

PREVALENCE OF URINARY SYMPTOMS IN WOMEN AND THEIR  
MANAGEMENT IN GENERAL PRACTICE, WITH PARTICULAR  
REFERENCE TO INCONTINENCE.

A thesis submitted to the University of Leicester for the degree of  
Doctor of Medicine

by

Dr. Jacqueline Victoria Jolleys

M.B. Ch. B (Bristol) B.A.(Open), M.R.C.G.P.

1992

UMI Number: U051178

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



UMI U051178

Published by ProQuest LLC 2015. Copyright in the Dissertation held by the Author.  
Microform Edition © ProQuest LLC.

All rights reserved. This work is protected against  
unauthorized copying under Title 17, United States Code.



ProQuest LLC  
789 East Eisenhower Parkway  
P.O. Box 1346  
Ann Arbor, MI 48106-1346



7501438662

X752258690

Fulfilling a lifetime's ambition.....

I dedicate this thesis to my husband, John,  
my children, Victoria, Catherine and Guy,  
and my parents. Thank you for bearing  
my preoccupation with patience.



Principiis obsta; sero medicina partura  
Cum mala per longas convaluere moras.

Stop it at the start, it's late for medicine to be  
prepared when disease has grown strong through  
long delays.

Remedia Amoris,91  
OVID 43 BC - AD 17

Sometimes these cogitations still amaze  
The troubled midnight and the noon's repose.

La Figlia Che Piange.  
T.S.Elliot 1888 - 1965

### Acknowledgements.

I am most grateful to the following for advice, encouragement and support: Professors R. C. Fraser and J. McVicar, Drs. C. Jagger, J. C. W. Jolleys, T. O'Dowd, A. Rashid, Messrs. R. Neuberg, R. Wakeford, Ms. C. Armitage, D. Clarke, J. Gentry, B. Hayes, S. Haydon, A. Heighton, A. Kitchener, P. Manno, J. Nelson, J. Wilson and Kabi - Pharmacia Pharmaceuticals Ltd.

### List of Tables.

- 2:1 Prevalence of urinary incontinence.
- 2:2 Prevalence of incontinence symptoms with age.
- 2:3 The relationship between symptoms and consulting the doctor.
- 2:4 Association between parity and incidence of urinary incontinence.
- 2:5 Relationship between nature of first delivery for patient ( with one pregnancy > 12 weeks ) and incontinence.
- 2:6 The relationship between previous vaginal sutures and the incidence of urinary incontinence.
- 2:7 Relationship between incontinence symptoms and pelvic floor exercises.
- 2:8 Comparison of incontinence symptoms between women who did and did not do pelvic floor exercises for less than 6 weeks and more than 6 weeks.
- 2:9 Prevalence of urinary symptoms in pre and post menopausal women.
- 2:10 Prevalence of incontinence in pre and post menopausal women.
- 2:11 Relationship between urinary incontinence and Gynae operations other than hysterectomy and repair.
- 3:1 Incidence of the three categories of incontinence for subjects and controls.
- 3:2 The reported onset of incontinence.
- 3:3 The parity of those reporting incontinence.
- 3:4 Reported outcome at 12 weeks for patients with stress, urge, or stress/urge incontinence.
- 3:5a The relationship between efficacy of the treatment for stress incontinence and age.

- 3:5b The relationship between efficacy of treatment for urge incontinence and age.
- 3:5c The relationship between results of treatment for stress and urge incontinence and age.
- 4:1 Reported prevalence of urinary symptoms in women in general practice during a two year period.
- 4:2 Reported prevalence of urinary symptoms, vaginal infections and urinary tract infections by age group.
- 4:3 The relationship between self - medication and social class.
- 5:1 The prevalence of urinary symptoms other than incontinence.
- 5:4 The relationship of menopausal status to urinary symptom prevalence.
- 5:6 The relationship between urethral syndrome and contraception.
- 5:7 The relationship between urethral syndrome and age.

### List of Figures.

- 1:1 Histogram to show the patients aged 0 - 34 years registered with the practice in 1987 and 1990.
- 1:2 Histogram to show the number of patients aged 35 - 74 years registered with the practice in 1987 and 1990.
- 1:3 Histogram to show the number of patients aged 75 years and over registered with the practice in 1987 and 1990.
- 1:4 Histogram displaying the age distribution of 0 - 34 year old females in the practice in 1987 and 1990.
- 1:5 Histogram showing the number of female patients aged 35 - 74 registered with the practice in 1987 and 1990.
- 1:6 Histogram to show the number of female patients over the age of 75 registered with the practice in 1987 and 1990.
- 1:7 Pie chart to show the age profile of the practice population in 1990.
- 1:8 Pie chart to show the age profile of the population of Leicestershire.
- 1:9 Pie chart to show the age profile for the population of Great Britain.
- 1:10 Pie chart to show the age distribution of females in the practice.
- 1:11 Pie chart to show the age distribution of females registered in Leicestershire.
- 1:12 Pie chart to show the age distribution for females in Great Britain.
- 1:13 Pie chart to show the social class distribution in the practice.
- 1:14 Pie chart to show the social class distribution in Charnwood.
- 1:15 Pie chart to show the social class distribution in Leicestershire.
- 1:16 Pie chart to show the social class distribution in Great Britain.

- 2:1 Prevalence of urinary incontinence.
- 2:2 Prevalence of urinary incontinence symptoms with age.
- 2:3 The relationship between previous vaginal sutures and the incidence of urinary incontinence.
- 2:4 The relationship of menopausal status to urinary symptom prevalence.
- 2:5 Relationship between urinary incontinence and Gynae. operations other than hysterectomy and repair.
- 3:1A Incidence of the three types of incontinence for subjects.
- 3:1B Incidence of the three types of incontinence for controls.
- 3:2A Reported onset of incontinence.
- 3:2B Women who could not recall the onset of incontinence.
- 3:2C The reported onset of incontinence.
- 3:3 The parity of those reporting incontinence.
- 3:4A Results of treating stress incontinence.
- 3:4B Results of treating urge incontinence.
- 3:4C Results of treating stress/urge incontinence.
- 5:1a The prevalence of urinary symptoms other than incontinence.
- 5:1b Reported prevalence of regular frequency and dysuria in women.
- 5:2 Change in reported symptom prevalence with time.
- 5:3 Relationship of sexual activity and frequency - dysuria syndrome.
- 5:4 Relationship of menopause to frequency - dysuria syndrome.
- 5:5 Relationship between parity and frequency - dysuria syndrome.
- 5:6a Relationship of contraception methods and frequency - dysuria syndrome (1).
- 5:6b Relationship of contraception methods and frequency - dysuria syndrome (2).

- 5:6c Relationship of contraception methods and frequency - dysuria syndrome (3).
- 5:7a Relationship of age and frequency - dysuria syndrome (1).
- 5:7b Relationship of age and frequency - dysuria syndrome (2).
- 5:8 Association of urinary tract infection and recurrent frequency - dysuria syndrome.

## Contents.

	Page
Acknowledgements.	1
List of Tables.	2
List of Figures.	4
<b><u>Chapter 1.</u> General introduction and background to the studies.</b>	
Origin of the studies.	1
Study aims.	3
Review of the literature.	4
Practice description / demography.	9
Glossary : Definitions of terms to be used.	24
Anatomy and physiology of the female urogenital tract. urinogenital tract.	27
Neurological control.	31
Mechanism of micturition.	35
Mechanism of continence.	36
Classification of incontinence.	37
British Registrar General's Classification of Occupation.	41
Statistical methods.	42
Presentation of the data.	44
Chronological order and timetable of fieldwork.	45
<b><u>Chapter 2</u> Reported prevalence of urinary incontinence in women in a general practice.</b>	
Introduction.	46



Aims of study.	47
Method.	48
Results.	50
* Response rate.	
*Prevalence of incontinence.	
* Factors and their association with incontinence.	
* Attitudes to incontinence.	
* Consultation rate.	
Discussion.	67
* Methodology.	
* Prevalence of incontinence.	
* Attitudes to incontinence .	
* Consultation rate.	
* Factors predisposing to the development of incontinence.	

**Chapter 3. Diagnosis and management of women with incontinence in general practice.**

Introduction.	74
Aims of study.	76
Method.	76
Results.	82
* Response rate.	
* Prevalence of the different types of incontinence.	
* Management of stress incontinence. urge incontinence. stress and urge incontinence.	

Discussion.	99
* Methodology.	
* Provision & uptake of services.	
* Review at 1 year	

**Chapter 4. Reported prevalence of other urinary symptoms in women in a general practice. Attitudes to consultation and to self - medication.**

Introduction.	108
Aims of study.	109
Patients and method.	109
Results.	111
* Response rate.	
* Demography.	
* Prevalence of reported episodes of frequency of urine.	
* Prevalence of reported episodes of dysuria.	
* Reported consultation rate with GP for U.T.I. or vaginal discharge / infection.	
* Factors associated with urinary symptoms.	
* Self - medication.	
* Consultation interval.	
* Attitudes to U.T.I.	
Discussion.	118
* Prevalence.	
* Attitudes.	
* Decision to consult.	
* Symptom as an indicator of bacterial urinary infection.	
* Methodology	

**Chapter 5. A study of women who report regular episodes of frequency and dysuria.**

Introduction.	124
Aims of study.	127
Method.	127
Results.	129
* Prevalence.	
* Associated factors.	
* Attitudes to urinary symptoms.	
* Consultation rate.	
Discussion.	143
* Methodology.	
* Prevalence.	
* Factors.	

**Chapter 6. Summary, conclusions and recommendations.**

Summary.	148
Conclusions & Recommendations	153
Further Research	157

**Appendices.**

Publications associated with this thesis.

List of Appendices.

References.

## 1. General introduction and background to the study.

This thesis owes its origins to observations made at a 'pop mobility' class. The class was composed of 35 females aged between 20 and 40 years of age and involved a demanding exercise programme. Women with 'weak bladders' were advised by the class leader to empty their bladders prior to the final exercise routine. The exercise of jumping with legs astride resulted in a degree of incontinence in approximately half of the women participating. The loss was regarded by the participants with disguised embarrassment and simple acceptance. Enquiry revealed that this was a common and indeed usual occurrence. Women who repeatedly suffered from incontinence of urine during classes were advised by the class leader not only to void urine prior to exercising but to insert tampons to support the bladder neck.

On reflection on the subject of urinary incontinence, there appeared to be a discrepancy between the number of women who apparently suffer from the complaint and the number who consult their doctor about the symptom since it was estimated that approximately ten women only consulted annually for urinary incontinence from a total practice population of 2,900.

A literature search was conducted to confirm whether the apparent prevalence of urinary incontinence in women as seen at the 'pop mobility' class or the consultation rate more accurately reflected recorded prevalence. Papers by Thomas et al ( 1980 ) and Crist et al ( 1972 ) suggested prevalence rates of 8.5 - 11.6% in women aged 15 - 64 and over 65 years, and 30% in nulliparous women aged 21 - 63 years respectively. Brocklehurst et al ( 1972 ) reported an incidence of 57% in women aged 45 - 64 and

Wolin ( 1969 ) and Nemir and Middleton ( 1984 ) found that 50.7% and 52% of nulliparous women suffered stress incontinence.

Thus the first study aimed to determine the true prevalence rate of urinary incontinence among females registered with the practice. Factors associated with incontinence, other urinary symptoms and reasons for failure to present the symptom of incontinence of urine for medical advice were also sought. ( Jolleys 1988 ).

With so high a prevalence it seemed essential to assess the capability of a general practitioner to diagnose and manage female urinary incontinence in the setting of general practice. The second study ( Jolleys 1989 ) was designed to this end using only the treatment regimes and outcome measures that are readily available to all family doctors so that the results would be widely applicable to general practice.

The third study looked in detail at the prevalence and duration of urinary symptoms other than incontinence, attitudes to self - medication, and attitudes influencing the decision to consult. ( Jolleys 1990 ).

The final study sought to determine the natural history of recurrent frequency - dysuria syndrome and to examine some of the associated factors. ( Jolleys 1991 ) through comparison of the results of two of the studies ( Jolleys 1988 and Jolleys 1990 ).

### Study Aims.

1) To establish the prevalence of urinary incontinence among adult women registered with a general practice, and to identify possible causative factors.

2) To identify reasons why female patients may not consult their general practitioner about urinary symptoms.

3) To determine whether a general practitioner could successfully diagnose and treat incontinent female patients without the need for special training or resources.

4) To establish the prevalence of dysuria and frequency in women in a general practice.

5) To study attitudes to and use of self care and primary health care for the symptoms of frequency and dysuria.

6) To study patients who suffer from frequency - dysuria syndrome to see if any factors can be identified.

## Review of the literature.

### Prevalence of incontinence.

Urinary incontinence in women is a common symptom. The prevalence depends on the definitions used and populations studied, and therefore varies widely, but is usually reported above 10%, at least in older women. ( Brocklehurst et al 1972, McGrother et al 1987, Samsioe et al 1985, Thomas et al 1980. ) Several studies have shown the incidence of urinary incontinence to be very high: Brocklehurst ( 1972 ) in a community based study of women aged 45 - 64 years found a prevalence of 57% ( N = 454 ); Milne et al ( 1972 ) studied women in Edinburgh aged 62 - 90 and found a prevalence of 42% ( N = 272 ); Nemir and Middleton ( 1954 ) looked at nulliparous American students and found a prevalence of 52% ( N = 1327 ); Osbourne ( 1976 ) looked at working women aged 35 - 60 and found a prevalence of incontinence of 26% ( N = 600 ). Incontinence is usually thought of as a condition associated with the process of ageing. However these studies indicate that urinary incontinence is common not only in the elderly, but also in the middle aged and young female. Thomas et al ( 1980 ) in their community prevalence study of 18000 patients in London showed the incidence of urinary incontinence to be high in all age groups, and that for the majority of patients the condition remained unrecognised by doctors. The study showed that once over the age of 25 years women have a 30% chance of suffering incontinence. The bi-modal distribution of incontinence described in this study is due to a predominance of genuine stress incontinence in women aged 25 - 64 years and a higher incidence of detrusor muscle instability in women over 75 years.

Furthermore with older and institutionalised patients many other factors influence the observed prevalence of incontinence. These include problems with mobility and dementia, as well as inadequate toileting facilities. ( Brocklehurst 1971, Campbell 1985, Clarke et al 1984, Exton Smith et al 1962, Exton Smith et al 1979, Isaacs 1964, Isaacs et al 1972, Mann 1984, Milne et al 1972, Newman 1978, Veter et al 1981, Yarnell and St Leger 1979).

### Treatment of incontinence.

The gynaecological and surgical aspects of incontinence have been extensively studied in selected groups of patients referred to specialist care. ( Eastwood 1979, Stanton et al 1980, Stanton and Cardozo 1980, Samsioe et al 1985 ). It is not established whether this knowledge is applicable to general practice and most of the described treatment regimes would not be suited to implementation in a surgery setting. There have been many published studies relating to the efficacy of pelvic floor exercises in the treatment of stress incontinence. ( Burns et al 1985, Henderson and Taylor 1897, Hendrickson 1981, Klarskov et al 1986, Kuhns- Hastings 1988, Laycock 1987, Montgomery 1986, Tchou et al 1988 ). Algorithmic methods and management programmes are becoming increasingly popular ( Hilton and Stanton 1981 ) since they aim to standardize the diagnostic evaluation and therapeutic approach by doctors including general practitioners.



### **Prevalence of other urinary symptoms.**

The prevalence of frequency and dysuria has rarely been studied in the community. ( Walker et al 1983, Waters et al 1970 ). Approximately 20% of adult females will complain of dysuria or dysuria and frequency during the course of one year ( Sanford 1975, Walker et al 1983 , Waters et al 1970 ). Dysuria is associated with less than  $10^5$  single growth bacteria / ml of urine in one -third to one - half of cases and many do not have bacteriuria at all. ( Gallagher et al 1965, Mond et al 1965, Walker et al 1983, Waters 1969 ). The latter group constitutes those patients with the urethral syndrome or frequency - dysuria syndrome or abacterial cystitis ( Medical Research Council Bacteriuria Committee 1979 ) and may account for 27% to 41% of all cases of female dysuria. (Gallagher et al 1965, Kraft and Stamey 1977 ).

### **Factors associated with recurrent frequency - dysuria syndrome.**

Previous work has postulated the causes of frequency - dysuria syndrome ( Gray and Pingleton 1956, Maskell et al 1979, Wilkins et al 1989 ) and attempted to define associated factors ( Gallagher et al 1965, O'Dowd et al 1984, Wilkins et al 1989 ) and describe its pathogenicity. ( Brooks et al 1972 ). Whether this syndrome represents occult bacterial infection of the urethral glands, or infection by slow growing anaerobic organisms or non- bacterial infections is uncertain but a large number of these patients will develop significant bacteriuria. ( Gallagher et al 1965, Maskell et al 1979 ). Studies have not addressed the natural history of the complaint other than to suggest that it is a self - limiting condition. ( O'Dowd et al 1984 ).



Edinburgh

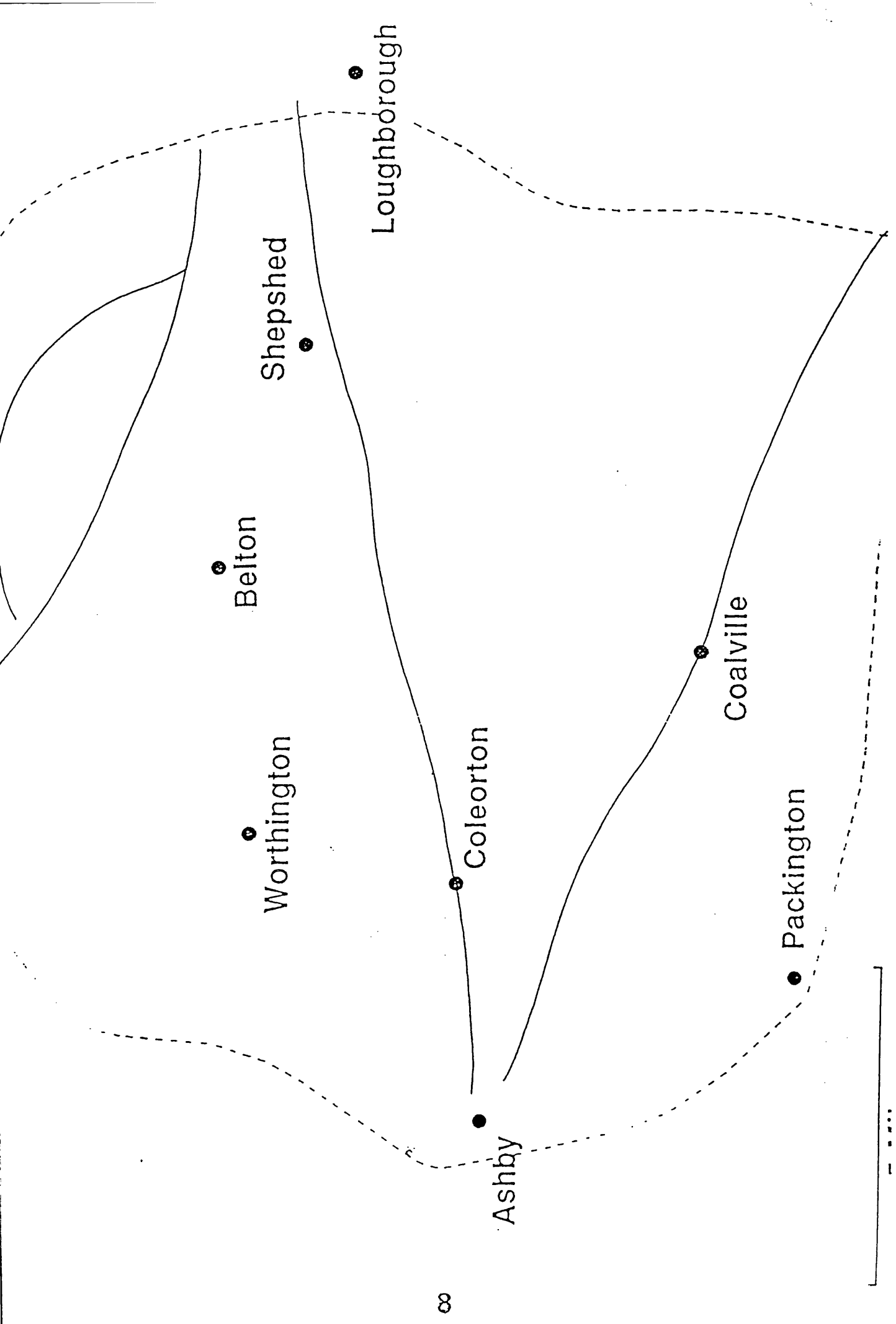
Nottingham

Practice Area

Leicester

Oxford

London



## Practice Description / Demography.

### Demography.

Demography is the study of the size and structure of human populations. It also includes the methods of collecting , analysing and presenting population data. In order to show that the female patients registered with the practice are representative of women in Leicestershire and in Great Britain, I had to compare practice statistics with those of the community. Unfortunately the most recent population census was nearly a decade ago, in 1981, whereas practice statistics are current. However, as I am comparing age profiles and social class, rather than population size, the comparison is valid, since these details change slowly with time. Furthermore, the studies reported span 5 years, so that these population data had only been released two years before the research commenced.

The practice is situated in north Leicestershire in the Charnwood and North West Leicestershire boroughs, bordering Derbyshire and Nottinghamshire, and covers an area of 55 square miles. The practice population remains constant at 2850 - 2900, the death and exit rate from the area equalling the birth and entry rate to the area. Furthermore the age profile of the practice has been constant for the last five years. The practice statistics relating to the total practice population for 1987 and 1990 are displayed in Figs. 1:1, 1:2 and 1:3. Similar data for the female practice population are shown in Figs. 1:4,1:5, and 1:6. There is no significant difference between the age profile of the practice , Charnwood, North West Leicestershire, Leicestershire and

Fig. 1:1 Histogram to show the patients aged 0 - 34 years registered with the practice in 1987 and 1990.

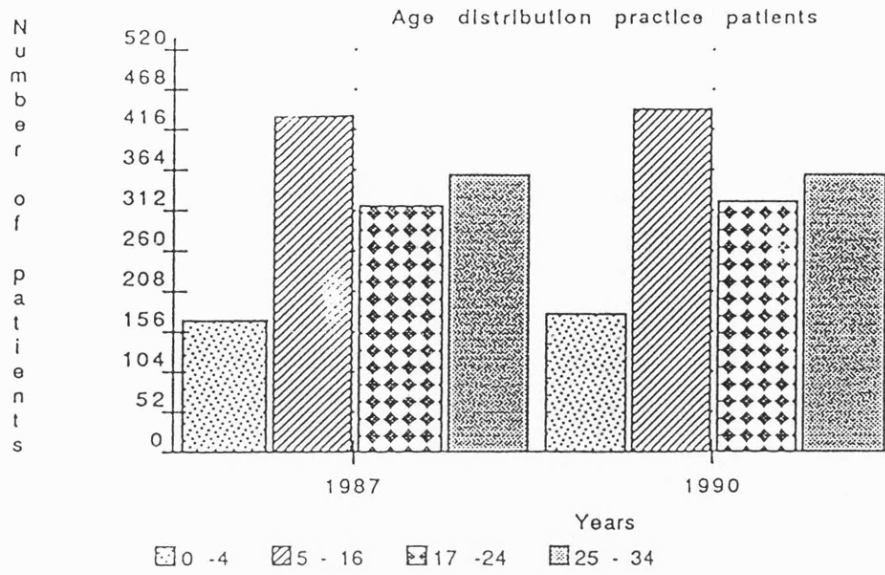


Fig. 1:2 Histogram to show the number of patients aged 35 - 74 years registered with the practice in 1987 and 1990.

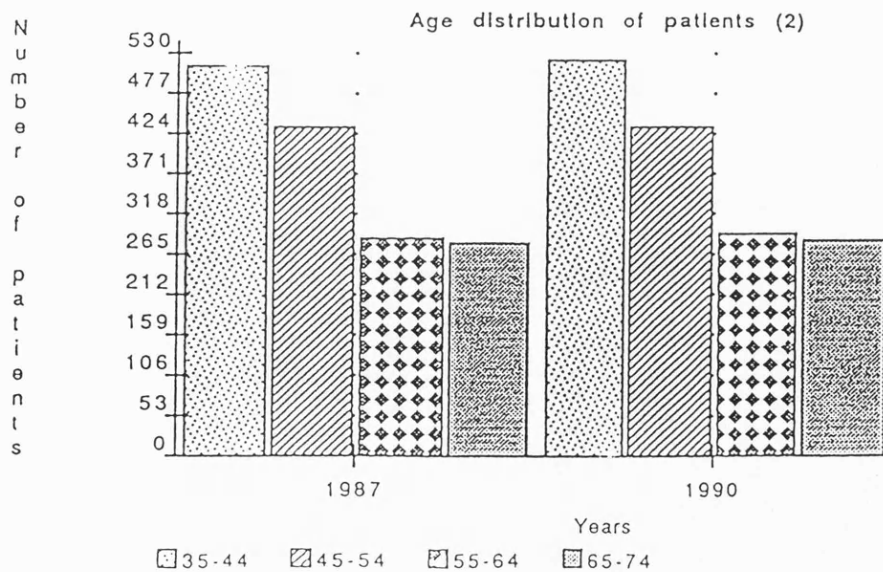


Fig. 1:3 Histogram to show the number of patients aged 75 years and over registered with the practice in 1987 and 1990.

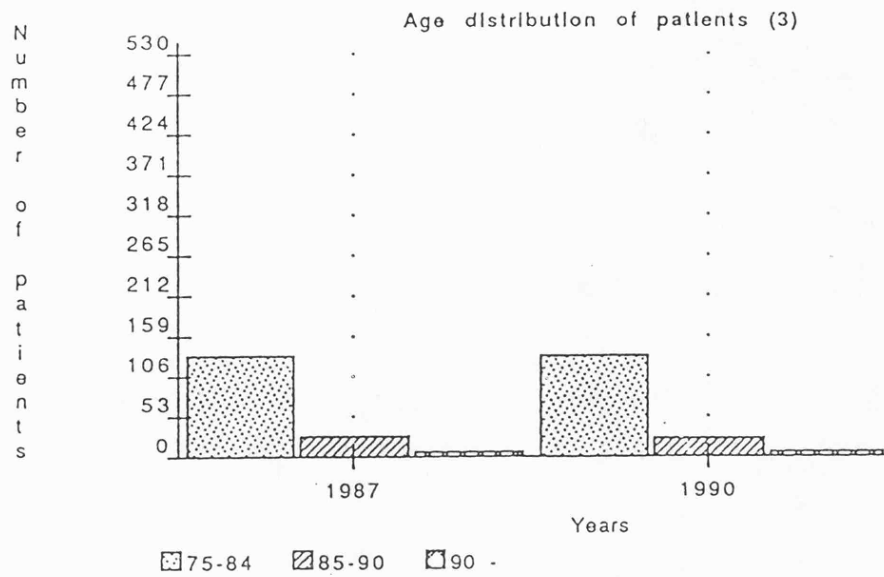


Fig. 1:4 Histogram displaying the age distribution of 0 - 34 year old females in the practice in 1987 and 1990

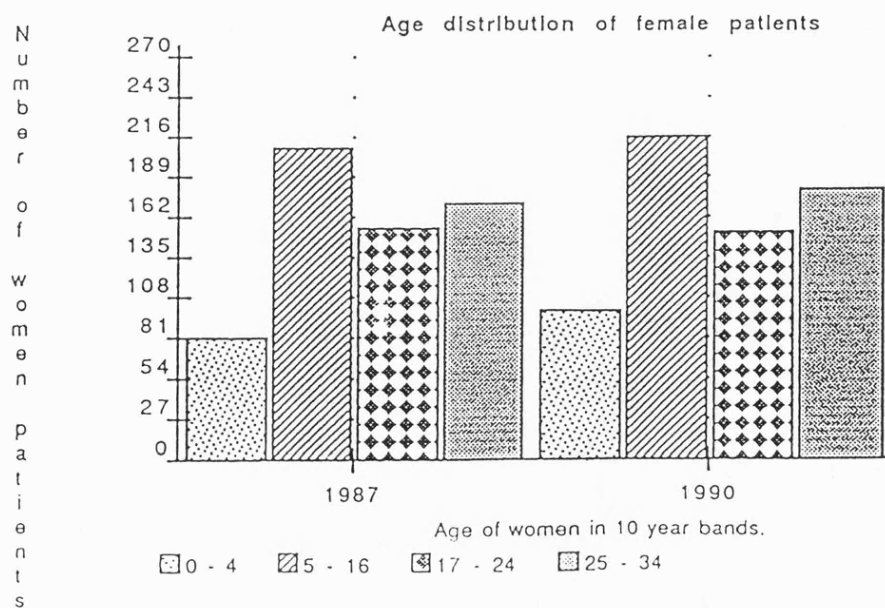


Fig. 1:5 Histogram showing the number of female patients aged 35 - 74 registered with the practice in 1987 and 1990.

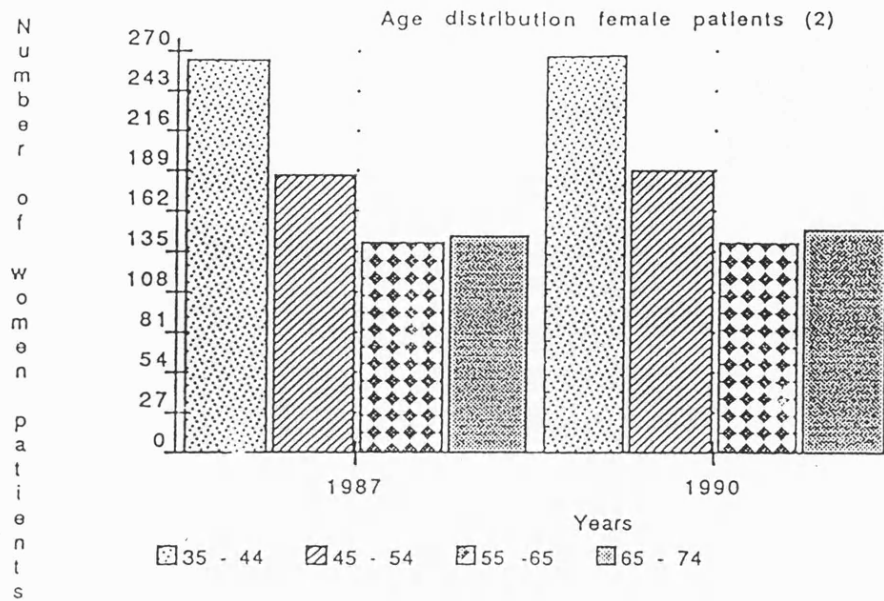


Fig. 1:6 Histogram to show the number of female patients over the age of 75 registered with the practice in 1987 and 1990.



Great Britain, either for the whole population ( See Fig. 1:7, 1:8, 1:9 ) or for females alone ( See Fig. 1:10, 1:11, 1:12 ). The doctors dispense medication for 68% of the practice list as this proportion of patients is classified as rural, living in the villages of Belton, Worthington and Newbold, Osgathorpe and Coleorton. The remainder of the practice population ( non - dispensing ) live in urban districts; Whitwick, Coalville and Shepshed. Medical services for the practice area are not exclusively provided by the partnership. There are eight practices adjacent to the Belton surgery so that in all parts of the practice area several practices offer medical care to residents, giving patients a choice of general practitioner.

North West Leicestershire is primarily a mining area. As the coal resources become exhausted and unprofitable mining is closed down, more light engineering is being introduced. The Charnwood borough is a mixed farming area and a dormitory region for commuters for Derby, Nottingham, Leicester, Loughborough, and more recently Birmingham. The major employers are the universities, two pharmaceutical companies, engineering companies, East Midlands Airport, civil service and local government. Thus, the employed population consists mostly of higher and lower professional, skilled and clerical workers.

Social class was assigned according to the occupation of the husband except in the case of a single female. Recently unemployed and retired people were classified according to previous occupation. The alternative method of classifying according to the educational standard of the person was considered but dismissed because it was not applicable to the more elderly section of the population. The profile of the practice



Census of the population. County Report:  
Leicestershire.

Office of Population Censuses and Surveys.

1981.

Taken from: Table 6 : Usually resident population: age by marital status

Age last birthday	<u>by sex.</u>		<u>County, districts.</u>	
	Leicestershire		Great Britain	
	all persons	females	all persons	females
0 - 4	54,221	26326	3218527	1567813
5 - 9	58223	28669	3550997	1727626
10 - 14	69061	33656	4271430	2081514
15	14007	6898	899277	439300
16 - 19	55831	27401	3567322	1745928
20 - 24	62433	38878	3958524	1954078
25 - 29	59266	29364	3616980	1797109
30 - 34	66162	32663	4014831	1999814
35 - 39	55129	27193	3392735	1688822
40 - 44	48108	23585	3080488	1533932
45 - 49	45967	22604	2974787	1484264
50 - 54	46819	23331	3074584	1554457
55 - 59	47455	23725	3167231	1625355
60 - 64	39457	23048	2784086	1473855
65 - 69	37683	23071	2667042	1461459
70 - 74	31986	18196	2265265	1311188
75 - 79	22980	14091	1600853	1005897
80 - 84	12998	8907	899555	628653
85+	7861	6002	552387	422657

East Midlands: Social class( 10% sample ) Table 5

Area	Social Class %						
	I	II	III	IV	V	inactive	
			Non-Man/ Man			head	
<b>G B</b>	4.5	18.8	9.1	26.2	12.2	4.1	22.7
<b>Leics</b>	4.3	19.1	9.1	29.0	13.5	3.4	19.2
<b>Charn.</b>	5.7	21.3	9.9	30.5	11.0	2.7	17.6
<b>N.W.L</b>	4.9	17.5	6.9	33.2	11.9	3.4	21.2

1990

AGE PROFILE: ALL PRACTICE PATIENTS

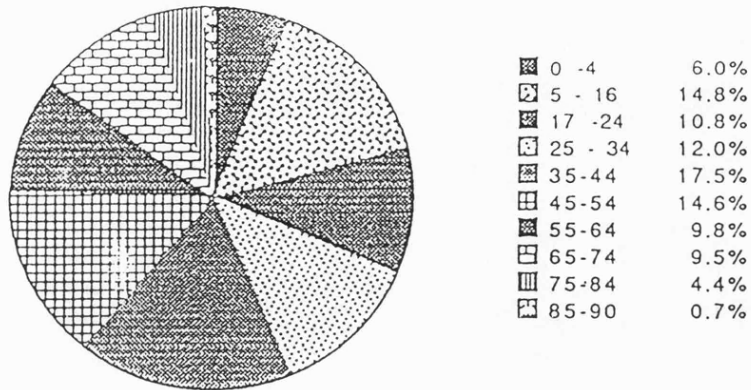


Fig. 1:8 Pie chart to show the age profile of the population of Leicestershire.

