ORIGINAL ARTICLE

The Difference Between Actual and Prescribed Weight Bearing of Total Hip Patients With a Trochanteric Osteotomy: Long-Term Vertical Force Measurements Inside and Outside the Hospital

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ABSTRACT. Hurkmans HL, Bussmann JB, Selles RW, Benda E, Stam HJ, Verhaar JA. The difference between actual and prescribed weight bearing of total hip patients with a trochanteric osteotomy: long-term vertical force measurements inside and outside the hospital. Arch Phys Med Rehabil 2007; 88:200-6.

Objective: To determine whether patients load the operated leg at a prescribed weight-bearing target load during postoperative recovery.

Design: A descriptive prospective study.

Setting: Orthopedic clinic and patients' homes.

Participants: Fifty patients who had undergone total hip arthroplasty (THA) with trochanteric osteotomy.

Intervention: Patients were verbally instructed by a physical therapist to perform partial weight bearing at a 10% body weight (BW) target load (n=33) or at a 50% BW target load (n=17).

Main Outcome Measures: Mean peak load (%BW) and percentage of patients and mean percentage of steps below, equal to, and above the target load. Weight bearing was measured when patients walked with (condition 1) and without (condition 2) a physical therapist in the hospital and walked at home (condition 3).

Results: The mean peak load was significantly higher than the target in the 10% BW group for all 3 conditions (condition 1, 19.2% BW; condition 2, 20.0% BW; condition 3, 26.8% BW). In the 50% BW group, the mean peak load was significantly lower than the target in conditions 1 (28.1% BW) and 2 (32.5% BW). No significant difference in weight bearing was found when walking with or without a physical therapist (change in 10% BW, −0.1% BW; change in 50% BW, −3.17% BW). At home, the mean peak load was significantly larger compared with walking without a physical therapist in the hospital (change in 10% BW, −7.0% BW; change in 50% BW, −11.5% BW).

Conclusions: Partial weight bearing at a specific target load was not achieved by patients with a THA when given verbal instructions. Especially when using a low target load and when walking at home with no supervision of a physical therapist, patients loaded the operated leg higher and more frequently above the target load. Other training methods (eg, biofeedback) have to be evaluated to use as training tools for partial weight bearing at specific target loads.

Key Words: Arthroplasty, replacement, hip; Physical therapy techniques; Rehabilitation; Weight bearing.

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PARTIAL WEIGHT BEARING (PWB) is commonly instructed during the rehabilitation of patients with fractures, osteotomies, amputations, or arthroplasties of the lower extremity.[1-10] For patients with a total hip arthroplasty (THA) and a trochanteric osteotomy, it is important to restrict the activation of the hip abductors to avoid nonunion of the trochanter fragment, which may lead to functional disability.[11-16] Although the relationship between the load under the foot and the load at the hip is complex, the conventional therapy is to restrict weight bearing. The maximum amount of weight bearing or target load is prescribed by the treating surgeon and given in percentage body weight (BW) or in kilogram load. The goal of PWB training given by the physical therapist is to ensure that the patient loads the operated leg at the prescribed target load.

Factors that may influence the patient's weight-bearing performance are the absence of the physical therapist, the setting (hospital or patient's home), and time after surgery. At the start of rehabilitation, the patient walks with the physical therapist in the hospital and receives instructions and feedback from the physical therapist. At a certain point during rehabilitation in the hospital, the physical therapist decides that the patient is able to perform PWB unsupervised. Although the results of commonly used instruction strategies are reported to be poor,[8,17] unsupervised walking without verbal feedback from the physical therapist could probably lead to higher limb loading than when walking with a physical therapist. Higher limb loading is also more likely to occur at the patient's home compared with the more controlled clinical setting. Nowadays, the patient recovers for several weeks at home (or in a nursing home), which is longer than the short hospital stay of 5 to 7 days. At home, the patient performs daily activities without help or supervision from a physical therapist and probably does more things alone, which may distract him/her, leading to inefficient handling of the walking aid.[18] Also, the home environment differs from the hospital environment, which may influence a patient's gait and, therefore, the loading of the operated leg. Because patients generally feel more confident and have less pain several weeks after surgery, they could load the limb above the prescribed target load. Additionally, because patients feel more confident

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they could become more active, thus increasing the risk of loading the limb above the prescribed target load.

