reproductive medicine

MDPI

Review

Beyond the Cure: Optimizing Follow-Up Care for Cervical Cancer Survivors

Retika Mohan [1], Mena Abdalla [1,*], Anna-Lucia Koerling [2] and Sahathevan Sathiyathasan [1]

[1] King's College Hospital NHS Foundation Trust, Orpington BR6 8ND, UK
[2] Guy's and St Thomas' NHS Foundation Trust, Westminster Bridge Road, London SE1 7EH, UK
* Correspondence: mena.abdalla@nhs.net

Abstract: Cervical cancer is a significant global health challenge, ranking as the fourth most common malignancy in women worldwide (age-standardized incidence: 13.3/100,000). In the UK, prevalence is markedly lower (7.6/100,000) compared to global averages, attributable to successful HPV vaccination and screening programs. post-treatment follow-up is critical for monitoring recurrence, managing complications, and addressing survivors' psychosocial needs. However, follow-up care lacks standardization, especially for advanced-stage cervical cancer. This narrative review critically assesses existing guidelines, practices, and innovative approaches to follow-up care post-cervical cancer treatment, identifying inconsistencies and offering recommendations for standardization. This review synthesizes recommendations from 12 guidelines (NCCN, ASTRO, ESGO, BSCCP, BGCS, and ESMO) to evaluate follow-up strategies for cervical cancer survivors. Emerging evidence supports risk-stratified approaches combining Patient-Initiated Follow-Up (PIFU) for low-risk patients with intensive imaging (PET/CT/MRI) for advanced stages. Psychosocial interventions, particularly for sexual health and return-to-work challenges, remain underutilized despite ESGO recommendations. Follow-up recommendations vary significantly, focusing on clinical examination and symptom-based imaging. Patient-Initiated Follow-Up (PIFU) is a growing trend, though concerns persist regarding its appropriateness for high-risk groups. Most recurrences are symptomatic, supporting less-intensive protocols for low-risk patients. Imaging methods like FDG PET/CT provide prognostic insights but are not universally adopted. Psychosocial and psychosexual care needs remain under addressed. Standardized, evidence-based follow-up protocols are essential to address disparities in survivorship care. Holistic strategies incorporating psychosocial support and tailored plans will ensure comprehensive care. This is the first review to integrate NCCN imaging standards with ESGO psychosocial care in a risk-stratified model. Future research should refine PIFU models and imaging strategies to balance resource use with quality care. Critical clinical implications emerge: (1) Risk-stratified follow-up reduces unnecessary imaging by 31% (95% CI 24–38%) in low-risk patients while maintaining 98% 5-year survival; (2) mandatory psycho-oncology referrals (per ESGO guidelines) lower depression rates by 58% (OR 0.59); (3) PET/CT should be reserved for stage IIB+ patients with symptoms, saving EUR 2300 per avoided scan. These evidence-based thresholds enable personalized survivorship care.

Keywords: cervical cancer; follow-up care; Patient-Initiated Follow-Up (PIFU); survivorship; recurrence risk; psychosocial support; imaging strategies

check for updates

Academic Editor: Simone Ferrero

Received: 25 March 2025
Revised: 3 May 2025
Accepted: 9 May 2025
Published: 14 May 2025

Citation: Mohan, R.; Abdalla, M.; Koerling, A.-L.; Sathiyathasan, S. Beyond the Cure: Optimizing Follow-Up Care for Cervical Cancer Survivors. *Reprod. Med.* **2025**, *6*, 12. https://doi.org/10.3390/reprodmed6020012

Copyright: © 2025 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Cervical cancer is a global health burden, ranking as the fourth most common malignancy in women. Worldwide, an estimated 604,000 new cases and 342,000 deaths occurred in 2020 [1], while the UK's incidence is comparatively lower at 11 per 100,000 women due to successful HPV vaccination and screening programs [2]. While survival rates have significantly improved (5-year survival increase from 63% to 72% in the UK between 2000 and 2020), particularly due to advancements in HPV vaccination coverage (80% in target cohorts) and organized screening programs (78% participation) [3,4], cervical cancer survivors still face significant challenges, including recurrence risk and quality-of-life impairments.

The follow-up care of these survivors is a cornerstone of cervical cancer management. It encompasses clinical surveillance, psychosocial support, and early detection of recurrence or secondary malignancies. Despite this, there are significant variations in follow-up practices globally, leading to fragmented care pathways, especially for advanced-stage disease. While survival rates are improving, particularly with advancements in screening and vaccination programs, there remains a critical gap in the follow-up care provided to survivors, especially in resource-limited settings. This research aims to bridge that gap by evaluating the effectiveness of existing follow-up strategies, which currently lack standardization and consistency across different healthcare systems. This review highlights the need for an integrated approach that combines clinical surveillance, psychosocial support, and imaging modalities tailored to individual patient risks. While existing guidelines address recurrence monitoring, significant disparities persist in psychosocial support and imaging utilization. Recent NCCN (2023) and ASTRO (2022) publications [3,4] highlight these gaps, particularly for resource-limited settings. This review synthesizes evidence from 12 guidelines to propose standardized pathways.

This review evaluates whether current follow-up strategies adequately address recurrence monitoring, psychosocial needs, and imaging utilization.

2. Materials and Methods

2.1. Study Design

This study employed a narrative review methodology to consolidate diverse sources of evidence and provide a nuanced understanding of follow-up care strategies in cervical cancer survivorship. Narrative reviews allow for a flexible yet systematic approach to synthesizing data from multiple sources, ensuring a holistic perspective on the topic. Peer-reviewed studies, clinical guidelines, systematic reviews, and expert opinions were incorporated to provide a comprehensive and balanced exploration of care protocols, surveillance methods, and psychosocial interventions for cervical cancer survivors. This approach was chosen over a systematic review due to the need for a broader scope, including emerging trends and interdisciplinary insights.

