

A photograph of the Samsung Medical Center building at dusk. The building is a large, modern structure with many windows, some of which are illuminated. The sky is dark blue, and the building's lights create a warm glow. The text is overlaid on the image.

Hypofractionated Radiation Therapy in Gynecologic Cancer

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Disclosures

- I have no financial arrangement or affiliations to disclose.

Agenda

Hypofractionated RT in

- I. Cervical cancer
 - I. Definitive
 - II. Adjuvant
- II. Endometrial cancer
- III. Palliative RT

Hypofractionation

Conventional RT

- 1.8~2Gy per fraction
- Target volume:
Gross tumor & adjacent normal tissue (microscopic tumors)
- Advantages
Safe
- Disadvantages
Long treatment time

Hypofractionated RT

- >2Gy/fraction (ex.40Gy/16frs)
- Target volume:
Gross tumor ± adjacent normal tissue
- Advantages
Short treatment time
- Disadvantages
Higher toxicities (can be overcome by IMRT)

SABR/SBRT/SRS

- 8-24Gy/1-4fraction
- Target volume:
Gross tumor
- Advantages
Short treatment time
Enhanced tumor controls by increased BED
- Disadvantages
Higher toxicities (can be overcome by IGRT & IMRT)

Benefit of hypofractionated RT

1. Resource Utilization and Cost Efficiency

Reduces machine time, increasing patient throughput -> improved access to RT

2. Patient Costs and visits

Fewer trips to the hospital

Lower costs (transportation, accommodation, time off work)

Less stress for their caregivers

Better mental well-being

3. Coordination of Combined Therapies

Simplified Scheduling, Reduced Treatment Gaps

Facilitates the integration of radiotherapy with systemic treatments (particularly for endometrial ca)

RT for cervical cancer

- Conventional fractionation is recommended in RT for cervical ca.



NCCN Guidelines Version 3.2024 Cervical Cancer

[NCCN Guidelines Index](#)
[Table of Contents](#)
[Discussion](#)

PRINCIPLES OF RADIATION THERAPY¹

General Treatment Information—Continued

Definitive RT for an Intact Cervix^a

- In patients with an intact cervix (ie, those who do not have surgery), the primary tumor and regional lymphatics at risk are typically treated with definitive EBRT to a dose of approximately 45 Gy (40–50 Gy). The volume of the EBRT would depend on the nodal status as determined surgically or radiographically (as previously described). The primary cervical tumor is then boosted, using brachytherapy, with an additional 30 to 40 Gy using either image guidance (preferred) or to point A (in low dose-rate [LDR] equivalent dose), for a total point A dose (as recommended in the guidelines) of 80 Gy for small-volume cervical tumors or ≥85 Gy for larger-volume cervical tumors. For very small tumors (medically inoperable IA1 or IA2) EQD2 D90 doses of 75–80 Gy may be considered. Grossly involved unresected nodes may be evaluated for boosting with an additional 10 to 15 Gy of highly conformal (and reduced-volume) EBRT. When using image guidance for EBRT, care must be taken to exclude or severely limit the volume of normal tissue included in the high-dose region(s) ([see Discussion](#)).

Posthysterectomy Adjuvant Radiation Therapy^a

- Following primary hysterectomy, the presence of one or more pathologic risk factors may warrant the use of adjuvant radiotherapy. At a minimum, the following should be covered: upper 3 to 4 cm of the vaginal cuff, the parametria, and immediately adjacent nodal basins (such as the external and internal iliac, obturator, and presacral nodes). For documented nodal metastasis, the superior border of the radiation field should be appropriately increased (as previously described). A dose of 45 to 50 Gy in standard fractionation with IMRT is generally recommended.⁵ Grossly involved unresected nodes may be evaluated for boosting with an additional 10 to 20 Gy of highly conformal (and reduced-volume) EBRT. With higher doses, especially of EBRT, care must be taken to exclude or severely limit the volume of normal tissue included in the high-dose region(s) ([see Discussion](#)).
- Consider Vaginal cuff brachytherapy for positive or close vaginal margins.

Biologic benefit of hypofractionation

Hypofractionation is standard-of-care in breast, prostate, and rectal cancers.
(high α/β ratios)

In cervical cancers, reduced overall treatment time (OTT) (<50 days) correlates with cancer control.

→ Might compensate reduced BED and numeric dose.

Definitive CCRT for cervical cancer

– retrospective data

- Tata Memorial Hospital
- 1994-1996, 62 patients with FIGO IIIB
- 39Gy/13frs, 2D-RT + ICR brachytherapy

- 5-year DFS rate was 59%.
- Acute Gr3-4 GI toxicities were observed in 6 (9.7%) patients.
- Late G3 GI toxicities occurred in 5 (8.1%) patients.



Definitive CCRT for cervical cancer

– retrospective data

- South Africa
- 2010-2011, 104 patients with FIGO IIIB cervical cancer
- EBRT 40Gy/16frs + HDR brachytherapy 9Gy x 2 frs
- RT alone.

- Complete response rates 70%, DFS at 20 months was 60%.
- Late GI toxicities in 5 patients (%).
- No late GU toxicity

Definitive CCRT for cervical cancer – retrospective data

- Retrospective study, 2011-2012, 414 patients with FIGO IIB-IIIB Uganda
- CFRT 50Gy/25frs (n=221) vs. HFRT 45Gy/15frs (n=193)
- 2D-RT + ICR boost, CCRT c weekly cisplatin (N=182)

- 6 months response rates
→ 67.6% (CR 36.6%)(HFRT) vs. 73.3% (CR 50.3%) (CFRT) (p=0.085)
- 5 year OS 46.6% (HFRT) vs. 44.9% (CFRT) (p=0.293)
- Toxicities : no differences

A Pilot Study of Moderately Hypo-Fractionated Whole Pelvic Radiotherapy with Concurrent Chemotherapy and Image-Guided High Dose Rate Brachytherapy for Locally Advanced Cervical Carcinoma

[A.K. Gandhi](#) · [M. Rastogi](#) · [U. Yadav](#) · [V. Mishra](#) · [A.K. Srivastava](#) · [A. Bharati](#) · [S.P. Mishra](#) [Show less](#)

50 patients of squamous cell carcinoma of cervix

Prospective single arm study, 2018-2021

WPRT 40 Gy in 16 fractions + LN boost 10 Gy in 4 fractions (3-D CRT)

CCRT (weekly cisplatin 40 mg/m²) + IGBT 7Gy x 4 frs

Median concurrent chemo cycles : 4 (range 3-5).

