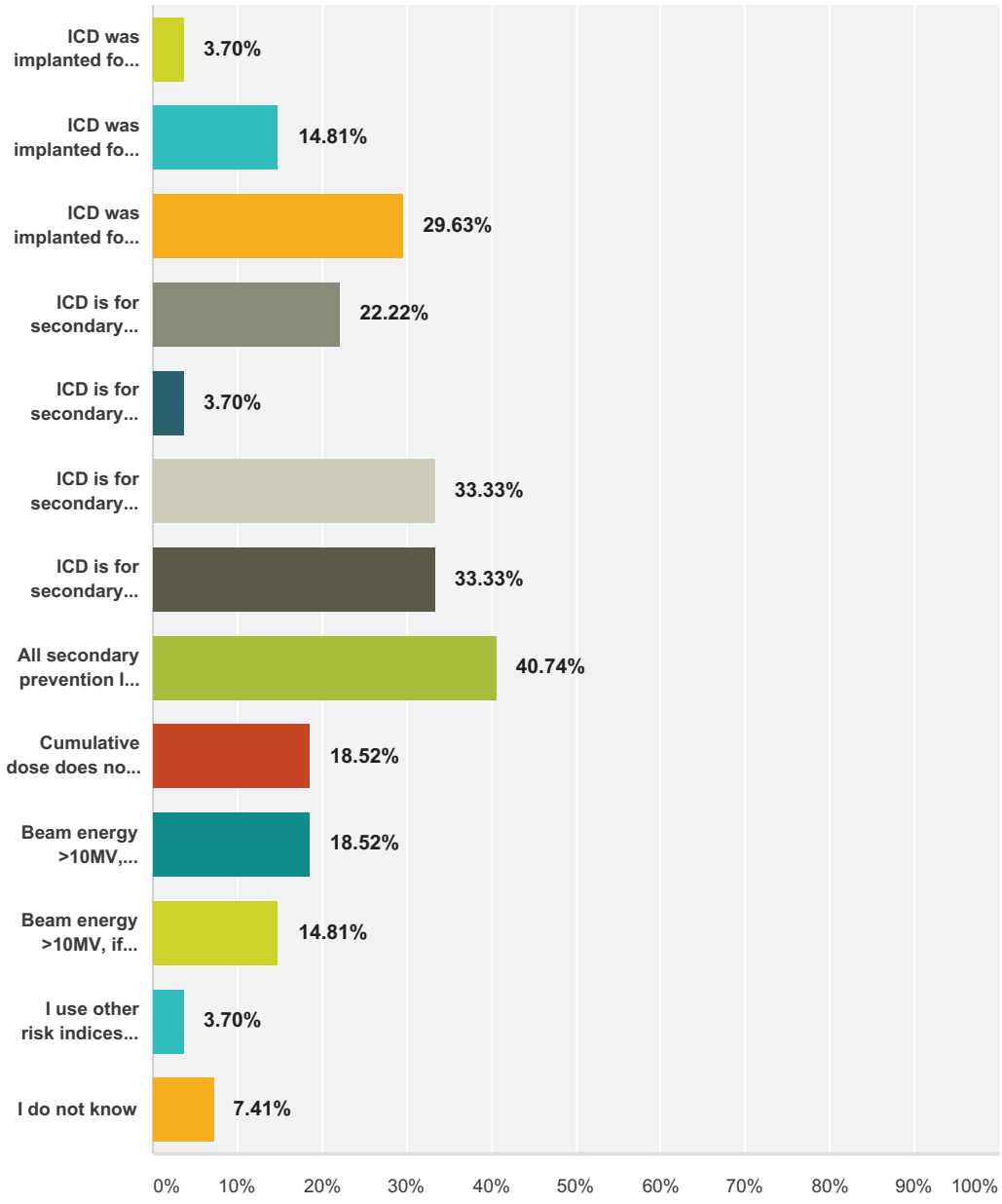


Answer Choices	Responses	
Patient is pacemaker-independent, and cumulative radiation dose to pacemaker is <2Gy	3.70%	1
Patient is pacemaker-independent and cumulative radiation dose is 2-10Gy	11.11%	3
Patient is pacemaker-independent and cumulative radiation dose exceeds 10Gy	25.93%	7
Patient is pacemaker-dependent, and fulfils the same criteria as pacemaker-independent high-risk patient,	25.93%	7

Patient is pacemaker-dependent and cumulative radiation dose on pacemaker is <2Gy	**7.41%**	2
Patient is pacemaker-dependent and cumulative radiation dose is 2-10Gy	**33.33%**	9
Patient is pacemaker-dependent and cumulative radiation dose exceeds 10Gy	**29.63%**	8
All pacemaker-dependent patients are at high-risk, irrespective of the dose	**48.15%**	13
Cumulative radiation dose does not matter, all pacemaker patients are at high-risk	**11.11%**	3
Photon beam energy >10MV, irrespectively from pacemaker-dependency and dose received by CIED	**18.52%**	5
Beam energy >10MV, if associated with other “low risk” indices	**14.81%**	4
I use other (not listed here) risk indices for risk assessment in pacemaker patients undergoing radiotherapy	**0.00%**	0
I do not know	**7.41%**	2
Total Respondents: 27		

