Cancer du sein à haut risque

Actualités en radiothérapie

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Cancers du sein à haut risque

Quelle définition?

Définition

« Risque de récidive élevé = évalué à plus de 20 % à 5 ans »

- Une approche plurifactorielle plutôt qu'une définition stricte

Facteurs anatomopathologiques:

- Triple négatif
- HER2+++
- Réponse au ttt néoadj
- Ki67 élevé
- ER faible ou négatif
- Grade 3
- Emboles

Facteurs cliniques:

- Âge <40 ans
- ≥T2
- Atteinte N+ (N2-N3)
- Mutation BRCA?

Tests génomiques:

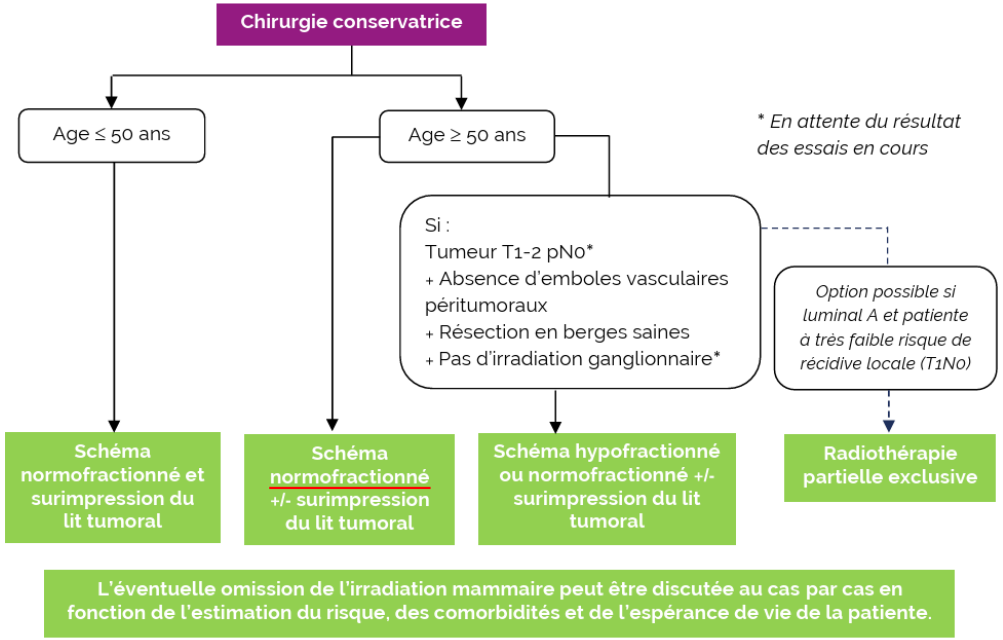
- Oncotype DX® score >26
- Mammaprint : High Risk
- Prosigna (PAM50) : Risque élevé

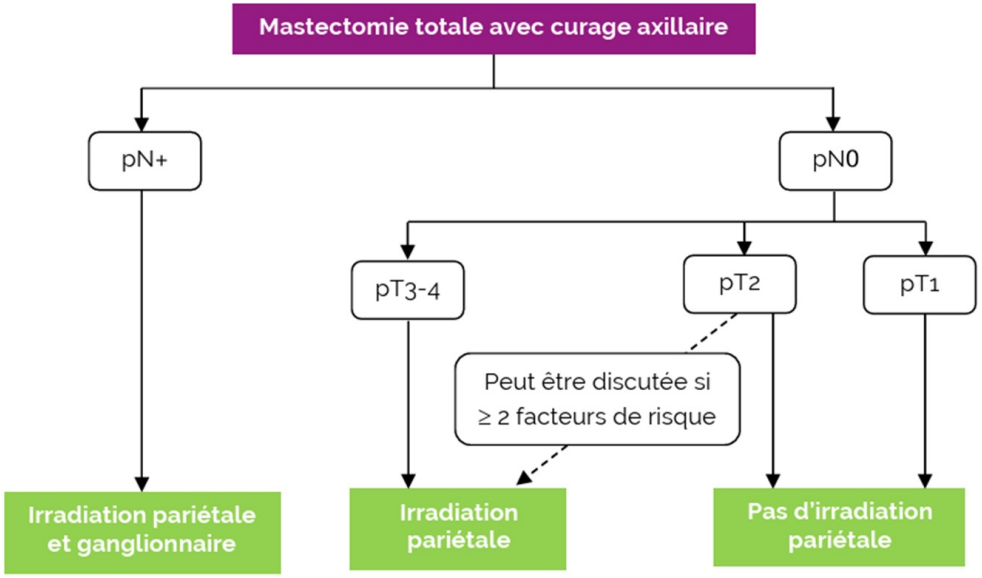
Recommandations

European Society for Radiotherapy and Oncology Advisory Committee in Radiation Oncology Practice consensus recommendations on patient selection and dose and fractionation for external beam radiotherapy in early breast cancer

	Consensus agreement	Strength
1. Whole breast irradiation		
1a. Moderate hypofractionated whole breast irradiation should be offered regardless of:		
I. Age at breast cancer diagnosis	91·3%	Strong consensus
II. Pathological tumour stage	91·3%	Strong consensus
III. Breast cancer biology	91·3%	Strong consensus
IV. Surgical margins status	100%	Unanimous consensus
V. Tumour bed boost	100%	Unanimous consensus
VI. Breast size	91·3%	Strong consensus
VII. Invasive or pre-invasive DCIS disease	91·3%	Strong consensus
VIII. Oncoplastic breast conserving surgery	91·3%	Strong consensus
IX. Use of systemic therapy	95·6%	Strong consensus
1b. Ultrahypofractionated (26 Gy in five fractions) whole breast irradiation can be offered as (1) standard of care or (2) within a randomised controlled trial or prospective registration cohort	86·9%	Consensus
2. Chest wall irradiation		
2a. Moderate hypofractionation can be offered for chest wall irradiation without breast reconstruction	95·6%	Strong consensus
2b. Moderate hypofractionation can be offered for chest wall irradiation regardless of time and type of breast reconstruction	86·9%	Consensus
2c. Ultrahypofractionation (26 Gy in five fractions) for chest wall irradiation without breast reconstruction can be offered as (1) standard of care or (2) within a randomised controlled trial or prospective registration cohort	78·3%	Consensus
2d. Ultrahypofractionation (26 Gy in five fractions) for chest wall irradiation after breast reconstruction can be offered within a randomised controlled or prospective registration cohort trial	90·5%	Strong consensus
3. Nodal irradiation		
3a. Moderate hypofractionation should be offered for nodal irradiation	82·6%	Consensus
3b. Ultrahypofractionation (26 Gy in five fractions) should not be offered for nodal irradiation until ongoing trials results are reported	87·0%	Consensus

Lancet Oncol 2022

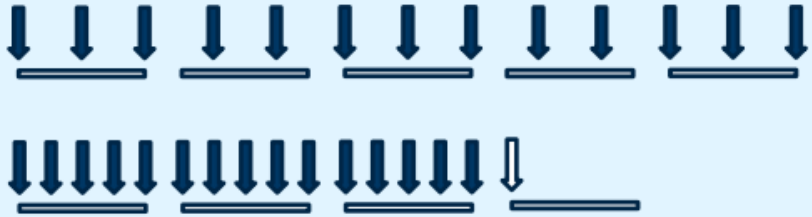
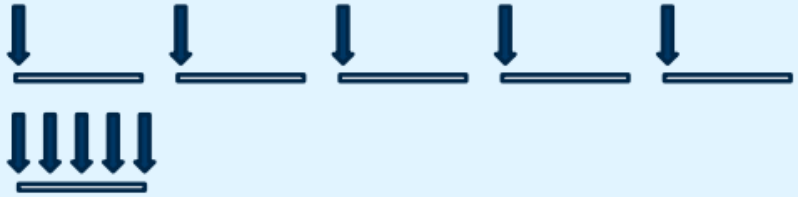

Chirurgie conservatrice
Age ≤ 50 ans
Age ≥ 50 ans
* En attente du résultat des essais en cours
Si :
Tumeur T1-2 pN0*
+ Absence d'emboles vasculaires péritumoraux
+ Résection en berges saines
+ Pas d'irradiation ganglionnaire*
Option possible si luminal A et patiente à très faible risque de récidive locale (T1N0)
Schéma normofractionné et surimpression du lit tumoral
Schéma normofractionné +/- surimpression du lit tumoral
Schéma hypofractionné ou normofractionné +/- surimpression du lit tumoral
Radiothérapie partielle exclusive
L'éventuelle omission de l'irradiation mammaire peut être discutée au cas par cas en fonction de l'estimation du risque, des comorbidités et de l'espérance de vie de la patiente.


Mastectomie totale avec curage axillaire
pN+
pN0
pT3-4
pT2
pT1
Peut être discutée si ≥ 2 facteurs de risque
Irradiation pariétale et ganglionnaire
Irradiation pariétale
Pas d'irradiation pariétale

INCA 2022

Hypofractionnement modéré

« Assurément le nouveau standard?»

Examples	Treatment course	Trials
Conventional fractionation 25 x 2 Gy (5 w)		EBCTCG meta-analysis
Moderate hypofractionation 13 x 3.2 Gy (5 w) 15-16 x 2.66-2.7 Gy (3 w)		START-P, START-A START-B, Ontario, MDACC, DBCG-HYPO, …
Ultra-hypofractionation 5 x 5.7 Gy (5 w) 5 x 5.2 Gy (1 w)		FAST FAST-Forward

D. Krug, SABCS 2022

Hypofractionnement modéré

Lu et al. BMC Cancer (2024) 24:181
https://doi.org/10.1186/s12885-024-11918-2

BMC Cancer

RESEARCH Open Access

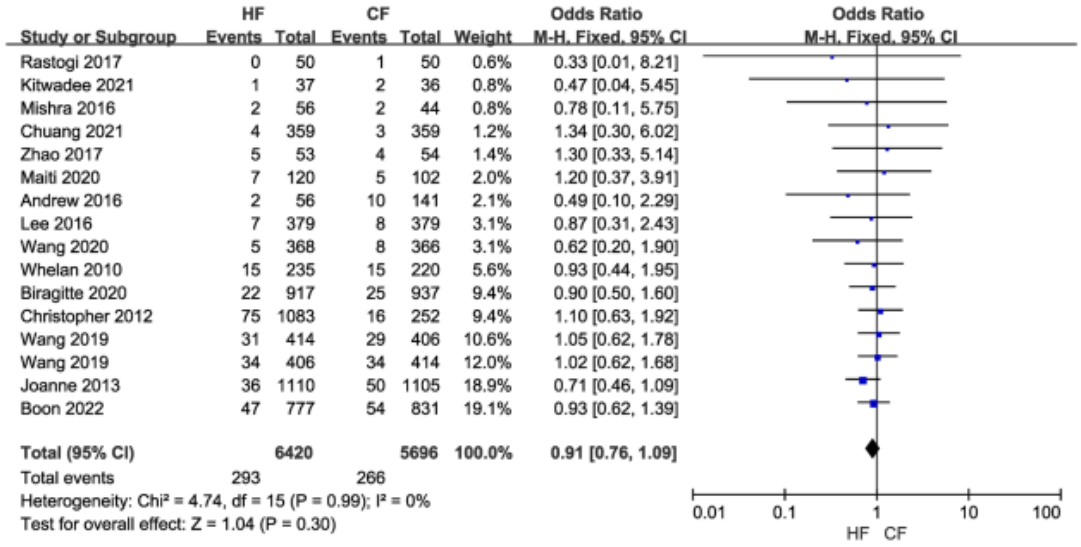
Efficacy and safety analysis of hypofractionated and conventional fractionated radiotherapy in postoperative breast cancer patients

Méta analyse 18246 patientes

35 études randomisées/rétrospectives/prospectives

RT CF 50Gy en 25 fractions vs RT HF

(2-5Gy/fraction)



Study or Subgroup	HF Events	HF Total	CF Events	CF Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Rastogi 2017	0	50	1	50	0.6%	0.33 [0.01, 8.21]
Kitwadee 2021	1	37	2	36	0.8%	0.47 [0.04, 5.45]
Mishra 2016	2	56	2	44	0.8%	0.78 [0.11, 5.75]
Chuang 2021	4	359	3	359	1.2%	1.34 [0.30, 6.02]
Zhao 2017	5	53	4	54	1.4%	1.30 [0.33, 5.14]
Maiti 2020	7	120	5	102	2.0%	1.20 [0.37, 3.91]
Andrew 2016	2	56	10	141	2.1%	0.49 [0.10, 2.29]
Lee 2016	7	379	8	379	3.1%	0.87 [0.31, 2.43]
Wang 2020	5	368	8	366	3.1%	0.62 [0.20, 1.90]
Whelan 2010	15	235	15	220	5.6%	0.93 [0.44, 1.95]
Biragitte 2020	22	917	25	937	9.4%	0.90 [0.50, 1.60]
Christopher 2012	75	1083	16	252	9.4%	1.10 [0.63, 1.92]
Wang 2019	31	414	29	406	10.6%	1.05 [0.62, 1.78]
Wang 2019	34	406	34	414	12.0%	1.02 [0.62, 1.68]
Joanne 2013	36	1110	50	1105	18.9%	0.71 [0.46, 1.09]
Boon 2022	47	777	54	831	19.1%	0.93 [0.62, 1.39]
Total (95% CI)		**6420**		**5696**	**100.0%**	**0.91 [0.76, 1.09]**
Total events	293		266			

Heterogeneity: Chi² = 4.74, df = 15 (P = 0.99); I² = 0%
Test for overall effect: Z = 1.04 (P = 0.30)

Fig. 2 Forest plot of local recurrence rate between the HF group and CF group

Hypofractionnement modéré

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35 études randomisées/rétrospectives/prospectives

RT CF 50Gy en 25 fractions vs RT HF

(2-5Gy/fraction)

Study or Subgroup	HF Events	HF Total	CF Events	CF Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Biragitte 2020	86	917	88	937	23.9%	1.00 [0.73, 1.36]
Chuang 2021	352	359	353	359	2.1%	0.85 [0.28, 2.57]
Joanne 2013	933	1110	893	1105	43.2%	1.25 [1.00, 1.56]
Kitwadee 2021	34	37	33	36	0.8%	1.03 [0.19, 5.48]
Simona 2018	137	138	146	149	0.3%	2.82 [0.29, 27.39]
Wang 2019	351	414	350	406	16.3%	0.89 [0.60, 1.32]
Wang 2020	359	368	359	366	2.7%	0.78 [0.29, 2.11]
Whelan 2010	199	235	186	220	8.9%	1.01 [0.61, 1.68]
Zhao 2017	46	53	48	54	1.9%	0.82 [0.26, 2.63]
Total (95% CI)		**3631**		**3632**	**100.0%**	**1.08 [0.93, 1.26]**
Total events	2497		2456			

Heterogeneity: Chi² = 4.45, df = 8 (P = 0.81); I² = 0%
Test for overall effect: Z = 1.07 (P = 0.28)

