

Diapression: An Integrated Model for Understanding the Experience of Individuals With Co-Occurring Diabetes and Depression

Paul Ciechanowski, MD, MPH

In recent years, clinicians and researchers have focused greater attention on clinical and health services strategies for effectively treating the growing number of individuals with multiple health conditions. In the United States, 75 million people have at least two chronic conditions,¹ and among individuals with diabetes, 90% have at least one other health condition in addition to diabetes.² The co-occurrence of diabetes and depression may be particularly challenging and worthy of greater attention because depression can increase diabetes symptom perception, negatively affect self-care behaviors, and significantly increase disability rates in individuals with diabetes.³

This article offers a conceptual clinical framework that can help to solve the health care communication challenges that patients and providers face when addressing depression and diabetes concurrently. An obvious example may be difficulty accepting a depression diagnosis or initiating associated treatment. For example, even when depression is correctly diagnosed using screening tools such as the Patient Health Questionnaire-9 (PHQ-9),⁴ the news of a new depression diagnosis may be significantly at odds with an affected individual's life experience. The course of depression is often insidious, and its symptom cluster may be hard for patients to tease apart from day-to-day stress. Patients may be relatively unaware

of depressive symptoms but are often more bothered by physical symptoms that may be amplified by depression.

Consider the following example: *Daryl is a 47-year-old man with a 5-year history of type 2 diabetes. He missed a health care appointment for the first time 3 months ago. Today, he is in your office complaining of "out of control sugars." A lab test obtained the day before showed an A1C value of 8.7%, which is an increase from 7.4% 6 months ago. He admits to running out of metformin 2 weeks ago and is asking to refill metformin, lisinopril, gabapentin, and lovastatin. In addition, he is asking whether his gabapentin dose can be increased because he has experienced significantly more burning neuropathy pain in the past 3 months. More reserved*

now than you are used to seeing him, Daryl is clearly frustrated as he describes progressively worsening insomnia, fatigue, inability to enjoy his usual activities, weight gain, and difficulty concentrating at work. He asks for pain control for his neuropathy because he believes his pain is at the root of all his problems, but you are not sure. You suspect Daryl may be depressed.

At any given time, about one in eight individuals with diabetes meets full diagnostic criteria for major depression.^{5,6} Another one-fifth may have less severe but clinically significant depressive symptoms.⁶ Untreated depression can negatively affect diabetes self-care and treatment adherence^{7,8} and diabetes outcomes such as glucose control⁹ and can be associated with increased morbidity and mortality.¹⁰

Effective evidence-based psychotherapeutic and medication treatments for depression in individuals with diabetes are available.^{11–15} Recent collaborative care interventions for depression combining these modalities and using a team approach have demonstrated efficacy and are well matched for treating patients with diabetes in medical home settings.^{5,16–18}

In addition to making an accurate depression diagnosis and selecting an appropriate treatment, successful initiation and maintenance of evidence-based treatments for depression ultimately depend on

IN BRIEF

One in eight individuals with diabetes has major depression, and another one-fifth may have less severe but clinically significant depressive symptoms. Diabetes patients with comorbid depression can have worse self-care and treatment adherence, glycemic control, and increased morbidity and mortality. The symptoms of diabetes and depression often intertwine in what can be termed "diapression." Approaching diapression in an integrated manner may be a novel approach to improve patient care.

patients' acceptance of and "buy-in" to a depression diagnosis and associated treatment. Because of their symptoms of depression, it is well known that affected individuals are less likely to successfully collaborate with health professionals, to accept new diagnoses, or to follow through with treatment. However, when depression and diabetes co-occur, there are also competing medical symptoms and medical treatment tasks that can divert the focus from depression.

This article reviews experiences that are commonplace in diabetes patients with depression and the evidence pertaining to each. Specifically, it reviews depression's influence on diabetes symptoms, diabetes self-care and treatment adherence, adverse life habits, health care utilization, and patient trust and satisfaction with care. It discusses the implications of each for health care communication and clinical practice. Finally, it offers a conceptual framework that looks beyond the diagnoses of "diabetes" and "depression" toward a fuller appreciation of patients' experiences that can be defined as "diapression."

