Urinary Catheterization

The most common site of nosocomial infection is the urinary tract. Approximately 40% of all hospital-acquired infections occur at this site; involving an estimated 600,000 patients annually. Nearly 75% of these patients have undergone some form of urologic instrumentation--often urinary catheterization--prior to their infection. Although not all catheter associated UTI's can be prevented, many could be avoided by proper management of the indwelling catheter.

The risk of bacteriuria associated with a urinary catheter depends upon the methods and duration of catheterization. After a single "in and out" catheterization, bacteriuria is seen in 1-5% of patients. A much more significant risk occurs in patients with indwelling catheters. Without benefit of a closed collecting system, 90% of these patients developed bacteriuria within 48 hours increasing to 95% at 4 days.

Catheter-associated UTI's are caused by bacteria acquired from several sources. Microorganisms that inhabit the distal urethra may be introduced into the bladder during or shortly after insertion of a urinary catheter. Gastrointestinal colonization with E. Coli, Klebsiella sp., Proteus sp., and Enterococci sp. may become urinary tract pathogens and subsequently cause infection. However, many other pathogens may be acquired from sources extrinsic to the patient. Cross-contamination of urinary catheters (i.e., passive transmission of bacteria from patient to patient on the hands of hospital personnel) is an important mode of transmission of these organisms. Bacteria from these extrinsic sources usually gain access to the catheterized urinary tract at one of the three sites: the urethralmeatal junction, the distal catheter-proximal drainage tube junction, or the collecting vessel or bag.

Based upon the preceding information and other current knowledge of hospital acquired UTI, the maintenance of a closed system of urinary drainage on a hospital-wide basis is needed. This requires the active cooperation of everyone--physicians, nurses, technicians, students, and the patients themselves. While the principles of closed drainage are simple, they require strict adherence.

Hands must be washed immediately before and after any manipulation of the catheter site or apparatus.

A sterile continuously closed drainage system should be maintained. Indwelling urinary catheters are to be used only when absolutely necessary. They are never to be used solely for nurse or physician convenience and they are to be discontinued as soon as possible.

- Catheters are inserted only by adequately trained personnel. See Nursing Procedure Manual for specific procedure instructions.

  Urinary catheters are aseptically inserted utilizing proper sterile technique and the following sterile equipment: gloves, a fenestrated drape, sterile sponges, an iodophor solution for peri-urethral cleansing, a lubricant jelly, and an appropriate size urinary catheter. Following insertion, catheters are properly secured to prevent movement and urethral traction.

- Once-a-day perineal care for catheterized patients should include:
  - Cleansing of the meatal-catheter junction with soap and water.

  - Nursing personnel will inspect catheter-meatal junction every shift for the need for additional perineal care.
- A sterile closed drainage system is used. The distal urinary catheter and the proximal drainage tube not disconnected (thus opening the closed system) unless required for irrigation of an obstructed catheter. Gentle milking of the drainage tubing will often unplug the catheter and make irrigation unnecessary. Should this fail, sterile technique is observed whenever the collecting system is opened and catheter irrigation is performed. The catheter-tubing junction is disinfected before disconnection. A large-volume sterile syringe and sterile irrigant fluid is used only once and then discarded. If frequent irrigations are necessary to insure catheter patency, a triple lumen catheter permitting continuous irrigation within a closed system is preferable.
- Small volumes of fresh urine for culture can be aspirated from the sampling port on the catheter using a sterile syringe and 21-gauge needle. The sampling port is first cleansed with a disinfectant such as tincture of iodine and/or alcohol.
- The air chamber that connects the distal drainage tubing to the drainage bag is to be in the vertical upright position at all times.
- Non-obstructed "downhill" flow must be maintained at all times. This requires emptying the collecting bag regularly using a separate collecting container for each patient. The catheter and collecting tube must be kept from "kinking". Replacing poorly functioning or obstructed catheters, and insuring that collecting bags always remain below the level of the bladder.
- All closed systems contaminated by inappropriate technique, accidental disconnection, leaks or other means, should be immediately replaced.
- In patients with urinary catheterization of less than two weeks duration, routine catheter change is not necessary except when obstruction, contamination or other malfunction occurs. In patients with chronic indwelling catheters, replacement is necessary only when sediment can be palpated in the catheter or when malfunction or obstruction occurs.
- In-service education for personnel taking care of catheterized patients should be periodically scheduled; similarly, catheterized patients themselves (particularly those that are ambulatory) should receive appropriate instructions.