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# Nudging as a Support for Behavioral Change in Lifestyle Medicine

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ANALYTIC REVIEW

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# Nudging as a Support for Behavioral Change in Lifestyle Medicine

**Abstract:** *The practice of lifestyle medicine and its emphasis on behavioral change continues to grow around the world. Yet much of the burden of disease weighing on healthcare systems from chronic, modifiable conditions remains stubbornly present. From a behavior change perspective, efforts to date have primarily focused on public health messaging and public health campaigns (global approaches) to interventions such as health coaching (individual approaches). There exists an opportunity to consider contextual elements which support behavioral change. The practice of "nudging" behavior in primary care and allied health settings is proposed as a means of responding to these contextual opportunities. Nudging does not assure change; however, it can invite curiosity about change and small behavioral efforts in the direction of a desired change. Furthermore, its nature conserves autonomy and patient choice while inviting a health-creating behavior. As such, when considered and applied in the context of public health and individual treatment options, it creates a consistent milieu in which behavior change is facilitated.*

**Keywords:** nudging; lifestyle medicine; behavior change; chronic disease; health; autonomy

## Introduction

The last 15–20 years have seen strong growth in lifestyle medicine approaches to health care[1,2] worldwide. Individual membership of the American College of Lifestyle Medicine alone is greater than 6000[3] and there are now Lifestyle Medicine Colleges and Societies established worldwide in several countries including the USA, UK, Australia, Brazil, India, Romania, Portugal, and Hungary to name only a few.[4]

Despite this, the burden of disease from chronic or lifestyle conditions continues to tax many countries around the world.[5] For example, the American Diabetes Association[6] published a 2018 report noting that the total costs of treating diagnosed diabetes in the USA in 2017 were $327 billion. A promising approach to augmenting current efforts to both improve health and reduce health care costs is found in the idea of "nudging"[7]—the systems and processes which make it easy for an individual to follow a behavioral prompt. The broad value of nudging in health care has already been established.

> "Nudging has already shown promise in supporting small, but contextually meaningful, changes in people's behavior."

It may be used to guide or even encourage particular behaviors. Patel et al[8] argue that "effective nudges abound in health care because choice architectures guide our behavior whether we know it or not."

Specifically, nudging presents an opportunity to influence health behavior change at a local community level. This is a level beyond the common remit of direct

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physician/patient interaction and simultaneously more granular than public health approaches. Primary care and allied health providers can cultivate and shape the milieu in which patient care interventions are delivered. These opportunities include treatment settings and rooms, décor, entrances, and manners in which patients may interact with these environments.

## Nudging

The origins of nudging lie in behavioral economics and political theory. The notion of the "nudge" was popularized by the University of Chicago scholars Thaler and Sunstein[7] in their eponymous 2008 book. They argued that nudging makes use of "choice architecture" and can be considered a type of "libertarian paternalism." In essence, a nudge increases the likelihood (but does not guarantee) that an individual will make a particular choice. This is achieved by modifying the environment, or elements of it, in a way that cues desired cognitive processes. For example, pedestrians can be encouraged to adhere to one side of a passageway by painting directional arrows on the ground. This does not guarantee that they will always do this, but it does strongly nudge a preferred walking behavior in that way. Similarly, the placement of waste repositories that separate glass from paper, from compostable and non-recyclable waste, does not guarantee that consumers will sort their waste accordingly; however, the use of colors and images which cue and perhaps evoke emotional responses, nudge consumers in the desired direction. Many waste systems operate with traffic light coloring. Famous nudges include the etching of a life-sized fly in the center of porcelain urinals in the male bathrooms at Amsterdam's Schiphol airport, in an effort to reduce floor spillage. This was shown to result in an 80% reduction in such spillage.[9] In each of the above examples, a value is placed upon a desired outcome. That value represents greater good rather than benefit to an individual—and the environmental architecture is designed or modified in a way that increases the likelihood that this behavior will generally be displayed.

Nudging is not without controversy. Its stance of libertarian paternalism has been criticized[10,11] for its potential to reduce autonomy and dignity and to violate individual liberties—to privilege a particular construction of good which may not be a choice that the individual would make themselves. Additional criticisms, particularly pertinent to the area of behavioral change, argue that nudging offers a limited platform on which long lasting and sustainable behavioral change may be based.[12] Sunstein has responded to these criticisms,[13] in part by arguing that it is impossible to create any environment that does not have choice architecture. If such architecture inherently exists, is it not then morally right to create and maintain an architecture which provides for the greatest good?