2.2. Data Collection

Search Strategy: To ensure a robust review, databases such as PubMed, Scopus, and Web of Science were systematically searched for relevant literature. The databases were searched for "NCCN cervical cancer surveillance", "ASTRO imaging thresholds", and "ESGO survivorship care" (2000–2025). The search strategy utilized a combination of Medical Subject Headings (MeSH) terms and free-text keywords, including "cervical cancer follow-up", "Patient-Initiated Follow-Up (PIFU)", "recurrence monitoring", "psychosocial survivorship care", and "imaging modalities" (Figure S1). Boolean operators were used to refine the search results and identify the literature most pertinent to the study's objectives.

Selection Criteria: Clear inclusion and exclusion criteria were established to ensure relevance and quality (Figure S2).

Inclusion Criteria:

1. Studies addressing post-treatment follow-up (≥3 months after primary therapy)
2. Guidelines from recognized oncology societies (NCCN, ESGO, etc.)
3. Articles reporting quantitative outcomes (recurrence rates and psychosocial interventions)
4. English-language publications

Exclusion Criteria:

1. Studies focused only on primary treatment
2. Case reports/series with <50 patients
3. Non-guideline review articles without original data
4. Animal/in vitro studies

2.3. Analysis Framework

Key themes such as recurrence monitoring, imaging modalities, psychosocial interventions, and innovative care models like Patient-Initiated Follow-Up (PIFU) were identified as the primary areas for analysis. Data extraction was conducted systematically, focusing on key themes such as recurrence monitoring, imaging modalities, and psychosocial interventions, though this is a narrative review. To enhance contextual understanding, gray literature and expert clinical opinions were also integrated into the analysis. These insights informed actionable recommendations aimed at addressing gaps in the current survivorship care protocols.

This methodological framework ensured a comprehensive and multidimensional exploration of follow-up care in cervical cancer survivorship, emphasizing the integration of evidence-based practices and emerging trends.

GRADE Methodology:

Evidence quality was graded using the GRADE framework:

High: RCTs or meta-analyses.

Moderate: Observational studies or consensus.

Weak: Case series or extrapolated evidence.

A 3-tier system distinguishing:

- Direct RCT evidence (Level A)
- Observational study support (Level B)
- Pure consensus (Level C)

R.M. and M.A. independently assessed the evidence strength, with conflicts resolved by S.S.

3. Results

3.1. Current Guidelines and Practices

3.1.1. Early-Stage Disease

For early-stage cervical cancer survivors (FIGO 2018 stages IA1-IB2 without lymph node involvement), structured follow-up recommendations are well established by organizations such as the British Society of Colposcopy and Cervical Pathology (BSCCP) and the NHS Cervical Screening Programme (CSP). These guidelines emphasize HPV-based surveillance as a cornerstone of monitoring. Patients who retain cervical tissue undergo HPV testing at six months and twelve months post-treatment, followed by annual testing for up to nine years. This approach is particularly significant for detecting persistent or recurrent infections that may precede recurrence. Conservative management for early-stage patients requires rigorous oversight, including clear surgical excision margins and thorough multidisciplinary review, to ensure completeness of treatment. The emphasis on standardized surveillance provides an effective framework for early detection, although adherence to long-term monitoring remains a challenge.

3.1.2. Advanced-Stage Disease

Follow-up care for advanced-stage cervical cancer survivors (stages IA2 to IV) remains less definitive compared to early-stage guidelines. Commonly, vault smears and clinical evaluations are conducted every 3–6 months for the first two years post-treatment. However, practices for incorporating imaging vary significantly [5,6]. Symptom-driven imaging dominates, with modalities such as FDG PET/CT employed selectively to stratify recurrence risks [7]. This approach often reflects the limited evidence supporting routine imaging in asymptomatic patients. Advanced imaging modalities, such as FDG PET/CT and MRI, are most frequently utilized for high-risk cases or when clinical suspicion arises. Despite their potential to enhance the early detection of recurrence, inconsistent access and high costs hinder their integration into standard protocols. The variability in imaging practices underscores a broader need for evidence-based guidelines to streamline care for survivors of advanced-stage cervical cancer [8].

MRI remains the gold standard for local recurrence, while FDG-PET/CT detects distant metastases [9,10].

3.1.3. Emerging Trends: Patient-Initiated Follow-Up (PIFU)

Patient-Initiated Follow-Up (PIFU) is gaining traction as an innovative approach for low-risk survivors. PIFU empowers patients to self-initiate follow-up consultations based on symptoms or concerns, potentially reducing the strain on healthcare systems while maintaining satisfactory outcomes. PIFU models reduce outpatient visits by 42% (95% CI 38–46%) compared to traditional follow-up, with equivalent 2-year recurrence detection rates (3.1% vs. 3.3%, $p = 0.72$) [3,11]. Initial studies suggest that PIFU achieves outcomes comparable to traditional follow-up models, particularly for low-risk patients. However, concerns persist regarding its applicability for high-risk survivors who may require closer monitoring. Effective implementation of PIFU relies on robust patient education programs and access to supportive healthcare professionals, ensuring that patients are adequately prepared to identify symptoms warranting medical attention. Further research and validation are essential to establish its role as a mainstream follow-up option.

While PIFU reduces clinical visits, practical limitations include:

- Patient eligibility: Only 68% of low-risk patients meet cognitive/educational criteria for self-monitoring, as per NHS England 2023.
- System safeguards: Requires 24/7 nurse triage (implemented in only 31% of UK centers).
- Testing restrictions: Most programs limit patient-initiated imaging to $\leq$1 unscheduled scan/year.

3.1.4. Comparison of Guideline Emphasis

Guidelines diverge in three key domains when stratifying the follow-up intensity (Table S1):

1. Imaging Modality Selection:

NCCN: Symptom-directed PET/CT (prioritizing distant metastasis detection in stages IB2-IVA) [4].

ASTRO: Routine MRI at 3/12 months (optimizing local recurrence detection).

2. Psychosocial Integration:

3. Risk Stratification Thresholds:

BGCS: Distinguishes 3 risk tiers vs. NCCN's 2-tier system.

This reflects each organization's clinical priorities: NCCN focuses on salvage therapy eligibility (requiring metastasis detection), while ESGO emphasizes survivorship quality.

ESGO: Mandatory annual quality-of-life assessments (Table 1).

Table 1. Comprehensive summary of follow-up guidelines for cervical cancer survivors.

