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COST COMPARISON DATA
FOR
ANTIPSYCHOTIC MEDICATIONS

INTRODUCTION

Given the current economic climate, physicians like most other groups are under pressure to find ways to save money. Whether it is a patient who complains about the high cost of medication, or the hospital which is seeking to reduce expenditures, physicians' prescribing practices can have a considerable impact.

This article presents data which the cost-conscious physician can apply to reduce medication costs for patients receiving antipsychotic medications. In addition to cost, convenience factors, such as the number of tablets to be taken per day, or the volume per injection for intramuscular medications, need to be considered.

The following tables and graphs provide cost comparison data for commonly used antipsychotic medications available in Québec. Separate comparisons are given for four different medication formats: tablets, oral liquid, intramuscular injection, and depot intramuscular injection.

The information regarding dosage availability, format size, and cost, was taken from the "Liste de Médicaments" number 30, January 1987, published by the Régie de l'assurance-maladie du Québec. To permit comparisons based on equivalent amounts of medication, dosages were calculated based on the antipsychotic equivalency of each type of medication to chlorpromazine (CPZ). For example, haloperidol is said to have 50 times the antipsychotic potency of chlorpromazine (2 mg of haloperidol have the same potency as 100 mg of CPZ), and therefore the CPZ equivalency (abbreviated as "CPZ equ" in the tables) of haloperidol is given as 50. These equivalencies were obtained from several standard texts. However, for the depot formats, equivalent amounts and dosage intervals were obtained from the "Haldol LA Dosage Diskette" (McNeil Pharmaceuticals, 1986), at the setting for haloperidol decanoate 50 mg every four weeks.

For the tablet and oral liquid formats, daily cost and medication quantities were calculated on the amounts which would be equivalent to 1000 mg of chlorpromazine per day. For intramuscular injections, the amount of chlorpromazine used as the basis for comparison is 100 mg. For the depot preparations, Haloperidol decanoate 200 mg every four weeks was the comparison standard.

In using this data, clinicians should bear in mind that there are many other factors besides cost which should influence prescribing decisions, for example, side effects; interactions with other medications; patient allergies; which medications have worked previously for individual patients, and so on.

ANTIPSYCHOTICS IN TABLET FORM

Table 1 lists 39 different preparations of antipsychotic medications in tablet form, in order of increasing cost per day, based on antipsychotic potency equivalent to chlorpromazine 1000 mg per day. Graph 1 does not include all 39 medications; only those 20 preparations which take six or fewer tablets to achieve equivalency with chlorpromazine 1000 mg, are included, and cost per day and the number of tablets per day are shown. The labels are keyed to Table 1.

