



# Toward an Emerging Role for Motivational Interviewing in Primary Care

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## Abstract

**Purpose of Review** Implementing Motivational Interviewing (MI) in primary care settings has been problematic due in part to persistent gaps in knowledge. Examples include poor understanding of how to effectively train persons to conduct MI, or of which aspects of MI-related communication are associated with better outcomes for patients. This review describes how recent research findings addressing the knowledge gaps support a growing role for MI in primary care.

**Recent Findings** Two trials of MI training combined classroom time with ongoing coaching and feedback, resulting in enhanced MI ability relative to a control arm where PCPs received minimal or no MI training. A third MI training trial excluded coaching and feedback, failing to increase use of MI. Adding to a growing list of behavioral health-related problems for which MI training has shown some effectiveness, a trial of training PCPs to use MI with depressed patients was associated with significantly improved depressive symptoms. Moreover, aspects of the PCPs' MI-related language and patients' arguments for positive behavior changes, "change talk," appeared to explain the positive effects of MI training on depression outcome.

**Summary** MI-training approaches have improved such that PCPs and possibly other clinic staff may want to consider MI training as a way to more effectively support their patients as they address behavioral health-related problems (e.g., tobacco use). MI training should focus on eliciting "change talk" from patients. Researchers and funding agencies might collaborate to continue closing knowledge gaps in the MI literature.

**Keywords** Motivational Interviewing · Primary care · MI training

## Introduction

### Preventable Morbidity and Mortality in Primary Care

Forty percent of deaths in the USA—900,000 per year—are attributable to behavioral health-related problems. These

problems, including drug, alcohol, and tobacco use, overeating and physical inactivity, and depression, are prevalent and also diminish quality of life [1]. The civilian, noninstitutionalized population in the USA averages about 1.5 visits each to primary care annually [2]. Thus, for many persons with behavioral health-related problems, primary care may serve as an optimal point of first contact with health care and an opportunity to address these problems [3–5].

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### Challenges to Counseling in Primary Care

Primary care providers (PCPs) report that they inconsistently screen and counsel for behavioral health-related problems [6]. Although simple lifestyle advice may have modest clinical effects on some behaviors such as smoking and alcohol use [7, 8], PCPs have not adopted the practice broadly [9]. Barriers to providing counseling for behavioral health-related problems include lack of training [10] and reimbursement [11], a reluctance to confront patients [12], limited time and competing priorities [13], and a sense that screening and counseling may not be effective [14]. A different approach to addressing some of these barriers may be needed to improve

outcomes for persons with behavioral problems presenting to primary care [15].

### Motivational Interviewing for Primary Care

Motivational Interviewing (MI) is a “collaborative conversation style for strengthening a person’s own motivation and commitment to change” [16]. Alternatively, it is defined as “a psychotherapeutic method commonly used for helping clients resolve ambivalence about changing problem behaviors” [17]. MI comprises two principal components [18]. MI spirit, a *relational* component, is described as a non-judgmental, collaborative, evoking of the patient’s perspectives and a guiding style supportive of autonomy that uses open questions and reflections. The *technical* component also employs open questions and reflective listening, but in the service of eliciting and amplifying specific patient statements that are arguments for change, “change talk” [16]. A growing body of research supports change talk as a possible mediator of the effects of the provider’s MI-consistent language on outcomes including reductions in alcohol and substance use [17, 19–21]. Sustain talk, arguments in favor of the status quo, has predicted worse clinical outcomes [22], an effect that may be particularly strong when persons are mandated to attend treatment [17]. Thus, MI training protocols should include skill development to elicit change talk, and possibly to limit sustain talk [23].

### Is Motivational Interviewing a Fit for Primary Care?

MI began in the specialty sector where time is allowed for “clients” to work through ambivalence and to devise change plans [24, 25]. Primary care has been identified as a potentially impactful place to address behavioral health-related problems with MI [26, 27]. PCPs get to know their patients over time, often years, and thus have an established relationship. However, primary care visits are relatively brief and patients seeing PCPs may be visiting for reasons unrelated to addressing behavioral problems and be at low levels of readiness to change. While PCPs, who provide the majority of behavioral health care in primary care settings, are well-trained in physical medicine, they may worry about a lack of time or inadequate foundational training in counseling to learn and effectively conduct MI [28].

