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## The Establishing of Validity and Reliability of an Incontinence Monitoring Record Used to Describe Individual Patterns of Urinary Incontinence

Janis Miller  
*Loyola University Chicago*

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THE ESTABLISHMENT OF VALIDITY AND RELIABILITY  
OF AN INCONTINENCE MONITORING RECORD USED TO  
DESCRIBE INDIVIDUAL PATTERNS OF URINARY INCONTINENCE

by  
Janis Miller

A Thesis Submitted to the Faculty  
of the Graduate School of Loyola University  
in Partial Fulfillment of the Requirements for the  
Degree of Master of Science in Nursing

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## VITA

The author, Janis Miriam Miller, is the daughter of Dale Miller and Ruth (Mitchell) Miller. She was born January 22, 1958, in Bloomington, Illinois.

Her elementary education was obtained at the public grade school of Chenoa, Illinois. Her secondary education was completed at Chenoa High School in 1976.

In May 1981, she received the degree of Bachelor of Science in Nursing from Goshen College, Goshen, Indiana.

She worked as a professional nurse between 1981 and 1986 in a variety of settings including hospital, home health and nursing home. Her major area of interest was gerontology.

In September 1986, she entered the Master of Science in Nursing Program at Loyola University of Chicago and was granted an assistantship. In January 1988, she was awarded the degree of Master of Science in Nursing.

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## CHAPTER I

### INTRODUCTION

"One of our most important but least discussed functions as adults is the ability to control our urination. The average person takes this complex skill for granted" (Wells, 1980, p. 236). Yet, 30-85% of long-term care, institutionalized, elderly patients are not able to control fully their bladder functions. (Yu & Kultreider, 1986). Many of these patients have cognitive impairments which make assessment and management of incontinence all the more difficult.

In this study the problem of assessing incontinence in a nursing home is addressed through the testing of an incontinence monitoring record.

### BACKGROUND

The cost of incontinence (in psychological, social, and economic terms) is enormous and is likely to increase as the elderly population increases, unless constructive solutions are discovered, evaluated and incorporated into clinical practice (Williams & Pannill, 1982). The Illinois Department of Public Aid now encourages attention to

continence by reimbursing the highest dollar amount for those residents whose incontinence can be controlled at least partially through specific interventions (Illinois Department of Public Aid, 1985). Previously, reimbursement was based solely on the number of incontinent episodes regardless of attempts to ameliorate the condition. The former policy provided little incentive for staff to do more than change a wet pad as needed. The new policy is indicative of the long overdue need for comprehensive evaluation and management of the problem of incontinence.

Although incontinence is sometimes intractable, it is a myth that there is nothing that can be done about it. With application of knowledge, rigorous exploration of practice, and careful study, it is possible to promote continence in some patients and to relieve others of physical and emotional suffering (Wells, 1980).

A thorough, accurate assessment of the pattern of incontinence is the first essential step in more effective management. With careful assessment, interventions can be based on the individual's particular pattern of incontinence and what this pattern reveals about management possibilities. In reality, however, objective descriptions of voiding patterns are difficult to obtain from either patients or staff. Voiding complaints are often nondescript (Julian, 1985). Very few people know exactly when they are wet (Williams & Pannill, 1982). A patient's cognitive

impairments may prohibit answering questions completely. Staff members often give varied and nonspecific reports of the patient's urologic symptoms and past history (Autry, Lauzon & Holliday, 1984).

This inconsistency has prompted the need for a method to describe incontinence in a more objective manner. A comprehensive documentation system should take into account the time, frequency and amount of incontinence. It should also provide a means of documenting other factors such as psychological and environmental variables correlating with the incontinent episode.

The purpose of this study was to determine if an incontinence monitoring record could provide an objective means of assessing incontinence in a population of nursing home patients in late stages of dementia.



## RESEARCH QUESTIONS

1. Can objective data about time, frequency, and amount of incontinence be obtained about patients in a nursing home through the use of The Incontinence Monitoring Record (IMR).
  - a. Does the IMR have construct validity?
  - b. Does the IMR measure the constructs of incontinence consistently?
2. What degree of interrater reliability can be established for the IMR?
  - a. Can interrater reliability be established at 80% or above prior to data collection by training nursing home staff to use the IMR?
  - b. Does monitoring of interrater reliability during data collection indicate a continued agreement of at least 80%.

## THEORETICAL FRAMEWORK

A physiological theory of incontinence is the framework upon which this study is based. The physiological theory indicates that particular patterns of incontinence correspond with particular underlying pathology. There is, therefore, a need for an assessment tool that can reveal these patterns.

Physiology of Normal Micturition: Continence is maintained through an intraurethral pressure that is higher

than the intravesical pressure. Intravesicular pressure is dependent on detrusor muscle tone, bladder volume and intra-abdominal pressure. Intraurethral pressure is influenced by intraabdominal pressure, tone of striated muscle, urethral smooth muscle and bladder neck smooth muscle, and thickness of the urethral mucosa.

Neurological control over micturition is maintained in the following way. Parasympathetic fibers from the sacral micturition center are responsible for bladder contraction. As the bladder fills, stretch receptors in the bladder wall are activated. "Sensory signals are conducted to the sacral segments of the cord through the pelvic nerves and then back again to the bladder through the parasympathetic fibers in these same nerves." (Guyton, 1986, p. 461) Once this micturition reflex begins, it is "self regenerative". That is, initial contraction of the bladder causes further activation of the receptors with subsequent increase in afferent impulses from the bladder, and increased parasympathetic stimulation back to the bladder, resulting in stronger degrees of contraction. The regenerative cycles of the micturition reflex cease when the micturition reflex fatigues. Fatigue may occur after a few seconds or up to more than a minute. In summary, the micturition reflex is "a single complete cycle of (a) progressive and rapid increase in pressure, (b) a period of sustained pressure,

and (c) return of the pressure to the basal tonic pressure of the bladder." (Guyton, 1986, p. 461).

Once a micturition reflex has occurred and has not succeeded in emptying the bladder, the nervous elements of this reflex usually remain in an inhibited state for at least a few minutes to sometimes as long as an hour or more before another micturition reflex occurs. (Guyton, 1986, p. 461).

The reflexes become more powerful with increased filling of the bladder.

Once the micturition reflex becomes powerful enough it forces the bladder neck open despite the tonic contraction of the bladder neck muscle. As the bladder neck muscle relaxes and the bladder neck stretches open, its stretch receptors are activated and cause another reflex.

This reflex passes to the sacral portion of the spinal cord and then back through the pudendal nerve to the external sphincter to inhibit it. The pelvic floor muscles are relaxed, which lengthens the bladder neck and allows extra urine to enter the neck under pressure, thus stretching its walls. This then excites the stretch receptors, which excites the micturition reflex and simultaneously inhibits the external urethral sphincter. Ordinarily, the urine will then be emptied. (Guyton, 1986, p. 462).

Pathophysiology of Incontinence: The many factors governing normal micturition reflect the potential vulnerability of the system to disease. Methods for categorizing incontinence generally reflect the underlying pathophysiology.

Stress Incontinence: Those patients who have experienced childbirth, obesity, estrogen deficiency, pelvic nerve injury, urologic surgery, sympatholytic drugs, or

weakened support structures, may develop a propensity for stress incontinence. This is also referred to in the literature as incompetent urethral sphincter, sphincter incompetence, or urethral insufficiency (Tallis & Norton, 1984, William & Pannill, 1982). In the process of aging there is a gradual decline in overall muscular tone resulting in diminished strength of the pelvic floor muscles and external sphincters. In some elderly women, this effect is compounded by urethral mucosal and periurethral tissue atrophy caused by estrogen deficiency and reduced circulation (Voith, 1986, Williams & Pannill, 1982, Ouslander & Uman, 1985).

Patients with an incompetent urethral sphincter characteristically experience stress incontinence as small losses of urine corresponding to increased abdominal pressure related, for example, to coughing, laughing, straining, or physical activity. They often do not experience incontinence at night (Voith, 1986).

Overflow Incontinence: Patients with a dementing illness may also develop a propensity for overflow incontinence. This problem is also referred to in the literature as obstructed outflow, atonic or hypotonic bladder, acontractile or neurogenic bladder, or dyssynergia. It is associated with such causative factors as an enlarged prostate, fecal impaction, motor neuron lesions, and muscle relaxant or anticholinergic drugs. A functional obstruction

can also occur when there are dyssynergistic contractions of the detrusor and external sphincters. In this case when the bladder contracts and the sphincters remain contracted, the bladder may be unable to fully expel the urine and overflow incontinence results (Alterescu, 1986, Williams & Pannill, 1982, Snustad & Rosenthal, 1985).

The pattern for overflow incontinence may at first appear similar to that for stress incontinence; i.e. leakage of urine usually occurs in small amounts, to the extent that there may be continuous dribbling incontinence (Julian, 1985, Ouslander & Uman, 1985, Voith, 1986, Tallis & Norton, 1984). However, in comparison to stress incontinence, full successful voiding is extremely infrequent. Attempts to void are discouraged by decreased urinary stream and/or a need to strain to urinate (Snustad & Rosenthal, 1985).

Detrusor Instability: A third category of bladder dysfunction common in patients with dementia is that of detrusor instability. Detrusor instability (also referred to as spastic bladder, uninhibited bladder, detrusor hyperreflexia, or reflex incontinence), occurs when the detrusor muscle, responsible for the contraction of the bladder, escapes from central nervous system inhibition resulting in contractions that occur spontaneously and in an uncontrolled manner (Alterescu, 1986, Snustad & Rosenthal, 1985). Among the numerous causes cited for detrusor instability-- irritative lesions such as infection,

radiation, chemotherapy, bladder stones, bladder cancer, cerebrovascular disease, multiple sclerosis, Parkinson's disease, tumors, and deconditioned voiding --dementia is cited as a common etiological component (Snustad & Rosenthal, 1985).

Characteristically in detrusor instability large volumes of urine are lost, typically after coughing or laughing. Leakage may occur in any position, but especially on first arising in the morning. There may or may not be nocturnal symptoms (Williams & Pannill, 1982, Julian, 1895, Snustad & Rosenthal, 1985).

Incontinence of Diverse Etiology: Incontinence due to a combination of any of the foregoing functional disorders can result in a confusing pattern of incontinence that belies distinctive etiological categorizing. Or, as is often the case in a patient with dementia, organs of the voiding system may be completely intact but impairment in cognitive function or mobility may prohibit access to the toilet. The effects of confusion and immobility are further aggravated by psychological conditions such as regression, anger, hostility, or emotional barriers to toileting (Ouslander & Uman, 1985).