Nudges should also not incur extensive on-going costs, in order that they be used widely. While costs may be incurred in designing and setting up a particular choice architecture, the ongoing use of this should not be costly—either to the individual or the community. Clearly, the more such behavioral nudges can be considered at the design stage of any environment, the lower the cost of construction and inclusion will be.

Nudges should also not be conflated with simple rewards for engaging in a behavior. Offering a financial incentive for someone to eat fruit is a reward system (and likely costly in the long term). Arranging the built environment so that fruit (in preference to another choice) is easily visible and reachable is a nudge.

Nudging, or the use of choice architecture to influence behavior, should not be seen as a solution to the challenges of encouraging pro-social and pro-health behavior. Rather, it is best viewed as one of several tools available to policy makers, educators and practitioners. When used alongside compelling public health education campaigns and the use of evidence-based behavioral change methodologies such as health coaching,[14,15] nudging can take its place as a useful component of the built environment which encourages (but does not guarantee) pro-social and pro-health behaviors.

Health practitioners who ordinarily work with patients and clients individually, still have opportunities to nudge the behavior of their clientele, by considering the ways in which they use choice architecture within consultation rooms, treatment centers and other workplaces. This choice architecture can invite patients to act or think in particular ways which will support their own health and well-being.

## The Intersection of Nudging and Autonomy

Autonomy has been identified as a key component of successful and sustainable health behavior change.[16-18] It is described as a "primary psychological need" by Deci and Ryan[19] in their seminal work on Self-Determination Theory (SDT). SDT argues that satisfaction of autonomy (alongside 2 other primary needs—competence and relatedness), forms the basis for high-quality motivation, engagement and persistence with an action. A sub-theory of SDT—the Basic Psychological Need Theory (BPNT)—defines basic psychological need as "*a psychological nutrient that is essential for individuals'*

*adjustment, integrity, and growth."*[20] It proposes that psychological well-being and optimal functioning is predicated, in part, on the satisfaction of the basic psychological need of autonomy.

Although nudges point to a particular desired behavioral outcome, they nevertheless preserve autonomy by inviting, rather than compelling, individuals to display the behavior. Directional pavement arrows for pedestrians invite rather than compel individuals to walk on one side of a pathway. Displaying the words "*Thank you for adhering to the speed limit,*" perhaps accompanied by a smiling face image, on a roadworks sign does likewise. Placing fruit at eye level by a grocery store cashier, or for that matter, placing sweets in the same location also invites, but does not compel behavior.

In this way, nudges uphold rather than minimize autonomy. In the above example of fruit and sweets, the notion of "libertarian paternalism"[7] is also evident. For the sake of public and individual health, consumption of fruit, rather than sweets, is desirable. If sweets are available but in a more difficult to identify and locate position than fruit, one may argue that the consumer is being manipulated. Perhaps this is correct; however, mounting a health argument for placing both items in equal positions is self-evidently meritless.

A further sub-theory of SDT—Relationships Motivation Theory (RMT)—posits that high-quality relationships can satisfy the psychological need for connectedness (in a similar manner to Seligman's PERMA Theory).[21] Importantly, high-quality relationships can also satisfy some needs for autonomy. For medical and health care providers, this ought to evoke reflections on ways in which relationships cultivated with patients—directly or indirectly—enhance (or limit) autonomy. Every action taken by a health care professional is sub-consciously filtered by the patient or client for its autonomy-enhancing effect.

## Opportunities in Lifestyle Medicine

Lifestyle Medicine has been defined as "the application of environmental, behavioral, medical, and motivational principles to the management (including self-care and self-management) of lifestyle-related health problems in a clinical and/or public health setting."[22] It seeks to educate and encourage patients to adopt practices which lead to vibrant and flourishing health. In fact, the principles of lifestyle medicine and positive psychology can be combined to create "*positive health,*" a term first used by Seligman,[23] to describe the combination of subjective, biological, and functional markers that point to whole person thriving.

High-quality research linking lifestyle medicine principles to health outcomes is widely available.[24,25] Various studies link lifestyle medicine application to improvements and even reversals in diabetes, heart attacks, strokes and cancers.[26]

A growing body of research literature is also pointing to the important role that positivity plays in robust and enduring health and well-being. For example, positive psychology practices support healthy eating and activity.[27] Positive emotions induced through meditation have been linked to reduced illness symptoms and an increased sense of purpose in life.[28] Living with a sense of purpose itself is linked with increased physical and mental health[29] including reduced risk of myocardial infarction in older adults.[30] Gratitude journaling is linked with reduced inflammatory biomarkers and increased parasympathetic heart rate variability in those with asymptomatic cardiovascular disease.[31] Positive emotions, thoughts, and behaviors increase well-being. A model for this mechanism has been proposed by Lyubormirsky and Layous. The model posits a mediating factor of "Person-Activity fit"—the influence of personality, cultural, motivational, and support factors on the activities undertaken.[32] Additionally, positive emotional experiences promote pro-health choices and lifestyles. The Upward spiral theory of lifestyle change proposed by Frederickson et al proposes that positive emotional experiences both create and sustain nonconscious motives in behavioral change.[27] This theory helps to fill an important gap in behavior change theories, identified as the Intention-Behavior Gap.[33]

