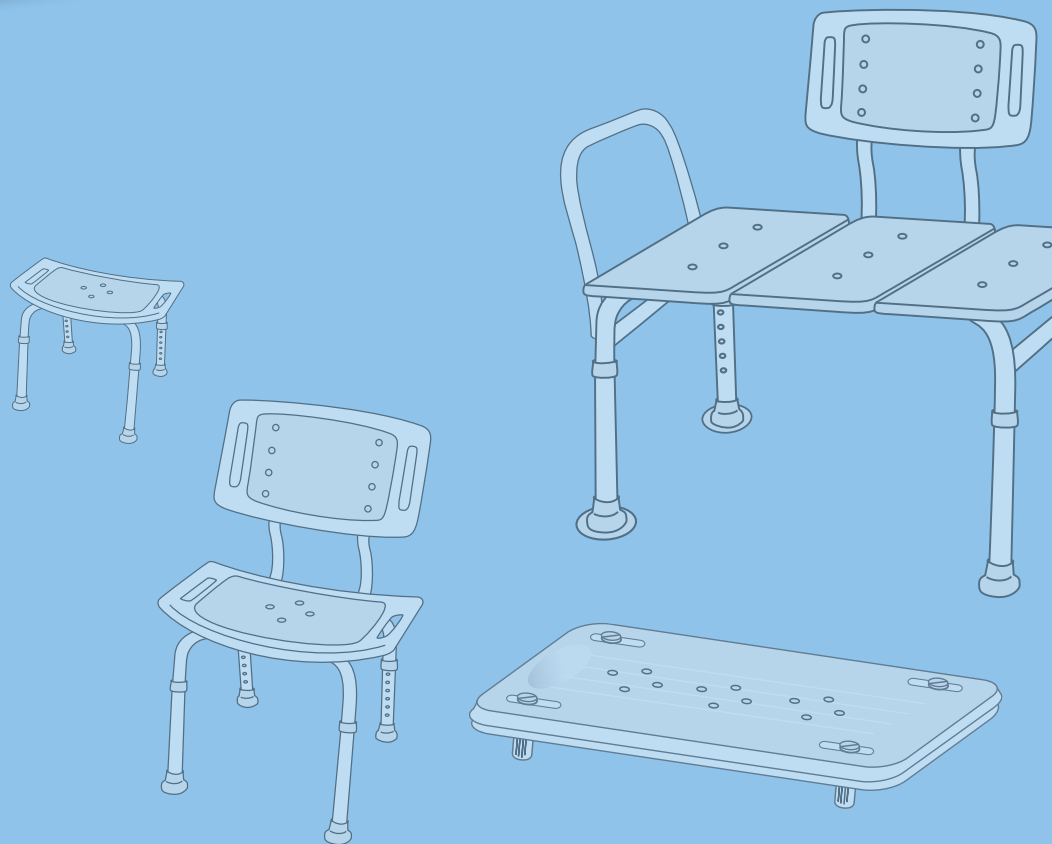