3-year OS 90.6% DFS 92.7%

	Gr2	Gr3
Acute GI	40%	20%
Acute GU	10%	6%
Late GI	12%	4%
Late GU	5%	0

Definitive CCRT for cervical cancer

– Ongoing trials

Trial number	Location	Study design	RT regimen	Period	Target No.	Primary endpoint
NCT04070976	Mexico	Randomized phase II	Arm1: 37.5Gy/15frs (2.5Gy/fr) Arm2: 45Gy/25frs + 28Gy HDR ICR	2019-2022	N=82	Acute and late toxicity
NCT05210270 (HYACINCT trial)	Philippine	Phase 1/2 Randomized	Arm1: 40Gy/15frs (45–48 Gy/15frs SIB) ICR 6.5–7.5 Gy x 4frs	2024-?	N=55	1: maximum tolerated dose for nSIB 2: 3mo CR rates
NCT04583254 (HEROICC-Trial)	Canada	Randomized phase II	Arm1: 40Gy/15frs (2.67Gy/fr) Arm2: 45Gy/25frs	2021-2023	N=48	Feasibility in Canadian Health Care System
TCTR2021081 2003 (HYPOCx-iRex)	Thailand	Randomized phase II	Arm1: 44 Gy/20 frs (IMRT, CCRT, IGBT) 53 Gy/20 frs LN SIB Arm2: 45 Gy/ 25 frs 55 Gy LN SIB	2021-2023	N=40	Toxicity
NCT04831437	Iran	Randomized phase II	Arm1: 40Gy/15frs Arm2: 45Gy/25frs + 28 HDR ICR LN boost 24Gy/3frs	2021-2023	N=60	Acute toxicity (3m) Early response (3m)

Interim analysis of Iran study

Ph II randomized, Non-inferiority trial
59 patients (stage IB to IIIC)

CCRT (weekly cisplatin)
45 Gy / 25 frs vs. 40 Gy / 15 frs
Brachy boost 28Gy/4frs, LN boost 24Gy/3frs

Primary endpoints : early toxicity and early response

Results: tumor size > 5 cm achieved higher CR rates in the conventional arm
while tumor size ≤ 5 cm better in Hypo arm (p= 0.02)

→ interim analysis failed to show non-inferiority of the hypofractionated CCRT to conventional CCRT.

→ second half of this trial using the IMRT technique and will restrict our patients to those with tumor size < 5 cm

Table 3 Comparison of grade 3 and higher toxicities between study groups

	Intervention	Control	χ^2/p value
Grade ≥ 3 Any	13/29 (44.8%)	9/30 (30%)	1.4/0.24
Grade ≥ 3 GI	8/29 (27.6%)	2/30 (6.7%)	4.6/0.032
Grade ≥ 3 GU	1/29 (3.4%)	2/30 (6.7%)	0.32/0.57
Grade ≥ 3 Hematologic	5/29 (17.2%)	7/30 (23.3%)	0.34/0.56
Grade ≥ 3 Skin	1/29 (3.4%)	0/30 (0%)	1.05/0.30
Grade ≥ 3 AKI	0/29 (0%)	0/30 (0%)	-

GI, gastrointestinal, *GU*, genitourinary, *AKI*, acute kidney injury

HYPOCx-iRex trial

Thai phase II randomized trial, non-inferiority
Endpoint: toxicity

IMRT, CCRT

44 Gy / 20 frs (LN SIB 53Gy/20frs) vs.
45 Gy / 25 frs (LN SIB 55Gy/20frs)

29 patients, median 8 months f/u
Hypo (n=15) Conventional (n=14)

One grade 3 acute GI toxicity in hypo arm
No grade 3 late GI, no grade 3 GU toxicity.

Difference of -0.07 [95% CI -0.47 to +0.32] cumulative GI toxicity exceeded margin of +0.09.

Role of adjuvant RT in cervical ca.

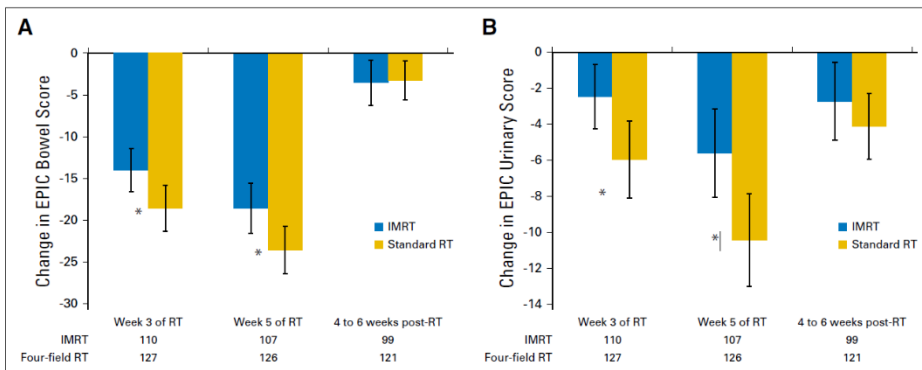
- Adjuvant RT improves PFS in patients with **LVSI, stromal invasion, and/or larger tumor size (>4cm)**, based on GOG 92 trial (Sedlis' criteria).
- Adjuvant CCRT improves OS and PFS in patients with **positive margin, parametrium invasion, or positive lymph node** based on GOG109 (Peter's criteria)



