



Hypofractionner pour mieux soigner

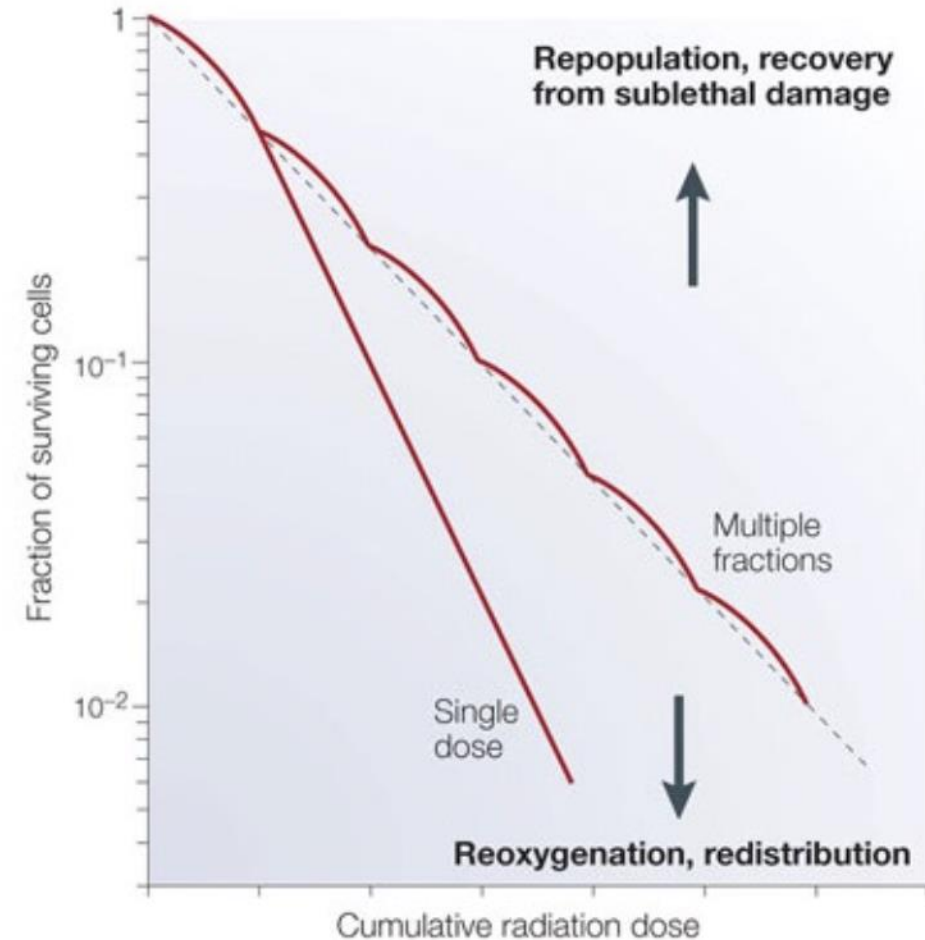


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Pour le Service de radio-oncologie du Centre universitaire de santé McGill

