



The art and science of designing personalized interventions

A look at how the application of health psychology is addressing Tx nonadherence

Report authors:
Clare Moloney,
Clinical Strategy
Director

Monisha Ahluwalia,
Health Psychology Specialist



Introduction

The design of successful interventions to improve self-management must balance theoretical frameworks with creative executions that will resonate with patients.

In recent years, the changing health landscape, which has seen a focus shift from acute to chronic disease management, has impacted the roles of healthcare providers and patients. In an acute setting, the healthcare professional is the expert in control of managing the situation; this happens in a comparatively short and fixed period of time. In chronic disease management, patients have a bigger role in managing their condition. To some extent they become the experts, particularly in terms of their ongoing and ever-changing personal experience of the disease. Therefore, effective support has to recognize the [self-management roles](#) of

these individuals and be able to flex over time to meet their changing personal needs and disease fluctuations.^[1] This leads to the notion of personally tailored [interventions](#) that provide people with the right set of skills, support and information to be confident self-managers.

Current recommendations support the notion of tailored interventions. And guidance states that interventions should be developed using an appropriate [theoretical framework](#), built from a robust model of behavior change.^[2] The field of behavior change has provided us with a number of tools to help support the design of personalized interventions.



CORE CONCEPT

Interventions based solely on the patient's stage of condition, their age, or other demographics, only take into account one of many factors that influence behavior change. The Capability, Opportunity and Motivation (COM-B) model aims to explain human behavior in terms of the range of mechanisms that may be involved in change. The model hypothesizes that as three components - Capability, Opportunity and Motivation (COM) - interact with each other, they cause the performance of a behavior (B). In turn, these components provide us with an opportunity to understand why a recommended behavior is not carried out. It is proposed that each component can directly influence behavior and that Opportunity and Capability may also impact Motivation, therefore having an additional indirect influence on behavior.^[3]

