


# BMJ Open Common procedures of remote measurement-based care in an integrated behavioural health context: protocol for a scoping review

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## ABSTRACT

**Introduction** Integrated behavioural health, a model of care that embeds mental health services in primary care, can potentially increase access to mental healthcare. With the increase in health information technologies, remote measurement-based care (RMBC) presents an opportunity to improve support of integrated care. This scoping review will comprehensively examine what common procedures are followed when RMBC for mental health is tested in integrated care settings.

**Methods and analysis** Based on an established six-step framework for conducting scoping reviews, we will search PubMed, Embase, PsycINFO, Cochrane, EBSCOhost and Web of Science with search terms related to 'integrated care' and 'RMBC'. Articles published from 2015 onwards, in English, including an intervention that meets our definition of RMBC, and are conducted in collaboration with primary care or in a primary care setting will be included. After data extraction, we will categorise key findings along the following dimensions: (1) common delivery practices of RMBC; (2) common technologies and instruments used and (3) most common barriers and facilitators when implementing RMBC in an integrated care model.

**Ethics and dissemination** Ethics approval is not required for this scoping review. For maximum impact, we will disseminate the findings to the scientific community (via publication in a peer-reviewed journal and at national conferences) and to the broader healthcare community. We will share findings with the broader healthcare community through our research centre's existing stakeholder communication structures and through guidance from our multidisciplinary research team. These key stakeholder relationships will continue to guide our subsequent RMBC research following the review.

## INTRODUCTION

As of 2019, only 45% of the estimated 51 million US adults with a mental health diagnosis (ie, mental illness or substance use disorder, SUD) received any treatment.<sup>1 2</sup> Moreover, disparities in access to mental health services exclude underserved populations including individuals beneath

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This scoping review will employ a comprehensive search strategy that has been iteratively developed with detailed guidance from a clinical librarian who has extensive experience in literature reviews.
- ⇒ Planned review tasks will closely align to Levac *et al*'s established enhancement to Arksey and O'Malley's framework for conducting scoping reviews.
- ⇒ Limiting the search to the integrated care context may exclude some findings about remote measurement-based care practices for mental health from other settings.
- ⇒ The search is limited to publications in English.

the poverty level, rural populations and racial/ethnic minorities from vital treatment.<sup>3-5</sup> To achieve the goal set by Healthy People 2030 that 64% of adults with a mental health diagnosis receive treatment, greater implementation of mental health interventions in accessible health settings is required.<sup>6</sup> One such health setting is primary care. As of 2018, underserved groups are more likely to be seen by a primary care provider than a psychiatric provider, yet they are less likely to be screened for mental health conditions by primary care.<sup>3 4</sup> In response to these challenges, integrated behavioural health (ie, integrated care) seeks to improve the coordination of care between primary care and mental health services to increase access to mental healthcare.<sup>7</sup> In practice, integrated care follows two basic models: either embedding a mental health clinician in a primary care practice or a developing network of referrals to facilitate a warm handoff to mental health services.

Based on published meta-analyses, integrated care improves symptoms of depression and anxiety with moderate effect sizes when compared with standard treatments.<sup>8</sup> Additionally, integrated care increased fidelity



to mental health treatment, facilitated warm hand-offs between PCP and mental health professionals, and improved physician and patient satisfaction with treatment.<sup>9 10</sup> Several large healthcare systems, such as the Veterans Health Administration and Kaiser Permanente, have implemented models of integrated care with varying levels of success, but delivering mental healthcare integrated with primary care poses challenges.<sup>11 12</sup> At the clinic level, additional tasks incorporated into the workflow, such as screenings, monitoring mental health symptoms and medication management, may overwhelm an already taxed primary care system. Based on qualitative data, primary care providers identify insufficient time, lack of training and inaccessibility of mental health referrals as key concerns.<sup>13</sup> Additionally, policy-level barriers inhibiting uptake of integrated care include organisational structures and reimbursement.<sup>14</sup>

Previously, researchers identified measurement-based care (MBC), the systematic assessment of mental health symptoms before or during a clinical encounter, as a way to address barriers and support delivery of integrated care.<sup>15</sup> Several systematic reviews and meta-analyses have demonstrated small to moderate effect sizes when MBC is compared with treatment as usual, for depression, anxiety and SUD.<sup>16-18</sup> MBC complements traditional procedures in medicine by using routine measurement to inform the treatment of patients. As such, MBC supports the delivery of integrated care by simplifying screening for mental health conditions, structuring feedback monitoring systems to ease coordination, integrating into workflow with ready-made assessments and streamlining referrals between disciplines.<sup>19</sup> MBC, however, remains underused in integrated care contexts.<sup>12</sup>

