


# BMJ Open Identification of barriers, enablers and interventions to inform deimplementation of low-value care in emergency medicine practice: A protocol for a mixed methods scoping review informed by the Theoretical Domains Framework

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**To cite:** Gangathimmaiah V, Evans R, Moodley N, *et al.* Identification of barriers, enablers and interventions to inform deimplementation of low-value care in emergency medicine practice: A protocol for a mixed methods scoping review informed by the Theoretical Domains Framework. *BMJ Open* 2022;**12**:e062755. doi:10.1136/bmjopen-2022-062755

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-062755>).

Received 10 March 2022  
Accepted 02 October 2022



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## ABSTRACT

**Introduction** Low-value care can lead to patient harm, misdirected clinician time and wastage of finite healthcare resources. Despite worldwide endeavours, deimplementing low-value care has proved challenging. Multifaceted, context and barrier-specific interventions are essential for successful deimplementation. The aim of this literature review is to summarise the evidence about barriers to, enablers of and interventions for deimplementation of low-value care in emergency medicine practice.

**Methods and analysis** A mixed methods scoping review using the Arksey and O'Malley framework will be conducted. MEDLINE, CINAHL, EMBASE, EMCare, Scopus and grey literature will be searched from inception. Primary studies will be included. Barriers, enablers and interventions will be mapped to the domains of the Theoretical Domains Framework. Study selection, data collection and quality assessment will be performed by two independent reviewers. NVivo software will be used for qualitative data analysis. Mixed Methods Appraisal Tool will be used for quality assessment. Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews framework will be used to present results.

**Ethics and dissemination** Ethics approval is not required for this scoping review. This review will generate an evidence summary regarding barriers to, enablers of and interventions for deimplementation of low-value care in emergency medicine practice. This review will facilitate discussions about deimplementation with relevant stakeholders including healthcare providers, consumers and managers. These discussions are expected to inform the design and conduct of planned future projects to identify context-specific barriers and enablers then codesign, implement and evaluate barrier-specific interventions.

## INTRODUCTION

Low-value care refers to healthcare interventions which confer little or no benefit, impose

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This scoping review will yield a comprehensive summary of barriers, enablers and interventions influencing deimplementation of low-value care in emergency medicine practice.
- ⇒ The use of the Theoretical Domains Framework to analyse the barriers and enablers is a strength as this has been associated with increased systematic uptake and success of deimplementation interventions and interventions.
- ⇒ The use of mixed methods approach is a strength as this will yield an integrated evidence synthesis to inform future practice, policy and research.
- ⇒ This review will have limited relevance to settings other than emergency medicine as deimplementation is influenced by contextual and cultural factors.

a risk of harm that exceeds benefit or incur a cost disproportionate to benefit.<sup>1</sup> Low-value care can lead to patient harm, misdirected clinician time and wastage of finite healthcare resources.<sup>2</sup> Studies from North America have estimated that at least 5%–19% of all interventions are low-value care, incurring annual expenditure of \$A99.6–\$A138.9 billion.<sup>3 4</sup> Analysis of prevalence and trends of low-value care in New South Wales, Australia estimated inpatient costs of \$A49.9–\$A99.3 million to the public hospital system in 2016–2017.<sup>5</sup>

To address low-value care, the American Board of Internal Medicine launched the Choosing Wisely campaign in 2012, aiming to engage physicians and patients in conversations regarding unnecessary tests, treatments and procedures.<sup>6</sup> Despite the campaign