AGE PROFILE FOR POPULATION LEICS.

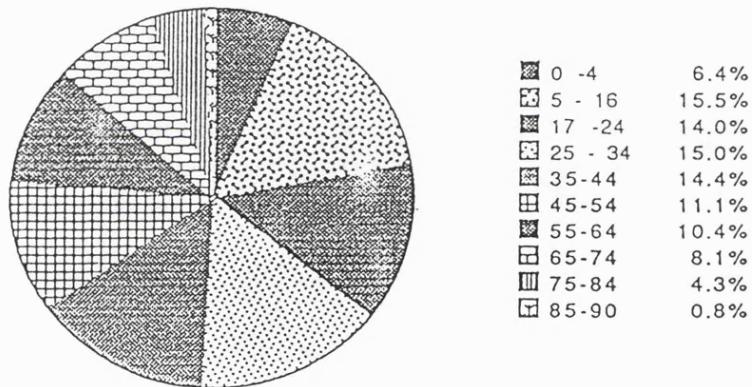
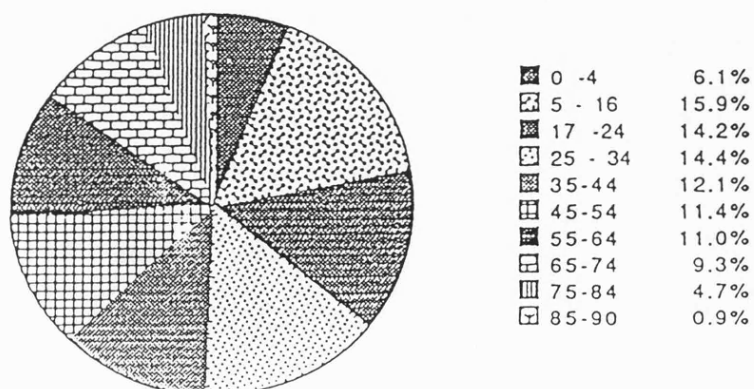


Fig. 1:9 Pie chart to show the age profile for the population of Great Britain.

AGE PROFILE FOR GREAT BRITAIN



AGE PROFILE FOR PRACTICE PATIENTS

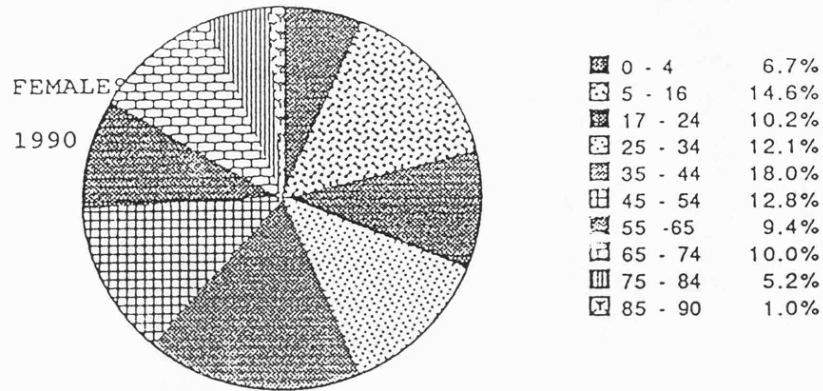


Fig. 1:11 Pie chart to show the age distribution of females registered in Leicestershire.

FEMALES

AGE PROFILE FOR LEICS. PATIENTS

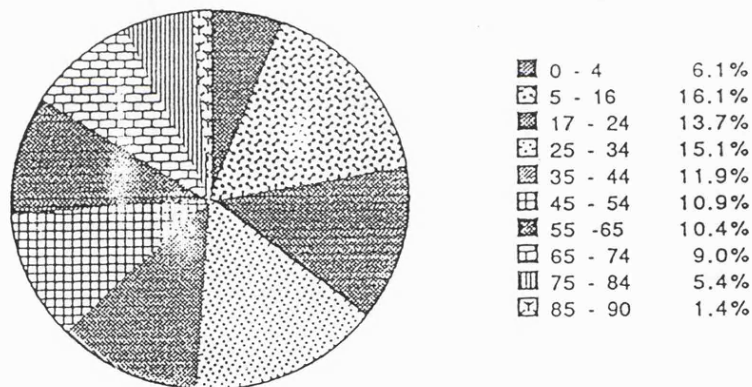
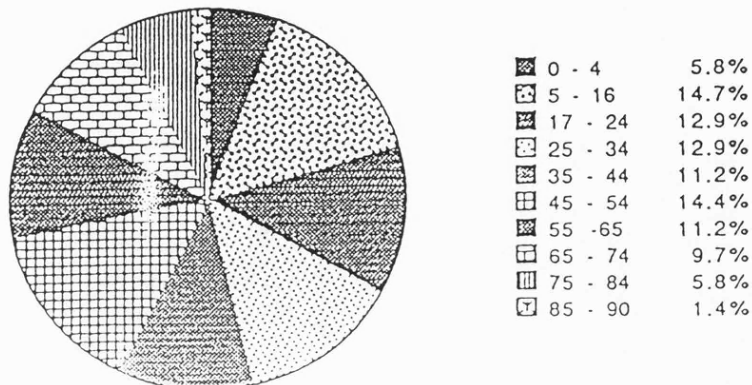


Fig. 1:12 Pie chart to show the age distribution of females in Great Britain.

AGE PROFILE OF GREAT BRITAIN.

FEMALES



population by social class according to the Registrar General 's abridged version of Classification of Occupation ( 1970, 1990 ) is similar to those of Charnwood and North West Leicestershire ( Office of Population Census Surveys 1981 ), having fewer higher professional people but proportionately more lower professional class. Although I classified the unemployed according to previous occupation in order to assign a social class ( a source of bias ), since the unemployed were from social classes IV and V, the proportion of social classes IV and V for the practice is similar to the two boroughs, ( See Fig. 1:13, 1:14 ) and to Leicestershire and Great Britain. ( See Fig. 1:15, 1:16 ) The social class profile of the practice thus equates to that of the British population.

Likewise, the frequency distributions of the age/sex profiles for the practice, Charnwood, North West Leicestershire, Leicestershire and Great Britain are similar. The static structure of the practice population as defined by the population pyramid shows that it is representative of larger areas, and similar to that of Great Britain.

I have demonstrated that the demography of the practice/study population is representative of larger populations in Great Britain with respect to age, sex and social class. Thus results from epidemiological studies of this population should be applicable to other populations in Great Britain, and their extrapolation should give prevalence rates for the total population. Precedence for this has occurred with the Framingham study ( Weatherall et al 1983 ), a prospective survey of a population in Massachussetts, the results of which have been said to be applicable to populations in the western world.

Fig. 1:13 Pie chart to show the social class distribution in the practice.

Social class : Practice

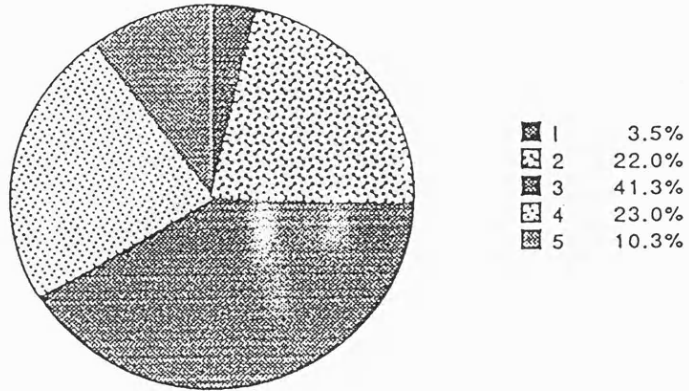


Fig. 1:14 Pie chart to show the social class distribution in Charnwood.

Social class Charnwood

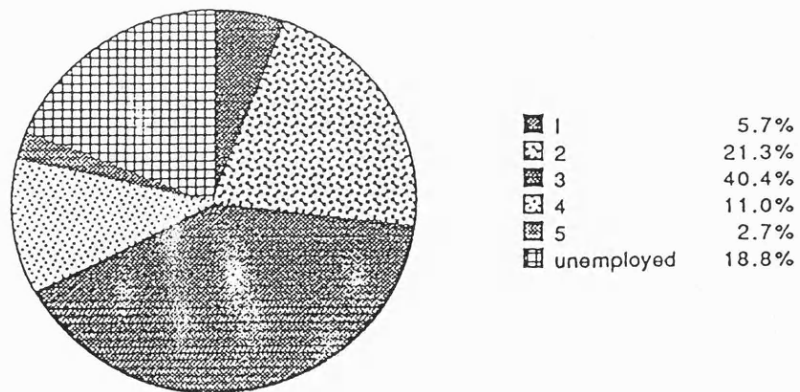




Fig. 1:15 Pie chart to show the social class distribution in Leicestershire.

Social class Leics

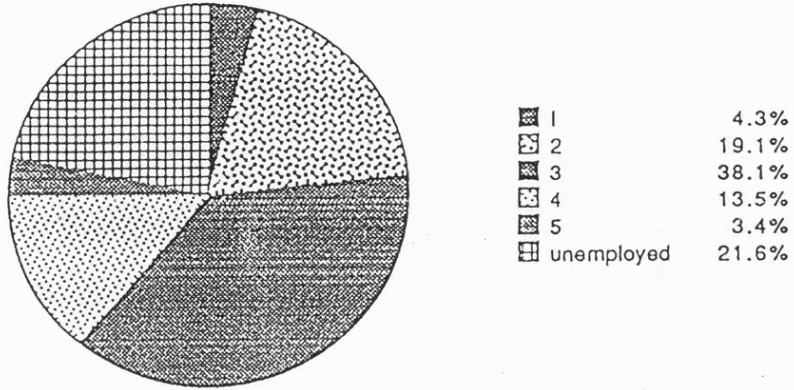
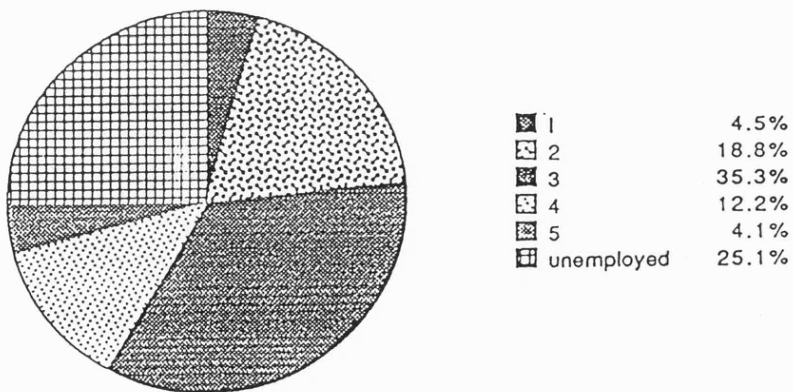


Fig. 1:16 Pie chart to show the social class distribution in Great Britain.

Social class G.B.





### Design of the surveys.

Epidemiology is the study of populations in a given environment in order to discover the aetiology of diseases. Epidemiological studies seek to identify associations between diseases and environmental factors. The study can collect information on a whole population or a sample, a selected fraction, of the population. ( analytical survey ). A simple census of a population living in a given area includes information from all people resident at that time. The question of whether categories of the population can be omitted entirely without loss has to be considered in each case. In some cases information which has little inherent interest is included in order to make the results comparable with those of previous studies or parallel surveys in other countries.

Frames suitable for the study of human populations are:-

- 1) surveys covering the whole population e.g. census. ( separate results can be obtained for small areas ).
- 2) surveys of whole populations of a country giving accurate estimations for the whole population but not for administrative areas.
- 3) local surveys covering a particular town or rural area, or several contrasted areas. This sample is not meant to be representative of the country as a whole.

The form of study chosen was a localised population survey. The denominator population, the population at risk, was defined as female and adult, over the age of 25 years. Thus the study population was all females aged 25 and over on the

commencement date of the study who were listed on the practice computer for administrative purposes. ( Yates 1981, Abramson 1976 ). This population was specified as the sampling frame so that it should represent the target population and minimise population bias , ( Woodward and Francis 1988 ). Selection bias is eliminated as the whole population was surveyed.

Verification of the results was by telephone questionnaire in one study and analysis of notes in another. In each of these cases a sample of the responses was selected for validation using probability or simple random sampling. This refers to a scheme in which the probability of selection for each set of responses was specified. In simple random sampling the population responses were numbered, then the requisite number of values were taken from random number tables and sets of responses with the corresponding numbers were selected into the sample. Thus each set of responses had the same chance of being selected as any other ( Kilpatrick 1977 ).

Glossary: Definitions of terms to be used.

*Bacteriuria*: presence of bacteria in the urine.

*Bladder*: reservoir for urine.

*Cystitis*: inflammation of the bladder.

*Detrusor*: muscular wall of the bladder which contracts to empty the bladder. *Unstable*

*detrusor*: uncontrolled contraction of this muscle or inability to inhibit detrusor contractions and is associated with the symptoms of frequency, urgency and urge incontinence.

*Dysfunction*: any disturbance of function of an organ.

*Dysuria*: pain on passing urine.

*Dyssynergia*: faulty co-ordination of groups of muscles or organs.

*Enuresis*: involuntary micturition.

*Frequency*: the passage of urine seven times or more per day, and more than twice per night. ( International Continence Society definition.)

*Haematuria*: blood in the urine.

*Hyperplasia*: enlargement of an organ resulting from an increased number of cells.

*Incontinence*: condition in which the voluntary loss of urine is a social and hygienic problem and is objectively demonstrable. ( International Continence Society definition ).

*Intercourse incontinence*: incontinence during intercourse: may be genuine stress incontinence on penetration or detrusor instability at orgasm.

*Nervous system: central*: the section of the system that controls and co-ordinates voluntary action. *Autonomic*: the section which controls involuntary action.

*Nocturnal enuresis*: involuntary micturition at night during sleep.

*Overflow incontinence*; leakage of urine from a fully distended bladder.

*Pelvic floor*: the muscular floor of the pelvis especially the levator ani muscles.

*Perineometer*: an instrument which objectively measures the power /contraction pressure exerted by the levator ani muscles of the pelvic floor.

*Prolapse*: descent of organ or part, e.g. uterus, vagina, bladder due to weakening of the supporting structures.

*Procidentia*: severe degree of prolapse so that the organ is protruding from the vagina.

*Retention (of urine)* : inability to pass urine.

*Stress incontinence*: involuntary loss of urine on exertion due solely to mechanical factors. Involuntary loss of urine on raising the intra-abdominal pressure. *Genuine stress incontinence* is the condition when the involuntary loss of urine occurs when the bladder pressure exceeds the maximum urethral pressure in the absence of a detrusor contraction. ( coughing and straining does not stimulate the detrusor to contract ).

*Urethra*: canal along which the urine passes from the bladder to be excreted.

*Urethral syndrome*. women with symptoms of urinary tract infection - frequency and dysuria - who were found to have midstream urine samples with less than 100,000 organisms per ml. are said to have urethral syndrome. This is also known as *frequency - dysuria syndrome* or *abacterial cystitis*.

*Ureters*: the tubes through which the urine passes from the kidneys to the bladder.

*Urgency*: an overwhelming desire to pass urine requiring immediate emptying of the bladder, usually accompanied by increased frequency.

*Urge incontinence*: involuntary loss of urine accompanied by a strong desire to void.

*Urinary fistula*: abnormal connection between the ureter, urethra or bladder and the

---

vagina resulting in continuous incontinence.

*Urinary tract infection:* UTI : bacteriuria with pure growth bacteria of  $10^5$  organisms / ml urine and  $10^6$  / litre white blood corpuscles. Red blood cells may or may not be present.

*Urodynamics:* a study of function of the lower urinary tract by means of pressure-flow measurements.

(Mandlestam 1986)

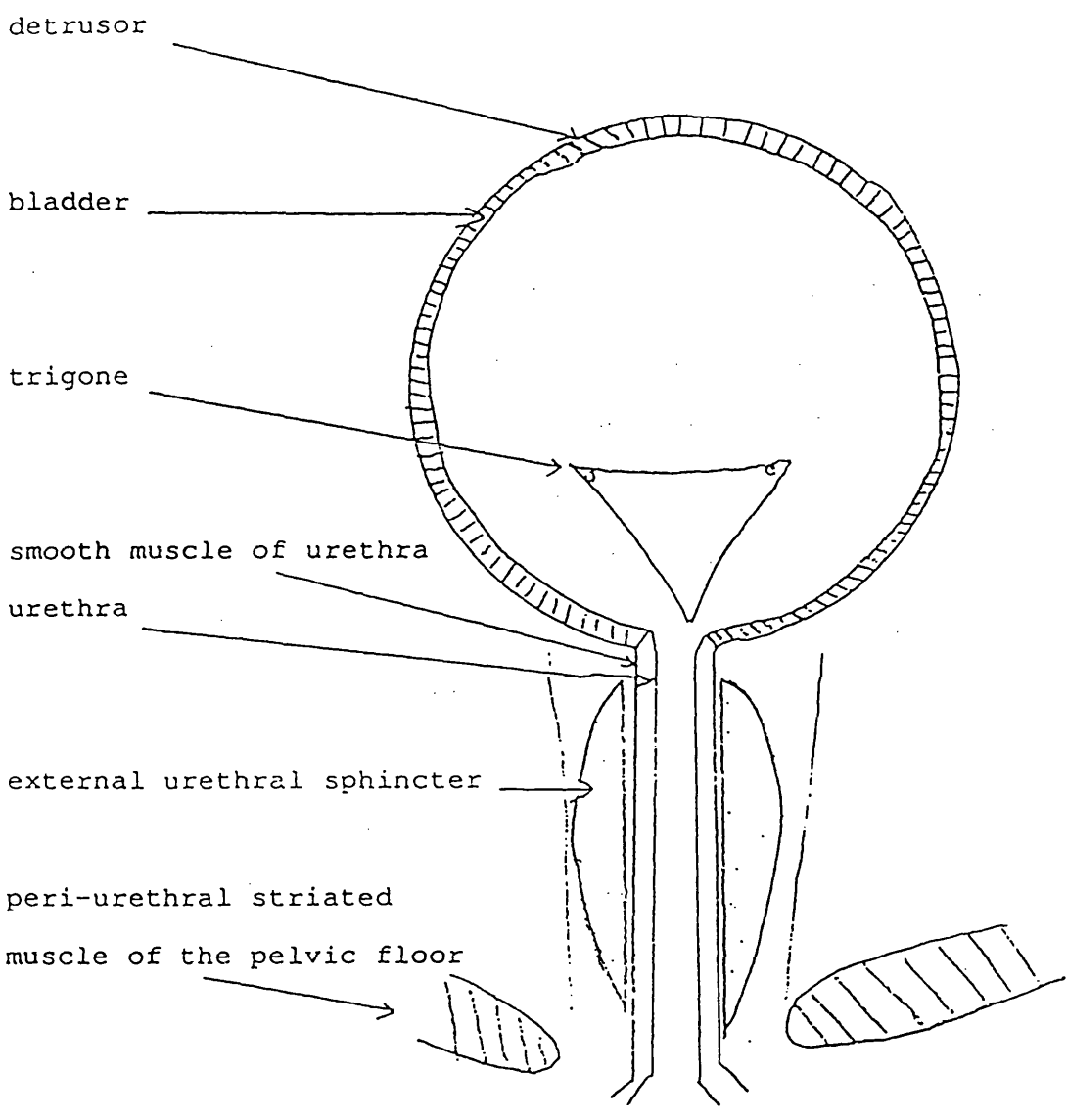
## Anatomy and physiology of the female urogenital tract.

The challenge of treating incontinence cannot be met without prior consideration of continence. An understanding of the anatomical structure and the physiological control of the bladder and urethra is essential if the complexities of continence are to be appreciated. With new technology and methods of investigation knowledge of bladder and urethral function has increased. Gosling's ( 1979 ) work with the electron microscope has been notable in this field. The formation of the International Continence Society twenty years ago confirmed the extent of interest in the study of continence, and the increasing membership bears witness to the growth of activity and commitment in this field.

### The bladder.

The lower urinary tract basically comprises the bladder, urethra and its surrounding sphincter mechanism. The function of the bladder is to store urine and expel it when socially appropriate. The bladder is a muscular sac, the wall of which is composed of a meshwork of interlacing bundles of smooth muscle fibres , not clearly defined into layers, forming the detrusor muscle. This muscle has the physical property of compliance which means that during the storage phase of micturition, the muscle accomodates the increasing volume of urine with the pressure remaining fairly constant. Compliance indicates the relationship between change in volume and pressure during filling. During normal filling, until almost the limit of distension of the bladder is reached, the compliance remains at infinity. On voiding the interwoven

Diagram representing a coronal section of the female  
lower urinary tract.



muscle bundles contract causing a reduction in all dimensions of the bladder enabling complete emptying of the organ to occur. The detrusor muscle is innervated by parasympathetic fibres arising from the 2nd, 3rd, and 4th sacral segments of the spinal cord via the pelvic nerve. The trigone of the bladder forms a firm muscular base for this structure and has orifices for the ureters and urethra. On contraction during micturition the trigone forms an open funnel leading into the urethra, but at rest it is flat. The flat base plate formed is essential for the maintenance of continence. ( Hutch 1965). It is composed of two distinct muscular layers. It is to the deep trigonal muscle that the detrusor of the bladder is anchored . Some refer to this layer as the detrusor muscle of the trigone. (Gosling 1979 ). The superficial trigonal muscle extends to the proximal urethra from the longitudinal layer of the ureteric muscle in continuity with it. The angle between the bladder base and the urethra is known as the posterior urethro - vesical angle. Disturbance of this angle at rest coupled with downward movement of the bladder base on straining could result in incontinence because of resulting urethral sphincter dysfunction.

### The urethra.

The watertight closure of the urethra is mainly due to compression of the folded urethral mucosa. The mucosa is entirely transitional cell epithelium in males, but in females the lower one third of the urethra is lined with stratified squamous cell epithelium which is under the hormonal influence of oestrogen. Thus it may be affected by hormonal changes around the menopause, and atrophic changes occurring post-menopausally may result in incontinence.



The proximal bladder neck sphincter, sometimes known as the internal sphincter, is formed from loops of detrusor muscle and elastic tissue which fold around the internal meatus and the urethral smooth muscle. The external sphincter is composed of striated muscle and its contraction between voids prevents the passage of urine through the urethra. In women there is no equivalent to the male internal sphincter around the proximal urethra, which is composed of circular smooth muscle richly supplied by sympathetic nerves. This additional sphincter in men is involved in the mechanism of ejaculation and prevents retrograde flow of seminal fluid into the bladder. This means that the urethral closure pressure in women is lower than that in men. Instead the smooth muscle runs in a longitudinal or oblique direction. The intrinsic muscle of the urethra is striated slow twitch musculature which surrounds the urethra exerting an influence on the whole length of the urethra, although it is most prominent in the middle third. Slow twitch muscle is capable of sustained contraction for prolonged periods and is innervated by the parasympathetic autonomic nervous system. The balance between sphincter and detrusor mechanisms is maintained by a co-ordinated reflex involving both autonomic and somatic nerves. The urethral sphincter mechanism has both parasympathetic and adrenergic innervation. The striated muscle of the pelvic floor which lies outside the urethra is supplied by the pudendal nerve ( S2, S3, and S4 ). It is fast twitch muscle capable of rapid but short lived contraction. Reflex contraction of this muscle which occurs on sudden coughing and straining, in response to stimulation of the muscle spindles of the pelvic floor which are sensitive to changes in tension reflecting alterations in intra-abdominal pressure, can stop micturition.

### The neurological control.

Co-ordinated reflex activity of the autonomic and somatic nerves maintains the balance between the detrusor and sphincter mechanisms. Peripherally these are mediated by efferent and afferent pathways between the micturition centre in the 2nd, 3rd and 4th sacral segments of the spinal cord and the lower urinary tract, and centrally by inhibitory and facilitatory influence of the higher centres of the nervous system. The parasympathetic fibres supply the detrusor muscle stimulating contraction, the smooth muscle of the urethra and the intramural striated muscle of the external urethral sphincter. Thus the cholinergic endings of the parasympathetic nerves in the urethral sphincter maintain urethral closure. If these become damaged, as in diabetic neuropathy or during pelvic surgery, urethral closing mechanisms may be affected. Alpha - adrenergic receptors of the sympathetic nerves from the thoraco-lumbar region ( T11-L1 ) are found in the smooth muscle of the proximal urethra, with beta receptors in the fundus of the bladder. Alpha receptors contract muscle fibres in response to noradrenaline release, whereas beta receptors respond by relaxing smooth muscle. Thus sympathetic nervous activity promotes urine storage. Pudendal nerves from the 2nd, 3rd and 4th sacral segments of the spinal cord supply the striated musculature of the pelvic floor. Proprioceptive and exteroceptive sensory impulses from the lower urinary tract and pelvic floor are carried in both pudendal and parasympathetic nerve pathways. These maintain cerebral cortex awareness and are an essential component of the feedback mechanism of the spinal cord. Increasing intra-abdominal pressure causes afferent stimulation from the muscle spindles in the pelvic floor and the abdominal cavity resulting in reflex contraction of the pelvic floor. Bladder filling

Diagram to show the neurological control of the lower urinary tract.

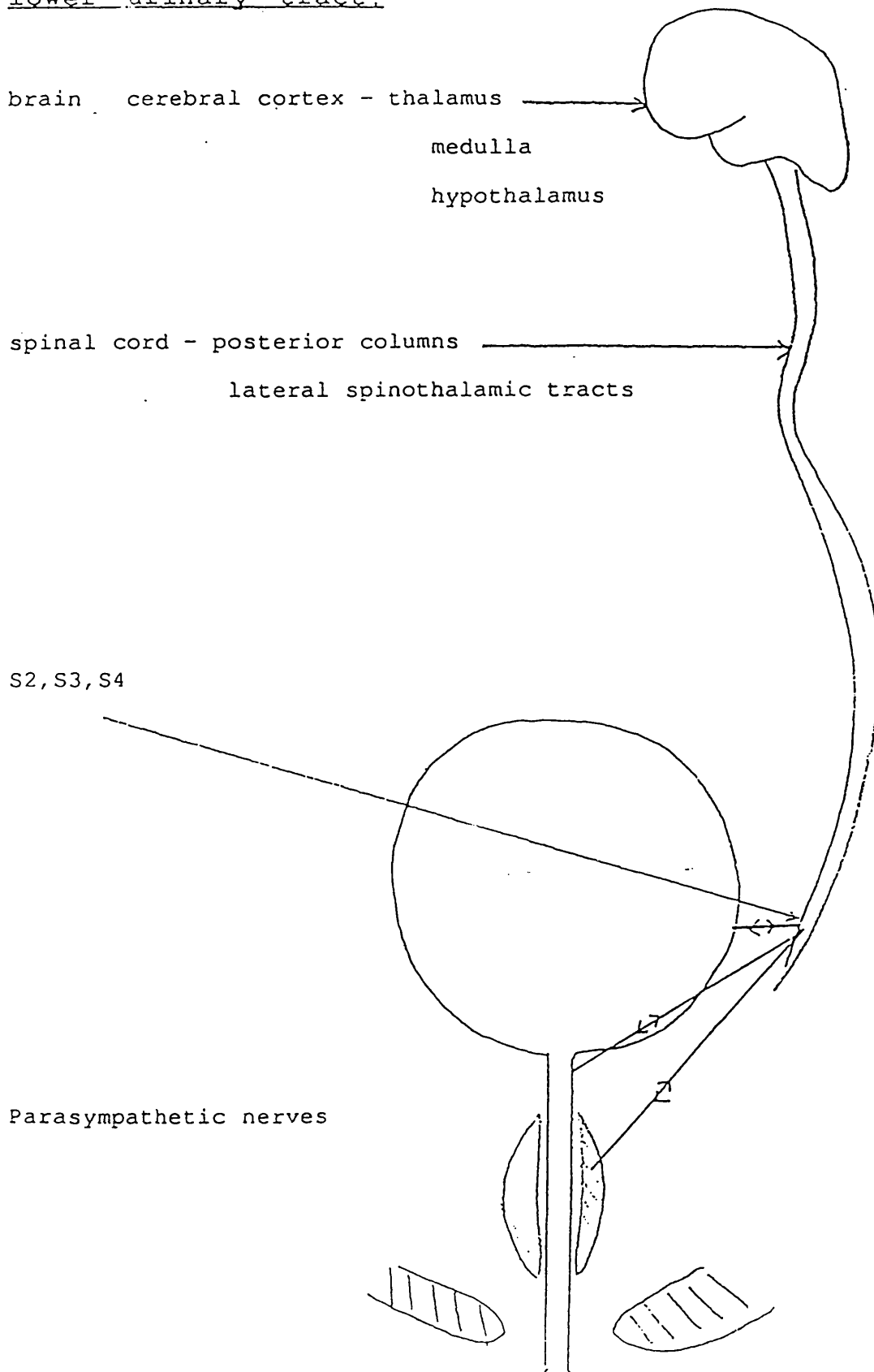


Diagram to show the neurological control of the lower urinary tract.

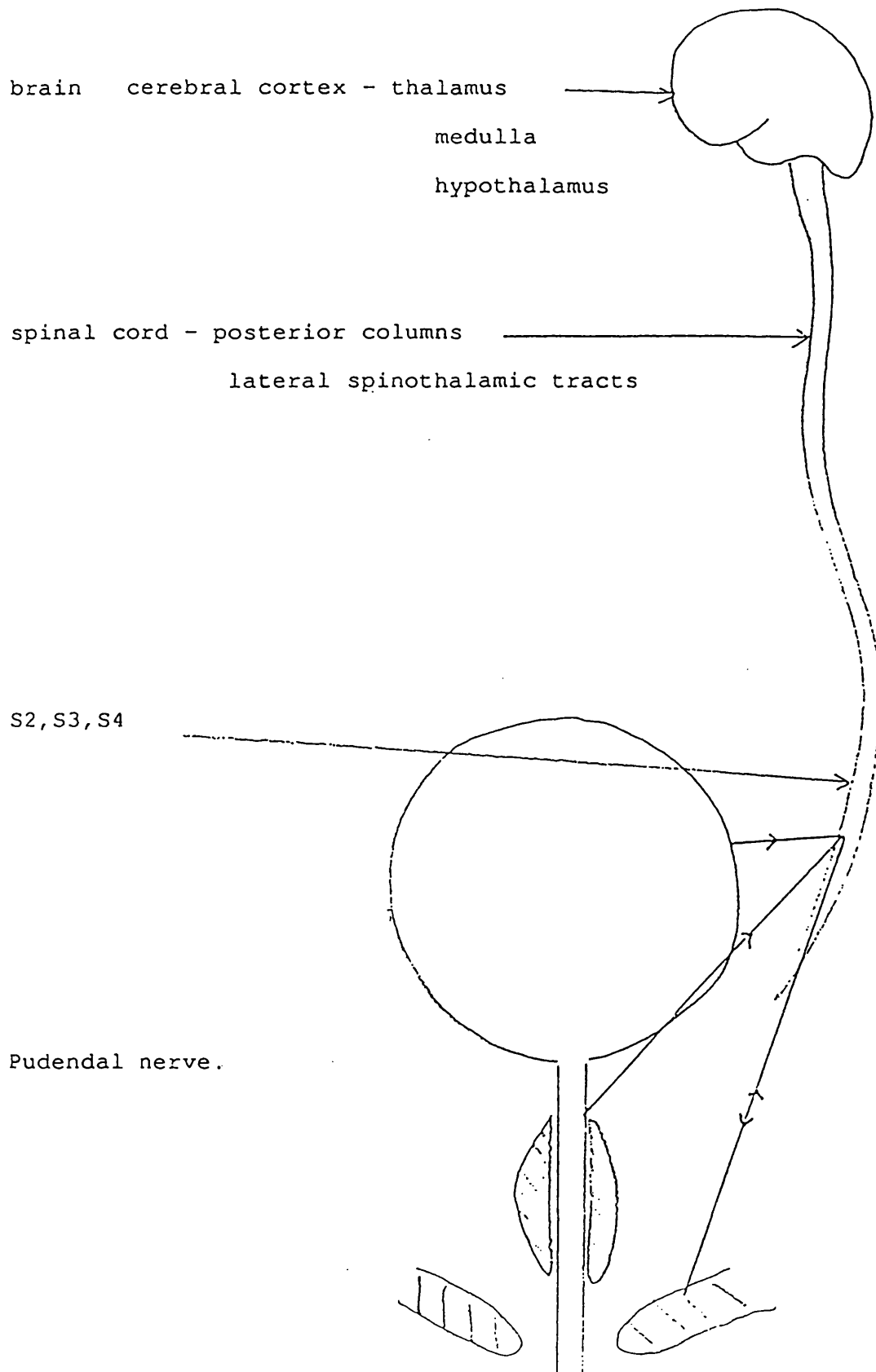
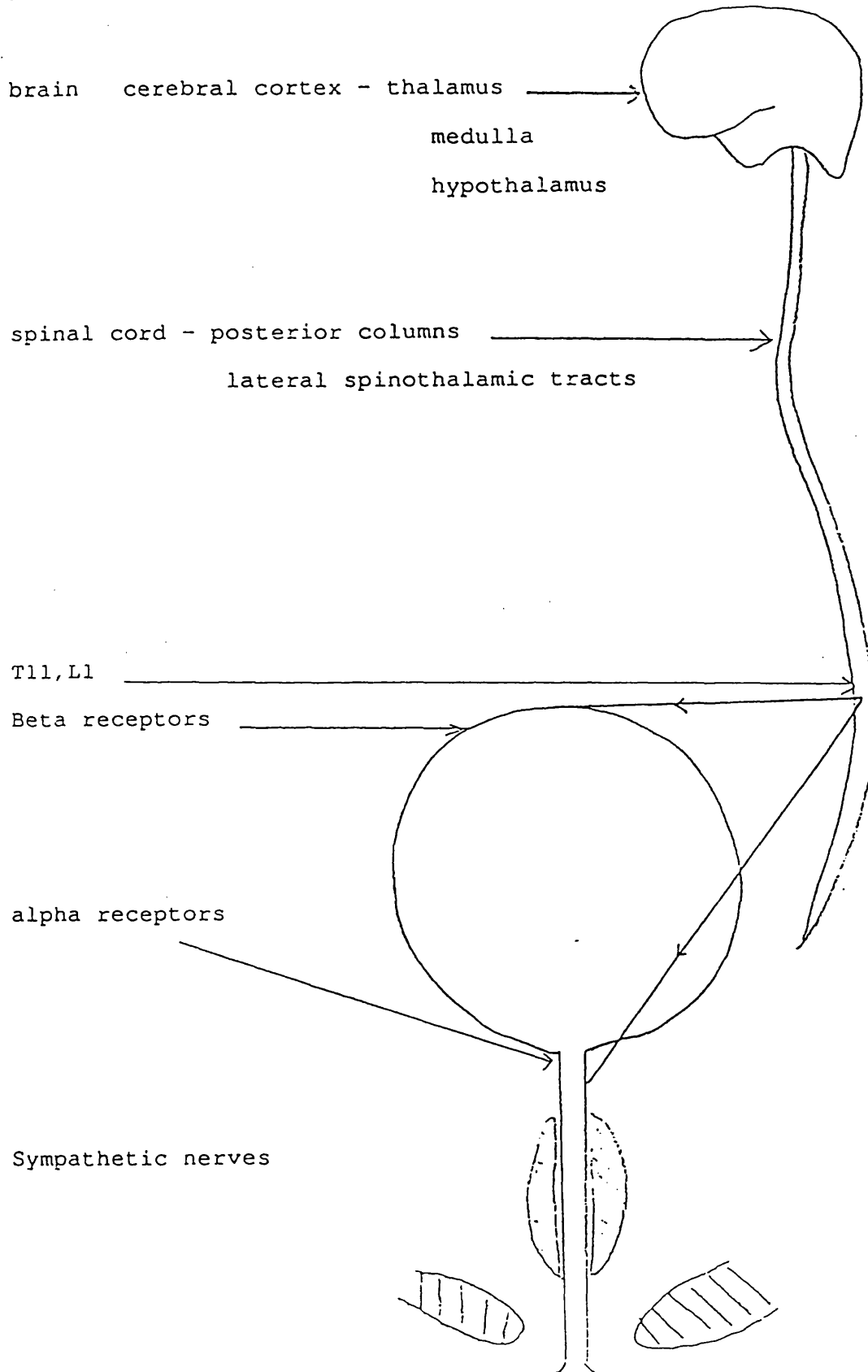


Diagram to show the neurological control of the lower urinary tract.



causes afferent discharge which stimulates pelvic floor contraction. This contraction supports the bladder and also potentiates inhibition of detrusor contraction.

