Heart & Stroke– Knowledge Translation Plan for Canadian Stroke Best Practices

Prepared for Heart & Stroke Foundation

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Prepared By:

Kyle Silveira, Christine (Tina) Fahim, Sharon E. Straus

Knowledge Translation Program
Li Ka Shing Knowledge Institute
St. Michael's Hospital

Contact:
Kyle Silveira
E: SilveiraK@smh.ca

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Introduction

What Is Knowledge Translation & Exchange (KT)?

The Canadian Institutes of Health Research (CIHR) define knowledge translation as **"the synthesis, dissemination, exchange and ethically-sound application of knowledge**"[1].

What Is The Heart & Stroke KT Plan?

The Canadian Heart & Stroke Foundation (H&S) commissioned the SPOR Evidence Alliance and the Knowledge Translation Program at the Li Ka Shing Knowledge Institute to assess their current KT activities and inform the development of a strategic and comprehensive KT plan that:

- Aligns with their new strategic directions and role as a health charity
- Considers their mission and enables change among varied audiences to enhance uptake and impact of their guidelines
- Meets the needs of target audiences across the continuum of care
- Is based on evidence from the field of KT science
- Is a multi-pronged approach that engages partners and enables sharing of knowledge synthesized by Heart and Stroke

The proposed KT plan is targeted to disseminating and implementing the Canadian Stroke Best Practices (SBPs), but may be applied to all H&S KT activities.

Methods

Part 1 of the consultation included a gap analysis describing barriers the H&S faces in the dissemination and implementation of SBPs. We provide recommendations to address those barriers and meet H&S KT goals, derived through discussions with stakeholders. Part 2 of the consultation included development of a summary table of the H&S's current KT strategies. We reviewed the KT literature, where available, and provide recommendations on how enhance the delivery of these strategies. In Part 3, we developed a list of suggested organizations and contacts that H&S may consider partnering with for future KT activities. Finally, Part 4 of the consultation included alternative KT models to the Knowledge-to-Action model that H&S can consider in the development of their overarching KT strategy.

Part 1: Gap Analysis

To inform the gap analysis, we engaged the following H&S stakeholders in group discussions and interviews from June-July 2019 in order to assess their perspectives on SBP dissemination and implementation:

- June 4th - Stroke Best Practices Advisory Committee
- June 6th - Community Consultation Advisory Group

- June 11th - Provincial -Territorial Advisory Group (PTAG)
- June 19th – Leanne Casaubon (Co-Chair of Educational Committee)
- June 24th – H&S Staff
- July 3rd – Andrea de Jong (SBP Project Lead)

Stakeholders were identified through discussions with H&S leadership as individuals or groups that play a role in SBP KT in: knowledge generation, dissemination, implementation, or as end users. A semi-structured interview guide was drafted for use based on the **Theoretical Domains Framework (TDF)** [2], a framework developed by implementation researchers to identify influences on health professional behaviour related to implementation of evidence-based recommendations.

The data gathered from these discussions were used to assess barriers to H&S's current dissemination and implementation goals and to identify opportunities for H&S to address these barriers. A number of implementation science theories, models, and frameworks were used to guide this process. The **Knowledge-to-Action (KTA) model** [3] is a conceptual framework for thinking about the process of moving knowledge into action and integrating the roles of knowledge creation and knowledge application. Specifically, we focused on the KTA steps: *'assess barriers and facilitators to knowledge use' and 'select, tailor and implement interventions'.* We mapped participants' responses about barriers and facilitators to uptake of SBPs to the **TDF** and **COM-B behavior change wheel** [4]. The COM-B framework is a 'behaviour system' involving three essential conditions: capability, opportunity, and motivation. This mapping process allowed us to determine the theoretical mechanisms of WHY target audiences may or may not change and HOW we can bring about change. The **Effective Practice and Organisation of Care** [5] **(EPOC)** taxonomy of health systems interventions was used to provide specific recommendations on KT strategies that could be used to implement change. Two people did this independently and disagreements were resolved by consensus.

Part 2: Overview of KT activities and recommendations

To inform the summary table of KT activities, the KT team assessed resources provided by H&S and the implementation science literature. Specifically, we used **The Canadian Agency for Drugs Technology and Health's** [6] **(CADTH) Rx for Change** database (which defines and organizes interventions according to the EPOC Group's intervention classification scheme) and **The Expert Recommendations for Implementing Change (ERIC)** study's compilation of implementation interventions [7], to identify and classify the KT activities H&S already carries out and to inform suggestions for new activities. CADTH also summarizes all relevant reviews on effectiveness for each intervention, which are evaluated for methodological quality and expert consensus according to AMSTAR [8] (A Measurement Tool to Assess Systematic Reviews). To inform suggestions for enhancing existing and proposed KT strategies, we focused on

prioritized identification of relevant systematic reviews, followed by primary studies. In some cases, we used opinions from websites, in particular to provide examples of educational delivery strategies. We indicate in our report where evidence is lacking, and present these areas as opportunities for further research and evidence generation. Relevant resources are also linked in this section.

Part 3: Potential Partners

A list of potential partners for Heart and Stroke to collaborate with on future knowledge translation initiatives was generated and key contacts were highlighted where known. These organizations and contacts were selected based on the relevance of their organization's work, their KT activities, and opportunities for funding.

Part 4: Description of the KTA

The Knowledge-to Action (KTA) Framework is a widely used KT framework that may be an applicable model to continue using for H&S KT activity. We explain the KTA cycle in detail and tailor it to the H&S context.

Part 5: Summary of Recommendations

We have created a summary of key recommendations, highlighting the KT activities that H&S is already conducting (and how to enhance them), and new KT activities for H&S to consider. This is a summary of key findings from Part 2 and Part 3 of this report.

Results

Part 1: Gap Analysis – Barriers, Goals, and Recommendations

We identified barriers to H&S's current KT goals and suggest recommendations for H&S to address them. Barriers, goals, and recommendations are separated by target audience: providers, provincial/territorial leaders, and patients. It is suggested that H&S prioritize which barriers they want to address, through discussions with key stakeholders from the target audience (e.g., patients should advise on KT activities targeting patients). We recommend H&S determine which activities can be led at the national level versus which activities should be delegated to the leads in provinces and territories. Whenever possible, H&S should provide resources, templates, and guidance for provinces and territories to support these activities. If possible, H&S can also consider evaluating impact of KT activities and consider a comprehensive annual evaluation of KT activities related to SBPs. This will ensure continuous monitoring of effect of implementation, and will uniquely position H&S to advance the science.

