

Evaluating the effects of healthcare programs and interventions

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Value-based Healthcare

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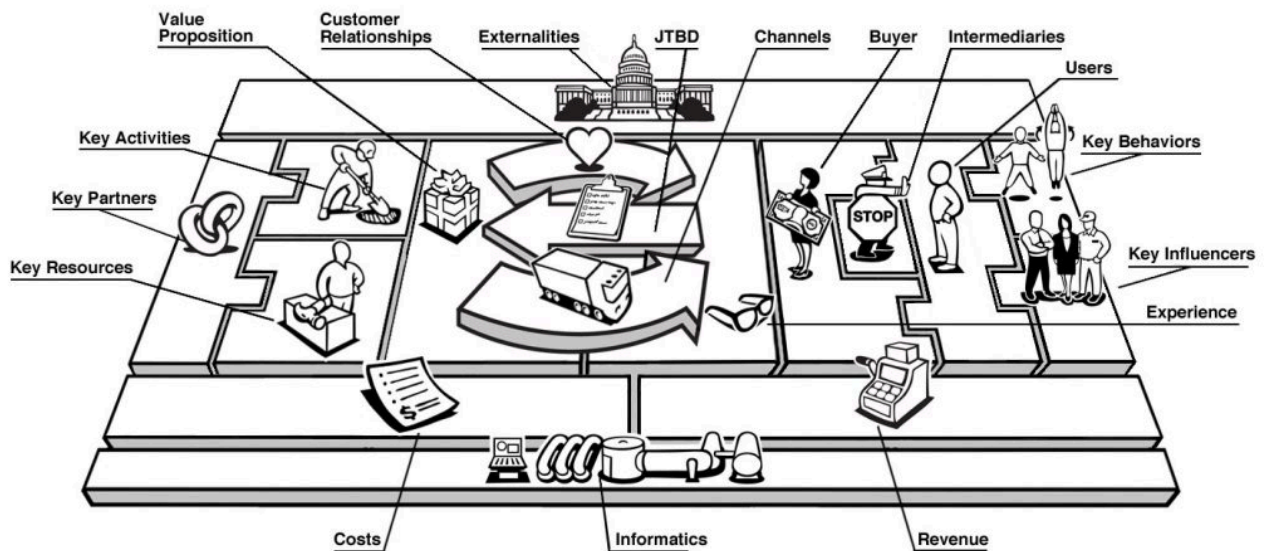
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Chapter 8: Evaluating the effects of healthcare programs and interventions

Dr Jennifer Kosiol and Dr Mark Avery



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Evaluating the effects of programs and interventions aimed at reducing low-value healthcare is essential for ensuring patient safety, improving healthcare quality, making efficient use of resources, and informing policy and clinical practice. Evaluation is a critical component in the ongoing effort to make healthcare systems more effective, efficient and patient centred. This chapter delves into the complexities of assessing the effects of such interventions, exploring the theoretical frameworks, evaluation designs and methodological considerations essential for a comprehensive evaluation. By examining the implications of low-value care on healthcare systems, providers and patients, this chapter provides insights into the importance of evaluating and improving interventions to enhance the quality and efficiency of healthcare delivery.

CHAPTER STRUCTURE

This chapter will cover the following topics:

- Low-value care evaluation
 - Prevalence and types of low-value care
 - Implications of low-value care for healthcare systems, providers and patients
- Evaluating low-value care programs and interventions
 - Why evaluation is necessary
 - Theoretical models and frameworks
 - De-implementation
- Implications for practice
 - Policy implications
 - Policy recommendations

8.1 Low-value care evaluation

The primary goal of healthcare is to benefit patients. Evaluations help ensure that care being provided is beneficial and not harmful (Owens et al., 2011). In the context of low-value care, where risks can outweigh benefits, this is critical. Effective evaluation helps to refine healthcare interventions to maximise patient safety and treatment efficacy. Low-value care refers to medical tests, procedures and treatments that provide little or no benefit to patients in specific clinical scenarios and, in some cases, may even cause harm (Colla et al., 2017). This concept extends to interventions that, when weighed against their potential risks, costs and the availability of more effective alternatives, are deemed unnecessary or inefficient. Low-value care can arise from overdiagnosis, underdiagnosis, overtreatment, undertreatment or practices that have been superseded by newer, evidence-based approaches.

Prevalence and types

Low-value care encompasses a broad spectrum of services, including diagnostic tests, medical treatments and surgical procedures (see Table 8.1). The prevalence of low-value care varies widely depending on the healthcare system, the specific types of care considered and the methodologies used for measurement.

Table 8.1: Types and examples of low-value care

Type	Example
Imaging tests	Unnecessary imaging tests for acute low back pain within the first six weeks without specific indications (O'Reilly-Jacob et al., 2019; Wami et al., 2019)
Antibiotic prescriptions	Prescribing antibiotics for viral upper respiratory infections where they are ineffective (Park et al., 2022)
Screening and testing	Overuse of screening tests in populations where the benefit is minimal such as prostate-specific antigen (PSA) testing for prostate cancer in men of certain ages (Gillette et al., 2023) or bone density (DEXA) scanning for osteoporosis in women under 65 without risk factors (Jeremiah et al., 2015)
Surgical procedures	Performing elective knee arthroscopy for osteoarthritis has been shown to have minimal benefit over conservative management (Berlin et al., 2020)

Studies across different countries and healthcare settings have reported varying rates of low-value care. For example, in the US it's estimated that a significant portion of healthcare spending is on services that do not improve patient outcomes (Owens et al., 2011).

