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AIRO2022

Radioterapia di precisione per un'oncologia innovativa e sostenibile

BOLOGNA, 25-27 NOVEMBRE
PALAZZO DEI CONGRESSI

Associazione Italiana Radioterapia e Oncologia clinica

Società Italiana di Radiobiologia

Organs at Risk (OARs) evaluation in Stereotactic Radiotherapy (SRT)

Domenico Genovesi

ISTITUTO di RADIOTERAPIA ONCOLOGICA CHIETI 1972 - 2022

Associazione Italiana Radioterapia e Oncologia clinica

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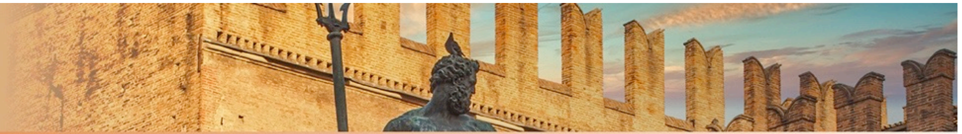


DICHIARAZIONE

Relatore: ***Domenico Genovesi***

Come da nuova regolamentazione della Commissione Nazionale per la Formazione Continua del Ministero della Salute, è richiesta la trasparenza delle fonti di finanziamento e dei rapporti con soggetti portatori di interessi commerciali in campo sanitario.

- Posizione di dipendente in aziende con interessi commerciali in campo sanitario: ***NIENTE DA DICHIARARE***
- Consulenza ad aziende con interessi commerciali in campo sanitario: ***NIENTE DA DICHIARARE***
- Fondi per la ricerca da aziende con interessi commerciali in campo sanitario: ***NIENTE DA DICHIARARE***
- Partecipazione ad Advisory Board: ***NIENTE DA DICHIARARE***
- Titolarità di brevetti in compartecipazione ad aziende con interessi commerciali in campo sanitario: ***NIENTE DA DICHIARARE***
- Partecipazioni azionarie in aziende con interessi commerciali in campo sanitario: ***NIENTE DA DICHIARARE***

OARs in SRT

Agenda

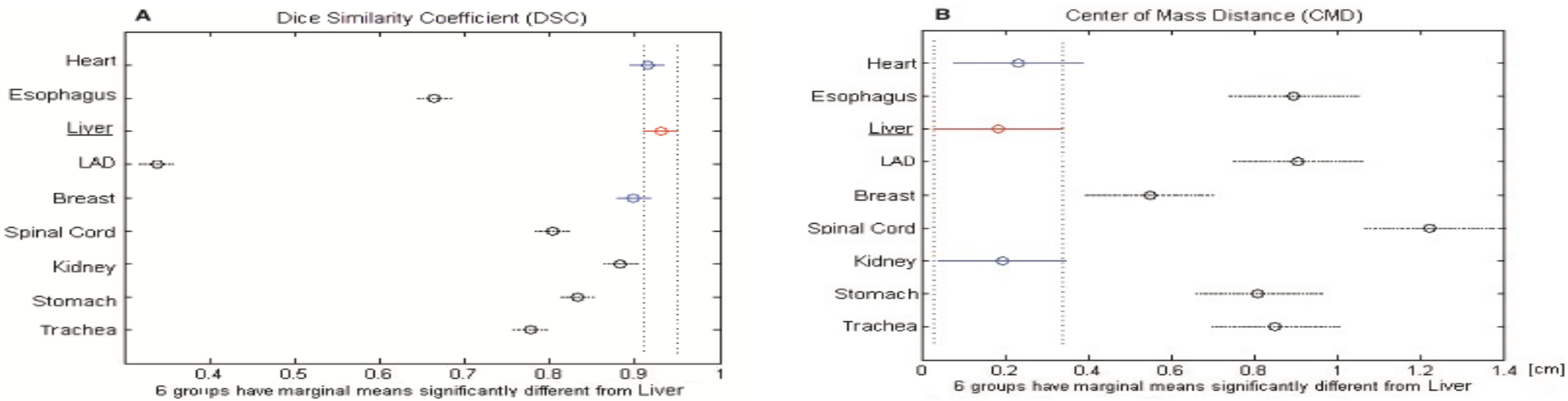
- ✓ *Imaging*
- ✓ *Contouring*
- ✓ *Dose -Volume Constraints (DVCs)*

ecancermedicalscience

ecancer 2020,

The emerging role of radiation therapists in the contouring of organs at risk in radiotherapy: analysis of inter-observer variability with radiation oncologists for the chest and upper abdomen

