

Clinical Inertia

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Medicine has traditionally focused on relieving patient symptoms. However, in developed countries, maintaining good health increasingly involves management of such problems as hypertension, dyslipidemia, and diabetes, which often have no symptoms. Moreover, abnormal blood pressure, lipid, and glucose values are generally sufficient to warrant treatment without further diagnostic maneuvers. Limitations in managing such problems are often due to *clinical inertia*—failure of health care providers to initiate or intensify therapy when indicated. Clinical inertia is due to at least three problems: overestimation of care provided; use of “soft” reasons to avoid intensification of therapy; and lack of education, training, and practice organization aimed at achieving therapeutic

goals. Strategies to overcome clinical inertia must focus on medical students, residents, and practicing physicians. Revised education programs should lead to assimilation of three concepts: the benefits of treating to therapeutic targets, the practical complexity of treating to target for different disorders, and the need to structure routine practice to facilitate effective management of disorders for which resolution of patient symptoms is not sufficient to guide care. Physicians will need to build into their practice a system of reminders and performance feedback to ensure necessary care.

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Excellence in patient care will always be partly limited by a lag in dissemination of knowledge. After an advance in clinical understanding, translation of this advance into revised guidelines for practice and incorporation of the guidelines leading to upgraded physician behavior may take 5 to 10 years (1, 2). While the explosion of technology can be expected to accelerate dissemination of information, a second, qualitatively different problem is impeding advancement of the standard of care. This second problem is due in part to a major component of traditional medical education and medical practice: the focus on relieving symptoms.

Historically, medicine has been driven largely by patient symptoms. However, illness and death in developed countries such as the United States are now due increasingly to disorders in which abnormal values may be the only manifestation of the disease: hypertension, dyslipidemia, and diabetes (3–6). These disorders may present as acute problems associated with signs and symptoms. Most often, however, complications resulting in patient symptoms occur only after the disease has existed for many years, as is the case with congestive heart failure, coronary artery disease, and foot ulcers. Thus, good management of these important problems demands that clinicians respond to the abnormal values in the absence of patient symptoms, and responses to such problems should be a high priority during clinical encounters.

WHAT IS CLINICAL INERTIA?

Strong evidence now indicates that therapy for hypertension, dyslipidemia, and diabetes can prevent or delay complications. The goals for management are well defined, effective therapies are widely available, and practice guidelines for each of these diseases have been disseminated extensively. Despite such advances, health care providers often do not initiate or intensify therapy appropriately during visits of patients with these problems. We define such behavior as *clinical inertia*—recognition of the problem, but failure to act.

We distinguish clinical inertia in the management of hypertension, dyslipidemia, and diabetes from problems in management of other disorders in which the patient may be asymptomatic but an underlying cause of the abnormality must be sought (for example, elevated levels of alkaline phosphatase) and disorders in which patient symptoms prompt action by the physician (for example, shortness of breath). For these other disorders, a diagnosis must be established before therapy can be initiated; physicians pursue the diagnosis, treat presumptively, or categorize the problem as not worth treating. In contrast, the presence of hypertension, lipid abnormalities, or hyperglycemia is sufficient to warrant treatment, and most physicians would agree that treatment is beneficial. However, many patients have these abnormalities but are not treated adequately or are not treated at all.

WHAT IS THE EVIDENCE FOR CLINICAL INERTIA IN THE MANAGEMENT OF HYPERTENSION, DYSLIPIDEMIA, AND DIABETES?

There are two lines of evidence for clinical inertia as a problem. The first is epidemiologic, and the second is based on analysis of physician behavior during patient visits.

