

Teaching Children and Young People Intermittent Self-Catheterization

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Intermittent catheterization is not a new concept. Evidence dates the use of such techniques back to Roman and Egyptian times, using materials including reeds and silver to fashion catheter tubes (Barton, 2000). Clean intermittent catheterization (CIC) or intermittent self-catheterization (ISC) was proposed as a viable alternative to indwelling catheters and incontinent stomal devices by Lapidus, Diokno, Silber, and Lowe (1972). ISC reduces the incidence of urinary tract infections (UTIs) and has a positive influence on the social management of urinary continence for many patients (Hunt, Oakeshott, & Whitaker, 1996). ISC is now an accepted form of treatment for neuropathic bladder dysfunction (Shah & Leach, 2001) and other causes of incomplete bladder emptying (Barton, 2000; Duffin, 2000).

Bladder control is a complex mechanism that is controlled both voluntarily and involuntarily (Barton, 2000). Normal bladder function involves the coordination of the urethral sphincter and the detrusor muscle to enable appro-

The need to catheterize through the urethra can begin at any age and stage of development in a child's life and may involve different strategies for teaching. Intermittent self-catheterization, as a self-management technique, can be of benefit both physically and psychologically to children and young people. Educational strategies are available to aid health care providers in teaching children and young people self-intermittent catheterization. Use of innovative techniques and resources may assist the practitioner in teaching self-catheterization successfully to this challenging population.

appropriate filling, storage, and emptying of urine. Impairment in the neurologic innervations to the bladder or congenital defects requires alternative methods to ensure bladder emptying. ISC involves a catheter being inserted periodically into the bladder to drain urine. Catheterization enables the bladder to empty and prevents over distension. Furthermore, ISC provides regular bladder emptying and decreases residual urine in the bladder which is a possible source of infection. As there are no effective medications for improving bladder emptying, intermittent catheterization is deemed the best management option (Fowler, 1996). In many instances, parents/caregivers are the primary focus of education regarding urethral catheterization for their child. But increasingly, children and young people are encouraged to manage their continence independently. In this article, teaching strategies for children and young people being taught ISC are addressed. Use of innovative techniques and resources may assist the practitioner with this challenging population.

Children, Young People, and ISC

The need to catheterize through the urethra can begin at any age and stage of development in a child's life and may involve different strategies for teaching. Examples of conditions which may precipitate the need for a child or young person to catheterize are outlined in Table 1. Often congenital conditions and anomalies require catheterization to begin at birth, following a thorough urological assessment. This will involve educating the parent/caregiver. Support for the family is essential at this stage as they will be performing the catheterization while adapting to having a child with impairments and disability.

Due to some acquired or developing illness or change in urologic pathology, older children and young people may have to be taught ISC. Self-catheterization, as a self-management technique, can be of benefit both physically and psychologically to children and young people. This skill can enable them to feel more in control

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Table 1.
Conditions That Can
Require Intermittent
Self-Catheterization

<p>Genitourinary Conditions/Anomalies Cloacal exstrophy, bladder exstrophy, sacral agenesis, posterior urethral valves</p>
<p>Genitourinary Dysfunction Detrusor instability, Hinman bladder (Mundy et al., 1994), gross vesicoureteral reflux, detrusor-sphincter dyssynergia</p>
<p>Neurologic Deficits Spinal cord injury, neuropathic bladder, spina bifida, myelodysplasia, tumors (including sacrococcygeal teratoma), pelvic rhabdomyosarcoma</p>

of their body, affording more privacy, providing freedom, and increasing their self-esteem (McCloughlin, Murray, Van Zandt, & Carr, 1996). It is important to carry out a thorough individualized nursing assessment to ascertain if the child is suitable for and capable of undertaking the procedure (Robinson, 2006). Children as young as 6 have successfully been taught ISC (Robinson, 2006) and at this age can possess adequate cognitive and manipulative skills to catheterize themselves (Edwards, Borzyskowski, Cox, & Badcok, 2004). Some practitioners believe children as young as age 5 can be gradually encouraged to adopt more involvement in catheterization if the technique has previously been carried out by parents/caregivers (Waters & Sherbondy, 2000). The authors' own clinical experience supports that some younger children can learn to self-catheterize. Evidence has also shown children as young as 4 can self-catheterize successfully (www.pullthru-network.org) (Brownlow, 2007). A summary of the literature relating to the successful components of a self-catheterization program and the determinants of a suitable child for such a program are addressed by Segal, Deatrick, and Hagelgans (1995).

