From the "PD First" Policy to the Innovation in PD Care

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Objective: *Due to the rapid growth of peritoneal dialysis (PD) program under the "PD First" policy of Thailand, it is necessary to have many voluntary well-training PD staffs and a good education program for PD nurses to serve an excellent PD outcome. In the present study novel devices, which could be practically used in PD patients, were developed by the creative PD trainee idea of to facilitate PD self-care and decrease work load of PD staffs.*
Material and Method: *Young PD nurses in the 3rd generation of PD trainee program from King Chulalongkorn Memorial Hospital were assigned to develop novel tools in order to assisting patient care in real practice. The efficacy of these inventions and patient satisfaction were assessed by comparing with the standard method.*
Results: *The authors presented two interesting innovations in the present study. The first one, "Troubleshooting Wheel", contained six common complaints and the advice for correcting each problem in the platform of rotating wheel. Participants could solve problems more rapidly than using the standard handbook for PD ($p < 0.01$) and also found the correct responses more frequently than the handbook ($p < 0.01$). The second one, "Exit Site Abacus", the sliding platform with automatic calculation of the sum of exit site score, was the easier method in evaluating the exit site infection than the conventional exit site scoring using the Prowant's table or their own memory.*
Conclusion: *Reinforcement of the development of PD nursing program not only increases the number of PD staffs but also contributes to the innovations for improving quality of PD care by the young new staffs.*

Keywords: *Peritoneal dialysis (PD), "PD First" policy, Innovation, Troubleshooting Wheel, Exit Site Abacus*

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Since the "Peritoneal Dialysis (PD) First" policy was launched in October 2008 under universal health care scheme, the number of PD patients was, therefore, increasing exponentially. From the National Health Security Office (NHSO) data, the number of PD patients, which was 1,100 cases before an advocate of the policy, grew up to 10,953 cases in February 2011[1]. In order to build an infrastructure support for the rapid growing of PD cases, the nationwide PD nurse training and catheter insertion courses for surgeons and nephrologists were established in Thailand. Until now, 3 generations of new PD nurses with 225 PD nurses have successfully been trained from the program[2].

Newcomers usually bring the new perspectives to the fields. The newly recruited PD staffs with young and fresh mind may respond to the same old

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problems differently and might bring up a great deal of innovative idea to improve quality of PD care. If all these innovative ideas can be translated into the innovation in PD care, the little first few steps of "PD First" policy in Thailand might be transformed into the substantial advance in the global PD community. The third-generation PD nurses of the nationwide PD nurse training program, who rotated to have actual practices in King Chulalongkorn Memorial Hospital during the period of 16 September-30 November 2010, were divided into 4 small groups in order to develop new technology in improving patient care as a part of training-course task. Here, the authors reported two examples of innovation in PD self-care that were originated from our PD trainee, the "Troubleshooting Wheel" and the "Exit Site Abacus". Both were developed in order to aid the patients' and caregivers' self-management of their common problems including exit-site infection with ease since the appropriate initial self-management of common peritoneal dialysis-related problems is critical for the good PD outcome.

Material and Method

"Troubleshooting Wheel": a novel PD trouble-shooting aid

To identify the most common problems that PD patients seek for the initial self-care advice, the authors did a pilot survey in 29 PD patients and caregivers who regularly visited the PD clinic in the King Chulalongkorn Memorial Hospital. The problems that PD patients frequently encountered included leg swelling, cloudy dialysate fluid, inflow/outflow pain, exit site discharge, slow/non-constant dialysate flow, catheter rupture/leak, headache, and nausea/vomiting as shown in Fig. 1.

The six most common complaints including leg edema, cloudy dialysate, inflow/outflow pain, discharge at exit-site, unsmooth flow, and torn/leakage catheter were selected and included in the newly developed trouble shooting aid. The rotating wheel was selected as a platform for this troubleshooting aid hence was called "Troubleshooting Wheel" (Fig. 2). When the user rotated the index (red arrowhead) of Troubleshooting wheel to the problem encountered, the step-by-step advice would appear in the outer troubleshooting zone. The details of the advice for each problem were illustrated in Fig. 3.

Exit site abacus: a novel exit site scoring aid

PD-related infections are the leading complications in PD patients. Exit site infection is one of the most important problems affecting technique survival of PD[3]. Early detection of exit site infection is essential for the good PD outcome. Although Prowant's exit site scoring has been developed to assist the assessment of exit site, it is still too complicated for most of PD patients and caregiver[3-5]. Therefore, the sliding platform with automatic calculating the sum of total exit-site score was developed to facilitate self-monitoring of PD exit site infection and hence was called as "Exit Site Abacus" (Fig. 4). The maximum score of 10 is a sum of individual symptoms and signs of the exit-site infection (0-2), including swelling, crust, redness, pain, and drainage. The score of 4 or greater suggested exit-site infection.