Epidemiologic Evidence for Clinical Inertia

Good management of patients with hypertension, dyslipidemia, or diabetes involves two steps: 1) recognizing the abnormality and 2) initiating and intensifying treatment until therapeutic goals are reached. Although physicians diagnose and treat many patients with these disorders (7, 8), most patients are treated inadequately. In the United States, a diagnosis is made for approximately 69% of patients with hypertension (9), 47% of patients with elevated cholesterol levels (10), and 65% of patients with diabetes (11). Moreover, pharmacologic therapy is used for approximately 53% of patients with hypertension (9), 17% to 23% of those with elevated cholesterol levels (10, 12, 13), and 73% of those with diagnosed diabetes (14). However, blood pressure control is adequate in only about 45% of patients treated for hypertension (9), low-density lipoprotein (LDL) cholesterol levels are reduced to goals consistent with National Cholesterol Education Program (NCEP) guidelines in only 14% to 38% of patients (15, 16), and hemoglobin A_{1c} values meet the American Diabetes Association goal of less than 7% (0.07) in only 33% of patients treated for diabetes (14).

Problems in making a diagnosis and initiating treatment show the need to educate physicians about the importance of the disorders and the benefits of therapy. However, achieving standard-of-care goals in only limited numbers of treated patients must be attributed either to therapeutic ineffectiveness or to clinical inertia. The attainment of treatment targets in clinical trials shows the effectiveness of present therapies for hypertension, elevated LDL cholesterol levels, and diabetes—leaving clinical inertia as the presumptive basis for treatment failure in many patients with these disorders.

Analysis of Physician Behavior during Patient Visits

Many patients diagnosed with and treated for hypertension, elevated LDL cholesterol levels, or diabetes

have physician visits in which therapy is not used properly despite failure to achieve targets.

Berlowitz and colleagues (17) followed hypertensive men at five Veterans Affairs hospitals in New England for 2 years. Forty percent of the patients had a blood pressure of 160/90 mm Hg despite an average of more than six hypertension-related physician visits per year. Although patients who received more intensive therapy had significantly better blood pressure control, therapy was increased during only 6.7% of patient visits. Persistent high blood pressure could not be attributed to patient nonadherence to therapy but appeared to occur because the managing physician did not intensify therapy. The authors noted that “physicians . . . repeatedly delayed making changes in the regimen”—an example of clinical inertia in blood pressure management.

Becker and coworkers (18) conducted a 2-year trial in Baltimore, Maryland, to evaluate care by a nurse trained in lipid management or enhanced primary care in which physicians received recommendations based on national guidelines. Patients reached goal levels of LDL cholesterol largely because of use of pharmacotherapy (this therapy was associated with a sixfold increase in the odds of reaching the goal level). However, at the end of follow-up, only 45% of patients in the nurse group and 17% of those in the enhanced primary care group still received this therapy. Because the patients were at particularly high risk (they each had a sibling who had documented coronary heart disease before 60 years of age), the authors noted that “it is surprising that more siblings requiring pharmacotherapy . . . did not receive it” (18). The authors also stated that the primary care providers generally “failed to apply . . . guidelines in the very high-risk population, even when prompted”—an example of clinical inertia in lipid management.

El-Kebbi and associates (19) examined clinical decision making over a 3-year period in a municipal hospital diabetes clinic in Atlanta, Georgia. Although providers had previously agreed on a common protocol for managing type 2 diabetes, therapy was intensified during only 36% of 1051 visits of patients who met criteria for advancement of therapy. A total of 198 patients with type 2 diabetes had hyperglycemia that persisted despite a 2-month trial of dietary management, had a previous hemoglobin A_{1c} value greater than 9% (0.09), and had a fasting plasma glucose level greater than 11.1 mmol/L (>200 mg/dL) that was measured and reported to pro-

viders during their visits. In these patients, pharmacotherapy was intensified in only 50% of visits—an example of clinical inertia in diabetes management.

In combination, the epidemiologic analyses and examinations of provider behavior during patient visits demonstrate the presence of clinical inertia.

WHAT CAUSES CLINICAL INERTIA?

Unsatisfactory outcomes of chronic medical conditions undoubtedly involve a component of patient non-adherence. Diabetes complications are found more often in patients who adhere poorly to visit scheduling (20), whereas coronary outcomes are improved in “adherent” patients even if treatment consists only of a placebo (21). Although outcomes may be related to such patient factors as age, years of education, occupation, and literacy (20, 22), it is well recognized that encouragement by physicians (23, 24) and social support systems (25–28) can enhance adherence. Moreover, although patients may not recall recommendations and may not adhere to advice on issues of lifestyle change, they are more likely to remember advice about prescribed medications (29).

