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## **BASIC MEDICAL DEVICES NEEDS FOR LONG-TERM CARE UNITS**

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### **ABSTRACT**

Healthcare facilities planning guides published by Quebec Ministry of Health and Social Services (MSSS) do not provide information on the minimum number of medical equipment required on the care units to support the mission of clinical and medical services. MSSS Technology Planning System (Actif+ Réseau) provides a standard nomenclature of medical devices and an associated management framework: service life, and replacement value. The creation in April 2015 of Integrated Centers of Care and Social Services resulted in the rapid development of the regions in terms of upgrading the technological platforms. This results in a multitude of development projects that require functional and technical programs (FTPs). The list of medical equipment for an FTP is most often required in a very short term, or even a few days. Knowing that political decisions can lead to the realization of FTPs in even shorter timeframes, there is a risk of providing very partial information or an unsuitable technology; which is a risk factor for the budgeting of the project and, consequently, for the service to patients and the population. We propose here a first sketch of the distribution of equipment on a long-term care unit for patients with loss of autonomy. We hope that such an approach will lead to the creation by the MSSS of a Technology Planning Guide for health care units in Quebec healthcare facilities to standardize the level of equipment expected to ensure normal clinical and medical operations. The level of current equipment compared to the standardized target could be the basis for a technological performance indicator of health and social services institutions.

**Keywords:** Planning Guide, Medical Devices, Technology Planning, Long Term Care, Technological Performance Indicator.

### **INTRODUCTION**

University teaching in biomedical and clinical engineering focuses primarily on medical technologies typically found in hospitals. It is even said that this learning is hospitalocentric. The arrival of Health and Social Services Centers (CSSS) and especially the Integrated Health and Social Services Center (CISSS) has resulted in a centralized management of medical technology including Local community services centers (CLSC), long term care units (CHSLD), Home Support, Youth Centers, Rehabilitation and even health care in local prison. A unexperienced biomedical engineer is not equipped to respond quickly to the equipment planning of these 'non-hospital' centers, since most of them were under the responsibility of building and material facilities services before the mergers.

From 2003 to 2015, we had the opportunity of working in institutions where our responsibility covered, in addition to the hospital, the CHSLD (2003-2009), home care, intermediate resources and CLSC (2009-2015). We share our experience here, hoping it could be adapted to the reader's regional reality.

### **MATERIALS AND METHODS**

Ratios are proposed starting from the asset inventories from 2003 to 2015 and the needs met after the creation of the CISSS on April 1st, 2015.

There is an operational component that proposes the management of service calls in CHSLDs with nominal response times defined from our experience.

## RESULTS

To the best of our knowledge of the functioning of CHSLDs, we propose the planning summarized in Table 1 likely to contribute to ensure a reasonable level of technology to the clinical and medical teams.