### Mechanism of Micturition.

The normal micturition cycle comprises the storage of urine until it can be voided at a convenient time in a suitable place. There is individual variation within the limits of normality as some people need to void more frequently than others and the bladder capacity is variable. Continence is maintained, in dynamic terms, when the pressure in the bladder is lower than the urethral resistance and urine is voided when this is reversed. Damage to the structures of the lower urinary tract, the urethral mucosa, the bladder neck, dyssynergism causing increased pressure to be exerted by the detrusor muscle, or from within the abdominal cavity, deficient proximal and distal urethral sphincter mechanisms can all result in incontinence. Incontinence can also result from disturbances to the neurological control of micturition. Afferent information is relayed back from the lower urinary tract to the central nervous system, at all levels between the spinal cord and the cerebral cortex but especially the medulla and thalamus, by sensory nerves in the posterior columns and the lateral spinothalamic tracts. Bladder sensation of fullness and voiding is perceived bilaterally in the spinal thalamic tracts, so that damage to both tracts must occur before normal bladder awareness is lost. Any disturbance of the central nervous system may cause disorders of micturition. The hypothalamus controls autonomic nervous function and the higher centres suppress detrusor contractions. The main influence of the brain is to inhibit micturition but it also allows co-ordination of the voiding mechanisms in the pons and voluntary inhibition of

the reflex in the cerebral cortex.

Normally the higher centres of the brain inhibit reflex voiding until it is socially appropriate, and control the voiding reflex to initiate micturition. As the bladder fills the sensory stretch receptors in the bladder wall are stimulated, the first sensation occurring at approximately 150 - 200mls. This sensation of filling is transmitted to the spinal cord via afferent nerves which in turn synapse with motor nerves which stimulate the reflex contraction of the detrusor muscle initiating micturition. Reflex information is transmitted in the normal patient to and from the cerebral cortex and pons via pathways in the spinal cord allowing inhibition of the reflex between voids. This also co-ordinates the reflex preventing dyssynergia. As the higher centres reduce or cease inhibition of the reflex micturition is initiated. This occurs normally during voluntary voiding but may possibly be a cause of incontinence. The initiation of micturition involves a co-ordinated relaxation of the the pelvic floor, relaxation of the urethral sphincter and then contraction of the detrusor muscle. In women voiding in the absence of detrusor muscle contraction is possible with merely the relaxation of the pelvic floor and urethra.

### **Mechanism of continence.**

Continence is maintained when the urethral pressure is higher than the pressure within the bladder. There are several aspects of bladder and urethral function which are essential for maintaining continence. The bladder is a highly compliant organ and can fill with only a small rise in internal pressure. The urethral sphincter contracts to

impart a positive pressure sufficient to ensure urethral closure. The urethral sphincter should not relax inappropriately or incontinence may occur. Voluntary inhibition of the voiding reflex is continued between voids. During coughing, sneezing and physical exertion which result in a rise in the intra-abdominal pressure, sensory information is also transmitted to the proximal urethra and peri-urethral skeletal musculature of the pelvic floor to initiate further contraction in order to prevent a pressure differential occurring and possible leakage of urine.

### Classification of Incontinence.

The International Continence Society defined incontinence as: 'The condition in which the involuntary loss of urine is a social or hygienic problem and is objectively demonstrable'.

A classification of types of incontinence based on presentation is useful in that it helps the clinician identify the possible cause of incontinence and from there decide a management plan.

#### **Stress incontinence.**

Stress incontinence is the term used to describe the symptom of involuntary loss of urine on laughing, coughing, physical exertion or sneezing. It can be observed as loss of urine from the urethra when the patient raises the intra - abdominal pressure by straining or coughing. If this does not occur when the patient is lying on the couch, it



may be demonstrated with the patient standing. Genuine stress incontinence, as defined by the International Continence Society, is the involuntary loss of urine which occurs when the intravesical pressure exceeds the maximum urethral pressure in the absence of detrusor contraction. Without conducting urodynamic studies it is impossible to determine who has stress incontinence with detrusor muscle contraction occurring on coughing, and who suffers from genuine stress incontinence. Genuine stress incontinence is associated with urethral sphincter defect. It may occur during intercourse on penetration. Giggle incontinence is a form of stress incontinence which occurs when laughing.

#### **Urge incontinence.**

Urge incontinence is the condition characterised by the involuntary loss of urine accompanied by the strong desire to void. It can be subdivided into two types:

Sensory urge incontinence: hypersensitivity of the bladder and urethral sensory receptors prevent the bladder filling normally. e.g. infection, bladder calculus.

Motor urge incontinence: due to unstable detrusor muscle contractions. ( This was not demonstrated in the study as this type of incontinence can only be demonstrated on urodynamic assessment and not by clinical examination .) This is the common cause of urge incontinence. It is characterised by urgency, frequency, nocturia and incontinence. Diuretics will often precipitate this form of incontinence. Detrusor instability can occur at orgasm causing incontinence during intercourse.

### **Overflow incontinence.**

This occurs when the intravesical pressure exceeds the maximum urethral pressure. Long standing obstruction to the outlet of the bladder results in bladder distention and loss of compliance. Effective detrusor muscle contractions can no longer occur and leakage of urine results. It is usually a continuous leakage . This is called retention with overflow and occurs most usually when there is prostatic hypertrophy , benign or malignant, in men. The raised intravesical pressure can lead to impaired renal function if not corrected as the raised intravesical pressure may result in obstruction of the upper urinary tract. The neurogenic bladder can also present like this due to detrusor failure following trauma to or lesions of the cauda equina. Faecal impaction is a common cause of overflow incontinence in the elderly, often immobile patient. Diabetic neuropathy and tabes dorsalis also cause overflow incontinence , as can multiple sclerosis.

### **Enuresis.**

Although this means incontinence it is generally understood to apply to nocturnal enuresis, or bed wetting. Bed wetting is very common in children, however all but one per cent have gained total bladder control by puberty. Usually urodynamic assessment will show these patients to have bladder instability.

## Continuous incontinence.

Continuous incontinence can occur due to a variety of conditions. If the patient is conscious of the loss ( rare ) it may be due to sphincter damage or degenerative changes. If the patient is unaware of the loss it is due to a neurological cause, such as atherosclerosis, depression, confusion, drugs and cerebro - vascular accident .

British Registrar General's Classification of Occupation.

Simplified version.

- |     |                   |  |
|-----|-------------------|--|
| I   | Upper and middle  | Higher professional<br>e.g. medicine, engineering, architecture, authors,<br>scientists, large employers,<br>Directors of business |
| II  | Intermediate      | Lower professional, e.g. teachers<br>pharmacists, social workers,<br>managers, farmers, owners of small businesses.                |
| III | Skilled workers   | clerical workers, artisans, foremen, supervisors   |
| IV  | Intermediate      | Semi - skilled workers e.g. factory operatives.<br>Agricultural labourers  |
| V   | Unskilled workers | Casual workers , domestic servants, labourers  |

### Statistical methods.

Statistical analysis using the chi squared test, Wilcoxon, t tests, analysis of variance, correlation tests and Mann - Whitney test was performed using the computer package, the Statistical Package for the Social Sciences (SPSSX). The methods of analysis selected depended on the assumptions relating to the distribution of the variable (s) being analysed. For the t tests, analysis of variance, and chi squared test the assumption is that the data come from a normal distribution and if two or more groups are being compared that the variability within each is the same. If the assumptions are violated the analysis might be invalidated.

Data which have an asymmetrical distribution, or for which the variability is considerably different across the groups, may require transformation before analysis, unless a distribution free method of analysis ( non parametric method ) is selected. These do not depend on assumptions about the distribution. Distribution free methods may also be appropriate for small data sets for which the assumptions cannot be adequately be validated. The Mann -Whitney U test is a distribution free equivalent of the two sample t test.

### Paired observations.

Where the comparison is between measurements for two different groups, the data are said to be unpaired ( e.g. subjects receiving two different treatments ). If the comparison is made on two measurements relating to the same individual in different

circumstances, ( e.g. before and after treatment ) the data are paired. For the unpaired data the Mann - Whitney U test would be used, but for paired data it would be replaced by the Wilcoxon test for paired data. Similarly the two sample t test for unpaired data is replaced by the paired t test. Chi squared test is not for use for paired data.

### Interpretation of hypothesis tests.

All hypothesis tests assess the plausibility of the observed data when some null hypothesis is true, ( such as there being no difference between the groups ), by means of the probability,  $p$ . The  $p$  value is the probability that the observed data would have occurred by chance were the null hypothesis true, i.e. due to sampling variation alone. If the value of  $p$  is large the data are plausible and consistent with the null hypothesis, and thus cannot be rejected. The probability of there being no real effect is not  $p$  so  $p$  is not significant. If  $p$  is small one doubts the null hypothesis, and  $p$  is said to be significant. For these studies the level of statistical significance was set at the 5% level. In practice a non significant result can occur even when there is a real large effect if the number of observations is small. Thus attention was paid to the number of subjects and the power of the study. Although there is a risk of a false positive finding, the risk diminishes for smaller  $p$  values. The tests were limited to one analysis, possibly two, for each set of data because of the risk of spurious significant results arising by chance alone. The more tests that are carried out the greater the likelihood of finding some significant results, however the expected number of false positive findings will increase too, but , this could be allowed for by setting a smaller level of  $p$  as criterion for statistical significance.

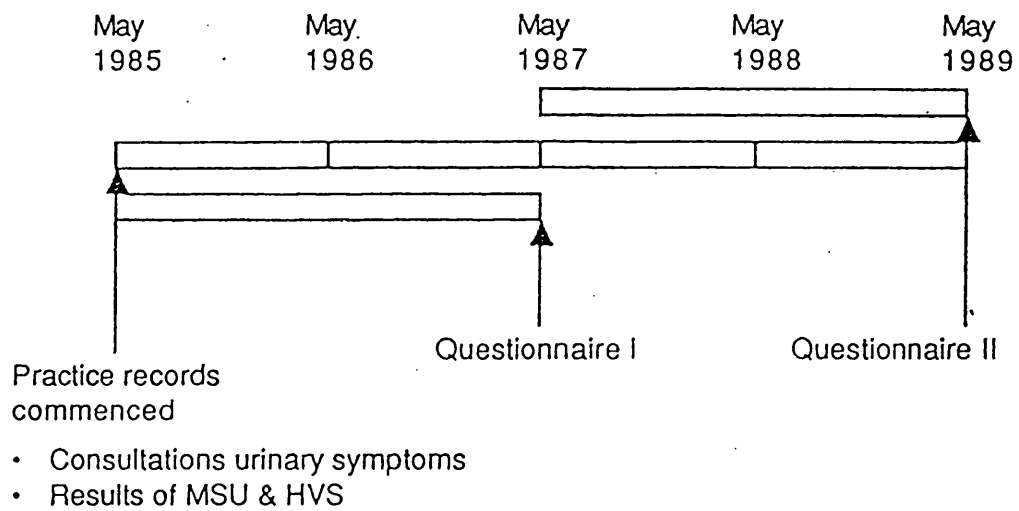
Many of the results have been analysed by two statistical methods, and unless stated there was correlation as to the significance of the p value.

### Presentation of the data.

Results from the research studies are presented in tabular and graphical form. Although the tables give the numeric data, when applicable, the data are also displayed in graphical format so that the trends are more evident. Were the data to be displayed visually, in graphical form alone, the exact data of the results would be lost.

The tables and graphs are numbered so that related data have similar numbers, e.g. Table 2:1 and Figure 2:1 correspond to one another.

## Chronological order and timetable of the fieldwork





## 2. Reported prevalence of urinary incontinence in women in a general practice.

### Introduction.

Although few patients complain spontaneously of urinary incontinence, this problem may frequently be elicited during history taking and on examination. Furthermore, urinary leakage during "pop mobility" and other physical exercise programmes is well recognised by tutors of these programmes.

The prevalence of urinary incontinence has mainly been studied in selected age groups or communities, rather than in a general population. ( Brocklehurst et al 1972, Campbell et al 1985, Crist et al 1972, Holding et al 1986, McGrother et al 1987, Samsioe et al 1985, Wolin 1969 ). A study by Thomas et al ( 1980 ) of the overall prevalence of urinary incontinence showed rates of 8.5% in women aged 15 - 64, 1.6% in men aged 15 - 64, 11.6% in women over 65, and 6.9% in men over 65. Other studies have found rates of incontinence ranging from 30% to 57% in women: Brocklehurst et al ( 1972 ) reported an incidence of 57% in women aged 45 - 64; Wolin ( 1969 ) found that 50.7% and Nemir and Middleton ( 1984 ) that 52% of nulliparous women had stress incontinence; and Crist et al ( 1972 ) found that about 30% of nulliparous women aged 21 - 63 experienced inappropriate urine loss. These apparent variations may be due partly to differing definitions and methods of eliciting the presence of incontinence. Furthermore, all these studies were carried out by investigators previously unknown to the patients.

In the knowledge of these variances the study was designed to determine the prevalence of urinary incontinence in women over the age of 25 years in a rural general practice in Leicestershire. Incontinence was defined as inappropriate leakage of urine. The study was constructed also to identify associated factors and to ascertain why some patients do not consult their general practitioner about the urinary symptoms they experience.

### Aims of the study.

This study sought to:

- \* establish the true prevalence of urinary incontinence in women patients over 25 years old in a general practice.
- \* establish volume of leakage and the need for protection against leakage of urine.
- \* establish the activities which provoke urinary incontinence.
- \* establish consultation rate for urinary incontinence.
- \* enquire about reasons preventing consultation for incontinence.
- \* seek the aetiological factors associated with urinary incontinence.

age

body mass

parity

type of delivery

size of baby

contraception

past history urinary tract infection / vaginal infection

pre - menopausal / post - menopausal status

post - natal exercises

gynaecological surgery

suturing at childbirth

\* establish the prevalence of other urinary symptoms in this group of patients.

\* establish the relationship between previous urinary tract infection and vaginal infection and urinary symptoms.

### Method.

All female patients registered with the practice were assigned an individual and permanent study number so that it was retained for the duration of the studies.

A questionnaire was formulated to ascertain the prevalence of incontinence and other urinary symptoms. Patients were asked whether they experienced leakage of urine on coughing, laughing, exercise, lifting, climbing stairs, with a full bladder, or other occasions. They were also asked to clarify subjectively the frequency of occurrence of each symptom as never, sometimes ( inappropriate urine loss less than twice a week ), or often ( incontinence several times a week ) and whether they wore sanitary protection if symptoms were experienced. If these symptoms had not caused them to seek medical advice the reasons for this were sought. Information was also collected about pregnancies of more than 12 weeks gestation, mode of delivery, whether they had required perineal suture after delivery, performance and duration of post - natal exercises, and contraception. Each patient's history of gynaecological surgery, particularly hysterectomy and operations to repair prolapse, was

---

determined. Patients with neurogenic bladder were identified by questions relating to emptying of the bladder. The questionnaire was tested on 100 randomly selected women and modified in the light of the results.

A postal questionnaire and letter of explanation ( see appendices v-vi, ii ) were sent to all women aged 25 and over registered with the practice on 1st May 1987. The questionnaire was also sent to every third nulliparous patient under 21 years of age whose name was recorded in the practice's oral contraceptive pill register: a total of 30 women were thus selected . These women were selected in order to augment the group of sexually active, nulliparous women in the study population aged 25 years and over. The practice age - sex register was cross checked with the family practitioner committee's computerised records to ensure the accuracy of the population. After 6 weeks non - respondents were sent a reminder and help was offered to those who required it to complete the form. Those not wishing to take part were asked to return the blank form.

Data from the questionnaires were coded with a prepared coding manual, ( see appendices vii - ix ) and each patient was given an identification number when data were transferred to a computer file. The data were analysed with the statistical package for social sciences ( SPSS-X ), using Chi Square and Mann - Whitney U tests as appropriate. Data obtained from the questionnaire were validated by telephone interviews, conducted by specially trained practice reception staff and the practice manager, with a 20% sample of the women who reported symptoms. The sample of the responses was selected for validation using probability or simple

random sampling. This refers to a scheme in which the probability of selection for each set of responses was specified. In simple random sampling, the responses having been numbered, the requisite number of values ( 20% ) were taken from random number tables and sets of responses with the corresponding numbers were selected into the sample. Thus each set of responses had the same chance of being selected as any other. ( Kilpatrick 1975 ). The patients were asked all the questions on the questionnaire and were also questioned about frequency and volume of urine loss. The data collected agreed with the questionnaires returned for 96% of these 105 women.

### Results.

Altogether 833 ( 89% ) of the 937 women registered with the practice responded to the questionnaire. No replies were received from 88 women, 10 women refused to take part, and six questionnaires were returned "unknown at this address". Table & fig. 2:1 show the reported incidence of urinary incontinence: 343 women ( 41% ) reported inappropriate leakage of urine.

The volume of urine leakage was described as:

dampening of underwear	232 women
requiring sanitary protection for physical activity	125 women
requiring change of underwear	63 women
requiring permanent sanitary protection	48 women

Table 2:1

## Prevalence of Urinary Incontinence (N = 833)

	Incontinent				Not incontinent		Total	
	N		%		N	%	N	%
	343		41		490	59	833	100
Incontinence:-	Often		Sometimes		Never			
	n	%	n	%	n	%	n	%
with coughing	37	4	167	20	629	76	833	100
with full bladder	24	3	138	17	671	80	833	100
with laughing	18	2	114	14	701	84	833	100
with exercise	24	3	79	9	730	88	833	100
other occasions usually sneezing	14	2	73	9	746	89	833	100
with lifting	9	1	55	7	769	92	833	100
with climbing stairs	3	<1	44	5	786	94	833	100

48 patients (5.8%) needed to wear permanent protection against leakage.

Fig 2:1

Prevalence of Urinary Incontinence

Often  
 Sometimes  
 Never N = 490

N = 343

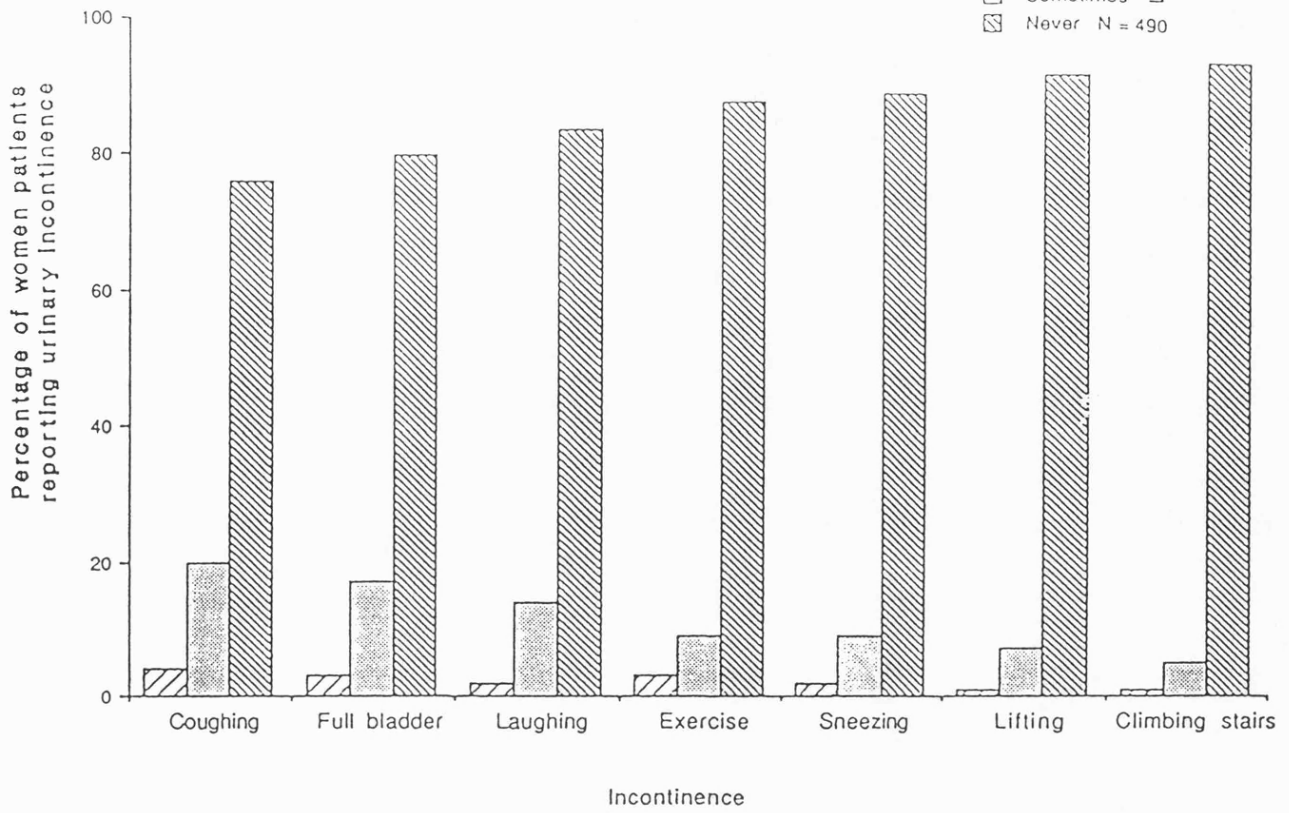


Fig 2:2

Prevalence of incontinence symptoms with age

N = 833

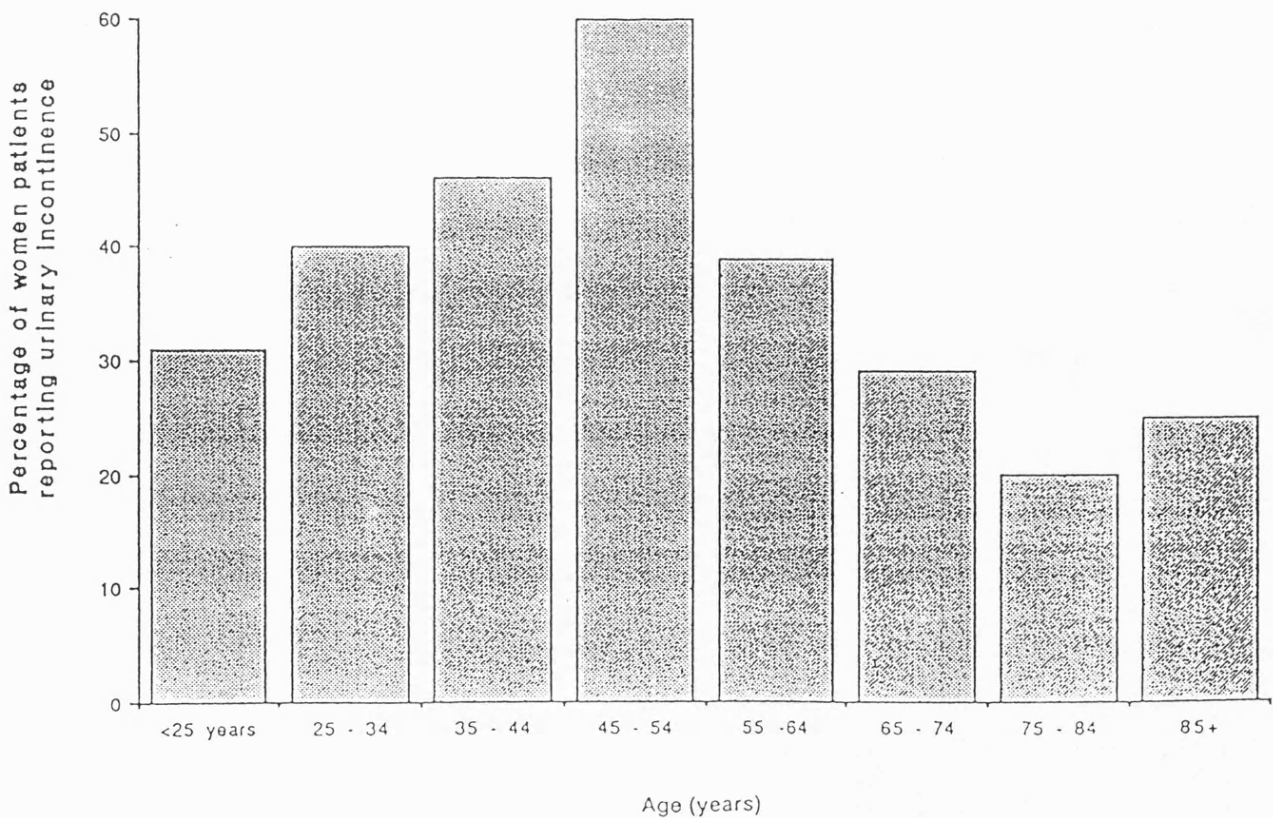


Table 2:2

### Prevalence of Incontinence Symptoms with age.

N = 833

Age group in years	Incontinent		Continent		Total	
	n	%	n	%	n	%
< 25 years	8	31	18	69	26	100
25 - 34	58	40	87	60	145	100
35 -44	104	46	123	54	227	100
45 - 54	86	60	58	40	144	100
55 - 64	47	39	75	61	122	100
65 - 74	30	29	74	71	104	100
75 - 84	12	20	49	80	61	100
85+	1	25	3	75	4	100
					833	100



The prevalence of symptoms tended to increase with increasing age up to age 54 but then declined. ( See Table & fig. 2:2.)

In answer to the question

"Why have you not spoken to the doctor about your incontinence?"

no reply	166 women
considered symptoms were not serious	121 women
symptoms too infrequent to warrant treatment	43 women
symptoms are a usual female complaint	36 women
too embarrassed to consult	13 women

Other reasons included that they believed their symptoms were due to ageing or childbirth, they had not got round to consulting the doctor or were afraid of surgery. ( Several women gave more than one answer.)

Patients were significantly more likely ( Mann Whitney  $p = 0.0001$  ) to consult their doctor the more they experienced factors that caused their incontinence. ( See Table 2:3.) Only 11/135 ( 8% ) patients with one leak symptom had consulted compared with 15/91 ( 16.5% ) with three leak symptoms and 5/34 ( 15% ) with five leak symptoms.

Altogether 30 ( 17% ) of the 181 nulliparous women were incontinent; eight ( 31% ) of the 26 nulliparous women aged under 25 were incontinent. This compared with 313 ( 49% ) of the 652 parous women ( Chi square  $p = 0.0001$  ). The incidence of urinary incontinence increased with parity, being 42% ( 66/157 ), 48% ( 129/268 ), 53%

( 72/136 ), 56% ( 8/15 ) and 58% (44/76) after one, two, three, four and more than four pregnancies, respectively. ( See Table 2:4. )

Patients who had a caesarian section or forceps delivery were more likely to suffer from incontinence than those who had a normal delivery for their first pregnancy ( Chi square  $p = 0.006$  ). ( See Table 2:5.) Only women who had one delivery were included in the analysis.

However women who had had perineal sutures after delivery were significantly more likely ( Mann Whitney  $p = 0.007$  ) to have symptoms of incontinence than those who had not. ( See Table & fig. 2:6.) 58% of women who had not been sutured did not experience urine leakage compared with 47% of the perineal sutured group who were symptom free.

A higher proportion of women who had done post - natal exercises experienced leakage than those who had not, 58% and 37% respectively. ( Mann - Whitney  $p = 0.0002$  ). ( See Table 2:7.) It was not possible to ascertain whether exercises practised daily were more effective in reducing later prevalence of leak symptoms as compared with pelvic floor exercises done less regularly since 190 out of 197 women who did pelvic floor exercises did them daily. Furthermore, a lower proportion of women who had done daily exercises for less than six weeks, 53%, reported symptoms compared to those who had done them for longer, 73%, ( Mann - Whitney  $p = 0.00057$  ). ( See Table 2:8.)

