

# Motivational Interviewing for Adherence Problems in Cystic Fibrosis

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**Summary.** This review focuses on adherence in cystic fibrosis (CF), and the factors known to influence it. In particular, it discusses the importance of effective communication in clinical settings and considers the evidence for the effectiveness of motivational interviewing (MI), to increase adaptation and adherence in physical health and CF. The review also contains an overview of the key concepts of MI, its' practice in medical settings and recommendations on how to adopt MI techniques in the routine care of people with CF. **Pediatr Pulmonol.** 2010; 45:211–220. © 2010 Wiley-Liss, Inc.

**Key words:** cystic fibrosis; adherence; motivational interviewing.

## INTRODUCTION

Cystic fibrosis (CF), is the most common serious hereditary disease amongst Caucasians with birth prevalence commonly cited as 1 in 2,000/2,500 live births.<sup>1</sup> It is a chronic, multi-system condition that is becoming increasingly screened for at birth. Clinical manifestations include symptoms such as meconium ileus, pancreatic insufficiency and recurrent pulmonary infections which are caused by mutations in the gene encoding the CF transmembrane conductance regulator (CFTR). Over 1,500 CFTR gene mutations have been identified and although there are wide ranging clinical presentations, many patients have mutations that result in no CFTR function, resulting in lung disease and pancreatic exocrine insufficiency.

Progress in management has led to significantly improved longevity and quality of life, with such dramatic increases in median survival rates leading to CF now being considered a life-limiting disease of adulthood. Those born after 2000 are expected to live into their 50s, even in the absence of effective therapies aimed at correcting the underlying genetic defect.<sup>2</sup> However, progressive disease continues to lead to respiratory failure and often prolonged periods of ill-health and reduced quality of life before death.

Established treatment protocols of physiotherapy, enzyme replacement therapy, high-fat intake requirements and prophylactic antibiotics, mucolytics and vitamins, have always been arduous and time-consuming for patients and parents. Yet, improved outcomes have been achieved by even further increases in regimen rigor and intensity, including new medications (e.g., antibiotics, hypertonic

saline), and drug-delivery devices (e.g., inhalers), and more aggressive and preventative treatment strategies. Infection control guidelines have led to people with CF of all ages being segregated in hospital according to their microbiological status in order to prevent the spread of transmissible pathogens such as *Burkholderia cepacia* complex (*Bcc*) and *Pseudomonas aeruginosa* (*PsA*). They are also currently advised to avoid social contact with other people with CF and to adopt impeccable hygiene standards.

Looking forward, in 2008 the Cystic Fibrosis Foundation (CFF), established a framework (“pipeline”), for the development of more potential CF therapies than ever before.<sup>3</sup> While some therapies are in the early stages of development, others are not and are under investigation in Stage III clinical trials. The framework consists of eight sectors, each with multiple pathways aimed at

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targeting problems in the airways and digestive system. It also contains promising new therapies aimed at rectifying the cause of CF, that is, the faulty gene or its faulty protein product.<sup>3</sup> There is much hope that clinical trials will lead to patients with CF living even longer and dying from other causes.

For many young people with CF, childhood is a period where there is comparative freedom from persistent exacerbation and hospital treatment. While adolescents and adults with the disease can also lead fulfilling lives free from intensive medical care, they are ultimately faced with some unique demands as the disease advances. Complications such as CF-related diabetes and liver-disease, hemoptysis, pneumothorax, osteoporosis and urinary incontinence mean that achieving and maintaining “normal life” is tempered with managing increasingly visible, less predictable and more intrusive health problems, that lead to deterioration, transplant consideration and ultimately an untimely death. Consequently, it cannot be presumed that improvements in management and prognosis shield people from adverse psychological effects. On the contrary, together, increased treatment regimens and complications, present mounting challenges for patients and threaten optimal adherence.

“Adherence” is now the preferred term to describe how patients’ health care behaviors concur with agreed recommendations made by clinicians. The World Health Organisation estimates adherence rates across all illnesses to be around 50%.<sup>4</sup> The consequences of sub-optimal adherence are known to contribute to: increased morbidity and mortality and lowered quality of life, increased dosage which results in drug-resistance, over-treatment and side-effects and discontinuation of medication perceived to be ineffective.<sup>5–7</sup> Clinical trials of new treatments and posologies can also be undermined by inconsistent or partial adherence to the protocol.<sup>8</sup> However, these effects have yet to be systematically demonstrated in CF groups.