Clinical inertia is a problem of the health care professional and the health care system, and it is separate from patient-related issues of adherence and access to care (30). While patient nonadherence is frequently cited as a barrier to better management (31, 32), patients generally follow medical recommendations in two critical ways: They return for office visits, and they do not decline to take medications as recommended (29, 33), although they may not take every dose of the medications (34). Thus, patient nonadherence cannot explain the failure of providers to initiate or advance therapy appropriately during patient visits. Financial pressures could limit time for patient care, but Chaudhry and colleagues (35) found little evidence that more productive physicians did not deliver preventive services. Concern about cost and side effects of medications may contribute to failure to use pharmacologic therapy when indicated. However, clinical inertia occurs in Veterans Affairs hospitals and public health clinics, where medication costs may be less of a problem (17, 19, 33, 36). In addition, side effects should be less of a concern in patients who are already taking lower doses of the drug (19, 36).

It is conceivable that health care providers could

make an active decision not to intensify therapy because the disease is considered unimportant (37), because treating asymptomatic patients may be less motivating to clinicians than managing symptomatic disease, or because clinicians are unfamiliar with guidelines for care. However, a recent survey of 370 primary care providers in Alabama, Iowa, and Maryland (31) found that the mean acceptable hemoglobin A_{1c} goal listed was 6.9% (0.069), consistent with American Diabetes Association guidelines (38) and similar to hemoglobin A_{1c} goals listed by internal medicine residents (32). Moreover, health care providers are accurate in categorizing patients' levels of diabetes control: For example, El-Kebbi and colleagues (33) found that providers appropriately identified 88% of patients with well-controlled diabetes and 94% of those with poorly controlled diabetes. Thus, clinical inertia cannot be attributed simply to lack of familiarity with standard of care guidelines, at least with respect to diabetes.

Clinical inertia may also reflect patients' lack of enthusiasm for management of asymptomatic problems. Patients without symptoms may be more concerned about the costs and risks of treatment than are patients who can expect that a recommended treatment will relieve symptoms. Patients who have previously experienced adverse side effects may be particularly reluctant to undergo treatment for asymptomatic disease, and their attitudes may influence physicians' decisions to pursue therapy aggressively. However, while the difficulties in managing asymptomatic problems are understandable and should be targets for both professional and patient education, they do not mitigate the need to improve care for disorders such as hypertension, dyslipidemia, and diabetes.

We believe that clinical inertia is due predominantly to three problems: overestimation of care provided; use of “soft” reasons to avoid intensification of therapy; and lack of education, training, and practice organization focused on achieving therapeutic goals.

Overestimation of Care Provided

Most providers are unaware of the limitations of their care. Headrick and associates (39) noted that residents overestimated their adherence to NCEP guidelines, and similar observations have been reported in studies of both residents and practicing physicians with

respect to hypertension management, lipid management, cancer screening, and assessment of cardiac risk factors (15, 40–43). For patients with diabetes, physician self-reports commonly overestimate the frequency of practices such as foot examinations, dilated-eye examinations, hemoglobin A_{1c} measurement, and urine protein screening compared with analyses of large claims databases and patient self-report of the frequency of these procedures (31).

Use of “Soft” Reasons To Avoid Intensification of Therapy

Although few studies have examined the basis for provider behavior, El-Kebbi and coworkers (33) assessed the barriers to provider adherence to management protocols in a specialty diabetes clinic. In 146 patient visits, therapy was not advanced even when providers identified inadequate diabetes control (average fasting plasma glucose level, 9.71 mmol/L [175 mg/dL]; random plasma glucose level, 13.38 mmol/L [241 mg/dL]). Reasons given by the providers for not advancing therapy included the perception that control was improving (41% of responses) and dietary nonadherence (12%). However, the average interval between patient visits was 2 to 3 months, and most patients were obese (average body mass index, 32 kg/m²) (44). Thus, most patients had had time to achieve a glycemic steady state, and dietary indiscretions were unlikely to be novel; therapy could probably have been advanced in 50% of these patients.

