

Radiotherapy Prescription Dose and Normal Tissue Tolerance Dose Protocol

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Brain Tumors (Conventional fractionation)

RT Prescription Dose: [7]

High Grade tumor: 60 Gy in 30# (2 Gy/#)

Low Grade tumor: 54 Gy in 30# (1.8 Gy/#)

Pituitary tumours: 45 Gy in 25# (1.8 Gy/#)

Normal Tissue Tolerance Dose:

OAR	Dose Constraints	
	Primary irradiation	Reirradiation
Brain	$V_{60\text{Gy}} \leq 3 \text{ cm}^3$ [16]	$D_{\text{Max}} \leq 30\text{-}40 \text{ Gy}$ (Cum BED $\leq 159 \text{ Gy}_2$) [5]
Brain stem	$D_{\text{Max}} \leq 55 \text{ Gy}$ [1]	$D_{\text{Max}} \leq 30\text{-}40 \text{ Gy}$ (Cum BED $\leq 159 \text{ Gy}_2$) [5]
Cochlea	$D_{\text{Mean}} \leq 40 \text{ Gy}$ [1]	
Eyes	$D_{\text{Max}} \leq 50 \text{ Gy}$ [1]	
Hippocampus	$D_{\text{Mean}} \leq 15 \text{ Gy}$ [9]	
Lacrimal Gland	$D_{\text{Max}} \leq 40 \text{ Gy}$ [1]	
Lens	$D_{\text{Max}} \leq 10 \text{ Gy}$ [1]	
Middle Ear	$D_{\text{Mean}} \leq 40 \text{ Gy}$ [1]	
Optic Chiasma	$D_{\text{Max}} \leq 55 \text{ Gy}$ [1]	$D_{10\text{cc}} \leq 8\text{-}10 \text{ Gy}$ [5]
Optic Nerve	$D_{\text{Max}} \leq 55 \text{ Gy}$ [1]	$D_{10\text{cc}} \leq 8\text{-}10 \text{ Gy}$ [5]
Pituitary	$D_{\text{Mean}} \leq 40 \text{ Gy}$ [1]	
Temporal Bone/TMJ	$V_{65\text{Gy}} \leq 10 \%$ [1]	Cum BED $\leq 100 \text{ Gy}_3$ [5]

Brain Tumors (Hypofractionation)

RT Prescription Dose: [6]

1. 40.5 Gy in 15# (2.7 Gy/#) to PTV
2. 34 Gy in 10# (3.4 Gy/#) to PTV
3. 30 Gy in 6# (5 Gy/#) to PTV

Palliative WBRT Dose:

1. 30 Gy in 10# (3 Gy/#) to Whole Brain PTV

Normal Tissue Tolerance Dose:

OAR	Dose Constraints		
	40.5 Gy/15#	34 Gy/10#	30 Gy/6#
Brain	$D_{Max} \leq 40 \text{ Gy [2]}$	$D_{Max} \leq 34 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$
Brain stem	$D_{Max} \leq 39 \text{ Gy [2]}$	$D_{Max} \leq 32 \text{ Gy [2]}$	$D_{Max} \leq 28 \text{ Gy [2]}$
Cochlea	$D_{Max} \leq 33 \text{ Gy [2]}$	$D_{Max} \leq 27 \text{ Gy [2]}$	$D_{Max} \leq 25 \text{ Gy [2]}$
Eyes	$D_{Max} \leq 35 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 25 \text{ Gy [2]}$
Hippocampus	$D_{Mean} \leq 15 \text{ Gy [9]}$	$D_{Mean} \leq 10 \text{ Gy [9]}$	$D_{Mean} \leq 8 \text{ Gy [9]}$
Lacrimal Gland	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 23 \text{ Gy [2]}$	$D_{Max} \leq 23 \text{ Gy [2]}$
Lens	$D_{Max} \leq 8 \text{ Gy [2]}$	$D_{Max} \leq 7 \text{ Gy [2]}$	$D_{Max} \leq 6 \text{ Gy [2]}$
Middle Ear	$D_{Max} \leq 33 \text{ Gy [2]}$	$D_{Max} \leq 27 \text{ Gy [2]}$	$D_{Max} \leq 25 \text{ Gy [2]}$
Optic Chiasma	$D_{Max} \leq 39 \text{ Gy [2]}$	$D_{Max} \leq 32 \text{ Gy [2]}$	$D_{Max} \leq 25 \text{ Gy [2]}$
Optic Nerve	$D_{Max} \leq 39 \text{ Gy [2]}$	$D_{Max} \leq 32 \text{ Gy [2]}$	$D_{Max} \leq 25 \text{ Gy [2]}$
Pituitary	$D_{Mean} \leq 30 \text{ Gy [2]}$	$D_{Mean} \leq 25 \text{ Gy [2]}$	$D_{Mean} \leq 20 \text{ Gy [2]}$
Temporal Bone/TMJ	$V_{40Gy} \leq 1 \text{ cm}^3 \text{ [2]}$	$V_{34Gy} \leq 1 \text{ cm}^3 \text{ [2]}$	$V_{30Gy} \leq 1 \text{ cm}^3 \text{ [2]}$

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Brain/brainstem	$\text{Cum BED} \leq 130 \text{ Gy}_2 \text{ [5]}$
Temporal lobe	$\text{Cum BED} \leq 150 \text{ Gy}_{2.5} \text{ [5]}$
Optic apparatus	$D_{10cc} \leq 8\text{-}10 \text{ Gy [5]}$

Brain Tumors (SRS/SRT)

RT Prescription Dose: [6,7]

Diagnosis	RT Dose	Notes
Arterio venous Malformation (AVM)	16 - 24 Gy in 1 #	Low risk
	24 - 27 Gy in 3 #	Large Lesion, High risk
Trigeminal Neuralgia	70 - 90 Gy in 1 #	
Meningioma	WHO grade I: 12 - 15 Gy in 1#	Lesion < 3 cm, > 3 mm from OAR
	WHO grade II-III: 16 - 20 Gy in 1#	
	25 - 30 Gy in 5 #	Lesion > 3 cm
Vestibular Schwannoma	12 - 13 Gy in 1 #	Lesion < 3 cm
	25 Gy in 5# or 30 Gy in 10#	Lesion > 3 cm
Pituitary Adenoma	14 - 18 Gy in 1 #	Non-secretory
	20 - 25 Gy in 1 #	ACTH/GH secreting
	15 - 25 Gy in 1 #	Other secretory
	21 Gy in 3# or 25 Gy in 5#	Lesion > 3 cm
Brain Mets	20 Gy in 1 #	Lesion < 2 cm
	18 Gy in 1 #	Lesion = 2 – 3 cm
	15 Gy in 1 # or 30 Gy in 5 #	Lesion > 3 cm

Normal Tissue Tolerance Dose:

