Troubleshooting Urinary Catheter Complications

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Presented by Capital Nursing Education

Objectives

- Identify different types of urinary catheters
- Review choice and use of catheters
- Identify complications related to urinary catheters
- Discuss preventative methods

OVERVIEW

Urinary catheters for patients with compromised bladder function come with many challenges and risks. No matter which type of urinary drainage device is used, each has its own problems and benefits. Learn how to care for these patients and minimize these risks. This webinar will cover how to identify and solve common problems and improve the outcomes for these patients.

TYPES OF UNIARY CATHERERS

Indwelling Catheter	Intermittent Catheters	External Catheters
Foley Suprapubic	Men’s Women's	Men’s Women's

Indwelling Urethral Catheterization (IUC)

A urinary catheter is inserted into the urethra and advanced into the bladder allowing for the continuous, passive drainage of urine from the bladder.

Short-Term Versus Long-Term Catheterization

Short-term catheterization: 1 to 14 days of use

30 days or less

Long-term catheterization: 30 days or more

used to manage urinary retention and incontinence when other methods are not effective or practical.

Indications for IUC

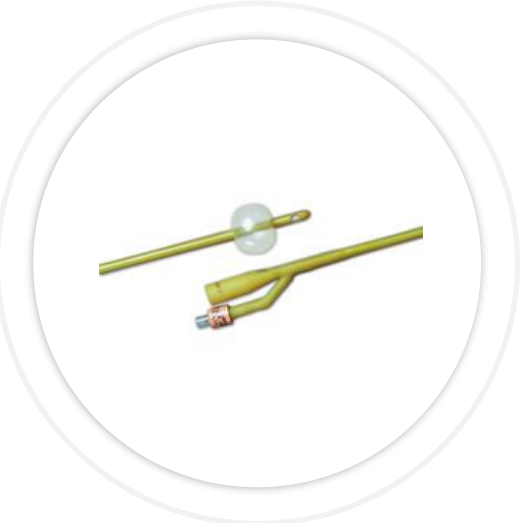
- Severe urine retention and obstruction of urine outflow (e.g., prostate enlargement).
- Comfort measures for patients who are terminally ill.
- Non-healing sacral, buttock, or perineal pressure injuries (stage III or IV)
- Perioperative use: – Prolonged surgery.
    - Surgeries on organs of the genitourinary tract.

Additional indications

- Operative patients with urinary incontinence.
- Hemodynamic monitoring during surgery.
- Continuous bladder irrigation for prevention of urethral obstruction from blood clots after genitourinary surgery.
- Measurement of urinary output in critically ill patients.
- Urodynamic testing.
- Imaging studies of the lower urinary tract.

Indwelling Catheters

100% Silicone Foley Catheter
2 way Foley catheter that is silicone/elastomer coated latex Foley catheter made from hydrophobic material that rejects moisture. It also protects against urethral irritation



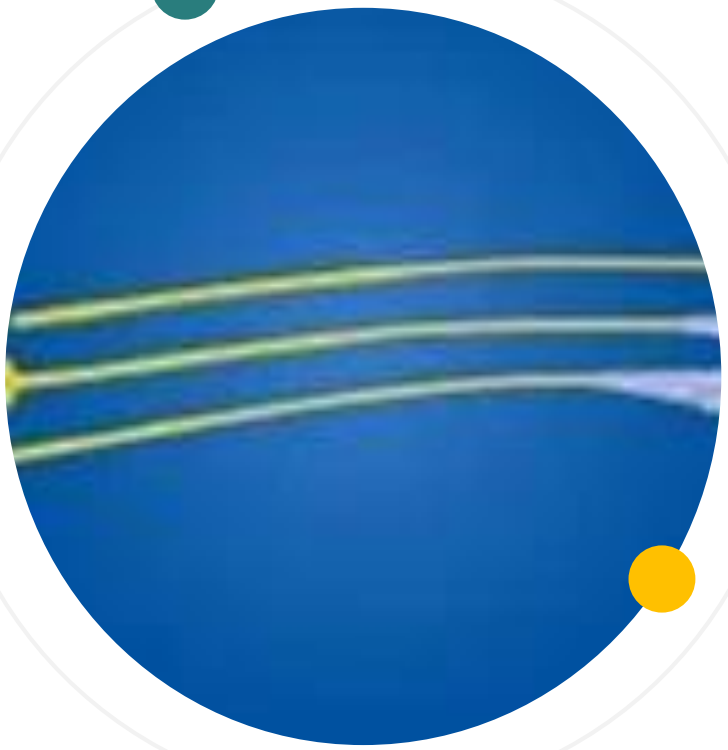
Indwelling Catheters

Bard Bardex Catheter (All Silicone)
good for latex sensitive people
Bard Coude Tip Catheter single eye is
a lubricath latex Foley.
Smoother insertion and comfort with
hydrogel coating.

Indwelling Catheters

Bard Coude Tip Catheter with hydrogel coatings and raised indicator to identify the direction of the catheters medium olive coude tip.