The Place of Urodynamics: Due to extensive diversity in the underlying pathology of incontinence, full urodynamic testing to ascertain an accurate pathophysiologic diagnosis is viewed by some as a prerequisite to successful treatment

(Snustad & Rosenthal, 1985, Williams & Pannill, 1982, Alterescu, 1986). However, urodynamic testing requires expensive equipment and personnel experienced in the performance and interpretation of the tests. The procedures are also "relatively uncomfortable and invasive, time consuming and inconvenient for many elderly persons" (Ouslander, 1985, p. 182). Persons with dementia may be subjected to the fear and trauma of being unable to make sense out of the purposes and surroundings of the testing.

Thus, although valuable for research studies, the specific contributions of urodynamics and their place in the clinical evaluation of elderly patients with dementias remains questionable. Most patients can be managed rationally without recourse to high powered urodynamics (Tallis & Norton, 1984). Methods of positive intervention can be instituted on the basis of a comprehensive history and physical examination.

#### DEFINING THE VARIABLES

Incontinence: Any uncontrolled leakage of urine regardless of amount or frequency, measured by observing and feeling undergarments or bedding to see if they are wet: a small amount, a large amount, or completely dry.

Monitoring Incontinence: The recording done when a patient is toileted or checked for incontinence.

Incontinence Monitoring Record: A record designed to indicate continence status and the results of toileting for bladder and bowel evacuation. For the purposes of this study, only the bladder monitoring portion was used. (See Appendix I).

Toileting: The activity of assisting a patient to void correctly by providing access to a bedpan, toilet, or commode.

Void Correctly: To urinate in a bedpan, toilet, or commode.

Nursing Home: Private, nonacademically affiliated, intermediate care facility of 129 beds. The 40 bed heavy care unit was chosen for this study based on the number of incontinent patients, degree of nurse aide care required, and administrative willingness to participate in the study.

Dementia: "An irreversible mental state characterized by decreased intellectual function, personality change, impairment of judgement, and often change in affect, due to permanently altered cerebral metabolism." (American Psychiatric Association as cited in Ebersole, 1985, pp. 669) For the purposes of this study, patients in advanced stages of dementia were defined as those patients with documented impaired mobility, impairment in activities of daily living such as dressing, grooming, bathing, and eating, and incontinent of urine.



### ASSUMPTIONS

- a. Incontinence is a complex physiological phenomenon.
- b. An organized framework of assessment and documentation is conducive to improved patient care.

### LIMITATIONS

- a. Generalizability of the findings is limited to patients with dementia living in a specific nursing home.
- b. Monitoring the pattern of incontinence may in and of itself alter that pattern (Ouslander, Urman, & Uman, 1986).
- c. Heightened awareness of staff during data collection may create a Hawthorne effect.
- d. Bias may be present due to nursing assistants' previous knowledge of the sample.
- e. No attempt is made to categorize patients according to anatomical defects (such as cystocele or rectocele) or type of incontinence.

### SUMMARY

In summary, this study proposed to test a tool for assessing incontinence in nursing home residents. Urodynamic testing is often difficult and inappropriate for nursing home patients, particularly those with Dementia. However, data gained through noninvasive assessment could help provide a basis for quality care even if an exact diagnosis is not known. The rationale for the tool arose out of the physiological theory base of normal and pathological micturition.

## CHAPTER II

### REVIEW OF THE LITERATURE

Bladder records (also referred to as incontinence charts or voiding records) long have been advocated as a fundamental component of the assessment and treatment process of incontinence. However, only recently have attempts been made to establish a design that is "objective, noninvasive, and requires few supplies and little staff time" (Ouslander, Urman, & Uman, 1986). Common shortcomings and disadvantages of bladder records have included:

lack of comprehensiveness, inadequate space for information, use of ambiguous terminology that is difficult to read and interpret, and relatively complicated instructions particularly problematic for recorders with limited educational background. (Ouslander & Urman & Uman, 1986).

Institutional records, which nursing assistants commonly must use for documentation, tend to have information crammed into a small space. While there may be room for the number of incontinent episodes there is often not space for time, amount and comments related to surrounding circumstances.

A review of the literature revealed very few comprehensive recording systems. Cley (1978) did the initial work on establishing a comprehensive voiding record through the use of colored dots on a habit-retraining chart.

Autrey et al. (1984) used a modified form of this chart in a study to develop a voiding record. Both Cley's and Autry's records permitted clear visualization of the individual's voiding habits but proved to be somewhat unwieldy for quick recording. Room for comments was missing and there was no assurance that the dots placed on the chart would stay in place. Designation of amount of incontinence was lacking and instructions for filling out the records were relatively complicated.

The Incontinence Monitoring Record: Ouslander (1986) undertook the design and testing of a new bladder record which he calls the Incontinence Monitoring Record (IMR). (See appendix I). It was designed with the intent of resolving some of the problems in existing methods and for use as a tool in research. The IMR is easily interpretable and quantifiable. It is practical and inexpensive enough for large scale nursing home use. It is purported to be simple and understandable for nurses' assistants to use. It is designed to provide clear differentiation between incontinent episodes, successful toileting, and a dry check without toileting. The record also permits differentiation between whether the amount of incontinence is small or large. However, it does not provide an empirical measurement to determine what constitutes small amount and what constitutes large amount. Reliability and validity were not specifically computed or estimated in the

development and testing of the IMR, with the exception of interrater reliability. Interrater reliability was 73% (based on 33 observations) between a nurses' aide and a gerontologic nurse practitioner, and 50% (based on 29 observations) between two nurses' aides (Ouslander, 1986).

#### SUMMARY

Although the use of "bladder records" and "incontinence charts" long have been advocated as fundamental to the assessment of incontinence, few have been comprehensively designed and tested. There is a need to test the usability and validity of an incontinence monitoring record.

## CHAPTER III

### METHODOLOGY

The research questions to be addressed in this study are as follows:

1. Can objective data about time, frequency, and amount of incontinence be obtained about patients in a nursing home through the use of The Incontinence Monitoring Record (IMR).

a. Does the IMR have construct validity?

b. Does the IMR measure the constructs of incontinence consistently.

2. What degree of interrater reliability can be established for the IMR?

a. Can interrater reliability be established at 80% or above prior to data collection by training nursing home staff to use the IMR?

b. Does monitoring of interrater reliability during data collection indicate a continued agreement of at least 80%.

A descriptive research design was chosen as the approach best suited to the purposes of this study. The study is intended as an extension of the work done by Ouslander, Urman, and Uman (1986) on the development and testing of an incontinence monitoring record.

SAMPLE

The setting was a private, nonprofit, nonacademically affiliated, intermediate care Nursing Home of 129 beds located in rural Illinois. Each nursing assistant at this facility had been certified in a three week vocational course in accordance with state requirements. The average length of employment for nursing assistants at this facility was 2.5 years. There were 32 nursing assistants involved in the study.

Patients residing on the heavy care unit of the facility were chosen for this study. Patients on this unit characteristically have multiple chronic health problems severely disruptive to mental orientation, communication, mobility and ability to perform activities of daily living. Many have some form of dementia. All are at least 65 years of age and require extensive assistance to meet daily care needs.

Patients were screened through chart review for inclusion criteria. Only 12 patients were found to qualify. No nursing assistant was ever assigned more than 3 of these patients at one time. One patient was eliminated from the study since she was found to have some degree of self toileting.

a. Inclusion Criteria:

1. 65 years old or older.

2. Documentation of incontinence for at least 30 days previous to the study.
3. A resident of the facility for at least 30 days previous to the study.
4. Required care by a nursing assistant for dressing, bathing, eating, and toileting needs.
5. Documented diagnosis of some form of dementia such as organic brain syndrome, senile dementia, Alzheimer's disease.
6. Female.

b. Exclusion Criteria:

1. Self-toileting or able to ring the call bell for assistance.
2. Taking diuretics or "bladder" medications such as anticholinergics.
3. Eating or snacking patterns known to differ from the routine times of the institution.
4. Known absences away from the unit of greater than two hours during the data gathering period.
5. Male.



TOOL

The IMR (appendix I) covers a 24-hour period, and makes use of symbols indicating continence status and the results of toileting. The record was designed to "allow" nursing staff to record, simply and rapidly, information relevant to continence status and toileting behavior as well as to enable them to recognize

readily patterns of incontinence and changes in those patterns with treatment programs. Three columns (incontinent, dry, and voided correctly) are included in the bladder section. A recording is to be made each time the patient is checked (Ouslander, Urman, & Uman, 1986).

The record includes provision for documentation of the time the check was made, the amount of incontinence in general terms of small or large, and also provision of space for recording the exact volume voided if that information is desired. The concomitant occurrence of fecal incontinence can also be recorded and blank spaces are provided to write in information about the circumstances surrounding the incontinent episodes.

(Ouslander, Urman, & Uman, 1986). Observations such as "rang for help", "on the way to the toilet", "wet bed while asleep", and "unaware of incontinence" can be recorded and are useful in the nursing assessment and approaches to the incontinent patient.

Ouslander, Urman, and Uman's study (1986) reported interrater reliability between a gerontologic nurse practitioner and a nurses' aide of 73% agreement, and between two nurses' aides, 50% agreement on the IMR. In a followup, unpublished, study of habit training in a nursing home, nurses' aides who were reasonably motivated had a 70-90% compliance rate in adhering to every two hour markings during day and evening shifts (J. Ouslander, personal communication, 1987). Recommendations were made to perform further tests of reliability and validity in future studies.

#### PROCEDURE

Prior to data collection, the proposed research was submitted for review by the Institutional Review Board of Loyola University Medical Center. The proposal was given an expedited review and approved. The nursing home at which data were collected did not have a formal review board in place. However, the study proposal was approved through administrative channels. (See appendix II).

In-service instruction was provided for all the licensed nursing staff and nursing assistants employed at the nursing home. (See appendix III). During the in-service program the purposes of the study were explained. Normal physiology of bladder emptying was demonstrated by use of a balloon model of a bladder. Pathological aspects of bladder

emptying were also demonstrated by balloon models designed to show overfilling of the bladder, blockage, weak sphincter control and a hyperactive bladder wall. The possibility of identifying varying patterns of incontinence corresponding to, and indicative of, underlying pathology was discussed. Also discussed was the possibility of varying incontinence management strategies according to individualized assessment of incontinence patterns. The staff was also commended for the many hours of hard work already given to the care of those suffering from incontinence. The purpose of this extensive degree of background information was to enhance staff motivation and understanding of the project.

Instruction was given about filling out the IMR. Correct use of the categories SMALL, LARGE, DRY, and VOIDED CORRECTLY were all explained. It was also explained that the VOIDED CORRECTLY column could be used in conjunction with a SMALL or a LARGE category if both columns were applicable on a single check. Nursing assistants were asked to check the patients and mark the records every two hours. The importance of accuracy in time, frequency, and amount was stressed.

