



Setting a research agenda for medical overuse

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ANALYSIS



Setting a research agenda for medical overuse

Although overuse in medicine is gaining increased attention, many questions remain unanswered. **Dan Morgan and colleagues** propose an agenda for coordinated research to improve our understanding of the problem

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Overuse of medical services is common.¹⁻⁵ In the United States, overuse represents as much as 30% of provided services⁵⁻⁹ and has been associated with worse outcomes and death.^{6 10} The problem has existed for decades,¹⁻¹² but despite heightened recognition in recent years¹³⁻¹⁸ many gaps remain in our basic understanding of its scope, drivers, and potential for harming patients physically, mentally, and financially. Recent efforts on overuse include a joint statement by the American Board of Internal Medicine and Academy Health calling for improved definitions of medical overuse,¹⁹ and the Robert Wood Johnson Foundation recommended changes in state policy to reduce overuse.²⁰

Although the Agency for Healthcare Research and Quality (AHRQ) sponsored a report on medical overuse in 2009, this report did not delineate a framework for research.²¹ Research into overuse remains poorly coordinated and terms such as overuse, overdiagnosis, and low value care are all used to describe various interpretations of the concept. Without a common language or conceptual framework to connect research efforts and objectives, understanding of overuse will remain fragmented and limit our ability to make healthcare safer, less expensive, and more patient centered. Calls have been made for a research agenda.^{22 23} This article provides a conceptual framework organizing the current research on overuse and formulating a research agenda. It reflects the consensus opinions of a working group of clinicians and researchers convened by the Lown Institute in December 2013.

What do we know about overuse?

Definitions

The Institute of Medicine and others have defined overuse as “care in the absence of a clear medical basis for use or when the benefit of therapy does not outweigh risks.”^{8 24} Closely related terms for overuse, often used as synonyms include overutilization, overmedicalization, and low value care.²⁵ Other related concepts include overdiagnosis—the diagnosis of conditions that will never cause symptoms or harm during a patient’s lifetime^{2 26}—and overtreatment—treatment that “according to sound science and the patient’s own preferences, cannot possibly help.”¹⁹ Figure 1↓ shows the relation between overdiagnosis, overtreatment, and overuse.

Frequency of overuse

Estimates of the scope of overuse vary from 10% to 30% of all care depending on the definition and method used (surveys of physicians^{27 28} or patients⁶ or claims data⁷⁻²⁹). Claims data have been used in “top down” approaches to identify geographic regions that use more surgery, hospitalization, and medical care. Such excess care has been associated with higher risk adjusted mortality.¹⁰⁻³⁵ Recently, administrative data have been used to measure use of “do not do” practices.²⁹ Most articles on overuse have examined outcomes that follow screening or diagnostic tests or discrete treatments.¹⁻³⁶ These investigations have identified potential overuse and established an evidence based

case for reversing standard practice, or “de-implementation” in many areas of medicine such as the routine use of proton pump inhibitors,³⁷ surgery for various orthopedic conditions,³⁸ estrogen replacement therapy,³⁹ vertebroplasty,⁴⁰ and inappropriate cardiac catheterizations.⁴¹ Recognition of such overuse requires the ability to identify when current evidence shows an intervention offers little or no benefit.⁴² Recent efforts to define overuse in cancer screening have identified the best methods to quantify overuse.⁴³

Factors promoting overuse

Many factors contribute to overuse (table 1).⁴⁴⁻⁴⁵ Some relate primarily to patients, others to providers. Some factors relate more to intrinsic (patient or provider beliefs) and others to extrinsic pressure (related to healthcare systems). The relative importance of different causes of overuse is unknown.