Simona Arculeo[1,2], Eleonora Miglietta[1], Fabrizio Nava[1], Anna Morra[1], Maria Cristina Leonardi[1], Stefania Comi[3], Delia Ciardo[1], Massimo Sarra Fiore[1], Marianna Alessandra Gerardi[1], Matteo Pepa[1], Simone Giovanni Gugliandolo[1], Lorenzo Livi[4], Roberto Orecchia[5], Barbara Alicja Jereczek-Fossa[1,2] and Samantha Dicuonzo[1]



Radiotherapy and Oncology 150 (2020) 30–39

Contents lists available at ScienceDirect

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journal homepage: www.thegreenjournal.com

Guidelines

Organ at risk delineation for radiation therapy clinical trials: Global Harmonization Group consensus guidelines

Romaana Mir [a,*], Sarah M. Kelly [b,c], Ying Xiao [d], Alisha Moore [e], Catharine H. Clark [f,g], Enrico Clementel [b],

Int J Radiat Oncol Biol Phys. 2021 May 01; 110(1): 1–10. doi:10.1016/j.ijrobp.2020.10.039.

High Dose per Fraction, Hypofractionated Treatment Effects in the Clinic (HyTEC): An Overview

Jimm Grimm, PhD[*,†], Lawrence B. Marks, MD[‡], Andrew Jackson, PhD[§], Brian D. Kavanagh,

Current Oncology

Curr. Oncol. **2022**, *29*, 7021–7050.

MDPI

Review

Dose–Volume Constraints fOr oRganS At risk In Radiotherapy (CORSAIR): An "All-in-One" Multicenter–Multidisciplinary Practical Summary

Silvia Bisello [1,2,*,†], Savino Cilla [3,†], Anna Benini [1,2], Raffaele Cardano [1,2], Nam P. Nguyen [4], Francesco Deodato [5], Gabriella Macchia [5], Milly Buwenge [1], Silvia Cammelli [1,2], Tigeneh Wondemagegnehu [6], A. F. M. Kamal Uddin [7], Stefania Rizzo [8], Alberto Bazzocchi [9], Lidia Strigari [10] and Alessio G. Morganti [1,2]

4.4 Table 4.1 Summary of pre-treatment imaging recommendations for specific clinical sites

	Lung	Liver	Adrenal	Prostate	Spine
Un-enhanced 3D planning CT	Exhale breath-hold if tolerated , additional assessment of motion is necessary (e.g. using 4DCT or fluoroscopy)	-	-	**Free-breathe or expire breath-hold recommended slice thickness <3mm**	**Recommended slice thickness <2mm.**
3D planning Contrast CT	-	**Exhale breath hold, acquired in venous phase for GTV delineation**	**Exhale breath hold for GTV delineation, include lung and kidneys**	-	-
4DCT	**Recommended MIP or individual phases for contouring tumour, AVIP or representative phase contouring OARs and for dose calculation**	**Recommended for assessing tumour motion**	Recommended for assessing tumour motion.	-	Recommended if treating around level of the diaphragm
MRI		Strongly recommended T1W or T2W, transaxial and sagittal (or 3D isotropic sequences with <2mm resolution	Recommended T1W or T2W, transaxial and sagittal (or 3D isotropic sequences with <2mm resolution	**T1W+Gad, T2W transaxial and sagittal (or 3D isotropic sequences with <2mm resolution**	**T1W+Gad, T2W transaxial and sagittal (or 3D isotropic sequences with ~1mm resolution.** Diffusion MRI can be useful for visualising the lesions
PET	FDG-PET with 4DCT in the treatment planning position (where possible). PET(3D)CT can be used to assist target delineation.	Consider FDG-PET	Not validated, but if chosen, do on same day as CT and in treatment position	-	-

Minimum standards highlighted in bold. Additional scans are at clinician's discretion.

