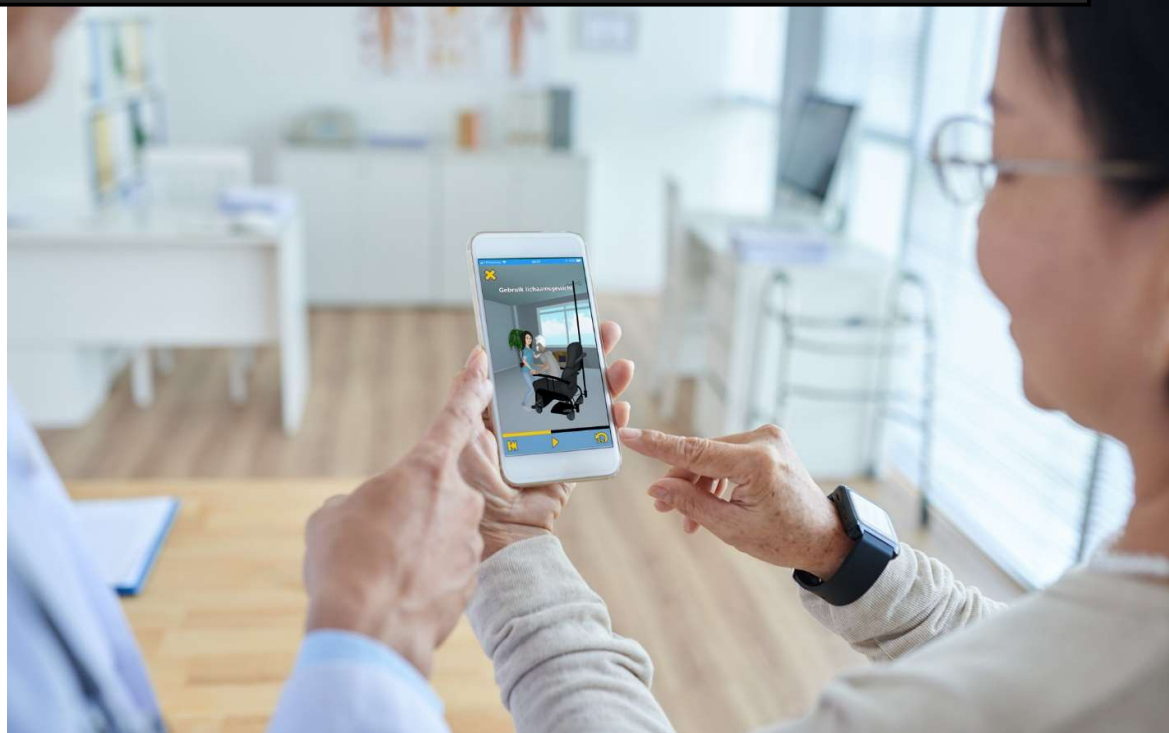




English version

# Obese clients and physical load of caregivers



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English version

*This article is a chapter from the eUlift manual 'Patient Handling for Caregivers' (2023). Authors: Fillip Buckens (AZ Gent), Kerensa Gaeremyck, Nico Knibbe (LOCOmotion), Hanneke Knibbe (LOCOmotion)*

Goderis, T. & Ollevier, A. (2024). Patient handling for caregivers. <https://eulift-app.com/>

*Obesity is a global health problem and, according to a recent study (2022) by the WHO, is also expected to increase in European countries. 59% of adults in Europe are overweight or obese. The percentages are rising rapidly, especially in the Mediterranean and Eastern European countries. The corona pandemic, in which teleworking and thus a sedentary lifestyle became the norm, contributed to this increase, according to the WHO.*

## BMI

Obesity is described as a chronic condition caused by excess body fat that harms health with an increased risk of premature morbidity and mortality (Wharton et al, 2022). In addition, obesity is the result of an imbalance between energy expenditure and energy intake of a person. The energy intake is then greater than the effective consumption, so that fat tissue accumulates in the body. This is associated with an increased risk of health problems, such as cancer and cardiovascular disease.

With the Body Mass Index (BMI) the weight status and thus the health risk of an adult can be roughly determined. It measures the ratio between body weight (expressed in kg) and height squared (expressed in m<sup>2</sup>). The number obtained tells you which weight category someone belongs to. A classification system is used for this (see table 1). Persons who fall outside – both above and below – the standard values are said to have an increased health risk.

