



Changes in skeletal muscle mass in patients with gynaecological cancer undergoing radiotherapy: a systematic review

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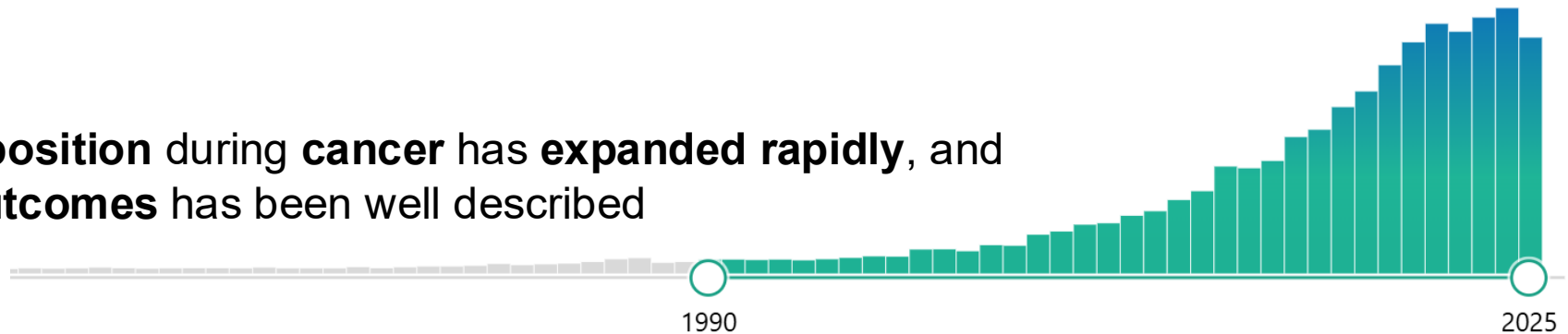
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(On behalf of the authors: Ms. Julieta Adaglio, Prof. Carla M. Prado, Ms. Ana Paula Pagano, Prof. David Currow, A/Prof. Jodie Ellis, and Dr. Mariana S. Sousa)

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Purpose

Research on **body composition** during **cancer** has **expanded rapidly**, and its **impact on clinical outcomes** has been well described

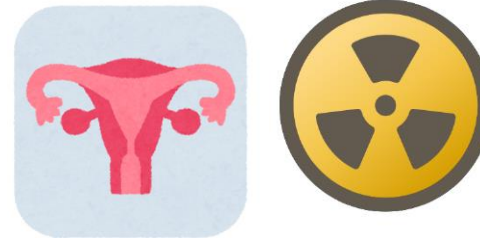


Limited research on **change** of muscle during cancer journey



(Jang et al., Xu et al., Wang et al.)

No review included patients with **Gynaecological Cancer** or focused on **radiotherapy**



Aim

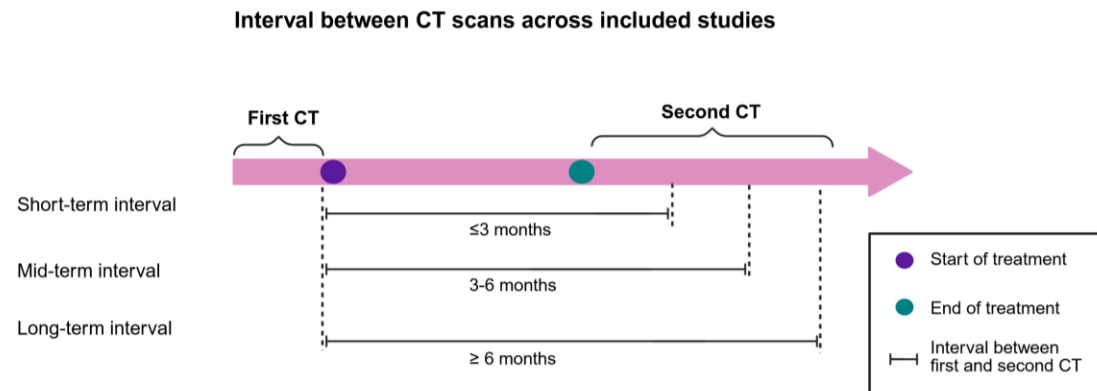
Examine **changes** in **skeletal muscle mass** and **muscle composition** of patients treated with **radiotherapy** for gynaecological cancers and evaluate its **impact** on **clinical outcomes**

Design

Systematic Review (PubMed, Embase (Ovid), and Scopus from inception- 06/2025)

Inclusion: English published studies which objectively measured changes in muscle mass **before** and **after radiotherapy** for gynaecological cancer using **validated body composition** assessment methods (BIA, DXA, CT scans).

