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Physicians' knowledge, practices, and attitudes on bone health management in breast and gynecological cancer patients

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Abstract

Background

Osteoporosis is a systemic disease characterized by low bone mass and structural deterioration, increasing fracture risk. Cancer therapies, including chemotherapy and endocrine treatments (ET), may negatively affect bone health.

Aims

To assess clinicians' knowledge and management practices regarding osteoporosis in patients receiving breast and gynecological cancer treatments at a large oncology institution.

Methods

Between January and April 2025, an anonymous 24-item survey was administered to physicians involved in managing patients with breast and gynecological cancers at the European Institute of Oncology. The survey focused on treatment-induced menopause and hypoestrogenism, including surgical ovarian ablation and pharmacological ovarian suppression. Both naturally postmenopausal women and premenopausal women experiencing treatment-induced menopause were included.

Results

The response rate was 73.5% (86/117). Among respondents, 93% routinely prescribe baseline bone densitometry (DXA) for patients with treatment-induced menopause, whereas only 6% refer patients to a specialist. Although 83.5% assess vitamin D levels and 91.5% prescribe supplementation when indicated, only 20.4% regularly initiate antiresorptive therapy (AT) at the start of ET. Decisions regarding AT or specialist referral are mainly based on DXA results (75%). Moreover, 46% believe AT should be offered to all postmenopausal patients, regardless of ET type.

Discussion

The survey highlights a substantial gap between guideline recommendations and clinical practice, even within a leading oncology center.

Conclusions

Targeted education and training are needed to improve clinicians' knowledge and optimize bone health management in cancer survivorship care.

Introduction

Breast and gynecological cancers represent a significant global health challenge, contributing to cancer-related morbidity and mortality among women [1].

Despite advancements in early detection and treatment that have led to improved survival rates, the long-term consequences of anti-cancer therapies—most notably cancer treatment-induced bone loss (CTIBL)—emerge as critical survivorship issues [2, 3].

The estrogen-deficient states resulting from endocrine therapies, surgical interventions, and chemotherapy accelerate the loss of bone mineral density (BMD), thereby increasing fracture risk and adversely affecting quality of life [4, 5].

Current guidelines emphasize the importance of proactive bone health management, advocating for regular dual-energy X-ray absorptiometry (DXA) monitoring and timely initiation of antiresorptive therapy (AT) when indicated [6–8].

However, substantial disparities persist between recommended practices and actual clinical implementation, highlighting the need for a systematic evaluation of physician knowledge and behavior regarding bone health management in cancer survivors [9].

This study aims to quantify adherence to established bone health guidelines, identify barriers to AT prescription and DXA utilization, and evaluate the role of interdisciplinary collaboration in mitigating the impact of CTIBL.

By examining specialty-specific practice patterns and institutional barriers, we seek to contribute valuable insights to the existing literature.

Unlike previous surveys that have focused primarily on nursing or geriatric populations [10], our research provides detailed data on the practices of medical and gynecological oncologists, identifying critical knowledge gaps that hinder the effective implementation of guidelines.

In addressing these issues, our findings advocate for tailored educational initiatives and integrated care models, aligning with the growing calls for patient-centered survivorship programs [11].

Through an in-depth analysis of practice patterns across various specialties at a major European cancer center, this study seeks to highlight the individual and institutional factors that impact the quality of bone health management in cancer survivors.

Methods

Study Design and Population

This cross-sectional study employed an online survey to evaluate bone health management practices among physicians caring for cancer patients with treatment-induced menopause, either following surgical ovarian ablation or as a consequence of systemic therapies resulting in ovarian function suppression at the European Institute of Oncology (IEO). The survey targeted medical oncologists, gynecological oncologists, and breast/gynecological surgeons actively involved in patient care. Data collection occurred between January and April 2025, with invitations distributed to 117 eligible clinicians via institutional email. Overall, 86 clinicians completed the questionnaire (response rate 73.5%).