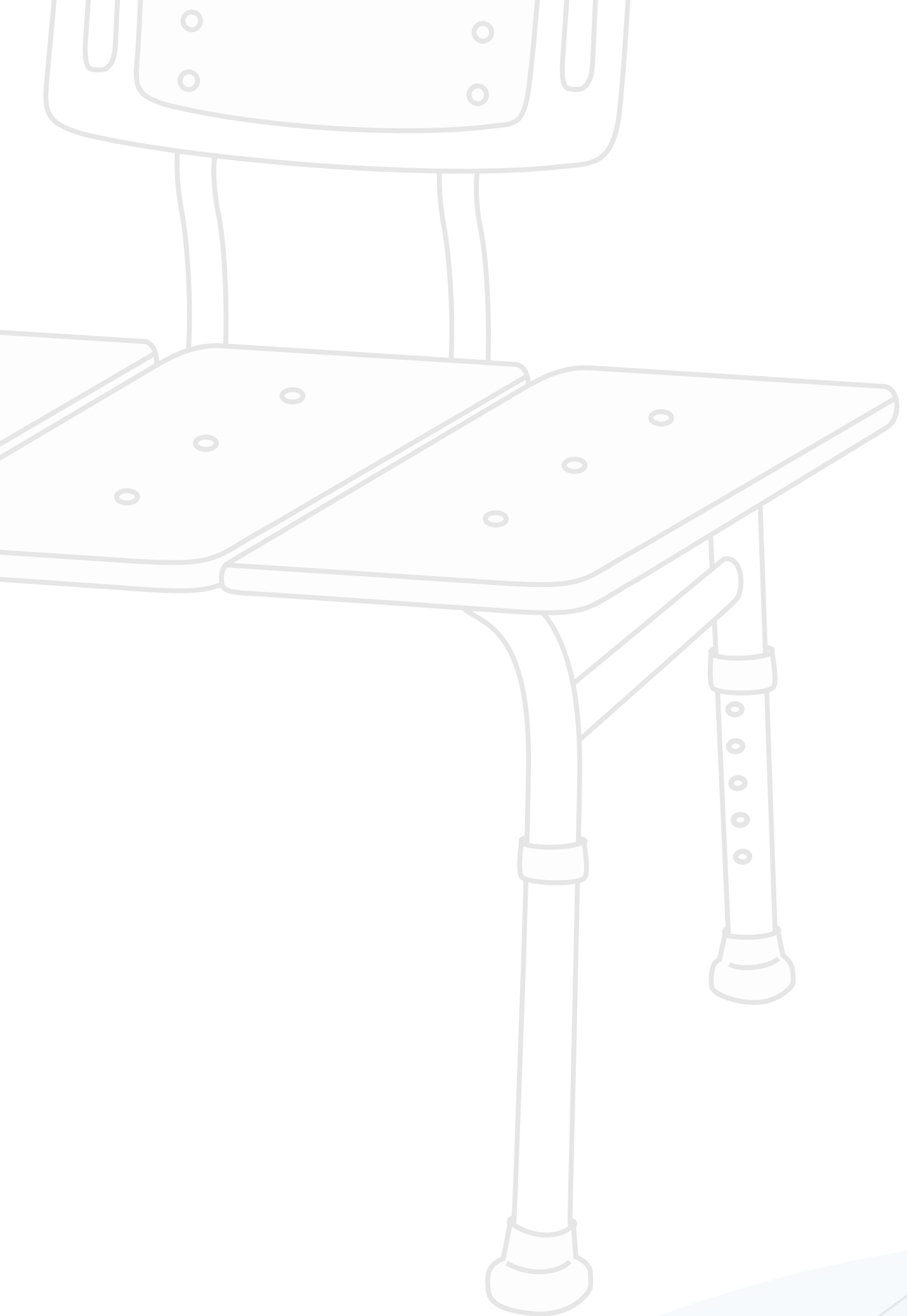