From BMI 25 we speak of overweight and a person is obese from BMI 30. This last group is further divided into three subclasses: obesity class I, obesity class II and obesity class III. Individuals who fall within this third obesity class are referred to as “morbidly obese individuals” or “bariatric patients.” They have a BMI 40+.

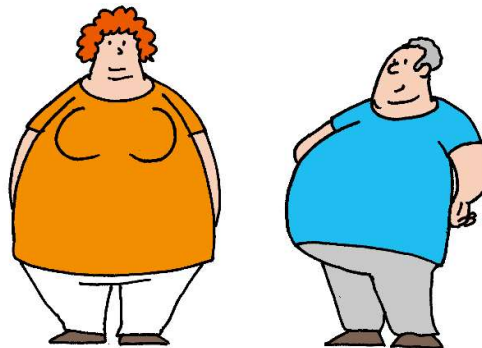
*Figure 1: Classification obese clients based on their BMI.*

BMI (kg/m <sup>2</sup> )	Classification	Health risk?
< 18.5	Under weight	Yes
18.5 – 24.9	Normal weight	No
25.0 – 29.9	Overweight	Yes
30.0 – 34.9	Obesity class I (moderate)	Yes
35.0 – 39.9	Obesity class II (serious)	Yes
≥ 40.0	Obesity class III (morbid)	Yes

## Physical load

When people suffering from obesity become dependent on care and become less mobile, the situation can arise that caregivers are physically overloaded because of patient transfers, washing, showering, etc. Two comparable studies (Wiggermann et al., 2021; Zhou & Wiggermann, 2021) show an increase in patient weight leads to an increase in lumbar compressive forces and caregiver hand strength when performing transfers. In another study, an increase in patient weight resulted in greater trunk and shoulder flexion while turning the patient in bed (Hwang et al., 2020). A survey of caregivers found that caregivers' back pain for a week or longer correlated with frequent transfers of obese individuals.

Employees who used assistive devices reported fewer physical complaints (Galinsky et al., 2021). Also, the use of ceiling lifts to move obese patients significantly reduces muscle activity and compressive forces on the caregiver's lumbar spine (Choi & Brings, 2015; Wiggermann et al., 2021; Zhou & Wiggermann, 2021). These studies emphasize the risks for healthcare providers and the importance of using adequate aids and transfer techniques.

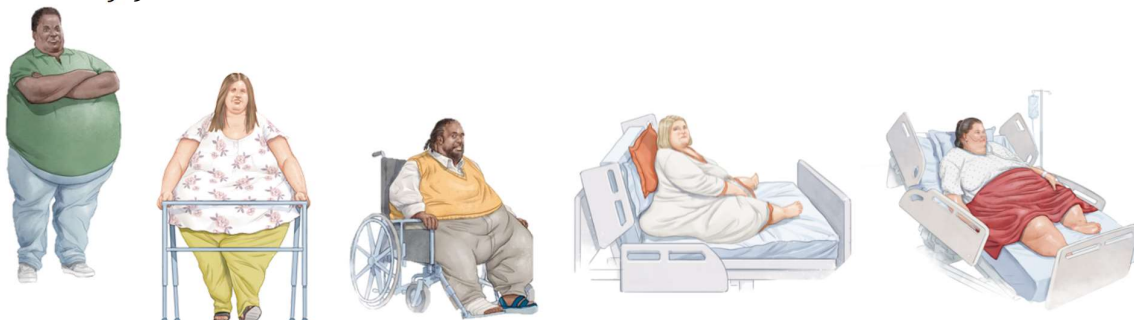


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## Mobility

The BMI is very partly determinative of the physical load of the care provider when performing a transfer, if that care provider is mentioned in the story at all. After all, just as with people who are not overweight, it is much more about mobility, defined as the extent to which someone can carry out the transfer or the care task themselves. When determining policy, both at the level of the care organization and at the client level, the division into the five mobility classes (MK5) is a practical starting point.

*Figure 2: The MK5, from A (leftmost) to E (rightmost) for obese clients (source: Arjo).*



## Body types

In addition to the classification based on BMI and Mobility Class, the body type also influences the choice of the safest way to move and care for the obese person. Broadly speaking, there are two body types, the apple and pear type. If the largest fat mass is around the abdomen, we speak of an 'apple', which in turn can be subdivided into two subtypes: the ascites distribution and pannus distribution (Figure 3). With a 'pear' the concentration of fat is somewhat lower, around the hips and in the legs. Here too we distinguish two subtypes: the abducted distribution and adducted distribution (Figure 4).

