

Factors associated with clinical inertia: an integrative review

Isabelle Aujoulat¹
Patricia Jacquemin¹
Ernst Rietzschel²
André Scheen³
Patrick Tréfois⁴
Johan Wens⁵
Elisabeth Darras¹
Michel P Hermans⁶

¹Université Catholique de Louvain, Institute of Health and Society, Brussels, ²Ghent University, Department of Cardiovascular Diseases and Department of Public Health, Faculty of Medicine and Health Sciences, Ghent, ³University of Liège, Division of Diabetes, Nutrition and Metabolic Disorders and Clinical Pharmacology Unit, CHU Liège, Liège, ⁴Société Scientifique de Médecine Générale, Brussels, ⁵University of Antwerp, Faculty of Medicine and Health Sciences, Primary and Interdisciplinary Care Antwerp, ⁶Université Catholique de Louvain, Institute of Experimental and Clinical Research and Cliniques Universitaires Saint-Luc, Department of Endocrinology and Nutrition, Brussels, Belgium

Correspondence: Isabelle Aujoulat
UCL-Institute of Health and Society, Clos
Chapelle-aux-Champs 30.15,
B-1200 Brussels, Belgium
Email isabelle.aujoulat@uclouvain.be

Abstract: Failure to initiate or intensify therapy according to evidence-based guidelines is increasingly being acknowledged as a phenomenon that contributes to inadequate management of chronic conditions, and is referred to as clinical inertia. However, the number and complexity of factors associated with the clinical reasoning that underlies the decision-making processes in medicine calls for a critical examination of the consistency of the concept. Indeed, in the absence of information on and justification of treatment decisions that were made, clinical inertia may be only apparent, and actually reflect good clinical practice. This integrative review seeks to address the factors generally associated with clinical inaction, in order to better delineate the concept of true clinical inertia.

Keywords: clinical inertia, evidence-based medicine, clinical decision, integrative review, concept clarification, physician adherence to guidelines

Introduction

Failure to treat to target, or prescription that is not concordant with guidelines, is increasingly being referred to as clinical inertia. Phillips et al first coined the term, which they defined as a failure to initiate or intensify therapy when indicated or a failure to act despite recognition of the problem.¹

Although clinical inertia is a major factor that contributes to inadequate management of chronic conditions (diabetes, hypertension, lipid disorders),^{2,3} its actual clinical impact remains unclear.⁴ It has been suggested that clinical inertia related to the management of diabetes, hypertension, and lipid disorders may contribute to up to 80% of heart attacks and strokes.⁵ As it is associated with poor control of risk factors known to lead to long-term health problems, clinical inertia has an economic impact in terms of national health care expenditure alongside medical consequences for patients.⁶⁻⁸

Studies on clinical inertia are most relevant in the context of asymptomatic chronic conditions, where therapeutic decisions are influenced by assessing evidence-based clinical outcomes rather than by monitoring symptoms or patients' complaints. Clinical inertia arises in the context of evidence-based practices, and may be identified if three conditions are precisely defined: recognized clinical outcomes (goals or targets); a recommended therapy that can be measured; and a window of time appropriate for initiation or intensification of treatment.^{2,5} It has been argued, however, that such standardized definitions of clinical inertia based on target, time frame, and the decision to intensify therapy (or not) are not sufficient to determine whether individual decisions to increase, decrease, or maintain therapy might be appropriate for a patient.^{9,10} Indeed, in order to adequately assess clinical inertia, it is necessary to define intermediate

outcomes that incorporate information on and justification of decisions relating to treatment.¹¹ In the absence of such information, clinical inertia may be only apparent, and actually reflect good clinical practice.⁹

In order to better disentangle true clinical inertia from apparent clinical inertia, it is necessary to understand which modifiable and nonmodifiable factors underlie true clinical inertia. The identification of such factors is a necessary step toward developing strategies to further improve adherence of providers to guidelines. O'Connor et al postulate three classes of factors leading to clinical inertia, ie, factors related to providers, patients, and the system, with an estimated relative contribution of 50%, 30%, and 20%,² respectively. Other authors report up to 75% provider-related factors.⁴ The provider-related factors that were initially defined by Phillips et al¹ are still assumed to be the most common contributors to clinical inertia,^{2,5,12} ie, providers overestimating the care they offer, providers' use of "soft" reasons to avoid therapy, and providers' lack of education, training, or organization for achieving therapeutic goals. However, it has been claimed that evidence regarding factors of clinical inertia is still poor due to a lack of well conducted studies.¹³

