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Prioritizing Implementation Barriers

TOOLKIT FOR DESIGNING AN IMPLEMENTATION INITIATIVE

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GETTING STARTED

What is an implementation barrier?

An "implementation barrier" is anything that inhibits the integration of an evidence-based intervention (**EBI**) in a specific setting, such as a physician practice, hospital, mental health clinic, or school. Implementation barriers belong to a broader class of factors called "determinants," which are contextual features that influence — positively or negatively — the implementation of EBIs.

Common determinants that are implementation barriers might include:

- The EBI is too costly
- The clinic staff lack the skills for EBI delivery
- The clinic workflow makes EBI delivery difficult
- There is no reimbursement for EBI delivery
- The clinic has done little planning for implementation

Who is this toolkit for?

This toolkit is for researchers implementing an EBI at a specific setting such as a clinic or school. This toolkit may also be helpful for partners or collaborators at the site who are helping to implement the EBI.

Why prioritize implementation barriers?

Often, researchers and their implementation partners identify more barriers to implementing an EBI than they can feasibly address, given available time, effort, and resources. Focusing on developing implementation strategies for the most high-priority barriers increases the likelihood of successful EBI implementation.

When do I use this toolkit?

This toolkit assumes you and your team have identified implementation barriers. The toolkit is to help your team determine which barriers are most important to address for your EBI implementation effort.

What is included in this toolkit?

This toolkit contains:

- Criteria for prioritizing implementation barriers
- Scoring systems for rating barriers using the criteria
- Guidance for using scores and criteria
- Free or low-cost tools to support rating barriers
- Recommendations for identifying and addressing interdependence among barriers

How should I use this toolkit?

This toolkit is a one-stop shop for *nearly* everything you need to prioritize implementation barriers. After the introduction and sections on how to prioritize barriers and address their interdependence, look at the sections on frequently asked questions and references if you need more information.

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INTRODUCTION

Assessing barriers to implementing EBIs — whether actual or anticipated — often identifies many more barriers than can be feasibly addressed. Developing strategies to address the most high-priority barriers is a way to be efficient with implementation time, energy, and resources.

But what makes an implementation barrier "high priority" and how do implementation teams prioritize barriers?

Implementation scientists designate a barrier as high priority if it is both important and feasible to address. To prioritize barriers, researchers may rate their relative importance and the feasibility of addressing them. Researchers may also ask implementers, such as clinical teams adding EBIs to their workflow, to rate them.

The rating method asks raters to mark each barrier's importance and feasibility of being addressed using a 4-point system (called a Likert scale). The scale assigns points for ratings ranging from "relatively unimportant" to "extremely important" and "not at all feasible" to "extremely feasible." If multiple people are involved in rating, their importance and feasibility ratings for each barrier are averaged. Average ratings are plotted on a 2-dimensional graph with feasibility as the y-axis and importance as the x-axis (Figure 1).

The graph produces a scatterplot of feasibility and importance ratings and is divided into four quadrants, or "Go Zones." The high-priority barriers are in the upper right, in quadrant I. These barriers have high ratings for both importance <u>and</u> feasibility.