By the way, heavy people usually don't really have a pure pear or apple shape, often there is a mixture of both. The weight distribution has consequences for, among other things, the way in which the obese client stands up. Someone with the 'pear' body type can bring the trunk quite far forward ('Vorlage'), and then stand up calmly and stably. If someone with the "apple" body type did that, he would fall over. The stand-up speed and stability are not fundamentally different for both body types. It is important that obese people have their own way of exercising. Hundreds of variations are also possible within the classifications 'apple' and 'pear'. Obese people often cannot stand up in a way that non-obese people can. So start from your own way of getting up. There is also a difference between people with an apple or pear shape in terms of the type of sling they need when transferring with a passive lift. Pear shaped individuals usually require an extra wide sling with good leg support. If there is an apple shape, an XXL sling is often sufficient. Sometimes extra support for the legs in the longitudinal direction is needed.

Figure 3: Body type apple (copyright picture eUlift).

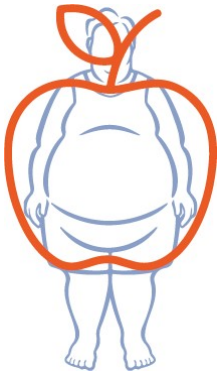

	<b>Body type</b>	<b>Apple</b>	
	<b>Fat concentration</b>	Around the belly	
	<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• The belly is usually hard</li> <li>• Waist circumference is larger than hip circumference</li> <li>• Knees and hips follow normal movement</li> <li>• Center of gravity is more at the front (risk of falling when bending forward)</li> </ul>	
	<b>Types</b>	<b>Ascites distribution</b>	<b>Pannus distribution</b>
	<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• Fat tissue: behind abdominal muscles</li> <li>• Belly is hard</li> <li>• Skin is tense</li> <li>• Respiratory problems in lying</li> <li>• Trunk flexion more difficult</li> </ul>	<ul style="list-style-type: none"> <li>• Fat tissue: for abdominal muscles</li> <li>• Belly hangs</li> <li>• Skin less tense</li> <li>• Fewer breathing problems when lying down</li> <li>• Trunk flexion easier</li> </ul>

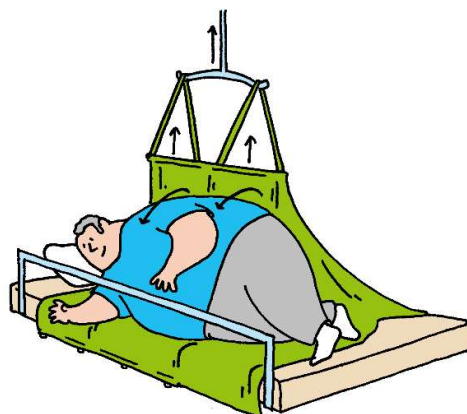
Figure 4: Body type pear (copyright picture eUlift).

	<b>Body type</b>	<b>Pear</b>	
	<b>Fat concentration</b>	Around the hips and the legs	
	<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• Belly is usually not very big and hard</li> <li>• The waist circumference is smaller than the hip circumference</li> <li>• The legs are often less able to bend</li> </ul>	
	<b>Types</b>	<b>Abducted distribution</b>	<b>Adducted distribution</b>
	<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• Fat tissue: inner legs</li> <li>• Legs are spread in standing and sitting (abduction)</li> </ul>	<ul style="list-style-type: none"> <li>• Fat tissue: outer thighs</li> </ul>

## Practical Guidelines Physical Load

If we know which MK5 Mobility Class the person with obesity has, we can use the Practice Guidelines for Physical Load (Hignett, S., et al, 2014) to roughly determine when which type of aids are needed to prevent physical overload for caregivers.

