Self-Catheterization Training of a Child with Myelomeningocele
(toileting independence, incontinent children)

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This paper describes how the occupational therapist, following a urologist's orders, teaches clean intermittent self-catheterization as a self-care skill to handicapped school children when no trained enterostomal therapist is available. It contains a review of the literature, a definition of neurogenic bladder types, a description of intermittent catheterization, and the steps involved in teaching the technique to children. A case study is given that shows the training of a child with myelomeningocele to catheterize herself, and the therapist's interaction with the school nurse and other members of the team.

Children and adults with bladder dysfunction can remain dry, uninjected, and in control of their urinary functions through intermittent self-catheterization, a process whereby they drain their own bladder several times daily with a rubber or plastic catheter using a clean, non-sterile technique.

In large medical centers, trained nurses or enterostomal therapists teach clean intermittent self-catheterization (CISC) to patients. Occupational therapists in these settings may be involved in CISC training by consulting on activities of daily living, preparing adaptive devices, or assisting with positioning. Therapists in public schools, however, may find that they are the professionals best prepared to teach children the self-care skill of intermittent self-catheterization when a local urologist initiates CISC. A recent court decision in Nebraska has resulted in policy changes in other states, such as Michigan, where the Department of Education has placed the responsibility for CISC on the school system during the school day, since independence in CISC may be a factor enabling the handicapped child to be mainstreamed into a less restrictive environment.

This paper describes the program of an occupational therapist who has been the primary instructor of CISC in a public school since the first referral in 1975, having trained nine children and consulted in nine other cases. It is written to assist others who may need to teach CISC to children or who may be able to suggest CISC to parents as an alternative to having a child in wet diapers, to indwelling catheters, or to urinary diversion surgery. It does not propose that occupational therapists take on a nursing function by catheterizing the child, but rather, that they use their skills to teach the child to care for his or her own toilet needs with CISC, freeing the child to enter a less restrictive school environment allowed by PL 94-142.

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Literature Review

In a historical overview, Yarnell and Checkles (1) stated that intermittent catheterization was first done during World War II by Sir Ludwig Guttmann on spinal cord patients by gownned doctors using sterile techniques. By allowing the bladder to fill and distend slightly before draining, Guttmann eliminated many of the complications of indwelling catheters that kept the bladder constantly inactive. After World War II, other techniques were attempted by urologists but they inevitably resulted in complication and
renal infection. Yarnell and Checkles further report that even surgical procedures resulted in persistent infection as well as frequent problems with collection devices.

Lapides, a University of Michigan urologist, introduced clean intermittent self-catheterization techniques in 1970 when a woman with multiple sclerosis requested a method other than surgery for treatment of her recurring urinary infections. Although trained to catheterize herself with a sterile technique, this patient soon relaxed the technique and began to use only soap and water to wash the catheter and at times inserted it after dropping it. Yet her urine remained completely devoid of bacteria (2).

Lapides et al. theorized that:

"-Decreased blood flow of any tissue weakens resistance to bacterial infection.

- An overdistended bladder slows circulation through its wall and thus becomes susceptible to infection.

- To prevent or cure infection, one must empty the bladder often by frequent catheterization."

(3, p 15)

This study presented the conclusion that frequent withdrawal of urine from the bladder, therefore, whether by sterile or clean technique, decreases susceptibility of tissues to urinary tract infections (3).

CISC has become the method of choice for handling the urinary problems of spinal cord-injured adults. Although much of the CISC research focuses on adults with the goal of becoming catheter free, two studies on incontinent children focus on the goal of lessening infection and assisting them to stay dry (4, 5).

Kass et al. (4) followed 42 patients less than 6 years old, most of whom were myelodysplastic, for a period ranging from 3 months to 7 years. These patients had good results from intermittent catheterization. One child did not improve urinary incontinence; 3 children showed marked improvement and, although damp, eliminated need for diapers, and 38 children were completely dry, regardless of the type of neurogenic bladder dysfunction.

Figure 1, derived from Whittington (6), shows the classifications of the neurogenic bladder into three types with the type determined by level of spinal cord injury. In lesions that are not severe, bladder function may return.

**Readiness for CISC Training**

Not every child with a neurogenic bladder is a good candidate for CISC. A urologist evaluates bladder capacity, anal sphincter tone, and condition of kidneys. The family must be willing to accept and commit themselves to follow the CISC program. Self-catheterization is unsuitable for patients who cannot grasp a catheter or holding device, who find it necessary to catheterize too frequently because of a small capacity bladder, or who have marked urinary stress incontinence (3).

Nurses, such as Altshuler, Meyer, and Butz (5), look for the following readiness skills before introducing CISC to children: ability to tell time, keep records, solve problems, feel comfortable with CISC, and have fine-motor and self-help skills. Occupational therapists recognize that children with myelomeningocele will often need training to develop these readiness skills. Atkins found myelomeningocele children had difficulty with writing, eating, dexterity, and other motor functions of the hands (7). Grimm suggested their impaired hand function was associated with tactile dysfunction (8). Since deviant hand function is characteristic of myelomeningocele children, they may need added time and precision in training to counter deficits in manual dexterity (9). Occupational therapists can assist them by task analysis and training in fine-motor and self-help skills. They may also construct adaptive devices such as that fashioned by Dailey and Michael, which permits C4-7-level males who are quadriplegic to catheterize themselves (10).