Another factor that may influence the patient's weight-bearing performance is the target load prescribed by the surgeon. Studies have shown that lower target loads (10−15kg, 10%−30% BW) resulted in larger differences between prescribed and actual weight bearing than higher target loads (50% BW).[5,19-21]

To gain insight into how much the patient really loads the operated leg during postoperative recovery, long-term weight-bearing measurements have to be performed during the patient's stay in the hospital and at the patient's home, instead of short-term gait analyses in a laboratory. In addition, performing measurements over several hours enables us to obtain average and extreme peak loads from routine daily activities. To perform these kinds of measurements, we previously adapted and validated an insole pressure system.[22,23]

The present study aimed to evaluate whether patients with a THA and trochanteric osteotomy unload their operated leg at a prescribed target load after verbal instructions from a physical therapist by comparing the target load with the actual load, which was measured by a valid and reliable insole pressure system. Specifically, we wanted to know what the difference is between the actual load and 2 target loads (10% and 50% of BW) in 3 conditions: (1) in the hospital in the presence of a physical therapist, (2) in the hospital without the presence of a physical therapist, and (3) at the patient's home 2 weeks after discharge.

METHODS

Patient Population

Between August 2002 and October 2004, 145 consecutive patients received a primary unilateral THA with trochanteric osteotomy for the treatment of osteoarthritis of the hip at the orthopedic departments of 2 hospitals participating in this study. All patients between the age of 40 and 80 years and from whom a written informed consent was obtained were included in the study. Exclusion criteria were: medical conditions or social problems whereby patients could not perform or could not be instructed to perform PWB (eg, Parkinson's disease, epilepsy, alcoholism); postoperative bed rest for more than 3 weeks; foot orthosis; foot deformities that needed special footwear; and a shoe size (European) smaller than 36 or larger than 45. This study was approved by the Erasmus MC–University Medical Center and the Ruwaard van Putten Hospital Institutional Review Boards.

Protocol

The patients were instructed by a physical therapist to perform PWB with a walker or elbow crutches (3-point gait[15]) depending on the walking ability of the patient. PWB training was standardized that only verbal instructions and verbal feedback were given during and/or after PWB, without the use of other training methods or equipment (eg, a bathroom scale or feedback device). The training was performed by 2 to 3 physical therapists in each hospital, which have more than 5 years of experience with PWB training. The patients were generally instructed with a 10% BW target load in 1 hospital and with a 50% BW target load in the other participating hospital because of different opinions of the operating surgeons on optimal weight bearing.

Weight bearing was measured with the Pedar Mobile system,[a] which was validated to measure the vertical force during walking over a long-term period.[22] The Pedar Mobile system is a portable insole pressure device with matrix insoles (thickness, 2mm). Each insole contains 99 capacitive sensors. Before each measurement, the Pedar insoles were calibrated by using the Trublu calibration device[a] and a GDH 14AN digital manometer.[b] The pressure loads applied were 4, 7, and 10 to 60N/cm² with intervals of 5N/cm². The Pedar system was placed in a custom vest together with a custom battery unit, consisting of 2 batteries (Sony NP750 Li-ion), which was worn by the patient (fig 1). An electronic device with an accelerometer was made to automatically start and stop the Pedar system so that data were recorded only when the patient was standing or walking. The accelerometer was fixated with adhesive tape on approximately the middle front part of the contralateral thigh. The Pedar Mobile system was turned on 1 hour in advance (acclimatization period), and zero settings were done at baseline and 1 hour.[22] Data collection started after the second zero setting. The weight-bearing measurements were performed on day 7±2 postoperatively in the hospital when the patient walked with a physical therapist (condition 1) or walked unsupervised (condition 2) and on day 21±5 postoperatively at the patient's home (or in a nursing home) 2 weeks after discharge (condition 3). Weight-bearing data during walking were collected over a period of 5 hours (from ±11:00 AM to ±4:00 PM) at a sample frequency of 50Hz.