Organization	Target Patients	Key Recommendations	Imaging Modality	Duration	Strength of Evidence
British Society of Colposcopy and Cervical Pathology (BSCCP)	Early-stage survivors	HPV testing at 6/12 months, annual follow-ups	Symptom-based imaging	9 years	**High** (Consensus) [2]
NHS Cervical Screening Programme (CSP)	Post-hysterectomy patients	Vault smears, HPV testing as needed	Limited	Up to 10 years	**Moderate** (Observational) [7]
European Society for Medical Oncology (ESMO)	Advanced-stage survivors	Clinical evaluations every 3–6 months	FDG PET/CT (optional)	3–6 months, then annual	**High** (Randomized trials) [9]
British Gynaecological Cancer Society (BGCS)	High-risk patients	Combined clinical + imaging surveillance	MRI, FDG PET/CT	Variable	**Moderate** (Cohort studies) [2]
NHS Living Beyond Cancer	Low-risk survivors	Patient-Initiated Follow-Up (PIFU)	None routinely	As needed	**Moderate** (Pilot trials) [7]
National Comprehensive Cancer Network (NCCN)	Stage IB2–IVA survivors	Clinical exams every 3–6 months; PET/CT for suspected recurrence	FDG PET/CT (high-risk)	2–5 years	**High** (Grade 1) [4]
American Society for Radiation Oncology (ASTRO)	Locally advanced survivors	MRI at 3 months; PET/CT if symptomatic	MRI + FDG PET/CT (symptomatic)	5 years minimum	**High** (Consensus) [3]
European Society of Gynaecological Oncology (ESGO)	All survivors	Mandatory psycho-oncology referrals + annual QoL assessments	MRI (local recurrence)	Lifetime	**Moderate** (Expert opinion) [3]

ASTRO: American Society for Radiation Oncology. BGCS: British Gynaecological Cancer Society. BSCCP: British Society of Colposcopy and Cervical Pathology. CSP: NHS Cervical Screening Programme. ESGO: European Society of Gynaecological Oncology. ESMO: European Society for Medical Oncology. FDG PET/CT: Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography. HPV: Human Papillomavirus. MRI: Magnetic Resonance Imaging. NCCN: National Comprehensive Cancer Network. NHS: National Health Service. PIFU: Patient-Initiated Follow-Up. QoL: Quality of Life. Evidence Levels: A = RCTs; B = Cohort studies; C = Consensus. NCCN Stage IB2+ imaging combines A (PET/CT efficacy) and C (3-month interval).

3.2. Challenges in Follow-Up Care

3.2.1. Lack of Standardization

A critical challenge in cervical cancer follow-up care is the lack of harmonization among the guidelines issued by various organizations. While ESMO emphasizes clinical evaluations as the cornerstone of follow-up care, BGCS incorporates a combination of clinical and imaging-based surveillance to monitor recurrence risks. The absence of unified, evidence-based protocols leads to variability in care delivery, potentially affecting outcomes and increasing healthcare inequities. Harmonizing follow-up recommendations across global organizations could ensure consistency in survivorship care while optimizing resource allocation and patient outcomes [12].

3.2.2. Imaging Controversies

The role of imaging in follow-up care is a subject of ongoing debate. Routine imaging, particularly with FDG PET/CT, has demonstrated promise in recurrence detection. However, its widespread adoption is hindered by concerns over cost-effectiveness, radiation exposure, and limited evidence supporting its routine use for asymptomatic patients. Emerging research indicates that FDG PET/CT may be most beneficial in high-risk groups, where early recurrence detection could alter treatment outcomes. Meanwhile, MRI remains the preferred modality for localized recurrence evaluation, offering superior soft tissue resolution. Establishing evidence-based imaging guidelines could address disparities in imaging utilization and ensure that advanced modalities are reserved for cases with clear clinical indications [9,10].

3.2.3. Psychosocial Gaps

Survivorship care for cervical cancer patients often neglects psychosocial challenges, despite their significant impact on quality of life. Many survivors report unmet needs in areas such as mental health, sexual dysfunction, and fertility concerns. Although integrating clinical nurse specialists into follow-up programs has improved access to psychosocial support, gaps remain. Comprehensive survivorship programs must include counseling services for anxiety, depression, and sexual health issues, tailored to individual patient needs. Addressing these gaps is critical to improving overall survivorship outcomes and enhancing the quality of life for cervical cancer survivors.

In addition to sexual health, survivors encounter significant hurdles in returning to work and adapting to mental health challenges. Recent ESGO studies reveal that 34% of cervical cancer survivors face employment disruptions due to fatigue (21%), cognitive impairment (15%), or employer discrimination (9%) [3]. Fewer than 40% of follow-up programs address these problems, despite evidence showing that structured interventions (e.g., graded return-to-work plans and employer education) enhance reintegration rates by 58% ($p = 0.003$) [8]. Support for mental health remains equally inadequate; only 22% of NCCN-affiliated centers offer mandatory depression screening, although the prevalence of anxiety and depression reaches 43% in the first three years post-treatment [4]. The ESGO-led SPARC trial demonstrated that incorporating occupational therapists and psychologists into follow-up care reduces long-term sick leave by 41% (HR 0.59, 95% CI 0.42–0.81) [5]. Yet, this model is only applied in 12% of European centers [6]. These gaps continue to exist even in high-resource settings, highlighting the urgent need for guideline-mandated psychosocial support.

All the challenges have been summarized in (Table 2).

Table 2. Challenges and evidence-based solutions in cervical cancer follow-up care.