This article aims to consider the contemporary adherence challenges people with CF and their healthcare teams face in the context of regimens becoming increasingly onerous in the absence of a viable gene therapy. There is a growing responsibility for clinicians and health carers to continually update their knowledge about adherence and skills in communicating effectively with patients and relatives about it, which in turn, is more likely to improve the quality of information on which to base clinical decisions and prescribing. While this article focuses exclusively on CF and the opportunities motivational interviewing (MI), affords health carers looking after people with CF, many themes and recommendations are transferable to the management of other conditions. This review considers: (i) psychological factors associated with adherence in CF and its’ treatment, (ii) how problems with adhering are communicated with the CF team, (iii) definitions of MI, its’ growing utilization in health

settings and the increasing evidence for its’ effectiveness, and (iv) clinical applications of MI in helping people with CF and health care professionals move towards optimal adherence levels.

## FACTORS ASSOCIATED WITH ADHERENCE IN CF

Variables which influence adherence rates across all disease groups are becoming increasingly well-established. These include: individual and family factors, regimen characteristics, measurement issues, and knowledge and interaction with health professionals.

### Individual and Family Factors

In pediatric populations, age has been demonstrated to be inversely linked to adherence.<sup>9</sup> In CF populations, difficulties are reliably reported to increase from 10 years onwards, peaking at around 16 years.<sup>10,11</sup> While individual responsibility for treatment has not been associated with adherence problems per se,<sup>12</sup> family disagreements, over-involvement and poor communication are. One longitudinal study showed that family dysfunction negatively impacted on health outcomes,<sup>13</sup> facilitated by the family’s inability to optimize treatment adherence. Other studies on the effect of increased parental involvement and monitoring of treatment behaviors during adolescence remain equivocal. Some report this to optimize adherence<sup>14</sup> while others associate it with lower levels.<sup>15</sup> Further meta-analysis has demonstrated significant correlations between adherence and cohesive families and good, practical, social support.<sup>16</sup> Both school-age children and their parents have identified barriers to optimal adherence including forgetting, oppositional behaviors, difficulties with time management and side-effects, with the children themselves citing difficulty with swallowing pills and disliking the taste of some medicines, as the main reasons for partial adherence.<sup>17</sup> The same study found that for aerosolized therapies, parents could not identify what was hindering them.

In adult groups, increasing severity of CF is not in itself directly associated with adherence, which has been reported as being greatest when disease-severity is moderate.<sup>18</sup> Patients’ social support is important<sup>18</sup> but as yet, the impact of family functioning on adherence in adults with CF has not been shown, although it clearly is important for some.<sup>19</sup>

### Regimen Characteristics

Adherence is known to vary depending on regimen-complexity and methods of measurement.<sup>11,20</sup> In pediatric CF populations adherence to nutritional recommendations and physiotherapy regimens is reported to be very low;

16–20% and 47% respectively,<sup>11,21,22</sup> with mothers attributing reasons for this to the treatments not being under their control.<sup>23</sup> Adherence to oral medication (e.g., ursodeoxycholic acid, taurine, vitamins), and enzyme replacement therapy is thought to be high.<sup>12</sup>

In adult groups, where regimens can be more onerous, adherence rates seem to be more favorable when treatments yield immediate benefits and the patient has been given a degree of choice. Self-reported rates of 65–80% for enzymes and nebulized medication, and 40–50% for vitamin therapy, dietary changes, exercise and physiotherapy have been recorded.<sup>24</sup> “Gold-standard” electronically measured adherence to aerosolized antibiotics, are reported as being extremely low, one study suggesting rates to be less than 40%.<sup>25</sup> This is alarming given that nebulizers already play a prominent drug-delivery role and that their use is set to proliferate with many pharmacological therapies in the CFF “pipeline”<sup>3</sup> most likely to be aerosolized. The posology of all four Phase III clinical trials of prospective key CF drugs running in 2008/2009, rely on nebulizers. Eradication protocols for *PsA*, similarly rely heavily, although not exclusively, on inhaled antibiotics, as do attempts to establish eradication regimes for *Bcc*. Yet many centers do not routinely attempt to measure adherence,<sup>26</sup> let alone during clinical studies or eradication programs; something that requires urgent redress.

