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ECONOMIC ANALYSIS OF PSYCHOTHERAPY FOR BORDERLINE PERSONALITY DISORDER PATIENTS

by

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CONTENTS

1 INTRODUCTION

The role of psychotherapy in mental health services has been questioned, both in terms of effectiveness and costs. The tendency of patients to continue in long term therapy (Follette and Cummings, 1967) has meant that insurers and other funders have been reluctant to provide this service. However, a number of studies have shown that outpatient psychotherapy is associated with lower medical service use (Follette and Cummings, 1967; Schlesinger et al, 1983; Jameson et al, 1978; Goldberg et al, 1970; Mumford et al, 1984; Ginsberg, 1984; Gabbard et al, 1997).Some commentators have argued that there is now a body of evidence supporting the cost effectiveness of psychotherapy, at least in some conditions (Lazar and Gabbard, 1997; Rainer, 1996). Most studies have used before/after designs and there are very few randomised controlled trials (Healey and Knapp 1995). As Mumford and Schlesinger (1987) point out, reductions in service use are not inevitable.

Borderline Personality Disorder (BPD) is a serious mental illness, with significant mortality and morbidity. BPD is often associated with other personality disorders and social dysfunction. Long term follow up studies have shown that most patients improve over time, whilst short-term outcomes are less favourable (Carver 1997). Psychotherapy has been shown to be of benefit in the treatment of BPD (McGrath, 1986) and there is some evidence that it is also cost effective ((Lazar and Gabbard, 1997).

Economic evaluation requires the comparison of the costs and benefits of a health program or service. In a full economic evaluation, both costs and benefits are measured. The most frequently used method is cost effectiveness analysis in which benefits are measured in terms of clinical outcomes, typically number of life years saved. Cost minimisation analysis is sometimes described as a partial economic analysis as only costs are measured and benefits are not considered. This form of analysis is appropriate when the outcomes of the program being evaluated have been demonstrated to be better or as good as the alternative.

There have been few economic analyses of psychotherapy; research has focussed on effectiveness while ignoring considerations of cost or cost-effectiveness (McGrath, 1994). Where cost has been a consideration, for the most part a lower use of health services has been taken to imply overall cost savings (Gabbard et al, 1997). However, Chisholm (1998) reported on the basis of three trials that when the cost of psychotherapy was added to other health service costs, the net impact of psychotherapy was cost neutral. These results must be

interpreted with caution as even the randomised controlled trials consisted of small samples, while other studies were of less rigorous research design. In the Australian context, Stevenson and Meares (1992) have demonstrated fewer hospital admissions and lower lengths of stay, fewer medical visits and reduced drug use over twelve months in BPD patients treated with psychotherapy. However, the initial study had not examined whether the cost savings due to reduced health service use were sufficient to offset the intensive period of psychotherapy. Yates and Newman (1980) point out that there are substantial differences in the cost of providing psychotherapy and that this cost is a major determinant of the cost-effectiveness.

The purpose of this study was to examine the cost effectiveness of a particular type of psychotherapy developed by Russell Meares as an extension of the Stevenson and Meares study. It was commissioned by the Department of Psychiatry at Westmead Hospital with support from the Royal Australian and New Zealand College of Psychiatrists. A cost minimisation analysis is appropriate as improved health outcomes from this psychotherapy had already been demonstrated.

2 METHODS

The aim of this analysis was to compare the costs of treating BPD with psychotherapy versus conventional care. Psychotherapy was continued over a twelve month period. Data were collected on health service use for twelve months prior to commencing psychotherapy and twelve months after the completion of the course of psychotherapy. Use of health services in the twelve months before psychotherapy were assumed to represent conventional care. It would be expected that during the psychotherapy treatment period, use of health services would be changing, either due to psychotherapy displacing other health service use or a gradual reduction in health service use as health state improved. Hence the use of services in the twelve months after the completion of psychotherapy is more representative of the outcome achieved. Therefore the net costs of psychotherapy were defined as the costs of health care for twelve months after psychotherapy was completed plus the cost of the psychotherapy less the cost of conventional care.