Figure 1. Graph of importance and feasibility ratings.
"• = scored ratings"
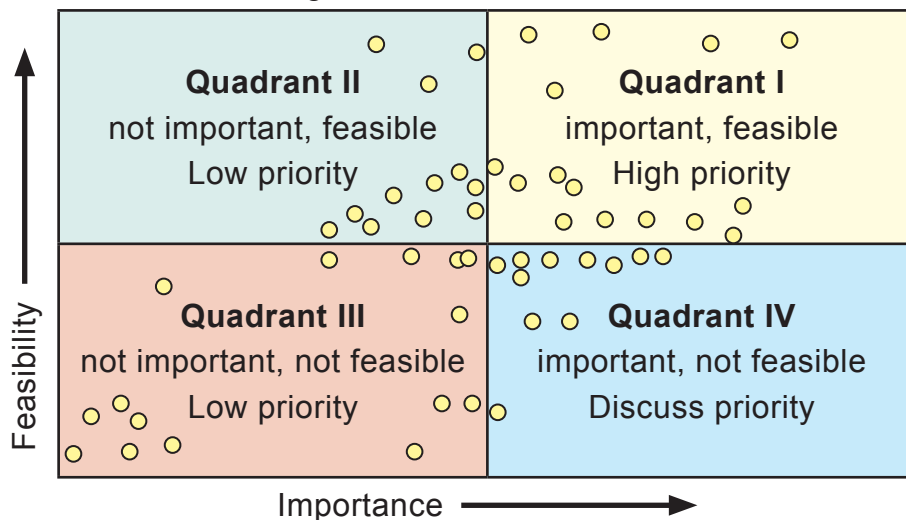
Rating methods are easy to use and require little additional data collection after implementation barriers are identified. Limitations are:

1. Focusing on the quadrant I barriers diverts attention from quadrant IV in the lower right, with barriers that are important but less feasible to address. Some of these barriers could be critical to implementation success. Focusing on barriers that are "low-hanging fruit" in quadrant I could prevent discussions about creatively addressing important but difficult barriers.

2. Other criteria for prioritizing barriers could be equally or more important than feasibility. In the next section, we list additional criteria to consider. At the end of the document, we provide a free, simple visualization tool for using 3 rather than 2 prioritization criteria.

3. Rating barriers independently of each other obscures the possibility that "low-priority" and "high-priority" barriers could be related and must be addressed together or consecutively despite their different ratings. (See section on interdependent barriers.)

In the next sections, we offer:

- Criteria for prioritizing implementation barriers

- 4-point Likert scales for rating barriers using these criteria

- Procedural guidance for using the criteria

- Free or low-cost tools to support rating barriers

- Recommendations for identifying and addressing temporal or causal interdependence among barriers

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CRITERIA AND RATING SCALES FOR PRIORITIZING BARRIERS

Implementation barriers can be prioritized based on a variety of criteria and researchers and implementers can use as many as they wish. However, some criteria are likely more relevant than others and visualizing the resulting prioritization is challenging with more than three criteria. We recommend using no more than two or three criteria.

In addition to the criteria described below, other possibilities for prioritizing barriers include level of staff motivation to address them, extent to which efforts to address them are already underway, or degree of barrier alignment with or impact on the organization's mission and goals.

Main criteria for prioritizing barriers	
Importance	Frequency
Duration	Addressability
Timing	Equity impact
Other possibilities	
Motivation or existing work to address them	Alignment with organization mission and goals

Criteria for prioritizing implementation barriers

Importance. Extent to which a barrier affects or likely affects an implementation outcome such as adoption or use of an EBI.

Given the common sense meaning of "prioritize," we recommend including importance as a prioritization criterion.

(Note for implementation researchers: This definition emphasizes the influence of a barrier on attaining the implementation outcome, i.e., potency of the inhibiting effect. This is a more specific definition of importance than is currently used to rate barriers or strategies [Waltz et al., 2015].)

Frequency. The regularity at which a barrier impacts, or likely impacts, an implementation outcome such as adoption or use of an EBI.

This criterion may be useful to consider in conjunction with importance because a barrier (a) might be very important yet uncommon (e.g., a staff absence), or (b) modestly important yet routine (e.g., a supply shortage).

Duration. The length of time a barrier affects an implementation outcome, such as EBI adoption or use.

We tend to overemphasize experiences that are freshest in memory (recency bias) so discussing and rating barriers using this criterion could spur teams to consider if any ratings about the importance of barriers were influenced by this bias.

Note that barriers that persist (e.g., unsupportive leadership) may reflect "deeper" or more structural constraints.

Addressability. The extent to which a barrier could be easily or conveniently addressed to attain an implementation outcome such as EBI adoption or use.

