Depression and diabetes can prey on the shortcomings of our health care system, such as fragmented, episodic care and poor continuity. Coordinating care can be fraught with difficulties, but it is the goal of many current efforts in health care reform.

In 2014, diabetes mellitus was diagnosed in close to 1 in 10 Americans while another estimated 86 million were considered to be prediabetic and at extremely high risk to progress to full-blown diabetes within 2 years. The prevalence of depression in adults with diabetes hovers around 20%, roughly double that found in the US general population. The presence of both conditions increases the overall symptom burden of each illness and results in further disability and increased health care costs. Moreover, adults with comorbid diabetes and depression have worse diabetes-related outcomes and die at an earlier age.

Physiologically, there have been links drawn between excessive cortisol secretion in depression and worsening clinical outcomes. Psychologically, adults with depression are often treatment-nonadherent for both diabetes and depression, lack motivation for participation in self-care, and may have multiple barriers to effective disease management. Because of the profound interplay between these two highly prevalent and taxing diseases, researchers and practitioners have begun using the term “diapression” to describe this clinical phenomenon.

Unfortunately, both depression and diabetes can prey on the greatest shortcomings of our health care system—namely, fragmented and episodic care; poor continuity; brief, problem-focused visits; and few opportunities for patient engagement and self-management support. Diabetes is an all-encompassing illness that affects every organ and requires vigilant follow-up to ensure that multiple preventive services are completed routinely, including dilated eye examinations, laboratory monitoring, screening for comorbid conditions (eg, hypertension, dyslipidemias), and appropriate pharmacotherapy.

Coordinating care can be fraught with difficulties, but it is the goal of many current efforts in health care reform. Depression further complicates this care because it is an internalizing illness that is hard to systematically identify. Patients with depression have difficulty in organizing their care and engaging in healthier lifestyle habits. Furthermore, they are particularly prone to poor follow-up and fragmented patterns of health care engagement.

Interventions for comorbid diabetes and depression
In spite of this dire predicament, many interventions have shown promise in improving care and outcomes for persons afflicted with depression and diabetes. Each disorder has a relatively standardized evidence-based approach that when applied systematically and aggressively results in improved outcomes for the majority of patients. Each disorder has relatively noninvasive, validated measures that correlate tightly with disease status and clinical outcomes (the hemoglobin A1c [HbA1c] level and the Patient Health Questionnaire [PHQ]-9 for diabetes and depression, respectively). In addition, each disorder is amenable to patient self-management through greater health literacy and education.

In the 1990s, health service researchers incorporated these evolving and essential elements of diabetes management into the Chronic Care Model, components of which have been replicated in nearly 80 randomized controlled trials of collaborative care for depression and anxiety disorders. Collaborative care is predicated on several fundamental concepts:

- Patient-centered care teams
- Population-based care
- Measurement-based “treat to target”
- Evidence-based care
- Systematic quality improvement and accountability for outcomes

In 2010, the first trial of depression and diabetes collaborative care (referred to as TEAMcare)
demonstrated significant improvements across both conditions as well as cost savings and reduced morbidity. In spite of robust results for collaborative care with multiple conditions, implementation of high-quality models has been slow, primarily hindered by lack of payment reform. Nevertheless, increasing numbers of psychiatrists are finding job satisfaction working in a collaborative care model, side by side with their primary care colleagues. The Figure details the working components of the TEAMcare collaborative care model, one of the most advanced forms of integrated behavioral health and primary care service delivery.

The following cases illustrate the usual workflows of a collaborative care team charged with managing diabetes and depression.

**CASE VIGNETTE**

Mary is 48 years old with adult-onset type 2 diabetes mellitus and obesity. She has had diabetes for 7 years, and her most recent HbA1c level was 9.8% (the target range is 7% to 8%, measured every 3 months). She is taking aspirin, a statin, and an ACE inhibitor for blood pressure that is well controlled at 125/82 mm Hg. She was seen by her primary care physician (PCP), Dr Johnson, about a week ago, who noted a high HbA1c level.

Mary has been struggling through a divorce and became tearful during the appointment, which prompted Dr Johnson to perform a routine depression screen. Mary was positive on the PHQ-2, which was subsequently followed by the PHQ-9. Her final PHQ-9 score was 21, which indicated that she was not presently suicidal; Mary also denied any thoughts of suicide.