Providers

Barrier	Goal	COM-B and TDF Mapping	Recommendation
Providers are not aware of SBPs	Providers know which SBPs are applicable to their practice and patient population	Capability → Knowledge → Education	Consider developing a communications plan/dissemination strategy specific to each new guideline release; can consult with a communications contact
Providers are not sure who to contact to access expertise on how to implement the SBPs	Providers should understand coordinated care pathways and know who to contact to access expertise on how to best implement the SBPs	Capability → Knowledge → Education	Consider having a point of contact for SBP support, particularly for community physicians. Embed this point of contact in a dissemination strategy so that providers KNOW this resource is available (List expertise, and information that the point of reference can provide)
Providers are not sure which SBPs are endorsed by professional organizations (i.e. by CAEP)	Clear recommendations available to providers (physicians, emergency providers, etc.)	Capability → Knowledge → Education	Consider emphasizing endorsements by professional organizations more prominently on SBP website, SBP resources, and SBP communications. Consider pursuing endorsements/support from professional organizations relevant to each guideline topic area and relevant specialty group.
Providers are overburdened by amount of resources from	Provider resources are locally tailored and easy to access for different providers groups	Capability → Memory, attention and decision	Consider adding a platform on the SBP website that displays H&S resources AND links out to partnered organization resources.

different organizations		processes → Environmental Restructuring	When creating this platform, categorize resources by what H&S offers and what other organizations offer, as well as by SBP topic area and relevant specialty provider group When possible, consider partnering with other specialty societies (e.g., paramedics, nursing groups) to ensure consistency in society-endorsed recommendations
Providers are not sure how to deliver treatments associated with SBPs	Providers are trained in uncommon treatments that may be recommended by SBPs (e.g. Rehab)	Capability → Skills → Training	Consider delivering needed training through the existing webinar series format and consider including 'new treatments' training within each webinar associated with a new guideline release Alternatively, consider delivering a training at a major conference, educating providers on uncommon treatments recommended by SBP
Providers have mixed perceptions on whether a specific recommendation will make a difference for their patient's care	Providers are confident that SBPs will make a positive difference in their patients' care	Motivation → Beliefs about consequences → Education	Consider, when possible, prioritizing recommendations (A,B,C level) in terms of potential benefit on patient outcomes Continue to emphasize sound guideline methods in future communications/dissemination efforts (sound methods=more buy-in). Consider including information on 'HOW will this make a difference' for my patient in any resource or communication (patients should inform this, and providers should review to ensure the message resonates with other providers → address motivation).
Providers are concerned about the burden of workload if SBPs are implemented	SBPs are implemented into workflow to reduce burden on providers	Motivation → Beliefs about consequences → Education	Consider creating a strategy where the implementation of *select* key recommendations within a guideline are promoted – so providers don't feel overwhelmed Determine how SBPs can be fit into regular workflow; Prioritize which SBPs should be implemented
Providers are distressed when considering implementation/de-implementation (if	Providers are motivated to de-implement low-evidence, low-impact practices that are familiar and implement SBPs	Motivation → Emotion → Persuasion	Consider promoting awareness of low value/potential harm of practices no longer recommended to change habits. At the national level, de-implementation messaging

they begin doing something new, they will have to stop doing something familiar)	that are unfamiliar		should be sensitive to the motivation/processing it will take for a provider to feel like what they've been doing is no longer 'the right thing to do' Consider promoting provincial/territorial teams to identify and produce local opinion leaders - the exact content of a motivational message should come from a provider-patient partnership
Providers want to account for patient preferences when delivering the SBPs	Providers are able to engage in shared decision making with their patients	Motivation → Intention → Education	Consider sourcing shared decision making resources/tools for providers
Providers do not have a quick point of reference with applicable SBPs synthesized	Providers can access consolidated, synthesized point of reference for SBPs	Capability → Memory, attention and decision processes → Education	Consider developing a provider resource to act as a summary sheet/document for each SBP topic area. The nature of this potential resource would be quick, condensed overview of high-value recommendations in a guideline. Consider creating a short summary tool with recommendations specific to a certain specialty group, when applicable Ensure these resources are well disseminated.
Providers are unsure how to choose between SBPs and different recommendations from different groups	Providers are able to distinguish SBPs from other guidelines whose recommendations don't fully align (specialty groups ex. emergency, cardiology, endopathology)	Capability → Memory, attention and decision processes → Education	Consider identifying key specialty groups with conflicting guidelines/recommendations and discuss a potential partnership
Providers do not have resources at the point of care	Providers can access SBPs at point of care	Opportunity → Environmental context and resources → Environmental restructuring	Consider working with CDSS to integrate guidelines into EMR (make available at point of care)
Providers in primary care are not attending Clinical Update conferences	Engage primary care providers with SBP updates	Opportunity → Environmental context and resources → Enablement	Consider pursuing a webinar series that is accredited and promoted through primary care communications channels. This can take place over a few weeks with one webinar a week. Consider attending/presenting at primary care conferences (ex. FMF, Pri-Med)
Providers have competing priorities	Providers' organizational priorities align with QI	Opportunity → Environmental	Consider providing an organizational priority planning

(organization efficiencies or different priority focusses) that take precedence over following SBP recommendations	priorities, so they are able to follow SBP recommendations	context and resources → Environmental restructuring	template, with examples of how to integrate efficiency goals with quality initiative. In keeping with iKT, front line providers should have input on this to ensure it is feasible

