Improving Mental Health and Addressing Mental Illness: Collaborative Care for the Management of Depressive Disorders

Summary Evidence Table – Economic Review

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
Authors Ciechanowski et al 2004 **Location** Metro Seattle, WA **Population** Seniors **Design** RCT RCT of community and home-based care of elderly for minor depression: Program to Encourage Active, Rewarding Lives for Seniors (PEARLS) **Economic Method** Average cost analysis – program cost only.	**Population** Elderly =>60 recruited from i. those receiving services from senior service agencies or in public housing or ii. Self-referred from letters mailed to residents/clients of public housing or collaborating agencies. **Inclusion** Group (i) screened using PRIME-MD and group (ii) had second screening through Structured Clinical Interview for DSM-IV (SCID). Those with minor depression or dysthymia were eligible. By recruitment source they were low income. Note there was significant difference in dysthymia between interv (61%) and control (35%), controlled in the analysis. **Sample Size and Demographics** Intervention – 72 Control – 66 Female-76%; Age -73; Minority-43%; Black-36%; Dysthymia-49%; Minor depression-51%. **Time Horizon** Recruitment during Jan'00 to May'03. Outcomes assessed at baseline, 6, and 12 months. Utilization assessed 6 months before, 6 after, and 12 months after baseline. 1-year intervention with Interv Phase with in-Person Contacts – 19 weeks; Followup phase by phone – 33 weeks	**Intervention** Home-based care with community agency collaboration for elderly with focus on Problem Solving Therapy (PST): 19 weeks in person contacts (mean actual 6.6) and 33 week follow-up with telephone contacts (mean actual 3.5). **1.** Therapists trained in PST: lectures, video, role-play, and training manual **2.** Pleasant activities between sessions **3.** PST modified to include physical activity and social activity **4.** Therapists provided feedback on actual sessions 8 sessions of in-home therapy during first 19 weeks of 50 minutes each **5.** 33 week follow-up with monthly phone contact **6.** Weekly or biweekly team meetings to discuss cases, attended by all therapists and the study	Depression measured by Patient Health Questionnaire (PHQ-9) regularly. Also, by HSCL-20 at 6 and 12 months. Effects measured by mixed effects regression. Odds of =>50% decrease in HSCL-20 scores: 6 months – 14.2; 12 months – 5.21 Odds of complete remission: 6 months – 7.39; 12 months – 4.96	**Providers** PST delivered by 3 masters-level social workers, of whom 1 serving 1 patient replaced by RN with PST training at end of recruitment period. **Program Cost** No program cost details provided, but includes personnel salaries, travel time, therapist and psychiatrist contacts, depression management sessions, PST trainer and quality control. **Per person program cost (n=72)**: PST Sessions-$538 Follow-up calls – $36 Psychiatrist calls – $15 Psychotherapy quality control – $111 Depression	**Health Care** No health care costs averted estimated or reported in monetized form. Authors assign indicator variables for hospital, ER, and more than 5 outpatient visits. **Productivity** No productivity losses estimated or reported. **Base Year** No base year provided. Use mid year of intervention (=2002) and MCPI (MCPI – 1.275) for 2008$.	**Economic Summary Measure** No summary economic measures reported beyond per patient program cost. **Summary Findings** **1.** Partnering with community agencies can reduce depression among isolated and poor elderly **2.** Significantly lower severity and greater remission for intervention at 6 and 12 months. **3.** Non-significant increase in depression from 6 to 12 months (authors say it may be due to decrease in non-specific contacts after 19 weeks) **4.** Functional and emotional well-being improved but physical and social well-being not significantly different between interv. and control. **5.** Interv. group less likely to report hospitalization **Limitations** **1.** Small sample **2.** Single metro area **3.** Self-reported utilization **4.** Can't separate

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		psychiatrist **7.** For those not showing improvement, psychiatrist makes contact with GP or patient directly to discuss and change treatments. **Comparison** For usual care controls, diagnosis sent to GP with recommendation to continue primary care		management – $103 Total - $803		effects of intervention components **5.** Baseline proportion of dysthymia very different though randomized. This was controlled for during the analysis.
Authors Dickinson et al. 2005 **Location** Multiple sites in USA **Population** **Design** RCT Original RCT is Rost 2002 and the Quest program. **Economic Method** Average cost model.	**Population** See Pyne 2003 for details. This study looks at a subsample of the intervention and control groups who had data on whether they presented with only physical complaints or with at least 1 psychological complaint at the index visit. The purpose is to determine if they have different clinical and utilization outcomes. Subsample has 200 patients. Authors don't provide the counts within intervention and control groups and the counts within subgroups based on presentation style. **Demographics** Mean Age-43; Fem-84%; White-47%; <=HS-20%; Employed-63% **Time Horizon** The utilization outcomes are analyzed over 2 year period. Original recruitment occurred in 1996-1997.	See Pyne 2003 for details.	There was improvement in clinical outcomes for those with physical and psychological complaints, compared to usual care. There was no improvement in clinical outcomes for those with physical complaints only.	**Program Cost** Details are in Pyne 2003 for program cost components. Within Table 2, authors report the per patient cost of intervention to be about $408 over 2 years for this subsample.	**Health Care** Self-reported health care utilization is provided in summary column along with intervention cost. Mean Outpatient Plus Intervention Costs over 2 Years for those presenting with psychological/physical complaints: Intervention group- $4,607 Control Group - $5,584 Mean Outpatient Plus Intervention Costs over 2 Years for those presenting with physical complaints: Intervention group- $4,216	**Economic Summary Measure** No economic summary measure provided or calculated. **Summary Findings** During 2 years, interv. group with psych/phys complaints reduced outpatient plus interv. costs by $1,368 compared to usual care, while improving clinically. During 2 years, interv. group with physical complaints increased outpatient plus interv. costs by $1,924 compared to usual care, while showing no clinical improvement. In sensitivity analysis with bootstrapping, cost savings exceeded intervention costs 92% of the time for the

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					Control Group - $2,683 **Productivity** No productivity measured. **Base Year** No base year reported. Will use 2000 as base, about 1 year after intervention, and MCPI (MCPI – 1.396) for 2008$.	group with psych/physical complaints. The corresponding % for those with physical complaints only was 2%.
Authors Domino et al. 2008 **Location** Multiple (9) US sites **Population** Seniors =>65 years **Design** Original RCT is Bartels 2004, Krahn 2006, Oslin 2006 **Economic Method** Cost Analysis – health care utilization	**Population** Patients =>65 screening positive for depression or alcohol or referred by PCP. Patients range from major to minor depression, dysthymia, panic and anxiety disorder, and alcohol abuse. Sites are 30 PCPs and 19 MH/SA specialist clinics (4 VA centers, 2 community health centers, 3 hospital networks). Original RCTs had 24,930 screened, interv.=999 and control=1023. Of these, 1460 with depression, 414 with alcohol dependence, and 148 with MH disorders or at risk for alcohol. **Inclusion** Cost study includes only those completing 3 and 6 month assessment and with administrative data, resulting in interv.=579 and control=603. **Demographics** White-61%; Hisp-17%; Black-14%; Asian-8%. Female-32% Represent rural, urban, and suburban. Medicare – 88%, Medicaid-26%, No insurance – 1%	Intervention is called Primary Care Research in Substance Abuse and Mental Health for the Elderly (PRISM-E) **Enhanced Specialty Referral (ESR)** Treated Comparison Group- Mandatory referral to specialty external MH/SA clinics; Rapid appointments; Follow-up for missed appointments; Assured transportation; Communication link back to PCP. **Integrated Care (IC)** Intervention Group Includes all features of the ESR group but also requires collocated MH/SA clinic. Staff must have Masters or	**Health Effects are published in 3 previous studies** Bartels 2004 – IC participants more likely to utilize treatments offered Krahn 2006 – Depression severity declined over 6 months but IC and ESR arms had no significant difference Oslin 2006 – For those with major depression, ESR showed greater reduction in depression severity than IC (Counter to expectations?)	No program costs provided	**Health Care** From self-reports at 3 and 6 months regarding past 3 months use. Separate behavioral health utilization identified. Baseline Adjusted 6 Month Total Expenditure for Depression: Non-VA System - $4,338 for IC and $4,196 for ESR VA System - $7,365 for IC and $8,165 for ESR Baseline Adjusted 6 Month Total Expenditure for Major Depression: Non-VA System - $4,691 for IC and $4,854 for ESR VA System - $8,324 for IC and $7,440 for ESR Baseline Adjusted 6 Month Total	**Economic Summary Measure** No economic summary reported beyond utilization. **Summary Findings** There was no statistically significant difference in total cost or in MH/SA costs between IC and ESR groups in either VA or non-VA settings. Only difference found was higher behavioral health care costs in IC in the VA setting. **Limitations** No program costs No productivity effects Only health care utilization No summary measures computable Older population may not be generalizable.