Apply this criterion with care, especially when combined with the criterion of importance. Focusing on the "low-hanging fruit" in Figure 1, quadrant I (important and addressable barriers) and neglecting important yet difficult barriers (quadrant IV, lower right) could undermine implementation success. (See the Limitations section near Figure 1.)

Timing. The ability to address a barrier now or in the near future, given current circumstances. Timing is related to, but distinct from addressability.

Although a barrier might be readily addressed with an implementation strategy (e.g., an in-service training could improve staff skills in EBI delivery), the moment might not be right (e.g., the clinic is short-staffed). Sudden, even disruptive events such as the unexpected departure of a senior manager can change the circumstances for addressing a barrier. Timing differs from sequencing (addressing barriers in a particular order) and urgency (addressing barriers as soon as possible).

Equity impact. The extent to which a barrier contributes to inequitable implementation outcomes, such as unequal receipt of EBIs.

With growing calls to prioritize health equity in implementation science, (Brownson et al., 2021; Metz et al., 2021), researchers and implementers should consider this criterion. The distinction between equity and equality is important yet subtle, making it difficult to communicate to others and adhere to consistently.

Equality means that all individuals or groups are given the same resources or opportunities, whereas equity recognizes individuals' different circumstances and allocates resources and opportunities with a goal of reaching equal outcomes. For example, clinics that are equally open to all, but only during the weekday, can pose a barrier to equitable receipt of EBIs for patients whose work or family obligations preclude visiting during "business hours."

The equity impact rating scale below emphasizes the impact of a barrier on achieving equal outcomes from an EBI implementation for all individuals and groups, rather than the impact on the process of EBI implementation.

Rating scales

The following 4-point Likert scales can be used to rate implementation barriers using the prioritization criteria. The definition for each criterion is repeated for convenience and likely would not be included in a paper-based or electronic rating form. The text in brackets would be replaced with implementation barriers for the specific EBI that were identified through research or practical methods (see Procedures and Tools section). The instructions (e.g., verb tense) might need revision if barriers are prioritized before implementation of an EBI has started.

Importance. Extent to which a barrier affects or likely affects an implementation outcome such as adoption or use of an EBI.

Frequency. The regularity at which a barrier impacts, or likely impacts, an implementation outcome such as adoption or use of an EBI.

Please rate how often the following barriers impact your ability to implement [name of the EBI]:

	Never impacts	Somewhat impacts	Often impacts	Always impacts
[BARRIER 1]	0	1	2	3
[BARRIER 2]	0	1	2	3
[BARRIER 3]	0	1	2	3
[...]	0	1	2	3

Duration. The length of time a barrier affects an implementation outcome, such as EBI adoption or use.

Please rate how long the following barriers will affect your ability to implement [name of the EBI]:

	Never been a problem	Only recently been a problem	Been a problem for a while	Been a problem a long time
[BARRIER 1]	0	1	2	3
[BARRIER 2]	0	1	2	3
[BARRIER 3]	0	1	2	3
[...]	0	1	2	3

Timing. The ability to address a barrier now or in the future, given current circumstances.

Please rate the feasibility of addressing the following barriers in the present environment:

	Not at all favorable	Somewhat favorable	Favorable	Very favorable
[BARRIER 1]	0	1	2	3
[BARRIER 2]	0	1	2	3
[BARRIER 3]	0	1	2	3
[...]	0	1	2	3

Addressability. The extent to which a barrier could be easily or conveniently addressed to attain an implementation outcome such as EBI adoption or use.

Please rate how feasible the following barriers would be to address:

	Not at all addressable	Somewhat addressable	Addressable	Very addressable
[BARRIER 1]	0	1	2	3
[BARRIER 2]	0	1	2	3
[BARRIER 3]	0	1	2	3
[…]	0	1	2	3

Equity impact. The extent to which a barrier contributes to inequitable implementation outcomes, such as unequal receipt of EBIs.

