

# K - PHARMACY STAFFING AND DRUG COSTS FOR SPECIFIC CLINICAL PROGRAMS AND PHARMACY SERVICES - ACUTE CARE HOSPITALS

## KEVIN HALL

This chapter contains data on the pharmacy staffing and drug costs associated with the delivery of drug distribution and clinical pharmacy services to specific patient care programs (e.g. medicine, surgery, oncology, mental health, etc.). Similar staffing and drug cost data are also provided for certain pharmacy services that often operate as discrete operational units of the pharmacy (e.g. IV admixture services, TPN admixture, investigational drug services, etc.).

The objectives of generating this data are two-fold:

1. to create more detailed benchmark data for those who are called upon to compare and justify their own pharmacy staffing and drug costs against those reported by other hospitals
2. to facilitate planning for new and expanded programs and services, by providing information on the pharmacy resources typically required to operate particular programs and services

Even if they weren't able to complete all sections of the benchmark survey, respondents were encouraged to provide any data that they could. For example, many respondents were able to provide a breakdown of drug costs by clinical program, but were not able to supply data on the staffing allocated to specific clinical programs. Similarly, many facilities were able to identify the clinical staff time provided to specific programs, but were not able to provide data on the breakdown of their drug distribution staffing for individual clinical programs.

Readers should note that the criteria for participation in the survey were modified this year, allowing hospitals with as few as 50 acute beds to participate in the survey. Overall, there were a larger number of hospitals that participated in the 2007/08 survey, compared to the 2005/06 survey. However, it is interesting to note that the percentages of respondents from small (50-200 beds), medium (201-500 beds) and large hospitals (greater than 500 beds) remained very similar to the 2005/06 survey. Nonetheless any comparisons to the benchmarking data in previous Hospital Pharmacy in Canada Reports should be done with the recognition that the hospitals that provided benchmarking data in 2007/08 may not be exactly the same group that provided benchmarking data in past surveys.

## STAFFING INDICATORS FOR SPECIFIC INPATIENT CLINICAL PROGRAMS

In Table K-1, data on staffing 8 inpatient clinical programs, typically found in many Canadian hospitals, are presented. Readers are reminded that the number of respondents in each cell may be different from those in other cells. As a result, there are some minor anomalies in the data. For example if the paid hours per patient day for clinical services and the paid hours per patient day for drug distribution services (for any given clinical program in the table) are added up, the result may not be exactly the same as the total paid hours per patient day, reported for that program. That is because the respondents who provided data for each of those three indicators may be different.

The data can be summarized as follows:

- High acuity/high complexity clinical programs, such as critical care and oncology/bone marrow transplant, consumed significantly larger amounts of pharmacy staffing, on a paid hour per patient day basis, than did low acuity/low complexity programs. This was true for both the clinical and distributive staffing indicators.

- When the staffing figures were looked at for teaching versus non-teaching hospitals, there are some interesting findings. For certain patient care programs (i.e intensive care, pediatrics and mental health) the reported staffing resources (paid hours per patient day) utilized by non-teaching hospitals are as high, or higher, than those reported by teaching hospitals. For other programs (i.e. oncology, medicine, surgery, and rehabilitation), the staffing resources utilized by the teaching hospitals appeared to be slightly higher than those utilized by non-teaching hospitals. Given the small number of respondents in some of the cells this data needs to be interpreted cautiously. However, if on a program by program basis the pharmacy resources used by teaching hospitals are not necessarily higher than those used by non-teaching hospitals, other explanations for the significant differences in overall staffing for teaching versus non-teaching hospitals, as reported in the Human Resources chapter of this survey, need to be considered. It is probable that there is a higher concentration of high-acuity clinical programs in teaching hospitals, which would contribute to the higher level of overall staffing resources (paid hours per patient day) in teaching hospitals. In addition, there may be certain other pharmacy services, such as drug information centres and investigational drug services, that are more likely to be present in teaching hospitals.

