

A CHAIR IS A CHAIR... UNTIL IT ISN'T

What Changes When a Dining Chair Becomes Part of Providing Care?

Mealtime Safety, Caregiver Ergonomics, Dignity and the Dining Environment

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Executive Summary

Helping someone with a dining chair is one of those ordinary acts we seldom stop to think about. We pull the chair away from the table, wait while the person sits down and then help move the chair into position. When the person is **independently mobile**, it is little more than courtesy. They turn, sit, adjust their position and contribute to moving themselves toward the table. The chair provides stability; the person provides the mobility.

The situation becomes quite different *when mobility declines*. Turning becomes difficult, stepping backwards less certain and the space between the chair and table harder to negotiate. Once seated, the person no longer has the strength or coordination to move themselves into position. At the end of the meal, the same problem occurs in reverse: they need enough room to stand and leave, but cannot move the chair away from the table themselves.

Nothing has changed about the chair. What has changed is the job we are asking it to perform. A second person—the caregiver—is now required to provide some or all of the movement that the person once provided independently.

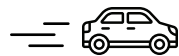
That changes how the dining chair should be considered. In **dependent care** communities, the chair no longer functions in isolation. It interacts with the person being assisted, the caregiver, the table, the flooring, the available space and the way care is provided.

The purpose of this paper is to look at that complete seating process and ask a fairly simple question: **what should be expected of a dining chair once it becomes part of providing care?**

The Elephant in the Room

Chair manufacturers appear to assume that wheels and dining chairs are not compatible. Perhaps our own experience with free-rolling task chairs helps reinforce that view. Whatever the reason, the fixed four-legged chair continues to be the default design offered for most dining environments.

This paper is not suggesting the answer is to simply put wheels on chairs. Chairs can already be made to roll. The more challenging question is whether a dining chair intended for dependent care can be designed to:



Move when **MOBILITY** is needed



Remain stable when **STABILITY** is required

1. It Matters Where You Stand...

From across the dining room, in dependent care settings helping someone become seated looks quite ordinary. The caregiver pulls the chair back, the person sits down and the chair is moved toward the table. We have seen the sequence so often that it is easy to think of it as chivalry rather than a care activity.

The view changes when we stand where the caregiver stands.

From the front...of the chair we notice the meal, the decor, the conversation and the people gathered around the table. That sense of normality is important, particularly in a care environment.

The dining room is one of the places where everyday life can still feel familiar, almost routine.





From behind...the chair, where the caregiver stands, we see something else. The table limits the available space. The chair arms partly hidden beneath it. A person with reduced mobility needs to turn, step backwards or shuffle sideways while trying to locate the chair behind them. Once they are seated, the caregiver has to push or pull the occupied chair into position. *Read more Fig. 1 (The Trip Zone), Page 13.*

When the meal is finished, that process has to be reversed before the person can stand and leave.

The meal **looks** the same from either side of the chair. The **work** required to make it possible does not.

2. The Conventional Dining Chair Does Its Job Very Well

There is nothing inherently wrong with the traditional four-legged dining chair. It has been remarkably successful because it performs the job for which it was designed.

That job assumes an independently mobile user. The person approaches the chair, pulls it away from the table, turns, sits, adjusts their position, moves themselves toward the table and later reverses the process. In that relationship, the chair supplies stability and the person supplies movement.

Within the **Dining Chair Classification System**, this is described as **Class A—Independent Living**. The classification is descriptive rather than critical. A Class A chair works extremely well when the person sitting in it can operate it independently.

The problem begins when the application changes. A conventional dining chair was not designed to reduce table interference for someone who needs assistance, expose support surfaces that have become difficult to reach, reposition an occupied chair or help move a seated person far enough away from the table to stand comfortably. Those requirements were never part of its original design brief.

The relevant question is what changes are necessary when a chair designed for independent living becomes part of dependent care.

3. Mealtime Assistance Is Not One Activity

It helps to separate assisted dining into three steps because each step asks something different of the person, the caregiver and the chair.

STEP 1: Becoming seated.

At this point the person is still standing, and fall prevention is the primary concern. A person whose balance, strength, coordination or vision has declined may be asked to enter a narrowing space between the chair and table, turn, step backward, locate a chair they can no longer see, find arms are partly obstructed and then control their descent into the seat. What appears to be the simple act of sitting down can become a surprisingly complicated sequence.

STEP 2: Being positioned at the table.

