# A Framework for Culture Change in a Metropolitan Medical Community

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## INTRODUCTION

Chronic illness is ubiquitous in the United States. More than 90% of adults aged 65 and over have at least 1 chronic disease, and the prevalence of multimorbidity, or multiple chronic diseases, is on the rise.[1] The pervasiveness of the most common chronic conditions—hypertension, hyperlipidemia, type 2 diabetes, coronary artery disease, obesity, and others—comes at a huge cost to individuals, families, and communities, measured in dollars and quality of life.[2]

It has been estimated that up to 80% of our most common and impactful chronic illnesses could be eliminated through optimizing lifestyle.[3] Poor diet is the leading risk factor for disability-adjusted life-years in this country,[4] and there is a growing body of evidence that a whole-food plant-based (WFPB) diet can halt the progression of, and even reverse, many of our most common chronic diseases.[5-8] A WFPB diet "consists of all minimally processed fruits, vegetables, whole grains, legumes, nuts and seeds, herbs, and spices and excludes all animal products, including red meat, poultry, fish, eggs, and dairy products."[9]

Unfortunately, there are many systems barriers that prevent lifestyle optimization. On the side of clinicians, primary care providers have limited time to spend with patients. The word "doctor" comes from the Latin *docere*—"to teach"—but modern medicine leaves inadequate time to teach patients about these "lifetime diseases" in any detail. Furthermore, nutrition education in medical schools is inadequate, with only 38% providing the minimum 25 hours recommended by the National Academy of Sciences.[10] This leaves physicians and other clinicians poorly equipped to discuss the root causes of illness with their patients and to counsel them appropriately. As a result, clinicians are often frustrated by the progression of chronic illnesses that could improve with lifestyle changes, as they prescribe more pills and procedures while their patients' illnesses progress and health deteriorates.

Patients also face many barriers that prevent optimal lifestyle approaches to reducing chronic disease. Issues of poverty, education, systemic racism, and other social determinants of health affect an individual's capacity for, and interest in, making lifestyle changes that will impact health.[11] Mixed messages from the media about the optimal diet may also leave patients confused and skeptical about the potential for diet to make a difference.

People do not make changes in a vacuum. Clinicians and their patients are social beings, and the changes that they make impact those around them. The work by Christakis and Fowler shows that when a person makes a change, it influences his or her community to 3 degrees of separation.[12] For example, if a person decides to stop smoking, her friends are less likely to smoke, as are her friends' friends, and her friends' friends' friends, even if they have never met. Similarly, medical practice patterns are significantly influenced