Moreover, we argue that the list of factors mentioned above is of little help in practice, because it does not take sufficient account of the considerable challenge that faces providers, since they have to make decisions in the context of uncertainty which is inherent in the practice of medicine.¹⁴ Practitioners need to be helped, in practice, to overcome true clinical inertia rather than systematically blamed for inaction (the latter being occasionally appropriate). As a first step toward elaborating solutions to help practitioners overcome true clinical inertia, we attempted through careful examination of the literature to identify and review factors that have been associated with clinical inertia since the term was first coined in 2001.

Materials and methods

Data sources and study selection

A preliminary search was done to determine the volume and distribution of literature between 2001 and July 2011 by searching PubMed with keywords ("clinical inertia" OR "therapeutic inertia" OR "physician inertia" OR "diagnostic inertia"), excluding comments (publication type). A total of 174 articles were published between 2001 and 2011, with about half of the citations published between 2009 and 2011.

The full text of each of the 174 publications retrieved from PubMed was individually reviewed as a first step toward integrating knowledge about factors associated with clinical inertia.

The results of our integrative review, presented hereafter, are based on a systematic process of thematic analysis, which was performed on a sample of 40 articles selected to provide a balanced selection of reports on the topic of clinical inertia. This selection was based on the following criteria: to reflect the range of diseases affected; to achieve an even selection of articles from across the whole time frame (2001–2011) while avoiding selection of many repetitive studies from the period 2009–2011; to avoid overrepresentation from one particular group of writers; and to provide a representative selection covering the different therapeutic domains.

Data extraction

All information relevant to our research objective (ie, to identify the various factors associated with clinical inertia) was extracted from each publication and analyzed inductively according to qualitative methods of thematic coding and categorization.¹⁵ The initial coding was a collaboration between two researchers (IA and PJ) who independently coded a selection of manuscripts in order to develop significant categories from the data itself, rather than from predetermined theories or hypotheses. The emerging thematic categories were discussed until a consensus was reached, keeping in mind that our findings should have a potential for clinical discussion and application. In other words, we deliberately looked at clinical inertia as a challenge for, rather than a failure of, health care providers. As a result of this inductive process of analysis and discussion, four main thematic categories were created and applied to all selected articles: providers' knowledge of and attitudes toward evidence-based guidelines; providers' own clinical judgment; providers' awareness of patients' attitudes, behaviors, and preferences; and providers' ability to make decisions in specific clinical contexts. This part of the coding was performed by IA. In order to ensure reliability of our results, this analysis was subsequently cross-checked by PJ. The full list of thematic categories and subcategories is presented in Table 1.

Results

Our results are presented hereafter according to the list of themes that were inductively created from the material and that are presented in Table 1.

Providers' knowledge of and attitudes toward evidence-based guidelines

(In)sufficient knowledge of guidelines

Lack of awareness of evidence-based goals of care, or lack of familiarity with guidelines, has been reported as a major,

Table 1 Summary of factors contributing to clinical inertia

Providers' knowledge of and attitudes toward evidence-based guidelines	Providers' own clinical judgment and experience in relation with specific situations	Providers' awareness of patient attitudes, behaviors and preferences	Providers' ability to make the appropriate decision within a given clinical and organizational context
(In)sufficient knowledge of guidelines (Dis)agreement with known guidelines (Dis)agreement with applicability of guidelines	Patients' characteristics Patients' medical factors and medical history	Providers' acknowledgment of patient preferences Patient adherence Patient health literacy and empowerment	Reluctance to or difficulty associated with change Clinical uncertainty Limited time to handle a number of competing demands Organizational and structural factors

sometimes self-reported, contributor to clinical inertia.^{5,16} Lack of familiarity with guidelines may have to do with the large number of guidelines, and the time required to keep these accurately updated.¹⁷

(Dis)agreement with known guidelines

Some limitations are inherent to the guidelines themselves, which may be written in an ambiguous way that makes uniform application by different practitioners difficult.¹⁷ However, physicians may also deviate from these guidelines because of disagreement with or distrust of the evidence underpinning goals of care.^{8,16,18,19}

