CLINICAL EVIDENCE SUMMARY

Assisted Hygiene and Wellness Solutions

Introduction

Since the creation of Arjo over sixty years ago, improving the hygiene care experience for patients, residents and caregivers has been at the very heart of what we do.

Our journey began when Arne Johansson, the original company founder, built the first height adjustable bathtub driven by a desire to improve care for his wife who had impaired mobility. This innovation was the first of many, all designed to improve safety and efficiency for busy caregivers, while focusing on the dignity, comfort and wellness of residents and patients during the showering and bathing process. This clear vision led Arjo to become the global market leader in the provision of hygiene solutions; a position it retains today.

We recognize that clinical decision making is complex and should be based upon the best available evidence. We invite you to review this clinical resource providing examples of evidence supporting the use of hygiene and bathing solutions.

Assisted hygiene and wellness

Hygiene care is more than just keeping the skin clean. For many people, having the opportunity to shower or bathe can have a significant impact on their general well-being and quality of life. For a patient during either a short or long term admission to a healthcare facility, continuing their personal hygiene habits often established over a lifetime can be challenging. Time pressured staff, cold unwelcoming hygiene facilities and often rigid routines mean the focus is frequently on getting the person clean as quickly as possible, rather than on person centered hygiene care that takes account of individual preferences. Providing personalized hygiene care can lead to a more relaxing and enjoyable hygiene experience with benefits for the person's well-being.

Assisted hygiene care challenges

Hygiene care tasks place a significant and increasing burden on time pressured caregivers as the number of frail, elderly, heavy or dependent residents and patients with complex health issues continues to rise.[1] Decisions regarding how people access hygiene facilities are made each day depending on the level of assistance required by each resident or patient. These decisions can impact the dignity and comfort of the care receiver, as well as both the physical load and overall workload for caregivers. Here are just some of the concerns that may influence these everyday decisions.

Caregivers

Showering and bathing tasks expose caregivers to a high risk of back and shoulder pain and injury.[2] Lack of appropriate showering equipment increases the risk for inefficiency and physical strain experienced by staff. Efficiency of providing hygiene care is dependent upon the mobility level of resident or patient, type of equipment available and appropriate training received.[3] Finally, there may be a perception that taking a person to the bath/shower takes longer and is more physically demanding compared to washing the person within their own bed.

Residents and Patients

Showering or bathing can have a significant impact on a person's well-being, but hygiene events are often rushed with a focus on getting the patient or resident clean as quickly as possible. Risk of falls on wet bathroom floors can be particularly hazardous especially for those with restricted mobility[4], or already classed as at risk from falls. Risk for cross infection of using shared bathtubs without robust decontamination. For preventive skincare, there is a need to keep the skin clean.[5] Last but not least, the concern to maintain one's dignity during the hygiene and bathing process.

Facility

The need for healthcare efficiencies and lack of storage space within facilities often means that under-utilized bathrooms are used as storage spaces for equipment, impacting the working space available to move lifts and other equipment required for hygiene tasks. Space within bathroom areas can be small and not ergonomically designed for people with increasing demands for assistance during hygiene care. Limited space for transfer, a lack of appropriate lift and showering equipment, and a lack of clear processes and protocols for assisted hygiene activities may increase the risks of patient and caregiver injury.

Person centered hygiene care

When entering a care environment for a short or long term stay, reliance on others to assist with personal hygiene may have a significant and potentially detrimental effect on the individual, who should always be involved in decisions regarding how their hygiene needs will be met.

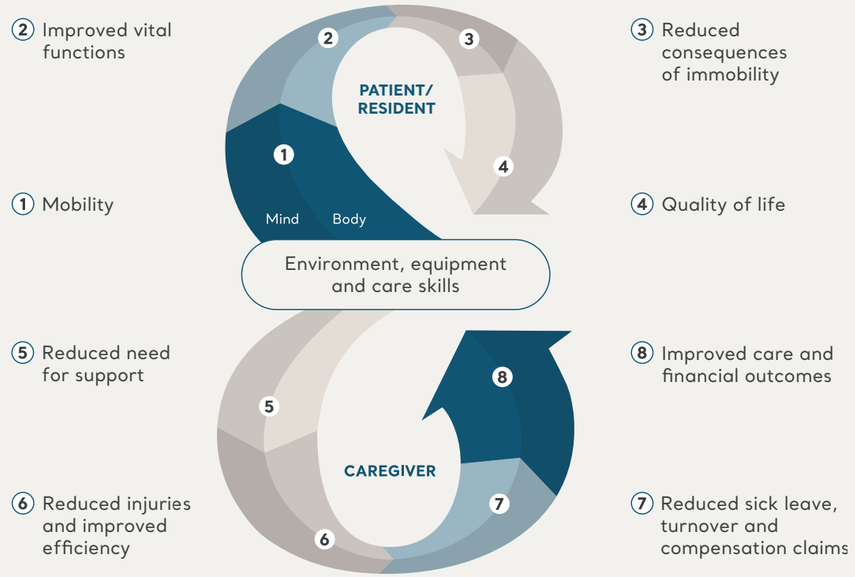
Caregivers need to assess if a patient or resident can bathe or shower independently, if help is required and if so, the type of assistance needed including equipment that may be required to support the activity in safety and with dignity.

Depending on the facilities available and the care needs of the individual, choices for providing hygiene care are centered on *showering, bathing in a tub, or bathing within or at the bedside.*

Decisions are often influenced by the caregiver's available time and the perceived ease of carrying out the different hygiene procedures. The quality of care received and the quality of work performed by the caregiver is reliant upon having the right environment, using the right equipment and utilizing the right care skills. This is represented by the **Arjo Positive Eight**.