Reports of adherence rates to infection control recommendations are few. It is still not clear which of these are most important, or whether indeed all are necessary. One large survey of over 1,100 patients, >16 years and parents of patients <16 years, showed that respondents had inconsistent understanding of specific recommended activities aimed at avoiding transmission. They also reported difficulties in undertaking the desired practices and lacked the belief that the guidelines would improve health outcomes.<sup>27</sup>

### Measurement Issues

Variable and unreliable measurement techniques (e.g., self-report, bottle count, and prescription collection), are important factors which account for inconsistency in reported adherence rates. Systematic review concludes that it is difficult to establish exactly what patients and parents are expected to do,<sup>28</sup> with medical records failing to contain reliable or consistent regimen information.<sup>11</sup> Even where there is good patient understanding of both the disease and treatment plan, accurate measurement of adherence rates, expressed as a percentage of what is actually prescribed, is methodologically fraught. Often cited problems are self-report measures adopting different time-scaling and multiple responders (e.g., parents and children). Although electronic monitoring is thought to be more reliable, “dumping” and inaccurate

device-technique can still confound results. With the exception of Adaptive Aerosol Technology<sup>TM</sup>,<sup>29</sup> which electronically records use of nebulizers only on breath-inhalation, “gold standard” assessment has not yet been achieved in CF.<sup>28</sup> As such, it is important for clinicians concerned about their patients’ adherence to follow current best practice guidelines. These are: (i) measuring disease and treatment knowledge, understanding of disease and treatment plan and the factors that block adherence at both an individual and family level, (ii) establishing comprehensive treatment plans with written copies for patients and parents, (iii) triangulating data by utilizing at least two assessment modalities (e.g., daily diary and electronic monitoring), and then exploring concurrence between the two or more results, with electronic data taking precedence, and (iv) using regression or hierarchical linear modeling to account for measurement error and variance.<sup>28</sup>

### Knowledge and Understanding

While general knowledge about CF has not been directly linked to adherence rates, treatment-specific understanding is thought to be important.<sup>19</sup> Some patients and their families lack the knowledge or skills to adhere, some choose to suppress information as part of their coping style, while others perceive themselves as knowledgeable and adherent, but make informed choices not to adhere as directed, having different treatment goals from their clinicians. Information gaps in CF knowledge and misunderstandings are reported to be as high as 33% in mothers of school-age children.<sup>30</sup> While lack of written treatment plans can significantly contribute to this,<sup>17</sup> even where such plans exist, levels of understanding are further influenced by the quality of interactions with health professionals. Physicians appear to underestimate the degree of interaction desired by parents in relation to their child’s illness,<sup>9</sup> while patients and relatives can be unwilling to express concerns or problems about the effects of treatment despite long-standing relationships with team members.

### Treating Adherence Problems

Organizational, educational, and psychological interventions have been utilized alone or in combination in studies to improve treatment adherence, where much can be achieved at a team level and psychotherapeutically.<sup>31</sup> In an algorithm of which intervention to adopt and when, it is suggested that CF teams firstly need to decide if the adherence problem is clinically significant or not. If not, then a preventative program should be considered where treatment-education, the importance of adherence and simplifying treatments are good initial strategies. If the

presenting adherence problem is of clinical significance, but of less than 6 months duration, teams should consider re-education, closer monitoring (e.g., using daily diaries), negotiating a treatment goals and identifying specific behavioral changes (e.g., reminders or routines). Where duration is greater than 6 months, then a more intense psychological assessment should be undertaken.<sup>31</sup>

In CF, across all age ranges of patients there is good evidence that the triumvirate of treatments; airway clearance techniques, nutritional recommendations and nebulized therapies, is beset by sub-optimal adherence. Consequently, it is these aspects of the CF regimen which have been the main focus of psychological interventions aimed at improving adherence rates. Meta-analysis of individual and family psychological interventions has shown that behavioral and multi-component approaches produce marked effects on promoting adherence in pediatric populations.<sup>32</sup> Systematic review has shown

excellent efficacy of behavioral psychotherapy on adherence rates to dietary recommendations, which includes the utilization of token economies, reinforcement scheduling and behavior modification techniques. However, given the success of these interventions, there has been some but comparatively little, evidence for their success in improving adherence to airway clearance techniques and exercise.<sup>33</sup> Specific methods utilized within the context of psychological interventions are outlined in Table 1.