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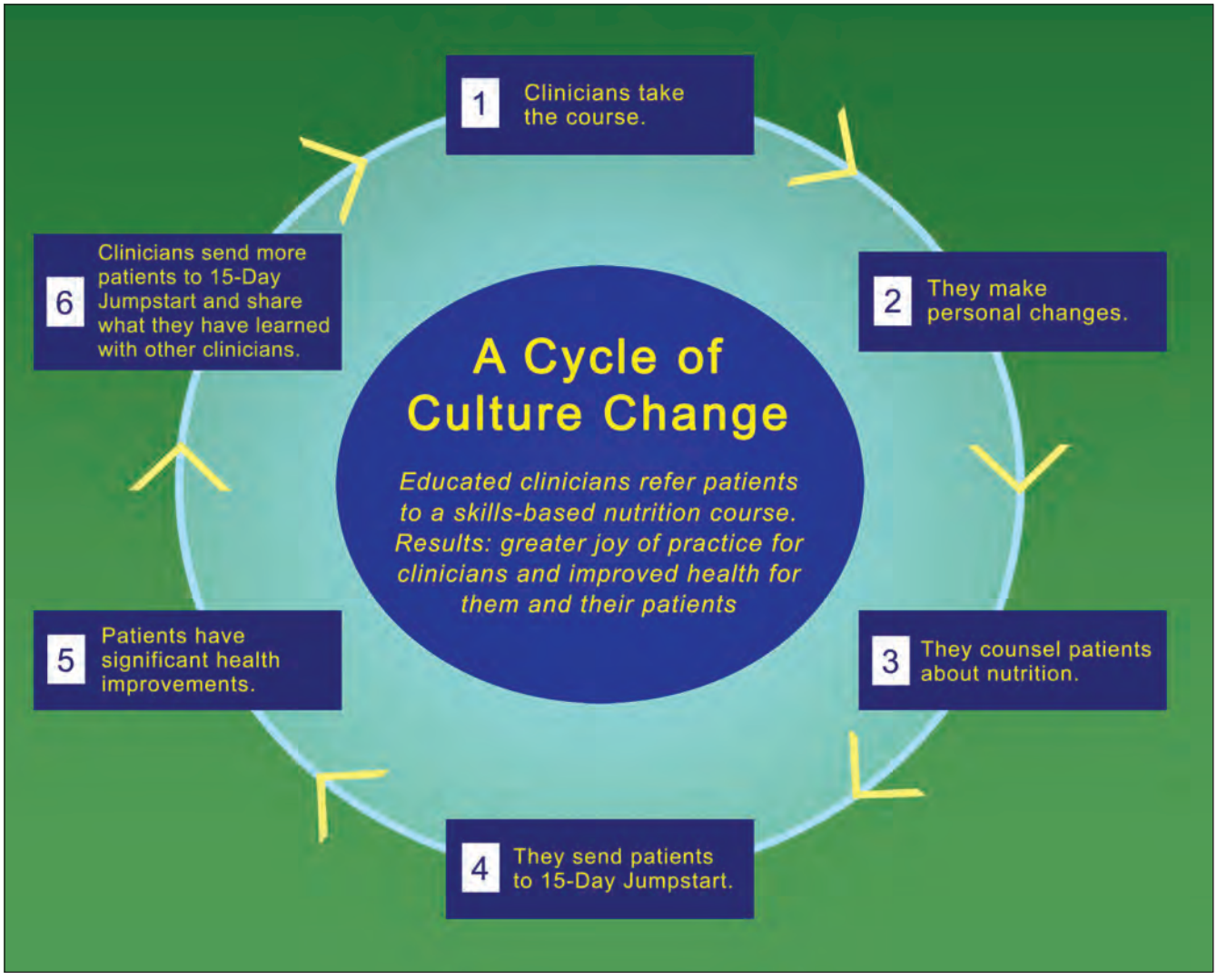
by the community that one practices in. The Dartmouth Atlas demonstrated that there are substantial practice variations around the country for issues as wide-ranging as beta-blocker utilization, treatment of early-stage prostate cancer, and management of diabetes.[13]

With these concepts in mind, we hypothesized that a 2-part program that first educated clinicians in nutrition and then invited them to refer patients to the 15-Day Jumpstart program, which provides similar nutrition education and the skills for moving to a WFPB diet, would (1) increase clinician confidence in their understanding of optimal nutrition for health; (2) increase the likelihood that clinicians would counsel patients about nutrition; (3) improve patient health; and (4) increase joy of practice.

## METHODS

In 2019, the Rochester Lifestyle Medicine Institute received a grant from an area accountable care organization. The grant provided funding for participation in 2 previously established programs. Up to 40 clinicians were able to take a 6-week course on the benefits of a WFPB diet, and then each participant was able to enroll 5 of their patients in the 15-Day Jumpstart program. We envisioned that this would create a cycle of culture change, depicted in **FIGURE 1**. In this framework, clinicians would take the course and make personal changes. They would personally experience health benefits, making it more likely that they would counsel their patients about nutrition.[14] They would then refer their patients to the 15-Day Jumpstart program. Based on previously published results

FIGURE 1. **Framework for a cycle of culture change**



of 15-Day Jumpstart outcomes, their patients would be likely to experience rapid benefits in health,[15] which would encourage clinicians to send more patients to the program and to let their colleagues know about the impact of a WFPB diet on health.