The Positive Eight

Promoting resident/patient mobility is the driving force behind the Positive Eight — our philosophy for generating long-term benefits for patients, caregivers and care facilities. Investing in the right environment, suitable assistive equipment and adopting the best caregiver practices can provide the optimal conditions to promote and enhance mobility. Promoting mobility can reduce the need for support, reduce caregiver injuries and improve efficiency. Ultimately, this all leads to improved care and financial outcomes.



The right **environment**, **equipment and care skills** need to be in place to allow the benefits of the Positive Eight to flow

By matching the right hygiene solution to the needs of residents and patients, Arjo hygiene equipment can provide a level of support designed to maintain and, where possible, encourage and promote mobility.

Supporting care choices

Having the right hygiene equipment for residents and patients who are self-reliant will support their continued independence and help ensure well-being is maintained.

Providing assistive devices and hygiene equipment for the more dependent person will enable access to shower or bathing facilities as preferred, as well as reduce the exposure to unacceptable levels of physical overload and risk of injury to the caregiver.

The Arjo Mobility Gallery™

The Mobility Gallery, as a functional assessment tool, can be used to assist facilities and caregivers to identify the hygiene requirements of residents and patients for whom they provide care and support decisions related to showering, tub bathing or bathing at the bedside.

Different mobility levels require a range of hygiene solutions

Arjo hygiene solutions are designed to assist in reducing risk of injury to caregivers and patients, and make hygiene tasks comfortable, efficient and dignified for the residents and patients. Our showering and bathing solutions are developed to meet both the needs of the individual and their caregivers. Having a comprehensive range of solutions allows the caregiver and the resident/patient to have a choice to best suit their functional needs and preferences.

> Assisting someone to maintain his or her personal hygiene needs can contribute to the comfort, safety, well-being and dignity of the individual.[6]

Solution chart

Mobility level	Showering	Sit or reclining bath solution	Recumbent bath solutions
ALBERT	Foldable seat	Sit or reclining bath	Bath chair Recumbent bath
BARBARA	Foldable seat High-low hygiene chair	Sit or reclining bath	Bath chair Recumbent bath
CARL	High-low hygiene chair Multi-purpose hygiene chair	Sit or reclining bath	Bath chair Bath trolley Recumbent bath
DORIS	Multi-purpose hygiene chair	Reclining bath	Bath trolley Recumbent bath
EMMA	Shower trolley		Bath trolley Recumbent bath

Reducing caregiver risk during assisted showering

Showering may be preferred for frequent personal hygiene procedures and is regularly used in hospitals.

Appropriate showering equipment promotes better posture and better care

Every day, caregivers assist residents and patients to take a shower. For the caregiver, the risk of physical overload from working in positions which involve bending, stooping and twisting, often using fixed height hygiene chairs, also known as shower chairs, means they can be subjected to high levels of static (postural) overload, which subsequently increases their risk of musculoskeletal injury.

The correct use of suitable adjustable height showering equipment can reduce the need for adopting awkward postures and can assist toward reducing injury related absenteeism, as well as improve working efficiency during the showering procedure.[7]

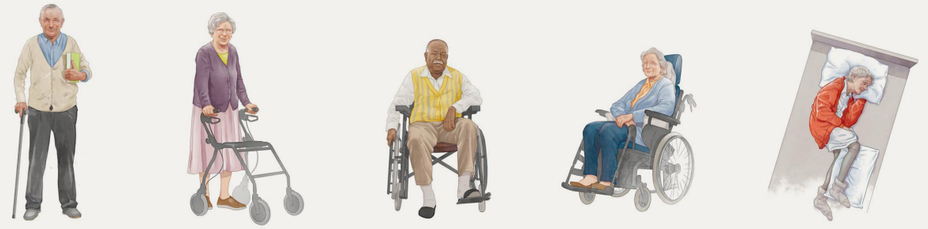
The suitable supportive equipment will also offer a more pleasant, comfortable and dignified shower experience for the individual. Knibbe et al undertook a laboratory study which illustrated the percentage of time caregivers spent in healthy working postures when showering patients using a variety of assistive devices.[8] The highest percent of neutral back postures were seen when caregivers used the Carendo hygiene chair.

Percentage of observations of caregivers with neutral back postures for 6 types of equipment (N=79.968 observations, N=112 procedures), Knibbe et al[8]

Equipment	% of neutral back postures (all)*	% of neutral back (mobility class C)*
High-low hygiene chair with profiling seat	77.3	73.9
High-low hygiene chair	66.4	67.1
Ergonomic high-low shower trolley	59.5	61.8
Fixed height hygiene chair (normal)	66.0	57.4
Fixed height hygiene chair (high)	65.9	56.4
High-low profiling bed	48.6	53.6

*Differences (Kruskal-Walls Test) statistically significant P < .05.

SHOWERING PRODUCTS



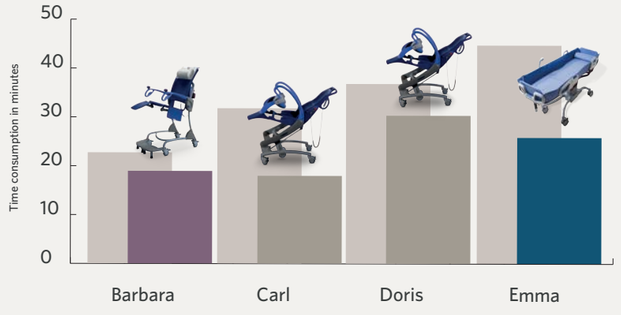
Using the Carendo resulted in the caregiver adopting 77% neutral back positions compared to only 48% when washing a person within their bed.[8]

Reducing static load

A study has shown that using the Carevo, an ergonomic and adjustable height shower trolley, reduces the static physical overload experienced by caregivers compared to when they use a standard shower trolley.[9]

The use of height adjustable devices when bathing or showering patients enables caregivers to work at their correct ergonomic height, reducing the static load on their musculoskeletal system and subsequent risk of injury and long term damage.

