Commitment Devices
Using Initiatives to Change Behavior

Unhealthy behaviors are responsible for a large proportion of health care costs and poor health outcomes.1 Surveys of large employers regularly identify unhealthy behaviors as the most important challenge to affordable benefits coverage. For this reason, employers increasingly leverage incentives to encourage changes in employees' health-related behaviors. According to one survey, 86% of large employers provide incentives for healthy behavior change.2 In this Viewpoint, we discuss the potential and limitations of an approach that behavioral science research has shown can be used to influence health behaviors but that is distinct from incentives: the use of commitment devices (Table).3

Many people intend to improve their health behaviors in the future (eg, to exercise more, adhere to medication regimens, eat well, quit smoking), but when the future arrives, they fail to follow through.4 People are not unaware of the challenges associated with achieving their goals: many take steps to precommit their “future selves” to follow-through. For example, those eager to exercise more may buy gym memberships with annual contracts so future visits will require no out-of-pocket expenses, or they will schedule exercise with workout partners so failing to show up will mean disappointing friends; alcoholics may take disulfiram in the morning so drinking alcohol in the evening will make them ill. These are examples of commitment devices—many of which have no financial cost, but all of which deliberately limit future choices. Commitment devices attempt to enforce people's voluntarily imposed restrictions until they have accomplished their goals, or their voluntarily imposed penalties for failing to accomplish their goals.

A common form of commitment device, also sometimes called a deposit contract or commitment contract, involves people voluntarily depositing money into accounts that they can access again only if they accomplish a goal. Commitment devices like this have been shown to help people lose weight, improve their diets, and stop smoking.5 People are not unaware of this gap and therefore fail to use commitment devices. Second, commitment devices associate consequences with people's failures to achieve their goals.

Commitment devices can be associated with a spectrum of consequences. Immutable consequences cannot be reversed by future choices. For example, if an alcoholic takes disulfiram, she imposes an unavoidable future physiological consequence on herself (vomiting) if she later fails to abstain from alcohol. Similarly, checking oneself into a substance abuse or psychiatric facility can limit choice, because one is typically not permitted to leave until certain goals are achieved. Other commitment devices involve immutable monetary consequences in which people risk losing their own money if by a predetermined date an independent assessor reports that these people did not accomplish their goals.

Commitment devices involving mutable consequences constrain future behaviors while also allowing people the future latitude to mitigate the consequences. For example, purchasing unhealthy foods in small portions can reduce food intake, purchasing only small plates for home use or at a buffet can limit portion sizes, purchasing gym memberships can reduce the visible costs of each gym visit, and ordering groceries in advance can reduce the likelihood of purchasing unhealthy foods when shopping while hungry.6 Similarly, temptation bundling, or allowing people to restrict their access to instantly gratifying experiences (eg, watching TV) only to occasions when they engage in goal-consistent behaviors (eg, exercising), is a form of mutable commitment device that increases gym attendance.7

Building Better Commitment Devices to Improve Health
Commitment devices may be powerful tools for changing health behaviors, but they are underused. For health professionals and patients to get more value out of commitment devices, several areas of research must be advanced. Specifically, maximizing the population health benefits of commitment devices requires increasing the proportion of people who use these devices and increasing their effectiveness.

Increasing Uptake
Commitment devices can only help those who use them. Uptake rates in research on commitment devices have been as low as a few percentage points, for example. This low uptake could in part be attributable to a lack of patient awareness about the gap between intentions and future behaviors. If so, health professionals could be instrumental in educating patients about this gap. Behavioral science techniques could also be used to increase uptake. For example, requiring patients to opt out of commitment devices, rather than attempting to convince patients to proactively opt in, could increase uptake. Opt-out policies have been shown to increase enrollment in programs such as organ donation and 401(k) retirement savings plans.
Opinion Viewpoint

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savings plans and could similarly increase commitment device par-
ticipation. Making enrollment and participation as simple as possi-
ble by eliminating unnecessary complexity could also facilitate
greater uptake of commitment devices. In addition, as people be-
come more experienced with commitment devices, researchers will
need to develop strategies for helping patients who did not meet
their past goals (and thus experienced the negative consequences
of commitment devices) elect to reuse commitment devices de-
spite their previous experiences.

Increasing Effectiveness at Minimal Cost
For commitment devices to meaningfully improve population health
they will need to be engineered to be more effective. First, many
health-relevant goals require changing long-term behavior even af-
after an initial objective has been achieved (ie, weight loss, medica-
tion adherence, and addiction management). More research should
examine whether and how commitment devices can be effective
maintenance tools, capable of assisting with long-term behavior
change. Expanding the use of commitment devices to facilitate health
maintenance will likely require novel strategies for maintaining peo-
ple’s engagement and attention at key moments when drop-off or
discontinuation is a risk. Second, commitment devices can be en-
geineered to provide positive feedback as soon as people begin using
them. This will involve guiding people to choose challenging but
achievable initial goals; developing mechanisms to keep those goals
salient at critical moments; and leveraging advances in wireless tech-
nologies to make dynamic feedback easier, cheaper, and timelier. De-
veloping commitment devices so their associated penalties in-
volve a range of consequences (beyond just monetary losses) will
likely increase their appeal. One promising direction for future com-
mitment device research involves leveraging the influence of exist-
ing social networks. Commitment devices that involve these net-
works by creating social consequences for failing to achieve goals
(i.e., disappointing exercise partners, having family members in-
formed when patients do not adhere to medication regimens) can
be implemented inexpensively.