HIGHLY RECOMMENDED

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Review

Dose–Volume Constraints fOr oRganS At risk In Radiotherapy (CORSAIR): An "All-in-One" Multicenter–Multidisciplinary Practical Summary

Silvia Bisello [1,2,*,†], Savino Cilla [3,†], Anna Benini [1,2], Raffaele Cardano [1,2], Nam P. Nguyen [4], Francesco Deodato [5], Gabriella Macchia [5], Milly Buwenge [1], Silvia Cammelli [1,2], Tigeneh Wondemagegnehu [6], A. F. M. Kamal Uddin [7], Stefania Rizzo [8], Alberto Bazzocchi [9], Lidia Strigari [10]

Table 2. Anatomical description of organs at risk (organ nomenclature based on the Global Quality Assurance of Radiation Therapy Clinical Trials Harmonization Group (GHG) contouring guidelines [29]).

Organ	Imaging Technique	Anatomical Description
Brainstem {Brainstem}	MRI	Divided into three parts: midbrain, pons, and medulla oblongata. Midbrain: from the nigral substance at the cerebral peduncle to the upper border of the pons. Include the quadrigeminal plate. Pons: caudal to midbrain, an oval-shaped structure on sagittal views. Medulla oblongata: from the pons to the dens of C2 [29,37,39] [α].
Optic Chiasm {OpticChiasm}	T1-weighted MRI	It is located in the subarachnoid space of the suprasellar cistern. Inferior border: pituitary gland. Posterior border: pituitary stalk. Lateral border: internal carotid artery. It originates anteriorly with the optic nerves and it continues dorsally to the optic tracts [37,39,67] [α].
Optic Nerve {OpticNrv_L OpticNrv_R}	T1-weighted MRI	Contour each optic nerve separately. Consider this structure from the posterior part of the eye to the optic chiasm passing through the optic canal to enter the skull [37,39,81] [α].
Hypothalamus {Hypothalamus}		Composed by two separate volumes on each side of the third ventricle. Superior boundaries: anterior and the posterior commissure. Inferior boundary: base of the third ventricle. Posterior boundary: interpeduncular fossa. Medial Border: third ventricle or the visible Cerebrospinal Fluid space. Lateral border: not clearly visible, consider 3 mm from the third ventricle. Include the mammillary bodies in the contour [37] [α].
Hippocampus {Hippocampus_L Hippocampus_R Hippocampi}	T1-weighted MRI	Composed by a posterior corpus and anterior head delimited by the lateral ventricle. Medial edge: quadrigeminal cistern. Lateral edge: temporal horn of the lateral ventricle. Dorsal edge: uncus. Contour each hippocampus separately. *Hippocampi* may be considered as volume sum for reporting purposes [29,37] [α] [40,79] [β].

Table 2. Anatomical description of organs at risk (organ nomenclature based on the Global Quality Assurance of Radiation Therapy Clinical Trials Harmonization Group (GHG) contouring guidelines [29]).

Organ	Imaging Technique	Anatomical Description
Coronary vessels		The left coronary artery is divided into Left Main Coronary artery (LMCA), Left Anterior Descending Artery (A_LAD, divided in three segments), and (CxCA, divided in two segments). The right coronary artery (RCA) is divided in 4 segments and the posterior descending artery (PDA). [74] (A) Consider the specific anatomical descriptions reported for individual coronary arteries.
Left Circumplex Coronary Artery (CxCA)		Proximal: from the LMCA in the left atrioventricular groove, it runs approximately 1.5 cm. Consider as caudal limit when it reaches the position between left ventricle and left atrium. Distal: from the proximal part it runs in the left atrioventricular groove in close relation to left atrium, cranially, and the inferior segment of left ventricle, caudally, to the crux of the heart [64,74] [α].
Lumbo-sacral Plexus {LumbSacPlex_L LumbSacPlex_R LumbSacPlexs}		At the level of L4–L5 vertebral body: anterior and lateral edges: psoas muscle, common iliac vessels; posterior and medial edges: L4–L5 vertebral body, neural foramina. At the level of S1–S2: anterior and medial edges: psoas muscle; lateral edge: iliacus muscle, sacroiliac joint; posterior edge: sacral ala; medial edge: S1–S2 and neural foramina. Level of superior aspect of piriformis muscle: anterior edge: iliac vessels; posterior edge: piriformis muscle. Level of ischial spine: anterior and medial edges: obturator internus muscle and ischial spine; lateral edge: piriformis muscle; posterior edge: gluteus maximus [72] [δ]. Define *LumbSacPlexs* if the entire lumbo-sacral plexus with bilateral nerve roots is considered. Otherwise, contour *LumbSacPlex_L/R* separately to denote structure laterality [29] [α].
Prostatic Urethra {Urethra_Prostatc}	T2-weighted MRI	It is commonly 3–4 cm in length and passes through the prostate gland. The cranial and caudal borders are defined by the limits of the prostate gland. Contour all muscle layers and use the sagittal view for a better identification [29] [α] [62] [γ].