By leveraging various health information technologies, remote MBC (RMBC) can increase uptake of MBC in integrated care settings.<sup>20-23</sup> RMBC refers to the assessment and tracking of symptoms outside the context of an in-person or telehealth clinical encounter (ie, not directly before, during or directly after).<sup>16</sup> A variety of technologies can be used to support RMBC, including but not limited to mobile phone apps, web portals and remote data capture tools (eg, RedCAP).<sup>20 24</sup> While no meta-analysis has been conducted for RMBC, one systematic review on the RMBC literature found that, similarly to MBC, RMBC was generally more effective when compared with treatment as usual.<sup>16</sup> Importantly, the authors commented that RMBC may be more feasible than traditional MBC due to flexibility and ease of capturing data with various technologies, a sentiment supported by a review of MBC that found easier implementation with technology.<sup>25</sup>

Therefore, the field of implementation science faces an opportunity to improve access to mental health services by facilitating implementation of RMBC within an integrated care context. To maximally capitalise on this opportunity, understanding the current landscape of RMBC in integrated care is an important next step for research. Namely, to inform future implementation strategies, it is not sufficient to know that RMBC is happening;

rather, it is important to know how, in what contexts and for what conditions, it is being successfully leveraged. As a concrete step towards understanding this ‘how’, we will conduct a scoping review to identify common procedures (eg, timing of sending assessments, technologies and specific instruments) used when RMBC is introduced in an integrated care context. Identifying these procedures can help leverage existing clinic workflows to design effective implementation strategies. Also, identifying the procedures can help determine relevant outcomes that need to be the focus of attention when testing RMBC implementation.

### Objective

The objective of this scoping review is to comprehensively examine what common procedures are followed when RMBC for mental health is tested or implemented in an integrated care setting. For the purposes of this review, we will define ‘integrated care’ broadly to mean behavioural healthcare that is delivered within the primary care setting or in coordination with primary care delivery. Following recommended practices for scoping reviews, we will map the current literature on RMBC, identify gaps for future research, and inform enhanced use of RMBC to support integrated care.

### METHODS AND ANALYSIS

Based on previous guidance for conducting scoping reviews,<sup>26 27</sup> we will structure the methods of our scoping review according to a six-stage methodological framework. The six stages include: (1) identifying the research question, (2) identifying the relevant studies, (3) selecting studies to review, (4) charting the data from selected studies, (5) summarising and reporting results and (6) consulting the relevant users of RMBC. Our methods for conducting and reporting each step will align with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extensions for Protocols (PRISMA<sup>28</sup>; for this protocol article) and Scoping Reviews (PRISMA-ScR<sup>29</sup>; for the subsequent article on this scoping review’s findings). To best accomplish the objective of our scoping review, we will use an iterative approach based on previous review protocols<sup>30 31</sup> to refine the study selection and data extraction process to meet our objective. We will use EndNote<sup>32</sup> and Covidence<sup>33</sup> to track, organise, identify and extract data from articles.

### Stage 1: identifying the research question

Following the recommendations of Levac *et al*,<sup>26</sup> we started with a broad research question and then narrowed based on preliminary searches to better accomplish the main objective of the scoping review. We started with the question, ‘What are the common procedures when conducting RMBC for mental health in an integrated care context?’ An initial search of the National Center for Biotechnology Information-PubMed and PsycINFO databases uncovered one systematic review specifically on

the effectiveness of RMBC and one review on increasing implementation of MBC. The systematic review of RMBC focused on feasibility and acceptability while highlighting the few studies that showed clinical effectiveness. Importantly, the results pointed to heterogeneity in the way RMBC is applied and the need for implementation strategies to diffuse RMBC into alternative contexts. In the review focused on implementation, a 10-point research agenda for implementation was proposed, but lacked the details necessary to guide implementation in integrated care settings.<sup>34</sup>