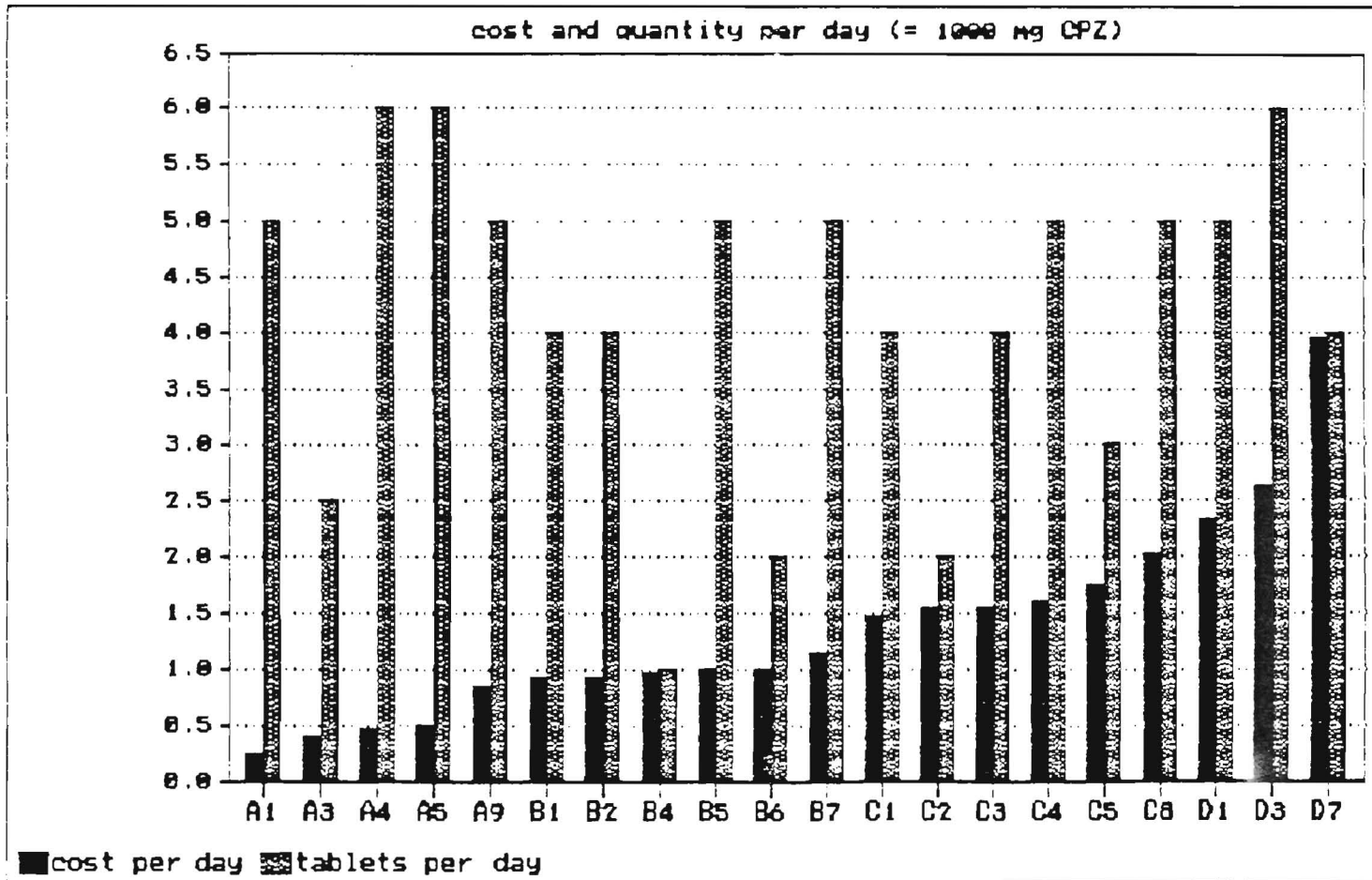
Table 1 - Antipsychotic Medications in Tablet Form

Label	Generic Name	Trade Name	Manufacturer	mg/ tab	CPZ equ	mg/ day	tabs /day	cost/ day
A1	trifluoperazine	trifluoperazine	Sands	10	20	50	5	\$0.25
A2	trifluoperazine	Trifluoperazine	Sands	5	20	50	10	\$0.28
A3	trifluoperazine	Apo-Trifluoperazine	Apotex	20	20	50	2.5	\$0.40
A4	perphenazine	Phenazine	ICN Canada	16	10	100	6	\$0.48
A5	perphenazine	Trilafon	Schering	16	10	100	6	\$0.49
A6	chlorpromazine	Novochlorpromazine	Novopharm	100	1	1000	10	\$0.72
A7	perphenazine	Phenazine	ICN Canada	8	10	100	12	\$0.79
A8	perphenazine	Trilafon	Schering	8	10	100	12	\$0.81
A9	chlorpromazine	Novochlorpromazine	Novopharm	200	1	1000	5	\$0.83
B1	haloperidol	Peridol	Technilab	5	50	20	4	\$0.91
B2	fluphenazine HCl	Permitil	Schering	5	50	20	4	\$0.92
B3	chlorpromazine	Chlorpromazine	Sands	50	1	1000	20	\$0.93
B4	haloperidol	Haldol	McNeil	20	50	20	1	\$0.98
B5	chlorpromazine	Largactil	Poulenc	200	1	1000	5	\$0.99
B6	haloperidol	Novo-peridol	Novopharm	10	50	20	2	\$0.99
B7	trifluoperazine	Stelazine	S.K. & F.	10	20	50	5	\$1.16
B8	chlorpromazine	Largactil	Poulenc	100	1	1000	10	\$1.20