Benefit of IMRT in adjuvant pelvic RT

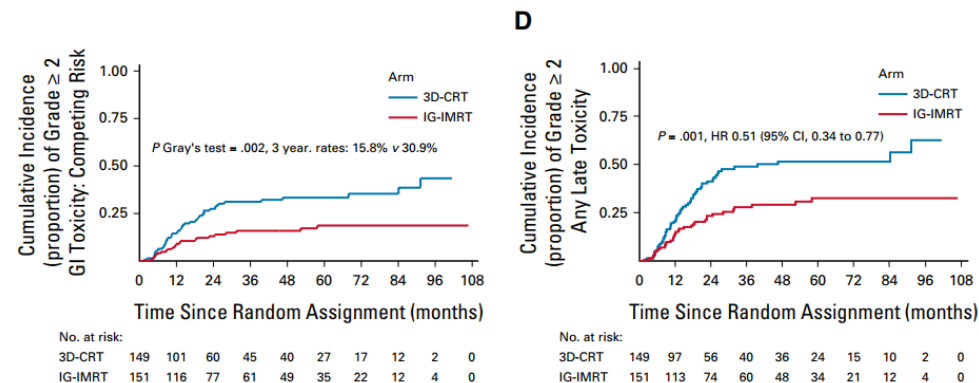
- RTOG 1203 study (=TIME-C trial) and PARCER trial showed the benefit of IMRT in reducing toxicities.

[RTOG 1203]



J Clin Oncol 2018 36:2538-2544

[PARCER trial]



J Clin Oncol 2021 39:3682-3692



Purpose of POHIM study

- The postoperative hypofractionated intensity-modulated radiation therapy (POHIM) trial is a phase II prospective study to evaluate toxicity following hypofractionated intensity modulated radiation therapy (IMRT) for cervical cancer.
- **Primary endpoint**
 - Acute toxicity Grade ≥ 3 (< 90 days after RT)
- **Secondary endpoint**
 - Late toxicity Grade ≥ 3
 - Quality of life
 - Progression-free survival



POHIM study

- Multi-institutional study

POHIM_RT (KROG 17-12)

- Historical data of acute GI, urinary, hematologic toxicities \geq grade 3

3%

$$N=(1.28)^2p(1-p)/(0.02)^2$$

- N= 120
- Study period: 4 years (2017-2021)

POHIM_CCRT (KROG 17-11)

- Historical data of acute GI, urinary, hematologic toxicities \geq grade 3

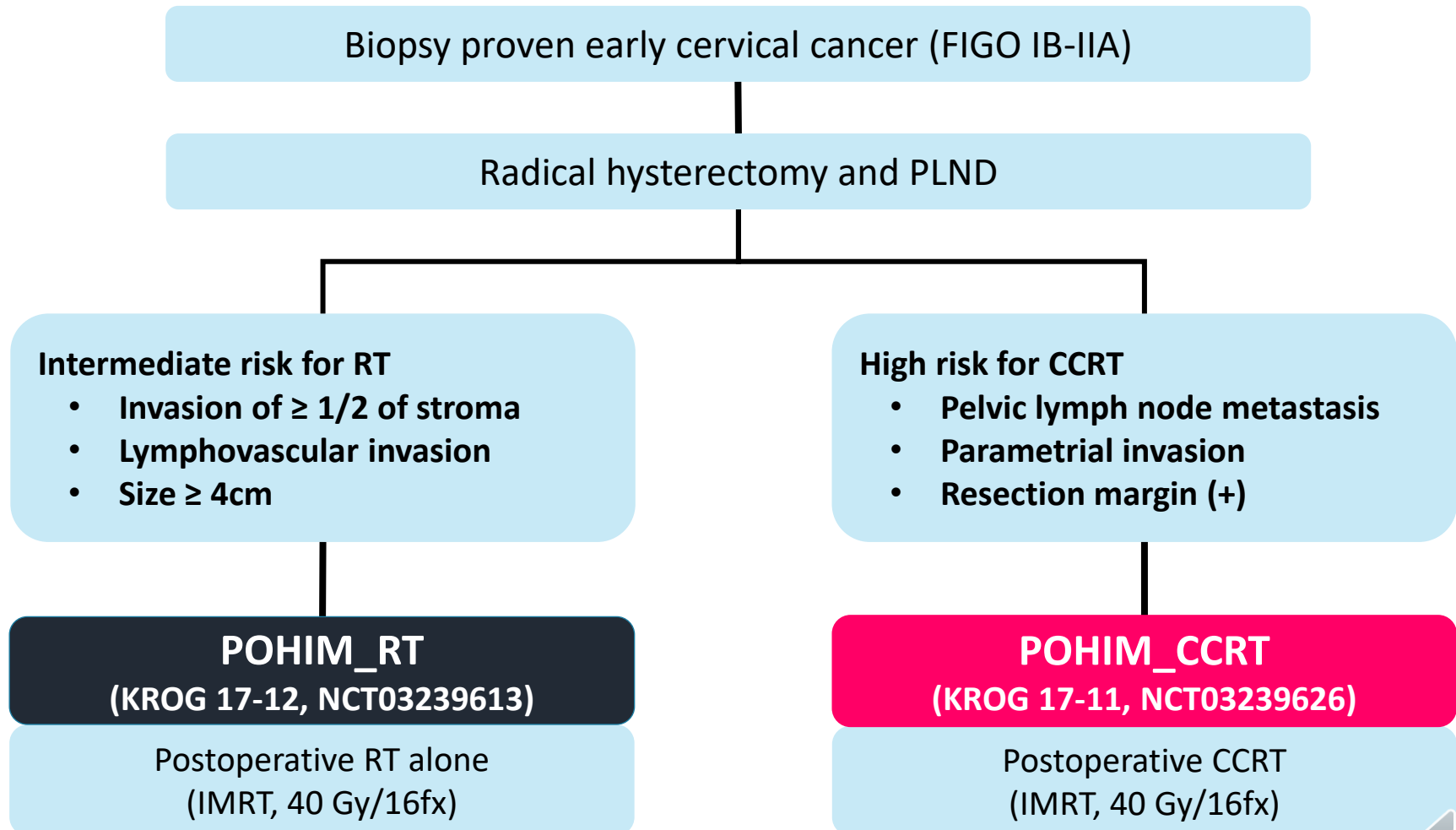
15%

$$N=(1.28)^2p(1-p)/(0.02)^2$$

- N= 84
- Study period: 4 years (2017-2021)