Data Analysis

Pedar-m Expert version 8.2 software[a] was used to calculate the vertical force data from the Pedar system. Then, all Pedar data were imported in a custom Matlab program[c] and were filtered by using a low-pass Butterworth filter with a cutoff frequency of 40Hz. The Matlab program was used to select the walking data within the data files and to correct the walking data for offset drift.[22] For each step, the maximum peak load was determined. From these maximum peak loads, the following variables were calculated for the 2 target loads (10% and 50% BW) and for each of the 3 conditions: the mean peak load (%BW) ± standard deviation; peak load variance within and between patients; the total number of steps; and the number and percentage of steps below the target load, equal to the target load, and above the target load. Based on the opinion of the orthopedic surgeons at our university hospital, we arbitrarily defined "below the target" as less than 5% BW for the 10% target load and less than 40% BW for the 50% target load and "above the target" as more than 20% BW for the 10% target load and more than 60% BW for the 50% target load. The remaining category was defined as "equal to the target."

One-sample t tests were used to compare the mean peak loads at conditions 1, 2, and 3 with the target load. Paired t tests or t tests were used to compare condition 1 with 2 and condition 2 with 3 for the mean peak load and the percentage of steps below, equal, and above the target load. Correlations between the dependent and the patient variables were determined with Pearson correlation tests. For each test, the level of significance was set at P less than .05. All statistical analyses were performed with SPSS[d] for Windows.

RESULTS

Patient Characteristics

Fifty patients participated in the study of which 33 patients performed PWB with a target load of 10% BW and 17 patients with a target load of 50% BW (fig 2). Patient characteristics are presented in table 1. Age was significantly higher ($t_{48}=2.3$, $P=.026$) and body weight was significantly lower ($t_{48}=-1.2$, $P=.023$) in the 10% target group compared with the 50% target group. When looking at men and women separately, these
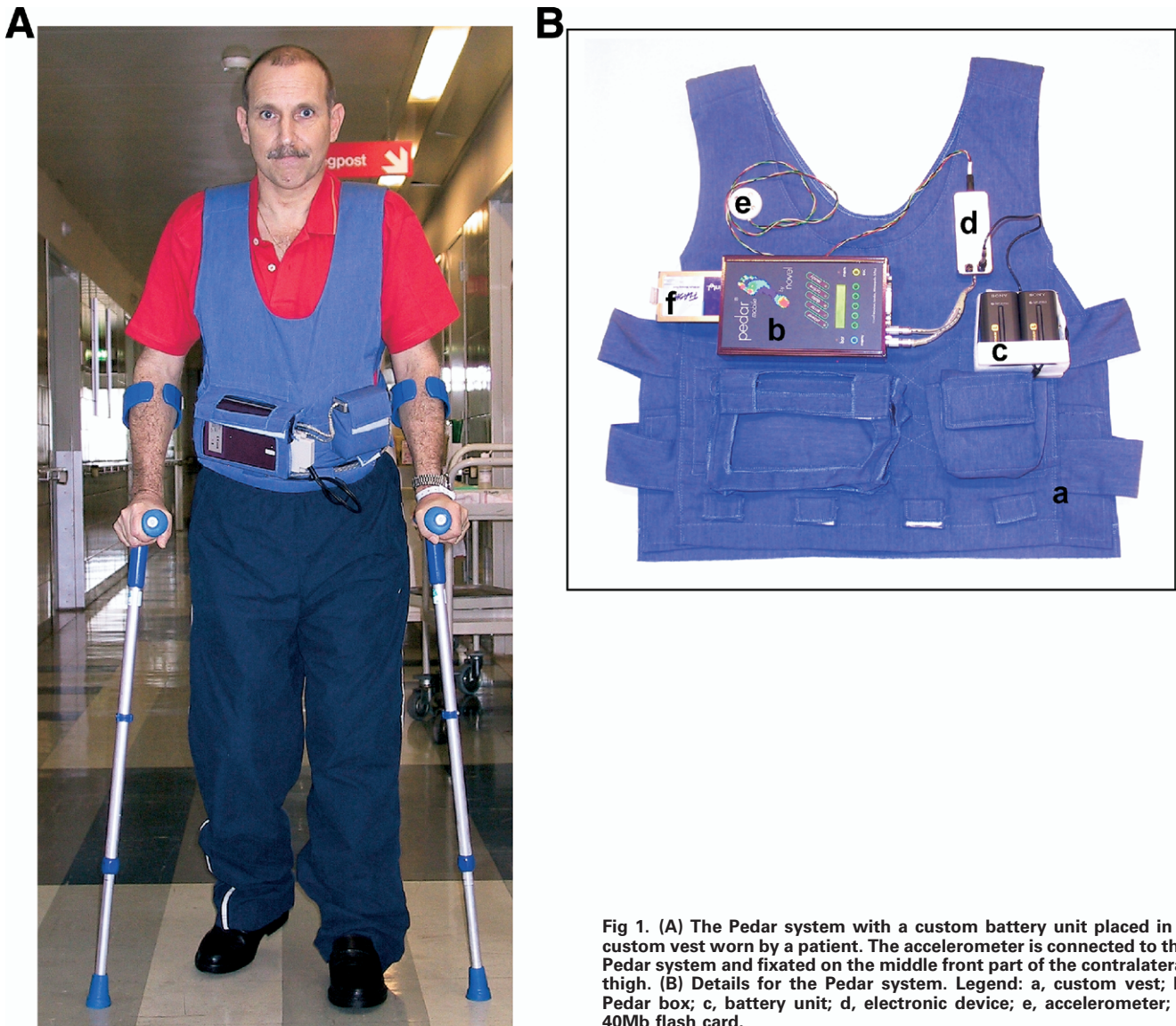
A