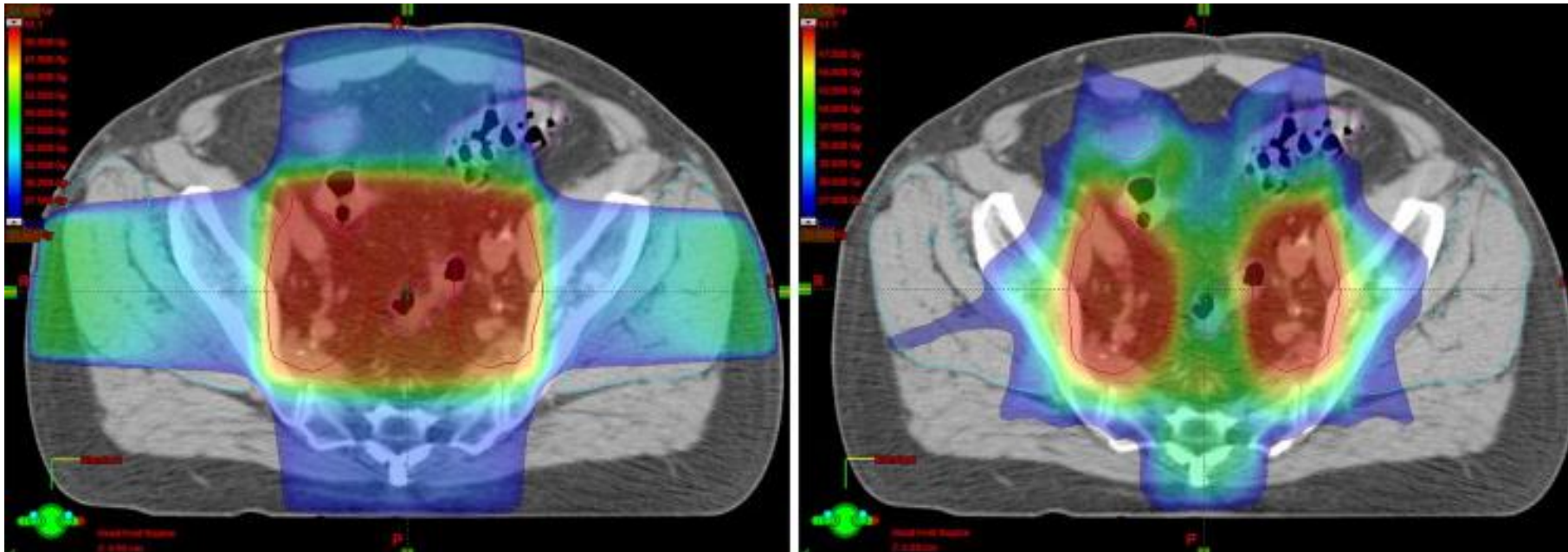
Hypofractionnement

- Radiothérapie conventionnelle
 - Dose de 2 Gy par fraction
 - Plusieurs fractions permettent de protéger les tissus sains
 - Meilleur contrôle tumoral avec fraction unique



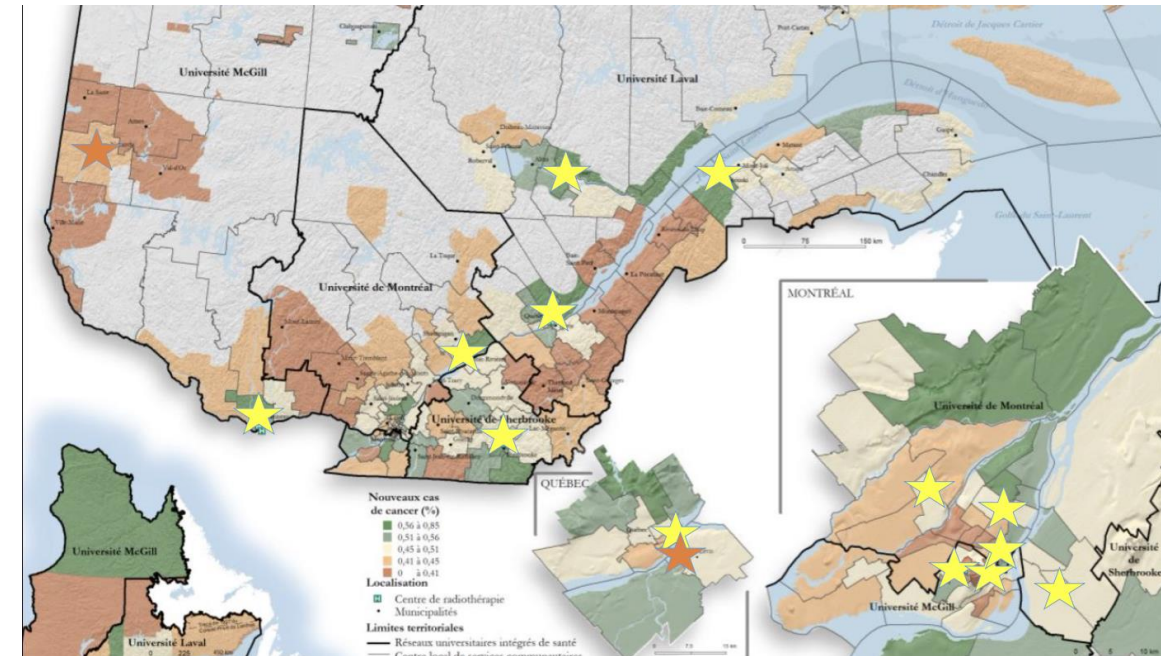
Hypofractionnement

- Hypofractionnement
 - Traitement par doses > 2 Gy par fraction
 - Moins de fractions par patient
 - Faisable grâce aux nouvelles technologies



Hypofractionnement

- Avantages
 - Pratique pour les patients
 - Meilleure adhésion au traitement
 - Meilleur accès aux soins à tous
- Pourquoi maintenant?
 - Accélération d'un changement de pratique débuté depuis plus d'une décennie
 - Épidémie de la COVID-19



Données cliniques: Cancer du sein

Radiotherapy and Oncology 162 (2021) 156–161

Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com



ELSEVIER



Original Article

Extreme weekly locoregional hypofractionated radiation in elderly women with non-metastatic breast cancer



Fadoua Rais*, James Man Git Tsui, Allyssa Daianska, Mame Daro Faye, Christine Lambert, Marc David, Valerie Panet-Raymond, Melissa Azoulay, Asma Saidi, Tarek Hijal

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Radiotherapy and Oncology 100 (2011) 93–100

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Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com



ELSEVIER



Phase III randomised trial

First results of the randomised UK FAST Trial of radiotherapy hypofractionation for treatment of early breast cancer (CRUKE/04/015)

The FAST Trialists group¹

Hypofractionated breast radiotherapy for 1 week versus 3 weeks (FAST-Forward): 5-year efficacy and late normal tissue effects results from a multicentre, non-inferiority, randomised, phase 3 trial

Adrian Murray Brunt*, Joanne S Haviland¹, Duncan A Wheatley, Mark A Sydenham, Abdulla Alhasso, David J Bloomfield, Charlie Chan, Mark Churn, Susan Cleator, Charlotte E Coles, Andrew Goodman, Adrian Hammett, Penelope Hopwood, Anna M Kirby, Cliona C Kinwan, Carolyn Morris, Zohal Nabi, Elinor Sawyer, Navita Somaiah, Liba Stones, Isabel Syndikus, Judith M Bliss¹, John R Yarnold¹, on behalf of the FAST-Forward Trial Management Group

Consensus statement 1

- Offer 26 Gray (Gy) in five fractions over one week for whole breast radiotherapy.