Bard Lubricath Foley Catheter with 2-way specialty Foley catheter with hydrogel coatings creating hydrophilic cushion between catheter Surface and the urethra



Indwelling Catheters

Antibiotic Coated Catheters
Foley Catheter 2-way Silicone 100%,
Antibacterial Coated - Catheter, Foley

Management of IUC

INSERTION

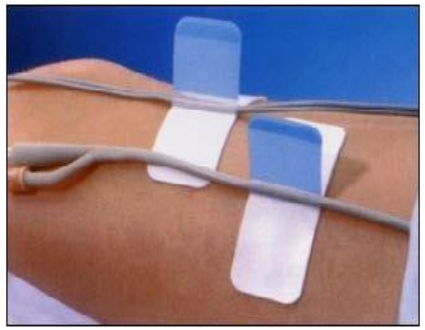
- Do not inflate the balloon to test for inflation.
- Balloon inflation. – Inflate the balloon with sterile water according to the manufacturer's guidelines. Do not use saline or other electrolyte solutions, which can cause crystallization in the balloon's port

IUC securement

Indwelling catheters should be secured to avoid traction on the catheter, which causes irritation and trauma to the urethra (e.g., urethritis, necrosis, erosion, stricture), and/or the bladder trigone muscle resulting in pain, spasm, and incontinence

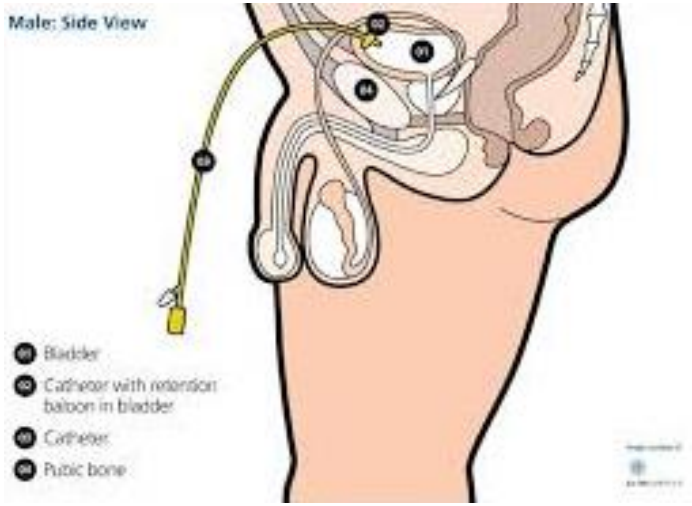
Securement is needed to prevent inadvertent dislodgement of the catheter

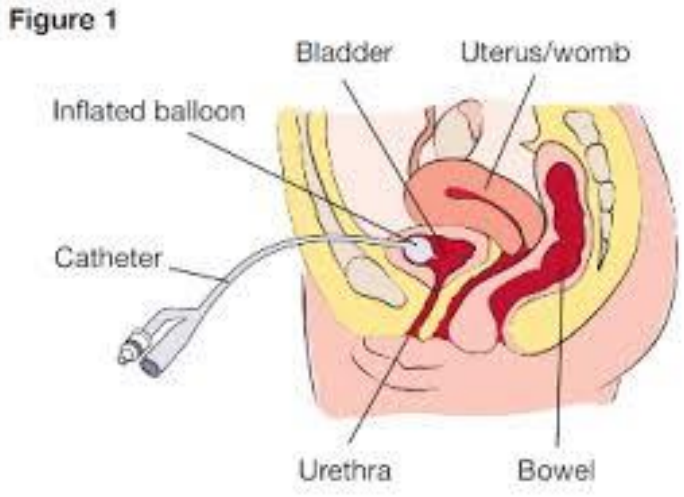
Selection of Securement Devices



Use and Choice of Indwelling Catheters

Suprapubic Catheter





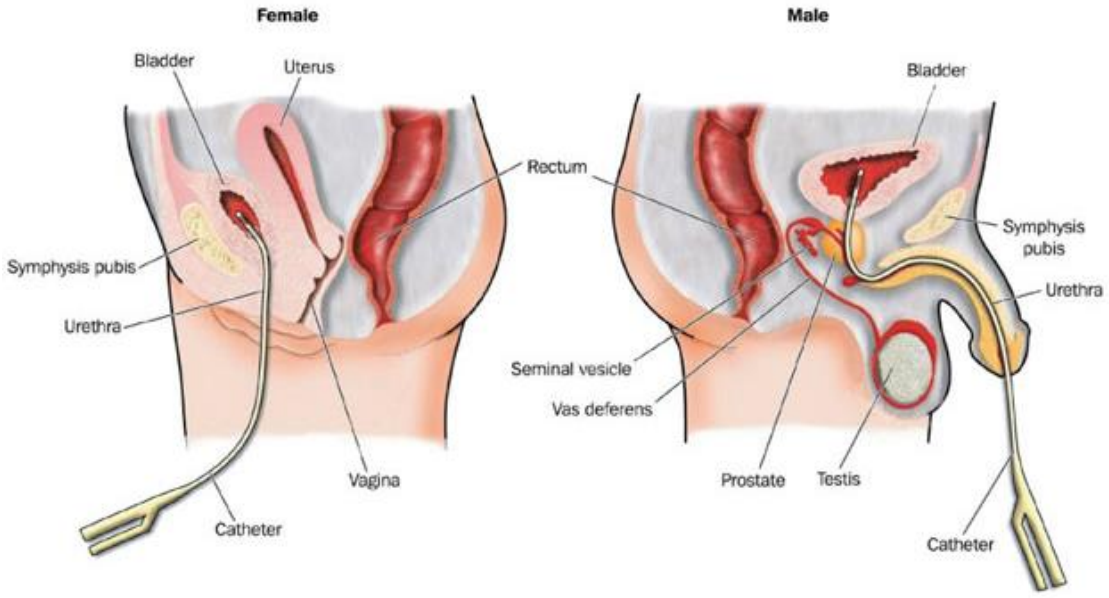
INSERTION

Anesthetic to manage pain
Small cut in abdomen
Suprapubic catheter placed directly into the bladder
Balloon inflated to keep it in
Attached to a gravity drainage bag or a leg bag