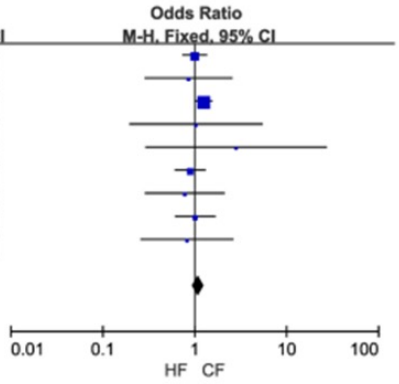


Fig. 3 Forest plot of overall survival between the HF group and CF group

Study or Subgroup	HF Events	HF Total	CF Events	CF Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Joanne 2013	928	1110	883	1105	58.2%	1.28 [1.03, 1.59]
Kitwadee 2021	35	37	34	36	0.7%	1.03 [0.14, 7.73]
Wang 2019	318	414	297	406	27.9%	1.22 [0.89, 1.67]
Wang 2020	342	368	345	366	9.8%	0.80 [0.44, 1.45]
Zhao 2017	43	53	45	54	3.4%	0.86 [0.32, 2.32]
Total (95% CI)		**1982**		**1967**	**100.0%**	**1.20 [1.01, 1.42]**
Total events	1666		1604			

Heterogeneity: Chi² = 2.60, df = 4 (P = 0.63); I² = 0%
Test for overall effect: Z = 2.13 (P = 0.03)

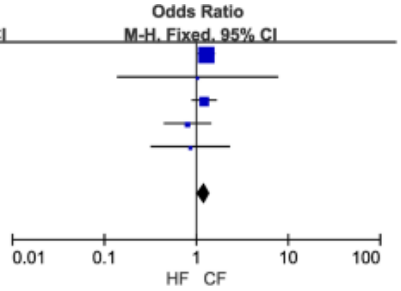
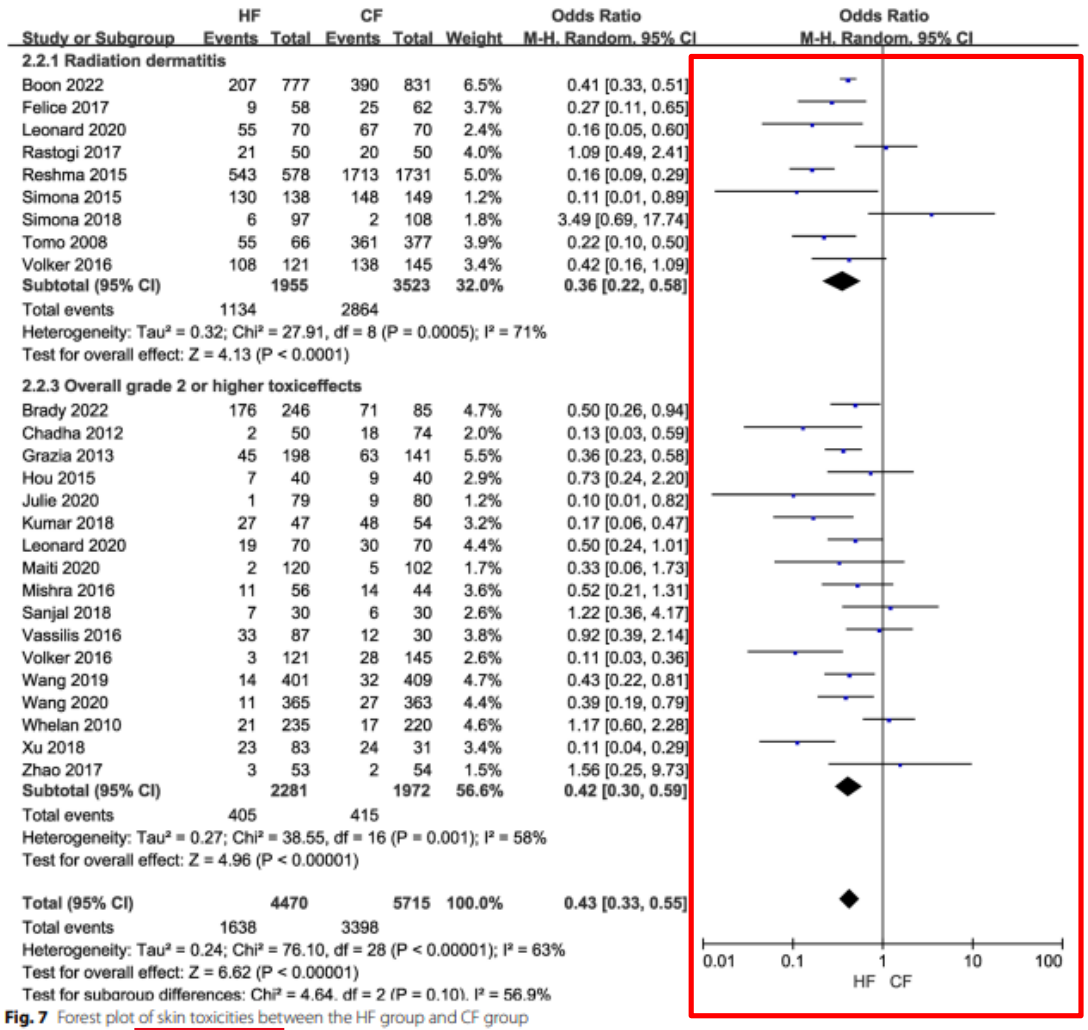


Fig. 4 Forest plot of disease-free survival between the HF group and CF group

Lu et al. BMC Cancer (2024) 24:181
https://doi.org/10.1186/s12885-024-11918-2

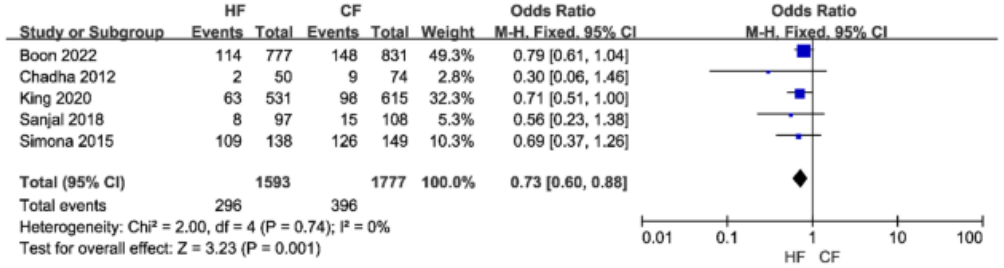


Study or Subgroup	HF Events	HF Total	CF Events	CF Total	Weight	Odds Ratio M-H, Random, 95% CI
2.2.1 Radiation dermatitis						
Boon 2022	207	777	390	831	6.5%	0.41 [0.33, 0.51]
Felice 2017	9	58	25	62	3.7%	0.27 [0.11, 0.65]
Leonard 2020	55	70	67	70	2.4%	0.16 [0.05, 0.60]
Rastogi 2017	21	50	20	50	4.0%	1.09 [0.49, 2.41]
Reshma 2015	543	578	1713	1731	5.0%	0.16 [0.09, 0.29]
Simona 2015	130	138	148	149	1.2%	0.11 [0.01, 0.89]
Simona 2018	6	97	2	108	1.8%	3.49 [0.69, 17.74]
Tomo 2008	55	66	361	377	3.9%	0.22 [0.10, 0.50]
Volker 2016	108	121	138	145	3.4%	0.42 [0.16, 1.09]
Subtotal (95% CI)		**1955**		**3523**	**32.0%**	**0.36 [0.22, 0.58]**
Total events	1134		2864			
Heterogeneity: Tau² = 0.32; Chi² = 27.91, df = 8 (P = 0.0005); I² = 71%						
Test for overall effect: Z = 4.13 (P < 0.0001)						
2.2.3 Overall grade 2 or higher toxiceffects						
Brady 2022	176	246	71	85	4.7%	0.50 [0.26, 0.94]
Chadha 2012	2	50	18	74	2.0%	0.13 [0.03, 0.59]
Grazia 2013	45	198	63	141	5.5%	0.36 [0.23, 0.58]
Hou 2015	7	40	9	40	2.9%	0.73 [0.24, 2.20]
Julie 2020	1	79	9	80	1.2%	0.10 [0.01, 0.82]
Kumar 2018	27	47	48	54	3.2%	0.17 [0.06, 0.47]
Leonard 2020	19	70	30	70	4.4%	0.50 [0.24, 1.01]
Maiti 2020	2	120	5	102	1.7%	0.33 [0.06, 1.73]
Mishra 2016	11	56	14	44	3.6%	0.52 [0.21, 1.31]
Sanjal 2018	7	30	6	30	2.6%	1.22 [0.36, 4.17]
Vassilis 2016	33	87	12	30	3.8%	0.92 [0.39, 2.14]
Volker 2016	3	121	28	145	2.6%	0.11 [0.03, 0.36]
Wang 2019	14	401	32	409	4.7%	0.43 [0.22, 0.81]
Wang 2020	11	365	27	363	4.4%	0.39 [0.19, 0.79]
Whelan 2010	21	235	17	220	4.6%	1.17 [0.60, 2.28]
Xu 2018	23	83	24	31	3.4%	0.11 [0.04, 0.29]
Zhao 2017	3	53	2	54	1.5%	1.56 [0.25, 9.73]
Subtotal (95% CI)		**2281**		**1972**	**56.6%**	**0.42 [0.30, 0.59]**
Total events	405		415			
Heterogeneity: Tau² = 0.27; Chi² = 38.55, df = 16 (P = 0.001); I² = 58%						
Test for overall effect: Z = 4.96 (P < 0.00001)						
Total (95% CI)		**4470**		**5715**	**100.0%**	**0.43 [0.33, 0.55]**
Total events	1638		3398			
Heterogeneity: Tau² = 0.24; Chi² = 76.10, df = 28 (P < 0.00001); I² = 63%						
Test for overall effect: Z = 6.62 (P < 0.00001)						
Test for subgroup differences: Chi² = 4.64, df = 2 (P = 0.10), I² = 56.9%						

Fig. 7 Forest plot of skin toxicities between the HF group and CF group

RESEARCH Open Access

Efficacy and safety analysis of hypofractionated and conventional fractionated radiotherapy in postoperative breast cancer patients



Study or Subgroup	HF Events	HF Total	CF Events	CF Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Boon 2022	114	777	148	831	49.3%	0.79 [0.61, 1.04]
Chadha 2012	2	50	9	74	2.8%	0.30 [0.06, 1.46]
King 2020	63	531	98	615	32.3%	0.71 [0.51, 1.00]
Sanjal 2018	8	97	15	108	5.3%	0.56 [0.23, 1.38]
Simona 2015	109	138	126	149	10.3%	0.69 [0.37, 1.26]
Total (95% CI)		**1593**		**1777**	**100.0%**	**0.73 [0.60, 0.88]**
Total events	296		396			
Heterogeneity: Chi² = 2.00, df = 4 (P = 0.74); I² = 0%						
Test for overall effect: Z = 3.23 (P = 0.001)						

Fig. 12 Forest plot of fatigue between the HF group and CF group

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BARCELONA SPAIN
13-17 SEPTEMBER 2024

HypoG-01

- 1265 patientes âge médian 58 ans
- T1-T3, N0-3,M0, toute histologie

45% mastectomie ; 82,8% curage

- **Randomisation**: RT loco-régionale 40Gy/15fr versus 50Gy/25fr +/- boost intégré

- **Objectif principal**: risque de lymphoedème à 3 ans
- **Objectif 2nd** : LRFS, DDFS, OS

Patients, tumours and treatments characteristics.

		3-week RT[a]		5-week RT[a,*]		Total	
		n = 631 (%)[a]		n = 629 (%)[a]		n = 1260 (%)[a]	
Age							
	Mean (sd)	58.5	(13.1)	58.3	(12.6)	58.4	(12.8)
Tumour (mm)							
	n (%)	624	(98.9)	622	(98.9)	1246	(98.9)
	Mean (sd)	26.9	(19.0)	26.8	(19.2)	26.9	(19.1)
Histology							
	Ductal	502	(79.6)	510	(81.1)	1012	(80.3)
	Lobular	90	(14.3)	79	(12.6)	169	(13.4)
	Other	38	(6.0)	35	(5.6)	73	(5.8)
	Unknown	1	(0.2)	5	(0.8)	6	(0.5)
Grade							
	I	64	(10.1)	59	(9.4)	123	(9.8)
	II	330	(52.3)	363	(57.7)	693	(55.0)
	III	228	(36.1)	198	(31.5)	426	(33.8)
	Unknown	9	(1.4)	9	(1.4)	18	(1.4)
Breast cancer subtype							
	HER2+	118	(18.8)	132	(21.0)	250	(19.9)
	HER2-, ER + or PR+	437	(69.8)	431	(68.6)	868	(69.2)
	HER2- and ER- and PR-	71	(11.3)	65	(10.4)	136	(10.8)
	Unknown	5	(0.8)	1	(0.2)	6	(0.5)
cT							
	0	19	(3.0)	17	(2.7)	36	(2.9)
	1	207	(32.8)	214	(34.0)	421	(33.4)
	2	300	(47.5)	293	(46.6)	593	(47.1)
	3	84	(13.3)	83	(13.2)	167	(13.3)
	4	9	(1.4)	6	(0.9)	15	(1.2)
	Unknown	12	(1.9)	16	(2.5)	28	(2.2)
cN							
	0	264	(41.8)	242	(38.5)	506	(40.2)
	1	296	(46.9)	310	(49.3)	606	(48.1)
	2	42	(6.7)	43	(6.8)	85	(6.7)
	3	16	(2.5)	17	(2.7)	33	(2.6)
	Unknown	13	(2.1)	17	(2.7)	30	(2.4)
Breast surgery							
	Mastectomy	287	(45.5)	282	(44.8)	569	(45.2)
	Lumpectomy	344	(54.5)	347	(55.2)	691	(54.8)
Axillary exploration							
	Axillary clearance	518	(82.1)	518	(82.4)	1036	(82.2)
	Sentinel node(s) biopsy	312	(49.4)	287	(45.6)	599	(47.5)
Radiotherapy technique							
	IMRT	332	(53.0)	320	(51.6)	652	(52.3)
	RT3D	295	(47.0)	300	(48.4)	595	(47.7)
	Unknown	4	(0.6)	9	(1.4)	13	(1.0)
Tumour-bed boost							
	n (%)[b]	297	(86.3)	308	(88.8)	605	(87.5)
	Integrated (SIB)	99	(33.3)	96	(31.2)	195	(32.2)
	Sequential	198	(66.7)	212	(68.8)	410	(67.8)
Systemic treatment							
	Preoperative chemotherapy	137	(21.7)	163	(25.9)	300	(23.8)
	Adjuvant Chemotherapy	396	(62.8)	395	(62.8)	791	(62.8)
	Preoperative endocrine therapy	14	(2.2)	7	(1.1)	21	(1.7)
	Adjuvant endocrine therapy	498	(78.9)	499	(79.3)	997	(79.1)

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- T1-T3, N0-3,M0, toute histologie