Provincial/Territorial Leaders

Barrier	Goal	Mapping	Recommendation
Provincial/Territorial Leaders do not receive the resources to support collaboratives/ community of practices (CoPs)	Provincial/Territorial leaders are able to organize learning collaboratives/community of practices (CoPs)	Opportunity → Environmental context and resources → Enablement; Environmental restructuring	If the IHI collaborative model is too resource intensive, explore amending the model by exploring options to meet virtually and locally (smaller groups) H&S and provinces/territories can meet to determine which activities will be led by each, to ensure assigned tasks are feasible given the available resources and supports
Provincial/Territorial Leaders do not have leaders that can influence systems of care that are designed to support local providers in following SBP recommendations	System leaders are educated about SBPs so that they can influence future design of health systems to support SBPs	Opportunity → Environmental context and resources → Enablement	Consider identifying system leaders that are able to influence health systems - Identify opinion leaders in provinces/territories Consider facilitating meetings for provinces/territories to share lessons learned and provide opportunity for systems leaders to connect, be familiarized and energized to support SBPs at their sites
Provincial/Territorial Leaders are at different maturity levels in regards to supporting SBP uptake and implementation	All provinces/territories are at similar stages of supporting SBP uptake and implementation	Opportunity → Environmental context and resources → Environmental restructuring	Consider supporting establishment of infrastructure for provincial/territorial wide networks for stroke leaders, executives, providers, clinicians, researchers, etc. where they do not already exist. If one large network is too resource intensive, aim to establish smaller networks more locally across health zones/authorities or by specialty group (acute, rehab, etc.) Provide coordinating support for provinces/territories that are lagging behind by facilitating sharing of “lessons learned” or “tips” from other provinces/territories that have established infrastructure

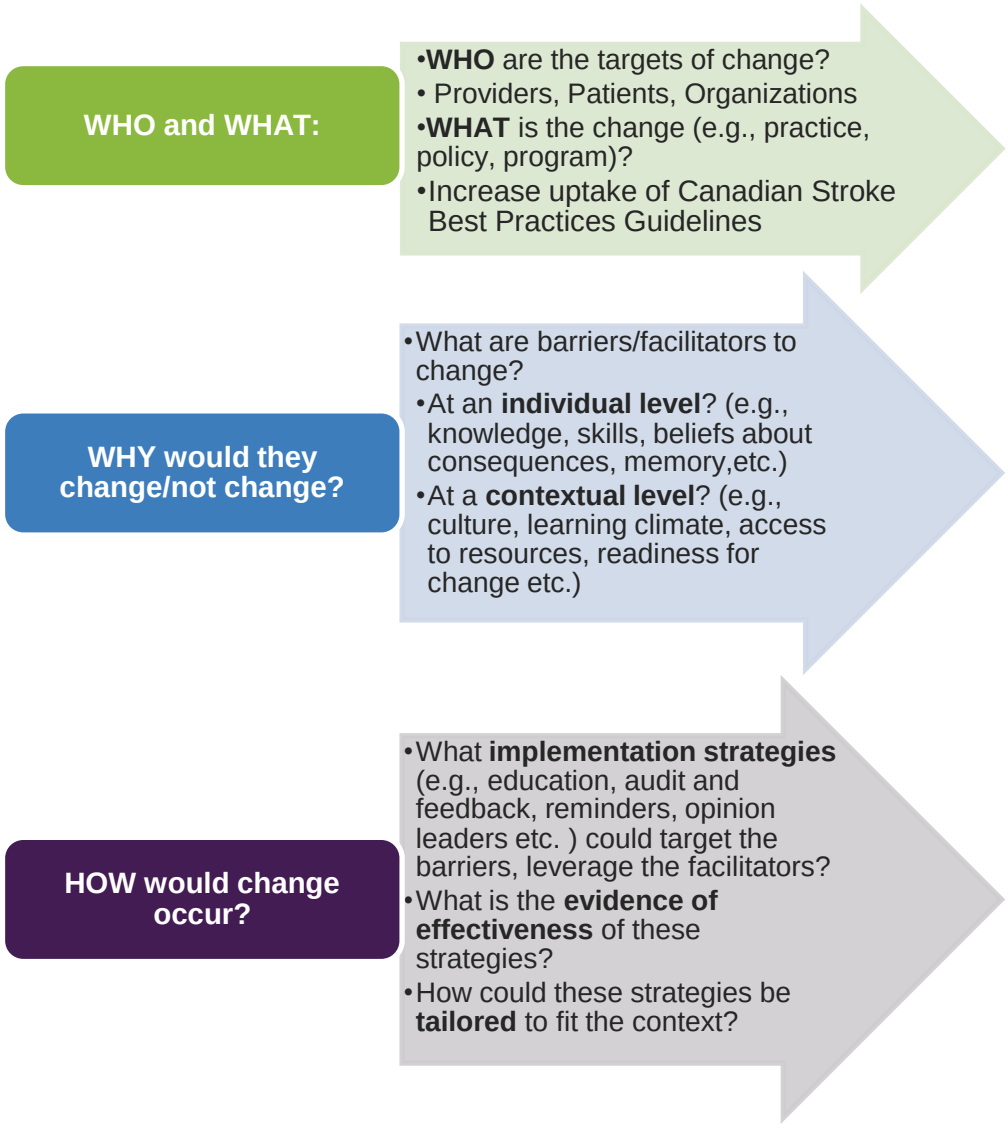
Patients

Barrier	Goal	Mapping	Recommendation
Patients/Caregivers feel like they are not being treated with sensitivity when interacting with some providers	Providers deliver SBPs with sensitivity when interacting with stroke patients (realize that stroke changes a person when delivering SBPs to patients)	Motivation → Emotion → Modeling (at provider level)	Consider modeling a presentation on what sensitivity toward stroke patients looks like at an upcoming conference or embedding this topic within upcoming webinars. Following integrated KT principles, involve survivors in the co-creation of the content for the presentation/webinar
Patients/Caregivers are not aware of the H&S Facebook Group Patients/Caregivers are not aware of H&S online patient-facing resources	Patients/Caregivers are aware of the H&S Facebook Groups and H&S resources	Capability → Knowledge → Education	Consider a mass media campaign in order to promote the H&S survivor/caregiver Facebook Groups In the H&S Facebook groups, promote resources. Alternatively, consider testing new strategies for dissemination on other forms of social media (e.g., twitter, videos, etc.)
Patients are currently not included in Stroke Congress	Involve patients *meaningfully* in future Stroke Congress events	Motivation→ Intentions →Modeling	Consider taking an iKT approach to patient engagement. This would involve asking patient partners and providers how they feel patients could be *meaningfully* featured in Stroke Congress and adapting accordingly. Consider how other conferences have approached involving patients and adapt to H&S context Below are some resources that can support meaningful patient engagement: https://patientvoicesbc.ca/resources/iap2-spectrum-public-participation/ https://chimb.ca/sub-sites/1-patient-engagement https://ceppp.ca/en/

Part 2: Summary Table of KT Activities & Recommendations for Enhanced Delivery

All of the KT activities that H&S currently undertakes were reviewed and we present a few new KT strategies for H&S to consider. Current H&S KT activities are mapped to defined KT strategies along with their estimates of effect from the literature. Suggestions for enhancing existing and proposed KT strategies are also proposed and we provide links to resources that may be helpful**.** Note that for many of the specific recommendations within each of these KT strategies, the evidence base is still emerging and limitations of this evidence should be noted. **Any KT strategy without "*Evidence of effectiveness on outcomes"* noted, would be considered innovative in the field.** Therefore, we suggest H&S track and monitor these strategies for impact.