Satisfaction evaluation

The user satisfactions were assessed by questionnaire using semi-quantitative scale. To test an

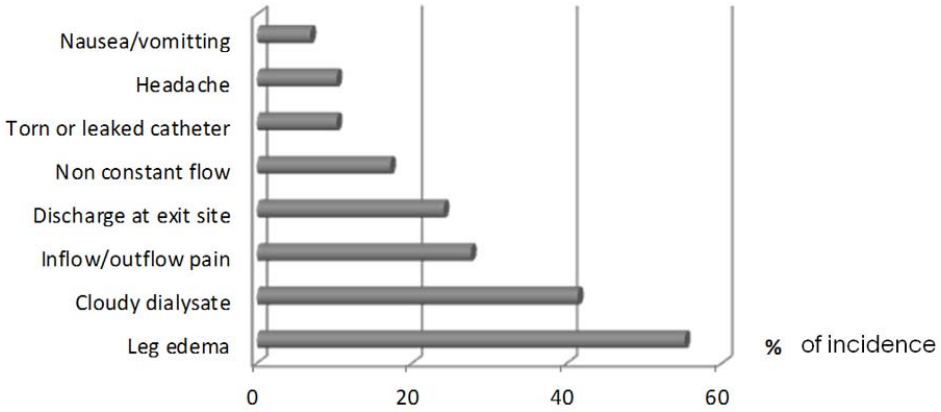

Fig. 1 The common problems that the PD patients sought for aduce

Fig. 2 "Troubleshooting Wheel": Front view (left) and back view (right)

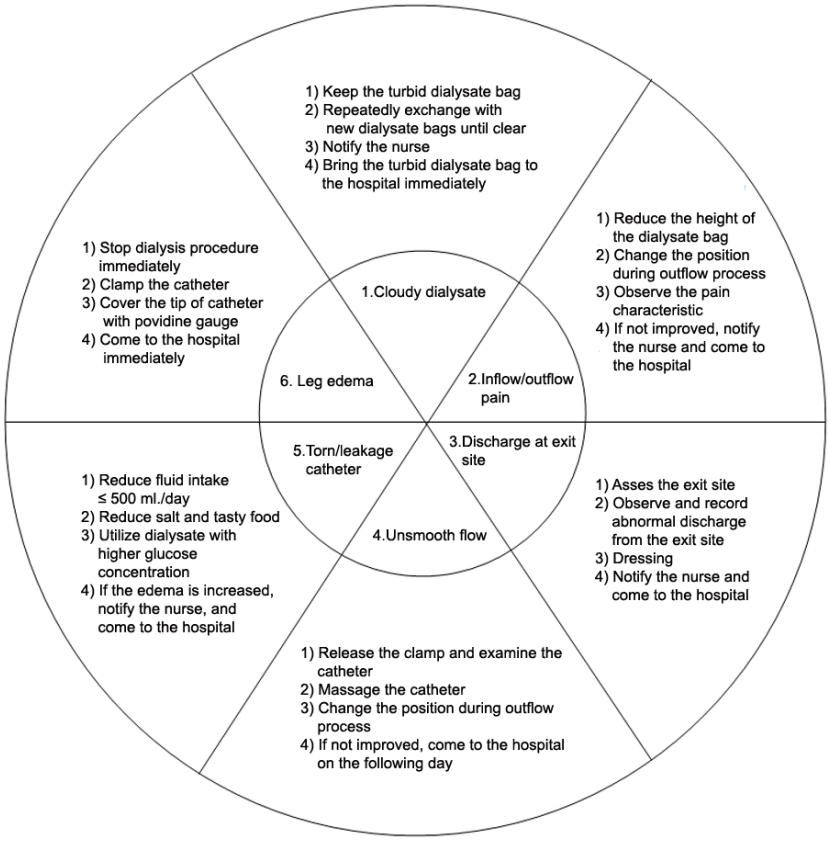

Fig. 3 Step-by-step advice for each problem in PD

effectiveness of the "Troubleshooting Wheel" in helping user to find appropriate self-management advice for the common complaints, a head-to-head comparison of the "Troubleshooting Wheel" and the standard PD handbook (Fig. 5) for the Thai PD patients and caregivers, which covered the basic knowledge of PD and useful first-aid management of PD common problems, were additionally conducted.