### Technological planning of medical devices in long-term care.

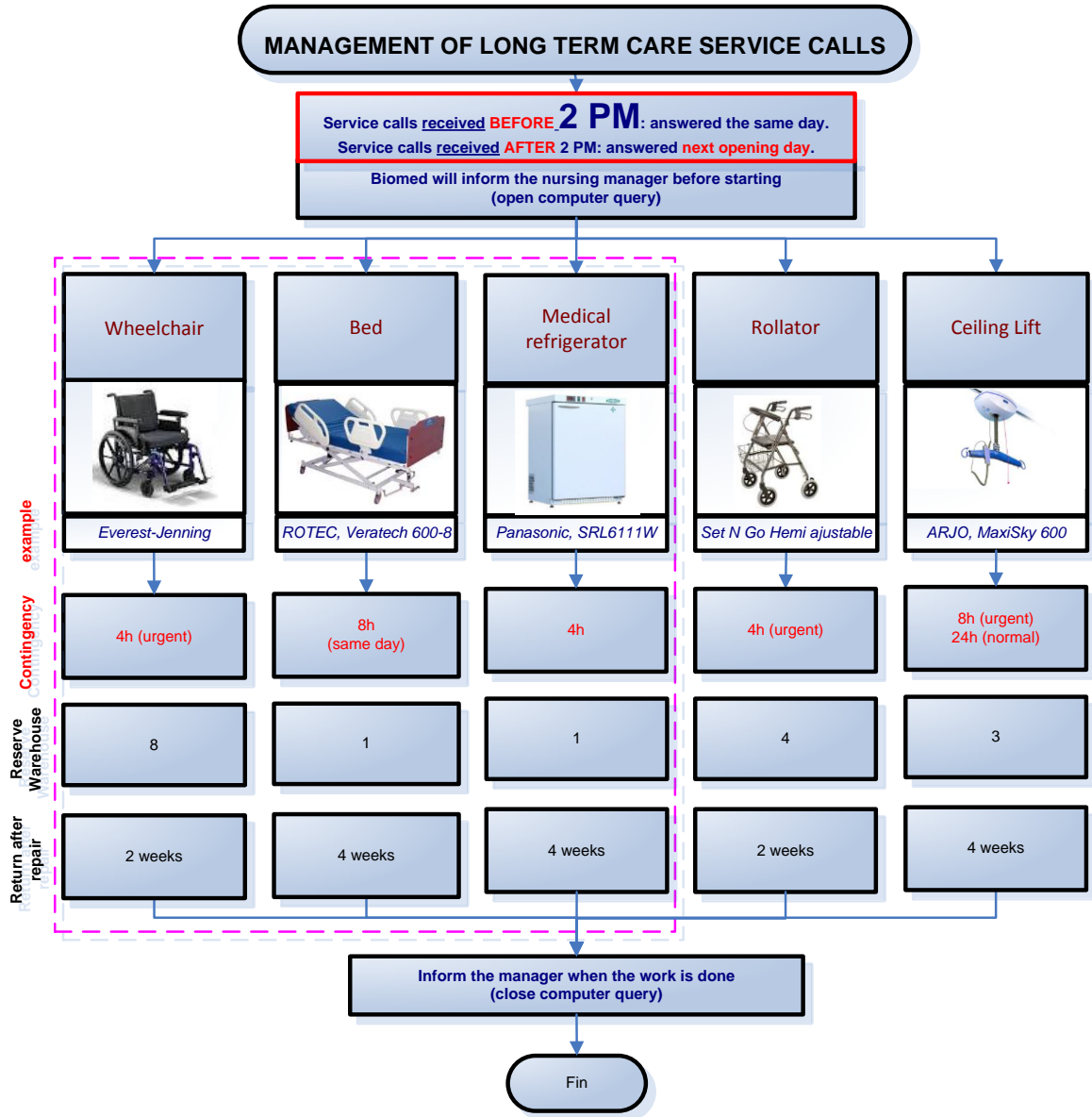
Designation of the device	Additional specification	Example (for information only)	Replacement Value (MSSS)	ART value (in January 2018)	Useful life (MSSS)	Per unit	Nursing station	By wing	By bathroom	By room	By bedside
Adjustable height bathtubs	no hydromassage	Arjo, Rhaspody P200+	11 000	13 000	20			1			
Automated Dispensing Cabinets		Accudose-Rx	50 000	60 000	15		1				
Automated External Defibrillator	include spare pads	AED Plus	3 000	1 500	10		1				
Bariatric ceiling lift with scale	5 spare slings	Maxi Sky 1000 4FB ECS	4 000	8 000	15	1					
Bariatric electric medical bed with scale and trapeze		Rotec Varitech 1100lbs	3 500	7 000	20						0,07
Ceiling Lift	include load test, 2 spare slings	MTM C-625 RTC	4 000	3 000	15				1	1	
Commode Chair		Hygie, Alu-Classic	800	600	25						0,4
Dual Ramp Wheelchair Scale		Rice Lake, Dual Ramp Scale	6 500	8 000	15	0,25					
Floor lifts	2 spare slings	Hoyer Presence	4 000	3 500	15			1			
Height Adjustable Rollator		Set N Go Hemi ajustable	not listed	300	not listed						0,3
Hygiene lift chair	- 1 enlarged base 26 " - 1 remote control - 1 external charger - 2 batteries - 1 belt	CM1000	6 000	10 000	15			1			
In bed Shower Unit		Reval, Rubis	not listed	10 000	not listed			1			
Lift bath trolley with Power Drive		Arjo, Miranti	6 000	15 000	15	1					
Low profile medical electric bed with extension		Rotec, Veratech 600-8	3 500	4 900	20						0,05
Low profile medical electric bed with scale		Umano ookSnow	3 500	4 700	20						0,25
Medication Cart	#Storage Bins = # patients	UDS, serrure automatique, tiroirs Versa	5 000	7 500	10			1			
Oxygen Concentrator (20% are 10L)		Everflo Quiet / Airsep New Life Intensity	1 800	500 (5L) / 1500(10L)	15						0,2
Oxygen Conserving Device		Devilbiss, PD1000I	400	550	15						0,2
Preventive mattress		Visco-Med 13000	2 000	500	15						0,2
Reclining bathtubs	for psychiatric unit	ConfortMédic, Motion	22 000	20 000	20	1					
Shower chair		Ocean Tilt Roue 5"	800	1 800	25				1		
Shower trolleys		Arjo, Concerto	6 000	8 000	15				1		
Standing and Raising Aid	2x rechargeable batteries, 1 charger, 2x (medium and large sling)	Sara 3000	4 000	5 500	15	2					
Static therapeutic mattress		Evolve 36x80	4 000	3 500	15						0,05
Tilt-in-space shower commode		Aquatec Ocean VIP	6 000	4 600	15						0,01
Trendelenburg / Anti-Trendelenburg hospital bed		Lojer, ScanAfia XS	3 500	6 000	20						0,03
Vaccine / medicine refrigerator	6 sqft	Panasonic, SRL6111W	6 000	2 000	15		1				
Vital Signs Monitor Without Memory	on pole, small, medium and large adult cuffs	Welch Allyn, Spot 420	4 000	1 800	13						0,1
Wheelchair	according to occupational therapist recommendation	Everest-Jenning	600	1 600	15						0,3

Table 1: Ratio of medical equipment proposed for nominal clinical operation in CHSLDs



### Planning for the maintenance of medical devices in CHSLDs

As an indication, we present in Figure 1, the management of service calls for some medical devices commonly present in CHSLDs.