# Algo Reference Manual

Designed for **occupational therapists** supporting non-occupational-therapist personnel involved in determining the need for bathing equipment for home-dwelling individuals experiencing bathing difficulties.



Clinical **Algorithm** for  
Selecting Bathing Equipment



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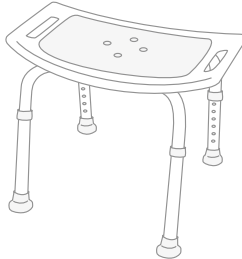
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Note: Efforts have been made to use gender-neutral language throughout this document.



## Introduction

In order to respond to the growing demand for occupational-therapy services set against a paucity of workers, the *Ordre des ergothérapeutes du Québec* (OEQ; Quebec college of occupational therapists) [1] and the Canadian Association of Occupational Therapists (CAOT) [2] recognize the potential contribution of support personnel (referred to in Quebec as non-occupational-therapist personnel) to providing occupational-therapy services. An occupational therapist must exercise professional judgment in assigning part of his or her clinical activities, when appropriate, to a non-occupational therapist such as determining a client's need for bathing equipment in simple clinical situations. The occupational therapist remains responsible for the services provided and must offer support, such as supervision and training, to non-occupational-therapist personnel.

In addition, OEQ recognizes that the manager of a health-care institution can establish that non-occupational-therapist personnel will be responsible for delivering certain services traditionally provided to the population by an occupational therapist, such as determining the need for bathing equipment [1]. OEQ therefore encourages Quebec occupational therapists to work with managers, for example, by taking part in the development of service-delivery protocols and training non-occupational-therapist personnel to perform certain clinical activities.

In these two contexts, the non-occupational-therapist personnel involved in determining the need for bathing **equipment** should have a tool to assist their decision-making (i.e., observation sheets and decision trees) [1, 3]. In 2008, Manon Guay, then an occupational therapist at the Memphrémagog HSSC, requested the collaboration of Professor Johanne Desrosiers, OT, PhD and Professor Marie-France Dubois, PhD, of the Faculty of Medicine and Health Sciences, both researchers at the Research Center on Aging of the HSSC–University Institute of Geriatrics of Sherbrooke, in developing such a tool and then to measure some of its metrological qualities.

### Algo's Objective

Algo supports non-occupational-therapist personnel in determining if the client needs a bath seat and determining which one best suits the client's needs. So, it won't take up related interventions such as determining the need for human bathing assistance, teaching bathtub or shower-stall transfer techniques, obtaining financial assistance to purchase the recommended equipment, organizing equipment loans from an HSSC, or maintaining professional records when a clinical activity is assigned to non-occupational-therapist personnel. In addition, when Algo is used in a health-care institution, training tailored to the local context should be provided by an occupational therapist. Moreover, policies and procedures should be put into place governing recourse to non-occupational-therapist personnel in determining the need for bathing equipment.

Algo was designed based on (1) document analysis of 53 in-house tools used in Quebec HSSCs and their policies and procedures, (2) consultations with occupational therapists and health and social-services auxiliaries active in this field, and (3) a review of scientific and professional literature on recourse to support personnel in occupational therapy [3–7]. Three occupational therapists—Judith Robitaille, Joëlle Charest, and Sophie Turgeon-Londei—closely collaborated on the development of Algo during the BATH (French initialism for need of technical aids for bathing) research project carried out with the support of the Estrie Health and Social-Services Agency.

Algo is a clinical algorithm, that is, a graphic map of the logical steps to take in resolving a clinical problem [8]. It comprises a series of items grouped according to **CMOP-E** categories. The person administering Algo must use his or her own judgment, that is, the “capacity to reflect with discernment, perspicacity, finesse, and common sense about things that are not immediately certain and cannot be rigorously demonstrated” (translated from p. 3, OEQ, 2005) in order to respond *yes* or *no* to the items in Algo.

## Algo’s Underlying Theoretical Model

The Canadian Model of Occupational Performance and Engagement (CMOP-E), derived from occupational-therapy paradigms, served in developing Algo. We opted for this theoretical model because it defines the three fundamental constructs of human functioning, namely occupation, person, and environment. According to CMOP-E, occupation is a bridge between the person and the environment, indicating that individuals act in the environment through occupation. An individual has cognitive, affective, and physical components that are transcended by his or her spirituality. Each individual lives within a unique environmental context—cultural, institutional, physical, and social—which offers occupational possibilities. CMOP-E is compatible with the competencies proposed by CAOT [2] for occupational-therapy support personnel. As a result, Algo promotes the occupational engagement of individuals who have difficulty bathing and promotes respect of the professional responsibilities of the occupational therapist who supports Algo users.

## Occupational-Therapy Clientele

The community occupational therapist practices the art and science of facilitating human participation in daily life through occupation [9]. Occupational therapists are health-care professionals who have received advanced training enabling them to deal with occupational challenges in order to foster the health and well-being of individuals and to promote a just society [9]. As a result, all clients who have difficulty bathing could be visited by an occupational therapist since is one of occupational therapy’s areas of expertise. Consequently, Algo does not aim at screening for individuals who would need occupational-therapy assessment, but rather those who could be visited by non-occupational-therapist personnel.