POHIM-RT, POHIM-CCRT study



Postoperative Hypofractionated Intensity-Modulated Radiotherapy With Concurrent Chemotherapy in Cervical Cancer

The POHIM-CCRT Nonrandomized Controlled Trial

Won Kyung Cho, MD; Won Park, MD; Sang-Won Kim, MD; Kang Kyu Lee, MD; Ki Jung Ahn, MD; Jin Hwa Choi, MD

Phase II study

Acute \geq Gr3 toxicities (primary endpoint)
: 2.5%

Late \geq Gr3 toxicities: none

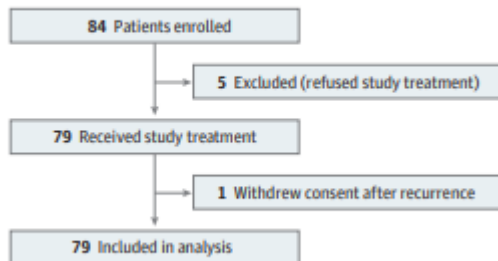
DFS: 79.3% @ 3Y

Phase III trials could be considered.

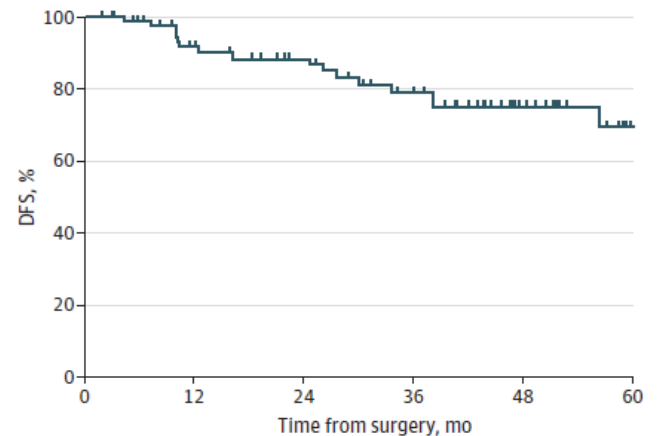
Table 2. Physician-Reported Acute Toxic Effects During or Within 3 Months After Radiotherapy Completion Based on the National Cancer Institute Common Terminology Criteria for Adverse Events, Version 4.0

Toxic effect	Patients, No. (%)
Any acute	
None	13 (16.5)
Grade 1	45 (57.0)
Grade 2	19 (24.1)
Grade 3	2 (2.5)

Figure 1. Study Flow Diagram



A DFS



No. at risk 79 61 50 38 23 7

Results of POHIM-RT trial

Patient characteristics (n=61)

Median age (IQR)	49 (41-55) years	
Clinical stage (FIGO)	IA	1 (1.6%)
	IB	53 (86.9%)
	IIA	7 (11.5%)
Median tumor size (IQR)	4.0 (2.6-5.0) cm	
Paraortic lymph node dissection	No	56 (91.8%)
	Yes	5 (8.2%)
Histology	Sqcc	41 (67.2%)
	Adenoca	19 (31.1%)
	Others	1 (1.6%)
Lymphovascular invasion	No	30 (49.2%)
	Yes	31 (50.8%)
Depth of invasion #	≤1/2	9 (15.3%)
	>1/2	50 (84.7%)
Tumor size > 4 cm	No	37 (60.7%)
	Yes	24 (39.3%)
Brachytherapy boost	No	49 (80.3%)
	Yes	12 (19.7%)

Toxicity (n=61)

	N (%)
Any acute toxicities	
No	11 (18.0%)
Yes	50 (82.0%)
Gastrointestinal toxicities	
None	12 (19.7%)
Grade 1	46 (75.4%)
Grade 2	2 (3.3%)
Grade 4	1 (1.6%)
Genitourinary toxicities	
None	37 (60.7%)
Grade 1	23 (37.7%)
Grade 2	1 (1.6%)
Hematologic toxicities	
None	55 (90.2%)
Grade 1	3 (4.9%)
Grade 2	3 (4.9%)

Grade 3 or higher acute toxicities was 1.6% (90% confidence interval, 0–3.7%).

3y DFS rate was 87.1%

Unpublished

Case review

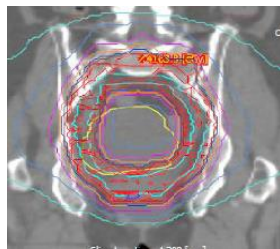
- 70 year, 156cm, 40.5kg (BMI 16.64)
- Sqcc, FIGO IB1
- Pathology) 2.5cm, invasion depth 10/12mm, LVI-, PM- RM- LN-

Radical hysterectomy
with PLND

RT alone 40Gy/16frs

Abdominal pain

ER visit
d/t abdominal pain
→ Panperitonitis c sigmoid
colon perforation
Hartmann's op, ICU care