B9	chlorpromazine	Largactil	Poulenc	50	1	1000	20	\$1.26
C1	haloperidol	Haldol	McNeil	5	50	20	4	\$1.48
C2	fluphenazine HCl	Moditen	Squibb	10	50	20	2	\$1.55
C3	fluphenazine HCl	Moditen	Squibb	5	50	20	4	\$1.56
C4	thiothixene	Navane	Pfizer	10	20	50	5	\$1.60
C5	loxapine succinate	Loxapac	Lederle	50	6.7	150	3	\$1.76
C6	thioridazine	pms-Thioridazine	Phmscience	100	1	1000	10	\$1.84
C7	trifluoperazine	Stelazine	S.K. & F.	5	20	50	10	\$1.93
C8	thioridazine	Novoridazine	Novopharm	200	1	1000	5	\$2.03
C9	fluphenazine HCl	Moditen	Squibb	2	50	20	10	\$2.25
D1	thioridazine	Mellaril	Sandoz	200	1	1000	5	\$2.33
D2	thiothixene	Navane	Pfizer	5	20	50	10	\$2.48
D3	loxapine succinate	Loxapac	Lederle	25	6.7	150	6	\$2.63
D4	thioridazine	Mellaril	Sandoz	100	1	1000	10	\$2.76
D5	chlorprothixene	Tarasan	Roche	50	1.5	650	13	\$2.89
D6	haloperidol	Haldol	McNeil	1	50	20	20	\$3.08
D7	pimozide	Orap	McNeil	10	25	40	4	\$3.93
D8	pimozide	Orap	McNeil	4	25	40	10	\$4.51
D9	chlorprothixene	Tarasan	Roche	15	1.5	650	43	\$4.74
E1	pimozide	Orap	McNeil	2	25	40	20	\$4.98
E2	methotrimeprazine	Nozinan	Poulenc	50	1	1000	20	\$6.98
E3	flupenthixol dihyd	Fluanxol	Merrell	3	50	20	6.7	\$2.75