OAR	Dose Constraints		
	1#	3#	5#
Brain	$V_{12Gy} \leq 10 \text{ cm}^3$ [4]	$V_{24Gy} \leq 10 \text{ cm}^3$ [4]	$V_{30Gy} \leq 10 \text{ cm}^3$ [4]
Brain stem	$D_{Max} \leq 15 \text{ Gy}$ [4]	$D_{Max} \leq 23 \text{ Gy}$ [4]	$D_{Max} \leq 31 \text{ Gy}$ [4]
Cochlea	$D_{Max} \leq 9 \text{ Gy}$ [2]	$D_{Max} \leq 17 \text{ Gy}$ [2]	$D_{Max} \leq 25 \text{ Gy}$ [2]
Eyes	$D_{Max} \leq 10 \text{ Gy}$ [2]	$D_{Max} \leq 17 \text{ Gy}$ [2]	$D_{Max} \leq 25 \text{ Gy}$ [2]
Hippocampus	$D_{Max} \leq 12 \text{ Gy}$	$D_{Max} \leq 20 \text{ Gy}$	$D_{Max} \leq 25 \text{ Gy}$
Lacrimal Gland	$D_{Max} \leq 10 \text{ Gy}$ [2]	$D_{Max} \leq 17 \text{ Gy}$ [2]	$D_{Max} \leq 25 \text{ Gy}$ [2]
Lens	$D_{Max} \leq 4 \text{ Gy}$	$D_{Max} \leq 5 \text{ Gy}$	$D_{Max} \leq 6 \text{ Gy}$
Middle Ear	$D_{Max} \leq 9 \text{ Gy}$ [2]	$D_{Max} \leq 17 \text{ Gy}$ [2]	$D_{Max} \leq 25 \text{ Gy}$ [2]
Optic Chiasma	$D_{Max} \leq 10 \text{ Gy}$ [2]	$D_{Max} \leq 17 \text{ Gy}$ [2]	$D_{Max} \leq 25 \text{ Gy}$ [2]
Optic Nerve	$D_{Max} \leq 10 \text{ Gy}$ [2]	$D_{Max} \leq 17 \text{ Gy}$ [2]	$D_{Max} \leq 25 \text{ Gy}$ [2]
Pituitary	$D_{Max} \leq 15 \text{ Gy}$ [6]	$D_{Max} \leq 20 \text{ Gy}$ [6]	$D_{Max} \leq 25 \text{ Gy}$ [6]
Skin	$D_{Max} \leq 27 \text{ Gy}$ [2]	$D_{Max} \leq 33 \text{ Gy}$ [2]	$D_{Max} \leq 38.5 \text{ Gy}$ [2]
Temporal Bone/TMJ	$D_{Max} \leq 15 \text{ Gy}$ [2]	$D_{Max} \leq 20 \text{ Gy}$ [2]	$D_{Max} \leq 25 \text{ Gy}$ [2]

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Brain/brainstem	$D_{Max} \leq 24 \text{ Gy}$ for involved volume <20 mm, $\leq 18 \text{ Gy}$ for volume 21 - 30 mm and $\leq 15 \text{ Gy}$ for volume 31 - 40 mm [5]
Temporal lobe	Cum BED $\leq 150 \text{ Gy}_{2.5}$ [5]
Optic apparatus	$D_{10cm^3} \leq 8-10 \text{ Gy}$ [5]

Head & Neck Cancers

RT Prescription Dose: [7]

Diagnosis	RT Dose	Notes
Nasopharynx	66 Gy in 33# + 12 Gy in 3# or 70Gy in 35#	Conventional
	70.2 Gy in 30# (2.34 Gy/#)	Hypofractionation
Larynx/ Vocal Cord	63 Gy in 28# (2.25 Gy/#)	T1 tumor
	65.25 Gy in 29# (2.25 Gy/#)	T2 tumor
Glottic cancer	55 Gy in 20# (2.75 Gy/#)	Hypofractionation
Other Sites	66 Gy + 59.4 Gy in 33#	GTV + PTV (SIB)
	60 Gy in 30# (66 Gy in 33# to high risk PTV, 54 Gy in 30# to low risk PTV)	Postop PTV

Normal Tissue Tolerance Dose:

OAR	Dose Constraints	
	Primary irradiation	Reirradiation
Brain	$D_{Max} \leq 60 \text{ Gy}$ [1]	$D_{Max} \leq 30\text{-}40 \text{ Gy}$ (Cum BED $\leq 159 \text{ Gy}_2$) [5]
Brain stem	$D_{Max} \leq 55 \text{ Gy}$ [1]	$D_{Max} \leq 30\text{-}40 \text{ Gy}$ (Cum BED $\leq 159 \text{ Gy}_2$) [5]
Brachial Plexus	$D_{Max} \leq 60 \text{ Gy}$ [1]	
Cochlea/Middle Ear	$D_{Mean} \leq 40 \text{ Gy}$ [1]	
Esophagus	$D_{Mean} \leq 34 \text{ Gy}$; $V_{50Gy} \leq 5 \text{ cm}^3$ [2]	Cum $D_{Mean} \leq 60 \text{ Gy}$ [5]
Eyes	$D_{Max} \leq 50 \text{ Gy}$ [1]	
Lacrimal Gland	$D_{Max} \leq 40 \text{ Gy}$ [1]	
Larynx	$D_{Mean} \leq 45 \text{ Gy}$ [1]	Cum $D_{Mean} \leq 60 \text{ Gy}$ [5]
Lens	$D_{Max} \leq 10 \text{ Gy}$ [1]	
Lips	$D_{Mean} \leq 35 \text{ Gy}$ [1]	
Mandible	$D_{Max} \leq 70 \text{ Gy}$ [1]	Cum BED $\leq 100 \text{ Gy}_3$ [5]
Optic Chiasma/ Nerve	$D_{Max} \leq 55 \text{ Gy}$ [1]	$D_{10cc} \leq 8\text{-}10 \text{ Gy}$ [5]
Oral Cavity	$D_{Mean} \leq 45 \text{ Gy}$ [1]	Cum $D_{Mean} \leq 60 \text{ Gy}$ [5]
Parotid	$D_{Mean} \leq 25 \text{ Gy}$; $V_{20Gy} \leq 50 \%$ [1]	Cum $D_{Mean} \leq 45 \text{ Gy}$ [5]
Pharyngeal Constrictor	$D_{Mean} \leq 50 \text{ Gy}$ [1]	Cum $D_{Mean} \leq 60 \text{ Gy}$ [5]
Pituitary	$D_{Mean} \leq 40 \text{ Gy}$ [1]	
Spinal Cord	$D_{Max} \leq 50 \text{ Gy}$ [1]	$D_{Max} \leq 20\text{-}24 \text{ Gy}$ (Cum BED $\leq 130 \text{ Gy}_2$) [5]
Submandibular gland	$D_{Mean} \leq 35 \text{ Gy}$ [16]	
Temporal Bone/TMJ	$V_{65Gy} \leq 10 \%$ [1]	Cum BED $\leq 100 \text{ Gy}_3$ [5]
Thyroid	$D_{Mean} \leq 45 \text{ Gy}$ [1]	
Trachea	$D_{Mean} \leq 40 \text{ Gy}$ [1]	