Whenever there is a request for occupational-therapy services, the occupational therapist has the authority to determine if it would be appropriate to assign clinical activities related to the intervention process to non-occupational-therapist personnel [1]. So, an occupational therapist could deem it necessary to intervene personally in the case of an individual who meets the characteristics targeted by Algo or ask for the collaboration of non-occupational-therapist personnel for an individual who doesn’t.

Non-occupational-therapist personnel determining the need for bathing equipment does not eliminate the relevance of referring, in certain cases, of referring the client to an occupational therapist. Examples of this would be if the client has difficulty carrying out activities of daily living or when there are architectural barriers in the home.

Especially in cases of doubt or unfamiliar situations, non-occupational-therapist personnel can refer at any time to an **occupational therapist** on their interdisciplinary team to discuss their observations and establish how to proceed. Moreover, non-occupational-therapist personnel need the support of an assigned occupational therapist in order to undertake selection of bathing equipment [7]. Indeed, the occupational therapist should supervise non-occupational-therapist personnel, respond to their questions, and meet with clients presenting complex clinical situations.

This reference manual, a complement to the user guide, explains the rationale underlying the items in Algo to inform occupational therapists who support and train non-occupational-therapist personnel. These details are presented in the following sections of Algo.

## Clientele

Algo targets “simple cases,” that is, adults and elders with morphologies within the normal range that present with foreseeable issues with occupational performance when performing hygiene at home in a standard bathtub or shower stall. As a result, non-occupational-therapist personnel must obtain the information needed to respond to the items in Section 1 in order to determine if the client has the characteristics of clients targeted by Algo. They must, however, use their own judgment when encountering unusual characteristics related to the occupation, person, or environment, and discuss them with an occupational therapist, if necessary.

**The client has a degenerative neurological disease (i.e. Parkinson or multiple sclerosis).  
OR**

**The client is at the end of life.**

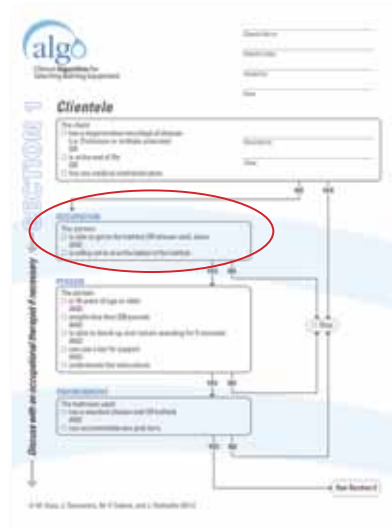
According to OEQ, non-occupational-therapist personnel should not be assigned the task of determining the need for bathing equipment in the case of individuals whose condition is unstable or requires complex skills or close follow-up [1]. As a result, non-occupational-therapist personnel must refrain from formulating recommendations for clients who are at the end of life or have a degenerative neurological disease.

**The client has a medical contraindication.**

Analyzing the influence of a medical contraindication on the selection of bathing equipment is a complex clinical activity that requires thorough knowledge. As a result, non-occupational-therapist personnel must refrain from formulating recommendations for clients with any medical contraindication whatsoever.

To illustrate, on the one hand, non-occupational-therapist personnel should not meet with a client who must restriction limb movement due to total hip replacement. On the other hand, non-occupational-therapist personnel can visit a client who had total knee replacement not requiring motion restrictions.

## Occupation



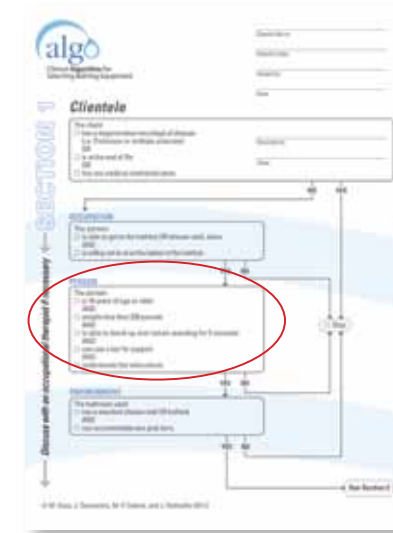
**The person is able to get to the bathtub or shower stall alone.**