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* "This product falls between D3 & D4, when ordered by cost per day."

Graph 1 - Daily Cost and Number of Tablets
for Antipsychotic Medications



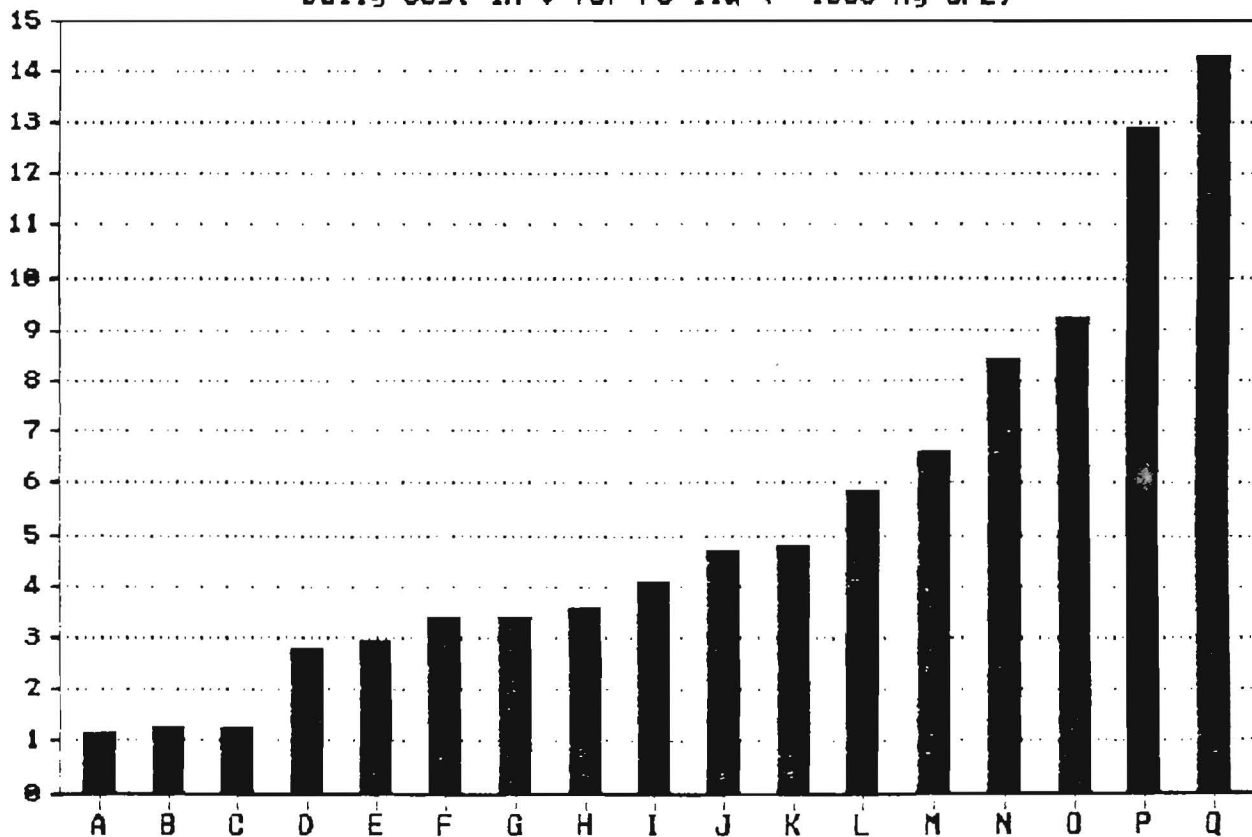
ORAL LIQUID ANTIPSYCHOTICS

Table 2 shows the daily cost as well as the daily quantity in millilitres, for the commonly used antipsychotics in oral liquid form. Graph 2a shows the daily cost, and Graph 2b the daily quantity. As for the tablet formats, equivalencies are based on chlorpromazine 1000 mg per day.

Table 2 - Antipsychotic Medications in Oral Liquid Form

Label	Generic Name	Trade Name	Manufacturer	Format	CPZ equ	mg/day	ml/day	cost/day
A	fluphenazine HCl	Moditen	Squibb	2.5 mg/5 ml	50	20	40	\$1.15
B	trifluoperazine	Terfluzine	ICN Canada	10 mg/ml	20	50	5	\$1.25
C	trifluoperazine	Stelazine Concen	S.K. & F.	10 mg/ml	20	50	5	\$1.27
D	haloperidol	Apo-Haloperidol	Apotex	2 mg/ml	50	20	10	\$2.78
E	chlorpromazine	Chlorpromanyl 20	Technilab	100 mg/5 ml	1	1000	50	\$2.95
F	haloperidol	Haldol	McNeil	2 mg/ml	50	20	10	\$3.38
G	chlorpromazine	Largactil	Poulenc	100 mg/5 ml	1	1000	50	\$3.42
H	loxapine	Loxapac Concentr	Lederle	25 mg/ml	6.7	150	6	\$3.55
I	thioridazine	Mellaril	Sandoz	30 mg/ml	1	1000	33	\$4.11
J	chlorpromazine	Largactil	Poulenc	25 mg/5 ml	1	1000	200	\$4.70
K	perphenazine	Trilafon concent	Schering	3.2 mg/ml	10	100	31	\$4.80
L	chlorpromazine	Chlorpromanyl 40	Technilab	40 mg/ml	1	1000	25	\$5.82
M	chlorpromazine	Largactil	Poulenc	40 mg/ml	1	1000	25	\$6.63
N	methotrimeprazine	Nozinan	Poulenc	40 mg/ml	1	1000	25	\$8.42
O	methotrimeprazine	Nozinan	Poulenc	25 mg/5 ml	1	1000	200	\$9.24
P	perphenazine	Trilafon	Schering	2 mg/5ml	10	100	250	12.85
Q	thioridazine	Mellaril	Sandoz	10 mg/5ml	1	1000	500	14.26

