Urinary Incontinence

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Urinary incontinence is a common disorder and various estimates have indicated that many more people experience the problem than was previously recognised. For the individual or the relatives, incontinence imposes a demoralising and debilitating condition; any attempt by the individual to participate in normal social activities can be severely restricted. For the doctor, incontinence is a symptom demanding an accurate diagnosis of the cause. This traditional approach may lead the patient to one or more specialist departments, yet not one of these may have the necessary experience to give practical advice on the management of this distressing condition. A comprehensive service, tailored to the needs of the individual patient, is required for that purpose.

Two complementary factors have raised pertinent questions regarding the management of incontinence. First, the emphasis on disability instigated a number of epidemiological studies that identified the high incidence of incontinence among impaired and handicapped people. Second, the advent of electromanometry in the evaluation of lower urinary tract disorders has introduced new concepts about the pathophysiology of incontinence. The combined effect of these studies has given a considerable stimulus to establishing a more rational approach to the management of the problem, with which the development of a coherent service can be formulated.

Epidemiology of Urinary Incontinence

Urinary incontinence affects all age groups from infancy to old age. Normal healthy individuals may experience an occasional episode of urinary loss. One report[1] showed a 32 per cent incidence of stress incontinence among 1,300 college girls, including 5 per cent who experienced the problem regularly. A similar study[2] on 4,211 young healthy nulliparous nursing students showed that 50.7 per cent had some degree of stress incontinence and 16.7 per cent of them noted a daily incidence. None of them had sought medical advice either because of embarrassment or because they did not think their problem was abnormal.

In a prevalence study on incontinence, Thomas et al.[3] sought to identify the number of incontinent patients recognised by the Health and Social Service agencies in two London boroughs, and to discover the number of unrecognised cases by means of a postal questionnaire to 22,430 people aged five years and over on the practice lists of 12 general practitioners. The results showed the wide disparity between the recognised and unrecognised groups. In women (Table 1), 2.5 per cent over the age of 65 were recognised as being incontinent by the Health and Social Service agencies, whereas 11.6 per cent were identified by the postal survey. Similarly, among the men (Table 2), 1.3 per cent of those over 65 were recognised and 6.9 per cent were unrecognised. The report concluded that many cases of urinary incontinence were unrecognised and that there might be considerable scope for improving its management.

Other reports have demonstrated a similar prevalence among the elderly population. Brocklehurst et al.[4] found that 23 per cent of women over the age of 65 experienced incontinence.

Table 1. Urinary incontinence—prevalence in women.

| Age Group | Recognised % | Unrecognised % |
|-----------|--------------|----------------|
| 15-64 years | 0.2          | 8.5            |
| 65 years + | 2.5          | 11.6           |

Table 2. Urinary incontinence—prevalence in men.

| Age Group | Recognised % | Unrecognised % |
|-----------|--------------|----------------|
| 15-64 years | 0.1          | 1.6            |
| 65 years + | 1.3          | 6.8            |

Urinary Incontinence and Disability

The Chronically Sick & Disabled Persons Act of 1970 placed an obligation on local authorities to inform themselves of the number of disabled persons and their needs and to take steps to meet those needs. Incontinence is not
classified as a disability and thus any estimate of the number of disabled persons with incontinence can only be speculative. One of the needs would involve an effective and efficient incontinence service, but to plan this some assessment of the size of the problem would be required.

A survey of the handicapped and impaired in Great Britain[5] estimated that there were just over 3,000,000 people aged 16 or over living in private households who had some physical, mental or sensory impairment. Of these, about 14 million were men and just over 12 million women. At least 50 per cent of the men and 66 per cent of the women were aged 65 or over, so on the basis of the evidence in the epidemiological reports already mentioned, incontinence would be expected to be an additional burden.

The prevalence rate of certain specific diseases causing impairment or handicap is shown in Table 3[6]. Disturbances of bladder control are common in patients with mental subnormality, multiple sclerosis, Parkinson’s disease and spina bifida and following cerebrovascular accidents.

A study[7] of 297 patients with multiple sclerosis demonstrated that 78 per cent had experienced bladder symptoms at some time. Sixty per cent had urgency of micturition, often associated with frequency, urge incontinence and hesitancy. Urge incontinence, found in 36 per cent, was a term that covered at one extreme those who experienced urgency with potential leakage and, at the other, urgency with precipitancy and almost complete bladder emptying; unconscious incontinence was reported in 10 per cent.