### 6-week nutrition course

From 2012 to 2020, one of the authors (TDB) taught a 6-week, 12-hour certified medical education (CME) course entitled "A Plant-Based Diet: Eating for Happiness and Health." The course was an introduction to the medical, environmental, and social basis for adopting a WFPB diet, suitable for the general public but offered for 12 hours of professional credit to physicians and other health professionals. The course outlines the relationship between nutrition and health, reviewing the literature that evaluates the connection of different dietary components with common chronic medical conditions, as well as the evidence for the benefits of a WFPB diet. Another author (CHB) provided recipes and food samples.

### 15-Day Jumpstart program

A full description of the 15-Day Jumpstart program has previously been published.[15] Briefly, the 15-Day Jumpstart program was designed as a medically supervised, in-person program to give patients knowledge and skills to adopt an Esselstyn-compliant WFPB diet.[16] This is a very low-fat dietary pattern that focuses on vegetables, fruit, whole grains, and legumes, and excludes animal products, high-fat plant foods, and processed foods. Each program enrolled about 24 patients. Patients had biometrics and fasting labs evaluated on days 1 and 15, with 1:1 counseling by a medical provider. They participated in small group, multimodal education on days 1 and 15, with a cooking class on day 2 and a plant-based potluck lunch on day 8. Support was provided throughout the program via daily emails and an option to participate in a closed Facebook group. In April 2020, because of the pandemic, the 15-Day Jumpstart was moved to an online format. Results are reported for the patients who completed the in-person program.

### Data collection

Data for both the nutrition course and the 15-Day Jumpstart program were collected as part of a quality improvement program. A protocol to analyze these data for publication was reviewed by the University of Rochester Research Subjects Review Board and determined to be an exempt study. Participating clinicians were surveyed at the end of the course and again at 3 months. 15-Day Jumpstart patients were surveyed on days 1 and 15 of the program, and biometric data (height, weight, vital signs, waist circumference) and point-of-care measurements (fasting glucose and cholesterol profile) were completed on those days as well.

### Statistical analysis

Patient characteristics are presented using descriptive statistics. Differences in pre-post values were calculated via paired *t* tests for all continuous variables, using 2-tailed *P* values.

## RESULTS

Thirty-seven clinicians participated in the 6-week nutrition course. Twenty-five of the 37 were physicians (67.6%); 8 were nurse practitioners, 3 were physician assistants, and 1 was a registered dietitian. At the end of the program, 25 participants completed a survey. The majority of survey respondents (24/25) stated that they felt confident about the type of eating pattern that was best for health, that they had learned about the role of nutrition in health (25/25), that they were more likely to counsel their patients about eating a WFPB diet (25/25), and that they were likely to talk to patients more about nutrition and chronic disease (24/25) **(TABLE 1)**. Furthermore, 96% of participants made changes to their own diet by the end of the course **(FIGURE 2)**.

The clinicians were surveyed 3 months later. Sixteen responded, and the majority noted that they had discussed nutrition, and particularly a WFPB diet, more with their patients. This, in turn, had led to more rewarding interactions with their patients **(TABLE 1)**. Seventy-three percent responded that they had patients who had experienced significant changes in their health as a result of being talked to and counseled about WFPB nutrition.

Patient characteristics are described in **TABLE 2**, and outcomes for patients are presented in **TABLE 3**. The average age was 56.5 years old, and patients were predominantly white and female, reflecting referrals to the program. Patients had significant weight loss (mean, 7.3 pounds; $P<0.0001$); blood pressure drop (reduction of 7.3 and 3.3 mm Hg in systolic and diastolic blood pressure, with $P=0.0002$ and 0.01, respectively); decrease in abdominal girth (mean, 1.0 inch; $P<0.0001$); drop in total, high-density lipoprotein (HDL), and low-density lipoprotein (LDL) cholesterol (mean decrease of 26.2, 7.5, and 21.6 points, respectively, with $P<0.0001$ for each); and decrease in fasting glucose (mean drop of 8.4 mg/dL; $P=0.008$).