(Dis)agreement with applicability of guidelines

Disagreement may occur not only with the guidelines themselves, but also with their applicability to certain groups of patients.¹⁷ According to Teles et al, "there may be quite a difference between understanding the evidence and using it".²⁰ Indeed, patients' individual characteristics impact on physicians' assessment of the relevance of specific guidelines. Elderly patients, patients with comorbidities, and those with affective or substance abuse problems are likely to be treated differently.^{2,17,18,21} The main reason for clinical inertia in such subgroups is uncertainty regarding the appropriateness of existing guidelines.²²

Providers' own clinical judgment and experience

Providers' attitude toward the appropriateness of applying specific guidelines for particular patients is influenced by their own clinical judgment and experience, and individual patients' sociodemographic characteristics and medical history.²³

Patient characteristics

Old age in patients may be considered a major factor in clinical inertia over a broad spectrum of chronic conditions.^{4,24,25}

More specifically, in the management of hypertension, fear of the consequences of treating an elderly person's hypertension may outweigh the perception of the risks associated with hypertension. Existing guidelines may therefore be perceived as having limited applicability.^{18,19} The same difficulty exists in the field of diabetes.²⁶ Moreover, gender disparities are reported by some, with women more likely to suffer than men as a result of clinical inertia with regard to the prevention of cardiovascular disease.^{27,28} However, other studies report no evidence of gender issues in relation to clinical inertia,²⁹ so the evidence is inconsistent. Last but not least, limited reimbursement, socioeconomic and cultural disparity in terms of affordability or acceptability of a prescribed treatment, or lack of health care availability for underserved populations are all significant barriers to treatment modification according to guidelines.^{6,17,18}

Patients' medical history

Several authors report that there might be no treatment intensification when the assessed values lie close to the desired threshold,^{8,10,11,21} especially if patients are already on therapy, and more time is needed to assess the effects of existing therapy.²¹ The presence of comorbidities raises uncertainty as to whether existing guidelines are systematically appropriate. In that regard, the management of hypertension in diabetic patients appears to be particularly problematic.^{10,30} On the one hand, due to the presence of more than one concomitant disease, one particular comorbid condition may appear as relatively less important.³¹ On the other hand, the sheer number of different medication techniques involved in treating several pathologies may be a barrier to further intensification of care.^{6,11,24,28-30,32,33} Reluctance to modify therapy may then be ascribed to a lack of alternative treatments, concern about potential adverse effects, and/or drug interactions.^{18,22}

Providers' awareness of patients' attitudes, behaviors, and preferences

Medical decisions are further influenced by the quality of the patient-provider relationship, with the providers' capacity to be more or less patient-centered on the one hand and the patients' disposition regarding adherence, health literacy, and self-empowerment on the other.

Providers' acknowledgment of patient preferences

Patients' preferences may include concerns regarding the importance of following clinical practice guidelines. Indeed, some patients would rather opt for a lifestyle change prior to medication.¹⁸ In the field of diabetes, the fear of weight gain and hypoglycemia is a major concern that may impact on patients' acceptance of treatment, and in turn influence the physician's decisions to intensify therapy.²²

Patient adherence

Established or suspected patient nonadherence may predispose providers to expect a negative result, thereby contributing to clinical inertia. Moreover, providers may feel that they are unable to overcome some patients' behaviors, such as smoking or eating disorders in obesity.¹⁷ Patient nonadherence and clinical inertia on the part of the physician are equally rooted in complex and intertwined factors related to the physician, the patient, the treatment, and the health care system, and both may be seen as reflecting the quality of some aspects of the patient-provider relationship that need to be improved.³⁴

Patient health literacy and empowerment

Patients who are more educated about their condition and the health risks inherent to it might be less likely to experience clinical inertia.³⁰ On the one hand, less educated patients might lack the necessary motivation for sufficient management of asymptomatic problems.¹ On the other hand, better educated patients are more likely to request more from their health care providers, and therefore experience less clinical inertia.³⁵

Providers' ability to make an appropriate decision in a given clinical and organizational context

The importance of the decision-making process involved in clinical inertia has been outlined by several authors,^{2,5} with four main factors identified as having a major impact

on the providers' decision-making ability, ie, providers' reluctance to change, uncertainty regarding the assessment of biological outcomes, competing demands, and organizational factors.

