RESEARCH PAPER

Prevalence of Low Back Pain and Urinary Incontinence in Gynecological Cancer Patients Undergoing Radiotherapy, Chemotherapy

Sakshi Prakash Yadav[1*], Dhairysheel Patil[2], Dr. Trupti Yadav[3]

[1*]Final year student, Krishna college of physiotherapy karad , Krishna Vishwa Vidyapeeth, karad
[2]Assistant professor, Department of oncology Physiotherpy, Krishna College of Physiotherapy, Krishna Vishwa Vidyapeeth, karad
[3]Associate professor Department of oncology Physiotherpy, Krishna College of Physiotherapy, Krishna Vishwa Vidyapeeth, karad

Corresponding Author

Sakshi Prakash Yadav

Background: Gynecological malignances- including cervical, ovarian, and endometrial cancers, often require radiotherapy and chemotherapy as primary treatment modalities. Although these treatments are effective in targeting cancerous cells, they can also give rise to musculoskeletal and urological issues. Low back pain (LBP) and urinary incontinence (UI) are among the most commonly reported complications, often neglected despite their significant impact on patients' overall life satisfaction and independent functioning.
Aim: To assess the prevalence of low back pain and urinary incontinence among patients undergoing radiotherapy, chemotherapy for gynecological cancers.
Methods: This observational study included 116 female patients diagnosed with various gynecological malignancies in Karad, between December 2024 and June 2025. Inclusion criteria were adults aged (>18 years) undergoing chemotherapy, radiotherapy, and able to provide informed consent.. Individuals with a prior history of low back pain (LBP), urinary incontinence (UI), or psychiatric illness were excluded. The intensity of pain was evaluated using the Numerical Pain Rating Scale (NPRS), while evaluation of urinary incontinence was assessed with the help of UDI-6 questionnaire.
Results: Among 116 gynecological cancer patients, cervical cancer (41.4%) was the most common, followed by ovarian (34.5%) and endometrial cancers (12.9%), with the highest prevalence observed in the 40–59 age group. The majority (69%) underwent combined chemoradiotherapy. Urinary incontinence was reported by 61.1% of patients with moderate to very severe symptoms (mean UDI-6 score 7.44). Low back pain was prevalent, with mean NPRS scores of 2.9 at rest and 4.34 during activity, showing a significant association between rest and activity pain levels ($p < 0.0001$).
Conclusion: Low back pain and urinary incontinence are highly prevalent among gynecological cancer patients undergoing treatment. This finding underscoring the need for integrating physiotherapy, pelvic floor rehabilitation, and pain management into routine oncological care to improve quality of life.

Keywords: Chemotherapy, Gynecological cancer, Low back pain, Radiotherapy, Urinary incontinence

How to cite this article: Yadav SP, Patil D, Yadav T. Prevalence of Low Back Pain and Urinary Incontinence in Gynecological Cancer Patients Undergoing Radiotherapy, Chemotherapy. Int J Drug Deliv Technol. 2026;16(13s): 909-915. DOI: 10.25258/ijddt.16.13s.102

INTRODUCTION

Cancer is a disease in which normal cells lose control over their growth, begin to multiply abnormally, and may spread to nearby or distant tissues. This breakdown in normal cell regulation occurs due to progressive genetic alterations that disturb essential processes such as cell division, DNA repair, and programmed cell death (1). Among the cancers that affect women**, gynecological cancers—**which include cervical, ovarian, endometrial, vaginal, and vulvar cancers—remain a major global health concern (2). Cervical and ovarian cancers are especially common. Despite advancements in screening programs and the introduction of HPV vaccination, cervical cancer still contributes significantly to illness and death, particularly in low- and middle-income countries (3). Meanwhile, endometrial cancer is increasingly diagnosed in high-income nations, largely due to shifting lifestyle, metabolic, and hormonal factors (4).