Differentiating between LARGE and SMALL amounts of incontinence was demonstrated by pouring 50cc of tinted water on the various undergarments and incontinence pads used in the facility. The 50cc served to demonstrate maximum amount of wetness to be categorized as SMALL. Staff

were instructed to categorize all greater degrees of wetness as LARGE. Differentiation between SMALL and LARGE was further reinforced by explaining that SMALL could be thought of as "dribbling" and LARGE could be thought of as "complete bladder emptying".

Staff were then asked to make an assessment of undergarments which had been removed from 10 of the sample population immediately before the in-service program. Some undergarments were wet, some dry and some soiled with feces. A 3x5 card indicating a time of day was attached to each undergarment. The 26 staff members present were asked individually to make their assessments and mark an IMR record according to the times indicated on the cards. All but two staff members marked their IMR's the same as the group norm on at least 8 out of the 10 markings. (Overall agreement was 83%). The two staff members who differed had markings that agreed with the group norm only 70% of the time. Both of them were asked to repeat the exercise using another sample of undergarments. They then compared their IMR's with the primary investigator and five other staff persons. This time markings agreed at least 80% of the time with the group norm. Twenty-six people were in attendance at the initial in-service program. The same in-service program was conducted for smaller groups at separate times for all remaining persons involved in data collection. Each in-service program lasted approximately 45 minutes. A total of

32 nursing assistants were trained in data collection. L.P.N.'s and R.N.'s also attended the in-service programs but only nursing assistants participated in the actual data collection.

Nursing assistants were asked to begin data collection immediately following the in-service program and continue for a 9 day period. Nursing assistants were assigned to collect data using the IMR for 1, 2, or 3 patients each shift; no nursing assistant was asked to fill out more than three IMR's per shift. Data collection continued for a nine day period. The first three days of data were not used in data analysis to allow time for getting into the routine of using the tool and to control for a potential Hawthorne effect.

#### SUMMARY

This study was descriptive in nature. Inclusion and exclusion criteria for the patient sample was established and administrative consent obtained. The IMR tested was a comprehensive assessment tool designed to monitor incontinence. In-service instruction was provided for all data gatherers.

## CHAPTER IV

### DATA ANALYSIS AND DISCUSSION

The research questions were used as the framework for data analysis. 1. Can objective data about time, frequency, and amount of incontinence be obtained about patients in a nursing home through the use of The Incontinence Monitoring Record?

1a. Does the tool have construct validity? The constructs of incontinence which evolved from the review of the literature are time, frequency, and amount. Data from the IMR's were analyzed through the use of descriptive statistics for these three constructs. Data for each patient were displayed in graph format (See appendix IV). Graphs were reviewed for evidence that data gained through the IMR revealed time, frequency, and amount of incontinence for each patient.

The data did show the approximate time of day when the patient was wet. For instance, the graph of patient number 2 shows the patient was found to be wet during the first day at 8:00, 12:00, and 18:00.

The IMR was sufficiently sensitive to pick up those times of day when the patient was not checked for incontinence. For instance, patient number two was not checked for incontinence at 6:00 a.m. and 10:00 a.m. on the

first day. Although the overall compliance for checks made every two hours was 92.4%, the noon check was frequently missed with a compliance rating of only 42.4%.

The data on time of incontinence should not be misconstrued as implicating an exact time. Categories marked at a particular time of day were only indicative of the last two hours. If the previous check was missed, the category marked was indicative of the the last four hours. An exact time of incontinence is, therefore, unknown.

In regard to frequency, the data indicated how often incontinence occurred for each patient. On the graphs (see appendix IV), a point in the rows labeled large or small indicates an occurrence of incontinence. Points are connected by lines representing the two hour interval to facilitate recognition of patterns.

The IMR documented frequency as often as one episode of incontinence every two hours based on a two hour check. (If incontinence occurred twice within the two hour interval it would still only show up in the data as once.) It is unknown if checks made at lesser or greater intervals would provide data of significantly different sensitivity to frequency.

The data indicated that raters could use the IMR to account for the amount of incontinence in terms of large, small, or none (dry or voided correctly). On the graphs in appendix IV, a point occurs in the column appropriate to the

amount of incontinence that occurred at that particular check. An exact amount of incontinence is not recorded on the IMR.

The categories LARGE and SMALL, used in combination with the category VOIDED CORRECTLY, provided additional information regarding instances in which the patient was found to be wet, but also able to void correctly during the same check. For instance, patient number eight, on day one at 8:00 a.m, was found wet but also able to void correctly.

There was, however, no way of telling, from checked categories on the IMR, if there were times when the nursing assistants provided the patient an opportunity to void correctly but no voiding occurred. Occasionally a nursing assistant made use of the comments section to indicate such an occurrence.

The analysis of data indicated that the IMR is a useful tool for assessing individual patient's: a. frequency of incontinence based on every two hour checks, b. times of day when incontinence occurs (approximated at every two hour intervals), c. amount of incontinence in terms of large, small, or none, and d. episodes of correct voiding even after incontinence had occurred.

The IMR did not provide an assessment of exact time, exact frequency, or exact amount of incontinence, nor did it provide information on patients who were toileted but,



nonetheless, unable to void. These limitations do not affect usefulness of the IMR for most purposes.

The second part of research question number one is: Does the IMR measure the constructs of incontinence consistently? Although exact consistency in the pattern of incontinence is not expected in a population of patients' with Dementia, a general trend across time is expected. Examination of the descriptive statistics from the IMR shows that each construct does stay relatively consistent when looked at in terms of a general trend (see appendix iv). However, because the data are not suitable for statistical testing, a specific reliability coefficient can not be generated.

Use of the IMR for the purpose of quantifying data for powerful statistical tests is limited. The limitation is due to the problem of conceptually categorizing VOIDED CORRECTLY. Information on voiding correctly is critical to the overall assessment of incontinence, however it does not provide data that is continuous in terms of degree of wetness. In other words, is the patient to be considered "dry" or "wet" upon voiding correctly? In light of this difficulty, the analysis of the data from the IMR is limited to statistical tests requiring only categorical data. Although this does not limit the tool's usefulness in most clinical settings, it may limit the tool's usefulness for some types of research.

A summary of the data analysis for research question number one is that the IMR does have satisfactory construct validity. A specific reliability coefficient cannot be determined for the IMR. However, there is consistency in general trends of the constructs for individual patients over time. The IMR does have some limitations regarding its ability to generate data for statistical analysis. The IMR's usefulness could be enhanced by refining it for clarification about when toileting was attempted but did not result in successful voiding. As is true of any newly developed instrument, the IMR should continue to be evaluated for validity and consistency of measurement through a variety of measurement techniques.

The second research question was: What degree of interrater reliability can be established for the IMR?

Interrater reliability is estimated by having two or more trained observers watching some event simultaneously and independently recording the relevant variables according to a predetermined plan or coding system. The resulting records can then be used to compute an index of equivalence or agreement. (Polit and Hungler, 1983, p. 392).

The first part of question number two is: 2a. Can interrater reliability be established at 80% or above prior to data collection by training nursing home staff to use the IMR? All nursing assistants were able to achieve an interrater reliability of at least 80% in training sessions prior to data collection. No nursing assistant needed more than two training sessions to achieve 80% agreement.

The second part of research question two is: 2b. Does monitoring of interrater reliability during data collection indicate a continued agreement of at least 80%? A spot check of interrater reliability was undertaken during the fourth 24 hour period of data collection to monitor if the degree of interrater reliability persisted from the time of training into data collection.

Four nursing assistants volunteered to assist in this part of the study. A team of two recorders (the primary investigator and a nursing assistant from the day shift) made rounds together during the day shift. Likewise, a team of two recorders (the primary investigator and the nursing assistant from the evening shift) made rounds together during the evening shift. During the night shift, a team of three recorders (the primary investigator and the two nursing assistants from the night shift) made rounds together. On each shift, the two or three team members did the check together on five patients being monitored and marked separate IMR's without disclosing their findings to each other.

Analysis of the data revealed that agreement was achieved 89% of the time between the nursing assistants and the primary investigator (based on 55 observations) when markings were compared. Agreement was also achieved 89% of the time between the two nursing assistants from the night shift (based on 20 observations).

Although only four of thirty-two nursing assistants were participants in this part of the interrater reliability testing, the researcher has a fair degree of confidence that the sample is indicative of group interrater reliability due to the high degree of agreement among nursing assistants during the training session. Nonetheless, interrater reliability should be monitored in future studies in order to validate that reliability between raters can be maintained from the time of training through the time of data collection.

A sample of interrater reliability determined in an earlier pilot study of the IMR was 73% agreement between a gerontologic nurse practitioner and a nurses' aide (based on 33 observations) and 50% agreement between two nurses' aides (based on 29 observations) (Ouslander, 1986). The relatively higher interrater reliability in the present study may be related to the type of in-service training for raters. However, this relationship needs to be explored more fully. Other factors such as difference in education and work experience could also be significant variables.

A summary of the data analysis for research question number two is that satisfactory interrater reliability can be established on the IMR with adequate in-service training. The number of raters participating in the spot check during data collection was, however, quite small and should be enlarged upon in future studies.

### SUMMARY

Data analysis revealed that the IMR appears to be a valid and usable tool for assessing incontinence. Interrater reliability met the criteria of at least 80% agreement for the training session and in a spot check during data collection. Further study to validate these findings is recommended.

## CHAPTER V

### IMPLICATIONS

In departing from the traditional view of "wet is wet and just change the pad" to the view of incontinence as a diverse phenomenon requiring varying interventions, the present study provides a new perspective on recent efforts to provide better care for incontinent patients. Reviewing a physiological theory base, and then using an assessment tool based on the constructs that evolved, provides direction for the study of incontinence. Evaluation of the usability and consistency of the IMR over time as a means of assessing incontinence has implications for practice. One is the potential for use as a screening aid in the selection of individuals for various management or treatment strategies.

It is recommended that this study of the IMR be used as a foundation for further investigations; in particular, studies to investigate the relationship between patterns of incontinence and underlying pathology. Other studies might take as their focus evaluation of the effectiveness of toileting programs, identification of patients who fall out of the "expected" incontinence pattern and therefore may be candidates for a different treatment modality, or "effective strategies to improve knowledge about and attitudes toward

urinary incontinence." (Ouslander, 1985, P. 190). Since the IMR is relatively new, future studies should also report reliability measures.

### RECOMMENDATIONS

Suggestions for using the IMR in practice include: 1. Gather data on a continuous basis in order to observe for changes in the patient's condition.

2. Work towards patient dryness and staff efficiency by timing opportunities to void correctly with an individual's particular pattern of incontinence.
3. Judge the type of incontinence undergarment most appropriate and cost effective based on the patient's pattern of incontinence.
4. Provide accountability for nursing assistants through use of the IMR.