Consensus statement 2

- Offer 26 Gy in five fractions over one week for chest wall radiotherapy.

Consensus statement 3

- Consider 26 Gy in five fractions over one week for chest wall radiotherapy with reconstruction.

Consensus statement 4

- Offer 26 Gy in five fractions over one week for partial breast radiotherapy.

Consensus statement 5

- Consider 28.5 Gy in five fractions over five weeks instead of 26 Gy in five fractions over one week for patients with significant co-morbidities and/or frailty that make daily radiotherapy difficult.

Consensus statement 6

- Fifteen fractions over three weeks is the current standard of care for breast nodal radiotherapy. Consider 26 Gy in five fractions for nodal radiotherapy (excluding the internal mammary chain [IMC]) only for patients with significant co-morbidities while awaiting the two-year normal tissue results of the FAST-Forward nodal sub-study (due to report in 2021).

www.rcr.ac.uk

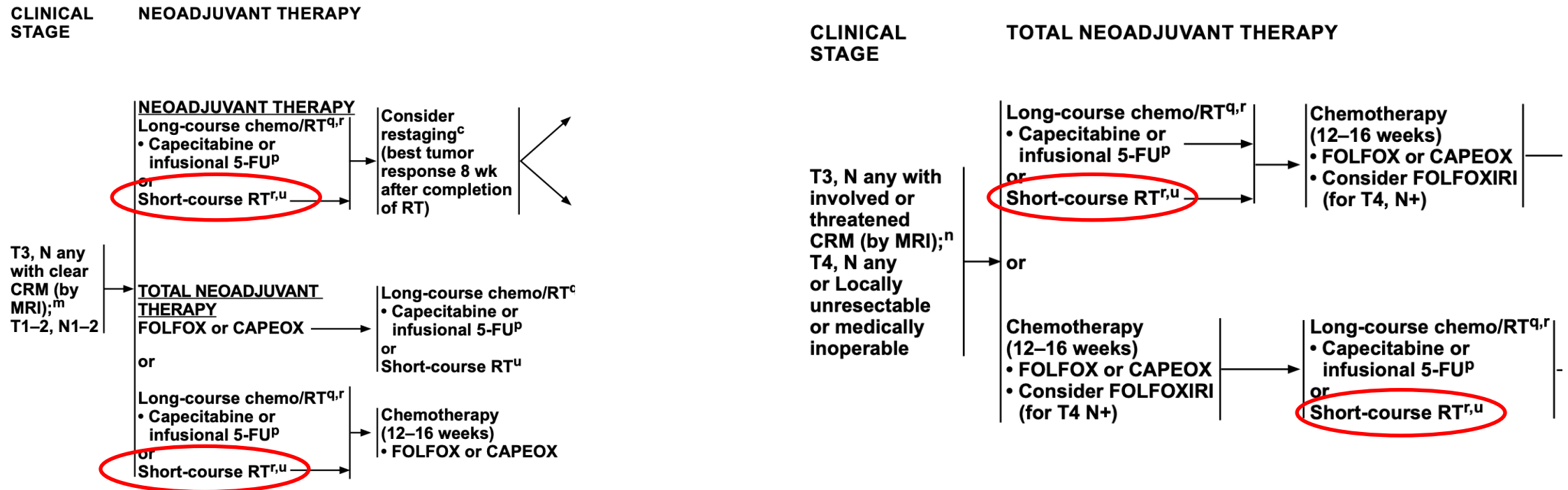
Postoperative radiotherapy for breast cancer: hypofractionation RCR consensus statements



Évolution du fractionnement en sein

SEIN	% cas hypo ultra ≤ 5 fractions	% cas hypo modéré 16 fractions	% cas conventionnel 25 fractions
2017	14	76	10
2018	22	70	8
2019	25	71	4
2020	81	18	0
2021	73	24	3

Données cliniques: Cancer du rectum



Original article doi:10.1111/codi.12466

Phase II trial of short-course radiotherapy followed by delayed surgery for locoregionally advanced rectal cancer

S. Faria*, N. Koppek*, T. Hijal*, S. Liberman†, P. Charlebois‡, B. Stein‡, S. Meterissian‡, A. Meguerditchian‡, Z. Fawaz‡ and G. Artho§

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Évolution du fractionnement en rectum

RECTUM	% cas hypo ultra ≤ 5 fractions	% cas conventionnel 25 fractions
2017	46	54
2018	49	51
2019	50	50
2020	83	17
2021	80	20

Données cliniques: Cancer du poumon

Radiation Oncology 2006



Research

Open Access

Absence of toxicity with hypofractionated 3-dimensional radiation therapy for inoperable, early stage non-small cell lung cancer

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ARTICLE

JNCI J Natl Cancer Inst (2014)

Phase II Study of Accelerated Hypofractionated Three-Dimensional Conformal Radiotherapy for Stage T1-3 N0 M0 Non-Small Cell Lung Cancer: NCIC CTG BR.25

Patrick Cheung, Sergio Faria, Shahida Ahmed, Pierre Chabot, Jonathan Greenland, Elizabeth Kurien, Islam Mohamed, James R. Wright, Helmut Hollenhorst, Catherine de Metz, Holly Campbell, Thi Toni Vu, Anand Karvat, Elaine S. Wai, Yee C. Ung, Glenwood Goss, Frances A. Shepherd, Patti O'Brien, Keyue Ding, Chris O'Callaghan

Manuscript received November 20, 2013; revised May 5, 2014; accepted May 13, 2014.