Reluctance or difficulty to change is a factor often associated with clinical inertia.^{17,19} It may explain what other authors following Phillips et al¹ have named "overestimation of current care"^{5,16} or "complacency with borderline values".⁴ It has to do with the subjective perception of providers that the care provided is sufficient.⁸

Uncertainty may arise in treating asymptomatic patients when the validity of clinical values is not credible enough. Successful implementation of clinical guidelines is related to the credibility of clinical values.^{4,30} However, physicians sometimes lack accurate information on which to base their decisions. For instance, clinical uncertainty regarding actual blood pressure^{17,18} or updated HbA1c values³⁶ are common phenomena.

Limited time to handle a number of competing demands is another important factor that impacts on physicians' decision-making capacity.^{6,22,37,38} The treatment of hypertension, for instance, may be placed at a lower level of priority when practitioners are faced with a number of other needs.¹⁷

Moreover, organizational and structural factors as well as specific, sometimes stressful, working conditions that are linked to different contexts of care play a role in clinical practice.^{11,39} Several authors looked at possible differences between general practice and hospital-based care. In the field of hypertension, one study found that treatment in primary care was a risk factor for clinical inertia.²⁴ Regarding the treatment of diabetes, the study reported by Goderis et al⁴⁰ in Belgium made it clear that factors related to the health care system are strongly involved in differences between primary care level and specialized care: "(In Belgium), initiation of insulin is particularly counteracted by the dichotomy between primary care and endocrinologists installed by the reimbursement system, limiting reimbursement of diabetes education and self home blood glucose monitoring materials to specialized diabetes centers. This skewed reimbursement prevents many general practitioners from timely initiating insulin, in an already insulin-hostile population." This was found to be true in other contexts as well, when policies restrict formulary access to newer, more expensive medication.³³ However, clinical inertia in relation to the treatment of diabetes has been clearly documented in hospital settings as well.⁴¹ Rather than opposing primary and specialist care, there have been suggestions that it is precisely "the lack of shared care

organization between the specialist and primary care” that may contribute to clinical inertia.²² Moreover, rather than simply distinguishing between different levels of care, the lack of availability of multidisciplinary and/or team-based care, which often characterizes general practice, has been cited by several authors as an important factor that might be associated with clinical inertia.^{8,17,25,42}

Discussion and conclusion

At the heart of evidence-based medicine is the providers’ capacity to integrate individual clinical expertise with the best available clinical evidence from systematic research.⁴³ Our review shows that a large number of potential factors are associated with clinical inertia in the broader sense. However, there is little evidence of any one or combination of factors that might be considered the primary determinant of clinical inertia. Taking into account the definition of evidence-based practice, we argue that our results further show that the factors generally associated with clinical inertia are not specific enough to distinguish appropriate inaction from true clinical inertia. Given the growing importance attached to the phenomenon of clinical inertia (174 articles published between 2001 and 2011, of which about half were published between 2009 and 2011), more research is needed to further examine the nature of true clinical inertia and establish the prevalence and weight of the various factors that contribute to it, as well as to better understand possible interactions between factors that might contribute simultaneously to clinical inertia.

Clinical inertia often manifests itself within complex clinical situations, eg, patients with comorbidities, younger or elderly patients, patients who are already on a number of medications, and patients of lower socioeconomic status. In such situations, inaction to some extent is sometimes more appropriate than intensifying treatment. Rather than simply representing a lack of awareness or genuine disagreement with existing guidelines, so-called clinical inertia might reflect conflicting or unaddressed issues with the applicability of guidelines to specific groups of patients where evidence is lacking. It has been recently suggested that individualizing targets and tactics may be clinically important for high-risk patients with type 2 diabetes.⁴⁴ It is assumed that clinical inertia is more likely to occur in patients who are less active and empowered, given that better educated patients tend to request more from health care providers and cope better with the challenge of developing the necessary motivation and skill to adhere to medical recommendations. Self-management support by intervening in the health education of patients is therefore a potentially important strategy to help overcome clinical inertia.^{34,37} Yet, at the same time,

better empowered patients might be able to express different preferences, eg, attempting lifestyle changes prior to starting on medication. Whether the decision to not initiate treatment under such circumstances should be labeled as clinical inertia is a matter for debate. Studies investigating the phenomenon of clinical inertia should systematically incorporate an analysis of the reasoning processes underlying the decisions that clinicians make.