Suggestions for research using the IMR include:

1. Avoid the use of greasy substances such as bagbalm or A&D ointment during data collection in order to decrease the difficulty of differentiating between the categories of DRY and SMALL.
2. Improve usefulness and clarity of the column termed "VOIDED CORRECTLY" by replacing it with two columns using the descriptive labels of "toileted successfully" and "toileted unsuccessfully".

3. Replicate the study with a similar population group and larger sample size.
4. Replicate the study using a longer time frame.
5. Replicate the study with a population of nursing home patients whose incontinence does not correspond with dementia.
6. Test the IMR's usefulness outside of a nursing home setting.
7. Measure staff attitude towards incontinence before and after the in-service program.
8. Measure patient's quality of life before and after care modifications based on data from the IMR.

Finally, it is recommended that the IMR be put to use in the clinical setting as a means of assessing incontinence to facilitate planning of care specific to individuals. The testing of interventions for positive change in incontinency management is needed. Basic to this is a means of accurate and comprehensive assessment before and after treatment interventions are instigated; assessment that could be done through use of the IMR.

#### SUMMARY

Tools for assessing incontinence have not been well developed and tested. The development of an incontinence monitoring tool that can be used by nursing assistants is



particularly needed to increase possibilities of studying incontinence in nursing homes. The purpose of this study was to test the Incontinence Monitoring Record as an assessment tool for incontinence in a nursing home.

The conclusion drawn from study was that objective data about time, frequency, and amount of incontinence can be obtained by nursing assistants using the Incontinence Monitoring Record with a select group of nursing home patients. Raters, after receiving adequate training about use of the IMR, are able to use the tool appropriately and achieve interrater reliability of 80% or more. Further research is needed to confirm the finding of this study and evaluate the usefulness of the tool in other populations.

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**APPENDIX I**

# INCONTINENCE MONITORING RECORD

INSTRUCTIONS: EACH TIME THE PATIENT IS CHECKED:

- 1) Mark *one* of the circles in the BLADDER section at the hour closest to the time the patient is checked.
- 2) Make an X in the BOWEL section if the patient has had an incontinent or normal bowel movement.

 = Incontinent, small amount

 = Dry

X = Incontinent BOWEL

 = Incontinent, large amount

 = Voided correctly

X = Normal BOWEL

PATIENT NAME \_\_\_\_\_ ROOM # \_\_\_\_\_ DATE \_\_\_\_\_

## BLADDER

## BOWEL

	INCONTINENT OF URINE	DRY	VOIDED CORRECTLY	INCONTINENT X	NORMAL X	INITIALS	COMMENTS
12 am	<input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/> cc _____				
1	<input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/> cc _____				
2	<input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/> cc _____				
3	<input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/> cc _____				
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11	<input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/> cc _____				
12 pm	<input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/> cc _____				
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10	<input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/> cc _____				
11	<input type="radio"/> <input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/> cc _____				

TOTALS:

**APPENDIX II**



LOYOLA UNIVERSITY OF CHICAGO  
 INSTITUTIONAL REVIEW BOARD FOR PROTECTION  
 OF HUMAN SUBJECTS — MEDICAL CENTER

2160 South First Avenue, Maywood, Illinois 60153.

Robert E. Herkin, M.D.  
 Chairman  
 831-3777

George S. McAloon, R.Ph.  
 Vice Chairman  
 831-3878

Susan E. Rekas  
 Administrative Secretary  
 831-4608

June 19, 1987

Janis Miller  
 4218 S. Maple  
 Stickney, Illinois 60402

Re: "Recognizing Patterns of Incontinence through use of the Incontinence  
 Monitoring Record."  
 IRB# 6/87-4d

Dear Ms. Miller:

At its meeting of June 17, 1987, the Institutional Review Board for the  
 Protection of Human Subjects reviewed the above-captioned protocol.

The study submitted does not require an Informed Consent document since  
 you are quantifying nursing observations normally made in the routine  
 care of the nursing home patients.

Via Expedited Review, the Board approved this low-risk nursing study.

You now have full IRB approval to proceed with your research project  
 and have been assigned the IRB number indicated above.

If you should have any questions or possible future changes with regard  
 to the study, please do not hesitate to contact us.

Yours truly,

Kenneth C. Micetich, M.D., Acting Chairman  
 Institutional Review Board for the  
 Protection of Human Subjects - Medical Center

KCM/s

cc: IRBPHS Members  
 IRBPHS file



Loyola University of Chicago  
Niehoff School of Nursing  
Chicago, Illinois

AGENCY PERMISSION FOR CONDUCTING STUDY

Meadows Mennonite Home grants permission to Janis Miller, a student enrolled in a program leading to a Master of Science in Nursing at Loyola University, the privilege of its facilities in order to study the following problem:

RECOGNIZING PATTERNS OF INCONTINENCE THROUGH USE OF THE INCONTINENCE MONITORING RECORD

The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final report of the study.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report of the study.
3. The agency (wants) (does not want) a conference with the student when the report is completed.

Date 6/8/87

Catherine Berry  
Administrator

Date 6/8/87

Janis M. Miller  
Graduate Student

**APPENDIX III**

## APPENDIX III

IN-SERVICE PROGRAM OUTLINE

## I. Introduction

## A. Why research on incontinence?

1. Prevalence of the problem.
2. Agony of the problem--cost and likelihood of institutionalization.
3. Absence of research up until recently.

## B. Why conduct the research at Meadows Mennonite Home?

1. Staff understand the severity of incontinence and have insights about it.
2. Desire to conduct the research where the problem is being dealt with on a daily basis.

## II. Background information.

## A. Theoretical framework--provides the basis for formulating the study.

1. Normal physiology of micturition.
  - a. The detrusor muscle.
  - b. The sphincters.
  - c. Neurological controls--voluntary and involuntary.
  - d. Demonstration of normal micturition through a balloon model.
2. Pathophysiology of micturition.

- a. Stress incontinence.
  1. Definition.
  2. Possible causes.
  3. Typical incontinence pattern.
  4. Possibilities of treatment and management.
- b. Detrusor instability.
  1. Definition.
  2. Possible causes.
  3. Typical incontinence pattern.
  4. Possibilities of treatment and management.
- c. Overflow incontinence.
  1. Definition.
  2. Possible causes.
  3. Typical incontinence pattern.
  4. Possibilities of treatment and management.
- d. Functional incontinence.
  1. Definition.
  2. Possible causes.
  3. Typical incontinence pattern.
  4. Possibilities of treatment and management.
- e. Demonstrations, using balloon models, of the various types of urinary incontinence.

III. Problematic areas in monitoring incontinence patterns.

- A. People often do not actually know when they are wet, particularly those who are confused.
- B. Difficulty of objectively assessing time, frequency, and amount.
- C. Lack of research on incontinence monitoring tools.
- D. Question of interrater reliability.

IV. Introduction and instruction on use of the Incontinence Monitoring Record.

- A. Disregard the bowel portion.
- B. Explanation of the VOIDED CORRECTLY column.
  - 1. Means they urinated in the toilet, commode, or bedpan.
  - 2. May be marked in combination with a marking on the SMALL or LARGE incontinence column if the patient was found to be wet at the check but also voided correctly during this same check when offered the opportunity.
- C. Explanation of the SMALL and LARGE columns.
  - 1. SMALL means less than 50cc and implies leakage or incomplete bladder emptying.
  - 2. LARGE means more than 50cc and implies total emptying of the bladder.
  - 3. Demonstration of the difference between SMALL and LARGE using 50cc of colored water on incontinence undergarments.

V. Interrater reliability.

A. General explanation of interrater reliability training.

B. Specific explanation of interrater reliability training for this study.

C. Time out for people to mark IMR's after assessing soiled undergarments.

VI. Instructions to begin data collection.

A. Mark the IMR every two hours.

B. Data collection to begin immediately after the in-service program and continue for 10 days.

Date: Thursday, July 16, 1987

Time: 1:45-2:45 Nurses and Nurse Aides... 1:45-3:15 Nurses

Subject: "Incontinence Patterns of the Elderly" and Inspection Results

Resource Persons: Janis M. Miller RN, BSN and Cathy Beery, Administrator

Nurse Aide Recognition - Mary Kauffman introduced and recognized Betty Clark CNA, Linda Sullivan CNA, and June Moser CNA for successful completion of the Advanced Nurse Aide Class. Not present but also receiving certificates and pins were Benita Stevens, Pat Backlund, Gloria Burnias, and Sandi Kauffman.

Janis Miller was introduced. She gave a presentation on "Incontinence Patterns of the Elderly" with a demonstration using balloons to show how the bladder functions and the problems that arise with aging. She is presently doing a research study on these problems for a thesis for her Master's Degree at Loyola University, Chicago.

Janis gave as her reasons for studying incontinence:

- 1) Not much effective research has been done in this area;
- 2) The cost for disposable undergarments for the elderly is over

\$8,000,000,000.

What is incontinence?

a) physiology - As the bladder fills it triggers the upper bladder wall to contract. This puts pressure on the bladder neck muscles (called the internal sphincter). The internal sphincter responds by opening. The urine lets down and puts pressure on the second set of muscles (the external sphincter). It responds to the pressure by sending messages to the brain that the bladder needs to be emptied.

b) Uninhibited bladder - the bladder wall contracts too strongly and it empties all at once without control.

c) Stress incontinence - the external sphincter muscle is lazy and does not respond properly causing dribbling. (Also called "giggling incontinence!")

d) Overflow incontinence - the bladder is too full and leaks out causing dribbling. Sometimes a blockage causes this problem. Sometimes the upper bladder wall muscle loses power to contract and push the urine out.

e) Functional bladder - the bladder works normally but the brain signal does not function properly in signaling the person it is time to find a proper place to empty the bladder.

Patterns of Incontinence:

- 1) Either very wet--or dry
- 2) Some dribbling, but able to completely empty bladder
- 3) Dribbling and cannot completely empty bladder
- 4) Able to control bladder and empty if taken to the toilet in time.
- 5) Mixed causes

Treatments for Incontinence vary, for example:

For #1 - Toilet at least every four hours

For #2 - Practice pelvic floor exercises to strengthen sphincter muscle

For #3 - REmove blockage if possible

For #4 - Toilet every two hours, regularly

For #5 - Try to find the causes

Information Needed to assess the pattern of incontinence

Timing - a.m., noon, or p.m.

Nursing Staff Meeting, July 16, 1987 - 2

Frequency - during 24 hour period  
Amount - large or small

At the end of this part of the inservice all inservice participants evaluated individually incontinent garments or pads to decide whether they showed evidence of large or small amounts of incontinence. There was 83% agreement on the evaluation.

Twelve residents have been chosen for the incontinence patterns research. Nurse aides will check these residents every two hours and mark what they find on the form provided posted in the resident's room. Janis will collect the forms and post new ones daily. The research will extend for eleven days. Data will be compiled and evaluated at the end of the eleven days. One of the goals of the research is at least 80% agreement on the differentiation between small and large amounts of incontinence.