Management of gynecological cancers usually involves a multimodal approach, in which **chemotherapy** and **radiotherapy** play central roles. Chemotherapy uses powerful drugs to destroy cancer cells by interrupting

Author for Correspondence:* **: Sakshi Prakash Yadav

vital cellular mechanisms such as DNA replication and cell division (5). These drugs induce cell death by processes like DNA damage, inhibition of enzymes such as topoisomerases, or disruption of microtubules required for mitosis (6). However, because chemotherapy drugs circulate throughout the body, they also affect healthy cells that naturally divide quickly. This leads to common side effects such as low blood counts, fatigue, digestive problems, hair loss, and nerve damage (7). These physiological disturbances can significantly influence the patient's daily functioning and overall well-being.

Radiotherapy, on the other hand, uses ionizing radiation to target and destroy cancer cells by causing DNA breaks and generating free radicals that impair replication (8). While modern techniques aim to deliver radiation as precisely as possible, it is not always possible to avoid exposure of nearby healthy tissues. Radiation can trigger inflammation, fibrosis, and vascular injury, altering the normal repair capacity of affected organs (9). In gynecological cancers, pelvic radiotherapy often impacts the bladder, rectum, pelvic floor muscles, and reproductive structures. This may lead to long-term issues such as urinary problems, bowel disturbances, sexual dysfunction, and persistent pelvic pain (10).

Although these treatments have greatly improved survival outcomes for women with gynecological cancers, their effects on the body are extensive and may continue long after therapy ends. Many survivors report ongoing symptoms such as fatigue, musculoskeletal discomfort, neuropathy, and genitourinary complications that affect quality of life and functional health (11). Understanding how chemotherapy and radiotherapy work—and how they influence normal physiological functions—is essential for enhancing patient care, developing rehabilitation strategies, and improving long-term recovery.

Overall, gynecological cancers represent a significant health burden worldwide. While advancements in chemoradiation have contributed to better prognosis, managing the physiological side effects of treatment remains an important area of research and clinical practice.

Material :

This was an observational study which included 116 participants and was conducted in Karad, Maharashtra, between December 2024 and June 2025. The study was approved by the Protocol Committee and Ethical Committee. Women aged 18 years and above who were able to communicate verbally, understand the study procedures, and provide written informed consent were included. Participants with a history of low back pain or urinary incontinence prior to their cancer diagnosis, or those with significant psychiatric illness, were excluded. Low back pain was assessed using the Numeric Pain Rating Scale (NPRS) at rest and during activity, while urinary symptoms were evaluated using the Urogenital Distress Inventory-6 (UDI-6) questionnaire

Statistical Analysis:

All variables were presented as percentages, means with standard deviations, and medians. Statistical significance was assessed using the Chi-square test. A p- value<0.05 was considered significant.

Ethical consideration:

The approval for this study is obtained from the institutional ethical committee of Krishna Vishwa Vidyapeeth deemed (to be university), Karad. Respondents were given detailed explanation about data collection sheet as well the study which is to be conducted and written informed consent was secured from each participant participating in this study . There was a volunteer involvement of all the respondents in this study whose confidentiality was thoroughly maintained.

Result :

This observational research focused on determining the prevalence of low back pain and urinary incontinence among gynecological cancer patients undergoing radiotherapy, chemotherapy. Results were concluded from responses to a UDI -6 Quesionnaire and NPRS scale at rest and on activity. This observational study involved the use of the UDI-6 questionnaire, consisting of six items, along with the NPRS scale to assess pain at rest and during activity.

Table 1 Type Of Cancer And Age Group

type of cancer / age group	21-39	40 - 59	60 +	Total
Ca cervix	02	25	21	48
Ca ovary	04	23	13	40
Ca endometrial	02	06	07	15
Ca vault	0	04	0	04
Ca vagina	0	01	03	04
Ca cervix vagina	0	02	01	03
Ca endometrial stroma	0	01	0	01
Ca endometrium	0	01	0	01
	8	63	45	116

Cervical cancer was the most common diagnosis (41.4%), followed by ovarian cancer (34.5%) and endometrial cancer (12.9%). Less frequent diagnoses included vault and vaginal cancers (3.4%), combined cervix–vagina tumors (2.6%), and endometrial stromal sarcoma (0.9%).