Please rate how much the following barriers impact, or would likely impact, your ability to implement [name of the EBI] equitably so that all groups, including marginalized ones, benefit:

	No impact on equity	Minor impact on equity	Some impact on equity	Major impact on equity
[BARRIER 1]	0	1	2	3
[BARRIER 2]	0	1	2	3
[BARRIER 3]	0	1	2	3
[…]	0	1	2	3

PROCEDURES AND TOOLS FOR PRIORITIZING BARRIERS

> There is no single best way to identify and
> prioritize implementation barriers.

The methods in this toolkit are intended to be combined with the barrier identification methods in other toolkits from the OPTICC and IMPACT Centers, for example on rapid evidence reviews or rapid ethnographic assessment. Conventional qualitative research methods (e.g., focus groups, interviews) can also be used to identify barriers. This section illustrates how barrier identification methods and prioritization methods could be combined, followed by suggestions for variations.

Example procedure for facilitated barrier prioritization

1. Conduct a rapid evidence review or rapid ethnographic assessment or a combination of these methods to identify barriers.

2. Have an implementation team meeting at the site where the EBI implementation will occur.

3. Describe an identified barrier to the team. Summarize what you have learned about it from the identification process.

4. Have team members rate the barrier using the criteria selected for this implementation initiative. Instant polling programs such as Poll Everywhere can be useful for this and subsequent steps.

5. Display the results and facilitate group discussion if team members substantially disagree in their ratings.

6. Repeat the process for the next identified barrier.

7. After all barriers are rated, use averages of the ratings to create a "Go Zone" plot (Figure 1) to show the team.

8. Facilitate discussion of the barriers in the high-priority quadrant I (upper right). If using three criteria, be sure to discuss barriers color coded as highly rated on the third criterion. Questions for discussion could include:

   • Do these seem like the right barriers to prioritize? Any disagreement?

   • Do any barriers elsewhere in the plot warrant discussion?

- Which prioritized barriers should have top priority and why? (See Frequently Asked Questions for guidance.)

- How addressable are the prioritized barriers? How could they be addressed?

Variations in procedures

Identification

In addition to research methods, practical methods can also identify barriers. For example, researchers could engage the implementation team in Nominal Group Technique (NGT) or brainstorming to list all barriers that come to mind.

If resource or time constraints preclude using research methods to identify local barriers, researchers could combine a rapid evidence review with NGT. Present the implementation team with the barriers identified in the rapid evidence review and engage them in NGT to identify the local barriers not surfaced in the review.

Prioritization

If an implementation team has too many barriers to discuss and rate serially, remove barriers that either do not occur in the setting or are not anticipated to arise in EBI implementation. The team could trim the list of barriers through group discussion. Alternatively, each team member could triage the list independently before a group discussion on which barriers to remove before rating.

In addition to instant polling (e.g., Poll Everywhere) researchers can use a web-based survey platform such REDCap for barrier rating. Implementation team members can independently rate barriers during a team meeting or on their own, at their convenience.

Research team members may prioritize identified barriers independently of the implementation team based on research data (e.g., rapid evidence reviews, rapid ethnographic assessment, standard qualitative methods). This requires data that is both relevant to the prioritization criteria and sufficiently granular to support rating. For example, for the frequency criterion, data must specifically report on how often a barrier occurs (e.g., weekly, monthly).

Qualitative data could be coded based on the prioritization criteria, displayed in tables, and rated using Likert scales, preferably by two or more independent raters. Greater inter-rater agreement can be achieved with decision rules to guide the rating. (For an example, see rating rules for evaluating determinants identified using the Consolidated Framework for Implementation Research, a common framework in implementation science.)

Practice advice

Barriers with more specific descriptions are easier to rate than barriers with vague descriptions. For example, a barrier described broadly as "administrative burden—time, human resources, financial support" is more difficult to rate than a barrier described specifically as "administrative burden related to translating or using interpreter services to complete measures" or "administrative burden related to the number of times and places in the electronic health record that clinicians need to document outcome measures."