Mobility class A concerns a fully active client who can carry out the transfers more or less independently. It is important to start from the spontaneous movement pattern, taking into account the body type (pear versus apple). Clients with Mobility Class B often use a transfer aid, but can do so more or less independently. Keep in mind that those aids must be strong, large and wide enough for the obese client. Someone with Mobility Class C has sufficient trunk balance, but little standing stability and therefore uses a standing or active lift. For transfers within the limits, a C uses a sliding sheet and, of course, an electrically height-adjustable bed. Also keep in mind that the aids must be suitable for the obese client. If the client is even less mobile (Mobility Class D) there is no more standing function and a very limited trunk balance. The client uses a sliding sheet and a passive hoist, both of course XXL. A Mobility Class E client is passive and completely dependent on third parties for movements. Encouraging self-reliance is no longer a purpose. For the use of the aids there are actually no differences with Mobility class D: a sliding sheet and a passive hoist.



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In view of the obese target group, the use of aids from Mobility Class B means that they must in particular be extra wide and strong. Think of extra wide and strong shower chairs, beds, wheelchairs,

etc. In addition, they are often equipped with extra smart features, for example beds with a built-in weighing unit. So, the obese client does not need to be moved when weighing.

A disadvantage of extra strong and wide aids is the weight. Maneuvering with a heavy aid and a heavy client can quickly result in physical overload for the carer. That is why more and more XXL aids are equipped with a motor, so that driving does not require any effort. This is not always necessary with hoists. Then a ceiling lift is a good alternative. An additional advantage of a ceiling lift is that less space is required. What is also nice is that the physical distance between the care provider and the client is smaller. Another advantage of ceiling lifts is that you can also easily turn the obese client in bed. The patient lies on a special sling that acts as a permanent sheet and can be attached to the ceiling lift on one side. Activating the lift causes the client to tilt.

## Assessment

Before implementing a specific occupational health policy for obese clients based on BMI, MK5, body types and the Practical Guidelines for Physical Load, it is important to perform a risk assessment (Bone et al., 2015; Choi & Brings, 2015).

This can be done on two levels. First of all, it is important for the care organization to know whether the obese client can receive safe and respectful care at all at the location in question. For example, are the available lifters strong enough to move clients (MK5 classes C, E or E) weighing more than 150 kilos? Are the doors wide enough for an extra wide bed? How much weight can the hanging toilets handle? How many kilos does the scale go up to? Are there extra wide chairs in the waiting room? Are the injection needles long enough (so that the medication does not leak into the surrounding tissue)? And what to do in case of calamities? For example, during CPR? The standard defibrillators are often not suitable for clients who are extremely overweight. And in case of fire or acute transport by ambulance? Is the ambulance stretcher designed for very heavy clients? And what should you do if an obese client has fallen? Is there contact with the funeral company about matters such as transport, size of the coffin, accessibility of the cooling and how post mortem care can be done respectfully (!)? In short, there is a lot to check beforehand. The BMI40+ Facility Check (see Appendix 1) is a useful tool for this.

## TilThermometer

In addition, it is wise to check the extent to which caregivers are exposed to physical overload when caring for obese clients. The TilThermometer ([www.tilthermometer.com](http://www.tilthermometer.com)) tests to what extent this is the case, also for obese people. As part of eUlift, the TilThermometer has become available in Lithuanian, Spanish, French and Hungarian. The instrument could already be used in Swedish, English and Dutch.

## Techniques

The transfer techniques within eUlift have been specifically established for the transfer of obese persons. This concerns practical matters such as the body's center of gravity, which can be different from that of people without obesity, the abdomen that can get in the way or a smaller range of motion of the elbows and shoulders. The techniques are demonstrated in video on <https://eulift-app.com/>.

## Shortness of breath

When obese clients lie flat in bed or sit up straight, the chest is under pressure and can cause shortness of breath. Pressure spots and bruising can also occur as a result of fatty tissue that is under pressure. Although this can happen in people with an apple and pear shape, it is important to be extra alert, especially with 'apples'. Putting the bed in an anti-trendelenburg (with the head end higher) or 'half sitting' (somewhere between 30° and 60°) can then be practical solutions.

If the patient is moved with a passive lift (MK5 class D or E), a twin-motor ceiling lift can be useful. Because the motors can be operated independently of each other, it is possible to create sufficient space for the abdomen and to prevent tightness as much as possible.

When the patient is moved with a lifter in a lying position, you can use a special sling with a series of adjustable length loops.

Depending on the body type and width of the client, this allows you to increase comfort and also prevent breathing problems. Something similar can be done with a custom-made sling (which must of course meet all safety requirements).