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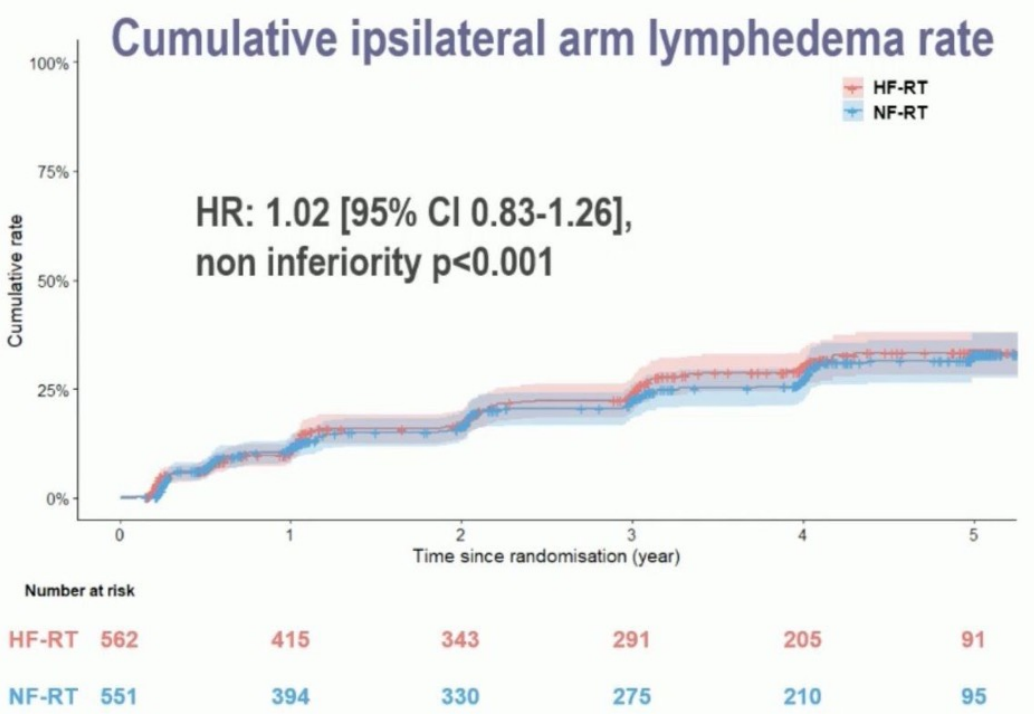
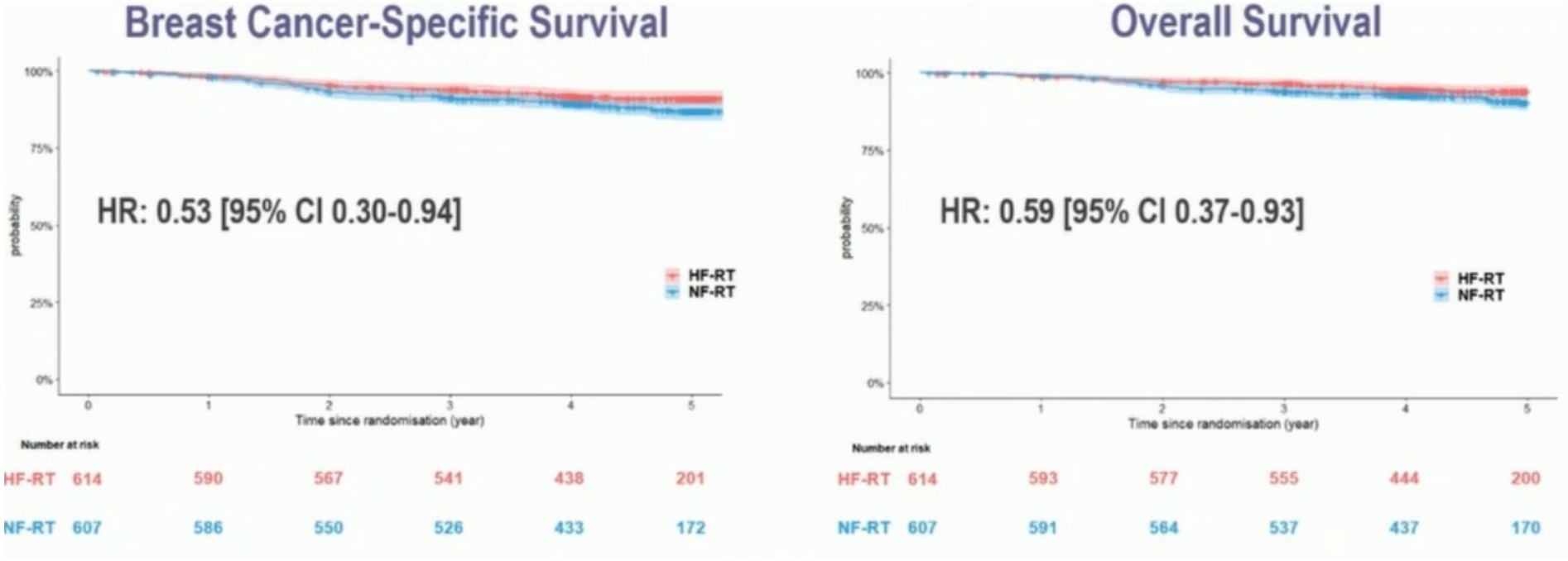


Sophia Riviera, ESMO 2024

HypoG-01


Breast Cancer-Specific Survival
HR: 0.53 [95% CI 0.30-0.94]
probability
100%
75%
50%
25%
0%
HF-RT
NF-RT
0
1
2
3
4
5
Time since randomisation (year)
Number at risk
HF-RT 614 590 567 541 438 201
NF-RT 607 586 550 526 433 172
Overall Survival
HR: 0.59 [95% CI 0.37-0.93]
probability
100%
75%
50%
25%
0%
HF-RT
NF-RT
0
1
2
3
4
5
Time since randomisation (year)
Number at risk
HF-RT 614 593 577 555 444 200
NF-RT 607 591 564 537 437 170

The DBCG Skagen trial 1: Phase III randomised trial of hypo- vs standard fractionated loco-regional radiotherapy in high-risk breast cancer patients

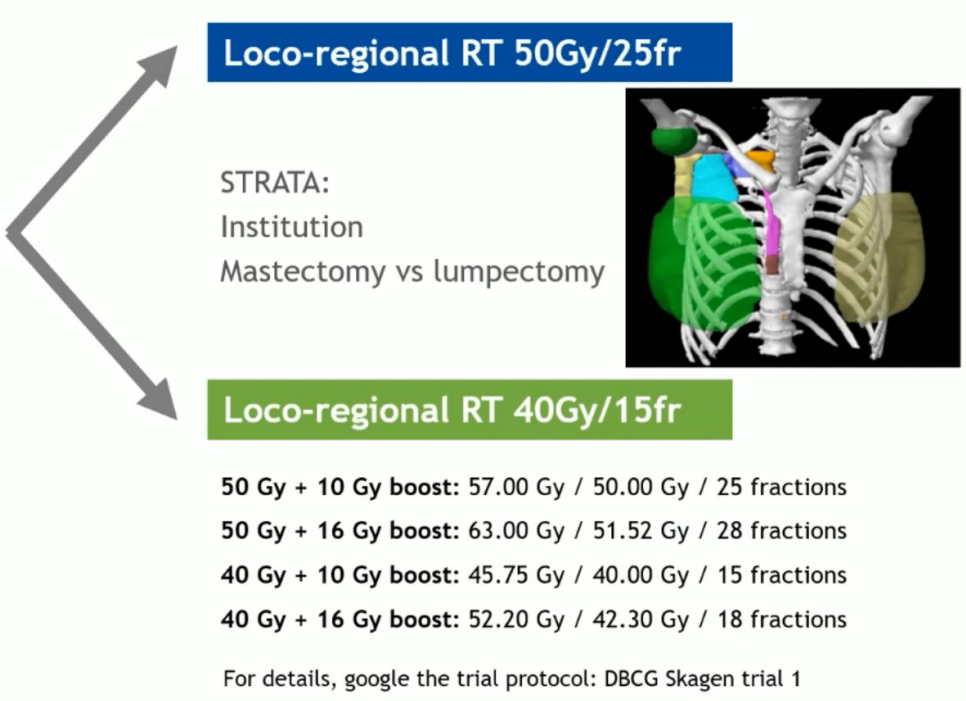
Birgitte V Offersen, Jan Alsner, Hanne M Nielsen, Troels Bechmann, Mette H Nielsen, Ingvil Mjaaland, Claus Kamby, Carine Kirkove, Tamaz Lörincz, Sami Al-Rawi, Egil B Støre, Andreas Schreiber, Mechthild Krause, Unn-Miriam Kasti, Louise W Matthiessen, Piotr Kedzierawski, Tanja Marinko, Miia Mokka, Tanja Skyttä, Maj-Britt Jensen, Jens Overgaard *on behalf of the DBCG RT Committee*

- 1865 patientes T1-T4, N0-3,M0 toute histologie

- Randomisation:

RT loco-régionale 40Gy/15fr versus 50Gy/25fr et **boost intégré**

- **Objectif principal**: risque de lymphoedème à 3 ans



ESTRO 2025

The DBCG Skagen trial 1: Phase III randomised trial of hypo- vs standard fractionated loco-regional radiotherapy in high-risk breast cancer patients

Birgitte V Offersen, Jan Alsner, Hanne M Nielsen, Troels Bechmann, Mette H Nielsen, Ingvil Mjaaland, Claus Kamby, Carine Kirkove, Tamaz Lörincz, Sami Al-Rawi, Egil B Støre, Andreas Schreiber, Mechthild Krause, Unn-Miriam Kasti, Louise W Matthiessen, Piotr Kedzierawski, Tanja Marinko, Miia Mokka, Tanja Skyttä, Maj-Britt Jensen, Jens Overgaard *on behalf of the DBCG RT Committee*

No NACT Intention-to-treat N=1,865 (64%)		50/25 n=932	40/15 n=933
Tumor size	1-20 mm	470 (50%)	470 (50%)
	21-50 mm	389 (42%)	389 (42%)
	>50 mm	57 (6%)	50 (5%)
	Unknown	16 (2%)	24 (3%)
Positive lymph nodes	0	13 (1%)	26 (3%)
	1-3	665 (71%)	660 (71%)
	4-9	145 (16%)	129 (14%)
	>9	62 (7%)	74 (8%)
	Unknown	47 (5%)	44 (5%)
Histology	Ductal carcinoma	727 (78%)	711 (76%)
	Lobular carcinoma	142 (15%)	156 (17%)
	Other	56 (6%)	57 (6%)
Grade	Not usable	4 (0%)	6 (1%)
	Grade 1	147 (16%)	153 (16%)
	Grade 2	522 (56%)	491 (53%)
	Grade 3	246 (26%)	263 (28%)
	Unknown	13 (1%)	20 (2%)
ER	Negative	70 (7%)	83 (9%)
	Positive	857 (92%)	843 (90%)
	Unknown	5 (1%)	7 (1%)
HER2	Negative	802 (86%)	807 (86%)
	Positive	121 (13%)	119 (13%)
	Unknown	9 (1%)	7 (1%)

NACT Intention-to-treat N=1,043 (36%)		50/25 n=512	40/15 n=531
ypCR	No	369 (72%)	383 (72%)
	Yes	138 (27%)	137 (26%)
	Unknown	5 (1%)	11 (2%)
ER	Negative	105 (21%)	96 (18%)
	Positive	324 (63%)	353 (66%)
	Unknown	83 (16%)	82 (16%)
HER2	Negative	313 (61%)	329 (62%)
	Positive	109 (21%)	109 (21%)
	Unknown	90 (18%)	93 (18%)

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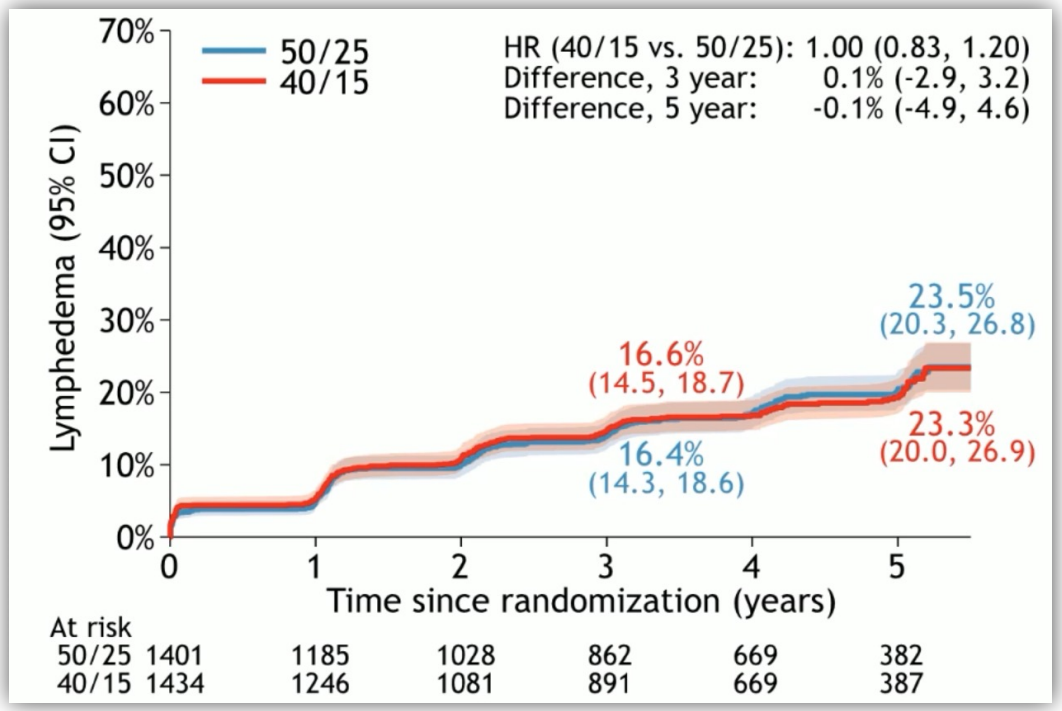