Table 1. General dose-volume constraints for adult patients (organ nomenclature based on the Global Quality Assurance of Radiation Therapy Clinical Trials Harmonization Group (GHG) contouring guidelines [29]).

Organ	Constraints (Conventional Fractionation) *	Constraints (Hypofractionation)			
		1 Fraction	3 Fractions	5 Fractions	8 Fractions
Optic Nerve	D_{MAX} < 55 Gy [39] (A)	$D_{MAX(0.035\ cm^3)}$ < 10 $Gy_{(mandatory)}$; $D_{MAX(0.035\ cm^3)}$ < 8 $Gy_{(optimal)}$; [6] (A)	$D_{MAX(0.035\ cm^3)}$ < 20 Gy (mandatory); $D_{MAX(0.035\ cm^3)}$ < 15 $Gy_{(optimal)}$; [6] (A) $V_{10.5\ Gy}$ < 0.5 cm^3 [10] (B)	$D_{MAX(0.035\ cm^3)}$ < 25 Gy (mandatory); $D_{MAX(0.035\ cm^3)}$ < 22.5 Gy (optimal); [6] (A) $V_{12.5\ Gy}$ < 0.5 cm^3 [10] (B)	
Cochlea	Ideally one side; D_{MEAN} < 45 Gy [5,39] (A) [40] (B)	D_{MEAN} < 9 Gy (mandatory) [7] (A); D_{MEAN} < 4 Gy (optimal) [6] (A), D_{MAX} < 12 Gy [10] (B)	D_{MEAN} < $17.1_{(optimal)}$ [6] (A); D_{MAX} < 20 Gy [10] (B)	D_{MEAN} < 25 $Gy_{(optimal)}$ [6] (A); D_{MAX} < 27.5 Gy [10] (B)	
Trachea		$D_{MAX(0.1\ cm^3)}$ < 20.2 $Gy_{(mandatory)}$ [6,25] (A); $D_{4\ cm^3}$ < 10.5 Gy [8] (A)	$D_{MAX(0.1\ cm^3)}$ < 30 $Gy_{(mandatory)}$ [6,25] (A); $D_{4\ cm^3}$ < 15 Gy [8] (A)	$D_{MAX(0.1\ cm^3)}$ < 38 Gy $_{mandatory)}$; $D_{MAX(0.1\ cm^3)}$ < 35 $Gy_{(optimal)}$ [6] (A); $D_{4\ cm^3}$ < 16.5 Gy; [8] (A) Avoid 105% of PTV prescription [25] (A)	$D_{MAX(0.1\ cm^3)}$ < 40 $Gy_{(mandatory)}$ [6] (A); $D_{MAX(0.5\ cm^3)}$ < 32 $Gy_{(optimal)}$; [7] (A)
Proximal Bronchus		$D_{MAX(0.1\ cm^3)}$ < 20.2 Gy $_{mandatory)}$ [6,25] (A); $D_{4\ cm^3}$ < 10.5 Gy; [8] (A)	$D_{MAX(0.1\ cm^3)}$ < 30 Gy $_{mandatory)}$ [6] (A); $D_{MAX(0.5\ cm^3)}$ <30 $Gy_{(optimal)}$; [7,25] (A); $D_{4\ cm^3}$ < 15; [8] (A)	$D_{MAX(0.1\ cm^3)}$ < 38 Gy $_{mandatory)}$; $D_{MAX(0.1\ cm^3)}$ < 35 $Gy_{(optimal)}$; [6] (A); $D_{4\ cm^3}$ < 16.5; [8] (A); Avoid 105% of PTV prescription [25] (A)	$D_{MAX(0.1\ cm^3)}$ < 40 $Gy_{(mandatory)}$; [6] (A); $D_{MAX(0.5\ cm^3)}$ < 32 $Gy_{(optimal)}$; [7] (A)

Table 1. General dose-volume constraints for adult patients (organ nomenclature based on the Global Quality Assurance of Radiation Therapy Clinical Trials Harmonization Group (GHG) contouring guidelines [29]).

