



## A population-based approach to the management of depression in a patient-centered medical home

Kenneth Kushner<sup>1</sup>, Gwynneth Schell<sup>2</sup>

### Abstract

**Objective:** This article describes the implementation of a population-based strategy to manage depression in a patient-centered medical home.

**Methods:** Review of English language articles; description of specific protocols utilized in one medical home.

**Results:** Depression is a global concern estimated to affect 350 million people worldwide. Rates for depression vary between the United States and the Peoples' Republic of China, possibly due to significant factors in under diagnosis of this often hidden burden. Given the comorbidity of depression with other health factors and the need for ongoing monitoring and care of this chronic illness, primary care has become a significant part of treatment interventions. Utilizing electronic health records (EHR), our strategy included the creation of a patient registry; selection of evidence-based treatment guidelines and protocols for point of care procedures; patient outreach and screening.

**Conclusion:** The population-based program we outline is highly dependent on the EHR and the flexibility of roles and responsibilities of clinical staff. Further investigation is warranted into improved patient outcomes.

**Keywords:** Depression; patient-centered medical home; population health

### Introduction

Depression is estimated to affect 350 million people worldwide [1]. According to the World Health Organization, depression will increase from third (4.3% of total) in 2004 to first (6.2% of total) in 2030 in the global burden of disease. Symptoms of depression lead to loss of productivity and a decrease in social and economic capital. Depression is currently the leading cause of lost years of healthy life for women 15–44 years of age [1].

Kessler et al. [2] estimated that the lifetime prevalence of major depressive disorder (MDD) in the US is 16.2% and the 12-month

prevalence is 6.6%. A recent systematic review of the literature on the epidemiology of MDD in the Peoples' Republic of China estimated the current, 12-month, and lifetime prevalence to be 1.6%, 2.3%, and 3.3%, respectively [3]. Researchers have identified underreporting as an important possibility in these findings for several reasons. First, there has been no national survey of depression since 1993 and the current literature overlooks entire provinces. Second, internationally-recognized diagnostic criteria for MDD were not adopted until 2000, leading to an inconsistency of past results.

1. Department of Family Medicine, University of Wisconsin and Wingra Access Family Medical Center, Madison, Wisconsin, USA

2. Department of Counseling Psychology, University of Wisconsin and Access Community Health Centers, Madison, Wisconsin, USA

### CORRESPONDING AUTHOR:

Kenneth Kushner  
Department of Family Medicine,  
University of Wisconsin and  
Wingra Access Family Medical  
Center, Madison, Wisconsin,  
USA

E-mail: [kenneth.kushner@fammed.wisc.edu](mailto:kenneth.kushner@fammed.wisc.edu)

Received 17 February 2015;

Accepted 12 March 2015



Third, cross-cultural reliability of assessment tools have not been validated in China, which could explain differing results depending on the choice of ratings scale used, the possibility of underreporting to an interviewer, and the possibility that Chinese are more likely to present with somatic symptoms of depression than Westerners, for whom the rating scales were developed [3].

### Defining depression

When discussing depression with lay people, a distinction should be made between sadness and depression. Sadness is normal and adaptive in adverse circumstances, while depression is dysfunctional and is dependent upon factors such as duration, number of symptoms, and level of impairment. Sometimes the term “clinical depression” is used to differentiate the psychiatric syndrome from the less serious “low mood.” The term “clinical” is often used in reference to MDD, a specific diagnostic classification the criteria of which are outlined in the American Psychiatric Association's Diagnostic and Statistical Manual, currently in the fifth edition (DSM-V) [4] and in the International Classification of Diseases, now in the 10<sup>th</sup> edition (ICD-10) [5]. MDD involves impairment in normal daily functioning that lasts an extended time and includes at least five of the following specific symptoms: depressed mood; lack of interest/pleasure; poor appetite or overeating; insomnia/hypersomnia; psychomotor agitation/retardation; low energy/fatigue; low self-esteem/guilt; poor concentration/indecisiveness; and suicidal ideations. Dysthymic disorder, which is a less severe and less episodic variant, may also be considered “clinical depression.” In this article we use the term “depression” to refer to clinically-significant depression that may or may not meet the formal criteria for MDD.