Survey Instrument Development

The 24-item questionnaire (Online Resource 1) was developed through iterative revisions by a multidisciplinary panel including medical oncologists, endocrinologists, and gynecologists. The instrument comprised four domains: (1) demographic and professional characteristics (specialty, age range, workplace setting, and geographic area; items 1–4); (2) menopausal status assessment practices (items 5–8); (3) bone health monitoring and prevention strategies (timing of DXA, vitamin D testing and supplementation, and lifestyle counseling; items 9–14); and (4) therapeutic interventions (hormone replacement therapy [HRT] and AT prescribing, awareness of AIFA Note 79, institutional care pathways, timing of AT in relation to adjuvant endocrine therapy, and non-initiation or discontinuation of AT; items 15–24). Items 20–23 were addressed only to specialists managing breast cancer. All items were closed-ended multiple-choice questions with predefined response options (e.g., “How long after the onset of menopause do you prescribe bone densitometry to your patient?”); item 1 also allowed a free-text “Other” response. The survey required approximately 8–12 minutes for completion, balancing comprehensiveness with respondent burden.

Data Collection Procedures

Participants accessed the survey through a secure platform (REDCap) compliant with the EU General Data Protection Regulation (GDPR). Three reminder emails were sent at 2-week intervals to non-responders. To minimize selection bias, the cover letter emphasized the study’s educational value without disclosing specific hypotheses. All responses were anonymized prior to analysis, with no incentives offered for participation. The IEO Institutional Review Board approved the study protocol, waiving written consent given the minimal-risk nature of survey research.

Statistical Analysis

Descriptive statistics were used to characterize the study population and response distributions. As all survey items were categorical, responses were reported as frequencies and percentages. For analysis, respondents’ specialties (item 1, including free-text responses) were grouped into five categories: medical oncologists, breast surgeons, gynecological surgeons, gynecological oncologists, and endocrinologists.

Ethical Considerations

The study adhered to the Declaration of Helsinki principles and Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for survey research. Participant anonymity was preserved by assigning unique identification codes, with no linkage between responses and personal identifiers. Data were stored on password-protected servers with access restricted to the study statistician. Results are reported in aggregate form to prevent potential identification of individual clinicians or practice patterns.

Results

The survey results provide a comprehensive overview of clinicians' knowledge, attitudes, and practices regarding bone health management in menopausal breast and gynecological cancer patients. Key findings are presented across four thematic subsections, highlighting areas where clinical practice diverges from guideline recommendations.

Demographic and medical specialty of involved physicians

The survey achieved a robust response rate of 73.5%, with 86 out of 117 invited physicians completing the questionnaire (Table 1). This high participation rate suggests strong clinician engagement with bone health management issues in cancer survivorship care. The respondent pool represented diverse oncology specialties, reflecting the multidisciplinary nature of bone health management in cancer patients.

Medical oncologists constituted the largest subgroup of respondents, accounting for 45.3% (n = 39), which highlights their crucial role in managing systemic therapies that affect bone metabolism. Surgical specialties collectively made up 37.2% of the participants, with breast surgeons representing 20.9% (n = 18) and gynecological surgeons 16.3% (n = 14). Endocrinologists also contributed to the survey, comprising 4.7% (n = 4) of the respondents, reflecting their involvement in the hormonal aspects of bone health management. Furthermore, gynecological oncologists represented 12.8% (n = 11) of the participants, emphasizing their unique perspective on addressing bone health in patients with gynecologic malignancies.

Age distribution analysis revealed that nearly half of respondents (47.1%, n = 40) fell within the 30–45 year range, representing early-to-mid career clinicians who likely completed recent training incorporating modern bone health guidelines. Physicians aged 46–55 years comprised 22.4% (n = 19), while those over 55 accounted for 18.8% (n = 16). The youngest cohort (under 30 years) represented 11.8% (n = 10) of respondents, suggesting active participation from trainees and junior faculty. This age stratification provides important context for interpreting practice patterns, as guideline awareness and adoption may vary across career stages.

The distribution of specialties and age groups reflects the clinical workforce composition at a European cancer center, with adequate representation from all key disciplines involved in bone health management. The predominance of medical oncologists aligns with their primary responsibility for prescribing endocrine therapies and monitoring long-term treatment effects. The substantial representation from surgical specialties is particularly relevant given that oophorectomy and other gynecologic procedures directly impact hormonal status and bone metabolism.

