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Technology Assessment Unit of
the McGill University Health Centre

Opportunity Costs Associated with Technology Expansion in the MUHC.

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of the McGill University Health Centre (MUHC)

by

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Invitation.

This document was developed to assist decision-making in the McGill University Health Centre. All are welcome to make use of it. However, to help us estimate its impact, it would be deeply appreciated if potential users could inform us whether it has influenced policy decisions in any way.

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EXECUTIVE SUMMARY

Introduction. The following report is not a Health Technology Assessment (HTA). Its purpose is to identify a largely unrecognised phenomenon. Each new technology acquired by the MUHC that increases net costs without reimbursement by government pushes the budget towards deficit. To avoid deficits the institution has to make cuts elsewhere. As a result, each such technology acquisition is made at the expense of other hospital functions. A study was initiated to establish the extent and significance of this process in the MUHC.

Method. We estimated net expenditure in five clinical cost centres of the Royal Victoria and Montreal General divisions of the MUHC, on new unreimbursed technologies in fiscal year 2007-08. We included only the direct net cost of *single use, expendable, equipment and supplies.* We excluded technologies that caused significant associated savings.

Results. In fiscal year 2007-2008 the net cost to the MUHC of new technologies (those introduced within the previous five years), that were not directly reimbursed by government added up to $6,552,496. Thus the *annual increase* in unreimbursed funds committed to new technology at this time averaged approximately $1.5 million per year.

However, the approximately $6.5 million spent in year five will remain a recurring item of expenditure in subsequent years (though of course the total may increase or diminish with time). Thus, if “new” is defined as introduced within the past 10 years, or 20 years (instead of 5), the total sum committed in 2007-2008 becomes $13.1 million or $26.2 million (assuming a constant rate of acquisition).

Discussion. Regardless of how “new” is defined, if no reimbursement is received from government, this commitment of resources can only be made at the expense of competing demands on budget, with adverse effects on the capacity and quality of the hospital's services. Furthermore, if this process occurs at a comparable level in other Quebec hospitals it must contribute significantly to the overcrowding of emergency rooms, and long wait times found in Quebec at this time.

Recommendations. It is important that this process be recognised. Although it cannot be corrected by hospital initiative alone, the MUHC should initiate a process whereby the rigour of evaluation of each contemplated technology acquisition is assured.
The hospital should also consider more closely tracking the costs of unreimbursed technologies over time in order to increase the number appeals for reimbursement.

SOMMAIRE

Introduction. Ce rapport ne constitue pas une évaluation technologique en soi. L'objectif visé est d'identifier un phénomène largement méconnu où chaque nouvelle technologie acquise par le CUSM, sans apport financier par le gouvernement, force le budget vers un état déficitaire. Pour éviter un déficit, l'établissement doit ainsi procéder à des coupures dans d'autres items budgétaires. En effet de telles acquisitions se font aux dépens d'autres fonctions hospitalières. Une étude fut ainsi initiée pour vérifier l'importance et l'étendue de ce processus au CUSM.

Méthodologie. Nous avons évalué les dépenses nettes dans cinq centres de coûts dans des divisions adultes du CUSM suite à l'acquisition de nouvelles technologies non remboursées par le gouvernement pour l'exercice financier 2007-2008. Seuls les coûts directs des items à usage unique et des fournitures conjointes furent considérés. Les technologies entraînant des économies significatives furent exclues.

Résultats. Pour l'exercice financier 2007-2008, le coût net relié aux nouvelles technologies au CUSM (celles introduites lors des cinq dernières années) s'élevait à 6 552 496 $. Ce montant reflète l'augmentation des dépenses en regard des technologies introduites depuis l'exercice financier 2002-2003 (soit un montant moyen d'environ 1,5 M$ par année).

Cependant, ce montant d'environ 6,5 M$ dépensé à l'an cinq demeurera un item de dépenses récurrentes pour les années subséquentes (ce montant pouvant, bien entendu, augmenter ou diminuer avec les années). Par contre, si le terme « nouvelles technologies » inclut celles introduites

depuis les 10 ou 20 dernières années (au lieu de 5), la somme des dépenses correspondantes devient plutôt 13,1 M$ ou 26,2 M$ (en supposant un taux constant d'acquisition).

Discussion. Quelle que soit la définition de « nouvelle technologie », si aucun remboursement n'est reçu de la part du gouvernement, cette exigence en ressources ne peut se faire qu'au détriment d'autres demandes budgétaires avec un impact sur la quantité et la qualité des services hospitaliers. De plus, si ce processus est présent dans d'autres établissements de santé québécois à un niveau comparable, ceci doit contribuer de façon importante à l'encombrement des urgences ainsi qu'aux temps d'attente prolongé dénotés au Québec.