### Evidence Base for MI in Primary Care Settings From an Overview of 22 Clinical Trials Published Prior to 2013 (Table 1)

Twenty-two trials of MI based in primary care were identified from reviews and meta-analyses of MI from both the pediatric and adult literature [29–31]. The randomized clinical trials of MI in primary care were described by target behavior and population, design and setting, who provided the MI, and

other descriptors [32–43, 44•, 45–53]. These trials were published between 1997 and 2011, and targeted 13 behavioral health-related problems including obesity or physical activity ( $n = 5$ ), risky alcohol use (5), and tobacco use (2).

Reflecting the range of problems addressed in primary care, patient populations varied widely, from children at risk for obesity to adults with high blood pressure. A description of the MI training approach, available in 16 of the 22 trials, varied from a 2-h training [53] to 40 h of classroom training and weekly supervision [35]. Several training approaches followed up classroom training with ongoing coaching or feedback [35, 36, 38, 44•, 50, 54].

The MI providers were non-specialist clinicians in 7 trials (RNs, primary care providers), specialized clinicians (counselor, social worker or therapist, nutritionist or health promotion/physical activity specialist, or case managers) in 12, and were non-clinical in 3 (lay person, college students, or research assistants).

Just 1 of 22 trials reported fidelity data with a reliable, valid instrument [44•]. In this trial, a total of only nine encounters selected by the three counselors were analyzed for fidelity, making it difficult to draw definitive conclusions about provision of MI. A focus on eliciting patient “change talk” was described as part of the MI training in only two trials [44•, 55].

Three of the trials had two control arms (e.g., wait list and usual care arms), and one had two intervention arms (different doses of motivational enhancement). Results showed a significant effect of the MI for 9 of 17 comparisons against control arms rated as weaker (e.g., wait list or usual care), and for three of nine comparisons against stronger controls (e.g., tailored counseling). For specific behavioral health-related problems targeted in more than one trial (physical activity/obesity, risky alcohol use, and smoking), results were mixed. No tests for MI’s putative mechanisms (e.g., change talk) were reported.

Given variability of MI training approaches, approaches to formatting MI, and limited understanding of what happened during clinical encounters, it is not entirely surprising that more than half of the comparisons were negative, and that outcomes for target behaviors with more than one trial were mixed. These early trials responded to a demand for ways to better support patients to change a broad range of problematic behaviors, and also exemplify the key knowledge gaps, described in multiple reviews [29, 31, 56], persisting across the MI literature.

### Knowledge Gaps in the MI Literature

The first knowledge gap is a limited understanding of how to effectively train persons to conduct MI in primary care. Two reviews of MI trainings for PCPs reported mixed results, possibly because of relatively brief training approaches [57, 58]. Second, clinical trials of MI have rarely ascertained the extent