Table 1
Characteristics of respondents and selected survey responses

Characteristic / item	n (%) or %
Specialty (n = 86)	
Medical oncologist	39 (45.3)
Breast surgeon	18 (20.9)
Gynecological surgeon	14 (16.3)
Gynecological oncologist	11 (12.8)
Endocrinologist	4 (4.7)
Age, years (n = 85)	
< 30	10 (11.8)
30–45	40 (47.1)
46–55	19 (22.4)
> 55	16 (18.8)
Menopausal status and services	
Regularly assesses menopausal status	97.6
Visits > 20 menopausal patients per month	78.0
Dedicated oncological menopause service available	87.2
Bone health assessment and prevention	
Prescribes baseline DXA after treatment-induced menopause	93.0
Refers to a specialist for baseline DXA	5.8
DXA within 6 months of menopause onset	36.3
DXA within 12–24 months of menopause onset	53.7
DXA after 24 months of menopause onset	10.0
Routinely measures serum vitamin D	83.5
Personally supplements vitamin D if deficient	91.5
Routinely provides bone health counseling	80.2
HRT and AT	
Does not prescribe HRT (outside area of expertise)	70.2

Characteristic / item	n (%) or %
Specialty (n = 86)	
Prescribes AT for primary prevention	40.7
Does not prescribe AT (outside area of expertise)	58.1
Aware of AIFA Note 79	89.3
Breast cancer specialists [a]	
PDTA for osteoporosis risk available at own institution	12.0
AT prescribed at start of adjuvant ET (always / most of the time)	2.0 / 20.4
AT or referral decision based on baseline DXA	75.0
AT or referral appropriate in all menopausal women, regardless of ET type	46.0

AT antiresorptive therapy, *DXA* dual-energy X-ray absorptiometry, *ET* endocrine therapy, *HRT* hormone replacement therapy, *PDTA* Diagnostic and Therapeutic Care Pathway

[a]Items 20–23 were addressed only to specialists managing breast cancer

Knowledge, attitudes and practice towards menopausal cancer patients

Most of the respondents (97.6%) declared to regularly check the menopausal state of outpatients with 78% of them visiting more than 20 menopausal (either natural menopause or iatrogenic) patients in a month, followed by 19.5% checking between 5 and 20 patients and only 2.5% checking less than 5 patients per month. Additionally, 59.8% of the respondents reported that more than half of their iatrogenic menopausal patients are such due to cancer treatments, 30.5% reported that less than half are iatrogenic menopausal patients due to cancer treatments, while only 7.3% declared to check cancer treatment related menopausal patients only. For 87.2% of the participants there is a dedicated menopausal cancer clinic within their Institution.

Knowledge, attitudes and practice towards bone densitometry, serum vitamin D levels measurements and supplementation and hormone replacement therapy (HRT)

The respondents were asked whether they usually prescribe or not bone densitometry as baseline evaluation among menopausal patients due to cancer treatments: 93% responded positively, 5.8% suggested specialty referral, with only 1.2% responding negatively. Regarding bone densitometry, 53.7% of participants declared that they usually prescribe it between 12 and 24 months from menopause starting, while 36.3% prescribe it within 6 months and only 10% after 24 months. When asked about ideal prescription timing, 48.1% of respondents indicated “as soon as possible”, 35.4% after at least 12–18

months from menopause starting and 16.5% after 18–25 months. As for serum vitamin D measurements as routine follow up, 83.5% of physicians stated that they regularly prescribed it, with 91.5% of them supplementing it themselves, if required.

Additionally, 80.2% of participants declared to personally provide counseling to patients concerning bone health and osteoporosis prevention, including diet, physical activity and lifestyle. 17.4% declared to provide counseling only when they had available time while 2.4% didn't provide such counseling.

With respect to hormone replacement therapy (HRT) in oncological patients, 40% of physicians deemed it useful for osteoporosis prevention (where appropriate), 28.2% considered it helpful in general population only, 20% didn't express any recommendations as outside of their area of expertise. 11.8% considered it only for premature menopausal patients. When asked about HRT prescription practices, 70.2% of participants do not prescribe it as outside their area of expertise, 13.1% regularly prescribe it, 10.7% is against such practice and 6% is favorable for premature menopausal patients only.

Knowledge, attitudes and practice towards antiresorptive therapy prescription and specialty referrals

With reference to the prescription of AT for the primary prevention of fractures, 58.1% declared not to prescribe it as beyond their area of expertise, while 40.7% prescribed it. 1.2% prescribes it for premature menopausal patients only. In this regard, the survey investigated also the knowledge of the AIFA Note 79, regulating the Italian Health System reimbursement of anti-osteoporotic drugs in primary and secondary prevention. It revealed that 89.3% of physicians are aware of it.