Breast Cancer (Conventional fractionation)

RT Prescription Dose: [7]

1. Phase I: 50 Gy in 25# (2 Gy/#) to PTV; 45 Gy in 25# (1.8 Gy/#) to low risk PTV
Phase II: 10 Gy in 5# (2 Gy/#) to PTV Boost

Normal Tissue Tolerance Dose:

OAR	Dose Constraints
Brachial Plexus	$D_{\text{Max}} \leq 50 \text{ Gy}$ [1]
Contra. Breast	$D_{\text{Mean}} \leq 4 \text{ Gy}$; $V_{10\text{Gy}} \leq 10 \%$ [1]
Contra. Lung	$D_{\text{Mean}} \leq 4 \text{ Gy}$; $V_{5\text{Gy}} \leq 10 \%$ [1]
Esophagus	$D_{\text{Mean}} \leq 20 \text{ Gy}$; $V_{50\text{Gy}} \leq 5 \text{ cm}^3$ [2]
Gastroesophageal Junction	$D_{\text{Mean}} \leq 3 \text{ Gy}$ [10]
Heart	$D_{\text{Mean}} \leq 8 \text{ Gy}$; $V_{5\text{Gy}} \leq 40 \%$; $V_{25\text{Gy}} \leq 10 \%$ [1]
Humeral Head	$D_{\text{Max}} \leq 45 \text{ Gy}$
Ipsilateral Lung	$D_{\text{Mean}} \leq 16 \text{ Gy}$; $V_{5\text{Gy}} \leq 60 \%$; $V_{20\text{Gy}} \leq 30 \%$ [1]
Larynx	$D_{\text{Mean}} \leq 40 \text{ Gy}$ [1]
Left Anterior Descending Artery	$D_{\text{Mean}} \leq 25 \text{ Gy}$; $V_{15 \text{ Gy}} \leq 10\%$ [16]
Right Coronary Artery	$D_{\text{Mean}} \leq 10 \text{ Gy}$
Spinal Cord	$D_{\text{Max}} \leq 45 \text{ Gy}$ [1]
Trachea	$D_{\text{Mean}} \leq 20 \text{ Gy}$ [1]
Thyroid	$D_{\text{Mean}} \leq 20 \text{ Gy}$; $V_{25\text{Gy}} \leq 62.5 \%$

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Contra. Breast	$D_{\text{Max}} \leq 40 \text{ Gy}$ [5]
Esophagus	$\text{Cum } D_{\text{Mean}} \leq 60 \text{ Gy}$ [5]
Heart	$\text{Cum BED} \leq 70 \text{ Gy}_3$; $D_{\text{Max}} \leq 49 \text{ Gy}_3$ [5]
Larynx	$\text{Cum } D_{\text{Mean}} \leq 60 \text{ Gy}$ [5]
Lungs	$D_{\text{Max}} \leq 60 \text{ Gy}$ [5]
Spinal Cord	$D_{\text{Max}} \leq 20\text{-}24 \text{ Gy}$ ($\text{Cum BED} \leq 130 \text{ Gy}_2$) [5]

Breast Cancer (Hypofractionation)

RT Prescription Dose: [6]

1. 40.5 Gy in 15# (2.7 Gy/#) to PTV; 48 Gy in 15# (3.2 Gy/#) to PTV Boost (SIB)
2. Phase I: 40.5 Gy in 15# (2.7 Gy/#) to PTV
Phase II: 10-12.5 Gy in 5# (2-2.5 Gy/#) or 12 Gy in 4# (3 Gy/#) to PTV Boost

Normal Tissue Tolerance Dose:

OAR	Dose Constraints
Brachial Plexus	$D_{Max} \leq 45 \text{ Gy}$ [2,6]
Contra. Breast	$D_{Mean} \leq 3 \text{ Gy}$; $V_{10Gy} \leq 5 \%$ [2,6]
Contra. Lung	$D_{Mean} \leq 3 \text{ Gy}$; $V_{4Gy} \leq 10 \%$ [2,6]
Esophagus	$D_{Mean} \leq 20 \text{ Gy}$; $V_{40Gy} \leq 5 \text{ cm}^3$ [2,6]
Gastroesophageal Junction	$D_{Mean} \leq 3 \text{ Gy}$ [10]
Heart	$D_{Mean} \leq 6 \text{ Gy}$; $V_{4Gy} \leq 40 \%$; $V_{20Gy} \leq 10 \%$ [2,6]
Humeral Head	$D_{Max} \leq 40 \text{ Gy}$
Ipsilateral Lung	$D_{Mean} \leq 12 \text{ Gy}$; $V_{4Gy} \leq 60 \%$; $V_{16Gy} \leq 30 \%$ [2,6]
Larynx	$D_{Mean} \leq 25 \text{ Gy}$ [2,6]
Left Anterior Descending Artery	$D_{Mean} \leq 22 \text{ Gy}$ [16]
Right Coronary Artery	$D_{Mean} \leq 8 \text{ Gy}$
Spinal Cord	$D_{Max} \leq 40 \text{ Gy}$ [2,6]
Trachea	$D_{Mean} \leq 15 \text{ Gy}$ [2,6]
Thyroid	$D_{Mean} \leq 15 \text{ Gy}$; $V_{25Gy} \leq 60 \%$ [2,6]

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Contra. Breast	$D_{Max} \leq 30 \text{ Gy}$ [5]
Esophagus	$\text{Cum } D_{Mean} \leq 50 \text{ Gy}$ [5]
Heart	$\text{Cum BED} \leq 60 \text{ Gy}_3$; $D_{Max} \leq 40 \text{ Gy}_3$ [5]
Larynx	$\text{Cum } D_{Mean} \leq 50 \text{ Gy}$ [5]
Lungs	$D_{Max} \leq 40 \text{ Gy}$ [5]
Spinal Cord	$D_{Max} \leq 20 \text{ Gy}$ [5]

Accelerated Partial Breast Irradiation (Hypofractionation)

RT Prescription Dose: [6]

1. 30 Gy in 5# (6 Gy/#) to PTV
2. 38.5 Gy in 10# (3.85 Gy/#) to PTV

Normal Tissue Tolerance Dose:

OAR	Dose Constraints	
	5#	10#
Brachial Plexus	$D_{Max} \leq 32 \text{ Gy [2,6]}$	$V_{38.5\text{Gy}} \leq 3 \text{ cm}^3 \text{ [2,6]}$
Contra. Breast	$D_{Max} \leq 3 \text{ Gy [2,6]}$	$D_{Max} \leq 5 \text{ Gy [2,6]}$
Contra. Lung	$V_{4\text{Gy}} \leq 10 \% \text{ [2,6]}$	$V_{4\text{Gy}} \leq 10 \% \text{ [2,6]}$
Esophagus	$V_{30\text{Gy}} \leq 5 \text{ cm}^3 \text{ [2,6]}$	$V_{38.5\text{Gy}} \leq 5 \text{ cm}^3 \text{ [2,6]}$
Gastroesophageal Junction	$D_{Max} \leq 10 \text{ Gy [10]}$	$D_{Max} \leq 10 \text{ Gy [10]}$
Heart	$V_{30\text{Gy}} \leq 5 \text{ cm}^3 \text{ [2,6]}$	$V_{38.5\text{Gy}} \leq 5 \text{ cm}^3 \text{ [2,6]}$
Ribs	$V_{30\text{Gy}} \leq 5 \text{ cm}^3 \text{ [2,6]}$	$V_{38.5\text{Gy}} \leq 5 \text{ cm}^3 \text{ [2,6]}$
Ipsilateral Lung	$V_{13.5\text{Gy}} \leq 35 \% \text{ [2,6]}$	$V_{16\text{Gy}} \leq 35 \% \text{ [2,6]}$
Left Anterior Descending Artery	$D_{Max} \leq 20 \text{ Gy}$	$D_{Max} \leq 25 \text{ Gy}$
Right Coronary Artery	$D_{Max} \leq 20 \text{ Gy}$	$D_{Max} \leq 25 \text{ Gy}$
Spinal Cord	$D_{Max} \leq 28 \text{ Gy [2,6]}$	$D_{Max} \leq 36 \text{ Gy [2,6]}$
Trachea	$V_{30\text{Gy}} \leq 5 \text{ cm}^3 \text{ [2,6]}$	$V_{38.5\text{Gy}} \leq 5 \text{ cm}^3 \text{ [2,6]}$

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Contra. Breast	$D_{Max} \leq 20 \text{ Gy [5]}$
Esophagus	$\text{Cum } D_{Mean} \leq 50 \text{ Gy [5]}$
Heart	$\text{Cum BED} \leq 60 \text{ Gy}_3; D_{Max} \leq 40 \text{ Gy}_3 \text{ [5]}$
Larynx	$\text{Cum } D_{Mean} \leq 50 \text{ Gy [5]}$
Lungs	$D_{Max} \leq 30 \text{ Gy [5]}$
Spinal Cord	$D_{Max} \leq 18 \text{ Gy [5]}$

Lung Cancer (Conventional fractionation)

RT Prescription Dose: [7]

Diagnosis	RT Dose	Notes
NSCLC	55 Gy in 20# (2.75 Gy/#)	Stage I, II (Hypofractionation)
	60 - 66 Gy in 30 - 33# (2 Gy/#)	Stage III
SCLC	40.5 Gy in 15# (2.7 Gy/#)	Grade B (Hypofractionation)
	66 Gy in 33# (2 Gy/#)	Grade A

Normal Tissue Tolerance Dose:

OAR	Dose Constraints
Brachial Plexus	$D_{Max} \leq 60 \text{ Gy}$ [1]
Breast	$V_{10Gy} \leq 20 \%$
Contra. Lung	$D_{Mean} \leq 5 \text{ Gy}$; $V_{5Gy} \leq 42 \%$ [1]
Combined Lung	$D_{Mean} \leq 20 \text{ Gy}$; $V_{20Gy} \leq 35 \%$ [1]
Esophagus	$D_{Mean} \leq 34 \text{ Gy}$; $V_{35Gy} \leq 50 \%$; $V_{50Gy} \leq 40 \%$; $V_{60Gy} \leq 10 \text{ cm}^3$ [1]
Heart	$D_{Mean} \leq 26 \text{ Gy}$; $V_{40Gy} \leq 40 \%$ [1]
Humeral Head	$D_{Max} \leq 45 \text{ Gy}$
Liver	$D_{Mean} \leq 20 \text{ Gy}$; $V_{30Gy} \leq 40 \%$ [1]
Spinal Cord	$D_{Max} \leq 45 \text{ Gy}$ [1]
Trachea	$D_{Mean} \leq 40 \text{ Gy}$ [1]
Thyroid	$D_{Mean} \leq 35 \text{ Gy}$ [1]

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Breast	$D_{Max} \leq 40 \text{ Gy}$ [5]
Esophagus	Cum $D_{Mean} \leq 60 \text{ Gy}$ [5]
Heart	Cum BED $\leq 70 \text{ Gy}_3$; $D_{Max} \leq 49 \text{ Gy}_3$ [5]
Liver	$D_{Max} \leq 50 \text{ Gy}$ [5]
Lungs	$D_{Max} \leq 60 \text{ Gy}$ [5]
Spinal Cord	$D_{Max} \leq 20\text{-}24 \text{ Gy}$ (Cum BED $\leq 130 \text{ Gy}_2$) [5]

Lung Cancer (SBRT)

RT Prescription Dose: [6,8]

Location	RT Dose	Notes
Central	60 Gy in 8# (7.5 Gy/#)	
	50 Gy in 5# (10 Gy/#)	
	50 Gy in 10# (5 Gy/#)	Reirradiation
Peripheral	54 Gy in 3# (18 Gy/#)	>2cm from CW
	55 Gy in 5# (11 Gy/#)	abutting CW

Normal Tissue Tolerance Dose:

OAR	Dose Constraints		
	3#	5#	8#
Brachial Plexus	$D_{Max} \leq 26 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 38 \text{ Gy [2]}$
Combined Lung	$V_{11.5\text{Gy}} \leq 37 \% \text{ [2]}$	$V_{13.5\text{Gy}} \leq 37 \% \text{ [2]}$	$V_{15\text{Gy}} \leq 37 \% \text{ [2]}$
Esophagus	$D_{Max} \leq 32 \text{ Gy [2]}$	$D_{Max} \leq 38 \text{ Gy [2]}$	$D_{Max} \leq 43 \text{ Gy [2]}$
Great Vessels	$D_{Max} \leq 45 \text{ Gy [2]}$	$D_{Max} \leq 53 \text{ Gy [2]}$	$D_{Max} \leq 62 \text{ Gy [2]}$
Heart	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 38 \text{ Gy [2]}$	$D_{Max} \leq 40 \text{ Gy [2]}$
Liver	Dose to $\geq 700 \text{ cm}^3 \leq 18 \text{ Gy [2]}$	Dose to $\geq 700 \text{ cm}^3 \leq 21.5 \text{ Gy [2]}$	Dose to $\geq 700 \text{ cm}^3 \leq 25 \text{ Gy [2]}$
Ribs	$D_{Max} \leq 50 \text{ Gy [2]}$	$D_{Max} \leq 55 \text{ Gy [2]}$	$D_{Max} \leq 60 \text{ Gy [2]}$
Spinal Cord	$D_{Max} \leq 22.5 \text{ Gy [2]}$	$D_{Max} \leq 28 \text{ Gy [2]}$	$D_{Max} \leq 34 \text{ Gy [2]}$
Skin	$D_{Max} \leq 33 \text{ Gy [2]}$	$D_{Max} \leq 38.5 \text{ Gy [2]}$	$D_{Max} \leq 45 \text{ Gy [2]}$
Trachea/Bronchus	$D_{Max} \leq 43 \text{ Gy [2]}$	$D_{Max} \leq 50 \text{ Gy [2]}$	$D_{Max} \leq 56 \text{ Gy [2]}$