**Table 1** Summary of 22 randomized trials of MI conducted in primary care settings (1997–2011)

First author/ year published	Target behavior (site/sample)	Design/setting	Who provided MI?	MI format/ control group	MI training approach/ “Change talk” in description?	Fidelity assessed/ How?/Data presented?	Significant advantage to MI?/mechanisms tested?
Obarzanek/2001	Cholesterol level (schools and pediatric practices/school aged children)	RCT/schools and pediatric practices	Behaviorist and nutritionist counselors	Used MI over 2 years from year 4 onward in 6-year trial/handout (weaker)	Unknown/No	No/NA/No	No long-term effect/No
Menon/2011	Colorectal cancer screening (primary care/adults aged 50 or higher not adherent with screening for colon cancer)	RCT	3 telephone counselors with a masters or doctoral degree	1 20-min MI session by telephone/ 1. Usual care; and (weaker) 2. Tailored counseling (stronger)	12-h classroom training, feedback on audio-recorded pilot encounters, practice with trainer by telephone, ongoing bi-monthly supervision/Yes	Yes/Motivational Interviewing Treatment Integrity instrument (3 sessions per provider)/Yes	No/No
D’Amico/2008	Marijuana use (primary care clinic/high-risk teenagers)	RCT/	Associate and Master’s level case managers	15 min face-to-face MI, and 5 min MI booster telephone call after 4 weeks/usual care (weaker)	Goals are to assess motivation and make a change plan; providers participated in several practice role-playing sessions (feedback/coaching)/no	Yes/Trainer listened to audio-recording and gave feedback/No	Yes/No
Ogedegbe/2008	Medication adherence (community health clinics/African American adults with high blood pressure)	RCT/2 health clinics	2 research assistants	30–40 min semi-structured MI counseling session at 3, 6, 9, and 12 months/usual care (weaker)	16-h baseline classroom training, annual 1-day booster training, feedback from trainer on audio-recorded encounters/No	No/NA/No	Yes/No
Barkin/2008	Media use, discipline approaches, and children’s access to firearms (pediatric clinics/children and parent(s) attending a clinic)	RCT/	Primary care providers	Brief MI to assess family interest and confidence in violence-prevention behaviors Educational handout on literacy promotion (weaker)	Unknown/NA	No/NA/No	Yes—for media use and locking guns only/No
Ball/2011	Obesity—percentage change of body mass index z-score (community clinic/ obese teens)	RCT/ body mass index z-score (community clinic/ obese teens)	RNs and registered dieticians	16–20 weekly sessions of education and motivation building using MI and CBT/ 1. Similar intervention omitting MI and CBT (stronger); or 2. Wait list control (weaker)	Two 1-day training sessions on MI, CBT, and behavior change principles/No	No/NA/No	No/No
Black/2010	Obesity—prevent increase in BMI over 24 months (primary care clinic/ obese teens)	RCT/Primary care clinic and proximate community	College-enrolled, African American mentors	12-session, home-and community-based intervention/Usual care (weaker)	40 h of training, including motivational interviewing, and weekly supervision during the intervention/No	No/NA/No	Yes/No
Greaves/2008	Obesity—0/yes (community clinic/overweight and obese adults)	RCT	5 “health promotion” counselors	Up to 11 30-min sessions face-to-face or by telephone over	2-day classroom seminar/No	Yes/BECCI instrument/No	Yes/No

Table 1 (continued)

First author/ year published	Target behavior (site/sample)	Design/setting	Who provided MI?	MI format/ control group	MI training approach/ "Change talk" in description?	Fidelity assessed/ How?/Data presented?	Significant advantage to MI?/mechanisms tested?
Hardcastle/2008	Physical activity (primary care clinic/patients at risk of coronary heart disease)	RCT/ RCT/	Dietician and physical activity specialist for each patient	6 months/Informational leaflet (weaker) Informational handout, 20–30 min MI sessions, up to 5 sessions over 6 months/Usual care (weaker) 30 min—menu of 6 strategies matched to change state/ 1. Brief advice by PCPs (stronger); or 2. Usual care (weaker)	2 4-h classroom trainings, coaching on 3 audio-recorded sessions, chance to meet and discuss MI over 6 months/Yes	Yes/Trainer listened to audio-recording and gave feedback/No	Yes/No
Hilsdon/2002	Physical activity (primary care clinics/sedentary patients aged 45–64)	3-arm RCT/	Health promotion specialists	1. Computer-assisted Motivational Intervention; or 2. Computer-assisted Motivational Intervention, and Up to 7 quarterly MI sessions in the community/ Standard usual prenatal care (weaker)	Unknown/No	No/NA/No	No/No
Barnet/2008	Prevention of repeat birth by 24 months postpartum (primary care clinic/adolescent mothers)	RCT/and proximate community	Lay persons from the community	1. Computer-assisted Motivational Intervention; or 2. Computer-assisted Motivational Intervention, and Up to 7 quarterly MI sessions in the community/ Standard usual prenatal care (weaker)	2.5 day classroom training on trans-theoretical model, MI, and MI protocol, and 1–8 bi-weekly sessions with an MI trainer to review MI encounters the providers chose to audio-record/No	Yes (one post-training session)/Motivational Interviewing Process Code/No	No/No
Sentf/1997	Risky drinking (primary care clinic/adults aged 21 and over)	RCT/primary care clinic	Counselors	30-s advice by primary care provider, then a counselor provides MI/Usual care (weaker)	Unknown/No	No/NA/No	Yes/No
Emmen/2005	Risky drinking (adults aged 21 and over)	RCT/	Therapists	150 min over two sessions psychosocial intervention/ Brief advice by PCP (stronger)	Unknown/No	Yes/Discussion of audiotaped-encounter with supervisor/No	No/No
Maisto/2001	Risky drinking (Outpatient General Internal Medicine clinics/adults aged 21 or over)	3-arm RCT/primary care clinics	3 intervention providers (control and intervention arms)	3 interventionists—30 min baseline and 2 20 min f/u sessions at 2 and 6 weeks, + booklet/ 1. Brief advice- 10-15 min of feedback + booklet (stronger); or 2. Standard care—physician may provide advice (weaker)	Unknown/No	No/NA/No	No/No
Schaus/2009	Risky drinking (student health center/college students screening positive for risky drinking)	RCT/	Primary care providers	2 20-min MI sessions with normative feedback of current drinking behavior/Usual care by primary care providers (weaker)	8-h classroom training, monthly feedback by MI trainer on audio-recorded sessions/No	Yes/NA/No	No/No
Noknoy/2010	Risky drinking (primary care units/adults aged 18–64)	RCT/	Registered nurse	Motivational Enhancement Therapy—3	6-h classroom/No	No/NA/No	Yes/No

