

# Improving Medical Care for Persons With Serious Mental Illness: Challenges and Solutions

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A critical step in addressing excess medical morbidity and mortality in persons with serious mental illness is to better understand and seek to improve the medical care that they receive. Medical quality deficits for persons with serious mental illness include problems related to overuse of certain medical services, such as emergency room care; underuse of some evidence-based general medical services; and misuse, or medical error. The origins of poor quality care for persons with mental disorders are rooted in interrelated contributory factors from patients, providers, and the medical and mental health care systems. At a system level, at least 4 types of separation between mental and medical health care may exacerbate the problems for persons with serious mental illnesses: (1) geographic (lack of co-located medical and mental health services), (2) financial (separate funding streams for medical and mental health services), (3) or ganizational (difficulty in sharing information and expertise across these systems), and (4) cultural (providers' focus on particular symptoms or disorders, rather than on the patients with those problems). Research studies and demonstration programs for improving medical care in this population have spanned a continuum of medical provider involvement from psychiatrist and patient training to on-site consultation by medical staff, multidisciplinary collaborative care approaches, and facilitated linkages between community and mental health and medical providers. Ultimately, it will be important to develop, test, and implement a range of models for improving the medical care of persons with serious mental disorders that are tailored to patients' needs, mental health system capacities, and local community resources.

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Mental health consumers, providers, and policymakers have recently awakened to a public health crisis among persons with serious mental illness.<sup>1</sup> Persons with serious mental illness are dying as much as 25 years younger than the general population, most often due to medical causes, in particular, cardiovascular disease.<sup>2</sup> Multiple risk factors, including physical activity, smoking, medication side effects, and the toxic effects of abused substances, may lead to and exacerbate medical comorbidity in these patients.<sup>3</sup> These patients are doubly challenged by the fact that they often receive a substandard quality of care for these conditions. Thus, a critical step in addressing morbidity and mortality in this population is to better understand and seek to improve the medical care that they receive.

This review will attempt to delineate more appropriate and effective ways of addressing the medical care needs of this vulnerable population. Three interrelated issues will be addressed: (1) evidence for the poor quality of medical care in this group of patients; (2) factors, particularly system-based factors, that underlie this deficiency; and (3) the evidence base that supports various approaches for improving medical care in these patients.

## SPECTRUM OF CARE IN SERIOUS MENTAL ILLNESS

In its National Roundtable on Quality of Care, the Institute of Medicine<sup>4</sup> described 3 general types of quality problems: over-

use, underuse, and misuse. *Overuse* is defined as obtaining too much of the "right" type of services, such as the inappropriate use of antibiotics. *Underuse* is defined as not enough use of these evidence-based services, such as underutilization of preventive treatments. Finally, *misuse*, a term commonly used interchangeably with medical error, involves the right type of services delivered in the wrong way, at the wrong time, or to the wrong person.

Katon et al.<sup>5</sup> have shown that persons with major depression (23.5%) or generalized anxiety disorder (21.8%) are "high utilizers" of health care, indicating overuse of certain medical services. Other studies<sup>6,7</sup> have reported that persons with serious mental disorders use the medical emergency room at rates far higher than the general population, suggesting a problem of overuse for this population as well.

Similarly, persons with mental disorders may be at risk for underuse of evidence-based medical services. Studies have identified potential deficits in cardiovascular care,<sup>8-10</sup> hypertension treatment,<sup>11</sup> use of preventive services,<sup>12,13</sup> adherence to medication regimens,<sup>14</sup> and care for diabetes<sup>15-17</sup> in this patient population. Recent results using the baseline data from 1460 subjects in the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) schizophrenia study<sup>18</sup> found that appropriate medical treatment was not received by 30.2% with diabetes, 62.4% with hypertension, and 88.0% with dyslipidemia. Underuse of evidence-based treatments may explain as much as 50% of the excess mortality rate seen after myocardial infarction in persons with mental disorders.<sup>19</sup>

Finally, persons with mental disorders may be at elevated risk for medical errors. In a recent study,<sup>20</sup> hospitalized patients with schizophrenia were found to have elevated rates of postoperative sepsis, respiratory deep vein thrombosis, and respiratory failure, suggesting the potential misuse of medical services.