2017.10.16

2017.11.21

2017.12.21

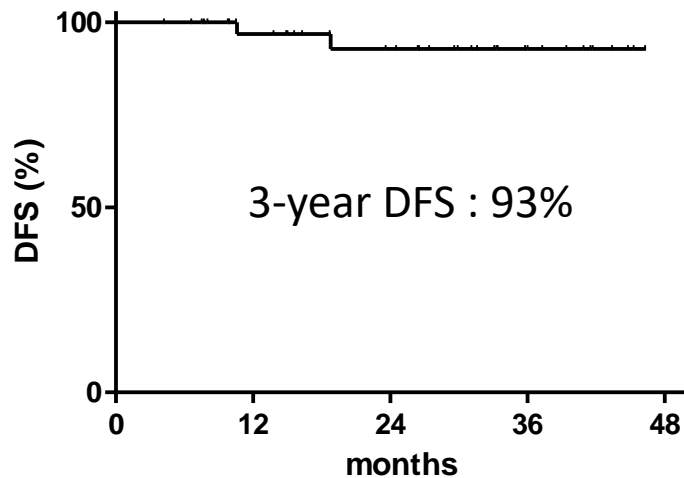
2018.1.25

~2021

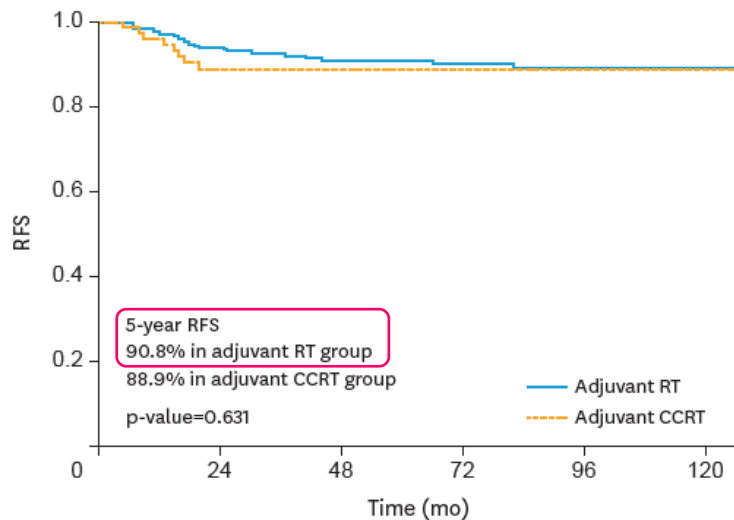
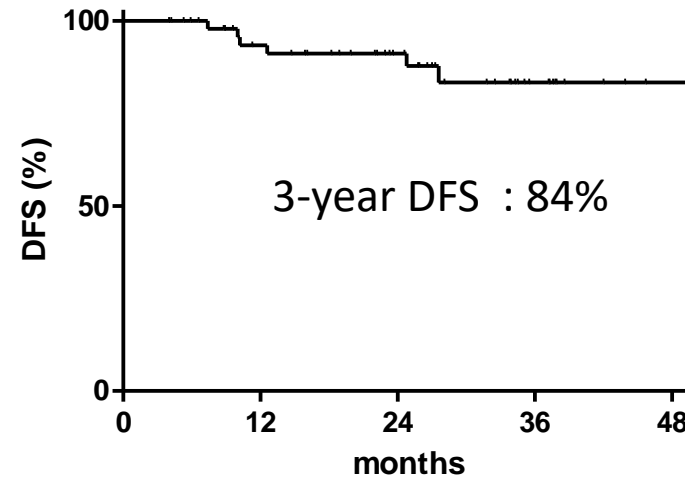
Fully recovered