The survey then focused on specialists (oncologists and breast surgeons) dealing with breast cancer. The first area of focus concerned the presence, within their Institution, of a PDTA (Diagnostic and Therapeutic Care Pathway) for the management of osteoporosis risk in patients treated with endocrine therapy (item 20). Only 12% of respondents reported that such a PDTA was available. The remaining respondents reported that no PDTA was available (30%), that no PDTA was available but patients could be referred to a dedicated bone health service within the Institution (30%), or that, in the absence of a PDTA, patients were referred to an outpatient osteoporosis specialist in the territory (28%).

Secondly, the survey focused on the timing of AT prescription in relation to adjuvant endocrine therapy prescription in breast cancer patients. 77.6% of physicians declared that the two prescriptions weren't simultaneous while 20.4% confirmed a simultaneous prescription "in most cases". Only 2% declared to always prescribe both therapies at the same time. Furthermore, when asked about prescription timing or osteoporosis clinic referral, 75% of respondents answered that their decision depended on baseline DXA result, 14.6% evaluate type and duration of endocrine therapy, 6.3% always either prescribe AT or refer patients to osteoporosis clinic at the time of endocrine therapy prescription, 4.2% declared not to ever consider prescription or referral.

Subsequently, the survey investigated which kind of hormonal therapy should be followed by AT prescription or referral to osteoporosis clinic. The largest proportion of respondents (46%) declared prescription and referral are suitable in all menopausal women (natural or iatrogenic) regardless of the type of hormonal therapy. Suitability declined to 7% if endocrine therapy consisted of LHRH agonist plus aromatase inhibitors and to 3% if consisted of LHRH agonist plus Tamoxifen. 2% of physicians considered appropriate prescription and referral in natural menopausal women only. The remaining respondents (42%) did not answer this item.

Lastly, the questionnaire explored the proportion of women who do not start or prematurely discontinue AT because of concerns about side effects or personal preferences (item 24). One third of respondents estimated this proportion at less than 20%, 11% at between 20% and 50%, and 5% at more than 50%, while another 5% reported that no patients declined or discontinued therapy. The remaining respondents (approximately 46%) did not answer this item.

Discussion

This survey explored the current practices in bone health management among physicians caring for menopausal cancer patients at the European Institute of Oncology. While the survey demonstrated a high response rate, it aligns with existing literature that reveals a significant gap between the established guidelines for bone health management in cancer patients and the actual practices employed by physicians.

As discussed in previous sections, it is essential to focus on patients with breast cancer and gynecological cancers when considering bone health management.

The treatment of these malignancies often involves various endocrine therapies that can lead to estrogen deficiency, adversely affecting bone structure [6, 12, 13].

In the context of breast cancer, endocrine therapy has long been a primary strategy for achieving local disease control and preventing distant recurrence in patients with hormone-receptor-positive tumors [14, 15]. This therapy is utilized in both metastatic and adjuvant settings, with high-risk patients potentially receiving treatment for extended periods (up to 10 years) [15]. Consequently, physicians must be knowledgeable about the potential bone-related complications and their management [7, 16].

Literature extensively documents the impact of different endocrine therapies on bone health, particularly regarding the differences between premenopausal and postmenopausal patients [17, 18].

Studies have shown a direct correlation between aromatase inhibitors and bone loss, with the combination of aromatase inhibitors and ovarian function suppression leading to the most significant negative effects on bone health. Conversely, Tamoxifen is generally considered to help preserve bone density in postmenopausal women [16, 18–20]. However, the actual relationship between bone loss and

fracture risk in women undergoing endocrine therapy remains underexplored, with few major trials addressing this issue.

The EBCTCG meta-analysis demonstrated similar fracture rates among patients receiving ovarian function suppression (OFS) plus aromatase inhibitors compared to those on Tamoxifen. However, when looking at specific trials, the Tamoxifen and Exemestane Trial (TEXT) and the Suppression of Ovarian Function Test (SOFT) both reported higher fracture rates in patients undergoing adjuvant endocrine therapy with OFS combined with aromatase inhibitors, compared to those treated with Tamoxifen alone or OFS plus Tamoxifen. These findings underscore the heightened risk of bone complications in patients receiving extended endocrine therapy, especially when aromatase inhibitors are involved [21–23].

Given the direct relationship between endocrine therapy and its detrimental effects on bone health, dedicated research has focused on identifying strategies to mitigate these impacts, including vitamin D and calcium supplementation alongside regular physical exercise, which are commonly prescribed by physicians [7, 24].