**Table 1** Eligibility criteria

PICOTS criteria	Inclusion criteria	Exclusion criteria (rationale)
Population	Human studies involving emergency healthcare providers, consumers or managers	Animal studies (not relevant to clinical practice)
Intervention/exposure	Deimplementation of low-value care	
Comparator	Usual/standard practice	
Outcome	Barriers or enablers or interventions to deimplement low-value care	
Timeframe	All reported timeframes will be included	
Setting	Emergency department	
Design	Primary quantitative, qualitative and mixed methods studies	Reviews, protocols, perspectives, comment, opinions, editorials, letters to editors, news articles, books, chapters, policies and guidelines (not primary sources of data)
Quality or risk of bias	Studies will be included regardless of quality	
Sample size	Studies will be included if sample size is 30 or more(except qualitative studies)	
Publication status	Studies will be included regardless of publication status	
Time period	Studies from inception to a maximum of 2 months prior to submission for publication will be included	
Language	Studies will be included regardless of their language of publication	

PICOTS, Population, Intervention, Comparator, Outcome, Timing, Setting.

gaining traction globally, deimplementing low-value care has proved complex and challenging.<sup>7–10</sup> Evidence suggests emphasising financial benefits of addressing low-value care could result in clinician disengagement and community distrust.<sup>11</sup> On the other hand, elucidating harms of low-value care and translating the recommendations into measurable outcomes may facilitate engagement.<sup>9 10</sup> Clinician and community engagement could be further enhanced by systematic exploration of determinants—also called barriers and enablers—of deimplementation of low-value care.<sup>12</sup>

Several literature reviews have explored barriers, enablers and interventions for deimplementation of low-value care.<sup>12–22</sup> Van Dulmen *et al* demonstrated that situation-specific knowledge of barriers and enablers is essential for designing tailored deimplementation interventions.<sup>12</sup> A systematic review conducted by Wang *et al* concluded that addressing patient, clinician and system-level barriers is necessary for successful deimplementation of low-value breast cancer surgery.<sup>13</sup> Deimplementation was perceived as challenging and controversial by healthcare staff who experienced anxiety, disempowerment, distrust and feelings of being dismissed and disrespected.<sup>14</sup> Change led by front-line clinicians, rigorous outcome data and transparent decision-making could strengthen deimplementation endeavours.<sup>14</sup> Multifaceted interventions have the greatest potential to reduce low-value care<sup>15–18</sup> when interventions target tests individually,<sup>16</sup> involve

patients in decision-making,<sup>19</sup> modify clinician environments,<sup>20</sup> address contextual factors<sup>17</sup> and are informed by behavioural change theories.<sup>21</sup> Identification of barriers and enablers as well as development of effective interventions have been highlighted as areas of deimplementation of low-value care that merit further research.<sup>22</sup>

As part of global efforts to address low-value care, leading emergency medicine organisations have developed recommendations to reduce coagulation studies,<sup>23</sup> urine cultures,<sup>24 25</sup> blood cultures,<sup>23</sup> cranial CT in syncope,<sup>26</sup> cranial CT in head trauma,<sup>23</sup> cervical CT in neck trauma,<sup>23</sup> ankle radiographs in ankle trauma,<sup>27</sup> duplex lower extremity ultrasound in suspected deep vein thrombosis,<sup>27</sup> CT pulmonary angiography in suspected pulmonary embolism<sup>27</sup> and CT of the kidney–ureters–bladder in suspected renal colic.<sup>23</sup> However, barriers, enablers and interventions for deimplementation of low-value care in emergency medicine practice have not been summarised in a literature review. The proposed literature review intends to address this knowledge gap. Such a review is necessary to better inform emergency clinicians who face unique challenges of overcrowding,<sup>28</sup> diagnostic uncertainty,<sup>29</sup> limited information,<sup>30</sup> ambulant patient population, high staff turnover and time constraints.<sup>31 32</sup> Such a review will also contribute to deimplementation endeavours in emergency departments (EDs) providing healthcare to a significant proportion of the national population in the USA (130 million visits/year),<sup>33</sup> the UK