Patients whose hospital admission costs before psychotherapy were $10,000 or greater were classified as high users of health services. Results are shown for all patients and for high user and low user sub-groups.

2.1 Identification of costs

The perspective taken is that of the health service, ie only health service costs are included. Costs to patients and their families are not included.

The health services considered were:

psychotherapy;

inpatient hospital treatment;

emergency hospital treatment;

ambulatory care including visits to general practitioners, specialists, psychologists, social workers, physiotherapy, dietitians;

diagnostic tests;

medications, prescription and over the counter.

Patient sample

This project was an extension of the previous study by Stevenson and Meares. Thirty patients with BPD were included in the study and completed twelve months of psychotherapy. Recruitment and eligibility criteria are described elsewhere (Stevenson and Meares, 1992).

Data collection

In the initial study, patients were asked, at interview before commencing psychotherapy, to recall their service use over the previous twelve months. Similarly, they were asked at follow up twelve months after completing psychotherapy, to again recall service use over the previous twelve months. In this study, Westmead medical records for all patients enrolled in the study were reviewed and data on service use extracted by one of the investigators (JS). Medical record data were used in preference to patient recall where they were available.

For each patient, GP visits and psychiatrist visits were compared with prescription medications, as patients need to visit a medical practitioner to obtain prescriptions. In a number of cases, the number of medical visits provided by recall were fewer than those implied by the medication use data. Where this was so, additional GP visits were imputed to ensure consistency with the medication use data. In one case where the medication can only

be prescribed by a specialist, one specialist visit was imputed. The results are shown both including and excluding imputed medical visits.

2.2 Unit costs

Psychotherapy

Each patient attended two x one hour treatment sessions weekly. Each session was one to one and administered by a trainee therapist. The trainees were psychiatric registrars, nurses and psychologists who were participating in a training course being developed at Westmead Hospital. As these were trainee therapists, additional supervision was required. Trainees met in groups of three with a supervising psychiatrist for one hour each week during which six patients (two per trainee) were reviewed. Therefore the additional training time was allocated over the twelve sessions per week.

Hourly wage rates according to public hospital awards were provided by Westmead Hospital. Superannuation and other on-costs were included. More details are given in Appendix 1.1. This gave a cost per hour of therapy of $43.35.

However, if psychotherapy for BPD was adopted more widely, it is not clear that all the therapy could be provided under the training program. An alternative means of providing psychotherapy is through specialist psychiatrists. This gives an alternative cost, based on the MBS scheduled fee, of $130.70 per session.

Emergency visits

Visits to Accident and Emergency were assigned an AN-DRG code where possible. The difference between the AN-DRG weighted cost including emergency care and the AN-DRG weighted cost without emergency care was used as the cost of an emergency visit for that AN-DRG. Where the reason for visit could not be coded, then the cost was estimated at the average cost (over all AN-DRGs) including emergency less the average cost excluding emergency. This gave a cost per emergency visit from $70.23 to $272.30 (appendix 1.2)

Ambulatory care

Visits to general practitioners and to specialists were costed using MBS fees. The cost used was the average MBS fee weighted according to frequency of that type of visit in the general

population. Frequency data were provided by the Health Insurance Commission. This gave an average cost per GP visit as $26.50 and for a specialist visit as $87.50. More details are in Appendix 1.3.

The cost of outpatient visits was taken from a draft report provided by NSW Health (details shown in Appendix 1.3). Costs are separated into new and repeat visits. The mean new visit cost varies from $16.00 (physiotherapy) to $35.00 (psychology).

Diagnostic tests

Costs used were taken from the MBS fees. The costs used are shown in appendix 1.4.

Inpatient care

Acute inpatient admissions were classified according to the Australian Diagnosis Related Groups (AN-DRG version 3). Cost weights were taken from NSW Health (1998). Where two or more AN-DRG codes could apply to a particular admission, the least costly option was selected. Relevant costs are shown in Appendix 2.