POHIM study – Survival outcomes

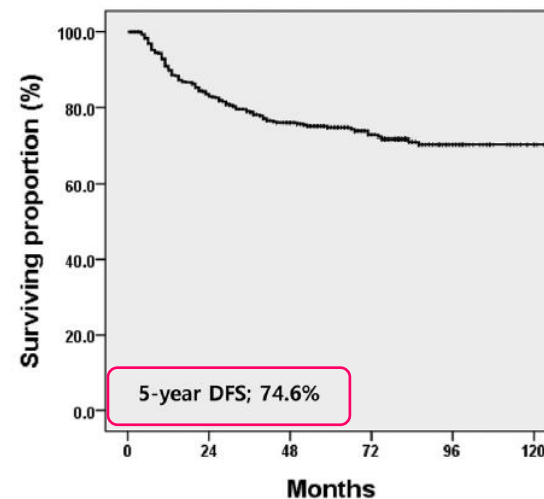
POHIM_RT



POHIM_CCRT



A Disease-free Survival



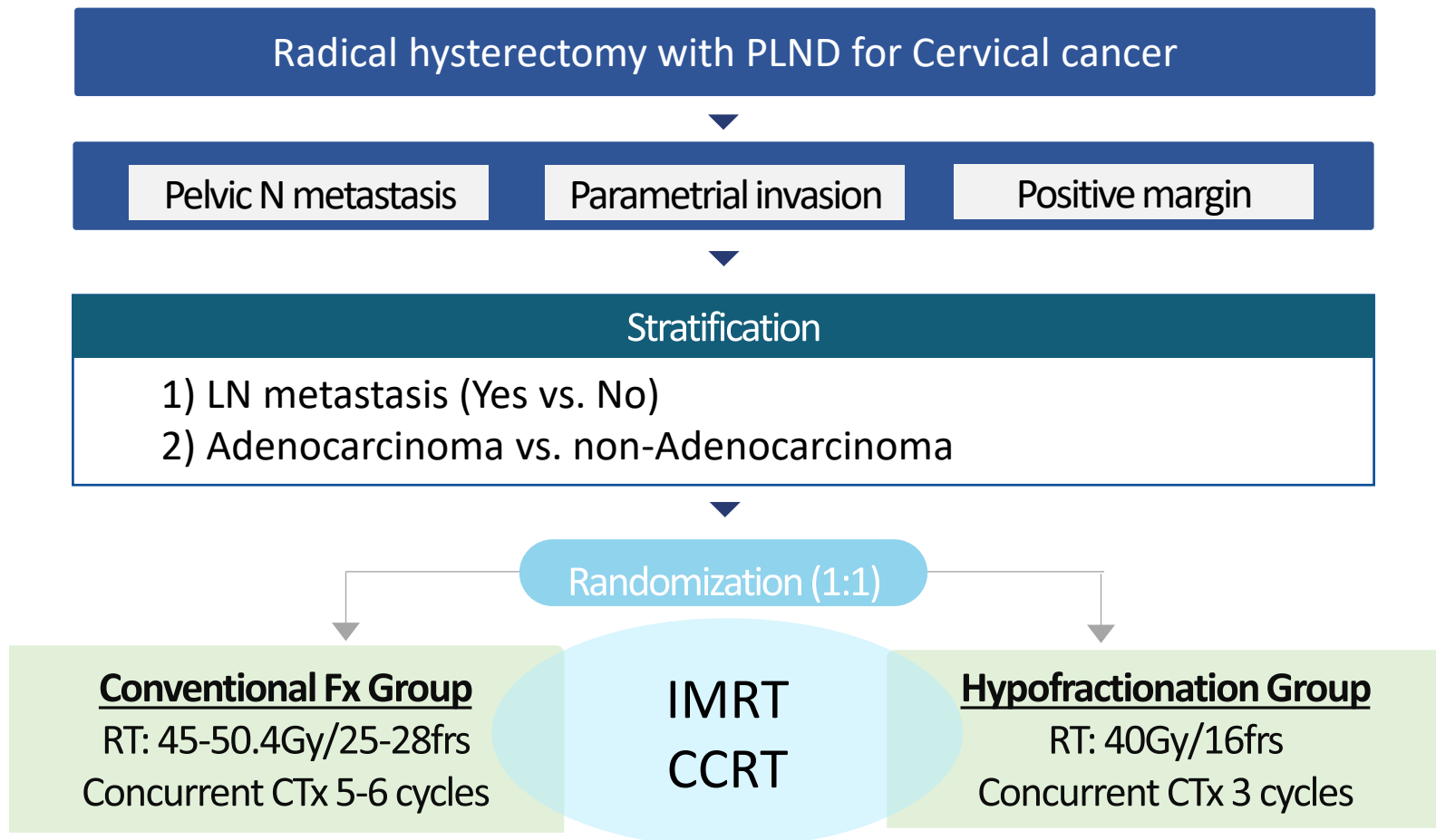
POHIM study – summary

- Acute toxicities of POHIM-RT/CCRT study (\geq Gr3 toxicities **1.9-2.4%**)
→ At least not higher than conventional fractionation
- Late toxicities of POHIM-RT/CCRT study
→ long term follow-up needed
- Survival outcomes ; comparable to conventional treatment
→ longer follow-up needed

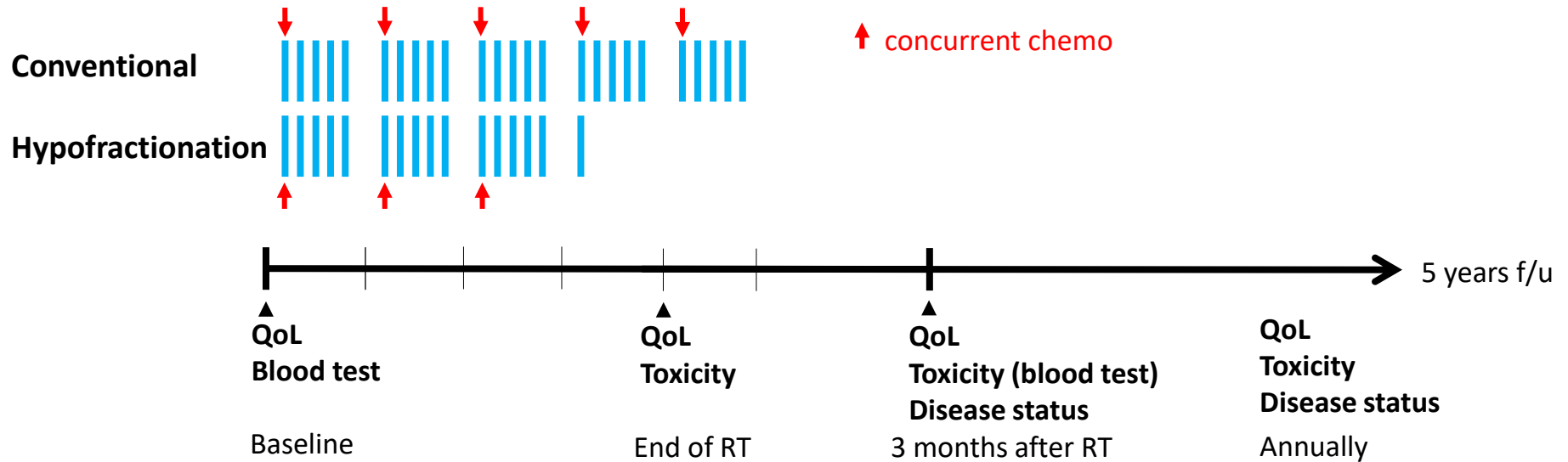


POHIM-P3 study

- Phase III, randomized trial
- Primary endpoint: 3-year disease free survival
- Target numbers: 284 patients, Enrollment period: 3 years, Follow-up: 5 years



POHIM_P3 trial – Assessment



	Toxicities	QoL	Disease status	Blood test
Method	CTCAE ver. 5	EORTC QLQ-C30, QLQ CX24	OPD F/U with P/E, AP/Chest CT	CBC, liver/kidney function test, tumor markers
Period	End of RT, postRT 3 m, annually	End of RT, postRT 3m, annually	postRT 3m, annually	Baseline, postRT 3m

RT in Endometrial cancer

- After radical hysterectomy, postoperative RT reduces recurrence risk in high risk stage I/stage II endometrial cancer.
- In stage III, chemotherapy +/- EBRT is recommended.



National
Comprehensive
Cancer
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NCCN Guidelines Version 1.2022 Endometrial Carcinoma

[NCCN Guidelines Index](#)
[Table of Contents](#)
[Discussion](#)

All staging in guideline is based on updated FIGO staging. ([See ST-1](#))

CLINICAL FINDINGS
(Endometrioid Histology)^a

ADJUVANT TREATMENT^{g,h}

Surgically staged^e:
Stage III, IV^f



Systemic therapy
± EBRT
± vaginal brachytherapy^s

Sequential CT-RT (CTx followed by RT, Sandwich regimen, RT followed by CTx)
CCRT (CCRT, CCRT followed by CTx, Sandwich CCRT regimen..)



HypoFx in endometrial ca.