**Description of CISC**

The primary goal in self-catheterization is frequent emptying of the bladder to enable the patient to remain dry and free from urinary infection. A catheter is inserted through the urethra into the bladder five or six times a day. Urine flows through the tube, thereby draining the bladder. After the flow stops, the tube is withdrawn slowly to drain residual urine.

Lapides (3) prefers a #14 clear plastic Robinson regular-length catheter for most patients; he uses a...
smaller size only with infants and very young children. We have used the catheter provided by the referring urologist, but have found that the firmer Robinson catheter is more easily inserted than a soft-rubber catheter.

We follow the CISC procedures given by the referring urologist, which are usually similar to those described by Altschuler, Meyer and Butz (6):

1. Wash hands with soap and water.
2. For males, lubricate catheter tip with water-soluble lubricant, hold penis at sides, insert catheter with firm gentle pressure. For females, separate labia, palpate meatus, insert catheter into bladder.
3. Push in additional 2.5 cm after urine starts.
4. Allow urine to flow until it stops, slowly remove catheter, holding catheter tip as it is removed to prevent spilling.
5. Wash catheter with soap and water, rinse and dry. Store in plastic bag.
6. Wash hands with soap and water.

Figure 2 shows the breakdown of these procedures into steps and the progressive order in which these steps are taught to the children in our program.

The following case history describes the progress of one student from incontinence to independent catheterization, which enabled her to be independent when mainstreamed to her home school.

Case Study
Subject: KM; Birthdate: 8/30/67
Diagnosis: Myelomeningocele with paraplegia

Initial Occupational Therapy Program
6/73—Goal: independence in diaper change. Progress noted but still requires help with diaper and transfer from wheelchair to mat.

6/74—Independent at home in diaper change when not wearing braces. Needs continued work on ADL and fine-motor skills. Progress noted in cutting. Cheerful; good work habits.

6/75—Able to organize work with less distraction, improved in fine-motor skills.

Catheterization Program
12/73—K informed occupational therapist of scheduled urinary diversion surgery. Occupational therapist, who was instructing another child in CISC on referral from University of Michigan Medical Center, informed K's mother of CISC as an alternative to surgery. K's mother was skeptical but agreed to consult urologist, who started K on intermittent catheterization. Mother was angry at urologist for not suggesting CISC initially.

1/76—K scheduled to be catheterized daily in OT. 1st session: Mother demonstrated technique shown her by urologist, catheterized K supine on mat, drained urine into urinal. 2nd session: K was catheterized by occupational therapists, therapist and attendant assisted her with transfer and clothing. K washed her hands before and after catheterization. 3rd session: K was asked to pull catheter out after urine flow stopped, washed her hands independently. At each succeeding session, K was expected to perform skills previously learned and begin to learn next skill, as shown in Figure 2.

4/76—K could insert catheter independently nearly every time. Began to catheterize herself in classroom with attendant giving minimal assistance with clothing. Given enough
change was necessary. Began to teach K to remove clothing while seated in wheelchair to enable her to catheterize self in chair without transfer to mat, draining catheter directly into toilet.

5/77—K spent a week away from home, mainstreamed with normal students from a neighborhood social club (Stepping Stones), handled her own toilet needs, and participated in activities.

6/77—K placed on follow-up program. Mainstreamed in regular classroom in building. Completely independent with CISC, wearing regular underclothes instead of diapers. Expressed interest in helping another girl learn CISC.

11/80—Follow-up: K now mainstreamed in home junior high school. Catheterizes herself at 2-hour intervals in a curtained stall of girls' restroom. No difficulty with clothing—unzips slacks, pushes loose-leg underpants aside. Keeps catheter at bedside for morning use, in bathroom at home, and in purse. Uses motorized transportation aid to move about school and get into restroom. K's impressions of CISC training: fear that she would injure herself because of lack of sensation, frustration on first attempts to palpate meatus and when urine came unexpectedly with bowel movement, surprise when she was able to learn so quickly.

Role of Occupational Therapist

Occupational therapist noted K's readiness to learn, her ability in other ADL areas, and her improved hand function. She explained CISC as an alternative to surgery and taught K to follow urologist's CISC program. She helped K find a functional position and later taught her to catheterize herself while in wheelchair, draining urine into toilet. She used anatomical drawings and a mirror to instruct, later discontinued mirror use to avoid dependence on it.

With younger children, using dolls and straws are used to practice catheterization, and activities such as Lite-Brite and pinch clothespins are used to improve pincer grasp. Stickers are given as rewards when a child performs a specific skill independently. A wall chart with stars indicating successes, and the opportunity to wear regular underclothes instead of diapers were found to be the best motivators.

Summary

Children with spinal cord injuries have had parents and professionals involved with their attempts at bowel and bladder training for years. They have experienced enemas, catheters, suppositories, and a variety of drainage systems. Once they become accustomed to CISC, they express pride in their ability to urinate more normally. They enjoy the freedom from wet diapers, show an improved self-concept, and develop a sense of independence.

Although catheterization has been considered to be a nursing function, occupational therapists may be directly involved in training school children in CISCs as part of the child's ADL training. Therapists should be aware of the theory behind this technique and the steps involved in teaching it, but should follow the techniques of the referring urologist. Many parents of spinal cord-injured infants are being taught to catheterize their children. When these children are seen in early intervention programs, occupational therapists can begin to train them to catheterize themselves. Independence in caring for toilet needs will enable them to be mainstreamed into regular classrooms in compliance with PL 94-192.

REFERENCES