1. Depression Can Mimic and Amplify Diabetes Symptoms

Depression is characterized by a cluster of emotional (e.g., sad mood), somatic (e.g., fatigue), and cognitive (e.g., impaired concentration) symptoms. According to the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*,¹⁹ patients with major or minor depression must exhibit either depressed mood, significant loss of pleasure most days, or both for at least a 2-week period. Clinical depressive symptoms also include fatigue, impaired concentration, changes in appetite, changes in sleep, or feelings of agitation or being slowed down. Such depressive symptoms may mimic symptoms

commonly experienced by patients with diabetes during the course of their illness. For example, with changes in blood glucose, patients often experience excessive sleepiness or fatigue, difficulty with concentration, changes in appetite, or feelings of agitation or sluggishness.

Prior research has also shown that depression amplifies diabetes symptoms such as excessive urination, excessive thirst, hunger, shakiness, blurry vision, and somnolence.^{20–22} In fact, individuals with diabetes who are depressed are more likely to report diabetes symptoms than patients with diabetes who are not depressed, even after controlling for A1C levels or the number of diabetes complications present.²⁰ Diabetes patients who are depressed, for example, are twice as likely as nondepressed patients to describe pain and numbness in their extremities and are more than four times as likely to report feeling faint or daytime sleepiness.²⁰

Implications for health care communication

Affected individuals who are unaware that they are depressed or unaware of the influence of depression on amplifying physical symptoms may primarily attribute their symptoms to inadequate diabetes management. During a health care visit, depressed patients may feel embarrassment, guilt, bewilderment, or resignation about their inability to adequately manage their diabetes. Physical examination or laboratory test results may not reflect the level of symptom severity suggested by patients' subjective complaints, which may further lead to challenging dynamics in the treatment relationship, particularly when clinicians are also unaware of concurrent depression.

A health care visit is an opportunity not only to make an accurate diagnosis of comorbid depression,

but also to provide education and information about how depression may amplify physical symptoms of diabetes. It can be quite relieving and comforting for demoralized patients to finally understand that symptoms they have been struggling with may, in large part, be driven by depression and not only by their lapses in self-care, which, as we will see in the next section, can also be affected by depression. Actively addressing the connection between depression and amplified diabetes symptoms can help to restore hope in a depressed individual, while helping to forge a stronger therapeutic alliance.

Back to our example:

Daryl's interest is piqued when you explain that physical symptoms can be amplified by depression. As he thinks about it, he realizes that he started having increased stress about being laid off 5 or 6 months ago—well before the onset of his worsening neuropathy pain. By the end of the health care visit, he has a new understanding about the escalating bothersome symptoms that have been confusing him and that he has felt powerless to control thus far.

2. Depression Is Associated With Poor Diabetes Self-Management and Treatment Adherence

Because diabetes management is primarily carried out by patients,²³ the presence of depression often leads to lower adherence in carrying out day-to-day diabetes tasks such as monitoring glucose or regularly taking oral medications or insulin. For example, based on pharmacy refill data in > 4,000 patients with type 2 diabetes, Lin et al.²⁴ showed that major depression was associated with lower adherence to oral hypoglycemic, antihypertensive, and lipid-lowering medications. Other studies have shown similar findings,

including the association of depression with lower rates of glucose monitoring.^{25,26}

Such self-management lapses may result from poor concentration, lack of motivation, decreased ability to collaborate with others, and fatigue that accompanies depression. Lapses in self-care, as well as central mechanisms related to the hypothalamic-pituitary-adrenocortical axis and other neurophysiological mechanisms, may lead to poor glycemic control.²⁷ Meta-analytic data²⁸ have confirmed that there is a significant association between depression and hyperglycemia in patients with type 1 or type 2 diabetes.