Table 2.3

**The relationship between symptoms and consulting the doctor**

No. of leak sysptoms	Yes		No		Total	
	n	%	n	%	n	%
0	0	0	343	100	343	100
1	11	8	124	92	135	100
2	17	15.5	92	84.5	109	100
3	15	16.5	76	83.5	91	100
4	9	16	48	84	57	100
5	5	15	29	85	34	100
6	6	22	21	78	27	100
7	4	27	11	73	15	100
8	3	50	3	50	6	100
9	1	33.5	2	66.5	3	100
10	2	100	0	0	2	100
Total	73		749		822	

11 Responses missing

Fig 2:3

The relationship between previous vaginal sutures and the incidence of urinary incontinence

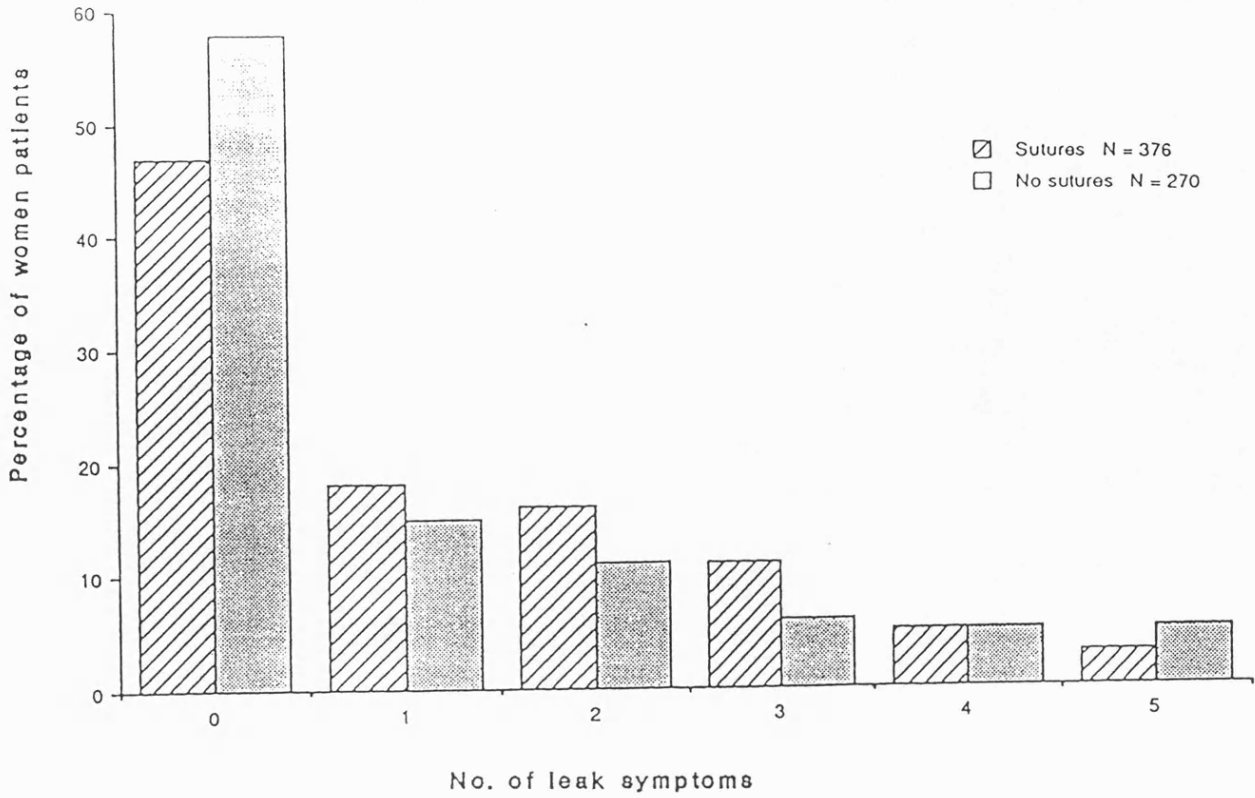


Fig 2:4

The relationship of menopausal status to urinary symptom prevalence

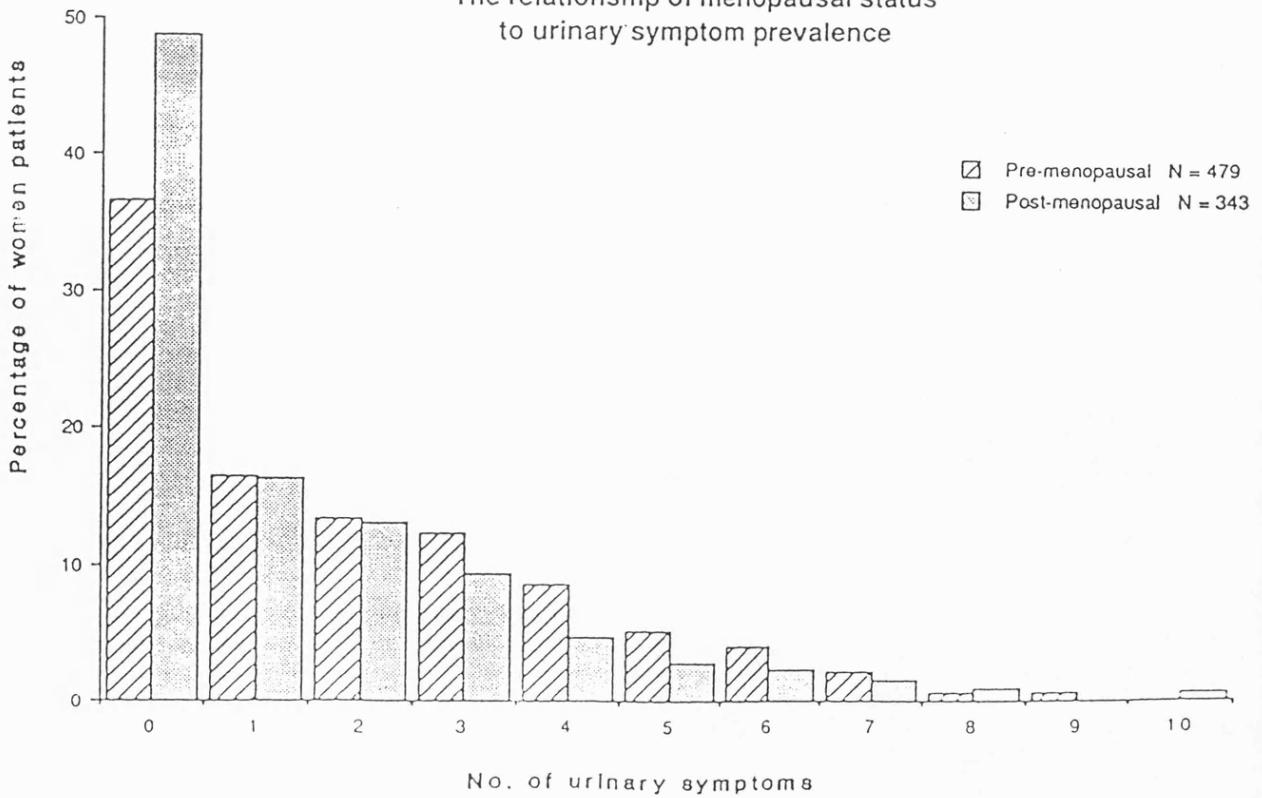


Table 2:4

### Association between parity and incidence of urinary incontinence

	Total No. of patients		Incontinent		Continent	
	n	%	n	%	n	%
Nulliparous	181	22	30	17	151	83
Parous	652	88	313	49	339	51
	833	100				
Parity						
1	157	100	66	42	91	58
2	268	100	129	48	139	52
3	136	100	72	53	64	47
4	15	100	8	56	7	44
4+	76	100	44	58	32	42
Total	652					

Table 2.5

**Relationship between nature of first delivery for patients  
(with one pregnancy > 12 weeks) and incontinence**

			Type of delivery			
	Normal		Forceps		Caesarian	
	N = 124		N = 21		N = 12	
	n	%	n	%	n	%
Continent	69	56	9	43	5	42
Incontinent	55	44	12	57	7	58
	124	100	21	100	12	100

Fig 2:5

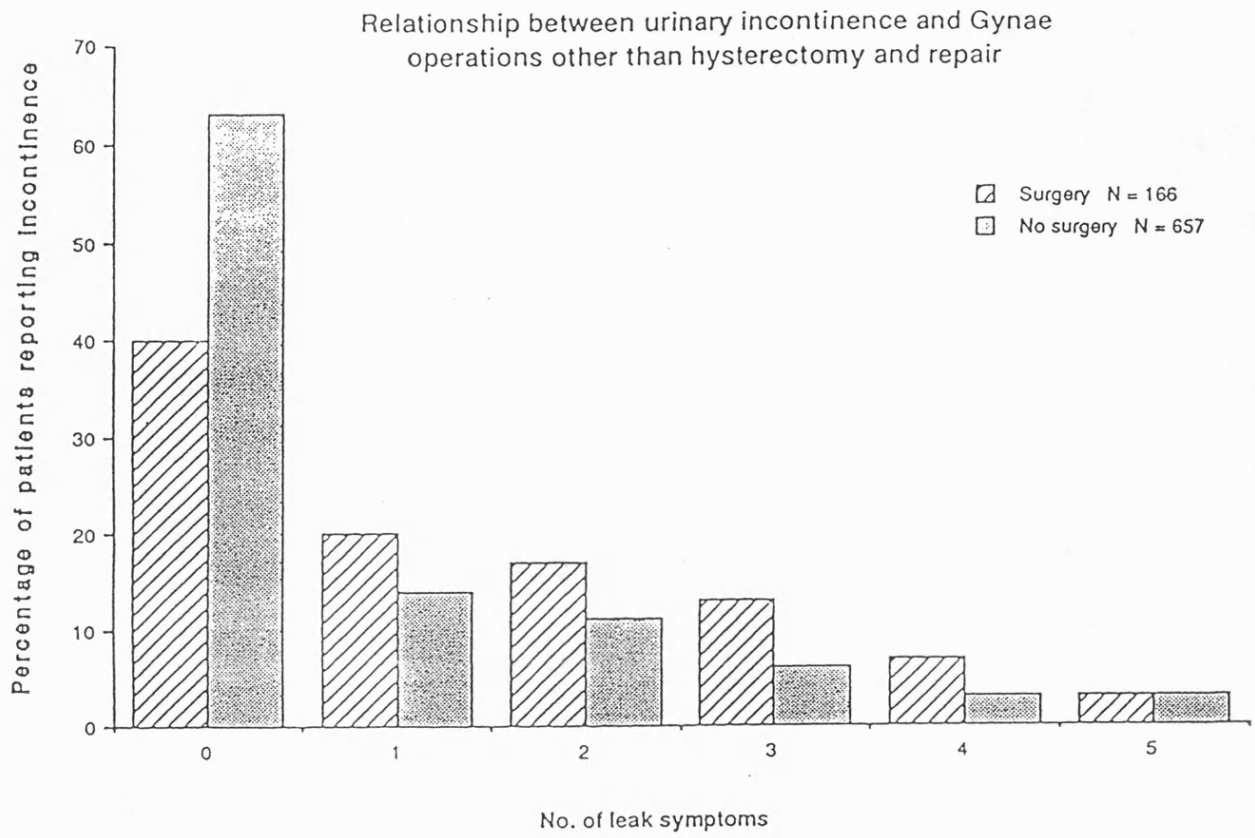


Table 2:6

**The relationship between previous vaginal sutures and the incidence of urinary incontinence**

No. of reported urinary incontinence symptoms	Needed sutures at delivery N = 376		No sutures at delivery N = 270	
	%	n	%	n
symptom free 0	47	175	58	157
1	18	66	15	41
2	16	61	11	30
3	11	43	6	16
4	5	19	5	13
5	3	12	5	13
<b>Total</b>	<b>100</b>	<b>376</b>	<b>100</b>	<b>270</b>



Table 2:7

### Relationship between incontinence symptoms and pelvic floor exercises

	N/A		Pelvic floor exercises		No	
	N = 176		N = 197		N = 450	
Leak symptoms	n	%	n	%	n	%
0	148	84	72	37	260	58
1	17	10	41	21	66	15
2	6	3	38	19	53	12
3	3	2	26	13	33	7
4 or more	2	1	20	10	38	8
Total	176	100	197	100	450	100

Table 2:8

**Comparison of incontinence symptoms between women  
who did pelvic floor exercises for less than  
6 weeks and more than six weeks**

N = 817

Leak symptoms	Length of time Pelvic floor exercises done					
	N/A n = 627		Daily <6 weeks n = 89		Daily >6 weeks n = 101	
	n	%	n	%	n	%
0	409	65	42	47	27	27
1	83	13	17	19	21	21
2	59	10	14	16	24	24
3	36	6	8	9	18	18
4	21	3	2	2	9	9
5 or more	19	3	6	6	2	1
Total	627	100	89	100	101	100

Table 2:9

## Prevalence of urinary symptoms in pre and post menopausal women

N = 823

Urinary symptoms	Pre menopause N = 479		Post menopause N = 344	
	n	%	n	%
0	176	37	167	49
1	79	16.5	56	16
2	64	13	45	13
3	59	12	32	9
4	41	9	16	5
5	25	5	9	3
6 or more	35	7.5	19	5
Total	479	100	344	100

N.B Menstrual status unknown : 10 respondents

Table 2:10

**Prevalence of incontinence in pre and  
post menopausal woman**

N = 823

Leak symptoms	Pre menopause N = 479		Post menopause N = 344	
	n	%	n	%
0	256	53	224	65
1	82	17	42	12
2	61	13	36	10.5
3	42	9	20	6
4 or more	38	8	22	6.5
Total	479	100	344	100

N.B Menstrual status unknown : 10 respondents

Table 2:11

Relationship between urinary incontinence and Gynae operations other than hysterectomy and repair

N = 823

No. of leak symptoms	Other Gynae operations (N = 166)		No surgery (N = 657)	
	%	n	%	n
0	40	66	63	414
1	20	33	14	91
2	17	28	11	69
3	13	22	6	40
4	7	11	3	22
5	3	6	3	21
Total	100	166	100	657

Urinary symptoms were more common in premenopausal than postmenopausal women, 63% versus 51% in total, and significantly more post menopausal women experienced more urinary symptoms than the pre menopausal group of women ( Mann - Whitney  $p = 0.0002$  ). ( See Table & fig. 2:9). Altogether 47% of the premenopausal women had episodes of incontinence compared with 35% of post menopausal women. Pre menopausal women reported more leak symptoms than the post menopausal group as shown in Table 2:10. ( Mann Whitney  $p = 0.0017$  ).

The number of patients who had undergone hysterectomy was very small, however it appeared that hysterectomy ( 10 women ) made no difference to the prevalence of leak symptoms. Leak symptoms were significantly ( Mann Whitney  $p = 0.0002$  ) more commonly reported by the 166 women who had had other gynaecological operations when compared with the group Of 657 women who had not undergone surgery. ( See Table & fig. 2:11 ) Eight women had undergone surgical repairs for urinary incontinence, with good results, and two required a ring pessary for a prolapsed uterus.

## Discussion.

### **Methodology.**

The postal questionnaire is a good, simple research tool through which to collect data. The information relates only to that time period. Careful structure and clear format was achieved through rigorous testing and coordinated pilot testing. Two questions were

built in to check validity which was high at 95%. The high response rate obtained through personal addressing of the questionnaire, the subjects knowing the author of the questionnaire, enclosing a stamped addressed envelope etc. and the reliability, shown through telephone confirmation of the responses, infer that the other information obtained is reliable. The use of predominantly closed questions may have increased the response rate and aided data analysis but constrained the information obtained by preventing deeper interrogation of the subject. Questionnaire studies constrain in that only the data originally requested can be obtained.

The two questions to which the response was poor could have been made clearer using a choice of response with a box to tick, or, were an open question preferred, placing a dotted line on which to write the response to the question. i.e. There was a poor response to the second part of the question ' Have you ever spoken to the doctor about this? Yes / No. If not, why have you not consulted him / her?' Many of the respondents (166 ) left it blank. Had options been given the response might have been directed ( and thus the validity would be in question ) but a higher response rate could have been achieved relating to this question. Response options could have been generated by conferencing of patients with incontinence who had previously not sought medical advice.

## **Results.**

Incontinence was reported by 31% of nulliparous women under 21 years old, which is closely similar to with the 30% proportion found by Crist et al ( 1972 ). The overall

prevalence of incontinence in nulliparous women, however, was 17%, suggesting that the prevalence in older nulliparous women is lower. The women under 21 were all known to be sexually active. This was not the case for nulliparous older women, many of whom were not married. There could therefore be an association between sexual activity and incontinence episodes which only further research could confirm or refute. Wolin ( 1969 ), however, reported that 51% of young, nulliparous females had stress incontinence and Nemir and Middleton ( 1984 ) found a prevalence of 52% in their hospital based study. Brocklehurst et al ( 1972 ) reported that 57% of women aged 45 - 64 had urinary incontinence whereas this study showed a prevalence of 60% in women aged 45 - 54 and 39% in those aged 55 - 64. The lower prevalence of incontinence with increasing age in postmenopausal women confirms a previous report of a decrease in incontinence with age ( Brocklehurst et al 1972 ).

The overall prevalence of incontinence found in this study was supported by the results of the telephone validation study, which confirmed that most of the women who had reported having symptoms sometimes or often were regularly incontinent according to the definition used by Thomas et al ( 1980 ) of twice or more per month. As urinary incontinence in women is so common it could perhaps be placed within the definition of normal urine control. However, the minority who require regular sanitary protection to avoid the embarrassment caused by the inappropriate leakage of urine have clinical stress incontinence. Some women can usually cope adequately with incontinence but under some circumstances -for example, during sporting activity - it becomes embarrassing. For them 'normal' incontinence merges with unacceptable clinical incontinence.



Incontinent women use a variety of control measures in self - care. ( Brink et al 1987, Herzog et al 1989, Jeter and Wagner 1990, and McGrother et al 1987 ). However many of these products used are not designed as incontinence aids and may not be as effective as pants and pads especially designed for the purpose. The former are more easily purchased, however, and less indicative of an incontinence problem.

Urinary incontinence is believed to be associated with parity. Thomas et al ( 1980 ) reported a higher prevalence in women who had had up to three babies compared with nulliparous women, but no appreciable difference occurred within the parous group.

Incontinence was more common among women who had had four or more babies. This study found that incontinence increased with parity up until and including the fourth pregnancy. ( See Table 2:4 ). Interestingly, most of the older women of high parity had never been incontinent. In the past women wore supporting garments, did more heavy work in the home and were perhaps physically fitter; they also "lay in" for longer in the puerperium. Perhaps these historical differences in practices associated with pregnancy could explain this apparently paradoxical finding.

Women who had had one delivery only were examined in order to look at the relationship between type of delivery and incontinence. Thus the numbers of women in each group were very small - too small to draw conclusions on the bearing of type of delivery on the development of incontinence. The study results demonstrate no

difference in the prevalence of incontinence after normal childbirth compared with forceps delivery. Caesarian section appeared to be associated with a higher prevalence of incontinence however again I emphasize that the numbers are too small to make any conclusions. Further and larger studies are needed to confirm or refute the association between caesarian section and incontinence.

In the studies by Herzog et al ( 1989 ) and Jeter and Wagner ( 1990 ) it was reported that only 10% of women did pelvic floor exercises compared to the 45% of women in this study. The apparent adverse effect on the development of incontinence of pelvic floor exercises is a cause for concern. In the form in which the study data are presented the prevalence of incontinence appeared to increase when these exercises were done daily, and increase further when pelvic floor exercises were continued for longer than six weeks. There could be more than one explanation for this: Firstly, it was a possibility women who had pre-existing leakage conscientiously did the exercises whereas those without problems were less conscientious. Secondly when women said they did pelvic floor exercises they might or might not have done them correctly. This is proposed in the light of findings made during the second study ( Jolleys 1989 ) when women were questioned about pelvic floor exercises and were taught to do them correctly. The study revealed that pelvic floor exercises were not universally understood - many versions were not isolated contractions of the levator ani muscles and some did not indeed include contraction of these muscles at all.

In the experience of these results it seems that the effectiveness of pelvic floor exercise programmes as instructed on maternity wards needs to be re-examined and

evaluated. Perhaps they should be taught differently and better supervised in their execution. Were urinary incontinence identified during pregnancy or at pre-conception counselling the exercises could be commenced earlier, which might ameliorate urinary incontinence. Further study is required to determine the effectiveness of prenatal exercises in the prevention of incontinence. As minor gynaecological surgery is significantly related to an increased prevalence of incontinence, current operative techniques may cause damage to the pelvic floor. The power of this study was too small to make statements about the relationship between urge incontinence and hysterectomy. However it does confirm previously documented increased prevalence of urinary symptoms. ( Hanley 1969, Jequier 1976 ).

The high prevalence of urinary incontinence in the study contrasts with the low number of incontinent women who have presented to their doctor. Many women appear to accept urinary incontinence and to cope with it by themselves. The women's reasons for not seeking help may be that they do not consider the problem serious enough, that they are embarrassed, or fear surgery; Norton et al ( 1988 ) subsequently reported a study confirming the reasons why women do not consult for incontinence. Furthermore other studies confirm that many women have been disappointed with the help offered by doctors. ( Fall et al 1985 and Mitterness 1987 ).

These results have several implications for clinical practice. The major conclusion is that general practitioners should ask female patients about incontinence on a routine basis in order to detect more cases, as a consequence of which this embarrassing and inconvenient complaint, necessitating permanent protection against leakage in

6% of all women, could be better identified and alleviated.

### 3. Diagnosis and management of women with incontinence in general practice.

#### Introduction.

Having discovered that 41% of the women patients registered with the practice suffered from regular - and largely unreported - incontinence according to the definition of Thomas et al ( 1980 ), the next challenge was to identify the underlying causes and institute appropriate management.

A range of hospital based services were available for the incontinent. There were continence clinics staffed by consultants, nurses and continence advisers, but appointments were limited and demand meant that there were long waiting lists. Gynaecologists see female patients with incontinence and assess them by urodynamics. Stress incontinence is treated by pelvic floor faradism with surgery reserved for the more severely affected. Physiotherapists work in conjunction with both the continence clinics and gynaecologists but their services are not always directly available to patients referred by general practitioners. Urologists also see patients with incontinence. In Leicestershire the urology service was already working to full capacity, with very long waiting lists , effectively excluding this option.

Because of these constraints and the high prevalence of urinary incontinence it was decided to treat, at least initially, all patients in the setting of general practice. A literature search revealed no studies assessing the treatment of urinary incontinence in general practice although a number of hospital studies have been reported. ( Bhatia

and Ostergard 1982, Kegel 1951, Jones 1965, Moore and Schofield 1967, Fliegner and Glenning 1979 and Glenning and Fliegner 1976.) Bhatia and Ostergard ( 1982 ) reported clinical cure of stress incontinence by retropubic urethropexy and Kegel ( 1951 ) and Jones ( 1965 ) reported studies assessing the efficacy of pelvic floor exercises in stress incontinence. Physiotherapy as management of stress incontinence is well documented. ( Harrison 1975, Mandlestam 1980, Mohr et al 1983, Moolgaoker 1976, and Stoddart 1983 ). Moreover, the literature was encouraging giving suggestions for a simple and practical approach for the diagnosis and management of urinary incontinence in general practice. ( Giesy 1986, Mohr et al 1983, Stenchever 1986 )

Jarvis et al ( 1980 ) looked at the correlation between the diagnosis given to the patient based on clinical symptoms and a final diagnosis based on cystometry in 100 incontinent women. In Jarvis's study the diagnosis made on clinical grounds alone was confirmed by urodynamics in only 68% of cases. 25% of women who were eventually diagnosed as having genuine stress incontinence presented with urgency. The conclusion drawn was that accurate diagnosis based on clinical symptoms alone is difficult since patients with either detrusor instability or stress incontinence often present with symptoms indicative of both disorders and thus would have been diagnosed as suffering from stress / urge incontinence. . Despite taking a careful history and examination , further investigation is almost always necessary as the bladder tends to be an unreliable witness in that symptoms often do not mirror the underlying cause. They concluded that generally, the correlation between clinical diagnosis and urodynamic diagnosis is poor.

The study was designed to investigate how effectively female urinary incontinence can be managed in general practice. The high prevalence, the need to employ low cost techniques and the emphasis on health promotion indicated the potential value of this approach.

### Aims of study.

This study was designed to determine whether a general practitioner could successfully diagnose and treat incontinent female patients without the need for special training and resources. For this reason subjective outcome criteria were adopted rather than objective urodynamic measures since perineometers are not readily available to general practitioners.

### Method.

All the 343 women patients registered with the practice who had reported regular incontinence of urine were sent an invitation ( see appendix xxii ) to discuss their incontinence problem. All patients were interviewed by myself using a personally administered questionnaire ( see appendix xiv ). This was designed to confirm urine leakage, provide information on the type and severity of the incontinence and determine when episodes of incontinence had started. Abdominal and vaginal examination were performed and a diagnosis of the type of incontinence was made. The urine was tested with Uristix to ascertain whether or not protein and / or haemoglobin were present. A mid - stream urine sample sent for microscopy and

culture. The work of Kass ( Kass 1957 ) has shown that a fresh specimen of urine of normal individuals does not contain more than 10,000 organisms per ml. of urine. In urinary tract infection , even if it is latent, it is usual to find more than 100,000 pure growth organisms per ml. Urinary tract infection was confirmed according to this criterion. Confirmed urinary tract infection was treated with an appropriate antibiotic and the patient reassessed using the same questionnaire if the incontinence persisted.

### Classification of incontinence.

Patients were placed in one of three diagnostic / management categories:

1. Stress incontinence.

- loss of urine on exertion, without active bladder contraction. It may imply that urethral sphincter incompetence is present.

2. Urge incontinence.

- involuntary loss of urine associated with a strong desire to void. This may be accompanied by a detrusor contraction.

3. Stress / urge incontinence.

- a combination of 1 and 2. ( From Jarvis's study 1980 it was recognised that this group of patients might suffer from detrusor instability or stress incontinence alone, however it was decided that the treatment programme assigned would not be detrimental to the patient's condition. )



### **Exclusion criteria.**

Patients with any of the following were offered consultant referral and excluded from the study:

vesico - vaginal fistula.

palpable bladder after micturition.

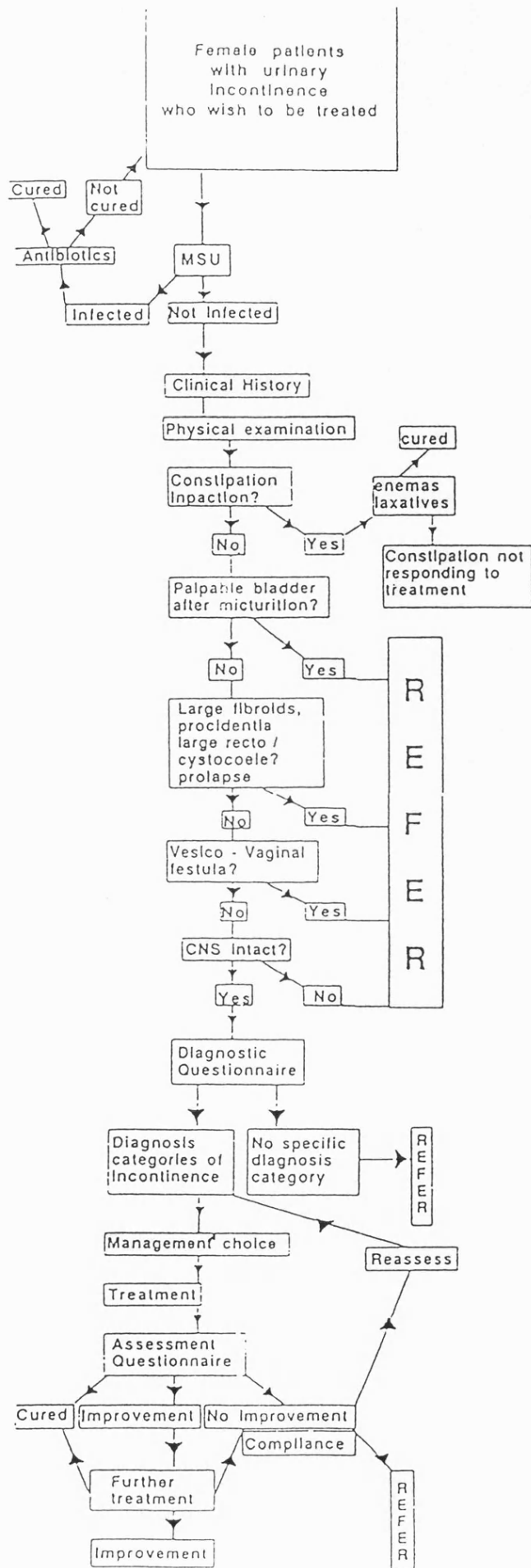
disease of the central nervous system e.g. multiple sclerosis, neurogenic bladder.

certain gynaecological conditions e.g. procidentia, large rectocele, large cystocele or fibroids of a severity requiring surgery.

no diagnosis .

### **Management of stress incontinence.**

Patients with stress incontinence were taught pelvic floor exercises. They were instructed to breathe normally while actively contracting the levator ani muscles ensuring that no simultaneous contraction of the abdominal, gluteal or adductor muscles occurred. Active contraction was confirmed by vaginal examination. Patients were told to refrain from activities which precipitated an incontinence episode. Advice on reducing the amount of lifting and the correct way to lift was also given. A pictorial explanation of stress incontinence and the pelvic floor was given in order to ensure understanding and compliance. with treatment regime. ( see appendix xxiv ). The patients were given a regular exercise programme of pelvic floor exercises - at least four contractions ten times daily ( see appendix xxvi ). Patients were given dietary advice for weight reduction if they were overweight i.e. a body mass index >23.9

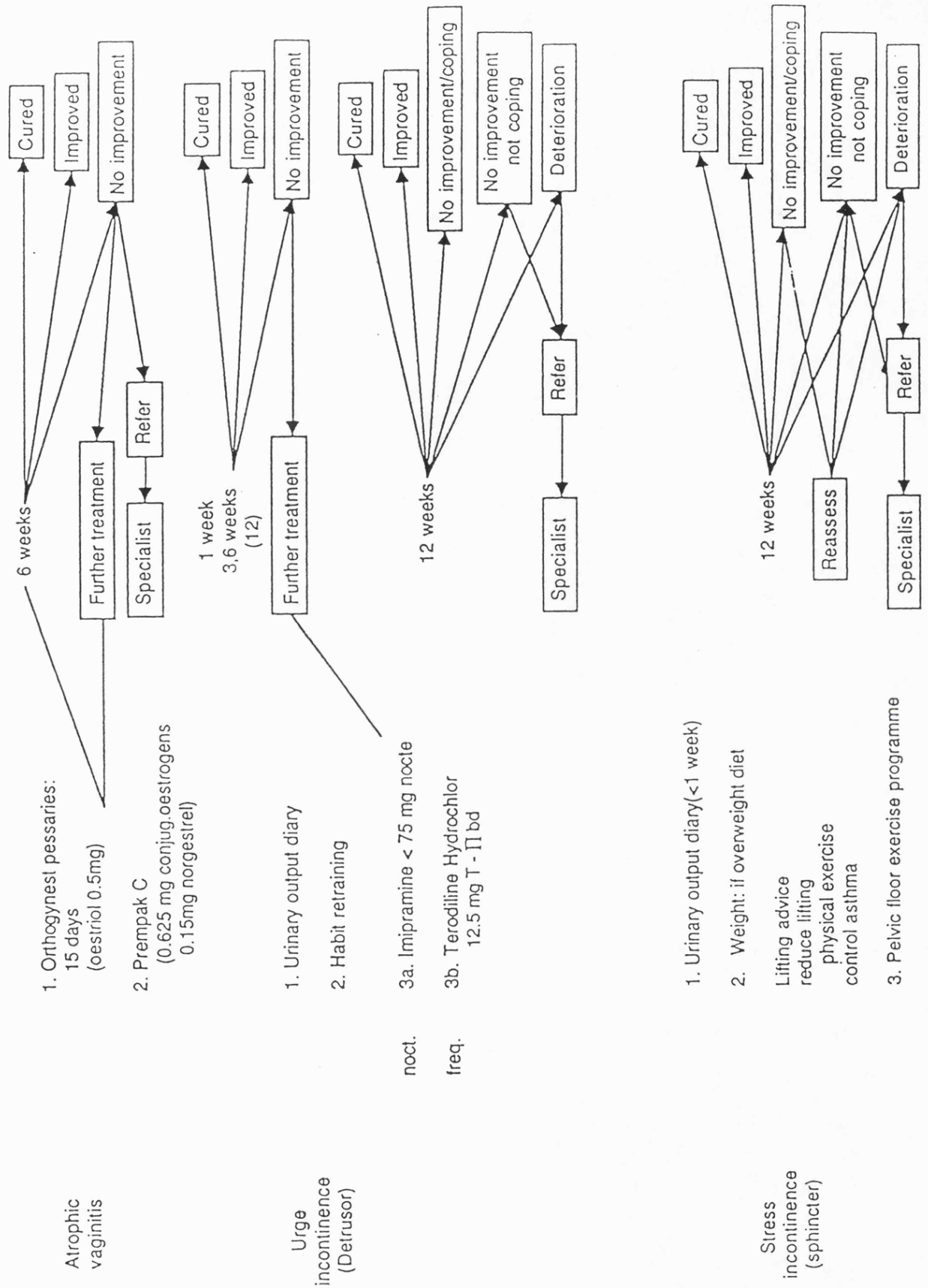


Diagnosis

Management

Assessment

Outcome



( Royal College of Physicians 1983 ).

### **Management of urge incontinence.**

Patients with urge incontinence kept a urinary output diary for two days. After discussion of this habit retraining was initiated and fluid intake regulated. ( see Appendices xxv-xxviii , xxix ) After two weeks the patient was reassessed. If nocturia was reported to occur at intervals of less than two hours or frequency was less than hourly treatment with terodiline hydrochloride 12.5mg ( one or two tablets twice daily ) was started.

Habit retraining was continued and at reassessment the need for medication was reconsidered. Marked atrophic vaginitis at pelvic examination was treated with oestriol 0.5mg pessaries, one daily for 15 days. At review patients with persisting severe atrophic vaginitis were considered for hormone replacement therapy. Weight reduction advice was given if the patient was overweight i.e. a body mass index > 23.9.

### **Management of stress / urge incontinence.**

These women were treated for both stress and urge incontinence as described above.

All patients were reassessed at 12 weeks using the same personally administered questionnaire and their opinion sought regarding change in their condition. The assessment was conducted by the practice manager to minimise bias. Patients

dissatisfied with a lack of improvement or their current condition were offered further help or consultant referral.

A control group of women with reported incontinence was recruited from surgery attenders who had not replied to the initial letter. The controls were interviewed and a diagnosis of the type of incontinence made but they received no treatment. Study patients and controls were matched for age, parity, type of incontinence, duration of symptoms, body mass index and range of body mass index. The control group was reassessed at 12 weeks.

### Results.

78 ( 23% ) replied to the invitation and 68 ( 19.5% ) kept their appointments. Of the 67 women attending for appointments two were offered referral since they had one of the exclusion conditions: one was referred for surgical repair of prolapse and the other had multiple sclerosis.

All 56 women approached to be controls consented. The incidence of the three categories of incontinence is shown in Table 3:1 and Fig. 3:1A which demonstrate a similar incidence of each type of incontinence for subjects and control groups. A total of ten women had undergone hysterectomy.

The prevalence of urge incontinence was 10 / 26 : 38% in the older age group women aged 55 + and of stress / urge incontinence was 5 / 26 : 19%, whereas for the

Table 3:1

## Incidence of the three categories of incontinence for subjects and controls

Type of incontinence	Subjects (N = 65)		Controls (N = 56)	
	n	%	n	%
Stress incontinence	41	63	41	73
Urge incontinence	16	25	10	18
Stress/Urge incontinence	8	12	5	9
Total	65	100	56	100

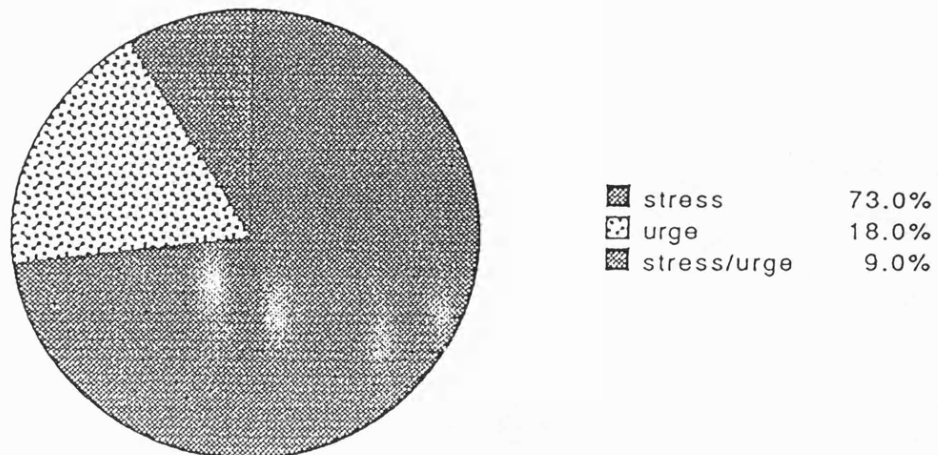
Fig. 3:1A Incidence of the three types of incontinence for subjects.

Incontinence in subjects N=65



Fig. 3:1B Incidence of the three types of incontinence for controls.

Incontinence in controls N = 56



35 - 54 year old patients the prevalences were 6 / 29 : 21% and 3 / 29 : 10% respectively. In the <34 years however neither condition was diagnosed, all women of that age group being diagnosed as suffering from stress incontinence. There is a trend for raised prevalence of urge incontinence in women aged 55 + but it is not statistically significant ( Chi square  $p = 0.074$  ). Similarly there is a trend for increased prevalence of stress / urge incontinence in women aged 35+ compared with younger women, again not reaching statistical significance. (Chi square  $p = 0.08$  ). Younger women were diagnosed as having stress incontinence significantly more than older women. 10 / 10 : 100 % in <34 years, 20 / 29 : 69% in 35 - 54 year olds and 11 / 26 : 42 % in 55+ age group. ( Chi square  $p = 0.015$  )

34 / 39 : 85 % of the patients who were diagnosed as suffering from urge and stress urge incontinence reported that they wet their clothes, cushions and household linen whereas none of the women with stress incontinence, 0 / 82 : 0 % reported more than dampening of pants. Similarly women suffering from urge and stress / urge incontinence reported that ' their problem affects their social life' by restricting travelling long distances 89%, and going shopping and walking 74%.

One subject only had a confirmed urinary tract infection on analysis of a mid - stream specimen of urine and on reassessment still had stress incontinence.

Five subjects were treated for atrophic vaginitis and had subsequent improvement of urge incontinence.



The reported onset of incontinence is shown in Table 3:2 and Fig. 3:2a and 3:2b. Twelve of the 121 women ( 10% ) reported being incontinent since childhood, 10 of whom had stress incontinence. There was no significant difference ( Analysis of Variance  $p = 0.0967$  ) in the reported time of onset of incontinence between the subject and control groups. ( See Table 3:2 ) Women with urge incontinence were significantly ( Chi square  $p = 0.001$  ) less likely to recall the onset of their incontinence than women with stress, or stress / urge incontinence, 19 / 26: 73%, 20 / 82 : 24%, 3 / 13 : 23% respectively. ( See Fig. 3:2c ) The onset of each type of incontinence appears not to be directly associated with the patients' parity with the exception of stress incontinence which was most frequently reported to start after the first or second pregnancies ( Chi square  $p = 0.0031$  ). ( See Table 3:3. )

At the twelve week follow up statistically significant cure or improvement was reported by women treated for stress ( Chi square  $p = 0.001$  ) and urge ( Chi square  $p = 0.001$  ) incontinence but not for stress / urge incontinence ( Chi square  $p = 0.0611$  ) , when compared with the controls. ( See Table 3:4 ). Although not statistically significant the outcome of the treatment of stress / urge incontinence shows a trend towards success. There was no statistical difference ( Analysis of Variance  $p = 0.2518$  ) in the efficacy of treatment by age group - less than 35 years, 35 - 54 years and 55 years and over - ( See Table 3:5a, 3:5b, 3:5c ) or by the duration of incontinence ( Analysis of Variance  $p = 0.1621$  ).