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	Time Horizon Study period March 1 '00 to March 30 '02. Assessment at 3 and 6 months after baseline.	PhD.			Expenditure for Depression: Non-VA System - $234 for IC and $267 for ESR VA System - $977 for IC and $580 for ESR Baseline Adjusted 6 Month Total Expenditure for Major Depression: Non-VA System - $277 for IC and $315 for ESR VA System - $1,276 for IC and $618 for ESR **Productivity** No productivity effects considered. **Base Year** Base year is 2002 (MCPI=1.27 for 2008$).	
Authors Ell et al. 2008 **Location** Los Angeles, CA UCLA Medical Center **Population** Predominantly Hispanic adult cancer patients **Design** RCT with treated control. Based on ADAPt-C collaborative care model. **Economic Method**	**Population** Patients =>90 days after diagnosis of cancer with baseline PHQ-9 score=>10 (major depression) or DSM-IV 2 questions indicating dysthymia. Predominantly low income **Exclusions** Usual exclusions with =>6 months expected life and ability to speak English/Spanish. **Demographics** Hispanic with no HS education; All over 18 years age; Female-84%; Age=>50-49%; Mean PHQ-9=13.09; Mostly foreign born; 72% with Un-staged or Stage I or II cancer.	**Intervention** ADAPt-C collaborative care model adapted from IMPACT stepped care model. **1.** Offered patient choice of problem solving therapy (PST), antidepressant medication (AM), or both. **2.** Staff include supervisory/prescribing Psychiatrist, Cancer Depression Clinical Specialist (CDCS), Social Worker with	Analysis was **'intent to treat'** **Main Effect** % of patients who show more than 50% reduction in **PHQ-9** score. **At 6 Months** Interv. – 82 (49%) Control – 63 (41%) Difference was stat insignificant at	**Program Costs** Only mean program cost provided and only for intervention group. Per person program cost for intervention group per year = **$566** Cost includes: **1.** CDCS **2.** Navigation services **3.** Telephone	**Health Care** No health care costs considered. **Productivity** No productivity effects considered. **Base Year** No base year provided. Use publication year minus 2 and MCPI (MCPI=1.08 for 2008$)	**Economic Summary Measure** None provided or computable **Limitations** Only program costs provided and only for intervention group and not for treated comparison. Effect measures don't allow for calculation of cost-effectiveness Possibility that effect of intervention is simply due to the removal of barriers to care for this low-income, low

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Cost Analysis	**Sample** Intervention – 242 Control – 230 **Time Horizon** No dates for intervention provided. Maintenance and telephone contacts up to 12 months after acute treatment. Follow-up at 6 and 12 months.	Masters, Patient Navigator, Oncologist **3.** Algorithmic stepped care and protocol-driven PST **4.** CDCS-manned telephone relapse prevention/maintenance **5.** Outcome monitoring over 12 months **6.** Initial visit with CDCS included psychiatric/psychosocial assessment, AM education, and choice of PST/AM **7.** Treatment monitoring and revision of treatment **8.** Psychiatrist-CDCS have weekly meetings to review patient treatments **9.** Website used for care management by CDCS and psychiatrist **10.** About 6-12 weeks of weekly PST sessions with homework. **Comparison** Note that Controls were 'Enhanced Usual Care' who received screening; oncologist informed about depression diagnosis; provided referrals to MH services and to community social services.	6 months **At 12 Months** Interv. – 91 (63%) Control – 57 (50%) With OR=1.98 and CI (1.16, -3.38)	and in-person supervision **4.** Evaluation and prescriptions by psychiatrist **5.** Educational brochures and relaxation tapes. (No mention about CDCS/Psychiatrist meetings, website etc)		education group with a serious and costly co-morbidity. Is the effect of intervention on depression patients with cancer generalizable to those without other illness?

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Authors Grypma et al. 2006 **Location** San Diego, CA **Population** One group age=>60 And the other with all adults. **Design** RCT Original RCT is Unutzer 2002. **Economic Method** Economic method is cost analysis comparing only the utilization costs, which probably includes inpatient care for intervention.	**Population** Patients from 2 clinics in the Kaiser Permanente system in San Diego, part of original RCT. **Sample** Original RCT group=141 and Post Study (PS) group=297. **Demographics** RCT had only those >=60 (mean=72) while PS has all adults (mean=63). Men were 19% in RCT and 8.4% in PS. **Time Horizon** HMO implementation 3 years after RCT completed. Analysis performed on data for 6 month after baseline.	This study implements the original RCT in an HMO setting, post study (PS) group, and compares outcomes to the RCT intervention group (RCT). **Continuation of RCT Plan:** Depression care manager (DCM) supervised by psychiatrist and general practice expert to assist each GP. DCM gives patient education; medication management; brief psychotherapy; relapse prevention. Web-based management of tracking contacts, treatment, and outcomes **PS added the following:** Optional group education Medical assistant to assist with tracking and records Original RCT offered for 6 months. PS offered for 6 months and option to extend for 12 months by patient. Length of treatment was patient choice.	RCT used HSCL-20 for control group and both HSCL-20 and PHQ-9 for interv. group for depression scores. PS used PHQ-9. Hence, comparison is possible only for PS against intervention group from RCT. RCT achieved 50% improvement in depression scores at 6 months. Statistical analysis shows no difference at 6 months between RCT and PS groups, implying similar 50% improvement. Same improvement holds when sample is restricted to those =>60.	**Program Cost** No mention of program costs. However, the cost of intervention may be included in the calculation of utilization or health care costs.	**Health Care** Mean Annual Health Care Costs: RCT - $9,332 in intervention versus $10,082 in usual care. In PS - $8,771 Note the costs in PS were lower than both intervention and control groups in the original RCT. However, the difference was not statistically significant due to large group variances. **Productivity** Productivity losses averted not considered. **Base Year** Base year reported is 2004. Use MCPI (1.174 for 2008$) for health care costs.	**Economic Summary Measure** No summary economic measures reported. This study reported only health care utilization and depression outcomes. Other plausible reasons for improvement: Additional medical assistant for tracking and referrals. Additional group education option Self-determined duration of participation **Limitations** Different instruments for depression measurement in RCT's control group and PS Same DCM and GP treated RCT and PS groups implying internal validity but not external No learning curve during PS phase No discussion of program costs and reviewers assume it is included in the health care utilization measure The PS program evolved and implemented partly because of residual money from original grant.