Practitioners need knowledge of a child's developmental level as well as the ability to adapt educational material and techniques to the individual child/young person and family. It is also important to assess the motivation and support the family can provide to the child/young person. Positive reinforcement from parents/caregivers is essential for children and young people when learning to catheterize (Rickert, Ashcraft, Rickert, & Thornsberry, 1990). The nurse/health care provider responsible for teaching a child ISC must be fully competent and aware of both local policies and protocols within the health care setting and any national guidelines regarding this procedure (Robinson, 2006).

When first informed of the need to self-catheterize, children and young people can become anxious and are often reluctant to carry out the procedure. Giving children the opportunity to be involved in decisions about themselves and facilitating their involvement in the informed consent process can reduce the level of anxiety (Alderson, 1993; Kain et al., 1998; Margolis et al., 1998). Providing children and young people with opportunities to make choices about their care and management is one of the greatest challenges in pediatric practice (Brooks, 2000). Choices can involve where teaching takes place as the child/young person might prefer for the procedure to be taught at home rather than in the hospital environment. Research with children and young people has demonstrated a clear preference for teaching to occur at home, with hospital environments being described as not private enough and too cold and clinical (Edwards et al., 2004). The education of children, young people, and their families must be planned and carried out appropriately for a positive outcome to be achieved. It is essential to understand the child/young person and family's lifestyle as this will enable ways of fitting in the routine of ISC with a minimum of disruption. Cooperative working and negotiation between children and health care professionals can pro-

mote compliance/adherence of the catheterization program (Barton, 2000).

ISC requires education and support for both the child and the family, particularly in the initial stages of teaching (Barton, 2000). Children might find the act of visualizing or feeling their urethra and passing a catheter stressful. Psychological adjustment might not be easy and there is often a need for long-term support (Barton, 2000). Appropriate preparation is vital in attempting to explore and acknowledge any negative effects of self-catheterization prior to the procedure being undertaken. Failure to adopt a self-catheterization regime is frequently due to child refusal, objection, and dislike (Borzyskowski, Cox, Edwards, & Owen, 2004). The education of families, children, and young people should always be designed to suit the child's cognitive and physical developmental level and be appropriate for their emotional, cultural, religious, and physical needs.

Methods Used in Teaching Children and Young People

Preparation programs generally include some or all of the following components: (a) informational pamphlets/leaflets, (b) demonstration, or (c) role-play with equipment (Mansson & Dykes, 2004). As one form of preparation may not be suitable for all children, practitioners may have to use a selection of various strategies (O'Connor-Von, 2000). Confusion with educational materials can result from vague instructions, overuse of technical terminology, or lack of clear diagrams/illustrations (Barton, 2000). Catheter manufacturers have produced teaching materials, help lines, magazines, and delivery services to fulfil patients' needs. Although many of these materials may have an adult focus, some relate to children and young people and can be individualized. An example of child-appropriate literature has been produced by Astra Tech (2006), which is in the form of a comic/magazine.

As mentioned previously, the role of the nurse/health provider is essential in providing education, support, and skill in teaching ISC. This role should be supported by other members of the pediatric team with special training in child development and appropriate play techniques. Play specialists can have a formal role in the preparation of children and young people for hospitalization and surgery (Sutherland, 2003). Their role is twofold. Play specialists possess skills and knowledge in preparing children for procedures using innovative methods. They also can be viewed by the child as an impartial health care professional with whom they may feel more able to discuss any issues or worries. Play specialists have a role both within a clinic area and acute care facilities and form part of most pediatric teams within the United Kingdom. Peer support and information sharing has been identified as successful strategies both prior to and following implementation of a catheterization regime (Edwards et al., 2004). Young people and children, who consent, can be brought together for group work, or parents can meet to share problems and triumphs.

The Catheterization Technique

Some children learn the ISC technique in a single session, while others will need weeks of help and support (Hunt et al., 1996). Children may feel embarrassed, fearful of putting a tube into their bodies, fearful of causing damage, or afraid of not being able to perform the procedure (Bennett, 2002). An explanation from the practitioner that pain sensors similar to those found in the skin are not present within the urinary tract can help alleviate this fear. The child is likely to feel pressure but not acute pain (Barton, 2000). Children need reassurance that the bladder will not puncture as catheters are very flexible and bend inside the bladder. The bladder wall is also thick, so the tube will not penetrate it. Children and young people can be fearful of hurting them-

selves by doing the procedure incorrectly (Edwards et al., 2004). In very anxious children, accompanied relaxation training and muscle relaxation are of benefit while teaching this procedure. However, this must be carried out by a practitioner with adequate and appropriate training in this field (Rickert et al., 1990).