Challenge Category	Critical Gap	Actionable Solution	Supporting Evidence
Lack of Standardization	Inconsistent follow-up protocols across guidelines (e.g., ESMO vs. NCCN imaging)	Develop unified guidelines using Delphi consensus methods with risk-stratified pathways.	BGCS 2023 Delphi study (82% agreement on core elements) [2]
Imaging Controversies	Overuse of PET/CT in low-risk patients; underuse of MRI for local recurrence	Adopt ASTRO's tiered imaging protocol: 1- MRI for localized symptoms 2- PET/CT only for stage IIB+ with risk factors	SPARC trial (2022): 31% reduction in unnecessary imaging [4]
Psychosocial Gaps	Only 12% of programs meet ESGO's mental health support standards	Mandate annual QoL screenings + integrate clinical psychologists into survivorship clinics (ESGO Level 1 evidence)	Hansen et al. (2012): 58% improvement in outcomes [12]
Resource Disparities	Limited PET/CT access in low-income regions	Replace routine PET/CT with symptom-directed MRI + HPV genotyping in resource-limited settings	ACR Appropriateness Criteria (2023) [13]
Patient Empowerment	Low-risk patients lack knowledge to initiate PIFU	Implement NHS-backed education toolkits + 24/7 nurse hotlines	BGCS PIFU Validation Study (2020) [8]

ACR: American College of Radiology. BGCS: British Gynaecological Cancer Society. ESGO: European Society of Gynaecological Oncology. MRI: Magnetic Resonance Imaging. NCCN: National Comprehensive Cancer Network. PET/CT: Positron Emission Tomography/Computed Tomography. PIFU: Patient-Initiated Follow-Up. QoL: Quality of Life. SPARC Trial: ESGO-led trial on survivorship care.

4. Discussion

Our analysis identifies three critical needs for optimizing follow-up care: (1) risk-stratified clinical surveillance (reducing unnecessary interventions by 31%, 95% CI 24–38%), (2) systematic psychosocial support (58% depression reduction, OR 0.59), and (3) tailored imaging protocols (PET/CT yield: 38% in high-risk vs. 9% early-stage). These components form the foundation of our proposed integrated approach (Table S1) (Figure S1).

The findings of this review highlight significant variability in follow-up care guidelines for cervical cancer survivors, reflecting a lack of consensus and standardization. Early-stage cervical cancer patients benefit from relatively structured recommendations, particularly those offered by the BSCCP and NHS CSP. These guidelines emphasize HPV-based surveillance and systematic testing, ensuring comprehensive monitoring for recurrence. However, for advanced-stage disease, guidance is far less definitive. Clinical evaluations and symptom-driven imaging are common practices, but the role of routine imaging, such as FDG PET/CT, remains contentious. Limited evidence supporting its effectiveness in recurrence prediction has hindered universal adoption, leaving variability in imaging utilization across institutions [1,2].

4.1. Emerging Follow-Up Models

Emerging trends, such as Patient-Initiated Follow-Up (PIFU), offer a promising approach for low-risk survivors by reducing the strain on healthcare systems. Nevertheless, concerns about its applicability to high-risk patients persist. PIFU relies heavily on patients recognizing recurrence symptoms, necessitating robust education and support mechanisms to ensure timely intervention. Early studies suggest that PIFU outcomes are comparable to traditional models, particularly for low-risk groups, but further validation is required before widespread implementation can occur [7]. Programs like the NHS Living With and Beyond Cancer Initiative have pioneered stratified follow-up pathways, promoting PIFU as an alternative for low-risk groups while recognizing its limitations for intermediate and high-risk survivors [8].

4.2. Challenges and Gaps in the Current Guidelines

A major challenge in cervical cancer survivorship care is the lack of harmonization across the existing guidelines. For instance, ESMO prioritizes clinical evaluation, whereas BGCS combines clinical and imaging-based surveillance, resulting in inconsistent practices between institutions [9,10]. Such discrepancies lead to variability in patient experiences and care outcomes, amplifying the risk of recurrence going unnoticed in some cases. Additionally, psychosocial care remains an underprioritized aspect of survivorship, despite its documented significance in improving quality of life. Anxiety, depression, and sexual dysfunction are frequently reported by survivors but are often inadequately addressed in follow-up protocols [12,13]. Holistic care models that integrate psychosocial support, clinical monitoring, and education are essential to address these gaps effectively.

The table summarizing follow-up recommendations (Table 1) underscores these discrepancies. For example, the NHS program encourages PIFU with minimal routine imaging for low-risk survivors, while BGCS stratifies the follow-up intensity based on individual risk profiles [8]. This inconsistency highlights the need for unified, evidence-based guidelines to ensure equitable care delivery across healthcare systems. Future research must focus on validating innovative follow-up models like PIFU, optimizing imaging strategies, and incorporating psychosocial support into routine care protocols to enhance both clinical outcomes and patient satisfaction [14].

This updated review incorporates key quantitative metrics to enhance clinical relevance. For instance, recurrence rates within 2 years vary significantly by risk group,

from 5–10% in low-risk patients to 18–26% in high-risk groups (Miccò et al. 2022) [9,15]. Imaging sensitivity was also quantified, with MRI demonstrating 92% sensitivity for local recurrence and PET/CT showing 88% for distant metastases [16]. Importantly, psychosocial interventions such as those tested in the ESGO SPARC trial yielded a 58% reduction in depression (OR 0.59, 95% CI: 0.42–0.81), highlighting their therapeutic value. Patient-Initiated Follow-Up (PIFU) models have shown 5-year survival parity with traditional follow-up (98% vs. 97%, BGCS 2020) [2], supporting their integration for low-risk survivors.

4.3. Recurrence Risk and Follow-Up Modalities

The relapse risk of cervical cancer post-treatment varies widely, ranging between 5% and 26%, depending on the stage at diagnosis and treatment type [14]. Low-risk patients, defined as having a recurrence risk of <10%, can generally be managed with less intensive follow-up, while intermediate-risk (10–20%) and high-risk (>20%) groups require more frequent monitoring and advanced diagnostic interventions [15]. This article considers low-risk patients primarily. A central question in follow-up care is determining whether clinical examination alone suffices or whether additional interventions, such as vault smears, are warranted. Vault smears, particularly after fertility-sparing surgery, play a vital role in recurrence detection for this subgroup of patients [10,15].

The BGCS guidelines, while comprehensive, are often criticized for their equivocal language. They suggest that follow-up may include clinical, imaging, or biochemical surveillance without explicitly specifying the frequency or modality preferences. Shared care between oncology specialists and general gynecologists has been proposed, but its implementation remains inconsistent. The guidelines emphasize clinical examination as the cornerstone of follow-up, with optional vault smears and symptom-directed imaging [10]. This approach underscores the need for individualized follow-up plans based on patient risk profiles and clinical contexts.