The summary table is organized into the **WHO and WHAT, WHY and HOW:**



WHO and WHAT:

Providers/Patients/Organizations/System Leaders adopt the stroke best practice recommendations

HOW

Strategies to address barriers/leverage facilitators

Current H&S Activities	KT Strategy	Recommendations for enhanced delivery	References
Providers: ✓ Healthcare provider resources (pocket cards, checklists, toolkits, frameworks, reports) ✓ Supporting KE implementation resources **Patients:** ✓ Patient resources	Develop education materials	○ Consider developing infographics for providers/ patients ○ Consider developing plain language summaries for the SBPs for providers/patients ○ Consider developing KT tools for providers on specific, prioritized SBP topic areas/recommendations (e.g. FAQs) ○ Consider developing "Success Stories" series for implementation of SBPs in a print or video model	https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2015.0642 https://www.sciencedirect.com/science/article/pii/S2452301117300792 https://www.researchgate.net/publication/328768909_Infographics_or_video_which_one_is_more_effective_in_asthmatic_patients'_health_a_randomized_clinical_trial

Providers and Patients: ✓ SBP Website	Distribute education materials *Evidence of effectiveness on outcomes (reviews with AMSTAR scores > 8; magnitude of effect: Effective for improving care outcomes (13 reviews); 2.0% improvement in care (Interquartile range (IQR) 0.0% to +11.0%) [9]*	Consider implementing active dissemination strategies including: ○ Distributing education materials to providers and patients via postal and/or electronic mail lists, electronic/digital, social and mass media Consider the following updates to the website: ○ Create a website map as a visual aid for navigating the SBP modules and SBP resources. ○ Add descriptive text under each resource icon on the Professional Resources" pages to provide a quick summary of what the resource is and how it can be used. ○ Incorporate a way to filter SBP guidelines and provider resources not only by *topic* but also by *target provider group (i.e. primary care, emergency, etc.)*. ○ Continue to solicit feedback for the website through annual online surveys and incorporate feedback on website layout and content. ○ Ensure all resources are linked through provincial/territorial websites/documents/communications (ensure these provincial/territorial bodies drive people to websites for webinars) [Evaluate cross-linking] ○ Adding button on H&S website to SBP website to drive more providers ○ Creating links to/from Canadian Stroke Consortium website	https://effectivehealthcare.ahrq.gov/sites/default/files/pdf/medical-evidence-communication_research.pdf https://www.ncbi.nlm.nih.gov/books/NBK174174/ https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD009401.pub2/full
Providers: ✓ Webinars (H&S Lead, Facebook live, etc.) ✓ Conferences (Canadian Stroke Congress, Clinical Update, Canadian Cardiovascular Congress session)	Conduct educational meetings *Evidence of effectiveness on outcomes (reviews with*	Consider using the following techniques in webinar and conference presentations: ○ Use patient examples/personal stories (appeal to provider motivations) ○ Engage audience in activity to break up didactic nature of presentation ○ Use visuals and limited text ○ Speak naturally, do not read slides	https://journals.sagepub.com/doi/abs/10.1177/2373379917700876 https://www.youtube.com/watch?v=1RwJbhkCA58 [1]

[1] These resources are not evidence based and just serve as examples that can be considered and tested by H&S

✓ Presentations at external conferences, Women's Heart Health Summit **Patients:** ✓ Webinars (Facebook Live)	*AMSTAR scores > 8; magnitude of effect: Effective for improving care and prescribing outcomes (22 reviews); 6.0% improvement in care (IQR +1.8% to +15.9%) [10]*	○ Print effective posters Consider adapting webinars to: ○ Clearly state purpose, goals, and outcomes ○ Integrate polling, active questioning, collective wondering, and back channel chatting to promote a highly interactive, facilitated approach instead of lecture ○ Provide options for active learning (contribute to webinar discussion and to make comments on content and materials) ○ Embed clinical cases when possible, to foster questioning, application of previously acquired knowledge, discovery of missing knowledge, and critical thinking ○ Tailor content to be as applicable to daily practice as possible	https://www.youtube.com/watch?v=1RwJbhkCA58 (posters)[1] https://tech.ed.gov/FutureReady/Professional-Learning[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4005175/ https://blog.clickmeeting.com/webinars-what-when-and-how-long[1]
Providers: ✓ Webinars (H&S as partners to other organizations)	Conduct educational outreach visits *Evidence of effectiveness on outcomes (reviews with AMSTAR scores > 8; magnitude of effect: Effective for improving care and behaviours (2 reviews)[11]*	○ Trained person should use principles of iKT – connect with the target organization to make sure their presentation is tailored to their needs ○ Give the organization members time to explain their context to make sure the training is applicable to them	https://implementationscience.biomedcentral.com/articles/10.1186/s13012-016-0399-1 https://implementationscience.biomedcentral.com/articles/10.1186/s13012-017-0700-y

Providers: ✓ Core quality indicators across 17 H&S conditions ✓ H&S Webinar Topic Selection ✓ H&S Webinar Feedback ✓ H&S Website Feedback	Audit and Feedback *Evidence of effectiveness on outcomes (reviews with AMSTAR scores > 8; magnitude of effect: Effective for improving care and prescribing outcomes (14 reviews); 11.2% (IQR +6.5% to +19.5%) [12]*	Consider the following suggestions for designing practice feedback for practices based on core quality indicators that are feasible to be collected. Practice feedback can then be shared with others. The same principles for audit and feedback would apply when garnering feedback for H&S KT activities: Nature of data available for feedback ○ Provide multiple instances of feedback ○ Provide feedback as soon as possible and at a frequency informed by the number of new patient cases ○ Provide individual rather than general data (practice – based vs. hospital based) ○ Choose comparators that reinforce desired behavior change (focus on similar, specific comparators) Nature of desired action ○ Recommend actions that are consistent with established goals and priorities ○ Recommend actions that can improve and are under the recipients control ○ Recommend specific actions Feedback Display ○ Closely link the visual display and summary message ○ Provide feedback in more than 1 way ○ Minimize extraneous cognitive load for feedback recipients Delivering feedback intervention ○ Address barriers to feedback use ○ Provide short, actionable messages followed by optional detail ○ Address credibility of the information ○ Prevent defensive reactions to feedback ○ Construct feedback through social interaction	https://www.afhto.ca/wp-content/uploads/5a.-Ann-Intern-Med-15-ways-to-improve-audit-and-feedback.pdf