Implications for health care communication

Depressive symptoms often smolder for months or years before they are identified, and the associated lack of treatment adherence and adequate self-care may lead to frustration and a sense of hopelessness in trying to successfully manage diabetes. During interactions with a health care provider, patients may feel shame or embarrassment about their inability to better manage diabetes, especially if this is an acute change. Very often, patients know what they need to do, but depression gets in the way. In other words, their “emotional mind” trumps their “rational mind” (e.g., “I know what I am supposed to do and what I am not supposed to do, but I still do the wrong things, and I don’t know why.”).

When unaware of their patients’ comorbid depression, clinicians may also feel discouraged about the lack of progress in diabetes management and outcomes and may unwittingly blame patients for not trying hard enough, which perpetuates the negative self-assessments depressed patients can have. It is helpful when clinicians can openly share that worsening self-care is a common,

expected, and most often temporary result of depression and that, with adequate depression treatment, this downward course can be reversed.

You mention to Daryl that you often see worsening diabetes self-care with untreated depression. You share that you are also familiar with the lack of motivation and difficulties with task organization in your patients at those times. You reassure Daryl that with appropriate treatment, diabetes self-care and outcomes usually begin to improve quickly. Daryl feels relieved at the prospect that depression may have caused his difficulties with self-care. He admits it has been so long since his diabetes self-management has been suboptimal that it will take time for this new view to fully sink in.

3. Depression Can Lead to Adverse Lifestyle Habits

In addition to interfering with obtaining regular physical activity,²⁴ untreated depression may be a prominent feature of two adverse lifestyle habits—emotional eating and cigarette smoking—because they are habits patients engage in to regulate emotions. Unfortunately, short-term temporary “gains” from engaging in these behaviors to regulate emotions are largely offset by longer-term “losses” associated with the health risks of overeating and smoking.

Eating disorders such as binge eating, bulimia, and subthreshold eating disorders are more prevalent among patients with type 1 or type 2 diabetes than among medical control subjects,^{29,30} and eating episodes can be triggered by negative emotions. These disorders can lead to poor dietary and glucose control and a greater likelihood of diabetes complications.³¹

A prevalent form of eating disorder tied to depression and emotional regulation among patients with diabetes is an eating pattern called

night-eating syndrome. In a study of 714 tertiary care patients with type 1 or type 2 diabetes,³² 10% of the sample reported a pattern of night eating defined as intake of > 25% of daily food intake after regular supertime. Compared to control subjects, patients engaging in night eating were more than twice as likely to have depression, and affected patients reported eating in response to anger, sadness, loneliness, worry, and being upset. Patients with night-eating behaviors were more than twice as likely to be obese, to have A1C values > 7%, and to have two or more diabetes complications.

Depression is twice as common in smokers as in nonsmokers, and smokers with a lifetime history of depression are half as likely to quit smoking as nonsmokers.^{33,34} As with emotional eating, depressed patients may also engage in smoking as a way of regulating emotions.

Implications for health care communication

A primary challenge for health care providers in dealing with depressed patients’ adverse health habits is to maintain a nonjudgmental and empathic stance. This may be particularly difficult when working with behaviors carrying a stigma such as smoking and overeating. By understanding these behaviors in the context of co-occurring depression, clinicians may have increased patience and may be better able to provide effective support toward changing these behaviors once depressive symptoms begin to wane.

Because of your open, nonjudgmental stance, Daryl shares with you that he has never snacked so much in his life. He admits that much of his snacking occurs at night as a way of helping him relax while he is lying awake worrying about how he will function at work the next day. He feels ashamed about his weight gain

and feels he has lost control. You help him see that his depressive symptoms and overeating are related and that he is not alone because the association between low mood and overeating is well supported in the literature.

4. Depression Is Associated With Changes in Health Care Utilization Patterns

A telltale sign of depression in medical settings is the onset of changing health care utilization patterns. On one hand, patients may use more health care overall (e.g., calling more, making more frequent appointments, getting more tests, or using urgent care or emergency services more frequently). A study of 367 primary care patients with diabetes demonstrated 86% higher health care costs for patients with high depression severity compared to those with low severity, a finding not explained by mental health costs and utilization.³⁵ Among > 4,000 adults with diabetes in a health maintenance organization, total health care costs were ~ 70% higher among those with major depression than among those without depression.³⁶ Even more compelling is a study of a nationally representative Medical Expenditure Panel Survey of individuals with diabetes³⁷ that reported health care costs 4.5 times higher in depressed patients than in those who were not depressed.