WHY SUPRAPUBIC

- When Urethra is damage or injured
- If pelvic floor muscles are weakened causing urethral catheter to fall out
- After surgeries involving the bladder, uterus, prostate or nearby organs
- To maintain sexual activity but needs catheter for a longer period of time
- Long term use as it may be more comfortable and easier to change than urethral catheter

URETHRAL INDWELLING CATHETER



CATHETER INSERTION

URETHRAL CATHETER

- Sterile Technique through urethra to bladder
- Balloon expands to hold in place
- Attached to a gravity drainage bag

Considerations when using Catheter

Thorough hand-washing before and after touching the catheter is vital.

The length of time between changes will vary based on the person's medical condition and how long they need the catheter.

The user may benefit from drinking extra water to keep the bladder and kidneys flushed out, which can lower the risk of a urinary tract infection.

Indwelling Catheter Care Complications

Catheter-Related Bladder Discomfort (CRBD)

Description. – Symptoms include sensations of suprapubic, urethral, and bladder burning and pain, the urge to void, and bladder spasms

CAUSES/CONTRIBUTIVE FACTORS.

- Intra-urethral pressure from the catheter.
- Catheter material or size.
- Large balloon or partially filled balloon.
- Manipulation and traction of catheter.
- Technique/procedure for catheter change.
- Concentrated urine.
- Local bladder irritation.
- Bladder stones.
- Constipation and fecal impaction.

CRBD Prevention and treatment

- Change to a smaller sized catheter such as a 16 Fr or 12 Fr, and/or use a catheter with a different type of material.
- Secure the catheter and tubing to prevent traction.
- Fill the balloon according to the manufacturer’s instructions.
- Establish a bowel program to prevent constipation.
- Maintain adequate fluid intake to achieve dilution of the urine
- Consider medications to prevent/reduce spasms/pain

Leakage around the Catheter

Unstable bladder contraction--Bladder spasm--detrusor instability

the force of the contraction pushes urine around the catheter causing leakage

Factors contributing to leakage around catheter

- Balloon irritation
- Improper catheter size
- Bacteriuria
- Impaction and Constipation
- Blockage of the catheter
- Inappropriate catheter composition

Balloon Irritation

- BIGGER IS NOT BETTER !
- If labeled 5ml or 10ml, both are instilled with 10ml of sterile water for inflation per manufacturers instructions
- Overfilling or under filling may interfere with the correct positioning of the catheter tip, leading to irritation.
- Under filled will allow the tip of the catheter to touch bladder wall
- Overfilling does not allow complete emptying
- 30ml balloons are used primarily to stop bleeding after surgery

CATHETER SIZE

Sized by outer circumference according to metric scale known as French gauge. One French unit equals 0.33mm in diameter

Golden rule is to use the smallest catheter size that allows for adequate drainage. (14-16Fr)

BACTERIURIA

UTIs may contribute to leaking catheters—need urine culture

Impossible to prevent bacteriuria in patient catheterized for longer than 14 days

Not all patients with bacteriuria have complications

Short term catheterization may benefit from PO antibiotics

Long term catheterization, when treated with antibiotics will only acquire resistant organisms.

Ultimately, the only effective treatment for bacteriuria is removal of catheter.

CMS guidelines on Signs and Symptoms of UTI in Nursing Home Residents With Catheters

With Catheters, must have 2 of the following symptoms

Fever

New flank pain or suprapubic pain or tenderness

Change in character of urine (bloody, foul smelling, etc.) or lab report of new pyuria or microscopic hematuria

Worsening of mental or functional status

Local findings of obstruction, leakage, mucosal trauma, or hematuria

Note:

Fever is the most frequent clinical presentation of UTI in the chronically catheterized resident

Catheter obstruction is often a precipitating event for fever and systemic infection

Fever with hematuria or catheter obstruction has a high probability of being from a urinary source.

HELPING TO PREVENT BACTERIURIA

Antibiotic-Coated Catheters

Prevent or delay bacteriuria in short term catheterized hospitalized patients.

Silver Alloy-Coated Catheters

Cause less inflammation
Bacteriostatic effect by reducing micro bacterial adherence and migration of bacteria to the bladder

BLOCKED CATHETER

- Proteus and Morganella species colonize and produce excessive urease which causes mucus and encrustations that may block the catheter
- Urease forms crystals around the catheter and in bladder

- Irrigation may help but better to change catheter
- Fluid intake of 2500cc or more in 24 hours, and regular soft bowel movements are less likely to have crystallization

IMPACTION AND CONSTIPATION

- Impacted rectum presses on the bladder and can cause pressure and spasms
- Prolonged constipation contributes to bacteriuria which in turn causes bladder spasms and leakage

IMPROPER CATHETER COMPOSITION

- Inexpensive coated catheter are available but should be restricted to short term use
- Silicone or bonded catheters are preferred for long term catheterization (2 weeks or longer)

CATHETER POSITIONING

- Avoid tension on bladder neck
- Penis should be supported against the body to prevent tension on the penile scrotal angle
- Secure to avoid tension and keep the catheter positioned below the bladder.