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Authors Kominski et al 2001 Oslin et al 2004 Note Oslin 2004 is same intervention with longer follow-up **Location** 9 Veterans Administration Medical Centers (VAMC) in US: Loma Linda; Long Beach; West LA; West Haven , CT; Miami; Tampa; Bay Pines, FL; Albany; Brockton, MA. **Population** Age >59 years **Design** Before-After with Comparator **Economic Method** Total cost model for utilization.	**Population** Recruited age >59 years from new hospital admissions for medical/surgical problems from VA system. **Inclusion** Screened for depression, anxiety, or alcohol disorder (measured with MHI, SF-36, AUDIT). Randomized those eligible, and not currently undergoing MH treatment, to usual care or Unified Psychogeriatric Biopsychosocial Evaluation and Treatment (UPBEAT). **Sample** Oslin 04: Control-1324; UPBEAT-1313 Kominski 01: Control-873; UPBEAT-814 **Demographics** Caucasian – 71%; Male – 96.5%; Age – 69.7+/-6.6 years. Note MH cases were mild to moderate. **Time Horizon** Oslin 04 followed up health effects at 6, 12, and 24 months. Kominski 01 followed up health effects and utilization at 6 and 12 months. Recruitment during March '95 to Dec '98.	**Intervention** Primarily a screening intervention with collaborative care. UPBEAT patients receive: 1. Psychogeriatric assessment 2. Care manager 3. Team of nurse, psychiatrist, psychologist, social worker 4. Training for staff 5. Health education and healthy life choices for patients 6. Assist with removal or barriers to care 7. Treatment plan 8. Follow up by phone or in person. **Comparison** Comparator is usual care which may include pharmacology and referrals to MH.	Oslin 04 finds significant improvement in MH based on several measures (SF36, MHI-D, AUDIT) for both UPBEAT and usual care with much of the effect evident at 6 months. This effect is sustained at 12 and 24 months. However, there is no significant difference between UPBEAT and usual care groups. Note that loss to follow up was about 40% (mainly due to death and withdrawal of consent).	**Program Cost** Not provided. The out-patient utilization must contain some of the program components.	**Health Care** Utilization reported only at 12 months before and 12 months after by Kominski 01. Data does not include utilization of non-VA providers. Current hospitalization costs included because UPBEAT starts after discharge. Includes patients with zero utilization but excludes those with hospitalizations >30 days. **Difference in outpatient costs before 12 months and after 12 months:** Upbeat: $3055 Usual: $1357 Intervention effect: $1698 **Difference in inpatient costs before 12 months and after 12 months:** Upbeat: -$6519 Usual: -$2130 Intervention effect: -$4389 Larger UPBEAT cost for out-patient because of phone contacts, psychiatric, and social work visits.	**Economic Summary Measure** No summary measures provided. **Summary Findings** Authors conclude from insignificant health effects of UPBEAT that intervention may not be worthwhile for non-treatment-seeking hospitalized elderly veterans. **Limitations** Concern that follow up with patients just hospitalized for medical/surgical procedures would naturally improve in MH symptoms after discharge and treatment? Concern why 24 month utilization of care was not performed in Oslin 04 to mirror Kominski 01.

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					This difference may be considered program cost, at least partially. **Productivity** No productivity effects reported. **Base Year** No base year provided. Use 1999, mid-point and MCPI (MCPI=1.45 for 2008$)	
Authors Lo Sasso et al. 2006 **Location** Multiple US sites **Population** Age 38-40 **Design** RCT Based on effectiveness study, Rost 2001 **Economic Method** Economic analysis is Cost-Benefit and ROI from employer perspective.	**Population** From 12 community primary care practices without onsite mental health. **Inclusion** Recruited based on DSM-IIIR meeting 5 of 9 criteria for major depression. **Sample** Econ evaluation on 198 with full follow-up and consistently employed. **Demographics** 85% female, 14% minority, age 38-40, Insured 85%, mean depression 6.7. **Time Horizon** Program occurred during April 96 – Sept 97, with follow-up at base, 6, 12, 18, 24 months with response of 92%, 86%, 77%, 73%.	**Intervention** **1.** Training for physicians and care managers about enhanced care **2.** Encourage patients to get psychotherapy or pharmacotherapy **3.** Telephone follow-up for adherence and to determine if GP meeting needed **4.** Monthly review of patient summaries by GP. **Comparison** Comparator with no regular care manager contacts and physician not informed about depression scores.	Note that health effects not discussed in this study. Focus is on productivity and absences effect on firm level productivity. The effects are provided in per treated worker and aggregate with little transparency how estimates were computed from results.	**Program Cost** Rost 2000 contains detailed cost and breakdown. No details provided. Company total is simply per worker value multiplied by 5% of hypothetical 1000 employees who seek depression treatment. Training is fixed cost for 10 sites assumed to be $5,825 per site. 2 Year Company Cost: Training - $58250 Enhanced treatment - $18000 Treatment - $42509	**Health Care** No averted health care costs estimated or reported. **Productivity** No details provided. 2 Year Productivity Impacts: Absenteeism - $103,126 Productivity - $373,875 Total - $477,000 **Base Year** Base year is 2000 for earnings and authors use CPI (CPI-1.250; MCPI-1.396 for 2008$)	**Economic Summary Measure** Authors perform sensitivity analysis based on impact on company productivity through different multipliers of wage rate of 1, 1.26, and others. Net-Benefit of Treatment (Benefit minus Cost) Where ROI = (B-C)/C Based on various multiplier values: Net benefit (ROI) Multiplier 1.0 - $358,230 (302%) Multiplier 1.26 - $482263 (406%) Based on sensitivity analysis of worst-case scenarios for turnover, measurement error etc, ROI ranges from 20% to 132%. Authors conclude the enhanced treatment saves money for the employer.

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				Total - $118,759		**Limitations** **1.** Lack of transparency in cost and benefit calculations from trial results **2.** Small trial of 12 practices **3.** Self-reported outcomes **4.** Health outcomes and health care utilization not accounted **5.** Hypothesized effects due to 5% of 1000-strong firm seeking depression treatment
Authors Matalon et al. 2002 **Location** Israel **Design** Before-after uncontrolled pilot program. **Economic Method** Average cost model.	**Population** N=40 referred patients from all 45 family practices within an HMO for a community in Israel. First 40 referrals recruited. Physicians asked to refer those difficult and frequent users, especially with multiple somatic complaints or psychological symptoms who don't accept interpretation. **Demographics** Female – 77.5%; Age -52; 35% less than HS and 10% with degrees. Major depression -47%; Minor depression – 38%; No mental diagnosis – 4% **Time Horizon** Date of intervention not provided. Appears to be 1-year intervention. Follow-up at least 1 year after 1st encounter.	**Intervention** Comprehensive intervention with: 1st Encounter: **i.** 3 questionnaires at 1st interview a. PRIME-MD b. Dartmouth Coop Chart functional assessment c. MOS SF-36 health and functional assessment. **ii.** Medical and psychological interview and trace family genogram **iii.** Physical exam followed by medical narrative interwoven with personal and family bio presented to social worker in presence of patient. Subsequent to 1st encounter: **i.** Individually tailored therapeutic	The authors measured only physician satisfaction with patient-physician relationship; health care utilization; health care costs. The physician satisfaction increased from 4.7 to 8 (Scale 0 to 10)	**Providers** Staffing: **a.** Family physician with psychiatric training (16 hrs/week) **b.** Medical social worker (6 hrs/week) **c.** Senior psychiatrist with oversight but no patient contact. Clinic functioned 2 days per week. **Program Cost** Authors report "The yearly costs of our clinic were $19,097." No details are provided and the amount appears small given scope of intervention.	**Health Care** Per patient cost of health care dropped from $5,633 to $1,621. Drawn from chart review and area HMO price list. **Productivity** No productivity losses estimated or reported. **Base Year** Reported in US$. No base year reported. Use MCPI and 2000, 2 years before publication year (MCPI-1.396 for 2008$)	**Summary Economic Measure** No summary economic measures reported. See health care utilization and physician satisfaction. **Limitations** **1.** Can't rule out time as factor in mental health improvement **2.** Unclear if change sustained beyond 1-year follow-up **3.** Cost of program reported by authors appears underestimate given scope of the intervention and staffing.