## POTENTIAL CAUSES OF POOR QUALITY CARE

Substandard medical care for persons with serious mental illness is likely to result from a range of contributory factors from patients, providers, and the health care system. The presence of

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a significant psychiatric disorder may adversely impact social and cognitive skills, including the ability to communicate with clinicians.<sup>21-23</sup> Lack of motivation may reduce patients' ability to initiate and follow through with medical treatment. Fearfulness and distrust also may make patients wary about engaging in medical care.

Provider factors include challenges on the part of both primary care physicians and mental health providers. Primary care physicians may feel uncomfortable treating persons with serious mental illness.<sup>24</sup> Psychiatrists and other mental health care providers may lack the knowledge or experience to provide medical care for their patients.<sup>25</sup> Also, psychiatrists and primary care providers alike often work under extreme time constraints and competing demands that may make them unable or unwilling to provide additional services.<sup>26</sup>

Health care system factors also make a substantial contribution to the problem of poor quality care in persons with serious mental disorders. Although some of these factors represent fragmentation within mental health care systems, many are a result of the separation of the medical and mental health systems of care.<sup>27,28</sup> There are at least 4 types of separation between the 2 systems: geographic, financial, organizational, and cultural. Geographic separation results from the fact that, particularly in the public sector, mental health and medical services are rarely provided by the same facility. As a result, a patient is required to go to 2 or more different places for treatment, which requires motivation, time, and money.

The present health care system also creates a financial separation between the medical and mental health systems of care. Mental health organizations often experience difficulty in obtaining reimbursement for delivery of routine screening and medical services.<sup>29</sup> For example, Medicaid may not pay for these services outside of medical facilities, and State mental block grants for the uninsured typically are even more restrictive. Financial separation typically creates externalities—situations in which services are paid for by 1 sector, but economic benefits accrue elsewhere.<sup>30</sup> For example, a proposed rationale for providing early screening and preventive services for persons with serious mental illness is that these services have the potential to reduce unnecessary emergency room visits and inpatient medical admissions.<sup>31</sup> From a strictly financial perspective, this argument may encourage leaders at a community mental health center to avoid providing screening and preventive services if the resulting monetary savings flow only to the local medical center or emergency room.

Organizational separation may manifest as impediments to communication and coordination between medical and mental health systems, often as a result of a lack of policies for sharing information.<sup>32</sup> For example, the absence of a shared chart can limit medical and psychiatric providers' awareness of each other's prescription directives, including orders for new medications, dosage changes, or treatment discontinuations. Mental health systems are particularly reluctant to share information about their patients, often wrongly assuming that regulations, such as the Health Insurance Portability and Accountability Act (HIPAA), proscribe this communication.<sup>32</sup>

Lastly, cultural separation results from the fact that medical and mental health providers and organizations are typically oriented toward providing care for particular conditions, rather than for the persons with those conditions. Community mental health

centers and state mental health authorities may see themselves as responsible for treating only their patients' mental conditions, rather than their full physical and mental needs. Only recently have these organizations begun to accept a broader range of responsibility for addressing the health and well-being of the patients they serve. The 2003 President's New Freedom Commission<sup>33</sup> has called for the mental health system to replace its narrow focus on symptom reduction with a broader emphasis on recovery, including patients' overall functioning and quality of life.