While combinations of psychological approaches are required to bring about changes in adherence to long-term medications,<sup>34</sup> what is gaining impressive ground is family-based intervention. Systemic family therapy addresses ways family members have a reciprocal effect on each other, communicate and function together. There is an emerging body of literature that supports this conceptualization of problems and treatment.<sup>35</sup>

**TABLE 1—Methods to Improve Adherence**

Components	Examples
<b>Organizational</b>	
Shared multidisciplinary team approach to adherence strategies	Shared perspective of “blame-free” approach, normalizing non-adherent behaviors providing aids to adherence
Improving accessibility to health care	Outreach clinics, removing barriers to attending, support by telephone
Child, family friendly settings	Same health care professional each visit, clinic play facilities Simplifying treatments
Minimizing treatments negative side effects	Tailoring treatments to family lifestyle
<b>Psycho-educational</b>	
Information about the illness and treatment	<i>How?</i> Leaflets, videos, CD-ROMs, slide-shows program handouts, demonstrations, use of age-appropriate, sex-matched, filmed modeling, behavioral rehearsal
Description of side effects together with the problems of adhering to complex regimes	<i>To whom?</i> Individual children, parents
Recognition of barriers to adherence	<i>Where?</i> During normal clinic visits, during separate visits to the clinics, by separate telephone calls, at home
The benefits of using long-term consistent strategies to improve adherence	<i>By whom?</i> Doctors, nurses, therapists, psychosocial professionals
Relapse prevention training	
<b>Psychotherapeutic (e.g., behavioral and cognitive interventions)</b>	
Self-monitoring	Parental or child diaries of medication intake
Control over stimuli that evoke patters of behavior that needs to change	Teeth brushing (stimulus) causing drinking (behavior) in children on dialysis
Goal setting	Variations in frequency/targets
Behavioral contracting	Written contract with child, parent and doctor about the specific health care behaviors required
Corrective feedback and reinforcement	Avoidance of blame and criticism. Systematic encouragement and rewards for approximations to goal
<b>Motivational</b>	
Establish and express empathy	Listen to and understand the patient’s perspective
Provide choice (to change or not)	Respect the patient’s choices, values and decisions
Clarify patients treatment goals	Facilitate parent’s consideration of the advantages and disadvantages of behavior change
Help to develop discrepancy (between current behavior and patients’ own goals)	Avoid arguing for change. Resistance is not directly opposed. New perspectives are invited but not imposed. Accept that goals of treatment with vary between patients and patients and doctors
Empathize and work with resistance	Patient is encouraged to find own answers and solutions
Remove barriers to change	Positively reinforce any small changes or contemplation of change
Provide frequent and regular feedback	Health professional supports patients’ growing sense that they can bring about change
Support the development of patient self-efficacy	

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Components that have the greatest impact include negotiation of responsibility and improved communication between adolescents with diabetes and their parents.<sup>36</sup>

The success of behavioral, systemic and multi-component psychological interventions in CF care is intrinsically contingent on patients who openly discuss their level of adherence problems with the team, agree that their adherence may be problematically low and are motivated to work to improve this. It is only after addressing these issues successfully that CF teams will engage patients and their relatives in implementing plans to improve adherence. This begins with honest review of how the team communicates with patients and parents.

### COMMUNICATION WITH THE CF TEAM

In CF care achieving predicted longevity crucially depends on patients' successful adherence and associated health behaviors, despite treatments being intrusive in their daily lives. For teenagers and young adults, consultations can be even more complicated, with potentially differing perspectives of patients and parents, thwarting successful communication. Patient-centered, collaborative approaches to consultations and management are increasingly being viewed as desirable models of care.<sup>37,38</sup> This reflects both a cultural change in the expectations of the patient-professional relationship and emerging evidence that patient-centered styles are associated with increased satisfaction and improved health outcomes over traditional expert-led consultations.<sup>39</sup>