**Table 2** Search concepts and terms

Concept	Synonyms
Low-value care	health services misuse OR medical overuse OR unnecessary procedures OR inappropriate prescribing OR potentially inappropriate medication list OR health services overuse OR health services overutilisation OR low-value OR low value OR unnecessary test OR unnecessary medication OR unnecessary surgery OR choosing wisely OR overdiagnosis OR overmedication OR overtreatment OR unwanted medical care OR medical reversal
Deimplementation <sup>[69]</sup>	deprescriptions OR deimplement OR deimplement OR disinvest OR deadopt OR deadopt OR disadopt OR decrease OR discontinue OR defund OR decommission OR decline OR delist OR reverse OR reject OR reallocate OR relinquish OR reappraise OR reprioritise OR redeploy OR abandon OR reassess OR replace OR reduce OR stop OR withdraw
Emergency Medicine	emergency physician OR emergency clinician OR emergency care provider OR emergency care specialist OR emergency medicine physician OR emergency medicine specialist OR emergency specialist OR emergentologist OR health personnel OR healthcare personnel OR health facilities OR healthcare facility OR emergency department OR ED OR casualty department OR accident and emergency OR emergency medicine OR hospital emergency service OR emergency room OR emergency unit OR emergency ward OR emergency outpatient unit or emergency service

(17.4million ED visits/year),<sup>34</sup> Canada (11.7million ED visits/year)<sup>35</sup> and Australia (8.8million ED visits/year).<sup>36</sup> The objective of this review is to examine the extent, range and nature of research activity by systematically evaluating and synthesising the literature about deimplementation of low-value care in emergency medicine practice. A scoping review methodology will be employed as this objective aligns with the accepted definition and purpose of a scoping review.<sup>37–39</sup>

## METHODS AND ANALYSIS

This scoping review will be conducted in alignment with the enhanced Arksey and O'Malley framework<sup>37 40–43</sup> employing a mixed methods approach and the Theoretical Domains Framework (TDF). The review is expected to take 12 months (1 November 2021 to 31 October 2022). The protocol has been registered with Open Science Framework Registry ([osf.io/bp8fa](https://osf.io/bp8fa)).

A mixed methods approach will be employed as this scoping review will integrate and synthesise data, from quantitative, qualitative and mixed methods studies.<sup>44</sup> This scoping review will be informed and underpinned by the TDF as use of theoretical principles to guide understanding has been found to increase systematic uptake and success of interventions, interventions and policies.<sup>45</sup> The TDF is a multilevel, well operationalised, implementation science framework with 128 constructs and 14 domains derived from 33 behavioural change theories.<sup>46 47</sup> The TDF has several strengths that make it a suitable choice to inform this review. First, the overlapping domains across multiple theories of behavioural change will enable comprehensive identification and mapping of potential barriers, enablers and interventions for deimplementation of low-value care<sup>46–48</sup> in emergency medicine practice. Second, the TDF has a predominant focus at individual-level factors,<sup>47</sup> which will enable accurate mapping of barriers, enablers and interventions at the level of emergency healthcare provider. Thirdly, the

TDF has been successfully applied to multiple studies in emergency medicine settings including a process evaluation of Canadian CT Head Rule trial,<sup>49</sup> a qualitative study of factors influencing mild traumatic brain injury<sup>50</sup> and a study of deimplementing low-value care in infant bronchiolitis.<sup>51</sup> Finally, a TDF-informed scoping review can guide the subsequent choice of appropriate behaviour change theories to develop, implement and evaluate interventions to change behaviour<sup>48</sup> of emergency healthcare providers. The scoping review framework is detailed below.

### Identification of research question

What is known from the existing literature about healthcare provider-level barriers to, enablers of and interventions for deimplementation of low-value care in emergency medicine practice?