The prevalence of low-value care in Japan was examined in a multicentre observational study involving 345,564 patients seeking care at acute care hospitals in 2019 (Miyawaki et al., 2022). The study identified 33 low-value care services occurring in 7.5 per cent of the population, which resulted in 0.5 per cent of overall annual healthcare spending. The study estimated that at least ¥100 billion (approximately US\$650 million) of medical overuse occurs annually in Japan, highlighting the considerable resources consumed by and economic impact of low-value care in the universal healthcare system.

A study in the US that focused on the prevalence of low-value prostate cancer screening in primary care clinics aimed to identify the proportion of primary care visits where low-value prostate-specific antigens (PSAs) and digital rectal exams (DREs) are ordered, as well as the characteristics associated with this practice (Gillette et al., 2023). The study found that the use of low-value PSAs and DREs was significant during the observed period, and the number of services ordered by primary care providers increased the likelihood of ordering low-value PSAs and performing low-value DREs. The study suggested that organisations looking to reduce the use of low-value prostate cancer screening should focus interventions on providers who order a high number of tests (Gillette et al., 2023).

Similarly in Germany a study that looked at the prevalence of low-value care in people with dementia found that the prevalence of low-value care was high, with 31 per cent of the study population receiving low-value care (Platen et al., 2021). The study also found that patients with dementia who received low-value care had a significantly low quality of life and were more likely to be hospitalised compared to those who did not receive low-value care.

In Australia, one study identified 156 potentially ineffective or unsafe non-pharmaceutical services listed on the Australian Medicare Benefits Schedule (Elshaugh et al., 2012). This effort, aimed at evaluating low-value care, used a multiplatform approach, including literature reviews and expert consultations. The findings serve as a basis for further clinical evaluation and prioritisation within health technology reassessment initiatives, emphasising the need for a systematic and evidence-based approach to identifying and reducing low-value care in the healthcare system.

FURTHER READING

For more detail on this Australian analysis, read the full study on the *Medical Journal of Australia* website.

[Over 150 potentially low-value health care practices: an Australian study](#)

Elshaugh, A. G., Watt, A. M., Munday, L., & Willis, C. (2012). Over 150 potentially low-value health care practices: an Australian study. *Medical Journal of Australia*, 197(10), 556–560.

Recent studies in New South Wales (NSW), Australia, have contributed significantly to the

understanding of low-value care in public hospitals (Badgery-Parker et al., 2019a). One study analysed hospital-admitted patient data across seven financial years (2010–2011 to 2016–2017), focusing on 27 procedures identified as potentially low value based on international and Australian recommendations. This study found that in the financial year 2016–2017 between 5,079 and 8,855 episodes of care were deemed low value, accounting for 11.0 per cent to 19.2 per cent of all procedures analysed. The total cost associated with these episodes of low-value care was estimated to be between A\$49.9 million and A\$99.3 million, indicating a significant financial impact on the healthcare system.

Another study investigated hospital characteristics associated with low-value care, aiming to understand factors contributing to variation in its provision (Badgery-Parker et al., 2019b). This research, which focused on seven low-value procedures, found little association between hospital characteristics and rates of low-value care, suggesting that low-value care is not a general property of hospitals in NSW. Instead, variations by procedure within hospitals were observed. The study highlighted the complexity of addressing low-value care and suggested that understanding its drivers might require examining the knowledge and attitudes of the clinicians who provide these procedures.

These findings underscore the prevalence and financial implications of low-value care for healthcare systems, providers and patients. The studies also emphasise the importance of considering procedure-specific variations and clinician-related factors in efforts to reduce low-value care.

Implications for healthcare systems, providers and patients

- **Healthcare systems:** Low-value care contributes to escalating healthcare costs without corresponding improvements in patient outcomes. It diverts resources away from high-value, necessary care, affecting the overall efficiency and sustainability of healthcare systems (Schwartz et al., 2014). Additionally, low-value care can exacerbate issues related to healthcare access and equity, as funds wasted on low-value care could be better used.
- **Providers:** For healthcare providers, engaging in low-value care can lead to professional dissatisfaction, especially when practitioners are aware of the mismatch between the care provided and the best evidence-based practices (Colla et al., 2015). It may also expose providers to increased risk of legal liability and damage to their professional reputation, especially in cases where low-value care results in patient harm.
- **Patients:** From the patient perspective, low-value care can lead to unnecessary financial burden due to out-of-pocket expenses for ineffective treatments (Colla et al., 2017). More importantly, it poses health risks, including potential side effects from unnecessary medication, complications from unwarranted procedures, and the psychological impact of overdiagnosis (Schwartz et al., 2014). It can also lead to misallocation of the patients' time and focus away from interventions that could genuinely improve their health

outcomes.

8.2 Evaluating low-value care programs and interventions

Evaluating programs and interventions designed to reduce low-value care is crucial for several reasons (see Table 8.2). Firstly, such evaluations facilitate the identification of inefficacies and inefficiencies in healthcare systems, enabling targeted improvements that enhance patient outcomes and safety. By scrutinising the effectiveness of various interventions aimed at minimising practices that offer little to no benefit to patients, healthcare providers can redirect resources towards more impactful and evidence-based care strategies (Ganguli et al., 2021). Secondly, from an economic perspective, the reduction of low-value care can lead to significant cost savings for healthcare systems, which is particularly crucial in an era of escalating healthcare expenditure (Elliott et al., 2021). These savings can then be reallocated to areas of higher need, thereby improving the overall equity and accessibility of healthcare services. Finally, evaluating these programs supports the cultivation of a culture of continuous quality improvement and evidence-based practice among healthcare professionals, fostering a more judicious use of healthcare resources (D’Avena et al., 2020). Ultimately the rigorous assessment of interventions designed to curtail low-value care is essential for advancing healthcare quality, optimising resource utilisation, and ensuring that patient care is effective and efficient.