### SYSTEM-BASED STRATEGIES FOR IMPROVING CARE

Each of the barriers just described suggests potential system-level solutions. Geographic separation can be addressed through the co-location of mental health and primary care services within the same facility. Some real-world examples of this approach include staff model health maintenance organizations (HMOs), such as Group Health at Puget Sound and Kaiser Permanente; the U.S. Veterans Administration (VA) Health System; and much of the National Health Service in the United Kingdom.<sup>34-36</sup> However, given the decentralized nature of medical and mental health practices in the United States, it is unlikely that co-location is a realistic alternative for all sites. Furthermore, although there may be fewer disparities in care in sites such as those of the VA that already co-locate medical and mental health care, there remains substantial room for improvement in the quality of medical care for persons with mental disorders at these sites.<sup>10,37</sup>

Financial separation can, in theory, be addressed by carving-in services in which 1 group takes financial and/or administrative responsibility for all mental and medical health care services. For instance, some community mental health centers have obtained licenses to provide single-source care for their clients. However, studies<sup>38</sup> have shown that integrating funding streams alone is often insufficient to result in integration at a clinical level. To have a positive impact on care, financial integration needs to be part of a broader quality improvement strategy.

A third system-level strategy to improve health care has focused on addressing the issue of organizational separation through improvements in information sharing. The VA services provide an example of a system with fully integrated electronic health records.<sup>39</sup> The most substantial challenge associated with fully shared health records is balancing the benefits of improved information transfer with the need to preserve patient privacy.<sup>40,41</sup> Specifically, while it is important for medical providers to have access to certain patient information (such as medications), defining access to potentially more sensitive information (such as clinical notes) remains a legal and ethical challenge. In other systems, it may be possible to develop a portable, hand-held, medical record that patients can carry between medical and mental health providers. However, 2 randomized trials in the United Kingdom<sup>42,43</sup> were unable to demonstrate a benefit to patients, largely because of the failure of clinicians and patients to use the records on a regular basis.

A final system-level strategy is to address cultural separation issues by improving accountability for medical care among mental health providers.<sup>44,45</sup> Examples of this strategy include the requirement that mental health providers keep a complete list of health problems for each patient and the use of quality assessment or accreditation measures that track the extent of coordination

**Table 1. Strategies to Improve Medical Care in Persons With Serious Mental Illness: A Continuum of Involvement of Medical Providers<sup>a</sup>**

Strategy	Involvement of Medical Providers	Requirements	Potential Sites
Training for patients or staff	Low	Time; training; motivated trainees	Sites with co-located clinicians
On-site medical consultation	Intermediate	Sufficient flow of patients to support medical consultant	Inpatient mental health and addiction settings
Collaborative care	Intermediate	Regular contact between medical and mental health/addiction staff	Staff model HMOs; VA Centers; some CMHCs
Facilitated referral to primary care	High	Adequate community medical resources; mechanism for linkage between the systems	Free-standing mental health and substance use clinics

<sup>a</sup>Based on Bower and Gilbody.<sup>47</sup>

Abbreviations: CMHCs = community mental health centers, HMOs = health maintenance organizations, VA = Veterans Administration.

between mental health clinicians and general medical providers. These are likely to be important, but not sufficient, strategies for improving medical care in this population.

### EVIDENCE-BASED MODELS

As outlined above, system “fixes” can be important steps in improving medical care for persons with severe mental disorders. However, any such changes are unlikely to be sufficient for substantially improving care in the psychiatric population. Furthermore, most patients, providers, and health care organizations will continue to operate under the constraints of the current systems, with ongoing barriers to obtaining high quality medical care.

Is it possible, under these imperfect conditions, to improve medical care for the psychiatric patient population? This is the question that “real-world” effectiveness trials seek to address. To date, only a handful of effectiveness trials<sup>44–46</sup> have assessed strategies to improve medical care in patients with behavioral disorders. However, the results from these trials<sup>46</sup> are quite promising, demonstrating that a range of strategies appear to be effective in improving linkage with, and quality of, medical care and improving self-reported health outcomes in groups with higher levels of baseline medical comorbidity.