Providers: ✓ Stroke collaboratives *(BC,AB)* ✓ Strategic Clinical networks *(AB)* ✓ Network Forums (*NS)*	Use a learning collaborative/community of practice	Consider making the following changes to using a learning collaborative/community of practice: ○ A number of provincial/territorial leaders (e.g., in BC, AB) have set up stroke collaboratives that meet to discuss a specific topic (e.g., acute care) within the SBP. ○ These collaborative and networks could be structured to cover more SBP topics, meet on a more regular basis (every 4 months) to share their lessons learned etc. ○ Ideally, with a collaborative in each province/territory, there could be an opportunity for sharing among the different provincial collaboratives etc. (e.g., SBP leaders meet monthly to discuss topics/share resource info etc.) ○ A number of provincial/territorial leaders (e.g., NS, AB) have leveraged network forums and strategic clinical networks to achieve the same goals where learning collaboratives are too resource intensive ○ Bring together relevant stakeholders for a specific topic and then brainstorm in person local adaptations to bring back ○ Consider adapting the IHI model to include virtual meetings and smaller groups ○ These meetings are also a great way to identify champions and local opinion leaders (other KT strategies suggested below)	*The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement.* IHI Innovation Series white paper. Boston: Institute for Healthcare Improvement; 2003. (Available on www.IHI.org) https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-4-27
Organizations: ✓ Stroke Distinction (Accreditation Canada)	Change accreditation or membership requirements	○ Consider promoting the Stroke Distinction more broadly through dissemination channels and communications strategy	https://accreditation.ca/stroke-distinction/
Providers: ✓ Using consultations and conferences as an opportunity to build champions *(NS, QC)*	Use of champions	Consider developing (or supporting provinces/territories to develop) a formalized champions program: ○ Champions are individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5960847/

		that the intervention may provoke in an organization. ○ This strategy includes preparing individuals for their role as champions. Champions are primarily internal to the organization. Additional issues raised include the need for guidance regarding: a) Methods and considerations related to the selection and identification of champions. Social network theory and methods may be useful in this regard. b) Training and or providing champions support materials. c) Addressing incentives or disincentives to the champion role. Whether there are needs for champions at different levels of an organization (e.g., clinic, region, national). ○ Champions are often distinguished from opinion leaders. Opinion leaders may be considered more of an objective third party with relevant expertise.	
System leaders: ✓ Policy/Advocacy campaigns (*all provinces/territories)* ○ *Stroke reports calls to action for various levels of government* ✓ SBPs are the base of policy and advocacy messages (*MN)*	Identify and use local opinion leaders *Evidence of effectiveness on outcomes (reviews with AMSTAR scores > 8; magnitude of effect:* *Effective for improving care outcomes (2 reviews)[13]*	Consider developing (or supporting provinces/territories to develop) a formalized local opinion leaders initiative, targeting system leaders to effect long term systems change and local providers to support organic, ground level change: ○ Inform providers identified by colleagues as opinion leaders or 'educationally influential' about SBPs in the hopes that they will influence colleagues to adopt it. ○ The opinions of individuals who refer people to services, or who initiate the connection to services also function in a key opinion role. ○ Keeping opinion leaders informed from pre-implementation through maintenance of the clinical innovation is important. ○ Ensuring that opinion leaders do not serve as implementation obstacles if they are not actively promoting the innovation is also important. ○ Local opinion leaders alone, or in combination with other interventions, can be effective in promoting evidence-	https://www.cochrane.org/CD000125/EPOC_are-local-opinion-leaders-effective-promoting-best-practice-healthcare-professionals-and-improving https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-1-3

		based practice, ○ The more specialized the group, the more opinion leaders may be a useful strategy. ○ Local opinion leaders' roles not clearly described in the literature, it is hard to comment on how to optimize effectiveness ○ Enhance communications – provide support to provinces with communications templates/education materials that they can lobby to governments ○ Provide supports to the provinces in terms of advocacy messages	
Systems Leaders: ✓ N/A	Mandate Change	Consider the following changes to Stroke Congress: ○ Create a mandate to involve SBPs in relevant presentations	
Organizations and Providers: ✓ N/A	Reminders *Effective for improving care and prescribing outcomes (14 reviews); 11.2% (IQR +6.5% to +19.5%) [14]*	Consider advocating for the development (or supporting provinces/territories to advocate for the development) of reminder systems designed to help clinicians recall SBPs and/or prompt them to follow the SBPs ○ Reminders could be patient or encounter specific, provided verbally, on paper, or electronically. ○ Computer-aided decision support and drug dosages are included in this strategy. ○ Reminders may be delivered at various time points (prior to service, during service, or following service)	
Providers and Patients: ✓ N/A	Social Media	○ There is no strong evidence for social media's effectiveness in the literature. ○ If considering using a SBP specific social media handle use an iKT approach. ○ Talk to patients/providers to see what sites they use (Twitter vs. Instagram vs. Linkedin vs. Facebook) and ask members of that target population to confirm the message/ accessibility before posting ○ Consult target population in developing content	https://www.jmir.org/2014/2/e40/

		○ Consider consulting a communications strategist for more social media recommendations	