Table 8.2: Importance of evaluating programs and interventions to reduce low-value care

Evaluation	Improvement
Effectiveness assessment	Evaluation helps determine whether specific interventions are effective in reducing the incidence of low-value care within healthcare systems. It identifies which strategies work best in particular contexts or populations, facilitating the replication of successful approaches.
Resource optimisation	By identifying the most cost-effective strategies for reducing low-value care, evaluations can guide the allocation of healthcare resources toward interventions that offer the greatest benefit in terms of improved patient outcomes and system efficiency.
Informing policy and practice	Evaluation findings can inform healthcare policy, guiding the development of guidelines, reimbursement models and quality improvement initiatives that discourage low-value practices and promote high-value care.
Enhancing patient care	Ultimately the goal of reducing low-value care is to improve patient care. Evaluations help ensure that interventions not only reduce unnecessary or harmful practices but also enhance patient satisfaction, safety and outcomes.
Continuous improvement	Evaluations provide feedback that can be used for the continuous refinement and improvement of interventions. This iterative process is essential in the dynamic field of healthcare, where new evidence and technologies constantly emerge.

Low-value care has significant negative implications for healthcare systems, providers and patients, making the evaluations of reduction efforts a critical endeavour. Such evaluations are key to ensuring that healthcare practices are aligned with the latest evidence, optimising the use of resources, and ultimately improving patient care and outcomes.

Why evaluation is necessary

The quality of healthcare delivery is closely tied to the prevalence of low-value care, which includes medical procedures and treatments that provide minimal or no benefit to patients. Such practices can detrimentally impact the overall quality of healthcare services by diverting resources away from more effective care and potentially exposing patients to unnecessary risks (D'Avena et al., 2020). To enhance healthcare quality, it is essential to evaluate interventions with the aim of discovering and reducing low-value care. These evaluations help to pinpoint ineffective or redundant practices and determine the best strategies to eliminate them. By systematically assessing and minimising health interventions, healthcare systems can ensure that the care provided is necessary and beneficial, thereby significantly improving the quality of services offered to patients. This process not only optimises patient outcomes but also contributes to the more efficient use of healthcare resources.

Patient satisfaction and trust

On the patient side, the reduction of low-value care has a direct and positive impact on patient satisfaction and trust in the healthcare system (Ganguli et al., 2021). When patients receive care that is perceived as necessary and beneficial their satisfaction with healthcare services increases. Patients tend to value treatment that is directly aligned with their health needs and outcomes, rather than care that is superfluous or ineffective. Trust in the healthcare system is bolstered when patients feel that the care they receive is based on their best interests and backed by sound medical evidence. This trust is fundamental to the patient–provider relationship and essential for the effective delivery of healthcare. Effective evaluation and consequent reduction of low-value care not only improves patient outcomes but also reinforces the confidence patients have in their healthcare providers and the system as a whole, leading to a more engaged and cooperative patient population.

Healthcare utilisation

Healthcare utilisation refers to how often and in what ways healthcare services are used by patients, and understanding its dynamics is essential in the evaluation of healthcare interventions. One of the primary goals of these evaluations is to ascertain whether efforts to reduce low-value care, which includes unnecessary or minimally beneficial treatments, results in a tangible decrease in the use of such services (Ganguli et al., 2022). This aspect of evaluation is crucial because it directly affects the efficiency and cost-effectiveness of healthcare delivery when interventions successfully reduce low-value care to the benefit of higher value services. Moreover, evaluations can reveal how the reduction

of low-value care impacts the overall demand for healthcare services, providing insights into patient behaviour and healthcare system efficiency. This understanding is pivotal for strategic planning and resource management within healthcare systems.

Clinical practice

On the frontlines of healthcare, the impact of these evaluations extends into clinical practice. The findings from evaluations guide clinicians to identify which interventions are truly effective in reducing low-value care, thereby informing and shaping clinical guidelines (Ganguli et al., 2022). This information is integral for healthcare providers in order to understand and implement best practices in patient care. By highlighting which practices are low value and which are beneficial, evaluations help in educating clinicians about the most effective and efficient ways to treat patients. This leads to a more evidence-based approach to patient care, ensuring that treatments are not only necessary but also beneficial for patient health. Consequently, informed clinical practice based on evaluation findings not only improves patient outcomes but also enhances the overall quality and sustainability of healthcare services.

Economic sustainability

Evaluating interventions aimed at reducing low-value care plays a crucial role in ensuring the long-term financial sustainability of healthcare systems. This process is vital in identifying and eliminating wasteful expenditures on healthcare services that are not beneficial, or in some cases, even harmful to patients (Ganguli et al., 2022). By focusing resources away from unnecessary care, healthcare systems can more effectively allocate their budgets towards treatments and interventions that offer real value and better health outcomes. This prudent allocation of resources is especially important in the context of rising healthcare costs and the challenges posed by ageing populations, which place additional strains on healthcare budgets. Effective evaluation and management of low-value care, therefore, not only improves patient care but also contributes significantly to the economic health and sustainability of the healthcare system, ensuring that it can continue to meet the needs of its population over time.