The pharmacological prevention and treatment of bone loss includes bisphosphonates, denosumab, and, more recently, romosozumab, which target bone remodeling through distinct mechanisms [25].

Recent data indicate that intravenous zoledronic acid is the only antiresorptive agent that effectively prevents bone loss in premenopausal women receiving OFS plus aromatase inhibitors, also correlating with a reduced fracture risk. In postmenopausal women on aromatase inhibitors, both bisphosphonates (intravenous or oral) and denosumab have shown benefits, although evidence regarding their impact on fracture risk is less conclusive [16, 26, 27].

Several trials, including ABCSG-12, HOBOE, and the EBCTCG meta-analysis, have also investigated the potential anticancer effects of antiresorptive agents. ABCSG-12 and HOBOE reported benefits from adding zoledronic acid to OFS as part of adjuvant endocrine therapy, while the EBCTCG analysis highlighted the role of bisphosphonates in reducing the risk of bone recurrence and breast cancer mortality, albeit with partial data regarding postmenopausal patients and those receiving OFS [28–30].

In light of these findings and in accordance with ASCO, NCCN, and ESMO guidelines, physicians are encouraged to provide bone health counseling to all women undergoing chronic endocrine treatment known to accelerate bone loss. This includes discussing strategies and potential adverse effects [6, 7].

Physicians should also assess fracture risk based on clinical factors and bone mineral density (BMD) using DXA scans. The aforementioned guidelines advocate for tailored strategies based on patient risk stratification. For instance, antiresorptive therapy is recommended for women receiving either an aromatase inhibitor or OFS who have a BMD T-score of <-2 or more than two risk factors for fractures [7, 16, 20].

Similarly, in the context of gynecological cancers (such as ovarian, endometrial, and cervical cancer), patients exhibit an increased risk of cancer treatment-induced bone loss (CTIBL) due to anti-cancer

therapies including total hysterectomy, oophorectomy, pelvic radiotherapy, or chemotherapy (such as platinum agents and taxanes, which can cause ovarian failure) [9, 12, 31, 32].

Chemotherapy-induced ovarian failure is also associated with rapid bone loss, with a reported loss of approximately 7.7% of lumbar spine bone mineral density within the first year of treatment in women with early breast cancer [33].

Therefore, early detection of CTIBL in gynecological cancer patients is crucial for improving quality of life and optimizing survivorship care. Similar to breast cancer, ASCO, NCCN, and ESMO guidelines promote bone health counseling in this setting, which includes baseline BMD assessment, monitoring of calcium and vitamin D levels, and the prescription of AT based on hypoestrogenism and clinical risk factors.

However, several studies reveal that a low percentage of patients undergo DXA scans to check their BMD, with only one in five patients supplementing calcium and vitamin D as recommended, and one in four women who should receive AT according to guidelines failing to do so [9].

The survey revealed that some clinicians reported referring patients based on a PDTA pathway, despite the fact that no such pathway currently exists at IEO, highlighting a significant gap between clinical practice and institutional structure.

This underscores the need for a formal multidisciplinary care pathway, such as a PDTA, or regional guidelines to standardize clinical practices. Such frameworks would promote coordinated, evidence-based care, reduce variability, and improve patient outcomes, ensuring consistent management of conditions like cancer treatment-induced bone loss (CTIBL) across specialties and institutions.

This study has some limitations. First, it was conducted at a single comprehensive cancer center, and practice patterns may differ in other institutions and healthcare settings, such as community hospitals or centers without dedicated menopause or bone health services; the generalisability of our findings may therefore be limited. Second, data were self-reported by clinicians and were not verified against actual prescribing or referral records; social desirability bias may thus have led to an overestimation of guideline-concordant practices. Third, although the response rate was high (73.5%), clinicians with a particular interest in bone health may have been more likely to participate, potentially introducing self-selection bias in the same direction. Fourth, the questionnaire was developed by a multidisciplinary panel but was not formally validated. Fifth, items 23 and 24 had a considerable proportion of missing responses (42% and approximately 46%, respectively), which reduces the precision of the corresponding estimates. Finally, the small number of respondents in some specialty groups did not allow meaningful comparisons across specialties.