Based on the preliminary searches, input from a multi-disciplinary group of researchers and clinicians, and guidance from the i-PARIHS implementation framework,<sup>35</sup> we refined our general research question to the following three questions: (1) How is RMBC for mental health commonly delivered in integrated care (ie, who does what, when, and where for RMBC-related tasks such as delivering feedback, data capture, data use and coordinating care)? (2) What are the common technologies and instruments used for RMBC in the integrated care context, and for which mental health diagnoses? and (3) What barriers and facilitators have been reported in implementing RMBC for mental health in an integrated care context?<sup>36</sup>

### Stage 2: identifying relevant studies

To comprehensively examine procedures for conducting RMBC in an integrated care setting, we will conduct a review of the existing literature on RMBC. To ensure methodological rigour, we have developed a comprehensive search strategy, with our research team members, a clinical librarian with extensive experience in literature reviews, and experts in RMBC and mental health to capture all relevant literature (online supplemental file 1). Search terms were refined through seminal publications concerning RMBC, titles and abstracts of key foundational articles, dictionaries, synonyms and subject headings from databases including Embase and PubMed. One obstacle to capture all the relevant articles was the variation in terms used in the literature. For example, RMBC may be referred to as 'feedback informed care,' 'routine outcome monitoring,' 'patient progress monitoring' or 'patient-reported outcomes'. Modelling after previous scoping reviews,<sup>30 31</sup> we mitigated this challenge through iterative development of search terms with relevant experts.

The electronic databases used to conduct the searches will include PubMed, Embase, PsycINFO, EbscoHost, Cochrane and Web of Science. These databases include topics related to medicine, health services, psychology, mental health, behavioural health interventions, and health policies and thus are likely to contain any studies related to RMBC. Boolean logic and proximity operators will combine and refine search terms. Using Covidence software, the duplicate articles will be removed. The research team will assess the first 100 articles identified through each database to determine the validity of our

search terms and to inform any revisions to our terms as needed.

### Stage 3: study selection

We will employ a two-phase process to select studies that will be included in the scoping review. The initial screening will review the title and abstract to determine eligibility for full text screening. The abstract will be screened to include those that meet the following criteria: (1) occurs from 2015 to the date of search (focusing on articles published around and since the Kennedy Forum's national call to increase MBC in 2015)<sup>37</sup>; (2) includes an intervention that meets our definition of RMBC taking place outside of the clinical encounter (eg, assessment completed through patient portal at home or assessment sent through text-message system before arriving to the clinic) and (3) is conducted in collaboration with primary care or in a primary care setting or within an integrated care model. We will exclude abstracts that are of conference proceedings, editorials/viewpoints, review manuscripts or manuscripts written in non-English languages. Based on the number of articles found, studies will be included for data extraction if the objective: (1) tests or evaluates an RMBC intervention or (2) tests or evaluates the implementation of an RMBC intervention.

We developed these selection criteria a priori through discussion among our research team members and with other relevant experts. At each phase of screening, we will further refine the criteria by applying them to the larger of 10 or 10% of articles to be screened. For each phase, two independent screeners will conduct the screening, then meet to review individual decisions, and determine the studies that meet the criteria. If consensus is required, a third independent screener will adjudicate any unresolved disputes. To determine reliability between screeners, we will calculate Cohen's kappa to assess their inter-rater agreement. Both the abstract and full-text screening will be tracked through Covidence software.<sup>33</sup>

### Stage 4: extracting and charting the data

We will use Covidence software to generate a data extraction template for the scoping review. The relevant domains and information we will extract from each article (including barriers and facilitators related to RMBC per i-PARIHS' innovation, recipients, context and facilitation constructs) are defined in table 1.

To enhance the data extraction, we will pilot our Covidence template on the larger of 10 articles or 10% of the articles to be reviewed. The data extraction template will be refined for the remaining articles. Following refinement, two reviewers will independently extract data from articles. A third independent reviewer will adjudicate and align any discrepancies through discussion.

### Stage 5: collating, summarising and reporting the results

We will present the results of our scoping view in alignment with the research questions and following the PRISMA-ScR guidelines.<sup>29</sup> We will create a tabular