Innovation and continuous improvement

The process of evaluating healthcare interventions is a key driver of innovation and continuous improvement within the healthcare sector. By regularly assessing the effectiveness of different healthcare practices, evaluations highlight areas that require improvement, thereby fostering a culture of evidence-based practice among healthcare professionals (Grimshaw et al., 2020). This ongoing process of evaluation and adaptation encourages healthcare systems and providers to continuously refine their practices, seeking more effective, efficient and patient-centred approaches to care. As healthcare needs and technologies evolve, this culture of continuous improvement ensures that healthcare systems remain dynamic and responsive, constantly striving to provide the highest quality

of care. Evaluation not only helps to maintain current standards of care but also acts as a catalyst for future advancements and innovations in healthcare.

Theoretical models and frameworks

To effectively identify and address low-value care, people involved in clinical decision-making, resource allocation and directing services should use theoretical frameworks and targeted evaluation strategies to differentiate necessary from unnecessary care and reallocate resources appropriately (Grimshaw et al., 2020). This section explores the applicability of theoretical frameworks and applied economics approaches to evaluating low-value care.

Theoretical approaches play a crucial role in tackling the challenges of reducing low-value care by offering a comprehensive method for understanding and addressing this issue. These approaches help to identify the key determinants that drive the use of low-value care, such as healthcare provider behaviours, healthcare system structures and existing gaps in knowledge (Grimshaw et al., 2020). With a thorough understanding of these underlying factors, theoretical frameworks and economic evaluation methodologies enable the formulation of precise strategies aimed at overcoming specific obstacles to the reduction of low-value care. Additionally, they enhance the ability to predict the outcomes of interventions designed to minimise low-value care, thereby increasing the likelihood of achieving effective and lasting improvements. Moreover, by providing a structured method for enacting changes in healthcare practices, theoretical models support stakeholders through the complex process of de-implementation and facilitating enduring behavioural adjustments in healthcare delivery.

The evaluation of healthcare interventions, particularly those aimed at reducing low-value care, benefits significantly from structured theoretical frameworks. Each provides a comprehensive approach to assessing interventions but from slightly different perspectives.

RE-AIM framework

The RE-AIM framework is particularly useful in evaluating and planning health interventions to reduce low-value care. The acronym stands for ‘reach, effectiveness, adoption, implementation and maintenance’, which combined determine public health impact:

- **Reach** assesses the extent to which a low-value care reduction initiative can engage the target population (Holtrop et al., 2021), especially those who benefit the most from reducing low-value care practices. It involves assessing the demographics and characteristics of the participants to ensure inclusivity and equity.
- **Effectiveness or efficacy** measures the impact of the intervention on important outcomes, including unintended adverse effects, reductions in low-value care practices and improvements in patient health outcomes. This dimension assesses whether the

intervention achieves its intended goals in real-world settings.

- **Adoption** by target settings or institutions looks the uptake of the intervention among healthcare providers and settings. For low-value care reduction efforts, it evaluates how widely and readily healthcare institutions and practitioners adopt strategies or tools aimed at minimising low-value practices.
- **Implementation** examines the intervention's fidelity and any modifications made during delivery. This includes assessing the consistency, cost and adaptability of reducing low-value care practices across different settings.
- **Maintenance** evaluates the extent to which the intervention becomes part of routine organisational practices and policies, including whether reductions in low-value care practices are sustained over time.

This comprehensive approach helps to identify which aspects of an intervention work well and which need adjustment, facilitating more effective and sustainable low-value care reduction efforts (D'Lima et al., 2022).

Consolidated Framework for Implementation Research

The Consolidated Framework for Implementation Research (CFIR) offers a systematic approach to addressing the multifaceted barriers to reducing low-value care. It encompasses five domains: intervention characteristics, outer setting, inner setting, characteristics of individuals and the implementation process (Safaeinili et al., 2020).

By evaluating these domains, the CFIR framework helps to identify critical factors that influence the successful implementation of low-value care reduction initiatives, allowing for tailored strategies that address specific barriers and facilitators within a given context.

The CFIR offers a comprehensive taxonomy of operationally defined constructs that influence the effectiveness of implementation interventions (Damschroder et al., 2022). It is organised into five major domains:

1. **Intervention characteristics:** considerations include the evidence strength and quality supporting the intervention, and adaptability, cost and complexity. For low-value care reduction, this involves evaluating how the intervention's design and features contribute to its effectiveness.
2. **Outer setting:** encompasses external factors like patient needs and resources, incentives and pressures from external sources. It looks at how external policies and incentives for reducing low-value care affect adoption and sustainability.
3. **Inner setting:** focuses on internal organisational characteristics, including the culture, implementation climate and readiness for implementation. This domain assesses how

healthcare organisations' internal environments support or hinder the reduction of low-value care.

4. **Characteristics of individuals:** involves the individuals involved in the intervention, including their personal attributes, beliefs about the intervention and self-efficacy. This domain evaluates how healthcare providers' attitudes and beliefs towards low-value care and its reduction influence the intervention's success.
5. **Implementation process:** examines the process itself, including planning, engaging, executing, and reflecting and evaluating. For low-value care reduction, this involves assessing how the intervention is implemented, the involvement of key stakeholders, and the use of feedback loops to refine and improve the intervention.

The logic model

The logic model is a tool that visually represents the relationships between resources, activities, outputs and outcomes of a program aimed at reducing low-value care. It helps planners and evaluators understand how an intervention is supposed to work and what it aims to achieve. By outlining the inputs (e.g. financial, human resources) and linking them to short-term and long-term goals, the logic model facilitates a clear understanding of the pathways through which change is expected to occur. It also serves as a critical framework for evaluating the effectiveness of low-value care reduction efforts, enabling stakeholders to measure progress towards objectives and identify areas for improvement (Smith et al., 2020).