An investigation[8] of the management of urinary incontinence in 50 patients with multiple sclerosis (Table 4) showed that many of the patients were not being made aware of more beneficial methods of management. Suggestions for improving the management of their incontinence were made to 33 of the 50 patients. Baldwin[9] stressed the high proportion of children with disabilities who are brought up by their families at home, and quoted an estimate that 90 per cent of severely physically and mentally handicapped children live at home. Her report paid particular attention to the physical and financial burden of incontinence to such families, and the variable quality of the service provided by the Area Health Authorities and Social Service departments.

The cost of managing incontinence to the families of 75 severely handicapped were studied by Townsend et al.[10]. The diagnoses in the survey were severe mental handicap in 60 per cent, spina bifida in 13 per cent, cerebral palsy in 12 per cent and other conditions 15 per cent. On average, mothers spent 10 hours a week dealing specifically with incontinence. Although attendance allowance (for those receiving it) covered a proportion of the costs, it was estimated that expenditure averaging more than £7 a week went uncompensated.

Twenty-five per cent of nursing time on a geriatric ward is spent specifically on the management of the incontinent patients[11]; the high proportion of patients with cerebrovascular disease and brain loss of one type or another necessitates palliative measures with suitable appliances rather than operative treatment. In 1976 Willington[12] estimated that 120 million underpads per annum were used in the Health Service in the UK at a cost of about £4,000,000, and Frost and Sullivan[13] considered the current UK market for incontinence pads and appliances to be of the order of £12,000,000.

### Evaluation of Urinary Incontinence

The study of lower urinary tract function by means of pressure and flow studies has been called urodynamic investigation. Urinary incontinence occurs when the pressure within the urinary bladder rises above the pressure maintaining urethral closure. In normal circumstances the bladder fills at a low intravesical pressure of less than 15 cm of water, and the maximum urethral pressure at the level of the external sphincter muscles between 45 and 65 cm of water. The balance between the activity of the detrusor muscle of the bladder and the urethral sphincter muscles is maintained and co-ordinated by a complex reflex mechanism involving local and central nervous pathways. During bladder filling, detrusor contractions are inhibited and during voiding detrusor contraction is associated with urethral sphincter relaxation until complete bladder emptying has occurred.

These mechanisms can be evaluated objectively by urodynamic investigations. The specific tests include cystometry with recording of the bladder pressures during filling and voiding, measurement of urethral pressures and urine flow rate. By combining these studies with a synchronous radiological display of the lower urinary tract during bladder filling and voiding, and a record of the electromyographic activity, a full picture of lower urinary tract function or dysfunction can be constructed. Detrusor activity may be normal, over-active or under-active, and urethral pressures may be normal, over-active or incompetent. The balance between the detrusor and the urethral sphincter mechanisms can also be demonstrated and evidence of dysynergia between the detrusor and the bladder neck or the external urethral sphincter mechanisms can be recognised.

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Table 3. Cause of impairment or handicap in Great Britain. Prevalence rates per 1,000 population aged 16 and over.

| Condition                      | Prevalence Rate per 1,000 |
|-------------------------------|---------------------------|
| Mental subnormality           | 0.7                       |
| Cerebral haemorrhage          | 3.3                       |
| Multiple sclerosis            | 0.6                       |
| Parkinson's disease           | 0.6                       |
| Spina bifida                  | 0.04                      |

Table 4. Urinary incontinence management in multiple sclerosis.

| Measure         | Percentage |
|-----------------|------------|
| Catheter        | 16         |
| Appliance       | 2          |
| Pads and pants  | 16         |
| Sanitary towels | 4          |
| None            | 12         |
| Total           | 50         |
The formation of the International Continence Society in 1971 at Exeter initiated considerable interest in this field. A special committee of the society has standardised the terminology and definitions used in urodynamic studies. Urinary incontinence was defined as 'a condition in which involuntary loss of urine is a social or hygienic problem and is objectively demonstrable' [14]. Four types of urinary incontinence were described.