Q18 Regarding assessment of radiotherapy-associated risk in ICD patients, you would consider that your patient is at high-risk if (multiple answers):

Answered: 27 Skipped: 9



Answer Choices	Responses
ICD was implanted for primary prevention of sudden cardiac death, and cumulative radiation dose to device is <2Gy	3.70% 1
ICD was implanted for primary prevention of sudden cardiac death, and cumulative radiation dose is 2-10Gy	14.81% 4
ICD was implanted for primary prevention of sudden cardiac death, and cumulative radiation dose exceeds 10Gy	29.63% 8

ICD is for secondary prevention (or patient had appropriate intervention after implantation), and fulfils the same criteria as primary prevention high-risk ICD patient	**22.22%** 6
ICD is for secondary prevention and cumulative radiation dose to device is <2Gy	**3.70%** 1
ICD is for secondary prevention and cumulative radiation dose is 2-10Gy	**33.33%** 9
ICD is for secondary prevention and cumulative radiation dose exceeds 10Gy	**33.33%** 9
All secondary prevention ICD patients are at high-risk, irrespective of the dose	**40.74%** 11
Cumulative dose does not matter, all ICD patients are at high-risk	**18.52%** 5
Beam energy >10MV, irrespective of prevention and dose received by CIED	**18.52%** 5
Beam energy >10MV, if associated with other “high risk” indices	**14.81%** 4
I use other risk indices for risk assessment in ICD patients undergoing radiotherapy	**3.70%** 1
I do not know	**7.41%** 2
Total Respondents: 27	

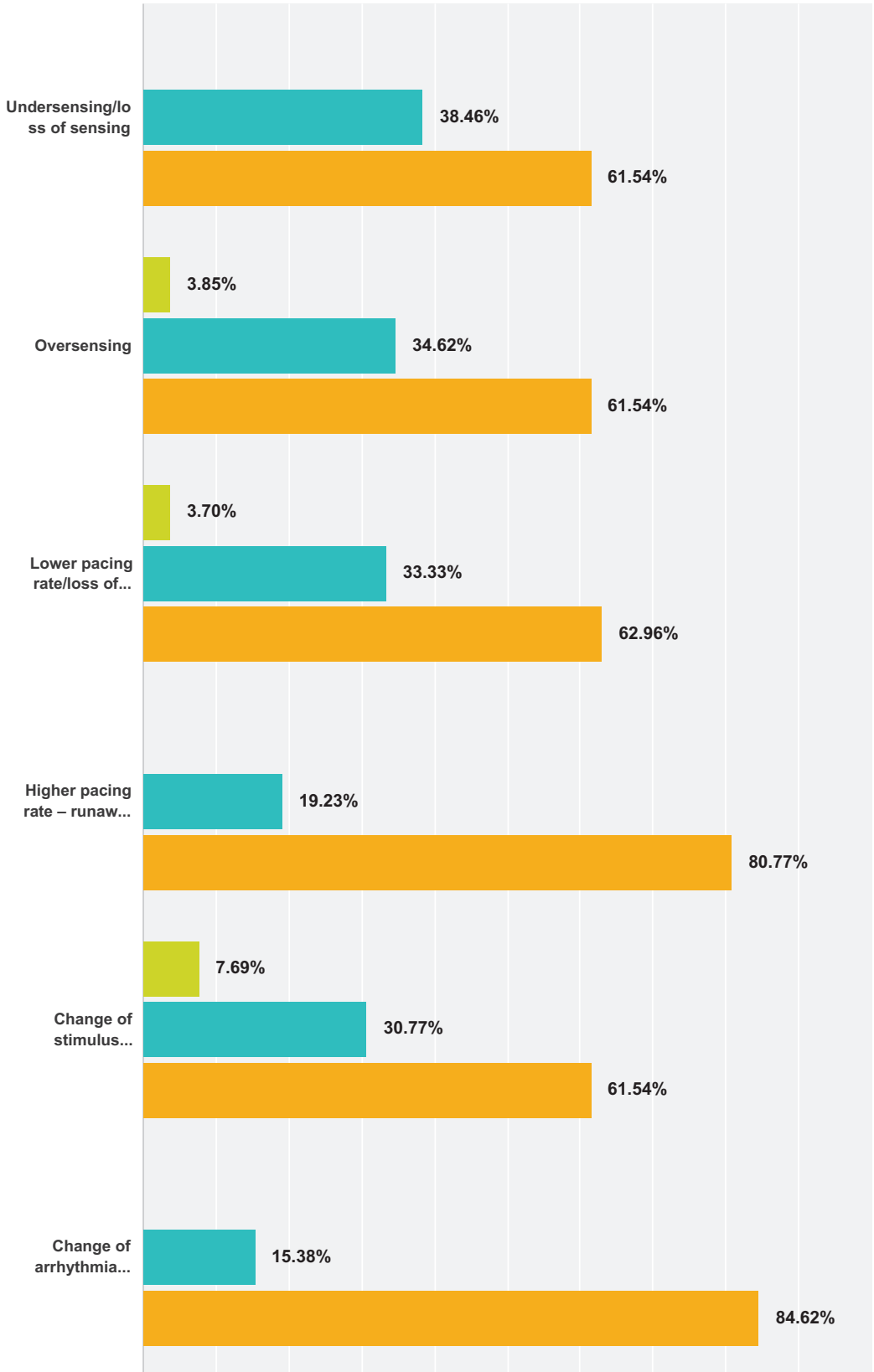
Q19 Among all my CIED patients treated with radiotherapy, the approximate percent of subjects who experienced device damage/dysfunction after radiation was: (Please, give the percentage)