Conclusion

This survey confirms the critical role of bone health management in cancer care and highlights the need for improved physician knowledge and training. It reveals significant gaps between guideline

recommendations and clinical practices for managing bone health in breast and gynecological cancer patients. While clinicians engage well with initial assessments, the timing of bone densitometry and the use of AT remain inconsistent. Notably, baseline DXA scans are frequently prescribed, but their timing relative to menopause onset varies widely, and reluctance to prescribe AT points to perceived expertise barriers.

The findings underscore the need for enhanced education and integrated care pathways to address these gaps, particularly in managing cancer treatment-induced bone loss (CTIBL). Future research should focus on multidisciplinary models that streamline bone health management in oncology. Targeted educational programs and institutional policy changes could help align practice with evidence-based guidelines, ultimately improving cancer survivor outcomes.

Declarations

Competing interests

E. Munzone reports consulting and advisory relationships with Exact Sciences, MSD Oncology, Daiichi Sankyo/AstraZeneca, Pfizer, Seagen, Ipsen, Pierre Fabre, and Lilly; participation in speakers' bureaus for AstraZeneca; and travel, accommodation, and/or expense support from Roche, Pfizer, Lilly, Novartis, Gilead Sciences, AstraZeneca, and Pierre Fabre. These relationships were outside the submitted work. G. Curigliano reports research grants from Merck; honoraria from Ellipses Pharma; support for attending meetings and/or travel from Roche/Genentech, Pfizer, Daiichi Sankyo, and AstraZeneca; membership of speakers' bureaus for Roche/Genentech, Novartis, Pfizer, Lilly, Foundation Medicine, Samsung, Daiichi Sankyo, Seagen, Menarini, Gilead Sciences, AstraZeneca, and Exact Sciences; and consulting or advisory roles for Roche/Genentech, Pfizer, Novartis, Lilly, Foundation Medicine, Bristol Myers Squibb, AstraZeneca, Daiichi Sankyo, GlaxoSmithKline, Seagen, Guardant Health, Veracyte, Celcuity, Menarini, Merck, Exact Sciences, Blueprint Medicines, and Gilead Sciences. He also holds leadership roles within ESMO, the European Society of Breast Cancer Specialists, and ESMO Open. These competing interests were outside the submitted work. M. Colleoni serves as Co-Chair of the International Breast Cancer Study Group (IBCSG) Scientific Committee. He has reported an institutional research grant from Roche in a previous publication. No additional financial conflicts of interest were declared. M. Brandi reports having received honoraria for serving on an international scientific board. She has also previously reported honoraria, consultancy fees, grants, and/or speaker fees from companies operating in the field of osteoporosis and bone health, including Amgen, Abiogen, Alexion, Amolyt, Bruno Farmaceutici, Calcilytix, Echolight, Eli Lilly, Kyowa Kirin, SPA, Theramex, and UCB Pharma. N. Bianco, G. Malvezzi, C. Valenza, D. Trapani, M. Manzoni, M. Milano, C. Mariani, V. Galimberti, C. Sangalli, D. Franchi, and S. Martella declare that they have no conflict of interest.

Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki. The study protocol was approved by the Institutional Review Board of the European Institute of Oncology IRCCS (approval ID: UID4612).

Consent to participate

The requirement for written informed consent was waived by the Institutional Review Board of the European Institute of Oncology IRCCS, given the minimal-risk nature of this anonymous survey.

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Author Contribution

N.B. and G.M. contributed equally and share first authorship. N.B., G.M., C.V., D.T., M.M., M.F.M., C.M., M.L.B., V.G., C.S., E.M., G.C., M.A.C., D.F. and S.M. contributed to the study conception and design, data collection, analysis and interpretation, and to drafting or critically revising the manuscript. All authors read and approved the final manuscript.

Data availability

The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

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Appendix 1. SURVEY QUESTIONS

1. **1. What is your main area of specialization?**

- - Gynecologist
- - Oncologist
- - General Practitioner
- - Internist
- - Medical Oncologist
- - Senologist Surgeon
- - Endocrinologist
- - Rheumatologist
- - Orthopedist
- - Other (please specify) _____

1. **2. What is your age range?**

- - < 30

– 30–45 years

– 46–55 years

- - >55 years

1. **3. Where do you primarily work?**

- - Hospital
- - Territorial Clinic
- - Cancer Center

1. **4. In which geographical area do you work?**

- - Northern Italy
- - Central Italy
- - Southern Italy and Islands

1. **5. Do you investigate the menopausal status of your patients regularly during outpatient visits?**

