

## Wiping Movement with Paper after the Excretion /Bowel movement — A Comparative Study between the Physically Unimpaired and Post-Stroke Hemiplegic Patients —

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### Introduction

Evacuation is an indispensable daily action, once or twice a day, and the most important one listed for training for hemiplegic persons. There are a variety of wiping movements with paper depending on the habits of the patient. Most of the time, even family members do not know how the patient has been wiping. Thus we have conducted this research to survey and analyze wiping movements with paper and particularly on the wiping movements of hemiplegic patients from cerebral apoplexy regarding the actual tendency of wiping movements and the reason for it, from observation-analysis.

### Subjects

Control group: Healthy hospital staff members, 169 person aged from 19 to 60, on average  $34.9 \pm 11.2$  years old with 31 males and 139 females. Hemiplegic group: 30 hemiplegic patients in "A" rehabilitation hospital in Niigata prefecture, who can get out of bed and hold the sitting position. Average age is  $69.4 \pm 13.5$  with 15 male and 15 female patients.

### Methods

Survey for the control group was carried out by questionnaires without identification. It consisted of age, sex and multiple choice answers from 6 wiping movements and posture that have been classified from pre-study, in using western

style toilets: ① from back while trunk in bending ② from back pelvic in anteversion ③ from back in semi-standing ④ from front in sitting ⑤ from front in semi-standing ⑥ from side and ⑦ others. These were shown in figures and the person could choose one of them.

The movements of the upper arms shown in figures were selected from ① use of whole upper arm (the main movement is shoulder and elbow joint) ② movement of hand (the main movement is hand and finger joints) ③ others. Besides these, the type of toilet stools (content of water, shape of stool like O shape or U shape, with washing equipment) were asked.

For the hemiplegic group, observation of wiping movement by paper was carried out at the actual evacuation site by either occupational therapist or nurse or helper. For patients who needed assistance, a helper observed their movement. For patients who did not need assistance, the observer obtained their permission to watch.

All of the hemiplegic patients due to cerebral apoplexy had received lower limbs Br. stage for evaluation of their function. We further carried out the evaluation for neck, trunk and pelvic functions following Yoshio et al.<sup>2,3)</sup> and discussed the relationship with wiping movement.

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**Results**

The posture in wiping shown in Fig.1 indicates the meaningful difference with  $\chi^2$  test. Any difference according to age on wiping was not found. This means that there are many variations in wiping methods but probably only six can be considered as general methods for wiping.

On the contrary, meaningfully more hemiplegic patients wiped from front on sitting. Meaningfully less in comparison with the control were from back with semi-standing and wiping from the sides.

The movement of the upper arms during wiping in the control was classified (Table 1). In the case of the frontal approach of arm, more movement of hand and finger joints, was shown while the back approach shows more movement of shoulder and elbow joints.

The approach of the upper arms was classified by sex difference in the healthy group (Table 2). Males show much more from back approach than females. There was no relation between wiping posture and the quantity of water in the toilet bowl and between posture and the use of a wash-toilet.

Fig. 3 shows the ratio of wiping from front in sitting and other approaches with lower limbs Br.stage. There was more low Br.stage among patients with from front in sitting. The patients less than stage III reached 66.7%. Patients using other approaches showed higher Br.stage, especially stage IV patients reached 64.7%.

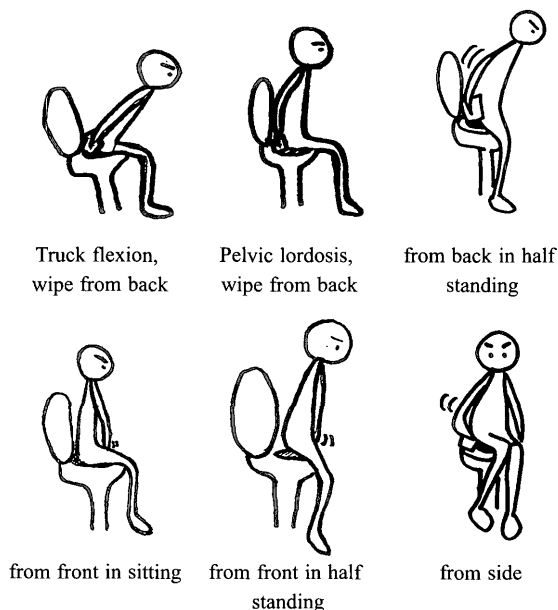
Similarly, the function of trunk and pelvic among hemiplegic due to cerebral apoplexy was compared between from front in sitting and other types (Fig.4). Patients wiping with 'from front in sitting' showed lower trunk function than the others, and all were less than stage IV. The patients using other approaches contained 5.6% of stage I but some were stage V and VI.

	from back	from front side
Hand · finger · joints movement	88.8%	37.1%
shoud · elbow joint movement	11.2%	62.9%
Total	98	70
		P<0.01