Évolution du fractionnement en poumon

POUMON	% cas curatifs hypo modéré 15 fractions	% cas curatifs conventionnel ≥ 25 fractions	% cas totaux SBRT 1 à 5 fractions
2017	62	38	44
2018	66	34	48
2019	65	35	52
2020	71	29	66
2021	71	29	63

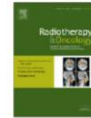
Données cliniques: Cancer de la prostate

Radiotherapy and Oncology 101 (2011) 486–489

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Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com



Prostate cancer radiotherapy

Treating intermediate-risk prostate cancer with hypofractionated external beam radiotherapy alone

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ARTICLE INFO

ABSTRACT

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Available online 22 August 2011

Purpose: Intermediate-risk prostate cancer has been treated in many ways; the most effective treatment is uncertain. Hypofractionated external beam radiotherapy (HyRT) is a short and convenient alternative treatment. We report our results of HyRT in intermediate-risk patients.
Material and methods: Eighty-two patients with intermediate-risk prostate cancer were treated with 3-dimensional conformal HyRT plans to the dose of 66 Gy/22 fractions prescribed at the isocenter without

www.redjournal.org

Clinical Investigation: Genitourinary Cancer

Hypofractionated Radiation Therapy (66 Gy in 22 Fractions at 3 Gy per Fraction) for Favorable-Risk Prostate Cancer: Long-term Outcomes

Nita Patel, MD, Sergio Faria, MD, PhD, Fabio Cury, MD, Marc David, MD, Marie Duclos, MD, George Shenouda, MD, PhD, Russell Ruo, PhD, and Luis Souhami, MD

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Received Oct 25, 2012, and in revised form Feb 3, 2013. Accepted for publication Feb 5, 2013

Ultra-hypofractionated versus conventionally fractionated radiotherapy for prostate cancer: 5-year outcomes of the HYPO-RT-PC randomised, non-inferiority, phase 3 trial

Anders Widmark, Adalsteinn Gunnlaugsson, Lars Beckman, Camilla Thellenberg-Karlsson, Morten Hoyer, Magnus Lagerlund, Jon Kindblom, Claes Gimman, Bengt Johansson, Kirsten Björnling, Mihajl Seke, Måns Agrup, Per Fransson, Björn Tavelin, David Norman, Björn Zackrisson, Harald Anderson, Elisabeth Kjellén, Lars Franzén, Per Nilsson

www.thelancet.com Vol 394 August 3, 2013



PRINCIPLES OF RADIATION THERAPY

Table 1: Below are examples of regimens that have shown acceptable efficacy and toxicity. The optimal regimen for an individual patient warrants evaluation of comorbid conditions, voiding symptoms and toxicity of therapy. Additional fractionation schemes may be used as long as sound oncologic principles and appropriate estimate of BED are considered.

See PROS-3, PROS-4, PROS-5, PROS-6, PROS-7, PROS-8, PROS-12, and PROS-H for other recommendations, including recommendations for neoadjuvant/concomitant/adjuvant ADT.

Regimen	Preferred Dose/Fractionation	NCCN Risk Group (✓ indicates an appropriate regimen option if radiation therapy is given)					Regional N1	Low Volume M1 ^a
		Very Low and Low	Favorable Intermediate	Unfavorable Intermediate	High and Very High			
EBRT								
Moderate Hypofractionation (Preferred)	3 Gy x 20 fx	✓	✓	✓	✓	✓		
	2.7 Gy x 26 fx							
	2.5 Gy x 28 fx							
	2.75 Gy x 20 fx							✓
Conventional Fractionation	1.8–2 Gy x 37–45 fx	✓	✓	✓	✓	✓		
Ultra-Hypofractionation	7.25–8 Gy x 5 fx	✓	✓	✓	✓			
	6.1 Gy x 7 fx							
	6 Gy x 6 fx							✓
Brachytherapy Monotherapy								
LDR								
	Iodine 125							
	Palladium 103	✓	✓					
	Cesium 131							
	145 Gy							
	125 Gy							
	115 Gy							
HDR								
	Iridium-192	✓	✓					
	13.5 Gy x 2 implants							
	9.5 Gy BID x 2 implants							
EBRT and Brachytherapy (combined with 45–50.4 Gy x 25–28 fx or 37.5 Gy x 15 fx)								
LDR								
	Iodine 125				✓	✓		
	Palladium 103							
	Cesium 131							
	110–115 Gy							
	90–100 Gy							
	85 Gy							
HDR								
	Iridium-192			✓	✓			
	15 Gy x 1 fx							
	10.75 Gy x 2 fx							

Évolution du fractionnement en prostate

PROSTATE	% cas hypo ultra ≤ 5 fractions	% cas hypo modéré 20 fractions	% cas conventionnel ≥ 30 fractions
2017	4	92	4
2018	3	94	3
2019	24	73	3
2020	66	33	1
2021	70	29	1