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Brachial Plexus	$D_{Max} \leq 18/22 \text{ Gy for 3/5# [5]}$
Esophagus	$\text{Cum } D_{Mean} \leq 50 \text{ Gy [5]}$
Great Vessels	$\text{Cum BED} \leq 100 \text{ Gy}_2 \text{ [5]}$
Heart	$\text{Cum BED} \leq 60 \text{ Gy}_3; D_{Max} \leq 40 \text{ Gy}_3 \text{ [5]}$
Liver	$D_{Max} \leq 40 \text{ Gy [5]}$
Lungs	$D_{Max} \leq 30 \text{ Gy [5]}$
Spinal Cord	$D_{Max} \leq 10 \text{ Gy for 1#; } D_{Max} \leq 14/18 \text{ Gy for 3/5# [5]}$

Esophagus Cancer (Conventional fractionation)

RT Prescription Dose: [7]

RT Dose	Notes
50 Gy in 25# (2 Gy/#)	Concomitant Chemo
60 Gy in 30# (2 Gy/#)	RT alone
41.4 Gy in 23# (1.8 Gy/#)	Neoadjuvant Grade A
45 Gy in 25# (1.8 Gy/#)	Neoadjuvant Grade B

Normal Tissue Tolerance Dose:

OAR	Dose Constraints
Brachial Plexus	$D_{Max} \leq 60 \text{ Gy}$ [1]
Breast	$V_{10Gy} \leq 20 \%$
Combined Lung	$D_{Mean} \leq 20 \text{ Gy}$; $V_{20Gy} \leq 35 \%$ [1]
Heart	$D_{Mean} \leq 26 \text{ Gy}$; $V_{25Gy} \leq 50 \%$ [1]
Humeral Head	$D_{Max} \leq 45 \text{ Gy}$
Liver	$D_{Mean} \leq 20 \text{ Gy}$; $V_{30Gy} \leq 40 \%$ [1]
Spinal Cord	$D_{Max} \leq 45 \text{ Gy}$ [1]
Trachea	$D_{Mean} \leq 40 \text{ Gy}$ [1]
Thyroid	$D_{Mean} \leq 35 \text{ Gy}$ [1]

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Breast	$D_{Max} \leq 40 \text{ Gy}$ [5]
Heart	$Cum \text{ BED} \leq 70 \text{ Gy}_3$; $D_{Max} \leq 49 \text{ Gy}_3$ [5]
Liver	$D_{Max} \leq 50 \text{ Gy}$ [5]
Lungs	$D_{Max} \leq 60 \text{ Gy}$ [5]
Spinal Cord	$D_{Max} \leq 20\text{-}24 \text{ Gy}$ ($Cum \text{ BED} \leq 130 \text{ Gy}_2$) [5]

Abdomen GI Cancers (Conventional fractionation)

RT Prescription Dose: [7,12,13]

Diagnosis	RT Dose	Notes
Liver cancer	30 Gy in 10# (3 Gy/#)	Whole liver- Palliative
	45 or 50 Gy in 25# (1.8 or 2 Gy/#)	PTV=1/3 rd of liver
	66 Gy in 33# (2 Gy/#)	PTV < 1/3 rd of liver
Gastric cancer	45 Gy in 25# (1.8 Gy/#)	
	20 Gy in 5# (4 Gy/#) or 6-8 Gy in 1#	Palliative
Pancreas cancer	45-54 Gy in 25-27# (1.8-2 Gy/#)	
	56 Gy to GTV, 45/50 Gy to PTV in 25#	SIB (2.24/1.8/2 Gy/#)
	58 Gy to GTV, 44.25 Gy to PTV in 15#	Hypo (3.9/2.95 Gy/#)
	60 Gy to GTV, 30 Gy to PTV in 10#	Hypo (6/3 Gy/#)
Periampullary cancer	45-50.4 Gy in 25-28# (1.8 Gy/#)	
Cholangiocarcinoma	45-50.4 Gy in 25-28# (1.8 Gy/#)	54-59.4 Gy to GTV
	67.5 Gy in 15# (4.5 Gy/#)	Hypofractionation
Renal cancer	41.4 -63 Gy in 23-35# (1.8/2 Gy/#)	

Normal Tissue Tolerance Dose:

OAR	Dose Constraints
Bowel bag	$D_{Mean} \leq 30 \text{ Gy}$; $V_{45\text{Gy}} \leq 200 \text{ cm}^3$ [1]
Combined Lungs	$D_{Mean} \leq 15 \text{ Gy}$; $V_{20\text{Gy}} \leq 22 \%$ [1]
Duodenum	$D_{Max} \leq 60 \text{ Gy}$; $V_{45\text{Gy}} \leq 5 \text{ cm}^3$; $D_{33\%} \leq 45 \text{ Gy}$ [2]
Esophagus	$V_{60\text{Gy}} \leq 10 \text{ cm}^3$ [1]
Gastroesophageal Junction	$D_{Mean} \leq 3 \text{ Gy}$ [10]
Heart	$D_{Mean} \leq 26 \text{ Gy}$; $V_{40\text{Gy}} \leq 40 \%$ [1]
Jejunum-Ileum	$D_{Max} \leq 60 \text{ Gy}$; $V_{45\text{Gy}} \leq 15 \%$ [16]
Kidney	$D_{Mean} \leq 18 \text{ Gy}$; Spare $\geq 200 \text{ cm}^3$ (combined) with $\leq 27 \text{ Gy}$ [2]
Liver	$D_{Mean} \leq 30 \text{ Gy}$; Spare $\geq 700 \text{ cm}^3$ with $\leq 36 \text{ Gy}$ [2]
Spinal Cord	$D_{Max} \leq 45 \text{ Gy}$ [1]
Spleen	$D_{Mean} \leq 40 \text{ Gy}$; $V_{45\text{Gy}} \leq 50 \text{ cm}^3$ [1]
Stomach	$D_{Mean} \leq 40 \text{ Gy}$; $V_{45\text{Gy}} \leq 50 \text{ cm}^3$ [1]