Organ	Constraints (Conventional Fractionation) *	Constraints (Hypofractionation)			
		1 Fraction	3 Fractions	5 Fractions	8 Fractions
Duodenum	$D_{MAX} \leq 55$ Gy; $V_{50\ Gy} \leq 10\ cm^3_{(optimal)}$; $V_{50\ Gy} \leq 10\%$; $V_{45\ Gy} \leq 15\%$ [36] (A)	$D_{MAX(0.1\ cm^3)} < 12.4\ Gy_{(mandatory)}$; $D_{10\ cm^3} < 9\ Gy_{(mandatory)}$ [6] (A); $D_{5\ cm^3} < 11.2\ Gy_{(optimal)}$ [8] (A)	$D_{MAX(0.1\ cm^3)} < 22.2\ Gy_{(mandatory)}$; $D_{10\ cm^3} < 11.4\ Gy_{(mandatory)}$ [6] (A); $D_{5\ cm^3} < 16.5\ Gy_{(mandatory)}$; [7] (A)	$D_{MAX(0.1\ cm^3)} < 35\ Gy_{(mandatory)}$; $D_{MAX(0.1\ cm^3)} < 33\ Gy_{(optimal)}$; $D_{10\ cm^3} < 25\ Gy_{(optimal)}$ [6] (A); $D_{1\ cm^3} < 33$ Gy; $D_{5\ cm^3} < 25$ Gy; $D_{9\ cm^3} < 15\ Gy_{(optimal)}$; [7] (A)	
Jejunum-Ileum	$D_{MAX} \leq 55$ Gy; $V_{50\ Gy} \leq 10\ cm^3_{(optimal)}$; $V_{15\ Gy} \leq 120\ cm^3_{(optimal)}$; $V_{50\ Gy} \leq 10\%$; $V_{45\ Gy} \leq 15\%$ [36] (A);	$D_{MAX(0.1\ cm^3)} < 15.4\ Gy_{(mandatory)}$ $V_{11.9\ Gy} < 5\ cm^3_{(mandatory)}$ [6] (A)	$D_{MAX(0.5\ cm^3)} < 25.2\ Gy_{(mandatory)}$ $D_{5\ cm^3} < 17.7\ Gy_{(mandatory)}$ [6] (A)	$D_{MAX(0.5\ cm^3)} < 35\ Gy_{(mandatory)}$; $D_{MAX(0.5\ cm^3)} < 30\ Gy_{(optimal)}$; $D_{10\ cm^3} < 25\ Gy_{(optimal)}$ [6] (A)	
Bowel	$V_{15\ Gy} < 120\ cm^3$; $V_{45\ Gy} < 195\ cm^3$ [5] (A)			For primary prostate SBRT only: $V_{18.1\ Gy} < 5\ cm^3$; $V_{30\ Gy} < 1\ cm^3_{(mandatory)}$ [7] (A)	
Bowel Large	$V_{45\ Gy} < 5\%$ or $<20\ cm^3$; $V_{35\ Gy} < 35\%$ or $150\ cm^3$; $V_{30\ Gy} < 50\%$ or $200\ cm^3$ [28] (A)	$D_{MAX(0.1\ cm^3)} < 18.4\ Gy_{(mandatory)}$ [6] (A); $V_{14.3\ Gy} < 20\ cm^3_{(optimal)}$ [8] (A)	$D_{MAX(0.1\ cm^3)} < 28.2$ Gy [6] (A); $D_{20\ cm^3} < 24\ Gy_{(optimal)}$; [8] (A)	$D_{MAX(0.1\ cm^3)} < 38$ Gy [6] (A); $D_{20\ cm^3} < 25\ Gy_{(optimal)}$; [8] (A)	
Bowel Small	$D_{MAX} \leq 55$ Gy; $V_{50\ Gy} \leq 10\ cm^3_{(optimal)}$; $V_{15\ Gy} \leq 120\ cm^3_{(optimal)}$; $V_{50\ Gy} \leq 10\%$; $V_{45\ Gy} \leq 15\%$ [36] (A);	$D_{MAX(0.1\ cm^3)} < 15.4\ Gy_{(mandatory)}$ $V_{11.9\ Gy} < 5\ cm^3_{(mandatory)}$ [6] (A);	$D_{MAX(0.5\ cm^3)} < 25.2\ Gy_{(mandatory)}$; $D_{5\ cm^3} < 17.7\ Gy_{(mandatory)}$ [6] (A);	$D_{MAX(0.5\ cm^3)} < 35\ Gy_{(mandatory)}$; $D_{MAX(0.5\ cm^3)} < 30\ Gy_{(optimal)}$; $D_{10\ cm^3} < 25\ Gy_{(optimal)}$; [6] (A)	
Lumbo-sacral Plexus	Pudendal Nerve $D_{MAX} < 60$ Gy [48] (C)	$D_{MAX(0.1\ cm^3)} < 16\ Gy_{(mandatory)}$; $D_{5\ cm^3} < 14.4\ Gy_{(optimal)}$; [6,7] (A)	$D_{MAX(0.1\ cm^3)} < 24$ Gy mandatory); $D_{5\ cm^3} < 22\ Gy_{(optimal)}$; [6,7] (A)	$D_{MAX(0.1\ cm^3)} < 32\ Gy_{(mandatory)}$; $D_{5\ cm^3} < 30\ Gy_{(optimal)}$; [6,8] (A)	

