

VR Workshop – Implementation Plan Toolkit

Barriers and facilitators to the implementation of VR



Figure 1. Theoretical Domains Framework. Cane, J., O'Connor, D. & Michie, S. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implementation Sci* 7, 37 (2012). <https://doi.org/10.1186/1748-5908-7-37>

Domain	Description	Guiding Questions for Discussion	Barriers/facilitators
Knowledge	Understanding of therapeutic VR and its benefits	What do you and your colleagues know about therapeutic VR? How can knowledge sharing about VR be improved within your team?	
Skills	Ability to use VR technology effectively	What skills are necessary for effective VR use? How can these skills be developed within your team?	
Memory, Attention, and Decision Processes	Ability to remember and focus on VR procedures	How can you and your team ensure VR guidelines are consistently followed? What decision-making support is needed?	
Behavioral Regulation	Managing performance and feedback	How can feedback on VR use be effectively provided within your team? What systems are in place for monitoring use?	

Beliefs about Capabilities (Confidence)	Confidence in one's ability to use VR	How confident are you and your colleagues in using VR? What can be done to increase this confidence?	
Social/Professional Role and Identity	Beliefs about roles and responsibilities in using VR	How does using VR fit into your and your colleagues' professional roles? Are there any role conflicts with VR use in your team?	
Beliefs about Consequences	Beliefs about the outcomes of using VR	What are the perceived benefits and risks of VR by you and your team? How do these perceptions affect VR use?	
Emotions	Feelings and emotions about VR	How do emotions affect the use of VR within your team? How can negative feelings be addressed?	
Goals (I want to)	Motivation to engage with VR	What motivates you and your colleagues to use or not use VR? What team goals can VR help achieve?	
Intentions (I plan to)	Plan to engage with VR	To what extent do you and your colleagues intend to use VR?	
Reinforcement	Rewards and incentives for using VR	What incentives could encourage VR use among your colleagues? How should achievements be rewarded?	
Optimism	Optimism about the impact of VR	How optimistic are you and your colleagues about VR's benefits? How can this optimism be enhanced?	
Environmental Context and Resources	External factors and resources affecting VR use	What physical or organizational barriers to VR use exist in your workplace? What resources are necessary?	
Social Influences	Social pressures and supports	How do social dynamics within your team influence VR adoption? How can a supportive environment be fostered?	