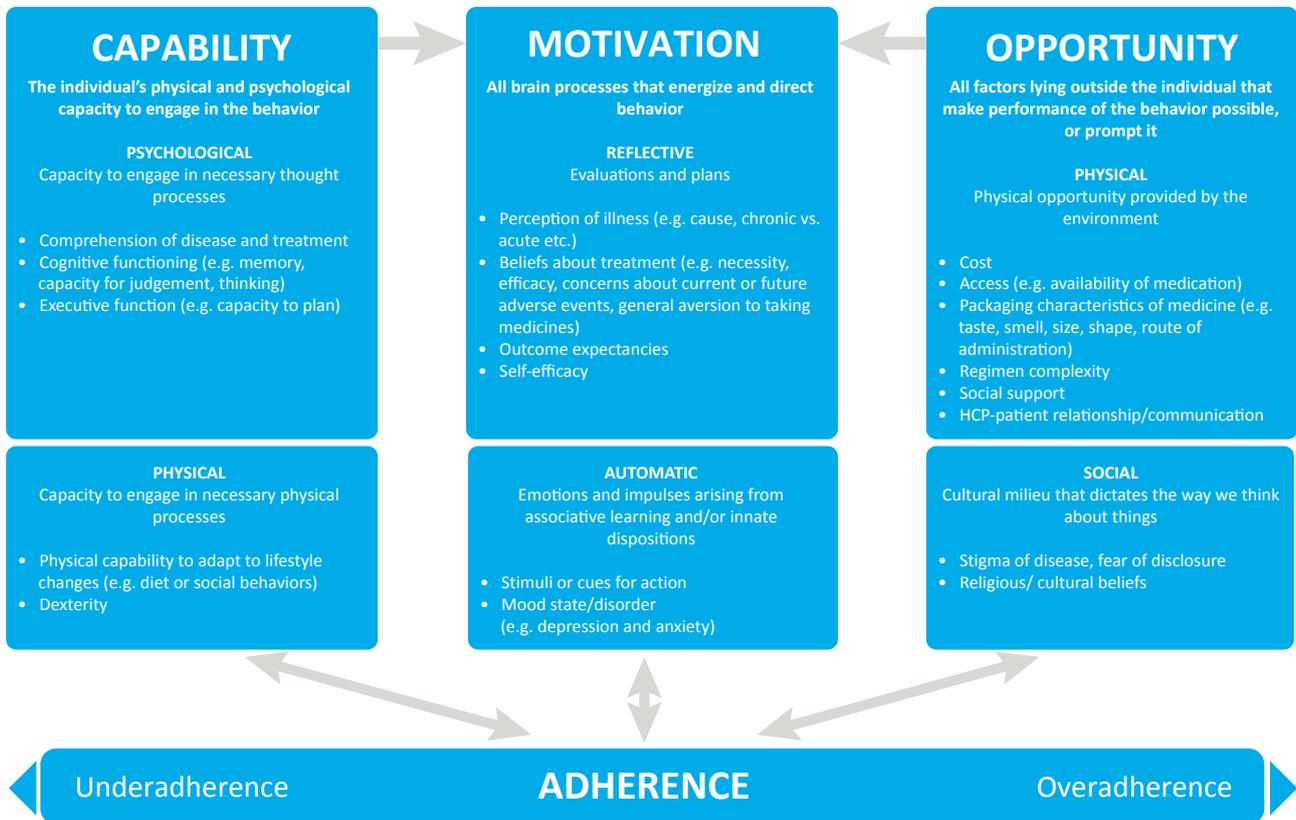


Just like any science, the science underlying behavior change can only take you so far with complex real world problems.

Michie et al. (2015)



Com-B Framework



Jackson et al (2014)

For example the [COM-B model](#)^[3] allows us to identify and classify a range of factors that may impact behavioral outcomes in a certain situation, which we can then screen for and target at an individual level. Complementary to this is the [Behavior Change Techniques](#) taxonomy^[4] which provides a comprehensive, evidence-based list of intervention options to help facilitate behavioral change. However, the science underlying the design of interventions can only take us so far.^[5] More often than not, they need to be implemented into the complexity of 'real world' situations. This is because interventions do not have the luxury of occurring in perfect isolation where all eventualities and parameters can be planned. In addition, there

is often a need to engage many different people, in greater numbers than you would for an average research study. This therefore leads us into a space where the ability to be creative and flexible with interventions and engage multiple stakeholders (e.g. patients, healthcare professionals, family members, caregivers), without compromising the fidelity of the intervention, is needed.

In this paper we look at two examples of tailored behavior change interventions and how the combination of a strong scientific underpinning, along with some creative flair and engagement methods, have led to successful 'real world' impactful interventions.

Patient support to improve medicines adherence in self-administered treatments

Evidence-based design + a compelling marketing campaign = positive patient **persistence** outcomes and high levels of patient and healthcare professional engagement.

Background

Despite the benefit of adjuvant hormonal therapy (HT) on mortality among women with breast cancer, many women are nonadherent with its use, both in terms of following the appropriate dosing regimen and persisting with the full course of treatment.^[5-8] Rates of discontinuation of adjuvant HT range from 16% to 32% within clinical trials and 17% to 31% outside of clinical trials.^[7]

The Challenge

- 1 Design and deliver an evidence-based patient support program (PSP) for women with breast cancer to improve **adherence** to HT treatments.
- 2 Ensure clinician acceptance and adoption of the support program. This was a particular challenge since, at the time, the concept of nonadherence was not widely accepted in the oncologist community.

The Science

Risk factors for adherence were identified through an extensive quantitative study, using **regression analysis** to determine the most impactful factors. This produced a 5-item discontinuation model that was used to design the following:

- Screening questions to be used at enrollment to quantify adherence risk and determine the prioritization of intervention topics tailored to the patient needs
- The core content topics and behavior change techniques to be used within the intervention content
- The focus of nurse-led calls for each individual patient

There was also a rigorous measurement strategy put in place to ensure that the impact of the PSP could be captured and that the data would be viable for presentation at scientific congress.