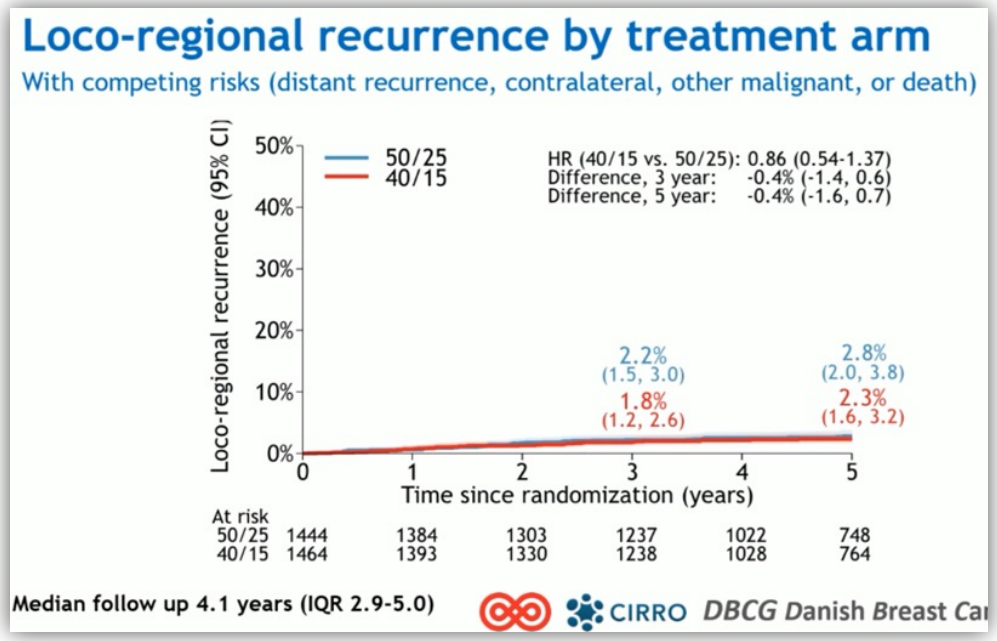

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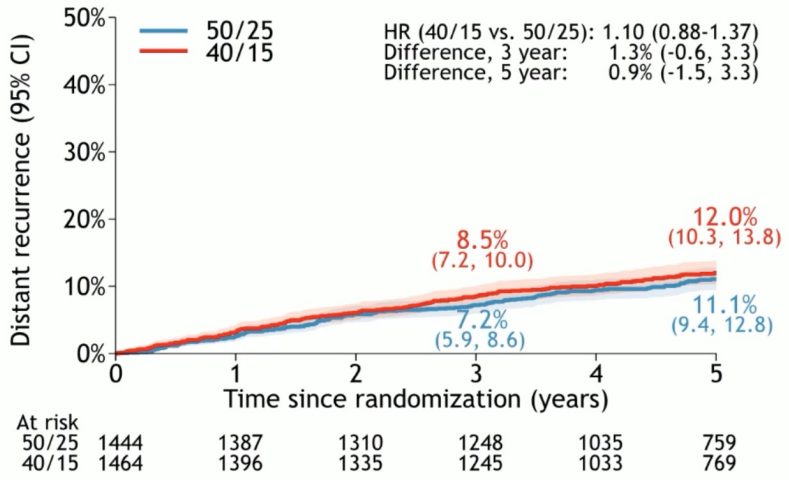
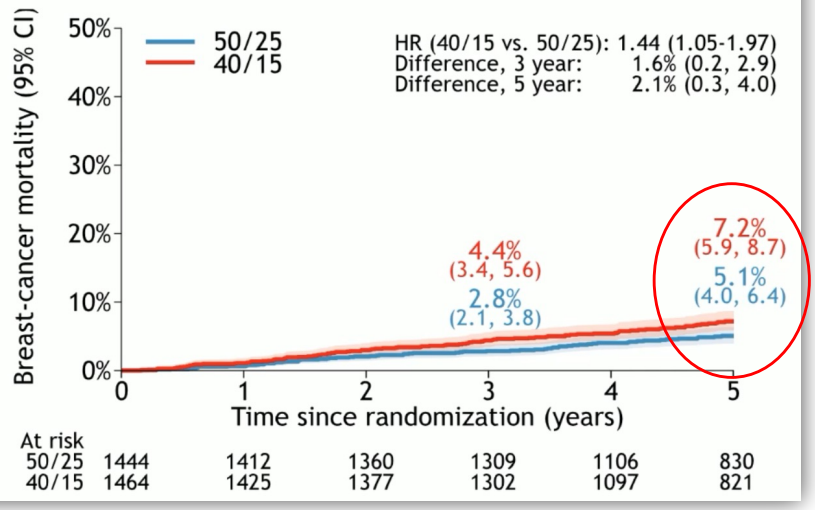
Distant recurrence by treatment arm

With competing risks (contralateral, other malignant, or death)



Breast-cancer mortality by treatment arm

With competing risk (death by other causes)



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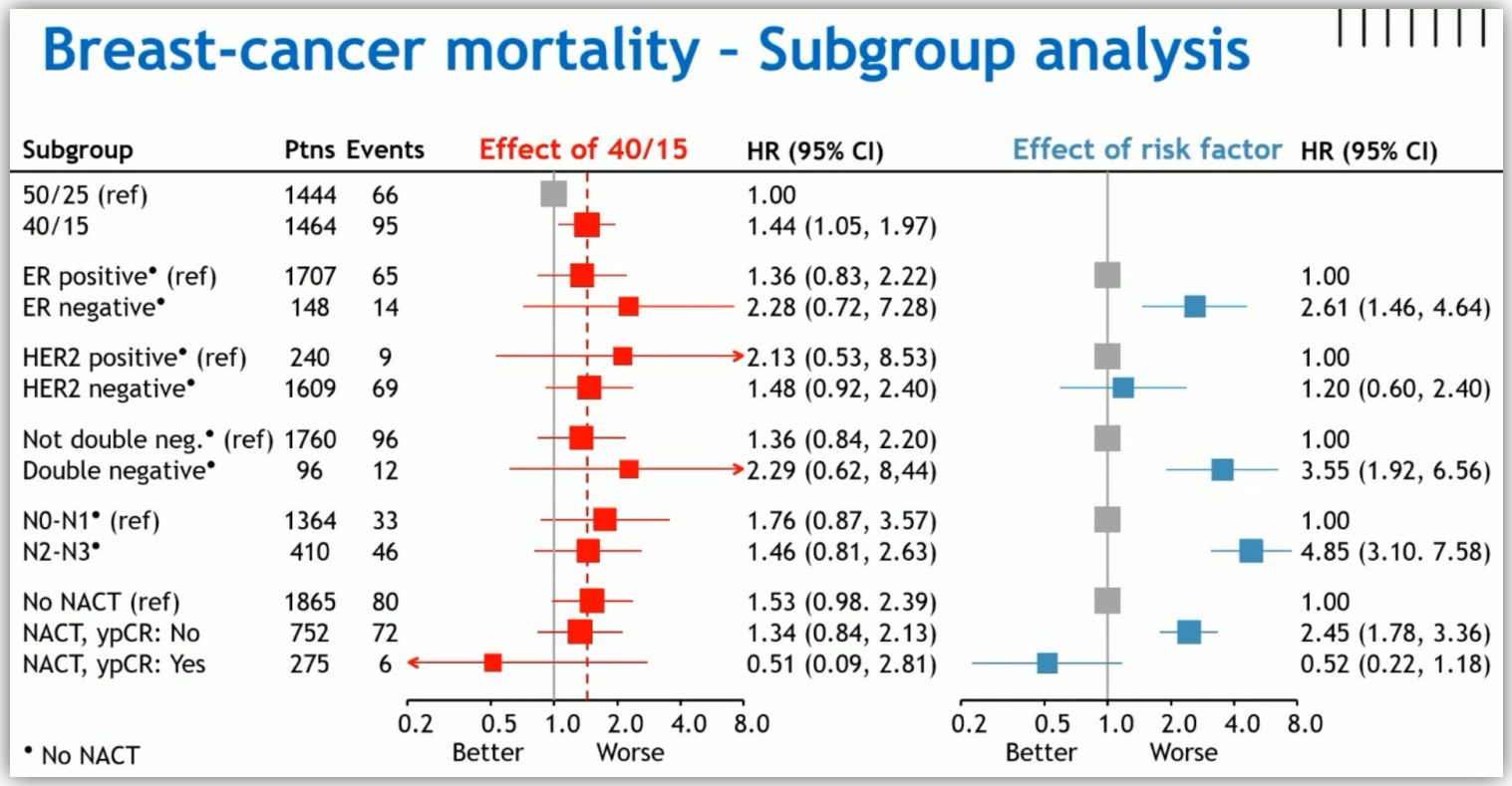
Breast-cancer mortality – Subgroup analysis



Hypofractionnement sévère

« Cancers du sein à haut risque:

Est-ce risqué? »

Murray Brunt
University of Keele, UK

FAST-Forward

ESTRO 2025

Hypofractionated breast radiotherapy for 1 week vs 3 weeks: 10-year efficacy and late normal tissue effects in the FAST-Forward randomised trial

- 4096 patientes pT1-T3 pN0-1 M0

Traitées de 2011-2014 avec :

- 40,05Gy en 15 fr
- Versus 26Gy ou 27Gy en 5 fr
- +/- boost séquentiel 16Gy/8fr ou 10Gy/5fr

- **Objectif principal: récidive homolatérale**
- **Obj 2nd: toxicité, nouvel évènement, QDVie**

		40Gy in 15Fr N=1361 (%)	27Gy in 5Fr N=1367 (%)	26Gy in 5Fr N=1368 (%)
Age (years)	Median (range)	60 (29-89)	61(25-90)	61(25-89)
Grade	1	23	23	22
	2	49	49	50
	3	28	28	28
Risk group	Low (age≥50 & G1 or 2)	62	63	62
	High (age<50 or G3)	38	37	38
Primary surgery	Breast conservation	93	94	94
	Mastectomy	7	6	6
Pathological node status	Positive	19	18	19
	Negative	81	82	81
ER / HER2 status	ER+ / HER2+	8	8	7
	ER+ / HER2-	82	83	81
	ER- / HER2+	3	2	3
	ER- / HER2-	7	7	9
Tumour bed boost	No	75	75	76
	Yes	25	25	24
Boost dose	10Gy in 5Fr	76	81	77
	16Gy in 8Fr	24	19	23

Murray Brunt
University of Keele, UK

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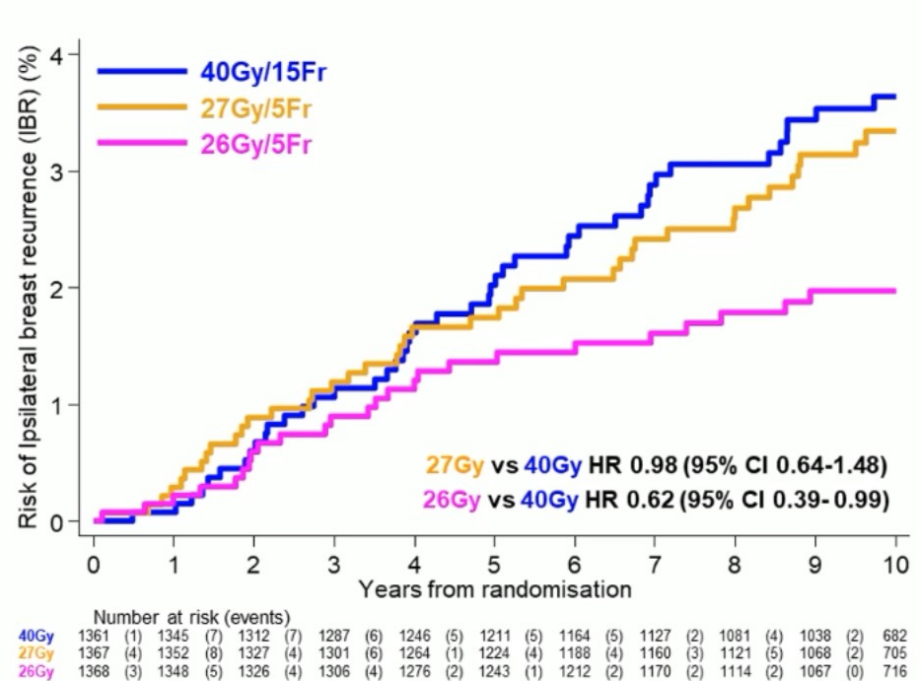
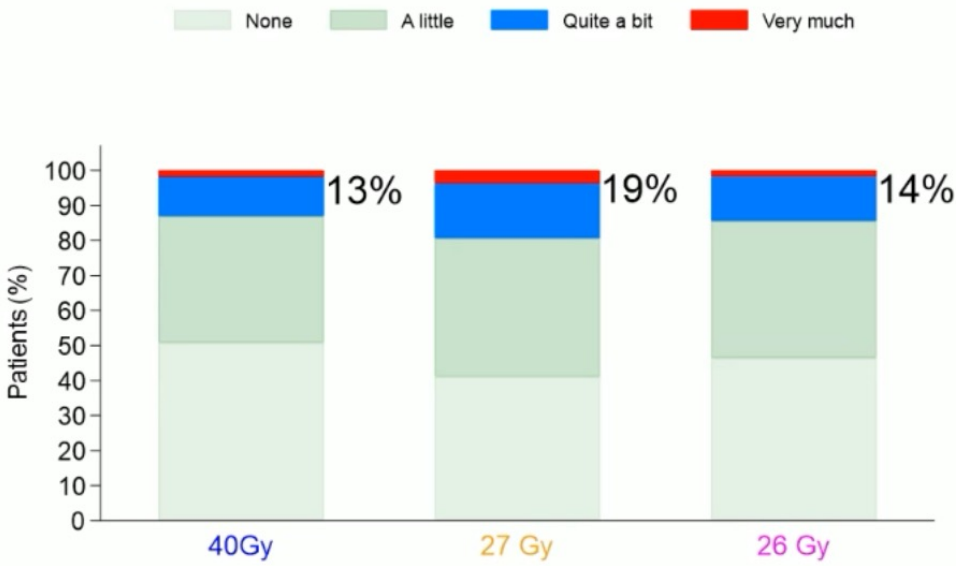


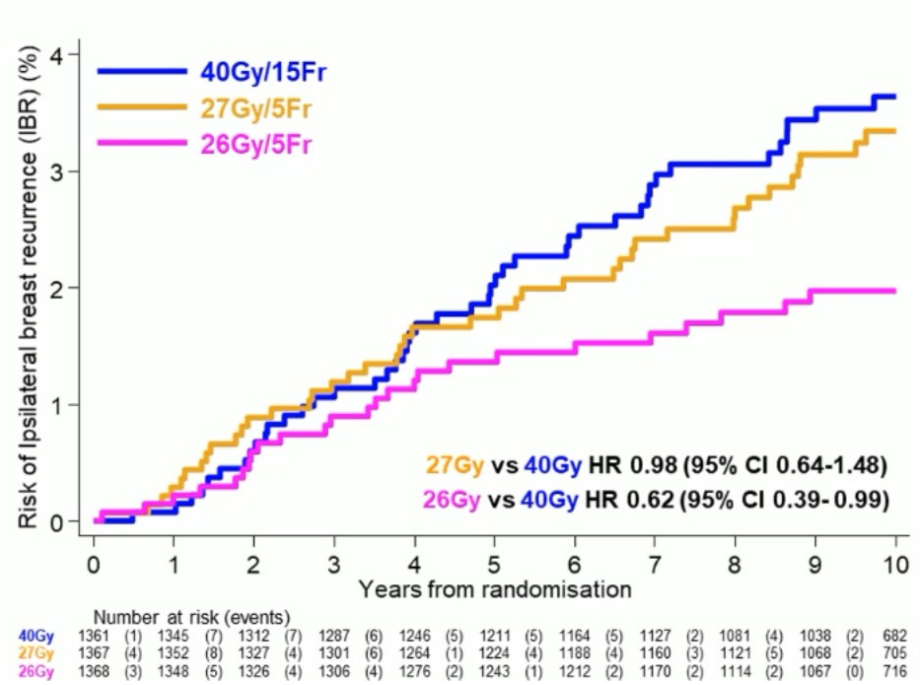
Murray Brunt
University of Keele, UK

Hypofractionated breast radiotherapy for 1 week vs 3 weeks: 10-year efficacy and late normal tissue effects in the FAST-Forward randomised trial

Breast/chest wall symptoms* at 10-years
(Clinician-reported, N = 2,345)



%s are those with moderate or marked effects



FAST-Forward

Radiotherapy and Oncology 207 (2025) 110915

Contents lists available at ScienceDirect

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journal homepage: www.thegreenjournal.com

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Patient- and clinician-assessed five-year normal tissue effects following one-week versus three-week axillary radiotherapy for breast cancer: Results from the phase III FAST-Forward trial randomised nodal sub-study