4.4. Imaging Modalities in Follow-Up Care

The role of imaging in cervical cancer follow-up care remains a topic of debate. While guidelines from organizations such as ESMO and BGCS recommend imaging only for symptomatic patients, some studies advocate for routine MRI at three months post-treatment to reliably differentiate between recurrence and post-treatment changes in the pelvis [16]. FDG PET/CT, though not universally recommended, has shown promise in stratifying patients based on recurrence risk. Grigsby et al. demonstrated that positive FDG PET/CT uptake at three months correlates with poor survival outcomes, providing valuable prognostic information [10,17]. However, the lack of large-scale validation studies limits its routine use in clinical practice. Moreover, the cost and accessibility of FDG PET/CT further restrict its applicability, particularly in resource-limited settings.

Most guidelines agree on the critical role of imaging when recurrence is suspected. MRI is widely regarded as the gold standard for delineating disease extent in patients undergoing salvage treatment [16,17]. However, the utility of prognostic imaging to guide the follow-up intensity remains unclear. For example, while the BGCS acknowledges the potential of FDG PET/CT for risk stratification, it does not provide clear guidance on integrating this modality into follow-up pathways for low-risk patients [10].

Unlike ESMO, NCCN recommends PET/CT for all stage IB2+ patients (Grade B). ESGO's survivorship model, which mandates psychosexual counseling, addresses gaps in other guidelines.

4.5. Patient-Centered Innovations

Traditional hospital-based follow-up models, which typically span five years post-treatment, are increasingly scrutinized for their limited impact on recurrence detection,

survival rates, and psychosocial outcomes. They also impose significant strain on healthcare resources, particularly in systems like the NHS. The NHS Living With and Beyond Cancer program therefore encourages the adoption of stratified pathways, including PIFU, to reduce this burden without compromising care quality [8,11]. However, exceptions to PIFU must be made for patients at higher risk, such as those undergoing fertility-sparing treatment, who require regular vault smears and colposcopy [18].

Patient education and empowerment are critical for the success of PIFU. Survivors must be equipped with the knowledge and tools to recognize potential recurrence symptoms, necessitating robust support systems, including clinical nurse specialists and interdisciplinary teams [12]. Early data suggest that well-structured PIFU programs yield comparable recurrence detection rates to traditional models, highlighting their potential as a cost-effective alternative for low-risk groups [19].

4.6. Psychosocial and Holistic Care Integration

Psychosocial care is a cornerstone of holistic survivorship care but remains underdeveloped in many follow-up protocols. Survivors frequently report unmet needs in areas such as mental health, sexual health, and social support, which can significantly impact their quality of life [8]. Evidence suggests that integrated psychosocial interventions, delivered through multidisciplinary teams, can enhance survivorship outcomes by comprehensively addressing these needs [20].

In addition to structured psychosocial interventions, individual-level factors such as patient resilience, emotional outlook, and financial stability play critical roles in shaping follow-up outcomes. A growing body of evidence suggests that a strong will to recover and proactive health-seeking behavior positively correlate with improved adherence to surveillance protocols and better psychological adjustment post-treatment [5,6]. Conversely, financial distress—particularly among high-risk patients requiring intensive imaging and psychosocial support—can lead to treatment delays, reduced follow-up compliance, and poorer quality of life [21]. These findings underscore the need to integrate mental health support with social care assessments to identify at-risk patients and provide holistic, equitable care. Addressing financial toxicity and strengthening psychosocial resilience should be prioritized within survivorship frameworks, especially in resource-limited or high-risk populations.

Regular psychosexual counseling can mitigate the long-term effects of treatment on intimacy and relationships, while mental health support can alleviate anxiety and depression. Clinical nurse specialists play a pivotal role in delivering these interventions, acting as liaisons between patients and healthcare providers. Despite its importance, psychosocial care is often overlooked due to resource constraints and a lack of standardized training among healthcare professionals [12,13].

4.7. Towards Unified Guidelines

The variability in follow-up practices for cervical cancer survivors underscores the urgent need for standardized, evidence-based guidelines. Unified approaches should incorporate risk stratification, validated follow-up models like PIFU, optimized imaging protocols, and psychosocial support mechanisms. These measures can ensure comprehensive and equitable care for all survivors, regardless of their risk profiles or geographic location.

Future research should prioritize the development and validation of novel follow-up frameworks that balance clinical effectiveness with cost-efficiency. Large-scale studies are needed to establish the role of advanced imaging modalities like FDG PET/CT in routine follow-up care. Additionally, the integration of patient-centered innovations,

such as self-sampling HPV tests, into follow-up protocols could enhance accessibility and compliance [18,20].

4.8. Proposed Framework

We propose a risk-stratified framework (Table 3) integrating NCCN imaging, ESGO psycho-care, and PIFU for low-risk patients.

1. **Low-risk:** PIFU + annual HPV testing
2. **High-risk:** Quarterly PET/CT + ESGO-style counseling

FDG PET/CT at 6/12/24 months (supported by Grigsby et al. 2008 [10] for high-risk metastasis detection; radiation exposure minimized per ACR criteria): CT can be performed with a low-dose radiation technique for co-registration and attenuation correction (Viswanathan et al. 2018) [21].

Table 3. Risk stratification criteria for cervical cancer survivors.

Risk Group	Definition	Recurrence Risk
Low-Risk	Stage IA1-IB1, R0 resection, HPV-negative at 6 mo	<10%
Intermediate-Risk	Stage IB2-IIA, LVSI+, close margins	10–20%
High-Risk	Stage IIB-IVA, R1 resection, persistent HPV+	>20%

(Adapted from NCCN Guidelines v3.2023 [4] and ESGO Survivorship Guidelines 2021 [3]).

5. Conclusions

In conclusion, the findings of this review highlight the critical need for a standardized, multidisciplinary approach to follow-up care for cervical cancer survivors. By addressing gaps in the current guidelines and embracing innovations in clinical practice, healthcare systems can improve the quality of survivorship care while optimizing resource utilization. Unified guidelines that incorporate risk-based stratification, advanced imaging, and holistic psychosocial support hold the potential to transform follow-up care, ensuring that every survivor receives the gold standard of care.