1. **Stress incontinence** is the involuntary loss of urine that occurs when the intravesical pressure exceeds the maximum urethral pressure in the absence of detrusor activity.

2. **Urge incontinence** is the involuntary loss of urine associated with a strong desire to void. Urge incontinence may be subdivided into—
   (a) motor urge incontinence, which is associated with uninhibited detrusor contractions.
   (b) sensory urge incontinence which is not caused by uninhibited detrusor contractions.

3. **Reflex incontinence** is due to abnormal reflex activity in the spinal cord in the absence of sensation, usually associated with a desire to micturate.

4. **Overflow incontinence** is an involuntary loss of urine when intravesical pressure exceeds the maximum urethral pressure owing to an elevation of the intravesical pressure associated with bladder distension but in the absence of detrusor activity.

Bates [15] introduced the term 'the unstable bladder' to describe the occurrence of detrusor contractions during bladder filling that the patient is unable to inhibit. A rise of intrinsic bladder pressure during such a contraction may be greater than the urethral closure, and incontinence may result. Bladder instability may be evident in patients with and without overt neurological abnormalities. It has been demonstrated in patients who experience frequency, urgency and urge incontinence, and in many cases no demonstrable neurological deficiency can be found. Thomas et al. [16] reported on the association of bladder instability and minimal pyramidal diseases, thus suggesting a possible link between patients with bladder instability of overt neurological origin and those in whom no neurological disease had been identified. Thomas et al. [17] have also emphasised the value of these observations in the management of patients with spinal cord lesions. The maintenance of renal function is essential to the long-term survival of patients with spinal cord damage. With urodynamic investigations, dysfunctional voiding patterns can now be recognised and managed more rationally.

The establishment of a urodynamic unit in Bristol has attracted more than 6,000 referrals of patients with lower urinary tract symptoms during the past ten years. The majority of the patients experienced some degree of urinary incontinence. In an earlier report [18], 54 per cent of the men and 77 per cent of the women attending the unit were noted as having a problem with the management of urinary loss but fewer than 10 per cent in each group required any appliance or catheter. The type of incontinence experienced is shown in Table 5. The majority of the women had stress, stress and urge, or urge incontinence, whereas the men had urge incontinence, enuresis or a post-micturition dribble. Of the women, the majority were in the 45-49 year old age group; most of the men were 60-64 years old. Fewer than 5 per cent of the patients were noted to have an associated urinary tract infection.

Because of the growing demand for health care, particularly of the old, there is a need to develop a rational policy, based on objective data, for the assessment and selection of patients for appropriate treatment. Urodynamic investigations have introduced a new diagnostic approach to a wide range of lower urinary tract disorders and have become a routine service commitment in the assessment of patients, particularly those in whom the cause of dysfunction is uncertain.

### Table 5. Urinary incontinence.

| Type                  | Male | Female |
|-----------------------|------|--------|
| Stress                | 12   | 356    |
| Stress/urge           | 10   | 505    |
| Urge                  | 193  | 287    |
| Enuresis              | 139  | 140    |
| Post-micturition dribble | 159   | 15     |
| Continuous            | 48   | 119    |
| **Total**             | 561  | 1,422  |

Management of Urinary Incontinence

There are two major categories of patients with urinary incontinence, those with a potentially remediable, and those with an irremediable condition. In the former group, management consists of promoting continence and in the latter, of finding the most practical and efficient method of coping with the urinary loss. The amount of urinary leakage varies from an occasional episode of minor inconvenience and no physical handicap to the patient, to total and uncontrolled flooding; yet the patient's reaction to the problem may be inversely proportional to the measured quantity. Clinical examination may rapidly classify the patient as curable or incurable, but there are many cases in which the condition cannot be adequately assessed at a brief consultation. Furthermore, the degree of handicap is influenced by a number of factors that need to be considered. These include—

1. The lack of services to ameliorate the condition;
2. environmental factors;
3. social factors, and
4. psychological factors.