To further support these efforts at reshaping the landscape of healthcare, the use of nudging provides opportunities to create environments in which a healthy choice is the default. Such opportunities capitalize on the capacity of the Upward Spiral theory to address the Intention-Behavior gap.

## Nudging vs Interventions

Guidance for health providers in recommending positive psychology interventions has already been provided. This guidance include recommendations for activities such as gratitude practices, mindfulness practices, time in nature and acts of kindness among many others.[34] These interventions are supported by research showing that when individuals engage in intentional behaviors and activities with a "positive core,"[35] they may increase and sustain pro-health behaviors as well as a sense of happiness.

The identification of the Intention-Behavior gap has shown that patients do not always act simply on the basis of knowing what they

should do. When examining the notion of intervention in healthcare, any prescription should always be made in consideration of the honoring of patient autonomy. As noted above, autonomy is a central tenet of successful and sustainable health behavior change.[19] Particular guidance on this is available from the study of compassionate communication[36] and the particular principle of making requests rather demands. This may require some revision of language used by practitioners, from constructions such as:

- *"I want you to..."*
- *"I'd like you to..."*
- *"I need you to..."*
- *"If you don't do X, then your risk of Y..."* to constructions such as:
- "*I wonder if you would be willing to..."*
- *"Which of X, Y or Z would you be willing to..."*.

This last construction is an example of a forced choice inquiry.[37] The form of the question assumes that a considered choice from the available options will be made, while still allowing some autonomy by choosing the activity.

Interventions of this type are usually made at the level of individual patient interaction. By contrast, nudges are open invitations to all who come into an environment, to consider engaging in a particular behavior or mental practice. There need be no direct interaction between provider and patient around a nudge. Autonomy is supported because the patient is free to disregard the nudge. The only means of learning about a particular patient's response to a nudge is to ask directly. In this way, engagement with a nudge can be reinforced in the mind of the patient.

Nudges allow the possibility of a middle ground between indiscriminate public health messages (for example, a *Quit smoking* billboard message is likely visible to many people who are non-smokers and not in need of the message) and targeted individual interventions, which require an immediate contact between provider and patient. They create the possibility of a constructed environment which encourages particular desired behaviors.

## Reviewing Nudges in Primary Care and Allied Health

Ledderer et al.[38] conducted a systematic review and meta-synthesis of lifestyle nudges. They ultimately reviewed 66 studies focused on nudging lifestyle behavior in the areas of diet/nutrition, exercise, weight, and sleep (with the vast majority—55/66—related to diet/nutrition). They ranged in duration from a single event to over a year and included both experimental and real-world settings. Of the 66 articles reviewed, 42 showed positive results. A further 11 showed mixed results; 10 showed no effect and 3 demonstrated a negative result (for example a nudge designed to increase the use of stairs resulted in reduced stair usage).

There are 2 notable features to the reviewed literature. The first is that none of the nudges took place in healthcare settings. One took place in a hospital cafeteria[39] and was directed only at hospital staff, and not patients. The second notable feature is that very few of these nudges focused on any behavior other than diet. All pillars of lifestyle medicine are vital for flourishing health and well-being. Yet little research appears to be currently focused on how these behaviors might be nudged.

The opportunity before primary health and medical care providers is to consider the ways in which a patient's health, and health behaviors, can be influenced not just through the conduct of a professional consultation, but by being in the environment in which that consultation is provided.

Therefore, medical and allied health practitioners may consider ways in which they can modify professional environments to nudge experiences of pro-health behaviors, positivity, as well as character virtues[40] which underpin efficacious pro-health behaviors. Well-designed nudges provide an easy and relatively inexpensive way of forming a backdrop for cultivating a cycle of virtuous behavior change and positivity experience. By engaging with this perspective of behavioral change, health care providers may build or modify an environment which will support these individual efforts and reinforce those efforts during consultations with their patients.