Of the 82 women reporting stress incontinence only 40% demonstrated it by cough voiding at the initial examination. All the women had some control of pelvic floor

Table 3:2

The reported onset of incontinence

N = 121

onset of incontinence	Incontinent		Stress		Urge		Stress/Urge	
	n	%	n	%	n	%	n	%
childhood	12	10	10	12	1	4	1	7.75
pregnancy 1	33	27	28	34	1	4	4	30.75
pregnancy 2	18	15	14	17	1	4	3	23
pregnancy 3	8	6	7	8.5	0	0	1	7.75
pregnancy 4 +	0	0	0	0	0	0	0	0
hysterectomy	7	6	2	2.5	4	15	1	7.75
other gynae operation	1	1	1	1.5	0	0	0	0
unknown	42	35	20	24.5	19	73	3	23
Totals	121	100	82	100	26	100	13	100

Fig. 3:2a

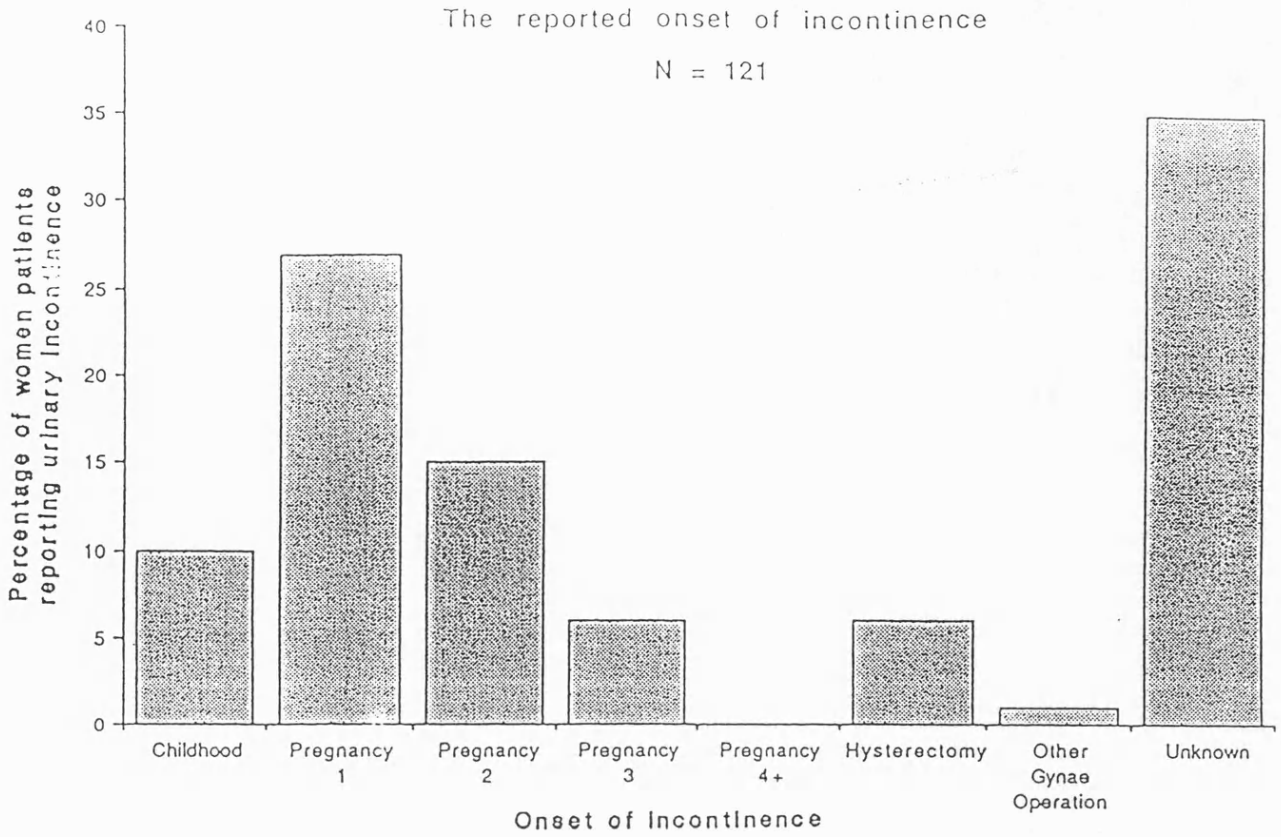


Fig. 3:2b.

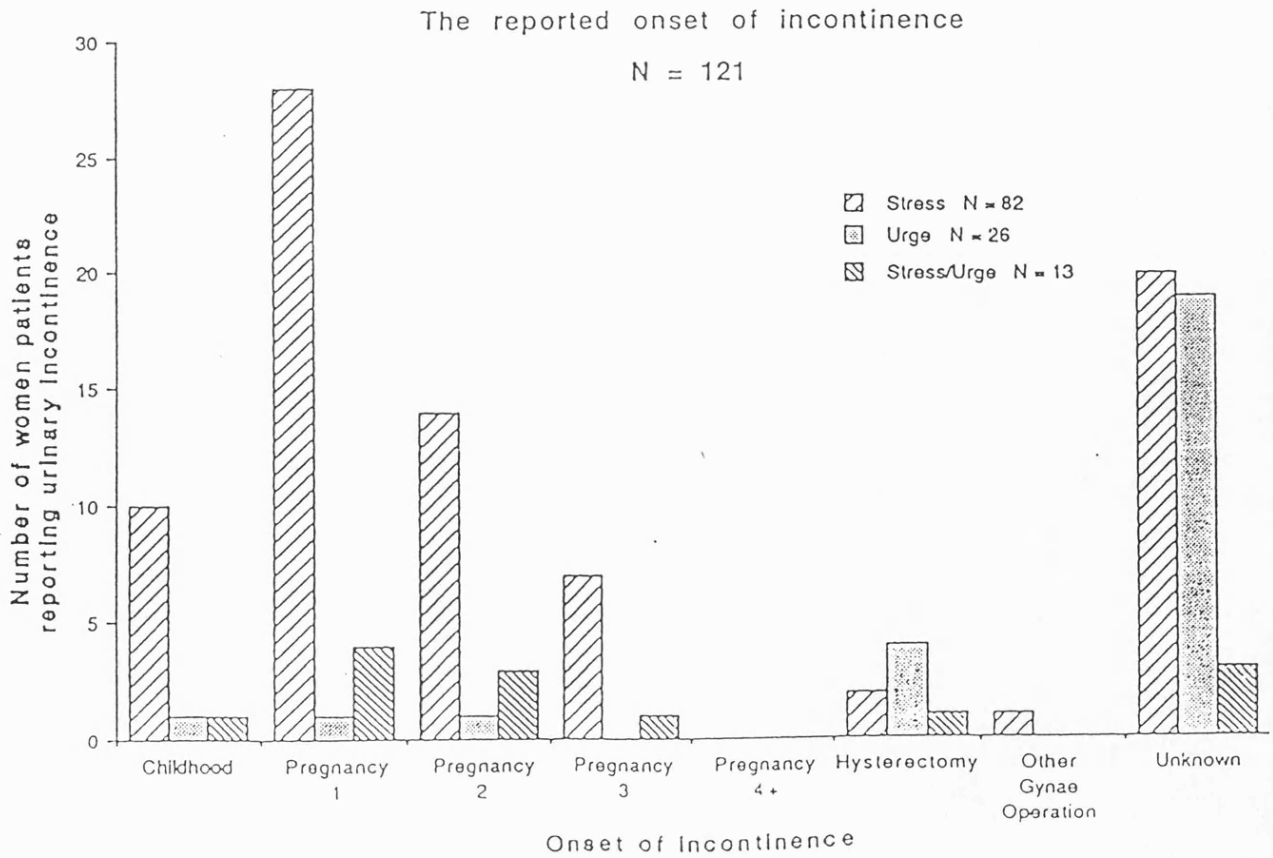


Fig. 3:2c

Women who could not recall the onset of incontinence

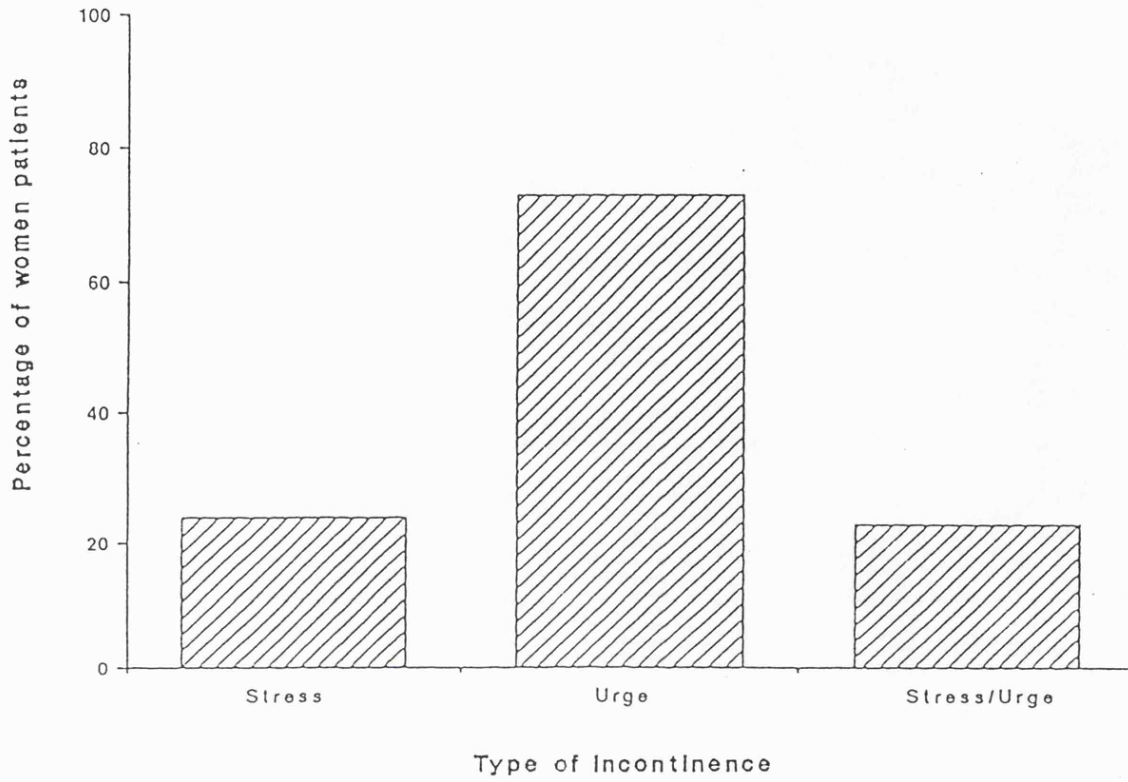


Table 3:3

### The parity of those reporting incontinence

N = 121

Parity	n	%
0	9	7
1	18	15
2	60	50
3	15	12
4	11	9
5	5	4
6	2	2
7	1	1
Total	121	100

Fig 3:3 The parity of those reporting incontinence

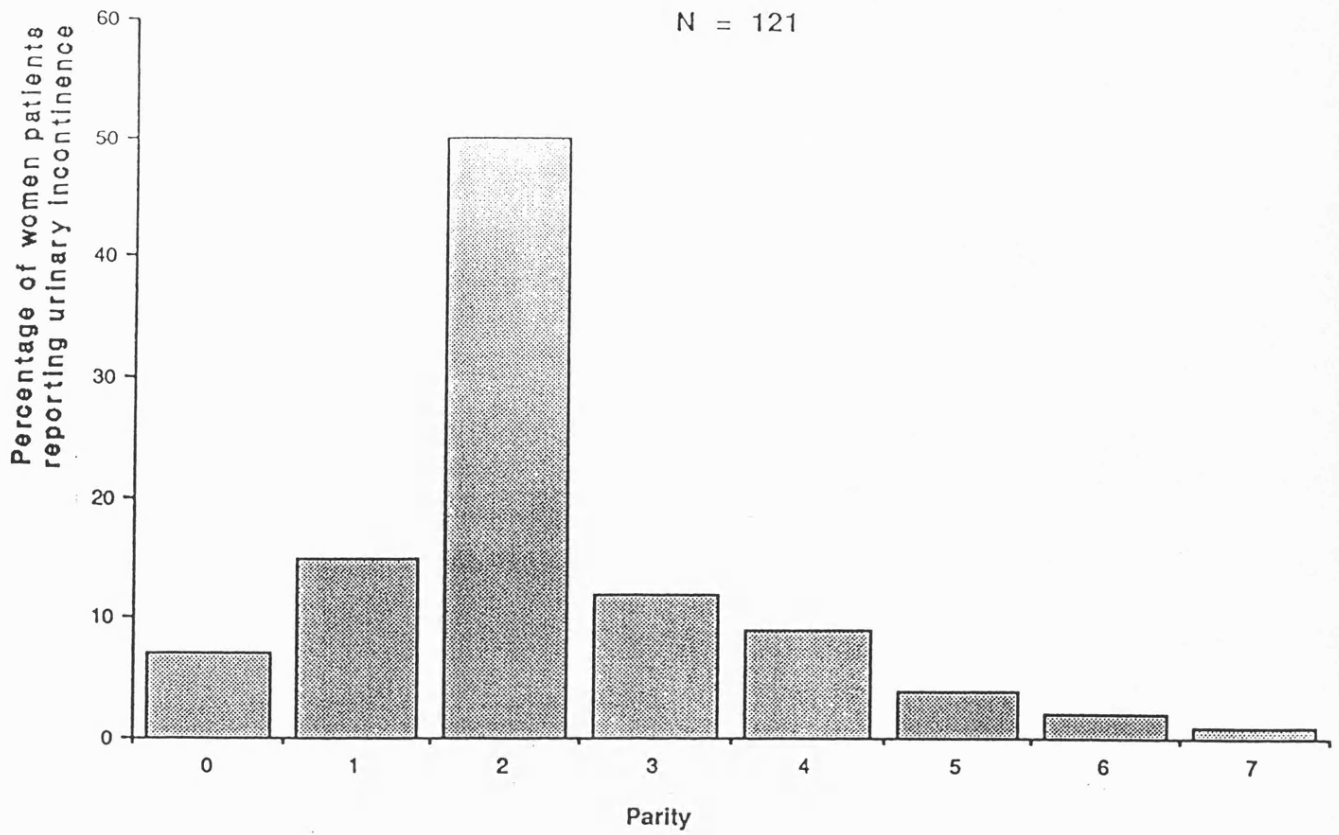


Fig. 3:4A Stress Incontinence

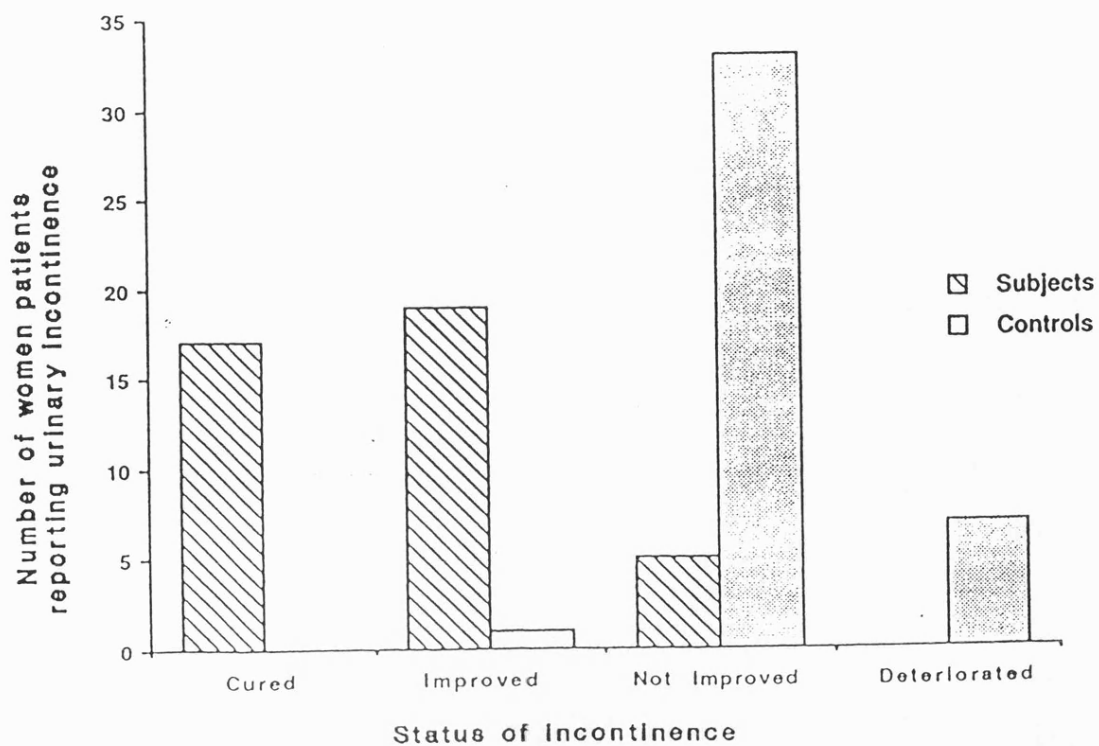


Table 3:4

### Reported outcome at 12 weeks for patients with stress, urge or stress/urge incontinence

Type of incontinence	N Number of patients = 121								Total	
	outcome									
	Cured		Improved		Not improved		Deteriorated		n	%
	n	%	n	%	n	%	n	%		
Stress incontinence										
Subjects	17	37	19	42	5	11	0	0	41	100
Controls	0	0	1	2,5	33	80.5	7	17	41	100
Urge incontinence										
subjects	12	75	4	25	0	0	0	0	16	100
Controls	0	0	0	0	9	90	1	10	10	100
Stress / Urge incontinence										
Subjects	2	25	4	50	2	25	0	0	8	100
Controls	0	0	0	0	4	80	1	20	5	100
									121	100

Fig. 3:4B Urge Incontinence

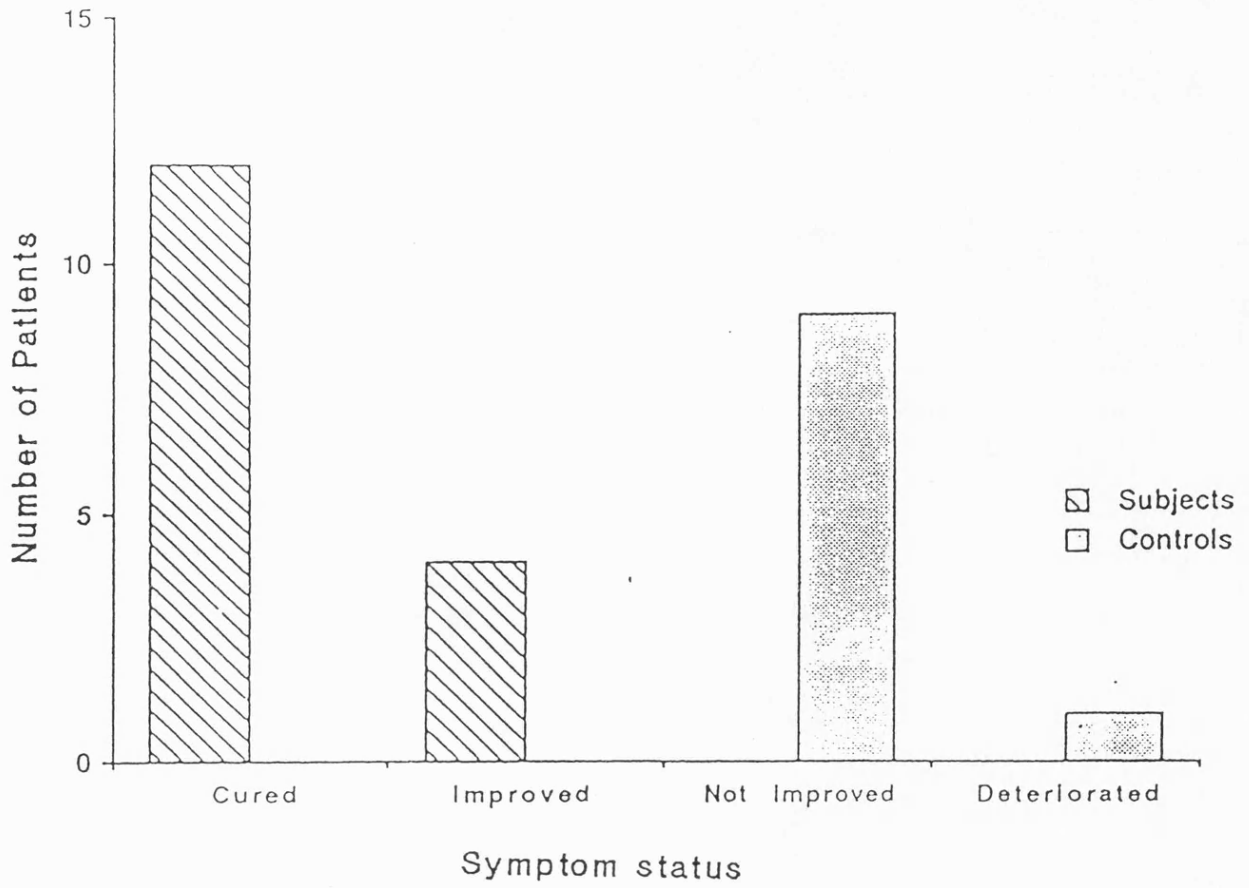


Fig. 3:4C Stress/Urge Incontinence

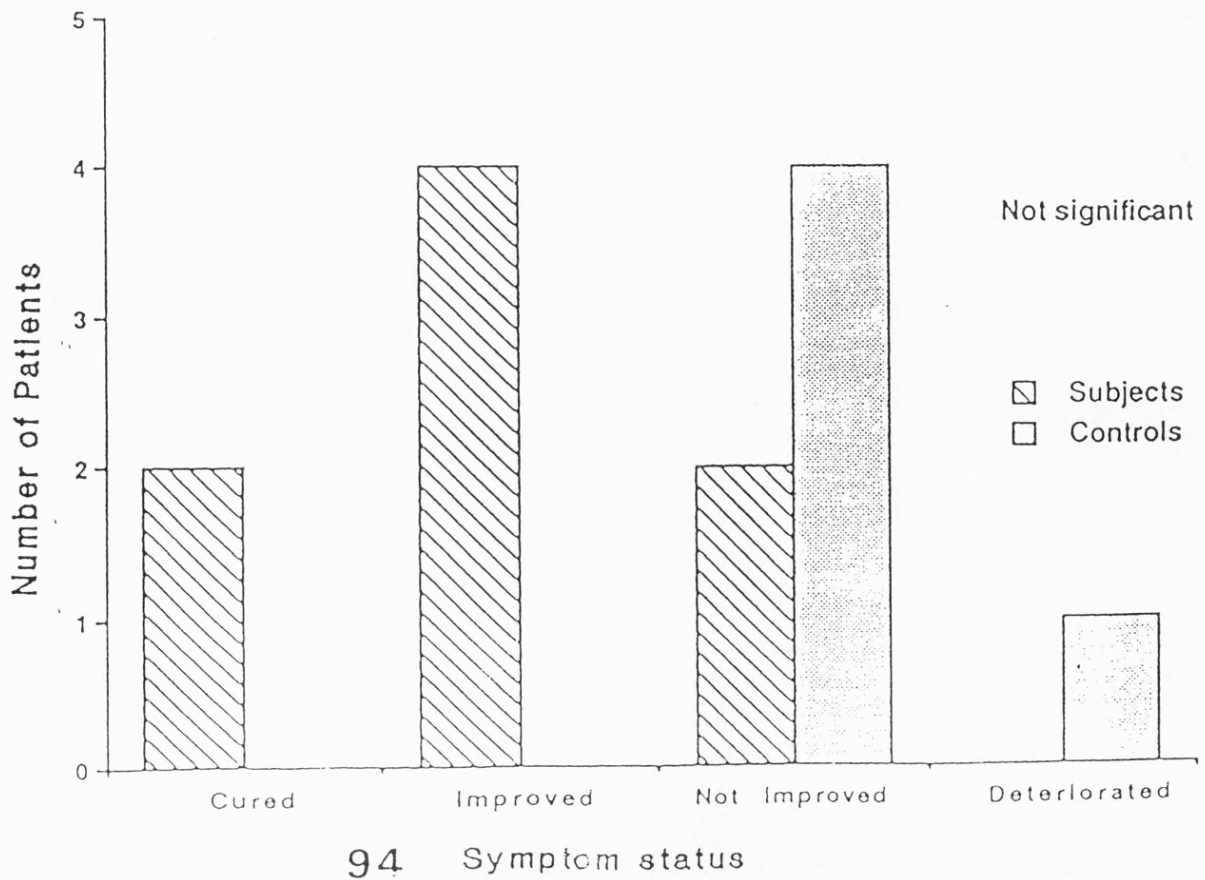




Table 3:5

The relationship between age and reported outcome of treatment for stress incontinence

N = 41

Age group years	Outcome		
	Cure/improv	no improv	deteriorated
<35	8	2	0
35 - 54	18	2	0
55+	10	1	0
Total	36	5	0

Table 3:5 b

### The relationship between efficacy of treatment for urge incontinence and age

N = 16

Age group	Treatment result		
	cure/improv	no improv	deteriorated
35 - 54	6	0	0
55+	10	0	0
Total	16	0	0

Table 3:5 c

The relationship between results of treatment for stress and urge incontinence and age

N = 8

Age group years	Treatment result		
	cure/improv	no improv	deteriorated
35 - 54	3	0	0
55+	3	2	0
Total	6	2	0

muscles at the initial vaginal examination assessment. No patient demonstrated cough voiding at the reassessment examination.

Habit retraining alone was not sufficient in 10 out of the 16 subjects with urge incontinence and terodiline hydrochloride was prescribed for patients with frequency to assist bladder control. In all but two patients the dose was reduced and stopped after four to eight weeks when total bladder control was regained. Imipramine was not used since no patient complained only of nocturia.

There was no difference between the average body mass index of the subject and control groups which were 25.16 and 25.10 respectively. There was a significant difference between the body mass index of the stress / urge group and the other patients. The body mass index of the individual groups of subjects suffering from stress incontinence, urge incontinence and stress / urge incontinence were 24.42, 24.90 and 29.48 respectively ( Analysis of Variance  $p = 0.0038$  ). Dietary advice was given to 28 subjects and 23 patients in the control group. At reassessment after 12 weeks the average weight loss was 3.5 kilos in the subject group and 3.0 kilos in the control patients.

Seven subjects were offered referral to a consultant but none accepted. The majority of the subjects ( 94% ) expressed satisfaction at having a diagnostic label and treatment plan and this was not related to whether or not a cure was achieved.

## Discussion.

### **Methodology.**

The dilemma of physician and researcher dictated the design of this study. Ideally a randomised controlled trial should have been conducted on the women who presented at the surgery for medical attention with random allocation of the patients to treatment and non - intervention groups and comparison of the results. However the patients requested help and active treatment. Although definitive work was needed to determine the efficacy of treatment in the community, hospital studies indicated that active treatment was more effective than no intervention so it seemed that,, in the interests of good patient care / management, watchful waiting was not an option for this group of people. The decision was made to case match those women who presented for treatment with women who complained of incontinence but who were not requesting treatment. Of course this introduced bias: The female patients who requested treatment may have been more severely affected, or perceived their condition to be more severe and unacceptable. The two groups may not have been comparable. I did know however, from my own previous research and that of others, that incontinence was unlikely to resolve with time other than around the menopause.

Another source of bias was that I was known to the patients, being their general practitioner. Although this is conducive to compliance with the treatment regime, it might have been that my patients over-emphasized their improvement in order not to disappoint or upset me. However, there was similar bias for both the subject and

control groups. Furthermore, I attempted to control this bias by having the reassessment interview conducted by the practice manager who had been trained to question using standard phrases, taught interview technique and had been rehearsed to deliver a standard interview. Nonetheless this may not have been sufficient to control for bias as she too was known to the patients through employment at the practice.

Although every effort was taken to equate the attention paid to the subjects and controls, the patients being treated for urge incontinence tended to make extra appointments to further discuss their treatment or progress, so that on balance the subjects did have more consultation time. The power of placebo treatment is well recognised, furthermore it is known that the doctor - patient relationship is influential. This is perhaps demonstrated by the fact that controls achieved 85% of the weight loss of subjects on the doctor's advice that they were overweight, yet they did not have the subject group's motivating factor of incontinence.

The methodology was planned in the knowledge that only 68% of patients with genuine stress incontinence diagnosed on clinical history and examination had the diagnosis confirmed on urodynamic testing and this fell to 51% for detrusor instability. (Jarvis et al 1980). It was decided not to do residual volume of urine assessments and perineometer measurements, weighing of pads etc. since these evaluations would not be done in the average general practice. Pads were not weighed because of the inconvenience to patients and also because amounts of urine loss in stress incontinence are very small. Although there was access to a perineometer it was not

used in case it should reduce the patients' participation rate. In retrospect I wish that I had assessed the power of the levator ani by vaginal examination at reassessment and objectively measured the power of the levator ani vaginal muscle throughout the study. I now do this when I treat patients.

It would be interesting in the future to further evaluate treatment of urinary incontinence in general practice using objective assessments. It would be interesting to assess the efficacy of vaginal cones as a method of treatment for stress incontinence, alone or as an adjuvant treatment.

Statistical analysis was carried out although in some cases data sets included very small numbers which are a potential source of error. Were these data sets larger some results might have achieved statistical significance which did not and vice versa. These areas of the research would benefit from repetition to confirm or refute the findings.

#### **Response rate.**

There was a low response rate to the invitation to consult for treatment. This may have reflected the facts that many women do not perceive urinary incontinence to be a problem, that it is common among women, they fear surgery, are embarrassed etc. (Jolleys 1988, Norton 1988). Of the 78 (23%) who replied, 67 (19.5%) kept their appointments within the allocated time. The remaining 11 respondents were unable to attend during the study period and so were excluded from the study to prevent

contamination. They have been seen and treated since.

Respondents were a biased group because they perceived their urinary incontinence to be a problem sufficiently serious to warrant treatment. Also, by self - selection, they were highly motivated and therefore may not be representative of incontinent women in general. For example, few of the <34 years age group presented for treatment yet they were identified through the prevalence study reported in chapter 2. This might be because the reported urine loss of stress incontinence is small in quantity, causing dampening of pants only, and the condition is less inconveniencing. There was no disruption to social life reported by the young women who presented with stress incontinence other than with sporting activities such as Keep Fit . The Mori Poll survey commissioned by the British Association of Continence Care which was published in February 1991 confirmed these findings and reported that sufferers accepted significant alterations to their lifestyle and social life in order to cope with their condition.

### **Prevalence and severity.**

The severity of the urinary incontinence was mostly slight, with small volumes of urine leakage, characteristic of stress incontinence, but the volume of urine leaked increased with increasing age and an increased prevalence of urge incontinence. Those older patients who presented for treatment in the >55 years group complained of large volume loss signified by wetting of underclothes, clothing and furniture, household linen etc. suffered from urge incontinence. Similar findings are reported by



Fall et al ( 1985 ), Thomas et al ( 1980 ) and Yarnell et al ( 1981 ) in which they also reported that stress incontinence predominates among young to middle aged women, while urge incontinence tends to become more prevalent with increasing age.

#### **Treatment effects.**

This study found that 36 of the 41 patients ( 88 %) with stress incontinence receiving treatment had improved after 12 weeks of pelvic floor exercises and 17 ( 41% ) reported total cure. Kegel ( 1951 ) found that 75% of women who had partial control of the pelvic floor muscles experienced complete relief of symptoms after seven to eight weeks pelvic floor exercises, confirmed by objective assessment with a perineometer. Kegel also reported that older people could be successfully treated by pelvic floor exercises. This was borne out by this study which showed that pelvic floor exercises taught in general practice can cure or ameliorate stress incontinence in a well motivated population irrespective of age, achieving comparable results to those obtained by hospital departments. Lagro - Janssen et al ( 1992 ) have since reported the results of their controlled trial of pelvic floor exercises in the treatment of stress incontinence in which 85% of the patients felt their condition had improved of whom 21% were cured. This study confirms the effectiveness of general practice management of stress incontinence.

Although adjuvant drug therapy may assist the patient to regain bladder control initially, for 80% of the patients with urge incontinence who received drug therapy it was unnecessary for the maintenance of continence.

The study found that conservative treatments for stress and urge incontinence were effective irrespective of age. A study published by Wiseman et al. ( 1991 ) has since confirmed these findings. The authors concluded that bladder retraining was the key to management of urge incontinence in elderly people and that adjuvant drug therapy such as terodiline did little to improve their condition.

None of the patients receiving treatment requested referral to a consultant when this was offered. Satisfaction at having a diagnostic label and treatment plan was expressed by the majority of women irrespective of whether they had been cured or not.

#### **Underlying causes.**

Although parity is a factor in stress incontinence ( Jolleys 1988, Yarnell et al 1982 ) the reported onset of incontinence in this study was not directly related to parity. Ten patients who had undergone hysterectomy were included in the study and seven of these attributed the onset of their incontinence to the operation, five reporting urge incontinence. Although the numbers are too small to draw conclusions further study of post - hysterectomy patients is indicated. More women could not recall the onset of urge incontinence ( 73% ) than stress incontinence ( 24% ), perhaps indicating a more insidious onset to the former complaint.

Twelve of the women in the study ( 10% ) reported inappropriate urine leakage since childhood and 10 of these had stress incontinence indicating a primary urethral

sphincter incompetence or pelvic floor weakness. The biased self selection method may have spuriously raised the prevalence of primary enuretics who have never obtained total bladder control. Nevertheless the true prevalence of primary enuresis may be higher than previously suspected.

This study showed that the majority of women reporting incontinence of urine to their general practitioner can be diagnosed and treated to their satisfaction, by a general practitioner with no specialised resources and minimal training in incontinence management. Despite the unreliable correlation of urinary symptoms with urodynamic diagnosis, the clinical diagnosis reached in the surgery in most cases indicated a management plan which improved of the condition. Effective and readily available treatment for incontinence in the setting of general practice is essential in view of the high prevalence of this common, embarrassing and inconvenient condition. Furthermore, successful community based treatment reduces consultant referral, is convenient for patients and increases the job satisfaction for the general practitioner.

