# Conceptualizing De-Implementation in Cancer Care Delivery

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In recent years, there has been impetus and justification for reducing or ceasing the delivery of ineffective, unproven, harmful, or low-value practices, treatments, programs, interventions, and guidelines in many health areas, including cancer, exemplified by the Choosing Wisely campaign[1]; literature on medical reversals,[2] overuse, and low-value care; conferences[3]; funding opportunities; and landmark reports on wasteful spending in health care in the United States.[4] Studying de-implementation[5]—defined as reducing or stopping the use of a health service or practice provided to patients by health care practitioners and health care delivery systems—will continue to be an important process in cancer care delivery as scientific evidence accumulates, fueled by more rigorous trials that mirror the conditions of everyday health care delivery settings.

Research suggests that overuse—including overscreening, overdiagnosis, and overtreatment—is common in cancer care delivery. Some treatments, practices, and interventions should be offered less frequently (eg, screening every 5 years instead of every 3 years) or with less intensity (eg, the Trial Assigning Individualized Options for Treatment [TAILORx] results regarding provision of chemotherapy for women with early-stage breast cancer[6]); others should be stopped entirely or reduced broadly. Overuse is prominent across the cancer care delivery continuum, including screening, diagnosis, and treatment.[7]

To reduce the gap between evidence of the harms of marginally effective or ineffective practices and clinical practice, we must move beyond mere description of the prevalence of the problem of overuse and focus on how best to address and remediate the problem. Arguably, more than other health domains, cancer is well positioned to advance this line of research and pave the way for a foundational understanding of how best to reduce or stop the use of ineffective cancer treatments, practices, and interventions. To this end, we propose an analytic framework (Fig 1) for understanding and conceptualizing de-implementation of inappropriate cancer management strategies. Our aim is to provide guidance for researchers to develop and test de-implementation strategies, when indicated, as well as a practical synthesis of factors for providers (eg, nurse practitioners, oncologists, patient navigators), quality improvement managers, and policymakers to consider when planning de-implementation efforts.

In applying the framework, we distinguish between four types of cancer-related treatments, practices, or interventions (collectively referred to herein as practices): ineffective, contradicted, mixed, and untested. Practices that are ineffective are those for which strong, consistent, cumulative, and compelling evidence exists that the practice (eg, ovarian cancer screening in asymptomatic women,[8] thyroid cancer screening in asymptomatic adults,[9] prostate-specific antigen screening in asymptomatic men expected to live less than 10 years[1]) does not achieve the target health outcome (eg, survival, quality of life) for the target population and may even incur a net harm. Contradicted practices (ie, medical reversals[10]) are those for which recent stronger evidence supersedes lower quality evidence that led to routine use of the intervention (eg, results from a large randomized controlled trial *v* observational cohort). Treatments, practices, or interventions classified as mixed are those for which both the quality and quantity of evidence for and against the efficacy of the practice are relatively equal, thus calling into question whether the practice will reliably achieve intended outcomes. Finally, untested practices, which may encompass aspirational yet unsubstantiated practices (eg, crystal healing for cancer treatment) are widely used but have yet to be studied. We describe the core aspects of a de-implementation framework, including five distinct yet interdependent factors and four corresponding subfactors.

The first factor, strength of evidence, is a formal assessment of the quality and quantity of evidence indicating that a practice should be de-implemented and the subsequent categorization of the practice as ineffective, contradicted, mixed, or untested. Consistent with other conceptualizations (eg, US Preventive Services Task Force methods[11]), quality of evidence is largely (although not exclusively) a function of study design. High-quality studies (assuming they are executed correctly) include those that use sufficiently powered experimental designs (eg, randomized