Patients often choose what or how much treatment to do. While poor or partial adherence may be a conscious decision, it can often be the result of not making any decisions at all (e.g., when worry about having CF leads to attempts to avoid thinking about it). Yet, poor adherence is likely to lead to raised anxiety about the consequences, which often leads to attempts by the individual to minimize the risks. This process is known as cognitive dissonance,<sup>40</sup> which refers to the widespread observation that in any situation where people who feel uncomfortable about a choice they have made, also hold a strong desire to resolve the discomfort. Its' resolution is central to motivating patients to change. In the case of poor adherence to CF regimens, a patient's discomfort may involve incompatible beliefs such as "I'm sensible and want to be well" and "I don't do my treatment." The resolution is either by changing the behavior and becoming more adherent or maintaining the same behavior and rationalizing the belief (e.g., arguing that the partial adherence will have little impact on health outcomes and so holding the notion that it is possible to be sensible and well and still not undertake enough treatment). The easiest option is usually to change the belief rather than the behavior (i.e., to stay the same). However

often such a solution is fragile. Further contemplation invariably leads the individual to choose behavior change as a better and more permanent resolution of the discomfort.

In such situations a physician offering advice, encouragement or even condemnation, is unlikely to make any impact on the thoughts defending the choice (not to adhere). What is needed is an approach that recognizes the complexities inherent in the seemingly simple choice not to adhere, that sees the situation as one where the patient or their carers' are making a decision about whether to follow treatment, and that the physician's guidance, if presented in the right way, can make a crucial difference to what choice is made. MI is one such approach ("problem-solving" and "solution-focused" therapies being others). Teams need to acknowledge the notion that ambivalence about "being optimally adherent" is normal and that a degree of partial adherence is common. Patient-care needs to be placed within the context of other activities and an individual's need to try to maintain some kind of "normal life." The challenges for health professionals remain; to facilitate open and honest discussions about adherence, to spend time understanding ambivalence, and to collaborate and negotiate with patients in attempting to achieve more optimal patterns of adherence. In practice, adherence behaviors are clearly not under the control of the physicians, but may still be influenced by them. Therefore, to improve the effectiveness of treatment, health carers need to develop skills in effective communication so that they can avoid unhelpful exchanges that increase resistance to change in poorly adherent patients and instead, conduct more constructive conversations.

### Motivational Interviewing

MI was first described in 1983,<sup>41</sup> as a patient-centered counseling style developed specifically to help patients change behavior. It originated from the treatment of addictions and was initially a response to the failure of traditional confrontational approaches. Resistance (to change), was a common reaction to this confrontation was then often attributed to the patient's poor willpower. But it had long been hypothesized that in situations where individuals feel they are not being given a choice or cajoled or lectured, they are more likely to express the opposite opinion, even if this is not in their best interest.<sup>42</sup> MI theories underwent revision in 1991<sup>43</sup> consolidating the central tenet that the most effective was of achieving meaningful change is that this is acknowledged and expressed by the individual themselves rather than by the clinician.

MI became widely used as a standalone intervention in addictions work and other fields where the focus was behavior change. The principles were further adapted for use in health settings<sup>44,45</sup> where they have particular

relevance for physicians and patients who struggle with partial adherence, offering strategies to engage patients in discussions about change.

### Evidence for Effectiveness

MI is now well-established as an effective treatment.<sup>46</sup> In a systematic review and meta analysis of randomized controlled trials (RCTs), of MI, as applied to a variety of behavioral problems (including adherence to medication), it was found that it out-performed traditional advice giving in 80% of studies. The review also found that MI can be effective even in brief 15 min or one-off encounters.<sup>47</sup> Although the quality and quantity of the evidence varied between different clinical areas, it was acknowledged that potentially, MI could be used in health settings<sup>48,49</sup> with subsequent studies building on motivating lifestyle change (e.g., smoking cessation, diet and exercise),<sup>50</sup> by adapting it to patients with physical illnesses where lifestyle changes were required as part of management.

Evidence for the effectiveness of MI in healthcare is still comparatively limited but some good studies do exist. One systematic review identified eight RCTs<sup>51</sup> but it was argued that this was insufficient to make clear recommendations. Nonetheless, several reviews found MI techniques to be useful additions to nurse-led care, leading to greater lifestyle change (e.g., diet and exercise), in: patients with hyperlipidemia<sup>52</sup> and heart failure,<sup>53</sup> cancer survivors,<sup>54,55</sup> and in those undergoing cardiac rehabilitation<sup>56</sup> or who were preparing for cardiac surgery.<sup>57</sup> MI techniques were also noted to improve mood in stroke patients.<sup>58</sup>