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		strategy developed with patient participation consisting of 10 encounters of 1 hour each to include: psychological/psychiatric referrals; pharmacological treatments; alternate medicine; participation of GP encouraged **ii.** Letter summary to GP following 1st encounter and at end of intervention.				
Authors Pyne et al. 2003 Original effectiveness is Rost 2000. **Location** Multiple states in US (n=10). **Design** Cluster (block) randomized. **Economic Method** Cost effectiveness model analysis.	**Population** 12 general practices without mental health on-site in 6 blocks of practice patterns and 1 randomized to intervention from each block. **Sample and Inclusion** N=479 patients recruited with score =>5 on Inventory to Diagnose Depression (IDD) (Zimmerman 1988); of which 211 beginning new treatment and 111 stated that antidepressants would be useful to treat depression. **Time Horizon** Recruited in 1996-97 and followed up at **6** and **12** months. Analytic horizon is **12** months.	**Intervention** **1.** Physicians and nurse managers in 4 telephone training sessions about AHRQ guidelines for depression treatment. Nurse had additional 8 hour training on depression education, assessment, and patient monitoring. **2.** Acute phase – Index meeting and average of 5.2 contacts with nurse during ~7 weeks after index. Physician included in index meeting. **3.** Continuing phase – extended over average of **9** months after index with about 4.0 nurse contacts for monitoring. Physicians received	Note all analysis is for those stating that antidepressants would be acceptable therapy (n=111) See summary column. Depression scales at 6 and 12 months converted to QALYs. Depression scales used Center for Epidemiological Study-Depression (mCES-D) as in Rost 2001, and HRQOL measured by Medical Outcomes	**Providers** Each practice had 2 physicians and 1 administrative assistant participating in study. The intervention practices added an office nurse as care manager. **Program Costs** Rost 2000 contains detailed cost and breakdown. Program costs from 'accountant perspective'. Training costs to include trainee time; airfare; meals; lodging;	**Health Care** Health care expenditures (past 6 months) from self-reported responses at 6 and 12 month follow-up, including: hospital days; ER visits; primary and mental health GP visits; psychotropic medications. Health care utilization not provided separately by authors. Only provide the net cost. Female Net Health Cost Per Person: Interv: $2,895 Usual: $2,089 Difference: $806 Male Net Health Cost Per Person: Interv: $2,799	**Summary Economic Measure** Analysis performed for Main (Base) case and additional scenarios. Base case excludes training costs and productivity losses due to illness, but includes the cost of travel time and transport to obtain treatment, and adverse effects. Main Summary Females:$6,555/ QALY Males: Not effective Other Scenarios Add productivity costs: female-$6,464/QALY; male-$18,835/QALY **Conclusion:** Intervention costs more but is cost-effective and below standard threshold for females while ineffective for males (conjecture that it is due to adverse effects of treatment)

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		monthly patient and treatment summaries. **Comparison** No care manager Physician not informed about depressed patients. No monthly summaries to physician.	Study SF-36. Brazier 1998 used to convert index to QALY as area under the curve.	manual. Implementation costs to include screening; preparation for delivery; intervention delivery; post-session record keeping; communication among providers; supervision. Acute and continuing phase costs (**12** months): Implementation - $163 per capita Training - $309 per capita **Productivity** Included in scenario and sensitivity analysis.	Usual: $2,811 Difference: -$13 **Base Year** Base year is 2000. Reviewers used CPI for all categories. (CPI - 1.250 MCPI – 1.396 for 2008$)	**Weaknesses:** Small sample size – especially for males

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Authors Pyne et al 2005 **Location** Multiple sites in USA. **Design** RCT Original RCT is Rost 2000 and details available in Pyne 2003. **Economic Method** Cost effectiveness analysis with program cost and utilization	**Population** Details in Pyne 2003. **Sample** A subsample from original RCT was drawn of those persons with information on receptivity to psychotherapy and antidepressants. Antidepressant Receptive Interv. – 63 Control – 48 Antidepressant Non-Receptive Interv. – 52 Control – 48 **Demographics** Antidepressant receptive group more likely depressed at baseline; more likely Caucasian than usual care. Antidepressant non-receptive younger; more likely with dysthymia and co-morbidity; and more receptive to counseling. Counseling receptive group more likely to be antidepressant receptive.	**Intervention** Details in Pyne 2003 Receptivity to antidepressants derived from Likert-type responses to question, "How acceptable is it to you to use antidepressant drugs?" Similar question posed about receptivity to counseling. Receptivity variables are dichotomous for ease of interpretation.	QALY calculated based on depression measure. Details in Pyne 2003. See incremental QALY in summary column.	**Program Costs** Rost 2000 contains detailed cost and breakdown. Authors state the intervention cost over **12** months= $223 per capita Training cost=$212 per capita Total cost=$436 per capita	**Health Care** Health care utilization excludes the cost of in-patient care but includes patient time to obtain treatment. See Pyne 2003 for details. Authors provide only the incremental (intervention+utilization) cost (see summary measure column). **Productivity** No productivity losses estimated or reported. **Base Year** Authors appear to have used base year 2000. (MCPI – 1.396 for 2008$)	**Summary Economic Measure** This study shows that the receptive groups produce favorable cost-effectiveness ratios while the non-receptive groups do not. Cost per QALY (Excludes Training Cost) Antidepressant Receptive - $8,186 Antidepressant And Counseling Receptive - $9,631 Antidepressant Or Counseling Receptive - $15,288 Cost per QALY (With Training Cost) Antidepressant Receptive - $11,629 Antidepressant And Counseling Receptive - $12,451 Antidepressant Or Counseling Receptive - $20,506 **Summary Findings** Receptivity to treatment at baseline appears to be important variable associated with favorable Cost/QALY. Patient preference for treatment appears to matter for outcomes. Ad hoc analysis showed that treatment in non-receptive patients associated with decreased self-worth measure (stigma?)

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Authors Reiss-Brennan et al. 2006 **Location** Salt Lake City, Utah **Design** Before-After with Comparator **Economic Method** Total cost model for utilization.	**Population** This is a stepped collaborative care implemented in general practices belonging to a HMO/PPO, Intermountain Healthcare (IHC) **Time Horizon** This is a pilot study with data from pre-intervention (1997-1999), 1 and half year lag, and post-intervention (2001-2003).	**Intervention** Stepped collaborative care in general practice. Non-financial incentives for GP to treat MH as part of everyday care MH training for GP and other staff. Tools for assessing MH and sharing electronic information with MH specialists Specialty care by advanced practice RN's and psychiatrists by phone or onsite Psychologists, nurses, and social workers can provide on-site brief cognitive-behavioral therapy Nursing care manager coordinates care, follows up with patients, psychiatrists, and therapists Advocacy and support from NAMI at no cost to patients Mental Health Registry with longitudinal data on patient history and treatment Web-based assessment tool accessible to patients/family and physician Web-based sharing	**Detection of Depression** At pre-intervention - ~7% for both groups Post-intervention - ~7% for non-integrated and ~9% for integrated clinics	**Providers** But mentions team composition: GP; Nurse care manager; Psychiatrist; Social worker; Psychologist. **Program Cost** Not provided.	**Health Care** Costs provided as time series graphs. Total claims costs slightly **lower** for integrated clinics in post-intervention period per adult patients (about $64-$127 difference). 'Depression claims' slightly **higher** for integrated clinics in post-intervention period per adult patient (about $165-$203 compared to $165) **Productivity** No productivity effects considered. **Base Year** No base year provided. Use 2002, midpoint in post-intervention and MCPI (MCPI=1.27 for 2008$)	**Summary Economic Measure** No summary measures provided or can be calculated. **Summary Findings** Overall conclusion is based on preliminary data – "MHI improved clinical outcome, increased depression detection rates, and improved patient satisfaction but did not increase health care claims costs" **Limitations** All data provided as time series graphical trends No program costs No productivity costs