Ruth M. Miller  
Recording Secretary

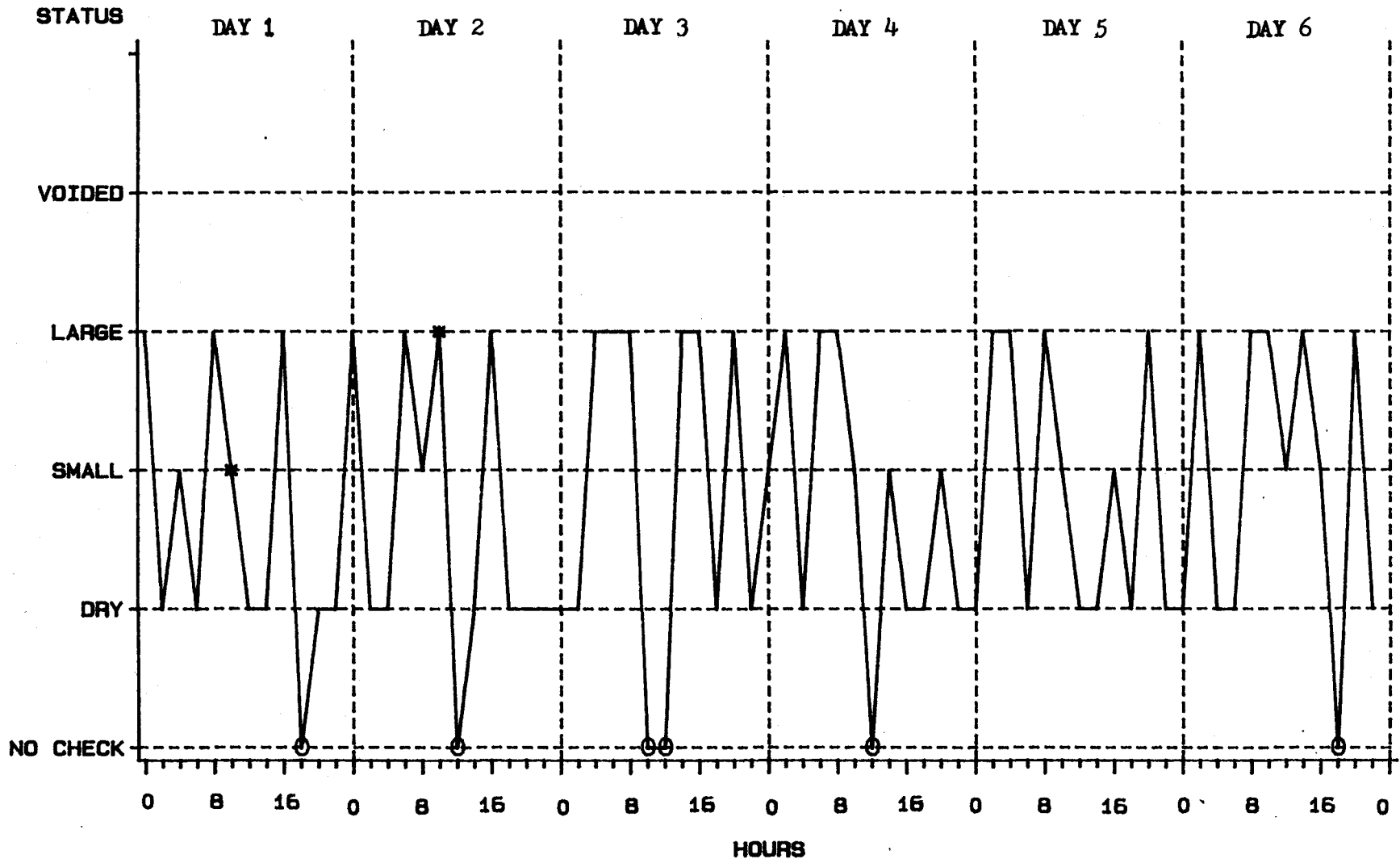


**APPENDIX IV**

# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

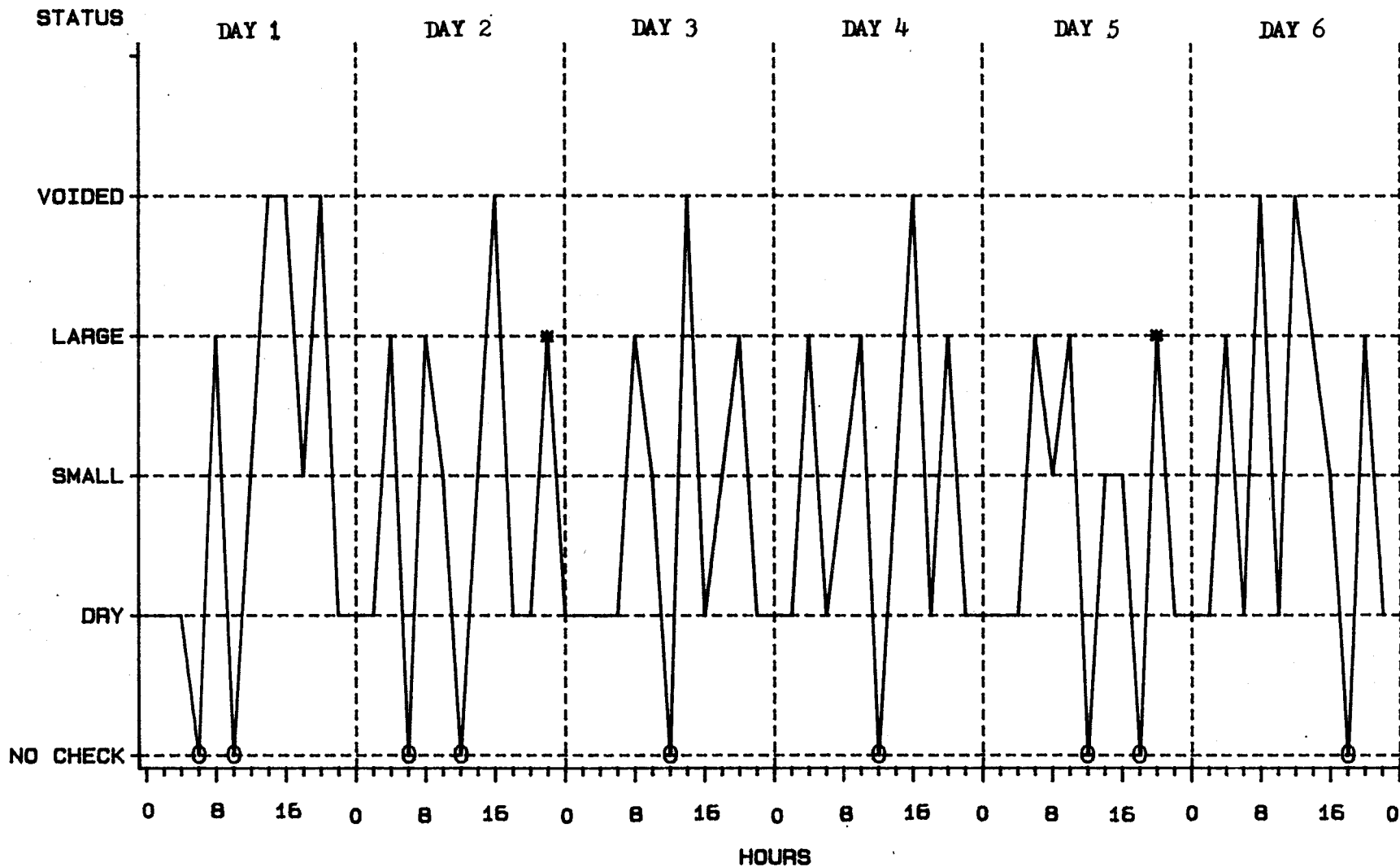
PATIENT-1



# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

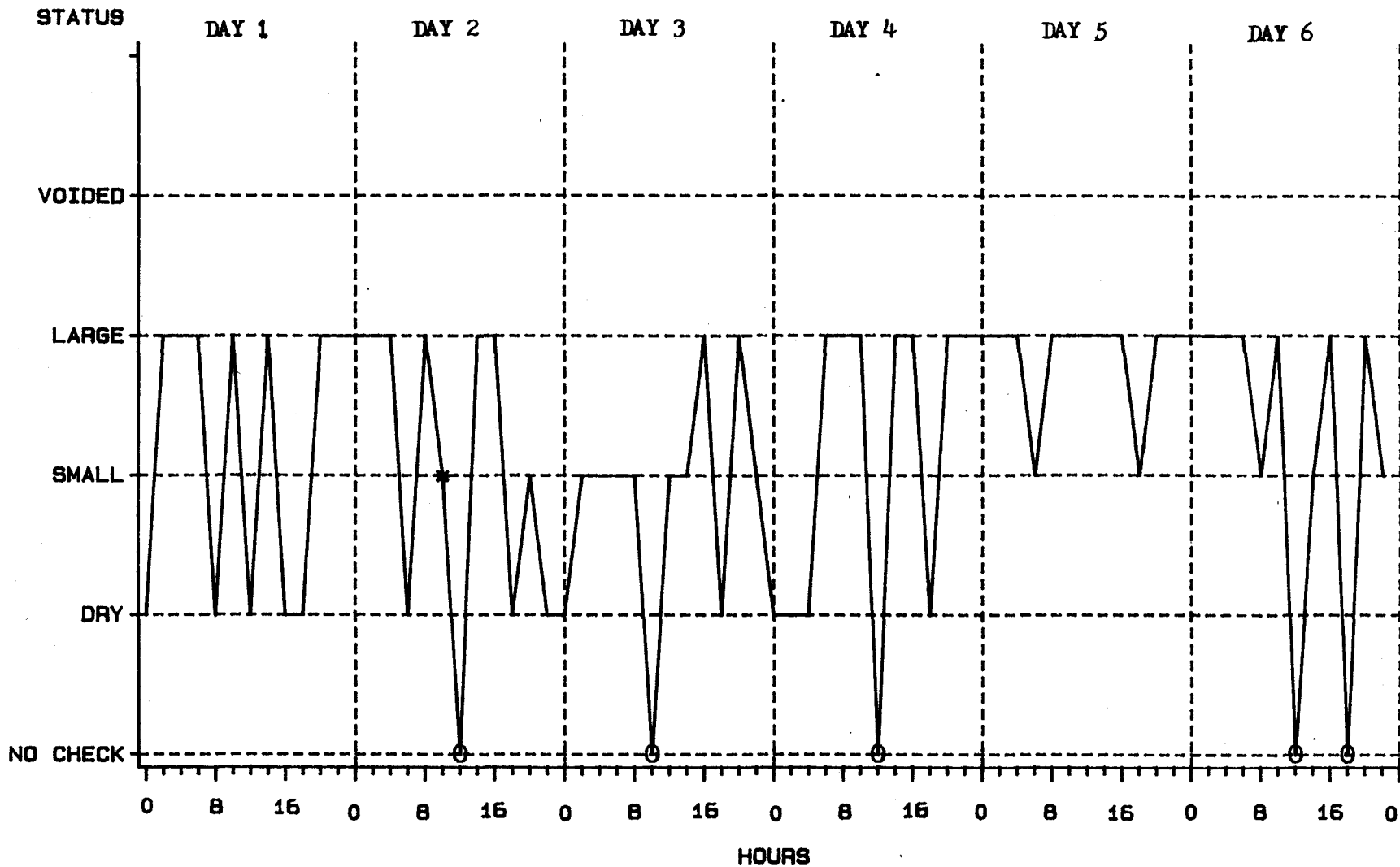
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# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