<u>REPAIRS MONITORING PROCESS</u>	
Responsibility of the care unit Manager	Electromechanical / Biomedical Technician
1. Check in the patient's room <b>BEFORE</b> calling Biomed 2. Notify Biomed of end-user's assessment of the completed work: closure (if satisfied) vs revision (specify concerns)	1. Agree with the manager about the start of the work 2. Inform the manager of the progress of work 3. Notify the manager at the end of the work

Figure 1: Proposed approach for the management of service calls for CHSLD's main medical equipment

## DISCUSSION

### Equipment level and response time

Table 1 and Figure 1 are intended as working tools for initiating the discussion so that, in a concerted manner, a consensual list will be established and a nominal response times be defined according to the size of the assigned support team. We expect the reader's contribution to propose an update of these data according to his/her technological experience in CHSLDs.

### Consolidation and technological upgrade of a care unit

In the event that the proposed approach is acceptable to the Biomedical Community, it would be the responsibility of the Biomedical Engineering Department to ensure that, in the long term, the care units have an acceptable level of primary medical equipment (Table 1). It would thus be possible to measure the performance of biomedical engineering departments in their ability to achieve this goal as much in asset management but also by maintaining the equipment in normal operating condition during their useful lifetime.

### Adding new technologies in CHSLDs

We can no longer call development the addition of a new technology in a CHSLD if this technology is minimally required according to the standard technological planning proposed in this document, both on the floor (Table 1) and in the functional reserve of biomedical engineering (Figure 1). Authorization from MSSS would however be required at each stage of adding new equipment as part of a technological upgrade. This is to ensure that it responds gradually to the institution's mission, based on locally available clinical and medical expertise.

### Asset maintenance in CHSLDs

Table 1 is indicative. However, MSSS could appropriate the rationale of the nominal distribution of medical equipment on the care units. Thus, if the notion of the required minimum level of medical equipment becomes a reality, MSSS could consider additional funding for the Equipment and furniture conservation plan in the context of technological upgrading. Otherwise, MSSS could then authorize the purchase of the said equipment at zero cost (without raising the initial amount authorized to the organization).

### Update of the replacement value and useful lifetime, taking into account the different configurations of the same technology

To take into account the various configurations that a medical technology may have, MSSS would benefit from considering instead an acceptable range of replacement cost values. For example, the cost of a patient lift is highly variable, depending on whether it is with or without a scale, standing, mobile vs. overhead including rail and load test (Table 1).

### Impact on technological planning in Local community services Centers (CLSC) and on short-term care units

The approach we propose here in CHSLDs can be extended to any clinical service where a patient is diagnosed and where he receives care: CLSCs, general hospitals, specialized hospitals, university institutes, rehabilitation centers, youth centers, etc.

### Proposal for a technological performance indicator for healthcare facilities

Based on the outline provided in this document, the Biomedical Engineering Department could be reviewed by its peers to obtain a compliance score for achieving the equipment objectives of their institution's care units. A minimum score of 70% of the recommended level of equipment would make it possible to pass successfully the peer review: 70% being the threshold of passage according to Quebec public organizations contracts Act. Only institutions that have successfully passed the peer review could have their biomedical engineering department included in any benchmarking related to budget performance or human resources.

### Healthcare facilities technological compliance classification

Three types of performances could be defined:

A = 90 to 100%: exemplary technological compliance

B = 80 to 89.99%: excellent compliance

C = 70 to 79.99%: nominal compliance.

Comparisons between biomedical engineering departments would be limited only to facilities with A or B compliance score; as being closest to the recommended technology standardization reference.



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## **CONCLUSION**

This article is a very personal opinion of technological planning in CHSLDs. Any comments and suggestions are welcome to enrich it. It suggests agreeing on a level of equipment expected on a care unit according to its mission and its expected service offer. This common data will serve, we hope, to guide healthcare professionals involved in the management of medical technology, including biomedical engineers newly graduated.

Knowledge of the standardized level of medical equipment per care unit may be one of the parameters that could be used to better interpret the comparative performances of biomedical engineering departments in healthcare facilities.

## **ACKNOWLEDGMENTS**

We are grateful to the long term care units' managers who, over the 14 past years, have given

their opinion and contributed to our biomedical technology management processes.

## **ABBREVIATIONS**

**ART** : Cost after tax recovery

**CHSLD** : Long Term Care Hospital Center

**CISSS** : Integrated Health and Social Services Center

**CLSC** : Local Community Service Center

**CSSS** : Health and Social Services Center

**MSSS** : Ministry of Health and Social Services

**FTP** : Functional and technical program