Dr Johnson called Julie, a care manager who works in his clinic. Julie has a background in behavioral health nursing and has been trained as a diabetes nurse educator. Julie briefly reviewed Mary’s case with Dr Johnson and the positive PHQ-9 score with him and then met with Mary for about 25 minutes. Julie performed several other screening tests, including an alcohol use screen and a screen for bipolar disorder, both of which were negative.

Julie noted that Mary’s medications included 20 mg of fluoxetine that had been prescribed by another physician—the prescription hadn’t been filled in 3 months. Julie then administered a brief problem-solving exercise that has proved effective for helping with depressive symptoms in primary care settings, and asked permission to contact Mary again in about a week to follow-up with her care.

Julie and Dr Johnson meet with Dr Carter (a fellow consultant PCP from the practice) and a consulting psychiatrist once a week to review their shared caseload. This week they begin by reviewing Mary’s case. Based on information provided by Julie, the consulting psychiatrist recommends that Mary restart fluoxetine, which is to be titrated to 40 mg within 2 weeks if tolerated. Dr Carter suggests the addition of 10 mg of glyburide daily in addition to the 1000 mg of metformin twice daily that Mary is currently taking. He also recommends that Mary consider checking her blood sugar level on a rotating schedule twice a day. Julie notes these recommendations using the clinic’s EMR system and the team moves on to the next patient (Table).

**CASE VIGNETTE**

Lucy, who is 28 years old, has type 2 diabetes mellitus. Lucy first presented 18 months ago with symptoms that included frequent urination and fatigue that began several months earlier. Dr Johnson sent for fasting blood work—her initial HbA1c level was 11.2%. Lucy was given metformin and glyburide, which were titrated to maximum dosage.

At her next appointment, Lucy reported that she was no longer interested in much of anything and all she wanted to do is sleep. She found herself irritable and argumentative most of the time. Julie administered a PHQ-9 to assess Lucy’s symptoms. The results showed moderately severe depression; Lucy was given 50 mg/d of sertraline, titrated to 200 mg/d.

Although improved, Lucy’s most recent blood glucose levels are still not on target, with an HbA1c level at 9.4%. During her most recent appointment with Dr Johnson, her glucose levels were reviewed and treatment adherence discussed. Julie noted that Lucy has been taking both medications consistently, she watches what she eats, and she tries to exercise once or twice a week.

The team is somewhat dismayed at Lucy’s consistently high HbA1c levels. Given her initial HbA1c level, there may have been rationale to start treatment with a long-acting insulin when she first presented, but this option was never raised. Starting insulin therapy is seen as very challenging, and often clinicians and patients delay initiation because of fear of pain, lifestyle changes, danger in dosing, or fear of weight gain or further depression. This is known as “psychological insulin resistance”; it is encountered frequently and often delays evidence-based care that would result in
significant improvements and outcomes. In fact, it is likely that the only way to control Lucy’s diabetes at this stage is with insulin. Dr Carter recommends that Lucy start taking 1 unit/kg of long-acting insulin in the evening. Julie will use motivational interviewing techniques to counsel Lucy about taking insulin.

The consulting psychiatrist notes that Lucy’s PHQ-9 (Table) remains stubbornly high (target is less than 5). Julie confirms that Lucy is consistently taking 200 mg of sertraline at night. In addition to reviewing with Julie some techniques of behavioral activation for Lucy, the consulting psychiatrist recommends starting bupropion XL 150 mg every morning and suggests that Julie consider encouraging Dr Johnson to increase the dose as tolerated after a few weeks, to 300 mg/d.

About 3 months later, the weekly coordinated care meeting cycles back to Mary and Lucy. At this point, Mary’s HbA1c level is 7.9%, her PHQ-9 is 10, and she is taking 40 mg of fluoxetine and 20 mg of glyburide. The team celebrates the initial success and quickly moves on to Lucy. Lucy has started taking insulin glargine (Lantus, a long-acting insulin) at night and her HbA1c level is down to 7.5%. Her bupropion XL dosage was titrated to 450 mg/d. She was medication-adherent, but she began to lose sleep and gradually became more anxious. She stopped taking it about a week ago, but she continues to take sertraline. Her PHQ-9 is 15 now.