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Bowel bag	Cum BED $\leq 100 \text{ Gy}_3$ [5]
Heart	Cum BED $\leq 70 \text{ Gy}_3$; $D_{Max} \leq 49 \text{ Gy}_3$ [5]
Liver, kidney	$D_{Max} \leq 50 \text{ Gy}$ [5]
Lungs	$D_{Max} \leq 60 \text{ Gy}$ [5]
Spinal Cord	$D_{Max} \leq 20\text{-}24 \text{ Gy}$ (Cum BED $\leq 130 \text{ Gy}_2$) [5]
Stomach, spleen	$D_{Max} \leq 50 \text{ Gy}$ [5]

Abdomen GI Cancers (SBRT)

RT Prescription Dose: [6,7,8,12,13]

Diagnosis	RT Dose	Notes
HCC, PVT	45 Gy in 3# (15 Gy/#)	GTV 1-5 cm
	50 Gy in 5# (10 Gy/#) (MLD < 13 Gy)	GTV < 10 cm; If Mean liver dose is exceeded, reduce the GTV dose
	40/45 Gy in 5# (8/9 Gy/#) (MLD < 15Gy)	
	30/35 Gy in 5# (6/7 Gy/#) (MLD < 16 Gy)	
Liver Mets	54 Gy in 3# (18 Gy/#)	PTV < 6 cm
	50-60 Gy in 5# (10-12 Gy/#)	If constraints not met, adopt 10#
	30-60 Gy in 10# (3-6 Gy/#)	Multiple lesions
Pancreas	30 Gy to PTV 50 Gy to vessel in 5#	SIB (6/10 Gy/#)
	24-36 Gy in 3# (8-12 Gy/#)	
RCC	39 Gy in 3# (13 Gy/#)	
	40 Gy in 5# (8 Gy/#)	

Normal Tissue Tolerance Dose:

OAR	Dose Constraints		
	3#	5#	10#
Bowel bag	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$	$D_{Max} \leq 45 \text{ Gy [2]}$
Combined Lungs	$V_{11.5Gy} \leq 37 \% [2]$	$V_{13.5Gy} \leq 37 \% [2]$	$V_{16Gy} \leq 37 \% [2]$
Cauda equina	$D_{Max} \leq 25.5 \text{ Gy [2]}$	$D_{Max} \leq 31.5 \text{ Gy [2]}$	$D_{Max} \leq 41 \text{ Gy [2]}$
Duodenum	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$	$D_{Max} \leq 45 \text{ Gy [2]}$
Esophagus	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$	$D_{Max} \leq 45 \text{ Gy [2]}$
Great Vessels	$D_{Max} \leq 45 \text{ Gy [2]}$	$D_{Max} \leq 53 \text{ Gy [2]}$	$D_{Max} \leq 63 \text{ Gy [2]}$
Heart	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 38 \text{ Gy [2]}$	$D_{Max} \leq 42.5 \text{ Gy [2]}$
Jejunum-Ileum	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$	$D_{Max} \leq 45 \text{ Gy [2]}$
Kidneys	Spare $\geq 200 \text{ cm}^3$ $\leq 16 \text{ Gy [2]}$	Spare $\geq 200 \text{ cm}^3$ $\leq 17.5 \text{ Gy [2]}$	Spare $\geq 200 \text{ cm}^3$ $\leq 21 \text{ Gy [2]}$
Liver-GTV	Spare $\geq 700 \text{ cm}^3$ $\leq 19 \text{ Gy [2]}$	Spare $\geq 700 \text{ cm}^3$ $\leq 21.5 \text{ Gy [2]}$	Spare $\geq 700 \text{ cm}^3$ $\leq 27 \text{ Gy [2]}$
Ribs	$D_{Max} \leq 50 \text{ Gy [2]}$	$D_{Max} \leq 57 \text{ Gy [2]}$	$D_{Max} \leq 60 \text{ Gy [2]}$
Spinal Cord	$D_{Max} \leq 22.5 \text{ Gy [2]}$	$D_{Max} \leq 28 \text{ Gy [2]}$	$D_{Max} \leq 36 \text{ Gy [2]}$
Spleen	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$	$D_{Max} \leq 45 \text{ Gy [2]}$
Stomach	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$	$D_{Max} \leq 45 \text{ Gy [2]}$
Skin	$D_{Max} \leq 33 \text{ Gy [2]}$	$D_{Max} \leq 38.5 \text{ Gy [2]}$	$D_{Max} \leq 48 \text{ Gy [2]}$

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Bowel bag	Cum BED $\leq 85 \text{ Gy}_3 [5]$
Heart	Cum BED $\leq 60 \text{ Gy}_3$; $D_{Max} \leq 40 \text{ Gy}_3 [5]$
Liver, kidney	$D_{Max} \leq 40 \text{ Gy [5]}$
Lungs	$D_{Max} \leq 30 \text{ Gy [5]}$
Spinal Cord	$D_{Max} \leq 10 \text{ Gy for 1#}; D_{Max} \leq 14/18 \text{ Gy for 3/5# [5]}$
Stomach, spleen	$D_{Max} \leq 40 \text{ Gy [5]}$

Pelvic Cancers (Conventional fractionation)

RT Prescription Dose: [7]

Diagnosis	RT Dose	Notes
Cervix/Endometrium	50 Gy in 25# (2 Gy/#)	10 Gy in 5# to Parametrium; 45 Gy to PTV node in 25#
	50.4 Gy in 28# (1.8 Gy/#)	
	60 Gy in 28# (2.14 Gy/#) to GTV node	SIB
Prostate	78 Gy in 39# (2 Gy/#) to Prostate PTV 50-54 Gy in 25-27# (2 Gy/#) to Nodal PTV	
Rectum/Anal canal	54/56.25 Gy in 27/25# (2/2.25 Gy/#)	Advanced stage
	50 Gy to PTV-P, 45 Gy to PTV-N	25# (2/1.8 Gy/#)
	45 Gy in 25# (1.8 Gy/#)	Sigmoid colon
Bladder	60-64 Gy in 30-32# (2 Gy/#)	

Normal Tissue Tolerance Dose:

OAR	Dose Constraints
Anal canal	$D_{\text{Mean}} \leq 40 \text{ Gy}$; $V_{20\text{Gy}} \leq 75 \%$ [16]
Bowel bag	$D_{\text{Mean}} \leq 30 \text{ Gy}$; $V_{45\text{Gy}} \leq 200 \text{ cm}^3$ [1]
Bladder	$D_{\text{Max}} \leq 75 \text{ Gy}$; $V_{60\text{Gy}} \leq 50 \%$; $V_{70\text{Gy}} \leq 35 \%$ [1]
Femoral head	$D_{\text{Max}} \leq 52 \text{ Gy}$; $V_{50\text{Gy}} \leq 5 \%$ [1]
Kidney	$D_{\text{Mean}} \leq 18 \text{ Gy}$; Spare $\geq 200 \text{ cm}^3$ (combined) with $\leq 27 \text{ Gy}$ [2]
Penile bulb	$D_{\text{Mean}} \leq 50 \text{ Gy}$ [1]
Rectum	$D_{\text{Max}} \leq 70 \text{ Gy}$; $V_{40\text{Gy}} \leq 60 \%$; $V_{70\text{Gy}} \leq 20 \%$ [1]
Testis/Ovaries	$D_{\text{Max}} \leq 6 \text{ Gy}$; $D_{\text{Mean}} \leq 5 \text{ Gy}$ [16]
Urethra	$D_{\text{Max}} \leq 70 \text{ Gy}$