Depression is interconnected with many other variables. In general, daily health factors such as the amount of sleep, stress, and exercise, may affect depression. Depression is also linked as an outcome to social factors such as bullying, debt, bereavement, homelessness, and trauma [6], and to co-morbid psychiatric and substance abuse problems [2].

One very serious outcome of depression is suicide. Indeed, a symptom of depression is suicidal ideations. According to the World Health Organization, an estimated 804,000 individuals

commit suicide each year and for each completed suicide, 20 individuals will attempt suicide. Thus, approximately 1 suicide death occurs every 40 seconds worldwide [7]. Depression has been linked to many other infections, diseases, and chronic illness, such as diabetes [8].

### Depression and primary care

The fact that depression correlates with so many other health factors provides an opening for access and care, even though depression is often concealed by the burdened individual. Treatment for depression in primary care has been described; evidence-based care for depression includes basic psychosocial support and antidepressant medication and/or brief psychotherapy [9–12]. Major obstacles to treatment are often a lack of access and social stigma [13]. Most people affected by depression do not receive the known effective treatment [2], and when treatment is offered, lack of adherence to the treatment regimen is often problematic [14, 15].

It has been estimated that one-third of adult patients in the US with depression receive treatment solely by primary care clinicians, as opposed to clinicians in the mental health sector (including psychiatrists and psychotherapists) [2], and that a majority of prescriptions for antidepressant medications are written by primary care providers [16]. This has led some to refer to US primary care as the “*de facto* mental health system” [17]. The World Health Organization is working to strengthen the integration of mental health care into primary care worldwide. This is a complex proposition incorporating a network of factors [1]. The goal is to develop resilient individuals and communities. The idea is that primary care is often the first and/or only time that an individual interacts with the health care system. At the point of contact, a primary physician can assess for symptoms of depression or other mental health issues. This provides an opportunity to intervene and increase positive healthy outcomes for the individual, community, and population as a whole.

### Depression as a chronic illness

The case has been made to view depression, or at least MDD, as a chronic psychiatric illness [18] because of the recurrent nature of depression. Based on US figures, it is estimated that “60% of people with a first episode of major depressive disorder



will experience a second episode; 70% of those with a second MDD episode will suffer a third; and 90% of those with three or more episodes will experience further, often many, more recurrences” [19]. From this perspective, depression requires ongoing, if not lifetime, monitoring and treatment.

### *Population-based approach to chronic illness and patient-centered medical homes*

There has been increasing interest in the US in recent years in a population-based approach to the management of chronic illness. This approach includes the use of explicit plans, protocols and guidelines, the reorganization of practice to meet the needs of patients, the use of patient registries, attention to the informational and behavioral change needs of patients, and a supportive information system [20]. Population-based protocols for the treatment of depression in primary care have been established [21].

The growing use of electronic health records (EHRs) has greatly facilitated the increased interest and implementation of population-based strategies in the US. This growth has also been stimulated by the prominence of the “patient-centered medical home” (PCMH) model, which has been described as “[a] combination of the core attributes of primary care – access, continuity, comprehensiveness, and coordination of care – with new approaches to health care delivery, including office practice innovations and reimbursement reform” [22]. The National Committee for Quality Assurance (NCQA), a private organization dedicated to improving the quality of health care, has a process to certify practices as PCMHs. Certification is voluntary; however, there is a strong possibility that reimbursement by insurance agencies will be enhanced for clinics that have PCMH certification in the future [23].

The NCQA application for PCMH certification requires the implementation of population-based measures for three chronic illnesses. In this article, we will describe the experience of one family medicine clinic in establishing a population-based approach to the management of depression as part of the application for PCMH designation. This necessitated the creation of a patient registry, the selection of evidence-based treatment guidelines and protocols for point of care procedures, patient outreach, and screening.

## **Methods**

### *The setting*

Wingra Access Family Medical Center (WAFMC) is a residency training site for the University of Wisconsin Department of Family Medicine. The staff includes 8 faculty family physicians (representing 3.8 full-time equivalents), 12 family medicine residents, 3 physician assistants, and a behavioral health team. WAFMC is a federally-qualified health center, a governmental subsidy program for community clinics. In 2013, WAFMC provided a total of 19,100 patient visits.