The logic model is a powerful tool for evaluating low-value care in healthcare systems, serving multiple functions that enhance the effectiveness and efficiency of healthcare services (Smith et al., 2020). Here's how it can be particularly useful:

1. **Clarifying program objectives:** the logic model helps to clearly define the objectives of interventions aimed at reducing low-value care. By outlining expected outcomes, it ensures that all stakeholders have a shared understanding of the program's goals.
2. **Structuring evaluation:** the model provides a framework for structuring the evaluation of low-value care interventions. By identifying inputs, activities, outputs, outcomes and long-term impacts, the logic model helps to pinpoint where evaluations should be focused to determine effectiveness.
3. **Identifying performance indicators:** through the logic model, specific indicators for performance can be identified at different stages of the intervention. These indicators are crucial for measuring progress towards reducing low-value care, allowing for ongoing monitoring and adjustment of strategies.
4. **Enhancing communication:** the model serves as a communication tool among stakeholders, including healthcare providers, policymakers and funders. By visualising

the process and expected outcomes of interventions, the logic model facilitates better understanding and support across different groups.

5. **Facilitating accountability:** by mapping out the sequence from inputs to outcomes, the logic model holds parties accountable for their roles in implementing interventions. It makes it easier to track whether resources are being used as intended and whether the interventions are producing the desired effect on reducing low-value care.
6. **Supporting continuous improvement:** the feedback loops within a logic model encourage continuous improvement. By regularly reviewing outcomes and impacts against objectives, healthcare organisations can iteratively refine their approaches to minimising low-value care.
7. **Aiding in resource allocation:** the model helps to rationalise the allocation of resources by highlighting the most critical activities and inputs required to achieve the desired outcomes. This can lead to more efficient use of funds and effort, directing them towards areas with the highest impact on reducing low-value care.

Theoretical Domains Framework

The Theoretical Domains Framework (TDF) consists of 14 domains that are designed to cover a wide range of factors influencing healthcare professionals' behaviours (Michie et al., 2005). These domains are derived from psychological and organisational theories to provide a comprehensive understanding of behaviour change.

1. **Knowledge:** awareness or understanding of the guideline or evidence
2. **Skills:** the ability to perform the behaviour
3. **Social/professional role and identity:** beliefs about the nature of one's job, responsibilities and engagement in the professional role
4. **Beliefs about capabilities:** confidence in one's abilities to perform the behaviour (self-efficacy)
5. **Optimism:** belief about the outcomes of the behaviour being positive
6. **Beliefs about consequences:** beliefs about the outcomes of the behaviour, including potential risks and benefits
7. **Motivation and goals:** the process of making a conscious decision to perform a behaviour or a goal that directs behaviour
8. **Memory, attention and decision processes:** the mechanisms for encoding, storing and retrieving information, and how attention and decision-making processes affect behaviour
9. **Environmental context and resources:** the environment and contextual factors that can support or hinder behaviour, including resources, barriers and facilitators

10. **Social influences:** the influence of others on behaviour, including social norms, support and pressure
11. **Emotion:** how feelings, emotions and mood influence behaviour
12. **Behavioural regulation:** strategies and processes to manage or change one's behaviour, including planning, self-monitoring and feedback
13. **Nature of the behaviours:** beliefs about the behaviour itself, including its complexity, the time it takes and its habitual nature
14. **Nature of the knowledge:** specifics about the knowledge required to perform the behaviour, distinguishing between different types of knowledge that may influence behaviour in different ways

Each domain can be targeted with specific interventions to address barriers or leverage facilitators to change healthcare professionals' behaviours, particularly in efforts to reduce low-value care (Michie et al., 2005). By assessing these domains in the context of specific behaviours, interventions can be more effectively designed and implemented to promote evidence-based practices and improve patient care outcomes.

The theory of planned behaviour

The theory of planned behaviour (TPB) is a psychological theory that aims to explain human action in specific contexts, based on the idea that intention toward behaviour, subjective norms and perceived behavioural control influence behaviour (Manstead & Parker, 1995). Its application in evaluating low-value care can provide insights into the reasons behind healthcare professionals' adherence to or departure from recommended practices (Takeshita et al., 2021). TPB explores intention, subjective norms and perceived behavioural control:

1. **Intention:** according to TPB, the most important determinant of behaviour is the intention to perform it. In the context of low-value care, this would involve a healthcare provider's intention to follow or not follow guidelines that identify low-value practices. Understanding the factors that influence these intentions can help in designing interventions to promote the reduction of low-value care.
2. **Subjective norms:** these are the perceived expectations of significant others, such as colleagues, patients and the broader medical community, regarding the behaviour in question. In terms of low-value care, if healthcare professionals perceive that important others believe they should avoid low-value practices, they may be more inclined to do so.
3. **Perceived behavioural control:** is the perceived ease or difficulty of performing the behaviour, influenced by experience and anticipated obstacles. In evaluating low-value care, understanding the perceived barriers and facilitators to avoiding low-value practices can inform targeted strategies to support behaviour change.

TPB can be used to develop surveys or interviews to assess healthcare providers' attitudes, norms and control beliefs about using or avoiding low-value care. Analysing these factors can help identify key leverage points for intervention, such as increasing awareness about the lack of benefit (or harm) of certain practices, altering perceived norms by influencing opinion leaders or through educational campaigns, or enhancing perceived control by providing resources or changing system-level barriers. By understanding the predictors of intention and behaviour as outlined by TPB, healthcare organisations and policymakers can design more effective interventions aimed at reducing low-value care, ultimately improving patient outcomes and resource utilisation.