### Identification of relevant studies

Primary observational and interventional studies that employed qualitative, quantitative or mixed methods approaches to explore barriers, enablers and interventions for deimplementation of low-value care in emergency medicine practice will be included. Low-value care will be defined as tests, treatments and procedures that, according to the best available evidence, have little or no benefit or impose harms that outweigh any likely benefits or incur costs that are disproportionate to any benefits.<sup>1</sup> Deimplementation will be defined as an active process of reducing low-value care by stopping or changing an existing practice.<sup>12</sup> Barriers will be defined as factors that decrease the likelihood of introduction and sustainability of deimplementation of low-value care.<sup>52</sup> Enablers will be defined as factors that increase the likelihood of introduction and sustainability of deimplementation of low-value care.<sup>53</sup> Interventions will be defined as actions that introduce and sustain deimplementation of low-value care.<sup>54</sup> Animal studies and quantitative studies with a sample size less than 30 will be excluded.<sup>55</sup> No date or language limits

**Table 3** Data variables and values

Data variable	Values
Author, year of publication, country of origin	
Aims and objectives	Identification of barriers/facilitators, evaluation of deimplementation strategy/intervention
Design	Quantitative, qualitative, mixed methods
Setting	Emergency medicine
Type of low-value care	Test, treatment, procedure
Stream, specialty, experience, gender and sample size of participants	Medical/nursing/allied health streams, medical/surgical/psychiatric/paediatric/general practice specialties and subspecialties, experience in years, male/female/other
Use of theories, frameworks or models of behavioural change	
Methodology and methods of data collection	Methodology: randomised/cohort/case-control/cross-sectional/descriptive (quantitative), descriptive/grounded theory/ethnography/action research/delphi/case study/phenomenology (qualitative), convergent/sequential/embedded/multiphase (mixed methods) Methods: surveys, questionnaires, interviews, focus groups, observation, key informants, other validated tools
Findings/results	Barriers, enablers, interventions, degree of agreement between participants about barriers/enablers, process measures of intervention including feasibility/relevance/acceptability/penetration/uptake/fidelity, outcome measures of intervention including effectiveness, cost-effectiveness/safety/quality/sustainability
Relevant additional variables	

will be applied to enable accurate mapping of the growth of emergency medicine literature about deimplementation of low-value care over time and ensure inclusion of all relevant studies. A complete list of eligibility criteria is presented in [table 1](#).

### Study selection

MEDLINE, CINAHL, EMBASE, EMCare and Scopus will be searched from inception to a maximum of 2 months prior to submission for publication. The search will be structured around three concepts: low-value, deimplementation and emergency medicine. The database search strategy will include a combination of relevant keywords, Medical Subject Heading terms, Boolean operators and wildcards (truncation and question mark to account for plural words and spelling variations respectively). The search will be refined through an iterative process in consultation with an experienced medical librarian. [Table 2](#) lists the proposed search terms. Grey literature will be identified through Grey Matters tool from the Canadian Association for Drugs and Technologies in Health,<sup>56</sup> Google Scholar, relevant websites (Choosing Wisely, NICE, Lown Institute, Right Care Alliance) and content experts. After elimination of duplicates, two reviewers will independently perform title and abstract screening of retrieved results to identify potentially eligible articles followed by a full-text review to determine eligible studies. Disagreements between the two initial reviewers will be discussed with and resolved by a third reviewer. Reference lists of included articles and relevant

excluded articles will be screened to identify additional eligible articles. All articles that undergo a full-text review will be assigned a unique identification number to enable accurate tracking of the included and excluded articles throughout the review process. Google Translate will be used to translate non-English articles. Endnote V.20.0 will be used to manage references.<sup>57</sup>

Inter-reviewer reliability will be calculated for title/abstract screening and full-text review stages using proportion of agreement between coders, Cohen's kappa<sup>58</sup> and prevalence and bias adjusted kappa.<sup>59</sup> The measures of inter-rater reliability will be reported to ensure transparency of the review process. These measures will not, however, alter the review process as any disagreements between the two independent reviewers during these phases will be resolved by a third reviewer.