Rewording and consolidation can clarify the meaning of identified barriers or reduce the redundancy of barriers identified from different sources. NGT, for example, often yields multiple descriptions, with slightly different wording, that can be combined to describe a single barrier. Since rewording and consolidation require judgment, decisions during barrier identification should be documented. Keep descriptions of reworded or consolidated barriers as specific as possible and avoid general category labels.

ADDRESSING INTERDEPENDENCE AMONG BARRIERS

Although current approaches to prioritizing barriers usually rate each barrier independently, barriers are often inter-related, or *interdependent*. Two forms of interdependence can distort prioritization ratings.

First, barriers can be *sequentially interdependent*, with some occurring before and therefore affecting others. These barriers must be addressed serially. For example, providers must be aware of or knowledgeable about an EBI before they can develop a positive attitude about it. Although lack of awareness or knowledge might not seem like an important barrier, it is essential to address before addressing barriers such as negative attitudes.

Second, barriers can be *reciprocally interdependent*, with two or more barriers influencing each other. In this case, addressing one barrier without addressing the others limits implementation success. An example comes from an organizational psychology framework that says that behavior is a function of ability, motivation, and opportunity (B = A x M x O; Blumberg and Pringle, 1982). Addressing ability barriers without addressing motivational and opportunity barriers will likely reduce successful outcomes.

In summary, rating barriers independently obscures the possibility that some low-priority barriers are inter-related with high-priority barriers. In this case, the interdependent barriers must be addressed — and in the proper temporal order or in combination — despite their different priority ratings.

Identifying interdependent barriers

Interdependent barriers must be identified before prioritizing them. Causal pathway diagrams, described in another toolkit, can be a useful tool for identifying interdependent barriers.

Interdependent barriers can be found by considering conditions that must be in place for an implementation strategy to work. Lack of these conditions (called preconditions in causal pathway diagrams) can be a barrier that must be overcome before starting strategies that target other barriers. Conditions that influence how well a strategy works (called moderators in causal pathway diagrams) can also be interdependent barriers if they inhibit a strategy to address a barrier.

Clues about sequential or reciprocal interdependent barriers can come from linguistic analysis of qualitative data, for example from focus groups or interviews about barriers. Researchers typically perform a content analysis of such data to identify and describe barriers. By looking for words that indicate causal, temporal, or conditional relationships among barriers—for example "by," "because," "when," "if," "then," and "after"—researchers can determine how people view or experience the inter-relatedness of barriers in their local context or setting. Researchers can also directly ask implementation partners if and how barriers they mentioned are inter-related.

Practical methods for identifying interdependent barriers include free listing (brainstorming) or NGT to identify barriers combined with pile sorting to ascertain independence. In this method, implementation team members independently create sets (piles) of barriers that they think are inter-related by adding the barriers to notecards, sticky notes, or concept mapping software. Barriers can be assigned to more than one set. Members then explain how the barriers in a set are inter-related. After a group discussion, members affirm or reconsider the barriers sets they produced. Delphi methods (Barrett and Heale, 2020) can help achieve consensus if needed.

Prioritizing interdependent barriers

Rating sets of barriers is more demanding than rating individual barriers. The task can be simplified by prioritizing interdependent barriers using a single criterion, most likely importance. The instruction could be: "Please rate how influential the following sets of barriers are on your ability to implement [name of the EBI]." The key is conveying that the ratings should apply to the barriers as a package.

CONCLUSION

We hope that the criteria, Likert scales, guidance, and free or low-cost tools in this toolkit help you prioritize implementation barriers in your research or implementation efforts. Prioritizing barriers in a live, interactive format can be fun, illuminating, and productive. A Frequently Asked Questions section is below. Please share your experience using the toolkit and any suggestions you have for improving it at our website.

Happy prioritizing!

FREQUENTLY ASKED QUESTIONS

When should I prioritize implementation barriers?