COMPLICATIONS

- Urethral damage
  - Urethritis, inflammation of the urethral meatus, may be due to frequent insertion of catheters.

- Erosion of the urethra especially in men.
  - Creation of a false passage can occur primarily in male patients with persisting urethral strictures.
  - Men with enlargement of the prostate gland are most at risk.

COMPLICATIONS

- Fistula formation
  - Develops in females between the bladder and the anterior vaginal wall.
  - Will present with complaints of leakage and drainage from the vagina.
  - Occurs in men between the prostate and urethra.

- Epididymitis
  - Due to urethral and bladder inflammation and scrotal abscess

COMPLICATIONS

- Bladder stones
  - Occur in at least 8% of patients with indwelling catheters.
- Bladder cancer
  - Long-term catheter users are the most at risk for developing squamous cell carcinoma.

- Hematuria occurs in patients who have long-term catheters and is a possible sign of CAUTIs, bladder cancer, or stones.

PREVENTION AND MAINTENANCE

PREVENTION PROBLEMS WITH INDWELLING CATHETERS

- Choose small catheter and balloon
- Maintain good hydration
- Prevent constipation
- Routine cleaning with mild soap and water
- Sterile technique when inserting a catheter

PREVENTION PROBLEMS - continued

- Keep drainage system closed as much as possible
- Copious lubrication of the catheter using to reduce urethral irritation
- Secure catheter to avoid traction
- Cleanse with antiseptic solution whenever tubing and catheter are disconnected
- Routine cleansing of drainage bags also helps with prevention with long term catheterization.

MAINTENANCE

- Clean the urethral area with soap and water 1 time daily
- Clean after every bowel movement to prevent infection.
- Avoid pulling on the tubing when cleaning as this may injure the urethra.
- Don't apply antibiotic ointment or any other antibacterial product to the urethra.
- Don't use lubricant on the urethra.
- Don't apply powder to the genital area or to the tubing.

Cleaning Drainage Bag (Every Three Days)

Have a clean backup bag or other drainage device ready.

- Wash your hands well with soap and water.
- Disconnect the bag from the catheter tubing. Connect the tubing to the backup bag or drainage device.
- Drain any remaining urine from the bag you just disconnected. Close the drainage valve.
- Pour some warm soapy water into the bag. Swish the soap around, being sure to get the corners of the bag.
- Open the drainage valve to drain the soap. Close the valve.
- Fill the bag with 2 parts vinegar and 3 parts water. Shake the solution a bit and allow it to remain in the bag for 30 minutes.
- Drain the vinegar solution and rinse the bag with cold tap water.
- Hang the bag to drain and air-dry.

CLEAN INTERMITTENT CATHETERIZATION (CIC)

Intermittent Catheterization (IC)

Definition / Description

- Intermittent catheterization (IC) is a safe and effective method to empty the bladder in patients with voiding disorders and should be considered as an alternative to short-term or long-term IUC.
- IC involves the use of a short, flexible catheter that is inserted through the urethra into the bladder to drain urine.
- Long-term IC is preferable to indwelling urethral or suprapubic catheters in patients with bladder emptying dysfunctions, and IC is associated with an infection risk between 0.5% and 8% .

INDICATIONS FOR IC

- Urinary incontinence , select cases
- Alternative to short-term or long-term IUC
- Acute urinary retention without bladder outlet obstruction.
- Acute urinary retention with bladder
- Chronic urinary retention as an alternative to an indwelling catheter.
- Installation of medications into the bladder.
- Collection of random urine samples

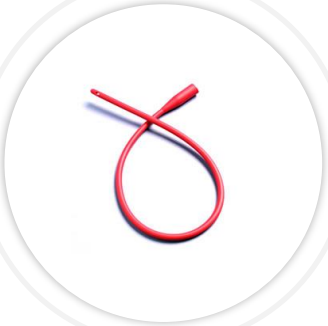
Intermittent Catheters

Apogee Intermittent Catheter Curved packaging. This is straight tip with smooth eyelets for comfort. Flexible funnel grip makes it easier handling Latex free

Apogee Red Rubber Straight catheter. This is Latex with straight tip.

Intermittent Catheters

Bard intermittent clean catheter
Rusch/MMG Intermittent closed system catheter with introducer tip
Cultramer Red Rubber Urethral Catheters which are hydrogel coated making them very slippery for ease of insertion.



CLEAN INTERMITTENT CATHETERIZATION

- Reasons
  - Chronic urinary retention
  - Neurologic conditions

- Complications
  - UTIs
  - Urethral stenosis
  - Prostatitis
  - Epididymitis
  - Urinary lithiasis
  - Urosepsis

COMPLICATIONS OF CIC

- Pilot Study by Rosemary Bolinger and Sandra Engberg in JWOCN 2013
- Cross-sectional survey design
- 44 community dwelling men and women
- CIC (Clean Intermittent Catheterization)for 2 or more months

Bolinger, Engbert, Barrier Complications, Adherence, Self reported quality of life for people using clean intermittent catheterization.