Données cliniques: Métastases

Technical Innovations & Patient Support in Radiation Oncology 9 (2019) 13–17



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Technical Innovations & Patient Support in Radiation Oncology

journal homepage: www.elsevier.com/locate/tipsro



Research article

Are radiation oncologists following guidelines? An audit of practice in patients with uncomplicated bone metastases



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<https://doi.org/10.1007/s10585-020-10067-7>

REVIEW



Better pain control with 8-gray single fraction palliative radiotherapy for skeletal metastases: a Bayesian network meta-analysis

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13 October 2020 / Accepted: 20 November 2020 / Published online: 9 February 2021
rthor(s) 2021

ASTRO GUIDELINE

PALLIATIVE RADIOTHERAPY FOR BONE METASTASES: AN ASTRO EVIDENCE-BASED GUIDELINE

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ANDREW VASSIL, M.D.,*** DEBORAH WATKINS BRUNER, R.N., PH.D.,††† AND WILLIAM HARTSELL, M.D.†††

Int. J. Radiation Oncology Biol. Phys., Vol. 75, No. 5, pp. 1501–1510, 2009
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doi:10.1016/j.ijrobp.2008.12.084



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REVIEW ARTICLE

CLINICAL INVESTIGATION

Palliation

INTERNATIONAL PATTERNS OF PRACTICE IN PALLIATIVE RADIOTHERAPY FOR PAINFUL BONE METASTASES: EVIDENCE-BASED PRACTICE?

ALYSA FAIRCHILD, M.D., F.R.C.P.C.,* ELIZABETH BARNES, M.D., F.R.C.P.C.,† SUNITA GHOSH, PH.D.,*
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Palliative Radiotherapy Trials for Bone Metastases: A Systematic Review

Edward Chow, Kristin Harris, Grace Fan, May Tsao, and Wai M. Sze

Évolution du fractionnement en métastases

METASTASES	% cas mets non SRS/SBRT 1 fraction	% cas mets non SRS/SBRT 2 à 5 fractions	% cas mets non SRS/SBRT > 5 fractions	% cas métastases SRS/SBRT
2017	63	34	3	15
2018	61	36	2	20
2019	62	32	1	21
2020	63	34	2	22
2021	65	34	1	19



Évolution du fractionnement au CUSM

Site	Conventionnel		Hypofractionnement		Différence en Fractions
	Dose (Gy)	Fractions	Dose (Gy)	Fractions	
Sein	50	25	26	5	20
	40	15			10
Prostate	78	39	60	20	19
			36.25	5	34
Poumon	60	30	52.5	15	15
Rectum	45	25	25	5	20
SNC	60	30	60	20	10
Sarcome	50	25	30	5	20
Poumon palliatif	20	5	17	2	3
Métastases os	20	5	8	1	4
SBRT poumon	48	4	34	1	3

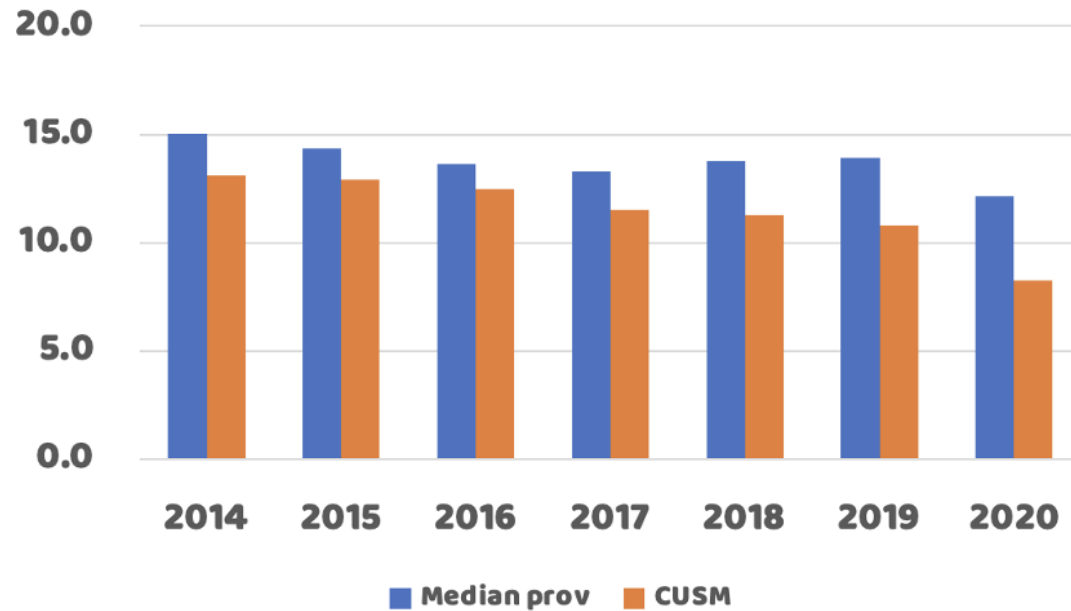
Quel effet théorique sur la capacité ?