Effect of overuse

The full effect of overuse on patients and health systems remains unknown.⁶⁷ Clear patient harms have been identified from practices such as screening for breast, prostate, and thyroid cancer.⁶⁸⁻⁶⁹ Similarly, magnetic resonance imaging for uncomplicated back pain can lead to surgery that poses net harm to patients.¹ The risk of harm from overuse varies depending on the disease, its treatment, and the rate of overuse of the therapy. Unnecessary treatment burden (the activities required of patients to access and use care and navigate complex healthcare systems) is an additional negative consequence of overuse.⁷⁰⁻⁷¹

Strategies to mitigate overuse

Various approaches focusing on patients, providers, or system changes have been used in an attempt to limit overuse and have had varying success. Efforts to promote patient engagement, such as shared decision making, may reduce overuse.³⁰⁻⁷⁵ At the provider level, some clinical practice guidelines have become less aggressive in their treatment recommendations.⁷⁶⁻⁷⁸ Provider groups have also developed lists of clinical interventions that offer little net benefit (low value lists).¹³⁻⁴⁰ Expanded understanding of the number needed to treat (NNT) has been proposed as a way to discuss overtreatment.⁷⁹

At the system level, tools to limit overuse may include constraining resources through regulatory mechanisms such as Certificates of Need and insurance mandated preapprovals; regulating access to testing and treatment⁸⁰⁻⁸¹; global payment contracts (such as accountable care organizations) or strategies that increase patient cost sharing (such as high deductible health plans); changing reimbursement and care models to prioritize primary care; and robust assessment for new and existing medical technology. The effect of such changes on overuse, however, is largely understudied.⁵¹

Research agenda for medical overuse

Although definitions related to overuse and understanding of its frequency and causes have advanced, we still need research to answer fundamental questions related to overuse to improve patient care (box). Below we discuss these in more detail.

Measure the frequency of overuse

Develop agency(ies) to monitor overuse of diagnoses and treatments—Frequency of overuse has generally been identified retrospectively in only a few specific clinical areas. Given the importance of overuse, development of national agencies (or

initially, branches within an agency) with authority similar to the US or European Centers for Disease Control and Prevention is a priority to monitor for “outbreaks” in use of diagnostic and treatment methods and variation in routine care. Surveillance of diagnostic billing codes and use of tests and therapies could be developed with appropriate methods for defining rates that account for changes in costs, reimbursements, and new tests. Such agencies could provide real time monitoring as well as annual descriptions of changes in rates of overuse along with potential contributing factors.

Define the scope of overdiagnosis and overtreatment—Although frequent overdiagnosis has been well described in cancer screening programs²⁻⁸² the overall frequency of inappropriate testing, overdiagnosis, and false positive results (and subsequent overtreatment) in other contexts is not well described (such as in ambulatory care or hospital medicine). Full assessment of the problem of overuse is another priority and would likely best be done using observational methods and patient level or administrative data.

Capture clinical information in administrative data to allow better assessment of overuse—Large scale measurement of overuse requires better means of evaluating administrative data. Current analysis of administrative data is retrospective and usually does not include sufficient clinical detail to assess appropriateness of care.²⁹ Real time administrative data with better methods for risk adjustment and understanding geographic variation are needed.³⁴

Identify factors promoting overuse

Identify the most important drivers of overuse—Although many factors contribute to overuse (table 1), there has been little exploration of the relative importance of these causes, how they interact, or the potential value of changing any single factor (such as malpractice tort reform or changes in reimbursement). Research should attempt to rank the relative importance of factors contributing to overuse. This would likely entail quasiexperimental analyses of changes in policies that relate to overuse.

Understand and communicate limitations in diagnostic testing—While diagnostic testing is essential to medicine,⁸³⁻⁸⁵ understanding of pretest probability, the frequency of false positives results, overdiagnosis, incidental findings, and subsequent treatment cascades, and a general approach to managing such results is needed. Ultimately, studies of tests that go beyond sensitivity or specificity and evaluate their impact on patient outcomes are needed.⁸⁶⁻⁸⁷ Methods for such studies include cohort, quasiexperimental, and randomised trial approaches and economic analyses.

