Supplemental Online Content

Kim KH, Oh J, Yang G, et al. Association of sinoatrial node radiation dose with atrial fibrillation and mortality in patients with lung cancer. *JAMA Oncol.* Published online September 22, 2022. doi:10.1001/jamaoncol.2022.4202

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eMethods

Coronary calcium measurement

Coronary artery calcium (CAC) was assessed using planning CT scans without contrast enhancement and without electrocardiogram (ECG)-synchronization with slice distances of 3.0 mm or less. The presence of calcification in left main, left anterior descending, left circumflex, and right coronary artery was reported separately. Patients with CAC score > 0 were considered to have coronary artery calcification. In addition, calcification in the aortic valve and mitral valve was evaluated manually.

Statistical analysis

The 95% confidence interval for C-indices were estimated through bootstrapping. The cumulative incidence of the designated cardiac event was estimated using a competing risk analysis where death of any cause was considered a competing event. Comparisons were made using Gray's test. The optimal cut-off point of the selected parameter was determined where the Gray's test statistic was maximised. OS was estimated using Kaplan-Meier curves and compared with log-rank tests. For multivariable analysis, a backwards stepwise regression was performed for the multivariable analysis. The multivariable model that minimised the Akaike information criterion value was chosen.

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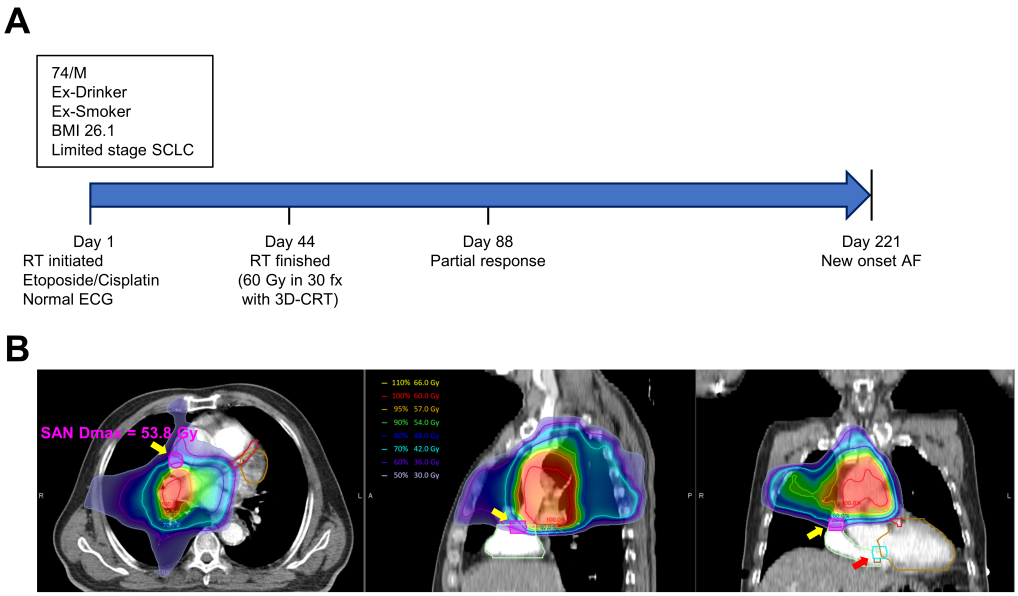

eFigure 1. Representative patient who developed AF after completion of definitive CRT. (A) A brief timeline of the treatment received, and events occurring during the follow-up period. AF developed 7 months after the initiation of CRT. (B) Isodose line is depicted on the patient's CT scan and SAN is delineated (*magenta*) and indicated with a *yellow* arrow. The AVN is delineated (*sky blue*) and indicated with a *red* arrow. SAN D_{max} is 53.8 Gy in this patient. AF = atrial fibrillation; AVN = atrioventricular node; CRT = chemoradiotherapy; SAN = sinoatrial node.

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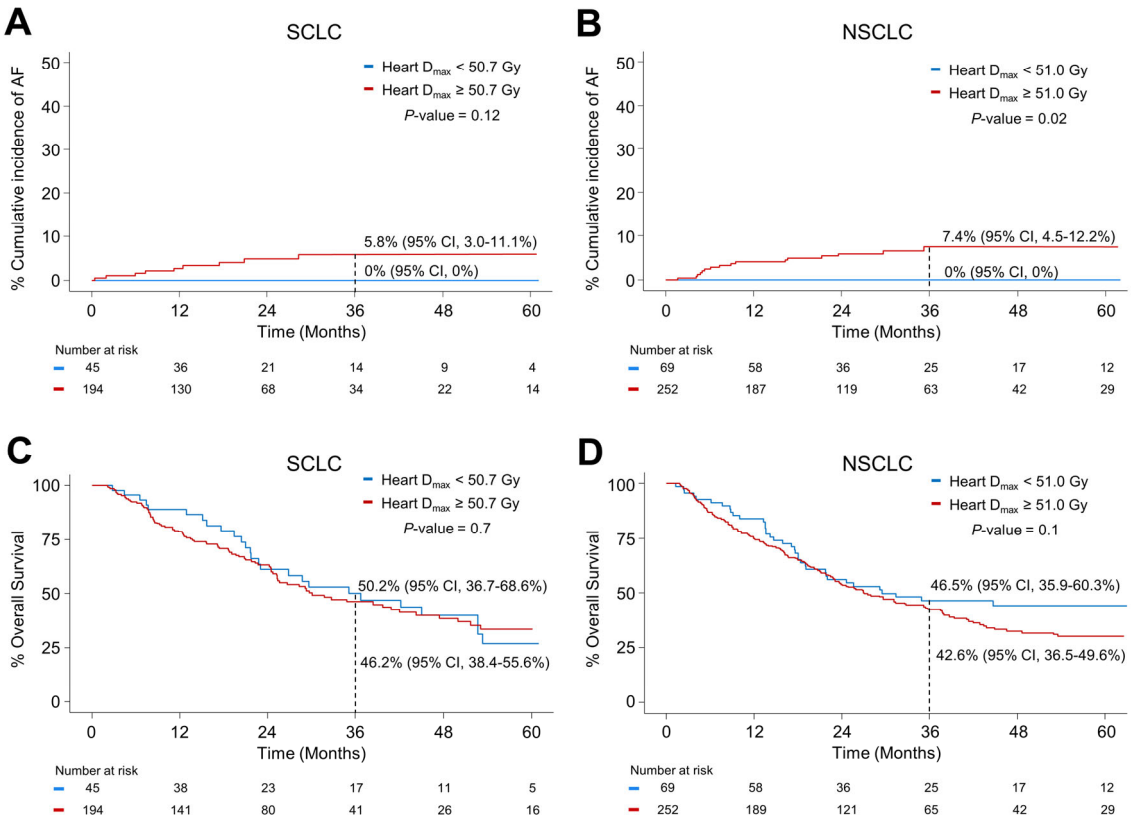

eFigure 2. Incidence of new onset AF and overall survival according to Heart D_{max}. (A-B) Cumulative incidence of AF in the SCLC (A) and NSCLC (B) cohorts. (C-D) Overall survival in patients with SCLC (C) and NSCLC (D). Optimal cut-off values that best predicted AF were determined.