**Table 1** (continued)

First author/ year published	Target behavior (site/sample)	Design/setting	Who provided MI?	MI format/ control group	MI training approach/ "Change talk" in description?	Fidelity assessed/ How?/Data presented?	Significant advantage to MI?/mechanisms tested?
Ahluwalia/2006	Tobacco use (community health center/African American light smokers)	2 × 2 factorial design/	Trained counselors	sessions/Treatment as usual—assessment only (weaker) Followed semi-structured scripts that explored the pros and cons of smoking/ quitting and motivation and confidence to quit/Nicotine gum (real/placebo) and education (by health educator) (stronger)	Unclear, included "weekly super-vision throughout the study period to ensure the integrity of the respective counseling protocols was maintained"/No	Yes/Each session was tape-recorded to maintain fidelity and consistency throughout the study/No	No/No
Soria/2006	Tobacco use (primary care clinics/smokers aged 15–75)	RCT/	PCP	3 20-min MI counseling sessions at the primary care clinic/Anti-smoking advice by PCP—3 min (stronger) General MI with intensive diabetes treatment/intensive diabetes treatment alone (stronger)	Role-playing and analysis of video-recorded interactions/No 1-day baseline and 2 4-h classroom refresher courses over 12 months/No	No/NA/No	Yes/No
Rubak/2009	Knowledge, beliefs regarding diabetes prevention and treatment, and motivation for change (primary care clinics/patients with diabetes aged 40–65)	RCT/	PCP			No/NA/No	Yes/No
Van Vorhees/2008	Engaging in a depression prevention website (pediatric practices/teens with depression)	RCT/	PCP and social worker	MI by an MI-trained PCP (1 session), then MI by a social worker (3 calls) + internet program/basic advice + internet program (stronger)	1-h lunch program for PCPs/No	Yes/Un-validated 1–5 scale/Yes	Yes/No
Olson/2008	Health behaviors (pediatric clinics/ teenagers)	RCT/	Pediatric and Family Medicine clinicians	MI by treating clinician/Usual care (weaker)	3-h interactive MI training for clinicians/No	No/NA/No	Yes for 2 of 5 behaviors (i.e., physical activity and # of milk servings) at 6 months/No No/ No
Chacko/2010	Increased checkups for sexually transmitted infections over 12 months (reproductive health clinic/adolescent and adult females)	RCT/urban	Trained Master's or Bachelor's level educator	Motivational Behavioral Intervention+ standard care by staff—MI informed by stage of change assessed at baseline, 2 and 6 months/Usual care by staff (weaker)	Unknown/No	No/NA/No	No/ No

to which MI was delivered as intended (fidelity), creating limitations to the internal and external validity of trial findings. For instance, fidelity information from a negative trial could help sort out whether the results appeared to be due to well-conducted but ineffective MI, or to poor fidelity to MI [59]. The third knowledge gap, poor understanding of why results tend to vary widely across MI trials targeting the same behavior (heterogeneity), may be related to the first two gaps [29, 31, 56, 60, 61]. Whereas improving outcomes and the efficiency of MI may depend upon identifying the components of MI that best explain outcomes, few trials have explored for possible mechanisms. Therefore, the fourth gap is paucity of descriptions of “moderators” and “mediators” of the effects of MI, or of MI training, on outcomes [62, 63].