The highest prevalence of cancer was in the 40–59 years age group, where both cervical and ovarian cancers were dominant.In patients above 60 years, cervical cancer continued to remain the leading type, followed by endometrial cancer. As shown in shown in Table 1 and Figure 1 .

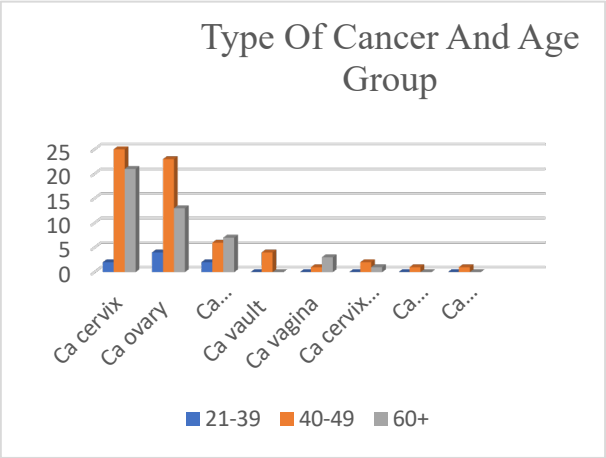

Figure 1 Type Of Cancer And Age Group

Table 2 Mode Of Treatment

Mode of treatment	No of patients	Percentage
Chemotherapy	10	8.6%
Radiotherapy	26	22.4%
Both	80	69%
Total	116	100%

In terms of treatment modalities, most patients (69%) underwent combined chemotherapy and radiotherapy, while 22% received radiation alone and only 9% were treated with chemotherapy alone, indicating that multimodal therapy is the preferred approach as shown in Table 2 and Figure 2

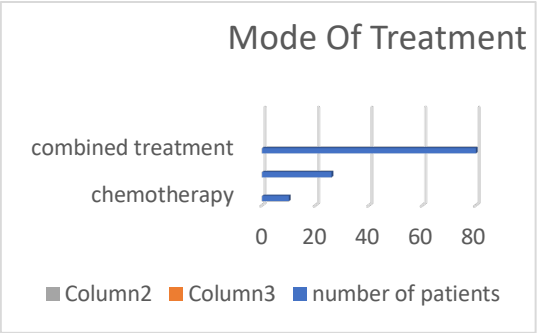

Figure 2 Mode Of Treatment

Table 3 Distribution Of Study Population According To Age Group And Mode Of Treatment

Age/ treatment	Chemotherapy	Radiation	Both	Total
21-39	0	3	5	8
40-59	6	11	46	63
60+	4	12	29	45
Total	10	26	80	116

Younger patients (21–39 years) were more likely to receive combined treatment. Middle-aged (40–59) and older (>60) groups predominantly received both treatments as well, though radiotherapy alone was also common in these age groups, as shown in Table 3and Figure 3

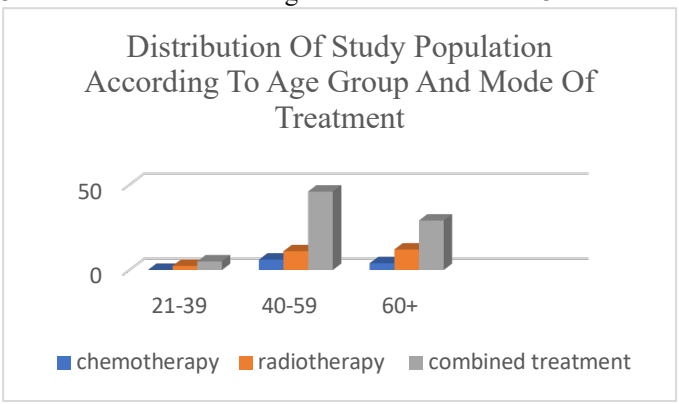

Figure 3 Age group and treatment

Table 4 UDI -6 Score

UDI-6	NO URINARY DISTRESS (SCORE 0)	MILD URINARY DISTRESS (SCORE 1-5)	MODERATE URINARY DISTRESS(SCORE 6-10)	SEVERE URINARY DISTRESS (SCORE 11-15)	VERY SEVERE URINARY DISTRESS(16-18)
NUMBER OF PATIENTS (n)	24	21	43	23	5