The design of the Carevo shower trolley is to enable the caregiver to get closer to the resident/patient and hence, further reduce caregiver static load while showering patients. Results of these recent studies illustrate the advantages of using this equipment over washing a person within their bed and also on a standard width and static height shower trolley.



Although there is a widespread belief that washing a resident or patient in bed is faster, a height adjustable shower or hygiene chair can be 35% more efficient.

Source: Schimmel G, Knibbe NE, The Smart Shower Chair, Final Report of the Zorg voor Beter (Better Care) Smart Shower Chairs project, 2005.

When using a Carendo multipurpose hygiene chair with a C patient, there is a potential of saving 14 minutes for each showering event, when compared to washing a C patient within their bed.[10]

Increase efficiency in assisted showering

Using known average timings for washing in bed and washing with an appropriate shower device[10], a study undertaken in a French long-term care facility showed that a total of 314 minutes or 5.2 hours could be saved daily if caregivers used appropriate height adjustable hygiene equipment instead of washing C, D and E patients within their bed. This equated to a potential annual saving of 20,000 Euros ($30,000 CAD / $24,000 USD).

Enabling efficient working

Washing, showering and cleaning patients is one of the most time-intensive care activities that caregivers can perform. Research showed that caregivers in a nursing home devoted 22% of their total working hours to washing, dressing wounds, showering, bathing and dressing.[10] With a shortage of caregivers and increasing dependency levels of residents and patients, finding more efficient ways of working has never been more important.

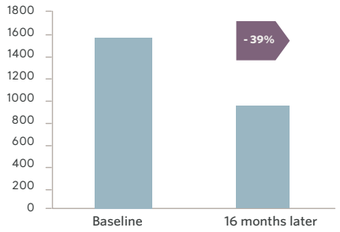
Time saving

Although there is a common perception that washing a resident or patient while they are within their bed is the fastest method, a recent study has shown that **using a height adjustable hygiene or shower chair, a profiling hygiene chair or a shower trolley with 'C' mobility level residents and patients can be 20% – 35% more efficient.[10]**

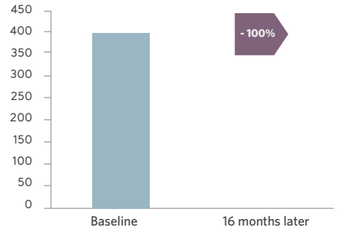
Improved efficiency

The use of appropriate hygiene equipment often enables caregivers to work more efficiently, reduce the number of transfers and potentially work without the assistance of a second caregiver. The one-to-one person focused interaction between patient/resident and caregiver is perceived as important in relation to aiding communication and reducing stress for residents and patients, especially when caring for people with dementia.[11]

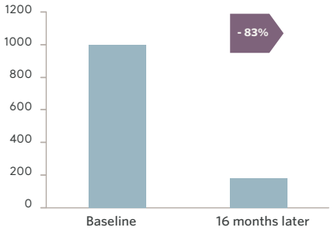
Total number of transfers



Transfers performed with 2 caregivers



Number of transfers performed in an unhealthy way

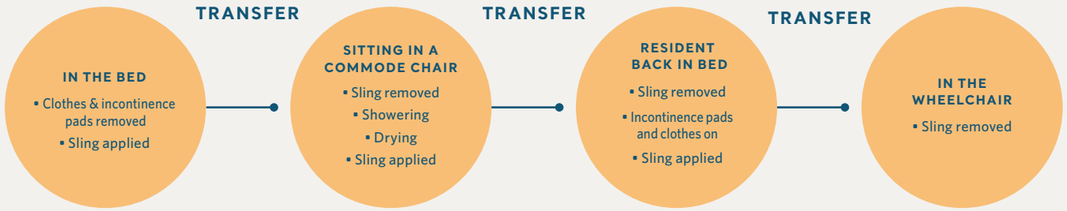


Increased efficiency was demonstrated in an observation study

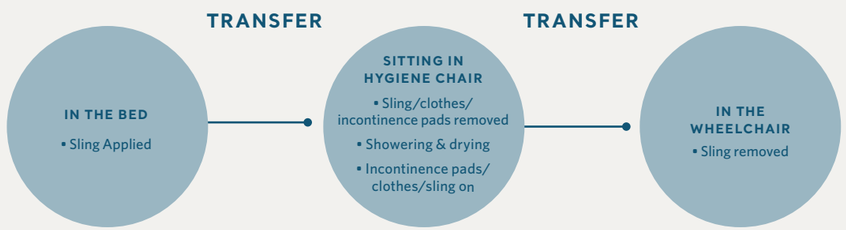
A study in Denmark[11] identified 64% of transfers performed in a long term care facility as potentially risky and unhealthy for the staff, of which 74% were in the hygiene area. The study pointed to one main gap related to time consumption and ergonomics, which limited access to ergonomic hygiene equipment for showering. This resulted in the organization's implementation of the Carendo hygiene chair, and together with a detailed training program, the follow-up after sixteen months showed an **83% reduction of transfers performed in an unhealthy way**. The total number of transfers had decreased by 39%, and the number of transfers requiring two members of staff was eliminated. Members of staff reported to be more satisfied since unnecessary or potentially dangerous transfers had substantially decreased, due to a more efficient way of working. The investment in the Carendo multipurpose hygiene chairs saved the equivalent time of one full time caregiver.

