Utilization and cost impact of integrating substance abuse treatment and primary care
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The study investigated two treatment programmes for patients with alcohol and drug disorders entering an outpatient Chemical Dependency Recovery Programme (CDRP). The first was the use of an Integrated Care model, whereby primary health care is provided alongside substance abuse treatment and the second an Independent Care model, where medical care is provided in the Health Maintenance Organisation's primary care clinics, but independent from substance abuse treatment. The CDRP provided group-based traditional outpatient and day treatment programmes with individual counselling available when needed. Pharmacotherapy was available from CDRP physicians for Integrated Care patients, and through primary care physicians for Independent Care patients.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised adult patients entering treatment for drug and/or alcohol abuse at the outpatient Chemical Dependency Recovery Programme (CDRP) in Kaiser Sacramento.

Setting
The study setting was primary care. The economic study was conducted in California, USA.

Dates to which data relate
The effectiveness study was conducted between March 1997 and December 1998. The resource use data were collected during the same period. The price year was 1998.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was undertaken prospectively on the same sample used in the effectiveness study.

Study sample
No sample size appears to have been determined in the planning phase of the study. New adult patients entering the outpatient CDRP at the Kaiser Sacramento facility between March 1997 and December 1998 were included in the study. 654 patients were randomised to one of two treatment modalities: an Integrated Care model (n=318), and an
Independent Care model (n=336). 45% of the Integrated Care model patients were women, and the mean age of this group was 37.5 years. 43% of the patients in the Independent Care model group were women and the mean age for this group was 37.0 years. Of the 654 patients randomised, 370 (57%) were diagnosed with a substance abuse-related medical condition (SAMC). Of these, 189 patients were included in the Integrated Care model, and 181 were included in the Independent Care model. Of the SAMC patients, 269 patients had at least one medical condition (which could or could not include patients with a co-morbid psychiatric condition) and 230 patients had at least one psychiatric condition (which could or could not include patients with a co-morbid medical condition).

**Study design**
The study was a randomised clinical trial conducted at a single centre (CDRP in Kaiser Sacramento). Groups were followed for a period of 12 months. No loss to follow-up was reported, and the authors reported that 90% of all patients had at least one group visit after treatment intake.

**Analysis of effectiveness**
The analysis of the clinical study was based on intention to treat. The outcomes used in the analysis were inpatient utilisation per 1,000 member months, which included the number of hospitalisations and days in hospital, and the number of emergency room (ER) visits per member month. Inpatient and outpatient utilisation were obtained from Kaiser Permanente's database. The authors divided utilisation data for all subjects into two periods: 12 months before intake in the programme and 12 months after intake for all cases.

To control any secular changes during this period of time, the authors examined the utilisation trends among general health plan members in the Sacramento service area (n=3,201) by selecting an age, sex, and length-of-enrolment matched control group from the service area from the membership database. In this analysis, members who had substance abuse or psychiatric diagnoses, or utilisation of substance abuse or psychiatric services, were excluded from the matched sample. In this model, the authors included an indicator variable for group (treatment group versus matched control group), time (pre- versus post-treatment) and an interaction term for group by time. The interaction term then indicated whether treatment patients showed greater or less reduction in the post-treatment period than the matched sample.

The authors analysed changes in utilisation within each treatment and between Integrated and Independent Care patients over time, and the authors also performed subgroup analysis by comparing SAMC patients in the two groups. Multivariate analyses were used to compare the differences between the two groups over time. The variables included in the analysis were time (1 if post-treatment), an integrated care variable, a treatment-by-time interaction term, and an indicator variable for SAMC. Multivariate analyses on utilisation were replicated for subgroups of patients who had any SAMC condition.

For both the full sample and the SAMC subgroup a comparison of 28 baseline variables found only one difference between the two treatment groups: Integrated Care patients had higher mean Family/Social Addiction Severity (ASI) scores than Independent Care patients (p<0.01).

**Effectiveness results**
Results from the comparison between the treatment group and the matched sample showed that differences in the reduction in inpatient use (ER visits, p=0.01 and inpatient days, p=0.02) were statistically significant in the treatment group.