After the person is safely seated they still need to be positioned close enough to the table to eat comfortably. An independent person normally completes that movement almost without thinking. They use their feet, shift their weight and move themselves forward. When that ability is lost, however, the movement is still required. Under the conventional process, it is simply transferred to the caregiver.

The caregiver pushes from behind, pulls from the side, rocks the chair to start it moving or makes several smaller adjustments until the person reaches the table. The action still looks like moving a chair, but it is no longer simply a furniture task. The caregiver must move an occupied chair across a floor while controlling the position and comfort of the person sitting in it.

STEP 3: Moving away from and exiting the table.

After the meal, the person needs enough room to stand, reach a walker or other mobility aid if required, and leave without the table becoming another obstacle. Again, the movement that an independent person would normally provide has to come from someone else.

With a fixed four-legged chair, (Class A) the caregiver pulls the combined chair-and-person backward across the floor. As this is physically demanding, the typical response is to move the chair only far enough to reach one of its arms and pivot the occupied chair to face away from the table. This solves the immediate problem of creating room to stand, but it also places lateral and twisting forces through the chair, the floor and the caregiver.

These three steps are inter-related. A chair that performs well while someone is sitting down but becomes extremely difficult to reposition has solved only part of the problem. A design that makes movement effortless but fails to remain secure while someone is standing or becoming seated has created a different problem. Dependent-care seating has to consider the complete cycle.

4. Dignity Is Also Part of the Process

Much of the discussion around assisted seating naturally focuses on safety and caregiver effort, but there is another person in the interaction: the individual sitting in the chair.



Most people do not want getting seated for lunch to become an event. They do not want a caregiver visibly struggling to move them, nor do they want the chair rocked, pulled or twisted while they are sitting in it. They want to take their place at the table, enjoy the meal and leave in much the same way everyone else does.

That is why dignity is more than ambiance & decor, dignity is also affected by the way assistance is provided.

Predictable movement matters. The direction from which the caregiver approaches matters. The amount of physical handling required matters. So does the ability to participate in an ordinary social activity without becoming the focus of the room.

A successful seating process should therefore require no more intervention than is reasonably necessary.

5. The Chair Does Not Operate by Itself

It is tempting to look for a chair solution to what appears to be a chair problem, but the dining chair is only one part of a larger environment.

The abilities of the person determine how much movement they can still provide. The caregiver's reach, posture and physical position affect how assistance is delivered. The chair contributes stability, geometry and resistance to movement. The table determines how easily the person can approach the seat and how much clearance is available. Flooring influences both stability and the effort required to move an occupied chair.

Space and workflow matter as well. Several people may require assistance at the same time. Caregivers balance multiple responsibilities while each meal is being served. A seating arrangement that works adequately for one person in an empty room may behave quite differently when several residents and caregivers are moving through the same space.

This suggests that the useful unit of analysis is not the chair alone. It is the complete seating environment.

6. Evidence Suggests the Current System is Failing

One reason the present process receives relatively little attention is that it has become normal. The caregiver moves the chair. The meal happens. Everyone carries on.

Yet the process leaves evidence behind to the contrary.

- (1) Dining chairs (Class A) used in dependent care become structurally unstable as arms and joints loosen over time. Frames are repeatedly subjected not only to the vertical forces associated with sitting, but also to the horizontal and twisting forces created when an occupied chair is pulled, rocked or pivoted. The chair, as purchased was not defective; however within dependent care settings, the chair experiences forces that were never contemplated in its original use.

Question: Currently how many chairs in your community are out of circulation waiting repairs?

- (2) Flooring can tell a similar story. Wear, indentation, tears or concentrated damage around dining tables may reflect the repeated movements taking place above the surface. A chair leg or glide being turned under load behaves differently from one supporting a stationary person.

From the Field: Flooring manufacturers point to damage caused as a result of occupied chairs being skidded across the floor as the number #1 reason for premature replacement.

- (3) Caregiver demands provide another clue. If lifting the back of an occupied chair, pulling it across the floor or twisting it by the arm has become an ordinary part of mealtime, it is reasonable to ask why the worker's body is providing the mechanical effort needed to make the chair function within the care process.

Read more...See Fig. 4 (How much Physical Effort can a Caregiver Exert Safely?), Page 15

- (4) Resident behavior confirms mealtime assistance is not always received well by residents. Mealtime activities are time sensitive events requiring care staff to accommodate as many residents as possible within a short period of time. Residents can display agitation and unsettledness when mealtime assistance is provided as a task to be completed, rather than an extension of a relationship building opportunity.

None of these observations, by themselves, prove that a particular chair is unsuitable. Taken together, however, they suggest what we have accepted as routine deserves closer examination.