Examples of barriers and facilitators to therapeutic VR

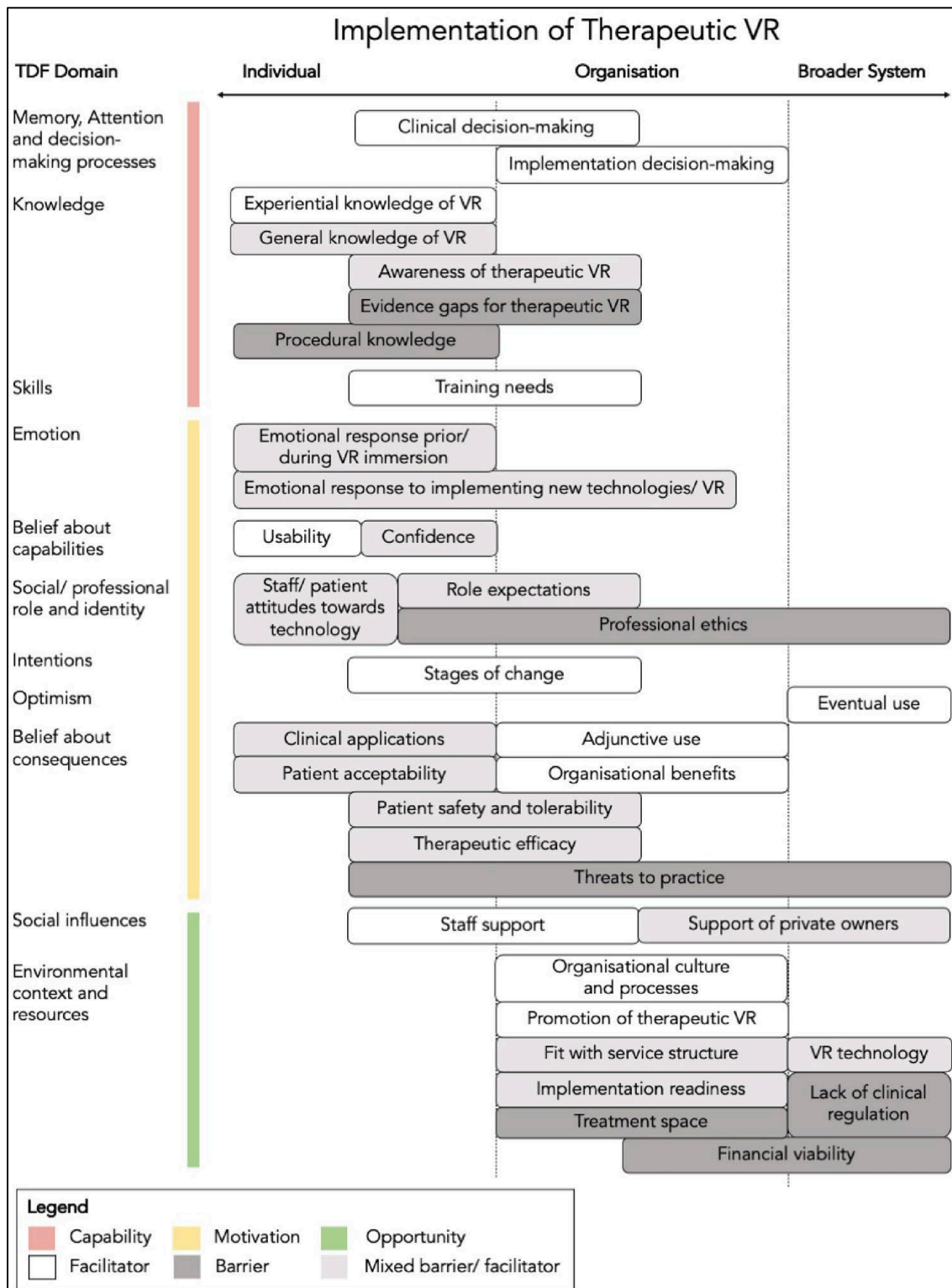


Figure 2. Examples of barriers and facilitators to the implementation of therapeutic VR. Chung, O. S., Dowling, N. L., Brown, C., Robinson, T., Johnson, A. M., Ng, C. H., Yücel, M., & Segrave, R. A. (2023). Using the Theoretical Domains Framework to Inform the Implementation of Therapeutic Virtual Reality into Mental Healthcare. *Administration and policy in mental health*, 50(2), 237–268. <https://doi.org/10.1007/s10488-022-01235-w>

Implementation strategies to promote the uptake of VR

Domains	No. of strategies	Implementation strategies	Domains	No. of strategies	Implementation strategies
1. Use of evaluative and iterative strategies	10	(1) Assess for readiness and identify barriers and facilitators; (2) Audit and provide feedback; (3) Purposefully reexamine the implementation; (4) Develop and implement tools for quality monitoring; (5) Develop and organize quality monitoring systems; (6) Develop a formal implementation blueprint; (7) Conduct local need assessment; (8) Stage implementation scale up; (9) Obtain and use patients/consumers and family feedback; (10) Conduct cyclical small tests of change	5. Training and education of stakeholders	11	(36) Conduct ongoing training; (37) Provide ongoing consultation; (38) Develop educational materials; (39) Make training dynamic; (40) Distribute educational materials; (41) Use train-the-trainer strategies; (42) Conduct educational meetings; (43) Conduct educational outreach visits; (44) Create a learning collaborative; (45) Shadow other experts; (46) Work with educational institutions
2. Provision of interactive assistance	4	(11) Facilitation; (12) Provide local technical assistance; (13) Provide clinical supervision; (14) Centralize technical assistance	6. Support of clinicians	5	(47) Facilitate relay of clinical data to providers; (48) Remind clinicians; (49) Develop resource sharing agreements; (50) Revise professional roles; (51) Create new clinical teams
3. Adapt and tailor to context	4	(15) Tailor strategies; (16) Promote adaptability; (17) Use data experts; (18) Use data warehousing techniques	7. Engagement with consumers	5	(52) Involve patients/consumers and family members; (53) Intervene with patients/consumers to enhance uptake and adherence; (54) Prepare patients/consumers to be active participants; (55) Increase demand; (56) Use mass media
4. Development of stakeholder inter-relationships	17	(19) Identify and prepare champions; (20) Organize clinician implementation team meetings; (21) Recruit, designate, and train for leadership; (22) Inform local opinion leaders; (23) Build a coalition; (24) Obtain formal commitments; (25) Identify early adopters; (26) Conduct local consensus discussions; (27) Capture and share local knowledge; (28) Use advisory boards and workgroups; (29) Use an implementation advisor; (30) Model and simulate change; (31) Visit other sites; (32) Involve executive boards; (33) Develop an implementation glossary; (34) Develop academic partnerships; (35) Promote network weaving	8. Use of financial strategies	9	(57) Fund and contract for the clinical innovation; (58) Access new funding; (59) Place innovation on fee for service lists/formularies; (60) Alter incentive/allowance structures; (61) Make billing easier; (62) Alter patient/consumer fees; (63) Use other payment schemes; (64) Develop disincentives; (65) Use capitated payments
			9. Change of infrastructure	8	(66) Mandate change; (67) Change record systems; (68) Change physical structure and equipment; (69) Create or change credentialing and/or licensure standards; (70) Change service sites; (71) Change accreditation or membership requirements; (72) Start a dissemination organization; (73) Change liability laws