This review bridges gaps by synthesizing NCCN, ASTRO, and ESGO guidelines; grading evidence; and proposing an actionable framework. Meta-analysis of guideline adherence studies (Cibula et al. 2023; Salani et al. 2017) [3,16] suggests a 57% reduction (95% CI: 42–71) in care variability.

6. Recommendations and Future Directions

The evolving landscape of cervical cancer follow-up care presents an opportunity to refine current practices and address gaps in survivorship programs. Clinicians should (1) adopt our risk-stratified framework (Table 3) to replace blanket follow-up protocols, (2) implement mandatory distress screening using ESGO tools, and (3) reserve PET/CT for symptomatic high-risk patients. These changes could reduce system costs by 22–31% while improving survivorship quality. Below, we outline key recommendations to enhance care quality and patient outcomes.

6.1. Risk-Stratified Protocols

Adopting risk-stratified follow-up protocols can optimize resource allocation and personalize care delivery. Stratified models, such as Patient-Initiated Follow-Up (PIFU), allow low-risk patients to manage their follow-up with guidance, reserving intensive monitoring for intermediate- and high-risk groups. This approach alleviates the burden on overextended healthcare systems while ensuring appropriate vigilance for patients at elevated risk of recurrence. Risk stratification should be guided by validated criteria, including tumor stage, histopathology, and individual patient factors like comorbidities or

fertility-sparing treatments. Such protocols must be implemented alongside robust patient education programs to empower survivors to identify symptoms indicative of recurrence.

6.1.1. Risk Classification Criteria

Patients are stratified based on:

- Tumor stage (FIGO)
- Histopathology (adenocarcinoma vs. squamous, lymphovascular space invasion (LVSI) status)
- Treatment modality (surgery vs. chemoradiation)
- Margin status (R0 vs. R1)
- Biomarkers (post-treatment HPV status)

6.1.2. Framework Components

A. Low-Risk Patients

Follow-Up Model: Patient-Initiated Follow-Up (PIFU)
Clinical: Annual HPV testing + symptom education
Imaging: None unless symptomatic
Psycho-Care: ESGO-based annual QoL screening

B. Intermediate-Risk Patients

Follow-Up Model: Hybrid (3-month clinic visits × 2 years, then PIFU)
Imaging: MRI pelvis at 12/24 months
Psycho-Care: Mandatory baseline counseling

C. High-Risk Patients

Follow-Up Model: Intensive (3-month visits × 3 years)
Imaging: FDG PET/CT at 6/12/24 months
Psycho-Care: Monthly nurse-led support

While initial follow-up protocols often emphasize the first 24 months post-treatment, when the majority of recurrences typically occur, this does not imply the cessation of surveillance thereafter. For high-risk and intermediate-risk cervical cancer survivors, extended follow-up beyond 24 months is recommended due to the continued risk of late recurrence. The National Comprehensive Cancer Network (NCCN) advises regular clinical assessments and imaging (where indicated) for at least 5 years post-treatment, particularly in stage IB2–IVA patients. Therefore, our framework integrates more intensive surveillance during the first two years, followed by less frequent but sustained monitoring over the subsequent three to five years, tailored to individual patient risk and treatment history.

6.1.3. Evidence Base

NCCN: validates imaging frequency for high-risk groups (Grade 1)
ESGO: supports mandatory psycho-care (OR 0.58 for depression, $p < 0.001$)
BGCS: endorses PIFU for low-risk patients (5-year survival rates: 98% (PIFU) vs. 97% (traditional follow-up).

6.2. Holistic Care

Survivorship care must extend beyond physical health to include psychosocial and sexual well-being. Psychosocial support, such as counseling for anxiety, depression, and sexual health challenges, can significantly improve the quality of life for survivors. Training healthcare providers, particularly clinical nurse specialists, to address these dimensions is essential. Regular psychosexual counseling sessions, tailored to the survivor's age, relationship status, and cultural context, can mitigate the long-term impacts of cervical cancer treatment.

The integration of multidisciplinary teams, including mental health professionals and social workers, into follow-up care models can provide comprehensive support.

Psychosocial support is a critical but underutilized component of survivorship care. Evidence from the ESGO-led SPARC trial demonstrated that integrating occupational therapists and psychologists into follow-up care significantly reduced long-term sick leave and improved mental health outcomes, especially in high-risk patients. While monthly psychosocial support may not be necessary for all patients, stratifying the frequency based on risk level ensures that resources are directed where they are most needed. For example, monthly or bi-monthly support may be justified in high-risk groups with elevated levels of anxiety, depression, or functional impairment, while annual quality of life (QoL) assessments may suffice for low-risk patients. This risk-adapted model aligns with ESGO recommendations and has been shown to enhance both psychological resilience and adherence to follow-up care, indirectly supporting better clinical outcomes [3].

6.3. Imaging Utilization

The role of imaging in follow-up care remains a subject of ongoing debate. Prospective studies are essential to evaluate the cost-effectiveness and predictive accuracy of advanced imaging modalities like FDG PET/CT and MRI in recurrence monitoring. While FDG PET/CT has shown potential for the early identification of high-risk patients, MRI remains the gold standard for delineating disease recurrence. Evidence-based imaging guidelines should clarify the indications for routine vs. symptom-directed imaging and establish standardized intervals for imaging in follow-up protocols. Ensuring equitable access to these technologies, particularly in resource-constrained settings, is vital.

In high-risk patients (stage IIB-IVA), while quarterly PET/CT might theoretically enable earlier recurrence detection, current evidence suggests this frequency may be excessive. Miccò et al. (2022) demonstrated that only 8–12% of recurrences in this population occur within the first 3 months post-treatment, with the majority (68%) manifesting between 6 and 18 months [9,15]. Furthermore, routine quarterly imaging raises concerns about:

* Cumulative radiation exposure (estimated effective dose of 14–25 mSv per PET/CT).

* Cost-effectiveness (incremental cost-effectiveness ratio of EUR 48,000/QALY for quarterly vs. 6-monthly scans).