Fractions par MET	MET par année	Capacité théorique
8.3	5 422	45 000
12	3 750	45 000
15	3 000	45 000

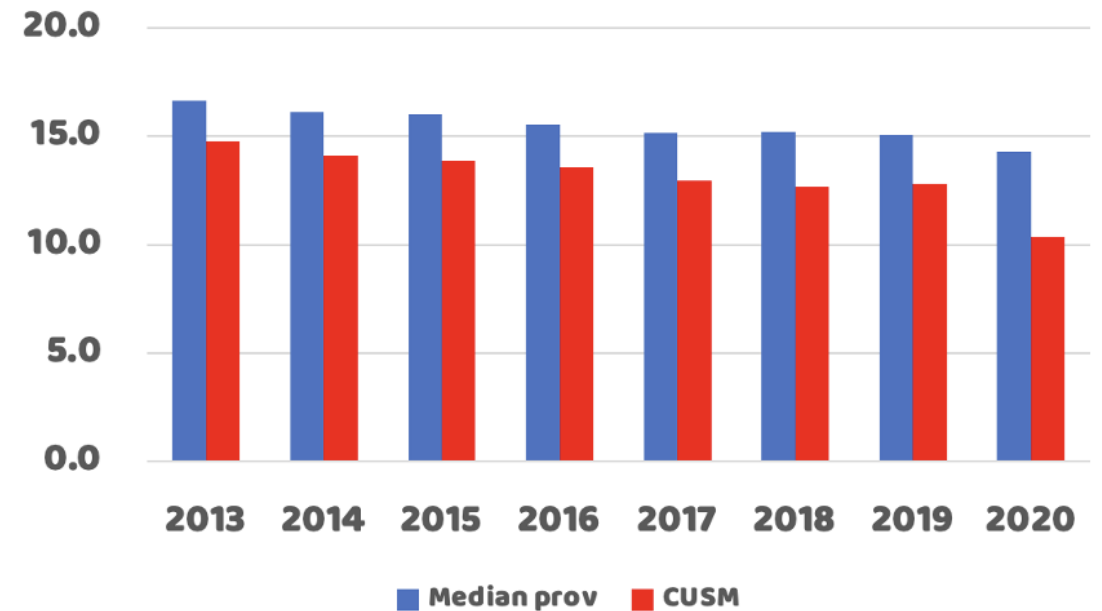
Capacité théorique = 6 accélérateurs x 10h x 3 fractions/heure