It would be harmful to recommend bathtub or shower-stall equipment without considering the movement required before actually using the equipment, even if the movement doesn't directly influence the selection of bathing equipment. Consequently, non-occupational-therapist personnel must refrain from formulating recommendations to a client receiving physical assistance (human assistance) to get around. Indeed, the need for physical assistance depicts a complex clinical situation that requires the expertise of an occupational therapist. They can, however, formulate recommendations for a client who only uses technical aids.

**The person is willing not to sit at the bottom of the bathtub.**

Transferring to the bottom of the bathtub is a component of the “bathing” activity, which requires ongoing analysis of the client's capacities in a scenario. Moreover, one elderly person out of seven who has difficulty getting up from the bottom of the bathtub will remain stuck there on at least one occasion [10]. Consequently, non-occupational-therapist personnel must refrain from formulating recommendations to clients who must or want to transfer to the bottom of the bathtub because of the high risk of harm.

## Person



**The person is 18 years of age or older.**

Pediatric clients must be seen by an occupational therapist, since their physical growth, normal development of their capacities, and the anticipated impact of the disease on their development must be taken into account when equipment is being selected. Consequently, non-occupational-therapist personnel must refrain from formulating recommendations for such clients.

**The person weighs less than 250 pounds.**

Bath-seat manufacturers generally indicate that product safety requires that the person's weight be less than 250 pounds. Consequently, non-occupational-therapist personnel must refrain from formulating recommendations for clients who weigh 250 pounds or more.

**The person is able to stand up and remain standing for 5 seconds.**

The client must stand up, with or without support, and place his or her full weight on at least one leg and hold the position for at least 5 seconds. A client who is unable to perform this task generally requires specialized equipment for bathing or uses complex transfer techniques (for example, a bath board). This exceeds the expected level of knowledge for “simple cases” and requires the expertise of an occupational therapist, regardless of the medical condition that resulted in the difficulty.

**The person can use a bar for support.**

All clients are recommended to add two wall grab bars that they can use for support for transfers or even bathing. Consequently, non-occupational-therapist personnel must use their own judgment to determine if the client is able to use these bars.

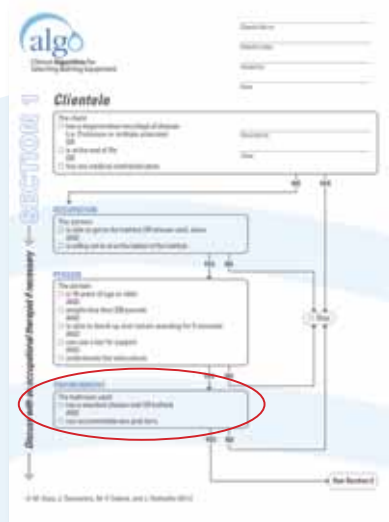
**The person understands the instructions.**

The client's capacity to memorize instructions does not influence the administration of Algo or impact on equipment selection. Nevertheless, non-occupational-therapist personnel must establish if the client is able to collaborate and understand what is required during the encounter.

## Height

Bath-seat height should be adjusted to the height of the knees of the home-dwelling individual with loss of independence [11, 12]. Consequently, the client's height doesn't serve in differentiating clinical situations that require the expertise of an occupational therapist.

## Environment



### The bathroom used has a standard shower stall OR bathtub.

There are many models of bathtubs and shower stalls, but no consensus on what “standard” means. For example, the standard bathtub found in apartments in historical neighborhoods can differ from those in single-family homes built in a residential development for retirees. Consequently, non-occupational-therapist personnel must use their own judgment in determining if the bathroom used by the client has a shower stall OR bathtub that would accommodate the installation of the equipment included in Algo. Moreover, podium bathtubs, corner bathtubs, and bathtubs on legs are not considered standard. Indeed, these types complicate analysis of the environment’s influence on transfers to the bathtub and few types of equipment will work with them. In addition, very small shower stalls are not considered standard because they restrict the client’s movement, which could be aggravated by adding a bath seat. Note that Section 2 of Algo asks non-occupational-therapist personnel to observe certain characteristics of the bathtub or shower stall when necessary.