**Table K-1. Pharmacy Benchmarking Data For Selected Clinical Programs 2007/08**

	Intensive Care	Oncology/ Bone Marrow Transplant	Medicine	Surgery	Mental Health	Rehab	Long Term Care	Pediatrics (in a general hospital)
<b>Mean Indicator Values - All Hospitals</b>								
<b>Total Paid Hours per Patient Day</b>	1.23 (n=27)	0.73 (n=14)	0.38 (n=23)	0.45 (n=20)	0.38 (n=24)	0.41 (n=13)	0.17 (n=15)	0.69 (n=10)
<b>Drug Distribution Paid hours Per Patient Day</b>	0.75 (n=28)	0.53 (n=14)	0.26 (n=26)	0.31 (n=25)	0.26 (n=26)	0.32 (n=15)	0.12 (n=20)	0.53 (n=14)
<b>Clinical Services Paid hours Per Patient Day</b>	0.38 (n=64)	0.28 (n=24)	0.11 (n=52)	0.13 (n=40)	0.10 (n=42)	0.11 (n=26)	0.06 (n=26)	0.23 (n=23)
<b>Drug Costs Per Patient Day</b>	\$113 (n=69)	\$155 (n=26)	\$20 (n=64)	\$28 (n=57)	\$12 (n=59)	\$14 (n=37)	\$8 (n=39)	\$22 (n=41)
<b>Mean Indicator Values - Teaching versus Non-Teaching Hospitals</b>								
<b>Total Paid hours Per Patient Day – Teaching</b>	1.13 (n=13)	0.81 (n=9)	0.41 (n=11)	0.49 (n=11)	0.33 (n=11)	0.44 (n=4)	0.17 (n=2)	0.41 (n=3)
<b>Total Paid hours Per Patient Day – Non-Teaching</b>	1.33 (n=14)	0.58 (n=5)	0.36 (n=12)	0.42 (n=9)	0.42 (n=13)	0.40 (n=9)	0.17 (n=13)	0.81 (n=7)
<b>Drug Costs Per Patient Day – Teaching</b>	\$143 (n=19)	\$154 (n=13)	\$28 (n=16)	\$33 (n=17)	\$14 (n=15)	\$31 (n=8)	\$10 (n=7)	\$25 (n=6)
<b>Drug Costs Per Patient Day – Non-Teaching</b>	\$101 (n=50)	\$156 (n=13)	\$17 (n=48)	\$25 (n=40)	\$11 (n=44)	\$10 (n=29)	\$8 (n=32)	\$22 (n=35)

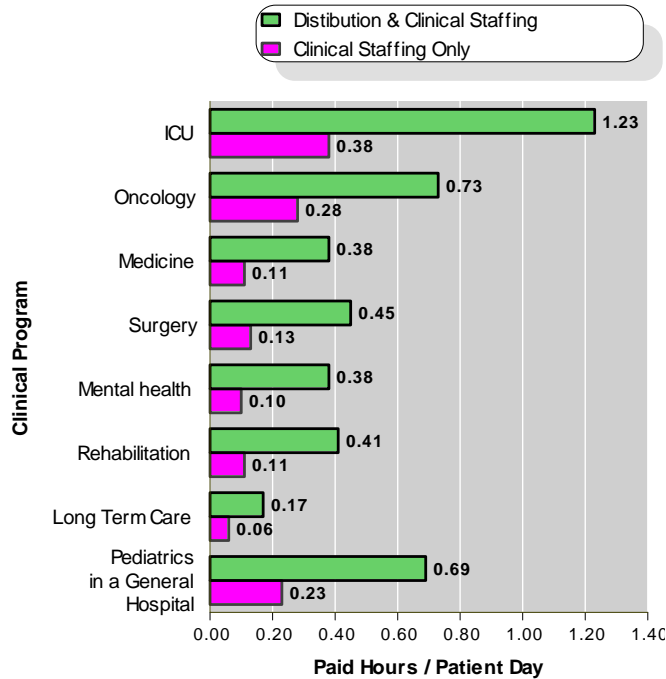
- Comparison of the staffing for distribution and clinical services (Figure K-1) indicates that the paid hours per patient day for clinical services represent between 26% to 38% of the total paid hours per patient day that are required for both distributive and clinical services. The clinical time component appears to be slightly higher in the 2007/08 survey, compared to the 2005/06 survey when the clinical component represented between 22% to 35% of the total paid hours. However, this still suggests that between 60% to 75% of the total paid hours for pharmacists and technicians are utilized to provide drug distribution services.

## DRUG COSTS FOR SPECIFIC INPATIENT CLINICAL PROGRAMS

In Table K-1, and in Figure K–2, mean drug cost data are provided for specific inpatient clinical programs.