%	20.6 %	18.1 %	37.0%	19.8 %	4.3%

Urinary incontinence was evaluated using the UDI-6 scale. The distribution was as follows: 20.6% of patients symptoms (score 6–10), 19.8% experienced severe distress (score 11–15), and 4.3% had very severe distress (score 16–18. Thus, a significant portion of the population (61.1%) reported moderate to very severe urinary distress as presented in Table 4 and Figure 4.

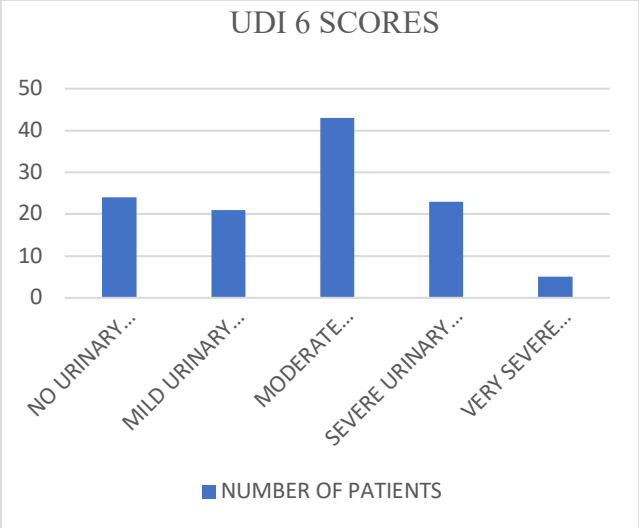

Figure 4 UDI -6 SCORE

Table 5 NPRS at rest

Pain Level	NPRS Score Range	Number Of Patients (N)	%
No Pain	0	36	31.0%
Mild Pain	1-3	29	25%
Moderate Pain	4-6	44	37.9%
Severe Pain	7-10	7	6.0%
Total		116	100%

Evaluation of low back pain was done using NPRS at rest and on activity . At rest, 31% of patients reported no pain, 25% reported mild pain, 37.9% experienced moderate pain, and 6% had severe pain. The mean NPRS score at rest was 2.90, with a median of 3.0 and mode of 0 as presented in Table 5 and Figure 5

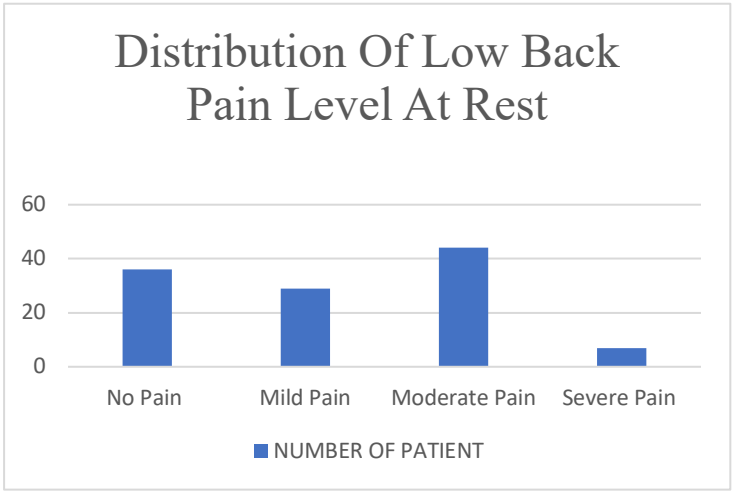

Figure 5 Distribution Of Low Back Pain Level At Rest

Table 6NPRS ON ACTIVITY

Pain Level	NPRS Score Range	Numbers Of Patients(N)	%
No Pain	0	35	30.1%
Mild Pain	1-3	7	6.0%
Moderate Pain	4-6	40	34.4%
Severe Pain	7-10	34	29.3%
Total Number		116	100%

During physical activity, the incidence of LBP intensified: 30.1% of patients reported no pain, while mild,
moderate, and severe pain were reported by 6.0%, 34.4%, and 29.3% of patients respectively. The mean NPRS score during activity was 4.34, with a median of 5.0 and mode of 0 as shown in Table 6 and Figure6 below shows the distribution of low back pain levels experienced on activity.