True clinical inertia corresponds to medical malpractice, and strategies need to be established in order to help providers recognize and overcome it. Possible strategies include the development of regular reminders and decision support tools. Indeed, performance audit and feedback, including benchmarking when feasible and acceptable, are very important issues in efforts to improve quality of care.^{17,19,21} As far as the training and education of health care providers is concerned, structured processes of scenario development/planning have proved useful in training future professionals to use an evidence-based approach in clinical decision-making.⁴⁵ These could be applied in contexts where clinical inertia arises.

As summarized in a recent publication by Reach, clinical inaction may be called true clinical inertia only if: a recommendation exists; the provider knows the recommendation; the provider believes the recommendation applies to the patient; the provider has the necessary resources to apply the recommendation; the provider does not apply the recommendation for a particular patient, even though the four aforementioned conditions are present.⁴⁶ The first condition, ie, the need for a recommendation, points to an important factor of clinical inaction that tends to be overlooked in the literature, ie, that of possible gaps, lack of clarity, or discrepancies in existing guidelines. In a search for common evidence-based quality indicators for type 2 diabetes care in practice guidelines across six European countries, Wens et al identified no fewer than 125 diabetes-related guidelines, of which only 81 (64.8%) met the necessary inclusion criteria to be considered for systematic review.⁴⁷ In their discussion, these authors pointed to the fact that guidelines do not always specifically include evidence-based indicators, that they fail to reflect all aspects of care, and that they rarely refer to the newest treatment or management options as a result of lack of supporting evidence. In conclusion, they advocate further systematic development of “internationally best evidence-based” indicators and guidelines to better inform practice.

Acknowledgments

We would like to acknowledge the contributions of Hans Vandenberghe and Annelies Vankeirsbilck, respectively

Lead Medical Affairs and Medical Affairs Manager, at AstraZeneca Belgium & Luxembourg, who participated in the design of the study, set up a scientific steering committee (coauthors), and facilitated discussions between the members of the steering committee around the concept of clinical inertia. We would like to thank them not only for the financial support received, but also for the very positive and open discussions and feedback from study design to preparation of the manuscript. The authors are also grateful to Cécile Fournier for her perceptive insights during informal discussions with the first author (IA) around the concept of clinical inertia and to Eric Legrand for invaluable administrative support.

Disclosure

The study received financial support from AstraZeneca Belgium and Luxembourg.