Diagnosis	n (%)
Neurogenic bladder	9 (20.5)
Prostate Ca	2 (0.05)
Benign Prostatic Hyperplasia	1 (0.02)
Multiple sclerosis	21 (47.7)
Spinal Cord Injury	2 (0.05)
Tetraplegia	1 (0.02)
Atonic bladder	1 (0.02)
Ca of the kidney	1 (0.02)
Spina bifida	1 (0.02)
Urinary tract infection	2 (0.05)
Transfer spinal myelitis	1 (0.02)
Frequent urinary tract infections from incomplete emptying	1 (0.02)
Transitional cell Ca of kidney	1 (0.02)

Barrier	n (%)
Public bathrooms (inadequate facilities—no sinks in stalls, shelves, space)	15 (34)
Dexterity—spasticity	9 (21)
Positioning (female)	11 (25)
Catheter itself:	
Wrong size catheter	1 (2.3)
Type/material of catheter	1 (2.3)
Not being comfortable with performing catheterization	2 (4.5)
Lack of proper training	5 (11.4)
Time limitation	6 (13.6)
Visual problems making it difficult to insert catheter	7 (15.9)
Inability to sense/feel the catheter being inserted	6 (13.6)
Cost of supplies	8 (18.1)
Lack of supplies	6 (13.6)
Weight issues	3 (6.8)

	n (%)
Complication	
Urinary tract infections	34 (77.2)
Bleeding	10 (22.7)
Difficulty passing the catheter	
Scar tissue	2 (4.5)
Not comfortable doing CIC	2 (4.5)
Stone formation	5 (11.4)
Prostatitis	2 (4.5)

Abbreviation: CIC, clean intermittent catheterization.

CONCLUSION OF THE STUDY

Most common barrier

- Access to bathrooms with sinks, shelves, and adequate space
- Muscle spasticity for MS patients

Complications

- Urinary tract infection #1

There needs to be more studies to examine the occurrence of UTI in people who reuse their catheters multiple times versus those who use single-use catheters.

Specific challenges for the patient in performing IC may include:

- Inadequate/inaccessible bathroom facilities.
- Inconvenience or difficulty in cleaning catheters; individual feels it is unaesthetic to carry and/or reuse catheters.
- Cost and/or lack of optimal supplies.
- Inability or unwillingness to perform frequent catheterizations.
- Anatomical constraints: urethral strictures, false passages, or bladder neck obstruction.
- Physical limitations: upper extremity impairment, visual problems, or difficulty in positioning (females).
- Co-morbid conditions: inability to feel the catheter being inserted, spasticity, and obesity.

Complications of CIC

- Bacteriuria
- 50% of CIC patients and is often referred to as “colonization.”
- Rarely leads to UTIs.
- Majority have no symptoms and therefore should not be treated with antibiotics.
- Urinary tract infections –
- 20% annual incidence, most common cause of sepsis and mortality in patients. More prevalent in patients who have higher residual urine volumes (> 400 cc) at the time of catheterization.
- Chronic pyelonephritis rarely develops.

- Urethral damage in men include
- Urethritis, inflammation of the urethral meatus, due to frequent insertion of catheters especially if there is a forceful catheterization against a closed sphincter.
- Urethral stricture is the result of urethral inflammatory response to repeated catheterization.
- increases with the number of years performing CIC.
- Difficulty with insertion is a sign of the presence of a urethral stricture.

Creation of a false passage can occur primarily in male patients with persisting urethral strictures. The false passage occurs because of trauma to the urethra and the site of the external sphincter

- Prostatitis – especially in aging men.
- Epididymitis, due to urethral and bladder inflammation, and scrotal abscess are seen in men.
- Bladder stones may occur in patients who perform CIC long term. Stones have been shown to grow around introduced pubic hairs.

MALE EXTERNAL CATHETERS

EXTERNAL COLLECTION DEVICES

- Decrease CAUTIs in hospital
- Decrease CAUTIs in home bound
- More comfortable than Indwelling

- Multiple different types
- Includes the retracted penis pouch
- Ease of use

MALE EXTERNAL CATHETERS

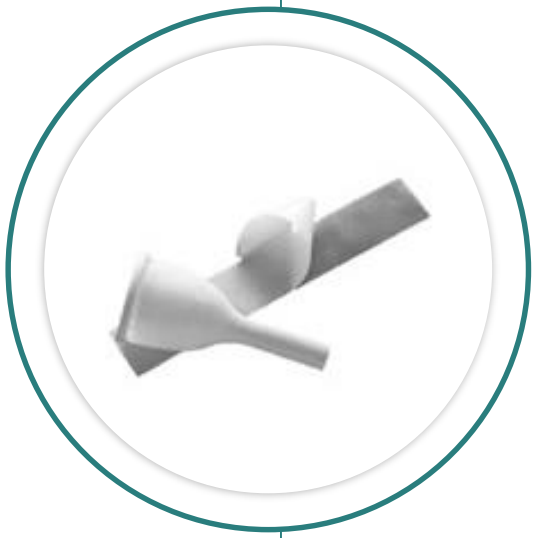
Active Cath –self adhering 1-piece latex catheter for active men who prefer extended wear.

Freedom Clear Long Seal External Catheter is silicone and self adhering.

MALE EXTERNAL CATHETERS

Coveen Male External Catheter Sport. Discreet, reliable and very easy to use.

Golden Drain Male External Catheter. This is one piece latex non self adhering catheter with high supportive cup preventing twisting with a 1 inch foam strap to hold it on.



MALE EXTERNAL CATHETERS

Hollister extended wear male external catheter with inner flap to minimize urine back flow.

Invite Extra Adhesive Male External Catheter is made to be comfortable with transparent material with adhesive inside.