7. Every Solution Creates a Trade-Off

The difficulty becomes clearer when we look at some of the approaches already in use.

A fixed four-legged chair provides the stability people expect when sitting down or standing up. That same friction with the floor, however, makes the chair more difficult to move once it is occupied.

A chair fitted with freely rolling casters is much easier to reposition, but most people would be uncomfortable relying on it if it moves unexpectedly while they were sitting or standing. The problem is therefore not whether wheels work. They clearly do. The problem is controlling when movement is available.

Front casters are another example. For a person who still has enough mobility to contribute to moving themselves toward the table, they can be helpful. When that ability disappears, however, a caregiver begins lifting the rear of the occupied chair in order to use the front wheels. The same feature is now being asked to perform a different job.

Flooring presents a similar trade-off. A resilient floor may be selected partly to reduce the consequences of a fall. At the same time, an occupied chair can sink slightly into that surface, increasing resistance when the caregiver tries to move it. Neither the chair nor the floor is necessarily at fault. They are interacting in a way that becomes important once the chair is routinely moved while occupied.

Caregiver training can improve technique, but it cannot remove the weight of the person, eliminate friction or change the geometry of the room. Rocking provides some momentum when moving a seated person towards the table, in reverse however the only option available to the caregiver is exerting brute force!

8. The Mechanics Are Not Complicated

There is no need to turn this into a physics paper. The basic mechanics are familiar.

An occupied chair sitting on a floor resists movement. The amount of force needed to move it depends on the combined load, the flooring, the chair glides or casters, the direction of travel and the position from which force is being applied.

When the person sitting in the chair can use their feet, shift their weight or otherwise contribute to the movement, they provide part of the effort themselves. As their mobility declines, that contribution decreases. The movement is still required, so the missing effort is transferred elsewhere—to the caregiver, the person behind the chair. As a result, caregivers are at risk of incurring a work related injury.

Consider a 225-pound person seated in a conventional four-legged dining chair on vinyl flooring, unable to assist with repositioning. It takes approximately **90–100 pounds of horizontal force to initiate movement**. *Read more...See Fig. 5 (Moving a Seated Person: What the Caregiver Must Do) Page 16*

A dining chair fitted with front casters also illustrates the point. When the person can contribute, the wheels help the chair move forward. When they cannot, the caregiver lifts the rear legs up so the chair can be pulled backward on the front casters. At that moment the chair is functioning much like a class 2 lever.

The comparison with a wheelbarrow is useful because a wheelbarrow is intentionally designed around that principle. It has long handles specifically to provide mechanical advantage. A dining chair does not., forcing the caregiver to exert physical effort while being positioned awkwardly behind the chair. *Read more...See Fig. 4 (The wheelbarrow effect), Page 15*

The laws of motion are not the problem. The design question is whether the chair is asking a human being to provide mechanical assistance that should be addressed in another way.

A design is incomplete when it requires excessive human effort to compensate for what the design itself should accomplish.

9. A Memory-Care Observation

A memory-care community provides an interesting example of why the physical care process deserves attention.

Before changing its approach to dining seating, the community documented five to eight incidents each month involving agitation or aggressive responses during mealtime. After introducing chairs that allowed residents to be seated and positioned differently, the number of documented incidents fell to zero the first month and remained there for the following years.

This was one community's experience and should not be treated as clinical proof that a particular chair or mobility feature will produce the same result elsewhere.

However, what is useful is what staff concluded after the change. They began looking differently at the way assistance had previously been provided. With fixed dining chairs, caregivers frequently approached residents from behind and physically pushed or repositioned the occupied chair. Staff came to believe residents experienced that movement as unexpected, uncomfortable or threatening.

The diagnosis of the resident had not changed. The caregiver still needed to provide assistance. The meal still needed to happen. What had changed was the way the person, caregiver and chair interacted.

That raises a worthwhile question. When someone responds negatively during care, do we look only at the person receiving the care, or do we also examine what the care process is expecting that person to experience?



From the Field: Care communities employing “best practices” for the care of persons living with dementia encourage staff to develop a relationship bond with each resident, and to do so specifically by eliminating the element of surprise or from approaching the seated person from behind. With that in mind, the outcome witnessed by this care community should have been predictable.

10. What Should a Better Solution Accomplish?

Looking at the complete seating cycle suggests four practical objectives.

The first is fall prevention. The environment should make becoming seated and standing again as straightforward as reasonably possible, with less unnecessary backward movement, side shuffling and searching for support.