### Goals for the Current Review

Considering these challenges to implementing MI in primary care, goals for the review include the following: (a) describing how recent trials have begun to address the key knowledge gaps; (b) posing unanswered questions and offering a few recommendations to adjust trial design in primary care; and (c) summarizing findings for health care systems, primary care clinics, or PCPs that may be pondering whether or not to learn MI.

## Methods

### Literature Search (2013–2017)

A search was conducted of the literature from January 1, 2013 to May 25, 2017 in PubMed, PsycInfo, and Web of Science using key words “primary care,” and “motivational interviewing” or “motivational enhancement” or “motivational intervention.” The goals were to identify trials of MI training or of conducting MI in primary care that addressed any of those four key knowledge gaps from the literature described above. Primary care was defined as a Family Medicine, Internal Medicine, or Pediatric clinic where definitive care is provided to the patient at the point of first contact (<http://www.aafp.org/about/policies/all/primary-care.html>).

### Exclusion Criteria

Non-RCTs were excluded, in addition to trials that did not focus on MI training or include MI in the intervention. Trials set outside primary care were excluded. Because fidelity data is necessary to address the key knowledge gaps, if MI fidelity was not measured with a validated instrument and compared across at least two randomization groups, then trials were excluded. Beyond trials of MI training, in which fidelity is an outcome, measures of fidelity and patient language have also

been proposed as potentially important mediator candidates in clinical trials of MI [22, 56]. In randomized trials, causal inference may be made for correlations between treatment assignment and a mediator, and between treatment assignment and clinical outcome, but not between a mediator and outcome [63]. Thus, measuring mediator candidates in both randomization groups of a randomized trial with the “MacArthur Approach” is an ideal method to assessing for mediator variables, which may help identify processes by which treatments work, thereby contributing to developing treatments that are more cost-effective, clinically impactful, and/or safer [63]. Trials of MI training and clinical outcome are categorized in Tables 2 and 3, respectively, by MI training approach, how fidelity was ascertained, and other descriptors.

## Results

### MI Primary Care Studies Since 2013 Addressing Key Knowledge Gaps (Table 2)

The search process identified 460 individual studies. Of these, there were 84 trials, of which 77 were excluded when it was noted that (a) MI fidelity was not measured in two randomization arms ( $n = 47$ ); (b) the setting was not primary care (22); or (c) the intervention was not MI or did not include MI in a multi-component intervention (8). One trial of the effect of training on MI performance but not on clinical outcome was identified for this review [64••]. Two research teams reported on the effects of MI training on both its performance and on clinical outcomes, publishing a manuscript each focused on the training results, and a manuscript each focused on the clinical outcomes [65••, 66••, 67••, 68••].

### Effects of MI Training on MI Performance (Table 2)

One trial focused on just the impact of training on MI performance. Fu et al. randomized primary care providers (10), nurses (17), and pharmacists (7) to high intensity MI training (4-h long workshop training, followed by peer coaching by MI champions and 6 booster sessions including telephone interactions with simulated patients) or to low intensity training (workshop only) [64••]. Relative to participants assigned to the low intensity training, participants in the high intensity group demonstrated 31% more MI-consistent behaviors (e.g., open questions and reflective statements), and significant improvements in MI spirit over 12 weeks ( $ps < .05$ ). The authors did not describe whether ratings of MI skill and spirit varied by provider type.

Two primary care MI training studies evaluated both the impact of training on MI performance as well as behavior change [65••, 67••]. Jansink et al. randomized Registered Nurses (RNs) providing routine care for persons with diabetes