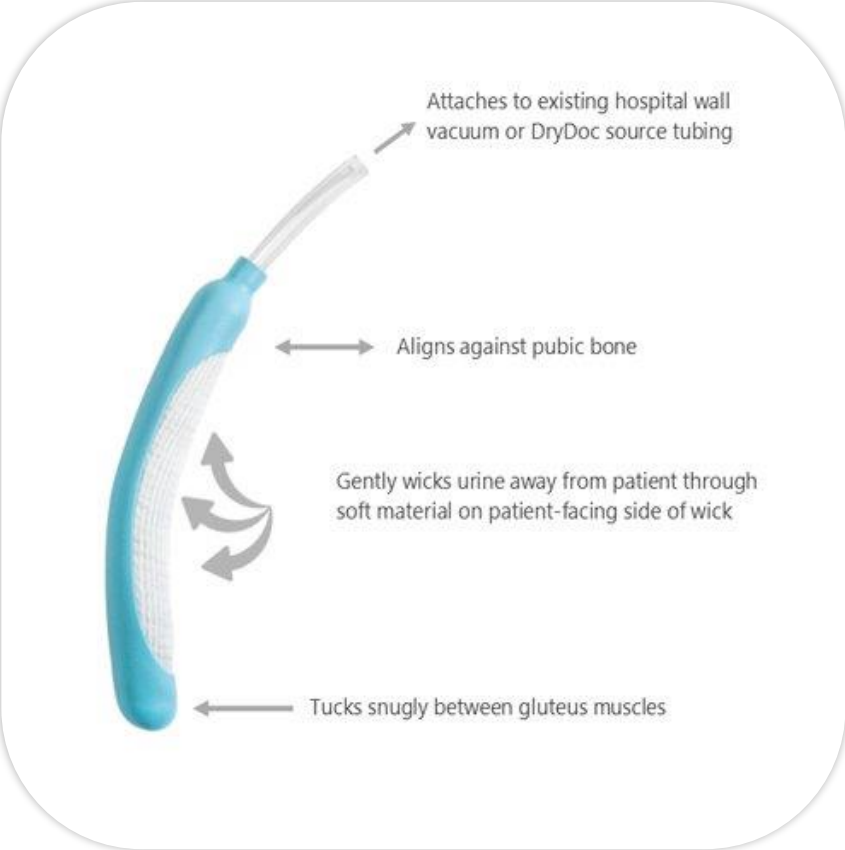
Male External Catheter Care

- Changing the catheter every 24 to 48 hours will decrease chance of infection.
- In hot and humid weather, condoms need more frequent changing.
- Instruct the man to trim the hairs on the shaft and base of the penis so they won’t stick to the adhesive tape on the inside of the catheter thus increasing skin irritation.
- Washing and drying the penile shaft before each catheter change will protect the skin from urine.
- If the patient is at risk for possible breakdown, consider applying a barrier film product when using the device. Avoid use of betadine solution since this can irritate the skin.
- Phimosis is present when the orifice of the foreskin is constricted, preventing retraction of the foreskin over the glans. This can occur as a result of over-constriction of the penis from a condom catheter

FEMALE EXTERNAL CATHETERS

FEMALE EXTERNAL CATHETERS

P U R E W I C K



- Simple, non invasive urinary incontinence management for women.
- Soft flexible to position between the female labia and buttocks.
- It is put to low wall suction.
- Can be used reclining, laying on side, lying down or while seated.

FEMALE EXTERNAL CATHETERS

Primafit is another external catheter that fits between the labia and pulls the urine out to the canister.

PEARLS

- Not appropriate for confused patients
- Not appropriate for patients that move around constantly
- Low Wall Suction is 40mmHg
- Change every 8-10 hours
- Not appropriate with loose stooling

- At each change, cleanse skin
- Must have pad under due to leakage
- Must be placed correctly to function correctly
- Decreases CAUTIs