In a long term care facility, 78% of caregivers agree that using Carendo improves their ability to perform washing and hygiene of all areas of the body including skin folds.[11]

TYPICAL SHOWERING WORKFLOW WITHOUT A CARENDO



TYPICAL SHOWERING WORKFLOW USING A CARENDO



The hygiene care environment

The hygiene care environment within healthcare can vary between a washroom dedicated for use by one resident/patient, to a centrally located bath or shower room which is shared. Ensuring that a shared bath or shower room is suitable for a number of individuals is important. The more flexible in design, the better the environment can be adapted for individual needs, for both assisted and independent showering or bathing. The possibility to make just small adaptations can be the difference between independence and loss of functional ability.

The Arjo Guide for Architects and Planners (2019)[13] provides further information related to both showering and bathing environments and space requirements for different mobility levels of residents and patients using a variety of assistive hygiene devices.

To find out more please visit:
arjo.com/int/solutions/architects-and-planners/

Table of evidence – showering

Author	Design	Key Findings
Knibbe et. al. Evaluating different methods of showering and washing patients; assessing ergonomic, time and quality aspects, Am J SPH, Vol. 6, No 2, 2016.	Laboratory study. The aim of the study was to provide a quantitative insight into postural load during hygiene tasks using video analysis and survey. 112 standardized hygiene procedures performed by 4 nurses, using six different types of equipment, and two washing techniques on acting patients with varying levels of mobility.	Patient mobility, type of equipment, and washing technique were related significantly to hygiene care duration. The skill of the nurse, type of equipment, and mobility were linked to the postural load on the back, overall, lower satisfaction with procedures on the high-low bed. Recommendations for reducing duration and extent of static load are given but more research is needed.
Hallström K. Wiese N. Improving Quality of Care and Workflow by Optimising the Working Conditions. A Case Study from a Danish Nursing Home. Proceedings 19th Triennial Congress of the IEA, Melbourne 9-14 August 2015	Case study. The aim of this study was to establish a more efficient and safer process for managing resident transfers. The objectives were to reduce the static load, and to reduce both the number of transfers classified as potentially risky or dangerous. Four physiotherapists assessed the resident transfers for a period of twenty-four hours. Methods used included mobility level classification, NIOSH equation, and static load analysis.	The baseline assessment identified 64% of the transfers as potentially risky and unhealthy for the staff, of which 74% were in the hygiene area. The observation identified limited access to ergonomic hygiene equipment for showering. A new process was implemented including the use of Carevo® together with ceiling lifts and training. The follow-up after sixteen months showed an 83% reduction of transfers performed in an unhealthy way. The total number of transfers was decreased by 39%, and the number of transfers requiring two members of staff was eliminated.
Knibbe N.E. et. al. How Smart is the Carevo®? Results of a Study on a New Shower Trolley Generation. The Ergonomics Open Journal, 2013, 6, 1-5.	Laboratory study. The purpose of the study was to compare the traditional height adjustable shower trolley with Carevo®, a shower trolley with a new design. The study involved 4 nurses carrying out 5 shower activities, with D and E patients all postures observed were filmed and analyzed using OVAKO.	Differences seen when caregiver works with Carevo®, compared with the traditional trolley: 10% improvement in time spent in a neutral safe back posture, 3% improvement in time spent in a non-flexed, non-twisted back posture, 9% improvement in time spent in a neutral safe neck posture. In addition, caregivers spent more time standing close to the patient's hip level, which resulted in 13% reduction in static load.

Author	Design	Key Findings
Freitag S. et. al. Frequent Bending— An Underestimated Burden in Nursing Professions, Ann. Occup. Hyg., pp. 1–11, 2011.	The aim of the study was to quantify the total duration per shift in which nurses work in a forward bending position over 20°. In addition, the influence of several factors on the occurrence of sagittal trunk inclinations in nurses was investigated. Trunk postures were recorded for nine nurses from four nursing homes and 18 nurses from seven hospitals using the CUELA measurement system. A total of 79 shifts, 27 in nursing homes and 52 in hospitals, were analyzed. All measurements were supported by video recordings.	The total duration of inclinations per shift was significantly affected by the working area. Nursing home nurses worked about twice as long per shift in a forward bending position compared with hospital nurses (112 versus 63 min) and they assumed almost one-third more inclinations per shift. Another factor was the extent of personal basic care, including hygiene tasks, performed by the nurses. It is very likely that future preventive measures, focusing on reducing the huge amount of inclination, would reduce the physical stress in everyday nursing work substantially.
Brinkhoff A., Knibbe N, The ErgoStat Program. Pilot study of an ergonomic intervention to reduce static loads for caregivers, www.asse.org Professonal Safety, Ergonomics, May 2003	Pilot study. An evaluation of an Ergonomic intervention to reduce static loads for caregivers. Measurement of postures before and after the program using OWAS.	After the intervention, a significant increase was observed in the percentage of time that caregivers spent working in a healthy position. The most notable improvement was seen in performing direct care tasks — demonstrated in particular with the improvement in the head position.
Schimmel G., Knibbe N.E. The Smart Shower Chair Final report of the Zorg voor Beter [Better Care] Smart Shower Chairs project, Opella and Locomotion 2003.	Pilot study. An evaluation of an Ergonomic intervention to reduce static loads for caregivers. Measurement of postures before and after the program using OWAS.	The time savings as a result of using a smart shower chair or hygiene chair, Carendo® are 14 minutes (Mobility Class C) and 6.5 minutes (Mobility Class D) per shower, and at the same time, the static load is lower when using Carendo®. The threshold for working with Carendo® appears to be fairly high, according to this project. Training, instruction and working regularly with the smart shower chair is therefore necessary in order to use the aid in an optimal manner.