Privacy and dignity must be maintained during ISC instruction. Unnecessary staff or uninvited family members present can be intrusive for the child (Bennett, 2002). The child or young person should be allowed to decide who he/she wishes to be present during the teaching. Demonstrating the technique several times in a private and supportive environment is key to establishing confidence in the procedure (Barton, 2000). Sometimes it is helpful to teach children lying on the bed in a semi-sitting position, with good lighting. Girls may require a mirror so that the urethral opening can be seen (Barton, 2000). For some girls, however, the use of mirrors may not be appropriate. The reflected image can be confusing and some have described seeing such an intimate and unfamiliar area of their body as "disgusting" or "horrible" (Edwards et al., 2004). For those who continue to struggle to locate the urethral opening, a small quantity of gentian violet dye has been used to highlight this opening. The gentian violet lasts for 24 hours with no reported damage to the perineal mucosa (Brown, 1990). Various catheter manufacturers provide equipment that can aid in holding onto a catheter and facilitate easier insertion. Positioning during catheterization becomes individualized through trial and error and children must be reassured that this takes time and persistence. Training for both able-bodied children and those with a physical impairment or disability can be conducted using the same procedures, as this may not be an influencing factor in the success of the skill. Once they are confident, and if mobility and dexterity allows, then the procedure can be transferred to the toilet. Some children and young people may

find ISC a challenge such as wheelchair users, obese children, or those with poor manual dexterity. These children may be reliant upon a parent to catheterize them or need assistance to transfer out of a wheelchair for the procedure. In such cases, surgery such as a Mitrofanoff (continent urinary diversion) may be an option for consideration.

Demonstration and Role Play

The first step in teaching ISC involves encouraging children and young people to experiment with the equipment. This is especially enlightening when demonstrating the addition of water to hydrophilic catheters and allowing the child/young person to differentiate the textures involved. The child may have anxiety about the feel of the catheter and can be encouraged to play with the catheter under supervision. Allowing the catheter to touch the skin and perineum without it being inserted can reassure the child that the catheter is a soft product that can be manipulated easily. It is important to allow for exploration of textures and sensation, following discussion of the process. Children and young people often find it helpful to "try out" catheterizing a model. There are medical models available that may be appropriate for demonstration and practice with older children and young people. The use of models for simulation is advantageous as they allow for both a trial and error technique and discussion of any problems before the procedure is carried out with the child (McComas, Lalli, & Benavides, 1999). Some models have many adaptations including bladders, which can be filled with water to mimic bladder emptying (Cobussen-Boekhorst, Van Der Weide, Fritz, & Gier, 2000). Toys or dolls can be customized and be used instead of more formal models. For younger children, giving a label to a catheter or urethra may help it appear less frightening. However, the process should not be disassociated from the child, only given a more acceptable term to possibly aid discussion (Bray & Sanders, 2006).

Guided visual imagery can be a useful strategy in teaching children ISC, with the child visualizing each step while the practitioner talks through the catheterization process (Rickert et al., 1990). This teaching technique may be more appropriate with older children, although it has been used successfully with children 7 years of age (Rickert et al., 1990).

Written Methods

Books and written materials have been used widely throughout health care to educate children and young people about varying issues from pre-operative preparation (Manworren & Woodring, 1998) to general health issues (for example, grossology). Grossology is literature designed specifically for children and young people celebrating the more basic functions of the body or "the science of really gross things" (Branzei & Keely, 2000). A potential issue relating to this method for education includes literacy problems and those children who may have developmental difficulties. Many catheter manufacturers produce very good patient literature, which is designed especially with children in mind. This literature is often bright and colorful and uses storytelling to teach the procedure. It is important that practitioners use this information with appropriate age groups as it may be patronizing to older children and young people. Some leaflets relate specifically to certain brands of catheter, so it is important that the right instructions are provided for the catheter the child will be using (Barton, 2000).

Written material can be an appropriate medium for educating children of all ages and adolescents if designed with sensitivity towards their developmental level. Written information should not be used in lieu of verbal preparation and education, but rather to support it (Audit Commission, 1993). Written booklets can be augmented by the inclusion of individualized sections for the child to complete to

address such issues as feelings and managing catheterization in school.