Statistical analysis

Data were expressed as number (percentage) and mean ± standard deviation (SD) unless otherwise

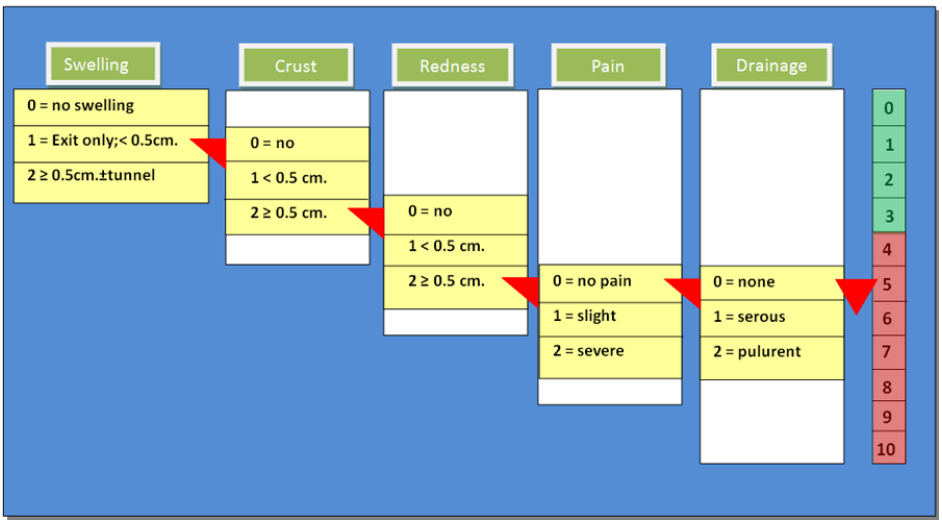

Fig. 4 "Exit Site Abacus"

Fig. 5 PD hand book for the patient: Cover page (left side) and inside page example (right side)

specified, with a 5% ($p < 0.05$) significant level. For parametric variables, the independent t-test was used to compare parametric variables between the two groups.

Results

Satisfaction and head-to-head comparison of the "Troubleshooting Wheel"

Almost all (95.8%) of the users (71 participants) had high satisfaction of the "Troubleshooting Wheel" (rating 4-5 out of 5) (Table 1).

By using the "Troubleshooting Wheel", the participants could solve the problems more rapidly than by using the handbook (47% faster, $p < 0.01$). Moreover, the "Troubleshooting Wheel" helped the participants to find the correct responses more frequently than the handbook (99% vs. 94%).

Satisfaction of "Exit Site Abacus"

The user satisfaction was assessed in 20 participants by questionnaire using semi-quantitative scale 1-3. After using the "Exit Site Abacus", 80% of

users thought that it was very useful (score 3 out of 3) and 85% of them believed that this method was much easier than conventional exit site scoring using table or their own memory (score 3 out of 3) (Table 3).

Discussion

Successful PD depends on cooperation and self-care skills of the patients[6]. Patients must have been trained since the decision of PD mode had been made. All the training requirements should be completed before the end of the break-in period. The patients should be able to perform perfectly all the PD exchange procedure and to self-manage with confidence regarding almost all common problems. Thus, there are so many tasks for the patients and caregivers to achieve and that this challenges the medical team how to build the patient confidence in the treatment and bring up the patient cooperation. Of interest, new patients often revisit quite early with a common problem that has first-aid management error. The "Troubleshooting Wheel" and "Exit Site Abacus" are proved to be useful tools in aiding the patients and caregivers in dealing with the common problems at home with ease. The inventors hope these tools will serve good peritoneal outcome for whole nation PD patients.

Acknowledgement

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Potential conflicts of interest

None.

Table 1. User satisfaction of "Troubleshooting Wheel" (percents)

User satisfaction	5 (Highest)	4 (High)	3 (Medium)	2 (Low)	1 (Lowest)
Improve quality of PD care	47.9	46.5	2.8	1.4	1.4
Provide useful advices	46.5	47.9	4.2	1.4	-
Easy to understand	50.7	45.1	2.8	1.4	-
Convenient to use	63.4	32.4	2.8	1.4	-
Proper user direction	53.5	42.3	2.8	1.4	-
Interesting device	60.6	35.2	2.8	1.4	-
Practical to follow the advices	62.0	35.2	1.4	1.4	-
Preferred troubleshooting guide	59.2	36.6	2.8	1.4	-
Overall satisfaction	64.8	32.4	1.4	1.4	-

Table 2. The effectiveness of "Troubleshooting Wheel" and handbook in solving PD-related problems

Measurement	Troubleshooting Wheel	Handbook	p-value
Time to find solution for the problem (min.)	2.2 ± 18.6	4.2 ± 33.4	< 0.01*
Correct answer (%)	98.7 ± 0.7	94.0 ± 14.2	< 0.01*

Table 3. User satisfaction of "Exit Site Abacus"

User satisfaction	3 (High)	2 (Moderate)	1 (Low)
It helps you to evaluate exit site easily	85.0	15.0	-
It increases your workload	-	40.0	60.0
It has an interesting device	35.0	60.0	5.0
It is convenient to use	40.0	50.0	10.0
It is the preferred useful guide	80.0	15.0	5.0
Overall satisfaction	55.0	45.0	-