Reducing caregiver risk during assisted bathing

Bathing promotes health benefits and can play an important role in nurturing wellness and improving quality of life. It has been recognized as a pleasurable relaxing experience for centuries. Bathing is a basis for hygiene, in addition it can promote a sense of well-being. A warm bath can relax both the body and the mind.[13]

Bathing is becoming even more important for individuals with impaired mobility and cognitive function. During the bathing process, the resident/patient can be encouraged to take part and wash as much of themselves as possible. This provides an opportunity to help maintain dignity and a level of independence.

"But what are the bathing challenges for caregivers and residents?"

FOR RESIDENTS

GETTING IN AND OUT OF THE BATH IS A CHALLENGE

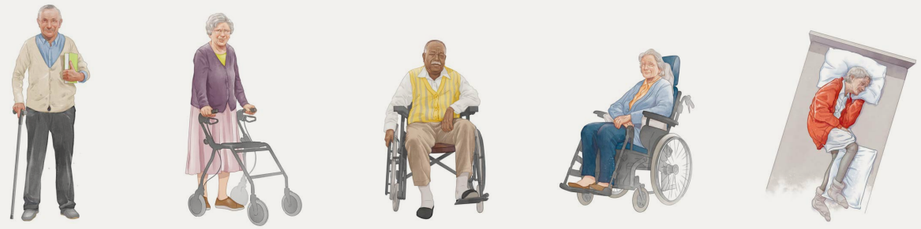
- The resident may feel cold if left wet and exposed during transfers
- The resident may be fearful of slipping
- Getting in and out of the bath may trigger undesirable behavior
- Dignity aspects related to undressing and dressing, this should happen in the bathroom to ensure dignity

FOR CAREGIVERS

THE BARRIER IS TIME AND SPACE

- There may be a risk of static overload for a caregiver
- There may be a perception that bathing takes a long time
- Assisted bathing involves a high number of assisted transfers
- Often no space to dry and dress in the bathing area
- The facility does not have the right equipment to support or transfer the resident/patient to or from the bath to provide sufficient support while immersed in the water

BATHINGG PRODUCTS



*Compatible hygiene lifts

Risk of caregiver injury during bathing procedures — appropriate bathing equipment promotes better posture and better care

Lifting residents and patients into and out of a bathtub, leaning over into the tub to reach the person to provide hygiene assistance as well as managing patient falls within the bathroom, have long been accepted as potential causes of physical strain and cause of injury to caregivers. Choosing the right bathing equipment for the resident/patient, as well as giving consideration for the needs of the caregiver, will assist the organization to proactively tackle the problem associated with such heavy handling and adoption of poor working postures. The extent of the physical stress experienced by the caregiver is dependent upon a number of factors, the mobility level of the resident/patient, the skill of the caregiver, the environment in which the bathing is taking place and the equipment which is available to use.[7,14]

Enhance mobility

Maintaining and promoting mobility is a crucial part of good quality care. Immersion in warm water may ease muscle tension and increase blood circulation.[13,15,16] Importantly, being immersed in water makes the body feel lighter, it can therefore reduce the load on joints, and movement may become easier. Bathing may offer a natural and pleasurable way to help patients and residents maintain their existing mobility as part of a mobility maintenance program. In addition, bathing in warm water could be an important benefit for people with limited joint mobility and trying to regain mobility during rehabilitation.[17]

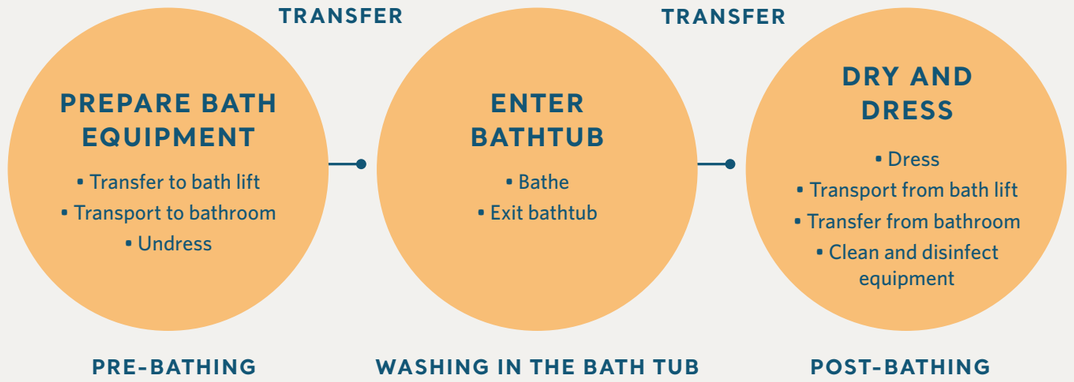
Bathing a resident or patient using a height adjustable bathtub can reduce static overload to the caregivers back by over 15% when compared to using a fixed height bathtub.[18]

Equipment	Percentage of time caregiver spent in healthy posture. (Higher score is less harmful)
High-low chair	58.8%
High-low bath	56.6%
High-low shower trolley	53.0%
Fixed bath	41.6%
High-low bed	39.4%
Fixed shower trolley	38.6%
Fixed hygiene chair	31.4%

Conclusion

With respect to postural load, the high-low bath and other height adjustable equipment place significantly less stress on the musculoskeletal system, especially when compared to the fixed bath, fixed shower trolley, fixed hygiene chair and high-low bed.[18]

3 STEP BATHING WORKFLOW



Increase efficiency in assisted bathing

Time savings and bathing

Although there is very little reliable research on the time taken to assist a resident or patient to take a bath, 'time' or 'perceived lack of it' is the most frequently heard reason for not assisting residents to bathe in a tub. The whole bathing process can be divided into 3 different 'steps':

- **Pre-bathing (preparation of the environment and patient)**
- **Washing in the bathtub**
- **Post-bathing (drying and dressing)**

Knibbe et al (2016) showed in their study, that it is the caregiver that often determines the time taken for washing, depending upon the perception of the subjective feelings of the resident/patient and went on to suggest that when bathing and showering, caregivers will often make the most of the 'wellness opportunity' rather than just performing the assisted cleaning.[8] Having functions on the bathtub which provide caregivers with time savings on the pre-bathing stage, such as pre-fill function on the tub can only assist to provide more time for positive 'well-being' opportunities with their residents and patients for them while they are in the tub itself.