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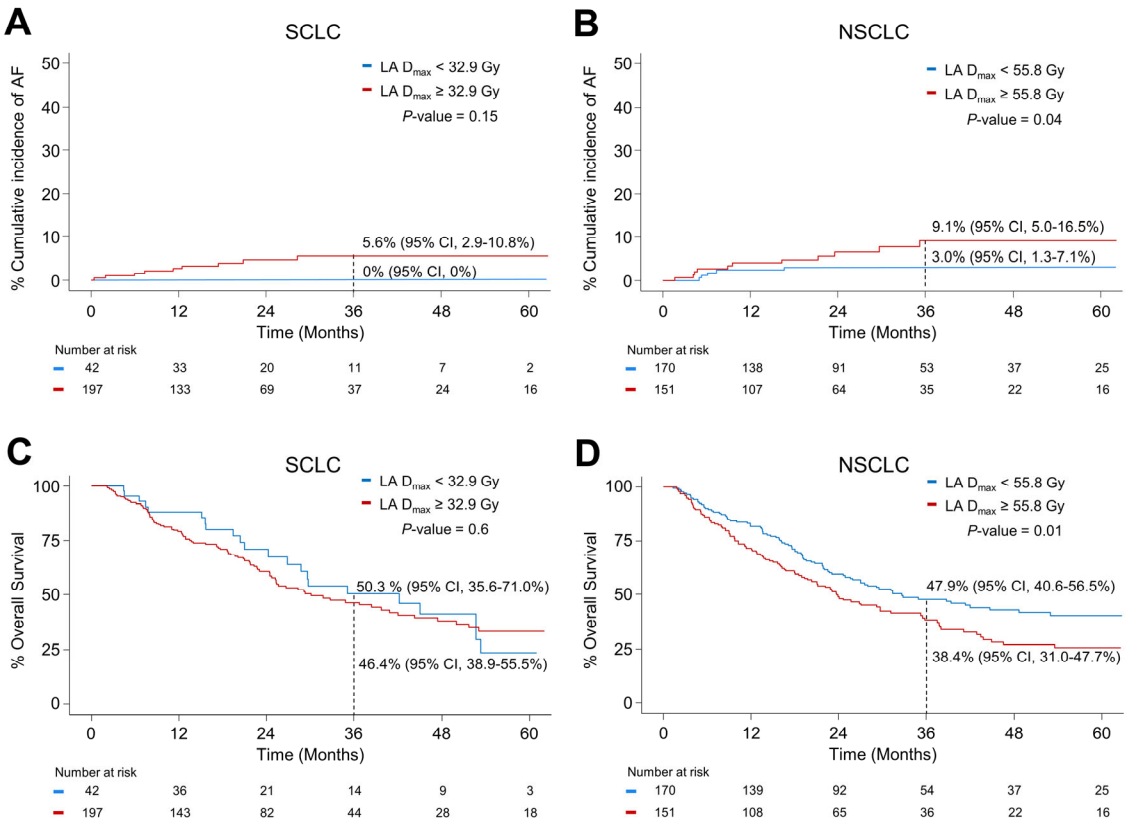

eFigure 3. Incidence of new onset AF and overall survival according to LA D_{max}. (A-B) Cumulative incidence of AF in the SCLC (A) and NSCLC (B) cohorts. (C-D) Overall survival in patients with SCLC (C) and NSCLC (D). Optimal cut-off values that best predicted AF were determined.

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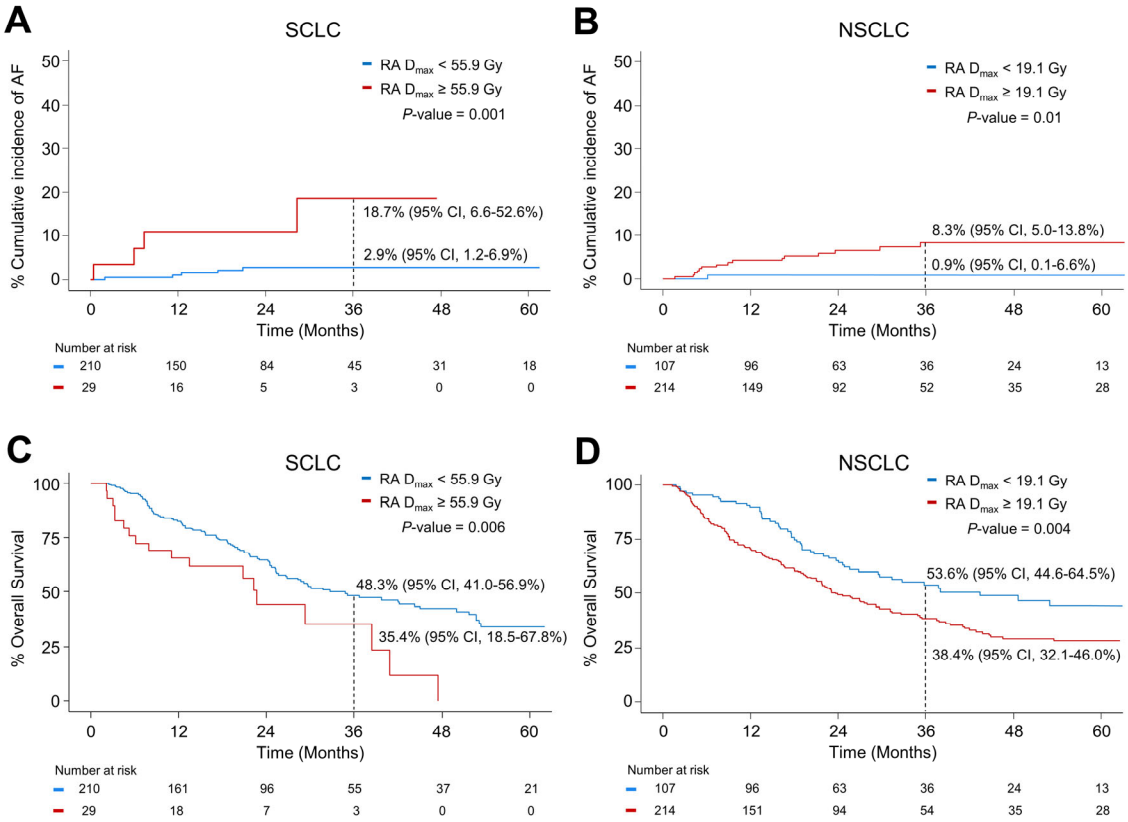

eFigure 4. Incidence of new onset AF and overall survival according to RA D_{max}. (A-B) Cumulative incidence of AF in the SCLC (A) and NSCLC (B) cohorts. (C-D) Overall survival in patients with SCLC (C) and NSCLC (D). Optimal cut-off values that best predicted AF were determined.

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eTable 1. Time dependent area under the receiver operating characteristic curve analysis of dose variables for cardiac substructures and atrial fibrillation (AF) in total, SCLC, and NSCLC cohorts