Explore how clinical uncertainty and cognitive biases may lead to overuse—Uncertainty is inherent in medicine and is a driver of overuse.⁵²⁻⁸⁴ We have limited understanding, however, of how providers experience uncertainty and how this affects clinical decisions. Research using surveys and qualitative and quasiexperimental approaches is needed to evaluate how uncertainty and cognitive biases result in clinical decisions.⁸⁷

Measure the effect of overuse

Study the physical and psychological harm of overuse on patients—Much of the research on harm from overuse has focused on populations and used administrative data, which cannot quantify many types of harm.¹⁰ Patient level clinical studies are needed to describe the specific physical, psychological, and economic harms that occur from overuse and the frequency of these harms.⁶⁶⁻⁸⁸

Research agenda for medical overuse*Measure frequency of overuse*

- Develop an agency to monitor overuse of diagnoses and treatments*
- Define the scope of overdiagnosis and overtreatment in medicine*
- Capture clinical information in administrative data that would allow for better assessment of overuse

Identify factors promoting overuse

- Identify the most important drivers of overuse*
- Understand and communicate limitations in diagnostic testing

Explore how clinical uncertainty and cognitive biases may lead to overuse

- Measure the impact of overuse*
- Study the full impact of overuse on patients in terms of physical and psychological harm
- Study the effect of overuse on treatment burden

Strategies to mitigate overuse

- Understand the impact of Choosing Wisely and other initiatives on clinical practice and patient outcomes*
- Understand patient and clinician views on the acceptability and legitimacy of different methods to encourage appropriate care
- Investigate how patients understand overuse and the best methods for communicating harms of overuse to patients
- Examine the effect of shared decision making and other patient directed interventions on overuse

Modifications to research infrastructure

- Develop common terminology (MeSH terms)*
- Improve institutional review boards' understanding of overuse
- Address overuse in guidelines

*Research priorities

Study the effect of overuse on treatment burden—Further understanding of how patients experience treatment burden is also needed, along with quantification of its effect and how to lessen treatment burden in clinical practice. A more complete description of the negative consequences of overuse at a patient level could lead to metrics for interventional trials or performance improvement. Methods to examine harms and treatment burden will likely include cross sectional, retrospective, prospective cohort, and qualitative studies.

Strategies to mitigate overuse

Understand the effect of low value lists on clinical practice and patient outcomes—Although Choosing Wisely, the most publicly visible effort to limit overuse,¹⁸⁻⁸⁹ has publicized the problem, its impact on patient care is not well described. This should be studied, probably in cross sectional and cohort studies with patient level or administrative data.

Understand patient views on the acceptability and legitimacy of different methods to encourage appropriate care—The concept of overuse implies setting limits on care, which may evoke concerns about rationing. Various policies are available to discourage overuse, such as ceasing to pay for low value interventions, and we need to assess the short and long term effectiveness and acceptability of both established and novel approaches. Surveys and qualitative methods will likely be most useful.

Investigate how patients understand overuse and the best methods for communicating its harms—If and when patients understand overuse is not well understood. Likewise, we do not know how patient expectations lead to overuse and which health beliefs create expectations for overuse. Studies are needed to determine the best methods to communicate with and educate patients on overuse in a way that will affect their decisions. Methods will likely include qualitative studies and quasiexperimental work.

Examine the effect of shared decision making and other patient focused interventions on overuse—Though shared decision

making is often invoked as means of reducing overuse, its effect is generally not known and merits study in qualitative and quasiexperimental research or randomized trials.

Modifications to research infrastructure

Create common terminology—Appropriate MeSH terms and keywords for searches in PubMed and other engines are needed to identify overuse literature with greater specificity and to improve communication of results across disciplines.

Improve institutional review boards' understanding of overuse research—Boards need to be made aware of the lack of evidence behind many current medical practices and of the growing body of evidence highlighting deficits in the safety and effectiveness of many others. Without evidence for standard practice, the balance of benefits to risks is such that placebo or no treatment may be acceptable comparisons to standard of care.