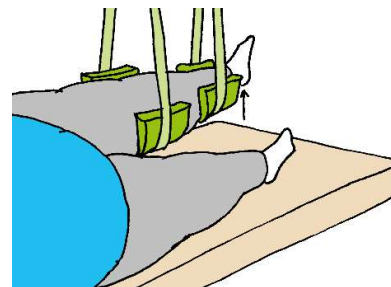


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## Skin

The skin deserves extra attention when caring for extremely heavy clients. The heavy perspiration and the sometimes very deep skin folds make skin care complex, heavy and time-consuming. Because obese people often find it difficult to wash and take care of themselves properly, the chance of 'missed spots' with the risk of infections and blemishes is high.

For example, ask the client to lift the abdomen when washing in bed, possibly using a bath towel. In order to be able to reach everything well, it can be useful to raise an arm or leg with a lift. After all, it is essential that the skin is thoroughly dry after washing. Even if disposable washcloths are used ('care cleansing').



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When touching, it is important to avoid large tensile forces on the skin. Due to the handling, the timing and the force with which this happens, shear forces are created on (and even in the skin), which can damage the skin. Therefore, touching should be done with the full hand as much as possible. This applies to both manual transfers (MK5 class A and B) and transfers



with an aid (MK5 class C, D and E). More information about the skin problems in relation to lifting, transfers and physical strain of caregivers can be found in another chapter of this eUlift Handbook.

## Respect

Caring for obese clients often presents a difficult dilemma. Healthcare providers may wonder why they should overload their bodies? While the client 'is to blame his- or herself?'

Then it is good to look at obese people from a different perspective. Knowledge of the background of the obese client is necessary. How did someone get so heavy? Often there is a world of problems behind it. After all, someone with obesity is a client with a chronic illness. No one is so heavy for their own pleasure. These people need care, just like people with a different disease.

Openly discuss the issue if a care team reacts negatively in advance to the arrival of an obese client. Look for solutions together with the client and his/her family. After all, this is often very annoying and sometimes even humiliating for the client. Of course, this does not mean that healthcare providers should go beyond their own mental and physical limits.

## Summary

For an effective ergonomics policy aimed at the care of obese clients, there are four pillars: BMI, MK5, body types and the Practical Guidelines for Physical Load. It is useful in advance to do an assessment of the working space and aids already present (BMI40+ Facility Check), and the degree of exposure to physical overload of the care providers when caring for obese clients (TilThermometer). In the solution sphere, (transfer) techniques and aids are offered. Special attention is needed for respiratory and skin problems, as well as respectful communication with the chronically ill obese patient group.

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## Appendix 1: BMI40+ Facility Check (2.0)

### BMI40+ ZorgorganisatieToets® (versie 1.0)

#### Hoeveel cliënten met overgewicht worden er verzorgd?

*Je kunt hierbij gebruik maken van de indeling van bariatrische cliënten in vijf Mobiliteitsklassen (zie figuur 1 op pagina 8). Als dit nul of heel erg weinig is, kun je afvragen of het überhaupt nodig is om maatregelen te treffen. Een argument kan desondanks zijn dat je organisatie voorbereid wil zijn op de toekomst.*

#### Zijn de bedden adequaat?

Ja Nee

- ▶ Is de maximale capaciteit (in kilo's) voldoende?    
*Het gaat dan zowel om het bed als om het (anti-decubitus) matras. Let ook op de maximale capaciteit van het hoofdeinde! Als dat onvoldoende is, kan de in bed zittende bariatrische cliënt achterover in bed zakken en zou zelfs kunnen stikken.*
- ▶ Zijn de slides (voor de transfers binnen de grenzen van het bed) groot genoeg?
- ▶ Hebben de bedden voldoende instelmogelijkheden zodat de cliënt niet volledig horizontaal hoeft te liggen?    
*Dit is nodig in verband met ademhalingsproblemen die vaak voorkomen bij bariatrische cliënten. De meeste leveranciers bieden speciale bariatrische bedden aan. Let er vooral op dat er een speciaal middengedeelte is dat voorkomt dat de cliënt in elkaar gedrukt wordt op het moment dat het bed naar een zitstand gaat. Dat is ook bij niet-bariatrische cliënten prettig en belangrijk, maar bij bariatrische cliënten is het echt nodig omdat ze anders niet meer kunnen ademen.*
- ▶ Zijn de bedden (met een bariatrische cliënt er in) veilig te manoeuvreren?    
*(Zie kader over manoeuvreren op pagina 27).*