	Total (n = 560)		SCLC (n = 239)		NSCLC (n = 321)	
Predictors	**Mean (SD)**	**c-index (95% CI)**	**Mean (SD)**	**c-index (95% CI)**	**Mean (SD)**	**c-index (95% CI)**
Heart_Mean	11.80 (8.08)	0.58 (0.51, 0.70)	11.46 (8.08)	0.51 (0.50, 0.65)	12.26 (8.08)	0.63 (0.51, 0.77)
Heart_Dmax	55.94 (13.68)	0.62 (0.56, 0.72)	56.34 (15.14)	0.59 (0.51, 0.75)	55.41 (11.46)	0.62 (0.54, 0.69)
Heart_V5	49.83 (29.94)	0.59 (0.51, 0.67)	48.75 (31.28)	0.53 (0.51, 0.74)	51.27 (28.03)	0.63 (0.51, 0.76)
Heart_V10	36.87 (26.18)	0.58 (0.51, 0.68)	36.12 (27.00)	0.51 (0.50, 0.66)	37.87 (25.05)	0.62 (0.51, 0.75)
Heart_V15	27.90 (22.17)	0.57 (0.50, 0.68)	27.34 (22.59)	0.52 (0.50, 0.66)	28.66 (21.61)	0.62 (0.50, 0.77)
Heart_V20	21.86 (19.22)	0.57 (0.50, 0.67)	21.24 (19.19)	0.51 (0.50, 0.67)	22.69 (19.26)	0.62 (0.51, 0.74)
Heart_V25	17.23 (16.49)	0.57 (0.51, 0.67)	16.52 (16.07)	0.50 (0.50, 0.66)	18.18 (17.01)	0.61 (0.51, 0.72)
Heart_V30	13.50 (14.09)	0.56 (0.50, 0.65)	12.76 (13.24)	0.51 (0.50, 0.68)	14.50 (15.14)	0.60 (0.51, 0.74)
Heart_V35	10.36 (11.90)	0.55 (0.50, 0.62)	9.61 (10.74)	0.51 (0.50, 0.68)	11.36 (13.26)	0.58 (0.50, 0.68)
Heart_V40	7.66 (9.81)	0.54 (0.50, 0.62)	6.97 (8.63)	0.52 (0.50, 0.69)	8.59 (11.14)	0.57 (0.50, 0.66)
Heart_V45	5.43 (7.99)	0.54 (0.50, 0.61)	4.93 (7.09)	0.53 (0.50, 0.70)	6.11 (9.04)	0.56 (0.50, 0.64)
Heart_V50	3.45 (5.72)	0.55 (0.50, 0.59)	3.34 (5.54)	0.53 (0.50, 0.67)	3.59 (5.96)	0.56 (0.50, 0.67)
Heart_V55	1.72 (3.11)	0.54 (0.50, 0.61)	1.98 (3.33)	0.54 (0.50, 0.60)	1.37 (2.75)	0.57 (0.50, 0.68)
Heart_V60	0.75 (1.75)	0.52 (0.50, 0.58)	0.91 (1.75)	0.55 (0.50, 0.66)	0.54 (1.73)	0.55 (0.50, 0.64)
RA_Mean	11.58 (11.52)	0.58 (0.51, 0.69)	10.69 (10.72)	0.53 (0.50, 0.70)	12.78 (12.43)	0.62 (0.51, 0.74)
RA_Dmax	30.84 (20.08)	0.62 (0.54, 0.71)	29.98 (20.37)	0.65 (0.51, 0.81)	32.00 (19.68)	0.61 (0.52, 0.71)
RA_V5	48.91 (39.81)	0.59 (0.51, 0.67)	46.35 (40.01)	0.52 (0.50, 0.74)	52.35 (39.36)	0.63 (0.52, 0.75)
RA_V10	37.18 (37.88)	0.58 (0.51, 0.69)	35.16 (37.41)	0.52 (0.50, 0.67)	39.89 (38.42)	0.63 (0.51, 0.76)
RA_V15	28.22 (34.18)	0.57 (0.50, 0.67)	26.38 (32.96)	0.51 (0.50, 0.64)	30.69 (35.68)	0.61 (0.51, 0.75)
RA_V20	22.07 (30.37)	0.57 (0.51, 0.67)	20.20 (28.61)	0.51 (0.50, 0.66)	24.58 (32.48)	0.61 (0.51, 0.73)
RA_V25	17.26 (26.90)	0.57 (0.50, 0.66)	15.43 (24.80)	0.51 (0.50, 0.68)	19.72 (29.36)	0.61 (0.51, 0.73)
RA_V30	13.24 (23.38)	0.57 (0.50, 0.66)	11.47 (21.13)	0.52 (0.50, 0.65)	15.62 (25.95)	0.60 (0.51, 0.71)
RA_V35	9.54 (19.29)	0.55 (0.50, 0.64)	7.83 (16.56)	0.53 (0.50, 0.65)	11.83 (22.28)	0.57 (0.50, 0.68)
RA_V40	6.44 (15.54)	0.54 (0.50, 0.61)	4.85 (12.43)	0.54 (0.50, 0.66)	8.57 (18.74)	0.54 (0.50, 0.65)
RA_V45	4.09 (12.25)	0.53 (0.50, 0.59)	3.02 (9.52)	0.54 (0.50, 0.66)	5.53 (15.06)	0.52 (0.50, 0.54)
RA_V50	2.31 (9.06)	0.52 (0.50, 0.58)	1.79 (6.66)	0.53 (0.50, 0.63)	2.99 (11.51)	0.51 (0.50, 0.58)
RA_V55	0.96 (4.61)	0.51 (0.50, 0.53)	0.88 (4.25)	0.50 (0.49, 0.55)	1.06 (5.06)	0.50 (0.50, 0.56)
RA_V60	0.36 (2.56)	0.51 (0.50, 0.53)	0.35 (2.23)	0.51 (0.50, 0.53)	0.38 (2.95)	0.51 (0.50, 0.54)
RV_Mean	7.56 (7.41)	0.54 (0.50, 0.64)	7.30 (7.29)	0.56 (0.51, 0.69)	7.92 (7.59)	0.60 (0.51, 0.73)
RV_Dmax	27.15 (15.49)	0.50 (0.50, 0.60)	26.28 (15.57)	0.55 (0.51, 0.70)	28.32 (15.33)	0.54 (0.50, 0.66)
RV_V5	40.40 (34.90)	0.57 (0.51, 0.68)	39.78 (36.10)	0.54 (0.5, 0.69)	41.23 (33.28)	0.62 (0.51, 0.78)
RV_V10	27.51 (30.04)	0.55 (0.50, 0.65)	27.36 (30.91)	0.57 (0.51, 0.70)	27.71 (28.90)	0.60 (0.50, 0.74)
RV_V15	17.97 (24.37)	0.53 (0.50, 0.61)	17.67 (24.51)	0.60 (0.51, 0.74)	18.36 (24.24)	0.59 (0.51, 0.71)
RV_V20	11.91 (19.82)	0.52 (0.50, 0.62)	11.39 (19.48)	0.58 (0.51, 0.77)	12.60 (20.28)	0.57 (0.50, 0.69)
RV_V25	7.57 (15.46)	0.53 (0.50, 0.61)	7.03 (15.34)	0.55 (0.51, 0.75)	8.30 (15.62)	0.56 (0.50, 0.69)
RV_V30	4.66 (11.63)	0.52 (0.50, 0.58)	4.03 (10.54)	0.52 (0.50, 0.73)	5.51 (12.93)	0.54 (0.50, 0.62)
RV_V35	2.82 (9.04)	0.51 (0.50, 0.60)	2.22 (7.58)	0.51 (0.50, 0.64)	3.62 (10.65)	0.50 (0.50, 0.64)
RV_V40	1.62 (7.35)	0.52 (0.50, 0.52)	1.17 (5.94)	0.51 (0.50, 0.64)	2.22 (8.87)	0.54 (0.50, 0.53)
RV_V45	1.04 (6.61)	0.52 (0.50, 0.58)	0.69 (5.15)	0.51 (0.50, 0.60)	1.52 (8.17)	0.54 (0.51, 0.61)
RV_V50	0.59 (4.33)	0.54 (0.52, 0.56)	0.43 (3.76)	0.55 (0.53, 0.57)	0.81 (4.98)	0.53 (0.51, 0.55)
RV_V55	0.17 (1.47)	0.52 (0.51, 0.54)	0.15 (1.27)	0.52 (0.51, 0.54)	0.18 (1.70)	0.52 (0.50, 0.54)
RV_V60	0.03 (0.33)	0.51 (0.50, 0.52)	0.03 (0.41)	0.50 (0.50, 0.51)	0.02 (0.19)	0.51 (0.50, 0.54)