Medications

Costs for medication during hospital stays were not counted as these are already included in the AN-DRG cost weights. Where dosage was not recorded, the lowest dose appropriate was determined by advice from a psychiatrist. Where dose and strength was not recorded, the cost was not included. Where an antibiotic was prescribed but not specified, it was assumed to be amoxyllin, the most commonly prescribed broad spectrum antibiotic and less expensive than newer classes of antibiotics.

Costs were as given in the Schedule of General Pharmaceutical Benefits for Approved Pharmacists and Medical Practitioners (1 November 1997) for the “dispensed price for max. qty”. Cost was rounded up to the minimum purchase quantity. Patient co-payments were not included (details in appendix 3).

Some medications recorded were no longer available. Where the drug was still listed on the Repatriation Schedule of the PBS, this cost was used. Otherwise, the wholesale price was obtained from the archives of Australian Pharmaceutical Industries Ltd, or from the manufacturer. 10% margin plus $4.34 dispensing fee was added to the wholesale price.

The cost of over the counter medications was based on the listed pharmaceutical wholesale price plus 50%.

3 RESULTS

There was a saving of approximately $670,000 in the costs of health services after the psychotherapy program. Table 1 shows the costs by service type.

The net difference in the costs of treatment must take into account the cost of psychotherapy. It was assumed that 50 sessions of psychotherapy would be provided over twelve months. The cost of psychotherapy was estimated on the basis of using trainee therapists; and using consultant psychiatrists. The former cost $4,335 per patient, and the latter $13,070. This cost was added to the costs of health service use after psychotherapy and the net difference between that and service use before psychotherapy was calculated. The results are shown in Table 2.

TABLE 1: CHANGE IN HEALTH SERVICE USE

	Before	**After**	**Saving**
Inpatient care	$683,977	$41,424	$642,553
Emergency visits	$15,327	$3,454	$11,873
Ambulatory care	$43,853	$40,339	$3,514
Diagnostic tests	$2,565	$112	$2,453
Medications	$20,067	$3,901	$16,166
Total	$765,789	$89,230	$676,559

TABLE 2: NET DIFFERENCE INCLUDING PSYCHOTHERAPY

Costs	Consultant Psychiatrists	Trainee Therapists
Conventional care	$765,789	$765,789
Psychotherapy	$392,000	$130,050
After therapy	$89,230	$89,230
Net saving	$284,559	$546,509

The results show that overall the psychotherapy program was cost saving. After the program, health care costs for this group of patients were around $89,000 for twelve months, a reduction of approximately $670,000. This more than offsets the costs of the program using trainee psychotherapists, giving net savings of over $500,000 over one year. Even using consultant psychiatrists, the program is associated with net savings over one year.

3.1 Costs of care by high and low users

Inpatient hospital treatment is the greatest component of the total cost, 90% of total costs before psychotherapy, and 45% after. However, this varies enormously across individuals from a number of patients who had no admissions, and therefore zero cost, to one patient who incurred costs of almost $150,000. The distribution of hospital costs is bimodal, with a number of patients incurring low or zero costs, and another group who appear to be high users of hospital services (see Figure 1). Consequently, the group was disaggregated into high users, those who incurred over $10,000 per annum in hospital costs (n = 12), and low users who incurred less than $10,000 per annum in hospital costs (n = 18). High users were responsible for approximately 90% of all hospital costs.

The costs of conventional care (ie before the psychotherapy program) by type of service and disaggregated by high and low users are shown in Table 3.

TABLE 3: AVERAGE COSTS PER PATIENT **BEFORE** PSYCHOTHERAPY

	Low n=18	**High n=12**	**Total n=30**
Inpatient care	$3,668	$51,497	$22,799
Emergency visits	$266	$878	$511
Ambulatory care	$1,622	$1,221	$1,461
Diagnostic tests	$80	$94	$85
Medications	$706	$613	$669
Total	$6,360	$54,315	$25,555

The costs of health service use following psychotherapy, again disaggregated into the same groups, still described as high and low users, are shown in table 4.