REFERENCE

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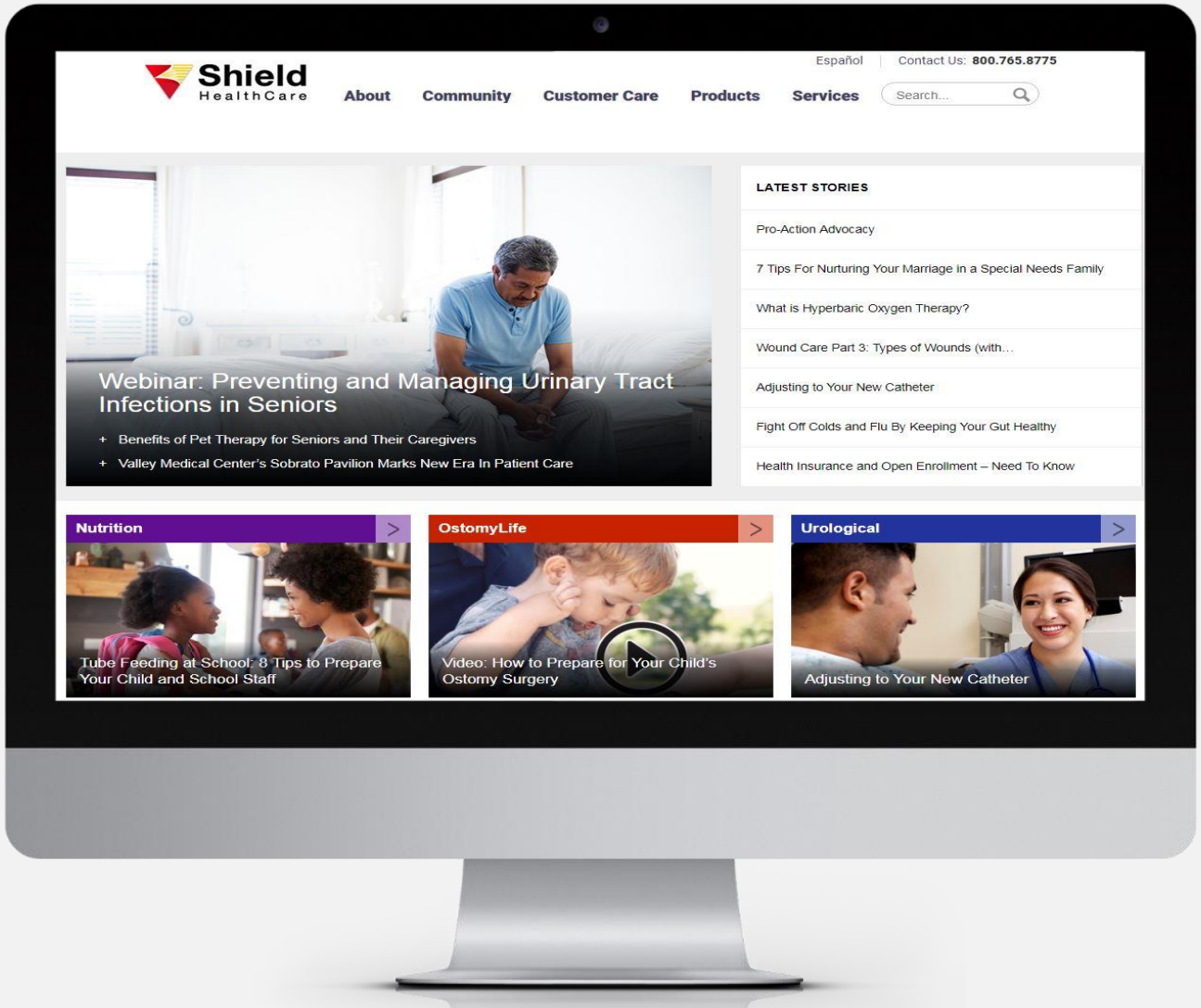

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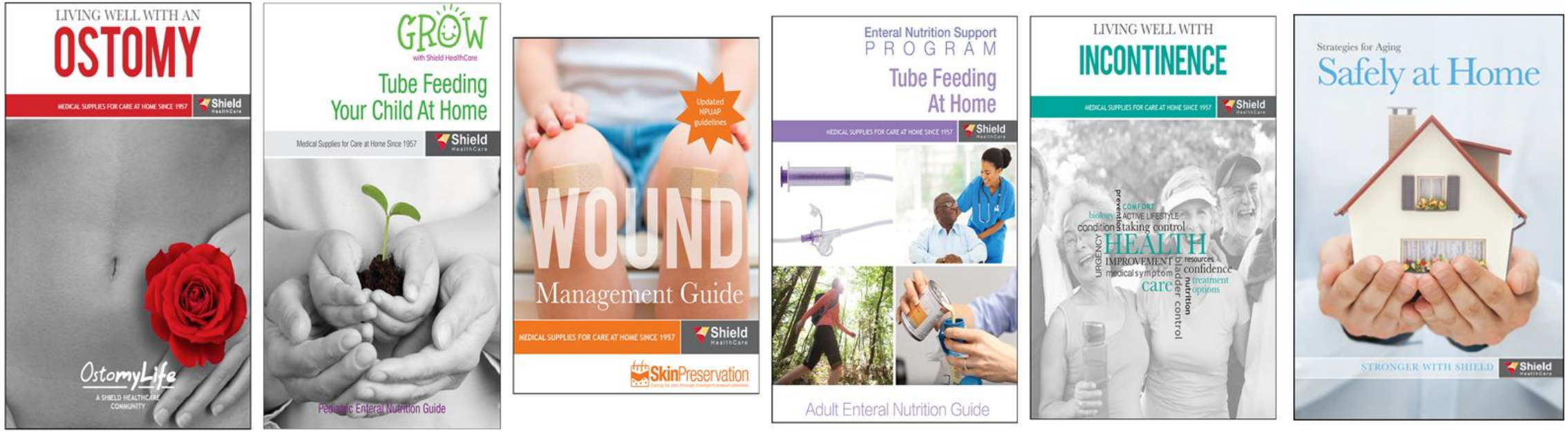