A. Murray Brunt [a,b,*], Fay H. Cafferty [b], Duncan Wheatley [c], Mark A. Sydenham [b],

pT1-T3 pN1-3a M0

Sans indication de RT de la CMI

Objectif principal: Œdème bras/main à 5 ans (questionnaire EORTC QLQ-BR23)

Non-infériorité : exclure une hausse ≥10%

	40 Gy/15 fractions	26 Gy/5 fractions	40 Gy/15 fractions	27 Gy/5 fractions
	All randomised (*N* = 181), (%)	*N* = 182, (%)	Randomised concurrently with 27 Gy/5 fractions (*N* = 108), (%)	*N* = 104, (%)
Age (years)				
Median (IQR)	61 (51–72)	60 (51–70)	60 (49–72)	57 (49–67)
Range	34–89	34–86	36–89	30–84
< 40	7 (4)	14 (8)	6 (6)	4 (4)
40–49	31 (17)	28 (15)	22 (20)	23 (22)
Tumour grade				
1	15 (8)	12 (7)	13 (12)	8 (8)
2	95 (52)	97 (53)	50 (46)	58 (56)
3	71 (39)	73 (40)	45 (42)	38 (36)
Primary surgery				
BCS	95 (52)	106 (58)	60 (56)	54 (52)
BCS with oncoplastic technique	2	2	2	1
Mastectomy	86 (48)	76 (42)	48 (44)	50 (48)
Mastectomy with immediate reconstruction	15	17	8	11
Maximal extent of axillary staging				
Sentinel node biopsy/guided axillary sampling	74 (41)	90 (50)	41 (38)	48 (46)
Axillary clearance	107 (59)	91 (50)	67 (62)	56 (54)
Not known	0	1	0	0
pT stage				
T1mi	2 (1)	2 (1)	1 (1)	1 (1)
T1a	2 (1)	2 (1)	2 (2)	
T1b	6 (3)	7 (4)	3 (3)	6 (6)
T1c	49 (27)	42 (23)	33 (31)	31 (30)
T2	92 (51)	100 (55)	54 (50)	50 (48)
T3	29 (16)	27 (15)	14 (13)	15 (14)
Not known	1	2	1	1
ER/HER-2 status				
ER+/HER-2+	29 (16)	27 (15)	22 (20)	13 (12)
ER+/HER-2−	124 (68)	122 (68)	72 (67)	79 (76)
ER−/HER-2+	7 (4)	6 (3)	3 (3)	4 (4)
ER−/HER-2−	21 (12)	24 (13)	11 (10)	8 (8)
Not known	0	2	0	0

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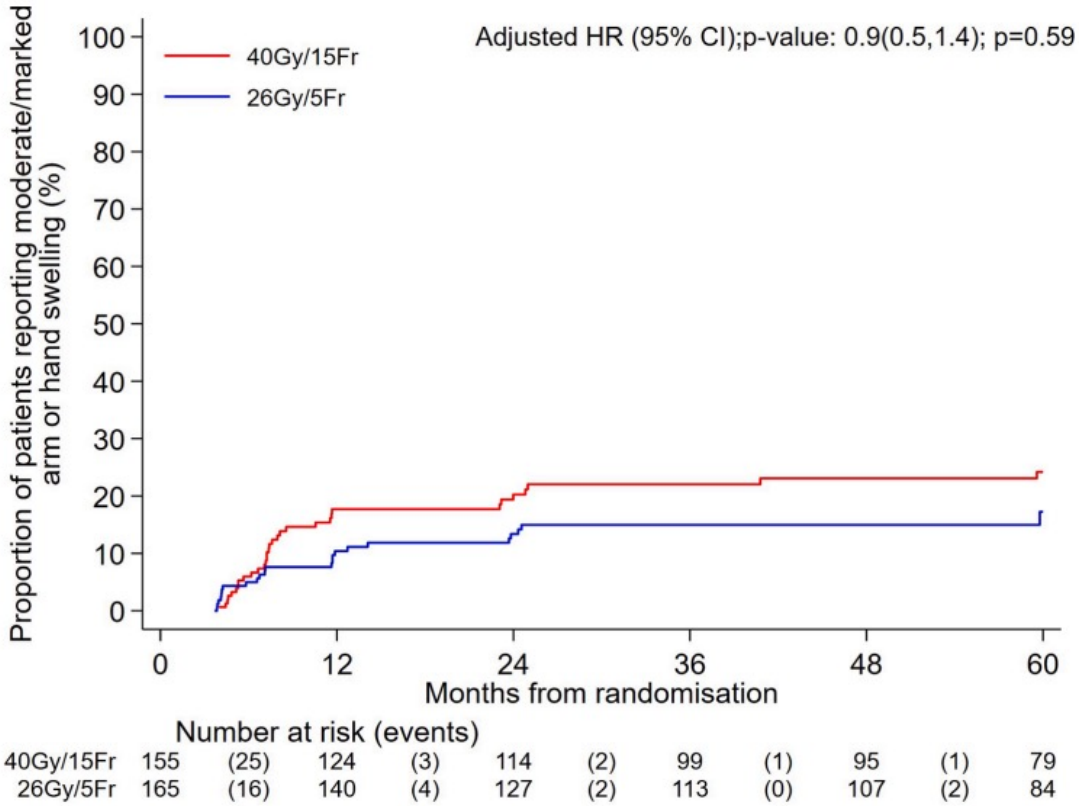
- Environ 50% chimiothérapie adjuvante
- 25% de chimiothérapie néo-adjuvante

- Boost séquentiel
- 50% de RT des aires I et II
- 70% de RT de l'aire III
- Plus de 90% de RT sur l'aire IV

- Modalité de RT?



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Pas de différence sur:

- La douleur
- Les difficultés à lever le bras
- Faiblesse du bras
- Raideur de l'épaule
- Engourdissement des doigts

Irradiation mammaire

« Peut on se passer du boost chez les patientes à haut risque? »

Radiotherapy and Oncology 207 (2025) 110905

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Local recurrence with and without a tumour-bed boost: A post-hoc analysis of the DBCG IMN2 study

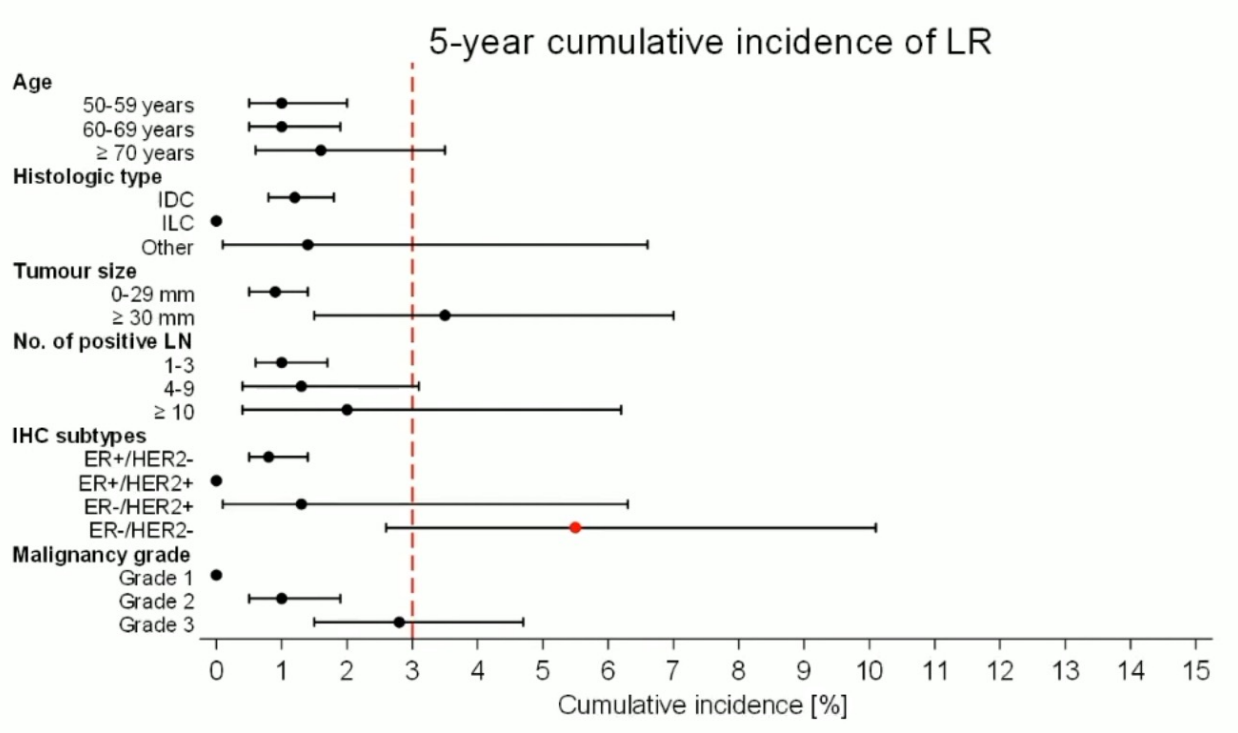
Anders W. Mølby Nielsen [a,b,c], Lise B.J. Thorsen [a,b,c], Demet Özcan [a,b,d],

2430 patientes pN+ traitées par BCS + RT
Traitement néo adjuvant non autorisé

≤40 ans: boost séquentiel 16Gy/8fr
41-49 ans : séquentiel 10Gy/5fr
Si marges <2mm : boost séquentiel 16Gy/8fr

1872 patientes ≥50 ans **sans** Boost
472 patientes ≤49 ans avec Boost

Objectifs:
Récidive locale



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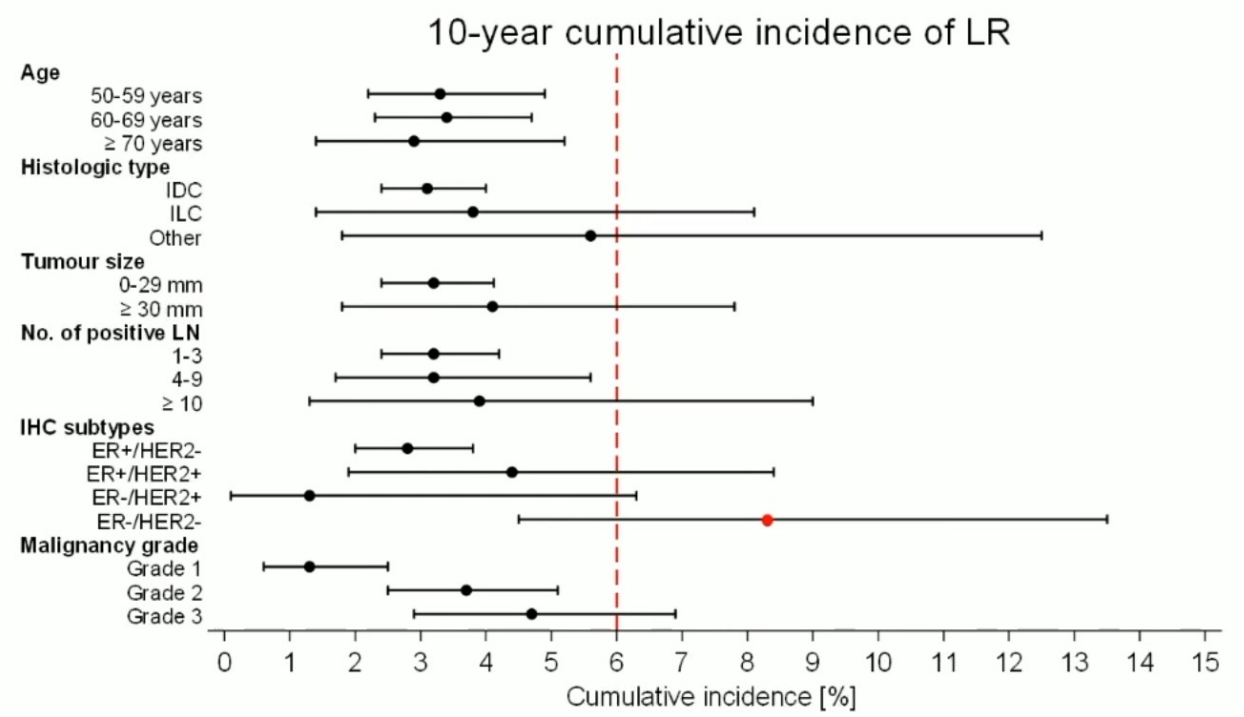

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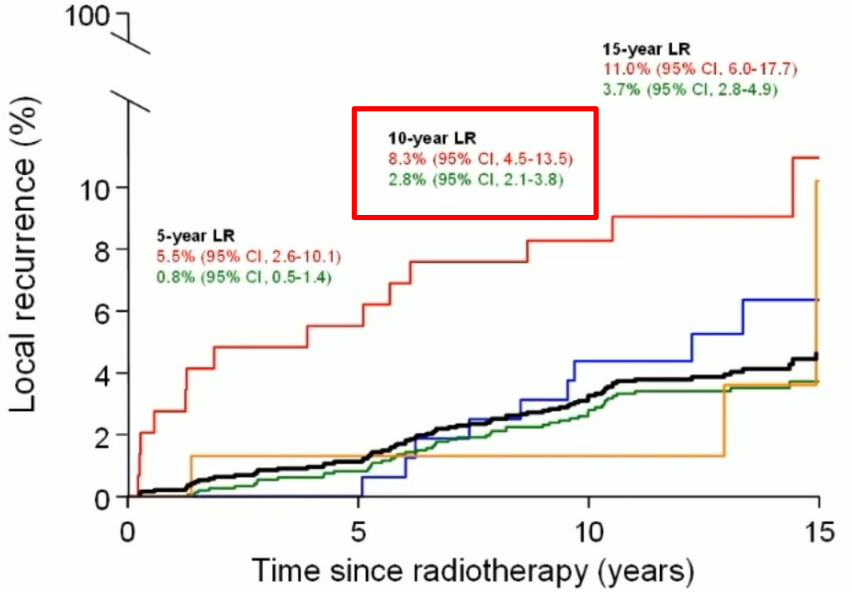


Number at risk

ER+/HER2-	1465	1269	941	164
ER+/HER2+	160	133	107	19
ER-/HER2+	76	59	48	8
ER-/HER2-	145	106	78	18
All patients	1872	1585	1188	209

Irradiation ganglionnaire en cas de N+

« Un dogme à faire tomber? »

Méta-analyse avec 16 études randomisées

Avant 2009

14324 patientes

Radiotherapy to regional nodes in early breast cancer: an individual patient data meta-analysis of 14 324 women in 16 trials