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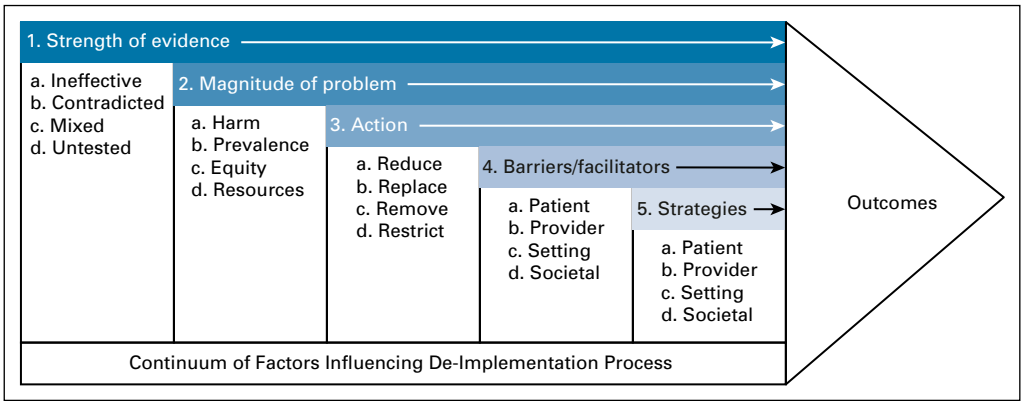


**FIG 1.** Framework for de-implementation in cancer care delivery.

controlled trials); less rigorous study designs include quasi-experimental (eg, interrupted time series), simple pre-post with no control condition, and observational, and finally, case studies, reflecting the weakest type of evidence.

The second factor, magnitude of problem, refers to a collection of four subfactors that together influence the timeliness and speed with which action should be taken to de-implement a cancer treatment, practice, or intervention, recognizing that not all can or should be de-implemented urgently. Harm refers to injury (eg, adverse effects, financial toxicity, depression) that patients incur from receiving the cancer treatment, practice, or intervention. Practices with more frequent and significant harms may be prioritized for de-implementation over practices for which harms are comparatively minimal. Prevalence is conceptualized as the extent to which the treatment, practice, or intervention is widely used and delivered to patients. Practices that are delivered to millions of patients may be prioritized for de-implementation over practices that reach comparatively fewer or a lower percentage of patients. Equity is the extent to which reduction or cessation of a treatment, practice, or intervention may benefit the full demographic range of the population. Finally, resources required to deliver and sustain the practice (eg, time, personnel, equipment) and opportunity costs associated with not delivering an alternative practice should be considered when assessing advisability of de-implementation efforts.

The third main factor, action, refers to the type of change that should occur within the cancer care delivery setting with respect to the target practice. Action is categorized into four broad types of change, including (1) reducing, (2) replacing, (3) removing, or (4) restricting. Reducing the delivery of the practice includes offering the practice less frequently (eg, screening every 3 to 5 years instead of annually for cervical cancer) and/or with less intensity (eg, breast-conserving surgery *v* mastectomy). Replacing the practice includes substituting the existing practice with a different one (eg, physical therapy instead of opioids). Removing the practice entirely is most applicable to practices that cause more harm than good and for which no replacement is appropriate (eg, granulocyte-macrophage colony-stimulating factor for patients with cancer at low risk for neutropenic infection). Finally, restricting a practice consists of narrowing the target population for whom it would be delivered routinely (eg, radical prostatectomy *v* active surveillance in many screen-detected prostate cancers) and/or the cancer care delivery setting in which it is delivered (eg, inpatient-only *v* inpatient and outpatient care).

The fourth factor—barriers/facilitators—are those elements that may either facilitate or hinder de-implementation efforts. Consistent with socioecologic frameworks, the first of four subfactors are patient-level attributes (eg, awareness, beliefs, trust) that exacerbate or attenuate de-implementation efforts. For example, patients who believe that more care or a more costly drug is nearly always better care may be unwilling to stop a treatment; other patients may be averse to invasive procedures and welcome the opportunity to receive a less invasive but equally effective practice. Attributes at the provider level—the second subfactor—may include attitudes, professional norms, fear, and self-efficacy, among others. On one hand, providers may practice defensive medicine for fear of litigation,[12] feel ill equipped to explain to patients why they should no longer receive a treatment that they have received for the past 5 years, or experience cognitive dissonance between provision of a service they have assumed to be beneficial and new evidence. On the other hand, providers may be skilled at shared decision making, stay up to date on published literature, and perceive supportive professional norms for not using ineffective treatments, all of which would facilitate the de-implementation process.