B

Fig 1. (A) The Pedar system with a custom battery unit placed in a custom vest worn by a patient. The accelerometer is connected to the Pedar system and fixated on the middle front part of the contralateral thigh. (B) Details for the Pedar system. Legend: a, custom vest; b, Pedar box; c, battery unit; d, electronic device; e, accelerometer; f, 40Mb flash card.

factors did not differ significantly between the 2 target groups. The 10% target group had significantly more women (χ^2_{33} test=11.8 P=.001), but not significantly fewer men than the 50% target group (χ^2_{14} test=1.0 P=.317). Age and body weight of the patient did not correlate in the 10% BW target group with the mean peak load and did not correlate with the percentage steps below, equal to, and above the target load in all 3 conditions. For the 50% target load in condition 1, a positive correlation was found between age and the percentage steps equal the target load (r=.62, P=.042) and between body weight and percentage steps above the target load (r=.73, P=.01). For condition 2, a negative correlation was found between age and percentage steps below the target load (r=−.69, P=.02). Because of mostly logistic reasons, not all patients were measured at each condition. From the 33 patients with the 10% BW target load, respectively, 25, 26, and 26 patients and from the 17 patients with the 50% BW target load, respectively, 11, 11, and 16 patients were measured for conditions 1, 2, and 3, respectively. To assess the amount of weight

bearing in the 10% BW and 50% BW target load group for conditions 1, 2, and 3 during a long-term period, a total of 1752, 3029, and 10,258 steps, respectively, and a total of 1120, 1788, and 7498 steps were evaluated.

PWB With Supervision

When patients walked with the physical therapist, 64% patients had a mean peak load equal to and 32% of the patients had a mean peak load above the 10% BW prescribed target load (table 2). The mean peak load (19.2% BW) was significantly higher than the target load (t_{24}=4.0, P=.001). Fifty percent of the steps were equal to the prescribed target load. The distribution of the peak loads showed a large variety in weight bearing, with peak loads up to 55% to 60% BW (fig 3). The patients' within-variance and between-variance weight bearing was 22.1% and 2.2% BW, respectively.

For the 50% target load, the number of patients with a mean peak load equal and above the prescribed target load was 36.4% and 0%, respectively. The mean peak load was signif-
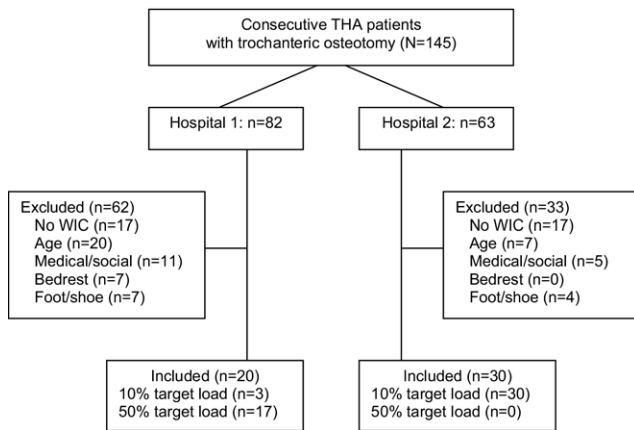
Fig 2. Flow chart of patient inclusion and exclusion in the study. Abbreviation: WIC, written informed consent.

icantly lower (28.1% BW) than the target load ($t_{10} = -4.5$, $P = .001$). Sixty-six percent of the steps were below the target load. The distribution of the peak loads showed loads up to 65% to 70% BW (fig 4), and patients' within-variance and between-variance weight bearing was 46.2% and 5.1% BW, respectively.