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LA_Mean	17.09 (11.98)	0.59 (0.51, 0.72)	16.49 (11.87)	0.51 (0.50, 0.73)	17.90 (12.09)	0.65 (0.51, 0.79)
LA_Dmax	47.47 (18.26)	0.58 (0.50, 0.70)	47.03 (19.76)	0.56 (0.50, 0.73)	48.07 (16.04)	0.58 (0.51, 0.77)
LA_V5	65.95 (33.39)	0.60 (0.51, 0.71)	63.74 (34.46)	0.55 (0.50, 0.74)	68.93 (31.72)	0.63 (0.51, 0.77)
LA_V10	51.71 (34.02)	0.57 (0.51, 0.68)	50.02 (34.30)	0.50 (0.50, 0.76)	53.98 (33.58)	0.61 (0.51, 0.75)
LA_V15	40.43 (31.74)	0.57 (0.51, 0.68)	39.15 (31.87)	0.51 (0.50, 0.72)	42.16 (31.57)	0.62 (0.51, 0.75)
LA_V20	32.56 (28.95)	0.57 (0.51, 0.69)	31.42 (28.86)	0.52 (0.50, 0.72)	34.08 (29.08)	0.63 (0.52, 0.77)
LA_V25	26.97 (26.69)	0.57 (0.50, 0.69)	25.76 (26.14)	0.54 (0.50, 0.74)	28.61 (27.38)	0.63 (0.51, 0.80)
LA_V30	22.41 (24.30)	0.57 (0.50, 0.68)	21.16 (23.29)	0.54 (0.50, 0.74)	24.08 (25.55)	0.63 (0.51, 0.79)
LA_V35	18.30 (21.75)	0.57 (0.51, 0.68)	16.98 (20.36)	0.54 (0.50, 0.74)	20.07 (23.42)	0.64 (0.52, 0.79)
LA_V40	14.46 (18.95)	0.57 (0.51, 0.67)	13.25 (17.50)	0.52 (0.50, 0.73)	16.09 (20.66)	0.63 (0.52, 0.79)
LA_V45	10.53 (15.66)	0.58 (0.51, 0.68)	9.71 (14.58)	0.51 (0.50, 0.69)	11.64 (16.98)	0.62 (0.53, 0.76)
LA_V50	6.83 (11.87)	0.58 (0.51, 0.66)	6.70 (11.50)	0.50 (0.50, 0.68)	7.00 (12.38)	0.62 (0.51, 0.74)
LA_V55	3.48 (7.63)	0.56 (0.50, 0.63)	4.01 (8.06)	0.56 (0.50, 0.68)	2.78 (6.96)	0.60 (0.51, 0.69)
LA_V60	1.40 (4.39)	0.54 (0.51, 0.61)	1.71 (4.74)	0.52 (0.50, 0.63)	0.99 (3.83)	0.57 (0.50, 0.71)
LV_Mean	7.24 (8.76)	0.53 (0.50, 0.62)	7.08 (8.87)	0.50 (0.50, 0.68)	7.45 (8.62)	0.54 (0.50, 0.67)
LV_Dmax	26.22 (19.88)	0.55 (0.50, 0.66)	25.15 (20.10)	0.55 (0.50, 0.70)	27.65 (19.53)	0.60 (0.50, 0.71)
LV_V5	35.36 (35.90)	0.57 (0.50, 0.68)	35.12 (36.89)	0.53 (0.50, 0.68)	35.70 (34.59)	0.59 (0.50, 0.79)
LV_V10	21.82 (30.42)	0.53 (0.50, 0.64)	21.70 (31.39)	0.50 (0.50, 0.65)	21.98 (29.14)	0.55 (0.50, 0.68)
LV_V15	15.09 (26.40)	0.51 (0.50, 0.60)	15.17 (27.36)	0.53 (0.50, 0.78)	14.98 (25.10)	0.54 (0.50, 0.67)
LV_V20	11.35 (22.76)	0.50 (0.50, 0.59)	11.28 (23.43)	0.52 (0.50, 0.73)	11.45 (21.87)	0.52 (0.50, 0.62)
LV_V25	8.47 (18.74)	0.50 (0.50, 0.58)	8.14 (18.84)	0.51 (0.50, 0.71)	8.90 (18.63)	0.51 (0.50, 0.62)
LV_V30	6.12 (15.09)	0.50 (0.50, 0.57)	5.67 (14.82)	0.50 (0.50, 0.71)	6.74 (15.46)	0.50 (0.50, 0.60)
LV_V35	4.34 (12.14)	0.50 (0.50, 0.57)	3.84 (11.72)	0.50 (0.50, 0.69)	5.00 (12.67)	0.50 (0.49, 0.59)
LV_V40	2.97 (9.58)	0.50 (0.50, 0.56)	2.55 (9.12)	0.51 (0.50, 0.64)	3.54 (10.15)	0.50 (0.49, 0.58)
LV_V45	2.05 (7.89)	0.51 (0.49, 0.55)	1.74 (7.53)	0.52 (0.50, 0.63)	2.46 (8.35)	0.50 (0.49, 0.58)
LV_V50	1.22 (6.01)	0.51 (0.49, 0.56)	1.11 (6.17)	0.52 (0.50, 0.61)	1.36 (5.80)	0.50 (0.49, 0.57)
LV_V55	0.49 (2.88)	0.51 (0.49, 0.55)	0.56 (3.52)	0.56 (0.50, 0.59)	0.40 (1.68)	0.50 (0.50, 0.55)
LV_V60	0.16 (0.92)	0.52 (0.51, 0.55)	0.17 (1.02)	0.53 (0.51, 0.55)	0.14 (0.77)	0.52 (0.50, 0.55)
RCA_Mean	10.42 (10.31)	0.55 (0.50, 0.63)	9.51 (9.50)	0.55 (0.50, 0.69)	11.65 (11.21)	0.61 (0.51, 0.74)
RCA_Dmax	17.38 (14.16)	0.57 (0.51, 0.65)	15.82 (13.58)	0.53 (0.50, 0.73)	19.47 (14.67)	0.60 (0.51, 0.71)
RCA_V5	51.99 (41.74)	0.55 (0.50, 0.65)	48.52 (41.89)	0.54 (0.50, 0.66)	56.64 (41.17)	0.60 (0.51, 0.73)
RCA_V10	38.34 (40.02)	0.53 (0.50, 0.63)	35.41 (39.85)	0.55 (0.50, 0.68)	42.27 (40.00)	0.57 (0.50, 0.71)
RCA_V15	26.93 (35.60)	0.53 (0.50, 0.62)	24.76 (34.51)	0.58 (0.50, 0.71)	29.85 (36.89)	0.59 (0.50, 0.72)
RCA_V20	18.86 (31.18)	0.55 (0.50, 0.65)	17.12 (29.66)	0.57 (0.50, 0.67)	21.19 (33.04)	0.62 (0.52, 0.78)
RCA_V25	12.53 (26.20)	0.56 (0.50, 0.64)	11.06 (24.50)	0.55 (0.50, 0.66)	14.50 (28.25)	0.63 (0.51, 0.73)
RCA_V30	8.25 (21.51)	0.53 (0.50, 0.60)	7.18 (19.71)	0.52 (0.50, 0.63)	9.70 (23.69)	0.57 (0.50, 0.68)
RCA_V35	4.84 (16.50)	0.52 (0.50, 0.58)	3.65 (13.22)	0.50 (0.50, 0.51)	6.45 (19.99)	0.53 (0.50, 0.59)
RCA_V40	2.77 (12.82)	0.51 (0.50, 0.56)	1.44 (8.38)	0.50 (0.50, 0.57)	4.55 (16.91)	0.54 (0.51, 0.57)
RCA_V45	1.56 (9.34)	0.50 (0.50, 0.53)	0.71 (5.87)	0.51 (0.50, 0.57)	2.70 (12.50)	0.52 (0.50, 0.54)
RCA_V50	0.75 (6.79)	0.51 (0.50, 0.51)	0.12 (1.66)	0.51 (0.50, 0.57)	1.60 (10.17)	0.50 (0.49, 0.51)
RCA_V55	0.35 (4.76)	0.50 (0.50, 0.50)	0.04 (0.74)	0.50 (0.50, 0.57)	0.76 (7.23)	0.50 (0.49, 0.51)
RCA_V60	0.07 (1.48)	0.50 (0.50, 0.50)	0.01 (0.26)	0.50 (0.50, 0.50)	0.15 (2.25)	0.50 (0.49, 0.51)
LAD_Mean	10.72 (9.65)	0.50 (0.50, 0.60)	10.37 (9.46)	0.52 (0.50, 0.71)	11.20 (9.90)	0.51 (0.50, 0.63)
LAD_Dmax	24.88 (17.12)	0.51 (0.50, 0.60)	23.20 (16.31)	0.52 (0.50, 0.75)	27.14 (17.94)	0.51 (0.50, 0.64)
LAD_V5	53.41 (33.46)	0.54 (0.50, 0.66)	53.67 (34.74)	0.51 (0.50, 0.68)	53.07 (31.72)	0.55 (0.50, 0.71)
LAD_V10	35.22 (33.08)	0.51 (0.50, 0.63)	35.40 (33.86)	0.55 (0.51, 0.71)	34.99 (32.07)	0.54 (0.50, 0.69)
LAD_V15	23.76 (29.16)	0.51 (0.50, 0.61)	23.56 (29.99)	0.53 (0.50, 0.73)	24.01 (28.06)	0.51 (0.50, 0.66)