Results from the comparison between the two treatment groups showed that the Integrated Care group had a downward trend in hospital use and a significant reduction in ER use in the after intake period. The number of patients hospitalised decreased from 10.4% to 7.8% (p=0.10) and those with any ER visits decreased from 36.2% to 30.9% (p=0.04).

For these patients there was also a downward tendency in hospitalisation rate from 17.12 to 11.13 per 1,000 member-month (p=0.21) and inpatient days from 71.77 to 34.31 per 1,000 member months (p=0.11). ER visits were unchanged.
For the Independent Care patients, there was a downward trend in inpatient days (p=0.12). ER visits were unchanged.

Multivariate analyses showed that, controlling for SAMC, the difference between the two groups over time was not statistically significant.

For SAMC Integrated Care patients, hospitalisation rates declined from 26.61 to 11.66 per 1,000 member-month (p=0.04) and inpatient days decreased from 114.18 to 39.53 per 1,000 member-month (p=0.05). ER use decreased from 0.10 to 0.07 visits per member months (p=0.03). Among SAMC Independent Care patients, inpatient rates did not change significantly, although there was a non-significant downward trend in inpatient days and ER visits. Multivariate analyses showed that the difference between the two groups over time was not statistically significant.

Among the medical SAMC patients, there were significant declines in inpatient use (p=0.02) and ER visits (p=0.0036) for Integrated Care patients.

**Clinical conclusions**
The study found no significant differences in utilisation rates between patients randomised to the Integrated Care group and those randomised to the Independent Care group over time. However, among the subset of patients with substance abuse-related medical conditions (SAMC), Integrated Care patients had significant decreases in hospitalisation rates, inpatient days and ER use.

**Measure of benefits used in the economic analysis**
No measure of benefit was used in the economic analysis. The study was therefore, in effect, a cost-consequences analysis.

**Direct costs**
Quantities and costs were reported separately for only some categories of resource use. The direct costs of the health insurer, Kaiser Permanente, were included in the analysis. These included inpatient, ER, primary care and non-emergent outpatient visit costs. The costs provided within Kaiser Permanente were obtained from its databases. Costs delivered outside Kaiser Permanente were obtained from the administrative databases recording billed and paid costs for these services. As all costs were incurred during an one-year period, discounting was not relevant, and hence was not performed. All costs were converted to 1998 prices using the Medical Care component of the Consumer Price Index.

**Statistical analysis of costs**
The authors compared the costs for study patients with the matched sample to determine whether the changes observed in the study sample reflected an overall trend not associated with treatment. In this model, the authors included an indicator variable for group (treatment group versus matched control group), time (pre- versus post-treatment) and an interaction term for group by time. The interaction term then indicated whether treatment patients showed more or less reduction in the post-treatment period than the matched sample. The authors analysed changes in costs within each treatment and between Integrated and Independent Care patients over time. The authors also performed subgroup analysis by comparing SAMC patients in the two groups. Multivariate analyses were used to compare the difference between the two groups over time. The variables included in the analysis were time (1 if post-treatment), an integrated care variable, a treatment-by-time interaction term, and an indicator variable for SAMC. Multivariate analyses on costs were replicated for subgroups of patients who had any SAMC condition.

**Indirect Costs**
Indirect costs were not included in the analysis.

**Currency**
US dollars ($).
Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
Please refer to the ‘Effectiveness results’ section.

Cost results
Results from the comparison of the treatment group to the matched sample showed that the costs for patients in the treatment group were significantly higher (p<0.0001) in the 12 months before. For study patients the total medical costs per member month declined from $248.78 to $185.63 (p=0.07). For the matched sample, there were no substantial changes in total medical costs.

Results from the comparison of the two treatment groups showed that for Integrated Care patients total costs declined from $290.27 to $177.26 per member-month (p=0.08). For Independent Care patients, total costs declined marginally from $208.93 to $193.46 (p=0.62). Multivariate analyses showed that the difference between the two treatment groups over time was not statistically significant.