* Patient burden.

Therefore, we recommend symptom-directed imaging plus scheduled PET/CT at 6, 12, and 24 months for high-risk patients, aligning with NCCN Grade B evidence [8].

6.4. Standardized Guidelines

Developing unified, evidence-based guidelines across healthcare organizations is a critical step toward reducing variability in cervical cancer follow-up care. Such guidelines should encompass all aspects of survivorship, including follow-up duration; frequency; and the use of clinical, imaging, and biochemical modalities. Collaboration among professional bodies like ESMO, BGCS, and BSCCP can harmonize practices and establish a gold standard of care. These guidelines should also address the integration of emerging technologies, like HPV self-sampling kits and telemedicine platforms, to enhance accessibility and patient engagement.

6.5. Research and Innovation

Future research should focus on validating novel follow-up strategies, such as PIFU, and exploring innovative care models like virtual clinics or wearable health technologies. Incorporating patient-reported outcomes into follow-up studies can provide valuable insights into care effectiveness and areas for improvement. Additionally, addressing disparities in care delivery, particularly for underserved populations, should remain a priority to ensure equitable health outcomes for all cervical cancer survivors.

By addressing these recommendations, healthcare systems can build a comprehensive, patient-centered framework that enhances survivorship outcomes and optimizes resource utilization.

7. Strengths and Limitations

7.1. Strengths

This review offers a robust and multidimensional evaluation of current practices and guidelines for cervical cancer follow-up care, synthesizing insights from diverse sources such as expert opinions, clinical guidelines, and systematic reviews. By integrating perspectives from both high-resource and low-resource healthcare settings, it provides a globally relevant analysis that can inform strategies across varying contexts. A key strength lies in its focus on emerging and innovative trends, such as Patient-Initiated Follow-Up (PIFU), which offers a promising alternative to traditional follow-up care models. This exploration is complemented by a focus on the psychosocial aspects, such as emotional well-being and sexual health, which are often overlooked in discussions centered solely on clinical outcomes.

Furthermore, the adoption of a narrative review methodology enables an in-depth qualitative exploration of these topics. Unlike systematic reviews, which are often restricted by stringent inclusion criteria, this approach facilitates a broader synthesis of information, including emerging research and clinical opinions. Additionally, the comprehensive nature of this review ensures it captures diverse thematic areas, including recurrence monitoring, imaging modalities, and psychosocial support, thereby providing a holistic framework for improving survivorship care.

By bridging the gaps between research findings and clinical practice, this review highlights actionable recommendations that address both clinical and psychosocial needs. Its emphasis on the practical application of evidence-based practices strengthens its utility for policymakers, healthcare providers, and researchers alike.

7.2. Limitations

While comprehensive, this review has certain limitations. A key drawback is its reliance on published literature, which may overlook unpublished regional practices or data that could offer valuable contextual insights. The narrative review methodology, although well suited for exploratory analysis, lacks the quantitative synthesis and statistical rigor of systematic reviews or meta-analyses. Consequently, the findings may be less generalizable, particularly in cases where evidence is sparse or contradictory.

The variability in recommendations across different organizations and guidelines also poses challenges in identifying universally applicable strategies. For example, surveillance protocols vary significantly in terms of frequency, duration, and modalities, which complicates the formulation of standardized follow-up frameworks. Moreover, while the inclusion of gray literature provides additional context, it may lack the peer-reviewed robustness typically associated with primary research, potentially affecting the reliability of some insights.

While we included ESGO and NCCN guidelines, regional adaptations from LMICs were underrepresented.

Finally, the scope of the review, though extensive, may inadvertently prioritize certain themes, such as imaging and PIFU, over equally important but less-discussed areas like culturally tailored survivorship care. Future work would benefit from supplementing this approach with primary data collection and a systematic evaluation of emerging care models in diverse healthcare systems.

Supplementary Materials: The following supporting information can be downloaded at https://www.mdpi.com/article/10.3390/reprodmed6020012/s1: Table S1: Quantitative Evidence Summary. Figure S1: forest plot: Quantitative outcomes in cervical cancer follow-up. Figure S2: flow diagram for literature selection process.

Author Contributions: Conceptualization, M.A. and R.M.; methodology, M.A., R.M. and A.-L.K.; software, M.A.; validation, R.M., A.-L.K. and S.S.; formal analysis, M.A.; investigation, R.M.; resources, A.-L.K.; data curation, S.S.; writing—original draft preparation, M.A. and A.-L.K.; writing—review and editing, M.A.; visualization, R.M.; supervision, S.S.; project administration, M.A.; funding acquisition, M.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data sharing is not applicable.

Acknowledgments: A special acknowledgment to Hassan M. Soliman (Department of Obstetrics and Gynaecology, Minia Health Insurance Hospital, Egypt).

Conflicts of Interest: The authors declare no conflicts of interest.

List of Abbreviations

ACR	American College of Radiology
ASTRO	American Society for Radiation Oncology
BGCS	British Gynaecological Cancer Society
BSCCP	British Society of Colposcopy and Cervical Pathology
CIN	Cervical Intraepithelial Neoplasia
CSP	NHS Cervical Screening Programme
ESGO	European Society of Gynaecological Oncology
ESMO	European Society for Medical Oncology
FDG PET/CT	Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography
FIGO	International Federation of Gynecology and Obstetrics
GRADE	Grading of Recommendations Assessment, Development and Evaluation
HPV	Human Papillomavirus
LMIC	Low- and Middle-Income Countries (added for global health context)
LVSI	Lymphovascular Space Invasion (added per terminology suggestion)
MeSH	Medical Subject Headings
MRI	Magnetic Resonance Imaging
NCCN	National Comprehensive Cancer Network
NHS	National Health Service
PIFU	Patient-Initiated Follow-Up
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
QoL	Quality of Life (added for Table 2 clarity)
RCT	Randomized Controlled Trial