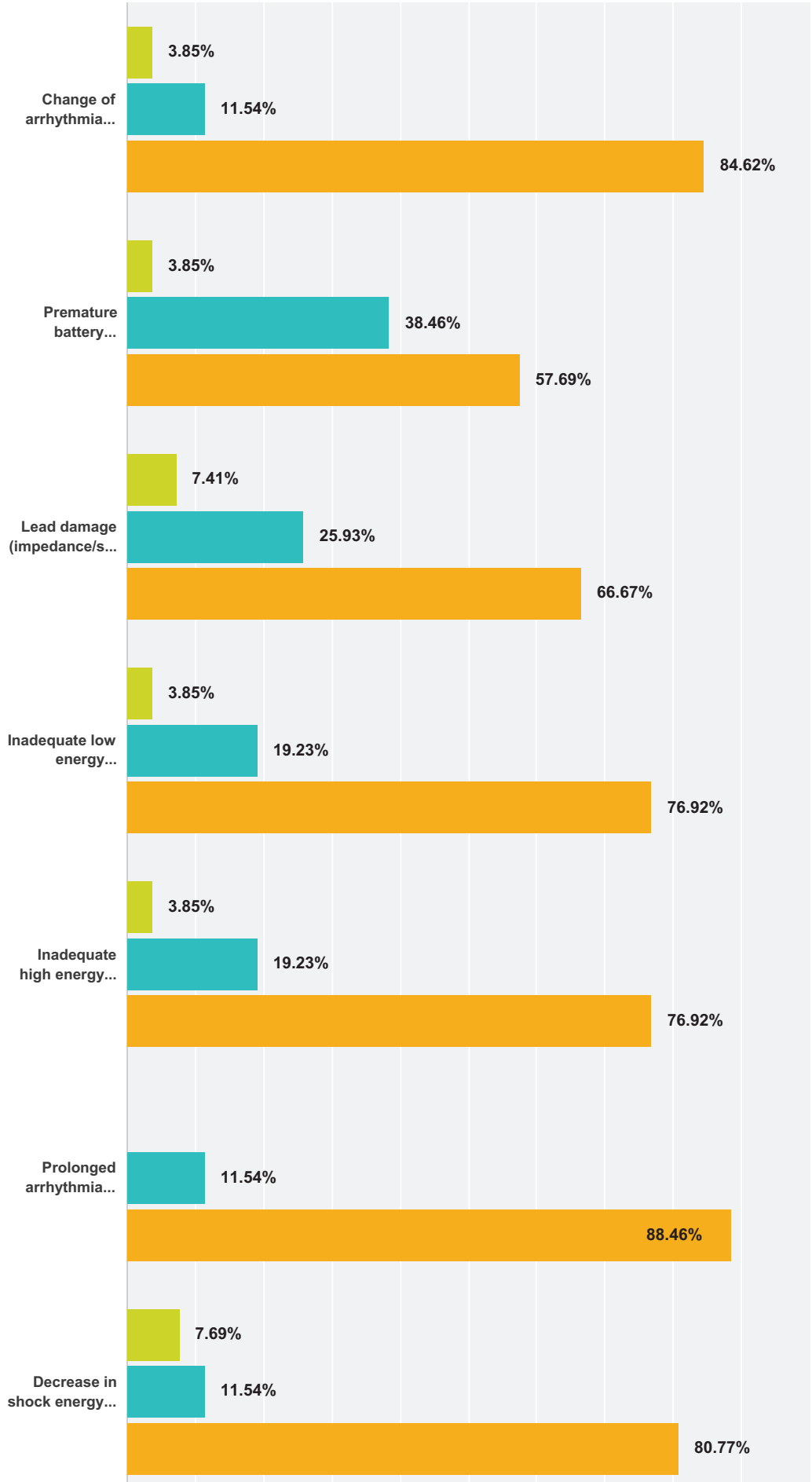
Answered: 27 Skipped: 9

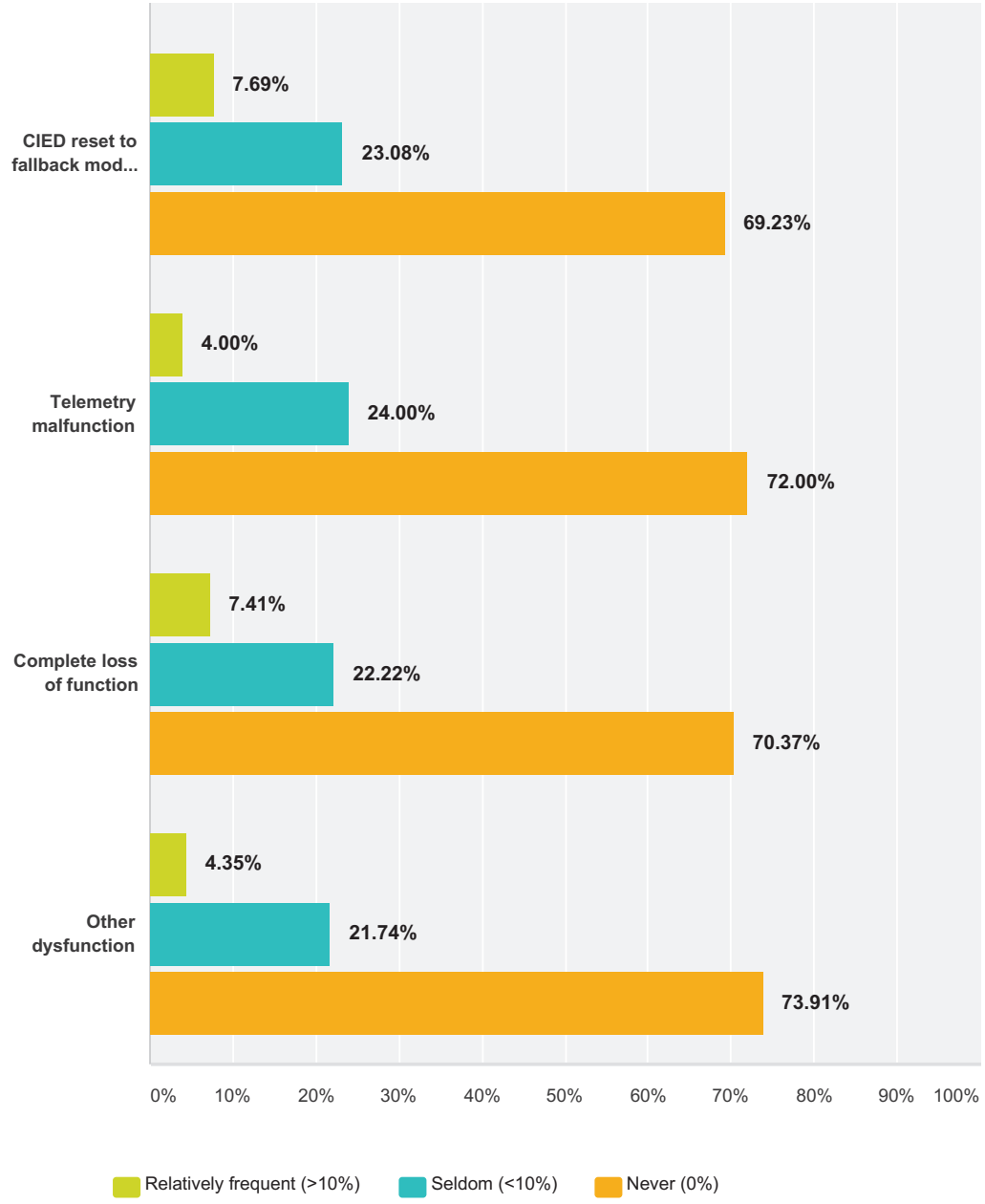
#	Responses	Date
1	2	3/13/2017 5:17 PM
2	0	3/12/2017 7:51 PM
3	5%	3/11/2017 9:54 AM
4	0%	3/10/2017 11:17 PM
5	2%	3/10/2017 10:07 PM
6	1%	3/10/2017 2:12 PM
7	1	3/10/2017 10:34 AM
8	5	3/10/2017 10:34 AM
9	0%	3/10/2017 6:05 AM
10	<1%	3/9/2017 10:59 PM
11	0	3/8/2017 8:56 PM
12	1	2/25/2017 8:37 PM
13	0%, we always change the position of CIED	2/24/2017 12:01 PM
14	I don't know	2/23/2017 2:10 PM
15	0	2/23/2017 8:28 AM
16	1%	2/22/2017 12:28 PM
17	currently there is no information on CIED damage after radiation	2/21/2017 1:37 PM
18	<5%	2/20/2017 8:07 PM
19	1	2/20/2017 1:32 AM
20	0	2/19/2017 11:27 PM
21	0	2/18/2017 6:04 PM
22	0	2/18/2017 8:03 AM
23	1%	2/17/2017 8:20 PM
24	1%	2/17/2017 10:35 AM
25	1	2/17/2017 7:02 AM
26	5%	2/16/2017 11:42 PM
27	<5	2/16/2017 6:42 PM