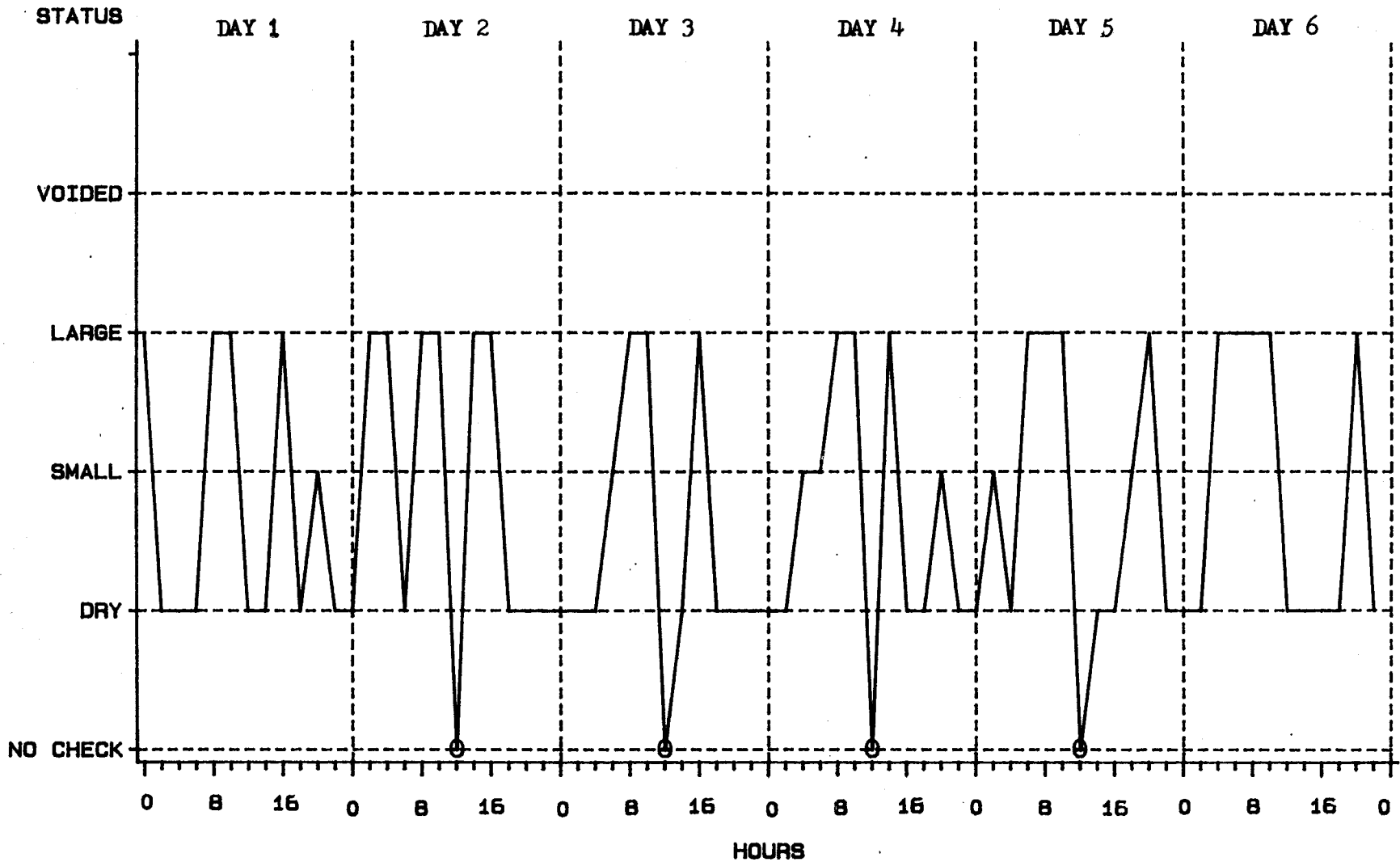
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# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