Analogous to conceptual models for organizing approaches for treatment of depression in primary care, models for improving medical care in persons with mental illnesses can be organized along a continuum from less to more involvement on the part of mental health care providers (Table 1).<sup>47</sup> At 1 end of the continuum, training programs may provide psychiatrists with the skills to diagnose and provide care for certain medical conditions. Although some investigators<sup>44,45</sup> initially proposed that psychiatrists with appropriate training could provide the bulk of medical care for persons with severe mental illness, this approach has not been widely adopted in routine practice for a variety of workforce and logistic reasons. Nonetheless, psychiatrists and other mental health providers are likely to play an important role in ensuring that patients receive appropriate screening and follow-up medical care, even if they do not directly provide these services.

A second approach that requires minimal input from medical providers trains patients in self-management<sup>48</sup> and/or therapeutic lifestyle change strategies.<sup>49,50</sup> Studies<sup>3</sup> in this area have demonstrated considerable potential to reduce lifestyle risk factors, such as poor diet, smoking, and obesity, in persons with serious mental illness. This approach is likely to be most useful as an adjunct to, rather than a replacement for, formal medical treatment.

In medical consultation models, a part-time or full-time medical consultant comes on-site to provide for the medical needs

of patients. This approach has been tested in several inpatient studies,<sup>51,52</sup> in which it has been shown to improve the quality of medical care substantially. Inpatient settings are likely to be the most appropriate sites for these consultative approaches, because they are relatively isolated (patients cannot travel offsite) and have sufficient economies of scale to support hiring a part- or full-time medical consultant.

The most widely tested approach to providing medical care for persons with serious mental or substance use disorders falls under the category of “collaborative care models,” in which care is delivered by multidisciplinary teams made up of both internists and mental health or substance use specialists.<sup>53–56</sup> These models are analogous to evidence-based approaches to treating depression in primary care, which have been shown to improve quality and outcomes in a range of study settings and across a variety of patients groups.<sup>57</sup> Like collaborative care approaches for the treatment of depression, multidisciplinary models have been most widely tested in quasi-integrated systems of care, such as the VA system and staff model HMOs. These settings already have a number of favorable conditions for integrating care—geographic co-location of medical and mental health services, financial integration of funding streams, shared medical records, and a close proximity between providers that can help break down cultural barriers to the provision of shared care. Implementing collaborative care models in other settings may be more challenging, but at least for depression in primary care, these models have proven to be feasible and cost-effective.<sup>58–61</sup>

Finally, under facilitated referral models,<sup>62</sup> a mental health facility can hire a care manager to provide linkage and coordinate follow-through with medical care in a community medical setting. These models are the simplest and least costly programs to implement in free-standing mental health settings such as community mental health centers. They do, however, depend on the availability of a high-quality community mental health provider and effective linkages between mental health and community medical provider organizations. The National Institute of Mental Health (NIMH) is currently funding a large study in Atlanta to test the effectiveness of this approach.

### CONCLUSION

It is probably most helpful to think of integration not as a “1-size-fits-all” solution, but rather as a process that needs to be tailored to the clinical and organizational features of any given mental health setting.<sup>46</sup> The recent Institute of Medicine report “Improving the Quality of Health Care for Mental and Substance-Use Conditions”<sup>32</sup> called for all organizations to “transition along a continuum of evidence-based coordination

models...[and] adopt models to which they can most easily transition from their current structure.” Mental health organizations need to take stock of their patients’ needs, internal capacities, and local community resources and determine what steps they can take to improve patients’ health and health care.