Julie reports that Lucy is struggling to overcome some diabetic nerve pain in her feet. The consulting psychiatrist recommends that Dr Johnson switch Lucy’s medication from sertraline to venlafaxine titrated to 150 mg/d as tolerated over 2 weeks. Dr Johnson later voices concerns about venlafaxine and blood pressure. Although Lucy’s most recent systolic blood pressure of 132 mm Hg suggests that Lucy can tolerate a therapeutic venlafaxine dose, her blood pressure will need to be monitored to ensure that it stays below 140 mm Hg. Dr Johnson agrees and writes the prescription after talking with the consultant psychiatrist.

Four weeks later, during a team meeting, Julie reports that Lucy’s PHQ-9 is 11 and her systolic blood pressure is 145 mm Hg. Dr Carter recommends that hydrochlorothiazide 25 mg be added to her medication regimen; the consulting psychiatrist recommends an increase in venlafaxine dosage to 225 mg/d; Lucy will need to have a basic metabolic panel check in a week to monitor her potassium level. Fortunately, Dr Johnson is seeing Lucy in a week and has ordered the medication change; he will follow-up with the lab work.

After another 8 weeks, Lucy’s blood pressure is controlled, her PHQ-9 score is 5, and her HbA1c is 7.3%. She is beginning to exercise more often and is improving her diet; she also now regularly schedules pleasurable activities with friends.

Mary continues to have periodic checkups and her depression and diabetes are well controlled 6 months into the program.

**Essentials of collaborative care**

These two cases demonstrate 4 of the 5 essential elements of collaborative care: (1) team-based care with shared responsibility for clinical outcomes, (2) measurement-based treat-to-target, (3) evidence-based care, and (4) population management with the use of a population management panel or registry.

Julie, the care manager, has an ideal skill set in both diabetes education and behavioral health. Elaborate training programs now exist in many regions to train care managers to acquire these skills. Recent studies have identified the key elements that make collaborative care programs successful: dedicated staff time; information technology support for registry management; clinical and administrative leadership and buy-in; systematic screening; patient identification and engagement; and outgoing, friendly, and flexible practitioners.9,10

While funding for these types of interventions has been slow, there is growing support for primary care management services. In turn, opportunities are being created for collaborative care models. Often the missing element in implementation is systematic use of a registry tool to guide caseload supervision. Many primary care clinics are investing in care managers to coordinate and navigate complex care for needy clients. Registry tools are available for download online and can be as simple as a spreadsheet. Some EMR systems allow for the creation of population registries manually, and there is growing interest in using data stored in a health information exchange, which consolidates data across separate clinical entities to drive registry management. Many implementations will begin in accordance with the resources available locally.

By focusing on measuring and tracking the outcomes of groups of patients, a system can direct limited clinical resources and expertise to the neediest of patients with manageable conditions, effecting the greatest change over time. Both diabetes and depression are treatable conditions, and solutions exist that have already changed the lives of thousands of patients. Outcomes can be improved by changing the way our health care system functions. Consider the following points if you
are mulling over your own local collaborative care intervention:
• Bear in mind the 5 key elements of collaborative care and implement what you can, when you can, and where you can.
• Proactively set up screening for depressive disorders in primary care, where they often present, since they are often underrecognized and undertreated.
• Find a local primary care champion in a clinic near you who would make a good partner in these efforts.
• Remember that diabetes and depression are frequently comorbid, and they need to be treated simultaneously to effect meaningful improvements.
• Without systematic measurement and follow-up, often aided by a registry, many patients are lost in care and do not systematically improve.

Additional Resources
• University of Washington AIMS Center, Technical Assistance for Collaborative Care Implementation: http://aims.uw.edu.

Figure. Diagram of TEAMcare collaborative care workflow

Table. Sample of a TEAMcare population management panel

Disclosures:
Dr Vanderlip is Assistant Professor of Psychiatry and Medical Informatics in the department of psychiatry at the University of Oklahoma School of Community Medicine in Tulsa. He is board-certified in family medicine and psychiatry. Dr Vanderlip receives occasional honoraria for TEAMcare trainings and webinars affiliated with the non-profit Training Exchange at the University of Washington. No off-label products are discussed, and he has no conflicts of interest to report for his spouse.

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