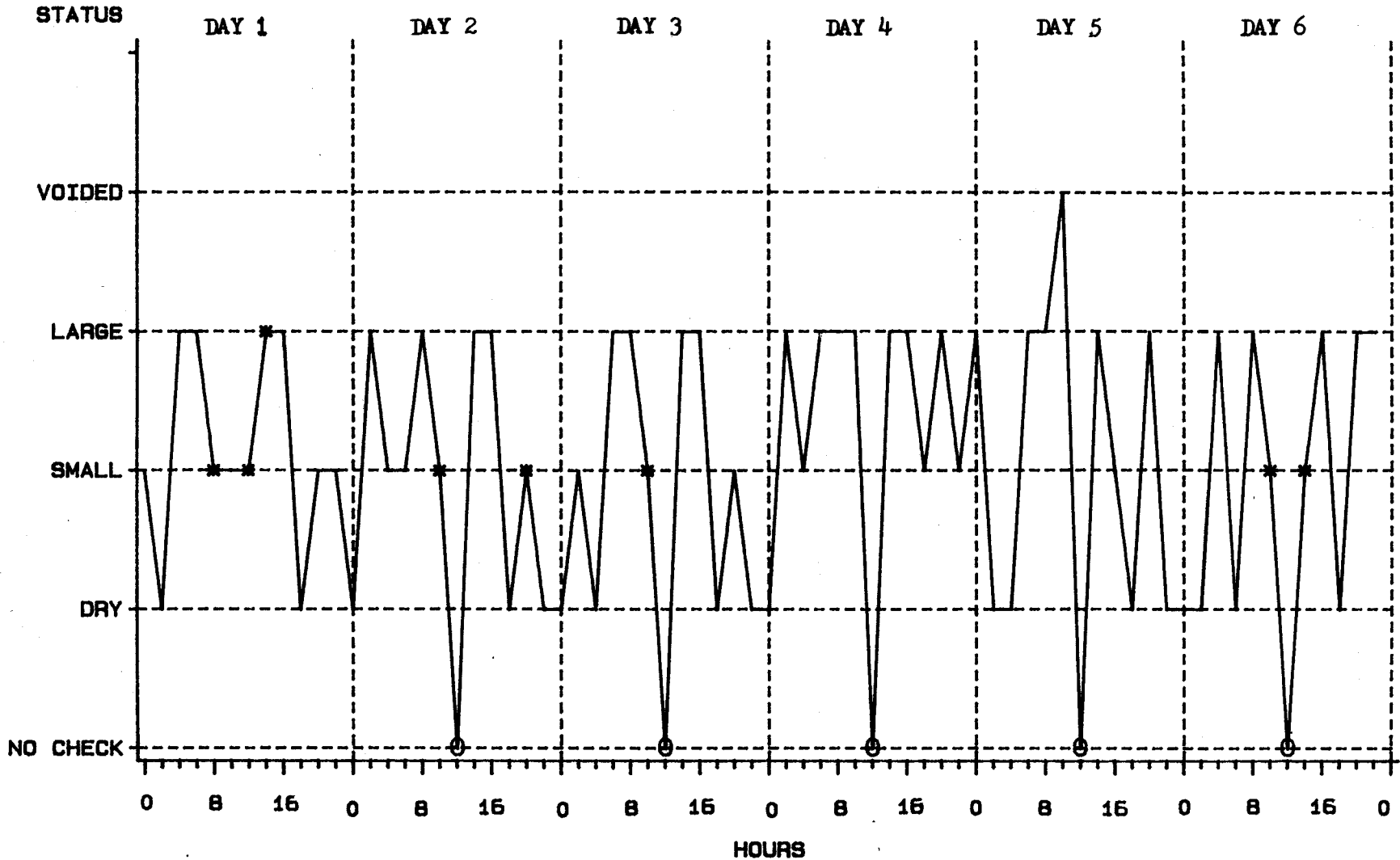
PATIENT-4



# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

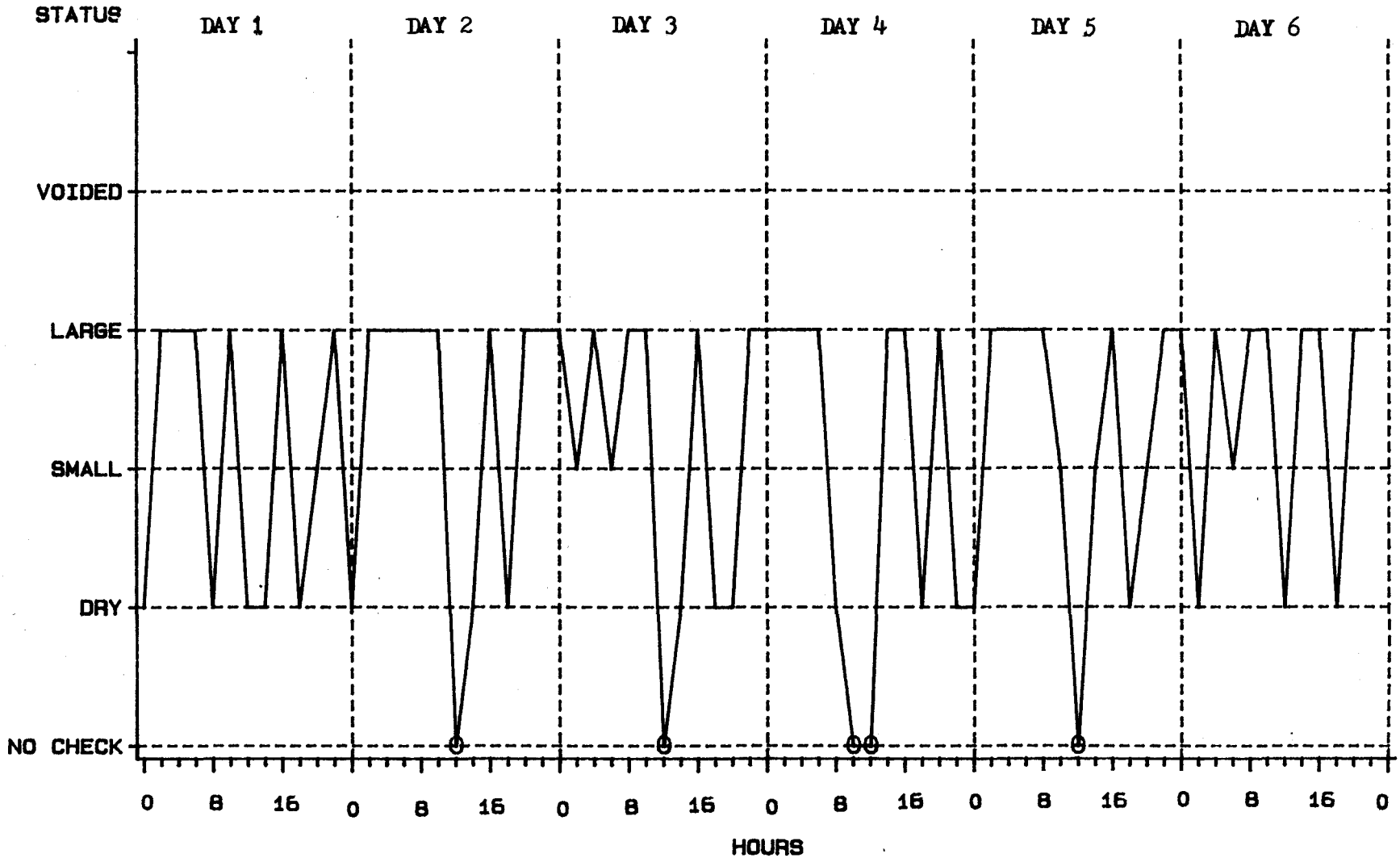
PATIENT-5



# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

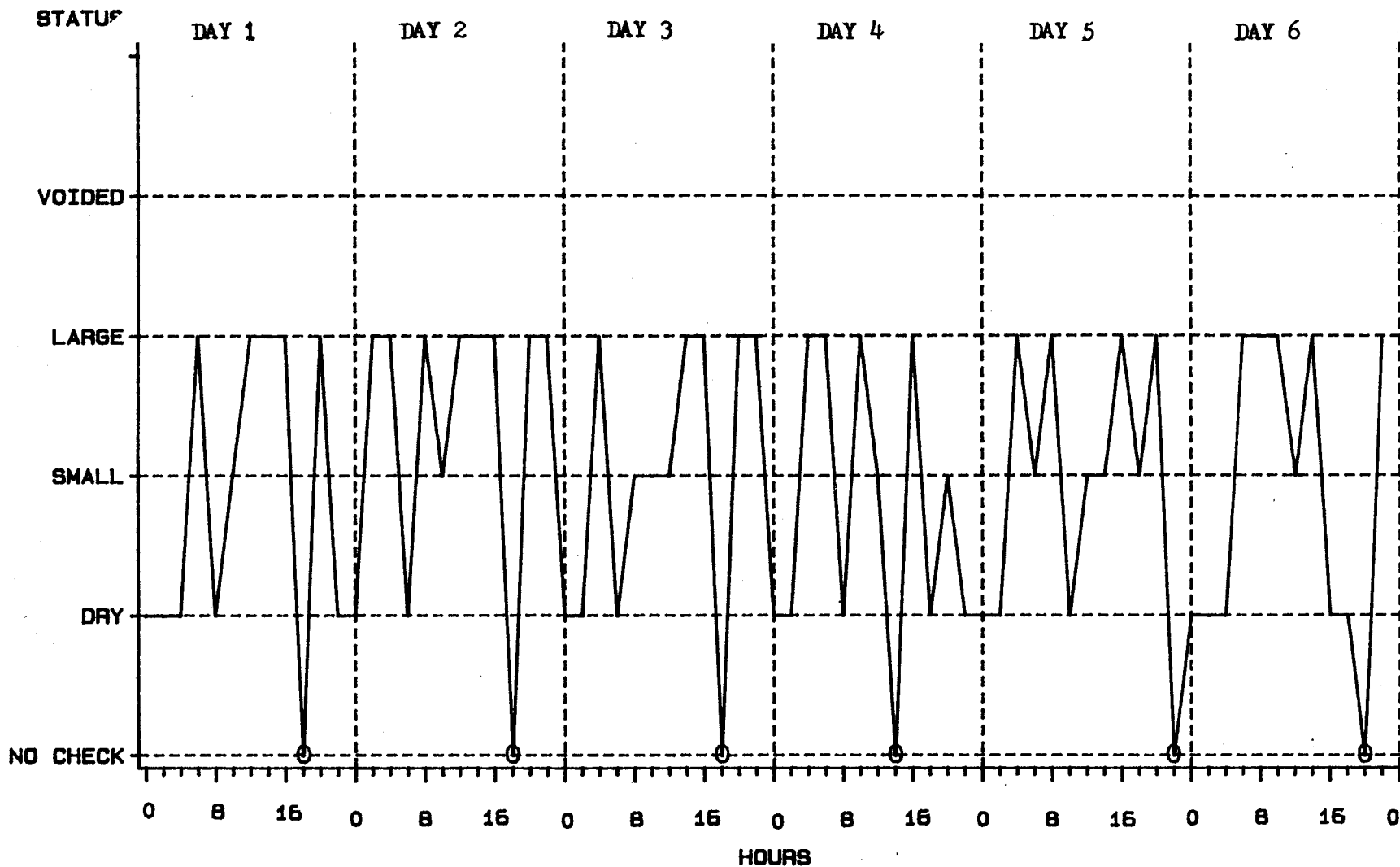
PATIENT-8



# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

PATIENT-7

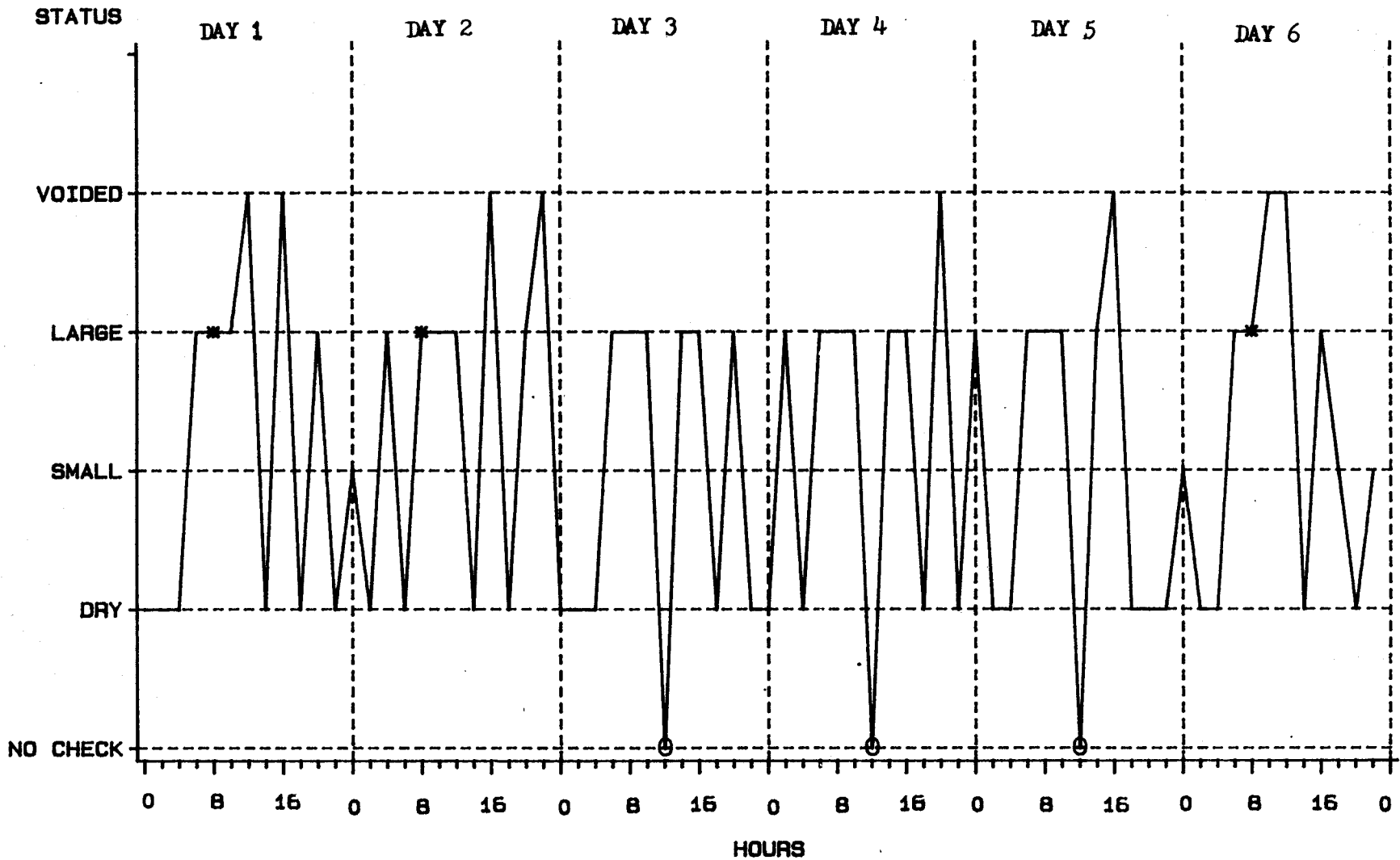




# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

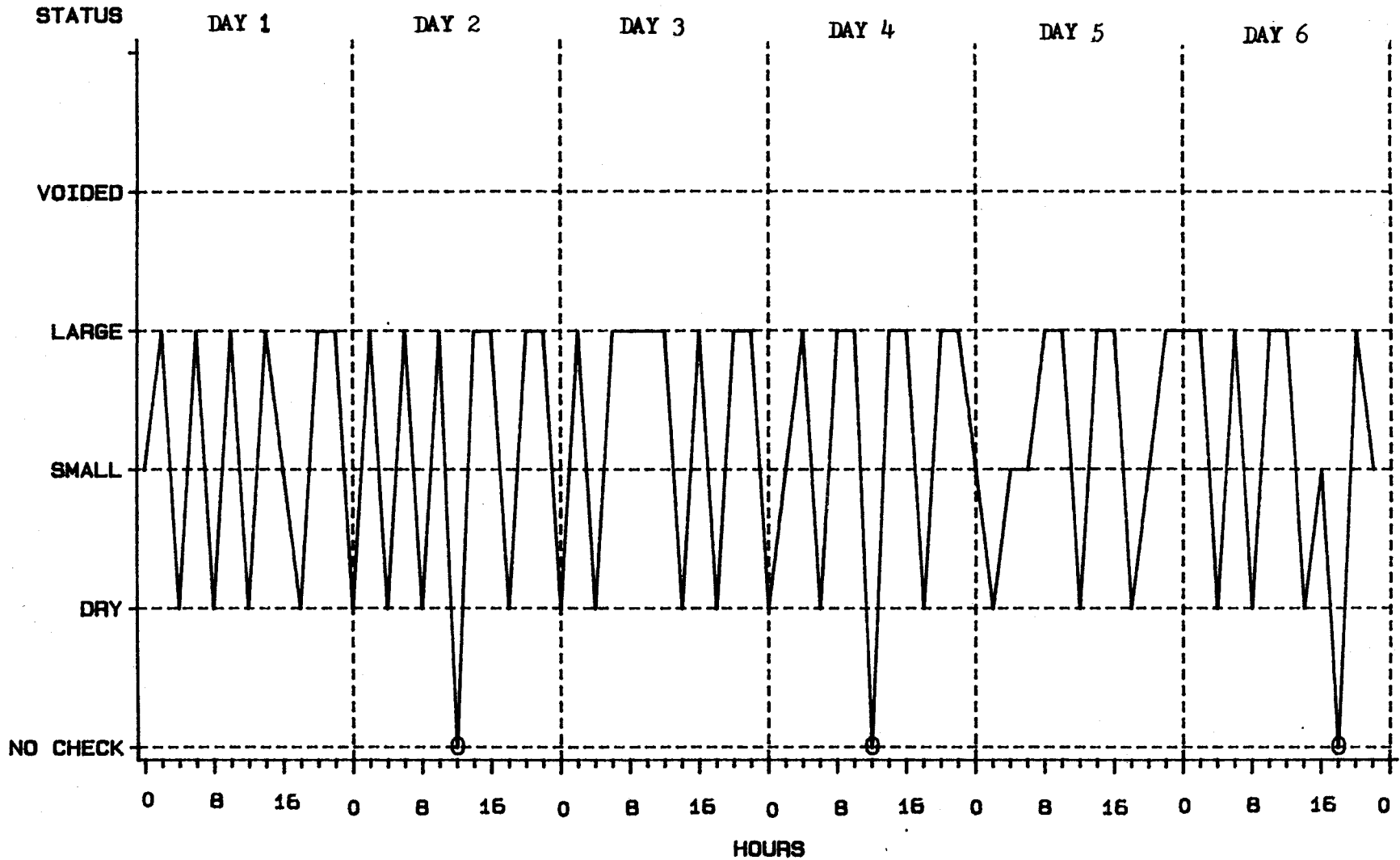
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# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

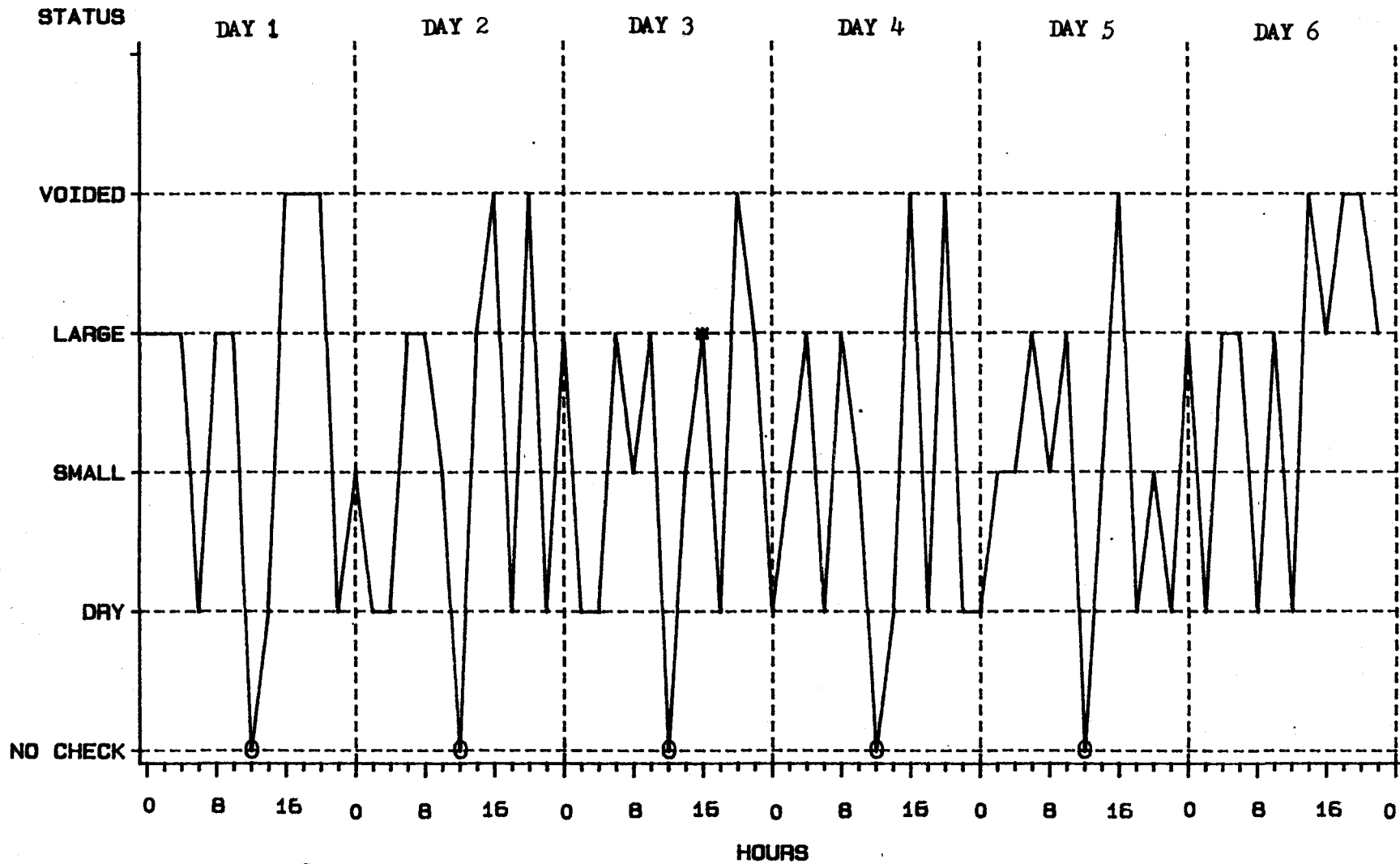
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# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