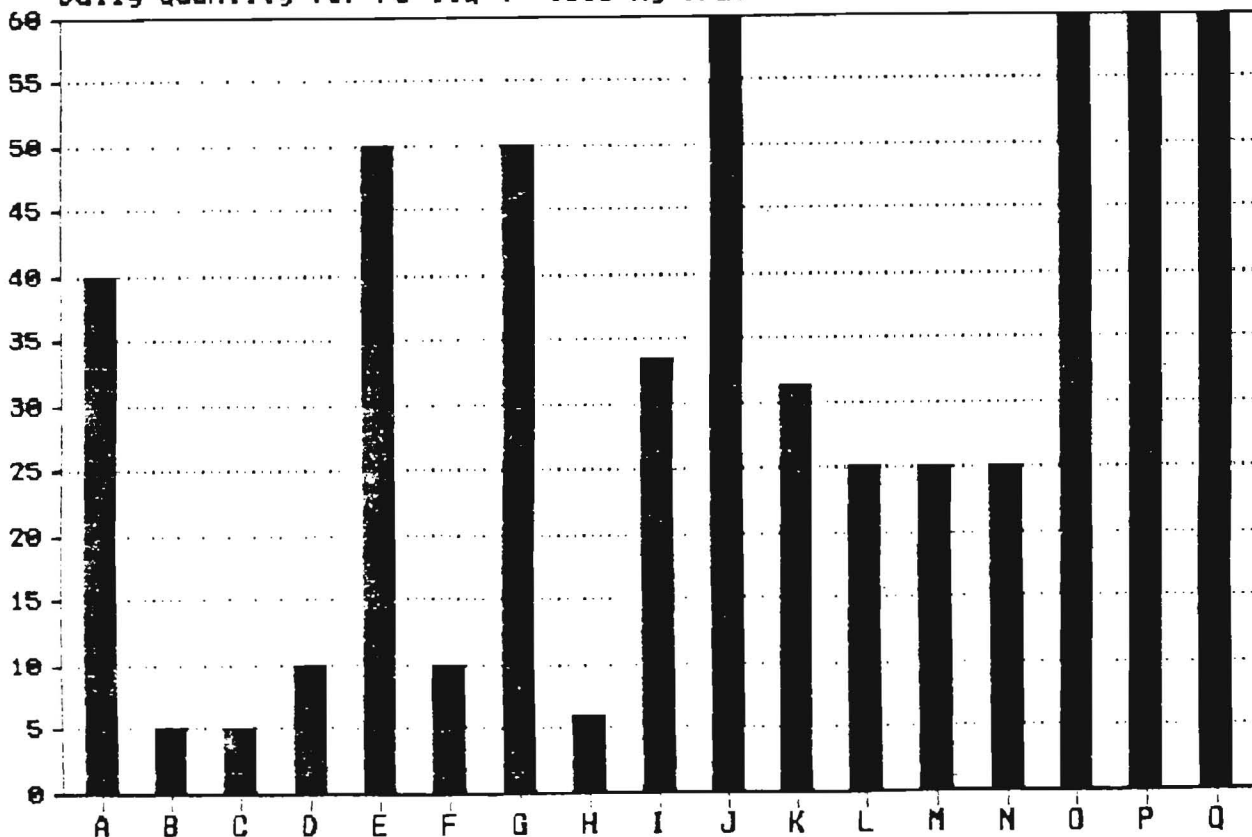
Daily Cost in \$ for PO liq (= 1000 mg CPZ)



■ cost per day

Graph 2a - Daily Cost for Oral Liquid Antipsychotics

Daily Quantity for PO liq (= 1000 mg CPZ)