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Bowel bag	Cum BED $\leq 100 \text{ Gy}_3$ [5]
Liver, kidney	$D_{\text{Max}} \leq 50 \text{ Gy}$ [5]
Bladder	Cum BED $\leq 120 \text{ Gy}_3$ [5]
Femoral head	Cum BED $\leq 100 \text{ Gy}_2$ [5]
Rectum	Cum BED $\leq 100 \text{ Gy}_3$ [5]

Pelvic Cancers (Hypo fractionation)

RT Prescription Dose:

Diagnosis	RT Dose	Notes
Prostate	60 Gy to prostate, 45 Gy to node in 20# (3/2.25 Gy/#)	CHHip Trial
	68 Gy to prostate, 50 Gy to node in 25# (2.72/2 Gy/#)	POP-RT Trial
	36.25 Gy in 5# (7.25 Gy/#)	SBRT [6]
Rectum	25 Gy in 5# (5 Gy/#)	RAPIDO Trial
Bladder	30-36 Gy in 5-6# (6 Gy/#)	Weekly once

Normal Tissue Tolerance Dose:

OAR	Dose Constraints	
	CHHip/POP-RT	5# SBRT
Bowel bag	$D_{\text{Mean}} \leq 25 \text{ Gy}$; $V_{40\text{Gy}} \leq 200 \text{ cm}^3$ [11]	$D_{\text{Max}} \leq 35 \text{ Gy}$; $V_{20\text{Gy}} \leq 50 \text{ cm}^3$ [2]
Bladder	$V_{40\text{Gy}} \leq 50 \%$; $V_{60\text{Gy}} \leq 25 \%$; $V_{100\%} \leq 5 \%$ [11]	$D_{\text{Max}} \leq 38 \text{ Gy}$; $V_{18\text{Gy}} \leq 50\%$ [2]
Femoral head	$V_{50\text{Gy}} \leq 3 \%$ [11]	$V_{30\text{Gy}} \leq 5 \text{ cm}^3$ [2]
Penile bulb	$V_{40\text{Gy}} \leq 50 \%$; $V_{100\%} \leq 10 \%$ [11]	$D_{\text{Max}} \leq 40 \text{ Gy}$; $V_{30\text{Gy}} \leq 50 \%$ [2]
Rectum	$V_{30\text{Gy}} \leq 70 \%$; $V_{40\text{Gy}} \leq 55 \%$; $V_{100\%} \leq 3 \%$ [11]	$D_{\text{Max}} \leq 38 \text{ Gy}$; $V_{18\text{Gy}} \leq 50\%$ [2]
Sacral plexus	$V_{44\text{Gy}} \leq 5 \text{ cm}^3$ [2]	$V_{30\text{Gy}} \leq 5 \text{ cm}^3$ [2]
Urethra	$V_{50\text{Gy}} \leq 40 \%$	$D_{50\%} \leq 42 \text{ Gy}$ [16]

Reirradiation Tolerance Dose:

OAR	Dose Constraints
Bowel bag	Cum BED $\leq 85 \text{ Gy}_3$ [5]
Liver, kidney	$D_{\text{Max}} \leq 40 \text{ Gy}$ [5]
Bladder	Cum BED $\leq 100 \text{ Gy}_3$ [5]
Femoral head	Cum BED $\leq 90 \text{ Gy}_2$ [5]
Rectum	Cum BED $\leq 85 \text{ Gy}_3$ [5]

Spine Tumors (SBRT)

RT Prescription Dose: [6]

Diagnosis	RT Dose	Notes
Spine Tumors	16-24 Gy in 1#	Malignant
	24-36 Gy in 3# (8-12 Gy/#)	
	30-40 Gy in 5# (6-8 Gy/#)	
Spine Tumors	12-18 Gy in 1#	Benign
	18-24 Gy in 3# (6-8 Gy/#)	
	25-30 Gy in 5# (5-6 Gy/#)	
Spine Mets, Bone Mets	16-24 Gy in 1#	
	27 Gy in 3# (9 Gy/#)	
	30 Gy in 5# (6 Gy/#)	

Normal Tissue Tolerance Dose:

OAR	Dose Constraints		
	1#	3#	5#
Bowel bag	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$
Bladder	$D_{Max} \leq 25 \text{ Gy [2]}$	$D_{Max} \leq 28 \text{ Gy [2]}$	$D_{Max} \leq 38 \text{ Gy [2]}$
Brachial plexus	$D_{Max} \leq 17 \text{ Gy [2]}$	$D_{Max} \leq 26 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$
Combined Lungs	$V_{8Gy} \leq 37 \% [2]$	$V_{11.5Gy} \leq 37 \% [2]$	$V_{13.5Gy} \leq 37 \% [2]$
Cauda equina	$D_{Max} \leq 16 \text{ Gy [2]}$	$D_{Max} \leq 25.5 \text{ Gy [2]}$	$D_{Max} \leq 31.5 \text{ Gy [2]}$
Duodenum	$D_{Max} \leq 22 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$
Esophagus	$D_{Max} \leq 24 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$
Great Vessels	$D_{Max} \leq 37 \text{ Gy [2]}$	$D_{Max} \leq 45 \text{ Gy [2]}$	$D_{Max} \leq 53 \text{ Gy [2]}$
Heart	$D_{Max} \leq 22 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 38 \text{ Gy [2]}$
Kidneys	$Spare \geq 200 \text{ cm}^3 \leq 9.5 \text{ Gy [2]}$	$Spare \geq 200 \text{ cm}^3 \leq 16 \text{ Gy [2]}$	$Spare \geq 200 \text{ cm}^3 \leq 17.5 \text{ Gy [2]}$
Liver	$Spare \geq 700 \text{ cm}^3 \leq 11.5 \text{ Gy [2]}$	$Spare \geq 700 \text{ cm}^3 \leq 19 \text{ Gy [2]}$	$Spare \geq 700 \text{ cm}^3 \leq 21.5 \text{ Gy [2]}$
Rectum	$D_{Max} \leq 25 \text{ Gy [2]}$	$D_{Max} \leq 28 \text{ Gy [2]}$	$D_{Max} \leq 38 \text{ Gy [2]}$
Ribs	$D_{Max} \leq 33 \text{ Gy [2]}$	$D_{Max} \leq 50 \text{ Gy [2]}$	$D_{Max} \leq 57 \text{ Gy [2]}$
Sacral plexus	$V_{14.5Gy} \leq 5 \text{ cm}^3 [2]$	$V_{22.5Gy} \leq 5 \text{ cm}^3 [2]$	$V_{30Gy} \leq 5 \text{ cm}^3 [2]$
Spinal Cord	$D_{Max} \leq 14 \text{ Gy [2]}$	$D_{Max} \leq 22.5 \text{ Gy [2]}$	$D_{Max} \leq 28 \text{ Gy [2]}$
Spleen	$D_{Max} \leq 22 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$
Stomach	$D_{Max} \leq 22 \text{ Gy [2]}$	$D_{Max} \leq 30 \text{ Gy [2]}$	$D_{Max} \leq 35 \text{ Gy [2]}$
Skin	$D_{Max} \leq 27 \text{ Gy [2]}$	$D_{Max} \leq 33 \text{ Gy [2]}$	$D_{Max} \leq 38.5 \text{ Gy [2]}$