*Disclosure of off-label usage:* The author has determined that, to the best of his knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

## REFERENCES

1. Parks J, Hester T, Karp S, et al. Morbidity and Mortality in People With Serious Mental Illness, Slides 071006. Alexandria, Va: National Association of State Mental Health Program Directors, Medical Directors Council, July 2006. Available at: <http://www.nasmhpd.org/.../Summer%202006%20commish/NASMHPD%20Morbidity%20and%20Mortality%20Slides%20071006.pdf>. Accessed Nov 4, 2006
2. Colton CW, Manderscheid RW. Congruencies in increased mortality rates, years of potential life lost, and causes of death among public mental health clients in eight states. *Prev Chronic Dis* 2006;3:A42
3. Compton MT, Daumit GL, Druss BG. Adverse health behaviors among individuals with serious mental illnesses: a preventive medicine perspective. *Harv Rev Psychiatry* 2006;14:212–222
4. Chassin MR, Galvin RW. The urgent need to improve health care quality. Institute of Medicine National Roundtable on Health Care Quality. *JAMA* 1998;280:1000–1005
5. Katon W, Von Korff M, Lin E, et al. Distressed high utilizers of medical care: DSM-III-R diagnoses and treatment needs. *Gen Hosp Psychiatry* 1990;12:355–362
6. Hackman AL, Goldberg RW, Brown CH, et al. Use of emergency department services for somatic reasons by people with serious mental illness. *Psychiatr Serv* 2006;57:563–566
7. Salsberry PJ, Chipps E, Kennedy C. Use of general medical services among Medicaid patients with severe and persistent mental illness. *Psychiatr Serv* 2005;56:458–462
8. Druss BG, Bradford DW, Rosenheck RA, et al. Mental disorders and use of cardiovascular procedures after myocardial infarction. *JAMA* 2000;283:506–511
9. Young JK, Foster DA. Cardiovascular procedures in patients with mental disorders. *JAMA* 2000;283:3198
10. Petersen LA, Normand S-LT, Druss BG, et al. Process of care and outcome after acute myocardial infarction for patients with mental illness in the VA health care system: are there disparities? *Health Serv Res* 2003;38:41–63
11. Wang PS, Avorn J, Brookhart A, et al. Effects of noncardiovascular comorbidities on antihypertensive use in elderly hypertensives. *Hypertension* 2005;46:273–279
12. Druss BG, Rosenheck RA, Desai MM, et al. Quality of preventive medical care for patients with mental disorders. *Med Care* 2002;40:129–136
13. Thorpe JM, Kalinowski CT, Patterson ME, et al. Psychological distress as a barrier to preventive care in community-dwelling elderly in the United States. *Med Care* 2006;44:187–191
14. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. *Arch Intern Med* 2000;160:2101–2107
15. Desai MM, Rosenheck RA, Druss BG, et al. Mental disorders and quality of diabetes care in the Veterans Health Administration. *Am J Psychiatry* 2002;159:1584–1590
16. Frayne SM, Halanych JH, Miller D, et al. Disparities in diabetes care: impact of mental illness. *Arch Intern Med* 2005;165:2631–2638
17. Kreyenbuhl J, Dickerson FB, Medoff DR, et al. Extent and management of cardiovascular risk factors in patients with type 2 diabetes and serious mental illness. *J Nerv Ment Dis* 2006;194:404–410
18. Nasrallah HA, Meyer JM, Goff DC, et al. Low rates of treatment for hypertension, dyslipidemia and diabetes in schizophrenia: data from the CATIE schizophrenia trial sample at baseline. *Schizophr Res* 2006;86:15–22
19. Druss BG, Bradford WD, Rosenheck RA, et al. Quality of medical care and excess mortality in older patients with mental disorders. *Arch Gen Psychiatry* 2001;58:565–572
20. Daumit GL, Pronovost PJ, Anthony CB, et al. Adverse events during medical and surgical hospitalizations for persons with schizophrenia. *Arch Gen Psychiatry* 2006;63:267–272
21. Bowie CR, Harvey PD. Cognition in schizophrenia: impairments, determinants, and functional importance. *Psychiatr Clin North Am* 2005;28:613–633
22. Elliot GR, Smiga S. Depression in the child and adolescent. *Pediatr Clin North Am* 2003;50:1093–1106
23. McPartland J, Klin A. Asperger’s syndrome. *Adolesc Med Clin* 2006;17:771–788