TABLE 4: AVERAGE COSTS PER PATIENT **AFTER** PSYCHOTHERAPY

	Low n = 18		**High n = 12**		**Total n = 30**
		saving		saving	
Inpatient care	$268	$3,400	$3,051	$48,446	$1,380
Emergency visits	$57	$20	$202	$676	$115
Ambulatory care	$1,656	$34	$877	$344	$1,344
Diagnostic tests	$0	$80	$9	$85	$4
Medications	$102	$604	$172	$441	$130
Total	$2,102	$4,258	$4,322	$49,992	$2,973

Hospital costs are the largest component of total costs, and the largest component of the costs of high service users. Twenty one patients had no hospital admissions in the year following psychotherapy; for the nine who were admitted, hospital costs ranged from $1,300 to $12,000.

While overall the psychotherapy program was associated with reduced costs, the results for previously low users of health services are more equivocal. For low users, the costs of the psychotherapy are about the same as the savings in health service use, with psychotherapy costed at trainee rates. However, if the reduction in health service use continues beyond the first year, then the savings outweigh the costs (see Table 5).

TABLE 5: NET AVERAGE COSTS OF PSYCHOTHERAPY USING TRAINEE THERAPISTS BY LOW AND HIGH USERS

	Low users	**High users**
Cost saving	$4,258	$49,992
Psychotherapy	$4,335	$4,335
Net difference	$(77)	$45,657
Net difference after 2 years	$4,181	$95,649

3.2 Reliability of data

In the initial study, data on service use were collected by asking patients to recall their service use over 12 months. The validity of data collected this way, particularly in this group of patients, is not known. However, 12 month recall is generally considered of poor validity for frequent events such as medical consultations and medication use, although it has more validity for infrequent events such as hospital admission. In this study, data on service use were collected from Westmead hospital records; these covered use of services provided by Westmead Hospital. For services provided elsewhere, patient recall was used. The comparison of Westmead record data with patient recall can provide some evidence of data validity. The number of events reported in patient recall should be greater than or equal to the number obtained from Westmead records for the two data sources to be consistent. The proportion of patients giving consistent responses ranges from 20% to 40% (table 6). The proportion of inconsistent responses and the extent of the inconsistency, up to 5 hospital admissions unreported, raises doubt about the validity of the data.

TABLE 6: CONSISTENCY OF RESPONSES

	Before	**After**
Hospital admissions	37%	20%
Medical consults	30%	40%

Therefore, the results were re-estimated excluding inconsistent responses (table 7).

TABLE 7: CHANGE IN AVERAGE COSTS OF HEALTH SERVICE USE

	Before	**After**	**Saving**
Inpatient care	$12,125	$781	$11,344
Emergency visits	$458	$96	$362
Ambulatory care	$1,240	$1,569	$(328)
Diagnostic tests	$75	$6	$69
Medications	$554	$122	$432
Total	$14,452	$2,574	$11,879

The savings due to the reduction in health care costs remain, although the amount saved is halved. This amount covers the costs of the psychotherapy when provided by trainees. However, if the therapy were to be provided by consultant psychiatrists the costs would be almost the same as the savings in the reduction of health care use over one year.

3.3 Sensitivity analysis

It is generally accepted that the effect of varying key parameters on the results should be analysed. In particular, where estimates are uncertain this shows how robust the results are to variation in those estimates.

The cost of the psychotherapy was estimated from the program as it was functioning at Westmead Hospital, that is using trainee therapists. There may be insufficient trainees to meet

the needs of an expanded program. Therefore, the costs of the program were estimated if consultant psychiatrists were used; and the results for high and low users are shown in table 8. The length of time over which reduced health service use would have to continue to be equivalent to the cost of the program is also shown.