The COM-B model

The COM-B model (capability, opportunity, motivation and behaviour) is a comprehensive framework for understanding behaviour change (Michie & West, 2013). It suggests that behaviour (B) results from an interaction between an individual's physical and psychological capabilities (C), their physical and social opportunities (O), and their reflective and automatic motivations (M). Capability refers to an individual's psychological and physical capacity to engage in the activity concerned, including having the necessary knowledge and skills. Opportunity encompasses all the factors that lie outside the individual that make the behaviour possible or prompt it, including environmental factors, social context and resources. Motivation covers the brain processes that direct behaviour, including habits, emotional responses, decision processes and analytical thinking.

In the context of evaluating low-value care, the COM-B model can be used to identify why healthcare professionals continue to provide care that is known to be of low value or why they struggle to adopt high-value care practices. For example:

- **Capability:** a provider might lack knowledge about current evidence-based practices or have insufficient skills to implement alternative, higher value interventions.
- **Opportunity:** the healthcare system or organisational context might not support changes in practice due to lack of resources, existing policies or cultural norms that favour the status quo.
- **Motivation:** providers may have personal beliefs or biases that favour certain interventions, regardless of their value, or they may be influenced by patients' expectations or demands for specific treatments.

Understanding these factors can help in designing targeted interventions to change behaviour. For instance, educational programs can enhance capability, changes in healthcare policies or environments can alter opportunities, and addressing beliefs and attitudes can influence motivation (Parker et al., 2022).

By applying the COM-B model to the issue of low-value care, healthcare organisations and policymakers can develop more nuanced and effective strategies for promoting the adoption of

evidence-based, high-value care practices among healthcare professionals, ultimately improving patient outcomes and efficiency within the healthcare system.

Normalisation process theory

Normalisation process theory (NPT) is a conceptual framework developed to understand the factors that support or inhibit the implementation, embedding and integration of new practices or innovations in healthcare settings (Murray et al., 2010). It provides a structured way to evaluate how new practices become normalised, focusing on the work individuals and groups do to make them routine parts of everyday practice. NPT is structured around four core constructs:

- **Coherence (or sense-making):** how people understand the new practice, its purpose and its value. In the context of low-value care, this could involve understanding why certain practices are considered low-value and recognising the need to change or eliminate these practices.
- **Cognitive participation (or engagement):** the relational work people do to build and sustain a community of practice around the new practice. For reducing low-value care, it involves healthcare professionals engaging with each other, policymakers and patients to support the de-adoption of low-value practices.
- **Collective action:** the operational work required to enact the new practice, including the allocation of resources, adjustments to existing workflows and technology use . In evaluating low-value care, it looks at how changes are implemented in clinical settings to reduce low-value practices.
- **Reflexive monitoring:** the appraisal work individuals and groups do to assess and understand how the new practice affects them and others around them. This could involve healthcare providers assessing the impact of reducing low-value care on patient outcomes, costs and their professional practice.

NPT is particularly useful in evaluating low-value care because it provides a comprehensive framework to understand not just the practical aspects of change (like how to reduce low-value care) but also the social processes that underpin these changes. It helps to identify why certain low-value practices persist despite evidence against them and what factors might facilitate their reduction or elimination (Murray et al., 2010). By applying NPT, researchers and healthcare organisations can gain insights into the complexities of changing established clinical practices. It helps in designing interventions that are not only technically sound but also socially feasible, promoting sustainable change towards high-value care. Through NPT, the focus is not only on the ‘what’ of the changes needed but also on the ‘how’ and ‘why’ aspects, ensuring a deeper understanding and more effective strategies for implementing and sustaining these changes.

Application to low-value care reduction efforts

These theoretical frameworks can be applied to the evaluation of low-value care reduction efforts by providing a structured approach to assess interventions comprehensively. They allow researchers and practitioners to consider a broad range of factors that influence the success of these interventions, from the characteristics of the intervention itself to the broader organisational and external environments in which they are implemented. By using these frameworks and theories, evaluators can identify not only whether an intervention was effective but also understand why it was successful or where it fell short, thereby informing future efforts to reduce low-value care in healthcare settings.

De-implementation

De-implementation in the context of low-value care refers to the process of intentionally discontinuing or reducing the use of medical practices, interventions or procedures that are proven to be ineffective, unlikely to provide benefit, or may even cause harm to patients (Verkerk et al., 2018). These are practices that, through rigorous evaluation and evidence, have been identified as not delivering sufficient value for the cost or for the potential risks they pose to patients. However, care deemed to be of low value is not universally so in every context. When addressing low-value care we must consider several elements to formulate successful strategies for its de-implementation (see Table 8.3).

Table 8.3: Elements for consideration of de-implementation

Element	Description
Identifying the underlying causes of low-value care	Recognising the different types of low-value care, such as ineffective care, inefficient care and unwanted care, can help tailor strategies to address specific issues.
Customising approaches based on the specific context of the low-value care	Considering the unique circumstances surrounding each low-value area is crucial for successful de-implementation efforts.
Integrating patient preferences and values	Acknowledging that the provision of care not aligned with patient preferences can lead to unwanted interventions and emphasises the critical role of shared decision-making and effective communication in mitigating low-value care.
Acknowledging the complexities of enacting sustainable change	De-implementation efforts demand perseverance, substantial time investment and resources to navigate obstacles and achieve lasting positive outcomes in healthcare delivery.
Accounting for environmental influences	The impact of local organisational structures, cultural norms, resource availability and financial incentives can influence the success of de-implementation strategies.

Source: Verkerk et al. (2018)

By incorporating these elements, healthcare professionals, decision-makers and scholars can devise bespoke strategies that effectively minimise low-value care, thereby enhancing the overall quality and efficiency of health services.