24. Lester H, Tritter JQ, Sorohan H. Patients’ and health professionals’ views on primary care for people with serious mental illness: focus group study. *BMJ* 2005;330:1122
25. Newcomer JW, Nasrallah HA, Loebel AD. The Atypical Antipsychotic Therapy and Metabolic Issues National Survey: practice patterns and knowledge of psychiatrists. *J Clin Psychopharmacol* 2004;24(5 suppl 1):S1–S6
26. Jaen CR, Stange KC, Nutting PA. Competing demands of primary care: a model for the delivery of clinical preventive services. *J Fam Pract* 1994;38:166–171
27. Bartels SJ. Caring for the whole person: integrated health care for older adults with severe mental illness and medical comorbidity. *J Am Geriatr Soc* 2004;52(suppl 12):S249–S257
28. Horvitz-Lennon M, Kilbourne AM, Pincus HA. From silos to bridges: meeting the general health care needs of adults with severe mental illnesses. *Health Aff (Millwood)* 2006;25:659–669
29. Koyanagi C. Get It Together: How to Integrate Physical and Mental Health Care for People with Serious Mental Illness. Washington, DC: Bazelon Center for Mental Health Law; 2004
30. Labelle RJ, Hurley JE. Implications of basing health-care resource allocations on cost-utility analysis in the presence of externalities. *J Health Econ* 1992;11:259–277
31. Friedmann PD, Hendrickson JC, Gerstein DR, et al. Do mechanisms that link addiction treatment patients to primary care influence subsequent utilization of emergency and hospital care? *Med Care* 2006;44:8–15
32. Institute of Medicine, Committee on Crossing the Quality Chasm: Adaptation to Mental Health and Addictive Disorders. Improving the Quality of Health Care for Mental and Substance-Use Conditions. Washington, DC: The National Press; 2006. Available at: <http://www.nap.edu/catalog/11470.html#toc>. Accessed Nov 3, 2006
33. President’s New Freedom Commission on Mental Health. Achieving the Promise: Transforming Mental Health Care in America. Executive Summary. Rockville, Md: US Dept of Health and Human Services; 2003. Publication SMA-03–3831. Available at: <http://www.mentalhealthcommission.gov/reports/FinalReport/downloads/downloads.html>. Accessed Nov 5, 2006
34. Walshe K, Smith J, Dixon J, et al. Primary care trusts. *BMJ* 2004;329:871–872
35. Quirk MP, Simon G, Todd J, et al. A look to the past, directions for the future. *Psychiatr Q* 2000;71:79–95
36. Kizer KW, Demakis JG, Feussner JR. Reinventing VA health care: systematizing quality improvement and quality innovation. *Med Care* 2000;38(6 suppl 1):I7–I16
37. Desai MM, Rosenheck RA, Druss BG, et al. Mental disorders and quality of diabetes care in the Veterans Health Administration. *Am J Psychiatry* 2002;159:1584–1590
38. Goldman HH, Morrissey JP, Rosenheck RA, et al. Lessons from the evaluation of the ACCESS program: access to community care and effective services. *Psychiatr Serv* 2002;53:967–969
39. Perlin JB, Kolodner RM, Roswell RH. The Veterans Health Administration: quality, value, accountability, and information as transforming strategies for patient-centered care. *Am J Manag Care* 2004;10:828–836
40. Tang PC, Ash JS, Bates DW, et al. Personal health records: definitions, benefits, and strategies for overcoming barriers to adoption. *J Am Med Assoc* 2006;13:121–126
41. Anderson JG. Social, ethical and legal barriers to E-health. *Int J Med Inform* 2006;Oct 23 [Epub ahead of print]
42. Warner JP, King M, Blizard R, et al. Patient-held shared care records for individuals with mental illness: randomized controlled evaluation. *Br J Psychiatry* 2000;177:319–324
43. Lester H, Allan T, Wilson S, et al. A cluster randomized controlled trial of patient-held medical records for people with schizophrenia receiving shared care. *Br J Gen Pract* 2003;53:197–203
44. Golomb BA, Pyne JM, Wright B, et al. The role of psychiatrists in primary care of patients with severe mental illness. *Psychiatr Serv* 2000;51:766–773
45. Shore JH. Psychiatry at a crossroad: our role in primary care. *Am J Psychiatry* 1996;153:1398–1403
46. Druss BG, von Esenwein SA. Improving general medical care for persons with mental and addictive disorders: systematic review. *Gen Hosp Psychiatry* 2006;28:145–153
47. Bower P, Gilbody S. Managing common mental health disorders in

