

CHAPTER VI

THE OUTCOME MEASUREMENTS

Two outcomes measured in this study are the urinary catheter associated infections and the control behaviors of the nursing personnels. How to measure these two outcomes is described in this chapter.

Urinary Catheter Associated Infections

This study deals with both asymptomatic and symptomatic urinary tract infections. The CDC criteria are applied for the definitions of cases. The CDC criteria for definitions of asymptomatic and symptomatic nosocomial urinary tract infections have been detailed in the appendices.

The diagnosis of cases for this study depends upon the result of at least two urine cultures. If the first culture is negative and the follow up urine culture is significantly positive (equal or greater than 10^5 /ml) for uropathogens of not more than two species, then, the case will be defined as having a urinary tract infection. If the first culture is positive, and the follow up culture is also significantly positive (equal to or greater than 10^5 /ml) for a different uropathogen, then the case will also be defined as having an infection. All the urine specimens have been collected by a standard aseptic technique (i.e. every single urine specimen has been collected by using a

sterile ten millilitre syringe and a sterile number twenty four or twenty five needle aspirating from the catheter after cleaning the aspiration site with 2% Tr. Iodine solution). Identification of the organisms as well as the antibiotics sensitivity test have been performed by one experienced microbiologist throughout the study period.

Whenever there is an eligible case, the investigator has been called through a beeper to attend the catheterization process in order to immediately collect a urine specimen for culture. When a urine specimen is obtained during the day and evening shifts, the investigator immediately takes it to the laboratory which is on the same floor (the 5th floor). The amount of 0.01 millilitre of the urine is streaked on the Macconkey and Trypticase agar plates then incubated in an incubator at the temperature of 38° C. Most urine specimens have been cultured immediately or at least within less than ten to fifteen minutes after catheterization. During the period from midnight till six o'clock in the morning (the night shift), if there is any case that needs urinary catheterization (usually there are very few cases), urine will be collected and kept in the refrigerator at temperature of 4° C immediately after catheterization. Early next morning this urine is streaked on the media plates and incubated. The next morning, a worker from the central laboratory transfers those plates to the central microbiological laboratory. Identification of organisms is done after incubating for two days or more by the experienced microbiologist. Then the investigator will go and get the laboratory finding results.

The second urine cultures in most cases have been done at the time of catheter removal, or when the patients die or are transferred to other wards. According to the routine practice in the wards, urine cultures are not usually done in every case of catheter removal. Therefore, the personnels tend to forget to notify the investigator to collect urine for culture at the time of the catheter removal especially in dead cases and cases who refuse for further treatments and hospitalization. To overcome this problem, two notices for reminding the personnels are placed on the urine bag and at the distal part of the catheter in every case. If the period of urinary catheter indwelling is longer than a week, a follow up urine culture have been carried out on a weekly basis. This process for urine culture has been strictly adhered to throughout the study period.

All the urine culture results have been recorded in a special form and kept attached to the original record of each subject.

Infection Control behaviors (practices) of the nursing Personnel

Control behaviors of the nursing personnels are the other variable to be measured. It is difficult to measure human behaviors and obtain unbiased data because human behavior is complex and influenced by many factors. Therefore, in order to minimize biases and get the fact much closer to the truth, multiple methods will be used to measure this variable. Those methods are questionnaires, observation and checklist.

1. Questionnaires

The questionnaires were constructed according to the control measures in Category I of the CDC recommendation which contains important main parts such personnel, catheter use, handwashing, catheter insertion, close sterile drainage, irrigation, specimen collection, urinary flow, and meatal care. Improvement of the questionnaires has been assisted by the content experts in field of nosocomial infections to ensure the credibility. The questionnaires have been pretested to a similar group of the study subjects in the same hospital to guarantee feasibility, precision, validity and reliability before the actual data collection.

2. Observation

The personnel control behaviors in the studied wards have been observed by the infection control nurses and the investigator without the personnel awareness. Observations have been performed when the infection control nurses visit the wards and do ward round. Observing and monitoring of the nursing personnel control behaviors have been carried out at the time of the surveillance of urinary tract infections in both groups. Ward visits have been performed in the morning when most nursing care procedures are concentrated. Patients who have urinary catheter indwelling have been thoroughly checked and control behaviours of personels observed.

The time for recording the patient fluid intake and output of the ward is about 2:00 to 2:30 p.m. Therefore, the

afternoon rounds have also been carried out to observe the procedures for emptying the urine bags without the personnels being aware of the check.

Observations of the catheterization techniques have been done whenever the patients need to retain the urinary catheters. The ward personnels have notified the investigator through a beeper immediately before catheterization. While waiting for the urine specimen, the catheterization technique is automatically and blindly observed throughout the process. The investigator has been available sixteen hours a day (from 8:00 a.m. to 12:00 p.m.). Therefore, most catheterization processes have been observed.

3. Checklist

A checklist is constructed according to the urinary tract infection control measures category I of the CDC. It consists of twenty three items (see in the appendices). The items cover all control practices recommended in category I. The infection control nurses as well as the investigator have regularly checked the personnel behaviors according to the checklists. They have recorded the behavioural data immediately after they have returned to their offices to avoid possible biases associated with the awareness on the part of the personnels that they are being monitored.

Among these methods, the observation and checklists are used as the gold standard for data analysis.