JAMA Oncology | Original Investigation

Quality-of-Life Outcomes and Toxic Effects Among Patients With Cancers of the Uterus Treated With Stereotactic Pelvic Adjuvant Radiation Therapy The SPARTACUS Phase 1/2 Nonrandomized Controlled Trial

Eric Leung, MD, MSc; Adam P. Gladwish, MD, MSc; Melanie Davidson, PhD; Amandeep Taggar, MD, MSc; Vikram Velker, MD; Elizabeth Barnes, MD; Lucas Mendez, MD, MSc; Elysia Donovan, MD; Lilian T. Gien, MD, MSc; Allan Covens, MD; Danielle Vicus, MD, MSc; Rachel Kupets, MD, MSc; Helen MacKay, MD; Kathy Han, MD, MSc; Patrick Cheung, MD; Liying Zhang, PhD; Andrew Loblaw, MD, MSc; David P. D'Souza, MD

Phase 1/2 Non-randomized Trial, 2019-2021

60 patients, stage I-III pelvic RT after hysterectomy

Whole pelvis 30Gy/5frs (EOD or once weekly)

Primary endpoint: acute toxicities, QOL

Preliminary results 1 patient experienced gr3 GI toxicity

JAMA Oncology 2022

Purpose of POHIM-EM study

- **Study:** Adjuvant hypofractionated intensity-modulated radiotherapy in stage III endometrial cancer: phase II single arm study (POHIM_EM)
- **Design:** Multicenter, prospective, phase II non-inferiority study
- **Primary endpoint**
 - Disease-free survival
- **RT regimen:** EBRT to whole pelvis 40Gy/16frs +/- chemotherapy



Eligibility

• Inclusion criteria

- Pathologically diagnosed stage III endometrial cancer
- After hysterectomy
- Age: 20~80 years old
- ECOG 0-2

• Exclusion criteria

- Non-endometrioid ca
- Stage IV
- Uncontrolled other cancers except for thyroid cancer, skin cancers

: 92

(Alpha 0.05 beta 0.2, Power 0.8, DFS margin 10%, drop rate 0.05)

Study period: 2022-2025



Ongoing studies in adjuvant RT

Trial number	Cancer	Study design	RT regimen	Period	Target No.	Primary endpoint
NCT04890912 (SPARTACUS II)	Stage I-III EM ca	Randomized	45 Gy/25 frs 30 Gy/5 frs (EOD)	2021-2023	N=50	EPIC bowel scores
NCT05857631 (PARCER II)	Cervix/EM	TaTa Hospital Phase II Single arm	39 Gy / 13 frs	2023-2026	N=90	Late toxicity
NCT04683653	Stage I-III EM ca. RT alone	University of Chicago Phase II	42.56 Gy/16 frs	2022-2025	N=40	safe and tolerable dose
NCT05691010	FIGO III EM ca	MSKCC	IMRT After #3-4 of carbo-paclitaxel WPRT 25 Gy/5frs	2023-2025	N=28	Safety
NCT0587613 (POHIM-EM study)	FIGO III EM ca	Phase II	40 Gy/16 frs	2022-2025	N=90	DFS

First Author and Year of Publication	Study Design	Number of Patients	Gynecological Cancer	RT Dose	Number of Fractions	Dose Per Fraction	Outcome	Follow-Up
Faul et al., 2000 [14]	Observational prospective	2	Ovarian	7	1	7	100% complete response (bleeding control) at 1 month	n/a
Macchia et al., 2016 [15]	Observational prospective	9	Cervical and uterine	30	3	10	89% CR; 11% marked improvement (bleeding control)	20 months
Georgina L. Jones et al., 2006 [16]	Observational prospective	16	Ovarian	n/a	n/a	Single fraction of 7 Gy or 2 fractions of 3 Gy b.d.	Effective palliation, pain relief, and symptom relief	3 months
F L Ampil et al., 2006 [17]	Retrospective observational	79	Cervical	n/a	n/a	n/a	Tumor control	11 months
Benoîte Méry et al., 2016 [10]	Retrospective observational	19	Uterine, cervical, vulvar, and vaginal	Median of 45 Gy (range: 6–76 Gy)	Median of 18 (range: 1–36 fractions)	Median of 3 Gy (range: 1.5–6 Gy)	Tumor control	4.5 months
A Tinger et al., 2001 [18]	Retrospective observational	80	Ovarian	n/a	n/a	n/a	Partial response	60 months
Sri Harsha Kombathula et al., 2022 [19]	Retrospective observational	184	Cervical, vaginal, uterine, and ovarian	Median of 35 Gy (range: 10–50 Gy)	Median of 15 (range: 1–20)	Median of 2.33 Gy (range: 2.33–10)	Symptom relief	36 months
Boulware et al., 1979 [20]	Retrospective observational	86	Cervical, vaginal, uterine, and ovarian	10 Gy	1	10 Gy	Bleeding control and pain relief	6 months
Boulware et al., 1979 [20]	Retrospective observational	55	Cervical, vaginal, uterine, and ovarian	10 Gy at 3–4-week interval	1	10 Gy	Bleeding control and pain relief	6 months
Boulware et al., 1979 [20]	Retrospective observational	20	Cervical, vaginal, uterine, and ovarian	10 Gy at 3–4-week interval	1	10 Gy	Bleeding control and pain relief	6 months
Hodson et al., 1983 [21]	Retrospective observational	27	Cervical, vaginal, uterine, and ovarian	10 Gy at 3–4-week interval	1	10 Gy	Bleeding control, pain relief, and improved vaginal discharge	7 months
Halle et al., 1986 [22]	Retrospective observational	42	Cervical and uterine	10 Gy at 3–4-week interval	1	10 Gy	Bleeding control, pain relief, and improved vaginal discharge	10 months

First Author and Year of Publication	Study Design	Number of Patients	Gynecological Cancer	RT Dose	Number of Fractions	Dose Per Fraction	Outcome	Follow-Up
Onsrud et al., 2001 [23]	Retrospective observational	64	Cervical and uterine	10 Gy	1	10 Gy	Bleeding control and improved vaginal discharge	12 months
Mishra et al., 2005 [24]	Retrospective observational	100	Cervical	10 Gy at 4 weeks; brachytherapy 30 Gy at point A	1–3	10 Gy	Bleeding control, pain relief, and improved vaginal discharge	9 months
Patricio et al., 1987 [25]	Retrospective observational	56	Cervical	13 Gy	2	6.5 Gy	Bleeding control and pain relief	n/a
Spanos et al., 1996 [26]	Subgroup analysis of a prospective trial	61	Cervical	14.8 Gy	4	3.7 Gy b.d.	Bleeding control and pain relief	12 months
Grigsby et al., 2002 [27]	Retrospective observational	15	Cervical	10 Gy	2	5 Gy	Bleeding control	n/a
Choan E. et al., 2006 [28]	Retrospective observational	53	Ovarian	Median of 30 Gy (range: 5–52.5 Gy)	Median of 10 Gy (range: 1–20)	Median of 3 Gy (range: 2.62–5 Gy)	Bleeding control and pain relief	n/a
M D Adelson et al., 1987 [29]	Retrospective observational	42	Ovarian	10–30 Gy	1 to 3	10 Gy	Bleeding control and pain relief	n/a
Corn et al., 2001 [30]	Retrospective observational	33	Ovarian	35 Gy (range: 7.5–45 Gy)	n/a	Median of 2.5 Gy (range: 1–5 Gy)	Symptom relief, bleeding control, pain relief	n/a