Q20 The abnormalities of CIED function you encountered in radiation-treated patients include by frequency:

Answered: 27 Skipped: 9




Change of arrhythmia...
3.85%
11.54%
84.62%
Premature battery...
3.85%
38.46%
57.69%
Lead damage (impedance/s...
7.41%
25.93%
66.67%
Inadequate low energy...
3.85%
19.23%
76.92%
Inadequate high energy...
3.85%
19.23%
76.92%
Prolonged arrhythmia...
11.54%
88.46%
Decrease in shock energy...
7.69%
11.54%
80.77%

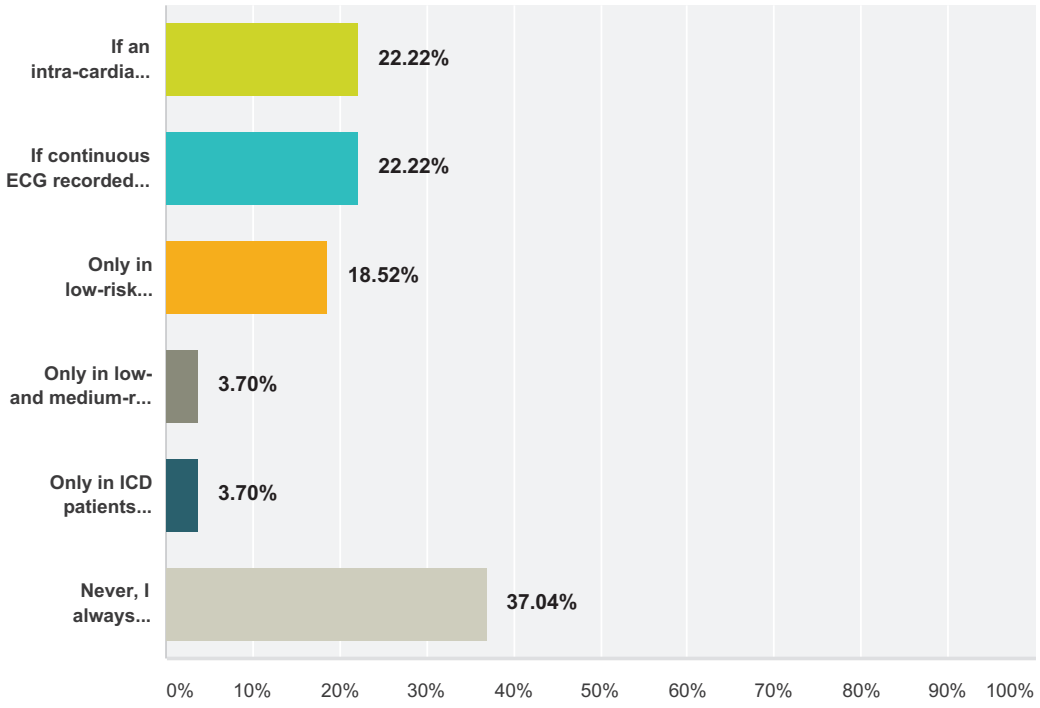


	Relatively frequent (>10%)	Seldom (<10%)	Never (0%)	Total
Undersensing/loss of sensing	**0.00%** 0	**38.46%** 10	**61.54%** 16	26
Oversensing	**3.85%** 1	**34.62%** 9	**61.54%** 16	26
Lower pacing rate/loss of pacing	**3.70%** 1	**33.33%** 9	**62.96%** 17	27
Higher pacing rate – runaway pacemaker syndrome	**0.00%** 0	**19.23%** 5	**80.77%** 21	26
Change of stimulus amplitude	**7.69%** 2	**30.77%** 8	**61.54%** 16	26
Change of arrhythmia detection settings	**0.00%** 0	**15.38%** 4	**84.62%** 22	26