Figure 3. Implementation strategies: Powell, B.J., Waltz, T.J., Chinman, M.J. et al. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. *Implementation Sci* 10, 21 (2015). <https://doi.org/10.1186/s13012-015-0209-1>

1. Use Evaluative and Iterative Strategies

Description: These strategies focus on the ongoing evaluation and adaptation of the implementation process, using data to inform improvements and refinements.

- **Examples for VR:**
 - **Conducting ongoing usability testing** to gather continuous feedback from users and make iterative improvements to the VR system.
 - **Implementing a staged rollout** of VR technology, starting with a small group of users to identify potential issues before wider deployment.

2. Provide Interactive Assistance

Description: This involves direct, hands-on support to help stakeholders overcome challenges related to the implementation.

- **Examples for VR:**
 - **Establishing a mentorship program** where experienced VR users can guide novices in using VR technologies effectively.
 - **Scheduling regular check-ins** with a VR specialist who can provide personalized support and advice to users.

3. Adapt and Tailor to Context

Description: Customization of the intervention to fit the local context, considering unique characteristics of the setting and population.

- **Examples for VR:**

- **Modifying VR content** to match the cultural and linguistic preferences of the patient population.
- **Adapting hardware setups** for different physical environments, such as outpatient clinics versus inpatient wards.

4. Develop Stakeholder Interrelationships

Description: Fostering collaborations and partnerships among various stakeholders to enhance buy-in and resource sharing.

- **Examples for VR:**
 - **Creating interdisciplinary teams** including IT professionals, healthcare workers, and administrators to oversee VR projects.
 - **Hosting joint workshops** for stakeholders to discuss expectations, experiences, and strategies for effective VR integration.

5. Train and Educate Stakeholders

Description: Providing training and educational resources to enhance stakeholders' knowledge and skills regarding the intervention.

- **Examples for VR:**
 - **Developing a certification program** for VR competencies among healthcare providers.
 - **Offering regular VR technology updates and training sessions** to keep all users informed about the latest features and best practices.

6. Support Clinicians

Description: Direct support to clinicians to help them integrate the new intervention into their practice without undue burden.

- **Examples for VR:**
 - **Creating easy-to-access VR procedure manuals** and quick reference guides.
 - **Providing dedicated time** during work hours for clinicians to explore and familiarize themselves with VR technologies.

7. Engage Consumers

Description: Involving patients and the public in the implementation process to ensure that the intervention meets their needs and preferences.

- **Examples for VR:**
 - **Facilitating patient focus groups** to gather insights on VR experiences and desired outcomes.
 - **Incorporating patient feedback into VR development cycles** to ensure the technology is responsive to patient needs.

8. Utilize Financial Strategies

Description: Applying financial tools and incentives to motivate stakeholder participation and resource allocation for the intervention.

- **Examples for VR:**
 - **Offering subsidies or reimbursements** for departments that achieve high levels of VR integration and patient satisfaction.
 - **Granting awards for innovative uses** of VR in patient care, which can provide funding and recognition.

9. Change Infrastructure

Description: Modifying the physical or organizational infrastructure to better support the new intervention.

- **Examples for VR:**
 - **Upgrading network systems** to ensure seamless VR software operation.
 - **Redesigning patient care areas** to incorporate VR stations that are easily accessible to patients and staff.