On the other hand, depressed diabetes patients may also use less appropriate health care as a result of missed or canceled appointments or as a result of avoiding scheduling appointments because of the lack of motivation, isolation, decreased concentration, or general disorganization that accompany depression. In a study of 3,900 patients with diabetes, those with major depression missed more than twice as many scheduled and same-day primary care appointments as those without depression.³⁸

In patients with diabetes, missing appointments is associated with poorer glycemic control,^{39,40} lower glucose self-monitoring rates, nonadherence to oral hypoglycemic medications,⁴⁰ greater obesity levels, higher blood pressure, more microvascular complications,⁴¹ and lower rates of complication screening.^{41,42} Often, missed or canceled appointments occur in the context of chaotic health care use that includes more higher-cost, unplanned appointments to urgent care clinics and emergency rooms.

Implications for health care communication

There are many existing patient-, organizational-, and provider-level interventions designed to decrease missed appointments.⁴³ Clinicians may benefit from use of automated tracking of appointments; increased communication through telephone calls, e-mail, and other Internet-based communication; and use of proactive contacts such as mailed or phoned reminders of appointments. By understanding how depressive symptoms lead to lower levels of motivation, concentration, and ability to organize one's life, providers and staff may achieve greater empathy and less frustration with their patients who miss appointments, while at the same time guide patients toward more constructive health care utilization patterns.

Daryl does not bring up the fact that he missed an appointment 3 months earlier. He intended to show up but was overwhelmed and had forgotten about his appointment despite a phone reminder from the clinic earlier in the week. Needless to say, he is embarrassed about this. You mention that, in addition to interfering with diabetes self-care and treatment adherence, depression can also interfere with making or keeping health care appointments. You establish

alternate ways for Daryl to contact you or others on your team during the next couple of months to ensure there is no further loss to follow-up.

5. Symptoms of Depression Reduce Levels of Trust and Satisfaction With Care

Depression is associated with lower satisfaction with care⁵ and with lower levels of trust⁴⁴ among patients with diabetes. However, as depression severity decreases, trust and collaboration can improve. In a 10-month study in primary care patients with type 2 diabetes,⁴⁴ patients whose depression decreased in severity over time had an increase in their ability to trust others, based on a measure of relationship style derived from attachment theory, compared to patients in whom depression severity either did not change or worsened. Randomized trials have also confirmed that providing greater quality of care of depression is associated with greater satisfaction with depression care.⁵

Implications for health care communication

The isolation and withdrawal that can accompany depression may significantly reduce a patient's capacity to effectively manage diabetes and other medical conditions. Affected individuals may be reluctant to make health care appointments or show up for appointments, and they may be less likely to actively seek support or collaborate with health care providers during health care visits. Openly discussing this common phenomenon in the context of patient education will allow patients and providers to have greater patience in accepting challenging patient-provider dynamics. It can be helpful for clinicians to remind patients that the inability to trust while depressed can generalize to include family members, friends, and other social supports who can assist in managing diabetes.

Daryl has a good relationship with you and trusts you, but he is less open than you remember him being. He admits that he feels embarrassed about his lack of diabetes control and isn't sure his trust is high enough at present to be open about admitting all the "mistakes" he has made in the past few months. You recognize that the level of collaboration you are used to with Daryl will likely return over the next few weeks or months.