The Art

Content Creation

A primary feature of the program was a series of quarterly magazines, offered for the full duration of therapy (5 years). It was important that these were focused on the key drivers of nonadherence as identified in the research to help facilitate positive adherence behaviors. Furthermore, it was also key that the content in these magazines felt relevant and engaging to the women who would be receiving them.

To this end, health psychology specialists worked with health journalists and consumer media designers in order to 'wrap' the intervention appropriately. Additionally, behavior change techniques (BCTs) were chosen not only based on their potential impact on outcomes, as well as how they might fit within the context of a consumer style magazine publication. For example:

Marketing Campaign

A high visibility campaign was launched utilizing existing sales force staff and relevant advertising channels. In addition, brand packaging was adapted to allow for the direct enrollment onto the PSP of women prescribed treatment. Feedback on the program and evidence of effectiveness had been collected from women to influence the content of marketing materials. This approach strengthened the message to oncologists.

Additionally, published evidence was shared with clinicians to improve understanding and promote greater awareness of the challenges with adherence to breast cancer treatments.

Behavior Change Technique	Magazine Feature
Credible source	Stories from other women with breast cancer
Information about health consequences	"Busting breast cancer myths"
Prompts / Cues	Activity planner

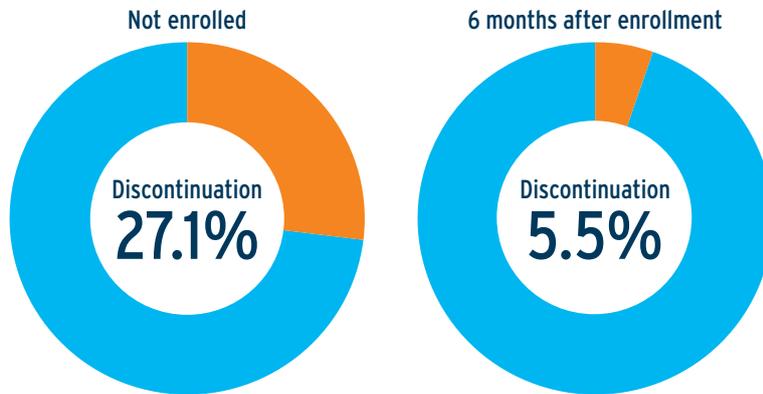


The design and early implementation of a robust measurement strategy is a vital part of the process. It not only allows us to demonstrate success, but also to ensure we are continuing to understand our patient needs and evolve our support offering.

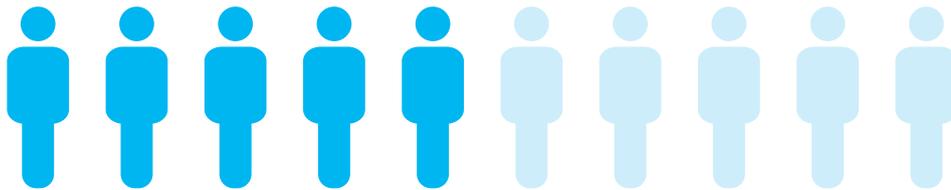


Magazines provided an opportunity to offer support and guidance through a medium that many women are familiar with. Having magazines delivered to women's homes was also an 'active' intervention - allowing us to reach out to our program members.

The Outcomes



- Discontinuation at 6 months was 5.5% for those enrolled on the program, compared to 27.1% for the census of all patients 1 year prior.



- Approximately 50% of all eligible patients are currently enrolled on the PSP.
- Strong patient advocacy
 - The magazine is currently ongoing and many women now write in to share their own stories.
- Positive program perception amongst oncologists.

Facilitating adherence discussions between patients and healthcare professionals

Evidence based design + a simple-to-use tool = empowered patients and enlightened healthcare professionals

Background

Patients are 4 times more likely to achieve remission from rheumatoid arthritis when treated with methotrexate. A large number of patients do not adhere to concomitant methotrexate and may instead be treated with alternate anti-TNF medications. Clinicians can further improve adherence rates to methotrexate by first identifying the nonadherent patients and then intervening to try to address the nonadherent behavior.