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LAD_V20	17.48 (25.97)	0.50 (0.50, 0.61)	16.86 (26.51)	0.51 (0.50, 0.73)	18.31 (25.26)	0.51 (0.50, 0.62)
LAD_V25	13.57 (22.88)	0.51 (0.50, 0.59)	12.53 (22.93)	0.50 (0.50, 0.70)	14.96 (22.79)	0.51 (0.50, 0.60)
LAD_V30	10.34 (19.75)	0.52 (0.50, 0.60)	9.18 (19.10)	0.51 (0.50, 0.67)	11.90 (20.53)	0.52 (0.50, 0.60)
LAD_V35	7.64 (17.01)	0.53 (0.50, 0.61)	6.41 (15.81)	0.52 (0.50, 0.69)	9.30 (18.40)	0.53 (0.50, 0.60)
LAD_V40	5.32 (14.08)	0.53 (0.50, 0.59)	4.27 (12.79)	0.52 (0.50, 0.66)	6.72 (15.57)	0.53 (0.50, 0.59)
LAD_V45	3.53 (11.82)	0.54 (0.51, 0.53)	2.57 (10.18)	0.52 (0.50, 0.65)	4.82 (13.63)	0.56 (0.50, 0.59)
LAD_V50	2.12 (9.37)	0.52 (0.51, 0.55)	1.50 (8.27)	0.51 (0.50, 0.61)	2.96 (10.63)	0.55 (0.53, 0.60)
LAD_V55	1.03 (5.92)	0.54 (0.51, 0.53)	0.71 (5.05)	0.55 (0.52, 0.57)	1.46 (6.92)	0.53 (0.52, 0.59)
LAD_V60	0.37 (3.35)	0.52 (0.51, 0.53)	0.24 (3.10)	0.52 (0.51, 0.55)	0.54 (3.66)	0.52 (0.50, 0.54)
LCX_Mean	14.90 (15.97)	0.55 (0.50, 0.60)	14.25 (15.46)	0.55 (0.50, 0.69)	15.77 (16.62)	0.53 (0.50, 0.65)
LCX_Dmax	24.33 (20.38)	0.52 (0.50, 0.64)	23.53 (20.27)	0.52 (0.50, 0.68)	25.40 (20.53)	0.52 (0.50, 0.68)
LCX_V5	58.63 (39.41)	0.55 (0.50, 0.67)	57.83 (40.30)	0.55 (0.50, 0.69)	59.72 (38.24)	0.55 (0.50, 0.71)
LCX_V10	38.27 (39.51)	0.52 (0.50, 0.65)	37.76 (40.10)	0.55 (0.50, 0.69)	38.94 (38.78)	0.55 (0.50, 0.69)
LCX_V15	29.76 (38.35)	0.51 (0.50, 0.65)	29.46 (38.38)	0.56 (0.50, 0.70)	30.17 (38.38)	0.55 (0.50, 0.67)
LCX_V20	25.52 (37.13)	0.50 (0.50, 0.60)	24.72 (36.74)	0.56 (0.51, 0.69)	26.60 (37.69)	0.52 (0.50, 0.64)
LCX_V25	22.38 (35.58)	0.51 (0.50, 0.59)	21.11 (34.87)	0.56 (0.50, 0.70)	24.09 (36.52)	0.52 (0.50, 0.65)
LCX_V30	19.76 (34.06)	0.52 (0.50, 0.59)	18.34 (33.09)	0.55 (0.51, 0.69)	21.68 (35.31)	0.51 (0.50, 0.66)
LCX_V35	16.96 (31.83)	0.52 (0.50, 0.58)	15.14 (30.11)	0.54 (0.51, 0.67)	19.40 (33.92)	0.50 (0.50, 0.64)
LCX_V40	14.20 (29.25)	0.51 (0.50, 0.58)	12.05 (26.70)	0.54 (0.50, 0.66)	17.08 (32.20)	0.51 (0.49, 0.63)
LCX_V45	11.28 (26.23)	0.51 (0.50, 0.60)	9.04 (23.50)	0.55 (0.50, 0.63)	14.29 (29.28)	0.51 (0.50, 0.61)
LCX_V50	8.44 (22.58)	0.51 (0.49, 0.57)	6.82 (20.55)	0.53 (0.51, 0.63)	10.61 (24.92)	0.51 (0.50, 0.61)
LCX_V55	5.01 (17.45)	0.51 (0.50, 0.55)	4.84 (16.86)	0.55 (0.52, 0.56)	5.23 (18.25)	0.51 (0.50, 0.60)
LCX_V60	2.23 (10.77)	0.52 (-, -)	2.23 (11.02)	0.53 (0.52, 0.56)	2.24 (10.46)	0.52 (-, -)
SAN_Mean	20.87 (16.80)	0.64 (0.53, 0.73)	20.08 (16.44)	0.66 (0.51, 0.85)	21.95 (17.24)	0.63 (0.52, 0.73)
SAN_Dmax	27.35 (18.87)	0.66 (0.56, 0.74)	26.95 (18.81)	0.68 (0.52, 0.84)	27.89 (18.98)	0.66 (0.54, 0.76)
SAN_V5	74.74 (39.29)	0.60 (0.53, 0.66)	73.26 (39.84)	0.53 (0.50, 0.72)	76.74 (38.54)	0.64 (0.57, 0.73)
SAN_V10	61.87 (44.64)	0.64 (0.55, 0.73)	60.82 (44.66)	0.61 (0.50, 0.78)	63.28 (44.66)	0.66 (0.55, 0.75)
SAN_V15	51.51 (45.93)	0.66 (0.58, 0.74)	49.81 (45.73)	0.66 (0.51, 0.83)	53.79 (46.20)	0.67 (0.56, 0.77)
SAN_V20	44.64 (45.88)	0.62 (0.53, 0.71)	43.21 (45.30)	0.65 (0.51, 0.81)	46.57 (46.66)	0.61 (0.51, 0.74)
SAN_V25	38.48 (44.85)	0.60 (0.51, 0.70)	36.84 (43.95)	0.64 (0.51, 0.80)	40.67 (46.02)	0.58 (0.50, 0.74)
SAN_V30	31.55 (42.32)	0.59 (0.50, 0.68)	29.02 (40.87)	0.63 (0.50, 0.81)	34.94 (44.06)	0.58 (0.51, 0.73)
SAN_V35	24.76 (38.92)	0.61 (0.51, 0.72)	22.64 (37.64)	0.64 (0.51, 0.80)	27.60 (40.48)	0.60 (0.50, 0.74)
SAN_V40	18.26 (34.37)	0.58 (0.51, 0.68)	16.20 (32.26)	0.62 (0.51, 0.77)	21.03 (36.91)	0.57 (0.50, 0.69)
SAN_V45	12.06 (28.28)	0.55 (0.50, 0.64)	10.46 (26.14)	0.59 (0.50, 0.72)	14.20 (30.84)	0.53 (0.50, 0.62)
SAN_V50	6.57 (21.23)	0.54 (0.50, 0.60)	6.54 (21.14)	0.57 (0.50, 0.74)	6.61 (21.38)	0.52 (0.50, 0.61)
SAN_V55	3.36 (14.64)	0.51 (0.50, 0.55)	3.22 (13.94)	0.52 (0.49, 0.54)	3.55 (15.55)	0.52 (0.50, 0.59)
SAN_V60	1.06 (7.93)	0.50 (0.50, 0.53)	1.10 (7.75)	0.51 (0.50, 0.52)	1.01 (8.19)	0.50 (0.50, 0.54)
AVN_Mean	8.51 (9.96)	0.55 (0.50, 0.64)	7.32 (9.26)	0.56 (0.50, 0.74)	10.11 (10.65)	0.61 (0.51, 0.76)
AVN_Dmax	11.60 (12.51)	0.55 (0.50, 0.65)	9.87 (11.62)	0.55 (0.50, 0.70)	13.92 (13.29)	0.62 (0.51, 0.78)
AVN_V5	43.17 (47.14)	0.56 (0.51, 0.65)	38.07 (46.62)	0.51 (0.50, 0.68)	50.02 (47.06)	0.59 (0.51, 0.72)
AVN_V10	32.96 (43.86)	0.52 (0.50, 0.65)	27.95 (42.15)	0.56 (0.50, 0.72)	39.69 (45.27)	0.57 (0.51, 0.69)
AVN_V15	21.79 (37.73)	0.51 (0.50, 0.60)	18.29 (35.37)	0.59 (0.51, 0.70)	26.49 (40.27)	0.53 (0.50, 0.65)
AVN_V20	13.95 (31.15)	0.52 (0.50, 0.63)	11.51 (28.84)	0.56 (0.50, 0.64)	17.24 (33.79)	0.56 (0.50, 0.69)
AVN_V25	8.61 (24.47)	0.53 (0.50, 0.61)	6.60 (21.74)	0.54 (0.50, 0.60)	11.30 (27.54)	0.57 (0.50, 0.73)
AVN_V30	5.18 (18.96)	0.53 (0.50, 0.62)	3.77 (16.71)	0.53 (0.50, 0.57)	7.08 (21.52)	0.56 (0.51, 0.69)
AVN_V35	2.92 (14.19)	0.52 (0.50, 0.57)	2.13 (12.54)	0.53 (0.51, 0.56)	3.99 (16.11)	0.54 (0.50, 0.63)
AVN_V40	1.54 (10.22)	0.51 (0.50, 0.53)	1.07 (8.22)	0.51 (0.50, 0.52)	2.17 (12.41)	0.51 (0.50, 0.57)