PWB Without Supervision

When walking without supervision in the hospital the percentage of patients with a mean peak load above the target load was increased with 9% to 10% in the 10% BW target load group. The mean peak load (20.0% BW) was again significantly higher than the target load ($t_{25} = 5.1$, $P = .000$). The percentage of steps equal the target load was 31.6%. As in condition 1, the distribution of the peak loads showed again a large variety in weight bearing, with peak loads up to 55% to 60% (see fig 3). The weight-bearing variance within and between patients was 33.6% and 1.9% BW, respectively.

Also within the 50% target group, an increase of 9% to 10% was found in the percentage of patients with the mean peak load above the target load. Similar to condition 1, the mean peak load was significantly lower (32.5% BW) than the target load ($t_{10} = -3.2$, $P = .009$). Without supervision, peak loads were measured up to 90% to 95% BW (see fig 4). The weight-bearing variance within and between patients was 54.8% and 5.7% BW, respectively.

PWB at Home 2 Weeks After Discharge

At home, 2 weeks after discharge, the percentage of patients with a mean peak load above the 10% target load was increased to 69.2%. The mean peak load (26.8% BW) was significantly higher than the prescribed target ($t_{25} = 6.7$, $P = .000$). The percentage of steps above the target load was increased to 63.6%. Peak loads were measured up to 70% to 75% BW (see fig 3). The weight-bearing variance within and between patients was 44.9% and 2.6% BW, respectively.

In the 50% BW target load group, the mean peak load (43.3% BW) did not differ significantly from the target load ($t_{15} = -1.7$, $P = .117$), and the percentage of steps above the target load was 17.4%. However, peak loads were measured up to 90% to 95% BW (see fig 4). The weight-bearing variance within and between patients was 106.1% and 5.8% BW, respectively.

Comparing PWB Conditions

When comparing condition 1 (in hospital with the physical therapist) with condition 2 (in hospital without the physical therapist), no significant difference was found in the mean peak load in both target load groups (table 3). In condition 3 (at home), the mean peak load was significantly higher than during condition 2 in both target load groups (10% BW target, $t_{22} = -2.4$, $P = .025$; 50% BW target, $t_9 = -2.6$, $P = .027$). No significant differences were found between conditions 1 and 2 for the percentage of steps above the target load. When patients walked at home at a 10% BW target load, 17.2% more steps were above the target load than during unsupervised walking in the hospital, but this difference was not significant ($t_{22} = -1.9$, $P = .074$). With a 50% BW target load, 9.4% more steps ($t_9 = -2.4$, $P = .043$) were above the instructed target load when patients walked at home. At home, patients walked significantly more during the 5-hour data-collection period than during unsupervised walking in the hospital (10% BW target, $t_{22} = -4.9$, $P = 000$; 50% BW target, $t_9 = -2.4$, $P = .039$), whereas in the hospital no difference was found in the number of steps (condition 1 vs condition 2).

DISCUSSION

The present study evaluated PWB of patients with a THA and trochanteric osteotomy during their postoperative recovery by measuring the actual load during walking with a validated insole pressure system over a 5-hour period in the hospital and at home and comparing it with 2 instructed target loads in 3 conditions.