A Fall Changes Everything for Everyone

The second is caregiver ergonomics. When a person can no longer provide the movement required to position themselves, the caregiver should not be expected to make up the difference through physical strength.

Is it any wonder that caregivers feel more like “hired muscle” than givers-of-care!

The third is dignity. Assistance should be predictable, respectful and unobtrusive enough that taking a place at the dining table continues to feel like an ordinary part of life.

As Mobility Decreases...Care Needs Increase See Fig. 2, Page 14

The fourth is safety for both people. Improving the experience for the caregiver should not create unnecessary risk for the person receiving assistance, and improving safety for the person receiving care should not transfer additional physical demand to the caregiver.

Musculoskeletal Disorders: The Injuries We Don't See. Not all workplace injuries result from a single trackable event. NIOSH identifies work factors that can contribute to musculoskeletal (MSD) disorders including lifting, pushing, pulling, carrying, repetitive work, forceful movement, bending, twisting and awkward postures.

These seemingly small, everyday movements place cumulative stress on the caregiver's backs, shoulders, arms, hands, muscles and joints and are routinely recorded as strain or over-exertion.

Occupational health and safety guidelines establish recommended force limits under specific working conditions, assuming the worker can adopt appropriate positions and apply force safely. **But mealtime assistance rarely provides ideal conditions.**



Caregivers must work around tables, chairs and residents, often reaching, twisting and pulling from awkward positions. These injuries are often recorded as strains or overexertion, making their connection to everyday mealtime assistance difficult to recognize.

Yet their consequences extend beyond the workplace, affecting the caregiver's health, family life and ability to continue providing care.

The dignity and safety of the person receiving care cannot be separated from the dignity and safety of the person providing it. A care process that relies on physical strain from caregivers is not an adequate long-term design solution.

Mealtime Mobility in Practice

The following videos illustrate how seated mobility can support positioning and movement at the dining table in different dining environments.

Four Person Table Arrangement



www.vimeo.com/1077330822

Community Dining (12+ Residents)



www.vimeo.com/1161882464

Note on Dining Chair Classification Terminology

⁽¹⁾The **Dining Chair Classification System (DCCS)** identifies four functional classifications of dining chairs based on how movement is provided, controlled and secured. The system recognizes that as personal mobility declines, the functional demands placed on the chair increases.

Class A—Independent Use: The traditional stationary dining chair, familiar in homes, restaurants and independent living settings. The person provides the movement required to become seated, position themselves at the table and exit.

Class B—Automatic-Lock Mobility: Designed for dependent care, these chairs incorporate a mobility system with brakes that engage automatically. Movement is enabled only when the caregiver operates the brake-release mechanism.

Class C—Manual-Lock Mobility: Designed for dependent care, these chairs incorporate a mobility system with manually operated brakes, allowing the caregiver to reposition the occupied chair and secure it when movement is no longer required. Retrofittable options are available.

Class D—Locking Swivel Seat: Features a swivel seat that can be rotated and locked into position, preventing unintended rotation when properly engaged. The locking mechanism can be operated independently by the seated person or with caregiver assistance.

The classification system is designed to help identify the application and functional requirement of each class enabling care communities to better match the chair to the level of each resident's care needs.

Purpose and Limitations

This paper does not propose that every fall, caregiver injury, damaged chair, difficult resident interaction or worn floor can be attributed to dining-chair design. Nor does it propose that one product or technology represents a universal solution.

The memory-care example described in this paper is a field observation from one community and should not be interpreted as controlled clinical evidence of causation. Its purpose is to illustrate why the physical care process itself deserves examination when outcomes change.

The broader purpose of this paper is to encourage care providers, furniture manufacturers, architects, therapists, safety professionals and researchers to examine the person, caregiver, chair, table, flooring, physical space and workflow together.

Only when the complete environment and the complete three-stage seating cycle are understood can individual interventions be evaluated for both what they solve and what consequences they create elsewhere.

Conclusion

The conventional dining chair remains one of the simplest and most successful pieces of furniture we use. For an independent person, it does exactly what is expected of it. The person approaches, sits, positions themselves, enjoys the meal and later gets up and leaves. The chair supplies stability while the person supplies the movement.

When the person's mobility changes, however, the job changes with it. Another person enters the process and begins providing the movements the chair's user can no longer provide independently.

At that point, the dining chair starts affecting more than comfort and decor. It influences how safely someone can become seated, how much physical effort is required from a caregiver, how the person experiences assistance, how the chair and floor wear and how easily the entire mealtime routine can be completed.