Comparaison nationale du fractionnement

Fractions/MET tous

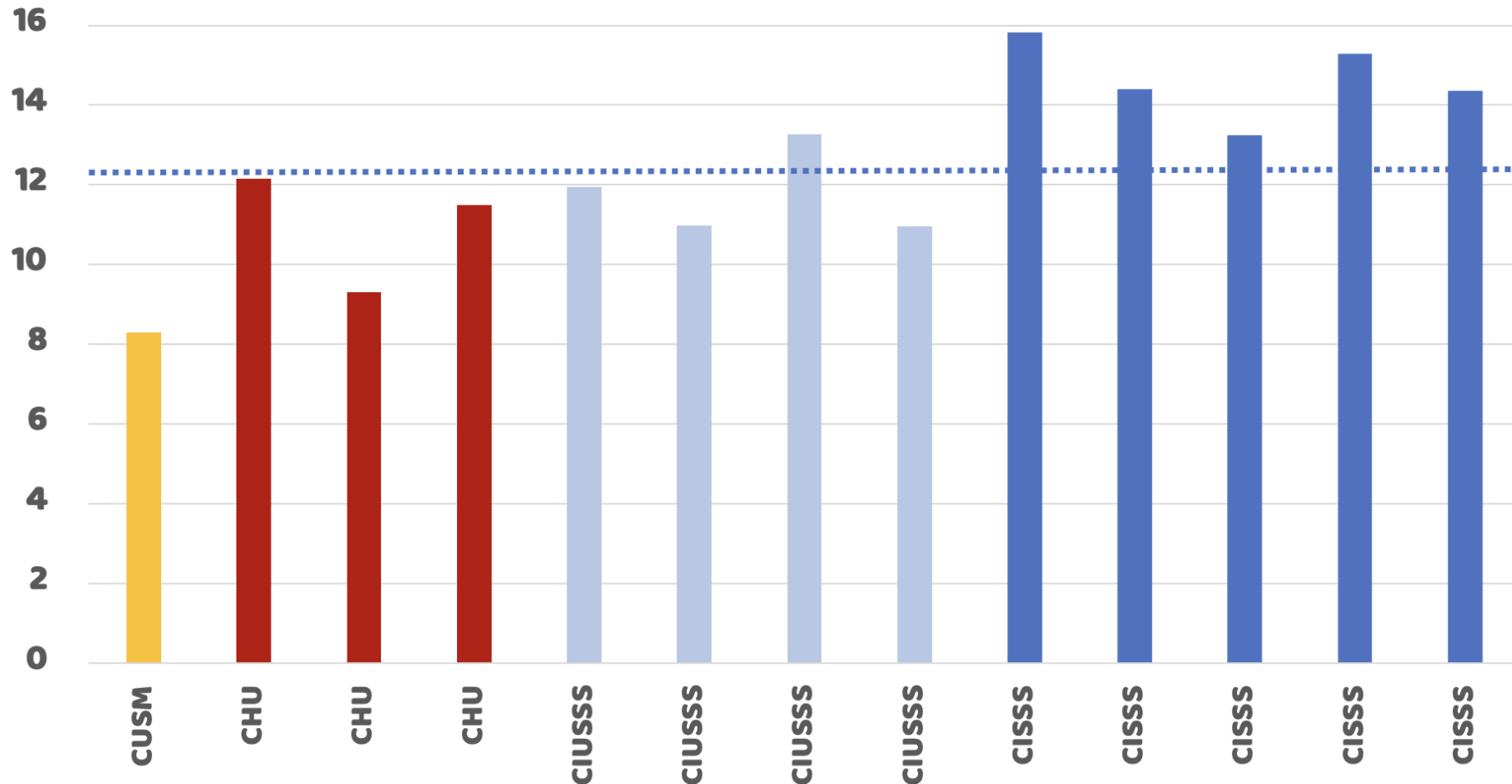


Fractions/MET excluant SRS/SBRT

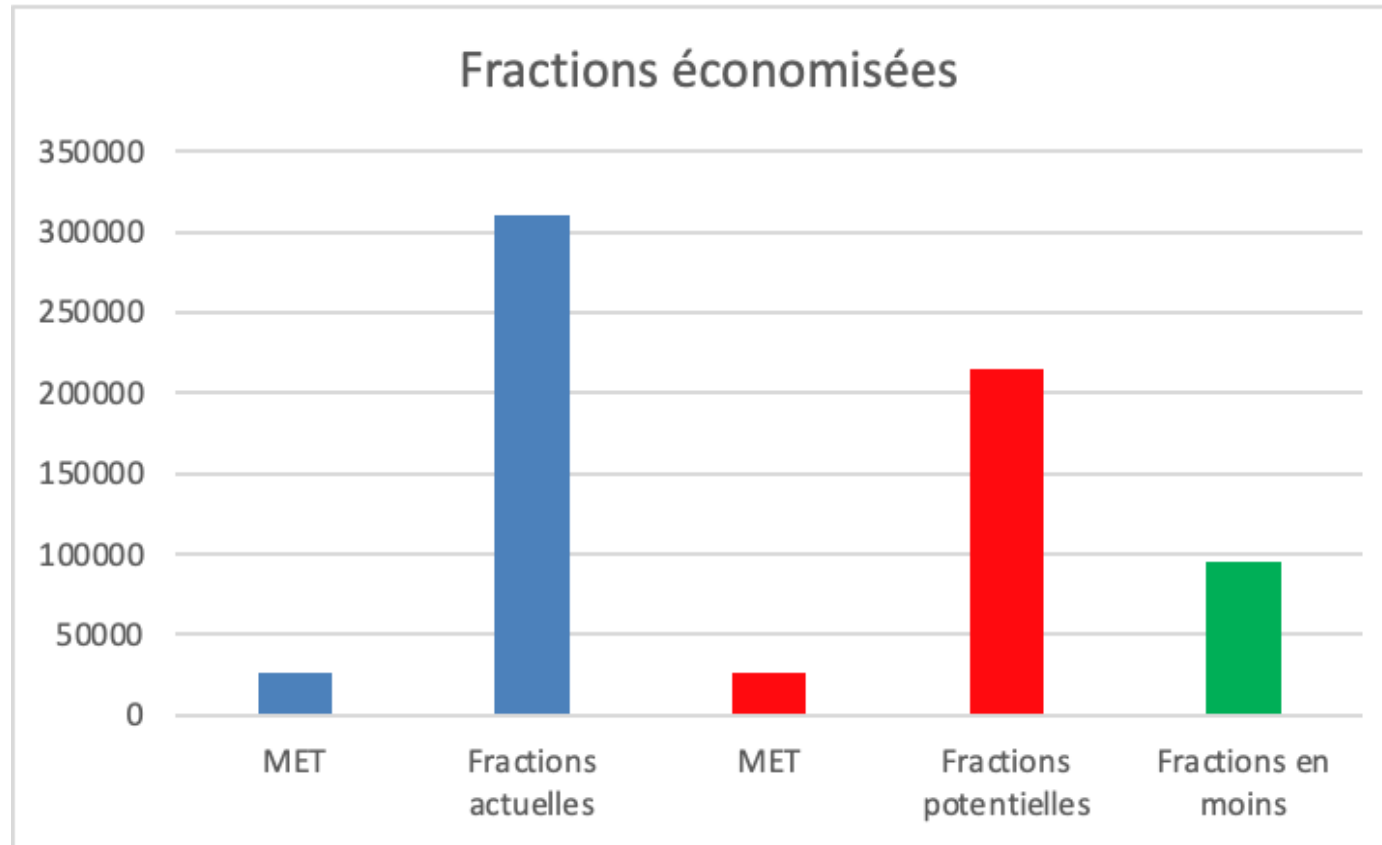


Comparaison nationale du fractionnement

Fractions/MET par centre 2020-2021



Mieux soigner – Optimiser nos ressources



Mises-en-traitement: 25,974
Fractions: 309,955
F/MET: 11.93
F/MET CUSM: 8.29
Fractions potentielles: 215,325