Part 3: Potential Partners

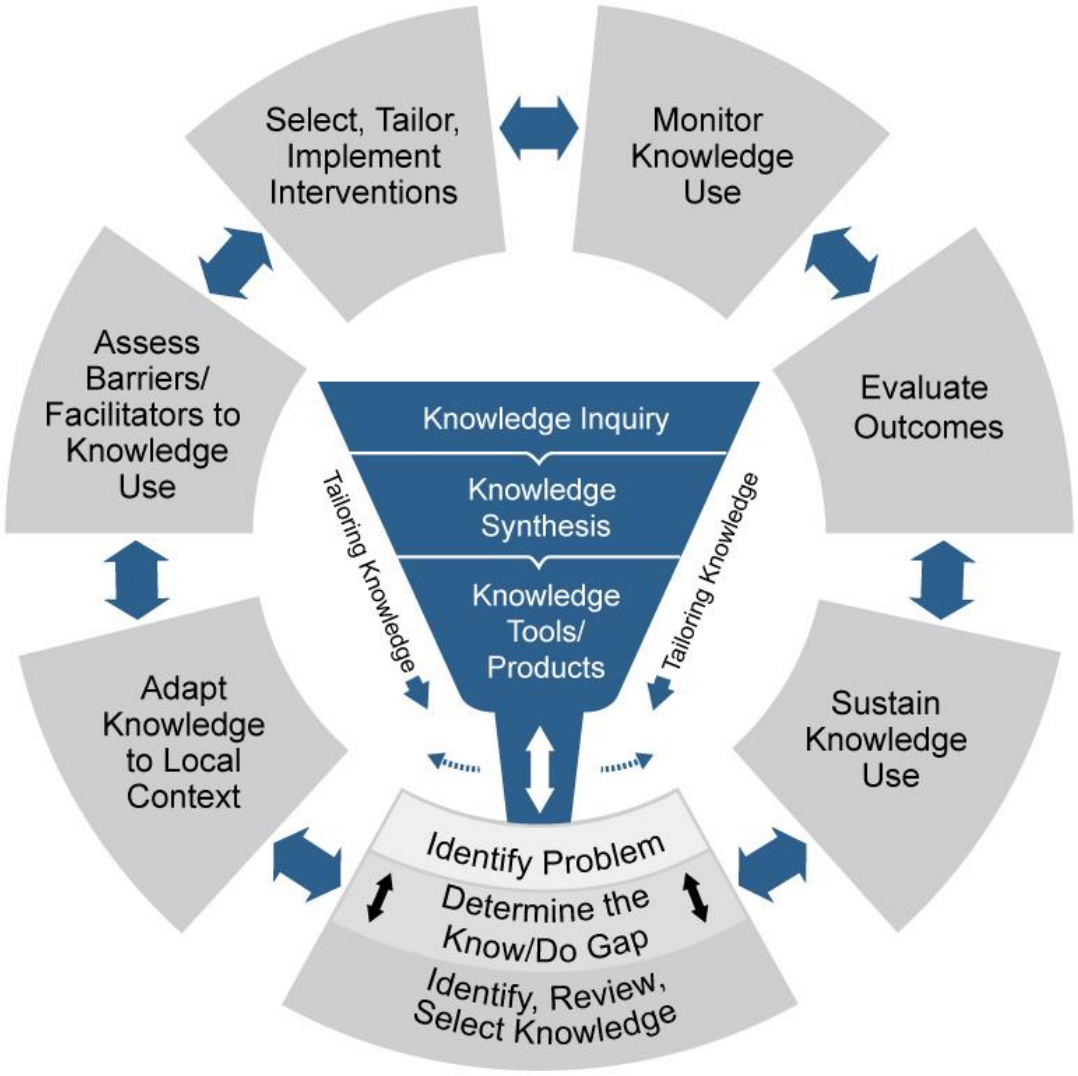
The table below highlights potential partners for the H&S to collaborate with on future KT initiatives. Potential partners are categorized as provincial, national, or international level organization and as funders, ministries, professional organizations and specialty societies, and journals. In some cases, contacts are identified.

	Provincial	National	International
Funders	○ BC: Michael Smith Foundation for Health Research ○ ○ KT activities (Gen Creighton, Manager, KT) ○ NS: Nova Scotia Health Research Foundation (NSHRF) ○ AB: Alberta Innovates	○ Canadian Institutes of Health Research (CIHR) ○ ○ Institute of Aging ○ ○ Institute of Circulatory and Respiratory Health ○ ○ Institutes of Indigenous Peoples' Health ○ Networks of Centres of Excellence of Canada	
Ministries	○ NS: Nova Scotia Health Authority	○ Public Health Association of Canada (PHAC) ➢ Contact: Dr. Rachel Rodin	
Professional Organizations and Specialty Societies	○ Ontario Brain Institute ○ Registered Nurses' Association of Ontario (RNAO) ○ College of Family Physicians of Ontario ○ (and similar organizations in each province/territory)	○ Canadian Medical Association ○ Canadian Task Force on Preventive Health Care (CTFPHC) ○ Canadian Cardiovascular Society ○ Canadian Stroke Consortium ○ Canadian Association of Emergency Physicians ○ Canadian Neurological Sciences Federation ○ College of Family Physicians Canada ➢ Contact: Mike Allen ○ Canadian Foundation for Healthcare Improvement ○ Diabetes Canada	○ American Stroke Association ○ American Heart Association ○ National Heart, Lung and Blood Institute (US) ○ ○ Center for Translation Research and Implementation Science (CTRIS) ○ World Health Organization

		○ Canadian Nurses Association ○ Paramedic Association of Canada Indigenous Works	
Journals		○ Canadian Medical Association Journal (CMAJ) ➢ Contact: Kim Barnhardt, (Communications and Partnerships) ○ Canadian Family Physician Journal ➢ Contact: Nick Pimlott (editor)	

Part 4: The Knowledge-to-Action Framework (KTA)

The Knowledge-to-Action cycle is a widely used KT framework that divides the knowledge to action process into two concepts: knowledge creation and action, with each composed of ideal phases or categories. In reality, the process is complex and dynamic and the boundaries between these two concepts and their ideal phases are fluid and permeable. The action phases may occur sequentially or simultaneously and the knowledge phases may influence the action phases [15].



Source: Graham ID et al. JCHEP 2006;26:13-24

The centre of the KTA Cycle is the “Knowledge Funnel”. For the H&S context, the Knowledge Funnel can be likened to the development of the SBPs. Looking at the primary evidence on a suggested SBP topic area *(Knowledge Inquiry)*, leads to a review of the evidence (*Knowledge Synthesis)*, resulting in a clinical practice guideline (*Knowledge Tool/ Product)*.