### The bathroom used can accommodate two grab bars.

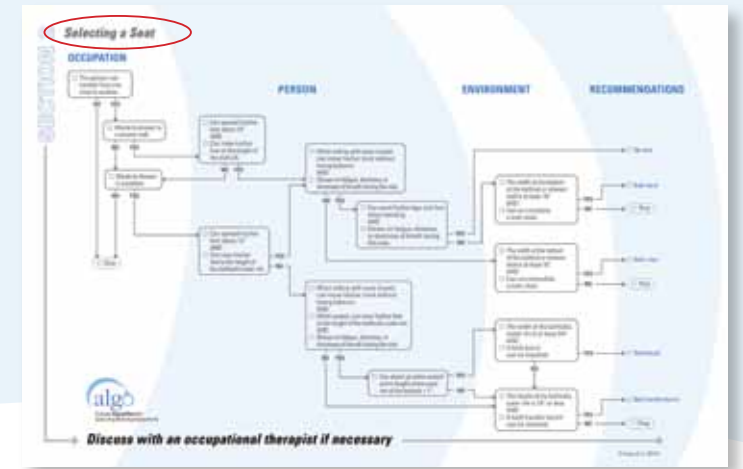
Adding wall grab bars is an effective measure for preventing falls regardless of how well the home-dwelling individual functions [13, 14]. Non-occupational-therapist personnel must therefore recommend adding two non-slip wall grab bars at least 24” in length (see Section 3 of Algo for information about their location). When non-occupational-therapist personnel deem that it is impossible to add these bars, they must refrain from formulating recommendations and ask for an occupational therapist’s assistance.

## Context for Using Algo

Algo can be used by non-occupational-therapist personnel in the context of delivering occupational-therapy services or upon the request of a manager at a health-care institution. Clients may or may not have human assistance for personal hygiene. Indeed, Algo centers the intervention on how a client with difficulty bathing functions while taking into account the presence of a caregiver or worker. Algo therefore can be used when a health-care institution implements hygiene services, but is not limited to adapting the work situation of health and social-services auxiliaries.

## SECTION 2 Selecting a Seat

Section 2 lets non-occupational-therapist personnel determine if the client needs a bath seat and determine which one best suits the client’s needs. This section is constructed as a clinical algorithm, specifically, “a set of rules which, if followed, will automatically generate the correct solution” (page 555, Lindsay and Norman, 1977) [15]. Consequently, this section includes a series of items that deal with occupation, person, and environment. Only the elements essential for decision-making in simple cases and for the bath seats currently used with these clients are included.



When solving a problem (in our case, identifying bathing equipment), potential solutions can be based on two types of cognitive tactics: heuristics and algorithms (Lindsay and Norman, 1980). With heuristics, solvers look for analogies between the current problem situation and past situations for which they know the solutions. They then use their skills in recognizing similarities and use strategies to identify solutions that were effective in dealing with past problems. Since heuristics do not guarantee success, the solver can waste time and energy on information that proves to be incidental. In complex clinical situations, occupational therapists have recourse to heuristics in solving the problems encountered.

Hagerton (1996), however, suggested that a health-care professional who encounters a familiar, routine problem solves it through automatic reflexes [16]. In other words, when faced with a “simple case” of a client needing bathing-equipment, occupational therapists use an algorithm tactic to arrive at the right solution. A non-occupational therapist who has a clinical algorithm that reproduces an occupational therapist’s reasoning doesn’t have to look for indicators or analogies between the current problem and past situations. To illustrate, the “level of initiative,” “handedness,” and presence of a “pedestal sink” are elements that the occupational therapist can take into consideration before recommending a specific piece of equipment. In an algorithm-based method, this information is unnecessary because it doesn’t systematically alter the recommendation. Indeed, whether the client has a little or a lot of initiative, is right-handed or left-handed, or the sink is on a pedestal or in a vanity has no impact on equipment selection. On the other hand, “signs of fatigue” indicate that the client should use a seat with a backrest.