Other potential rationalizations or barriers to care include concerns about whether results from large studies in a research trial environment can legitimately guide decision making for individual patients in a more typical clinical setting, potential side effects and interactions of contemplated therapeutic agents with other drugs the patient is taking, and patient aversion to medical therapy on rational or irrational grounds. Thus, what appears to be clinical inertia may actually be an appropriate response to patients who want “caring” rather than “management for silent problems,” although it would be hard to determine in such cases whether the patients are adequately informed about the benefits and risks of their posture. The relative frequency of such general problems as compared with more disease-specific barriers, such as

those examined by El-Kebbi and colleagues (33), is unknown but would be worth examining.

Lack of Training and Practice Organization Focused on Therapeutic Goals

Most physicians lack the educational background, training, and practice structure needed to help attain therapeutic goals. Physicians may not have been taught and may not appreciate the extent to which escalation of dosage and polypharmacy are needed for disease management. Sever (45), Freis (46), and Materson and colleagues (47, 48) have emphasized the need for polypharmacy in treatment of hypertension. Marcelino and Feingold (36) reported that in a population in which 24% to 33% of patients treated with 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase inhibitors met NCEP guidelines, only 2 of 90 patients were receiving maximal dosage regimens. In the United Kingdom Prospective Diabetes Study, monotherapy was generally insufficient to sustain good glycemic control (49). Hayward and coworkers (50) noted that in a large health maintenance organization in which 60% of patients using insulin had a hemoglobin A_{1c} value greater than 8.0% (0.08), only 7% of patients injected insulin three or more times per day. In contrast, Miller and colleagues (51) found that complex treatment regimens were required to produce an average hemoglobin A_{1c} value of 6.9% (0.069) in patients with type 2 diabetes: Only 38% of patients used oral agents alone (54% of these needed two or more agents), whereas 31% used oral agents and insulin in combination and 26% used insulin alone (42% of these patients injected insulin three or more times per day).

Physicians have little training and experience in “treating to target.” While prospective clinical efficacy studies often incorporate protocols in which dosage is adjusted until specific goals are reached (52, 53), longitudinal clinical opportunities with emphasis on intensifying therapy to meet standard-of-care goals are uncommon in most medical school and residency programs.

Physicians have not been shown how to structure their practices to facilitate identification of therapeutic problems. For example, Kottke and coworkers (54, 55) found that primary care clinics often did not implement quality improvement initiatives that might have enhanced the delivery of important preventive services.

The routine use of preventive medicine checklists (56) and diabetes flowsheets (57) has been shown to improve care, but most physicians have not been taught the need for such approaches or how to implement them in different settings.

HOW CAN WE AVOID CLINICAL INERTIA?

Clinical inertia is a problem even in centers considered excellent in clinical practice and medical education. Bernard and coworkers (32) compared self-described with recorded performance of recommended diabetes services in a general medicine clinic of a municipal hospital in Atlanta. Resident physicians had good knowledge of guidelines for patient care, but hemoglobin A_{1c} values in their patients averaged 8.5% (0.085) and were particularly elevated in patients using oral agents or insulin. The trend for higher hemoglobin A_{1c} values in patients managed with pharmacologic agents was similar to that found in the Third National Health and Nutrition Evaluation Survey (14). Thus, undergraduate and graduate medical education must be modified to prepare primary care physicians to improve management of patients with problems such as hypertension, dyslipidemia, and diabetes.