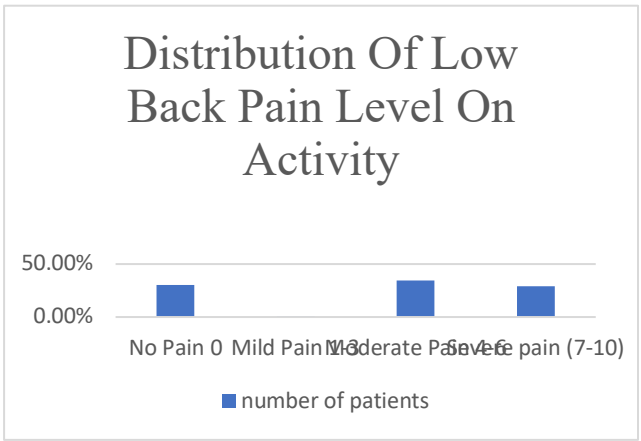

Figure6 Distribution of lowback pain levels experienced on activity

Association Between NPRS Scores at Rest and During Activity

The relationship between pain scores reported at rest and during activity was analyzed using the Chi-square test for independence. A significant association was observed, $p < 0.0001$, indicating that pain levels at rest were closely linked to pain experienced during activity.

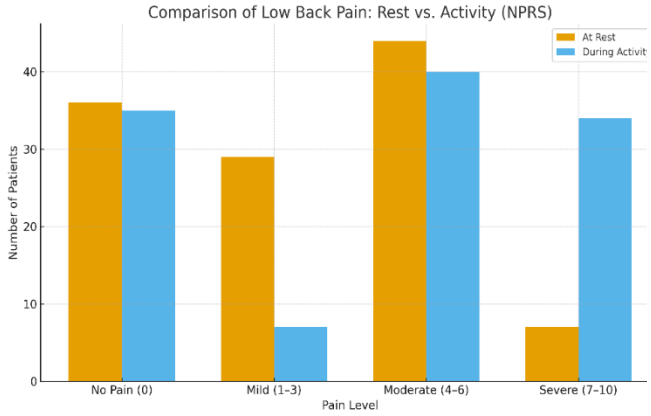

Figure 7comparison of low back pain : rest vs.activity (NPRS)

This thorough data analysis provides important prespectives on the high prevalence of LBP and UI in gynecological cancer patients undergoing therapy. The results highlight the importance of holistic treatment approaches including physiotherapy, pelvic floor rehabilitation, and pain management interventions as part of the standard care protocols for oncology patients. Future studies may aim to explore longitudinal trends and the effect of such interventions on improving quality of life.

Discussion

This study investigated the prevalence of urinary incontinence (UI) and low back pain (LBP) among gynecological cancer patients undergoing chemotherapy, radiotherapy, and combined chemoradiotherapy. The findings indicate that both symptoms are highly prevalent, emphasizing the complex interaction between cancer pathophysiology, treatment-related tissue damage, and changes in musculoskeletal and pelvic floor function. These results highlight the importance of early screening and rehabilitation in improving survivorship outcomes.

The distribution of cancer types in this study—predominantly cervical, ovarian, and endometrial cancers—reflects international patterns, particularly in regions where cervical cancer remains a leading gynecologic malignancy (2,3). Cervical and other pelvic cancers often require pelvic radiotherapy with or without concurrent chemotherapy, exposing pelvic organs and soft tissues to radiation fields that significantly increase long-term morbidity. Endometrial cancer, the third most common in this cohort, also frequently requires multimodal therapy depending on stage and histological risk (4).