Games/Exercises

Games and exercises are used frequently in health care settings to aid understanding and educate children and young people. Communication can be assisted by the use of pictures, with visual methods helping to shift control of an interaction to the participant. The construction of games for a specific topic have been used successfully and can enhance learning (for example, adapted Trivial Pursuit® game for testing the knowledge of diabetes mellitus) (Engvall & McCarthy, 1996). The practitioner should be sensitive to the possibility that such games tend to focus on competitive challenges between children/young people which may affect an already impaired self-esteem.

Body outlines have been used successfully to aid discussion and assessment of the understanding of ISC by children (Edwards et al., 2004). Children up to 19 years of age can have a poor understanding of the reasons behind performing ISC (Edwards et al., 2004). It can be useful for children and young people to outline where all the related body parts are on a body outline (such as kidneys, bladder, and urethra). This can direct discussion and help understanding of "what goes where." Body outlines are often helpful with parents/caregivers as it cannot be assumed that adults know the anatomy or how the process works.

The use of star/goal charts can be successful with children, with stars or chosen symbols being rewarded for completion of tasks. Star/goal charts can be a visual reminder of the child's progress and provide a sense of achievement. This type of technique, using competency-based training strategies, has been used widely in parent training programs and more recently directly with children (Rickert et al., 1990). The goals should be achievable and used to focus on any aspects of the process. A star/symbol can be

given for washing hands properly or getting equipment ready. It is also suggested that particularly difficult steps in catheterization (for example, finding the urethral opening for girls and pushing through the urinary sphincter for boys) is broken down into smaller achievable parts (Brown, 1990). These parts could include identifying the urethral opening on a model, or inserting the catheter to just before the sphincter. Positive reinforcement from the parent/caregiver should accompany this process. Use of a task list can be beneficial in breaking down the technique and gradually increasing involvement (Gorski, Slifer, Kelly-Suttka, & Lowery, 2004). The charts can be designed and individualized by the children themselves and laminated for reuse with stickers or marker pens. Flash cards are available for use with children to teach self-catheterization (Brown, 1990) and provide a more interactive teaching session, which can help children remember the steps involved (Gorski Slifer, Kelly, Suttka, & Lowery, 2004). These cards can be designed to be used with different children and can also be individualized. The use of flash cards allows the practitioner to select only the steps which are relevant to that child (Brown, 1990).

Another method, using a storyboard or spider diagram, has been used with older children and adolescents. In constructing a storyboard or spider diagram, a central theme is drawn on paper. The older child makes branches of important points, which results in a diagram looking like a spider, of what they think it will be like to self-catheterize. This teaching strategy provides a valuable method for discussion and reflection and enables children to reassess how things are compared to what they expected.

Computers and Technology

Teaching methods using videos and DVDs have been used in school settings to educate children and young people about general health promotion issues. For specific videos on ISC, prescreen-

ing by the practitioner is essential to ensure appropriateness for the age of the child. Once deemed appropriate, the video can be viewed together with the child (Robinson, 2006). When a child sees a peer performing ISC on a video/DVD, the feasibility of the child performing the same task can be validated (Brown, 1990). Additionally, there is the opportunity to ask questions while watching the procedure and it can be watched as many times as they desire (Brown, 1990).

The Internet and computer software have great potential as an educational tool. It can allow for the specific tailoring of information for different groups and developmental levels, which is a key aspect essential for effective education (Casazza & Ciccazzo, 2006; Goldman, 2006). Educational software is being developed for a number of illness conditions (Redsell, Collier, Garraud, Evans, & Cawood, 2003). These programs allow for paced/individualized learning which creates more meaning for the participant and are of interest to children and young people (Rassini, Gutman, & Silner, 2004). Such programs also allow the users to see the consequences of their decisions within a relatively safe environment (Redsell et al., 2003). Children have increasing access to computers through both school and home-life and feel comfortable using this medium. Research shows that in comparison to traditional preparation techniques (leaflets), young people aged 10 to 16 years scheduled for adenoids and tonsil surgery had greater knowledge and satisfaction using a computerized guidance program (O'Connor-Von, 2000). However, these findings have not been replicated in other studies which found no difference in outcome of education between computer-assisted programs and the more traditional leaflets (Redsell et al., 2003). It is suggested that multimedia is more appropriate for those children with less prior knowledge of the topic (Mayer, 1997).

Catheterization Education

Personal hygiene. Self-catheterization is a clean rather than sterile procedure. Children and young people should be shown how to wash their hands properly. The increased availability of alcoholic hand gels now makes this process more thorough and convenient when access to hand-washing facilities is limited. Some clinicians recommend the genitals be washed prior to each catheterization (Doherty, 2000; Duffin, 2000), but there is little evidence to support this practice (Bennett, 2002). Washing the genitals once a day with soap and water is adequate, with extra attention needed in girls during menstruation (Bennett, 2002).