Change of arrhythmia therapy settings	**3.85%** 1	**11.54%** 3	**84.62%** 22	26
Premature battery depletion	**3.85%** 1	**38.46%** 10	**57.69%** 15	26
Lead damage (impedance/sensing/pacing threshold out of range)	**7.41%** 2	**25.93%** 7	**66.67%** 18	27
Inadequate low energy antiarrhythmic therapy in ICD	**3.85%** 1	**19.23%** 5	**76.92%** 20	26
Inadequate high energy antiarrhythmic therapy in ICD	**3.85%** 1	**19.23%** 5	**76.92%** 20	26
Prolonged arrhythmia detection/capacitator charging	**0.00%** 0	**11.54%** 3	**88.46%** 23	26
Decrease in shock energy delivered by ICD	**7.69%** 2	**11.54%** 3	**80.77%** 21	26
CIED reset to fallback mode or power-on-reset mode	**7.69%** 2	**23.08%** 6	**69.23%** 18	26
Telemetry malfunction	**4.00%** 1	**24.00%** 6	**72.00%** 18	25
Complete loss of function	**7.41%** 2	**22.22%** 6	**70.37%** 19	27
Other dysfunction	**4.35%** 1	**21.74%** 5	**73.91%** 17	23

Q21 In ICD patient planned for radiotherapy, would you refrain from deactivating antiarrhythmic therapies prior to RT (multiple answers):

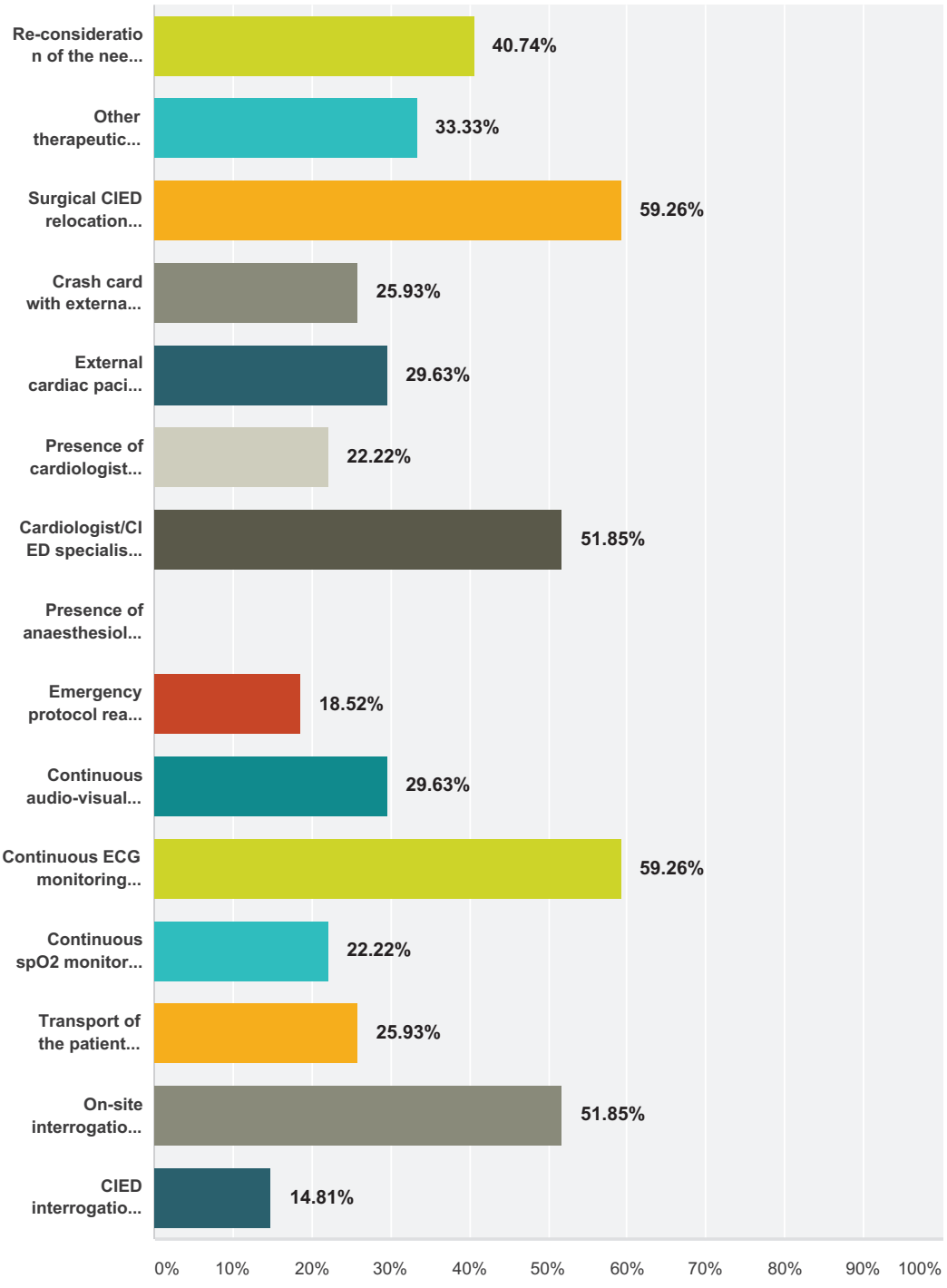
Answered: 27 Skipped: 9



Answer Choices	Responses	
If an intra-cardiac electrogram during the first fraction did not show aberrations or morphology that would trigger antitachycardia therapy	22.22%	6
If continuous ECG recorded during the first RT fraction did not show abnormalities	22.22%	6
Only in low-risk patients	18.52%	5
Only in low- and medium-risk patients	3.70%	1
Only in ICD patients implanted for primary prevention	3.70%	1
Never, I always deactivate ICD prior to RT in all patients	37.04%	10
Total Respondents: 27		

Q22 What safety precautions do you undertake/recommend if a high-risk CIED patient is planned to undergo radiotherapy for cancer (multiple answers)?