Table S5. Specific dose-volume constraints for adult patients treated for stereotactic arrhythmia radioablation (STAR).

Organ	Constraints for single dose hypofractionation
Anterior Descending Artery	$D_{MAX(0.03\ cm3)} \leq 12$ Gy [24] [B] $D_{MAX} \leq 14$ Gy [22] [D]
Aorta	$D_{MAX(0.1\ cm3)} \leq 15.4$ Gy [6] [A];
Bowel Small	$D_{MAX(0.5\ cm3)} < 15.4$ Gy (mandatory); $D_{5cm3} < 11.9$ Gy (optimal) [8] [A]
Bowel Large	$D_{MAX} < 18.4$ Gy (mandatory); $D_{20cm3} < 14.3$ Gy (optimal) [8] [A]
Chestwall	$D_{MAX(0.1\ cm3)} < 30$ Gy (optimal) [6] [A]; $D_{1cm3} < 22$ Gy [8] [A]
Esophagus	$D_{MAX(0.1\ cm3)} \leq 15.4$ Gy [6] [A]; $V_{11.9Gy} < 5\ cm^3$; $V_{16Gy} < 0.03\ cm^3$ [8,21] [A]
Hearth- PTV	$D_{MAX(0.1\ cm3)} \leq 22$ Gy [6] [A]; $V_{16Gy} < 15\ cm^3$; [8,21] [A] [23] [B] $D_{50\%} \leq 5$ Gy [22] [D]
Implantable Cardioverter Defibrillator (ICD)	$D_{MAX} \leq 0.5$ Gy [22] [D] $D_{MAX} < 2$ Gy [80,122] [A]
Left Circumplex Coronary Artery (CxCA)	$D_{MAX(0.03\ cm3)} \leq 12$ Gy [24] [B] $D_{MAX} \leq 14$ Gy [22] [D]
Left Main Coronary artery (LMCA)	$D_{MAX(0.03\ cm3)} \leq 12$ Gy [24] [B] $D_{MAX} \leq 14$ Gy [22] [D]
Liver	$V_{9.1Gy} < 700\ cm^3$; [6,8,21] [A]
Lung	$V_{20Gy} < 15\%$ (mandatory); $D_{MEAN} < 8$ Gy (mandatory); $V_{20Gy} < 10\%$ (optimal); [6] [A] $V_{7Gy} < 1500\ cm^3$; $V_{7.4Gy} < 1000\ cm^3$; [8,21] [A]
Proximal Brochus	$D_{MAX(0.1\ cm3)} \leq 20.2$ Gy [6] [A] $V_{10.5Gy} < 4\ cm^3$; [8,21] [A]
Right Coronary Artery(RCA)	$D_{MAX(0.03\ cm3)} \leq 12$ Gy [24] [B]
Skin	$D_{MAX(0.01\ cm3)} < 26$ Gy (mandatory); $D_{10cm3} < 23$ Gy (mandatory) [6,8] [A]
SpinalCord	$D_{MAX(0.035\ cm3)} < 14$ Gy (mandatory); $D_{MAX(0.035\ cm3)} < 12.4$ Gy (optimal) [6] [A] $V_{7Gy} < 1.2\ cm^3$;
	$V_{10Gy} < 0.35\ cm^3$; [8,21] [A]
Stomach	$D_{MAX(0.1\ cm3)} < 12.4$ Gy (mandatory); $D_{10cm3} < 11.2$ Gy (optimal) [6,8] [A]
Superior Vena cava	$D_{MAX(0.1\ cm3)} \leq 15.4$ Gy [6] [A]; $D_{50\%} \leq 0.6$ Gy [22] [D]
Trachea	$D_{MAX} \leq 20.2$ Gy; $V_{10.5Gy} < 4\ cm^3$; [8,21] [A]