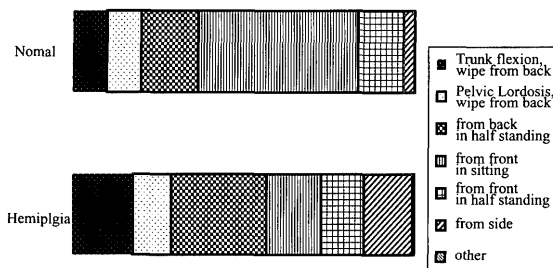
**Table 1 Uppers extremity and postare.**

	man	woman
from back	77.42%	54.35%
from front · side	22.58%	45.65%
Total	31	138
		P<0.01

**Table 2 Ratio of wiping methods in man and woman.**



**Fig 1 Posture and wiping methods.**



**Fig 2 Posture when wiping by paper.**

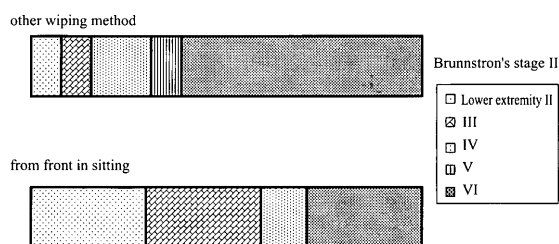


Fig 3 Lower extremity Brunstron's stage and methods of wiping.

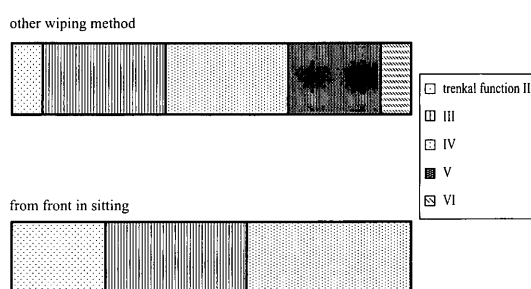


Fig 4 Trunkal function and wiping methods.

**Discussion:**

The difference in wiping between healthy people and hemiplegic patients should be carefully considered because of the age difference and the change of wiping method from the side to from front in sitting among patients. Person used to wiping in semi -standing position may feel difficulty as the supportive strength of lower limbs weaken and the balance to support non-hemiplegic lower limbs becomes uneven. In such cases, the dangers of falling will be much higher. In person wiping from back, lower safety of trunk induces difficulty in rotation of the body. In the case of side approach in hemiplegics, the center of gravity moves to the hip of the plegic side and then one must straighten up the upper body. This is also dangerous. The increase of 'from front in sitting' among hemiplegic patients due to cerebral apoplexy could be due to their supporting power, stability and voluntary power of lower limbs, trunk and pelvic being reduced.

It has been suggested that each method has

merits and demerits. When one wipes ones buttock while seated on the toilet seat, it is safer and needs less motion but the available space for hand use is much less. Also the uncomfortable feeling caused by placing the hand below the toilet seat and the unhygienic feeling are demerits. When wiping takes place while buttocks are separated from toilet seat, it is much easier, with more space for the hand. One does not need to place the hand inside the toilet bowl, but it requires more movement and balance for the lower limbs and trunk. The diversity of wiping may come from ease of posture, ability and balance of lower limbs and trunk, hygienic view, psychological point and so on. From the results, hemiplegic patients search and find the easiest method based on minimizing the unbalance of limbs and trunk for wiping

The difference of upper limb movement depending on the posture comes from the angle of elbow joints whether the upper limbs is in front or back of the trunk. In the case of the stretched elbow, the shoulder joint plays an important role and in the case of bending the elbow joint, the movement of hand and finger joints becomes of major importance.

The reason that male patients do not the approach from the front can be speculated from hygienic point that his upper limb may touch his genitals.

Shindo<sup>4)</sup> divides the training process for evacuation as following: basic training for ability to balance during movement, transfer and change of posture; presentation of action aimed for moving and the practice; and how to use the welfare equipments and to live with this. Such presentation must be proceeded by evaluation of the function of trunk, pelvis and lower limbs. Then, a safe method for patients, for example, {from front in sitting} wiping approach for the patients weakened in trunk function and lower limb function, should be recommended. At the same time, good conditions (toilet with water wash, good toi-

let seat, hand rail and so on) should be prepared<sup>1)5)6)7)8)</sup>.

It has been noticed that staff in charge of the rehabilitation of hemiplegic patients due to cerebral apoplexy should pay attention to the significant number of patients, who have a change of wiping method during toilet training, especially for those with lower Br.stage limb and trunk function. When rehabilitation staff ignore the teaching of how to wipe after evacuation with paper, patients trying carry out their usual approach may be put into dangerous situations. Teaching and treatment must be carried out at the site.

It is important that rehabilitation staff know the previous method used in the prior previous healthy period, which may have many variations, and they must evaluate the function of trunk, pelvis and lower limbs before starting training and practice. Also the staff must thoroughly explain to patients why the change is necessary from their habitual method.

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