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# SOCIOECONOMICAL EFFECT OF BLADDER FUNCTIONAL ASSESSMENT-BASED OPTIMAL PROMPTED VOIDING CARE FOR INSTITUTIONALIZED ELDERLY WITH URINARY INCONTINENCE IN JAPAN

**Motofumi Suzuki[1], Y Igawa[1], T Fujimura[1], H Nishimatsu[1], H Kume[1], Y Koyama[2], Y Iguchi[3], T Saito[3], Y Homma[1]**

[1]Department of Urology, The University of Tokyo, [2]Koyama Medical and Welfare Group, [3]Megumi Long-Term Care Health Facility

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## Abstract

We evaluated socioeconomical effect of 'Ultrasound-directed prompted voiding care' for elderly with urinary incontinence living in nursing homes. The cost of continence aids (diaper/pad) was decreased in a time-dependent manner. The effect was significant in elderly with fair bladder function, while not in elderly with fair bladder function. We could not evaluate economical cost of caregivers, however; their quality of life were not worsened. Bodily pain and mental health were significantly improved after the intervention.

## Objectives

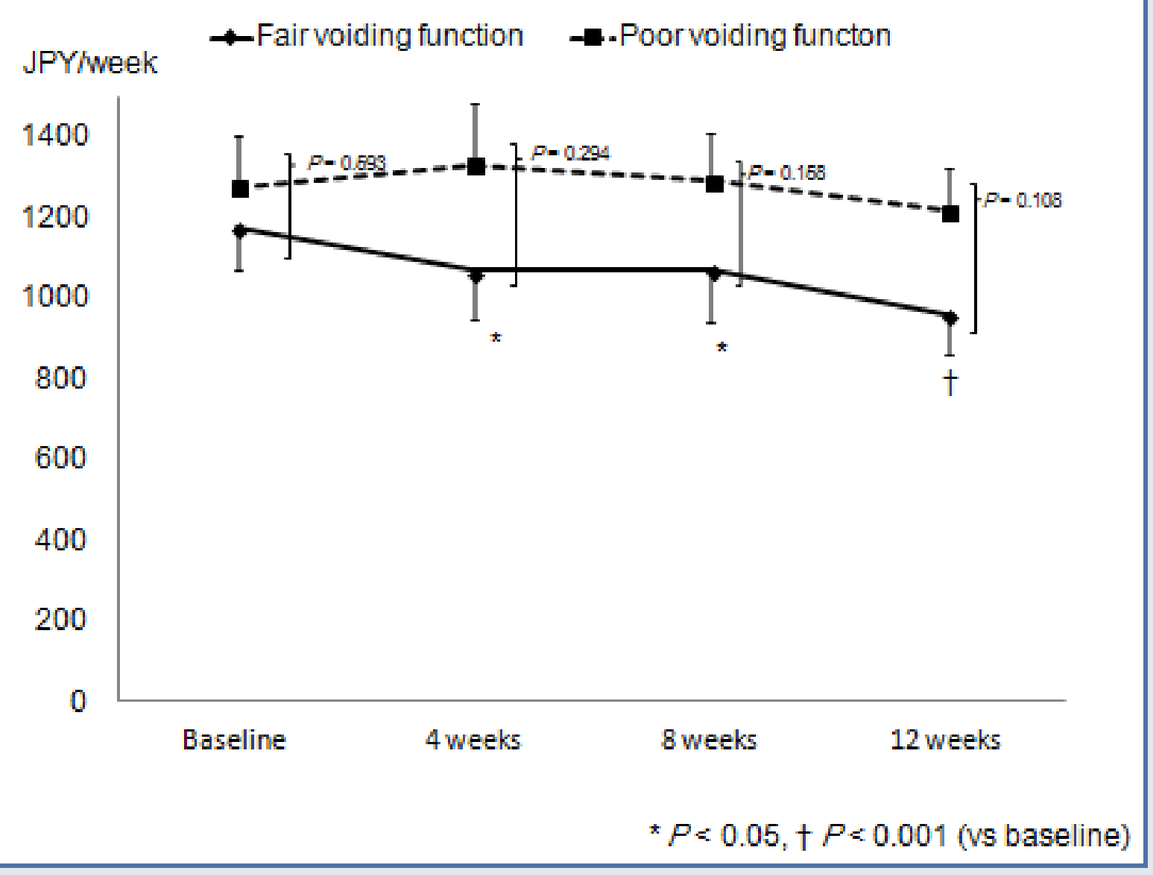
Prompted voiding (PV) is a common procedure to support elderly to void [1]. Elderly is asked at regular intervals if he or she has a desire to void. However, for elderly who cannot express desire to void or lost urinary sensation, PV cannot work effectively and result in increasing caregivers' burden. Recently, we developed a new method of personalized voiding support care named 'Ultrasound-directed PV (UPV)'. Timing of voiding was planned on the basis of bladder function assessed by voided urine volume per time and residual urine volume of each individual. In this study, we evaluated the efficacy of UPV for frail elderly with urinary incontinence living in nursing homes.