*Early Breast Cancer Trialists' Collaborative Group (EBCTCG)**

	Number of trials	Number of women	Number of deaths	Woman-years since diagnosis					Women given systemic therapy, %		
				Median follow-up (IQR)	Total ('000s)	Distribution by years ('000s)			Chemo-therapy*	ER+ and endocrine therapy	Any
						<10	10 to <20	≥20			
Older trials (1961–78)†											
IMC, SCF, and axilla‡	7	1940	1424	29·3 (16·3–41·8)	23·9	13·5	6·5	3·9	22·6%	0·0%	22·6%
IMC	..	..	..	..	..	..	..	..	..	..	..
SCF and axilla§	1	217	117	9·9 (9·5–10·0)	1·5	1·5	0·0	0·0	0·0%	0·0%	0·0%
Subtotal	8	2157	1541	25·6 (12·4–41·7)	25·4	15·0	6·5	3·9	20·3%	0·0%	20·3%
Newer trials (1989 onwards)†											
IMC, SCF, axilla‡	2	5836	1446	13·5 (10·1–16·2)	66·7	50·6	16·1	0·0	66·0%	60·4%	89·2%
IMC¶	4	5420	2041	14·3 (11·2–15·8)	58·6	43·6	13·8	1·3	58·8%	60·9%	91·9%
SCF and axilla§	2	911	107	5·4 (3·2–11·4)	6·8	5·2	1·5	0·1	55·9%	65·1%	92·5%
Subtotal	8	12 167	3594	13·7 (9·9–16·0)	132·1	99·3	31·4	1·4	62·0%	61·0%	90·7%
All trials											
IMC, SCF, and axilla‡	9	7776	2870	14·1 (10·4–17·4)	90·6	64·1	22·6	4·0	55·2%	45·3%	72·6%
IMC	4	5420	2041	14·3 (11·2–15·8)	58·6	43·6	13·8	1·3	58·8%	60·9%	91·9%
SCF and axilla§	3	1128	224	6·3 (3·6–11·2)	8·2	6·6	1·5	0·1	45·1%	52·6%	74·7%
All	16	14 324	5135	14·0 (10·0–16·4)	157·5	114·3	37·9	5·4	55·7%	51·8%	80·1%

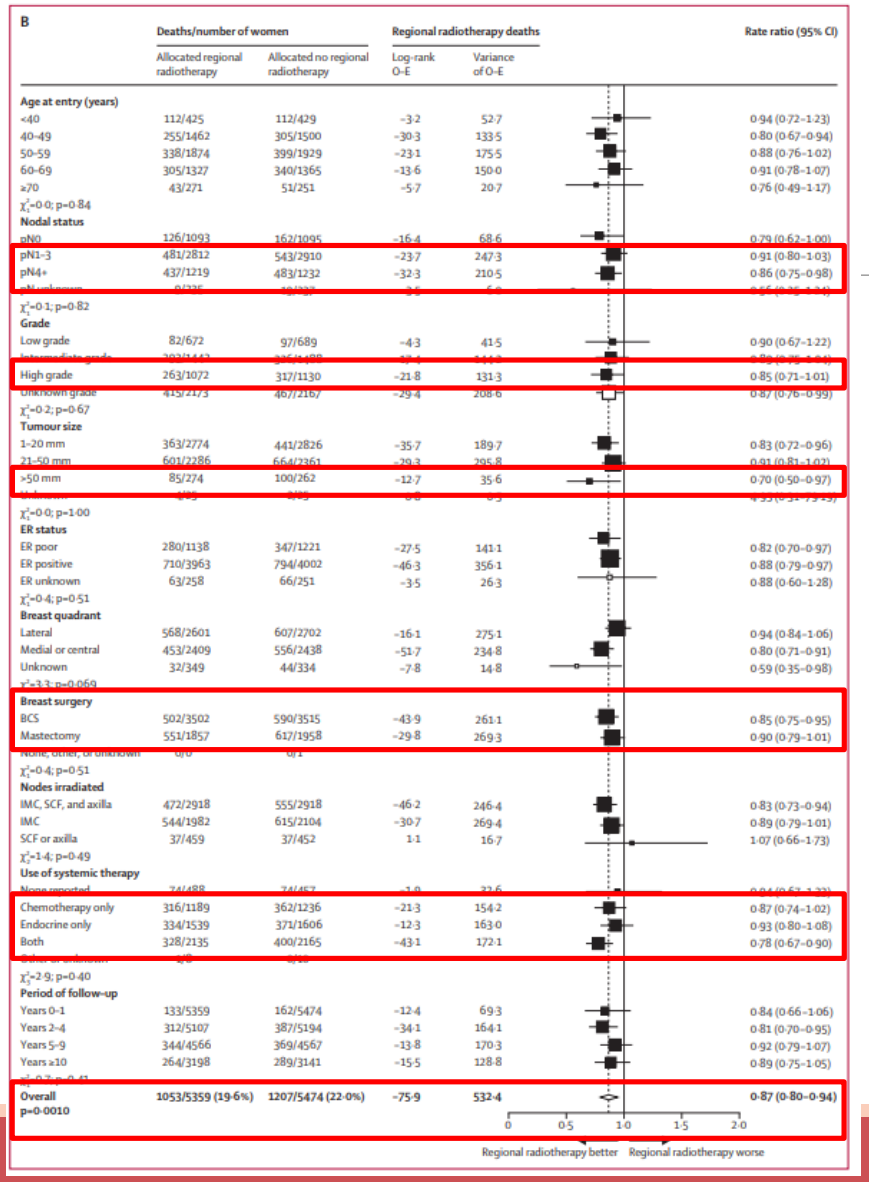
Treatment to the breast and chest wall was the same in both groups and might have included radiotherapy. IMC=internal mammary chain. SCF=supraclavicular fossa (level medial 3/4). Axilla=nodes in levels 1–3. ER=oestrogen receptor. *In women who received chemotherapy, the type given was anthracycline (no taxane) in 2079 (26·0%) of 7986 women, taxane-containing in 1254 (15·7%) women, and unknown or other in 4653 (58·3%) women. In the newer trials, chemotherapy was received by 7548 (62·0%) of 12 167 women and endocrine therapy by 7421 (61·0%) women. †Data were available for 16 trials, start dates from 1961 to 2008, and unavailable for one trial including 165 women, starting in 1985 (appendix pp 17–20). ‡IMC, SCF, and axilla: two trials were IMC and SCF radiotherapy versus no radiotherapy to these nodal regions (4060 women), and seven were IMC, SCF, and axilla radiotherapy versus no radiotherapy to these nodal regions (3716 women). §SCF and axilla: one trial was axilla radiotherapy versus no radiotherapy to this nodal region (435 women), one trial was SCF radiotherapy versus no radiotherapy to this nodal region (476 women), and one trial was SCF and axilla radiotherapy versus no radiotherapy to these nodal regions (217 women). ¶IMC: all four trials were IMC radiotherapy versus no radiotherapy to this nodal region (5420 women) including a study in which nodal radiotherapy was allocated by laterality. Patients with right breast cancers received IMC radiotherapy, and patients with left breast cancers did not.

Table 1: Availability of data from trials beginning before 2009 and comparing radiotherapy versus no radiotherapy to the regional nodes

The Lancet 2023

Radiotherapy to regional nodes in early breast cancer: an individual patient data meta-analysis of 14 324 women in 16 trials

*Early Breast Cancer Trialists' Collaborative Group (EBCTCG)**



B	Deaths/number of women		Regional radiotherapy deaths		Rate ratio (95% CI)
	Allocated regional radiotherapy	Allocated no regional radiotherapy	Log-rank O-E	Variance of O-E	
Age at entry (years)					
<40	112/425	112/429	−3·2	52·7	0·94 (0·72–1·23)
40–49	255/1462	305/1500	−30·3	133·5	0·80 (0·67–0·94)
50–59	338/1874	399/1929	−23·1	175·5	0·88 (0·76–1·02)
60–69	305/1327	340/1365	−13·6	150·0	0·91 (0·78–1·07)
≥70	43/271	51/251	−5·7	20·7	0·76 (0·49–1·17)
χ^2_1=0·0; p=0·84					
Nodal status					
pN0	126/1093	162/1095	−16·4	68·6	0·79 (0·62–1·00)
pN1–3	481/2812	543/2910	−23·7	247·3	0·91 (0·80–1·03)
pN4+	437/1219	483/1232	−32·3	210·5	0·86 (0·75–0·98)
pN unknown	0/235	1/237	−0·6	0·6	0·55 (0·25–1·24)
χ^2_1=0·1; p=0·82					
Grade					
Low grade	82/672	97/689	−4·3	41·5	0·90 (0·67–1·22)
Intermediate grade	202/1442	225/1498	−18·4	111·2	0·89 (0·74–1·08)
High grade	263/1072	317/1130	−21·8	131·3	0·85 (0·71–1·01)
Unknown grade	415/2173	467/2167	−29·4	208·6	0·87 (0·76–0·99)
χ^2_2=0·2; p=0·67					
Tumour size					
1–20 mm	363/2774	441/2826	−35·7	189·7	0·83 (0·72–0·96)
21–50 mm	601/2286	664/2361	−29·3	295·8	0·91 (0·81–1·02)
>50 mm	85/274	100/262	−12·7	35·6	0·70 (0·50–0·97)
Unknown	4/85	2/85	0·8	0·5	4·33 (0·74–25·45)
χ^2_3=0·0; p=1·00					
ER status					
ER poor	280/1138	347/1221	−27·5	141·1	0·82 (0·70–0·97)
ER positive	710/3963	794/4002	−46·3	356·1	0·88 (0·79–0·97)
ER unknown	63/258	66/251	−3·5	26·3	0·88 (0·60–1·28)
χ^2_2=0·4; p=0·51					
Breast quadrant					
Lateral	568/2601	607/2702	−16·1	275·1	0·94 (0·84–1·06)
Medial or central	453/2409	556/2438	−51·7	234·8	0·80 (0·71–0·91)
Unknown	32/349	44/334	−7·8	14·8	0·59 (0·35–0·98)
χ^2_2=3·3; p=0·069					
Breast surgery					
BCS	502/3502	590/3515	−43·9	261·1	0·85 (0·75–0·95)
Mastectomy	551/1857	617/1958	−29·8	269·3	0·90 (0·79–1·01)
None, other, or unknown	0/0	0/1			
χ^2_1=0·4; p=0·51					
Nodes irradiated					
IMC, SCF, and axilla	472/2918	555/2918	−46·2	246·4	0·83 (0·73–0·94)
IMC	544/1982	615/2104	−30·7	269·4	0·89 (0·79–1·01)
SCF or axilla	37/459	37/452	1·1	16·7	1·07 (0·66–1·73)
χ^2_2=1·4; p=0·49					
Use of systemic therapy					
None reported	74/488	74/457	−1·0	32·6	0·94 (0·67–1·33)
Chemotherapy only	316/1189	362/1236	−21·3	154·2	0·87 (0·74–1·02)
Endocrine only	334/1539	371/1606	−12·3	163·0	0·93 (0·80–1·08)
Both	328/2135	400/2165	−43·1	172·1	0·78 (0·67–0·90)
Other or unknown	4/8	3/10			
χ^2_3=2·9; p=0·40					
Period of follow-up					
Years 0–1	133/5359	162/5474	−12·4	69·3	0·84 (0·66–1·06)
Years 2–4	312/5107	387/5194	−34·1	164·1	0·81 (0·70–0·95)
Years 5–9	344/4566	369/4567	−13·8	170·3	0·92 (0·79–1·07)
Years ≥10	264/3198	289/3141	−15·5	128·8	0·89 (0·75–1·05)
χ^2_3=0·7; p=0·41					
Overall p=0·0010	**1053/5359 (19·6%)**	**1207/5474 (22·0%)**	**−75·9**	**532·4**	**0·87 (0·80–0·94)**

0 0·5 1·0 1·5 2·0

Regional radiotherapy better — Regional radiotherapy worse

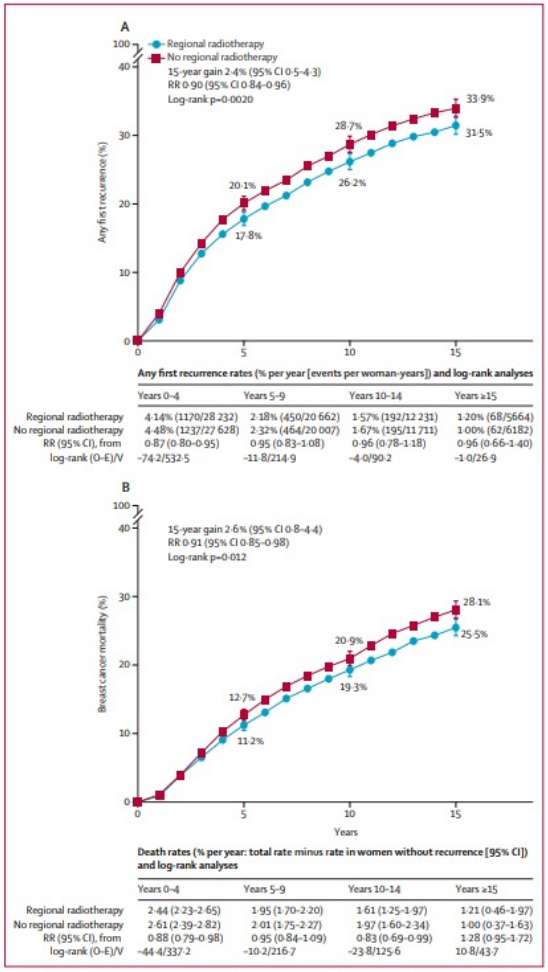


Figure 1: **Effect of regional node radiotherapy on (A) any recurrence and (B) breast cancer mortality in 12 990 women in 15 trials**
2157 women in eight older trials and 10 833 women in seven newer trials. One newer trial of 1334 women that reported only all-cause mortality was excluded. RR=rate ratio.

	Regional radiotherapy	No regional radiotherapy	Gain from regional radiotherapy
Any recurrence			
pN0	19·0%	21·3%	2·3%
pN1–3	25·6%	28·5%	2·9%
pN4+	46·8%	51·1%	4·3%
Breast cancer mortality			
pN0	10·9%	12·5%	1·6%
pN1–3	20·3%	23·0%	2·7%
pN4+	40·5%	45·0%	4·5%

Data are 15-year cumulative risks. The overall rate ratios (RRs) for any recurrence (RR=0·88; figure 3) and breast cancer mortality (0·87; figure 3) were applied to annual rates of any recurrence and breast cancer mortality in the trials, averaged over treatment groups (there was no significant heterogeneity in the proportional reductions [RRs] for any recurrence and breast cancer mortality). pN0=pathologically node negative. pN1–3=one to three involved axillary lymph nodes. pN4+=four or more involved axillary lymph nodes.

Table 2: **Absolute effect of regional node radiotherapy on 15-year risk of any recurrence and breast cancer mortality by nodal status in 10 833 women in the seven newer trials with data on recurrence**

The Lancet 2023

RNI si ypN0 ?