Recommandations. Il est important que ce processus soit reconnu. Même si cette situation ne peut être corrigée par les seules initiatives d'un établissement, le CUSM devrait considérer la mise en place d'un processus selon lequel l'acquisition de toute nouvelle technologie serait évaluée de façon rigoureuse. Enfin, le CUSM devrait établir un suivi des coûts des technologies non remboursées de façon à mettre en place des incitatifs de remboursement.

Opportunity Costs Associated with Technology Expansion in the MUHC.

FOREWORD

The following report is not a Health Technology Assessment (HTA). Its objective is to identify, and estimate the extent of a largely unrecognised phenomenon; namely the progressive commitment of funds within the hospital's fixed global budget to finance new technologies at the *expense of existing services*.

BACKGROUND

The continuing acquisition and use of new technologies, (defined here as the drugs, devices and procedures used by health professionals), is a substantial driver of increasing healthcare costs[1-4,] . Estimates of the proportion of the increase in healthcare spending attributable to the costs of new technology range from 39% (US,1998) [5] , and 50% (UK,1977-2000) [6], to 66% (US and Canada,1975-2000)[7].

Apart from "big ticket" items which are approved by government, decisions to acquire items of lesser unit cost are usually made at the hospital level. If well chosen, all new technologies introduced by the hospital should have a positive effect on clinical outcome, reducing mortality and morbidity. However, these new technologies differ in one important respect. Some will replace older technologies which may be equally or more expensive, resulting in either offset savings or an increase in efficiency. (eg., percutaneous correction of congenital heart defects, or transvenous insertion of heart valves in the catheterisation suite). Other technologies , however, which also reduce mortality and morbidity manage previously untreated conditions, and for these there are no significant offset savings. (eg., implantable cardiac defibrillators, mechanical hearts) .

Importantly, the cost of these acquisitions is not always reimbursed to the hospitals, and each time this happens, the budget available to operate the institution is effectively reduced by the opportunity cost of that acquisition. If this happens frequently, this process will cause erosion of both the

capacity and the quality of hospital services, with prolongation of wait times and deterioration of the quality of care.

To understand this process, consider the analogy of a household with fixed annual income in which there is a relentlessly increasing cost item, say the Hydro bill. To pay this bill each year without going into deficit, cut-backs must be made elsewhere, such as in dining out, movies, holidays, and home maintenance. Over time, although overall household expenditure is unchanged and remains in balance with income, the quality of life in the home deteriorates.

In the Canadian healthcare system the equivalent of the household is the hospital, and the equivalent of the Hydro bill is the net cost of new technologies. Each new technology that increases net costs without reimbursement by government puts the institution's budget into the red. Since deficits are not permitted the institution has to make cuts elsewhere, and because salaries and supplies cannot be easily cut, savings must be achieved by extension of hospital holidays, lower staff patient ratios, curtailment of overtime work, or bed closures. All these measures, if significant, will eventually result in congested emergency rooms, longer wait times, poorer hospital hygiene and stressful working conditions.

Are these measures "significant"? No departments keep lists of their "new technologies", let alone those that have not been reimbursed by government. To quantify the extent of this problem would therefore require a line by line examination of all departmental expenditures, a project beyond current resources. However, it has been possible to examine the technology acquisitions in five cost centres, as described below.

METHOD

New technology acquisitions that have not been reimbursed by government were identified with the help of the responsible administrators in five cost centres with direct patient responsibility in the Royal Victoria and Montreal General divisions of the McGill University Health Centre (see Table 1).

Definition. Clearly, the result of this enquiry will depend on how "new" technologies are defined. Initially, “new” technologies were arbitrarily defined as those introduced within the past five years. However, the development of new applications of a previously accepted technology can also cause an explosive increase in use. Accordingly, we also considered as “new” those technologies in which use had more than doubled in the previous five years.

Costs. We estimated the *net* cost of new technologies, as defined, in the budget year 2007-08. We included only the *direct costs* of *expendable*, *single use* equipment and *supplies* for which no specific reimbursement was received from government. Costs of capital equipment, which are often paid by Foundations or the manufacturers were excluded as were the hospital operating costs associated with the use of the technology.

Also excluded where those technologies that resulted in offset savings of approximately the same magnitude as their costs. These were: the transvenous pulmonary valve, the percutaneous (transvenous) closure of patent foramen ovale , atrial septal defect and patent ductus arteriosus, insertion of biliary stents , and the Impella left ventricular assist device[8].

RESULTS

The new technologies (those introduced within the previous five years) and their net cost to the MUHC in fiscal year 2007-2008 are shown in Table 1. The total, $6,552,496, reflects the increase in spending on those introduced since fiscal year 2002-2003 (an average increase in spending of $1.5 million per year).