Health care delivery setting (hereafter referred to as setting), the third subfactor within barriers/facilitators, includes (but is not limited to) organizational culture, social networks, leadership, revenue, and resources. For example, cancer care delivery organizations (eg, cancer centers, hospitals) with unstable or insufficient revenue may be less inclined to de-implement profit-generating practices compared with organizations with supportive leadership and culture, which may embrace de-implementation to improve efficiency. The fourth and final subfactor—societal

attributes—such as regulations, health policy, cultural norms, and payment structures—affect de-implementation. Regulatory changes, such as those issued by the Food and Drug Administration (eg, recommendation against use of morcellation in perimenopausal and postmenopausal women) can significantly drive de-implementation despite, in some cases, strong cultural norms in support of its use. Insurance policies may drive de-implementation by limiting the use of ineffective practices, but may also impede de-implementation efforts by reimbursing for treatments with insufficient or poor-quality evidence. Cultural perceptions that more treatment is always better treatment and preference for quick fixes (eg, surgery, magnetic resonance imaging) rather than equally effective yet less intense care (eg, physical therapy, palliative care), may further inhibit de-implementation.

De-implementation strategies (hereafter referred to as strategies), the last conceptual factor, are approaches (eg, techniques, tactics, methods) that can be used to drive the de-implementation process. The selection of strategies should be informed by established theories of individual (eg, patient, provider) and organizational behavior change, aligned with the preidentified barriers/facilitators that generated the need for active de-implementation efforts in the first place, and reflect the type of targeted action. Pilot data—collected within the context of a research study or from quality improvement activities—may identify patient-, provider-, health care delivery setting–, and societal-level factors that are preventing the appropriate de-implementation of an ineffective cancer treatment. Consequently, multilevel strategies targeting these multilevel barriers/facilitators should be tailored to the context to facilitate the de-implementation process and sustain its benefits.

At the patient level, examples of strategies include mailed brochures encouraging patients to talk with their provider about reducing their prescription medications (where appropriate) and embedding culturally tailored learning modules on the problem of overuse within patient portals. At the provider level, strategies may include interactive, skills-building workshops on how to communicate with patients about de-implementation; educational seminars that provide timely updates on cancer practices that may be appropriate targets for de-implementation; audit and formal feedback or report cards to help providers change their behavior; and removal of the treatment as the default setting in order sets. Strategies targeting the health care delivery setting may include leadership endorsement, organizational change interventions, and participation in quality improvement collaboratives. Societal strategies are likely the most impactful strategies to drive de-implementation, but also the most difficult to deploy. Where possible, societal strategies can be leveraged to facilitate de-implementation; examples include (but are not limited to) Food and Drug Administration warnings, mass media campaigns, or value-based reimbursement policies. Importantly, a combination of strategies is likely necessary to drive de-implementation, given that it is inherently a multilevel, complex issue requiring various levers of change at different phases in the process.

We recognize that de-implementation is a difficult enterprise, especially in dealing with one of the most feared diseases in society such as cancer. Research and practice efforts to de-implement cancer treatments, practices, and interventions may present unique challenges to application of the proposed framework. First, there are ethical and legal issues when de-implementing practices that lack solid evidence for their discontinued use. For example, what are the legal implications for institutional review boards, researchers, health care systems, and funding agencies that support de-implementing a practice if such actions are aimed at reducing practices of assumed benefit? Second, processes are needed to identify substantive changes to ratings of the quality of evidence across a range of practices and include guidance for how to change course, as indicated. Third, approaches are needed to facilitate the reintroduction of previously de-implemented treatments if new, high-quality evidence emerges supporting its use and to do so without decreasing public trust in the medical research establishment. Finally, stakeholders will need to identify effective ways to convey the importance of de-implementation without inadvertently suggesting that it represents withdrawing or withholding necessary care or is simply an effort to save money at the cost of lives.

De-implementation is an important component in refining cancer care. For the practice community, the framework provides a comprehensive pathway for identifying, prioritizing, understanding, and de-implementing inappropriate cancer treatments, practices, and interventions. For the scientific community, the framework highlights aspects of de-implementation that are ripe for research. It serves as an initial starting point for conceptualizing de-implementation and will undoubtedly be refined as empirical evidence and practice experience accumulates. Together, practice and research efforts on de-implementation will help improve the delivery of appropriate cancer care treatments, practices, and interventions to patients.


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## PRIOR PRESENTATION

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## AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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