The high proportion of patients with moderate to very severe urinary distress. Such symptoms are consistent with known mechanisms of radiation-induced pelvic injury. Pelvic radiotherapy can lead to urothelial damage, vascular changes, and progressive fibrosis, reducing bladder compliance and contributing to urgency, frequency, and incontinence (8,9). Radiation also affects the pelvic floor musculature and connective tissues, impairing urethral support and sphincter control. Additionally, autonomic nerve injury from radiation fields can alter bladder sensation and detrusor function, further increasing UI risk (9,10).

Chemotherapy may exacerbate these problems. Many chemotherapeutic agents used in gynecologic cancers—including platinum-based regimens—cause peripheral neuropathy, impairing sensory pathways involved in bladder control (6,7). Systemic effects such as fatigue, nausea, dehydration, and electrolyte imbalance may further worsen urinary symptoms. The combination of radiotherapy-induced structural changes and chemotherapy-induced neuromuscular impairment likely explains the high UI scores in this study. These mechanisms align with toxicity patterns reported in pelvic cancer survivors, who frequently demonstrate bladder dysfunction months or years after treatment (10,11).

This study also found a significant prevalence of LBP, with pain scores higher during activity than at rest. These findings are consistent with the multifactorial nature of LBP in gynecologic cancer patients. Radiotherapy contributes to musculoskeletal dysfunction by inducing fibrosis in pelvic soft tissues, weakening load-bearing structures, and altering biomechanics of the lumbar–pelvic region (8,9). Radiation-associated bone loss, particularly pelvic insufficiency fractures, is a documented late complication that can manifest as persistent LBP (9,10). Damage to sacral nerve roots or lumbosacral plexus structures may also contribute to neuropathic components of pain.

Chemotherapy further influences LBP through systemic mechanisms. Sarcopenia is a common consequence of systemic cancer therapy, driven by muscle catabolism,

decreased physical activity, and reduced nutritional intake (5,7). Loss of core and paraspinal muscle strength compromises spinal stability and increases mechanical loading during daily activities, explaining why pain intensifies with movement. Chemotherapy-induced neuropathy also disrupts proprioception and gait stability, potentially increasing strain on the lower back (6,7). This interaction between treatment modalities and musculoskeletal impairment aligns with reports describing chronic pain and functional limitations in cancer survivors (11).

Age distribution also plays a role in symptom severity. Many participants in our study belonged to the 40–59 age group, a demographic more likely to have baseline pelvic floor weakening, degenerative spinal changes, or obesity—factors that heighten vulnerability to UI and LBP when exposed to cancer therapy. Global data demonstrate that non-modifiable factors such as age interact with treatment toxicity to amplify functional impairment in gynecologic cancers (2,11).

The combined burden of UI and LBP significantly affects quality of life. UI contributes to reduced mobility, embarrassment, sexual dysfunction, and social withdrawal, while persistent LBP limits daily activities and increases psychological distress (10,11). Together, these symptoms may hinder adherence to follow-up care, rehabilitation efforts, and long-term health maintenance. Survivorship literature consistently emphasizes the need for proactive management of treatment side effects to reduce chronic morbidity and improve functional outcomes (11).

Clinically, the findings support routine screening for pelvic floor dysfunction and LBP throughout the cancer care continuum. Validated tools such as the UDI-6 for urinary symptoms and the NPRS for pain are useful for early identification. Pelvic floor muscle training, bladder retraining techniques, and core stabilization exercises have shown promise in reducing symptom severity in pelvic cancer survivors. Early physiotherapy can mitigate the musculoskeletal deconditioning caused by chemotherapy (5) and counteract radiation-related biomechanical changes (8,9). Patients with severe or persistent UI may require urological assessment, while those with refractory LBP may benefit from pain management strategies including neuropathic agents and manual therapy (10,11).