Fractions potentiellement économisées au niveau national

94,630

Mieux soigner – Impacts socio-administratifs

- 94,630 fractions en moins, c'est
 - 15 accélérateurs linéaires en moins
 - \$45,000,000 en coût de capital chaque 10 ans
 - \$4,500,000 en coût annuel de maintenance
 - Réinvestissements en radio-onco pour améliorer les soins
 - Possibilités de déploiement de nouvelles technologies
 - Meilleure allocation des ressources humaines

Mieux soigner – Impacts socio-administratifs

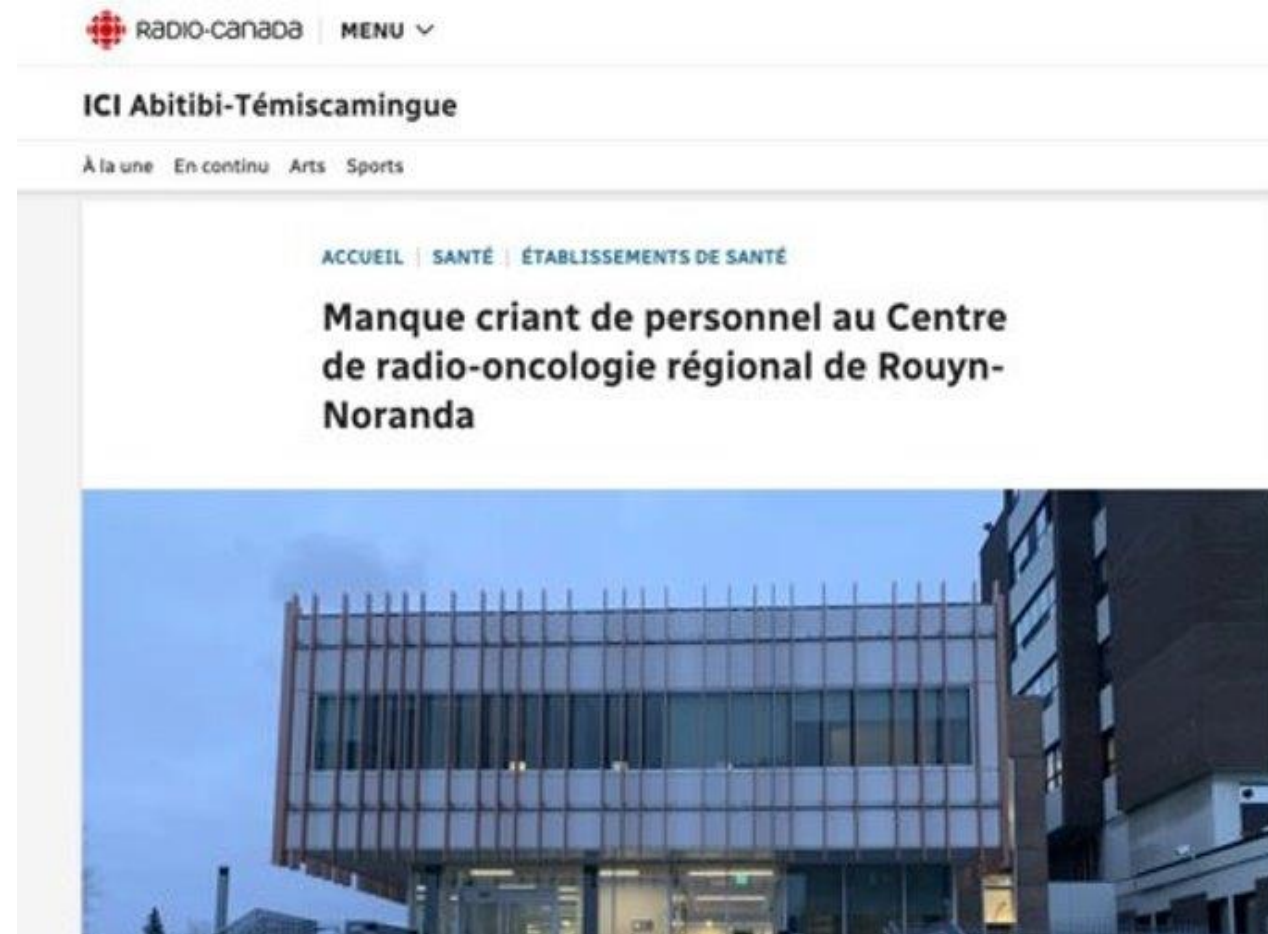
- C'est aussi:
 - Une meilleure qualité de vie pour le personnel
 - Meilleurs horaires
 - Profession plus attrayante
 - Technologues affectés à des tâches de développement
 - Planification
 - Projets d'amélioration de la qualité
 - Accompagnement et enseignement des patients
 - Projets de recherche

Mieux soigner – Impacts socio-administratifs

- 94,630 fractions en moins, c'est aussi
 - Moins de déplacements pour les patients
 - Coûts réduits
 - Confort
 - Moins de visites en cours de traitement
 - Meilleure gestion des salles d'attente
 - Capacité pour affronter la vague de cancers post-COVID-19
 - ~20% de cancers non diagnostiqués
 - >10 ans de capacité supplémentaire

Mieux soigner – Impacts socio-administratifs

- Meilleure gestion de la main d'oeuvre



Merci