Table 1 Definition of domains	
Domain	Definition
Author	Authors of the paper
Year Published	Year the article was published
Funding source	The agency or institution funding the study
Country	The country where the study occurred
Setting	The type of the setting (eg, clinical, community, hospital) that the study was conducted in
Objective	The overall aim of the study (eg, to test efficacy of the intervention, to test implementation)
Design	Approach taken by the study to reach the objective (eg, experimental, observational)
Target population	The population that the study results are intended to be applicable to
Sample size	The total no of clinics, organisations, or individuals participating in the study
Diagnosis	The diagnosis the treatment is targeting (eg, depression, bipolar disorder, substance use disorder)
Delivery of treatment	The treatment is delivered remotely, in-person or using a technology platform of some kind
Measures used	Type of instrument used to measure symptoms (eg, standardised, designed for the study) and name of instruments used.
Use and timing of the data collected from measures	The use of data collected from RMBC could include feedback immediately after taking assessment, providing feedback in-person, or tracking data to show trends
Staff involved	The level of involved clinic staff for the remote measurement-based care (eg, does the physician recommend the intervention, who provides feedback, what level of other staff need to be involved)
Data capturing tool	The tool used to deliver the remote assessment/measure (eg, REDCap, mobile phone app or email)
Level of implementation	The emphasis on implementation for the study low level=only concerned with efficacy; mid-level=hybrid of effectiveness and implementation; high level=implementation was the objective of the study
Main findings	The effectiveness of the intervention or the implementation effort
Barriers to RMBC	Per the i-PARIHS framework, <sup>35</sup> innovation-related, recipients-related, context-related and facilitation-related barriers to RMBC
Facilitators of RMBC	Per the i-PARIHS framework, <sup>35</sup> innovation-related, recipients-related, context-related and facilitation-related enablers of RMBC
	RMBC, remote measurement-based care.



representation of the key findings according to the following dimensions: (1) common delivery practices of RMBC for mental health in integrated care; (2) the common technologies and instruments used for RMBC in integrated care, and prevalence of particular mental health diagnoses; (3) the most salient barriers and facilitators reported in implementing RMBC for mental health in an integrated care context.

In addition to the main findings, we will report prevalent trends in characteristics of the reviewed studies, including and not limited to common technologies used in RMBC and study designs applied for studying RMBC (eg, interventional vs observational; focused on effectiveness, implementation or both). The tabular structure of extracted data supported by the Covidence software will enable efficient grouping and filtering of included studies by these different specifications, allowing subgroup analyses such as whether a specific symptom measure is delivered via RMBC more frequently for certain target populations than others. The aim of these secondary findings will be to establish a firmer understanding of the extent of the field's focus on RMBC implementation in integrated care.

### Stage 6: consultation process and engagement of knowledge users

We will closely engage our multidisciplinary research colleagues and partnered healthcare system representatives for each of stages 1 through 5 above. These individuals will include clinicians, administrators and health services researchers with expertise in a variety of relevant subject matters such as MBC, remote healthcare delivery, and implementation of evidence-based practices. Seeking regular consultation from these individuals will enable us to meaningfully contextualise our review steps, resulting findings and their implications.

### Patient and public involvement

To ensure the relevancy of our results, we will include patient representatives as consultants for the projects. The Center for Healthcare Organisation and Implementation Research, one of the Department of Veterans Affairs Health Services Research and Development Centers of Innovation, created the Veterans Engaged in Research Group (VERG). VERG engages Veterans and their family

members as active partners in research through communication regarding opportunities to be involved, codevelopment of research ideas and collaboration on tasks. The group meets quarterly and distributes a monthly newsletter. We plan to engage VERG by using the quarterly meetings as an outlet to elicits feedback from the group and to gain a perspective of the Veteran patients about the results of the scoping review. We will use the newsletter as a method to disseminate findings and invite discussion about the scoping review.

### Anticipated timeline

Our anticipated timeline for the planned scoping review is provided in [table 2](#).

### Ethics and dissemination

Our scoping review does not require ethical approval. We will consult relevant stakeholders as research collaborators; therefore, informed consent and other ethical approvals from institutions will not apply to scoping review procedures. We will disseminate the findings of the scoping review to both the scientific community and the broader healthcare community. We will publish findings in a peer-reviewed journal, and present findings at national conferences as the means to disseminate findings to the scientific community. We will share findings with the larger healthcare community through our research centre's existing stakeholder communication structures, and through guidance from our multidisciplinary research team (as discussed in stage 6 of the scoping review methods). These key stakeholder relationships, built during our scoping review, will continue to guide our subsequent RMBC research following the review.

### DISCUSSION

Our review can offer a timely survey of the literature to improve future RMBC implementation endeavours. To our knowledge, no one has performed a scoping review of RMBC use in integrated care to identify procedures, instruments, and barriers and facilitators.