Moving Toward a More Integrated Clinical Approach to Assessing and Initiating Depression Treatment in Patients With Diabetes

The literature on treating depression in medical settings is full of examples of barriers to achieving a depression diagnosis and initiating treatment. Such examples include competing tasks and demands; stigma; lack of time, interest, or training to treat depression; and lack of treatment resources and support.⁴⁵

Furthermore, data suggest that in busy medical settings, fewer than half of patients with comorbid depression are accurately diagnosed or prescribed treatment, and, of those, fewer than half receive adequate antidepressant treatment, and just 10% receive evidence-based psychotherapy.⁴⁶ The prevailing health care system has been described as rushed, complex, and impersonal.^{47,48} Opportunities for meaningful patient-provider interactions during which patients' presenting complaints can be more fully understood have progressively diminished as greater numbers of complex chronic conditions need to be assessed without commensurate increases in clinical time.

Although collaborative care models^{5,16-18} for treating depression have worked around many of these barriers through the use of a team approach, one of the mainstays of these models has been patient

education delivered at the time of diagnosis. The approach offered here is consistent with the educational focus taken in collaborative care models but pays even greater attention to patients' experiences leading up to a depression diagnosis.

This approach encourages clinicians to briefly "take off their clinical glasses" and see the *person* who is struggling with concurrent complex diabetes and depression symptoms before applying diagnostic criteria and categories. In other words, before focusing on either the *diagnosis* "diabetes" or the *diagnosis* "depression," it is helpful to briefly but meaningfully review with patients their undifferentiated, potentially confusing *experience* that can be best described as "diapres-

sion." Focusing on the diapression experience is a quick and simple way to validate and empathize with patients. Furthermore, this focus then lays the foundation to provide patient education about depression's influence on diabetes symptoms, diabetes self-care and treatment adherence, adverse life habits, health care utilization, and patient trust and satisfaction with care.

There are many potential benefits to these steps, not the least of which are an improved therapeutic alliance, opportunities for activation and education of patients, and better treatment adherence (Table 1). Such a clinical approach is not a substitute for systematic diagnosis using screening tools such as the PHQ-9⁴ and treatment initiation, but it can

Table 1. Potential Benefits of a Clinical Focus on Undifferentiated Experiences in Patients With Concurrent Diabetes and Depression (i.e., Diapression*)

- Raising awareness of the presence of depression in a diabetes treatment setting by considering depression's subjective and objective presenting features
- Increasing the likelihood of clinical screening for depression in patients who may have predominantly physical symptoms
- Increasing the likelihood of acceptance of a depression diagnosis and depression treatment
- Decreasing patients' and clinicians' misattribution of depressive symptoms to diabetes symptoms or lack of self-care
- Decreasing bewilderment, shame, or resignation about the inability to adequately manage diabetes when in a depressed state
- Reducing challenging patient-provider relationship dynamics resulting from unexplained physical symptoms or symptoms out of proportion to subjective complaints or test results
- Reducing clinicians' nihilism or frustration with patients' lack of progress in diabetes self-management in the context of depression
- Reducing stigma and judgment about poor lifestyle habits stemming from depression
- Improving trust, satisfaction, and patient-provider communication
- Providing an alternate view to one that may imply that patients are "difficult"
- Providing an explanatory model based on evidence for understanding worsening diabetes symptoms or lack of self-care in the context of depression
- Providing a framework for understanding changes in health care use (e.g., missed or canceled appointments or overuse of services)

**Diapression focuses on the adverse impact of depression on diabetes symptoms, diabetes self-care and treatment adherence, adverse life habits, health care utilization, and patient trust and satisfaction with care.*

be a practical complement to these essential clinical processes.

The alternative in rushed and busy clinical settings is often an increased likelihood of clinical missteps during which lack of understanding and communication impasses commonly accompany the presentation of depression. As a backdrop, chronically ill patients and medical clinicians typically see chronic conditions very differently. Patients do not speak “ICD” or “DSM.” Conversely, most clinicians do not wake up worrying about how day-to-day tasks of managing diabetes will fit into their day. Communication pitfalls in approaching depression care range from missed recognition and diagnosis of depression to communication impasses in which clinicians are perceived as imposing a depression diagnosis on patients. Even worse, in situations in which clinicians are unaware of a depressive diagnosis, patients may even be seen as failing, as being “somatizers,” or as “difficult patients” or may be blamed for not taking their conditions seriously.