For many patients with minor yet distressing episodes of incontinence the problem looms less ominously when they discover that the condition can be ameliorated by simple conservative methods. Others can be helped to deal with environmental difficulties in the home; facilitating access to a toilet, the provision of a commode if mobility is restricted, the fitting of grab rails or adjusting the height of the toilet are all examples of practical help. The social factors include the loneliness of elderly persons and the feeling of ostracism created by the condition. Psychological states such as a sense of bereavement may be associated with the onset of incontinence.
Patients with a potentially remediable condition require a methodical and detailed assessment. The severity of incontinence can be estimated by asking the patient to chart the pattern of micturition, recording frequency, volume of urine voided, and any episodes of urinary leakage. Measurement of the urinary loss has been undertaken by means of the Uriilos nappy which records the volume in millilitres[19] but the test is not without practical difficulties. Routine clinical evaluation, including urine culture and radiology, may allow an initial classification into stress, urge or overflow incontinence, and appropriate treatment may be instituted. The value of intensive re-education of the pelvic floor muscles, using a perineometer to monitor the improvement in female patients with stress incontinence, can be of particular value[20]. The psychological aspects of urge incontinence have been recognised by Frewen[21] and bladder retraining regimes are used with considerable advantage. The indications for and details of the operative treatment of urinary incontinence are beyond the scope of this article but there has been a recent reappraisal of the indications for surgical intervention and the techniques of operation. Urodynamic studies, as a form of preoperative investigation, are essential if the pathophysiological abnormality is to be identified.

The irremediable group of patients is a major challenge to the Health and Social Services. Efficient organisation and co-ordination are required for the long-term management of patients with incurable urinary incontinence, who require: the provision of adequate supplies of pants, pads and appliances, the management of catheter care, and stoma care following urinary diversion.

Since Willington et al.[22] described the use of marsupial pants for urinary incontinence, a wide variety of these garments has become available. The choice of pants is an individual matter which should, ideally, be discussed and decided by the patient and an experienced nurse. Incontinence pads vary in their effectiveness and cost, and an efficient pad service is not universally provided in the community. The fitting and supply of incontinence appliances for male patients requires careful supervision by trained staff to prevent complications. Patients requiring these aids, or their families, can also be helped if a washing machine or an efficient laundry service can be provided by the Area Health and Local Authorities.

The decision to use a catheter for an individual patient usually necessitates careful supervision and life-long management by trained staff. Many complications can occur with long-term urethral catheterisation—urethritis, catheter blockage, extravasation and urinary leakage bypassing the catheter. Ferrie et al.[23] have emphasised the benefit to be derived from a staff specially trained to undertake catheter care in the community. They have also noted the advantage of intermittent, as opposed to continuous, drainage of the bladder. A regular change of catheter is essential. In recent years, intermittent non-sterile self-catheterisation has been advocated for certain groups of patients[24,25] particularly those with chronic neurological conditions such as multiple sclerosis and spina bifida. Careful tuition and supervision by a nurse trained in the technique are important if this method is to succeed. Finally, supra-pubic catheterisation provides an alternative method of bladder drainage and is of value to those patients who wish to remain sexually active.

Urinary diversion by means of an ileal or colonic conduit is used in carefully selected patients who have a reasonably good prognosis[26]. The need for close and continued supervision of these patients by trained personnel with experience of stoma care is now recognised. Stoma problems are not uncommon and direct access to a special department is a considerable advantage to the patient.

This brief outline of the management of urinary incontinence emphasises the need for trained medical and nursing staff to direct and co-ordinate the care of the patient. The subject embodies such a wide spectrum of disorders and methods of treatment that few clinicians or nurses can have sufficient experience of the subject. The final choice of method, however, must be tailored to the patient's individual needs. The appointment of a Research Nurse in the Urodynamic Unit in Bristol recog- nises the major contribution that a specialist nurse can make to the management of the incontinent patient. Most of the patients are women and they prefer to discuss this embarrassing condition with a nurse of their own sex. The nurse now undertakes a regular nursing clinic, giving advice on simple remedial pelvic floor exercises, and on bladder drill by charting and toilet training, as well as providing suitable garments and aids[27]. In selected cases she carries out a home assessment with a patient, noting any practical problems, or she may arrange a three to five day admission to hospital for assessment and observation. Social and psychological problems are exposed by this approach. The nurse has also played an active role in the education of medical students, nursing staff and home helps in the care and management of urinary incontinence. The liaison between the hospital and the community has also improved and community staff contact the specialist nurse for advice on a wide variety of the difficulties they experience. Finally, certain areas of market research have been undertaken on commercially available products, and improvements in design and manufacture of aids and appliances have been suggested.