Legend: CxCA: Left Circumplex Coronary Artery; DMax: Maximum Dose; Gy: Gray; ICD: implantable cardioverter defibrillator; A_LAD: Left Anterior Descending Coronary Artery; LMCA: Left Main Coronary artery; RCA: Right Coronary Artery; PTV: Planning Target Volume. The anatomical descriptions are reported in Table 2. Common abbreviations were used in the tables: V● = Volume receiving a dose ≥ ● Gy, D●● = dose received by % of the organ volume, D● = dose received by γ cm3 (the cubic centimeters) of the organ volume, DMAX = maximum dose received by the organ, DMEAN = mean dose received by the organ. Volumes and doses were ex-pressed as percentage (%) or absolute values (cm3 or Gy, respectively). The letters in square brackets indicate the levels of evidence, classified as follows: [A] International guidelines; [B] literature review on clinical or planning studies; [C] Data from results of clinical or planning studies; [D] expert opinions or used in prospective trials. * Please consider anatomical description reported in **Table1 or 2. Note:** other cardiac substructures (Pulmonary trunk, right and left pulmonary veins, right and left ventricles, right atrium, inferior vena cava, phrenic nerve) may be delineated for dosimetric purposes.

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Topic Discussion

Organ at Risk Dose Constraints in SABR: A Systematic Review of Active Clinical Trials

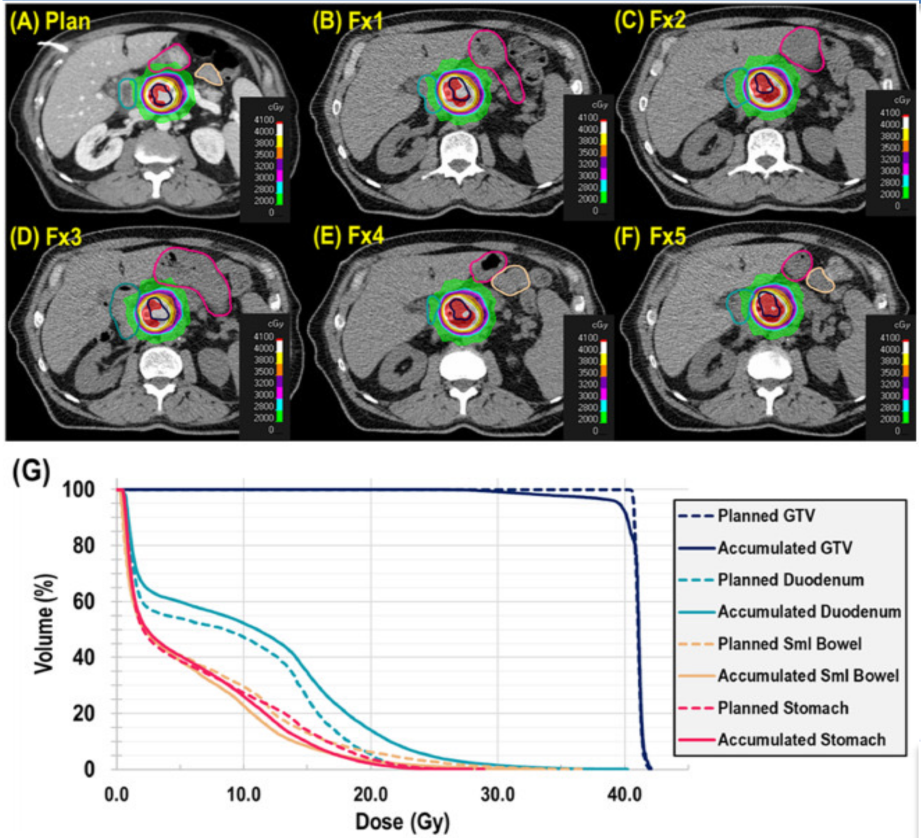
Serenna G. Gerhard, BHSc (candidate),[a] David A. Palma, MD, PhD,[a,*] Andrew J. Arifin, MD,[a] Alexander V. Louie, MD, PhD,[b] George J. Li, HBSc,[c] Faiez Al-Shafa, MD,[d] Patrick Cheung, MD,[b] George B. Rodrigues, MD, PhD,[a] Carol W. Bassim, DMD, MSc, MHSc,[e] and Mark T. Corkum, MD, MSc[b]