For SAMC Integrated Care patients, total medical costs declined from $431.12 to $200.03 (p=0.02). Among SAMC Independent Care patients there was a downward trend in total medical costs (p=0.25). Multivariate analyses showed that the decrease in total medical cost over time was significantly greater (p=0.02) for Integrated Care patients.

Among the medical SAMC Integrated Care patients, total medical costs declined from $506.70 to $184.37 (p=0.02). For medical SAMC Independent Care patients there was a declining trend in total medical costs (p=0.06). Multivariate analyses showed that the decrease in total medical cost over time was significantly greater (p=0.03) for Integrated Care patients.

Among the psychiatric SAMC Integrated Care patients, total medical costs declined from $565.82 to $222.15 (p=0.03). For medical SAMC Independent Care patients total medical costs did not decline significantly, (p=0.59). Multivariate analyses showed that the decrease in total medical cost over time was significantly greater (p=0.03) for Integrated Care patients.

Synthesis of costs and benefits
The costs and benefits were not combined.

Authors' conclusions
The authors concluded that the findings for the full sample suggested that integrating substance abuse treatment with primary care may not be necessary or appropriate for all patients. However, the authors also concluded that it could be beneficial to refer patients with substance abuse related medical conditions to a provider also trained in addiction medicine, as there appeared to be large cost impacts of providing integrated care for such patients.

CRD COMMENTARY - Selection of comparators
The use of Independent Care as the comparator was justified by the authors because in the USA medical care is seldom provided as part of substance abuse treatment. You should decide if this is a widely used health technology in your own setting.

Validity of estimate of measure of effectiveness
The analysis was based on a randomised clinical trial (RCT), which was appropriate for the study question, as well-conducted RCTs are considered the gold standard when comparing different health interventions. The study sample was
representative of the study population. Patient groups were shown to be comparable on 27 baseline variables. Only one difference between the two treatment groups was found, with Integrated Care patients having higher mean Family/Social Addiction Severity (ASI) scores than Independent Care patients. Appropriate statistical techniques were undertaken to take account of potential biases and confounding factors. Furthermore, external controls were used to control any secular changes in medical utilisation that could have affected the authors' findings. The main limitation of the study was that no power calculations were conducted and thus, the sample size may have had insufficient statistical power to detect differences in outcomes.

**Validity of estimate of measure of benefit**
The authors did not derive a measure of health benefit. The analysis was therefore categorised as a cost-consequences analysis.

**Validity of estimate of costs**
All categories of cost relevant to the perspective adopted were included in the analysis, and it would appear that no relevant costs were omitted from the analysis. Quantities and costs were only reported separately for some categories of resource use. This limits the generalisability of the authors' results to other settings. Both resource use and costs were derived from the authors' settings. The authors performed appropriate and thorough statistical analyses of both costs and resource use to test for any statistical differences between the two groups and over time. The price year was reported, which will ease any future reflation exercises. Since all costs were incurred over one year, discounting was not relevant.

**Other issues**
The authors did not directly compare their results with those from other studies. However, they did mention that a similar study conducted in Sacramento found that treatment outcomes were significantly better for patients with substance abuse-related medical conditions (SAMC) who received integrated medical and substance abuse treatment. The issue of generalisability to other settings was not addressed. The authors do not appear to have presented their results selectively, and their conclusions reflected the scope of the analysis. As the main limitation of their study, the authors reported retrospective power calculations that showed that the study did not have sufficient statistical power to detect important differences in costs between the two treatment groups.

**Implications of the study**
The authors argued in their study for screening of medical conditions in substance abuse treatment. They also argued that if a primary care provider suspected that a presenting medical problem was related to substance use, it would be cost beneficial, and good practice to refer such patients to a medical care provider also trained in addiction medicine.

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**Other publications of related interest**
Holder H D, Blose J O. Typical patterns and cost of alcoholism treatment across a variety of populations and providers. Alcoholism, Clinical and Experimental Research 1991;15:190-195.


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