References

- Phillips LS, Branch WT, Cook CB, et al. Clinical inertia. *Ann Intern Med.* 2001;135(9):825–834.
- O'Connor PJ, Sperl-Hillen JA, Johnson PE, Rush WA, Biltz G. Clinical inertia and outpatient medical errors. In: Henriksen K, Battles JB, Marks ES, Lewin DI, editors. *Advances in Patient Safety: From Research to Implementation (Volume 2: Concepts and Methodology)*. Rockville, MD, USA: Agency for Healthcare Research and Quality; 2005.
- Oh SW, Lee HJ, Chin HJ, Hwang JI. Adherence to clinical practice guidelines and outcomes in diabetic patients. *Int J Qual Health Care.* 2011;23(4):413–419.
- Faria C, Wenzel M, Lee KW, Coderre K, Nichols J, Belletti DA. A narrative review of clinical inertia: focus on hypertension. *J Am Soc Hypertens.* 2009;3(4):267–276.
- Byrnes PD. Why haven't I changed that? Therapeutic inertia in general practice. *Aust Fam Physician.* 2011;40(1–2):24–28.
- Henke RM, Zaslavsky AM, McGuire TG, Ayanian JZ, Rubenstein LV. Clinical inertia in depression treatment. *Med Care.* 2009;47(9):959–967.
- Wagner EH, Sandhu N, Newton KM, McCulloch DK, Ramsey SD, Grothaus LC. Effect of improved glycemic control on health care costs and utilization. *JAMA.* 2001;285(2):182–189.
- Wang TJ, Vasan RS. Epidemiology of uncontrolled hypertension in the United States. *Circulation.* 2005;112(11):1651–1662.
- Allen JD, Curtiss FR, Fairman KA. Nonadherence, clinical inertia, or therapeutic inertia? *J Manag Care Pharm.* 2009;15(8):690–695.
- Berlowitz DR, Ash AS, Glickman M, et al. Developing a quality measure for clinical inertia in diabetes care. *Health Serv Res.* 2005;40(6 Pt 1):1836–1853.
- Guthrie B, Inkster M, Fahey T. Tackling therapeutic inertia: role of treatment data in quality indicators. *BMJ.* 2007;335(7619):542–544.
- Giugliano D, Esposito K. Clinical inertia as a clinical safeguard. *JAMA.* 2011;305(15):1591–1592.
- Touze E, Coste J, Voicu M, et al. Importance of in-hospital initiation of therapies and therapeutic inertia in secondary stroke prevention: IMplementation of Prevention After a Cerebrovascular event (IMPACT) Study. *Stroke.* 2008;39(6):1834–1843.
- Aujoulat I, Deccache A, Charles AS, et al. Non-adherence in adolescent transplant recipients: the role of uncertainty in health care providers. *Pediatr Transplant.* 2011;15(2):148–156.
- Gibbs GR. *Analysing Qualitative Data*. Thousand Oaks, CA, USA: Sage Publications Ltd; 2007.
- Dang S, Sanchez A, Oropesa L, Roos BA, Florez H. Telehealth-assisted care coordination of older veterans with type 2 diabetes lowers coronary heart disease risk despite clinical inertia. *Diabetes Technol Ther.* 2010;12(12):995–1001.
- Handler J, Lackland DT. Translation of hypertension treatment guidelines into practice: a review of implementation. *J Am Soc Hypertens.* 2011;5(4):197–207.
- Howes F, Hansen E, Williams D, Nelson M. Barriers to diagnosing and managing hypertension – a qualitative study in Australian general practice. *Aust Fam Physician.* 2010;39(7):511–516.
- Cavazos JM, Naik AD, Woofter A, Abraham NS. Barriers to physician adherence to nonsteroidal anti-inflammatory drug guidelines: a qualitative study. *Aliment Pharmacol Ther.* 2008;28(6):789–798.
- Teles JM, Silva E, Westphal G, Filho RC, Machado FR. Surviving sepsis campaign in Brazil. *Shock.* 2008;30 Suppl 1:47–52.
- Ruzicka M, Leenen FH. Moving beyond guidelines: are report cards the answer to high rates of uncontrolled hypertension? *Curr Hypertens Rep.* 2006;8(4):324–329.
- Nicolucci A, Rossi MC. Incretin-based therapies: a new potential treatment approach to overcome clinical inertia in type 2 diabetes. *Acta Biomed.* 2008;79(3):184–191.
- Inzucchi SE, Bergenstal RM, Buse JB, et al. Management of hyperglycaemia in type 2 diabetes: a patient-centered approach. Position statement of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetologia.* 2012;55(6):1577–1596.
- Redon J, Coca A, Lazaro P, et al. Factors associated with therapeutic inertia in hypertension: validation of a predictive model. *J Hypertens.* 2010;28(8):1770–1777.
- Rosenthal T, Nussinovitch N. Managing hypertension in the elderly in light of the changes during aging. *Blood Press.* 2008;17(4):186–194.
- Goderis G, Borgermans L, Heyman J, et al. Type 2 diabetes in primary care in Belgium: need for structured shared care. *Exp Clin Endocrinol Diabetes.* 2009;117(8):367–372.
- Willig JH, Jackson DA, Westfall AO, et al. Clinical inertia in the management of low-density lipoprotein abnormalities in an HIV clinic. *Clin Infect Dis.* 2008;46(8):1315–1318.
- Scheen AJ, Lefebvre PJ, Kulbertus H. [Cardiovascular prevention: could the polypill reduce the risk of clinical inertia and poor compliance?]. *Rev Med Liege.* 2010;65(5–6):267–272. French.
- Crowley MJ, Smith VA, Olsen MK, et al. Treatment intensification in a hypertension telemanagement trial: clinical inertia or good clinical judgment? *Hypertension.* 2011;58(4):552–558.
- Sutton E, Wilson H, Kaboli PJ, Carter BL. Why physicians do not prescribe a thiazide diuretic. *J Clin Hypertens (Greenwich).* 2010;12(7):502–507.
- Tejedor Varillas A, Leon Vazquez F, Lora Pablos D, Perez Martin A, Vargas Negrin F, Gomez de la Camara A. [Can an intervention on clinical inertia have an impact on the perception of pain, functionality and quality of life in patients with hip and/or knee osteoarthritis? Results from a cluster randomised trial]. *Aten Primaria.* 2012;44(2):65–72. Spanish.
- Nelson SA, Dresser GK, Vandervoort MK, et al. Barriers to blood pressure control: a STITCH substudy. *J Clin Hypertens (Greenwich).* 2011;13(2):73–80.
- Shah BR, Hux JE, Laupacis A, Zinman B, van Walraven C. Clinical inertia in response to inadequate glycemic control: do specialists differ from primary care physicians? *Diabetes Care.* 2005;28(3):600–606.
- Scheen AJ. [Inertia in clinical practice: causes, consequences, solutions]. *Rev Med Liege.* 2010;65(5–6):232–238. French.
- Hartmann CW, Sciamanna CN, Blanch DC, et al. A website to improve asthma care by suggesting patient questions for physicians: qualitative analysis of user experiences. *J Med Internet Res.* 2007;9(1):e3.

