

PATHWAYS Annotated Bibliography – Interventional Study Arm

Pathways Randomized Controlled Trial: This trial tested the effect of a collaborative care intervention versus usual primary care in improving the quality of depression care, depressive and diabetes outcomes, and medical costs in 329 patients with depression and diabetes.

Katon W, Lin EHB, Von Korff M, et al. Integrating depression and chronic disease care among patients with diabetes and/or coronary heart disease: the design of the TEAMcare study. *Contemp Clin Trials* 2010 Mar 26 [Epub ahead of print]. This paper describes the methodology and design issues involved in developing a new model of care to treating patients with diabetes and/or heart disease and comorbid depression with poor medical disease control (HbA1c >8.5, SBP >140, LDL >130).

Katon W, Von Korff M, Lin EHB, et al. The Pathways Study: A randomized trial of collaborative care in patients with diabetes and depression. *Arch Gen Psychiatry* 61:1042-9, 2004. A total of 329 primary care patients with diabetes and major depression and/or dysthymia were randomized to a nurse collaborative care (CC) intervention versus usual care. Patients in the intervention group were provided enhanced education and support of antidepressant medication prescribed by the primary care physician or problem-solving treatment delivered in primary care by a nurse. When compared to usual care patients, intervention patients showed greater improvement in adequacy of dosage of antidepressant medication treatment in the first 6-month [OR = 4.15 (95% CI 2.28-7.55)] and second 6-month periods [OR = 2.90 (95% CI 1.69-4.98)], less depression severity over time ($p < .004$), a higher rate of patient-rated global improvement at 6 months [Intervention 69% vs. Usual Care 39.3%, OR = 3.50 (95% CI 2.16-5.68)] and 12 months [Intervention 71.9% vs. UC 42.3%, OR = 3.50 (95% CI 2.14-5.72)], and higher satisfaction with care at 6 months ($p < .03$) and 12 months ($p < .002$). Although depressive outcomes improved, no differences in HbA1c, outcomes were observed between intervention and usual care patients. The lack of effect on HbA1c, despite improvement in depression, suggests that further trials need to focus on a multimodal intervention that addresses depression, behavioral risk factors and diabetes disease control.

Ciechanowski P, Russo J, Katon W, et al. The association of patient relationship style and outcomes in collaborative care treatment for depression in patients with diabetes. *Medical Care* 44:283-91, 2006. Patients in the Pathways intervention trial were divided into the two attachment groups based on a standardized attachment scale: those with an independent style who often have more problems collaborating with physicians and the medical system and those with a more interactive style. Among independent-style patients, those receiving the intervention had 47 more depression-free days ($p < .0003$) and greater satisfaction with depression care ($p < .05$) compared to those receiving usual care. There were no significant differences in depression outcomes or satisfaction with care between intervention and usual care groups in patients with a more interactive style. These data suggest that collaborative care is most effective in patients with maladaptive attachment styles who have problems partnering with their primary care physician and medical system.

Lin EHB, Katon W, Rutter C, et al. Effects of enhanced depression treatment on diabetes self-care. *Ann Fam Med* 4:46-53, 2006. The Pathways collaborative care intervention was associated with a significant improvement in quality of depression care and improvement in depressive outcomes over a 2-year period compared to usual care. This paper found that, despite improvements in depressive outcomes in intervention compared to usual care patients, there was no evidence of improvement in exercise,

cessation of smoking, diet, or in adherence to disease control medication in intervention versus control patients. However, patients enrolled in collaborative care had significantly lower BMI at 12 months compared to controls ($p < .01$).

Kinder L, Katon W, Russo J, et al. Improving depression care in patients with diabetes and multiple complications. *J Gen Intern Med* 21:1036-41, 2006. This secondary analysis compared outcomes of collaborative care versus usual care in patients with diabetes with 2 or more diabetes complications compared to those with 0 to 1 complication. The Pathways collaborative care intervention was more successful in reducing depressive symptoms compared to usual primary care in patients with 2 or more diabetes complications ($p < .05$). Patients with less than 2 diabetes complications experienced similar reductions in depressive symptoms in both intervention and usual care groups. These data suggest that collaborative care is most effective in patients with the greatest severity of diabetes (and other medical comorbidity) where competing priorities may make it difficult for the primary care doctor to focus on effective treatment for depression.

Simon G, Katon W, Lin EHB, et al. Cost-effectiveness of systematic depression treatment among people with diabetes. *Arch Gen Psychiatry* 64:65-72, 2007. Depression co-occurring with diabetes is associated with higher health services costs, suggesting that more effective depression treatment might reduce the use of other medical services. Among 329 depressed patients with diabetes, a collaborative care intervention was associated with a mean of 61 additional depression-free days (95% CI 11 to 82) and had outpatient costs that averaged \$314 less (95% CI -\$1007 to \$379) compared to usual care patients. Thus, improvement of depression outcomes in patients with diabetes is associated with a high likelihood of cost-offset effect.

Katon W, Russo J, Von Korff M, et al. Long-Term Effects on Medical Costs of Improving Depression Outcomes in Patients with Depression and Diabetes. *Diabetes Care*, 31(6) 1155-9, 2008. Patients in the collaborative care group of the PATHWAYS interventional study had improved depression outcomes and trends for reduced 5 year mean total medical costs compared to usual care patients. Thus the Pathways depression collaborative care program improved depression outcomes compared to usual care with no evidence of greater long-term costs, and with trends for reduced costs among the more severely medically ill patients with diabetes.