Implementation barriers are often prioritized early in an implementation effort, before implementation begins, so that strategies can be selected, designed, and deployed to target high-priority barriers to EBI implementation. (The Causal Pathway Diagrams toolkit can help in selecting implementation strategies to address high-priority barriers.)

Reassessing and re-prioritizing barriers during implementation can help, as the set of high-priority barriers might change as they are addressed, conditions change, or new barriers emerge.

Who should do the rating?

Raters should be knowledgeable about the implemented EBI and the setting or context in which implementation will occur. The more knowledge they have, the more informed their ratings will be.

Although we refer to an "implementation team," this might not be a formal group. In that case, think about who in the setting or context would be a knowledgeable rater. How long have they worked in the setting? What organizational role or position do they hold? What role will or might they play in the implementation effort? Unit managers, for example, might be more knowledgeable than front-line staff about financial resource availability, but less knowledgeable than front-line staff about patient needs and resources.

How many barriers can an implementation team rate and how long does it take?

A team can rate quite a lot of barriers. For example, a researcher using this toolkit reported that in a group session, members of her implementation team rated 26 barriers on 2 criteria (importance and duration) using a web-based survey in REDCap.

The team members needed less than 10 minutes to do the rating and the researcher did not immediately produce a Go Zone plot. Had the researcher used an instant polling program such as Poll Everywhere to rate the barriers interactively, constructed a Go Zone plot immediately, and facilitated discussion of the prioritization results in the plot, the group session would have taken more time.

How can I use more than three rating criteria?

Visualizing prioritization results with more than three criteria can be challenging. The more criteria, the more time and cognitive effort to prioritize barriers.

To use more than three criteria, consider a two-stage approach in which all implementation barriers are rated using three criteria and then a subset of barriers (e.g., high-priority, quadrant I of the Go Zone plot) are rated using one or two additional criteria. For example, in the first stage, the implementation team could rate all barriers on importance, frequency, and equity impact. In the second stage, the team could rate the subset of barriers that rated highly on the three criteria using the additional criterion of addressability.

An alternative that involves more math is computing a cross-criteria mean score weighted by the importance assigned to each criterion. For example, to rate barriers on importance, frequency, duration, and addressability:

- Decide whether you want to assign different weights to the criteria (e.g., 1.0 for importance, 0.5 for frequency, 0.5 for duration, and 1.0 for addressability) or assign equal weights (e.g., 1.0 for all criteria).

- For each barrier, compute the average rating for each criterion.

- Then, for each barrier, compute a cross-criteria mean score by multiplying the average rating for each criterion with the weight assigned to the criterion.

- Then average the weighted average ratings.

Example of calculating weighted scores for barriers evaluated by more than 3 criteria

Barrier X has average ratings of 3.2 for importance, 2.9 for frequency, 3.1 for duration, and 1.5 for addressability.	The weighted cross-criteria mean score for Barrier X is 1.925, calculated as follows: (3.2 x 1) importance + (2.9 x 0.5) frequency + (3.1 x 0.5) duration + (1.5 x 1) addressability 7.7 divided by 4 to average = 1.925
The implementation team decides to weight criteria as 1.0 for importance, 0.5 for frequency, 0.5 for duration, and 1.0 for addressability.	

What do I do if there are too many high-priority barriers to address?

Consider applying a two-stage approach as described above. For example, consider further prioritizing the list of high-priority barriers using criteria such as addressability or urgency. Consider also whether the timing is better for addressing some high-priority barriers first. Consider whether some barriers are interdependent and should be prioritized and addressed as a package.

Should I prioritize using implementation facilitators?

Typically, researchers and implementation partners prioritize implementation barriers rather than implementation facilitators (contextual factors that make EBI implementation easier). This helps implementation teams target high-priority barriers with implementation strategies.

If your team desires, however, implementation facilitators could also be prioritized using the criteria and rating scales in this toolkit.

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