Detailed list and descriptions of implementation strategies

1. Use of evaluative and iterative strategies
<p>Assess for readiness and identify barriers and facilitators (Use of evaluative and iterative strategies) Assess various aspects of an organization to determine its degree of readiness to implement, barriers that may impede implementation, and strengths that can be used in the implementation effort.</p>
<p>Audit and provide feedback (Use of evaluative and iterative strategies) Collect and summarize clinical performance data over a specified time period and give it to clinicians and administrators to monitor, evaluate, and modify provider behavior.</p>
<p>Conduct cyclical small tests of change (Use of evaluative and iterative strategies) Implement changes in a cyclical fashion using small tests of change before taking changes system-wide. Tests of change benefit from systematic measurement, and results of the tests of change are studied for insights on how to do better. This process continues serially over time, and refinement is added with each cycle.</p>
<p>Conduct local needs assessment (Use of evaluative and iterative strategies) Collect and analyze data related to the need for the innovation.</p>
<p>Develop a formal implementation blueprint (Use of evaluative and iterative strategies) Develop a formal implementation blueprint that includes all goals and strategies. The blueprint should include: 1) aim/purpose of the implementation; 2) scope of the change (e.g., what organizational units are affected); 3) timeframe and milestones; and 4) appropriate performance/progress measures. Use and update this plan to guide the implementation effort over time.</p>
<p>Develop and implement tools for quality monitoring (Use of evaluative and iterative strategies) Develop, test, and introduce into quality-monitoring systems the right input—the appropriate language, protocols, algorithms, standards, and measures (of processes, patient/consumer outcomes, and implementation outcomes) that are often specific to the innovation being implemented.</p>
<p>Develop and organize quality monitoring systems (Use of evaluative and iterative strategies) Develop and organize systems and procedures that monitor clinical processes and/or outcomes for the purpose of quality assurance and improvement.</p>
<p>Obtain and use patients/consumers and family feedback (Use of evaluative and iterative strategies) Develop strategies to increase patient/consumer and family feedback on the implementation effort.</p>
<p>Purposely reexamine the implementation (Use of evaluative and iterative strategies) Monitor progress and adjust clinical practices and implementation strategies to continuously improve the quality of care.</p>
<p>Stage implementation scale up (Use of evaluative and iterative strategies) Phase implementation efforts by starting with small pilots or demonstration projects and gradually moving to a system wide rollout.</p>
2. Provision of interactive assistance
<p>Centralize technical assistance (Provision of interactive assistance) Develop and use a centralized system to deliver technical assistance focused on implementation issues.</p>