Plan for the whole bath session:

When planning the bathing area and the bathing process, it's important to keep the whole bathing session in mind. The workflow needs to be planned; from undressing, to bathing, showering, toileting and re-dressing. In the planning of a central bathing area and the bathing process, several aspects need to be taken into consideration.

Plan how resident/patient gets to the bathroom

It is a good idea to be able to get to the bathroom dressed, ambulating or sitting in a wheelchair/hygiene chair or bath chair, as this preserves the resident/patient dignity and ensures that the person stays warm.

Where to get undressed & dressed

The preferred solution is to be undressed and dressed either in the bedroom or in the bathroom. Many residents and patients need some level of assistance; an active lifter, a bath lift chair or trolley could be good options. Enough space, dignity and risk for the undressed person getting cold are key aspects to be kept in mind.

Have a secluded place for getting to the toilet

It is a good idea to empty their bladder and bowels before bathing or showering. The toilet area could be integrated with, or be adjacent to the bathroom.

Plan a safe way to enter the bathtub

Entering the bathtub should be carried out in a way that is safe for both the resident/patient and the caregiver, reducing the risk of slipping and subsequent falling.

Create a safe working environment

During bathing, the caregiver should be able to provide assistance to the resident/patient using in a safe working posture, the tub and patient seat should be at a comfortable height while the resident/patient relaxes comfortably.

Offer a shower

The resident/patient may prefer a shower prior to, or after the bathing session. To support independent or assisted showering as an alternative to bathing, there should be a separate showering area; this area could also be used to clean the resident/patient in the event of the resident/patient needing to empty their bladder/bowels during the bathing session.

Getting out of the bath

Even if the resident/patient did not need support to enter the bath, exiting could be difficult. After the bathtub the resident/patient is warm, wet and maybe feeling very relaxed. Using a lift to reduce the risk for the resident/patient falling and to avoid strain on the staff is to be recommended in most cases.

Drying and dressing

It is good to plan for a heated area for assisted drying. It is important that the resident/patient can relax and does not get cold after the bath. A warm towel is a welcome detail that enhances the feeling of well-being and maintains the persons dignity.

Relaxation

It is also important to plan for an area where the resident/patient can sit and relax for a while. A bathing session can be nice, but also exhausting, and a short time of recovery after the bath is often appreciated.

Cleaning

To avoid the risk of cross-infection, the bathtub and equipment used during bathing or showering will need to be cleaned and disinfected. A bath or shower panel with built-in cleaning disinfection function is a welcome time-saving feature for the caregivers.

Bathing to enhance well-being

The action of the bubbles bursting against the skin removes dirt particles from the skin in a gentle brushing action.[28, 29, 30]

Reduce pain and induce relaxation

Regular bathing can reduce pain when part of a pain management program[15,19] and also increase relaxation.[20,21] Bathing with specially formulated shampoo/body wash and bath additives can also be a gentle and effective way to clean a resident with sensitive skin.

Bathing in warm water in general has a naturally calming effect. The warm bath water supports the body in a near weightless state, helps relieve muscle tension and induces relaxation. The relaxing nature of bathing in warm water has been shown to achieve positive clinical results, potentially diminishing the need for painkillers and sedatives.[22] It may also be beneficial in reducing stress and anxiety and to improve sleep.[21,]

Goto et al, in their randomized controlled trial, suggests that routine immersion bathing has positive effects on both mental and physical health, such as lowered stress and anxiety levels, as well as increasing hyperthermic action which increases blood flow.[12]

A study using the Parker® Spa bath within a palliative care environment concluded that using a spa bath with such patients was a simple way for nursing staff to enhance the comfort of their patients within the normal course of their duties and without the need for additional training.[23]

Stimulate the senses

Snoezelen™ multi-sensory environments are often specially designed to deliver stimuli to various senses of the person, using lighting effects, color, sounds, music, scents, etc. They are by nature, relaxing spaces that help to reduce agitation and anxiety, but they can also engage and delight the user, stimulating reactions and encouraging communication. The bathing session could give an excellent chance for sensory stimulation, the temperature and tactile feeling from the water, the smell of bath oils, color, light and music could be used to stimulate the resident.

The use of light, sound and smell can be used to gently stimulate the senses to create either a relaxing or stimulating environment. Music during bathing may calm the resident and lessen aggressive and agitated behaviors.[24] But we need to keep in mind all residents and patients are different and what works well for someone could cause anger or frustration for someone else. This means the bathing session and bath environment need to have a person focused care approach.

Using SOUND & VISION may engage the senses and potentially enhance the bathing experience for the resident/patient. It has been shown that the use of music can contribute towards the lessening of aggressive and agitated behaviors in older people with dementia.[24, 25]

Support skin care

The skin protects the body and bathing may help to protect the skin. However, what you put in the bathwater can complement or counteract good skin management. Making good choices in bath liquids and choosing Hydrosound® as a washing method are two factors that can contribute to optimum skin care.