Quality Improvement Efforts Should Be Focused on Provider Behavior

Is it possible to overcome clinical inertia? Cook and colleagues (44) examined provider behavior and hemoglobin A_{1c} outcomes in five yearly cohorts of patients presenting for a first visit to a municipal hospital diabetes clinic in Atlanta in 1992 to 1996 (average hemoglobin A_{1c} value, 9.3% [0.093]). In 1994, the clinic instituted a quality improvement effort to intensify diabetes therapy when indicated. The initiative significantly improved hemoglobin A_{1c} values; after 12 months of care, the average hemoglobin A_{1c} value was 8.4% (0.084) in 1992 to 1994 and decreased to 7.6% (0.076) in 1995 to 1996. Thus, improvement in “process”—in this case, intensification of therapy—was associated with better “outcome”—hemoglobin A_{1c}. This study shows that clinical inertia can be overcome. Based in part on such observations, a randomized, controlled trial is now being conducted at Emory University School of Medicine in Atlanta to determine whether computerized reminders or feedback on performance directed at clinical decision

making by internal medicine residents (increasing dosage or adding a new medication when clinically indicated) will improve blood pressure, lipid, and glucose outcomes in their diabetic patients at Grady Memorial Hospital in Atlanta.

Strategies To Aid Good Practice

What should be done to help overcome clinical inertia? Recognizing the difficulties in management of chronic diseases (3), some health care systems are using case managers (58–60) or patient care teams (61) to support practitioners. However, strategies will also probably need to focus on medical students, residents, and practicing physicians. Simple promulgation of guidelines is likely to have little impact (62). Instead, education should lead to assimilation of three concepts: the benefits (and costs and side effects) of treating to therapeutic targets, the practical complexity of treating to target for different disorders, and the need to structure routine practice to facilitate effective management of disorders for which resolution of symptoms is not sufficient to guide care.

The concept of facilitating effective management is particularly important: Physicians must learn that because they are likely to overlook problems that are not associated with patient symptoms and to overestimate their own adherence to established treatment guidelines, they will need to build into their practice a system to ensure that they provide necessary care (63). In 1986, Eisenberg (1) noted that the most effective way to alter physician behavior was to incorporate educational information into individualized, timely feedback to clinicians on their performance. More recently, Greco, Eisenberg, Davis, and others (64–67) reviewed continuing medical education strategies to change physician performance and emphasized that interventions delivered in the traditional conference lecture setting often have little benefit. Because self-reported practices for hypertension treatment appear to be closer to national guidelines when physicians are more familiar with research methods and recommendations of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (40), it remains possible that evidence-based educational conferences have some merit. However, alternative methods, including the use of reminders (such as flowsheets) and targeted feedback

on performance, are often more effective in altering the behavior of practicing clinicians (42, 65, 66, 68).

Davis and colleagues (65) noted that reminders to providers were effective interventions in 22 of the 26 studies they examined. Reminders may take several forms, including computerized reports with flags to identify abnormal values (69, 70), checklists to record preventive services performed (56, 71), or simple flowsheets with detailed guidelines for management (57, 72). McDonald and colleagues at the Regenstrief Institute in Indianapolis, Indiana, were among the first to use computerized reminders to change clinical practice (69); during a 2-year period, appropriate action among the physicians who received the reminders increased 20% compared with physicians who did not receive the reminders. More recently, Litzelman and colleagues (72) generated flowsheets on diabetic foot care for patients in a general medicine clinic as part of a multifaceted intervention; they reported that serious foot infections were 50% less common among study patients than among controls. Similar approaches have been used effectively to improve physician adherence to health maintenance services (73), diabetes preventive care guidelines (74), and cholesterol management guidelines (75)—and to obviate the tendency of physicians to overestimate their own adherence (75). Although the benefit of reminders may deteriorate over time (76), most reviews continue to support the efficacy of computer-based clinical decision support systems in improving physician performance (77); comprehensive reviews of manual and computer-generated paper reminders are under way (78, 79). Thus, reminders, whether computerized or on hard copy, appear to be effective in reinforcing clinical practice, prompting the provider to take immediate action while the patient is present (57, 65, 70).