■ ml per day

Graph 2b - Daily Quantity for Oral Liquid Antipsychotics

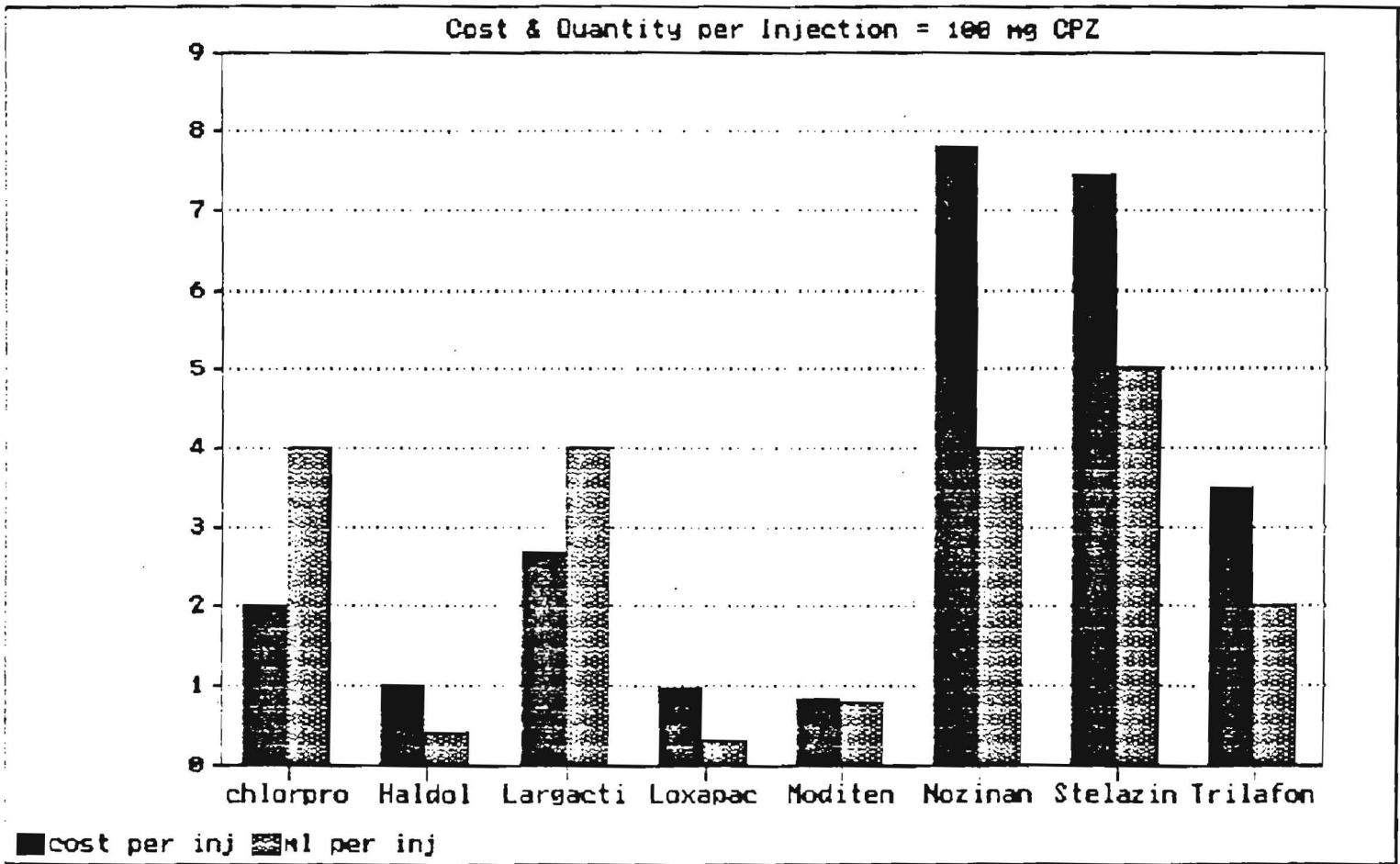
**ANTIPSYCHOTICS FOR
INTRAMUSCULAR INJECTION**

Table 3 and Graph 3 show the cost and quantity data for intramuscular medication. In this case, values are given per injection, and the dosages are related to chlorpromazine 100 mg. While this is a common dosage for CPZ, for example when used in a rapid tranquilization protocol, it leads to quantities for other medication, eg haloperidol 2 mg, which are less likely to be used (more typically, 10 mg of haloperidol is prescribed for rapid tranquilization).

Table 3 - Antipsychotics for Intramuscular Injection

Label	Generic Name	Trade Name	Manufacturer	Format	CPZ equ	mg/ inj	ml/ inj	cost/ inj
Moditen	fluphenazine HCl	Moditen	Squibb	2.5 mg/ml	50	2	0.8	\$0.82
Loxapac	loxapine HCl	Loxapac I.M.	Lederle	50 mg/ml	6.7	15	0.3	\$0.97
Haldol	haloperidol	Haldol	McNeil	5 mg/ml	50	2	0.4	\$1.01
chlorpro	chlorpromazine	Chlorpromazine	Horner	25 mg/ml	1	100	4.0	\$2.02
Largactil	chlorpromazine HCl	Largactil	Poulenc	25 mg/ml	1	100	4.0	\$2.66
Trilafon	perphenazine	Trilafon	Schering	5 mg/ml	10	10	2.0	\$3.46
Stelazin	trifluoperazine	Stelazine	S.K.& F.	1 mg/ml	20	5	5.0	\$7.45
Nozinan	methotrimeprazine	Nozinan	Poulenc	25 mg/ml	1	100	4.0	\$7.80

Graph 3 - Antipsychotics for Intramuscular Injection



DEPOT ANTIPSYCHOTICS

Tables 4a and 4b show the identifying data and the cost, quantity, and dose frequency data for the six different depot antipsychotics (labeled A through F) available in Quebec. As mentioned in the Introduction, the cost comparisons are based on equivalencies to Haldol LA 50 mg given every four weeks, as published by McNeil. The actual dosages used are based on Haldol LA 200 mg every four weeks, which corresponds to approximately 10 to 20 mg per day of regular haloperidol, or 500 to 1000 mg per day of chlorpromazine.