TABLE 8: NET AVERAGE COSTS OF PROGRAM GIVEN BY PSYCHIATRISTSBY LOW AND HIGH USERS

	Low users	**High users**
Cost saving	$4,258	$49,950
Psychotherapy	$13,070	$13,070
Net difference	$(8,812)	$36,880
Years taken to recoup costs	3.04	0.26

The costs of medical visits included a number of visits which were imputed from the reported data on medications; this occurred when the specific medication usage reported could not be prescribed without a consultation. This may reflect the fact that prescription drugs were able to be obtained without a consultation; alternatively it may reflect errors in patient recall. The cost estimates based on actual visits reported are shown in table 9. For most patients in the study there were no imputed visits, that is their reported doctor visits were consistent with their reported consultations. In the cost estimates before the psychotherapy program, there was one patient who accounted for over $7,000 of imputed costs; and after one (other) patient, for over $1,000 of imputed costs. The results are shown with these two outliers excluded.

TABLE 9: COSTS OF AMBULATORY CARE - REPORTED VISITS

	Before	**After**
No of patients with no imputed visits	23	24
Cost of ambulatory care	$43,853	$40,339
Cost without imputed visits	$35,260	$38,007
Cost without outliers	$36,539	$39,173

The impact of one or a small number of patients whose service use patterns fall widely outside the range of service use for the rest of the group can be substantial, particularly when the size of the group is relatively small. In this group of patients, there was one whose hospital admissions were costed at almost $150,000 in one year. This compares with the average for the rest of the group of $18,500. As hospital costs are the largest component of total costs, this one patient could have an undue effect on the group results. Therefore the results were re-estimated with the exclusion of this one outlier and are shown in tables 10 and 11.

TABLE 10: CHANGE IN HEALTH SERVICE USE COSTS EXCLUDING OUTLIER

	Before	**After**	**Difference**
Inpatient care	$540,220	$39,895	$500,325
Other	$80,377	$46,333	$34,044
Total	$620,597	$86,228	$534,369

TABLE 11: CHANGE IN AVERAGE HEALTH SERVICE USE COSTS FOR HIGH USE PATIENTS EXCLUDING OUTLIER

	Before	**After**	**Difference**
Inpatient care	$43,109	$3,189	$39,920
Other	$2,930	$1,240	$1,690
Total	$46,039	$4,429	$41,610

Whilst this one patient was responsible for the majority of hospital costs before the psychotherapy program, the exclusion of this outlier does not affect the overall results. There remains a substantial reduction in the costs of health service use, largely in hospital admissions, after the psychotherapy program.

4 DISCUSSION

This study group comprised 30 patients and comprised a before/after design. Therefore it does not overcome criticisms of other work in this area. As such, the results must be regarded with caution.

These results show a substantial cost saving in the use of health services after a one year program of psychotherapy. The exclusion of individuals with extremely high service use reduces the amount of the savings but not substantially. The psychotherapy program was costed based on the costs of trainee therapists. In an expansion of the program, or development of a similar program elsewhere, it may not be feasible to use trainee staff. Therefore, the program was also costed using consultant psychiatrists. Even at this higher cost, the program appears to reduce net costs.

However, most of the cost data are developed from recall of service use. In this study, data were verified by checking Westmead Hospital records. Data were judged as consistent when the hospital records service use is at least as great as the data provided by patient recall. On this criterion, 30% to 40% patient data are inconsistent. The true figure is likely to be higher as this criterion can only assess under-reporting. The reliability of the data are of particular concern, as there is the potential for bias. Patients recalling service use to an investigator who is involved in service delivery are likely to attempt to please the investigator which in this instance would be lower reporting of service use after the psychotherapy. On the other hand, patients with borderline personality disorder may have more accurate recall after therapy. The hospital admission data have more consistent responses in the 'after' period; however, for medical consultations, the 'after' responses are less consistent (table 6). When the results are re-estimated excluding the known inconsistent (ie for under-reporting) results, the net cost savings are modest (for a program delivered by trainees) to neutral (for a program delivered by psychiatrists). We have no way of testing the data for over-reporting. But if there is substantial over-reporting in the 'before' period compared to the 'after' period, then the cost savings would be over-estimated. This means the results must be interpreted with great caution. However if these savings continue to accrue over future years, the net savings will increase. These figures continue to be collected and will be reassessed at a future date.