- For studies including **interventions** that could influence muscle mass, **only control groups** were analyzed.
- **Overlapping populations** were carefully reviewed, and data were **reported only once** to avoid duplication.



A change was considered significant when it exceeded the **Least Significant Change (LSC) threshold (1.8–2%)**. Otherwise, statistical significance was determined by **$p \leq 0.05$ or confidence intervals** excluding zero.

Results

16 studies out of 2804 were **included** / **Quality**:10 good; 6 fair / **Location**: 13 Asia, 3 Latin America

Characteristics



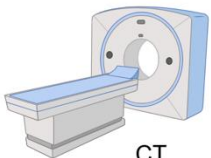
Cervical
75% (n=12)



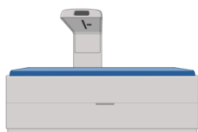
Endometrial
6% (n=1)



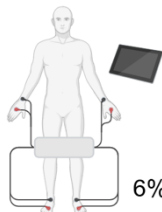
Mixed types
19% (n=3)



CT
81% (n=13)



DXA
13% (n=2)



BIA
6% (n=1)

n° studies that found a significant loss
n° studies that found NO significant loss

		n	1	2	3	4	5	6	7	8
Muscle quantity	Skeletal Muscle									
	Skeletal Muscle Index									
	Fat Free Mass									
	Fat Free Mass Index									
	Paravertebral Muscle Area									
Muscle quality	Skeletal Muscle Radiodensity									
	Phase Angle									

Overall Survival: 8/11

Progression Free Survival: 8/13

Results from CT Scans

	Skeletal Muscle Index	Skeletal Muscle radio-Density
Relative overall mean changes	Short term: -6.1% Mid-term: -0.9% Long-term: -3.4%	Short-term: -9% Mid-term: -2.8% Long-term: -2.1%

Summary of the impact of CT scans variables on survival outcomes:

	SMI on OS HR (95%IC)	SMI on PFS HR (95%IC)	SMD on OS HR (95%IC)	SMD on PFS HR (95%IC)
Short-term	6.16 (1.37, 27.56)	2.83 (1.01, 7.89)	No data	No data
Mid-term	3.49 (1.44, 8.42) to 5.73 (2.90, 11.34)	3.55 (1.19, 10.57) to 6.31 (3.18, 12.53)	1.83 (0.94, 3.56)	1.00 (0.53, 1.87) to 1.69 (0.87, 3.28)
Long-term	1.28 (0.53, 3.11)	1.34 (0.61, 2.97)	11.08 (2.43, 50.58)	6.24 (2.32, 29.23)

Discussion

Considerations



All studies reporting values below the LSC were by the same author and used CT analysis software with limited published precision data



When excluding those values, SMI loss in our review was consistent with findings from studies across various chemotherapy regimens



Difficulties isolating to radiotherapy: treatment approaches varied among the included studies, with only two focusing exclusively on radiotherapy

Future research



More globally representative data and studies are essential



Standardized muscle assessment protocols and consistent reporting are needed (i.e., absolute muscle area (cm²))



Including inter/intra-observer precision and use of validated software, will enhance comparability

Data under review – please do not photograph or distribute.

CONCLUSION

A **rapid** and **sustained** decline in muscle mass was observed, mostly associated with **poorer clinical outcomes**

These findings emphasize the need for **timely** and **continuous** strategies to maintain muscle health throughout radiotherapy and the recovery period

Fundings & Conflict of interest:

- This work received **no funding**
- CMP has previously received honoraria and/or paid consultancy from Abbott Nutrition, Nutricia, Nestlé Health Science, and Novo Nordisk

Thank you!

Questions & Discussion

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