Table 4b and Graph 4 give two different sets of figures for four of the six medications. For these four, McNeil shows a range of dosage and dose interval. When the label has the suffix "m", it refers to the maximum dosage and the minimum dose interval for that medication. When there is no suffix, the minimum dosage and maximum dose interval are shown. Please note that the inverse of the dose interval (ie the dose frequency in injections per month, is actually given in the table and the graph.

Several of the medications are available in more than one concentration. Only the highest concentrations have been included here, as the lower concentrations would result in unacceptably high quantities per injection in many cases. Moreover, the lower concentrations invariably cost more per milligram.

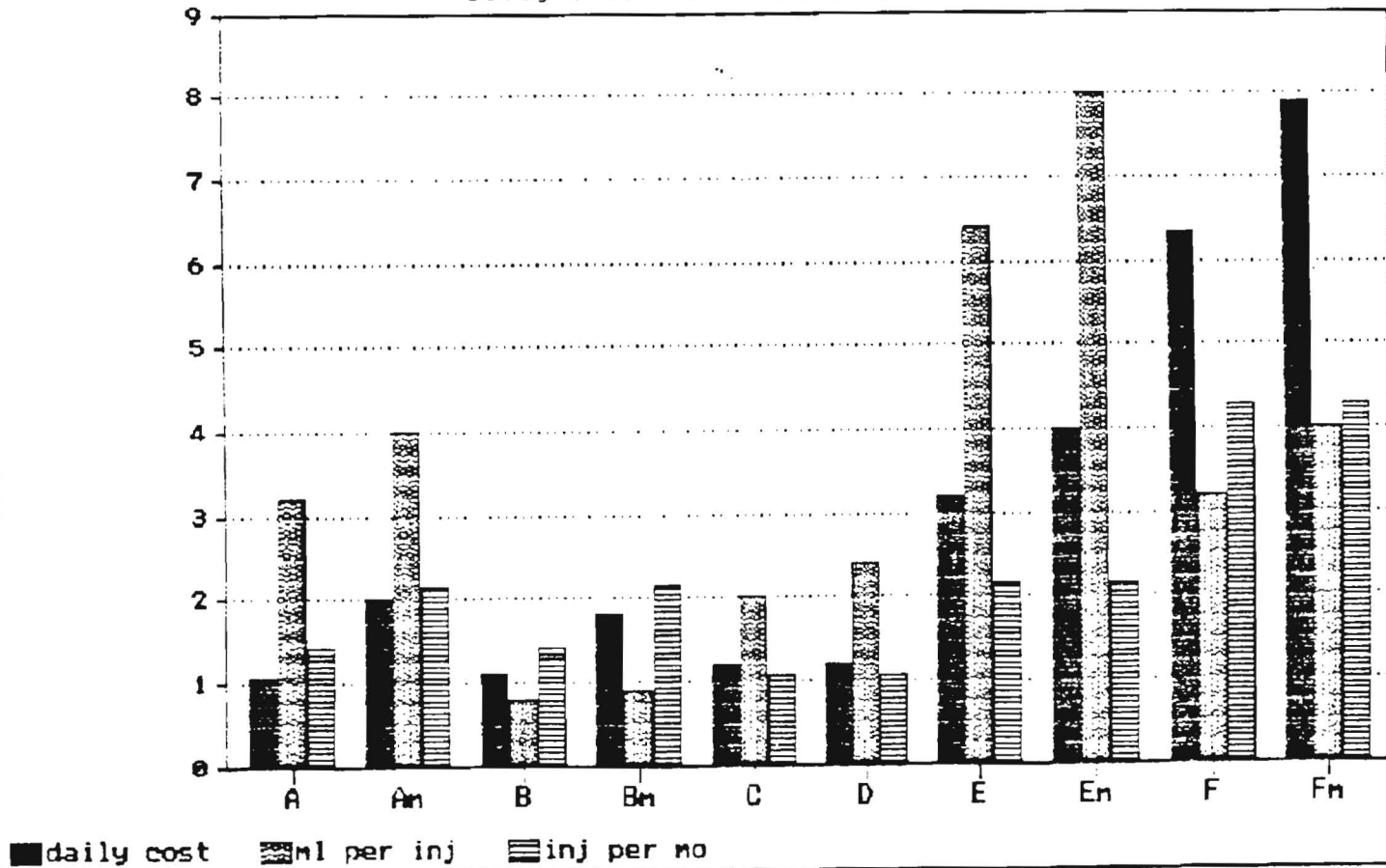
Table 4a - Identifying Data for Depot Antipsychotics