Products. Nurses and health care providers must maintain competence in their professional practice and remain updated. This competence includes the knowledge and use of new catheter products which are designed, tested, and manufactured to set standards (Smith, 2003). Several studies compared the effects of intermittent catheterization using catheters of different materials. Currently, there is a lack of conclusive evidence. But the available research suggests that hydrophilic catheters are preferable for use due to reduced trauma on insertion and increased patient comfort (Giannantoni et al., 2001; Smith, 2003). Children and their families must be aware that such catheters are single-use only and must be disposed of appropriately. The economics of catheterization will need to be considered for some populations where access to products may be difficult. In such instances, reusable products can be trialed. If problems such as UTIs are encountered frequently, it may prove to be a more suitable option to use single-use only products.

There is a range of different diameter sizes (French Charriere, Ch or interchangeably seen as Fr) available. In pediatric practice, sizes 6 to 12 Ch are appropriate (see Table 2). The smallest diameter catheters that will effectively empty the bladder should be used (Pellowe, Loveday, Harper, Robinson, & Pratt, 2001). Table 3

Table 2.
Recommended Urethral Catheter Sizes in the Pediatric Population

Age in Years	Charriere (Ch) size or French (Fr)
0-2	6 Ch
2-5	6-8 Ch
5-10	8-10 Ch
10-16	10-12 Ch

Source: Bray & Sanders, 2006.

outlines some of the materials available in catheters for intermittent catheterization. This table is not exhaustive but intended to provide the practitioner with a sample of materials available for use. Most companies who manufacture catheters for intermittent catheterization have information easily searchable on the Internet. The authors do not recommend or endorse any particular products for use. This decision needs to be made by the health care professional, child, and the family.

It is important for the practitioner to inform the family and child of the choice of products that are available to them prior to learning ISC. It is useful for the younger child to play with the various products and become accustomed to them to help reduce any preconceived fears or anxiety. Assessment of the child or adolescent's dexterity is vital when selecting a possible product for use. The family should be informed of how products can be ordered and supplied including issues of prescriptions and home delivery. This can prevent any problems arising when the child is discharged home and minimizes stress at a time of transition. Discussion should also take place regarding the importance of where to keep supplies (such as with relatives, in the car, and in school). Bags can be purchased in which to keep products and reduce their visibility from other children.

Some children and young people prefer the use of prelubricated products (with lubricating

Table 3.
Available Catheter Materials for Intermittent Catheterization

Hydrophilic catheters	Intermittent silicone catheters
Pre-lubricated catheters	Silver impregnated-coated catheters
Catheters with attached drainage	Rigid tubular solid silver reusable catheters
Polyvinyl chloride (PVC) catheters	

jelly in the packaging) when away from their normal environment. This reduces the need for access to water to fill a catheter packet. Certain catheters now have integral water to facilitate activation when there is no access to tap water. Additionally, some catheters are produced with a bag attached to aid drainage. These catheters can be useful for children and young people with poor dexterity or limited access to toilet facilities.

Increasingly, anesthetic gels (Instillagel® and lidocaine gels) are used for lubrication. This serves to make the procedure as pain free as possible and can reduce the incidence of infection due to such preparations being in sterile ready-to-use packs (Gentry & Cope, 2005). If using lidocaine gel, it is necessary to identify any patients who may be at risk of possible systemic effects. These can include patients with liver disease, hypotension, cardiac problems, pregnancy, epilepsy, and children (Addison & Mould, 2000). It is not accepted practice for such gels to be used as part of an everyday catheterization regime.

Personal relationships. Developing an open and comfortable relationship with the young person and providing an environment that is private may allow for further disclosure of worries or concerns. It cannot be assumed that children and young people feel comfortable discussing ISC issues within their family context. Issues of sexual development, changes in sexual arousal, or issues of self-esteem and body image may need to be explored by the practitioner. Maintaining or developing new relationships and when to trust someone to tell them about their health needs,

including ISC, are important topics to discuss with the child.