However, the definition of "new" has to be arbitrary. Regardless of whether these technologies are still defined as new in year six or seven after their introduction, the approximately $6.5 million spent in year five will remain a recurring item of expenditure in subsequent years (though of course the total may increase or diminish with time). Thus, if “new” is defined as introduced within the past 10 years, or 20 years (instead of 5), the sum committed to new technology in 2007-8 becomes $13.1 million or $26.2 million (assuming a constant rate of acquisition).

DISCUSSION

The extent of this process. Regardless of how "new" is defined, if no budget reimbursement is received from government, and if a deficit is to be avoided, this commitment of resources can only be made at the expense of competing budgetary demands, with adverse effects on hospital capacity and quality.

The extent of this process elsewhere in Quebec is unknown. However, if it occurs at a comparable level in other Quebec hospitals, it must contribute significantly to the overcrowding of emergency rooms, and the prolongation of wait times that have been increasingly experienced over the past 15 years.

Why does this happen? The present discussion is not a criticism of the hospital or of the government, but of the process itself. Hospitals are *expected* to update their equipment and procedures and in doing so are expected to acquire new technologies. At the same time the Government expects the institutions that it funds to make the best use of their budgets and to stay out of deficit. However, hospitals can be criticised and even sued for not providing up-to-date treatment and drugs, but not for closing beds, understaffing their facilities, or reducing operating hours. So this is a process that favours acquisition of new technologies at the expense of other services.

INESSS. How will this process be affected by the proposed new Institut national d' excellence en santé et services sociaux du Québec? As currently outlined, the Ministry is expected to exert financial and political pressure on institutions to induce them to conform to the technology guidelines produced by INESSS[9]. Unless there is at the same time specific reimbursement of hospitals for the costs they incur as a result of conforming to INESSS guidelines, the process we have described here will accelerate, with further negative effects on hospital services.

Corrective measures. It is clear that this process cannot be corrected by hospital initiative alone. First, there must be recognition by both government and its health institutions of the principle that in general, *new technologies should not be acquired until the source of funding has been clearly identified*. That this is feasible is demonstrated by Israel where the introduction of new technologies must, by law, be accompanied by

additions to the health fund's budget that fully reflect their anticipated costs.[10]

Are there *any* steps that could be taken *within the MUHC* to reduce the negative effects of this process ? Of the 21 unreimbursed new technologies listed in Table 1, only four have been the subject of a health technology assessment (HTA) by the Technology Assessment Unit (TAU). (Of these, one, VAC wound therapy was not recommended). Systematic insistence that all applications for new technology acquisitions must include hard evidence of benefit might well slow the process of technology acquisition to some extent.

It is also possible that systematic identification of unreimbursed technologies with tracking of their costs year by year could facilitate the development of more applications for reimbursement.

CONCLUSIONS

- **Every time the net costs of new technologies are not reimbursed by government, there is an equivalent reduction in the funds available for hospital operation.**
- **In the year 2007-08, in five cost centres of the MUHC, approximately $6.5 million net was spent on unreimbursed new technologies (introduced within the previous five years). *Thus, the average rate of increase of expenditure on unreimbursed new technology over that period was $1.5 million per year.***
- **If "new" was defined as "within the previous 10 or 20 (instead of 5) years", the annual sum committed to new technologies would be $13.1 million or $26.2 million (assuming a constant rate of acquisition).**
- **However new is defined, this commitment of resources to technology acquisition must significantly reduce the volume, and perhaps the quality of the health services delivered by the hospital.**

RECOMMENDATIONS

- **Although it cannot be corrected by hospital initiative alone, it is important that this process be recognized.**
- **The MUHC should initiate a process whereby the rigour of evaluation of each contemplated technology acquisition is assured.**
- **The hospital should also consider more closely tracking the costs of unreimbursed technologies over time, to facilitate the development of appeals for reimbursement.**

TABLE 1

Expenditure (2007-08) on Unreimbursed New(acquired since 2003)Technologies.

	ITEM	COST$	TAU Recommendation
Heart Cath	Percutaneous aortic valve	204,000	
	Pacemakers (ICD excluded)	604,087	
OR	Cardioblate (Atrial Fibrillation)	96,666	
	Talon sternal closure device	90,000	
	Heart valves	224,000	
	Mitral Rings	180,000	
	Mechanical Hearts	603,000	
	Pulsatile Renal Perfusion	22,500	Recommended
	Knee arthroplasty. Navitrack	26,325	Recommended
	Mechanical Sutures	1,600,000	
Ward	Therapeutic mattresses	754,035	
	VAC Wound therapy	404,832	Not Recommended
ICU	Continuous Renal Replacement	878,480	
Imaging	Embolic device coils	140,017	
	Vena cava	229,447	
	Transjug. Intrahep. Porto-Syst. Shunt	48,319	
	Permanent tunneled catheters	18,451	
	Periph. Inserted Central Caths	55,461	
	Radiofrequency ablation (RFA)	74,980	Recommended
	Biopsies	30,101	
	Stents	267,795	
TOTAL		6,552,496	

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