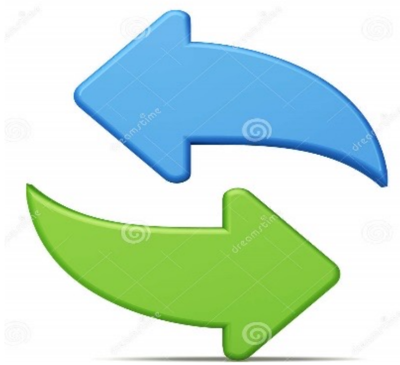
Planning OAR volume (PRV) constraints were explicitly mentioned in 13/53 trials. The most common organs where a PRV was used was spinal cord (n = 12, PRV margin range: 1-3 mm), followed by cauda equina (n = 4, PRV margin range: 1-3 mm) and esophagus (n = 2, 2 mm PRV margin). Circumferential radiation was recommended to be avoided in the duodenum (n = 6), small bowel (n = 5), colon (n = 3), and rectum (n = 6).

CA CANCER J CLIN 2021;71:437–454

Radiation Therapy-Associated Toxicity: Etiology, Management, and Prevention

Kyle Wang, MD [1]; Joel E. Tepper, MD[2]





Reporting
acute & late
toxicities and
correlation
with DVCs & DVHs:

<u>the value of Clinic !!!</u>

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Physics and Imaging in Radiation Oncology

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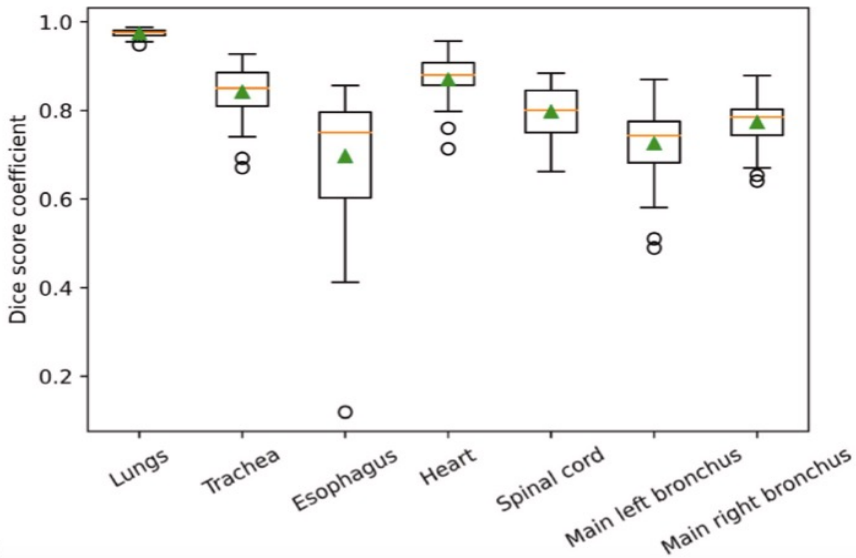
Original Research Article

Dose-volume-based evaluation of convolutional neural network-based auto-segmentation of thoracic organs at risk

Noémie Johnston [a,1], Jeffrey De Rycke [b,1], Yolande Lievens [b,c], Marc van Eijkeren [b,c], Jan Aelterman [d,e], Eva Vandersmissen [f], Stephan Ponte [a], Barbara Vanderstraeten [b,c,*]



Post-processing manual adjustments of automatic contours: always necessary:

the value of Anatomo-radiological knowledge !!!

Take Home Messages: OARs & SBRT

- New references for correct use of Imaging:
- New references for correct Contouring:
- Dose-Volume Constraints:
- Need of more knowledge on PRV management

- *The value of Clinic on Toxicities & DVCs correlation*
- *The value of Anatomo-radiological knowledge*