The outside of the KTA Cycle is the “Action Cycle”. The action cycle is the process by which knowledge is implemented. Based on planned-action theories, the action cycle represents phases of activities that are needed to achieve a deliberately engineered change in groups of people. For the H&S context, the action cycle presents the steps H&S would follow to design, implement and test KT activities.

The seven phases of the action cycle are listed and defined below [16]:

1. **Identifying the Knowledge-to-Action Gaps**
    - Identification of the knowledge-to-action gaps (knowledge needs) is the starting point of knowledge implementation. This needs assessment should involve rigorous methods and engage relevant stakeholders. Stakeholders should be engaged throughout the implementation process.
2. **Adapting Knowledge to Local Context**
    - Any knowledge must be adapted to local settings to ensure it is relevant and feasible. For example, H&S can adapt guidelines to ensure they are consistent with context within the partner organizations and applicable to the target audience. We suggest involving your target population (patients, providers) in this phase as well.
3. **Assessing Barriers/Facilitators to Knowledge Use**
    - Once you have developed a KT strategy, determine why patients/providers are likely to use/not use it.
    - Methods to access barriers and facilitators to knowledge use include:
        i. The Delphi procedure (to achieve consensus among a panel of experts)
        ii. Qualitative approaches such as focus groups, interviews, and questionnaires and systematic reviews of these study types
        iii. Statistical analysis on observational dataset by exploring potential determinants of variation in health care delivery
        iv. Statistical analysis of multiple studies concerning guideline implementation to determine factors that account for the heterogeneity of effects across studies
4. **Selecting, Tailoring, Implementing Interventions**
    - Once you have identified potential barriers to implementation of your KT strategy, identify corresponding strategies to overcome these barriers.

Knowledge translation interventions need to be tailored to specific barriers for change, similar to a clinical treatment that is tailored to a diagnosed health problem. For example, if providers are unaware of a new H&S guideline, consider holding webinars, training sessions, or using social media to disseminate the guideline.

- KT interventions should be tailored to the barrier to knowledge use on a theory-driven basis. We have used theory to map potential barriers and facilitators to corresponding strategies for H&S activities in Results Part 1.

5. **Monitoring Knowledge Use**
    - To maximize the impact of your KT Strategy, monitor the response by your target population. You can use the feedback to further tailor your KT Strategy.
6. **Evaluating Outcomes**
    - To determine the impact of your KT strategy, evaluate your implementation activities using explicit, rigorous methods. H&S can consider both qualitative and quantitative methodologies. It is critical to identify relevant outcomes, which can be at the patient, provider or health system level.
    - Because the evaluation of outcome may be a lengthy and resource-consuming task, attention is also paid to the processes under which knowledge is being implemented and the activities that bring about knowledge use.
    - H&S can consider evaluating any implemented strategies and report findings to advance the implementation science literature (e.g., are patients more informed of guidelines disseminated on social media vs. printed materials?).
7. **Sustaining Knowledge Use**
    - The sustenance of knowledge use refers to the continued implementation of evidence over time. While not made explicit in the KTA, spread and scale of the interventions should also be considered.
    - H&S should determine which strategies are effective and identify the resources needed to sustain these strategies.
    - The consideration of sustainability should occur early in the process and include the discussion of: budgetary resources, human resources, and the health care system.

Part 5: Summary of Recommendations

Activities H&S is doing and should continue doing:

H&S is currently conducting several KT activities and we would recommend they continue to execute *all* of their current efforts. The following list highlights current H&S KT activities and summarizes key recommendations for components that could be enhanced or added (for more detailed information, please see tables in Results Part 1 and Part 2):

- **Conferences** (Canadian Stroke Congress, Clinical Update, Canadian Cardiovascular Congress session)
    - Consider attending/presenting at primary care conferences (ex. Family Medicine Forum (FMF), Pri-Med).
    - Consider pursuing a webinar series that is accredited and promoted through primary care communications channels to replace Clinical Update. This can take place over a few weeks with one webinar a week.
    - Consider how other conferences have approached involving patients and adapt to H&S context. For example, patients can co-present sessions including workshops.
- **Webinars** (H&S Lead, Facebook live, etc.)
    - Consider embedding relevant topics (e.g., 'what sensitivity toward stroke patients looks like') within upcoming webinars. By relevant we mean those identified in needs assessments among your stakeholders. Following integrated KT principles, involve the target population (e.g., stroke survivors) in the co-creation and co-presentation of the content for the webinar. Case-based discussions are also very helpful.
- **Education Materials** (Health care provider resources, patient resources, implementation resources)
    - Consider developing a summary sheet/document for each SBP topic area, which is targeted to clinicians; this could be in the form of an algorithm or infographic. The nature of this potential resource would be a quick, condensed overview of high-value recommendations in a guideline. Consider creating a short summary tool with recommendations specific to individual specialty groups (e.g. cardiology, emergency, etc.) when applicable. These can then be shared at specialty meetings such as with primary care clinicians who attend the FMF.
    - Consider developing brief "Success Stories" series for *implementation* of SBPs in a print or video model and post to SBP website.
- **SBP Website**
    - Ensure all resources are linked through provincial/territorial partners' websites, documents and communications.
- **Quality & Performance monitoring** (Core quality indicators, webinar topic selection, feedback processes)
    - Consider a comprehensive annual evaluation of KT activities related to SBPs; the RE-AIM framework could be used to guide this evaluation.
    - Involve the target population (e.g., patients, providers) to determine which indicators should be monitored in the evaluation.
- **Policy & Advocacy** (Policy/Advocacy campaigns, Stroke reports' calls to action for various levels of government)

- Consider facilitating meetings for provinces/territories to share lessons learned and provide opportunity for systems leaders to connect, be familiarized and energized to support SBPs at their sites. Explore opportunities to connect with the health ministries across the country and identify opportunities to help them achieve their mandates with regards to patient-centred care.

Key recommendations specific to SBP Guidelines:
Consider developing a communications plan/dissemination strategy specific to each new SBP guideline release; can consult with a communications contact and include social media presence including use of social media influencers.
Consider developing key partnerships with other governing bodies such as professional organizations (e.g. Registered Nurses Association of Ontario) to ensure consistent guideline recommendations.
Consider promoting the Stroke Distinction more broadly through dissemination channels and communications strategy.
Consider pursuing endorsements/support from professional organizations relevant to each guideline topic area and relevant specialty group; submit regular commentaries to their specialty journals with tips/strategies relevant to their audience.
Consider emphasizing endorsements by professional organizations more prominently on SBP website, SBP resources, and SBP communications.
Consider creating a strategy where the implementation of *select* key recommendations within a guideline are promoted – so providers don't feel overwhelmed or, provide sessions for relevant audiences on how to prioritise recommendations for local implementation.
Determine how SBPs can be fit into regular workflow; Prioritize which SBPs should be the focus of implementation efforts.
Consider working with CDSS to integrate SBPs into the EMR; suggest working with an EHR vendor to develop embedded decision support, reminders, audit/feedback tools.