Sensitivity and specificity of the search strategy will be evaluated as follows. Sensitivity will be calculated as ratio of the number of included studies indexed in MEDLINE that were retrieved by the search strategy to the number of included studies indexed in MEDLINE.<sup>60</sup> For acceptable sensitivity, we will identify 10 sentinel articles and ensure that they are all included in the search results. Specificity will be calculated as the ratio of number of included studies indexed in MEDLINE that were retrieved by the search strategy to the number of studies initially retrieved by the search strategy.<sup>60</sup> For acceptable specificity, we will determine the feasibility of the scoping review by



**Table 4** Domains and definitions of the Theoretical Domains Framework

Domain	Definition
1. Knowledge	An awareness of the existence of something
2. Skills	An ability or proficiency acquired through practice
3. Social/professional role and identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting
4. Beliefs about capabilities	Acceptance of the truth, reality or validity about an ability, talent, or facility that a person can put to constructive use
5. Optimism	The confidence that things will happen for the best or that desired goals will be attained
6. Beliefs about Consequences	Acceptance of the truth, reality or validity about outcomes of a behaviour in a given situation
7. Reinforcement	Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus
8. Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way
9. Goals	Mental representations of outcomes or end states that an individual wants to achieve
10. Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives
11. Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence and adaptive behaviour
12. Social influences	Those interpersonal processes that can cause individuals to change their thoughts, feelings or behaviours
13. Emotion	A complex reaction pattern, involving experiential, behavioural and physiological elements, by which the individual attempts to deal with a personally significant matter or event
14. Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions

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ensuring that the total number of citations to screen is less than 50 000.

### Data charting

Two reviewers will independently chart data from included studies using a standardised data collection form (Microsoft Excel, 2022<sup>61</sup>) using an iterative process of data collection and refinement of the data collection form. Following data collection for 10% of included studies, the reviewers will meet to determine whether the data collection approach is consistent with the review objectives and whether relevant additional data variables need to be included. Data variables of interest and values are listed in [table 3](#). Two reviewers will independently sift and sort the collected data. Any disagreements will be discussed with and resolved by a third reviewer. Authors of included studies will be contacted for further data or clarification if indicated.

### Collating, summarising and reporting results

Data will be subjected to quantitative and qualitative analyses. The analyses will be structured around the barriers, enablers and interventions of deimplementation of low-value care in emergency medicine practice. The quantitative analysis will summarise barriers, enablers and interventions in terms of trends across time, geography, economies (high-income vs low-middle income countries), design (controlled vs uncontrolled studies) and

quality (high-quality vs low-quality studies). The qualitative analysis will map barriers, enablers and interventions to the 14 domains of the TDF shown in [table 4](#). The qualitative analysis will involve line by line and axial coding followed by thematic analysis of coded data. Themes will be predetermined and aligned to the domains of the TDF. As the domains of the TDF are not mutually exclusive, barriers, enablers and interventions will be mapped to all relevant domains of the TDF. NVivo data management software will be used to facilitate qualitative data analysis.<sup>62</sup>

Quality assessment of included studies will be performed by two independent reviewers using the Mixed Methods Appraisal Tool,<sup>63</sup> a validated tool for assessing methodological quality of quantitative, qualitative and mixed-method studies ([figure 1](#)). Although quality assessment was not part of the original Arksey and O'Malley framework, a lack of quality assessment could make the results of a scoping review challenging to interpret<sup>64</sup> and limit the uptake of findings into policy and practice.<sup>39</sup> Quality assessment will enable the synthesis of the results based on quality of included studies. Quality assessment will thus lend additional rigour to the scoping review methodology.