<p>Facilitation (Provision of interactive assistance) A process of interactive problem solving and support that occurs in a context of a recognized need for improvement and a supportive interpersonal relationship.</p>
<p>Provide clinical supervision (Provision of interactive assistance) Provide clinicians with ongoing supervision focusing on the innovation. Provide training for clinical supervisors who will supervise clinicians who provide the innovation.</p>
<p>Provide local technical assistance (Provision of interactive assistance) Develop and use a system to deliver technical assistance focused on implementation issues using local personnel.</p>
<p>3. Adapt and tailor to context</p>
<p>Promote adaptability (Adapt and tailor to context) Identify the ways a clinical innovation can be tailored to meet local needs and clarify which elements of the innovation must be maintained to preserve fidelity.</p>
<p>Tailor strategies (Adapt and tailor to context) Tailor the implementation strategies to address barriers and leverage facilitators that were identified through earlier data collection.</p>
<p>Use data experts (Adapt and tailor to context) Involve, hire, and/or consult experts to inform management on the use of data generated by implementation efforts.</p>
<p>Use data warehousing techniques (Adapt and tailor to context) Integrate clinical records across facilities and organizations to facilitate implementation across systems.</p>
<p>4. Development of stakeholder interrelationships</p>
<p>Build a coalition (Development of stakeholder interrelationships) Recruit and cultivate relationships with partners in the implementation effort.</p>
<p>Capture and share local knowledge (Development of stakeholder interrelationships) Capture local knowledge from implementation sites on how implementers and clinicians made something work in their setting and then share it with other sites.</p>
<p>Conduct local consensus discussions (Development of stakeholder interrelationships) Include local providers and other stakeholders in discussions that address whether the chosen problem is important and whether the clinical innovation to address it is appropriate.</p>
<p>Develop academic partnerships (Development of stakeholder interrelationships) Partner with a university or academic unit for the purposes of shared training and bringing research skills to an implementation project.</p>
<p>Develop an implementation glossary (Development of stakeholder interrelationships) Develop and distribute a list of terms describing the innovation, implementation, and the stakeholders in the organizational change.</p>
<p>Identify and prepare champions (Development of stakeholder interrelationships) Identify and prepare individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in an organization.</p>
<p>Identify early adopters (Development of stakeholder interrelationships) Identify early adopters at the local site to learn from their experiences with the practice innovation.</p>
<p>Inform local opinion leaders (Development of stakeholder interrelationships) Inform providers identified by colleagues as opinion leaders or 'educationally influential' about the clinical innovation in the hopes that they will influence colleagues to adopt it.</p>
<p>Involve executive boards (Development of stakeholder interrelationships) Involve existing governing structures (e.g., boards of directors, medical staff boards of governance) in the implementation effort, including the review of data on implementation processes.</p>
<p>Model and simulate change (Development of stakeholder interrelationships) Model or simulate the change that will be implemented prior to implementation.</p>
<p>Obtain formal commitments (Development of stakeholder interrelationships) Obtain written commitments from key partners that state what they will do to implement the innovation.</p>
<p>Organize clinician implementation team meetings (Development of stakeholder interrelationships) Develop and support teams of clinicians who are implementing the innovation and give them protected time to reflect on the implementation effort, share lessons learned, and support one another's learning.</p>
<p>Promote network weaving (Development of stakeholder interrelationships) Identify and build on existing high quality working relationships and networks within and outside the organization, organizational units, teams, etc. to promote information sharing, collaborative problem-solving, and a shared vision/goal related to implementing the innovation.</p>
<p>Recruit, designate, and train for leadership (Development of stakeholder interrelationships)</p>

Recruit, designate, and train leaders for the change effort.
Use advisory boards and workgroups (Development of stakeholder interrelationships) Create and engage a formal group of multiple kinds of stakeholders to provide input and advice on implementation efforts and to elicit recommendations for improvements.
Use an implementation advisor (Development of stakeholder interrelationships) Seek guidance from experts in implementation.
Visit other sites (Development of stakeholder interrelationships) Visit sites where a similar implementation effort has been considered successful.
5. Training and education of stakeholders
Conduct educational meetings (Training and education of stakeholders) Hold meetings targeted toward different stakeholder groups (e.g., providers, administrators, other organizational stakeholders, and community, patient/consumer, and family stakeholders) to teach them about the clinical innovation.
Conduct educational outreach visits (Training and education of stakeholders) Have a trained person meet with providers in their practice settings to educate providers about the clinical innovation with the intent of changing the provider's practice.
Conduct ongoing training (Training and education of stakeholders) Plan for and conduct training in the clinical innovation in an ongoing way.
Create a learning collaborative (Training and education of stakeholders) Facilitate the formation of groups of providers or provider organizations and foster a collaborative learning environment to improve implementation of the clinical innovation.
Develop educational materials (Training and education of stakeholders) Develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about the innovation and for clinicians to learn how to deliver the clinical innovation.
Distribute educational materials (Training and education of stakeholders) Distribute educational materials (including guidelines, manuals and toolkits) in person, by mail, and/or electronically.
Make training dynamic (Training and education of stakeholders) Vary the information delivery methods to cater to different learning styles work contexts, and shape the training in the innovation to be interactive.
Provide ongoing consultation (Training and education of stakeholders) Provide ongoing consultation with one or more experts in the strategies used to support implementing the innovation.
Shadow other experts (Training and education of stakeholders) Provide ways for key individuals to directly observe experienced people engage with or use the targeted practice change/innovation.
Use train-the-trainer strategies (Training and education of stakeholders) Train designated clinicians or organizations to train others in the clinical innovation.
Work with educational institutions (Training and education of stakeholders) Encourage educational institutions to train clinicians in the innovation.
6. Support of clinicians
Create new clinical teams (Support of clinicians) Change who serves on the clinical team, adding different disciplines and different skills to make it more likely that the clinical innovation is delivered (or is more successfully delivered).
Develop resource sharing agreements (Support of clinicians) Develop partnerships with organizations that have resources needed to implement the innovation.
Facilitate relay of clinical data to providers (Support of clinicians) Provide as close to real-time data as possible about key measures of process/outcomes using integrated modes/channels of communication in a way that promotes use of the targeted innovation.
Remind clinicians (Support of clinicians) Develop reminder systems designed to help clinicians to recall information and/or prompt them to use the clinical innovation.
Revise professional roles (Support of clinicians) Shift and revise roles among professionals who provide care, and redesign job characteristics.
7. Engagement with consumers
Increase demand (Engagement with consumers) Attempt to influence the market for the clinical innovation to increase competition intensity and to increase the maturity of the market for the clinical innovation.