**Table 2** Trials of MI training in primary care (2013–2017)

First author/year	Who received MI training?	MI training approach (focus on change talk? Yes/no)	Control group	How was fidelity assessed?	MI training results
Fu et al./2015	34 Primary care providers, nurses, and pharmacists	Arm 1 (high intensity)—4-h MI workshop with ongoing peer coaching by MI champions and 6 booster sessions including telephone interactions with simulated patients (Yes)	Arm 2 (low intensity)—4 h MI workshop only (Yes)	All trial participants conducted 2 pre- and 2 post-training objective structured clinical examinations with simulated patients. These were analyzed with the Motivational Interviewing Treatment Integrity instrument (global and behavior frequency scales)	Over 12 weeks, high intensity group participants demonstrated 31% improvement in MI-consistent behaviors, and .57 point improvement in MI spirit (5-point scale) relative to low intensity group participants
Jansink et al./2013	65 registered nurses (30 intervention, 35 control)	Four ½-day training sessions spread over 12 months. Theory of MI, group discussion, role-playing, feedback on 1 video-recorded encounter. Monthly phone calls available with the professional trainer (Yes)	No training	Five visits were video-recorded at baseline and after 1 year. The recordings were rated with the Behaviour Change Counseling Index (BECCI) to evaluate the practice of 11 specific MI skills. Three global scales from the Motivational Interviewing Treatment Integrity instrument were used	Overall, relative to the untrained control nurses, after 12 months the MI-trained nurses improved on 1 of the 11 BECCI MI skills, “inviting the patient to talk about behavior change” ( $p = .009$ ). None of the global scales from the MITI improved significantly
Keeley et al./2014	26 primary care providers (10 intervention, 16 control)	8-h baseline classroom training, classroom refreshers after 4- and 12-months, feedback on 2–4 audio-recorded encounters (Yes)	No training	Motivational Interviewing Treatment Integrity instrument version 3.1.1 (global and behavior frequency scales); MI was rated from all audio-recorded index encounters over the 29 month clinical trial	MI-trained PCPs made MI-consistent language 26% more frequently than their untrained counterparts ( $p = .005$ ). Numbers of open questions and complex reflections, and global ratings for Direction and MI spirit were significantly improved over the 29-month trial for MI-trained providers ( $ps < .05$ )

to MI training with 4 ½-day classroom trainings spread out over 12 months, or to no training [65••]. The research team assessed MI skills at baseline and again at 12 months from analyses of audio-recorded clinical visits in both randomization groups. Relative to their untrained counterparts, RNs randomized to MI training demonstrated significant improvement on only 1 of 14 validated measures of communication. MI performance may have improved earlier in the trial but was not evaluated until 12 months, at which time skills may have dissipated. More frequent fidelity assessments over the trial may have identified the lack of training effect and prompted a stepped-up approach.

Keeley et al. randomized 26 PCPs to MI training or to no training. MI training comprised a baseline 8-h classroom training, feedback on 2–4 audio-recorded encounters with patients screening positive for depression, and an opportunity to participate in two 4-h refresher classroom trainings after 4 and 12 months [67••]. The MI training emphasized ways to elicit and respond to change talk from patients. Encounters with patients screening positive for depression ( $n = 165$ ) and randomized to treatment by MI-trained and untrained providers were audio-recorded for analysis with a valid instrument. MI-trained PCPs were able to perform some but not all MI skills better than untrained control PCPs. Frequency of MI-consistent language

**Table 3** Clinical trials of MI in primary care improving understanding of fidelity, heterogeneity of outcomes, or possible mechanisms (2013–2017)

First author	Year	Design	Who provided MI?	MI format	MI training approach/ Focus on change talk/ control group	Fidelity assessed/ Data presented	Target/Significant advantage to MI condition?
Jansink	2013	RCT	Registered nurses	Nurse-led structured diabetes care with a protocol, record keeping, reminders, and feedback, plus training in motivational interviewing and agenda setting	Four ½-day training sessions spread over 12 months. Theory of Motivational Interviewing, group discussion, role-playing, feedback on 1 video-recorded encounter. Monthly phone calls available with the professional trainer (Yes)/Usual care	Yes/Yes	Sugar control, diet, and physical activity/No
Keeley	2016	RCT	Primary care providers	Primary care providers used MI to structure discussions around depression at primary care visits	8-h baseline training, 4- and 12-month refreshers, feedback on 2–4 audio-recorded encounters/ explicit focus on hearing and eliciting change talk/Enhanced usual care	Yes/Yes	Depression/Yes—significant improvement for patients treated by MI-trained PCPs relative to patients treated by untrained control PCPs

(fMICO) was calculated by summing the MI techniques and dividing by time. In the intention-to-treat analysis, PCPs assigned to the MI training averaged higher rates of fMICO compared with those who received no training (Cohen's  $d$  clinical effect size = .44 (small),  $p = .005$ ). While no main effect of MI training on ratings of MI spirit was described, a slope analysis over 2.5 years after the baseline training was conducted for providers trained in MI. Global spirit and direction, open questions, and complex reflections improved significantly over the course of the trial ( $ps < .05$ ) [68••].