The results have also been disaggregated according to whether patients were initially high users of hospital services. For high users, there is on average a substantial net cost saving;

however, for low users the cost difference was neutral. This suggests that further work to identify those patients who stand to benefit most from this form of therapy may be useful.

The program may be cost effective, even if the net cost result at the end of one year is neutral. If the reduction in health service use is continued into the future without further psychotherapy, then the stream of cost savings may outweigh the cost of the program. If the health outcomes from the program are improved, then even an increase in net costs may be justified.

This analysis cannot unequivocally conclude that psychotherapy for BPD patients is cost saving or cost effective. The evidence presented here suggests that it may be. The study is limited by a small sample of patients, the unreliability of the data, and the before/after study design. The results also suggest that it may be possible to identify a sub -group of BPD patients who will benefit from psychotherapy. Further research is required to develop evidence based recommendations.

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APPENDIX 1: DERIVATION OF UNIT COST DATA

1.1 Cost of psychotherapy

Cost of trainees' time is the weighted average hourly cost (salary plus oncosts) assuming that trainee psychiatrists, nurses and psychologists gave equal numbers of psychotherapy sessions.

Hourly cost of trainee psychiatrist	$26.78
Hourly cost of nurse	$22.83
Hourly cost of psychologist	$26.17
Average hourly cost	$25.26

Supervision costs were the one hour meeting of three trainees with a supervising psychiatrist each week. This session involved one hour of the psychiatrist's time and three hours of the trainees' time. It was assumed that supervision time could be allocated equally over all therapy sessions, ie 12 per week.

Hourly cost of psychiatrist	$141.30
Weekly cost of supervision	$217.08
Cost of supervision per session	$ 18.09
Average cost of one hour of therapy	$ 43.35

1.2 Cost of accident and emergency visits

AN-DRG no.	Title	Cost
885	Injuries age < 65	$272.30
861	Drug intoxication and withdrawal	$175.43
847	Personality disorders and acute reactions	$ 70.23
932	Signs and symptoms	$171.70
261	Chest pain	$260.55
464	Signs & symptoms, muscl sys & conn tiss age < 70 w/out cc	$159.37
668	Menstrual & other fem reprod age <70 W/out cc	$121.81
	Unspecified	$ 86.00

1.3 Cost of ambulatory medical care

GP Visits

Item No.	No. of services (1996/7)	Fraction of total	Cost
23	74,434,236	0.90968	$ 24.70
36	7,390,687	0.09032	$ 44.65
Total:	81,824,923		

Weighted cost for GP visit **$ 26.50**

Specialists

Item No.	No. of services (1996/7)	Fraction of total	Cost
104	3,968,706	0.26692	$ 63.90
105	5,078,097	0.34153	$ 32.00
106	104,632	0.00704	$ 52.60
110	1,433,994	0.09644	$112.65
116	4,170,236	0.28047	$ 56.40
119	113,081	0.00761	$ 32.00
Total:	14,868,746		

Weighted cost for Specialist visit **$ 87.05**

References:(1) Medicare estimates and statistics for 1996/97
(2) Medicare Benefits Schedule Book, 1 November 1997

1.4 Other Outpatient Visits

	Mean cost New visits	Mean cost Repeat visits
Physiotherapy	$ 16.00	$ 12.00
Social Work	$ 27.00	$ 21.00
Dietitian	$ 17.00	$ 9.00
Psychology	$ 35.00	$ 26.00

Ref: Ambulatory Survey of Selected NSW Public Hospitals: Outpatient Services (Draft Document) NSW Health Department, February