Etude randomisée de phase III (NSABP B-51/RTOG 1304)

1641 patientes T1-T3, N1, M0

ypN0 après chimiothérapie néoadjuvante

Groupe RNI : RT sein ou paroi + ggl

Groupe sans RNI : sein uniquement si conservateur

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Omitting Regional Nodal Irradiation after Response to Neoadjuvant Chemotherapy

E.P. Mamounas,[1] H. Bandos,[2,3] J.R. White,[4] T.B. Julian,[5] A.J. Khan,[6] S.F. Shaitelman,[7]

Table 1. Demographic and Clinical Characteristics of the Patients at Baseline.*

Characteristic	Regional Nodal Irradiation (N=820)	No Regional Nodal Irradiation (N=821)
Age		
Median — yr	52	52
Distribution — no. (%)		
≤39 yr	120 (14.6)	119 (14.5)
40–49 yr	215 (26.2)	207 (25.2)
50–59 yr	274 (33.4)	266 (32.4)
≥60 yr	211 (25.7)	229 (27.9)
Type of surgery — no. (%)		
Lumpectomy	473 (57.7)	474 (57.7)
Mastectomy	347 (42.3)	347 (42.3)
Clinical tumor stage — no. (%)‡		
T1	170 (20.7)	171 (20.8)
T2	499 (60.9)	484 (59.0)
T3	151 (18.4)	166 (20.2)
HR status — no. (%)		
Negative	386 (47.1)	382 (46.5)
Positive	434 (52.9)	439 (53.5)
HER2 status — no. (%)		
Negative	355 (43.3)	356 (43.4)
Positive	465 (56.7)	465 (56.6)
Tumor subtype — no. (%)		
Triple negative	191 (23.3)	175 (21.3)
HR positive and HER2 negative	164 (20.0)	181 (22.0)
HR negative and HER2 positive	195 (23.8)	207 (25.2)
HR positive and HER2 positive	270 (32.9)	258 (31.4)
Adjuvant chemotherapy — no. (%)		
No	813 (99.1)	817 (99.5)
Yes	7 (0.9)	4 (0.5)
Pathological complete response in breast — no. (%)		
Absent	176 (21.5)	182 (22.2)
Present	644 (78.5)	639 (77.8)
Axillary staging — no. (%)		
Sentinel-lymph-node biopsy§	461 (56.2)	448 (54.6)
Axillary-lymph-node dissection¶	359 (43.8)	373 (45.4)

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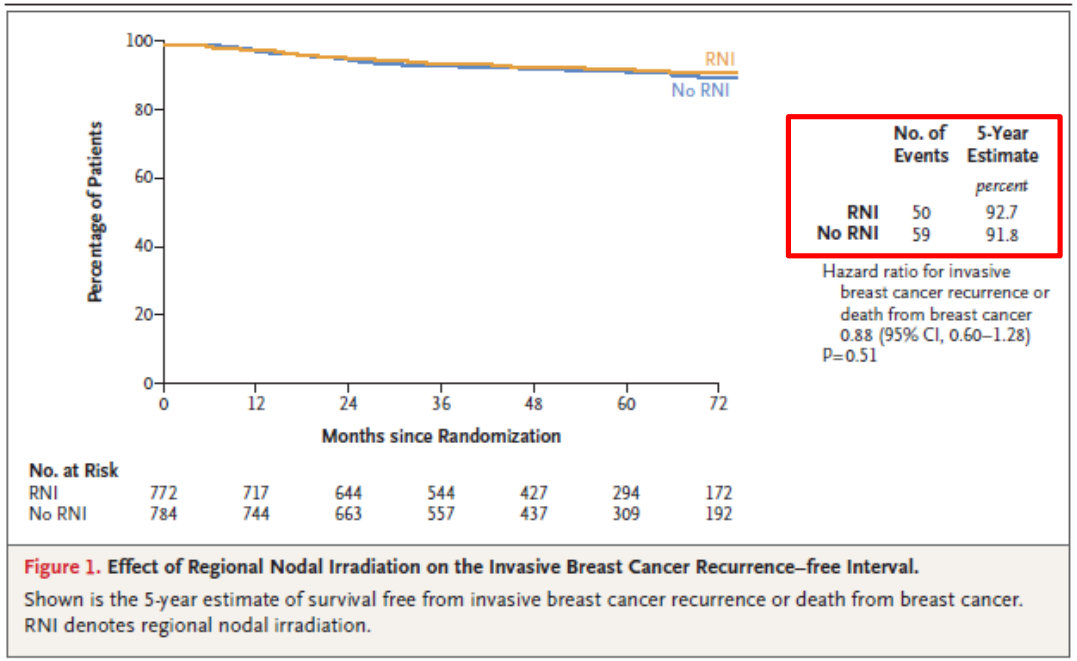

Figure 1. Effect of Regional Nodal Irradiation on the Invasive Breast Cancer Recurrence–free Interval.
Shown is the 5-year estimate of survival free from invasive breast cancer recurrence or death from breast cancer. RNI denotes regional nodal irradiation.

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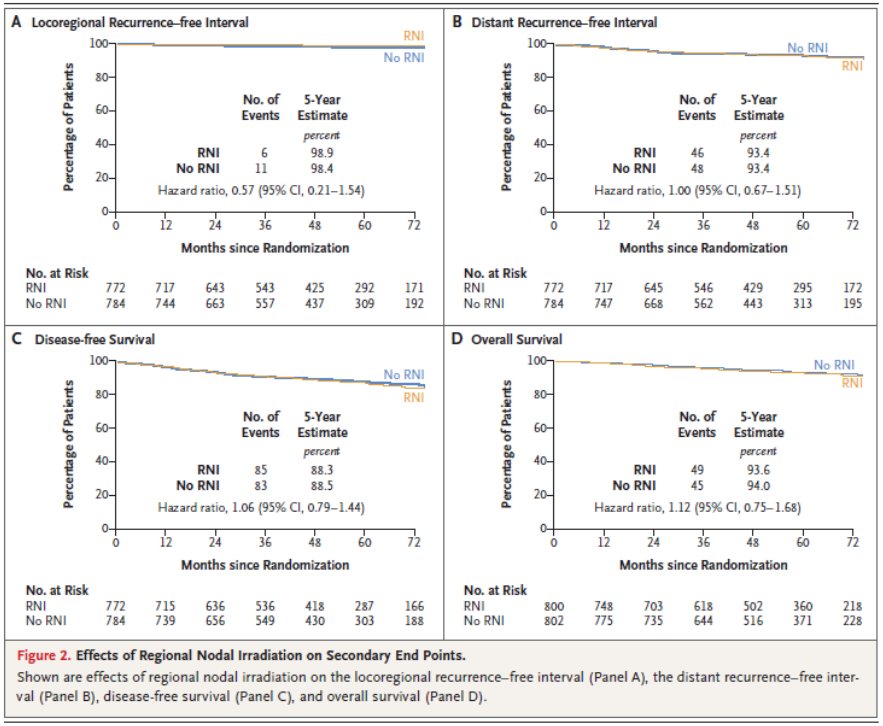

Figure 2. Effects of Regional Nodal Irradiation on Secondary End Points.
Shown are effects of regional nodal irradiation on the locoregional recurrence–free interval (Panel A), the distant recurrence–free interval (Panel B), disease-free survival (Panel C), and overall survival (Panel D).

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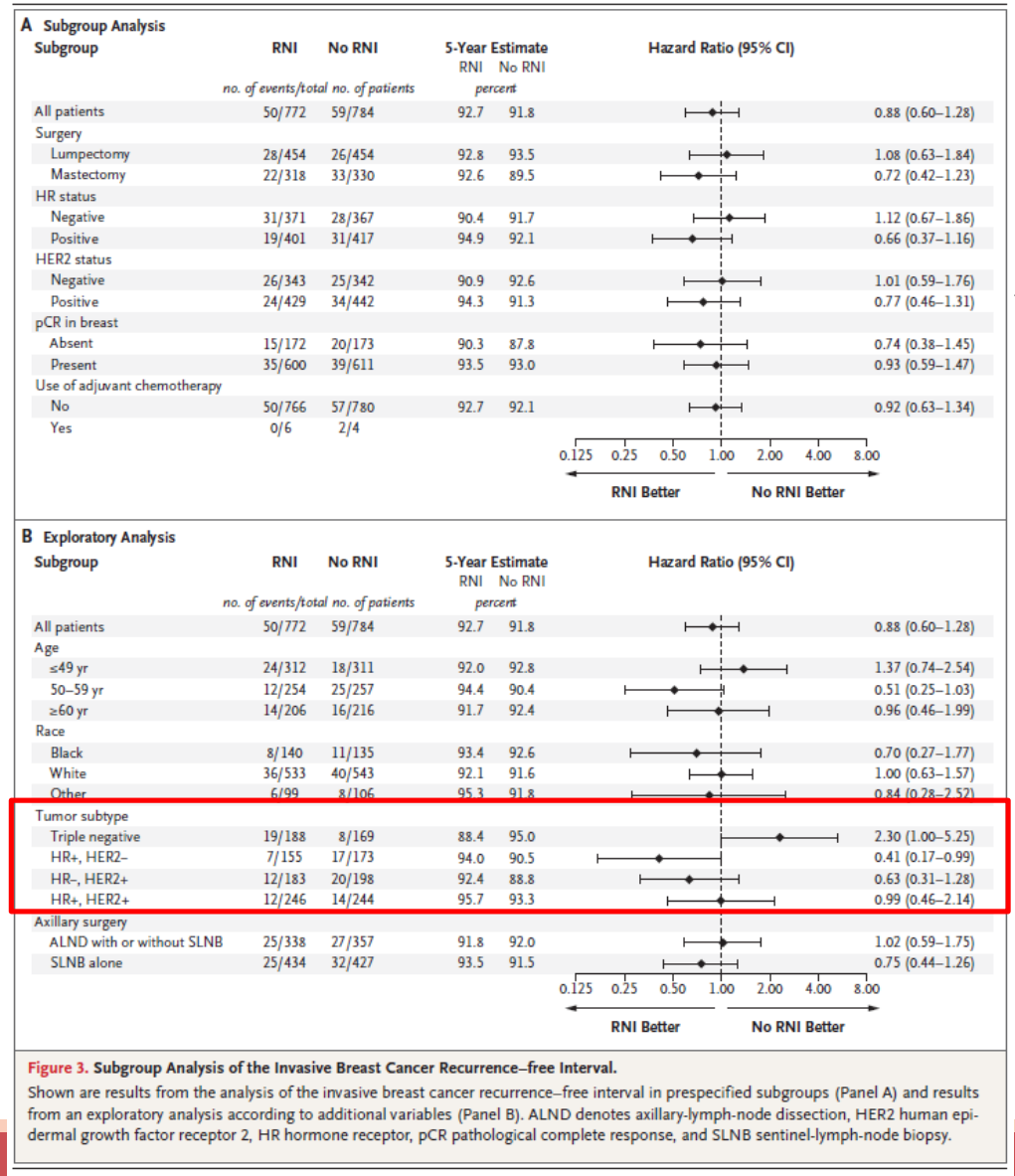


A Subgroup Analysis

Subgroup	RNI	No RNI	5-Year Estimate RNI	5-Year Estimate No RNI	Hazard Ratio (95% CI)
	no. of events/total	no. of patients	percent		
All patients	50/772	59/784	92.7	91.8	0.88 (0.60–1.28)
Surgery					
Lumpectomy	28/454	26/454	92.8	93.5	1.08 (0.63–1.84)
Mastectomy	22/318	33/330	92.6	89.5	0.72 (0.42–1.23)
HR status					
Negative	31/371	28/367	90.4	91.7	1.12 (0.67–1.86)
Positive	19/401	31/417	94.9	92.1	0.66 (0.37–1.16)
HER2 status					
Negative	26/343	25/342	90.9	92.6	1.01 (0.59–1.76)
Positive	24/429	34/442	94.3	91.3	0.77 (0.46–1.31)
pCR in breast					
Absent	15/172	20/173	90.3	87.8	0.74 (0.38–1.45)
Present	35/600	39/611	93.5	93.0	0.93 (0.59–1.47)
Use of adjuvant chemotherapy					
No	50/766	57/780	92.7	92.1	0.92 (0.63–1.34)
Yes	0/6	2/4			

0.125 0.25 0.50 1.00 2.00 4.00 8.00

RNI Better — No RNI Better

B Exploratory Analysis

Subgroup	RNI	No RNI	5-Year Estimate RNI	5-Year Estimate No RNI	Hazard Ratio (95% CI)
	no. of events/total	no. of patients	percent		
All patients	50/772	59/784	92.7	91.8	0.88 (0.60–1.28)
Age					
≤49 yr	24/312	18/311	92.0	92.8	1.37 (0.74–2.54)
50–59 yr	12/254	25/257	94.4	90.4	0.51 (0.25–1.03)
≥60 yr	14/206	16/216	91.7	92.4	0.96 (0.46–1.99)
Race					
Black	8/140	11/135	93.4	92.6	0.70 (0.27–1.77)
White	36/533	40/543	92.1	91.6	1.00 (0.63–1.57)
Other	6/99	8/106	95.3	91.8	0.84 (0.28–2.52)
Tumor subtype					
Triple negative	19/188	8/169	88.4	95.0	2.30 (1.00–5.25)
HR+, HER2–	7/155	17/173	94.0	90.5	0.41 (0.17–0.99)
HR–, HER2+	12/183	20/198	92.4	88.8	0.63 (0.31–1.28)
HR+, HER2+	12/246	14/244	95.7	93.3	0.99 (0.46–2.14)
Axillary surgery					
ALND with or without SLNB	25/338	27/357	91.8	92.0	1.02 (0.59–1.75)
SLNB alone	25/434	32/427	93.5	91.5	0.75 (0.44–1.26)

0.125 0.25 0.50 1.00 2.00 4.00 8.00

RNI Better — No RNI Better

Figure 3. Subgroup Analysis of the Invasive Breast Cancer Recurrence–free Interval.

Shown are results from the analysis of the invasive breast cancer recurrence–free interval in prespecified subgroups (Panel A) and results from an exploratory analysis according to additional variables (Panel B). ALND denotes axillary-lymph-node dissection, HER2 human epidermal growth factor receptor 2, HR hormone receptor, pCR pathological complete response, and SLNB sentinel-lymph-node biopsy.

Radiothérapie et patientes mutées BRCA

« Aussi efficace que la mastectomie?»