Being in school. Previously, children with complex health needs would attend special educational establishments and be excluded from mainstream schools. It is now unlawful in the United Kingdom for schools to exclude children with a disability (The Stationary Office, 2001). A well drawn health care plan identifying how to manage the child's needs relating to ISC and who to contact in a crisis will help the child or young person manage his/her condition in school. It is essential that careful liaison occurs between the family, child/young person, health care team, and the school to enable sensitive and effective support with the practical and social challenges of self-catheterization (Edwards et al., 2004). Practical advice to help manage school activities such as ensuring the bladder is emptied prior to sports or swimming are important to discuss. Provision must also be made for storage and disposal of equipment including a suitable private place for children and young people to attend to their needs. Often school trips are raised as a concern from both the teacher and parent's perspective. The child needs to have a sense of responsibility and independence in doing ISC if the school trip is to include nights away from home.

Complications

Children on ISC require regular medical followup to assess for any changing needs and to provide an opportunity to discuss any ongoing support issues (Bennett, 2002). Complications from intermittent catheterization

can include UTIs. Children and their families need to understand that their urine may always show some presence of bacteria. Bacteriuria is common and inevitable as ISC facilitates the inoculation of periurethral bacteria into the bladder (Clarke, Samuel, & Boddy, 2005). It has previously been common practice to use prophylactic antibiotics to prevent UTIs in adults and children using ISC. This practice, however, is now being challenged. Antibiotic misuse and the development of resistant organisms are of widespread concern throughout the medical world (Clarke et al., 2005). Research has shown the use of prophylactic antibiotics does not eradicate bacteriuria nor prevent the development of UTIs (Clarke et al., 2005). Treatment of bacteriuria should not occur unless children and young people develop symptoms such as temperature, cystitis, flank pain, or hematuria. If such symptoms are noted, the infection should be treated by appropriate antibiotics based on a positive culture and sensitivity report (Barton, 2000).

Children and young people may occasionally notice a small amount of fresh blood during catheterization. This can be due to initial localized trauma (Duffin, 2000). Children and their families should be educated of such possibilities to prevent any alarm or concern. Families must also be made aware that children on ISC may be at an increased incidence to develop bladder calculi (Barroso, Jednak, Fleming, Barthol, & Gonzalez, 2000). There has also been retrospective adult data which have discussed the presence of bladder cancer in patients on ISC (West et al., 1999). But, it must be recognized that such results do not constitute conclusive evidence on which to base practice and further research in this field is needed. Families should be fully informed of all possible complications to enable informed decision making and increased observation for possible problems.

Within the authors' clinical area, children and young people on ISC undergo annual renal ultrasound imaging. If the child is having UTIs or there is a change in his/her ultrasound report or levels of continence, then further diagnostic tests may need to be considered.

Conclusion

ISC is a recognized and well-established procedure that aims to facilitate a safe urinary elimination system for children and young people and help maintain continence. Sensitivity, adaptability, resourcefulness, and patience are skills that the health care professional should possess along with a respect for the child/young person's privacy and dignity. Certain children and young people learn ISC very quickly while others may take many months to feel comfortable and confident. During this time, the nurse/health care provider must both support and motivate the child and family. With patience and guidance, the final outcome is successful transition to ISC as part of the child's day-to-day life. ■