<p><u>Intervene with patients/consumers to enhance uptake and adherence</u> (Engagement with consumers) Develop strategies with patients to encourage and problem solve around adherence.</p>
<p><u>Involve patients/consumers and family members</u> (Engagement with consumers) Engage or include patients/consumers and families in the implementation effort.</p>
<p><u>Prepare patients/consumers to be active participants</u> (Engagement with consumers) Prepare patients/consumers to be active in their care, to ask questions, and specifically to inquire about care guidelines, the evidence behind clinical decisions, or about available evidence-supported treatments.</p>
<p><u>Use mass media</u> (Engagement with consumers) Use media to reach large numbers of people to spread the word about the clinical innovation.</p>
<p>8. Use of financial strategies</p>
<p><u>Access new funding</u> (Use of financial strategies) Access new or existing money to facilitate the implementation.</p>
<p><u>Alter incentive/allowance structures</u> (Use of financial strategies) Work to incentivize the adoption and implementation of the clinical innovation.</p>
<p><u>Alter patient/consumer fees</u> (Use of financial strategies) Create fee structures where patients/consumers pay less for preferred treatments (the clinical innovation) and more for less-preferred treatments.</p>
<p><u>Develop disincentives</u> (Use of financial strategies) Provide financial disincentives for failure to implement or use the clinical innovations.</p>
<p><u>Fund and contract for the clinical innovation</u> (Use of financial strategies) Governments and other payers of services issue requests for proposals to deliver the innovation, use contracting processes to motivate providers to deliver the clinical innovation, and develop new funding formulas that make it more likely that providers will deliver the innovation.</p>
<p><u>Make billing easier</u> (Use of financial strategies) Make it easier to bill for the clinical innovation.</p>
<p><u>Place innovation on fee for service lists/formularies</u> (Use of financial strategies) Work to place the clinical innovation on lists of actions for which providers can be reimbursed (e.g., a drug is placed on a formulary, a procedure is now reimbursable).</p>
<p><u>Use capitated payments</u> (Use of financial strategies) Pay providers or care systems a set amount per patient/consumer for delivering clinical care.</p>
<p><u>Use other payment schemes</u> (Use of financial strategies) Introduce payment approaches (in a catch-all category).</p>
<p>9. Change of infrastructure</p>
<p><u>Change accreditation or membership requirements</u> (Change of infrastructure) Strive to alter accreditation standards so that they require or encourage use of the clinical innovation. Work to alter membership organization requirements so that those who want to affiliate with the organization are encouraged or required to use the clinical innovation.</p>
<p><u>Change liability laws</u> (Change of infrastructure) Participate in liability reform efforts that make clinicians more willing to deliver the clinical innovation.</p>
<p><u>Change physical structure and equipment</u> (Change of infrastructure) Evaluate current configurations and adapt, as needed, the physical structure and/or equipment (e.g., changing the layout of a room, adding equipment) to best accommodate the targeted innovation.</p>
<p><u>Change record systems</u> (Change of infrastructure) Change records systems to allow better assessment of implementation or clinical outcomes.</p>
<p><u>Change service sites</u> (Change of infrastructure) Change the location of clinical service sites to increase access.</p>
<p><u>Create or change credentialing and/or licensure standards</u> (Change of infrastructure) Create an organization that certifies clinicians in the innovation or encourage an existing organization to do so. Change governmental professional certification or licensure requirements to include delivering the innovation. Work to alter continuing education requirements to shape professional practice toward the innovation.</p>
<p><u>Mandate change</u> (Change of infrastructure) Have leadership declare the priority of the innovation and their determination to have it implemented.</p>
<p><u>Start a dissemination organization</u> (Change of infrastructure) Identify or start a separate organization that is responsible for disseminating the clinical innovation. It could be a for-profit or non-profit organization.</p>