New activities for H&S to consider:

While H&S is currently conducting a vast array of KT activities, there are a few new activities that we recommend H&S consider (for more information please see Results Part 2):

- **Social Media**
  - If considering using a SBP specific social media handle use an iKT approach: Consult target population in developing content
  - Consider consulting a communications strategist for more social media recommendations including use of social media influencers
  - Track and evaluate the impact of social media for dissemination
- **Identify and use local opinion leaders**
  - Consider developing (or supporting provinces/territories to develop) a formalized local opinion leaders initiative, targeting system leaders to effect long term systems change and local providers to support organic, ground level change.
- **Use of Champions**
  - Consider developing (or supporting provinces/territories to develop) a formalized champions program (e.g., champions in each province).
  - Champions are individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in an organization.
- **Mass Media**
  - Consider a mass media campaign in order to promote the H&S Survivor/Caregiver Facebook groups – a major, meaningful resource for stroke survivors across Canada.

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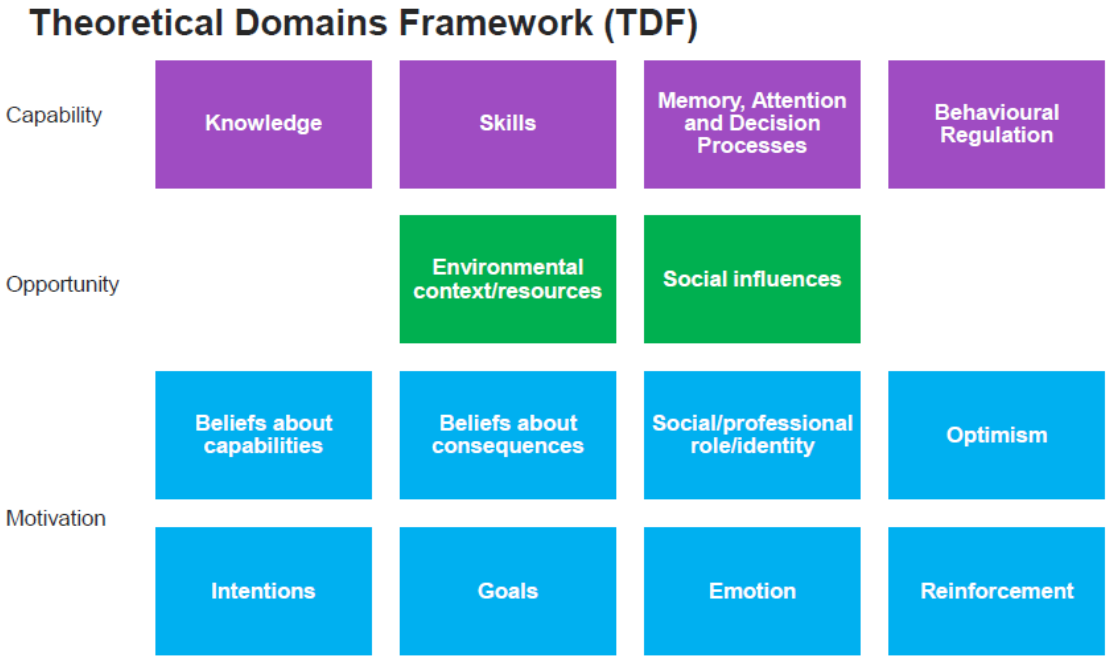
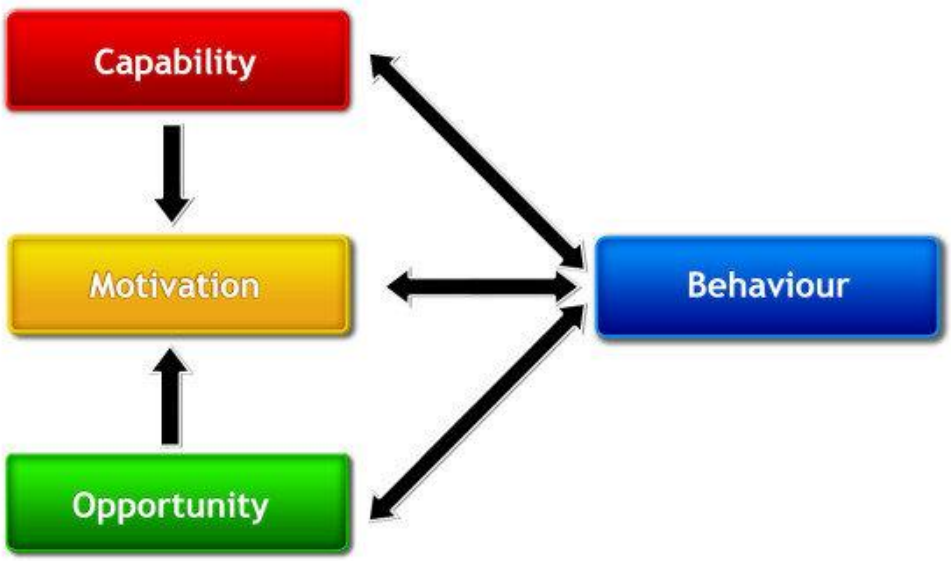
Appendix

1. Theoretical Domains Framework (TDF):



Source: Cane, O'Connor, & Michie(2012). Implementation Science; 7:37. doi: 10.1186/1748-5908-7-37.

2. COM-B behavior change:



Capability: Knowledge, skills, and the abilities to engage in the behaviour

Opportunity: Outside factors that make the behaviour possible

Motivation: Brain processes which direct our decisions and behaviours

Source: Michie, Atkins, & West (2014). The Behaviour Change Wheel: A Guide to Designing Interventions. Silverback Publishing: London.

3. The Expert Recommendations for Implementing Change (ERIC) study's compilation of implementation interventions