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AVN_V45	0.85 (7.48)	0.50 (0.50, 0.51)	0.35 (4.77)	0.51 (0.50, 0.52)	1.51 (10.01)	0.50 (0.49, 0.56)
AVN_V50	0.23 (3.38)	0.50 (0.50, 0.51)	0.20 (3.51)	0.50 (0.50, 0.52)	0.28 (3.21)	0.50 (0.49, 0.51)
AVN_V55	0.02 (0.38)	0.50 (0.49, 0.51)	0.03 (0.50)	-	0.00 (0.00)	0.50 (0.49, 0.51)
AVN_V60	0.00 (0.00)	-	0.00 (0.00)	-	0.00 (0.00)	-

SCLC = small cell lung cancer; NSCLC = non-small cell lung cancer; RA = right atrium; RV = right ventricle; LA = left atrium; LV = left ventricle; RCA = right coronary artery; LAD = left anterior descending artery; LCX = left circumflex artery; SAN = sinoatrial node; AVN = atrioventricular node; SD = standard deviation.

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eTable 2. C-index of the top 5 dose volume parameters for cardiac substructures predictive for atrial fibrillation in total, SCLC, and NSCLC cohorts

Total (n = 560)		SCLC (n = 239)		NSCLC (n = 321)	
Predictors	**c-index**	**Predictors**	**c-index**	**Predictors**	**c-index**
SAN Dmax	0.661 (0.563, 0.742)	SAN Dmax	0.675 (0.516, 0.837)	SAN V15Gy	0.665 (0.563, 0.775)
SAN V15Gy	0.658 (0.577, 0.738)	SAN V15Gy	0.659 (0.509, 0.830)	SAN Dmax	0.660 (0.536, 0.759)
SAN V10Gy	0.637 (0.552, 0.726)	SAN Dmean	0.656 (0.509, 0.848)	SAN V10Gy	0.659 (0.548, 0.747)
SAN Dmean	0.636 (0.528, 0.735)	SAN V20Gy	0.648 (0.512, 0.808)	LA Dmean	0.649 (0.509, 0.787)
RA Dmax	0.619 (0.537, 0.715)	RA Dmax	0.648 (0.507, 0.809)	SAN V5Gy	0.638 (0.568, 0.730)

SCLC = small cell lung cancer; NSCLC = non-small cell lung cancer; RA = right atrium; LA = left atrium; SAN = sinoatrial node.

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eTable 3. Cox proportional hazards regression analysis for overall survival in SCLC cohort

		Univariable			Multivariable	
Variable	**HR**	**95% CI**	***P***	**aHR**	**95% CI**	***P***
SAN D_{max}, Gy						
<53.5	1.00	(ref)		1.00	(ref)	
≥53.5	2.05	1.19-3.53	0.01	2.68	1.53-4.71	<0.001
Age, y	1.03	1.01-1.05	0.002	1.02	1.00-1.05	0.03
Sex						
Male	1.00	(ref)				
Female	1.29	0.73-2.29	0.39			
ECOG Performance						
0	1.00	(ref)		1.00	(ref)	
1-2	3.17	1.29-7.77	0.01	2.24	0.89-5.61	0.09
Tobacco use						
Never	1.00	(ref)				
Ever	0.59	0.32-1.10	0.10			
Alcohol use						
Never	1.00	(ref)				
Ever	1.04	0.71-1.52	0.84			
Hypertension						
No	1.00	(ref)				
Yes	1.48	1.03-2.12	0.03			
Diabetes						
No	1.00	(ref)				
Yes	1.36	0.94-1.99	0.11			
Cardiovascular disease						
No	1.00	(ref)		1.00	(ref)	
Yes	1.98	1.33-2.94	0.001	1.54	1.00-2.36	0.05
Coronary artery calcium score						
No	1.00	(ref)				
Yes	0.96	0.63-1.46	0.85			
CAC score	1.00	1.00-1.00	0.62			
Number of coronary arteries with calcification						
0	1.00	(ref)				
1-2	0.94	0.55-1.58	0.82			
3-4	0.97	0.62-1.51	0.88			
Aortic valve calcification						
No	1.00	(ref)				
Yes	1.35	0.91-2.00	0.13			
Mitral valve calcification						
No	1.00	(ref)				
Yes	1.43	0.70-2.92	0.33			
Pericardial effusion						
No	1.00	(ref)				
Yes						
BMI, m^2/kg	1.07	1.02-1.13	0.009	1.06	1.00-1.12	0.04
AJCC Stage						
I-IIIA	1.00	(ref)				
IIIB-IIIC	0.98	0.68-1.40	0.90			
Chemotherapy						
Etoposide + Cisplatin	1.00	(ref)				
Etoposide + Carboplatin	0.85	0.60-1.22	0.39			
RT dose, Gy	0.95	0.92-0.98	0.003			
RT modality						

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3D-CRT	1.00	(ref)		1.00	(ref)	
IMRT	0.46	0.31-0.68	<0.001	0.50	0.33-0.74	<0.001

AJCC = American Joint Committee on Cancer; BMI = body mass index; CVD = cardiovascular disease; ECOG = Eastern Cooperative Oncology Group; IMRT = intensity modulated radiotherapy; NA = not applicable; RT = radiotherapy; SAN D_{max} = maximum radiation dose exposed to sinoatrial node; WHO = World Health Organization; 3-DCRT = 3-dimensional conformal radiotherapy

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eTable 4. Cox proportional hazards regression analysis for overall survival in NSCLC cohort