Conclusions

A greater awareness of the social burden of urinary incontinence has arisen in recent years as a result of the emphasis placed on the care of the disabled. The results of epidemiological surveys emphasise the need to develop an improved standard of care for those suffering from urinary incontinence. In the past, the responsibility for the management of incontinence has been fragmented between many different departments, both in the hospital and in the community, and there has been a lack of adequate communication and liaison between the various sections of the Health Service. The development of urodynamic investigations has aroused considerable interest in the pathophysiology of incontinence and has provided a stimulus to improving its treatment. The
management of the incontinent patient requires good
team-work and liaison between clinicians, nursing staff,
physiotherapists and social workers, all of whom have
experience and a comprehensive knowledge of the many
problems urinary incontinence presents.

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References

1. Nemir, A. and Middleton, R. P. (1954) American Journal of Obstetrics
   and Gynaecology, 68, 1166.
2. Wolin, L. H. (1969) Journal of Urology, 101, 545.
3. Thomas, Thelma M., Plymat, Kay R., Blannin, Janet and Meade,
   T. W. (1980) British Medical Journal, 281, 1243.
4. Brocklehurst, J. C., Dillane, J. B., Griffiths, L. and Fry, J. (1968)
   Gerontologia Clinica, 10, 242.
5. Harris, A. I., Cox, E. and Smith, C. R. W. (1971) Handicapped and
   Impaired in Great Britain. O.P.C.S London: HMSO.
6. Knight, R. and Warren, M. D. (1978) Physically Disabled People
   Living at Home: A Study of Numbers and Needs. (No. 13.) London:
   HMSO.
7. Miller, H., Simpson, C. A. and Yeates, W. K. (1965) British
   Medical Journal, 1, 1263.
8. Thomas, Thelma M., Karran, O. D. and Meade, T. W. (1981)
   Journal of the Royal College of General Practitioners, 31, 296.
9. Baldwin, S. (1977) Disabled Children—Counting the Costs. The Dis-
   ability Alliance.
10. Townsend, J., Heng, L., Thomas, T., Egan, M. and Meade, T. W.
    (1981) Community Medicine, 3, 119.
11. Exton-Smith, A. N., Norton, D. and McLaren, R. (1962) An
    Investigation of Geriatric Nursing Problems in Hospital. London:
    National Corporation for the Care of Old People.
12. Willington, F. L. (ed) (1976) Incontinence in the Elderly. London:
    Academic Press.
13. Frost & Sullivan Inc. (1979) Urinary Incontinence in Europe. New
    York: Frost & Sullivan.
14. Bates, P., Bradley, W. E., Glen, E., Griffiths, D., Melchior, H.,
    Rowan, D., Sterling, A., Zinner, N. and Hald, T. (1979) Journal of
    Urology, 121, 551.
15. Bates, C. P. (1971) Annals of the Royal College of Surgeons, England, 49,
    18.
16. Thomas, D. G., Davies-Jones, G. A. B. and Clarke, S. J. (1980)
    British Journal of Urology, 52, 460.
17. Thomas, D. G., Smallwood, R. and Graham, D. (1975) ibid., 47,
    161.
18. Feneley, R. C. L., Shepherd, A. M., Powell, P. H. and Blannin,
    J. (1979) ibid., 51, 493.
19. Stanton, S. L. and Ritchie, D. (1977) American Journal of Obstetrics &
   Gynaecology, 128, 461.
20. Kegel, A. H. (1951) Journal of the American Medical Association, 146,
    915.
21. Frewen, W. K. (1978) British Journal of Urology, 50, 246.
22. Willington, F. L. (1973) British Medical Journal, 3, 626.
23. Ferrie, G., Glen, E. S. and Hunter, B. (1979) ibid., 2, 1046.
24. Lapides, J., Diokno, A. C., Silber, S. J. and Lowe, B. S. (1972)
   Journal of Urology, 107, 458.
25. Withycombe, J., Whitaker, R. and Hunt, G. (1978) Lancet, 2, 981.
26. Desmond, A. D. and Shuttleworth, K. E. D. (1977) British Journal of
   Urology, 49, 495.
27. Blannin, Janet (1980) Nursing Times, 76, 1015.