The Challenge

- 1 To facilitate open dialogue between patients and healthcare professionals (HCPs) relating to medication nonadherence in rheumatoid arthritis, with a particular focus on disease modifying anti-rheumatic drugs (DMARDs).
- 2 To assist healthcare professionals in delivering personalized intervention support as part of usual care to help address nonadherence, where identified.

The Science

Risk factors for adherence were identified through a review of published literature and discussions with an advisory board of specialist nurses and rheumatologists.

These factors were used to determine the following:

- Screening questions to be used before or during the consultation to facilitate discussions
- The core content topics and behavior change techniques to be used by the healthcare professional as part of their conversations
- The details of the patient guide

Some of the risk factors for adherence included: Concerns of side effects, negative illness beliefs including perceptions of timeframe and consequences, perceived necessity for treatment, and perceived drug efficacy.

To help refine the solution and optimize HCP engagement, a pilot was conducted in four specialist centers, with both consultant rheumatologists and specialist nurses using the guide with their patients. The guide was used with >150 patients across the four centers during the pilot.

The Art

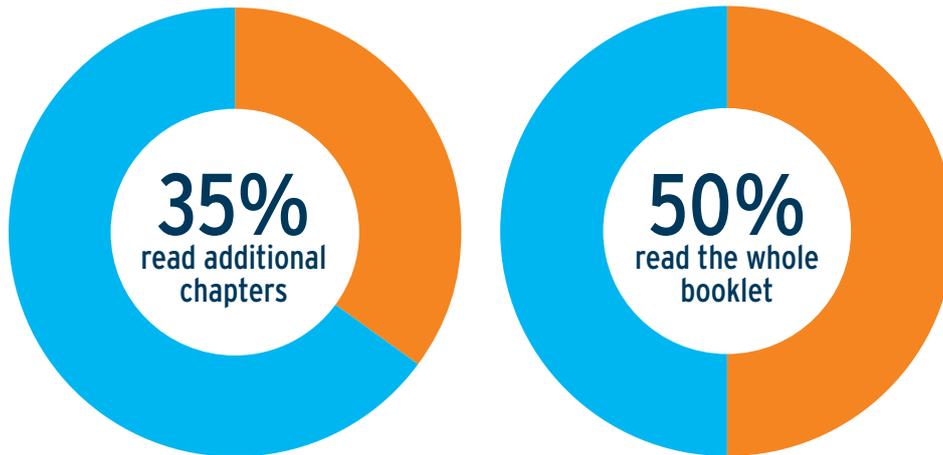
Designing the guide

Taking these insights, health psychology specialists worked with a consumer-focused creative communications team to develop an engaging, easy to use and effective discussion guide. The guide comprised of:

- A seven-question screener to help identify key topics for discussion
- Tabular quick reference guides based on screener responses to frame the discussion and for the patient to read at home
- Notes pages to help with information retention and personalizing the advice
- Challenges and tools, built around key behavior change techniques, including a 'Problem Solving Challenge,' 'Identifying Thinking Traps,' 'Treatment Experience Diary' and 'Medication Planner.'
- A complementary HCP implementation manual, used as a quick reference handbook for HCPs on how to use the guide with their patients.

The Outcomes

- HCP feedback and utilization from the pilot:
 - Screener questionnaire successfully directed patients to read one or more chapters



- 35% of patients read additional chapters to those they were directed to
- 50% of patients read the whole booklet
- Patients felt empowered to ask the right questions (as perceived by the treating HCP)

“There were a couple of [patients] where you thought, ‘oh God, we’ve really not given them very much information at all’... people that had been on [DMARDs] for five, ten years, were saying, ‘what’s this DMARD thing that they keep talking about?’... So it was quite illuminating”

“[Patients] talked about how useful it was, they didn’t feel alone, they wished they had this book ages ago”