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
		of patient history and treatment Electronic Medical records. **Comparison** 6 comparator clinics from the same urban area.				
Authors Reiss-Brennan et al. 2009 **Location** Salt Lake City, UT **Design** Retrospective cohort with treatment and usual care. **Economic Method** This is a purely health care utilization study	**Population** 18,587 patients identified with first time depression diagnosis between 2004 and 2006 within HMO - Intermountain Health HQ in Salt Lake City, UT with operations in UT and MT **Inclusion** Must have been continuously enrolled **12** months before and **12** months after identification. **Sample** Patients selected from 5 MHI and 8 non-MHI clinics, based on location of majority of claims. After removal of outliers in utilization (annual claims=>3 SDs of mean, ~$250K), final Treatment Group=796 and Usual Care=429. **Demographics** Age=>18 and <63. Female – 66-67%; Average age-39-42; Commercially insured. Patients classified in 3 complexities: depression only (~84%); depression plus 1 comorbidity (~15%); depression plus =>2 comorbidities.(~2%). **Time Horizon** Patients with Diagnosis between 2004-2006, and claims analyzed **12** months pre and **12** months post identification.	69 of the HMO's 130 GP clinics have mental health integrated (MHI) programs. See Reiss-Brennan 2006 for intervention description.	No health effects are discussed in this paper.	**Program Cost** No program costs provided. However, authors claim that internal study showed MHI was operating cost neutral in 3-4 years.	**Health Care** Utilization drawn from **12** months pre and **12** months post diagnosis claims. Claims increased for both groups. However, claims for all lines of service increase for MHI was 73% and 100% for usual care group. On the other hand, the MHI group had higher claims growth for psychiatry & counseling and antidepressants. Odds ratios analysis shows MHI group was 54% less likely to use ER and 49% less likely to use inpatient psychiatric care, both being expensive services. For patients with 1 co-morbidity, the usual care group had an increase of 100% while the MHI group had only an 8%	**Summary Economic Measure** No summary economic measure computed. **Limitations** No health effects reported No program cost Sample is younger and more insured than general population Some patients may have crossed over MHI to non-MHI clinics during analysis period No co-pays or deductibles considered

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
					increase. Authors conclude from reduced claims growth for MHI group that the system would have saved $323,342 if the usual care cohort had been treated in MHI clinics. **Productivity** No productivity effects considered. **Base Year** Base year is 2005 (MCPI=1.13 for 2008$)	
Authors Rost et al. 2005 Original effectiveness is Rost 2000. **Location** Multiple US sites (n=10) **Population** Patients from 12 general practices **Design** Cluster (block) randomized. **Economic Method** Cost effectiveness model analysis.	**Population** Patients from 12 general practices without mental health on-site in 6 blocks of practice patterns and 1 randomized to intervention from each block. **Sample** N=479 patients recruited with score =>5 on Inventory to Diagnose Depression (IDD) (Zimmerman 1988); of which 211 beginning new treatment. Analysis is for the 211 who were not currently being treated.	Intervention described in evidence tables for Pyne 2003, Lo Sasso 2006, and not repeated here. Difference from other studies on same intervention is the longer follow-up at **24** months.	The health effect of the intervention is measured by self-reported depression free days, which is converted to QALY using the literature-based formula: 1 depression free day (DFD) =0.00082 (0.3/365) QALY. See summary column.	**Program Cost** Rost 2000 contains detailed cost and breakdown. Per person costs: Screening - $44; Care Manager preps - $41; Record Keeping - $59; Care Manager Contacts - $76; Physician Reviews - $59; Care Manager to Physician communications - $7; Physician to Care Manager Communications - $23; Overheads- $93; Total for 2 years - $402;	**Health Care** Health care utilization does not include hospital days since this is a small group at large cost and similar for intervention and control. Health costs included primary care visits, mental health visits, ER, and medications. **Productivity** No productivity losses estimated or reported since this is captured by QALY derived from depression free days and full functionality. **Base Year**	**Summary Economic Measure** 2 perspectives: Social – program cost + outpatient costs + patient time and transport Health plan – program cost + outpatient costs Incremental QALY: In 2 years enhanced care had 647.6 depression free days (DFD) and usual care had 588.2, an increment of 59.4. Translated to QALY, the increment is 0.049 Incremental Cost: In 2 years, societal incremental cost is $876 and Health Plan incremental cost is $695. Note first year cost is much higher.

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
				Annual Cost - $201.	Authors use CPI and 2000 as base (CPI-1.250 for 2008$)	Incremental CEA: Ranges from $11,990 to $17,883 per QALY, where the lower bound is based on medications at generic prices. Acceptability curve analysis showed CEA would be less than $25K/QALY in 100% of the time. Authors note their 2 year estimates are less than their previous 1-year estimates because of greater QALY and health care savings from second year and longer term follow-up.
Authors Schoenbaum et al. 2004 **Location** Multiple US locations **Population** Multiple HMOs with large Hispanic population. **Design** Group randomized. **Economic Method** The present study conducts cost and cost-effectiveness over **24** months separately for White and Latino patients.	**Population** Details may be found in Wells 1999. 6 HMOs, with large Hispanic populations, participated. Types included staff and group HMOs, an independent physician network, and a public delivery system. Several sites had carve-outs. **Sample** 46 practices participated. HMOs were categorized into blocks based on socioeconomic factors, on-site MH staff, and provider specialty. Practices randomized to quality improvement arms QI-Med (n=424), QI-Therapy (n=489), or usual care (n=443). **Demographics** Analysis performed for 778 White and 398 Latinos. There were 180 from 'other race/ethnicity'. **Time Horizon**	**Intervention** Partners in Care (PIC) model detailed in Wells 1999. Note this study is related to Wells 2007, Schoenbaum 2001 and the original RCT discussed in Wells 1999 and Rubenstein 1999.	All effects are measured over 2 years. QALY-SF calculated based on responses to specific short form questionnaire developed for program. QALY-DB calculated from survey reported depression burden days based on method of Lave et al 1998. Based on literature, used 0.2-0.4 to convert a	**Program Costs** Per Patient **24**-month Latino Average Costs Usua1- $4,266; Incr. Cost for QI-Meds- $367; Incr. Cost for QI-Therapy- $213 (However, none significant) Per Patient 24-month White Average Costs Usual- $5,322; Incr. Cost for QI-Meds- $865; Incr. Cost for QI-Therapy- $993 (However, none significant)	**Health Care** Self-reported utilization. Note the cost of health care is included in the estimates provided in the program cost column. Health care costs increased for all intervention groups compared to usual care. Days missed from work based on employment status at beginning and end of each **6**-month period and multiplied by 116 (# workdays). Over 2 years, QI-Therapy increased White days of work	**Economic Summary Measure** Cost effectiveness-Latino QALY-SF QI-Meds-$122,413 QI-Therapy- $7,995 QALY-DB QI-Meds- $167,550 to $335,105 (Not Signif.) QI-Therapy- $3,404 to $6,810 Cost effectiveness-Whites QALY-SF QI-Meds-$37,950 QI-Therapy- $44,347 QALY-DB QI-Meds- $30,367 to $59,413 (Not Signif.) QI-Therapy- $29,240 to $58,482 **Findings Summary** At baseline, 22% of

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
	Mailed surveys followed up every **6** months for 2 years. Recruitment in 1996-97.		year of depression to loss of QALY. QALY-SF Latinos Incr. due to QI-Meds-0 .003 and due to QI-Therapy-0.0266 QALY-DB Latinos Incr. due to QI-Meds-0 .001 to 0.002 (Not Signif.) and due to QI-Therapy-0.0312 to 0.0625 QALY-SF Whites Incr. due to QI-Meds-0 .0228 and due to QI-Therapy-0.0224 QALY-DB Whites (Not Signif.) Incr. due to QI-Meds-0 .0142 to 0.0285 and due to QI-Therapy-0.017 to 0.034		by 27. The increment in both interventions for Latinos and QI-Med for Whites was 20 days, but none were significant. **Productivity** Days of work not monetized in ICER calculations. **Base Year** No base provided. Use 1998, the year of price lists used for per unit costs. (CPI- 1.321 MCPI – 1.504 for 2008$).	Latinos and 35% of Whites had appropriate depression care past **6** months. QI-Therapy was highly cost-effective for Latinos while QI-Meds was not. Both interventions were cost-effective for Whites. Effects on work were qualitatively large but statistically insignificant except for QI-Therapy for Whites. This paper finds overall that therapy is cost-effective. **Limitations** Self-reported outcomes. Productivity not included in ICER.
Authors Simon et al. 2007 **Location** Washington and Idaho	**Population** 9 primary care clinics of Group Health Cooperative (GHC) in Washington and Idaho. **Inclusion** Those with diabetes identified from	**Intervention** Intervention follows IMPACT model of stepped collaborative care. **1.** Multicomponent	Effectiveness defined as # depression free days (DFD) (Hopkins	**Program Costs** No overall program costs provided. Following per	**Health Care** In Year 1, interv. had $889 more in depression care and about $254 less in non-depress	**Economic Summary Measure** No summary measures provided. **Summary Findings** From the health care