### Effects of MI Training on Behavioral Health-Related Outcomes

In Jansink et al., the authors concluded that lifestyle counseling based on MI principles integrated into structured diabetes care did not alter sugar control, diet, or physical activity [66••]. Several months later, however, the authors reported on how MI training did not appear to improve MI performance. This is an example of how context, understanding provision of MI in this instance, improved the interpretation of results from a clinical trial. At a minimum, given the observed lack of fidelity to MI, it would be problematic to conclude an intervention based on MI principles was provided to patients. Training may influence provision of MI to varying degrees [69].

In Keeley et al., patients visiting MI-trained PCPs experienced a more favorable trajectory of PHQ-9 depressive symptom scores over 36 weeks than their untrained counterparts ( $p = .018$ ). Moreover, those patients assigned to the

intervention arm experienced improved depressive symptoms at 36 weeks relative to their counterparts allocated to control. This difference in depressive symptoms was equivalent to a Cohen's  $d = .41$  [.11, .72], a small clinical effect size. Rates of remission from depression were higher at 36 weeks for patients treated by providers trained in MI (Success Rate Difference = 14.53%, 95% CI [1.79, 27.26],  $p = .026$ ). However, MI training did not appear to influence secondary goals, increased uptake and adherence to anti-depressant medication and counseling [68••].

### Identifying Mediators of the Effect of MI Training on Clinical Outcome (Table 3)

Jansink et al. did not collect fidelity data on all audio-recorded encounters, precluding exploration for mechanisms. Using the MacArthur Approach [62], Keeley et al. systematically explored for how measures of PCP and patient language during index encounters with patients newly diagnosed with depression might help explain the effect of the MI training on improvement in depressive symptoms over 36 weeks. Global rating of the providers' ability to direct clinical discussions toward treating depression, and the patients' change talk around activities the patient discussed as possibly helpful for addressing depression (e.g., attending religious services, spending time with family members, shopping, or reading a self-help book for depression), appeared to mediate the effects of MI training on improved clinical outcome ( $ps < .05$ ).



## Limitations

As the search process required that the term “Primary Care” be attached to articles for consideration, it is possible that some trials set in primary care but not characterized accordingly were not detected in the literature. The use of the terms “MI” and “MI training” can be confusing. For primary care providers, there appear to be sustainable improvements in provision of MI after training, yet thresholds of proficiency may not be attained, and it is inaccurate to describe the intervention in these instances as MI as was intended by its founders. “MI Training” is a more accurate description of the intervention in many instances.

## Conclusion

In this review we describe how recent trials of MI training and downstream effects on provision of MI and clinical outcomes have begun addressing gaps in knowledge across the MI literature. These gaps have included limited understanding of the following: (1) how well MI training translates to subsequent provision of MI; (2) to what extent MI is provided in clinical trials of MI; (3) why results of MI trials for specific behavioral problems produce puzzling heterogeneous results; and (4) what aspects of clinician and patient language link training to clinical outcomes. Addressing these knowledge gaps provides support for an emerging role for MI in primary care.

Two of three MI training approaches identified from the more recent primary care literature combined classroom time with booster sessions, ongoing coaching, and/ or feedback, which appeared to improve measures of communication outcomes for up to 2.5 years [64••, 67••]. However, the intensity of the trainings may not be scalable in real world settings. In addition, while beginning proficiency thresholds were difficult for non-specialists to achieve in training trials by Fu et al. and Keeley et al. [64••, 67••], absolute gains in MI skill with training appeared similar for PCPs when compared to therapists who typically have foundational MI skills [23].

The trials of the effects of MI training on clinical outcomes by Jansink et al. and Keeley et al. assessed fidelity during the trial, providing vital context to interpreting the effects of “MI” on the outcomes. In the trial by Jansink et al., there was no effect of MI training on outcomes, plausibly because provision of MI was not enhanced by MI training relative to control. Keeley et al. reported that MI-trained PCPs conducted better MI than untrained control PCPs, and that their patients experienced better clinical outcomes relative to patients visiting untrained PCPs. This finding supports a causal link between MI training and improved depression outcomes, but does not in itself link aspects of MI or of related patient language to clinical outcome.