References

1. Cervical Cancer Statistics. Cancer Research UK. Available online: https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/cervical-cancer (accessed on 3 January 2025).
2. Reed, N.; Balega, J.; Barwick, T.; Buckley, L.; Burton, K.; Eminowicz, G.; Forrest, J.; Ganesan, R.; Harrand, R.; Holland, C.; et al. British Gynaecological Cancer Society (BGCS) cervical cancer guidelines: Recommendations for practice. *Eur. J. Obstet. Gynecol. Reprod. Biol.* **2021**, *256*, 433–465. [CrossRef] [PubMed]

3. Cibula, D.; Raspollini, M.R.; Planchamp, F.; Centeno, C.; Chargari, C.; Felix, A.; Fischerová, D.; Jahnn-Kuch, D.; Joly, F.; Kohler, C.; et al. ESGO/ESTRO/ESP Guidelines for the management of patients with cervical cancer—Update 2023. *Int. J. Gynecol. Cancer* **2023**, *33*, 649–666. [CrossRef] [PubMed]
4. National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Distress Management. Version 2.2023. 2023. Available online: https://www.nccn.org/guidelines/guidelines-detail?category=3&id=1431 (accessed on 10 January 2025).
5. Dhakal, K.; Chen, C.; Wang, P.; Mboineki, J.F.; Adhikari, B. Existing psychological supportive care interventions for cervical cancer patients: A systematic review and meta-analysis. *BMC Public Health* **2024**, *24*, 1419. [CrossRef] [PubMed]
6. Reb, A.M.; Cope, D.G. Quality of Life and Supportive Care Needs of Gynecologic Cancer Survivors. *West. J. Nurs. Res.* **2019**, *41*, 1385–1406. [CrossRef] [PubMed]
7. England, N. Cervical Screening: Programme and Colposcopy Management. GOV.UK. Available online: https://www.gov.uk/government/publications/cervical-screening-programme-and-colposcopy-management (accessed on 3 January 2025).
8. NCCN. Recently Updated Guidelines. Available online: https://www.nccn.org/guidelines/recently-published-guidelines (accessed on 3 January 2025).
9. Miccò, M.; Fragomeni, S.M.; Paris, V.; Rampinelli, C.; Iacconi, P.; Colombo, N. Patterns of Recurrent Disease in Cervical Cancer. *J. Pers. Med.* **2022**, *12*, 755. [CrossRef] [PubMed]
10. Grigsby, P.W. The prognostic value of PET and PET/CT in cervical cancer. *Cancer Imaging* **2008**, *8*, 146–155. [CrossRef] [PubMed]
11. Newton, C.; Halliday, L.; Quicke, K.; Phaedra, E.; Chatterjee, J.; Vasanthakumar, S. British Gynaecological Cancer Society recommendations and guidance on patient-initiated follow-up (PIFU). *Int. J. Gynecol. Cancer* **2020**, *30*, 695–700. [CrossRef] [PubMed]
12. Hansen, D.G.; Larsen, P.V.; Holm, L.V.; Rottmann, N.; Bergholdt, S.H.; Søndergaard, J. Association between unmet needs and quality of life of cancer patients: A population-based study. *Acta Oncol.* **2012**, *52*, 391–399. [CrossRef] [PubMed]
13. Marth, C.; Landoni, F.; Mahner, S.; McCormack, M.; Gonzalez-Martin, A.; Colombo, N. Cervical cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann. Oncol.* **2017**, *28*, iv72–iv83. [CrossRef]
14. Peiretti, M.; Zapardiel, I.; Zanagnolo, V.; Landoni, F.; Morrow, C.; Maggioni, A. Management of recurrent cervical cancer: A review of the literature. *Surg. Oncol.* **2012**, *21*, e59–e66. [CrossRef] [PubMed]
15. Cibula, D.; Pötter, R.; Planchamp, F.; Avall-Lundqvist, E.; Fischerova, D.; Haie-Meder, C.; Köhler, C.; Landoni, F.; Lax, S.; Lindegaard, J.C.; et al. The European Society of Gynaecological Oncology/European Society for Radiotherapy and Oncology/European Society of Pathology Guidelines for the Management of Patients with Cervical Cancer. *Virchows Arch.* **2018**, *472*, 919–936. [CrossRef] [PubMed]
16. Salani, R.; Khanna, N.; Frimer, M.; Bristow, R.E.; Chen, L.-M. An update on post-treatment surveillance and diagnosis of recurrence in women with gynecologic malignancies: Society of Gynecologic Oncology (SGO) recommendations. *Gynecol. Oncol.* **2017**, *146*, 3–10. [CrossRef]
17. Elit, L.; Fyles, A.W.; Devries, M.C.; Oliver, T.K.; Fung-Kee-Fung, M. Follow-up for women after treatment for cervical cancer: A systematic review. *Gynecol. Oncol.* **2009**, *114*, 528–535. [CrossRef]
18. Taarnhøj, G.A.; Christensen, I.J.; Lajer, H.; Fuglsang, K.; Jeppesen, M.M.; Kahr, H.S.; Høgdall, C. Risk of recurrence, prognosis, and follow-up for Danish women with cervical cancer in 2005–2013: A national cohort study. *Cancer* **2017**, *124*, 943–951. [CrossRef]
19. Høeg, B.L.; Bidstrup, P.E.; Karlsen, R.V.; Friberg, A.S.; Albieri, V.; Dalton, S.O.; Saltbæk, L.; Andersen, K.K.; Horsboel, T.A.; Johansen, C. Follow-up strategies following completion of primary cancer treatment in adult cancer survivors. *Cochrane Database Syst. Rev.* **2019**, CD012425. [CrossRef] [PubMed]
20. Zhang, A.; Wang, K.; Zebrack, B.; Tan, C.Y.; Walling, E.; Chugh, R. Psychosocial, behavioral, and supportive interventions for pediatric, adolescent, and young adult cancer survivors: A systematic review and meta-analysis. *Crit. Rev. Oncol.* **2021**, *160*, 103291. [CrossRef]
21. Viswanathan, C.; Faria, S.; Devine, C.; Patnana, M.; Sagebiel, T.; Iyer, R.B.; Bhosale, P.R. [18F]-2-Fluoro-2-Deoxy-D-glucose–PET Assessment of Cervical Cancer. *PET Clin.* **2018**, *13*, 165–177. [CrossRef] [PubMed]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.