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
Population Adults from primary care clinics **Design** RCT Original study is Katon 2004. RCT of collaborative care for depression with DM2 comorbidity. Also called PATHWAYS study. **Economic Method** Cost model for utilization.	electronic records and sent Patient Health Questionnaire (PHQ) for depression screening. Those scoring >=10 contacted for 2nd phone interview. Only untreated or unremitted depression is eligible. **Sample** N=329 agreed to enroll and 278 had complete data. **Demographics** Age-58; Female – 35%; White 71-80%; DM2 – 96%. High retention at **6** months -89%; **12** months – 88%; **24** months – 85%. Population includes those on Medicare, Medicaid, and low income. **Time Horizon** Study ran from March 01 to May 02, with active contacts **12** months after randomization. Follow-up at **3**, **6**, **12**, **24** months after randomization.	depression management in primary care with 3 registered nurses. **2.** Patient given choice of pharmacotherapy or psychotherapy. **3.** If less than 50% improvement in PHQ score in 12 weeks, adjust drugs or assess psychotherapy **4.** If no improvement in 24 weeks, patient offered in-person psychiatric consult or specialty MH care within GHC. **5.** Initial 60 minute interview with depression nurse **6.** 30 minute in-person or phone contact with depression nurse twice a month during acute phase. **7.** Later contacts dependent on clinical response and decrease to every **2** months after remission **8.** Active contacts up to **12** months after randomization. **Comparison** Comparator is usual care consisting of GP antidepressant treatment or referral to MH.	Symptoms Checklist: SCL<0.5 is depression free; SCL>2.0 is fully symptomatic) Mean depression score significantly lower for intervention compared to usual care at **6** months, and maintained at **12** and **24** months. Intervention had 20 more DFD's than usual care in year 1 and 33 more in Year 2. With baseline adjustment, incremental effectiveness was 61 DFD over 2 years.	unit costs drawn from cost accounts and budget at GHC. Supervision and IS support - $72 per person Salary+fringe+ 30% overhead used for staff In-person nurse visit - $100 per visit Nurse phone call - $39 per call Program cost is likely contained in the excess of out-patient costs for intervention compared to usual care during year 1.	care. In Year 2, interv. had about $127 more in depress care, but $1,778 less in non-depress care. In secondary analysis, in-patient + out-patient costs were about same – Interv. - $26,858 Usual - $28,268. The authors don't focus on in-patient costs because of the small sample size. Incremental costs are adjusted for demographics, 6-month prior utilization, and comorbidities where prior costs are truncated at 95%. Note that the intervention, based on utilization, is cost-saving for out-patient costs and slightly cost-saving for in-patient plus out-patient costs. **Productivity** No productivity effects reported. **Base Year** No base year provided. Use 2002 as base, mid year	utilization results, it may be stated that significant health effect is achieved without much higher direct treatment costs, and there is significant savings from non-depression care utilization. **Limitations** No direct report of program costs. Only utilization data from GHC. Focus on out-patient costs. No productivity effects. In-patient costs unreliable due to small sample. Authors report willingness to pay, but reviewers don't use them because they are hypotheticals and not directly from study participants.

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
					of **24** month follow-up and MCPI (MCPI=1.27 for 2008$)	
Authors Strong 2008 **Location** SE Scotland, UK **Population** Adults diagnosed with cancer **Design** RCT **Economic Method** Cost Utility	**Population** Large regional tertiary NHS cancer care center. Those with diagnosis of cancer and prognosis of at least **6** months. Screened for major depression by questionnaire and by phone- score => 1.75 on symptom checklist SCL-20. **Sample** 660 of 8,153 screened had depression. After refusals and exclusions, 99 randomized to usual care and 101 to intervention. Note 99 from interv. and 97 from usual care had **3** months data. **Demographics** Mean age – 56 with SD 11.9; Female – 71% **Time Horizon** Screening occurred Oct'03-Dec'05. Treatment length was **3** months and follow-up **3** months after treatment.	**Intervention** Pilot intervention. Intervention is usual care+: **1.** Maximum of ten 45-minute sessions with trained cancer nurse **2.** Depression and treatment education **3.** Problem-solving **4.** Coping with helplessness **5.**Communications with GP and oncologist; **6.** Three month follow-up with monthly phone calls **7.** GP makes all prescriptions **8.** Nurses undergo **3** month training; supervisory psychiatrist **9.**Nurse and psychiatrist meet weekly to discuss patient progress. **Comparison** Comparator is usual care where every patient in NHS has a GP and every cancer patient has an oncologist. Both physicians are informed about the depression diagnosis and given advice about antidepressants if requested.	**Primary Outcome – SCL-20** Baseline: Interv-2.35, Usual-2.25 **3** month: Interv-1.20, Usual-1.55 Standardized Mean Difference – 0.43 **Response to Treatment** SCL-20 decreased more than 50% for 53% in interv. and for 34% in usual care **Remission** Remission was 15% greater for interv. than in usual care. **QALY** Incremental QALY due to interv. over **6** months was 0.063 and over **12** months was 0.103	**Providers** Team composed of 3 cancer nurses and supervisory study psychiatrists. **Program Costs** Average cost of intervention reported at $425 Program Cost Components or Drivers For 101 interv. patients, average was 7 45- minute sessions over **3** months, with range from 2 to 10. Three patients had zero sessions. Weekly nurse and psychiatrist meetings. Follow-up over **3** months with monthly phone calls. Reports to GP and oncologist. Most sessions occurred in cancer center but 6% were by phone and 5% at patient' home.	**Health Care** Interv. had higher utilization of $39 ($285 vs $246) Pharma Value Intervention had higher pharma cost of $80 ($114 vs $34) **Productivity** No productivity effects reported. But may be captured in QALY **Base Year** No base year provided. Use 2006 as base and MCPI (PPP=0.64; MCPI=1.04 for 2008$).	**Economic Summary Measure** Total incremental cost per patient over **6** months= $544. This is program cost plus health care utilization plus pharma. Incremental cost per QALY **6** months - $8,577 (Presume this is ~$544/0.063) Sensitivity analysis using upper/lower bounds of CI for effect size and cost of intervention gives ICER between $4,713 and $19,988. **Limitations** Training costs not included. Pilot intervention. Validity of depression scores for seriously ill patients may be questioned. Possible bias in self-reported outcomes. High rate of refusal to participate – however this is common for similarly ill populations. Specific to NHS-UK context. Excluded patients with