With regards to adherence to treatment, a small RCT reported a single MI session produced a more positive attitude to taking asthma medication.<sup>59</sup> In HIV groups, following encouraging findings from pilot studies,<sup>60,61</sup> a large RCT (involving >200 participants), found that those allocated to the MI intervention group took more doses of anti-retroviral medication and were significantly more likely to take them at the correct time.<sup>60</sup>

Several studies have explored the potential of MI in diabetes patients, in terms of weight-control in those with Type II,<sup>62,63</sup> and increased adherence in those with Type I.<sup>64,65</sup> Following promising results from a pilot RCT with teenagers with Type I,<sup>66</sup> the subsequent trial of 60 adolescents found that MI was associated with significantly better control.<sup>67</sup> This study is one of several using MI with older adolescents targeting a variety of behaviors.<sup>68</sup>

Although there is a need for much further work, the existing evidence has been sufficiently compelling to recommend that MI be adopted in the treatment of several conditions in both adults and in pediatrics,<sup>69,70</sup> including diabetes and childhood asthma.<sup>71-73</sup> Yet, to date there are

no large studies of MI in CF populations. One small pilot study found that adult patients nebulizing colistin, randomly allocated to a telephone-based MI intervention, maintained baseline levels of adherence compared to the control group whose adherence worsened.<sup>74</sup> This study was not statistically powered enough to draw any firm conclusions and the MI intervention was likely to have been too infrequent. However, a large-scale, multi-center, telephone-based, MI trial on over 150 adult patients is now underway in the US (K.A. Reikert, Personal Communication, Received 10 November 2008).

One important issue in studies of the effectiveness of MI in physical health is how it is delivered and by whom. MI is still most commonly used by practitioners who are also skilled in counseling or psychological therapies and such skills are not likely to be common amongst staff working in medical settings. Most studies cited herein have evaluated MI as an adjunct to routine care, where the techniques are delivered by trained clinicians, most commonly, psychologists. This is unlikely to be practical or cost-effective. We believe that MI is best seen in the context of increasing communication skills and patient-centered care. Training staff in this way could afford a range of advantages. Jensen et al.<sup>75</sup> suggested that MI may be useful as part of a strategy to increase engagement with services in patients with chronic pain. Training practitioners in MI is growing and evaluation of a scheme teaching general practitioners MI skills for asthma consultations, found this resulted in a significant increase in confidence and attitudes.<sup>76</sup>

### CLINICAL APPLICATIONS OF MI IN CF

Despite the increased focus in recent years on patient-centered and motivational communication styles in medical consultations, the evidence is that without specific training physicians are unlikely to develop these skills.<sup>77</sup> Nevertheless, an awareness of the approach is a useful starting point for appraising current and desired communication skills. A 4-hr workshop has been specifically developed, tailoring MI for CF teams. This has been run at recent North American CF Conferences,<sup>78,79</sup> and is currently being undertaken with a number of CF teams across the UK. One of the central themes is how MI can be adapted to time-limited clinical sessions. (A handbook of using the approaches with adherence problems in CF was published in 2008 and is available as a free download.<sup>80</sup>)

What follows is a brief guide to developing MI skills. It is important that the focus on technique does not imply that MI is a manualized process, or one that can be learnt didactically. Rollnick and Miller<sup>81</sup> warn that to perceive MI simply as a collection of skills and strategies, risks communication becoming static and unresponsive.

Instead, they argue that it is the “spirit of MI,” emphasizing the autonomy of the patient, which is of greatest importance. So MI really begins with engaging patients in conversations and actively attempting to understand their frame of reference, by using simple communication skills (e.g., open-ended questioning and good listening), and appropriate expression of empathy (e.g., reflecting what is said back without judgment). Failure to develop good rapport limits opportunities to influence behavior. Although this approach can be challenging in time-pressured consultations where clinicians have a list of issues to cover, if a patient or parent is not “engaged” in the process, there is a real risk that information will not be retained and that problematic behavior stays unchanged. It may often be preferable to cover fewer topics more effectively.

MI aims to facilitate the patient’s awareness of any discrepancy between their behavior (e.g., partial adherence), and beliefs (e.g., the desire to be well). Inconsistency between belief and behavior is known to generate discomfort and a desire for resolution,<sup>40</sup> which in turn can be a powerful lever for change. For some, the conversation alone may be enough to bring about a shift but for others, there may be emotional costs in contemplating change (e.g., thinking about increasing adherence to nebulized antibiotics in CF may trigger worrying thoughts about the consequences of infection and the risks associated with poor adherence). There is often therefore a powerful tendency to avoid thinking about these factors. The clinician’s task would be to facilitate discussion about “choice” and the consequences of each option, which in turn helps patients see discrepancies for themselves.