In this study, we found that 55% of the patients did not load their operated leg at the prescribed target load during their recovery when walking with (condition 1) or without (condition 2) supervision of a physical therapist in the hospital and when walking at home (condition 3). The results were even worse when looking at the percentage of steps (61%) taken by the patients that were unequal to the target loads. Previous patient studies on PWB also found that a large percentage of steps (40%−80%) of the patients were above the target load

Table 1: Age and Body Weight of the Patients in the 10% and 50% BW Target Load Group, and the Mean Differences With Test Values

Characteristics	10% BW Target Load	50% BW Target Load	10% to 50% BW Target Load
Patients	33	17	NA
Age (y)	64.1±8.7	57.8±10.0	6.2±2.7
			$t_{48} = 2.3$, $P = .026$
BW (kg)	75.4±9.1	79.7±17.7	−4.3±3.8
			$t_{48} = -1.2$, $P = .023$
Men	6	10	−4
			$\chi^2_{14} = 1.0$, $P = .317$
Age (y)	58.0±7.5	53.1±6.6	4.9±3.6
			$t_{14} = 1.4$, $P = .195$
BW (kg)	79.0±4.1	87.5±17.2	−8.5±5.7
			$t_{14} = -1.5$, $P = .163$
Women	27	7	20
			$\chi^2_{33} = 11.8$, $P = .001$
Age (y)	65.4±8.4	64.6±10.4	0.84±3.7
			$t_{32} = 0.2$, $P = .825$
BW (kg)	74.6±9.6	68.7±12.3	5.9±4.4
			$t_{32} = 1.4$, $P = .183$

NOTE. Values are n or mean ± standard deviation (SD).
Abbreviation: NA, not applicable.

Table 2: PWB Data of the Patients During Condition 1, 2, and 3 With a 10% BW and 50% BW Target Load

Condition (n)	TL (% BW)	Patients (n)	MPL (% BW)	All Steps (n)	MPL < TL (% patients)	MPL = TL (% patients)	MPL > TL (% patients)	Steps < TL (%)	Steps = TL (%)	Steps > TL (%)
1	10	25	19.2±11.4	70.1±39.7	4.0	64.0	32.0	11.4±20.5	50.1±34.4	38.5±39.7
	50	11	28.1±16.0	101.8±58.9	63.6	36.4	0	66.1±40.1	31.6±37.3	2.3±7.7
2	10	26	20.0±9.8	116.5±79.5	3.9	53.8	42.3	9.7±20.8	43.8±30.9	46.5±36.0
	50	11	32.5±17.9	162.5±113.1	63.6	27.3	9.1	63.3±42.5	27.8±35.8	8.9±25.7
3	10	26	26.8±12.8	394.5±251.4	0	30.8	69.2	3.2±5.0	33.2±34.5	63.6±38.3
	50	16	43.3±15.9	486.6±378.6	37.5	56.3	6.2	35.4±35.9	47.2±29.0	17.4±23.4
Overall					28.8±30.2	44.8±15.2	26.5±26.5	31.5±27.9	39.1±9.2	29.6±23.9

NOTE. Values are n, percentage, or mean ± SD. Body weight ranges: 10% target load: "below target (<TL)"=0%−5% BW; "equal to target (=TL)"=5%−20% BW; "above target (>TL)"=20%−100% BW; 50% target load: "<TL"=0%−40% BW; "=TL"=40%−60% BW; ">TL"=60%−100% BW.
Abbreviations: MPL, mean peak load; TL, target load.

when using either verbal instructions and observation and/or the hand-under-the-foot method and/or a bathroom scale.[1,5,7,8,17] This indicates that the commonly used methods are inadequate to obtain the prescribed target load. However, our data also showed that PWB seemed to be determined by environment and time after discharge (hospital vs home) and by the prescribed target load. So, when the clinical goal is not to load the operated leg above the target load then verbal instructions seemed to be sufficient for PWB in the hospital at a 50% BW target load.

Although observation with verbal feedback is a subjective method to control weight bearing, we expected higher limb loads compared with the situation in which the patients walked in the hospital without feedback. However, no significant differences were found between the mean peak load and the percentage steps above the target load of conditions 1 and 2 (see table 3). This would indicate that the patients learned to limit the load on their leg at a certain level when trained by a physical therapist, although this was not the instructed load. Weight-bearing training was done by giving verbal feedback after performing PWB for a few steps. Winstein et al[24] concluded that this "postresponse feedback" was effective for learning a PWB skill, but that concurrent feedback (eg, audio feedback during the weight performance) is needed for immediate performance. Another aspect that could explain the similar weight bearing in both conditions is the postoperative pain,

which may have led the patients to be more cautious in placing the foot on the ground.[25]