#### **Provision and uptake of services.**

Since general practitioners are encouraged to ask about continence at the 'Over 75' health check, there will be a need to offer forms of therapy to incontinence sufferers. Furthermore were family doctors to adopt the policy of enquiring at every opportunity about continence, at pre-conception counselling, prenatal and postnatal appointments, well woman and well man screening, more patients with incontinence would be identified. One of the problems would be setting aside time for their

diagnosis and management as the process is quite time consuming: 45 minutes for the initial consultation. Fortunately all patients would not present at the same time so a long assessment appointment could be offered at the end of a surgery. A larger practice might set up a Continence Health Promotion Clinic with the added advantage that the practice nurse and physiotherapist could become involved in patient management, instructing on pelvic floor exercises, habit retraining and advising on and monitoring weight reduction. The majority of patients could be treated at the clinic, initially at least, with a full history, examination and basic investigations done in the setting of general practice. Those patients who fail to respond to non invasive management regimes, or for whom the diagnosis is uncertain ( such as the stress / urge incontinence group ) selectively can be referred to continence clinics for urodynamic assessment and treatment.

#### Review at one year post study.

All but one of the subjects and controls, a woman subject with stress / urge incontinence, was contacted approximately one year after the study was completed, the one woman having moved from the district. The women were again interviewed by the trained practice manager using the standard questionnaire interview proforma. None of the women in the subject group reported deterioration in their condition, but three with urge incontinence who were controls had deteriorated. Two patients reported further improvement in their condition, both of whom had previously been treated for stress incontinence. The other patients stated that their condition was unchanged with previously reported improvement sustained. ( Table 3:6 ).

Table 3:6

**Reported outcome at 1 year for patients with stress, urge, or stress/urge incontinence.**

N = 120

Condition	Total number		Number of patients					
			Condition unchanged/ improvement sustained.		Improved		Deteriorated	
	N	%	n	%	n	%	n	%
Stress incontinence								
Subjects	41	100	39	95	2	5	0	0
Controls	41	100	41	100	0	0	0	0
Urge incontinence								
Subjects	16	100	16	0	0	0	0	0
Controls	10	100	7	70	0	0	3	30
Stress/urge incontinence								
Subjects	7	100	7	100	0	0	0	0
Controls	5	100	5	100	0	0	0	0

#### 4. The reported prevalence of urinary symptoms in women in a rural general practice.

##### Introduction.

Symptoms suggesting urinary tract infection occur commonly in women. Many of these symptom episodes lead to consultations with a general practitioner. In Great Britain and New Zealand approximately 1 per 100 new consultations in general practice are for symptoms suggesting urinary tract infection. (Fry et al 1962, Logan and Cushion 1958, Loudon and Greenlagh 1962, and Gallagher et al 1965.) The 1981 - 82 National Study of Morbidity Statistics from General Practice gave a consultation rate for cystitis and urinary tract infection among female patients as 62.5 per 1000 women at risk. Furthermore, a Dutch study reported that 6 out of every 100 women seen in general practice complained of frequency and dysuria. The majority of these episodes respond satisfactorily to treatment with antibiotics although 50% of women presenting do not have a bacterial infection. ( Walker et al 1983, Waters 1969 ). Despite evidence to the contrary, many doctors do not believe that it is possible to distinguish clinically between urinary tract infection with bacteriuria and urethral syndrome, even using uristix and labstix, without the results of a mid - stream urine analysis. ( Anderson 1981, Brumfitt 1988, Dobbs and Fleming 1987, Fleming 1987, Howie 1976, Jewes and Spencer 1988, Lawson et al 1973, O'Dowd 1988, Thornton 1987 ).

Lower urinary tract disorders in women fall into three categories:

- a) asymptomatic bacteriuria
- b) symptomatic urinary tract infection

c) urethral syndrome ( frequency and dysuria but with no significant bacteriuria ).

The prevalence of frequency and dysuria in women in the community has rarely been studied ( Walker et al 1983, Waters et al 1970 ) even though urinary tract infection is the commonest condition in adults for which general practitioners prescribe antibiotics. ( Brooks 1982 ).

### Aims of the study.

This study sought to examine:

- \* the prevalence of dysuria and frequency in women in a general practice.
- \* attitudes to urinary symptoms.
- \* decision to consult.
- \* attitudes to self - care.
- \* prevalence and types of self - medication administered.
- \* effect of patient's age and social class with respect to self - care.

### Patients and method.

Subjects were the women born before 1.5.62 who had been allocated an individual study number prior to the commencement of study number one ( Jolleys 1988 ), who were registered with the practice on 1.5.87 and remained registered during the two year study period. During this period all consultations for urinary tract symptoms and vaginal discharge were recorded. Results of mid - stream urine analysis and high

vaginal swab tests were also kept. The questionnaire ( appendix xx ) was designed, having consulted a statistician, with assistance from colleagues at the Nottingham General Practitioner Research Club where possible using questions from validated questionnaires. The questionnaire was piloted around colleagues and then to 100 women selected using random number tables. It was modified in the light of the results. By means of the validated postal questionnaire and accompanying letter ( appendix xxiii ) information was sought about occupation of the patient and her spouse, whether the respondent had ever had 'stinging of urine' and / or 'need to pass urine more frequently than usual' ( excluding frequency due to diuretics ) for more than a few days, and whether these symptoms had been experienced in the previous two years. The respondents were asked whether they had consulted the doctor for these symptoms, about treatment for urinary tract infections, vaginal infections, and about how long the symptoms needed to persist before a medical opinion was sought. There were questions relating to the use of self medication and others which sought to examine patients' beliefs relating to the possible consequences of urinary tract infections.

One reminder was sent after one month to non - responders. Those not wishing to take part were asked to confirm this by returning a blank form. The patients' clinical records were used to validate the replies of those who claimed to have consulted the doctor for urinary symptoms, urinary tract infections and vaginal discharge during the previous two years. 20% of those who had not consulted the doctor for these symptoms were randomly selected for verification from the practice medical records. A 20% sample of the responses was selected for validation using probability or simple random



sampling. This refers to a scheme in which the probability of selection for each set of responses was specified. In simple random sampling since the population responses are already numbered, the requisite number of values were taken from random number tables and sets of responses with the corresponding numbers were selected into the sample. Thus each set of responses had the same chance of being selected as any other.( Kilpatrick 1977 ). Confirmation of the patients claims was achieved in 98% of cases.

Data from the returned questionnaires were coded using a prepared coding manual. (see appendices xxi-xxii) The data were analysed using a standard SSPS - X package. Results were analysed using the Chi - square and Mann - Whitney tests. Patients were grouped in 10 year age bands for the purposes of analysis. Occupation details were used to place the patient in social class groupings according to the Registrar General's abridged version of classification of occupation. ( 1970, 1990) Social class was assigned according to the occupation of the husband except in the case of a single female. Retired persons and temporarily unemployed persons were classified according to past occupation.

## **Results.**

Of the 684 questionnaires sent out, 661 were completed and returned giving a response rate of 96.5%. A further 20 questionnaires ( 3% ) were returned blank.

Episodes of frequency were reported by 234 women ( 35.4% ) and episodes of dysuria

by 179 ( 27% ). ( See Table 4:1.) 37 women ( 5.5% ) reported that episodes of frequency lasting several days had occurred on more than 12 occasions in the 2 year period and 8 women ( 1% ) reported a similar incidence for dysuria. However experiencing these symptoms had not resulted in a consultation on most occasions. This group of patients, 38 in all, had only consulted 1 - 3 times for symptoms suggesting urinary tract infection, a total of 59 occasions, an average of 1.2 consultations per patient for 12 or more symptom episodes.

At these consultations bacterial infection was confirmed in 51 cases ( 86% ) . 100 women had been treated by the partners for urinary tract infection ( 15% ) and 64 ( 10% ) had confirmed significant bacteriuria ( pure growth bacteriuria of  $10^5$  / ml ) on laboratory MSU testing ( despite the limitations of testing - see discussion section ).

48 women ( 8% ) had been treated for vaginal infection diagnosed by the clinical presentation of unpleasant vaginal discharge, soreness or / and itching. In 37 cases high vaginal swab confirmed infection with either monilia ( 34 ) or Trichomonas ( 3). The swabs were also cultured for Chlamydia and Gardnerella but neither was isolated.

494 women replied to the question " How long would you wait between the onset of symptoms before seeking medical advice?" The range of response was 1 - 20 days. 61 patients ( 13% ) said they would seek immediate attention. A further 99 ( 20% ) would consult by the second day, 101 ( 21% ) on the third day, 49 ( 10% ) on the fourth day, 52 ( 11% ) on the fifth day and 107 ( 22% ) one week after the onset of symptoms. 15 women ( 3% ) said that they would wait longer than two weeks to seek medical

Table 4:1

### Reported prevalence of urinary symptoms in women in general practice during a two year period

N = 661

Symptom prevalence	Frequency		dysuria	
	n	%	n	%
Frequently (12 times /24 months)	37	5.5	8	1
Sometimes (6 - 12 times /24 months)	57	8.5	29	4
Occasionally (1 - 6 times 24/months)	140	21	142	22
never	427	65	482	73
Total	661	100	661	100

advice. There was no statistically significant difference found in the consultation intervals between social classes nor between those women who had and had not been treated for urinary tract infection.

A further area investigated was that of self - medication. 225 ( 34% ) said that they would treat themselves before seeking medical advice. 159 patients ( 24% ) said that they would increase their fluid intake and 109 ( 16.5% ) stated specifically that they would drink lemon barley water. 113 patients ( 17% ) bought a proprietary medicine from the chemist.

To a statistically significant extent a higher proportion of 25 - 34 year olds purchase over - the - counter medicines than the other age bands. 28 / 88 ( 32% ) of 25 - 34 year olds by over the counter medicines compared with 30 / 186 ( 16% ) of 35 - 44 year olds, 29 / 131 ( 22% ) of 45 - 54 years, 14 / 100 ( 14% ) of 55 -64 year olds and 12 / 155 ( 8% ) of 65+ year olds. ( Chi squared = 26.1, df = 4, p = 0.0001 ). Those aged 45 and over were more likely to drink lemon barley water than the younger age groups. 10 / 88 ( 11% ) , 31 / 186 ( 17% ) , 35 / 131 ( 27% ) , 14 / 100 (14% ) , and 19 / 155 ( 12% ) in 25 - 34, 34 - 44, 45 - 54, 55 -64 and 65+ year olds respectively. ( Chi squared = 14.1, df = 4, p = 0.007 ). The proportion of women who treat their symptoms by increasing their fluid intake bears an inverse relationship to their age - 30 / 88 ( 34% ) , 55 / 186 ( 30% ) , 37 / 131 ( 28% ) , 15 / 100 ( 15% ) and 22 / 155 ( 14% ) for age groups 25 - 34, 35 - 44, 45 - 54, 55 - 64 and 65+ years respectively. ( Chi squared = 21.9, df = 4, p = 0.0002 ).

Table 4:2

### Reported prevalence of urinary symptoms, vaginal infections and urinary tract infections by age group

N = 661

Age group		Frequency		Dysuria		UTI		Vaginal infections	
Years	N	n	%	n	%	n	%	n	%
25 - 34	88	38	44	33	38	23	26	17	19
35 - 44	186	69	38	55	30	27	14.5	19	10
45 - 54	131	51	39	40	31	17	13	7	6
55 - 64	101	31	31	20	20	15	15	2	2
65+	155	45	29	31	20	18	12	3	3

Table 4:3 shows that social classes 2 ( n = 139 ) and 3 ( n = 282 ) self - treated to a significantly greater extent than social classes 1 ( n = 23 ) and 4 ( n = 151 ), 58 / 139 : 42%, 101 / 282: 36% and 7 / 23: 30%, 42 / 151: 28% respectively. Social classes 1 - 4 self - treated more than social class 5 ( n = 66 ), 14 / 66: 22%. ( Chi squared = 10.8, df = 4, p = 0.029 ).

Similarly, to a statistically significant extent social classes 2 and 3 purchase more medicines than social classes 1, 4 and 5 - 35 / 139: 25% and 51 / 282: 18%, 3 / 23: 13%, 18 / 151: 12% and 7 / 66: 11% respectively. ( Chi squared = 11.5, df = 4, p = 0.002 ).( See Table 4:3 ).

No significant association was found between the level of self - treatment and treatment by a general practitioner for urinary infections.

Younger age groups reported significantly more episodes of frequency ( Chi squared = 24.8, df = 4, p = 0.0001 ) and dysuria ( Chi squared = 11.3, df = 4, p = 0.02 ). They also suffered significantly more episodes of confirmed urinary tract infection ( Chi squared = 10.3, df = 4, p = 0.03 ) and vaginal infections than older age groups ( Chi squared = 46.6, df = 4, p = 0.00001 ), the prevalence bearing an inverse relationship to increasing age. ( See Table 4:2 ). They did not report any association between urinary symptoms and the menses. Neither was there reported any association between urinary symptoms and recent intercourse.

In answer to the question "Do you believe that urinary tract infections could have

Table 4:3

The relationship between self - medication and social class

N = 661

social class	N = 661		Self treatment		Purchase proprietary medicines	
	n	%	n	%	n	%
1	23	3.5	7	30	3	13
2	139	21	58	42	35	25
3	282	42.5	101	36	51	18
4	151	23	42	28	18	12
5	66	10	14	22	7	11
Total	661	100				

serious consequences?", 381 women ( 58% ) said "No" and 220 ( 33% ) said that they could. 60 women ( 9% ) did not reply to the question. This pattern of response was repeated in all ten year age bands. However a significant association was found in reply to this question between those who had and had not consulted for a urinary tract infection during the study period. ( Chi squared = 7.2, df = 1, p = 0.007 ). A lower proportion 23 / 96 ( 24% ) of those women who had been treated for urinary tract infections believed that urinary tract infections could have possible serious sequelae than those women, 197 / 505 ( 39% ) who had not suffered an infection.

### Discussion.

In the two year study period 35% of women said that they had experienced episodes of frequency lasting several days, and 27% dysuria. Walker et al ( 1983 ) found that 20% had suffered dysuria. The differences may be explained by the difference in the length of study period and the differences in the age range studied. Furthermore the female patients in my practice were previously sensitized to urinary symptoms by previous questionnaires and may now perceive symptom prevalence to be more significant. 100 women were treated for UTIs in the previous 2 years, 64% having confirmed bacteriuria. Even with a practice consultation rate of 4 per year this is a higher level of consultations in women patients with urinary symptoms than is reported in other studies ( Fry et al 1963, Gallagher et al 1965 , Logan and Cushion 1858 and Loudon and Greenlagh 1962 ) but is less than half the incidence reported in a Dutch study ( Gaymans et al 1976 ).



Perhaps the continuing research on urinary symptoms has focussed the attention of patients on these. Another explanation might be that this is a dispensing practice and patients who might otherwise have gone to a pharmacist attended the practice instead out of convenience. Were this the case, it would imply that in other practices women who have UTIs are attending the pharmacist in increased numbers. This study confirms the already documented trend for younger sexually active females to suffer more urinary symptoms than their older less sexually active counterparts. ( Gallagher et al 1965 ).

Are UTIs self - limiting and do infections require treatment with antibiotics? What is the value of a Kass MSU test ( Kass 1957 ) result particularly if there is frequency and the patient is drinking excessively in order to self - medicate? Kass's work in the 1950s remains the basis of bacteriological examination of the urine upon which the diagnosis of UTI is made. Kass recognised the ascending pathogenesis of UTI and the role of catheterisation in introducing organisms into the bladder. The original work related to the diagnosis of pyelonephritis. Comparison of counts in catheter and MSU specimens resulted in the criterion for diagnosis of significant by culture of fresh carefully collected MSUs. It is important to recognise the limitations of the MSU investigation in the diagnosis of UTI. Infection of clinical importance can arise from other parts of the urinary tract than the bladder and its adjacent structures. Infection in these sites can be caused by the aerobic bowel flora. In the community there are potential problems relating to contamination of the MSU e.g. commensal flora of the distal urethra; ensuring the correct procedure for collecting the specimen; getting a fresh sample to the laboratory; the timing of the specimen etc. ( Maskell 1989 ) It can be argued that

simple microscopy of the fresh urine sample will give accurate information as to the presence or absence of infection. Culture can be reserved to confirm the nature of a proven infection. If there is no evidence of UTI on testing the urine there is no need to give an antibiotic, since UTIs do not serious sequelae. Indeed the antibiotic may cause the bacterial flora to change which can give rise to the symptoms of frequency and dysuria.

Urinary tract infections are a common source of morbidity. However the morbidity and mortality due to UTIs are difficult to assess. UTI is an important cause of days lost from work by female employees per year as was shown by an American survey conducted by the Department of Health, Education and Science in 1970. UTI is a term which encompasses a wide variety of clinical conditions with microbial invasion of the tissues of the urinary tract. When infection is limited to a single site, the bladder ( cystitis ) or the urethra ( urethritis ) the entire urinary tract is at risk of invasion by bacteria.

The European Dialysis Registry ( Laurent et al 1983 ) showed that chronic pyelonephritis, the possible end result of recurrent UTI, accounted for 12% of cases of end - stage renal failure. The American Medical Association ( 1975 ) also reported that 13% of renal transplantations were due to pyelonephritis. Although pyelonephritis accounts for a substantial proportion of individuals requiring renal transplantation, for the most part infection in these patients is superimposed on major underlying renal abnormality which predisposes to infection. Although a causal association has been demonstrated between bacteriuria in early pregnancy and the development of acute pyelonephritis later in pregnancy, ( Turck et al 1962, Williams, Reeve and Cordie,

Williams, Reeve and Brumfitt, Williams et al 1973 ), literature and case reviews ( Sussman et al 1969 ) and prospective studies in non - pregnant women have failed to show that bacteriuria leads to chronic pyelonephritis which progresses to renal impairment. Research has not indicated that recurrent acute pyelonephritis will ever progress to become chronic pyelonephritis.

This paper demonstrates a lack of knowledge about UTIs among female patients. A third believe that UTIS may have serious consequences. There is doubt as to the significance of the response to this question as I did not enquire what was meant by serious consequences neither were any possible sequelae suggested. There is widespread use of self - care including the purchase of over - the - counter remedies and consequent delay in seeking medical attention. Furthermore the study showed that women who presented with a UTI did not have a better understanding of the condition than women who did not suffer from urinary symptoms, continued to self - medicate and wait as long before consulting a doctor.

Over one third of women were prepared to self - medicate. Approximately one third of women in the age group 25 - 54 would increase fluid intake on experiencing urinary symptoms. The drinking of lemon barley specifically was a popular remedy in the 45 - 54 year olds however younger women in particular those aged 25 -34 years were more likely to purchase an over the counter preparation from the chemist. The changing attitude to self - medication could result from media coverage of the subject and advertisements in women's magazines etc. This could also explain the differences in self - medication patterns between the social class groups.

## Methodology

The responses to the questionnaire were validated from the medical records and the validity of the questionnaire tested by piloting it initially, and subsequently by the inclusion of questions requiring similar responses. The problems encountered were those inherent in a closed response questionnaire, in that only a finite range of replies were acceptable and justification for the response was not sought. One difficulty with the questionnaire became obvious as the results were analysed. The question asked how often a patient experienced the symptoms of frequency or dysuria for several days, and yet 13% of women would seek immediate medical attention for that symptom after only one day. How would they have known that the symptoms might have lasted several days? This discrepancy was not found when the questionnaire was piloted. One could have telephone interviewed the respondents to clarify this but I chose not to as it was not included in the original methodology.

In retrospect I wish that I had enquired about the frequency of intercourse in order to see the significance of recent intercourse on reporting of urinary symptoms.

I was most surprised at the degree of correlation between the patients' questionnaire responses and the medical records. ( 98% ). Consultations are not always well documented in the medical records especially those occurring out - of - hours when notes are not always to hand, and the consultation may have been by another doctor. In order to prevent this potential discrepancy, practice staff recorded all consultations

for urinary symptoms and vaginal problems separately, plus results of investigation. The other doctor in the practice was reminded at regular intervals of the need for diligent record keeping.

Although patients were asked for details of their occupation and that of their husband, the job description was often too vague to accurately define social class. A personally administered questionnaire would have been more suited to this. I chose to place unemployed and retired people in the social class bracket to which they would have been assigned had they been working or related to previous employment. These are both potential sources of error.

## 5. A study of women who report regular episodes of dysuria and frequency.

### Introduction

The Medical Research Council's definition for urethral syndrome is 'a chemical syndrome often called cystitis consisting of frequency and dysuria. Bladder bacteria in men ought to be present' ( Medical Research Council Bacteriuria Committee 1979 ). Urethral syndrome is characterised by lower urinary tract symptoms in the absence of bladder or urethral abnormality or significant infection ( Kass 1956, Kass 1957 ). Symptoms include recurrent dysuria, frequency, urgency and the feeling of incomplete bladder emptying. ( Anonymous 1977 ). Thus women complaining of urinary symptoms, frequency and dysuria, who do not have evidence of urinary tract infection, pure growth bacteriuria of  $10^5$  organisms per millilitre and leucocytes  $> 10^6$  / litre, are said to have urethral syndrome. ( Brooks et al 1972, Catell et al 1975 , Papapetropoulou and Pappas 1987). Urethral syndrome is also known as abacterial cystitis and frequency - dysuria syndrome.

Urinary symptoms are common. From epidemiological work it is known that one woman in two experiences dysuria at some time in her life and over 25 per cent of these women report three or more episodes. Furthermore 20 per cent of women experience dysuria in a year and yet only a minority consult a general practitioner.

( Walker et al 1988 ).

The prevalence of urinary frequency and dysuria is known ( Jolleys 1990, Office of Health Economics 1989, Office of Population Censuses and Surveys 1981-2, Walker et al 1983 ) and previous work has established the prevalence of frequency-dysuria syndrome ( O'Dowd et al 1984 ), postulated its causes ( Gray and Pingleton 1956, Maskell et al 1979, Wilkins et al 1989, Brumfitt 1991 ), suggested, compared and assessed treatment regimes ( Bergman et al 1989, Furner et al 1988, Sand et al 1989 ), and attempted to define associated factors ( Gallagher et al 1965 , O'Dowd et al 1984, Wilkins et al 1989 ). None, however, have addressed the natural history of the complaint other than to state that it is a short or self-limiting condition. ( O'Dowd et al 1984 ).

Symptoms suggestive of urinary tract infection and cystitis account for six consultations a year per 100 women at risk ( Office of Population Censuses and Surveys 1981-2). Nearly 50 per cent of women patients who complain of frequency and dysuria however have no evidence of infection in the urine ( Gallagher et al 1965, Jolleys 1990, Mond et al 1965, Walker et al 1983).

The aetiology of frequency - dysuria syndrome is obscure and has been attributed to associated anxiety neurosis (Gray and Pingleton 1956 , Wilkins et al 1989 ). A psychological basis to the syndrome has been postulated for centuries ( Scotti 1984, Gray and Pingleton 1956, Rees and Farhoumand 1977, Mason et al 1977, and Carson et al 1980 ). Empirical study has been limited to women undergoing investigation in hospital for chronic urinary symptoms ( Carson et al 1980, Mc. Cauley et al 1987 ) and reliable psychological assessments have rarely been conducted. (Zufall 1963 ). It

has been noted, however, that psychological and psychosomatic complaints are common in women who suffer from frequency - dysuria syndrome ( O'Dowd et al 1984 ) and furthermore, in the follow up study of women with this syndrome, psychosomatic disorders and menstrual problems were reported to be more common than in controls. ( O'Dowd et al 1986 ). A study published by Sumners et al 1992 may have helped disprove the postulated association between the frequency - dysuria syndrome and psychiatric problems. Non-specific inflammation, oestrogenic sensitivity and urethral stenosis or spasm have been implicated as possible causes , ( Scotti 1984 ) as have low grade infection or infection with various organisms, corynebacteria or anaerobic bacteria colonised in the bladder mucosa. ( Maskell et al 1979, Maskell 1985 ). Chlamidia trachomatis infection ( Panja 1983, Stamm et al 1980 ) or slow growing , CO<sub>2</sub> dependent, gram positive pathogenic organisms ( Maskell et al 1979 ). Other studies have demonstrated no causative association between Chlamydia trachomatis, fastidious organisms and Neisseria gonorrhoea and the frequency - dysuria syndrome ( Brumfitt et al 1981, Burnley et al 1983, Gallagher et al 1965, Gillespie et al 1989, O'Dowd et al 1984 ). Furthermore in a prospective study in general practice broad spectrum antibiotic treatment was no more effective than placebo. ( O'Dowd et al 1984 ).

**Note:**

Throughout the study reference is made to frequency - dysuria syndrome and not urethral syndrome since the diagnosis relates to the reporting of the symptoms of frequency and dysuria only. As it was a questionnaire study about symptom prevalence over previous months the urine was not tested so abacteriuria was not confirmed.



### Aims of the study.

This study, conducted retrospectively, in which patients' responses to the two questionnaires in May 1987 and May 1989 were analysed and compared, sought to:

- \* examine the natural history of recurrent frequency - dysuria syndrome.
- \* examine symptom prevalence and the consultation rate.
- \* clarify the aetiology of frequency - dysuria syndrome by considering its relationship

with:-

age

sexual activity

recent sexual intercourse

pre - menopausal / post - menopausal status

type of contraception

change of partner

parity

- \* examine the relationship between frequency - dysuria syndrome and urinary tract infection with bacteriuria.

### Method.

Between 1.5.85 and 1.5.89 practice records had been kept of all consultations for urinary symptoms and vaginal discharge. Results of mid stream urine analyses and

high vaginal swabs had been also kept. Reported changes in marital status of women registered with the practice had been noted.

The subjects were all the women born before 1.5.62 who were registered continuously with the practice between 1.5.85 and 1.5.89. Two self - administered postal questionnaires had been sent to the subjects on 1.5.87 and 1.5.89 and who had been allocated an individual study number prior to the commencement of study one. The questionnaires sent at an interval of two years posed similar questions pertaining to episodes of urinary frequency lasting two days or more, episodes of dysuria lasting two or more days, frequency of reported symptoms ( 12 times in 24 months, 6 - 12 times in 24 months , 1 - 6 times in 24 months or never ) urinary tract infection, vaginal infection / treated vaginal discharge, sexual activity, last menstrual period, contraception , marital status / change in marital status, parity, and association of symptoms with recent sexual intercourse, during the two years preceding the questionnaire.

The responses to questions relating to consultation with the doctor for urinary tract infection or vaginal discharge were validated using the patients ' clinical records for all those who replied positively and a random 20% sample of those who reported that they had not consulted were also selected for validation. The replies to the two questionnaires were compared and data statistically analysed using SPSS-X. Patients were initially grouped in ten year age bands for the purposes of analysis but were further aggregated because of small numbers.

A urine sample from the subjects was requested and examined in the surgery for protein, blood and nitrites to identify infection. A further urine sample of any which proved positive for protein, blood or nitrites was sent to the laboratory for mid - stream urine analysis, even though it was appreciated that the presence of protein did not necessarily indicate infection.

### **Results.**

744 women patients fulfilled the selection criteria of whom 721 had responded to the two questionnaires; a response rate of 97%. Confirmation of the patients' claims from medical records was achieved in 98% of cases. Urine analysis was performed for 709 of the 744 subjects ( 95 %) and in one case was urinary tract infection confirmed.

For the period 1985 - 1987 60 women ( 8% ) reported regular episodes of symptoms of frequency and dysuria ( either 6 -12 times in 24 months or > 12 times in 24 months. ( See Table 5:1 & fig. 5:1a and 5:1b.) Between 1987 and 1989, 101 women ( 14% ) reported regular symptoms. 29 women reported symptoms regularly throughout the four years. 31 ( 4% ) who reported regular symptoms in the first questionnaire improved during the second study period. 72 women ( 10% ) who reported no symptoms in 1987 deteriorated and reported regular dysuria and frequency during 1987 - 1989. ( See Figure 5:2.)

159 women ( 22% ) were not sexually active. None of these reported regular symptoms. Of the 562 women ( 78% ) who were sexually active 132 ( 18% ) reported

Table 5:1

**The prevalence of urinary symptoms  
other than incontinence**

N = 833

Symptom	never		sometimes		often		Total	
	n	%	n	%	n	%	n	%
urgency	581	70	220	26	32	4	833	100
dysuria	680	82	145	17	8	1	833	100
frequency	620	74.5	180	21.5	33	4	833	100

Fig.5:1a

The prevalence of urinary symptoms other than incontinence

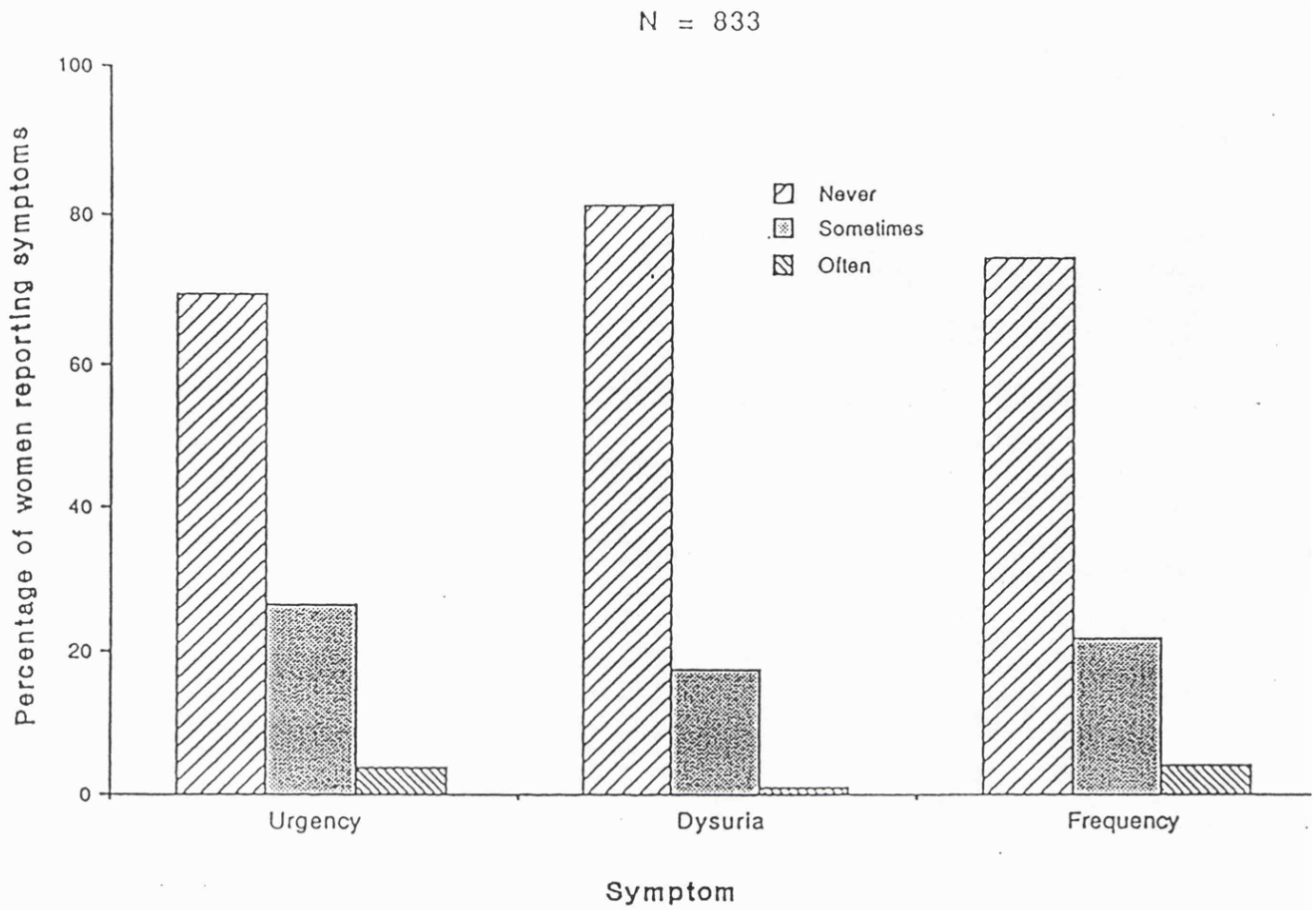


Fig. 5:1b

Reported prevalence of regular frequency & dysuria in women

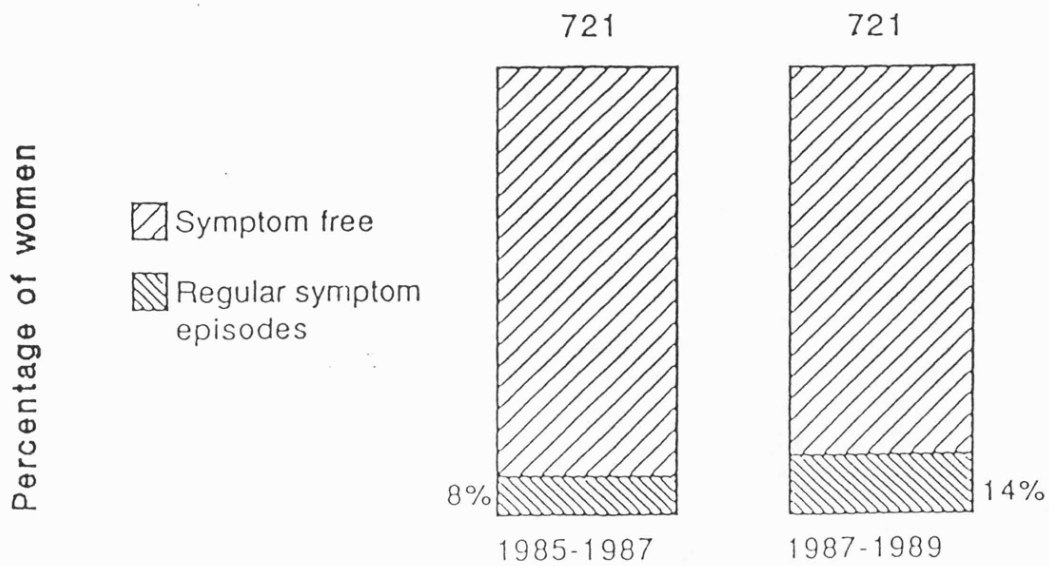
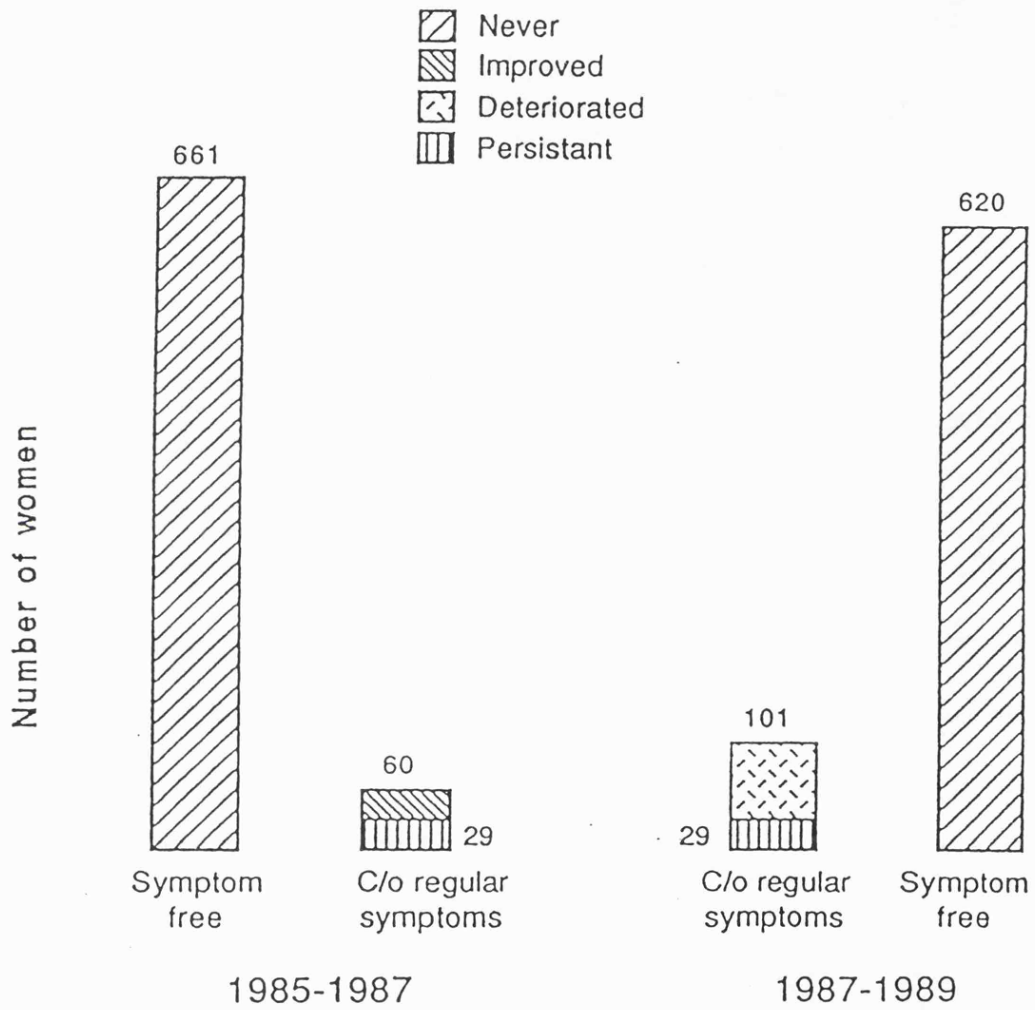


Fig 5:2

### Change in reported symptom prevalence with time



regular symptoms in one or both questionnaires. ( See Figure 5:3.)