References

1. National Health Security Office, Ministry of Public Health, Thailand. CAPD report 2008. Bangkok: NHSO; 2008.
2. Thaiyuenwong J, Mahatanan N, Boonyakarn A, Rodpai S, Kanjanabuch T, Eiam-Ong S, et al. Nationwide peritoneal dialysis nurse training in Thailand. J Med Assoc Thai. In press 2011.
3. Kathuria P, Twardowski ZJ, Nichols WK. Peritoneal dialysis access and exit-site care including surgical aspects. In: Khanna R, Krediat RT, editors. Nolph and Gokal's textbook of peritoneal dialysis. 3rd ed. New York: Springer; 2009: 371-446.
4. Prowant BF, Warady BA, Nolph KD. Peritoneal dialysis catheter exit-site care: results of an international survey. Perit Dial Int 1993; 13: 149-54.
5. Schroder CH. Validation of a scoring system for exit-site evaluation. Perit Dial Int 2001; 21: 623-4.
6. Bernardini J, Price V, Figueiredo A. International Society for Peritoneal Dialysis (ISPD) Nursing Liaison Committee. Peritoneal dialysis patient training, 2006. Perit Dial Int 2006; 26: 625-32.

จากนโยบายประกันสุขภาพสู่นวัตกรรมสำหรับการดูแลผู้ป่วยล้างไตทางช่องท้อง

วรพจน์ เตรียมตระการผล, พิสุทธิ์ กตเวทิน, ขนิษฐา ยิ้มแสงหยัด, ภาสุนันท์ แก้วสีนาค, สุธาสินี แสงอนันตการ, สุกรรณิการ์ พันดร, ดารุณี บุดดีวงศ์, เอื้องฟ้า ปรากฏ, จันทร์เพ็ญ คำสุโพธิ์, นพดล ธรรมสุธีร์, เรณู ใยบัวเอี่ยม, ศวิฏา คุ้มวงศ์, ปิยาภรณ์ โท่วันนัง, ยุวดี ธีรศิลป์, นันทา มหัธนันท์, สมชาย เอี่ยมอ่อง, เถลิงศักดิ์ กาญจนบุษย์

วัตถุประสงค์*: เพื่อพัฒนาเครื่องมือที่ช่วยสำหรับการดูแลรักษาผู้ป่วยล้างไตทางช่องท้อง*

วัสดุและวิธีการ*: พยาบาลวิชาชีพที่อยู่ระหว่างการฝึกอบรมภาคปฏิบัติการดูแลรักษาผู้ป่วยล้างไตทางช่องท้อง ณ โรงพยาบาลจุฬาลงกรณ์ สภากาชาดไทย ถูกมอบหมายให้คิดค้นสิ่งประดิษฐ์ ที่สามารถช่วยให้การรักษาพยาบาลผู้ป่วย สะดวก รวดเร็วและลดภาระงานที่เกิดขึ้นทั้งผู้ดูแลและพยาบาลที่ดูแลผู้ป่วยล้างไตทางช่องท้อง โดยมีการประเมินผลจากความพึงพอใจของผู้ป่วย และผู้ดูแลที่มีต่อสิ่งประดิษฐ์นั้นเทียบกับวิธีมาตรฐาน*

ผลการศึกษา*: ผลงานนำเสนอชิ้นแรก "วงล้อแก้ก่อน" เป็นแผ่นหมุนที่ใส่ข้อมูลปัญหาที่สำคัญรวมถึงวิธีการดูแลเบื้องต้นรวมหกข้อ โดยพบว่าสามารถให้ข้อมูลการรักษาที่รวดเร็ว ($p < 0.01$) และแม่นยำ ($p < 0.01$) กว่าการเปิดค้นจากหนังสือ "คู่มือแนะนำการล้างไตทางช่องท้องสำหรับผู้ป่วย" ผลงานอีกชิ้น "เครื่องมือช่วยประเมินแผลทางออกของสาย" เป็นแผ่นไม้บรรทัดนับคะแนนรวม สำหรับช่วยวินิจฉัยการติดเชื้อของช่องทางออกของสายบริเวณผนังหน้าท้อง พบว่าแผ่นไม้บรรทัดสามารถประเมินคะแนนการติดเชื้อได้รวดเร็ว และแม่นยำกว่าการเปิดจากตารางประเมินช่องทางออกของสายและการจดจำ*

สรุป*: การจัดการสอนพยาบาลวิชาชีพสำหรับดูแลรักษาผู้ป่วยล้างไตทางช่องท้อง นอกจากเป็นการเพิ่มจำนวนพยาบาลผู้ดูแลผู้ป่วยแล้ว ยังเป็นการเปิดโอกาสให้นักเรียนพัฒนาความคิดสร้างสรรค์สิ่งประดิษฐ์ที่มีประโยชน์ต่อผู้ป่วย*