At home, the patients loaded their operated leg significantly higher than during unsupervised PWB in the hospital. A reason for this could be that the patients might be more confident and/or may have less pain. These factors might have contributed to the significantly greater number of steps measured at home, which also could increase the risk of incorrect loading the leg. In addition, when a patient walks more the patient could also become fatigued as walking with walking aids is physically demanding[26-28] and, consequently, load the leg more than the prescribed target load. Also, the patients' compliance with weight-bearing instructions could influence the loading of the operated leg at home. At the patient's home, we occasionally observed that patients used only 1 crutch or did not use the walking aids at all, for example, when opening the front door or while making coffee. Several patients stated that they sometimes forgot to use the walking aid when standing up. Unfortunately, we were not able to match the load data with these events.

We found that, with a low prescribed target load (10% BW), a large number of steps were above the target load. This is in line with previous studies on PWB that also found relatively less accuracy when a low target load was used.[7,20,21] It is obvious that when the patient has to place less weight on the
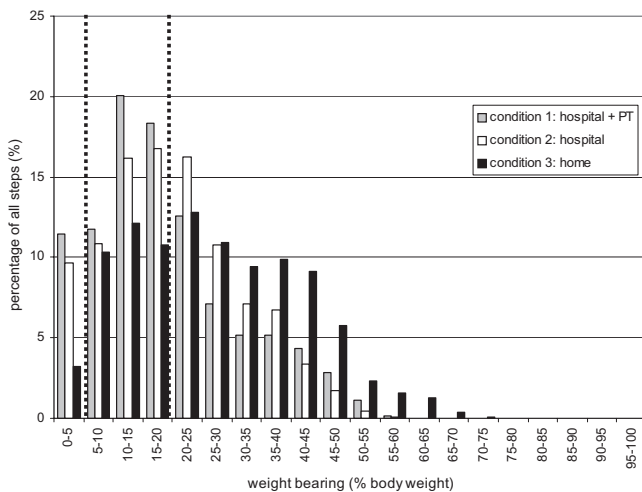

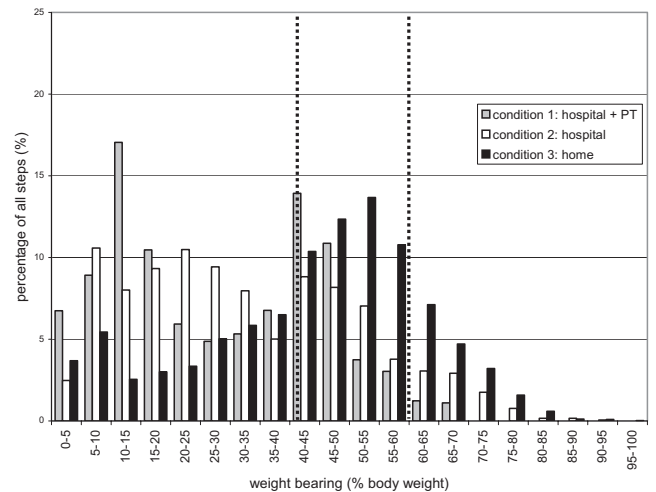**Fig 3. Distribution of the peak forces for the 3 conditions with the target load set at 10% BW.**

Fig 4. Distribution of the peak forces for the 3 conditions with the target load set at 50% BW.

Table 3: Comparison of the PWB Outcome Measures Between Conditions 1 and 2 and Conditions 2 and 3 for the 10% BW and 50% BW Target Load

Patients (n)	Conditions (n)	Δ Mean Peak Load (% BW)	Δ Steps <TL (%)	Δ Steps = TL (%)	Δ Steps >TL (%)
		10% BW target load			
20	1 and 2	−0.1	−1.6	3.5	−1.8
		$P=.869$	$P=.526$	$P=.397$	$P=.633$
		$t_{19}=0.2$	$t_{19}=0.6$	$t_{19}=-0.9$	$t_{19}=0.5$
23	2 and 3	−7.0	6.7	10.5	−17.2
		$P=.025^*$	$P=.175$	$P=.216$	$P=.074$
		$t_{22}=-2.4$	$t_{22}=1.4$	$t_{22}=1.3$	$t_{22}=-1.9$
		50% BW target load			
8	1 and 2	−3.17	−1.9	0.1	1.8
		$P=.409$	$P=.686$	$P=.977$	$P=.538$
		$t_{7}=0.9$	$t_{7}=0.4$	$t_{7}=-0.0$	$t_{7}=-0.6$
10	2 and 3	−11.5	30.3	−21.0	−9.4
		$P=.027^*$	$P=.041^*$	$P=.116$	$P=.043^*$
		$t_{9}=-2.6$	$t_{9}=2.4$	$t_{9}=-1.7$	$t_{9}=-2.4$