In 2012, the WAFMC leadership decided to apply for designation as a patient-centered medical home by the NCQA. The leadership team chose depression as one of the three chronic illnesses for which a population approach is demonstrated. WAFMC was awarded level 3 PCMH designation in 2014, the highest level of certification offered by NCQA.

### *Creation of an adult depression registry*

Three inclusion criteria were used to create a registry of adult patients with depression, as follows: 1)  $\geq 18$  years of age; 2) diagnosis of MDD, dysthymic disorder, or depressive disorder not otherwise specified (ICD-9 codes 299.xx, 300.4, or 311, respectively) on a patient’s ongoing problem list; and/or 3) diagnosis of depression (using the same preceding ICD-9 codes) for a patient visit within the last 2 years. The EHR used by WAFMC (Epic Systems, Verona, WI, USA) enables automated searches of patients using those criteria. This resulted in 1465 patients on the initial registry, representing 21% of the patient population. The primary medicine clinicians (physicians and physician assistants) were then asked to inspect their lists of registry patients and update the lists if they thought a patient no longer met the criteria for a diagnosis of depression. The primary medicine clinicians were also asked to add depression to the problem lists of any other patients for whom they thought it appropriate. The team established a protocol in which the registry was updated and sent out to the medical providers on a quarterly basis. The creation and updating of the registry was overseen by the first author. Initially, the first author received one spreadsheet for the entire clinic, culled the spreadsheet, and sent individualized reports to each medical provider of the patients on his/her panel who were also on the depression registry. A recent innovation, the depression



reporting workbench (described below), greatly simplified this task.

### *Selection of evidence-based treatment guidelines*

The decision was made to standardize the treatment of depression in adults by the selection of a single evidence-based guideline for all medical providers. The guideline selected was published by the Institute for Clinical Systems Improvement (ICSI) [12]. To increase the medical clinician's awareness of the guidelines, a template was created for insertion in the EHR under the depression diagnosis in the registry patients' problem lists. The template includes a brief summary of the major points of the guidelines, as well as a hyperlink to the entire ICSI monograph. The template also includes information pertinent to depression (e.g., past medical problems and history of psychiatric hospitalization), which was filled out by the medical provider. The medical assistants were charged with ensuring that the templates were updated.

### *Establishment of point of care procedures*

To ensure that relevant information was obtained and distributed to patients during their actual medical visits, several point of care procedures were put into place. First, an EHR template for a depression-oriented visit was created, which included questions, such as whether or not the patient is responding to treatment, and if not, what the barriers are. Second, patient education handouts pertaining to depression were created within the EHR to be inserted into the patients' after visit summary and printed for the patients. The handouts included self-management strategies and community resources for people suffering from depression. Third, a standardized measure (the PHQ-9) for quantifying symptom severity was selected.

The PHQ-9 was developed by Spitzer et al. [24], and is in the public domain. It consists of 9 questions based on the DSM-IV criteria for MDD and is commonly used internationally as both a screening measure and an instrument to track the severity of depression [25, 26]. The PHQ-9 has been translated into Chinese [27, 28]. A protocol was established so that patients on the depression registry are administered a PHQ-9 once a year (at a minimum) and at every depression-related

appointment. All PHQ-9 scores were entered into a searchable field in the EHR.

### *Patient outreach*

To ensure that patients on the depression registry complete the PHQ-9 at least yearly, registry patients' most recent scores on that test were run quarterly. Any patient who had not had a PHQ-9 score recorded within the last year received a call from a registrar, informing him/her that he/she was overdue for an appointment with his/her primary care physician to discuss depression. The registrar then offered to schedule an appointment. A standardized script was created for these outreach calls.

### *Creation of a protocol to screen for depression*

To better identify new cases of depression, protocols were established to screen all new WAFMC patients for depression when they had their initial visits in the facility and to screen all established WAFMC patients on a yearly basis. The instrument selected to screen for depression is the PHQ-2, a 2-question (depressed mood and anhedonia) variant of the PHQ-9 [29]. A Chinese version has been used in Hong Kong [26]. Patients who endorse either symptom are then administered the PHQ-9. The decision of whether or not to diagnose the patient with depression, thus placing them on the depression registry, is made by his/her medical provider.