Results of the review will be presented using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for Scoping Reviews

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	S1. Are there clear research questions?				
	S2. Do the collected data allow to address the research questions?				
<i>Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.</i>					
1. Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?				
	1.2. Are the qualitative data collection methods adequate to address the research question?				
	1.3. Are the findings adequately derived from the data?				
	1.4. Is the interpretation of results sufficiently substantiated by data?				
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?				
2. Quantitative randomized controlled trials	2.1. Is randomization appropriately performed?				
	2.2. Are the groups comparable at baseline?				
	2.3. Are there complete outcome data?				
	2.4. Are outcome assessors blinded to the intervention provided?				
	2.5. Did the participants adhere to the assigned intervention?				
3. Quantitative non-randomized	3.1. Are the participants representative of the target population?				
	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?				
	3.3. Are there complete outcome data?				
	3.4. Are the confounders accounted for in the design and analysis?				
	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the research question?				
	4.2. Is the sample representative of the target population?				
	4.3. Are the measurements appropriate?				
	4.4. Is the risk of nonresponse bias low?				
	4.5. Is the statistical analysis appropriate to answer the research question?				
5. Mixed methods	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?				
	5.2. Are the different components of the study effectively integrated to answer the research question?				
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?				
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?				
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?				

**Figure 1** Mixed Methods Appraisal Tool.

framework.<sup>65</sup> The results of the search strategy will be summarised in a PRISMA flow diagram. Search strategies for individual databases will be summarised and presented in a tabular format (online supplemental file). The results of the quantitative analysis will be presented as frequencies and proportions in a tabular summary of research methods, geographic location, types, numbers and range of barriers/enablers/interventions, degree of agreement about barriers and enablers, effectiveness of implementation process and effectiveness of interventions. The results of the qualitative analysis will be presented as a tabular summary of barriers, enablers and interventions mapped to the domains of TDF. The results from the quantitative and qualitative analyses will be synthesised and integrated using the Joanna Briggs Institute (JBI) convergent-integrated approach.<sup>66</sup> The results will be discussed in the context of current literature and in alignment to the review objective. The results of quality assessment of included studies will be presented as a tabular summary and their implications on the applicability of the review findings will be discussed. Limitations of the scoping review as well as implications for policy, practice and research will be discussed.

### Stakeholder consultation

Stakeholder consultation will not be part of this scoping review. However, the findings of this scoping review will be integral to stakeholder consultations that will inform three planned sequential projects to deimplement low-value care in emergency medicine practice. Emergency healthcare providers, consumers and managers will be the major stakeholders in these projects.

### PATIENT AND PUBLIC INVOLVEMENT

Patients and public were not involved in the design of this scoping review and will not be involved in its conduct.

### ETHICS AND DISSEMINATION

Ethics approval is not required for this scoping review of literature. The findings of this review are expected to contribute to the rapidly growing evidence base about deimplementation of low-value care as well as inform emergency medicine practitioners about potential barriers, enablers and interventions. This review will inform subsequent planned projects at Townsville University Hospital, Queensland, Australia. This regionally located hospital has a catchment of 670 000 people and an annual ED census of 91 997 for 2020–2021.<sup>67</sup> The planned projects are expected to identify context specific, barriers and enablers to deimplementation of low-value care, codesign barrier-specific interventions, implement and evaluate the interventions in sequential phases. As participants in these projects, healthcare providers at Townsville University Hospital Emergency Department will be an integral part of the knowledge translation process. Healthcare consumers at Townsville University Hospital are also anticipated to be a part of the knowledge translation process by enabling deimplementation via shared decision-making with emergency healthcare providers. The findings of this review will inform discussions with the Townsville University Hospital managers about the systemic changes that can support healthcare providers to deimplement low-value care. The findings of this review as well as the subsequent projects will enhance the evidence base of emergency medicine. Findings will be disseminated via conference presentations, peer-reviewed publications and discussions with formal and informal research networks of the reviewers

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**Acknowledgements** VG would like to thank his colleagues at Townsville University Hospital for their support and encouragement in pursuing his PhD.

**Contributors** VG conceived and designed the study and drafted the manuscript. RE, NM, TSG, ND, MC and KC critically reviewed and approved the final manuscript.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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