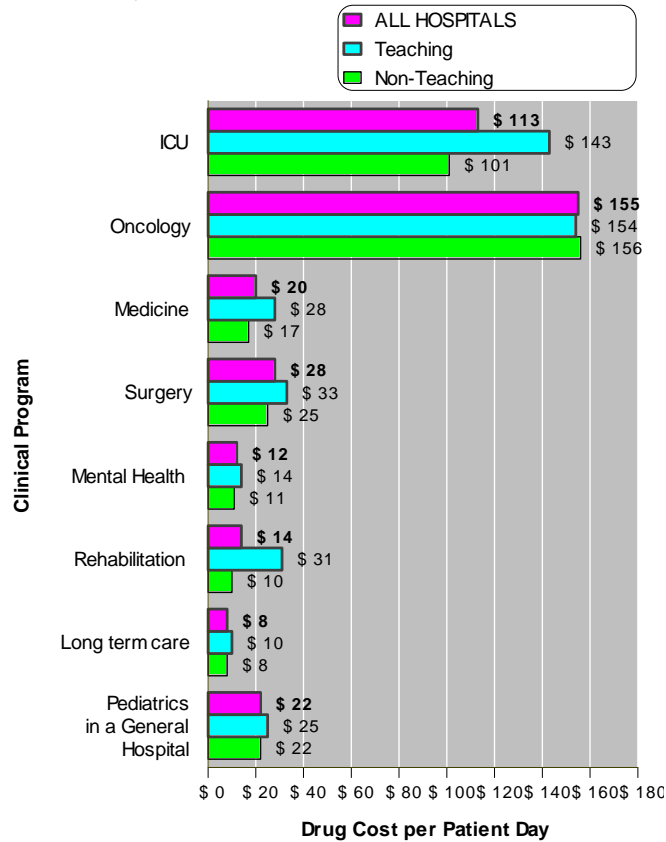
- Like the staffing data provided above, the drug cost data are very consistent with the data provided in the benchmarking chapter of the 2005/06 survey report. There were minimal or no changes in drug costs for the intensive care, medicine, mental health and long term care programs. For the oncology, surgery, rehabilitation and pediatric programs, the drug costs in 2007/08 were 8% to 22% (annualized) higher in 2007/08.

**Figure K-1. Mean Pharmacy Staffing 2007/08**



- With the exception of oncology/BMT, drug costs for each clinical program are higher in teaching hospitals than in non-teaching hospitals. This may reflect greater use of new, more expensive drugs in the teaching hospital environment. Although the number of reporting hospitals is not large, it does appear that the drug costs in rehabilitation appear to be much higher in teaching hospitals than in non-teaching hospitals in 2007/08, a finding that was not evident in the 2005/06 survey results. It is possible that this reflects the growing use of botulinum toxin to treat muscle spasms in certain types of rehabilitation patients, a relatively new therapy that may be more commonly used in teaching hospitals at this time.

**Figure K-2. Mean Drug Costs 2007/08**



## STAFFING AND DRUG COST INDICATORS FOR OTHER PROGRAMS AND SERVICES

In Table K-2, mean staffing indicators are provided for a number of programs and services where the workload denominator is something other than patient days (e.g. OR cases, concurrent studies managed, admixtures prepared, etc.). The denominator that appears in Table K-2 was chosen because it intuitively seems to have a relationship to the staffing input, and because many facilities would be able to measure and track it.