The goal of de-implementation is to reduce or eliminate low-value care practices in healthcare. De-implementation aims to address the overuse of unnecessary or ineffective healthcare interventions that do not benefit patients and may even cause harm. By identifying and removing low-value care practices, healthcare systems can improve the quality and safety of care, reduce costs and enhance overall patient outcomes. De-implementation efforts seek to promote evidence-based practices, optimise resource allocation, and ensure that patients receive care that is truly beneficial and aligned with their preferences (Verkerk et al., 2018; Wang et al., 2018).

Active steps for de-implementation

The concept of de-implementation acknowledges that simply identifying low-value care is not enough; active steps must be taken to eliminate or reduce such practices:

- **Identification of leaders in de-implementation:** understand the characteristics of leaders in de-implementation to help find clinical champions who can drive de-implementation initiatives forward. This involves identifying individuals with specific personal characteristics or those with high outcome expectancy and motivation (van Bodegom-Vos et al., 2017).
- **Evidence-based practice:** ensure that that decision to de-implement care is based on strong evidence indicating its ineffectiveness or potential to harm. Use current research, clinical guidelines and data to support the de-implementation process (Wang et al., 2018).
- **Engagement:** engage healthcare providers, patients and other stakeholders in understanding the need to move away from these practices. This can involve educational campaigns, discussions and presenting evidence illustrating the lack of value or potential harm of the practices in question. Engaging stakeholders from the beginning fosters collaboration and support for change (Wang et al., 2018).
- **Clear communication:** communicate transparently with stakeholders about the reasons for de-implementation, the expected outcomes and the timelines . Clear communication builds trust and understanding among stakeholders (Wang et al., 2018).
- **Strategy development:** develop and implement strategies to facilitate the removal of low-value practices from routine care. Strategies can vary widely, from changing reimbursement policies to discourage certain practices to incorporating decision support tools into electronic health record systems or revising clinical guidelines to exclude low-value care (van Bodegom-Vos et al., 2017).

- **Monitoring and evaluation:** continuously monitor the process of de-implementation to assess its impact on healthcare delivery and patient outcomes. This includes evaluating whether discontinuing low-value practices leads to the adoption of higher value alternatives and ensuring that de-implementation does not inadvertently lead to the neglect of necessary care. Factors for measuring process outcome include feasibility, fidelity, cost, penetration and sustainability of the de-implementation efforts (Prusaczyk et al., 2020).
- **Feedback and adaptation:** provide feedback to healthcare providers and systems on the progress of de-implementation efforts and make necessary adjustments to strategies based on observed outcomes and feedback (Wang et al., 2018).

De-implementation challenges include overcoming inertia in clinical practice, addressing financial and professional incentives that may support low-value care, and navigating patient expectations and demands. Effective de-implementation requires a multifaceted approach, combining evidence-based policy, education and system-level changes to shift healthcare practices towards more valuable, patient-centred care.

8.3 Case studies

Case 1: Choosing Wisely Australia

Choosing Wisely Australia, initiated by NPS MedicineWise in 2015 and backed by health professional bodies, fosters national discussion on avoiding unnecessary medical tests, treatments and procedures. It promotes healthcare that is evidence-based, non-redundant, safe and necessary, challenging the belief that more care is always better (O’Callaghan et al., 2015). The campaign encourages the use of theoretical models and frameworks to evaluate and address low-value care. For example, TDF is noted for its relevance in interventions that target professional practice and organisational behaviour change.

Choosing Wisely promotes improved dialogue between clinicians and consumers regarding necessary care, driven by six core principles focused on evidence-based, transparent and -improved practices. Recommendations developed by healthcare professionals provide a foundation for reducing unnecessary healthcare practices.

The campaign’s success highlights the power of provider and patient education in reducing low-value care. A key factor was the use of clear, evidence-based recommendations developed by professional societies, making it easier for providers to discuss and justify care decisions with patients. However, impact varied across different practices and regions, indicating the need for local implementation strategies and the importance of measuring and reporting outcomes.

Case 2: Royal Children’s Hospital

The Royal Children’s Hospital Melbourne is involved in reducing its conception of low-value care, focusing on unnecessary practices that provide little benefit, may cause harm or are costly. The Health Services Research Unit supports initiatives like the EVOLVE project by the Royal Australasian College of Physicians, which identifies low-value treatments in child health. It focuses on creating lists of treatments that should not be routinely performed, based on evidence and expert consensus, and uses a variety of behaviour change models and frameworks to create sustainable change and reduce low-value care. The goal is to improve patient care by eliminating unnecessary and potentially harmful interventions, promoting more sustainable healthcare practices. This is part of broader efforts to ensure healthcare is sustainable by focusing on effective, necessary treatments.

8.4 Unsuccessful case studies

Reducing antibiotic prescriptions for acute respiratory infections

Despite guidelines recommending against the use of antibiotics for most acute respiratory infections), overprescription remains a problem in many settings. This is largely due to interventions being solely focused on provider education without addressing patient expectations or system-level incentives (Barlam et al., 2016). This highlights the need for multifaceted approaches that include patient education, provider feedback mechanisms and potentially system-level changes to reduce the perceived need for prescribing.

Routine daily lab testing in hospitalised patients

Routine daily laboratory tests for hospitalised patients without specific indications represent a common low-value practice. Efforts to reduce this practice often face challenges related to ingrained routines and the perceived safety net of frequent testing (Eaton et al., 2017). Unsuccessful interventions have pointed to the need for strong leadership support, cultural change within institutions and mechanisms that make it easier to follow new protocols, such as changes to order sets in electronic health record systems.