Feedback on performance involves providing clinicians with information on their practice. To be effective, the feedback must be individualized and delivered in a timely fashion, and must be specific to the clinical issue at hand (1, 80). For example, although feedback at the departmental level may have little effect (81), Lagrew and Morgan reported that providing obstetricians with confidential, individualized feedback led to a 50% decrease in the use of cesarean section in a private hospital (82). However, Davis and colleagues (65) concluded that feedback is more likely to be of benefit if combined with some form of face-to-face chart review. Feedback

on performance can enhance diabetes outcomes (83, 84) and provides an opportunity to address attitudinal barriers (23, 85), such as perceived lack of seriousness of diabetes (86) or perceived patient nonadherence. In a recent study of patients taking HMG-CoA reductase inhibitors, NCEP goals were attained in 45% of patients followed by nonphysicians who were given feedback on their performance compared with 30% of patients followed by physicians who were not given feedback (36). Recent comprehensive reviews (87, 88) continue to support the benefit of audit and feedback on performance, particularly in ordering diagnostic tests and prescribing medication appropriately. However, few studies have examined specific details, such as exact content, the timing of the feedback, and the format of the feedback (87).

Curry (89) has pointed out that implementation of patient care guidelines may also be enhanced by organizational strategies, including a demand for guideline implementation and use of systems to facilitate implementation, and Nelson and colleagues (90) have argued that physicians must begin to measure their own work if their practice is to improve. It seems likely that the best approach to avoiding clinical inertia is to combine flowsheets/reminders and feedback on performance. Learning of such strategies in medical school and residency might be best accomplished by a combination of practice and feedback on performance in designing and using such aids to care.

In our own experience, use of paper flowsheets to follow critical values in patients with chronic illness has been a convenient, inexpensive approach that combines the features of internal data monitoring and feedback and reminds physicians to order tests (if the blanks are empty) and to intensify therapy (if goals are not met). However, few medical education programs teach students and residents how to design and use such tools. We teach them what to do, but we don't teach them how to make sure they do it. We believe that this area is ripe for development.

Cautions

Experienced clinicians will recognize that exceptions always occur (30) and that rigid insistence on the uniform application of guidelines for patient management could result in overtreatment or inappropriate actions. Accordingly, in the implementation of practice aids such

as reminders or feedback, it will be important to allow individualization of care. For example, ideal clinical decision making might involve intensifying diabetes therapy 80% to 90% of the time rather than 100% of the time when hemoglobin A_{1c} values exceed 7% (0.07), allowing some leeway for the management of patients who are frail or have had problems with severe hypoglycemia.

CONCLUSIONS

Hypertension, dyslipidemia, and diabetes are common and costly problems. Guidelines for managing these problems are well established, but many patients are not treated effectively. Although attaining standard-of-care goals can be limited by access, cost, and patient nonadherence, in many cases the problem lies in clinical inertia—failure of health care providers to initiate or intensify therapy when indicated. Better management of chronic disorders such as these will require a reorientation of medical education and medical practice to include a greater emphasis on approaches to facilitate appropriate provider responses to asymptomatic problems.

KEY POINTS

1. Clinical inertia is a common problem in management of patients with asymptomatic chronic illness.

2. Causes of clinical inertia include overestimation of care provided; use of “soft” reasons to avoid intensification of therapy; and lack of education, training, and practice organization focused on achieving therapeutic goals.

3. Revised educational programs will need to focus on the benefits of treating to therapeutic targets, the practical complexity and need for polypharmacy in treating to target, and the need to structure routine practice to facilitate effective management of disorders for which resolution of patient symptoms is not sufficient to guide care.

4. Strategies that help to avoid clinical inertia include quality improvement efforts focused on provider behavior, the use of flowsheets and computerized or paper reminders, and regular feedback on performance.

5. To avoid overtreatment, build in some allowances for appropriate individualization of patient care.

RECOMMENDATIONS FOR AVOIDING CLINICAL INERTIA

1. Continued medical education that emphasizes evidence-based guidelines for care.

2. Undergraduate, graduate, and postgraduate medical education programs focused on the danger of clinical inertia.

3. Emphasis in undergraduate and graduate medical education not only on disease mechanisms, diagnosis, and therapy but also on strategies that facilitate good care.

4. Systematic self-measurement of practice performance.

5. Routine use of computerized or paper flowsheets to follow diagnostic test results, monitor use of therapy, and prompt action to achieve therapeutic goals and implement routine preventive screening.

6. Regular interaction with peers or opinion leaders to obtain feedback on performance.

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