References

- Addison, R., & Mould, C. (2000). Risk assessment in suprapubic catheterization. *Nursing Standard*, *14*(36), 43-46.
- Alderson, P. (1993). *Children's consent to surgery*. Oxford: OUP.
- Astra Tech. (2006). *Felix and Julia*. Retrieved May 10, 2007, from www.Astratech.com/main.aspx/Item/575450/navt/73077/nav1/73108/nava/73109
- Audit Commission. (1993). *What seems to be the matter: Communication between hospitals and patients*. London: Author.
- Barroso, U., Jednak, R., Fleming, P., Barthol, J., & Gonzalez, R. (2000). Bladder calculi in children who perform clean intermittent catheterization. *BJU International*, *85*, 879-884.
- Barton, R. (2000). Intermittent self-catheterization. *Nursing Standard*, *15*(9), 47-52.
- Bennett, E. (2002). Intermittent self-catheterization and the female patient. *Nursing Standard*, *17*(7), 37-42.
- Borzyskowski, M., Cox, A., Edwards, M., & Owen, A. (2004). Neuropathic bladder and intermittent catheterization: Social and psychological impact on families. *Developmental Medicine and Child Neurology*, *46*, 160-167.
- Branzei, S., & Keely, J. (2002). *Grossology, The science of really gross things*. Los Angeles: Price, Stern, Sloan Publishers Inc.
- Bray, L., & Sanders, C. (2006). Preparing children and young people for stoma surgery. *Paediatric Nursing*, *18*(4), 33-37.
- Brooks, G. (2000). Children's competency to consent: A framework for practice. *Paediatric Nursing*, *10*, 31-35
- Brown, J. (1990). A practical approach to teaching self-catheterization to children with myelomeningocele. *Journal of Enterostomal Therapy*, *17*, 54-56.
- Brownlow, S. (2007). *Clean intermittent self-catheterization*. Retrieved May 10, 2007, from www.pullthru.net/work.org/index.php?option=com_content&task=view&id=57&Itemid=126
- Casazza, K., & Ciccazzo, M. (2006). Improving the dietary patterns of adolescents using a computer-based approach. *Journal of School Health*, *76*(2), 43-46.
- Clarke, S., Samuel, M., & Boddy, S. (2005). Are prophylactic antibiotics necessary with clean intermittent catheterization? A randomized controlled trial. *Journal of Pediatric Surgery*, *40*, 568-571.
- Cobussen-Boekhorst, J., Van Der Weide, M., Fritz, W., & Gier, R. (2000). Using an instructional model to teach intermittent catheterization to children. *BJU International*, *85*, 551-553.
- Doherty, W. (2000). Intermittent catheterisation: Draining the bladder. *Nursing Times*, *96*(31), 13.
- Duffin, H. (2000). Intermittent self-catheterisation. *Journal of Community Nursing*, *14*(10).
- Edwards, M., Borzyskowski, M., Cox, A., & Badcock, J. (2004). Neuropathic bladder and intermittent catheterization: Social and psychological impact on children and adolescents. *Developmental Medicine and Child Neurology*, *46*, 168-177.
- Engvall, J., & McCarthy, A.M. (1996). Innovative approaches for teaching children with chronic conditions. *Journal of Pediatric Health Care*, *10*(5), 239-242.
- Fowler, C. (1996). Bladder problems. In *Multiple Sclerosis information for nurse and health professionals: Information pack*. Letchworth, MS: Research Trust.
- Gentry, H., & Cope, S. (2005). Using silver to reduce catheter-associated urinary tract infections. *Nursing Standard*, *19*(50), 51-54.
- Giannantoni, A., Stasi, S., Scivoletto, G., Vergili, G., Dolci, S., & Parenna, M. (2001). Intermittent catheterization with a prelubricated catheter in spinal cord injured patients. A prospective cross over, randomised study. *The Journal of Urology*, *166*, 13-33.
- Goldman, J. (2006). Web-based designed activities for young people in health care education: A constructivist approach. *Health Education Journal*, *65*(1), 14-27.
- Gorski, J., Slifer, K., Kelly-Suttka, J., & Lowery, K. (2004). Behavioral interventions for pediatric patients acute pain and anxiety: Improving health regimen compliance and outcome. *Children's Health Care*, *33*(1), 1-20.
- Hunt, G., Oakeshott, P., & Whitaker, R. (1996). Intermittent catheterization: Simple, safe, and effective but under-used. *British Medical Journal*, *312*(7023), 103-107.
- Kain, Z., Caramico, L., Mayes, L., Geneviro, J., Bornstein, M., & Hofstadter, M. (1998). Preoperative preparation programs for children: A Comparative Examination. *Journal of Anesthetic Analgesia*, *87*, 1249-1255.
- Lapides, J., Diokno, A., Silber, S., & Lowe, B. (1972). Clean, intermittent self-catheterization in the treatment of urinary tract disease. *Journal of Urology*, *107*(3), 458-461.
- Mansson, M., & Dykes, A. (2004). Practices for preparing children for clinical examinations and procedures in Swedish pediatric wards. *Pediatric Nursing*, *30*(3), 182-188.
- Manworren, R.C., & Woodring, B. (1998). Evaluating children's literature as a source for patient education. *Pediatric Nursing*, *24*(6), 548-553.
- Margolis, J., Ginsberg, B., Dear, G., Ross, A., Goral, J., & Bailey, A. (1998). Paediatric preoperative teaching: Effects at induction and post-operatively. *Journal of Paediatric Anaesthesia*, *8*, 17-23.
- Mayer, R. (1997). Multimedia learning: Are we asking the right questions. *Educational Psychologist*, *32*, 1-19.
- McCloughlin, J., Murray, M., Van Zandt, K., & Carr, M. (1996). Clean intermittent catheterization - Practical procedures. *Developmental Medicine and Neurology*, *38*, 446-454.
- McComas, J., Lalli, J., & Benavides, C. (1999). Increasing accuracy and decreasing latency during clean intermittent self-catheterisation procedures with young children. *Journal of Applied Behavior Analysis*, *32*, 217-220.
- Mundy, A., Stephenson, T., & Wein, A. (1994). Neuropathic bladder in childhood. In A.M.K. Rickwood, & L.D. Lee (Eds.). *Urodynamics: Principles, practice, and application* (pp. 403-422). London: Churchill Livingstone.
- O'Connor-Von, S. (2000). Preparing children for surgery - An integrative research review. *AORN Journal*, *72*(2), 334-343.
- Pellowe, C., Loveday, H., Harper, P., Robinson, N., & Pratt, R. (2001). Preventing infections from short-term indwelling catheters. *Nursing Times*, *87*(37), 67-68.
- Rassini, M., Gutman, Y., & Silner, D. (2004). Developing a computer game to prepare children for surgery. *AORN Journal*, *80*(6), 1095-2006.
- Redsell, S., Collier, J., Garraud, P., Evans, J., & Cawood, C. (2003). Multimedia versus written information for nocturnal enuresis education: A cluster randomised controlled trial. *Child: Care, Health and Development*, *29*(2), 121-129.