8.5 Implications for practice

Evaluating low-value care programs and interventions has taught us the importance of robust evidence-based practice, effective communication and adaptive healthcare policy. Successes demonstrate the potential for improving patient care and reducing unnecessary costs when interventions are critically assessed and updated. Failures often highlight systemic barriers such as resistance to change, the complexity of disentangling financial incentives, and the challenge of aligning healthcare provider and patient expectations with best practices. These lessons underscore the need for ongoing education, transparent policymaking and a culture that embraces evidence over habit or convenience (Roski et al., 2014). Examples of success strategies, and some of their complexities, include:

- **Provider and patient education:** effective in increasing awareness but must be coupled with actionable tools and system-level support for sustained change
- **System-level incentives and supports:** critical for enabling and sustaining practice change; misaligned incentives can undermine interventions
- **Tailored interventions:** strategies need to be adapted to specific contexts, healthcare settings and target populations for maximum effectiveness
- **Measurement and feedback:** ongoing measurement of intervention impact and regular feedback to providers are key components of successful programs
- **Cultural and behavioural change:** addressing underlying cultural norms and behaviours within healthcare settings is essential for reducing low-value care
- **Maintaining a patient-centred approach:** reducing low-value care emphasises the role of the patient as an active participant in their care, promoting informed choice and shared decision-making

These examples underscore the complexity of reducing low-value care and the need for comprehensive, contextually adapted strategies that address the multifaceted drivers of healthcare provider behaviour and healthcare system dynamics.

Policy implications

The evaluation of interventions aimed at reducing low-value care yields significant insights with broad policy implications. These findings can inform strategies for healthcare policymakers, providers and institutions, guiding the development of effective, scalable interventions that enhance

care quality and efficiency (Colla et al., 2015; Schwartz et al., 2014). Below is an analysis of these policy implications and recommendations for various stakeholders.

- **Cost savings and resource allocation:** evaluations often reveal that reducing low-value care can lead to substantial cost savings and more efficient use of healthcare resources (Pandaya, 2018). Policymakers must consider reallocating these savings to areas of greater need, improving overall healthcare system sustainability.
- **Quality of care:** findings typically indicate that eliminating low-value interventions does not harm patient outcomes and may even improve them by reducing exposure to unnecessary risks. This underscores the need for policies that prioritise patient safety and quality of care over the volume of services provided.
- **Health equity:** evaluations may highlight disparities in the impact of low-value care reduction interventions across different populations. Policies should address these disparities to ensure that efforts to reduce low-value care improve health equity rather than exacerbate existing inequities.
- **Provider behaviour and incentives:** insights into how healthcare providers respond to interventions suggest that traditional fee-for-service models may incentivise low-value care. Policymakers should consider alternative payment models that align provider incentives with the delivery of high-value, patient-centred care.

Policy recommendations

- **Support evidence-based policymaking:** encourage the use of data from evaluations in policy development. Invest in ongoing research to identify and understand low-value practices and effective interventions for reducing them (Chalmers et al., 2018).
- **Implement alternative payment models:** transition from fee-for-service to value-based payment models that reward providers for quality, not quantity, of care. Models could include bundled payments, accountable care organisations or pay-for-performance schemes.
- **Promote transparency and patient engagement:** develop policies that enhance transparency about the benefits, risks and costs of treatments. Support initiatives that empower patients to make informed decisions about their care.
- **Address health disparities:** ensure that policies aimed at reducing low-value care do not inadvertently limit access to necessary services for underprivileged populations. Monitor and evaluate the impact of these policies on different demographic groups (Kim et al., 2021).

For healthcare **providers** (Chalmers et al., 2018):

- **Foster a culture of high-value care:** emphasise the importance of reducing low-value care in training and continuing education. Encourage clinical decision-making that considers the latest evidence, patient preferences and the potential value of interventions.
- **Use decision support tools:** implement clinical decision support systems in electronic health records that alert providers to potential low-value care and suggest alternatives based on best practices and evidence.
- **Engage in shared decision-making:** adopt shared decision-making approaches that involve patients in care decisions, using decision aids where appropriate to facilitate understanding of options.

For healthcare **institutions** (Chalmers et al., 2018):

- **Incorporate low-value care reduction into quality improvement:** make the reduction of low-value care a key component of quality improvement initiatives. Use data analytics to identify areas for improvement and track the impact of interventions.
- **Support provider education and training:** provide resources and opportunities for healthcare providers to learn about identifying and reducing low-value care, including workshops, seminars and access to current research.
- **Create incentive structures:** develop incentive structures that reward providers for reducing low-value care and improving patient outcomes, aligning institutional goals with the delivery of high-value care.

By implementing these recommendations, policymakers, healthcare providers and institutions can effectively address the challenges identified in evaluations of low-value care reduction interventions, enhancing healthcare quality, efficiency and equity.

8.6 Conclusion

This chapter highlighted the criticality of evaluating interventions targeting the reduction of low-value care to enhance healthcare quality, patient safety and system sustainability. Key takeaways include the necessity of robust evaluation frameworks, the role of economic analyses in understanding cost implications, and the importance of addressing systemic and behavioural aspects to effect change. This prompts further reflection on how healthcare systems can more effectively integrate and prioritise evaluations to foster a culture of high-value, patient-centred care.

ACTIVITY

1. Reflect on how the evaluation of low-value care interventions can impact patient outcomes and healthcare efficiency.
2. Find one study on evaluating low-value care interventions and summarise its key findings in a few sentences.
3. A hospital implements a new protocol to reduce unnecessary tests. What evaluation method would you choose to assess its impact?

8.7 References

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