### *Creation of a depression reporting workbench*

The WAFMC EHR is administered by the University of Wisconsin Medical Foundation (UWMF), an umbrella group that manages all of the clinical facilities affiliated with the University of Wisconsin Medical School. Recently, the UWMF created a depression "reporting workbench" within the EHR. This workbench will facilitate the maintenance of the WAFMC depression registry. While this development occurred after WAFMC received its PCMH designation, it is worth describing here because the workbench illustrates the capabilities of EHRs in population-based care. The workbench allows individual providers to generate, on demand, reports of all of his/her patients on the depression registry. The report includes, among other options, the date and score of the patient's most recent PHQ-9 assessment, the last date he/she received a prescription



for an antidepressant, the last hospital admission date, and whether or not the patient has a known substance abuse problem. The workbench thus allows individual medical providers to look at the registries of their own patients without requiring the intercession of an administrator. The workbench also allows administrators to run reports of all of the clinicians under his/her jurisdiction to determine compliance with the protocols described above and to generate reports of the clinic as a whole.

Because this is a report of a quality improvement process, it does not require institutional review board approval.

### Discussion

In this article we have described the development of a population-based program for the management of depression in a primary care setting. This program is based on viewing depression as a chronic disease and follows the principles of the patient-centered medical home. While we described only one clinic's experience, we believe that with two caveats it has applicability to other primary care settings.

The first caveat is that the system we developed is highly dependent on our EHR. We do not think that we would not have had the resources to develop and maintain the patient registry without an EHR. The fact that the diagnostic categories in patients' problems list are searchable allowed us to easily establish and update the registry of patients with the relevant diagnostic codes for depression. Further, the fact we were able to conduct searches to determine when patients were last administered the PHQ-9 allows us to determine who is overdue for a depression-focused visit with his/her primary care physician and to reach out to them to set up an appointment. The creation of the depression reporting workbench further simplified the administrative aspects of these tasks in that the reports to the individual medical providers no longer had to be culled by the first author to get the reports to the right people. The workbench further allows the individual clinicians to very conveniently run their own depression registry reports so that they can monitor the status of their own panels of depressed patients.

The second caveat about the applicability of our program to other settings is that it required flexibility of roles and responsibilities of some clinic personnel. The senior author, who provided direct psychological care for >35 years, redefined himself, in part, as an administrator of the depression database

and outreach program. Similarly, the medical assistants had to adapt to their new responsibilities of ensuring that the patients' problem list templates were updated. Finally, the registrars had to adjust to their new role of reaching out to patients who were overdue for depression-oriented appointments. It is our opinion that all these personnel successfully made these transitions because they understood the value of these changes; however, we feel the transition to the new system may not have gone smoothly had the personnel not been as flexible with respect to their roles and responsibilities.

This report was descriptive in nature. It is too soon to determine whether or not the program we described will lead to improved patient outcomes. That is a question we hope to explore in the future.

### Conflict of interest

The authors declare no conflict of interest.

### Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

### References

1. World Federation for Mental Health. Depression: a global health crisis. 2012.
2. Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, et al. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *J Am Med Assoc* 2003;289:3095–105.
3. Gu L, Xie J, Long J, Chen Q, Chen Q, Pan R, et al. Epidemiology of major depressive disorder in mainland China: a systematic review. *PLoS ONE* 2013;8:1–9.
4. American Psychiatric Association, DSM-V Task Force. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*. Washington, DC: American Psychiatric Association; 2013.
5. World Health Organization. *The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines*. Geneva: World Health Organization; 1992.
6. Commission on Social Determinants of Health, World Health Organization. *Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health* [Internet]. World Health Organization; 2008. Available from: [www.who.int/social\\_determinants/thecommission/finalreport/en/](http://www.who.int/social_determinants/thecommission/finalreport/en/).