Hydrosound

The use of HYDROSOUND, a low frequency ultrasound, has been shown to be able to cleanse the skin through the gentle mechanical action of streaming microbubbles. Low frequency ultrasound has also been shown to improve peripheral circulation and has been used in wound care to remove non-viable tissue. **The action of the bubbles bursting against the skin removes dirt particles from the skin in a gentle brushing fashion.[30,31,32] Hydrosound has also been found to have germicidal effects in water, which could further support good infection prevention and control practices.[35]**

Hydromassage

It is possible that HYDROMASSAGE can assist in pain management,[26,27] in particular chronic pain, as well as contribute to the reduction of lower limb stiffness.[28] Hydromassage works by creating a gentle and controlled movement of the water and has the effect of creating agitation in the bathwater. This in turn provides a gentle massaging effect which is intended to support relaxation as well as give a pleasant sensory experience.

Adding music-assisted bathing into the activities of daily living routine may assist in lessening of aggressive and agitated behaviours exhibited prior to and during bathing, and has been found to have a residual calming effect after the bath.[32]

Table of evidence – bathing

Author	Design	Key Findings
Falagas M. E. The therapeutic effect of balneotherapy: evaluation of the evidence from randomized controlled trials, Int J Clin Pract. 2009 Jul;63(7)	*Literature Review.* Systematic review with the aim to evaluate balneotherapy. PubMed, Scopus and Cochrane library were searched for randomized controlled trials, examining the clinical effect of balneotherapy (both as a solitary approach and in the context of spa) on various diseases.	29 RCTs were evaluated; 22 investigated the use of balneotherapy in rheumatological diseases: eight osteoarthritis, six fibromyalgia, four ankylosing spondylitis, four Rheumatoid Arthritis (RA) and three RCTs in other Musculoskeletal System diseases (MSD) and chronic low back pain. 1,720 patients were evaluated in these studies. Balneotherapy did result in reduced pain in patients with rheumatological diseases and chronic low back pain, in comparison to the control group in 17 of the 25 RCTs examined. This beneficial effect was measured differently and lasted for different periods of time; from ten days to one year. The available data suggest that balneotherapy may be truly associated with improvement in several rheumatological diseases.
Matz H. et. al. Balneotherapy in dermatology, Dermatologic Therapy, Vol. 16, 2003	*Evidence overview.* An article describing the evidence behind balneotherapy, which involves immersion of the patient in mineral water baths or pools. The major importance of balneotherapy and spa therapy both individually and as complements to other therapies lies in their potential after standard medical treatments have failed to give comfort to these patients.	Bathing in water with a high salt concentration is safe, effective, and pleasant for healing and recovery. This approach needs no chemicals or potentially harmful drugs. There are almost no side effects during and after treatment, and there is a very low risk to the patient's general health and well-being. The major dermatologic diseases that are frequently treated by balneotherapy with a high rate of success are psoriasis and atopic dermatitis. The mechanisms behind spa therapy have not been fully elucidated. They probably incorporate chemical, thermal, mechanical, and immunomodulatory effects.
Scherba G. et. al. Quantitative Assessment of the Germicidal Efficacy of Ultrasonic Energy Applied and Environmental Microbiology, July 1991	*Laboratory Study.* The purpose of this study was to evaluate quantitatively the degree to which microorganisms could be inactivated through the administration of ultrasonic energy into water, 39 +/- 0.3°C. Aqueous suspensions of specific bacteria, fungus, and viruses were exposed to an ultrasonic frequency of 26 kHz. The pathogens were selected based on their normal routes of infection (e.g., skin or intestinal tract) or their structural similarities to such agents, likely to be found as contaminants of whirlpools and hot tubs.	There was a significant effect on all four bacteria, with percent killed increasing with increased duration of exposure. There was a significant reduction in fungal growth compared with that in the controls, with decreased growth with increased ultrasound intensity. Therewas a significant reduction for feline herpesvirus with intensity, but there was no apparent effect of ultrasound on feline calicivirus. These results suggest that ultrasound in the low-kilohertz frequency range is capable to some degree of inactivating certain disease agents that may reside in water. The physical mechanism of inactivation appears to be transient cavitation.