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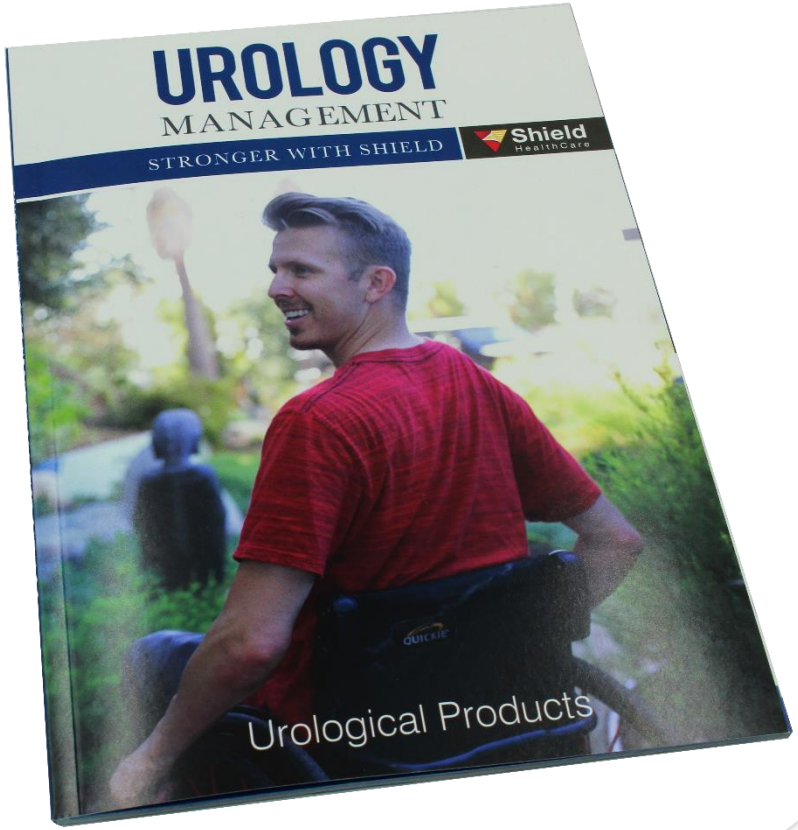

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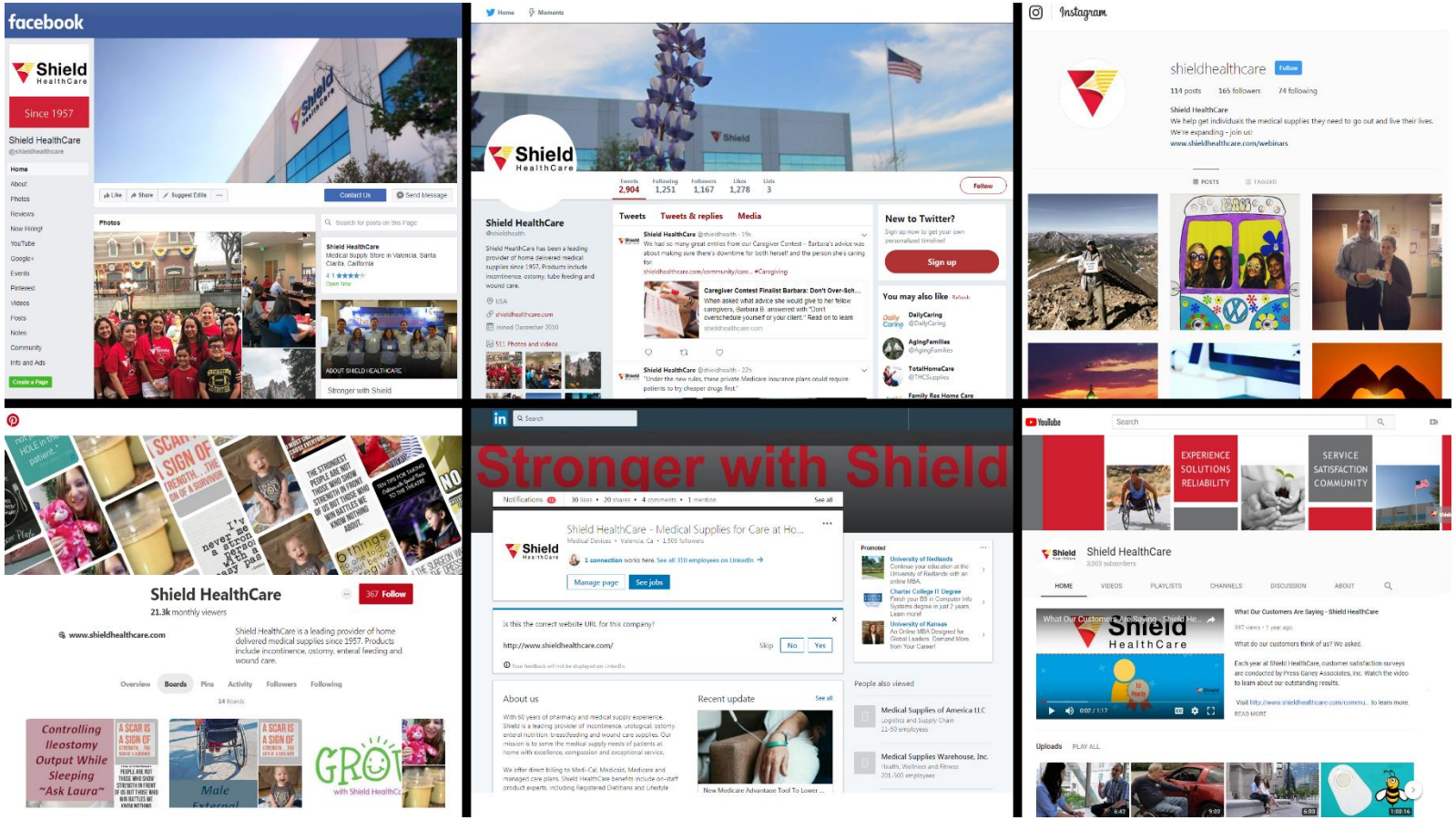

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