Conclusions
Patients are more successful at achieving their health goals when
they have access to commitment devices, and commitment de-
vices are usually inexpensive to provide. However, uptake and on-
going participation rates in commitment devices are often low. Al-
though there have been some tests of highly effective commitment
devices, strategies for achieving higher rates of ongoing engage-
ment and sustained behavior change are needed for this tool to have
wide-scale influence and benefit. Leveraging existing social net-
works may be a potential low-cost means of achieving and sustain-
ing healthier behaviors through commitment devices.

Table. Examples of Commitment Devices

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
<th>Health Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Put money in a deposit contract</td>
<td>Forfeit money by failure to achieve a specific goal by a given date (eg, quitting smoking within 6 mo, losing 5 lb within 2 mo)</td>
<td>Any</td>
</tr>
<tr>
<td>Engage in temptation bundling</td>
<td>Restrict access to instantly gratifying experiences (eg, watching TV) only to occasions when engaging in goal-consistent behaviors (eg, exercising)</td>
<td>Any</td>
</tr>
<tr>
<td>Purchase vices in small packages</td>
<td>Limit portion sizes for unhealthy items (eg, cigarettes, junk food, alcohol)</td>
<td>Reduce consumption</td>
</tr>
<tr>
<td>Purchase small plates</td>
<td>Limit food portion sizes</td>
<td>Reduce consumption</td>
</tr>
<tr>
<td>Order groceries online</td>
<td>Avoid purchasing unhealthy foods on impulse</td>
<td>Improve diet</td>
</tr>
<tr>
<td>Take disulfiram</td>
<td>Ensure that drinking alcohol in the future will cause illness</td>
<td>Treat alcoholism</td>
</tr>
<tr>
<td>Check into a treatment center</td>
<td>Ensure no access to addictive substances (eg, alcohol, drugs) until professionals deem a patient ready</td>
<td>Treat addiction</td>
</tr>
<tr>
<td>Purchase an annual gym membership</td>
<td>Ensure future gym visits will not require out-of-pocket payment</td>
<td>Increase exercise</td>
</tr>
<tr>
<td>Schedule workouts with an exercise partner</td>
<td>Disappoint a friend by failure to visit the gym</td>
<td>Increase exercise</td>
</tr>
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</table>

Any savings plans and could similarly increase commitment device participation. Making enrollment and participation as simple as possible by eliminating unnecessary complexity could also facilitate greater uptake of commitment devices. In addition, as people become more experienced with commitment devices, researchers will need to develop strategies for helping patients who did not meet their past goals (and thus experienced the negative consequences of commitment devices) elect to reuse commitment devices despite their previous experiences.

Increasing Effectiveness at Minimal Cost
For commitment devices to meaningfully improve population health they will need to be engineered to be more effective. First, many health-relevant goals require changing long-term behavior even after an initial objective has been achieved (ie, weight loss, medication adherence, and addiction management). More research should examine whether and how commitment devices can be effective maintenance tools, capable of assisting with long-term behavior change. Expanding the use of commitment devices to facilitate health maintenance will likely require novel strategies for maintaining people’s engagement and attention at key moments when drop-off or discontinuation is a risk. Second, commitment devices can be engineered to provide positive feedback as soon as people begin using them. This will involve guiding people to choose challenging but achievable initial goals; developing mechanisms to keep those goals salient at critical moments; and leveraging advances in wireless technologies to make dynamic feedback easier, cheaper, and timelier. Developing commitment devices so their associated penalties involve a range of consequences (beyond just monetary losses) will likely increase their appeal. One promising direction for future commitment device research involves leveraging the influence of existing social networks. Commitment devices that involve these networks by creating social consequences for failing to achieve goals (ie, disappointing exercise partners, having family members informed when patients do not adhere to medication regimens) can be implemented inexpensively.

Conclusions
Patients are more successful at achieving their health goals when they have access to commitment devices, and commitment devices are usually inexpensive to provide. However, uptake and ongoing participation rates in commitment devices are often low. Although there have been some tests of highly effective commitment devices, strategies for achieving higher rates of ongoing engagement and sustained behavior change are needed for this tool to have wide-scale influence and benefit. Leveraging existing social networks may be a potential low-cost means of achieving and sustaining healthier behaviors through commitment devices.

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