1.5 Outpatient diagnostic tests

		Item No.
Chest x-ray	$ 37.20	66225
Plain abdominal x-ray	$ 37.60	58900
Full blood count	$ 17.20	65007
Thyroid function tests	$ 41.00	66329
Liver function tests	$ 19.80	66211
Biochemistry	$ 19.80	66211
Lung function test	$103.50	11503
ECG	$ 23.30	11700
Wrist x-ray	$ 41.85	57509
Urine examination	$ 20.55	69217
Bone Scan	$ 78.60	12306
Abdominal ultrasound	$100.45	55036
Mammogram	$ 49.70	59303
Breast Ultrasound	$100.45	55034
Breast biopsy	$103.00	30363
Urea	$ 9.55	66201
Creatinine	$ 9.55	66201
Barium meal	$116.10	58912
CMV, Monospot	$ 13.90	69229
Electrolytes	$ 15.70	66207
Syphilis serology	$ 34.70	69281
Hep A and Hep B	$ 24.70	69276
Igm	$ 14.85	71067

Ref: Medicare Benefits Schedule Book, 1 November 1997.
Commonwealth Department of Health and Family Services: AGPS

APPENDIX 2: HOSPITAL ADMISSION COST DATA

Costs for selected AN-DRGs

No.	AN-DRG Title	Cost Weight	Total Cost ($)	Trim Point (in days)	Outlier per Diem Payment($)
846	Eating & obsessive-compulsive disorders	2.96	$7,296.40	60	$300
847	Personality disorders & acute reactions	0.54	$1,331.10	12	$350
861	Drug intoxication and withdrawal	1.21	$2,982.65	20	$425
932	Signs & symptoms	0.89	$2,193.85	15	$350
675	Vaginal delivery with moderately complicating diagnosis	0.91	$2,243.15	11	$500
686	Other antenatal admission with moderate or no complicating diagnosis	0.37	$ 912.05	6	$400
683	Abortion + D&C, aspiration curettage or hysterectomy	0.32	$ 788.80	1	$375
684	Pre-term labour	0.21	$ 517.65	1	$475
661	Diagnostic curettage &/or diagnostic hysteroscopy	0.33	$ 813.45	4	$375
674	Vaginal delivery without complicating diagnosis	0.74	$1,824.10	10	$500
663	Other feminine reprod. System O.R. Procs age <65 w/o malignancy w/o cc	0.53	$1,306.45	11	$475
42	Viral Meningitis	0.08	$1,972.00	10	$400
347	Abdominal pain or mesenteric adenitis w/o cc	0.39	$ 961.35	6	$350
187	Bronchitis & asthma age <50 w/o cc	0.43	$1,059.95	6	$350
557	Minor bladder procedures w/o cc	1.01	$2,489.65	12	$450
319	Abdominal, hernia and other umbilical procedures age >9	1.01	$2,711.50	10	$425
863	Other drug use disorder & dependence	0.75	$1,848.75	12	$350
47	Seizure age <65 w/o cc	0.41	$1,010.65	6	$300
314	Appendectomy w/o complicated principal diagnosis	0.92	$2,267.80	7	$425
422	Soft tissue procedures	0.96	$2,366.40	9	$450
885	Injuries age <65	0.04	$ 986.00	6	$325
128	Dental extractions and restorations	0.32	$ 788.80	4	$375
335	Other colonoscopy w/o cc	0.03	$ 739.50	11	$450
183	Pneumothorax w cc	1.71	$4,215.15	18	$425

Reference: NSW Health 1998. Technical Paper, Structural and Funding Policy Branch. The Casemix Standards.