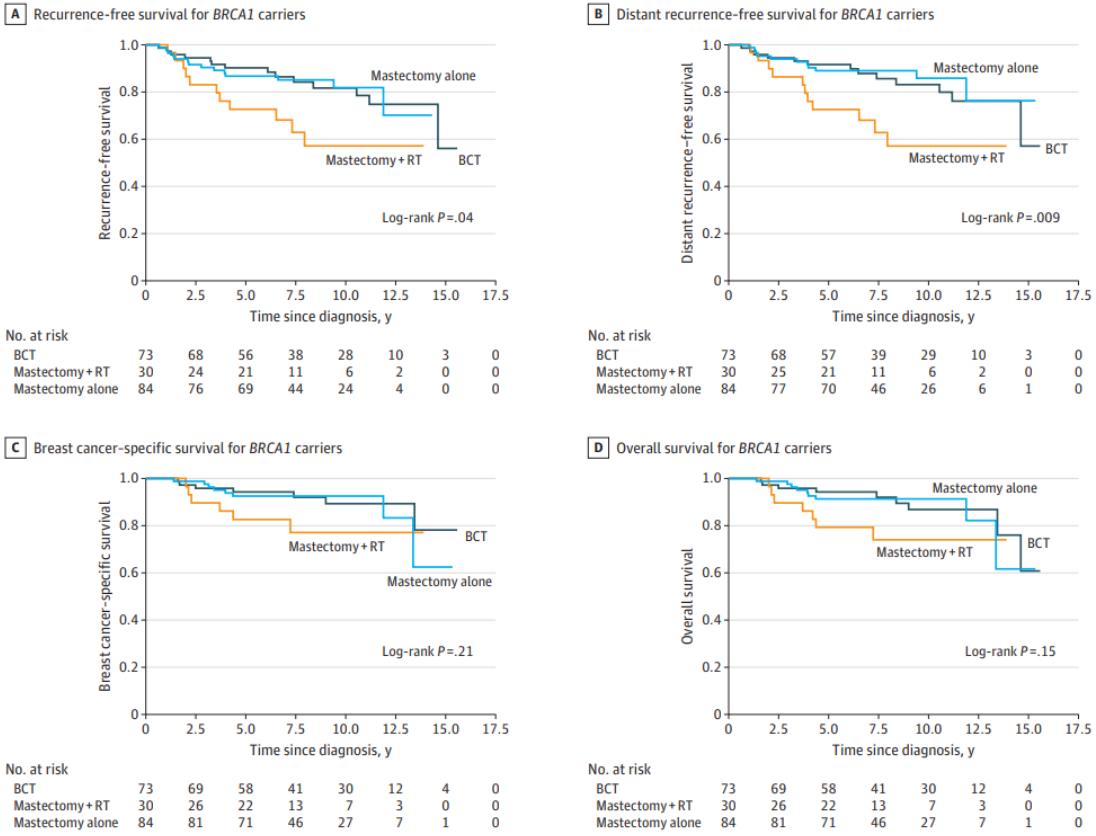
JAMA Network Open

Original Investigation | Surgery

Comparison of Survival After Breast-Conserving Therapy vs Mastectomy Among Patients With or Without the *BRCA1/2* Variant in a Large Series of Unselected Chinese Patients With Breast Cancer

Qiting Wan, MD; Liming Su, MD; Tao Ouyang, MD; Jinfeng Li, MD; Tianfeng Wang, MD; Zhaoqing Fan, MD; Tie Fan, MD; Benyao Lin, MD; Yuntao Xie, MD, PhD

Figure 1. Survival of *BRCA1* Variant Carriers Receiving Breast-Conserving Therapy (BCT), Mastectomy With Radiotherapy (RT), or Mastectomy Alone



Cohorte rétrospective 8396 patientes:

- 187 BRCA 1
- 304 BRCA 2
- 7905 non porteuses

Traitements:

BCT + RT 37,3%

Mastectomie +RT 18%

Mastectomie seule 44,7%

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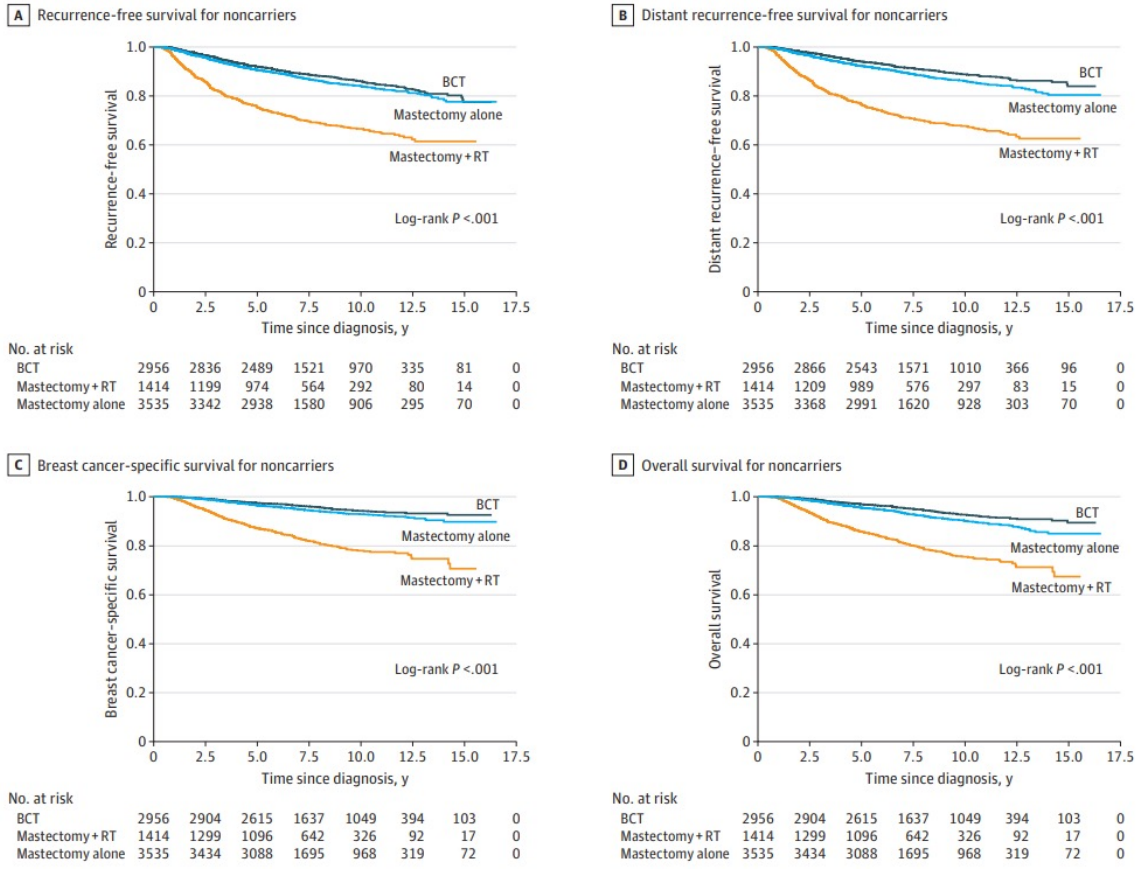
Figure 3. Survival of Noncarriers Receiving Breast-Conserving Therapy (BCT), Mastectomy With Radiotherapy (RT), or Mastectomy Alone



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Traitements:

BCT + RT 37,3%

Mastectomie +RT 18%

Mastectomie seule 44,7%

Patientes mutées BRCA 1/2

Etude de cohorte multicentrique

4837 patientes incluses ≤ 40 ans :
- 1704 BCS+RT
- 1488 Mastectomie
- 1645 Mastectomie+RT

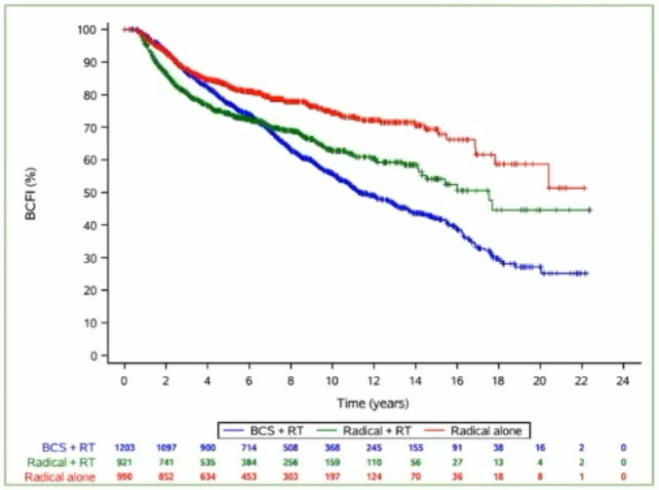
Objectifs:
OS, Breast Cancer Free Interval, Breast Cancer Free Survival

	BCS + RT (n = 1704), n (%)	MS alone (n = 1488), n (%)	MS + RT (n = 1645), n (%)	Total (n = 4837), n (%)
Median age at diagnosis, years (IQR)	35.0 (31.0-38.0)	35.0 (31.0-38.0)	35.0 (31.0-37.0)	35.0 (31.0-38.0)
BRCA				
BRCA1	1203 (70.6)	990 (66.5)	921 (56.0)	3114 (64.4)
BRCA2	501 (29.4)	498 (33.5)	724 (44.0)	1723 (35.6)
Median time to BRCA test, years (IQR)	1.4 (0.3-4.8)	0.1 (0.0-0.7)	0.3 (0.1-1.5)	0.4 (0.1-1.5)
BRCA TEST				
Test before diagnosis	74 (4.3)	246 (16.5)	124 (7.5)	444 (9.2)
Test at diagnosis	448 (26.3)	730 (49.1)	777 (47.2)	1955 (40.4)
Test after diagnosis	1113 (65.3)	413 (27.8)	654 (39.8)	2180 (45.1)
Unknown date of BRCA testing	69 (4.0)	99 (6.7)	90 (5.5)	258 (5.3)
Tumour stage at diagnosis				
Stage I	572 (33.6)	577 (38.8)	83 (5.0)	1232 (25.5)
Stage II	934 (54.8)	833 (56.0)	901 (54.8)	2668 (55.2)
Stage III	198 (11.6)	78 (5.2)	661 (40.2)	937 (19.4)
Tumour grade				
G1	30 (1.8)	39 (2.6)	27 (1.6)	96 (2.0)
G2	359 (21.1)	387 (26.0)	457 (27.8)	1203 (24.9)
G3	1315 (77.2)	1062 (71.4)	1161 (70.6)	3538 (73.1)
Hormone receptor status				
Negative	1030 (60.4)	790 (53.1)	781 (47.5)	2601 (53.8)
Positive	674 (39.6)	698 (46.9)	864 (52.5)	2236 (46.2)
HER2 status				
Negative	1542 (90.5)	1338 (89.9)	1452 (88.3)	4332 (89.6)
Positive	96 (5.6)	102 (6.9)	137 (8.3)	335 (6.9)
Unknown	66 (3.9)	48 (3.2)	56 (3.4)	170 (3.5)
Tumour subtype				
HER2+	98 (5.8)	105 (7.1)	143 (8.7)	346 (7.2)
TNBC	996 (58.5)	760 (51.1)	743 (45.2)	2499 (51.7)
Luminal B	395 (23.2)	356 (23.9)	480 (29.2)	1231 (25.4)
Luminal A	215 (12.6)	267 (17.9)	279 (17.0)	761 (15.7)

Patientes mutées BRCA 1/2

Event Type	BCS + RT n (%)	MS alone n (%)	MS + RT n (%)	Total n (%)
No event	925 (54.28)	1106 (74.33)	1085 (65.96)	3116 (64.42)
Locoregional relapse	176 (10.33)	103 (6.92)	87 (5.29)	366 (7.57)
Second primary breast cancer	343 (20.13)	101 (6.79)	114 (6.93)	558 (11.54)
Distant relapse (competing)	159 (9.33)	119 (8.00)	294 (17.87)	572 (11.83)
Second primary malignancy (non-breast, competing)	93 (5.46)	49 (3.29)	48 (2.92)	190 (3.93)
Death without recurrence (competing)	8 (0.47)	10 (0.67)	17 (1.03)	35 (0.72)
Total	1704 (35.23)	1488 (30.76)	1645 (34.01)	4837 (100.0)

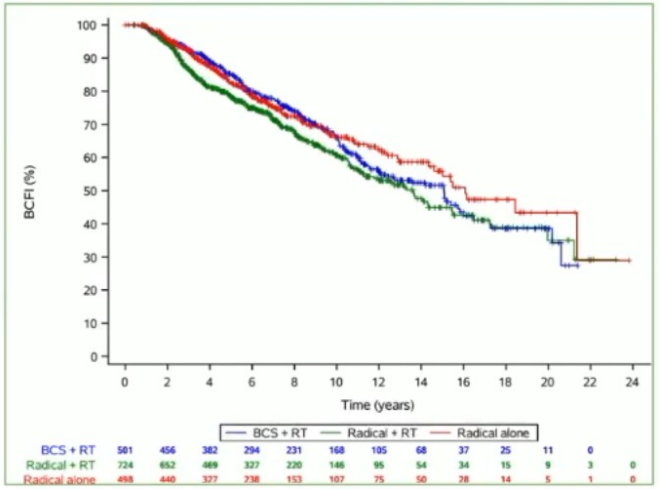
BRCA BCY cohorte, C. Becherini, ESTRO 2025



***BRCA1* Carriers**

Adjusted* HR:	**1.28** (95% CI 1.01-1.37)
With left truncation:	**1.41** (95% CI 1.11-1.80) ✓
Test before/at diagnosis:	**1.29** (95% CI 0.90-1.86)

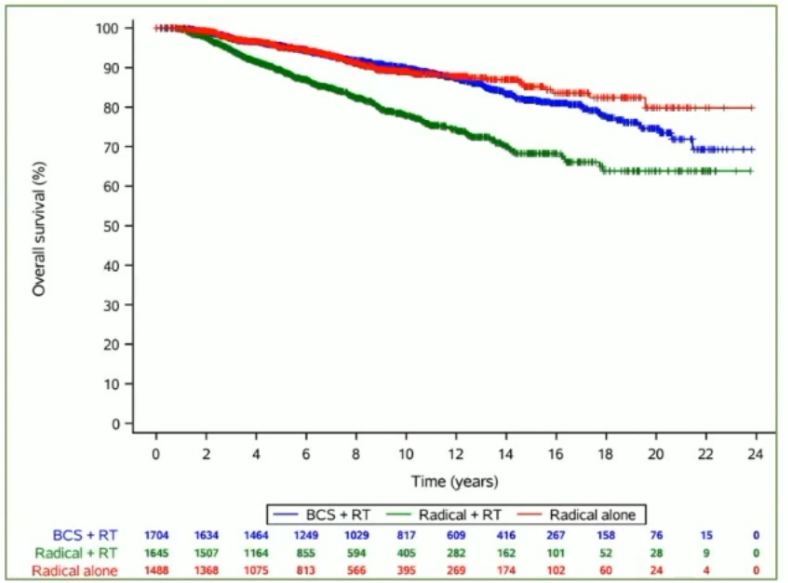
BCS+RT was associated with a worse BCFI compared to MS alone



***BRCA2* Carriers**

Adjusted* HR:	**0.78** (95% CI 0.60-1.00)
With left truncation:	**0.74** (95% CI 0.54-1.02)
Test before/at diagnosis:	**0.22** (95% CI 0.11-0.44) ✓

Significant OS benefit observed in BRCA2 carriers tested before/at diagnosis



Adjusted* HR for BCS + RT vs MS alone:

Overall:	**0.93** (95% CI 0.72-1.21)
With left truncation:	**1.02** (95% CI 0.78-1.34)
BRCA-tested before/at diagnosis:	**0.68** (95% CI 0.39-1.16)

Radiothérapie et nouveaux traitements systémiques

« Un bon ou un mauvais mélange?»

12/06/2025

Gestion des traitements

International multidisciplinary consensus on the integration of radiotherapy with new systemic treatments for breast cancer: European Society for Radiotherapy and Oncology (ESTRO)-endorsed recommendations

Icro Meattini, Carlotta Becherini, Saverio Caini, Charlotte E Coles, Javier Cortes, Giuseppe Curigliano, Evandro de Azambuja, Clare M Isacke,

Anti HER2 (Trastuzumab, Pertuzumab, Lapatinib..)

Immunothérapie

PARP Inhibiteurs

Anticorps conjugués
TDM1
Trastuzumab Deruxtecan

Inhibiteurs de CDK 4/6

PIK3 inhibiteurs et MTOR Inhibiteurs

Lancet Oncol, Février 2024

Conclusion

« Cancers du sein à haut risque : quoi de neuf en 2025? »

Cancers du sein à haut risque

- ✓ **RT modérément hypofractionnée** reste le standard, possibilité de la proposer **pour les N+**
- ✓ **RNI** reste le standard
- ✓ **Boost** : impact majeur chez les TN
- ✓ **26Gy en 5fr** : option thérapeutique si N0
- ✓ **BRCA mutées** : BCS+RT ou mastectomie, choix partagé avec la patiente

A venir…

- ✓ **Omission de la RT chez les ypN0?** (Triples négatifs +++)
- ✓ Résultats poolés HypoG-01 / DCBG SKAGEN
- ✓ Nodal FAST FORWARD : **données de survie**