Palliative hypofractionated RT

- Ulleval Univ, Norway
- Palliative hypofractionated RT to GY cancer, n=46
- 10Gy x 1 fraction (n=10), 2 fractions (n=34), 3 fractions (n=2)
- Symptom was relieved in 61%, 78%, 67% in 1 fx, 2 fxs, and 3 fxs group.
- Late GI toxicity (Gr3-4) occurred in 6% after 9-10 months.
- 10Gy x 1-3 fractions were effective, but GI toxicities should be taken into account → In IMRT era, we might reduce the toxicities.

Palliative hypofractionated RT

- Palliative hypofractionated RT to GY cancer, n=51
- 0-7-21 regimen from MGH, 6-8Gy x 3frs, 2D, 3D-RT



Table 4

Acute and late radiation-induced toxicities

	Acute side-effects (n = 33)	Late side-effects (n = 12)
None	14	6
Gastrointestinal		
Grade 1/2	10	1
Grade 3/4	—	—
Grade 5	1	1
Genitourinary		
Grade 1/2	1	2
Grade 3/4	—	—
Grade 5	—	—
Skin		
Grade 1/2	7	—
Grade 3/4	—	—
Grade 5	—	—
Bone		
Grade 1/2	—	1
Grade 3/4	—	1
Grade 5	—	—

Table 3

Symptom control

	Bleeding (n = 26)	Pain (n = 25)
Symptom relief		
Complete response	16 (61.5%)	5 (20%)
Partial response	8 (30.8%)	14 (56%)
No change	2 (7.7%)	3 (12%)
Deteriorating symptoms	0 (0%)	3 (12%)

92%

76%

1 (acute) and 2 (late) \geq Gr3 toxicities

Palliative hypofractionated RT

- Hypofractionated radiation leads to rapid bleeding cessation .
- N=43 (26 CFRT, 17 HFRT)

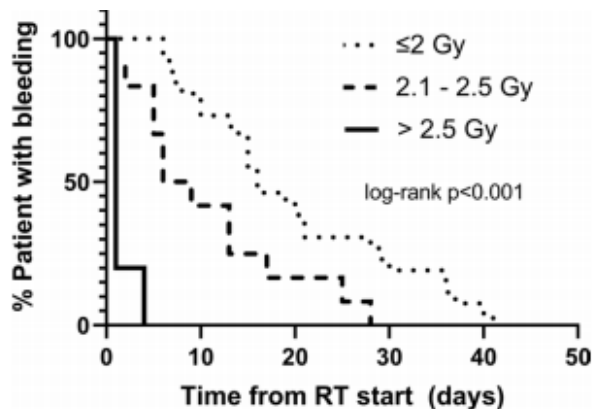


Fig. 3 The effect of radiation dose per fraction on time to bleeding cessation. Time to bleeding cessation is presented for patients

Table 3 Univariable and multivariable cox proportional hazards analysis of the association of listed dichotomized variables with time to bleeding cessation

Variable	Univariable analysis			Multivariable analysis		
	HR	95% CI	P value	HR	95% CI	P value
CFRT	3.23	1.65–6.32	0.001	3.26	1.37–7.80	0.008
Age 50+	2.17	1.11–4.22	0.022	0.74	0.28–1.96	0.543
Concurrent chemo	0.54	0.29–1.02	0.057	0.76	0.31–1.88	0.550
Non-White	0.97	0.53–1.80	0.941			
AC or AP use	0.62	0.22–1.77	0.373			
Non-cervical primary	1.20	0.62–2.33	0.581			
Pre-menopausal	0.70	0.38–1.29	0.259			
Transfusion required	1.14	0.60–2.21	0.680			
Metastatic	1.15	0.60–2.20	0.669			
Recurrence	3.53	1.42–8.82	0.007	1.96	0.51–7.54	0.326
Prior pelvic RT	10.50	1.17–93.9	0.035	2.06	0.16–27.00	0.582
Prior pelvic surgery	1.87	0.93–3.77	0.080	1.76	0.68–4.57	0.243
Prior systemic therapy	6.12	2.30–16.33	<0.001	2.17	0.64–7.28	0.211
Pretreatment Hgb (continuous)	0.96	0.82–1.12	0.597			

Pre-specified criteria for inclusion in a final multivariable model was $p < 0.2$ on univariable analysis

ABSTRACT ONLY · Volume 176, Supplement 1, S35, September 2023

A phase I study of tremelimumab, durvalumab, and hypofractionated radiotherapy for metastatic gynecologic cancers (040)

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- Phase I study (UTSW and MDACC)
- 18 pts with Cervical vaginal vulvar ca.
- Durvalumab + tremelimumab #4 (every 4 weeks) + Durvalumab #4
- SBRT 8Gy x 3 frs day 3-7
- Endpoint: Safety
- PD-L1-high (N=12): CR 2 PR 1 SD 3 PD 6
- PD-L1 low (N=6): SD 4 PD 2

Summary

- Based on retrospective data and preliminary results of several prospective studies, hypofractionation (2-3Gy/fractions) with or without concurrent chemotherapy might be safe, particularly in IMRT setting, and effectiveness needs to be evaluated in further studies.
- In palliative RT, hypofractionation is preferred option, particularly for vaginal bleeding.



A photograph of the Samsung Medical Center building at dusk. The building is a large, modern structure with a glass facade, illuminated from within. The sky is a deep blue, and the surrounding area is dark with some trees visible in the foreground. The text "Thank You For your attention" is overlaid on the image in a light blue and white font.

Thank You
For your attention

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