Address overuse in guidelines—Guidelines generally recommend when to treat but not when to avoid treatment. Often, guideline recommendations are extrapolated to diseases or patients in which the intervention was never studied (such as patients with complex multimorbidity).⁶⁵⁻⁹⁰ We recommend guidelines include recommendations of when not to test or treat, limitations to existing evidence, and a section on “possibility for overuse.” Also of interest is whether “do not do” recommendations might reduce the practice of “defensive medicine.”

Funding

These research agenda items will require creative approaches and determined individuals to better understand, describe, and ultimately improve medical care. Such work will require support. Public agencies such as the US National Institutes of Health, Agency for Healthcare Research and Quality, Patient Centered Outcomes Research Institute, Department of Veterans Affairs, CDC, United Kingdom research councils, European Commission, and Australia's National Health and Medical Research Council should devote a portion of funding towards the study of overuse. Foundations such as Robert Wood Johnson

Foundation, ABIM Foundation, and the Commonwealth Fund also have an important role supporting novel ideas and initiatives.

Conclusions

Overuse of medical care is an increasingly recognized problem that affects costs and patient safety and satisfaction. Standardizing terms such as overdiagnosis and overtreatment, campaigns such as Choosing Wisely, and journal sections focused on overuse, including those by *The BMJ* (www.bmj.com/too-much-medicine), *JAMA*,¹⁷ and *Annals of Internal Medicine*,¹⁶ are helping build awareness. The priorities for future research include developing public agencies to monitor overuse; defining the scope of overuse as well as physical and psychological harms; evaluating the effect of Choosing Wisely and other efforts to curb overuse; improving understanding of overuse by review boards and guidelines panels; and adopting standard terminology for library search engines. With concerted research efforts, the coming years could greatly improve our knowledge of overuse to maximize the benefits of medical care.

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Key messages

- Research into the effects of overuse in medicine is uncoordinated
- More research is needed to define the extent of overuse and its harms
- Adoption of standard terminology is essential to better understanding
- Public agencies are needed to monitor overuse
- Evaluation of current efforts to curb overuse is also a priority

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Table

Table 1 | Provider and patient factors identified as causing overuse of medical care

Intrinsic	Extrinsic
Provider driven	
Belief more care is better ^{7,46,47}	Financial—provider ⁴⁵ and hospital ^{32,33,48}
Lack of knowledge of harm from overuse ^{26,49}	Resource supply ⁵⁰
Discomfort with uncertainty ^{44,45,49,51,52}	Defensive medicine ^{1,28}
Poor knowledge of patient preference ⁵³	Variation in medical and surgical practice ^{54,55,56}
Regret for errors of omission greater than commission ^{28,45}	Process measures ⁵⁷
	Inadequate time ^{1,27,28}
Belief action better than inaction ^{28,52}	Positive publication bias ^{44,45,58}
Use of therapeutics “off label” ⁵⁹	Guidelines promoting overuse ^{60,61,62}
Over-reliance on pathophysiological and anatomical reasoning	Medical culture ⁶³
	Lack of training in shared decision making ¹
Desire for reassurance ⁶⁴	Advocacy groups ¹
	Medicalization of non-disease (eg, baldness) ^{1,48,65}
Patient driven	
Belief more care is better ^{7,46,47}	Financial—third party payment shielding from costs ^{1,45}
Lack of knowledge of harm from overuse ¹	
Discomfort with uncertainty ^{1,47}	Culture of avoiding mortality ¹
	Media misrepresentation of research ¹
	Advocacy groups ¹
	Medicalization of non-disease (eg, baldness) ^{1,48,66}

Figure

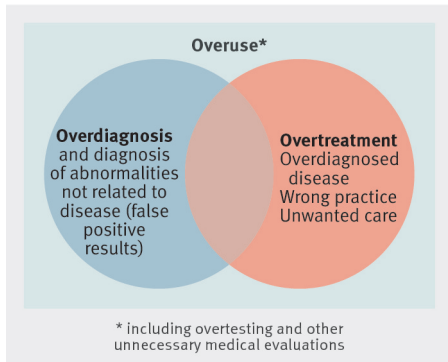


Fig 1 Relation between overdiagnosis, overtreatment, and overuse