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
				Note that nurse training cost not included.		poor cancer prognosis.
Authors Unutzer et al. 2003 **Location** Puget Sound, WA **Population** Adults **Design** Not RCT. Based on patients from 2 previous RCTs. **Economic Method** Willingness to pay for depression care study.	**Population** Patients from Puget Sound, WA. Age 18 to 80. **Sample** The previous RCTs were: **1.** Persistent depression group assigned to collaborative care or usual care (N=228) - Katon 1999a Stepped collaborative care for primary care patients with persistent symptoms of depression. Archives of General Psychiatry 56:1109–1115, 1999. **2.** Relapse prevention program randomized to relapse prevention and usual care - Katon 1999b A randomized trial of relapse prevention of depression in primary care. Archives of General Psychiatry 56:1109–1115, 1999. This last reference is incorrect (Its is a 2001 paper by Katon et al)	**Intervention** No intervention. The patients from these RCTs were asked about willingness to pay for **6** month course of care to eliminate depression. Measured at base and **6** month follow-up. Contingent valuation method based on payment-card technique. Question was: "Assume for a moment that you had no health insurance but that there was a treatment that would completely eliminate the symptoms of depression. How much money would you be willing to pay each month for a six-month treatment?" Respondents were given continuous response choices from $0 to $400 as well as more than $400 per month.	No effectiveness reported here. See original RCTs.	**Program Costs** No program costs associated with this experiment. Authors report the per participant cost in original RCTs was about $180 per month over **6** months (Total-$1080)	**Health Care** No health care costs measured for this study. **Productivity** No productivity losses estimated or reported. **Base Year** Use MCPI and 1998, second year of intervention (MCPI – 1.504 for 2008$)	**Summary Economic Measure** Willingness to pay per month: $411 +/-277 for persistent depression $403 +/- 283 for relapse prevention **Summary Findings** Willingness to pay: **1.** Was $370 at the 25th percentile of depression severity vs $439 at 75th percentile. **2.** Was $346 at the 25th percentile of household income vs $439 at 75th percentile. **3.** Decreased from $406 +/- 280 at baseline to $322 +/- 262 at six months. **4.** Was substantially greater than the actual costs of depression treatment provided to the intervention patients in this study - about $180 per month **5.** For those with major depression in persistent depression group was slightly higher at 6-8 weeks - $418 +/- 283 compared to baseline. Neither treatment type or depression severity nor their interaction were significant predictors of willingness to pay at **6** months.

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
Authors Unutzer et al. 2008 **Location** California and Washington **Population** Adults **Design** RCT Original RCT is Unutzer 2001 and 2002. Original CEA studies are Katon 2005 and 2006. **Economic Method** Cost Analysis.	**Population** 2 HMOs in California and Washington. Patients recruited from depression screening or from physician referrals. **Sample** Sample sizes at years 1-4: 534; 521; 464; 437. Those with 4 year data included in this analysis: Intervention – 279 Control – 272 **Demographics** Female – 72%; Age – 73; Minority – 9%; Insured - >80%; HS Grad – 89% **Time Horizon** Recruitment in July'99 to Aug'01. Intervention is 1 year. Cost data for 1999-2006, with 4 years data for each participant. This study extends follow-up to 4 years from 2 years in previous studies.	**Intervention** 1-year stepped collaborative care with nurse of psychologist as care manager in GP office. **a.** Initial biopsychosocial by care manager with depression education and treatment options **b.** Patient offered pharmacotherapy or problem solving therapy (6-8 sessions) **c.** Care managers trained in stepped collaborative care in 2-day workshop **d.** GP has geriatric expertise **e.** Psychiatrist oversight of assessment and treatment f. Follow-up by care manager every 2 weeks during acute and every month in continuing phase **f.** End of **12** months, care manager does a relapse prevention plan **Comparison** Usual care patients and their GP told about their diagnosis and encouraged to get help through their GP.	No clinical effects measured in this extended study. See Katon 2005 for 2 year follow-up.	**Program Costs** Estimated at $639 per person (n=279) Program costs is for 1-year intervention based on detailed study records of all patient contacts; benefits plus salary plus 30% of care manager, psychiatrist, and GP; staff time; supervision; intervention materials.	**Health Care** Health care includes in-patient and out-patient costs, medications… from cost-accounting data from 2 HMOs. Authors report 4-year cost of intervention is smaller than usual care, for savings of $4,120 per person. The difference is not statistically significant (small sample), but bootstrapping showed 87% probability that intervention is cost saving. Hence, benefits of lower utilization take 2-4 years to show after intervention. **Productivity** Productivity losses averted not considered. Base is not provided. Use midpoint of 1999-2006, that is 2003 and MCPI (MCPI-1.225 for 2008$)	**Summary Economic Measure** No summary economic measure computed. Only provides program cost plus health care utilization for intervention and usual care. Previous study showed intervention more costly in year 1 and lower cost in year 2 compared to usual care (Katon 2005) **Limitations** **a.** Only 2 HMO data analyzed b. Insured, educated, dominantly white population c. No clinical outcomes measured at 4 years preventing calculation of CEA.

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
Authors Wang et al. 2007 **Location** USA – Nationwide **Population** Working adults **Design** RCT **Economic Method** Average cost model.	**Population** Participants from members of large managed behavioral health organization, United Behavioral Health (UBH), representing diverse industries and professions. **Inclusion** Recruited from 2 level screening, beginning with HRA and followed by Quick Inventory of Depression Symptoms-SR (QIDS-SR). Depression measured by QIDS-SR and work performance by WHO Health & productivity Questionnaire (HPQ). **Sample** Initial 7,978 consented to participate, and final 604 randomized (Inter=304, Control=300). In intervention 35 missed 6 month follow-up and 44 missed the **12** month (15%). In control, the numbers were 22 and 30 (10%), respectively. **Demographics** Those with at least moderate depression. Mean age- 41-42; Fem – 70-77%; College – 38-44%; Depr. Score – 13-14; Actual work week – 42-44 hrs; Job Perf-0.7. **Time Horizon** Recruitment in Jan 04 to Feb 05. Blinded assessment by research firm at **6** and **12** months by telephone interview after baseline.	**Intervention** Structured telephone outreach by Masters mental health clinician Care Manager; treatment assessment; facilitation of psychotherapy or antidepressant referrals; adherence support; psychotherapy by phone (for decliners of in-person therapy) in **2** month, 8 session cognitive behavioral therapy with workbook and self-help. Staff receives additional training with 1 hr/week supervision. Participants receive psycho-educational workbook. In person treatments monitored, assessed with feedback to physicians and patients. UBH psychiatrist available for consultation. Care manager supported by electronic decision tools. Care manager caseload – 50-70. **Comparison** Usual care – patient advised of diagnosis with recommendation to consult with	All effects including health, employment, productivity measured by logistic regression with weights for treatment assignment based on sociodemographics Interv. had significantly lower QIDS-SR scores at **6** months (B=-1) and at 12 months (B=-1.1). proportion recovering significantly higher for inter, but only at **12** months.	**Program Costs** Not provided. Authors hypothesize $107-$427 per participant based on other studies for similar low-intensity intervention.	**Health Care** General utilization of health care not feasible since not all data collected yet. Study measures utilization of mental health contacts with care manager and with specialists. Interv group more likely to receive specialty MH treatment, (10 more with OR=1.6) and less likely to receive MH care in primary setting (OR=0.7), and twice as many contacts with Care Manager. Health care utilization not monetized. **Productivity** Productivity measured as effective hours as composite of days of work, job performance, and retention of job (employee perspective of holding any job). Effective hours significantly higher in interv. at **6** months (Beta=3) and at **12** months (Beta=3.3). Underlying this effective hours improvement is 2 hrs/week increment worked	**Economic Summary Measure** No summary measures provided or can be calculated. **Summary Findings** Authors report significant improvement in depression score and recovery for interv. compared to control. Authors convert the 2 hrs/week increment of work by intervention compared to control to annual value based on average BLS US median-wages to arrive at $1,800 $1,922 per capita effect of intervention. This exceeds the postulated $107-$427 per capita cost of program. However, this savings will be moderated by the extra 10 specialty MH contacts per capita made by interv. during the **12** months. **Limitations** Unclear why authors weight the regression by weights for treatment assignment based on sociodemographics. Data is pooled for **12** months, assuming effects are equal in the 56 month and **12** month follow-up. Lack of monetized full health care utilizations.