That does not mean the conventional chair has failed. It means that dining chairs intended for use in **Independent Living** and **Dependent Care** settings require different criteria.

For manufacturers, designers, care providers and those responsible for workplace safety, the distinction is fundamental. A dining chair intended for dependent care must provide stability when stability is required and enable movement when mobility is necessary—without transferring excessive physical demands to the caregiver..

FORM VS **FUNCTION**

A CHAIR IS A CHAIR...UNTIL a caregiver is required to provide physical effort assisting a seated person into position at the table. At that moment the chair is no longer simply furniture (*form*), as it has become a permanent part of a communities' **care infrastructure** (*function*).

Fig. 1

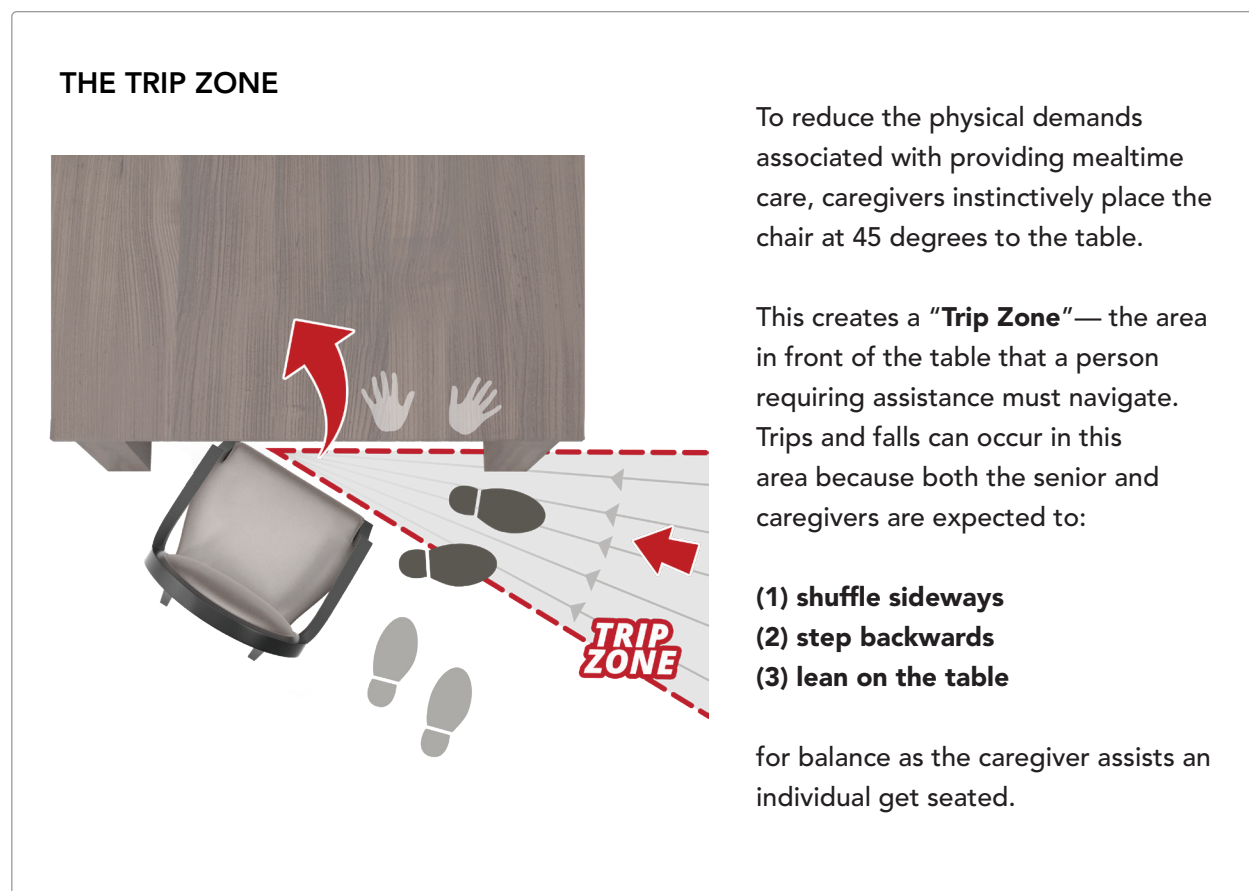


Fig. 2

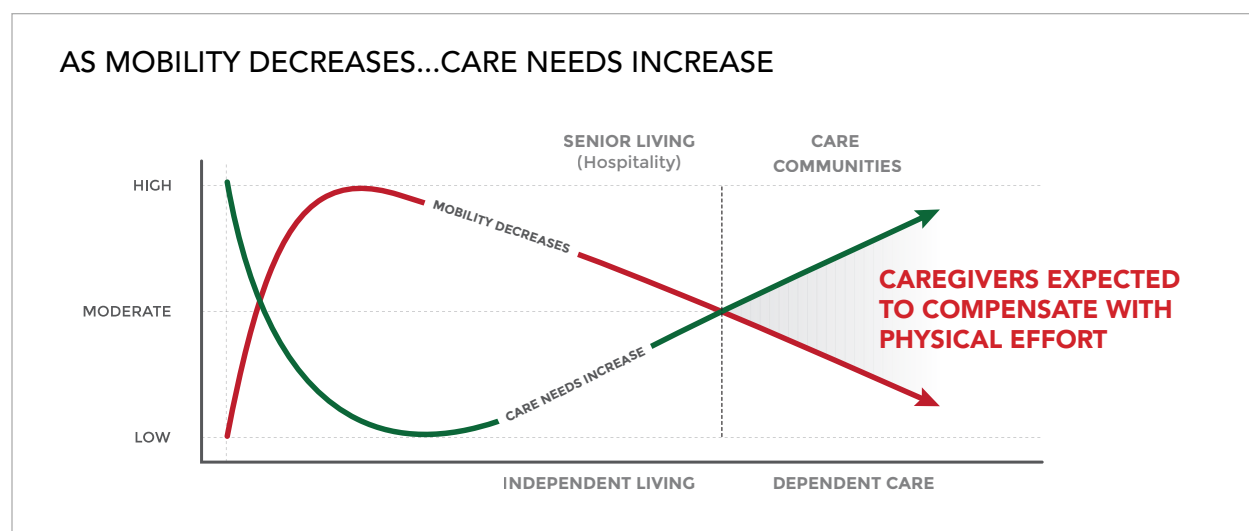


Fig. 4

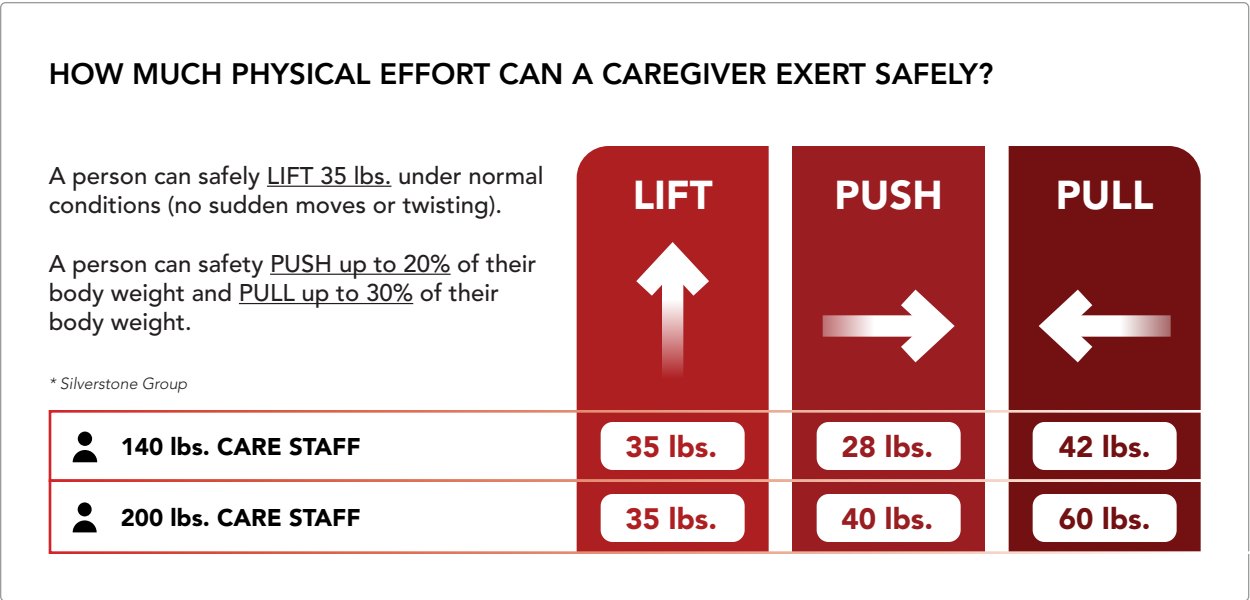


Fig. 4

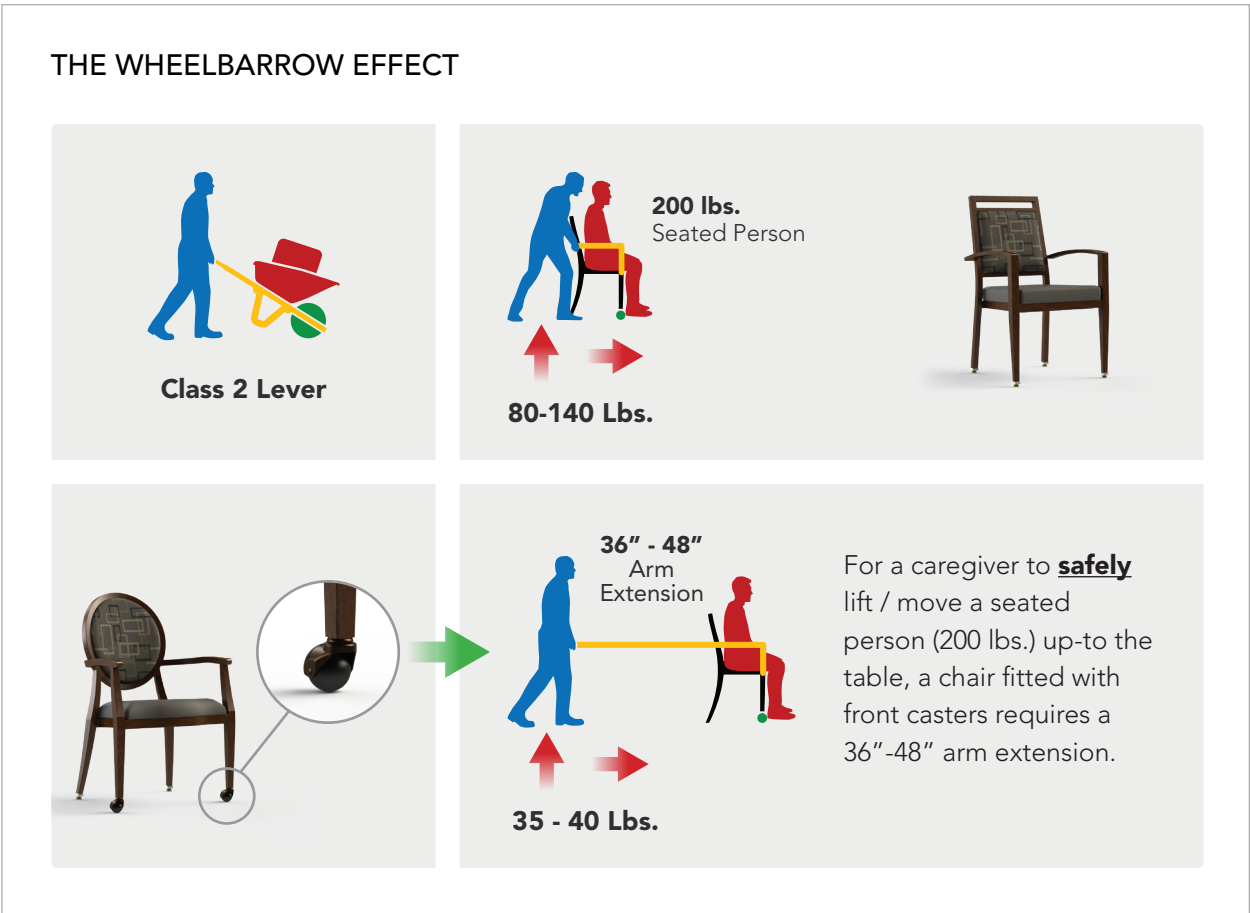
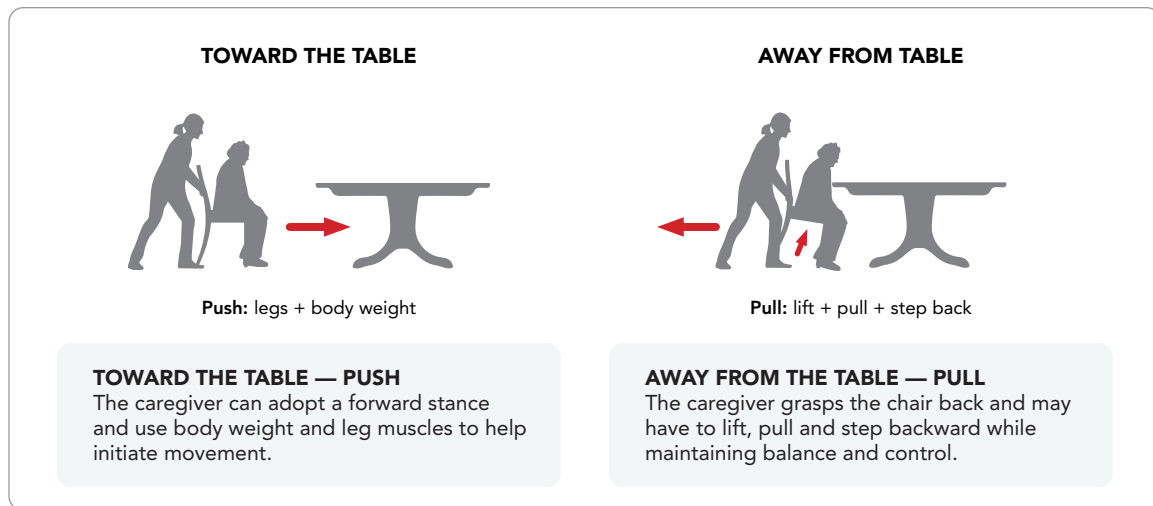