Answered: 27 Skipped: 9

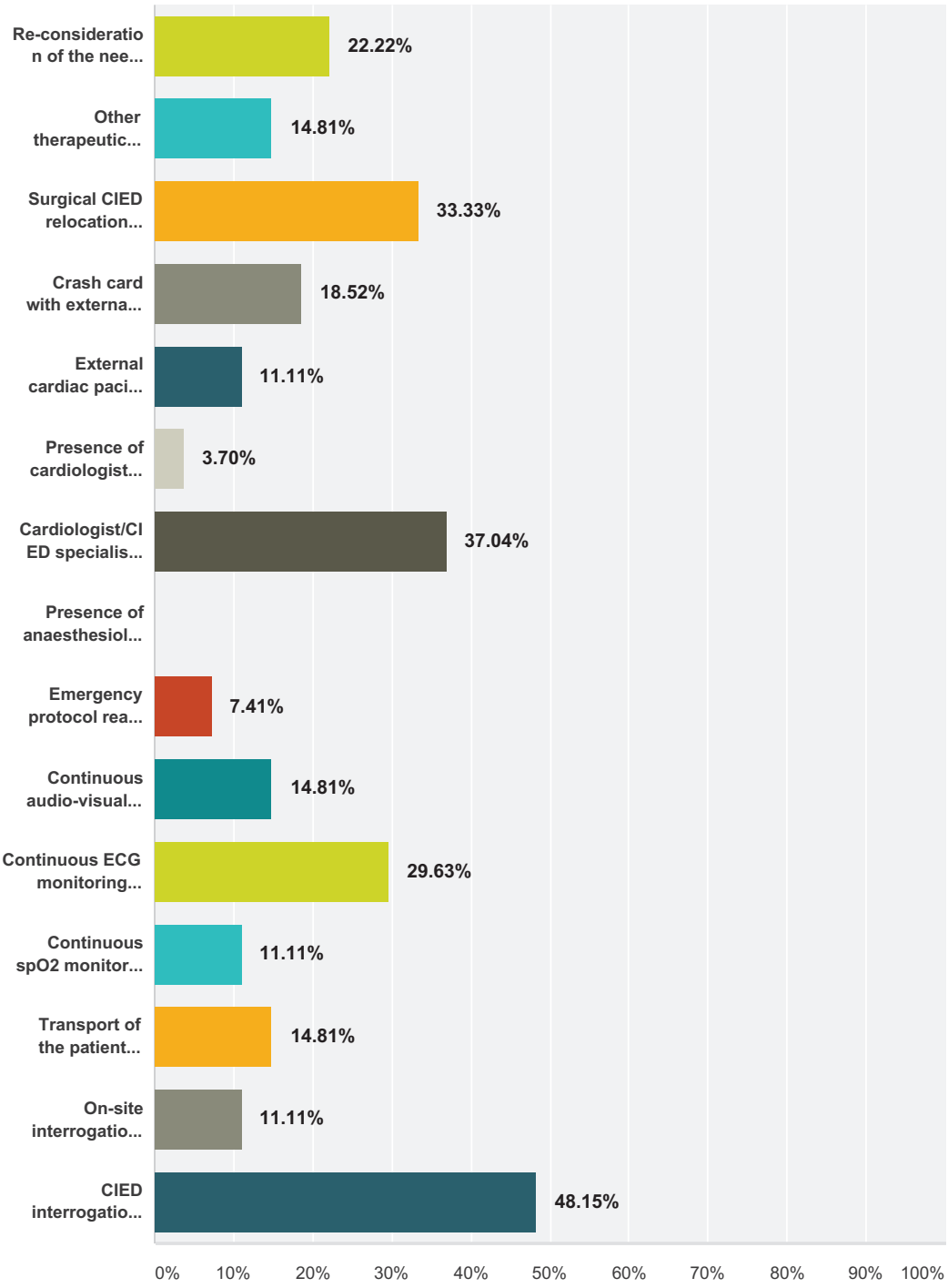


Answer Choices	Responses
Re-consideration of the need for radiotherapy, or modification of the radiotherapy plan, aiming at radiation reduction	40.74% 11