As we enter an era in which treating patients with multiple conditions is commonplace, clinicians need a streamlined way to “check in” and validate the experience of the individuals in front of them. In the coming years, more patients will be presenting with increasingly complex comorbid conditions that will require a fresh approach to prevent dissatisfaction and communication lapses. Never before have patients been so dissatisfied with their health care, which has been described as “a nightmare to navigate.”²⁴⁷ Furthermore, national polls of doctors show that, despite a very high valuing of the patient-provider relationship to the practice of medicine, the majority of doctors now find medicine less rewarding, and increasing numbers talk about

quitting medicine altogether or significantly reducing the number of patients they see.⁴⁹

In increasingly rushed and impersonal clinical settings in which clinicians’ eyes are increasingly averted to computer screens⁵⁰ and away from patients’ eyes, a focus on diapression and proactive patient education can be another useful “technology” to ensure that we take brief pause and truly orient ourselves to our patients’ experience.

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REFERENCES

- Anderson G: Chronic conditions: making the case for ongoing care [article online]. Available from http://www.fightchronicdisease.org/pdfs/PFCD_FINAL_PRINT.pdf. Accessed 11 February 2011
- Parekh AK, Barton MB: The challenge of multiple comorbidity for the U.S. health care system. *JAMA* 303:1303–1304, 2010
- Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, Ustun B: Depression, chronic diseases, and decrements in health: results from the World Health Surveys. *Lancet* 370:851–858, 2007
- Spitzer RL, Kroenke K, Williams JB: Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *JAMA* 282:1737–1744, 1999
- Katon WJ, Von Korff M, Lin EH, Simon G, Ludman E, Russo J, Ciechanowski P, Walker E, Bush T: The Pathways Study: a randomized trial of collaborative care in patients with diabetes and depression. *Arch Gen Psychiatry* 61:1042–1049, 2004
- Anderson RJ, Freedland KE, Clouse RE, Lustman PJ: The prevalence of comorbid depression in adults with diabetes: a meta-analysis. *Diabetes Care* 24:1069–1078, 2001
- DiMatteo MR, Lepper HS, Croghan TW: Depression is a risk factor for non-compliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. *Arch Intern Med* 160:2101–2107, 2000
- Gonzalez JS, Safren SA, Cagliero E, Wexler DJ, Delahanty L, Wittenberg E, Blais MA, Meigs JB, Grant RW: Depression, self-care, and medication adherence in type 2 diabetes: relationships across the full range of symptom severity. *Diabetes Care* 30:2222–2227, 2007
- Lustman PJ, Clouse RE: Depression in diabetic patients: the relationship between mood and glycemic control. *J Diabetes Complications* 19:113–122, 2005
- Katon WJ, Rutter C, Simon G, Lin EH, Ludman E, Ciechanowski P, Kinder L, Young B, Von Korff M: The association of comorbid depression with mortality in patients with type 2 diabetes. *Diabetes Care* 28:2668–2672, 2005
- Lustman PJ, Griffith LS, Clouse RE, Freedland KE, Eisen SA, Rubin EH, Carney RM, McGill JB: Effects of nortriptyline on depression and glycemic control in diabetes: results of a double-blind, placebo-controlled trial. *Psychosom Med* 59:241–250, 1997
- Lustman PJ, Griffith LS, Freedland KE, Kissel SS, Clouse RE: Cognitive behavior therapy for depression in type 2 diabetes mellitus: a randomized, controlled trial. *Ann Intern Med* 129:613–621, 1998
- Lustman PJ, Freedland KE, Griffith LS, Clouse RE: Fluoxetine for depression in diabetes: a randomized double-blind placebo-controlled trial. *Diabetes Care* 23:618–623, 2000
- Williams MM, Clouse RE, Nix BD, Rubin EH, Sayuk GS, McGill JB, Gelenberg AJ, Ciechanowski PS, Hirsch IB, Lustman PJ: Efficacy of sertraline in prevention of depression recurrence in older versus younger adults with diabetes. *Diabetes Care* 30:801–806, 2007
- Simson U, Nawarotzky U, Friese G, Porck W, Schottenfeld-Naor Y, Hahn S, Scherbaum WA, Kruse J: Psychotherapy intervention to reduce depressive symptoms in patients with diabetic foot syndrome. *Diabet Med* 25:206–212, 2008
- Williams JW Jr, Katon W, Lin EHB, Nöel PH, Worchel J, Cornell J, Harpole L, Gultz BA, Hunkeler E, Mika V, Unützer J, IMPACT Investigators: The effectiveness of depression care management on diabetes-related outcomes in older patients. *Ann Intern Med* 140:1015–1024, 2004
- Ell K, Katon W, Xie B, Lee PJ, Kapetanovic S, Guterman J, Chou CP: Collaborative care management of major depression among low-income, predominantly Hispanic subjects with diabetes: a randomized controlled trial. *Diabetes Care* 33:706–713, 2010
- Katon W, Lin EHB, Von Korff M, Ciechanowski P, Ludman E, Young B, Peterson D, Rutter M, McGregor M, McCulloch D: Collaborative care for patients with depression and chronic illnesses. *N Engl J Med* 363:2611–2620, 2010
- American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed., text revision. Washington, D.C., American Psychiatric Association, 2000
- Ludman EJ, Katon W, Russo J, Von Korff M, Simon G, Ciechanowski P, Lin E, Bush T, Walker E, Young B: Depression and diabetes symptom burden. *Gen Hosp Psychiatry* 26:430–436, 2004
- Lustman PS, Clouse RE, Carney RM: Depression and the reporting of diabetes symptoms. *Int J Psychiatry Med* 18:295–303, 1988