Fig. 5

MOVING A SEATED PERSON: WHAT THE CAREGIVER MUST DO

A 225 lb person is seated in a conventional four-leg dining chair with fixed glides. The caregiver must move the occupied chair toward the table—and later move it away.



A SIMPLE CALCULATION

225 lb person + 25 lb chair = 250 lb combined weight

250 lb × 0.40 assumed friction factor = about **100 lb** of horizontal force to start sliding.

This example does not mean the caregiver lifts **100 lb** vertically. It illustrates the horizontal effort needed to overcome floor friction. Actual force varies with chair glides, flooring and conditions.

WHY IT MATTERS

Pushing and pulling are not the same physical task. The backward movement introduces a combination of gripping, lifting, pulling and stepping backward. Repeated at mealtimes, these demands deserve consideration in chair design and caregiver safety.

The chair has not failed structurally. It has failed functionally.

Technical note and references

The illustrative 0.40 friction factor is assumed, not measured; this is not a workplace force assessment.

Physics: OpenStax, University Physics Vol. 1, §6.2 ($F = \mu N$). Ergonomics: Canadian Centre for Occupational Health and Safety, Pushing and Pulling.

Detailed methods: openstax.org/books/university-physics-volume-1/pages/6-2-friction | cchohs.ca/oshanswers/ergonomics/push1.html

Appendix — Editorial Note

The Design Challenge

The challenge identified in this paper, is not simply to make a dining chair easier to move. That solution has existed for decades in the form of 1970's dinette chairs and computer task chairs. However, often these are considered unsafe as unrestricted chair movement creates unacceptable risks when assisting a person with reduced mobility.

Rather, the design challenge is to develop a dining chair that balances the need to:

1. **Prevent falls** when a person is being seated or assisted from the table.
2. **Reduce the physical demands on caregivers** when assistance is required.
3. **Enhance the seated person's sense of dignity and self-worth.**
4.**without compromising safety** for either the seated person or the caregiver.

A Solution Already Exists

The reality is that a practical solution to moving and positioning a seated person already exists: **the wheelchair**. Its design allows a caregiver to move a seated person toward or away from a table with considerably less physical effort than a conventional four-legged dining chair. With appropriate braking and positioning, it also provides the stability required for assisted seating.

However, the wheelchair is not universally accepted as an appropriate substitute for a dining chair. For some seniors, it represents a loss of dignity, independence and identity ("the wheelchair is one appliance before the gurney"). Families, too, resist the use of a wheelchair at mealtimes when they believe a conventional dining chair offers a more normal and dignified dining experience.

The Unresolved Responsibility

The uncomfortable truth, if a design solution is not identified, and as a society we say the wheelchair is not a suitable option, an alternative design must be provided.

Without that alternative, the responsibility for moving and positioning a seated person falls upon the caregiver, who must physically compensate for the limitations of a chair never designed for this purpose.

When society rejects an existing solution without providing an acceptable alternative, we are effectively asking caregivers to compensate, through physical effort, for what furniture design has failed to address.

We cannot simultaneously insist that seniors experience the dignity of conventional dining furniture while expecting caregivers to absorb the physical consequences of furniture that does not accommodate dependent care.

That is not a failure of caregiving. It is an unresolved design responsibility.