Study Details	Population Characteristics Sample Size Time Horizon	Intervention and Comparison Description	Effect Size	Providers Program Costs	Health Care Costs and Productivity Losses Averted	Economic Summary Measure and Major Results
		clinician.			by intervention over control, improved job retention (93% vs 88%) at **12** months). **Base Year** No base year provided. Use 2006, year after recruitment and CPI (CPI=1.068 for 2008$)	
Authors Wells et al. 2007 **Location** USA – Multiple Sites **Population** Adults from managed care. **Design** Block random controlled trial. Original RCT is Rubenstein 1999. Note that Wells 2008 finds that the effect of intervention disappears at 9 years and also produces unexpected negative outcomes for white participants. **Economic Method** Cost effectiveness.	**Population** Multiple sites in US- 6 Managed Care Organizations. Screened 27,332 for depressive disorder or sub threshold depression based on WHO Composite International Diagnostic Interview (CIDI). **Sample** Usual care (n=443) –GP's care with guidelines mailed to medical directors. Interv. 1 (n=424)– Quality improvement in medical care (Med Quality). Interv. 2 (n=489)– Quality improvement in Therapy (Therapy Quality). **Demographics** White-56-66%; Latino-22-33%; Black 5-7%. Female-71-77%; Age-44; Depressive disorders-70-77%; Employed-63-65%. Significant differences controlled in analysis. **Time Horizon** Recruitment in 1996-97. Analyzed those with both health and cost outcomes at 2 years after enrollment.	**Intervention** **1.** Each practice team educated in 2-day workshop, and provided with patient education materials, tracking forms, clinician manuals, lecture slides **2.** For Med Quality, nurses support adherence by monthly phone or visits for 6-12 months **3.** For Therapy Quality, therapists trained to provide cognitive-behavioral sessions at $8-15 (primary co pay) or $30-53 (non-primary co pay). **4.** Patients could receive Interv. 1, Interv. 2, both, or neither. **5.** Initial assessment informed education, treatment, and management plan for each patient.	All outcomes analyzed for those with sub threshold and depressive disorder over 2 years. Also note that analysis pooled Med Quality and Therapy Quality groups. **Baseline:** Patient screening questionnaire (PSQ) for demographics; and Patient assessment questionnaire (PAQ) for depression and health outcomes; telephone interview for economic variables and utilization.	**Providers** Each intervention site had 1 GP; 1 Practice Nurse; 1 Practice Administrator; 1 Psychologist or Psychiatrist **Program Costs** Program costs include screening; intervention materials; nurse assessments; supervision; contacts with patients, patient time to obtain treatments. Authors state the research provided each MCO with ½ of their participation costs - $40K-$92K. Unclear if	**Health Care** Self-reported ER visits, medical and mental health visits, psychotropic medications, outpatient days, patient time to obtain care. Self-reports used because claims data incomplete. Inpatient costs excluded because it is small # of persons and similar for control and intervention. Authors report higher health care costs* than usual care of $1,372 and $56, for those with depressive symptoms and sub threshold depression, respectively. **Productivity** Self-reported days of absence and also measured as difference between	**Summary Economic Measure** Sub threshold Group* $2,679/QALY [-22K, 28K], based on QALY-SF $2,880/QALY [-25K, 30K], based on QALY-DB Depressive Disorder Group $70,959/QALY [18K, 123K], based on QALY-SF $47,825/QALY [24K, 73K], based on QALY-DB **Limitations** Authors conclude that the CEA results indicate that both sub threshold and depressive disorder individuals can feasibly be treated in this intervention, without recourse to expensive screening. Why inpatient costs are excluded is not convincing. What is the need to include those with sub threshold depression in

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			Follow-up: PAQs at 6, 12, 18, and 24 months Telephone survey at 24 months. (Response rate at baseline 95% and at 24 months 85%) **Measures QALY–SF** – based on SF-12 and utility weights from survey of physicians. Authors report 0.017 and 0.018 gains* in QALY for those with depressive disorder and sub threshold depression, respectively. **Days of depression (QALY-DB)** – from each survey and converted to QALYs (Lit assigns 0.2 to 0.4 for each year of depression to each QALY). Authors report 41 days and 31 days reduction in depressed days, for those	the reported amount is the full cost or the ½ cost. Elsewhere, the authors report the incremental cost of the intervention was: $114 per person for Med Quality and $104 for Therapy Quality.	average of employment status at beginning and end of each 6-month survey period. Authors report increased employment days of 23 and 15, for those with depressive symptoms and sub threshold depression, respectively. **Base Year** No base provided. Use 1998, the year of price lists used for per unit costs. (CPI- 1.321 MCPI – 1.504 for 2008$)	intervention? Effectiveness and cost effectiveness for sub threshold are not significant for many outcomes.

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			with depressive disorders and sub threshold depression, respectively.			
Authors Gilbody et al. 2006 **Design** Review of economic evaluations Only RCTs included. **Economic Method** Only those with summary economic measures such as ICER, Cost-Benefit, Cost-Utility.	**Population** 11 studies constitute 4757 patients with depression. See 'intervention' column for details. **Search** Search conducted in Medline, Embase, Cinahl, PsycLit, EconLit, Cochrane, NHS Health Economics Evaluation database, and database of abstracts of reviews. Cover period from inception to November 2005. **Time Horizon** Studies generally had a 6 month time horizon, but Schoenbaum 2001 had **24** month and Katon 2002 had **28** month horizon.	**Types of interventions:** **1.** Provider education (# = 2) Thompson 2000; Gask 2004 **2.** Enhanced care for newly diagnosed depression (# = 8) Von Korff 1998; Simon 2000; Simon 2001a; Simon 2001b; Simon 2002; Schoenbaum 2001; Liu 2003; Pyne 2003 **3.** Enhanced care for treatment-resistant depression (# = 1) Simon 2001a and Katon 2002 are same intervention **4.** Enhanced care to prevent relapse in recurrent depression (# = 1) Simon 2002 All studies had some form of clinical practice guidelines, with varying intensity of implementation. For example, Simon 2000 had brief contact by non-specialist nurses for adherence, monitoring, and follow-up. In Von Korff 1998, a care manager	Simon 2000, 2001a,b, and 2002 reported depression free days. Schoenbaum 2001 and Pyne 2003 reported quality adjusted life years by combining population level utility estimates with patient level ratings from short form instruments.	**Program Costs** All studies found that the intervention increased program costs compared to controls. This review does not provide program cost by itself since costs are provided net of health care costs.	**Health Care** Studies considered both primary care and direct health care costs of treating depression or all out-patient costs. **Productivity** No studies considered the productivity costs of depression for the patient or for their careers, aside from income loss to obtain treatment. **Base Year** Results reported in both UK and US currencies. Authors report using a "common current exchange rate." Since this is unclear, we use 2006, year of publication as base year CPI (CPI=1.068, MCPI=1.083 for 2008$)	**Economic Summary Measure** In all studies, the intervention cost more than the comparator. **Newly diagnosed depression** Considering primary care depression treatments costs only, estimates of incremental costs per depression free day ranged from $14 (Simon 2000) to $26 (Simon 2002). Expanding health care utilization beyond primary care, Simon 2001b and Liu 2003 find there is some offset to the intervention cost but not sufficient to make the program cost-saving. Cost-utility is estimated to range from $16,514 by Pyne 2003 for a nurse-delivered case management to $38,947 by Schoenbaum 2001 for a complex program to enhance medication adherence. **Treatment resistant depression** Simon 2001a report $22 per depression free

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		coordinated care among GP, specialist, and offered brief psychosocial interventions. Schoenbaum 2001 was most comprehensive with screening, patient/physician education, guidelines, case management, specialist care, and behavioral therapy.				day for a stepped care program at 6 months. The program had a persistent clinical effect but the cost difference became non-significant at **28** months as reported in Katon 2002. However, Katon 2002 had large attrition. **Relapse Prevention** Simon 2002 report improved clinical outcomes at **12** months at a cost of $26 per depression free day with primary and secondary care plus medications. There was some suggestion of offset when all out-patient costs are considered, but without significance. **Limitations** Only RCTs included.