- ²²Ciechanowski P, Katon W, Russo J, Hirsch I: The relationship of depressive symptoms to symptom reporting, self-care and glucose control in diabetes. *Gen Hosp Psychiatry* 25:246–252, 2003
- ²³Anderson RM: Is the problem of compliance all in our heads? *Diabetes Educ* 11:31–34, 1985
- ²⁴Lin EHB, Katon W, Von Korff M, Rutter C, Simon GE, Oliver M, Ciechanowski P, Ludman EJ, Bush T, Young B: Relationship of depression and diabetes self-care, medication adherence, and preventive care. *Diabetes Care* 27:2154–2160, 2004
- ²⁵Wagner JA, Tennen H, Osborn CY: Lifetime depression and diabetes self-management in women with type 2 diabetes: a case-control study. *Diabet Med* 27:713–717, 2010
- ²⁶Gonzalez JS, Peyrot M, McCarl LA, Collins EM, Serpa L, Mimiaga MJ, Safren SA: Depression and diabetes treatment nonadherence: a meta-analysis. *Diabetes Care* 31:2398–2403, 2008
- ²⁷Winokur A, Maislin G, Phillips JL, Amsterdam JD: Insulin resistance after oral glucose tolerance testing in patients with major depression. *Am J Psychiatry* 145:325–330, 1988
- ²⁸Lustman PJ, Anderson RJ, Freedland KE, de Groot M, Carney RM, Clouse RE: Depression and poor glycemic control. *Diabetes Care* 23:934–942, 2000
- ²⁹Colton PA, Olmsted MP, Daneman D, Rydall A, Rodin G: Disturbed eating behavior and eating disorders in preteen and early teenage girls with type 1 diabetes: a case controlled study. *Diabetes Care* 27:1654–1659, 2004
- ³⁰Crow S, Kendall D, Praus B, Thuras P: Binge eating and other psychopathology in patients with type II diabetes mellitus. *Int J Eat Disord* 30:222–226, 2000
- ³¹Peveler RC, Bryden KS, Neil HAW, Fairburn CG, Mayou RA, Dunger DB, Turner HM: The relationship of disordered eating habits and attitudes to clinical outcomes in young adult females with type 1 diabetes. *Diabetes Care* 28:84–88, 2005
- ³²Morse S, Ciechanowski PS, Katon WJ, Hirsch I: Isn't this just bedtime snacking? The potential adverse effects of night eating symptoms on treatment adherence and outcomes in patients with diabetes. *Diabetes Care* 29:1800–1804, 2006
- ³³Pomerleau CS, Aubin HJ, Pomerleau OF: Self-reported alcohol use patterns in a sample of male and female heavy smokers. *J Addict Dis* 16:19–24, 1997
- ³⁴Hall SM, Muñoz RF, Reus VI, Sees KL: Nicotine, negative affect, and depression. *J Consult Clin Psychol* 61:761–767, 1993
- ³⁵Ciechanowski P, Katon WJ, Russo JE: Depression and diabetes: impact of depressive symptoms on adherence, function and costs. *Arch Intern Med* 160:3278–3285, 2000
- ³⁶Simon GE, Katon WJ, Lin EHB, Ludman E, VonKorff M, Ciechanowski P, Young BA: Diabetes complications and depression as predictors of health service costs. *Gen Hosp Psychiatry* 27:344–351, 2005