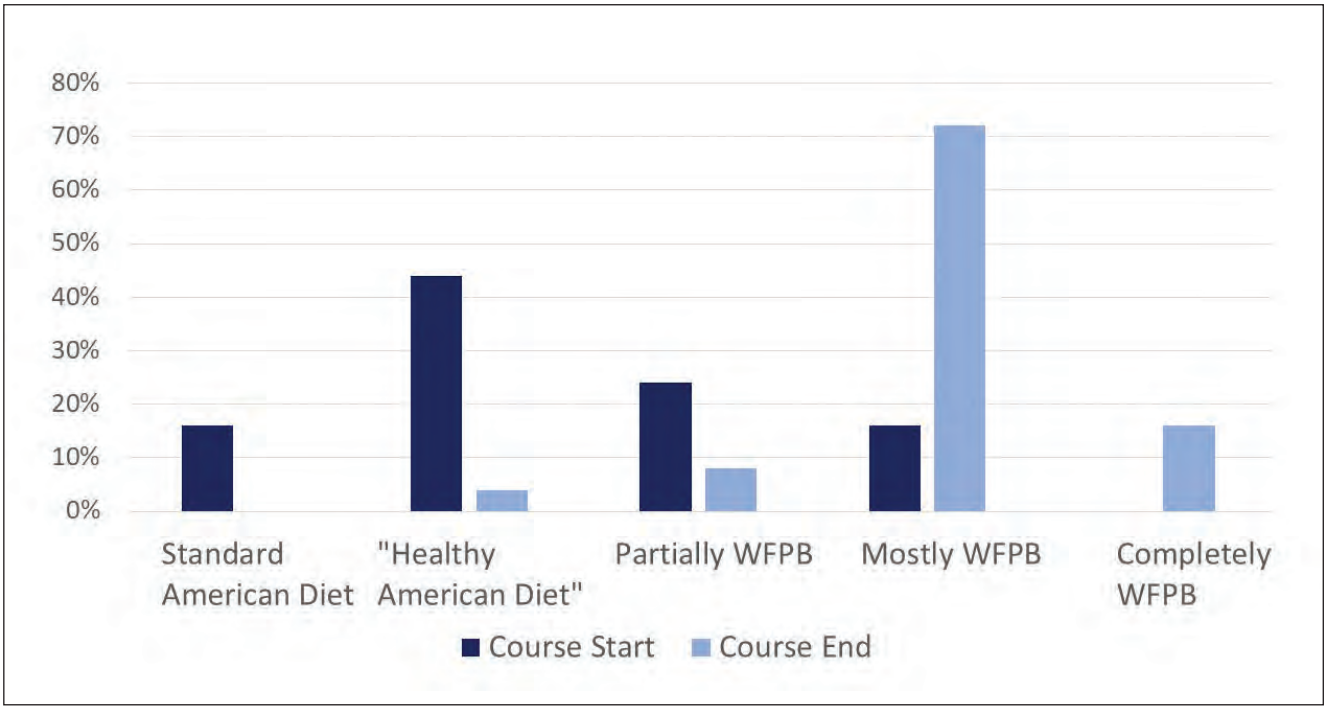
## DISCUSSION

This paper presents a framework for fostering culture change in a medium-sized metropolitan area. Combining the education of clinicians with a short clinical intervention for their patients appears to be an effective way to increase awareness