The proposed scoping review will comprehensively search the peer-reviewed literature to highlight the commonly used procedures for RMBC in an integrated care context. However, the scoping review will

**Table 2** Anticipated timeline

	Month							
	1	2	3	4	5	6	7	8
Stage 1: defining the research question (completed)								
Stage 2: identifying relevant studies	X							
Stage 3: study selection	X	X	X					
Stage 4: extracting and charting the data			X	X	X	X		
Stage 5: collating, summarising and reporting the results						X	X	X
Stage 6: consultation process and engagement of knowledge users	X	X	X	X	X	X	X	X



potentially include several limitations. First, the variation in reporting across the studies included in our review may result in limited available details to extract on the ‘how’ of reviewed RMBC procedures. To help address this limitation, we plan to include in our search as necessary methodological papers, such as protocol papers, that can be expected to contain the desired procedural information. Second, applications of RMBC in real-world settings may not always appear in peer-reviewed literature (eg, RMBC data capture platforms created by health information technology companies may be used in real-world settings but not necessarily published as journal articles). Thus, clinics and hospitals may be implementing and using methods of RMBC in an integrated care setting that we miss in our review. To accurately depict this limitation in reporting our findings, we will plan to document, whenever possible, whether the RMBC information that we find is regarding primarily a ‘real-world’ setting, a research setting or a combination. Third, limiting the search to articles written in English will exclude information about RMBC practices for mental health that are reported using non-English languages. By sharing our protocol and eventual review findings openly with the field, we hope that researchers proficient in other languages will be encouraged to bring such practices to light to complement our work. Fourth, aligning with the purpose of conducting scoping reviews,<sup>38</sup> this scoping review does not aim to assess and synthesise the effectiveness of RMBC practices and in turn will not assess the quality or risk of bias of the included studies. We see this work as a key early step towards identifying meaningful indicators using which an eventual systematic review can be conducted to assess RMBC practices’ effectiveness.

Importantly, our scoping review has several anticipated strengths. First, findings from the review will elucidate opportunities for RMBC implementation and evaluation in integrated care that have not yet been pursued. Especially given that African American and rural populations, compared with White and non-rural populations, are more likely to use primary care for mental health services,<sup>39 40</sup> identified opportunities could lead to more equitable access to evidence-based RMBC for these populations. Second, identified barriers and facilitators related to RBMC in integrated care can point to specific implementation strategies that address the barriers and leverage the facilitators. Resulting implications will be a timely contribution to implementation science, as the field actively seeks ways to choose strategies that account for context-specific needs.<sup>41</sup>

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**Contributors** ER conceptualised, designed and drafted the manuscript for the scoping review. TPH conceptualised, designed and added substantive feedback to drafts of the manuscript. SLS conceptualised, designed and added substantive feedback to drafts of the manuscript. SKS helped design the scoping review procedures and made substantive feedback to the manuscript. BK conceptualised, designed and helped draft the manuscript.

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Supplementary file: Search strategy					
Databases	<i>PubMed, Embase, PsycInfo, Cochrane, EBSCOhost, Web of Science</i>				
Filters	Due to small number of results in preliminary searches, we will not include any filters in the searches				
Key terms for search:	Measurement-based care		Remote		Primary care
Keywords	"measurement based care" OR "feedback informed treatment" OR "routine patient monitoring" OR ("outcome informed therapy" OR "measurement feedback systems"	AND	"remote measurement" OR "remote monitoring" OR "remote assessment" OR "remote symptom monitoring" OR "remote symptom assessment" OR "passive sensing" OR "passive monitoring" OR "econsult*" OR "e-consult*" OR "ehealth" OR "e-mental health" OR "virtual" OR "digital measurement" OR "ecological momentary assessment"  cell phone* OR cell phone OR cellular phone* OR mobile app OR mobile apps OR mobile application* OR mobile applications OR mhealth OR mhealt OR mobile phone* OR mobile technolog* OR smart phone* OR telemonitoring OR text message* OR text messaging OR texting OR short message service* OR sms OR email OR online messaging	AND	"Primary care" OR "General practitioner" OR "Family physician" OR "Family medicine" OR "General medicine" OR "Primary care nursing"



MeSH terms	No MeSH terms available		No MeSH terms available		Primary Health Care[MeSH Terms] OR Primary Care Nursing[MeSH Terms]) OR Physicians, Primary Care[MeSH Terms] OR General practice[MeSH Terms] OR General practitioners[MeSH Terms] OR Physicians, family[MeSH Terms]
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