Pre - menopausal women ( n=426 ) reported significantly more symptoms than post - menopausal women ( n=295 ). Twenty - three pre - menopausal women ( 5% ) reported persistent symptoms, 49 ( 11% ) reported regular symptoms in the second questionnaire, 21 ( 5% ) in the first questionnaire and 333 ( 79% ) reported never experiencing frequency and dysuria. The corresponding figures for post - menopausal women were 6 ( 2% ), 23 ( 8% ), 10 ( 3% ) and 256 ( 87% ). ( Mann Whitney  $p = 0.001$  ) ( See Table 5:2 & fig. 5:4.)

Fewer nullipara ( n = 154 ) reported regular urinary symptoms than parous women ( n = 577 ). 136 ( 89% ) nulliparous patients reported never experiencing symptoms. Two nullipara ( 1% ) reported persistent regular symptoms, 5 ( 3% ) reported symptoms in the first questionnaire only and 11 ( 7% ) in the second questionnaire. For parous women the corresponding figures were 453 ( 79% ) who reported that they never experienced symptoms with 27 ( 5% ) having persistent symptoms of frequency and dysuria, 26 ( 5% ) in the first study period and 61 ( 11% ) in the second study period. ( Mann Whitney  $p = 0.06$  ) ( See Figure 5:5.)

There was no significant difference ( Mann Whitney  $p = 0.085$  ) in reported symptoms of frequency - dysuria syndrome in women using different forms of contraception. Women using the coil, sheath or cap were more likely to have persistent symptoms than those who were on the pill, sterilised or using no contraception ( mainly post-menopausal ). Those women who used no contraception or were fitted with the coil

Fig. 5:3

### Relationship of sexual activity and frequency - dysuria syndrome

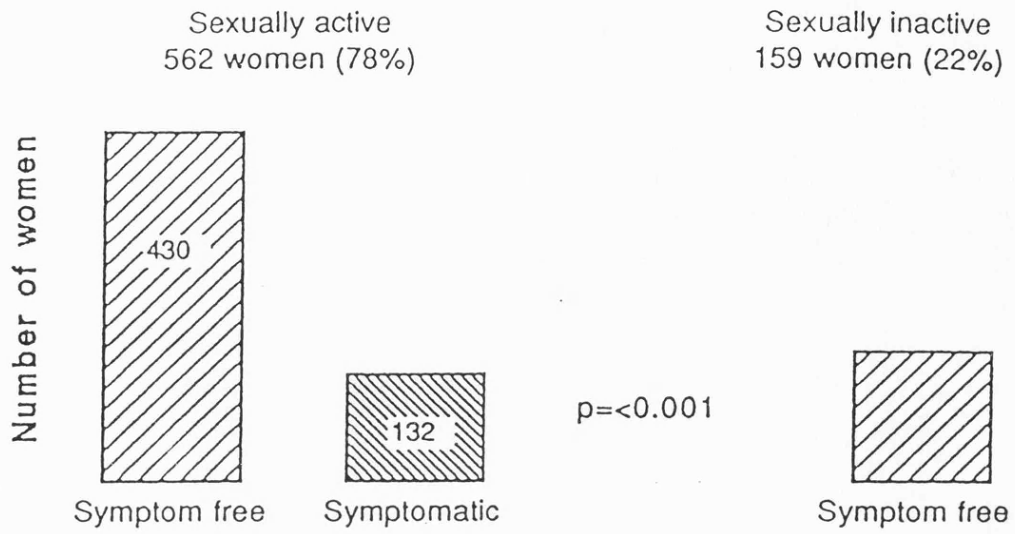


Fig. 5:4

### Relationship of menopause to frequency - dysuria syndrome

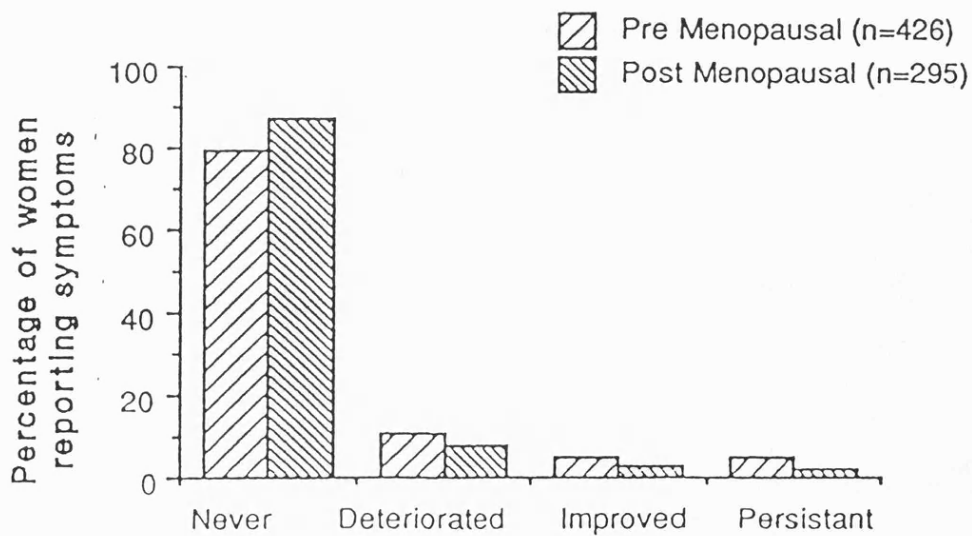




Table 5:2

**The relationship of menopausal status  
to urinary symptom prevalence**

N = 822

Reported incidence of all urinary symptoms urgency incontinence dysuria, frequency Number of symptoms.	Pre - menopausal N = 479		Post menopausal N = 343	
	n	%	n	%
0	176	36.7	167	48.6
1	79	16.5	56	16.3
2	64	13.4	45	13
3	59	12.3	32	9.3
4	41	8.6	16	4.7
5	25	5.2	9	2.8
6	19	4	8	2.3
7	10	2.1	5	1.5
8	3	0.6	3	0.9
9	3	0.6	0	0
10	0	0	2	0.6
Total	479	100	343	100

There is a significantly higher incidence of all urinary symptoms in the pre - menopausal group.

## Relationship between parity and frequency-dysuria syndrome

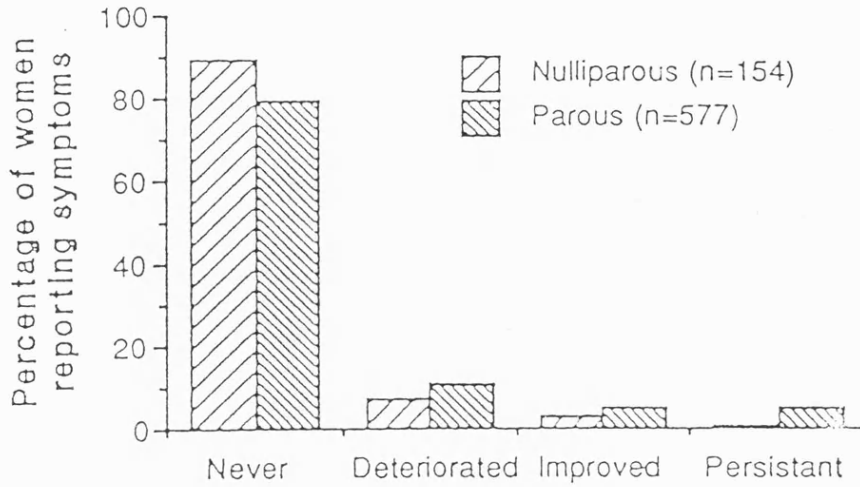


Fig. 5:6a

## Relationship of contraception method and frequency-dysuria syndrome (1)

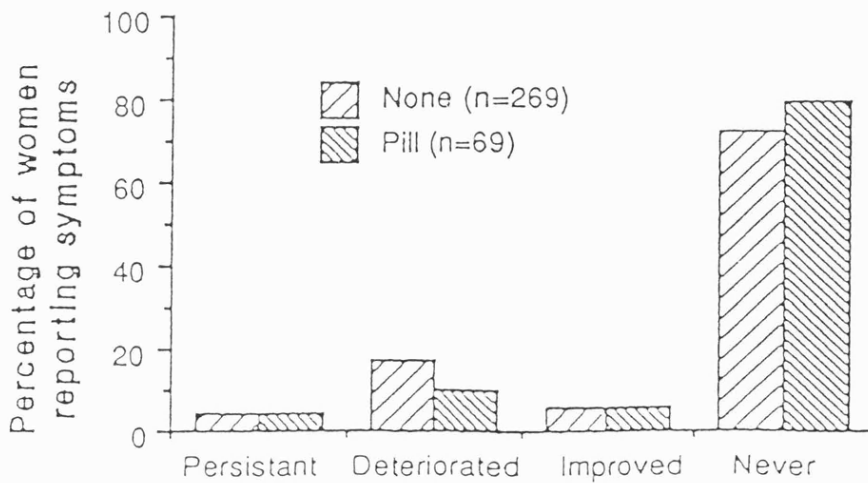


Fig. 5:6b

### Relationship of contraception method and frequency-dysuria syndrome (2)

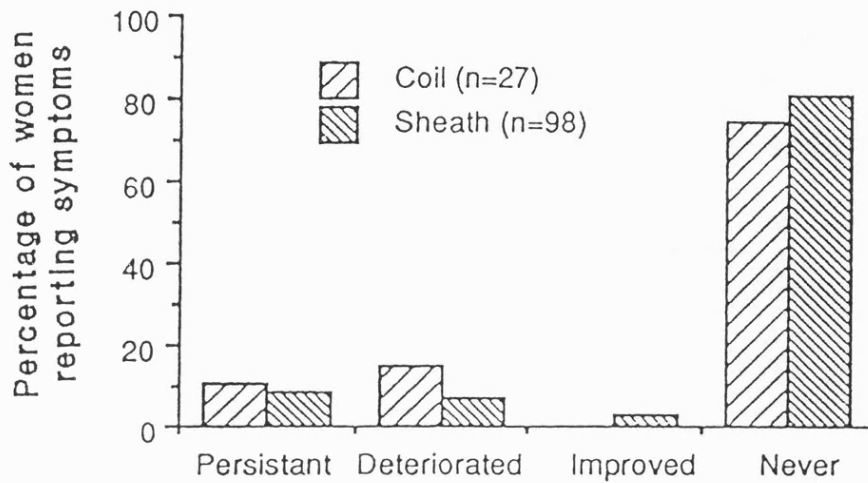


Fig. 5:6c

### Relationship of contraception method and frequency-dysuria syndrome (3)

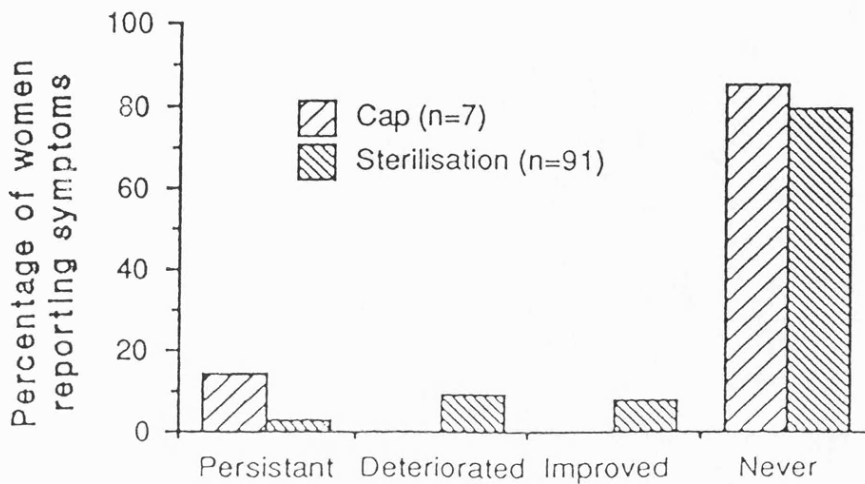


Table 5:3

## The relationship between frequency - dysuria and contraception

N=561

Type of contraception	symptom episodes: frequency and dysuria										
		persistant		worse		better		never		Total	
	N	%	n	%	n	%	n	%	n	%	n
none	269	4	11	17	46	6	16	73	196	100	269
pill	69	4	3	10	7	6	4	80	55	100	69
coil	27	11	3	15	4	0	0	74	20	100	27
sheath	98	8.5	9	7.5	7	3	3	81	79	100	98
cap	7	14	1	0	0	0	0	86	6	100	7
sterilisation	91	3	3	9	8	8	7	80	73	100	90

were least likely to be totally symptom free. ( See Table 5:3 & figures 5:6a,b,c.)

The relationship between age and frequency - dysuria syndrome is complex. More women in the younger age groups, 25 -34 years ( 6% ) and 35 - 54 years ( 5% ) reported persistent recurrent symptoms than those in the older age groups, 55 - 74 years ( 1.5% ) and 75 years plus ( 2% ) .Fewer of the younger women reported no frequency - dysuria episodes than women in the older age groups, 113 ( 78% ), 257 ( 78% ) and 176 ( 91% ) and 43 ( 84% ) respectively. ( Mann Whitney  $p = 0.001$  ) ( See Table 5:4 & figures 5:7a,b.)

Only 2 women out of 132 who reported regular frequency - dysuria syndrome symptoms during the study felt that recent sexual intercourse related to their symptoms.

Treatment for vaginal discharge during the study period did not have a significant association with reporting of regular symptoms. ( Mann Whitney  $p = 0.07$  ) . Women who reported regular frequency and dysuria (  $n=132$  ) were more likely , however, to have been treated for vaginal discharge ( 16 / 132 :12% ) than those (  $n=589$  ) who did not ( 41 / 589: 7% ) . ( See Figure 5:8.)

Similarly 123 women had been treated for urinary tract infection during the four years ( confirmed on MSU in 60% ). 57 women ( 57 / 579: 10% ) who did not report regular symptoms had been treated for UTI compared with 66 ( 66 / 142: 50% ) of those who experience regular urinary symptoms. ( Mann Whitney  $p = 0.0001$  )

Table 5:4

**The relationship between severity of symptom episodes of frequency  
and dysuria and age**

N = 721

		Symptom episodes: frequency and dysuria									
age in years	N	persistent		worse		better		never		Total	
		n	%	n	%	n	%	n	%	n	%
		25 - 34	145	9	6	17	12	6	4	113	78
35 - 54	331	17	5	33	10	23	7	258	78	331	100
55 - 74	194	3	1.5	13	7	2	1	176	90.5	194	100
75 +	51	1	2	6	12	1	2	43	84	51	100

Fig.5:7a

### Relationship of age and frequency-dysuria syndrome (1)

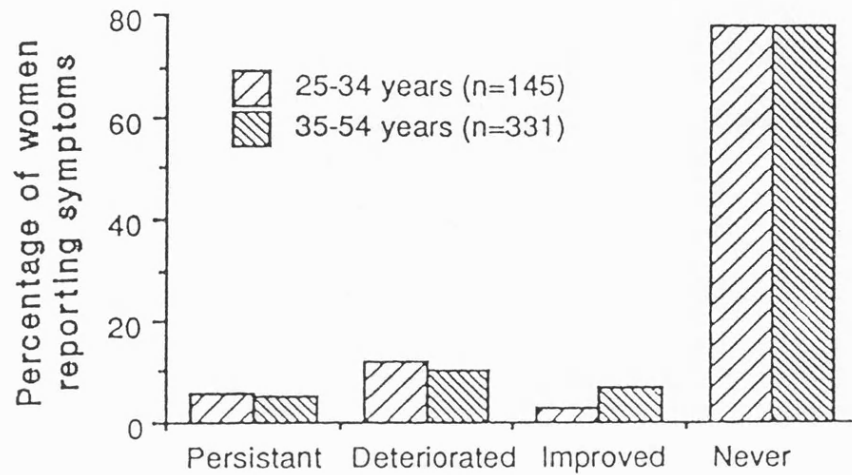


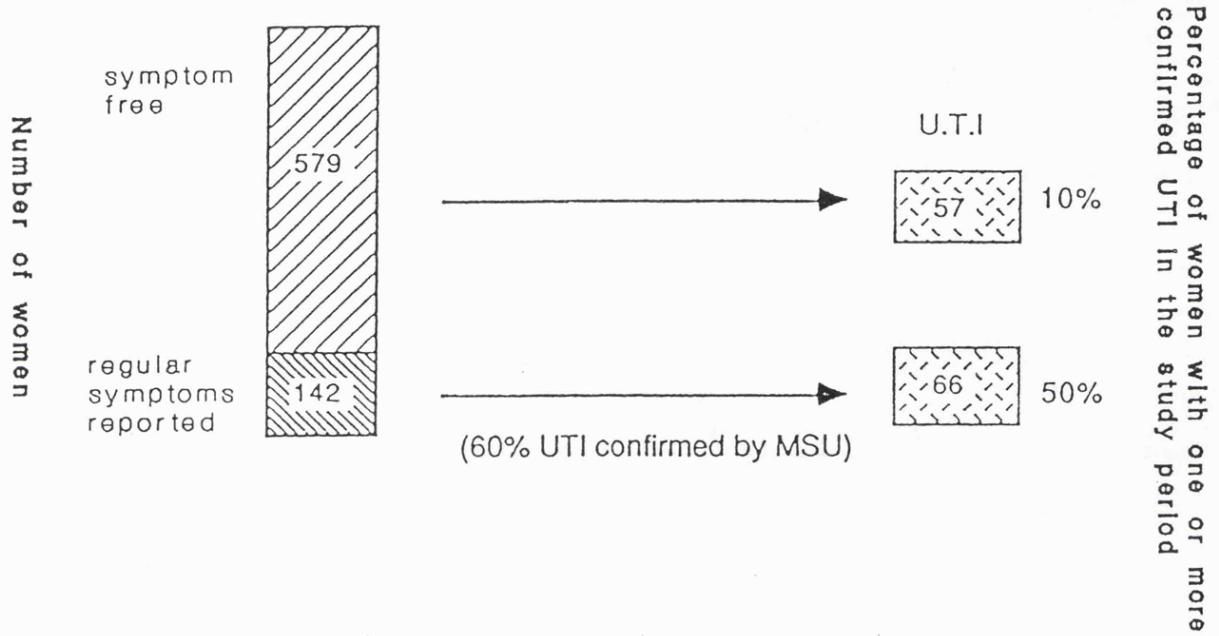
Fig.5:7b

### Relationship of age and frequency-dysuria syndrome (2)



Fig.5:8

### Association of urinary tract infection and recurrent frequency - dysuria syndrome





Of the 132 women who reported regular urinary symptoms 17 ( 13% ) had a recorded change in their marital circumstances ( widowed, separated, married, new partner ) during the four years. The rate of recorded change for other women registered with the practice was 1:25 per year which is similar.

## **Discussion.**

### **Methodology.**

The results described in this study were obtained by comparison of data collected from two questionnaires. Each questionnaire asked the patient to reflect over symptom prevalence in the previous two year period. Two years is a long time interval and there would be inaccuracy as a result of this. However patients were also asked about consultations during this time interval and, as I have recorded, data obtained from the questionnaires correlated closely with data extracted from the patient's medical records. I have thus presumed that symptom recall would be equally accurate. Since the two questionnaires enquired about the same symptoms it might be that the first sensitized the patients to the symptoms, hence the increase in reported symptom prevalence in the second study.

### **Results.**

This study indicates that young women, ( 25 -54 years ) who are sexually active suffer more from frequency - dysuria syndrome than older women. Between 55 years and 74

years there are fewer women suffering persistent urinary symptoms, however there are more women who are beginning to experience regular symptoms. The decrease in reported symptoms between the ages of 55 and 74 years is most likely to be due to decreasing sexual activity. However during that period post - menopausal atrophic change develop and it could be these that account for the rising prevalence of urinary symptoms in the older age group, especially the over 75 years. ( See Table 5:4 ) This symptom prevalence is echoed in the 3rd National Study, morbidity statistics from general practice, ( Office of Population Censuses and Surveys 1981-2 ) which reports a high constant consultation rate for urinary symptoms by women aged 15 - 44 years, a lower rate for those aged 45 - 74 years the rate rising sharply again in women aged 75 years and over. However it is known that there is a marked increase in the prevalence of chronic urinary tract infection in the elderly. At least 20% of women in the over 65 years age group have significant bacteriuria ( Boscia et al 1986, Brocklehurst et al 1968, Kasviki - Charvati et al 1982 ), although the prevalence is greatest in long stay geriatric patients and least in elderly people living at home. ( Ahktar et al 1972, Brocklehurst et al 1968, Milne et al 1972 and Sourander and Kasanen 1972 ). Elderly people living in residential homes come midway in the ranking. (Dontas et al 1968 ). Furthermore, it is known that the majority of elderly people with urinary tract infection do not have symptoms of urinary tract infection. ( Boscia et al 1986 ). Since , in the practice there are very few elderly women living in residential care, and none in long stay beds, the prevalence of infection should be minimised. This is confirmed by the absence of infection on urine testing in this study. Thus the reported prevalence of urinary symptoms is not likely to be due to covert urinary tract infections.

In general post - menopausal women suffer fewer urinary symptoms than the pre - menopausal. Were the number of subjects larger it would be interesting to subdivide the post - menopausal group into peri - menopausal, < 5 years post - menopausal, <10 years and >10 years; I suspect that the prevalence of symptoms would rise substantially with increasing number of years since the menopause.

The study also indicates that recurrent as well as acute ( O'Dowd et al 1984 ) frequency - dysuria syndrome is a self - limiting condition. It may be that it has a natural periodicity in younger people as its incidence seems unrelated to type of contraception, change in sexual partners, and recent sexual intercourse. In order to further assess these factors further study is required on larger numbers of women: 1) to compare the prevalence of frequency and dysuria with the various methods of contraception, 2) to see whether a change of sexual partner can influence or eradicate recurrent frequency - dysuria syndrome.

29 / 721 women reported persistent, recurrent frequency and dysuria. This is a similar figure to the annual incidence of 48/1000 reported by Brooks for women over 15 years old. ( Brooks 1978 ) However the overall reported incidence for the regular symptoms of dysuria and frequency was 60/721 to 101/721 which is significantly greater than that proposed by Brooks or found by O'Dowd ( O'Dowd 1984 ) - 15/1000 women per year, the major difference being that these women did not seek medical help for their symptoms.

In this study 183 women consulted for their urinary symptoms during the four year

study period of whom 74 proved to have a confirmed urinary tract infection and 29 had vaginal infection with discharge. Thus 80 women had consulted for frequency - dysuria syndrome, an annual rate of 28/1000 women. The increased reporting of regular urinary symptoms in the second survey may reflect a natural variation in the prevalence, or it may reflect an alteration in symptom perception, an effect of being studied. ( Hawthorne effect ) These patients also reported repeated attacks of symptoms, whereas O'Dowd reported no relapses during the following 12 months ( O'Dowd 1984 ) , although the authors postulated that the subjects were frightened of reporting further symptoms by fear of further investigation, or that the knowledge gained enabled them to tolerate any future symptoms. Frequency - dysuria syndrome does appear to be associated with an increased incidence of UTI which complicates decision making in the general practice management of these urinary symptoms .

### **Conclusions and comment.**

It appears that the symptoms of frequency and dysuria persist for many years in some patients. It is likely that these patients have a physical disease and there is solid scientific evidence to support it. The fact that many patients have received antibacterial treatment fits well with the theory that a distortion of commensal flora by antibiotics may be one of the most important aetiological factors in the condition. The current recommendation by laboratories ( Maskell R. 1989 ) is that antibiotics are withheld as these may fuel the symptoms. Fastidious organisms are found in the urine of the great majority of women who have symptoms without anaerobic bacteriuria. My current regimen is explanation of the condition to the patient, withholding of antibiotics

except for episodes of proven aerobic infection and then limiting the course to three days. The outcome appears to be quite favourable when the management is applied early in the natural history of the condition.

## 6. Summary, conclusions and recommendations.

### Summary.

#### **Reported prevalence of urinary incontinence in women in a general practice.**

##### *Study design.*

A community based population study, using a self - administered postal questionnaire.

##### *The results.*

\*The overall prevalence of urinary incontinence in women aged 25 years and over was 41%.

\*Rates were lower in nulliparous and postmenopausal women than in parous and premenopausal women.

\*6% women require regular protection against inappropriate leakage of urine and 15% need to wear protection for running, jumping, participating in exercise classes or doing sports.

\*The prevalence of incontinence increased with increasing parity.

\*Most older women of high parity had never been incontinent.

\*Incontinence was significantly associated with perineal suturing after childbirth.

\*Incontinence was significantly associated with a past history of gynaecological surgery.

\*Incontinence was not related to mode of delivery.

\*Post - natal exercises for the pelvic floor were not shown to be beneficial, and seemingly adversely affected the incidence of incontinence.

\*Incontinence is common and is therefore perceived by many women as normal, and not serious; thus it is often not reported to the doctor.

### *Conclusions.*

Incontinence in women is common and is often not presented to the doctor. General practitioners should enquire after the condition in order to offer treatment to the 6% of women who need permanent protection, and the 15% who require occasional protection against inappropriate leakage of urine.

## **Diagnosis and management of female urinary incontinence in general practice.**

### *Study design.*

Self - administered postal questionnaire to select subjects and controls.

Consultation for diagnosis and management.

- Personally administered questionnaire and physical examination.

- Administration of suitable management plan ( subjects only ) based on :-

treatment of UTI if present

weight reduction if BMI > 23.9

Stress incontinence - pelvic floor exercises

Urge incontinence - habit retraining

Stress / urge incontinence - pelvic floor exercises and habit retraining ( recognising

Jarvis's work ( Jarvis 1980 ) which stressed that without urodynamic assessment the diagnosis cannot be certain from symptom reporting alone ).

Atrophic vaginitis - treatment with hormone preparations

Review at 12 weeks.

- Personally administered validated questionnaire : trained Practice Manager.

### *The Results.*

\*Significant improvement in incontinence was reported by the treated women in the stress and urge categories.

\*Although not statistically significant, the outcome of treatment of the stress/urge incontinence group indicated a trend towards success.

\*There was no significant difference in reported efficacy of treatment between age groups.

\*Treatment was shown to be effective irrespective of the duration of the incontinence.

\*Women who suffered from urge incontinence were less likely to be able to recall the onset of incontinence than those with stress incontinence.

\*10% of women in this study suffered from a continence problem since childhood.

\*Women most often associated the onset of incontinence with first, second and third pregnancies.

### *Conclusions.*

This study shows that for the majority of women reporting incontinence, the condition can be diagnosed by a general practitioner and significantly improved by appropriate



intervention.

**The reported prevalence of urinary symptoms in women in one rural practice.**

*Study design.*

Community based study of women, aged 25 years and over, using a self - administered validated questionnaire.

*The Results.*

\*The prevalence of episodes of dysuria in the previous two years was 27%.

\*The prevalence of episodes of frequency was 34%.

\*Only 8% of women had received treatment for vaginal infections ( monilia and Trichomonas although patients were also investigated for Chlamydia and Gardnerella ) , and 15% for urinary symptoms ( 10% of whom had confirmed bacteriuria ) during this period.

\*34% of women said they would self-treat prior to consulting a doctor.

\*17% would buy proprietary medicines.

\*36% of women wait for five days or longer after onset of urinary symptoms before consulting. Reported interval between onset of symptoms and seeking medical advice ranged from 1 - 20 days.

\*58% of women did not believe that urinary tract infections could have serious consequences rising to 76% among women who had consulted previously for a urinary tract infection.

\*Patients with recurrent symptoms did not consult any earlier than other women, or self-treat less often.

#### *Conclusions.*

Consultation for urinary symptoms by women is common, but symptom prevalence is higher. Most symptom episodes do not result in a consultation. A third of women self-treat before seeing a doctor with consequent delay.

#### **A study of women who report regular episodes of dysuria and frequency.**

#### *Study design.*

A retrospective comparative analysis of responses to similar questions posed in two self-administered questionnaires completed at an interval of two years by the study population of women aged 25 years and over.

#### *The Results.*

\*8.5% women patients reported regular frequency - dysuria symptoms in the first two year period and 14% in the subsequent two year period.

\*4% reported regular symptoms throughout the study period of four years.

\*Sexually inactive women did not report regular symptoms. There was a significant association of frequency - dysuria syndrome and sexual activity.

\*There was no association reported with recent sexual intercourse. However the true significance of this is not known as the time interval between onset of symptoms and intercourse was not requested, neither was the usual frequency of sexual intercourse asked after .

\*Symptoms were less common in the 55 - 74 year old age group than younger and older age groups.

\*There was no association demonstrated between type of contraception used and reported symptoms.

\*Pre - menopausal women reported significantly more symptoms than post - menopausal women.

\*The study was unable to ascertain the significance of change of sexual partner.

\*Women who complained of regular frequency - dysuria syndrome were five times more likely to have suffered from a urinary tract infection with bacteriuria during the study period than other women.

#### *Conclusions.*

A women who suffers regular frequency - dysuria syndrome will not necessarily continue to do so, although a small proportion do. Further research in the form of a long - term prospective study is necessary to determine the natural history of recurrent frequency - dysuria syndrome and its associated factors.

General practitioners need to be aware of the increased prevalence of bacteriuria infection in women presenting with recurrent frequency - dysuria syndrome.

#### **Conclusions and recommendations.**

Since there is a widespread belief among women that incontinence is something that has to be suffered rather than a condition to be treated, it is essential to educate

patients. They must be informed that incontinence is a common symptom which can frequently be cured and always be improved. Furthermore women need to be encouraged to present for treatment.

It should be the role of the general practitioner to expose the problem through screening, case finding or opportunistically. When a patient is consulting for any problem, noticing damp underwear, a smell of urine, or abdominal and perineal rashes should prompt enquiry about continence. Continence is now discussed at the 'Over 75 years' health screening appointment. From this research it appears that it is equally appropriate to enquire about continence at pre - conception counselling, ante - natal, post - natal and well woman appointments.

The general practitioner's role should then be to medically assess the patient, form a diagnosis, offer management in the form of advice and treatment and/or refer to an appropriate health professional; consultant, continence advisor, health visitor and district nurse. It may also require a referral to another professional , e.g. social worker. Finally, the role of the general practitioner includes counselling the incontinent patient, giving support and understanding, encouraging self - help, and helping to restore self - esteem and self - confidence.

General practitioners are in the best position to publicise facts relating to incontinence since they meet every registered patient at least once every three years. They are also respected, and research has shown that advice given by general practitioners related to cessation of smoking is more effective than any other advice. General practitioners

are in an excellent position to publicise the common prevalence of incontinence and the fact that young people suffer as well as the elderly. Free discussion will lessen the taboo that is associated with the complaint. Doctors should emphasize the treatability of the condition and encourage self - help as well as promoting seeking early professional advice.

Since incontinence is so prevalent, it is inconceivable that there would be sufficient specialist services should all sufferers present. With such a high prevalence, and a sensitive condition, patients would most likely be encouraged to present to their general practitioner with whom they are acquainted. At the moment many general practitioners would be unable to respond to their request for help and treatment, other than by referral to a specialist service. It is essential that the assessment and appropriate management of patients with incontinence is offered in primary care so that selected patients only are referred to specialist services for urodynamic assessment and specialist treatments. In order to improve continence care in general practice there is need for education, firstly to reinforce that incontinence is a medical and not a social problem, and secondly that it is the condition which requires treatment and not merely its effects. Continence care needs to be taught to medical students incorporated into the medical school curriculum. It should be also addressed during vocational training. Furthermore there is a need for post - graduate education for general practitioners in all aspects of diagnosis and management of the incontinent patient.