TABLE 1. **Clinician survey responses at the completion of the course and 3 months after completion**

| Clinician responses | % Agreeing or strongly agreeing |
|---|---|
| **On completion of the nutrition course (N=25)** | |
| "I learned important information about the role of nutrition in health." | 100 |
| "I am confident that I know about the type of eating pattern that is best for my patients' health." | 96 |
| "I am more likely to talk to my patients about the role of nutrition in chronic disease as a result of taking this course." | 96 |
| "I am more likely to counsel my patients about eating a whole-food, plant-based diet as a result of taking this course." | 100 |
| **At 3 months (N=16)** | |
| "I talk to my patients more about the role of nutrition in chronic disease as a result of taking Dr. Barnett's course 'Eating for Health and Happiness.'" | 100 |
| "I counsel my patients about eating a whole-food, plant-based diet as a result of taking Dr. Barnett's course 'Eating for Health and Happiness.'" | 88 |
| "Talking to my patients about the role of nutrition in chronic disease makes my work more rewarding." | 88 |
| "Talking to my patients about eating a whole-food, plant-based diet makes my work more rewarding." | 81 |
| "Being able to refer my patients to the 15-Day Jumpstart program makes my work more rewarding." | 81 |

FIGURE 2. **Clinician self-reported dietary pattern at the beginning and end of the course[a,b]**




[a]N=25; 96% of clinicians made changes to their diet.

[b]A WFPB diet consists of minimally processed fruits, vegetables, whole grains, legumes, nuts and seeds, herbs, and spices and excludes all animal products, including red meat, poultry, fish, eggs, and dairy products.

TABLE 2. **Patient characteristics (N=74)**

| Characteristics | No. (%) |
|---|---|
| Age, years (mean, 56.5; SD, 12.6) | |
| 10-20 | 2 (2.7) |
| 21-30 | 3 (4.1) |
| 31-40 | 1 (1.4) |
| 41-50 | 9 (12.2) |
| 51-60 | 28 (37.8) |
| 61-70 | 26 (35.1) |
| 71-80 | 5 (6.8) |
| Sex | |
| Women | 53 (71.6) |
| Men | 21 (28.4) |
| Race | |
| White | 50 (67.6) |
| African American | 6 (8.1) |
| Native American | 1 (1.4) |
| Two or more races | 2 (2.7) |
| Hispanic | 1 (1.4) |
| Did not specify | 14 (18.9) |
| Pre-existing conditions | |
| Prediabetes | 7 (9.5) |
| Type 1 diabetes | 0 (0) |
| Type 2 diabetes | 20 (27.0) |
| Hypertension | 47 (63.5) |
| Hyperlipidemia | 48 (64.9) |
| Cancer | 6 (8.1) |
| Coronary artery disease | 9 (12.2) |

SD, standard deviation.

of the impact of nutrition on chronic disease and to create a feedback loop that increases the likelihood that clinicians will discuss plant-based nutrition with their patients. As far as we are aware, this is the first program to combine the education of practitioners with a clinical program for their patients as an approach to changing the culture and practice patterns of a community. The feedback that clinicians get, first from changing their own diet and then from seeing the benefits to their patients, makes it more likely that they will continue to make these recommendations to their patients.

The education of clinicians increases their confidence and makes them more likely to counsel patients. It can also increase their joy of practice—an important outcome at a time when clinician burnout is at a dangerously high level.[17] This finding is not surprising, given the principles of the self-determination theory of motivation and personality, which were incorporated into the 6-week nutrition course and were also used to develop the 15-Day Jumpstart program. Self-determination theory is built on the idea that 3 basic psychological needs have to be fulfilled in order to grow and to thrive: autonomy, competence, and relatedness.[18]

Autonomy is the urge to act volitionally in accord with one's own values and sense of self. Competence is the desire to be effective in dealing with one's surroundings. Relatedness is the desire to be connected to others and to experience caring. Clinicians decide to take this program and to counsel their patients using what they have learned; this fosters autonomy. Competence increases by understanding the literature and the rationale for plant-based nutrition and then experiencing improved patient outcomes as a result of counseling them based on this knowledge. Access to laboratory data to assess rapid changes from the start to the completion of the program increases a sense of com-