Label	Generic Name	Trade Name	Manufacturer	Format
A	fluphenazine decanoate	Modecate	Squibb	depot 25 mg/ml
B	flupenthixol decanoate	Fluanxol Depot	Merrell	depot 100 mg/ml
C	haloperidol decanoate	Haldol LA	McNeil	depot 100 mg/ml
D	pipotiazine palmitate	Piportil L4	Poulenc	depot 50mg/ml
E	fluphenazine enanthate	Moditen	Squibb	depot 25 mg/ml
F	fluspirilene	Imap Forte	McNeil	depot 10 mg/ml

Table 4b - Cost, Quantity, and Dose Frequency for Depot Antipsychotics

Label	Trade Name	Haldol LA equiv	dose interval	mg per inj	daily cost	ml per inj	inj per month
A	Modecate	20	21	80	\$1.07	3.2	1.4
Am	Modecate	25	14	100	\$2.01	4.0	2.1
B	Fluanxol Depot	20	21	80	\$1.09	0.8	1.4
Bm	Fluanxol Depot	22	14	88	\$1.81	0.9	2.1
C	Haldol LA	50	28	200	\$1.20	2.0	1.1
D	Piportil L4 100	30	28	120	\$1.21	2.4	1.1
E	Moditen	40	14	160	\$3.21	6.4	2.1
Em	Moditen	50	14	200	\$4.01	8.0	2.1
F	Imap Forte	8	7	32	\$6.32	3.2	4.3
Fm	Imap Forte	10	7	40	\$7.90	4.0	4.3

Daily Cost (\$) (= haldol LA 200 mg/4 wks)



Graph 4 - Cost, quantity, and Dose Frequency for Depot Antipsychotics

For those four formulations for which a conversion range is given, graph 4 and table 4b show the two extremes for each range (ie at one end is the low dose, long dose interval; at the other end of the range is the high dose at the short dose interval). Thus it appears that fluphenazine decanoate (labels A and Am) is the most inexpensive, at least at the lower extreme of its conversion range. However, it is only pennies per day less expensive than flupenthixol decanoate (labels B and Bm), haloperidol decanoate (label C), and pipotiazine palmitate (label D), and it has a considerably larger injection volume than the other three. Whereas flupenthixol decanoate has the lowest injection volume, its dosage interval is no longer than that for fluphenazine decanoate. The other two inexpensive preparations differ only in that haloperidol decanoate has a slightly smaller injection volume. The last two depot medications, fluphenazine enanthate and fluspirilene, suffer from daily costs 3 to 6 times higher than the low-cost preparations, considerably higher injection volume or a short interval between injections.

If high doses are needed, flupenthixol decanoate might be the most appropriate choice. At lower doses, the long dose interval of haloperidol decanoate and pipotiazine palmitate suggest that these might improve compliance and lower the associated costs (syringes, needles, nursing time, etc.).

It is possible also to compare the relative costs of the different medication formats. Considering haloperidol, tablets have a daily cost of \$0.91, while the oral liquid form costs \$2.78. The depot preparation costs only \$1.20 per day. Thus, if compliance is a problem (for example, inpatients who "cheek" their tablets) it may be preferable to go to the depot preparation rather than oral liquid. If oral liquids must be used, trifluoperazine provides the lowest daily volume while it costs, at \$1.25 per day, only slightly more than depot preparations, and in the same range as many popular medications in tablet form.