Therefore, the essential elements in selecting a seat, or indicators, as well as the items for measuring them are presented in Table 1. They have been based on a synthesis of information gathered when inventorying Quebec tools and consulting occupational therapists who regularly practise in this field.

## Recommendations Given to the Client

Section 3 is completed by non-occupational-therapist personnel, based on their observations, and then given to the client. The recommendations come under three headings: (1) *General Advice*; (2) *Adding a Seat*, and (3) *Adding Wall Grab Bars*.

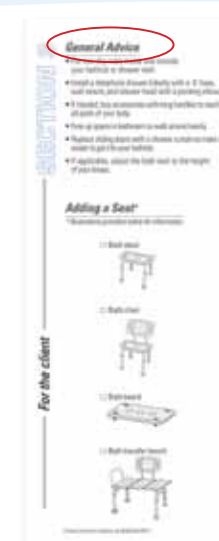
### Adding a Seat



The Algo process leads one of four types of bath seats generally available in pharmacies and major department stores. They are (1) *bath stool*; (2) *bath chair*; (3) *bath board*; and (4) *bath transfer bench*. No specific brands are named (e.g., AMG, Lumex, Drive Medical) since product development and availability are unpredictable. Equipment such as bath boards with backrest, bath transfer bench with perineal cutout, shower chairs with armrests, patient lifts, and bath lifts are not possible outcomes with Algo, since they are used in clinical situations that are not simple.

Moreover, round stools are not included in Algo equipment, since additional indicators—such as client pelvis width—must be considered in selecting them. The occupational therapists consulted in developing Algo did not, however, retain this parameter. They felt that, since inquiring about this measurement could be offensive to clients, non-occupational-therapist personnel should rather use their judgment and discuss alternatives with an occupational therapist.

### General Advice



The general advice applies to all clients and does not figure into the selections that non-occupational-therapist personnel must make. In fact, it consists of recommendations that apply to the population in general to promote health and prevent falls in the home.

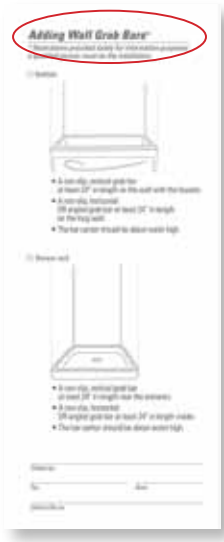
### No Seat

Algo guides non-occupational-therapist personnel towards a “no-seat” outcome when the client is able to transfer to the bathtub or shower stall and to bathe standing up. Moreover, it is safe for a health and social-services auxiliary to provide physical assistance for bathing to an individual who doesn’t use a seat provided that the auxiliary complies with the principles governing positioning, assisting, and movement in restricted spaces such as a home bathroom [17]. For example, in the case of clients with an intellectual disability, cognitive impairment, or a mental-health issue, an auxiliary could assist in washing their hair or guiding their movements during bathing without the need of a bath seat in their bathtub or shower stall [18].