7. World Health Organization. Preventing suicide: a global imperative. Geneva; 2014.
8. Holt R, de Groot M, Golden S. Diabetes and depression. *Curr Diab Rep Springer US* 2014;14:491–9.
9. Kurian BT, Grannemann B, Trivedi MH. Feasible evidence-based strategies to manage depression in primary care. *Curr Psychiatry Rep* 2012;14:370–5.
10. Tylee A. Identifying and managing depression in primary care in the United Kingdom. *J Clin Psychiatry* 2006;67 Suppl 6:41–5.
11. Gaynes BN, Warden D, Trivedi MH, Wisniewski SR, Fava M, Rush AJ. What did STAR\*D teach us? Results from a large-scale, practical, clinical trial for patients with depression. *Psychiatr Serv* 2009;60:1439–45.
12. Mitchell J, Degan B, Haight B, Kessler D, Mack N, Mallen E, et al. Adult Depression in Primary Care Guidelines [Internet]. 2013. pp. 1–131. Available from: [www.icsi.org/\\_asset/fnhdm3/Depr-Interactive0512b.pdf](http://www.icsi.org/_asset/fnhdm3/Depr-Interactive0512b.pdf).
13. World Health Organization. Prevention of mental disorders: effective interventions and policies options, Summary Report. 2004.
14. Gallimore C, Kushner K. A pharmacist-guided protocol for improved monitoring of patients on antidepressants. *WMJ* 2013;112:124–8.
15. Smolders M, Laurant M, Verhaak P, Prins M, van Marwijk H, Penninx B, et al. Adherence to evidence-based guidelines for depression and anxiety disorders is associated with recording of the diagnosis. *Gen Hosp Psychiatry* 2009;31:460–9.
16. Mojtabai R, Olfson M. National patterns in antidepressant treatment by psychiatrists and general medical providers: results from the national comorbidity survey replication. *J Clin Psychiatry* 2008;69:1064–74.
17. Kessler R, Stafford D. Primary care is the de facto mental Health System. Collaborative medicine case studies. New York, NY: Springer New York; 2008. pp. 9–21.
18. Andrews G. Should depression be managed as a chronic disease? *Brit Med J* 2001;322:419–21.
19. Monroe SM, Harkness KL. Is depression a chronic mental illness? *Psychol Med* 2012;42:899–902.
20. Wagner EH, Austin BT, Von Korff M. Organizing care for patients with chronic illness. *Milbank Q* 1996;74:511–44.
21. Katon W, Von Korff M, Lin E, Unutzer J, Simon G, Walker E, et al. Population-based care of depression: effective disease management strategies to decrease prevalence. *Gen Hosp Psychiatry* 1997;19:169–78.
22. Arend J, Tsang-Quinn J, Levine C, Thomas D. The patient-centered medical home: History, components, and review of the evidence. *Mt Sinai J Med* 2012;79:433–50.
23. Edwards ST, Bitton A, Hong J, Landon BE. Patient-centered medical home initiatives expanded in 2009–13: providers, patients, and payment incentives increased. *Health Aff* 2014;33:1823–31.
24. Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary care evaluation of mental disorders. Patient health questionnaire. *JAMA* 1999;282:1737–44.
25. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med* 2001;16:606–13.
26. Yu X, Stewart SM, Wong PTK, Lam TH. Screening for depression with the Patient Health Questionnaire-2 (PHQ-2) among the general population in Hong Kong. *J Affect Disord* 2011;134:444–7.
27. Wang W, Bian Q, Zhao Y, Li X, Wang W, Du J, et al. Reliability and validity of the Chinese version of the Patient Health Questionnaire (PHQ-9) in the general population. *Gen Hosp Psychiatry* 2014;36:539–44.
28. Chen S, Chiu H, Xu B, Ma Y, Jin T, Wu M, et al. Reliability and validity of the PHQ-9 for screening late-life depression in Chinese primary care. *Int J Geriatric Psychiatry* 2010;25:1127–33.
29. Arroll B, Goodyear-Smith F, Crengle S, Gunn J, Kerse N, Fishman T, et al. Validation of PHQ-2 and PHQ-9 to screen for major depression in the primary care population. *Ann Fam Med* 2010;8:348–53.