“[Patients] felt that it was written in a very positive way and it was giving a very positive message”

- Post-pilot
 - An initial print run of 1000 guides for approximately 350 clinics was exhausted within two months following launch in the United Kingdom
 - A total of 6,500 reprints (6.5x the original printed guides) have been requested over the course of 6 months following pilot
- Centers that have used the guide continue to order copies directly, with a number setting up continual replenishment orders
- Over 85 meetings from 2013 have been held across multiple centers to discuss nonadherence and disseminate the guide



Summary

Intervention design and implementation in the 'real world' requires the marrying of a robust scientific underpinning with the ability to creatively respond and flex to fit a variety of different commercial, practical and social needs and considerations.

This report provides two examples of how this approach can deliver patient support and behavior change initiatives that are impactful, engaging and wide reaching with the benefits being realized by multiple stakeholders.

Research

What is COM-B?

Health psychology specialists from Atlantis Healthcare have recently published a paper demonstrating the key COM-B factors linked specifically to medication adherence. An overview of this adherence model is expanded on below.

Capability: The physical and psychological capacity to engage in outcome related activities. For example, having the physical dexterity to self-inject or sufficient executive functioning to remember to take a pill each day.

Opportunity: Factors which lie 'outside' of the individual which allow for, or prompt a behavior to happen; these can be both physical and social. For example, reimbursement schemes which make treatment financially viable, or cultural

beliefs which may be contradictory to physician recommendations.

Motivation: Brain processes, both reflective and automatic, which 'internally' drive behavior. This might be, for example, beliefs about treatment, such as the need to take it as prescribed and depression leading to apathy about the importance of self-care.

Further reading

More information about the application of COM-B can be found in these research papers

<http://bit.ly/26nUVUc>

<http://bit.ly/1T8NGGe>

Tech insights

How can technology play a role in the art & science of intervention design?

Technology platforms provide a great opportunity to deliver information to patients in a quick and time-relevant manner, such as scheduled medication reminders via SMS or treatment related information, accessed via a website post prescription.

However, the opportunities for leveraging technology-based solutions to enhance health outcomes are wider reaching than simply the provision of information. For example:

- 'Online' cognitive-behavioral therapy interventions have been shown to be as effective as face-to-face therapy in some conditions^[10]
- Behavior change techniques (BCTs) such as Modeling, Goal Setting and Action Planning have all demonstrated effectiveness when delivered online^[11]
- Furthermore, the use of web-based interventions to promote positive social comparison and improve perceptions of social support has been identified as an important point of consideration for the development of technology-based solutions.^[11, 12]

In line with overarching principles of behavior change, greater outcomes are more likely to be seen when theory has been used to inform intervention design and multiple techniques are used within an intervention.^[11, 12]

There is also evidence of how the inclusion of user experience design principles from across the web design landscape can further enhance the effectiveness and level of engagement with solutions.^[13]

Therefore, maximizing the opportunities that technology platforms offer in this context requires the utilization of proven behavior change models and techniques, alongside core principles of user experience design to deliver interventions that are both engaging and impactful.

Glossary

Adherence - An overarching term to describe the extent to which the patient's behavior matches agreed recommendations from the healthcare provider. Adherence emphasizes the role of the patient during the agreement phase and depends on the patient's ability to follow through with the treatment.

Behavior change techniques - Behavior-based constructs that can be directed at addressing and changing behavioral determinants such as intention, perceived behavioral control, self-efficacy, and outcome expectancy.^[14]

Interventions - Actions that are expected to bring about change in people.^[15]

Regression analysis - A statistical tool used to assess the relationship between variables. This type of statistical analysis evaluates the causal effect of one variable upon another.^[16]

Self-management roles - Learning and practicing skills necessary to carry on an active and emotionally satisfying life in the face of a chronic condition.^[17]

Theoretical framework - A structure that can hold or support a theory of research study. It introduces and describes the theory that explains why the research problems under examination exist.

Persistence - The duration of time from initiation to discontinuation of therapy.¹⁸

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