36. Ziemer DC, El-Kebbi IM, Umpierrez GE, Rhee MK, Phillips LS, Cook CB. Diabetes management in urban African Americans: review of a public hospital experience. *Ethn Dis*. 2008;18(3):336–341.
37. Stuckey HL, Dellasega C, Graber NJ, Mauger DT, Lendel I, Gabbay RA. Diabetes nurse case management and motivational interviewing for change (DYNAMIC): study design and baseline characteristics in the chronic care model for type 2 diabetes. *Contemp Clin Trials*. 2009;30(4):366–374.
38. Grant RW, Pirraglia PA, Meigs JB, Singer DE. Trends in complexity of diabetes care in the United States from 1991 to 2000. *Arch Intern Med*. 2004;164(10):1134–1139.
39. Fahey T, Schroeder K, Ebrahim S. Educational and organisational interventions used to improve the management of hypertension in primary care: a systematic review. *Br J Gen Pract*. 2005;55(520):875–882.
40. Goderis G, Borgermans L, Heyrman J, et al. Type 2 diabetes in primary care in Belgium: need for structured shared care. *Exp Clin Endocrinol Diabetes*. 2009;117(8):367–372.
41. Cook CB, Zimmerman RS, Gauthier SM, et al. Understanding and improving management of inpatient diabetes mellitus: the Mayo Clinic Arizona experience. *J Diabetes Sci Technol*. 2008;2(6):925–931.
42. Kiberd J, Panek R, Kiberd B. Strategies to reduce clinical inertia in hypertensive kidney transplant recipients. *BMC Nephrol*. 2007;8:10.
43. Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ*. 1996;312(7023):71–72.
44. Riddle MC, Karl DM. Individualizing targets and tactics for high-risk patients with type 2 diabetes: practical lessons from ACCORD and other cardiovascular trials. *Diabetes Care*. 2012;35(10):2100–2107.
45. Manns PJ, Darrach J. A structured process to develop scenarios for use in evaluation of an evidence-based approach in clinical decision making. *Adv Med Educ Pract*. 2012;3:113–119.
46. Reach G. [Clinical inertia: How is it possible?] *Médecine des Maladies Métaboliques*. 2011;5(5):567–573. French.
47. Wens J, Dirven K, Mathieu C, Paulus D, Van Royen P. Quality indicators for type-2 diabetes care in practice guidelines: an example from six European countries. *Prim Care Diabetes*. 2007;1(1):17–23.

Advances in Medical Education and Practice

Publish your work in this journal

Advances in Medical Education and Practice is an international, peer-reviewed, open access journal that aims to present and publish research on Medical Education covering medical, dental, nursing and allied health care professional education. The journal covers undergraduate education, postgraduate training and continuing medical education

Submit your manuscript here: <http://www.dovepress.com/advances-in-medical-education-and-practice-journal>

Dovepress

including emerging trends and innovative models linking education, research, and health care services. The manuscript management system is completely online and includes a very quick and fair peer-review system. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.