		Univariable			Multivariable	
Variable	**HR**	**95% CI**	***P***	**aHR**	**95% CI**	***P***
SAN D_{max}, Gy						
<20.0	1.00	(ref)		1.00	(ref)	
≥20.0	1.75	1.31-2.34	<0.001	1.97	1.45-2.68	<0.001
Age, y	1.02	1.01-1.04	0.001	1.03	1.01-1.05	<0.001
Sex						
Male	1.00	(ref)		1.00	(ref)	
Female	0.63	0.43-0.93	0.02	0.57	0.38-0.85	0.005
ECOG Performance						
0	1.00	(ref)	00.0	1.00	(ref)	
1-2	1.49	0.96-2.33	0.08	1.46	0.93-2.32	0.10
Tobacco use						
Never	1.00	(ref)				
Ever	1.55	1.09-2.21	0.02			
Alcohol use						
Never	1.00	(ref)				
Ever	0.97	0.73-1.30	0.86			
Hypertension						
No	1.00	(ref)				
Yes	1.28	0.97-1.69	0.09			
Diabetes						
No	1.00	(ref)		1.00	(ref)	
Yes	1.49	1.09-2.04	0.01	1.28	0.92-1.77	0.14
Cardiovascular disease						
No	1.00	(ref)				
Yes	1.13	0.80-1.65	0.52			
Coronary artery calcium score						
No	1.00	(ref)				
Yes	1.38	0.96-1.98	0.08			
CAC score	1.00	1.00-1.00	0.02			
Number of coronary arteries with calcification						
0	1.00	(ref)				
1-2	1.21	0.79-1.85	0.38			
3-4	1.56	1.06-2.28	0.02			
Aortic valve calcification						
No	1.00	(ref)		1.00	(ref)	
Yes	1.00	0.72-1.37	0.98	0.73	0.52-1.02	0.07
Mitral valve calcification						
No	1.00	(ref)				
Yes	1.05	0.64-1.72	0.85			
Pericarditis						
No	1.00	(ref)				
Yes						
BMI, m^2/kg	0.96	0.92-1.00	0.04	0.95	0.92-0.99	0.01
AJCC Stage						
II-IIIA	1.00	(ref)		1.00	(ref)	
IIIB-IIIC	1.51	1.11-2.05	0.009	1.53	1.11-2.10	0.009
Chemotherapy						
Others	1.00	(ref)				
Paclitaxel + Carboplatin	0.96	0.57-1.60	0.88			
Maintenance ICI						
No	1.00	(ref)				

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Yes	0.65	0.43-0.98	0.04			
RT dose, Gy	0.93	0.90-0.97	0.001	0.95	0.91-0.99	0.03
RT modality						
3D-CRT	1.00	(ref)				
IMRT	0.76	0.57-1.01	0.06			

AJCC = American Joint Committee on Cancer; BMI = body mass index; CVD = cardiovascular disease; ECOG = Eastern Cooperative Oncology Group; ICI = immune checkpoint inhibitor; IMRT = intensity modulated radiotherapy; NA = not applicable; RT = radiotherapy; SAN D_{max} = maximum radiation dose exposed to sinoatrial node; WHO = World Health Organization; 3-DCRT = 3-dimensional conformal radiotherapy

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eTable 5. Competing risk regression analysis for atrial fibrillation in SCLC cohort using RA D_{max}

		Univariable			Multivariable	
Variable	**HR**	**95% CI**	***P***	**aHR**	**95% CI**	***P***
RA D_{max}, Gy						
<55.9	1.00	(ref)		1.00	(ref)	
≥55.9	6.92	1.89-25.4	0.004	20.54	5.57-75.65	<0.001
Age, y	1.05	0.99-1.11	0.12	1.09	1.00-1.18	0.05
Sex	NA[a]					
Male						
Female						
ECOG Performance	NA					
0						
1-2						
Tobacco use						
Never	1.00	(ref)				
Ever	2.14	0.45-10.21	0.34			
Alcohol use						
Never	1.00	(ref)		1.00	(ref)	
Ever	4.24	0.55-32.83	0.17	8.32	1.11-61.94	0.04
Hypertension						
No	1.00	(ref)				
Yes	1.32	0.35-4.96	0.68			
Diabetes						
No	1.00	(ref)				
Yes	0.71	0.15-3.44	0.67			
Cardiovascular disease						
No	1.00	(ref)				
Yes	2.12	0.53-8.53	0.29			
Coronary artery calcium score						
No	1.00	(ref)				
Yes	0.96	0.20-4.75	0.96			
CAC score	1.00	1.00-1.00	0.61			
Number of coronary arteries with calcification						
0	1.00	(ref)				
1-2	2.34	0.45-12.3	0.31	1.83	0.37-9.02	0.46
3-4	0.39	0.05-2.83	0.35	0.18	0.02-1.41	0.10
Aortic valve calcification						
No	1.00	(ref)				
Yes	1.40	0.35-5.63	0.64			
Mitral valve calcification						
No	1.00	(ref)				
Yes	2.32	0.28-19.0	0.43			
Pericardial effusion	NA					
No						
Yes						
Chest surgery after CRT						
No	NA					
Yes						
BMI, m^2/kg	1.18	1.00-1.39	0.05	1.37	1.04-1.82	0.03
AJCC Stage						
I-IIIA	1.00	(ref)				
IIIB-IIIC	0.61	0.16-2.26	0.46			
Chemotherapy						
Etoposide + Cisplatin	1.00	(ref)				
Etoposide + Carboplatin	0.92	0.25-3.42	0.91			

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RT dose, Gy	0.99	0.89-1.10	0.83			
RT modality						
3D-CRT	1.00	(ref)				
IMRT	0.32	0.06-1.65	0.18			

[a]NA indicates categorical variable that had no events in one of the subgroup and not applicable for regression analysis.

AJCC = American Joint Committee on Cancer; BMI = body mass index; CVD = cardiovascular disease; DM = diabetes mellitus; ECOG = Eastern Cooperative Oncology Group; HTN = hypertension; IMRT = intensity modulated radiotherapy; NA = not applicable; RT = radiotherapy; SAN D_{max} = maximum radiation dose exposed to sinoatrial node; SCLC = small cell lung cancer; WHO = World Health Organization; 3-DCRT = 3-dimensional conformal radiotherapy

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eTable 6. Competing risk regression analysis for atrial fibrillation in NSCLC cohort using RA D_{max}

		Univariable			Multivariable	
Variable	**HR**	**95% CI**	***P***	**aHR**	**95% CI**	***P***
RA D_{max}, Gy						
<19.1	1.00	(ref)		1.00	(ref)	
≥19.1	4.60	1.04-20.3	0.04	5.97	1.34-26.57	0.02
Age, y	1.03	0.97-1.09	0.30			
Sex						
Male	1.00	(ref)				
Female	0.53	0.13-2.25	0.39			
ECOG Performance						
0	1.00	(ref)				
1-2	2.64	0.35-19.96	0.35			
Tobacco use						
Never	1.00	(ref)		1.00	(ref)	
Ever	5.15	0.71-37.7	0.11	4.45	0.64-31.16	0.13
Alcohol use						
Never	1.00	(ref)				
Ever	0.63	0.25-1.63	0.34			
Hypertension						
No	1.00	(ref)		1.00	(ref)	
Yes	3.38	1.19-9.56	0.02	3.70	1.26-10.85	0.02
Diabetes						
No	1.00	(ref)				
Yes	3.08	1.18-8.02	0.02			
Cardiovascular disease						
No	1.00	(ref)		1.00	(ref)	
Yes	0.69	0.16-2.95	0.61	0.35	0.09-1.37	0.13
Coronary artery calcium						
No	1.00	(ref)				
Yes	4.16	0.56-31.1	0.16			
CAC score	1.00	1.00-1.01	0.03			
Number of coronary arteries with calcification						
0	1.00	(ref)				
1-2	2.97	0.34-26.3	0.33			
3-4	4.96	0.65-37.8	0.12			
Aortic valve calcification						
No	1.00	(ref)		1.00	(ref)	
Yes	4.24	1.64-11	0.003	3.56	1.31-9.81	0.01
Mitral valve calcification						
No	1.00	(ref)				
Yes	2.45	0.69-8.64	0.16			
Pericardial effusion						
No	1.00	(ref)				
Yes	0.80	0.11-5.85	0.82			
Chest surgery after CRT						
No	NA[a]					
Yes						
BMI, m^2/kg	1.01	0.9-1.12	0.89			
AJCC Stage						
II-IIIA	1.00	(ref)				
IIIB-IIIC	0.94	0.35-2.54	0.90			
Chemotherapy						
Others	1.00	(ref)				
Paclitaxel + Carboplatin	0.71	0.16-3.11	0.65			

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Maintenance ICI						
No	1.00	(ref)				
Yes	0.91	0.26-3.15	0.88			
RT dose, Gy	1.05	0.94-1.17	0.39			
RT modality						
3D-CRT	1.00	(ref)				
IMRT	1.50	0.55-4.14	0.43			

[a]NA indicates categorical variable that had no events in one of the subgroup and not applicable for regression analysis.