Other therapeutic options taken into consideration (chemotherapy)	**33.33%**	9
Surgical CIED relocation considered	**59.26%**	16
Crash card with external defibrillator available	**25.93%**	7
External cardiac pacing available	**29.63%**	8
Presence of cardiologist with the programmer during radiotherapy	**22.22%**	6
Cardiologist/CIED specialist available within 10 minutes	**51.85%**	14
Presence of anaesthesiologist during radiotherapy	**0.00%**	0
Emergency protocol ready and reanimation team at hand	**18.52%**	5
Continuous audio-visual patient monitoring during RT	**29.63%**	8
Continuous ECG monitoring during every RT fraction	**59.26%**	16
Continuous spO2 monitoring during every RT fraction	**22.22%**	6
Transport of the patient under medical surveillance to cardiology centre to check-up, deactivate/activate CIED before and after every RT session	**25.93%**	7
On-site interrogation/reprogramming of CIED before and after every RT	**51.85%**	14
CIED interrogation only after the last RT session	**14.81%**	4
Total Respondents: 27		

Q23 What safety precautions do you undertake/recommend if low-risk CIED patient is planned to undergo radiotherapy for cancer (multiple answers)?

Answered: 27 Skipped: 9

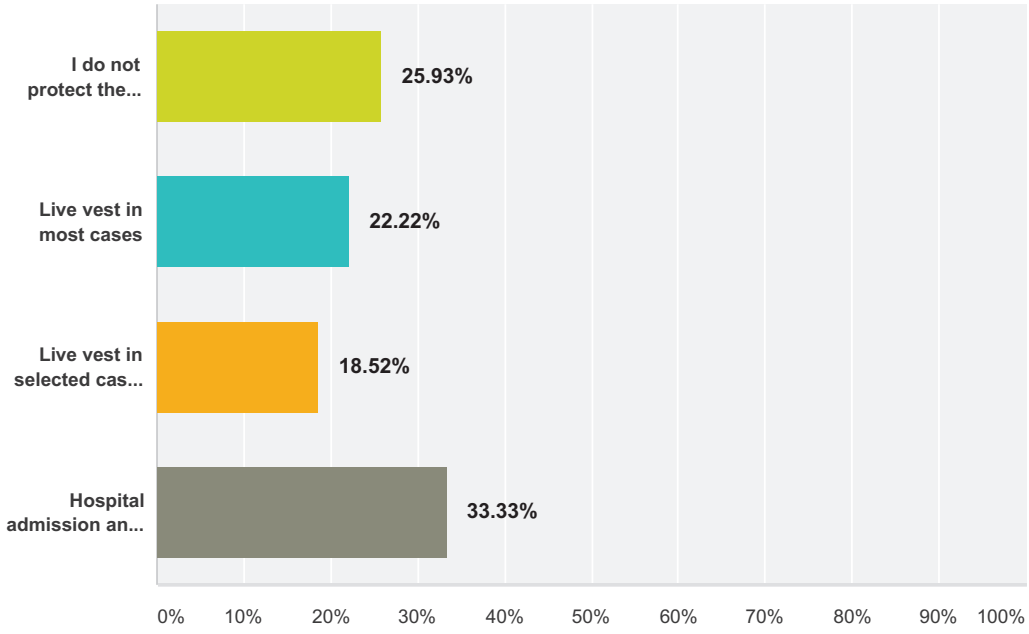


Answer Choices	Responses	
Re-consideration of the need for radiotherapy, or modification of the radiotherapy plan, aiming at radiation reduction	22.22%	6

Other therapeutic options taken into consideration (chemotherapy)	**14.81%**	4
Surgical CIED relocation considered	**33.33%**	9
Crash card with external defibrillator available	**18.52%**	5
External cardiac pacing available	**11.11%**	3
Presence of cardiologist with the programmer during radiotherapy	**3.70%**	1
Cardiologist/CIED specialist available within 10 minutes	**37.04%**	10
Presence of anaesthesiologist during radiotherapy	**0.00%**	0
Emergency protocol ready and reanimation team at hand	**7.41%**	2
Continuous audio-visual patient monitoring during RT	**14.81%**	4
Continuous ECG monitoring during every RT fraction	**29.63%**	8
Continuous spO2 monitoring during every RT fraction	**11.11%**	3
Transport of the patient under medical surveillance to cardiology centre to check-up, deactivate/activate CIED before and after every RT session	**14.81%**	4
On-site interrogation/reprogramming of CIED before and after every RT	**11.11%**	3
CIED interrogation only after the last RT session	**48.15%**	13
Total Respondents: 27		

Q24 In patients requiring ICD explantation for curative outpatientradiotherapy, how do you usually protect the patient against sudden cardiac death until the ICD can be re-implanted:

Answered: 27 Skipped: 9



Answer Choices	Responses	
I do not protect the patient against sudden death	25.93%	7
Live vest in most cases	22.22%	6
Live vest in selected cases only	18.52%	5
Hospital admission and telemetry (no ambulatory radiotherapy in these patients).	33.33%	9
Total		27