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- Rickert, V., Ashcraft, E., Rickert, C., & Thomsberry, R. (1990). Behavioural methods for teaching self-catheterization skills to anxious children with myelomeningocele. *Archives of Physical Medicine and Rehabilitation, 71*, 751-753.
- Robinson, J. (2006). Intermittent self-catheterization: Principles and practice. *British Journal of Community Nursing, 11*(4), 144-152.
- Segal, E., Deatrick, J., & Hagelgans, N. (1995). The determinants of successful self-catheterisation programs in children with myelomeningocele. *Journal of Pediatric Nursing, 10*, 82-88.
- Shah, J., & Leach, G. (2001). *Urinary continence* (2nd ed.). Oxford: Health Press.
- Smith, L. (2003). Which catheter? Criteria for selection of urinary catheters for children. *Paediatric Nursing, 15*(3), 14-18.
- Sutherland, T. (2003). Comparison of hospital and home-based preparation for cardiac surgery. *Paediatric Nursing, 15*(5), 13-18.
- The Stationary Office. (2001). *Special Educational Needs and Disability Act*. London: Author.
- Waters, J., & Sherbondy, A. (2000). *Clean intermittent catheterization*. Retrieved February 25, 2007, from www.health-care.uiowa.edu/cdd/patients/cic.asp
- West, D., Cummings, J., Longo, W., Virgo, K., Johnson, F., & Parra, R. (1999). Role of chronic catheterization in the development of bladder cancer in patients with spinal cord injury. *Urology, 53*, 292-297.

Intermittent self-catheterization, as a self-management technique, can be of benefit both physically and psychologically to children and young people. Educational strategies are available to aid health care providers in teaching children and young people self-intermittent catheterization. Use of innovative techniques and resources may assist the practitioner in teaching self-catheterization successfully to this challenging population. Discover the world's research. 17+ million members. Intermittent catheters and preventing infections, Intermittent catheters use in removing urine from the bladder. Intermittent Catheters - Teaching Self-Catheterization. Contents. Ideal Patient. Many times children under the age of say 15 even, may have to have their parent do it because they will not comply, and there's actually research on the fact that children are getting repeated urinary tract infections because they don't want to do the catheterization. One of the hallmarks of knowing whether a patient can catheterize is can they perform self-care? So can they dress themselves and transfer? Those individuals who are more immobile, who have more other problems with ADLs is not going to be successful at performing self-catheterization. Problem Patient. Does your child have urinary retention? Try our catheter guides for children and learn about keeping a healthy routine, emptying the bladder and the wee game. Your doctor or nurse may prescribe the use of an intermittent catheter- a thin plastic tube that is inserted through the urethra and into the bladder. Why emptying the bladder is so important. Patients performing self-catheterization should follow the advice of, and direct questions about use of the product to, their medical professional. Before using the device, carefully read the product labels and information accompanying the device including the instructions for use which contain additional safety information. Research Feed. Teaching children and young people intermittent self-catheterization. L. Bray, C. Sanders. *Medicine*. 2007. 11. Save. Alert. Current Evidence on Intermittent Catheterization: Sterile Single-Use Catheters or Clean Reused Catheters and the Incidence of UTI. K. Getliffe, M. Fader, Colleen B. Allen, K. Pinar, K. Moore. *Medicine*. 2007. 53. View 4 excerpts, references background and methods. Save.