TABLE 3. **Patient clinical outcomes**

| Measures (average) | n | Day 1 | Day 15 | Mean change | *P* value |
|---|---|---|---|---|---|
| Weight, lb | 63 | 213.3 | 206.0 | –7.3 | <0.0001 |
| Systolic blood pressure, mm Hg | 63 | 131.7 | 124.5 | –7.3 | 0.0002 |
| Diastolic blood pressure, mm Hg | 62 | 83.5 | 80.2 | –3.3 | 0.01 |
| Abdominal girth, in | 61 | 44.5 | 43.4 | –1.0 | <0.0001 |
| Total cholesterol, mg/dL | 62 | 176.8 | 150.6 | –26.2 | <0.0001 |
| Triglycerides, mg/dL | 62 | 132.9 | 134.4 | 1.5 | 0.81 |
| HDL cholesterol, mg/dL | 61 | 54.8 | 47.3 | –7.5 | <0.0001 |
| LDL cholesterol, mg/dL (calculated) | 53 | 103.9 | 82.3 | –21.6 | <0.0001 |
| Fasting glucose, mg/dL | 62 | 114.1 | 105.7 | –8.4 | 0.008 |

petence for both clinician and patient. And, finally, relatedness increases in working with patients to improve their chronic conditions.

It has been demonstrated that clinicians who practice a health habit are more likely to counsel their patients about that habit.[14,19] Ninety-six percent of clinicians who took the plant-based nutrition course and completed the survey made changes in their own diet.

### Limitations

This study has some limitations. First, this is a small study based on a quality improvement database. Not all participants responded to survey requests, limiting generalizability. However, the responses to the surveys were overwhelmingly positive, so that even if participants with less favorable responses did not provide data, thereby leading to an overestimate of benefit, it is clear that the impact of this program was substantial.

Second, this program was completed in 1 midsized community. It is possible that in smaller communities—where there are fewer clinicians to share experience or reduced population density—there might be less of an impact. Similarly, larger communities might require a larger core group in order to make an impact. It will be important to replicate this approach in other communities to assess whether there is a similar impact.

Third, the onset of the COVID-19 pandemic necessitated a change in the format of the 15-Day Jumpstart program. With converting to a virtual format, many participants did not get complete pre- and post-data, and we, therefore, reported on the in-person participants only. Although the in-person program has been shown to be impactful,[15] further work needs to be done to evaluate the impact of the online version of the program and its outcomes relative to the in-person model.

Finally, participants in this program were self-selecting. It is likely that clinicians who were more interested in nutrition to begin with were more likely to take the course and were also more likely to engage their patients in discussions of nutrition. However, even if clinicians started off receptive to this program, they appear to have had room for growth. They made changes to their own eating patterns and experienced improvements to clinical practice. We expect these benefits to proliferate, as clinicians are likely to discuss both personal and patient successes with their colleagues and to influence their behavior as well.

Some clinicians and communities may be less receptive. The Dartmouth Atlas has demonstrated that there is significant variability in practice patterns in the United States.[13] Studies of social networks and personal connections give a rationale as to why that may be.[12] It is unclear how effective this program would be in less receptive communities. However, clinicians have colleagues across the country and the world, and interactions with them are easier than ever in our new era of online forums.

Additionally, the cost of the 15-Day Jumpstart program is not covered by medical insurance at this time. Grant funding has been obtained so that members of underserved communities can take the program free of charge, but those who are not supported by grant funding must pay for the program out of pocket. Although efforts have been made to minimize the cost of the Jumpstart program (currently $0 to $149, depending on grant coverage), it may still be unaffordable to many, in turn limiting the uptake, accessibility, and generalizability of this approach.

Further evaluation is needed to determine the duration of impact of the 15-Day Jumpstart program on patient health, and whether participants remain adherent to dietary pattern.

In summary, a program that uses the 2-part approach of educating clinicians and providing an opportunity for patients to experience rapid health changes through changing their diet may provide a template for encouraging culture change by creating a feedback loop with multiple benefits. These benefits include improved patient health and higher job satisfaction for clinicians. ●

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