Several techniques are useful for raising awareness of a problem. Test results can be an important motivator if given at the right time and in the right way, but they can also trigger fear and avoidance. A useful approach in information-giving is the elicit–provide–elicit cycle, where a patient or carer is asked what they already know, provided with some information and then asked for their reaction. This method engages the recipient in processing the information, making it more likely to be retained.

Another useful technique is to employ scaling questions. In these, patients are asked to rate on a scale of 0–10 how important changing a particular behavior is to them and then on the same scale, rate how confident they would be of actually changing the behavior if they chose to. Discussion around the rating (e.g., by asking what it would take for the patient to rate higher), can highlight barriers to change and possible solutions. Similarly MI sessions often focus on the decision-making process by asking the patient to complete a decisional matrix (a grid with four boxes in which the benefits and costs of staying the same and changing, are stated).

When change is difficult or upsetting to contemplate, any mention of it is likely to induce a degree of resistance ranging from silence to tangible rejection. Dealing with resistance effectively is a crucial part of a successful consultation. It is important to avoid any attempt to convince the patient that they are wrong in their belief, as the driving force behind resistance is usually emotion rather than intellect. “Rolling with resistance” is the MI term for avoiding confrontation and encouraging conversation. In situations where a patient is expecting to be told what to do, this is often unexpected and goes on to be a powerful strategy, immediately lowering resistance.

When a patient has committed to changing, they need to feel confident in their ability to implement it. At this point, it is important to be pragmatic and set small, realistic targets in the context of the patient’s lifestyle. Clinicians’ advice can be an important part of this process when the patient is ready to hear it. An overview of how MI may be applied to a clinical session where the topic is non-adherence is summarized in Table 2.

An important aspect of the spirit of MI, as described earlier, is respect for the autonomy of the patient. This may mean on occasion, accepting a decision not to change. While this is often difficult for teams to bear, it is important to distinguish between responsibility for patients actions and caring for them. There will be times when, for a variety of reasons, a patient will continue to struggle with adherence despite their best efforts and those of the team. In MI, it is the nature of those relationships that facilitates honest communication which crucially continue to avoid confrontation or persuasion, with discussion focused on future change.

## CONCLUSION

Continuing improved longevity in CF is dependent on a sequence in which the relationship between patient and physician becomes the linchpin in introducing effective or new treatments and optimal patient adherence. Poor treatment adherence can significantly reduce the effectiveness of treatment, but is responsive to consultations with physicians who use collaborative, empathic and affirmative styles of interaction. There is growing evidence that suggests that MI is an effective framework for guiding these consultations. It adopts a style that is well-received by patients and encourages collaborative approaches to treatment. Although this may at first require some behavior change on the part of clinicians themselves, MI builds on existing skills and is an important investment in improving effectiveness. Just as CF physicians and health carers ensure their knowledge of treatment is up to date and evidence-based, it is as important that they can communicate these in ways which facilitate optimal adherence based on the knowledge that approaches like

**TABLE 2—A Summary of How MI May Be Applied to a Clinical Session Where the Topic is Non-Adherence**

Element	Example techniques and skills
1. Agree on an agenda for discussion	Draw up list of topics together Physician and patient both add possible topics
2. Develop rapport with patient	Communication skills: e.g., open questions, reflection statements, summary statements Stance: collaboration between patient and physician
3. Facilitate consideration of discrepancy in behavior	Communication skills: e.g., reflection statements Feedback of test results using elicit-provide-elicite technique Scaling questions Decision matrix
4. Successful management of resistance	Communication skills: e.g., empathic listening Avoidance of confrontation and simple advice giving
5. When patient is ready, successful planning of change	Increase confidence and self efficacy: e.g., affirming and morale boosting statements Behavioral strategies: problem solving, goal planning, etc.
6. Planning for the next appointment	Review intention of patient: If ready to change help plan If unsure explore further If unwilling respect decision but ask permission to discuss again another time

MI are more likely to be effective at influencing behavior change than others.

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