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#### Maak een virtuele rondje door je zorgorganisatie. Waar loopt een bariatrische cliënt letterlijk en figuurlijk tegenaan? Check of de volgende zaken BMI40+ proof zijn en vul eventueel aan:

Ja Nee

- ▶ toiletpot (hangend?)
- ▶ steunen en beugels    
*Niet alleen de steunen en beugels zelf, denk ook aan de muur en de wijze van bevestigen.*
- ▶ sproeiföhninstallatie
- ▶ weegschaal
- ▶ rollator
- ▶ ondersteek
- ▶ incontinentie materiaal    
*Het zwaarste incontinentiemateriaal (XL) is geschikt voor cliënten tot ongeveer 150 kilo. Bij ergonomisch incontinentie materiaal is het mogelijk de heupband te verlengen met de band van een andere (eventueel al gebruikte) inco. Het verlengen doe je door middel van het klittenband.*
- ▶ bloeddrukmeter
- ▶ personenlift
- ▶ lengte injectienaalden    
*Bij te korte naalden kan de medicatie weglekken naar het omliggende vetweefsel.*
- ▶ hulpmiddelen die bij het zwachtelen worden gebruikt ter ondersteuning van de armen of benen
- ▶ hulpmiddelen en inrichting van het mortuarium
- ▶ \_\_\_\_\_
- ▶ \_\_\_\_\_

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		Ja	Nee
▶	Zijn de eventuele hulpmiddelen die op het bed zijn bevestigd (papegaai, bedladder, etc) bestand tegen het gewicht van de cliënt?	<input type="checkbox"/>	<input type="checkbox"/>
▶	Zijn de bedden voldoende breed?	<input type="checkbox"/>	<input type="checkbox"/>
<i>Anders kan de bariatrische cliënt zich niet goed bewegen in bed, of krijgt wonden van het bedhek. Er zijn ook speciale bedden die smaller of breder ingesteld kunnen worden. De zorgverlener kan er dan beter bij om zorg te verlenen en het bed kan toch door de deuropening.</i>			
<b>Zijn de stoelen voldoende breed en sterk?</b>			
<i>Het gaat hier feitelijk om alle stoelen: poststoelen, douchestoelen, rolstoelen, lui stoelen, stoelen in de recreatie ruimte, etc.</i>			
▶	Zijn de stoelen zo breed dat de billen niet vast komen te zitten tussen de leuning?	<input type="checkbox"/>	<input type="checkbox"/>
▶	Zijn de leuning sterk genoeg om op te steunen? <i>De maximale capaciteit is na te gaan op de gebruiksaanwijzing of via de leverancier.</i>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Zijn de tilliften adequaat?</b>			
▶	Is de maximale capaciteit van de lift voldoende*?	<input type="checkbox"/>	<input type="checkbox"/>
▶	Is de maximale capaciteit van de tilbanden voldoende*?	<input type="checkbox"/>	<input type="checkbox"/>
▶	Is het mogelijk de cliënt van de grond te tillen?	<input type="checkbox"/>	<input type="checkbox"/>
* Dit moet op de tillift of tilband staan (eis van de IGZ).			
			13



		Ja	Nee
<b>BMI40+ ZorgorganisatieToets® (versie 1.0)</b>			
<b>Is er voldoende ruimte*? Denk daarbij aan:</b>			
▶	breedte van de deuren (in verband met een breed bariatrisch bed)	<input type="checkbox"/>	<input type="checkbox"/>
▶	extra ruimte rondom het bed	<input type="checkbox"/>	<input type="checkbox"/>
▶	gangen (kan overal de bocht gemaakt worden?)	<input type="checkbox"/>	<input type="checkbox"/>
▶	de liften	<input type="checkbox"/>	<input type="checkbox"/>
▶	natte cellen	<input type="checkbox"/>	<input type="checkbox"/>
▶	_____	<input type="checkbox"/>	<input type="checkbox"/>
▶	_____	<input type="checkbox"/>	<input type="checkbox"/>
* Sommige leveranciers bieden specifieke kennis aan over de ruimtebehoefte van hun bariatrische hulpmiddelen. Informeer daarnaar bij aanschaf en (ver)bouw.			
<b>Etcetera</b>			
▶	_____	<input type="checkbox"/>	<input type="checkbox"/>
▶	_____	<input type="checkbox"/>	<input type="checkbox"/>
			15