APPENDIX 3: MEDICATIONS COSTS

Generic Name of Drug	*Strength*	*Quantity*	*No. of Repeats*	*Brand names*	*Disp. Price For max. qty.*
Benztropine	2mg	60	2	Cogentin	$ 6.88
Trifluoperazine	2mg	100	5	Stelazine	$ 8.41
Trifluoperazine	5mg	100	5	Stelazine	$ 8.41
Chlorpromazine	100mg	100	5	Largactil	$12.78
Amozycillin	500mg	20	1	Amoxil	$11.77
Naproxen	500mg	50	3	Naprosyn	$14.45
Naproxen	250mg	100	3	Naprosyn	$16.78
Indomethacin	25mg	100	3	Indocid	$10.20
Codeine phosphate with paracetamol	30mg l500mg	20	0	Panadeine Forte	$ 6.86
Codeine with aspirin	30mg 500mg	20	0	Codral Forte	$ 6.87
Carbamazepine	400mg	200	2	Tegretol	$65.72
Thioridazine	10mg	100	5	Melleril	$ 8.21
Thioridazine	25mg	100	5	Melleril	$ 9.71
Thioridazine	50mg	100	5	Melleril	$10.08
Thioridazine	100mg	100	5	Melleril	$13.62
Diazepam	5mg	50	0	Valium	$ 7.86
Temazepam	10mg	25	0	Normison	$ 7.34
Amitriptyline	25mg	50	2	Tryptanol	$ 6.61
Nitrazepam	5mg	25	0	Mogadon	$ 7.34
Clomipramine	25mg	50	2	Anafranil	$19.83
Oxazepam	30mg	25	0	Serepax	$ 7.29
Phenelzine	15mg	50	2	Nardil	$13.25
Tranylcypromine	10mg	50	2	Parnate	$13.25
Lithium carbonate	250mg	200	2	Lithicarb	$11.44
Trimipramine	50mg	50	2	Surmontil	$ 7.16
Imipramine	25mg	50	2	Tofranil	$ 6.63
Dothiepin	25mg	50	2	Prothiaden	$ 8.43
Doxepin	25mg	50	2	Sinequan	$ 7.44
Desipramine	25mg	50	2	Pertofran	$ 7.42
Pindolol	5mg	100	5	Visken	$12.22
Aluminium/magnes. Susp.	500mls	2	5	Mylanta	$11.58
Cimetidine	200mg	120	5	Tagamet	$32.43
Paracetamo	l500mg	100	1	Dymadon	$ 7.48
Codeine Phosphate	30mg	20	0		$ 9.07
Metronidazole	200mg	21	1	Flagyl	$ 8.34
Clomiphene	50mg	10	5	Clomid	$43.22
Salbutamol		2	5	Ventolin	$10.70
Beclomethasone	100mg	1	5	Becotide 100	$17.07
Theophylline	250mg	100	5	Nuelin SR	$11.16

From the Schedule of Pharmaceutical Benefits - November 1997

Medications that were listed as General Pharmaceutical Benefits at the time of the study

Generic Name of Drug	*Strength*	*Quantity*	*No. of Repeats*	*Brand names*	*Disp. Price For max. qty.*
Carbamazepine	400mg	200	2	Tegretol	$65.72
Chloral Hydrate	500mg	25	0	Noctec [1]	$6.61
				Vitaminorum [2]	$5.46
Codeine + paracetamol	8mg-500mg	50	2	Dymadon Co.	$9.43
Codeine + aspirin	8mg-500mg	50	2	Aspalgin	$9.47
Private prescriptions					
Flunitrazepam	2mg	2	5	Rohypnol	$11.20
		100		Digesic	$31.95
		100		Nembudine	$26.95
	10mg	100		Librium	$23.00
	1mg	50		Ativan	$26.95
OTC medications					
Codeine + paracetamol	8mg-500mg	100		Dymadon Co.	$11.95
				Mersyndol	$ 7.50
Codeine + paracetamol	8mg-500mg	100		Panadeine	$14.95
Paracetamol		100		Panadol	$11.95
Aspirin	300mg	40		Aspro	$ 5.95

[1] Wholesale price provided by API
[2] Wholesale price provided by Pharmacy Dept., Westmead Hospital