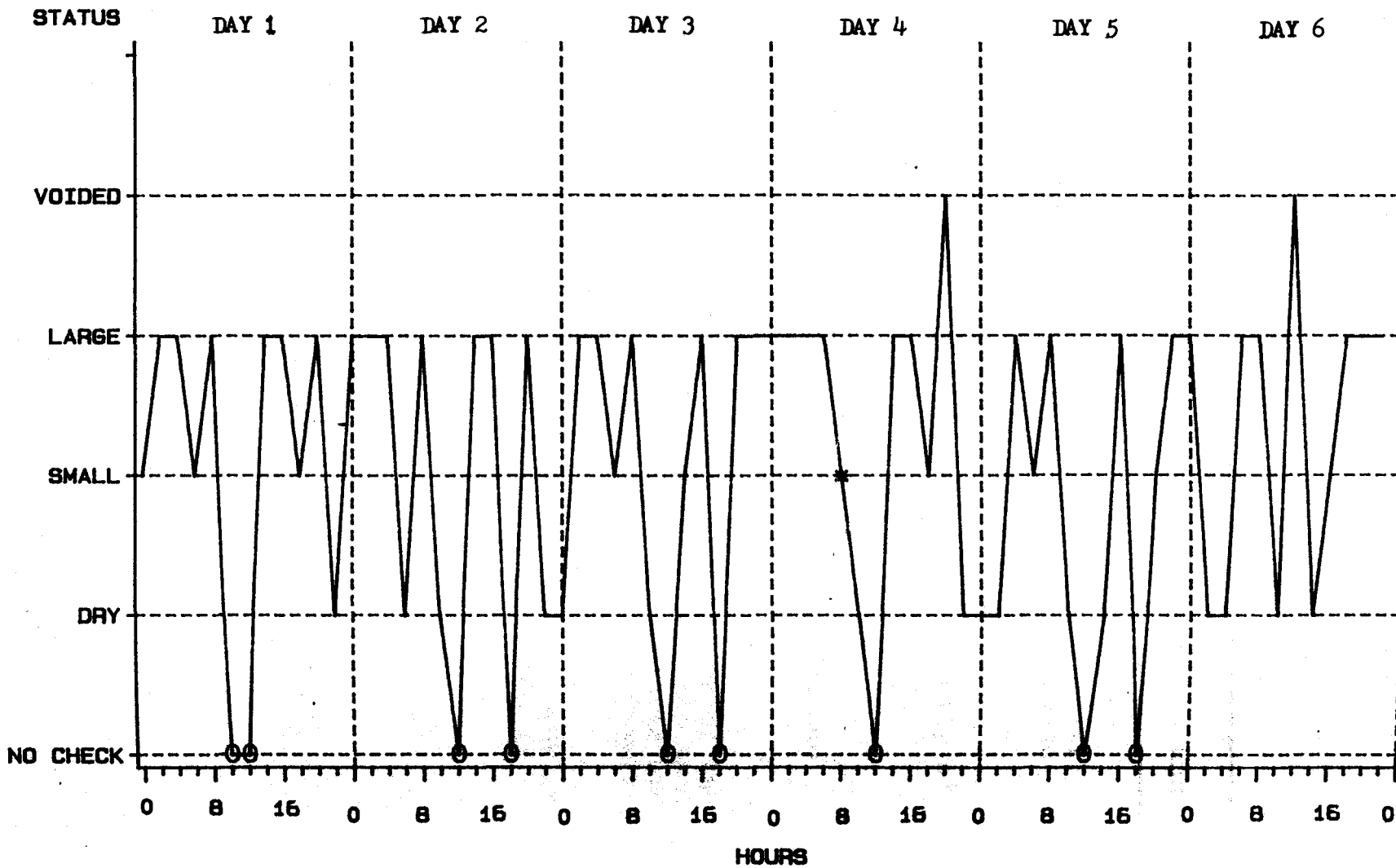
PATIENT=10



# Patterns of Incontinence over Time

\* = Incontinence Combined with Voided Correctly

PATIENT-11



APPROVAL SHEET

The thesis submitted by Janis M. Miller has been read and approved by the following committee:

Claudette Varricchio, D.S.N., Director, Associate Professor, Nursing, Loyola University of Chicago

JoAnn Hungelmann, D.Sc., Associate Professor, Nursing, Loyola University of Chicago

Rosanne Perez-Woods, Ed.D., Professor, Nursing, Loyola University of Chicago

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Science in Nursing.

12-9-87  
Date

Claudette Varricchio, R.N. D.S.N.  
Director's Signature