## Applying Knowledge Gleaned From Mediator Variables

As describe above, exploratory mediator analyses uncovered ratings of the clinicians’ ability to be directive (“global direction”) and the patients’ “change talk” as mediators of the effect of MI training on depressive symptoms over 36 weeks. While the MacArthur Approach does not establish a causal association between mediator variables and outcome, mediators surfaced by the process may contribute two types of helpful information. First, mediators point toward ways to tailor interventions to make them more potent. For instance, the MI training conducted by Keeley et al. may increase focus on using MI skills to be directive, and on teaching clinicians to elicit change talk. Second, mediators derived from patient language may provide the PCP with real-time information during the clinical encounter that is prognostic of subsequent clinical outcome. As increasing frequency of change talk during the encounter may be associated positively with improved depressive symptoms over time, when the depressed patient is not voicing change talk the clinician may want to ask more questions or change their approach. Thus, mediators may inform modifications to MI training to enhance outcome, and may add actionable information during a clinical encounter.

Of note, in the trial by Keeley et al., MI training was not associated with increased receipt of evidence-based treatment (antidepressant medication or counseling). It is possible that the goal of increasing receipt of evidence-based treatment was not always aligned with the patients’ desired approach to handling depression. Considering the nature and balance of patients’ change and sustain talk and whether and how providers responded to patient language [17] might provide insight the lack of impact on uptake and adherence to evidence-based treatments for depression. As a whole, the recent trials of effects of MI training on MI performance and clinical outcome have begun addressing the four knowledge gaps described above.

## Unanswered Questions

Some of the queries arising from this review included the following:

1. Who should provide MI in primary care, and for which behavioral problems?
2. To what extent could training be tailored to provider type and how?
3. Should MI target the specific problem behavior itself, focus on achieving referral to specialty services, or both?
4. How might theories of behavior change contribute to modified, more effective versions of MI (or MI training)?

## Considerations When Conducting Research on MI in Primary Care

Recommendations for research design generally mirror efforts to address the four knowledge gaps described above. Ideally, the MI training scheme should replicate a multi-faceted approach, including booster classroom sessions as well as performance feedback, as described in several MI training trials in this review and summarized by Schwalbe et al. [70]. MI fidelity and patients' change talk and sustain talk should be assessed in both the intervention and control arms during the index and subsequent visits throughout the episode of care. This recommendation is supported by a consensus report recommending that all studies of health behavior change collect and report treatment integrity and fidelity data [59]. All trials should hypothesize and explore for moderators, which define how patients benefit or not from different treatments, and mediators, which suggest mechanisms of treatment that may facilitate its refinement and optimization [63].

Also, investigating which providers benefit most and least from an MI training protocol, and why, might define who may benefit more from an alternative training approach, and could suggest ways to increase the clinical impact of training. Most aspects of MI, in addition to change talk and sustain talk, appear detectable across clinical encounters with untrained PCPs [67•, 71]. Thus, using the "MacArthur Approach," mediator analyses of both the PCPs' and patients' language during clinical encounters are feasible in trials [62, 72]. A reasonable dose of MI may not accrue in a single visit, and it may be valuable to extend the length of the trial to 36 weeks or longer to allow time for extra MI sessions.

## What Should PCPs Take Away From This Article?

A growing literature highlights MI training as a way to support primary care patients to address a range of behavioral health-related problems such as tobacco and alcohol use, physical inactivity and overeating, and depression. If PCPs and other clinic staff wish to learn MI, recent research findings suggest that the multi-faceted training approach described in this manuscript is effective. MI training should include a focus on learning to elicit "change talk," language in favor of changing the target behavior. Time dedicated to learning MI over the first year totals about 20 h. In following years, 4 to 8 h of training annually appears sufficient to maintain or grow MI ability. While the overall clinical effect size for MI is typically small for problematic behaviors [29], the cumulative impact is potentially substantial across multiple patients and health-related behaviors. While much is still to be learned about MI, these findings provide a rationale for PCPs to strongly consider MI training.

This review covered advancements in primary care settings over the last several years in training persons to improve

provision of MI, using fidelity information to provide context when considering effects of MI training on clinical outcome, and exploring for mediator variables to help tailor MI training approaches and enhance outcomes.

## Compliance with Ethical Standards

**Conflict of Interest** Robert Keeley, Matthew Engel, Alex Reed, David Brody, and Brian L. Burke each declare no potential conflicts of interest.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

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