## Methods

**Study period:** November 2011 to December 2012
**Participants:** Ninety-six Japanese frail elderly with urinary incontinence from six nursing homes. Prior to the study, all participants had been cared by PV or timed voiding method as a usual care.
**Procedure:** We recorded their bladder diary with a check of wetness, voided volume of urine, and residual urine volume. We measured residual urine volume by an ultrasound device (BladderScan® BVI 6100, Verathon Inc., Bothell, WA). Those checks were performed with an interval of every one to two hours for at least one month. Urologists and caregivers determined voiding pattern of each individual and planned individualized UPV. The mean bladder capacity at voiding (voided urine volume + residual urine volume) was regarded as the optimal bladder volume for the individual to pass urine. Optimal prompted voiding was undertaken, where the subject was prompted to go to toilet regardless of his or her desire to void, when the ultrasound-estimated bladder volume was equivalent to the individual optimal bladder volume.
**Definition of bladder function:** The bladder function was classified into fair group (the mean residual urine volume < 100 mL and the mean voided volume ≥ 100 mL) and poor group (the mean residual urine volume ≥ 100 mL or the mean voided volume < 100 mL; however; we prompted all participants to toilet by each of optimal voiding interval without discrimination of voiding function. Efficacy of UPV was evaluated as change in cost of continence aids. Caregivers' quality of life was measured by the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36v2™) [2].

## Results

Figure 1. Chronological changes in costs of continence aids.




Currency rate (9th August, 2013)
*1 EUR = 129 JPY*
*1 USD = 97 JPY*
*1 GBP = 150 JPY*

Table 1. Caregivers' QOL: changes in subscales of SF-36.

| Subscale | n | Before (Mean ± SD) | After (Mean ± SD) | *P* value |
|---|---|---|---|---|
| Physical functioning | 38 | 88.0 ± 13.4 | 87.8 ± 15.1 | 0.892 |
| Role physical | 35 | 84.9 ± 18.1 | 88.0 ± 13.9 | 0.378 |
| Bodily pain | 35 | 58.9 ± 23.0 | 69.0 ± 17.7 | **0.034** |
| General health perceptions | 34 | 59.9 ± 16.0 | 60.8 ± 18.8 | 0.937 |
| Vitality | 34 | 50.6 ± 17.4 | 58.7 ± 17.7 | 0.057 |
| Social functioning | 38 | 79.0 ± 20.4 | 83.9 ± 22.3 | 0.289 |
| Role emotional | 35 | 80.5 ± 18.7 | 87.4 ± 16.6 | 0.132 |
| Mental health | 34 | 60.5 ± 20.6 | 68.2 ±15.5 | **0.007** |

## Conclusions

In the future, a large-scale with long follow-up study evaluated by generalized measures, such as Mini-Mental Scale Examination [3] for cognitive function, Barthel Index for activity of daily living of elderly [4], Zarit Burden Scale for caregivers' burden [5] should be warranted to generalize the efficacy of UPV in the meanings of elderly's general function as well as cost-effectiveness of continence aids and caregivers' burden.

## References

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