AJCC = American Joint Committee on Cancer; BMI = body mass index; CVD = cardiovascular disease; DM = diabetes mellitus; ECOG = Eastern Cooperative Oncology Group; HTN = hypertension; ICI = immune checkpoint inhibitor; IMRT = intensity modulated radiotherapy; NA = not applicable; NSCLC = non-small cell lung cancer; RT = radiotherapy; SAN D_{max} = maximum radiation dose exposed to sinoatrial node; WHO = World Health Organization; 3D-CRT = 3-dimensional conformal radiotherapy

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eTable 7. Cox proportional hazards regression analysis for overall survival in SCLC cohort using RA D_{max}

		Univariable			Multivariable	
Variable	**HR**	**95% CI**	***P***	**aHR**	**95% CI**	***P***
RA D_{max}, Gy						
<55.9	1.00	(ref)		1.00	(ref)	
≥55.9	1.88	1.12-3.16	0.02	2.29	1.34-3.91	0.002
Age, y	1.03	1.01-1.05	0.002	1.02	1.00-1.04	0.07
Sex						
Male	1.00	(ref)				
Female	1.29	0.73-2.29	0.39			
ECOG Performance						
0	1.00	(ref)		1.00	(ref)	
1-2	3.17	1.29-7.77	0.01	2.30	0.91-5.79	0.08
Tobacco use						
Never	1.00	(ref)				
Ever	0.59	0.32-1.10	0.10			
Alcohol use						
Never	1.00	(ref)				
Ever	1.04	0.71-1.52	0.84			
Hypertension						
No	1.00	(ref)				
Yes	1.48	1.03-2.12	0.03			
Diabetes						
No	1.00	(ref)				
Yes	1.36	0.94-1.99	0.11			
Cardiovascular disease						
No	1.00	(ref)		1.00	(ref)	
Yes	1.98	1.33-2.94	0.001	1.53	1.00-2.35	0.05
Coronary artery calcium score						
No	1.00	(ref)				
Yes	0.96	0.63-1.46	0.85			
CAC score	1.00	1.00-1.00	0.62			
Number of coronary arteries with calcification						
0	1.00	(ref)				
1-2	0.94	0.55-1.58	0.82			
3-4	0.97	0.62-1.51	0.88			
Aortic valve calcification						
No	1.00	(ref)				
Yes	1.35	0.91-2.00	0.13			
Mitral valve calcification						
No	1.00	(ref)				
Yes	1.43	0.70-2.92	0.33			
Pericardial effusion						
No	1.00	(ref)				
Yes	1.05	0.51-2.14	0.90			
BMI, m^2/kg	1.07	1.02-1.13	0.009	1.05	1.00-1.11	0.06
AJCC Stage						
I-IIIA	1.00	(ref)				
IIIB-IIIC	0.98	0.68-1.40	0.90			
Chemotherapy						
Etoposide + Cisplatin	1.00	(ref)				
Etoposide + Carboplatin	0.85	0.60-1.22	0.39			
RT dose, Gy	0.95	0.92-0.98	0.003			
RT modality						

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3D-CRT	1.00	(ref)		1.00	(ref)	
IMRT	0.46	0.31-0.68	<0.001	0.48	0.32-0.72	<0.001

AJCC = American Joint Committee on Cancer; BMI = body mass index; CVD = cardiovascular disease; ECOG = Eastern Cooperative Oncology Group; IMRT = intensity modulated radiotherapy; NA = not applicable; RT = radiotherapy; SAN D_{max} = maximum radiation dose exposed to sinoatrial node; WHO = World Health Organization; 3-DCRT = 3-dimensional conformal radiotherapy

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eTable 8. Cox proportional hazards regression analysis for overall survival in NSCLC cohort using RA D_{max}

		Univariable			Multivariable	
Variable	**HR**	**95% CI**	***P***	**aHR**	**95% CI**	***P***
RA D_{max}, Gy						
<19.1	1.00	(ref)		1.00	(ref)	
≥19.1	1.62	1.20-2.20	0.002	1.57	1.14-2.17	0.005
Age, y	1.02	1.01-1.04	0.001	1.03	1.01-1.04	0.001
Sex						
Male	1.00	(ref)		1.00	(ref)	
Female	0.63	0.43-0.93	0.02	0.62	0.42-0.92	0.02
ECOG Performance						
0	1.00	(ref)		1.00	(ref)	
1-2	1.49	0.96-2.33	0.08	1.42	0.89-2.24	0.13
Tobacco use						
Never	1.00	(ref)				
Ever	1.55	1.09-2.21	0.02			
Alcohol use						
Never	1.00	(ref)				
Ever	0.97	0.73-1.30	0.86			
Hypertension						
No	1.00	(ref)				
Yes	1.28	0.97-1.69	0.09			
Diabetes						
No	1.00	(ref)		1.00	(ref)	
Yes	1.49	1.09-2.04	0.01	1.37	1.00-1.89	0.06
Cardiovascular disease						
No	1.00	(ref)				
Yes	1.13	0.80-1.65	0.52			
Coronary artery calcium score						
No	1.00	(ref)				
Yes	1.38	0.96-1.98	0.08			
CAC score	1.00	1.00-1.00	0.02			
Number of coronary arteries with calcification						
0	1.00	(ref)				
1-2	1.21	0.79-1.85	0.38			
3-4	1.56	1.06-2.28	0.02			
Aortic valve calcification						
No	1.00	(ref)		1.00	(ref)	
Yes	1.00	0.72-1.37	0.98	0.78	0.56-1.10	0.16
Mitral valve calcification						
No	1.00	(ref)				
Yes	1.05	0.64-1.72	0.85			
Pericarditis						
No	1.00	(ref)		1.00	(ref)	
Yes	2.10	1.34-3.29	0.001	1.77	1.12-2.79	0.01
BMI, m^2/kg	0.96	0.92-1.00	0.04	0.97	0.93-1.00	0.08
AJCC Stage						
II-IIIA	1.00	(ref)		1.00	(ref)	
IIIB-IIIC	1.51	1.11-2.05	0.009	1.48	1.08-2.04	0.02
Chemotherapy						
Others	1.00	(ref)				
Paclitaxel + Carboplatin	0.96	0.57-1.60	0.88			
Maintenance ICI						
No	1.00	(ref)		1.00	(ref)	

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Yes	0.65	0.43-0.98	0.04	0.73	0.48-1.11	0.14
RT dose, Gy	0.93	0.90-0.97	0.001	0.94	0.90-0.98	0.005
RT modality						
3D-CRT	1.00	(ref)				
IMRT	0.76	0.57-1.01	0.06			

AJCC = American Joint Committee on Cancer; BMI = body mass index; CVD = cardiovascular disease; ECOG = Eastern Cooperative Oncology Group; ICI = immune checkpoint inhibitor; IMRT = intensity modulated radiotherapy; NA = not applicable; RT = radiotherapy; SAN D_{max} = maximum radiation dose exposed to sinoatrial node; WHO = World Health Organization; 3-DCRT = 3-dimensional conformal radiotherapy

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