Nudges can be customized to local environments and conditions and may also bring out aspects of the personality and passions of the provider. For example, a suburban physician practice in a stand-alone building may have a planting garden at the entrance to the building—in which patients can plant a seed or seedling before coming into their appointment. Such an act has the potential to evoke both physical and psychological well-being benefits,[41] likely through some combination of biophilia, stress reduction, and attention restoration. Note the way in which this satisfies important criteria for nudging positivity—it is relatively inexpensive, it doesn't directly address a particular health behavior, but a pre-cursor to this behavior and it is entirely at the discretion of the patient to engage—there is no negative impact from not engaging but the potential of a positive impact when the choice is made to engage. While this particular nudge may not be useful in a physician practice on the 14$^{th}$ floor of a downtown building, some variation of it may still be possible.

There are a large number of (and arguably limitless) ways in which nudges could be constructed to prime and cue opportunities for pro-health behavior, based on positive health. Environments could include medical practices, allied health practices and hospitals. Nudges could evoke experiences of positivity, reflections on achievements, acts of kindness, pro-health choices, making decisions for future pro-health action, and expressions of gratitude to name a few. All of these represent vehicles for cueing pro-health behaviors.

In order to create and/or modify environments in which nudges may be possible, a design thinking mindset, and more broadly the approach to organizational change and growth described by Appreciative Inquiry(AI)[42] is useful. AI has been used extensively and successfully in healthcare settings over the past 1 to 2 decades to redesign both structures and processes in healthcare settings.[43-45] Within the AI process, (which could be broadly considered inductive rather than deductive) 2 particular steps are of particular value—the "Discover" and "Dream" stages of the 5-D cycle.[35] Together, these stages provide opportunities to reflect on what might already be working well in this respect, in addition to an opportunity to imagine the possibilities that could be executed within a particular space.

## Some Brief Examples of Possible Nudges

As noted in the reviewed studies above, lifestyle nudges related to diet, nutrition, exercise, weight, and sleep have proven broadly useful. Following are some brief examples of possible nudges that could be used in primary care settings.

- Stenciling the number of calories burned (or vertical feet of ascent) on stair risers, to encourage movement and cue achievement.
- Giving consideration to the ways in which patient are greeted on arrival and farewelled on departure. A greeting which includes a phrase such as "What's been your best achievement this week?" rather than simply "How are you?" nudges the patient to reflect on their achievements.
- Inviting patients to write a current health behavior success on a sticky-note and affixing to a wall while waiting for an appointment to start. This may cue positive recollections, sense of achievement and provide a discussion basis during the health consultation.
- Having a bowl of fruit on the counter or other highly visible location as patients arrive, to encourage healthful eating.
- Tuning waiting room televisions to nature documentaries to cue "nurturing by nature."[41] Several studies have demonstrated the benefits of simply viewing images of nature including reduction in stress[46] and reduction in negative affect in those living in hardship.[47]
- Giving consideration to office décor including wall and ceiling color. Although the science of color and psychology is far from settled, some studies confirm an association between the color blue and a subjective sense of calm.[48,49] The evoking of a sense of calm prior to a medical or health consultation is likely to have a beneficial impact on patient/provider interaction, focus, and attention.
- Providing an *Acts of kindness* lucky dip. A bucket or other vessel containing pieces of paper with acts of kindness can be furnished in a waiting room. The patient has the option of randomly selecting an action and carrying it out. The execution of random acts of kindness leads to improved stress responses,[50] among other benefits.

None of these actions in and of themselves leads directly to a health outcome; however, they have the capacity to evoke experiences of positivity and to prime pro-social and pro-health behaviors. They form a backdrop against which health interactions and interventions occur and as such, they consider not just the intervention, but the milieu in which the intervention is executed. Significantly, none of them is costly and all of them are optional from a patient perspective.

## What Is Needed now?

In order to harness fully a person's capacity for change, the 3 layers of intervention must be considered: public health messaging (indiscriminate), personal interventions (highly discriminate) and the milieu or environment in which a person accesses medical and health services (semi-targeted). This last milieu of treatment area represents a considerable opportunity. Future research should investigate:

- the range of nudges including relational, visual, auditory, kinesthetic and other sensory experiences which evoke positivity;
- types of nudges which may reliably evoke experiences of positivity in healthcare settings;
- opportunities to design and construct greenfield primary health facilities in which nudges are native;
- opportunities to modify existing facilities to include straightforward and inexpensive nudges; and
- training health care providers to amplify experiences of nudging

in their patients by engaging in open, curious and appreciative conversation.

## Conclusion

Nudging has already shown promise in supporting small, but contextually meaningful, changes in people's behavior. Despite criticisms, nudges can be designed in a manner that preserves individual autonomy. A behavioral change gap currently exists in health care, between the levels of public health messaging and activity, and individualized primary care intervention. Nudging pro-social and pro-health behaviors could fill this gap.

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