This study also highlights important directions for future research. The absence of pre-treatment baseline measures limits the ability to isolate treatment effects. Prospective studies with baseline pelvic floor and musculoskeletal assessments are recommended. Additionally, integrating objective measures such as pelvic floor ultrasound, bone density testing, gait analysis, and electromyography would deepen the understanding of treatment-related dysfunction. Given that cancer survivors often live many years beyond primary treatment, it is essential to evaluate the long-term benefits of early rehabilitation and survivorship-focused programs (11).

CONCLUSION

This study investigates the clinical burden of low back pain (LBP) and urinary incontinence (UI) in gynecological cancer patients undergoing radiotherapy, chemotherapy. The finding from the study reveals that cervical cancer as the most widespread, primarily affecting women aged 40–59 years.Urinary incontinence was common, with over 60% of patients reporting moderate to very severe symptoms, especially following combined treatments.Low back pain appeared prominently evident during physical activity, indicating treatment-related musculoskeletal impact.These findings emphasize on essential role of interdisciplinary care, including physiotherapy, to address functional impairments in cancer survivors.

LIMITATIONS-

The study was conducted at a single center with a small, region-specific sample, limiting generalizability.

Reliance on patient recall and medical records introduces potential recall and documentation bias.

Confounding variables such as comorbidities, hormonal therapy, and prior surgeries were not controlled.

Outcome measures were limited to UDI-6 and NPRS, excluding broader assessments like quality of life.

FUTURE SCOPE

Conduct intervention studies to examine the influence of physiotherapy, including core strengthening and pelvic floor rehabilitation.

Perform correlation studies to identify contributing factors such as age, BMI, cancer stage, and treatment type for targeted interventions.

Financial support and sponsorship : Nil

a. Hanahan D, Weinberg RA. Hallmarks of cancer: the next generation. *Cell.* 2011;144(5):646–74. https://doi.org/10.1016/j.cell.2011.02.013
b. World Health Organization (WHO). Gynecological cancers: key facts. Geneva: WHO; 2023. https://www.who.int/news-room/fact-sheets/detail/cervical-cancer
c. Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J, et al. Estimates of global cervical cancer incidence and mortality: a worldwide analysis. *Lancet Glob Health.* 2020;8(2):e191–203. https://doi.org/10.1016/S2214-109X(19)30482-6
d. Morice P, Leary A, Creutzberg C, Abu-Rustum N, Darai E. Endometrial cancer. *Lancet.* 2016;387(10023):1094–108. https://doi.org/10.1016/S0140-6736(15)00130-0
e. Chabner BA, Longo DL. *Cancer Chemotherapy and Biotherapy: Principles and Practice.* 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2016. https://books.google.com/books/about/Cancer_Chemotherapy_and_Biotherapy.html?id=QfA0CwAAQBAJ
f. Thorn CF, Oshiro C, Marsh S, Hernandez-Boussard T, McLeod H, Klein TE, et al. Doxorubicin pathways: pharmacodynamics and adverse effects. *Pharmacogenet Genomics.* 2011;21(7):440–6. https://doi.org/10.1097/FPC.0b013e32833ffb56
g. National Cancer Institute (NCI). Chemotherapy side effects. Bethesda, MD: NCI; 2022. https://www.cancer.gov/about-cancer/treatment/side-effects
h. Joiner MC, van der Kogel AJ. *Basic Clinical Radiobiology.* 5th ed. Boca Raton: CRC Press; 2018. https://doi.org/10.1201/9780429441640
i. Bentzen SM. Preventing or reducing late side effects of radiation therapy: radiobiology meets molecular pathology. *Nat Rev Cancer.* 2006;6(9):702–13. https://doi.org/10.1038/nrc1956
j. Kirchheiner K, Nout RA, Czajka A, et al. Health-related quality of life and pelvic radiotherapy toxicity in gynecologic cancers. *Radiother Oncol.* 2020;147:139–46. https://doi.org/10.1016/j.radonc.2020.03.010
k. Wang T, Molassiotis A, Chung BP, Tan JY. Unmet care needs of cancer survivors: a review of the literature. *Support Care Cancer.* 2018;26(3):513–25. https://doi.org/10.1007/s00520-017-3898-9