NOTE. Values are mean difference (Δ). Body weight ranges: 10% target load: "below target (<TL)"=0%−5% BW; "equal to target (=TL)"=5%−20% BW; "above target (>TL)"=20%−100% BW; 50% target load: "<TL"=0%−40% BW; "=TL"=40%−60% BW; ">TL"=60%−100% BW.
*Significant at $P<.05$.

operated leg more weight has to be placed on the walking aid, and, therefore, more muscle strength of the upper arm is needed.[29,30] Chow et al[31] found that the muscle power of the upper arm influenced the ability of the patient to perform PWB. Higher weight-bearing loads (up to 90%−95% BW) were measured in the 50% BW target load group, which could increase the risk of complications. Therefore, a simple practical solution to decrease weight bearing in the 50% BW target load group could be to use the more strict 10% BW weight-bearing verbal instructions. For instructing patients at a 10% BW target load, other methods (eg, audio feedback) should be used.[5,7,32]

To evaluate PWB, it is important to measure not only the amount of loading but also the duration (amount of steps) of loading. Complications can occur because of an occasional full weight bearing but may also occur as a result of long-term weight bearing just above the target load. Individual patient data in our study show a large variability in amount and duration of loading between separate walking periods, ranging from several seconds to 10 to 20 minutes. Also, an increase in loading was seen in the longer walking periods, which may indicate that patients were getting (more) fatigued because of longer intensive use of the walking aids and/or were becoming less concentrated.[18,26-28] This suggests that weight-bearing instructions should not only include a restriction in the amount of loading but also emphasize the importance of limiting the duration of walking to, for instance, 5-minute walking sessions.

Study Limitations

There is still no definition or consensus as to what constitutes "too much" loading because no data are available that relate complication rates to either the amount or the duration of loading. Therefore, the surgeons in our hospital use the arbitrarily chosen weight-bearing cutoffs (below, equal, above) for the 10% and 50% BW target load as described in the methods and considered 10% (or less) of the steps above the target load to be acceptable. The 2 target load groups were not compared on the outcome measures because of differences in size and patient characteristics. PWB differences between the 2 target load groups could also be caused by confounding elements such as different physical therapists at the 2 hospitals. The

statistical analysis used in our study (ie, repeated t tests) has its limitations. Other statistical methods (eg, repeated-measures analysis, Bonferroni adjustment) were considered; however, these methods also have their restrictions. The data in the article do not suggest that some results were statistically significant by chance, for example, 5 of the 6 one-sample t tests were significant instead of 1 comparison (5% × 6 tests = 0.3) was falsely declared significant at P less than .05. Furthermore, given the sample sizes in our study we chose to use standard t tests.

CONCLUSIONS

PWB at a specific target load was not achieved by patients with a THA when given verbal instructions. Especially when using a low target load and when walking at home with no supervision of a physical therapist, patients loaded the operated leg higher and more frequently above the target load. When a 50% target load is prescribed, verbal instructions for 10% target load training could be used to avoid high weight-bearing loads at the patient's home. However, other training methods (eg, biofeedback), have to be evaluated for being useful training tools for PWB at specific target loads. Also, little to no information is available on the influence of factors (eg, age, body weight, upper-extremity force, duration of walking) on the amount of loading during weight bearing. This information is important for the clinician to properly instruct patients to perform PWB in the hospital and especially during recovery at home.

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Suppliers

a. Novel Gmbh, Ismaninger St 51, 81675 Munich, Germany.
b. Greisinger Electronic GmbH, Hans-Sachs-Str 26, D-93128 Regenstauf, Germany.
c. The MathWorks Inc, 3 Apple Hill Dr, Natick, MA 01760-2098.
d. Version 10; SPSS Inc, 233 S Wacker Dr, 11th Fl, Chicago, IL 60606.