Reirradiation Tolerance Dose:

Spinal Cord	$D_{Max} \leq 10 \text{ Gy for 1#; } D_{Max} \leq 14/18 \text{ Gy for 3/5# [5]}$
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Pediatric Cancers

RT Prescription Dose: [7]

Diagnosis	RT Dose	Notes
Leukemia	24 Gy in 15# (1.6 Gy/#)	
	14.4 Gy in 8# (1.8 Gy/#)	TBI, Twice daily
	12 Gy in 6# (2 Gy/#)	TBI, Twice daily
	5.4 Gy in 3# (1.8 Gy/#)	Cranial boost post TBI
Benign hematological disorders	2-3 Gy in 1#	TBI
Hodgkin lymphoma	19.8 Gy in 11# (1.8 Gy/#)	Residual Boost 10 Gy in 5#
Neuroblastoma	21 Gy in 14# (1.5 Gy/#)	
Wilms' tumour	14.4 Gy in 8# (1.8 Gy/#)	Intermediate risk
	25.2 Gy in 14# (1.8 Gy/#)	High risk
	15-21 Gy in 10-14# (1.5 Gy/#)	Whole Abdomen RT
	15 Gy in 10# (1.5 Gy/#)	Whole Lung RT
Rhabdomyosarcoma	50.4 Gy in 28# (1.8 Gy/#)	No surgery
	36-41.4 Gy in 20-23# (1.8 Gy/#)	Postoperative
Ewings and PPNET	45 Gy in 25# (1.8 Gy/#)	Residual Boost 10 Gy in 5#
	15 Gy in 10# (1.5 Gy/#)	Whole Lung RT
Astrocytoma	54 Gy in 30# (1.8 Gy/#)	
spinal astrocytoma	50.4 Gy in 28# (1.8 Gy/#)	
Ependymoma	59.4 Gy in 33# (1.8 Gy/#)	
Medulloblastoma Standard-risk	23.4 Gy in 13# (1.8 Gy/#)	CSI
	30.6 Gy in 17# (1.8 Gy/#)	Boost to tumor bed or PF
Medulloblastoma High-risk	36 Gy in 20# (1.8 Gy/#)	CSI
	19.8 Gy in 11# (1.8 Gy/#)	Boost to tumor bed or PF 50.4 Gy Boost to spinal mets
Brain stem glioma	54 Gy in 30# (1.8 Gy/#)	

Other Cancers

RT Prescription Dose: [7]

Diagnosis	RT Dose	Notes
Hodgkin lymphoma (HL)	30 Gy in 15# (2 Gy/#)	Early stage
	36 Gy in 18# (2 Gy/#)	Advanced stage
Relapsed HL	30 Gy in 10# (3 Gy/#)	
	30 Gy in 15# (2 Gy/#)	Reirradiation
NHL	30 Gy in 15# (2 Gy/#)	
Mantle cell lymphoma	45 Gy in 25# (1.8 Gy/#)	
T-cell lymphoma	50 Gy in 25# (2 Gy/#)	
CNS lymphoma	40-45 Gy in 20-25#	
Mycosis fungoides	8/12 Gy in 2/3# (4 Gy/#)	
Indolent lymphoma	24 Gy in 12# (2 Gy/#)	
Palliative NHL	30 Gy in 10# (3 Gy/#)	
soft tissue sarcoma (STS)	50 Gy in 25# (2 Gy/#)	Preop RT
	50 Gy in 25# (2 Gy/#) + 10 -16 Gy Boost in 5-8#	Postop RT
Unresectable extremity STS	66 Gy in 33# (2 Gy/#)	
Retroperitoneal STS	50 Gy in 25# (2 Gy/#)	
Desmoids tumour	56 Gy in 28# (2 Gy/#)	
Ewing's & PNET	45/50.4 Gy in 25/28# (1.8 Gy/#)	Preop RT
	54 Gy in 30# (1.8 Gy/#) + 5.4 Gy Boost in 3#	Unresectable disease
	50.4 Gy in 28# (1.8 Gy/#)	Paraspinal tumours
	18 Gy in 12# (1.5 Gy/#)	Whole lung RT
Seminoma	20 Gy in 10# (2 Gy/#)	Stage I
	30 Gy in 15# (2 Gy/#)	Stage II
Oligometastases: bone	18-24 Gy in 1#	
	30-45 Gy in 3# (10-15 Gy/#)	
	30 Gy in 5# (6 Gy/#)	Reirradiation
Oligometastases: lung	48-54 Gy in 3# (16-18 Gy/#)	
	55-60 Gy in 5# (11-12 Gy/#)	Abutting chest wall
	60 Gy in 8# (7.5 Gy/#)	Central lung/mediastinum
Oligometastases: liver	45-51 Gy in 3# (15-17 Gy/#)	
	50-60 Gy in 5# (10-12 Gy/#)	
Oligometastases: adrenal	30-36 Gy in 3# (10-12 Gy/#)	
Skin SCC & BCC	18-20 Gy in 1#	lesions < 3 cm
	35 Gy in 5# (7 Gy/#)	lesions < 4 cm
	50 Gy in 20# (2.5 Gy/#)	
	60 Gy in 30# (2 Gy/#)	Larger lesions
Melanoma	48 Gy in 20# (2.4 Gy/#)	Grade A
	50-60 Gy in 25-30# (2 Gy/#)	Grade C

α/β ratio of various organs in BED calculation

Organ	α/β ratio (Gy) [15]
Bone	6.0
Bowel bag	4.0 - 6.0
Bladder	3.1 – 10.0
Brachial plexus	3.0
Brain stem	2.0
Breast	2.0 – 3.0
Cauda equina	3.0
Duodenum	5.0
Esophagus	4.0
Heart	3.0
Kidneys	2.0
Larynx	2.0 – 4.0
Liver	1.5
Lungs	3.0 – 6.0
Optic apparatus	2.0
Prostate	1.1 – 3.7
Rectum	5.0
Salivary glands	3.0
Skin	10.0
Spinal Cord	2.0 – 4.0
Spleen	4.0
Stomach	4.0

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