- - Yes
- - No

1. **6. If 'Yes', how many menopausal patients (both physiological and iatrogenic) do you visit in a month?**

- - < 5

– 5–20

- - >20

1. **7. Of these, how many are women in menopausal iatrogenic status due to oncological treatments?**

- - All
- - None
- - More than half
- - Less than half

1. **8. Is there a dedicated service for oncological menopause at your institution?**

- - Yes
- - No

1. **9. When early menopause occurs due to oncological treatments, do you prescribe bone densitometry to obtain the baseline bone density value?**

- - Yes
- - No
- - I refer to a dedicated specialist

1. **10. How long after the onset of menopause do you prescribe bone densitometry to your patient?**

- - Within 6 months of the onset of menopause
- - Within 12–24 months of the onset of menopause
- - Generally after 24 months of the onset of menopause

1. **11. Ideally, how long after the onset of menopause would you prescribe bone densitometry?**

- - As soon as possible
- - After at least 12–18 months from the onset of menopause
- - After about 18–24 months from the onset of menopause

1. **12. Among general check-up or oncological follow-up exams, do you regularly prescribe vitamin D dosage?**

- - Yes
- - No

1. **13. If 'Yes', do you personally supplement vitamin D if deficient?**

- - Yes
- - No
- - No, I refer to the Primary Care Physician or specialist

1. **14. Do you regularly provide your patients with information about nutrition, lifestyle, and physical activity with a particular focus on bone health and counseling aimed at osteoporosis prevention?**

- - Yes
- - No
- - Sometimes, when I have time to do it

1. **15. Do you believe that hormone replacement therapy (HRT) can help prevent osteoporosis in oncological patients if it is not contraindicated?**

- - Yes, but only for patients with early menopause
- - Yes, for all menopausal patients who do not have indications for HRT
- - No, in oncological patients, but only in the general population
- - I don’t know, it’s not my field

1. **16. Have you ever prescribed hormone replacement therapy for primary prevention of osteoporosis risk?**

- - Yes
- - Yes, but exclusively in women with early menopause
- - No, because I disagree
- - No, because it’s not my field

1. **17. Have you ever prescribed anti-resorptive therapy for primary prevention of osteoporosis risk?**

- - Yes
- - Yes, but exclusively in women with early menopause
- - No, because I disagree
- - No, because it’s not my field

1. **18. Are you familiar with AIFA note 79?**

- - Yes
- - No

1. **19. If you are familiar with it and answered 'Yes' to question 17, do you apply the note for the prescription of anti-resorptive therapy?**

- - Yes
- - No

1. **20. For specialists (oncologists and breast surgeons) dealing with breast cancer: Is there a PDTA for managing the risk of osteoporosis in patients undergoing hormonal blockade at your institution?**

- - Yes
- - No, but there is a dedicated service for bone health to which patients can be referred
- - No, I refer to an outpatient specialist visit for Osteoporosis in the territory

1. **21. For specialists (oncologists and breast surgeons) dealing with breast cancer: Does the prescription of anti-resorptive therapy typically occur at the time of adjuvant hormonal prescription?**

- - Yes, always
- - Most of the time
- - No

1. **22. For specialists (oncologists and breast surgeons) dealing with breast cancer: Does the prescription of anti-resorptive therapy or referral for evaluation at the Osteoporosis Ambulatory typically occur at the time of adjuvant hormonal prescription?**

- - Yes, always
- - No, never
- - Depends on the result of the initial BMD
- - Depends on the type and duration of hormonal therapy prescribed

1. **23. For specialists (oncologists and breast surgeons) dealing with breast cancer: In your experience, under what circumstances should the prescription of anti-resorptive therapy or referral for evaluation at the Osteoporosis Ambulatory occur when starting adjuvant hormonal therapy?**

- - Only for Tamoxifen
- - Only for Aromatase Inhibitors

- - LHRH analog + tamoxifen
- - LHRH analog + Aromatase Inhibitors
- - In women with physiological menopause
- - In all women in menopause (induced or physiological) regardless of the hormonal therapy prescribed

1. **24. In your experience, how many women do not start or discontinue anti-resorptive therapy prematurely due to preferences or fears of side effects (e.g., osteonecrosis of the jaw)?**

- - None
- - All
- - < 20%
- - < 50%
- - > 50