- ³⁷Egede LE, Zheng D, Simpson K: Comorbid depression is associated with increased health care use and expenditures in individuals with diabetes. *Diabetes Care* 25:464–470, 2002
- ³⁸Ciechanowski P, Russo J, Katon W, Simon G, Ludman E, Von Korff M, Young B, Lin E: Where is the patient? The association of psychosocial factors with missed primary care appointments in patients with diabetes. *Gen Hosp Psychiatry* 28:9–17, 2006
- ³⁹Jacobson AM, Adler AG, Derby L, Anderson BJ, Wolfsdorf JI: Clinic attendance and glycemic control: study of contrasting groups of patients with IDDM. *Diabetes Care* 14:599–601, 1992
- ⁴⁰Karter AJ, Parker MM, Moffet HH, Ahmed AT, Ferrara A, Liu JY, Selby JV: Missed appointments and poor glycemic control: an opportunity to identify high-risk diabetic patients. *Med Care* 42:110–115, 2004
- ⁴¹Hammersley MS, Holland MR, Walford S, Thorn PA: What happens to defaulters from a diabetic clinic? *BMJ* 292:1330–1332, 1985
- ⁴²Corsi A, De-Castro A, Ghisoni G, Oddi A, Comaschi M: Reasons for patient dropout in attendance at diabetes clinics and evaluation of quality of care. *G Ital Diabetol* 14:239–242, 1994
- ⁴³Griffin SJ: Lost to follow-up: the problem of defaulters from diabetes clinics. *Diabet Med* 15 (Suppl. 3):S14–S24, 1998
- ⁴⁴Ciechanowski P, Katon W, Russo J: The association of depression and perceptions of interpersonal relationships in patients with diabetes. *J Psychosom Med* 58:139–144, 2005
- ⁴⁵Seelig MD, Katon W: Gaps in depression care: why primary care physicians should hone their depression screening, diagnosis, and management skills. *J Occup Environ Med* 50:451–458, 2008
- ⁴⁶Simon GE: Evidence review: efficacy and effectiveness of antidepressant treatment in primary care. *Gen Hosp Psychiatry* 24:213–224, 2002
- ⁴⁷Institute of Medicine: *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, D.C., National Academy Press, 2001
- ⁴⁸American Hospital Association, Picker Institute: *Eye on Patients: A Report from the American Hospital Association and the Picker Institute*. Chicago, American Hospital Association and Picker Institute, 1997
- ⁴⁹The Physicians Foundation: Survey finds numerous problems facing primary care doctors, predicts escalating shortage ahead [article online]. Available from <http://www.physiciansfoundation.org/FoundationReportDetails.aspx?id=78>. Accessed 13 December 2010
- ⁵⁰Linder JA, Schnipper JL, Tsurikova R, Melnikas AJ, Volk LA, Middleton B: Barriers to electronic health record use during patient visits. *AMIA Annu Symp Proc* 2006:499–503

Paul Ciechanowski, MD, MPH, is an associate professor in the Department of Psychiatry and Behavioral Sciences at the University of Washington in Seattle. He is also chief executive officer and founder of the company Samepage in Seattle.

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