- primary care: conceptual models and evidence base. *BMJ* 2005;330:839–842
48. Klam J, McLay M, Grabke D. Personal empowerment program: addressing health concerns in people with schizophrenia. *J Psychosoc Nurs Ment Health Serv* 2006;44:20–28
  49. Brar JS, Ganguli R, Pandina G, et al. Effects of behavioral therapy on weight loss in overweight and obese patients with schizophrenia or schizoaffective disorder. *J Clin Psychiatry* 2005;66:205–212
  50. McKibbin CL, Patterson TL, Norman G, et al. A lifestyle intervention for older schizophrenia patients with diabetes mellitus: a randomized controlled trial. *Schizophr Res* 2006;86:36–44
  51. Umbricht-Schneiter A, Ginn DH, Pabst KM, et al. Providing medical care to methadone clinic patients: referral vs on-site care. *Am J Public Health* 1994;84:207–210
  52. Rubin AS, Littenberg B, Ross R, et al. Effects on processes and costs of care associated with the addition of an internist to an inpatient psychiatry team. *Psychiatr Serv* 2005;56:463–467
  53. Willenbring ML, Olson DH. A randomized trial of integrated outpatient treatment for medically ill alcoholic men. *Arch Intern Med* 1999;159:1946–1952
  54. Druss BG, Rohrbaugh RM, Levinson CM, et al. Integrated medical care for patients with serious psychiatric illness: a randomized trial. *Arch Gen Psychiatry* 2001;58:861–868
  55. Weisner C, Mertens J, Parthasarathy S, et al. Integrating primary medical care with addiction treatment: a randomized controlled trial. *JAMA* 2001;286:1715–1723
  56. Saxon AJ, Malte CA, Sloan KL, et al. Randomized trial of onsite versus referral primary medical care for veterans in addictions treatment. *Med Care* 2006;44:334–342
  57. Gilbody S, Whitty P, Grimshaw J, et al. Educational and organizational interventions to improve the management of depression in primary care: a systematic review. *JAMA* 2003;289:3145–3151
  58. Wells KB, Sherbourne C, Schoenbaum M, et al. Impact of disseminating quality improvement programs for depression in managed primary care: a randomized controlled trial. *JAMA* 2000;283:212–220
  59. Unutzer J, Katon W, Callahan CM, et al. Collaborative care management of late-life depression in the primary care setting: a randomized controlled trial. *JAMA* 2002;288:2836–2845
  60. Rost K, Nutting P, Smith JL, et al. Managing depression as a chronic disease: a randomised trial of ongoing treatment in primary care. *BMJ* 2002;325:934–939
  61. Dietrich AJ, Oxman TE, Williams JW Jr, et al. Re-engineering systems for the treatment of depression in primary care: cluster randomised controlled trial. *BMJ* 2004;329:602–605
  62. Samet JH, Larson MJ, Horton N, et al. Linking alcohol- and drug-dependent adults to primary medical care: a randomized controlled trial of a multi-disciplinary health intervention in a detoxification unit. *Addiction* 2003;98:509–516