**Table 1.** Indicators for an algorithm-based tactic in selecting bathtub and shower-stall equipment

Aspects	Indicators	Tasks to Operationalize the Indicator	Consequences
Occupation	Functional mobility	The person can transfer from one chair to another	Case complexity: physical assistance required for transfers
	Client's preference	Wants to shower in a shower stall Wants to shower in a standard bathtub	Preferred location
Person	Standing balance	Can raise his/her feet to the height of the shower-stall sill Can raise his/her feet to the height of the bathtub's outer rim Can spread his/her feet about 12"	Can step across the shower-stall sill or the bathtub's outer rim
	Sitting balance	When sitting with eyes closed, can move his/her trunk without losing balance When seated, can raise his/her feet to the height of the bathtub's outer rim	Can maintain balance when sitting
	Endurance	Shows no fatigue, dizziness, or shortness of breath during the visit	Needs to lean against something
	Muscular strength and joint amplitude	Can reach his/her legs and feet when standing Shows no sign of fatigue, dizziness, or shortness of breath during the task Can stand up when seated at the height of the outer rim of the bathtub + 1"	Needs to sit A bath board can be installed
Environment	Bathroom	Can accommodate the equipment needed by the client	Case complexity: architectural barriers
	Bathtub and / or shower stall	The width at the bottom of the bathtub or shower stall is at least 18"	A bath stool or a bath chair can be installed
		The width of the bathtub's inside rim is at least 3/4" The height of the bathtub's outer rim is 19" or less	A bath board can be installed A bath transfer bench can be installed

## Adding Wall Grab Bars



Adding wall grab bars is a recognized fall-prevention method. A single configuration is almost always appropriate for clients that need such devices [13, 14]. Consequently, in order to minimize the risk of errors by non-occupational-therapist personnel and to promote the safety of clients at risk of falling, non-occupational-therapist personnel recommend to all clients that they should add two wall grab bars at least 24 inches in length.

**First grab bar** is installed vertically on the wall with the bathtub's faucets or on the wall near the entrance to the shower stall. The main purpose of this grab bar is to provide support to the client when stepping over the bathtub's outer rim or the shower stall's still.

**Second grab bar** is installed on the bathtub's long wall or inside the shower stall. The purposes of this bar are to steady the client when bathing as well as when sitting down on and getting up from a bath seat. The second bar can be

horizontal or angled, depending on the client's preferences and elements in the environment. When an angled bar is used, the upper end is towards the faucets [13].

The exact position of wall grab bars is influenced by the location of wall studs, which the non-occupational-therapist personnel does not need to verify. So, the recommendations of non-occupational-therapist personnel are given solely for informational purposes and the bars must be installed by a qualified person. There are also wall mounts on the market for installing grab bars in existing molded shower stalls [18]. Lastly, bars attached to the bathtub are not an issue with Algo because factors pertaining to the client and environment as well as the activity's components complicate the selection of this type of bar [5].

## Terminology

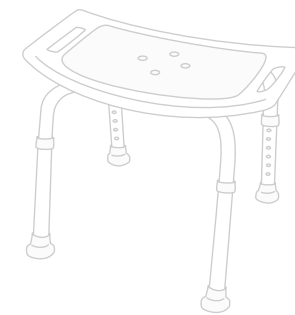
In order to promote shared understanding about the equipment involved, Algo uses the terminology for mobility aids from the classification of mobility aids adopted by the *Centre régional d'information de démonstration et d'évaluation des aides techniques (CRIDÉAT)* [19]. This classification is a common language, integrated into the electronic inventory of mobility aids of the Pierrefonds CLSC as well as the ICLSC software used in HSSCs.



# SECTION 4 Notes

Section 4 is a checklist for non-occupational-therapist personnel. Indeed, it provides space to write down questions, document bathroom configuration, enter comments about interventions, etc. [7] The information gathered can support communication with the client or members of the interdisciplinary team, including an occupational therapist. This space, however, was not intended for applying client record-keeping policies but rather for responding to the support needs of non-occupational-therapist personnel.

## Notes



## Acknowledgments

Premised on the conviction that clinical settings have promising initiatives, Algo is the product of a research team's work enriched by ideas from Quebec providers. We are grateful to Danielle Desnoyers, the clinicians, and the managers who collaborated closely on this project. Their novel ideas; expertise; and sound, relevant comments have made Algo an instrument rooted in clinical reality and based on evidence. We also want to thank the organizations who provided financial support for the development and validation of Algo: Estrie Health and Social-Services Agency, Canadian Institutes of Health Research, *Fonds de recherche en santé du Québec*, *Institut de recherche Robert-Sauvé en santé et sécurité du travail*, Canadian Association of Occupational Therapists, and the doctoral-level microprogram on analyzing and assessing health-care interventions at the University of Montréal.

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