Author	Design	Key Findings
Goto et. al. Physical and Mental Effects of Bathing: A Randomized Intervention Study, Evidence-Based Complementary and Alternative Medicine, Volume 2018, Article ID 9521086	*Randomized controlled trial.* This study compared the effects on health of immersion bathing, whole-body immersion bathing, and shower bathing in 38 participants who received 2-week intervention of immersion bathing in warm water (40°C) for 10 min followed by 2-week shower bathing without immersion or vice versa (n = 19 each group).	Visual analogue scale scores were significantly better for fatigue, stress, pain, and smile and tended to be better for self-reported heath and skin condition after bathing intervention than after showering intervention. The Health Survey showed significantly better general health, mental health, role emotional, and social functioning scores. Scores were lower for stress, tension-anxiety, anger-hostility, and depression-dejection.
Karagulle M, Real-life effectiveness of spa therapy in rheumatic and musculoskeletal diseases: a retrospective study of 819 patients Int J Biometeorol 2017:61	*Retrospective observational study.* The objective was to determine the use and efficacy of spa therapy in 819 patients with a wide spectrum of rheumatic and musculoskeletal diseases under real-life clinical practice circumstances. All adult patients with rheumatic and musculoskeletal diseases, who were prescribed a spa therapy in various health resorts in Turkey between 2002 and 2012 were analyzed. Patients followed a usual 2-week course of spa therapy. The patients were examined before and after the spa therapy.	The patients included had the following diagnoses: 536 osteoarthritis; 115 fibromyalgia; 50 lumbar disc herniation; 34 cervical disc herniation; 23 nonspecific low back pain; 22 ankylosing spondylitis; 16 rheumatoid arthritis; 9 rotator cuff tendinitis; and 14 other conditions/diseases. The result showed statistically significant decrease in pain scores in all patients except for in the subgroups hip osteoarthritis and rheumatoid arthritis. In addition the result showed a statistically significant improvement in function in all patients except for the patients suffering hip osteoarthritis, rheumatoid arthritis and rotator cuff tendinitis. The study results suggest that real-life spa therapy may be effective in a variety of rheumatic and musculoskeletal diseases by improving function and reducing pain.
Goris D. E. et. al, Quantitative systematic review of the effects of non-pharmacological interventions on reducing apathy in persons with dementia, Journal of Advanced Nursing, Nov 2016; 72 (11)	*Quantitative systematic review.* The aim of the study was to review the quantitative evidence concerning the effects of non-pharmacological interventions on reducing apathy in persons with dementia. The CINAHL, PubMed, PSYCH info and Cochrane Trials databases were searched for research published in English, inclusive through December 2014, with no early year limiters set.	In the search, 16 international randomized controlled trials or quasi-experimental studies were identified. The review suggested that selected non-pharmacological interventions are effective in reducing apathy among persons with Alzheimer Dementia Specifically. Music therapy, tailored personal contact, cognitive stimulation therapy, multi-sensory behavior therapy (including Snoezelen), group art therapy and therapeutic conversation all show some effect in reducing apathy without producing negative side effects. Overall, these interventions are heterogeneous in many ways, including their method of engaging a person with dementia, the apparent target of their therapeutic effect (behavioral, emotional or cognitive domains of apathy) and the extent to which interventions were tailored to a specific individual.
Matzer et. al. Stress-Relieving Effects of Short-Term Balneotherapy – a Randomized Controlled Pilot Study in Healthy Adults, Forschende Komplementarmedizin 2014;21:105–110	*Randomized study.* The aim of the study was to evaluate the stress-relieving effects of balneotherapy compared to Progressive Muscle Relaxation (PMR) 49 healthy volunteers were randomized to balneotherapy, PMR, or a resting control group, each intervention lasting for 25 min; subjective relaxation and salivary cortisol were measured. It was also examined whether participants with a high versus low stress level would have a different response.	In a pre-post comparison, salivary cortisol decreased and subjective relaxation ratings increased in all 3 groups. Study participants in the balneotherapy group rated themselves as more relaxed after the intervention as compared to the other two groups. Participants with a high versus low stress showed a similar relaxation response. Findings suggest that compared to PMR and resting, balneotherapy seems to be more beneficial with regard to subjective relaxation effects and similarly beneficial with regard to a decrease in salivary cortisol.

Bathing at the bedside

A bed bath is not the most effective way of washing patients, however it may sometimes be the chosen solution. It may be the only way to meet the hygiene needs of some residents who are unable to transfer out of bed, whether unconscious, receiving end of life care, or perhaps during outbreak and/or infection prevention demands.

Bed bath versus showering and bathing

Bed bathing can help to maintain the hygiene needs of residents and patients who are bedridden as a result of acute illness or chronic debilitation. However, in many cases within a general care facility, the decision to provide the patient or resident with a bed bath may be taken as a result of the caregiver perception that taking a person to the bathroom takes too long.[8,34] It can also be the chosen because the facility does not offer the right environment or equipment to allow showering or bathing to take place. Undertaking patient hygiene in bed is a strong contributor to excessive static overload on the caregiver leading to pain and injury.[33,34] Additional studies have shown that the time a caregiver spends in an unhealthy posture is higher in the activity of bathing in bed, when compared to showering in a height adjustable hygiene chair or shower trolley. Knibbe et al (2016). When bathing in the bedroom is necessary, strongly consider mitigating the heightened risk of static load and potential for injury of bathing in bed, and consider practices utilizing height adjustable showering equipment at the bedside instead. Whether bathing in bed or at the bedside with height adjustable showering equipment, consider the use of "washing without water" options, that is the use of pre-heated wipes impregnated with a special cleansing and caring lotion have been shown to both improve quality of care by increasing patient satisfaction, as well as increasing efficiency of work for the caregiver when compared to the traditional process of using soap, water and towels.[34]

Using wash gloves led to a reduction in the number of repositioning activities as opposed to the traditional bed bathing method with water, soap, washcloths, and towels. The reduction of postural load for caregivers was also significant as less time was spent in ergonomically unsound postures. An increase in efficiency was found as a full body wash took an average 7.2 minutes less time than the traditional method.[34]

A final thought....

In this clinical evidence brochure, we have indicated many of the challenges facing caregivers, patients and residents in providing and receiving hygiene care. Concerns such as caregiver workplace strain and injuries, time inefficiencies, equipment and environment provision as well as the concern for patient comfort, choice and general well-being all influencing the hygiene care process. We realize that you have a choice when it comes to your provider of hygiene solutions, and also recognize that using the right equipment represents only one important part of effective hygiene care. With adequate equipment and changes to the hygiene environment, safer, calmer and more ergonomic hygiene procedures for both the resident, patient and caregiver are indeed possible.

With Arjo's many years of knowledge and experience with hygiene solutions, we can also support your facility with a range of education, assessment and service solutions. We can help you to get the right product, to the right resident/patient, at the right time. We welcome your questions and invite you to contact us through your local Arjo representative, or visit our website at **www.arjo.ca** (for Canada) or **www.arjo.us** (for US).

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