**Table K-2 Mean Pharmacy Staffing and Drug Cost Indicators for Other Programs and Services 2007/08**

Program or Service	All Hospitals	Teaching	Non-Teaching
<b>Oncology Admixture</b>			
Total paid hours per admixture	0.85 (n=41)	0.86 (n=15)	0.84 (n=26)
Clinical paid hours per admixture	0.26 (n=45)	0.31 (n=16)	0.23 (n=29)
Drug costs per admixture	\$359 (n=54)	\$283 (n=17)	\$394 (n=37)
<b>Centralized IV admixture</b>			
Total paid hours per admixture	0.20 (n=12)	0.11 (n=8)	0.40 (n=4)
Drug cost per admixture	\$11 (n=12)	\$14 (n=8)	\$7 (n=4)
<b>Home IV admixture</b>			
Total paid hours per admixture	1.07 (n=7)	0.95 (n=4)	1.23 (n=3)
Clinical paid hours per admixture	0.48 (n=8)	0.52 (n=4)	0.43 (n=4)
Drug distribution paid hours per admixture	0.66 (n=10)	0.43 (n=4)	0.81 (n=6)
Drug cost per admixture	\$39 (n=11)	\$23 (n=5)	\$52 (n=6)
<b>TPN Admixture</b>			
Total paid hours per admixture	0.93 (n=20)	0.43 (n=8)	1.26 (n=12)
Clinical paid hours per admixture	0.18 (n=27)	0.09 (n=10)	0.23 (n=17)
Drug distribution paid hours per admixture	0.66 (n=28)	0.39 (n=10)	0.81 (n=18)
Drug cost per admixture	\$40 (n=34)	\$28 (n=14)	\$48 (n=20)
<b>Investigational Drug Studies</b>			
Total paid hours per concurrent study managed	71 (n=14)	66 (n=11)	92 (n=3)
<b>Renal Dialysis</b>			
Total paid hours per patient year	46 (n=9)	54 (n=4)	39 (n=5)
Clinical paid hours per patient year	32 (n=21)	31 (n=11)	34 (n=10)
Drug cost per patient year (excluding erythropoietic agents)	\$3,734 (n=24)	\$4,952 (n=8)	\$3,126 (n=16)
Drug costs for erythropoietic agents	\$15,338 (n=18)	\$16,560 (n=8)	\$14,360 (n=10)
<b>Emergency Room</b>			
Total paid hours per ER visit	0.09 (n=22)	0.09 (n=9)	0.08 (n=13)
Drug cost per visit	\$10 (n=72)	\$12 (n=22)	\$9 (n=50)
<b>Operating Room</b>			
Total paid hours per case	0.30 (n=6)	0.26 (n=3)	0.34 (n=3)
Drug cost per case	\$50 (n=51)	\$62 (n=16)	\$44 (n=35)

The results in the above table were very similar, in most cases, to those reported in the 2005/06 Hospital Pharmacy in Canada Report. Exceptions are noted in the points below.

- The mean drug cost per oncology admixture was substantially higher in 2007/08 (\$359) than in 2005/06 (\$220). Similar to the finding in the 2005/06 report, drug costs per admixture in non-teaching hospitals (\$394, n=37) were substantially higher than in teaching hospitals (\$283, n=17). The mean drug costs per admixture were based on data from a reasonable number of respondents and should therefore be reasonably reliable, but the reasons for this difference are unclear.
- In 2007/08 respondents reported 0.20 total paid hours per admixture in centralized IV admixture programs, compared to 0.13 hours per admixture in the 2005/06 report. Drug costs per admixture were also reported to be substantially higher in 2007/08 (\$11 per admixture) than in 2005/06 (\$4.42 per admixture). The number of respondents that provided data in both years was quite small, 12 in 2007/08 and 7 in 2005/06, which makes the mean values more susceptible to the influence of outliers.
- In 2007/08, respondents reported a mean of 1.07 total hours per home IV admixture, compared to 1.64 hours in 2005/06. In 2005/06 there had been quite a striking difference between teaching hospitals (0.67 hours per admixture) and non-teaching hospitals (2.06 hours per admixture.) Those differences are much less in the 2007/08 results (0.95 total hours per home IV admixture in teaching hospitals, versus 1.23 hours in non-teaching hospitals). These results must be interpreted in light of the relatively small number of respondents in each sub-group, but the results in 2007/08 show less variability and are likely more reliable estimates of the total hours required for both the clinical services and the preparation of home IV admixtures.
- For those facilities that reported data on their investigational drug study service, the total hours per concurrent study being managed increased from 56 in 2005/06 to 71 hours in 2007/08. This may reflect the increasing complexity and workload associated with many drug studies.
- The data reported for pharmacy services for renal dialysis patients suggests that this service involves a substantial commitment of pharmacy manpower. The total pharmacy hours per year for each of the average number of renal dialysis patients being managed during that year were reported to be 46 hours in 2007/08, compared to 26 hours in the 2005/06 report. The clinical hours per patient showed the biggest increase, from 19 to 32 hours per year per dialysis patient.
- In the 2007/08 survey we included a new question dealing with erythropoietic drug costs for renal dialysis patients. The reported average cost per patient per year was \$15,338. Costs were reasonably similar for teaching (\$16,560) and non-teaching hospitals (\$14,360).

It is hoped that the data contained in this section of the survey will prove useful to pharmacy managers and others who are interested in benchmarking pharmacy resource utilization and/or using this data for the planning of new and expanded pharmacy programs.