A questionnaire study called ' Continence Promotion in general practice - a national

survey' ( Jolleys & Wilson - in press ) set out to examine the current provision of continence promotion in primary care and to determine the training requirements of medical and nursing staff by looking at attitudes, skills and knowledge related to continence promotion in 1:20 general practitioners in the United Kingdom. A response rate of 69% revealed that less than 30% of general practitioners felt confident to diagnose and manage incontinence, with only 17% confidence in the management of urge incontinence. 80%, 75% and 72% said that training was totally inadequate at undergraduate, vocational training and post graduate levels respectively. 92% requested further post - graduate training. 95% felt that the doctor's role was to identify new patients, 76% to assess the patient and 70% to manage the incontinence. 90% felt that general practitioners should offer advice and information. The paper concluded that general practitioners felt that continence promotion should be an integral part of general practice but felt inadequately trained and requested further education on the subject.

General practitioners should be encouraged initially to try to assess patients and offer management advice. Even when the treatment regime does not result in an improvement of symptoms, the patient has often benefitted from the counsel given during the appointment. Considering the worst scenario, the patient has not been harmed and referral merely delayed. In a successful case, the patient has been treated conveniently within the practice without delay, and the over - stretched continence services have been spared a referral. The general practitioner is rewarded for his effort by enhanced job satisfaction and often a delighted, grateful patient.

**In summary,** effective and readily available treatment for incontinence in the setting of general practice is essential in view of the high prevalence of this common, embarrassing and inconvenient condition. Successful community treatment reduces consultant referral, conserves resources, is convenient for patients and increases job satisfaction for the general practitioner.

Were a general practitioner to enquire at every opportunity about continence, he could find that he had a large case load of incontinent patients. It might be advantageous to adopt a joint approach to care with other members of the primary health care team who profess an interest in incontinence, setting up a clinic for continence care, and sharing the work, e.g. with the practice nurse, a physiotherapist interested in Kegel's exercises, a dietician, a district nurse, and a health visitor. A recent paper in the British Medical Journal demonstrated an approach to the management of incontinence in the community using nurses as the main resource. ( O' Brien et al. 1991 ).

One of these studies showed that the opportunity to assess the patient's knowledge of urinary conditions, and educate accordingly is not always taken in the consultation. Increased knowledge could improve self - care, reduce inappropriate consultations, promote earlier, appropriate consultations and reduce morbidity and possibly time lost from work.

#### **Further research.**

These studies indicate the need for further research in many areas;

\*To further assess the relationship between prevalence of urinary incontinence and (1) multiple birth, (2) the various minor gynaecological procedures, (3) forceps delivery, caesarian section etc.

\*A prospective randomised controlled trial to assess the efficacy of pelvic floor exercises done throughout the pregnancy and post - partum in reducing the incidence of stress incontinence. Also to see whether being more physically fit prevents the development of incontinence.

\*A randomised controlled trial to assess whether the wearing of supportive garments reduces the prevalence of incontinence.

\*More research is needed on recurrent frequency - dysuria syndrome. A prospective trial over several years could determine the natural history of the complaint and could elucidate the significance of possible causal factors e.g. change of sexual partner, sexual intercourse, douching, type of contraception used etc.

\*Conducting a study to assess the psychological morbidity associated with the symptom of urinary incontinence by administration of the Nottingham Health Profile to patients both before and after treatment for incontinence.



## Appendices.

## List of Appendices.

List of appendices.

Letter to patients. May 1987

Letter to patients. September 1987

Questionnaire for study 1.

Coding manual for study 1 questionnaire.

Questionnaire 2.

Coding manual for questionnaire 2.

Personally administered questionnaire - study II

Questionnaire for study 3.

Coding manual for study 3.

Letter introducing questionnaire 2

Letter for study 3.

Diagram of pelvic floor used in study 2.

Habit retraining form.

Pelvic floor exercises form.

Urinary continence chart.

Frequency - volume chart.

Publications associated with this thesis.

Copies of publications.

*Dr. J. C. W. Jolleys* M.A. B.M. B.Ch. DRCOG. *DR. J. V. Jolleys* B.A. M.B.Ch.B. M.R.C.G.P.  
The Surgery · Mill Lane · Belton · Nr. Loughborough · Leics · LE12 9UJ  
Telephone: Coalville 222368

---

May 1987.

Dear

It has recently come to my notice that some of my female patients suffer from incontinence and yet do not consult a doctor for this complaint. I wonder if you would be kind enough to complete the enclosed questionnaire which asks about urine leakage and other urinary symptoms experienced during the past two years. I have also asked for details of pregnancies, childbirth, urine infections, contraception etc. so that I can see if there are any factors common to those who experience symptoms.

I enclose a stamped addressed envelope for the return of the form. I would appreciate an early reply. If you require any assistance with the form please do not hesitate to contact the surgery. Your replies will be treated as confidential . If you feel you cannot participate please return the blank form to me to confirm this.

Thanking you in anticipation.

Yours sincerely,

Jacqueline V. Jolleys

*Dr. J. C. W. Jolleys M.A. B.M. B.Ch. DRCOG. DR. J. V. Jolleys B.A. M.B.Ch.B. M.R.C.G.P.*  
*The Surgery · Mill Lane · Belton · Nr. Loughborough · Leics · LE12 9UJ*  
*Telephone: Coalville 222368*

---

September 1987

Dear

Thank you very much for returning my questionnaire. I was surprised to find that so many of my patients said they suffer from urinary symptoms including incontinence. Although not everyone said that it was distressing, I propose to enquire from each patient further details to clarify the problem so that I can later offer a consultation for diagnosis and treatment should this be requested. I wonder if you would be kind enough to complete a second questionnaire. Could you also please indicate on the form (question 18) whether you would like an appointment to see either myself or a specialist in this field.

I enclose a stamped addressed envelope. I would be grateful if you could complete this at your earliest convenience. If you require any assistance with the form please do not hesitate to contact the surgery.

Kindest regards.

Yours sincerely,

Jacquelin V. Jolleys

**Questionnaires and coding manuals for the  
studies**

Office use only

Study Number

--	--	--	--

1. Name

2. Age

--	--

3. Date of last period

--	--	--	--	--	--

4. How many times have you been pregnant?

--	--

5. Were any of these miscarriages?  yes  no

If so, did the pregnancy last less than 12 weeks?  yes  
 did the pregnancy last more than 12 weeks?  yes


6. nature of delivery	normal	forceps	caesarian section
birth 1			
birth 2			
birth 3			
birth 4			
birth 5			


7. Did you need stitches after childbirth?

yes  no

--

8. Did you do pelvic floor exercises after delivery?  
 if so, was that daily?

yes  
 no


how long did you do the exercises for?

less than 6 weeks  yes  
 more than 6 weeks  yes

--

9. Have you had any gynaecological operation?  yes  no

Hysterectomy  yes  
 Prolapse  yes  
 Other  yes


10. What form of contraception do you or your partner use?

--

11. Have you suffered from any of the following in the past two years?

Office  
use  
only

NATURE OF DELIVERY	NEVER	SOMETIMES (less than 12 times)	OFTEN (more than 12 times)	
a) an urgent need to pass water/urine				<input type="checkbox"/>
b) stinging of water				<input type="checkbox"/>
c) an increase in need to pass water				<input type="checkbox"/>
	NEVER	SOMETIMES (once a month or less)	OFTEN (2x a month or more)	
leaking of water with - coughing - exercise - laughing - lifting - climbing stairs - full bladder - other occasions				<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

12. Do you have to wear protection because of this? yes  no

13. Have you ever spoken to your doctor about this? yes  no   
If not, why have you not consulted him/her?

14. Do you have to strain to pass water? yes  no

15. Do you feel you empty your bladder completely when you pass water? yes  no

16. Have you ever had treatment for cystitis?  
never  sometimes (< once a year)  often (once a year or more)

17. Have you ever had treatment for vaginal discharge?  
never  sometimes (< once a year)  often (once a year or more)

Coding Manual    Incontinence Study I.

1) Study number	1 - 999		
2) Age	25 - 98		
missing	99		
3) Date of last period	1 - 31		
	1 - 12		
	10 - 87		
missing	99		
4) How many times have you been pregnant ?	0 - 20		
5) Were any of these miscarriages? No. of times.	0 - 8		
missing	9		
If so, did the pregnancy last less than 12 weeks?	0 - 8		
If so, did the pregnancy last more than 12 weeks?	0 - 8		
missing	9		
6) Nature of delivery	normal	1	
	forceps	2	
	caesarian section	3	
	missing	9	
7) Did you need stitches after childbirth?			
	Yes = 1	No = 2	
8) Did you do pelvic floor exercises after delivery?			
	Yes = 1	No = 2	
If so, was that daily?	Yes = 1	No = 2	0 = NA



For how long did you do exercises?

0 = NA < 6 weeks = 1

> 6 weeks = 2

9) Have you had any gynaecological operation?

Yes = 1 No = 2

Hysterectomy = 1

Prolapse = 2

Other = 3

Missing = 9

10) What form of contraception do you or your partner use?

None = 0

pill = 1

cap = 3

sheath = 4

Female Sterilization = 5

Male Sterilization = 6

Depoprovera = 7

Missing = 9

11) Do you suffer from any of the following?

Never = 1 Sometimes = 2 Often = 3 Missing = 9

12) Do you have to wear protection because of this?

Yes = 1 No = 2 0 = NA 9 = missing

13) Have you ever spoken to the doctor about this ?

Yes = 1 No = 2 0 = NA 9 = missing

If not, why have you not consulted him/her?

1 = not too bad

2 = infrequent problem

3 = Don't know what to say

4 = embarrassed

5 = usual female complaint

6 = common complaint - not worth consulting

7 = fear of surgery

18 = NA

19 = missing

14) Do you have to strain to pass water?

Yes = 1 No = 2 9 = missing

15) Do you feel you empty your bladder completely when you pass water?

Yes = 1 No = 2 9 = missing

16) Have you had treatment for cystitis?

Never = 1 Sometimes = 2 Often = 3 Missing = 9

17) Have you had treatment for vaginal discharge?

Never = 1 Sometimes = 2 Often = 3 Missing = 9

Patient number

Patient name

Office  
use  
only

--	--	--

Question (tick) Answer

*Frequency*

1. How often do you go to the toilet to pass urine on average in the daytime? ( ) less than once every 2 hrs.  
( ) once every 1-2 hrs.  
( ) more than once an hour

*Nocturia*

2. Does the feeling of need to pass urine/water wake you up during a nights sleep? ( ) 3 or more times a night  
( ) 1 or 2 times a night  
( ) no.

*Urgency*

3. Do you feel the normal urge to pass urine when the bladder us full? ( ) yes  
( ) no.

4. Do you have difficulty in holding your water once you feel the urge to go? ( ) yes  
( ) no.

5. Would you have to hurry to reach a nearby toilet? ( ) yes  
( ) no.

6. Could you wait if somebody was using the toilet? ( ) yes  
( ) no.

7. Do you sometimes fail to get to a nearby toilet in time? ( ) yes  
( ) no.

*Incontinence*

8. Are you always completely dry? ( ) yes  
( ) no.

9. Do you ever lose control of your water, even for a short time so that some urine escapes from you? ( ) yes  
( ) no.

10. Are you ever wet? ( ) yes   
 ( ) no.
11. IF YES. Do you become wet, lose control of urine? ( ) 1-2 times a month   
 ( ) once a week  
 ( ) dally  
 ( ) several times a day
12. If you become wet, do you:  
 - just dampen your pants ( ) yes   
 - need to change your pants ( ) yes  
 - wet your clothing ( ) yes  
 - do you wear protection when doing exercise? ( ) yes   
 ( ) no  
 - mini pads ( ) yes   
 - tampax ( ) yes  
 - other ( ) yes
13. Are these urinary problems worse before a menstrual period? ( ) yes   
 ( ) no.
14. When did you first notice difficulty in controlling your urine? since  
 - childhood ( ) yes   
 - pregnancy 1 ( ) yes  
 - pregnancy 2 ( ) yes  
 - pregnancy 3 ( ) yes  
 - hysterectomy ( ) yes  
 - other gynae operation ( ) yes
15. Was the birth weight of any of your babies: - 9-10 lbs ( ) yes   
 - > 10 lbs ( ) yes
16. What is your height? (cms)
17. What is your weight? (kgs)
18. Would you like an appointment to discuss these problems? ( ) yes   
 ( ) no
- Whom would you like to see? ( ) Dr Jacqueline Jolleys   
 ( ) a specially trained nurse  
 ( ) a consultant at the hospital

Coding manual.

1) How often do you go to the toilet to pass urine on average in the daytime?

Less than once every 2 hours = 1

Once every 1 - 2 hours = 2

More than once an hour = 3

2) Does the feeling of need to pass urine/ water wake you up during the night?

3 or more times a night = 1

1 or 2 times a night = 2

no = 3

3) Do you feel the normal urge to pass urine when the bladder is full ?

Yes = 1                      No = 2

4) Do you have difficulty in holding your water once you feel the urge to go?

Yes = 1                      No = 2

5) Would you have to hurry to reach a nearby toilet?

Yes = 1                      No = 2

6) Could you wait if somebody was using the toilet?

Yes = 1                      No = 2

7) Do you sometimes fail to get to a nearby toilet in time?

Yes = 1                      No = 2

8) Are you always completely dry?

Yes = 1                      No = 2

9) Do you ever lose control of your water, even for a short time so that some urine escapes from you?

Yes = 1                      No = 2

10) Are you ever wet?

Yes = 1                      No = 2

11) If yes, do you become wet, lose control of your urine?

1 - 2 times a month              = 1

once a week                      = 2

daily                                = 3

several times a day              = 4

12) If you become wet do you

dampen your pants              Yes = 1      No = 2

change your pants              Yes = 1      No = 2

wet your clothing              Yes = 1      No = 2

Do you wear protection when doing exercise?

Yes = 1      No = 2

mini pads                      Yes = 1      No = 2

Tampax                         Yes = 1      No = 2

13) Are these urinary problems worse before a menstrual period?

Yes = 1                      No = 2

14) When did you first notice difficulty in controlling your urine?

Since childhood                      Yes = 1      No = 2      N/A = 3

Since pregnancy number 1              Yes = 1      No = 2      N/A = 3

Since pregnancy number 2              Yes = 1      No = 2      N/A = 3

Since pregnancy number 3              Yes = 1      No = 2      N/A = 3

Since hysterectomy                      Yes = 1      No = 2      N/A = 3

Since other gynaecological operation      Yes = 1      No = 2      N/A = 3

15) Was the birth weight of any of your babies

9 - 10 lbs      Yes = 1    No = 2    N/A = 3

over 10 lbs      Yes = 1    No = 2    N/A = 3

16) What is your height? cms

100 - 200 allowed

17) What is your weight? kgms

40 - 90 allowed

18) Would you like an appointment to discuss these problems?

Yes = 1      No = 2

All missing data were coded 9 or 99

INCONTINENCE STUDY II

--	--	--

Patient's name

Number

Case = 1      Control = 2

1. Do you have any difficulty controlling your urine?

Yes = 1      N = 2

If yes, when did this begin?

Approximate date: Month.....Year.....

--	--

--	--

2. Are you:

Completely dry = 1      Not completely dry = 3  
 Sometimes wet = 2      Frequently wet through = 4

3. When you lose water is it just a few drops or does it flood out?

Few drops = 1      Floods = 2

4. Please indicate the types of items made wet, if any:

Incontinence pads	Y = 1	N = 2
Pants	Y = 1	N = 2
Clothes	Y = 1	N = 2
House (cushions, etc.)	Y = 1	N = 2
Bedding	Y = 1	N = 2


5. Do you ever get wet/damp without any warning?

Yes = 1      N = 2

6. Do you find it difficult to remain dry if you cough or sneeze or if you change position or do physical exercise?

Yes = 1      N = 2



7. How often do you go to the toilet to pass urine on average in the day time?

Less than every 2 hours	= 1	Do not normally pass urine	= 4
Once every 1-2 hours	= 2	Urine leaks continually	= 5
More than once per hour	= 3		<input type="checkbox"/>

8. Does the feeling of need to pass urine wake you up during a night's sleep?

No	= 1	Less than once a night	= 3
1 or 2 times per night?	= 2	3 or more times per night	= 4

9. Do you still feel the normal urge to pass urine when your bladder is full?

Yes = 1                      No = 2                     

If yes: could you wait if somebody was using the toilet?

N/A=0                      Yes = 1                      No = 2                     

If no: do you sometimes fail to get to a nearby empty toilet in time?

N/A = 0                      Yes = 1                      No = 2                     

10. After you have finished passing water, do you feel you have to sit down/go back again immediately to carry on?

Yes = 1                      No = 2                     

11. When you pass urine, is the flow good?

Yes = 1                      No = 2                     

12. Do you feel any pains of any sort as you pass urine at present?

Yes = 1                      No = 2                     

13. Do you feel that your womb is dropping inside your vagina?

N/A = 0                      Yes = 1                      No = 2

14. Do you use aids (appliances or pads and pants) to help control any leakage of urine during the day or night?

Yes = 1      No = 2

15. Please indicate the type and source of aids you currently use, including aids obtained privately and from the N.H.S.

N/A = 0      Private = 1      NHS = 2      NHS/Private = 3

16. Do you find your problem affects your social life?

Yes = 1      No = 2

If yes please indicate below activities affected by your problem.

Going shopping/walking      Yes = 1      No = 2      N/A = 0

Travelling long distance      Yes = 1      No = 2      N/A = 0

Keep fit exercise      Yes = 1      No = 2      N/A = 0

Other (please specify).....

.....

.....

.....

17. Would you describe your health at present as:

Good = 1

Fair = 2

Poor = 3

18. How many pregnancies of more than 12 weeks have you had?  
No. of pregnancies.....

19. Have you had any operations on the womb, etc?  
Yes = 1      No = 2

20. Have you ever had an operation related to your bladder?  
Yes = 1      N = 2

21. Are these urinary problems worse before a menstrual period?  
N/A = 0      Yes = 1      N = 2

22. When did you first notice difficulty in controlling your urine?

- since childhood = 1
- since pregnancy No. 1 = 2
- since pregnancy No. 2 = 3
- since pregnancy No. 3 = 4
- since hysterectomy = 5
- since other gynaecological operation = 6

23. Was the birth weight of any of your babies  
>9lbs = 1      9 - 10 lbs = 2      <10lbs = 3

24. What is your height (cms) ?

25. What is your weight (kgs)?

26. Do you feel that the treatment you have received has been of any benefit?

cured = 1

improved = 2

no improvement but coping better = 3

no improvement but not coping better = 4

deteriorated = 5

other (specify) = 6

27. Are there any comments you would like to make about the current provision of N.H.S. aids and services?

.....

.....

.....

.....

.....

.....

NAME: .....  
Christian Surname

STUDY NUMBER

DATE OF BIRTH: [ ][ ][ ][ ][ ][ ]  
DATE MONTH YEAR

[ ][ ][ ]

PLEASE PLACE TICK IN APPROPRIATE SQUARE

FOR OFFIC USE ONLY

1. Have there been periods of several days when you have needed to pass urine much more frequently than usual?  
Yes  No

How many times has this occurred in the past two years?

Frequently (more than 12 times)

Sometimes (6 - 12 times)

Occasionally (1 - 6 times)

Never

2. Have you suffered from stinging of urine in the past 2 years?

Frequently (more than 12 times)

Sometimes (6 - 12 times)

Occasionally (1 - 6 times)

Never

3. Have you been treated by a Doctor for cystitis or urinary tract infection in the past two years?

Yes  No

4. Have you been treated by a Doctor for thrush in the past two years?

Yes  No

5. Do you treat yourself with any of the following remedies before consulting the Doctor with a urinary problem?

Yes No

Increased fluid intake

Drinking lemon barley

Purchasing medicine from the chemist

6. How many days would you treat yourself before contacting the doctor with a urinary problem?

7. Are the episodes of stinging of urine related to your monthly period?

Yes  No  Not applicable

8. Do you believe that these urinary symptoms may have serious consequences?

Yes  No

9. What is your husband's occupation? .....  
What is your occupation? .....



7) Are the episodes of stinging of the urine related to your monthly period?

Yes = 1      No = 2      Not applicable = 3

8) Do you believe that these urinary symptoms may have serious consequences?

Yes = 1

No = 2

9) What is your husband's occupation?

What is your occupation?

Social class 1 - 5 allowed

All missing data were entered as 9.

*Dr. J. C. W. Jolleys* M.A. B.M. B.Ch. DRCOG. *DR. J. V. Jolleys* B.A. M.B.Ch.B. M.R.C.G.P.  
The Surgery · Mill Lane · Belton · Nr. Loughborough · Leics · LE12 9UJ  
Telephone: Coalville 222368

---

May 1989

Dear

It is two years since I wrote to every woman registered with the practice to enquire about prevalence of urinary symptoms in women. To further this knowledge I wonder if you would be so kind as to complete the enclosed short questionnaire (it should only take a few minutes) and return it to me as soon as possible in the stamped addressed envelope provided. The information will be treated as confidential.

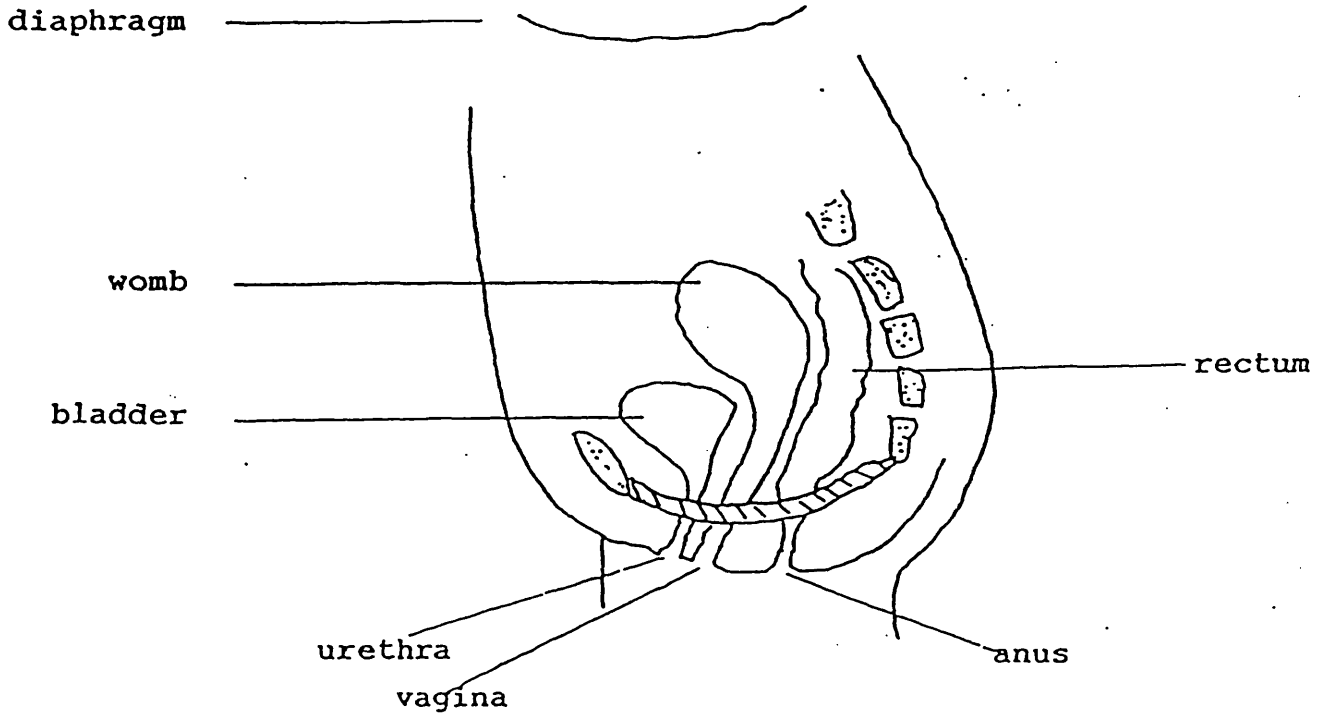
Thanking you in anticipation of your cooperation for which I am most grateful.

Yours sincerely

Dr Jacqueline V Jolleys  
General Practitioner



THE PELVIC FLOOR



## HABIT RE-TRAINING

1 Start by going to the toilet to pass urine every .....hours.

2 You must go whether you want to go or not.

You must go even if you are already wet.

You must not cheat and go before the time is up!

3 Keep to this toileting time until you have two whole days with out being wet. Don't worry about the night-time at this stage.

4 When you can manage two consecutive dry days, extend your time between visits to the toilet by half an hour. You will probably find that initially you become wet again on occasions but do not go back to the previous short time. Persist with this new time strictly as before.

5 When you have two dry days at this new time, extend the time again by half an hour and so on until you reach four hours between visits to the toilet.

6 When you can wait four hours between visits to pass urine stop watching the clock and regard yourself as normal.

7 Do keep a check on yourself and do not allow yourself to go back to your old way of going so frequently.

By this time you should be able to go without a pad quite confidently.

## PELVIC FLOOR EXERCISES

The muscles that form the floor of your pelvis have been very stretched during your life by pregnancy, delivery and lifting. If they are allowed to remain weak.....leaking of urine.....vaginal prolapse or slackness may result.

Practice the exercises sitting with the thighs apart as follows:- close your back and front passages, now draw them up inside you and HOLD. Count to 4 then let go slowly.

Repeat 4 times.

Do 4 pelvic floor exercises every hour.

A time to do these exercises might be after passing water.

AFTER THREE MONTHS TEST your pelvic floor muscles like this:-

Ensure your bladder is nearly full (about 3 hours from last empty)

Stand feet apart and bounce up and down on the spot and cough deeply twice.

Dry pants indicate recovery.

If leakage of urine occurs continue exercises for 3 more months.

Retest.

It is advisable to do some pelvic floor exercises for the rest of your life.

**Publications associated with this thesis.**

The following publications in peer refereed journals have been associated with the work described in this thesis.

1) Jolleys J.V. Reported prevalence of urinary incontinence in women in a general practice. Br. Med. J. 1988;296:1300 - 1302.

2) Jolleys J.V. Diagnosis and management of female urinary incontinence in general practice. J. Roy. Coll. Gen. Pract. 1989;39:277 - 279.

3) Jolleys J.V. The reported prevalence of urinary symptoms in women in one rural general practice. B. J. Gen. Pract. 1990;40:335 -337.

4) Jolleys J.V. Factors associated with regular episodes of dysuria among women in one rural general practice. B. J. Gen. Pract. 1991;41:241-243

## URINARY CONTINENCE CHART

Go to the toilet every .....hours,  
whether you want to or not, and whether you are wet or dry.

Date: Day:														
	wet or dry	was urine passed	wet or dry	was urine passed	wet or dry	was urine passed	wet or dry	was urine passed	wet or dry	was urine passed	wet or dry	was urine passed	wet or dry	was urine passed
12 midnight														
1 am														
2 am														
3 am														
4 am														
5 am														
6 am														
7 am														
8 am														
9 am														
10 am														
11 am														
12 noon														
1 pm														
2 pm														
3 pm														
4 pm														
5 pm														
6 pm														
7 pm														
8 pm														
9 pm														
10 pm														
11 pm														

# FREQUENCY/VOLUME CHART

Go to the toilet when you want to go.  
Measure the amount passed each time.

Date:													
time	vol.	time	vol.	time	vol.	time	vol.	time	vol.	time	vol.	time	vol.

# PRACTICE OBSERVED

## Practice Research

### Reported prevalence of urinary incontinence in women in a general practice

JACQUELINE V JOLLEYS

#### Abstract

To determine the prevalence of urinary incontinence and other urinary symptoms a questionnaire was sent to all women aged 25 and over and to women under 21 taking oral contraceptives registered with a rural practice (n=937); the questionnaire was completed by 833 women (89%). The overall prevalence of urinary incontinence was 41% (343/833); rates were lower in nulliparous and postmenopausal women (30/181 (17%) and 120/344 (35%) respectively) than parous and premenopausal women (313/652 (48%) and 225/479 (47%) respectively). Incontinence was significantly associated with perineal suturing after childbirth, being present in 201 of 376 (53%) women with sutures compared with 113 of 270 (42%) without. Of the 166 women with a history of minor gynaecological surgery, 100 had symptoms of incontinence, compared with 263 of the 657 (37%) without such a history. Incontinence was not related to type of delivery, and postnatal exercises for the pelvic floor were not beneficial.

Inappropriate leakage of urine is perceived by many women as common and therefore not serious; thus it is often not reported to the doctor. Nevertheless, the 6% of women who always require protection against leakage could be helped by treatment.

#### Introduction

Although few patients complain spontaneously of urinary incontinence, this problem may frequently be elicited during history

taking and on examination. Furthermore, urinary leakage during "pop mobility" and other physical exercise programmes is well recognised by tutors of these programmes.

The prevalence of urinary incontinence has rarely been studied in a population, only in selected age groups or communities.<sup>1,2</sup> A study by Thomas *et al* of the overall prevalence of urinary incontinence showed rates of 8.5% in women aged 15-64, 1.6% in men aged 15-64, 11.6% in women over 65, and 6.9% in men over 65.<sup>3</sup> Other studies have found rates of incontinence ranging from 30% to 57% in women: Brocklehurst *et al* reported an incidence of 57% in women aged 45-64<sup>4</sup>; Wolin found that 50.7% and Nemir and Middleton that 52% of nulliparous women had stress incontinence<sup>5</sup>; and Crist *et al* found that about 30% of nulliparous women aged 21-63 experienced inappropriate urine loss.<sup>6</sup> These variations may be due partly to differing definitions of and methods of eliciting the presence of incontinence. Furthermore, all these studies were carried out by people unknown to the patients.

Because of these discrepancies I carried out a study to determine the prevalence of urinary incontinence in women over the age of 25 in a rural general practice in Leicestershire. Incontinence was defined as inappropriate leakage of urine. The study was also designed to identify associated factors and to ascertain why some patients do not consult their general practitioner about urinary symptoms.

#### Methods

A questionnaire was formulated to ascertain the prevalence of urinary symptoms including incontinence. Patients were asked whether they experienced leakage of urine on coughing, laughing, exercise, lifting, climbing stairs, a full bladder, or other occasions and were asked to classify subjectively the frequency of occurrence of each symptom as never, sometimes (inappropriate urine loss less than twice a week), or often (incontinence several times a week). They were asked if they wore sanitary protection because of their symptoms. If these symptoms had not caused

Faculty of Medicine, University of Leicester, Leicester LE1 7RH  
JACQUELINE V JOLLEYS, MB, MRCP, lecturer in general practice

Correspondence to: The Surgery, Mill Lane, Belton, Leicestershire LE12 9JU.

them to seek medical advice the reasons for this were sought. Information was also collected about pregnancies of more than 12 weeks' gestation, mode of delivery, whether they had required perineal sutures after delivery, performance and duration of postnatal exercises, and contraception. Each patient's history of gynaecological surgery, particularly hysterectomy and operations to repair prolapse, was noted. Patients with neurogenic bladder were identified by questions relating to emptying of the bladder. The questionnaire was tested on 100 randomly selected women and modified in the light of the results.

A postal questionnaire and letter of explanation were sent to all women aged 25 and over and to the 30 women (all nulliparous) under 21 taking oral contraceptives who were registered with the practice on 1 May 1987. The practice's age-sex register was cross checked with the family practitioner committee's computerised records to ensure the accuracy of the population. After six weeks non-respondents were sent a reminder and help was offered to those who required it to complete the form. Those not wishing to take part were asked to return the blank form.

Data from the questionnaire were coded with a prepared coding manual, and each patient was given an identification number when data were transferred to a computer file. The data were analysed with the statistical package for the social sciences (SPSS-X), and Mann-Whitney U tests. Data obtained from the questionnaire were validated by telephone interviews with 20% of the women who had reported symptoms, who were also questioned about frequency and volume of urine loss. The data collected agreed with the questionnaires returned for 96% of these 105 women.

## Results

Altogether 833 (89%) of the 937 women registered with the practice answered the questions on the questionnaire. No replies were received from 88 women, 10 women refused to take part, and six questionnaires were

TABLE I—Prevalence of symptoms of urinary incontinence in women (n=833). Figures are numbers (percentages) of women

	Often†	Sometimes†	Never
On coughing	37 (4)	167 (20)	629 (76)
With full bladder	24 (3)	138 (17)	671 (80)
On laughing	18 (2)	114 (14)	701 (84)
On exercise	24 (3)	79 (9)	730 (88)
On lifting	9 (1)	55 (7)	769 (92)
On climbing stairs	3 (1)	44 (5)	786 (94)
On other occasions (usually sneezing)	14 (2)	73 (9)	746 (89)

\*Altogether 490 women reported that they never had symptoms of incontinence on any occasion.

†The groups "often" and "sometimes" are not mutually exclusive—for example, one woman might complain of having symptoms often on coughing but only sometimes on laughing.

TABLE II—Prevalence of symptoms of urinary incontinence related to age

Age group (years)	No of women	No (%) with symptoms of incontinence
<25	26	8 (31)
25-34	145	58 (40)
35-44	227	104 (46)
45-54	144	86 (60)
55-64	122	48 (39)
65-74	104	30 (29)
75-84	61	12 (20)
≥85	4	1 (25)
All age groups	833	343 (41)

returned marked "unknown at this address." Table I shows the reported incidence of urinary incontinence: 343 women (41%) reported inappropriate leakage of urine. The volume of leakage was described by 232 women as dampening of underwear; 63 required a change of underwear, and 48 always needed to wear protection against leakage. A total of 125 required protection during physical activity. The prevalence of symptoms tended to increase with increasing age up to age 54 but then declined (table II).

In answer to the question "Why have you not spoken to the doctor about your incontinence?" 166 women did not reply, 121 did not consider their symptoms to be a serious problem, 43 said that their symptoms were too

infrequent to warrant treatment, 36 said that their symptoms were a usual female complaint, and 13 were too embarrassed to speak to their doctor about incontinence. Other reasons included that they believed their symptoms due to aging or childbirth and that they had not got round to consulting the doctor or were afraid of surgery. (Several women gave more than one answer.) Patients were more likely to consult their doctor the more the factors that precipitated their incontinence. Thus 10 (8%) of the 124 women with only one precipitating factor had consulted their doctor compared with five (15%) of the 33 with four and two (18%) of the 11 with six factors.

TABLE III—Symptoms of urinary incontinence in parous women (n=646\*) who did and did not have perineal sutures after delivery. Figures are numbers (percentages) of women

No of factors precipitating urinary incontinence	Sutures after delivery (n=376)	No sutures after delivery (n=270)
0	175 (47)	157 (58)
1	66 (18)†	41 (15)
2	61 (16)	30 (11)
3	43 (11)	16 (6)
4	19 (5)	13 (5)
5	6 (2)	10 (4)
≥6	6 (1)	3 (1)

\*Six women did not complete the question about suturing.

†p=0.007 For women with symptoms of urinary incontinence (Mann-Whitney two tailed test).

TABLE IV—Prevalence of symptoms of urinary incontinence in women who had and had not had gynaecological operations other than hysterectomy and repair. Figures are numbers (percentages) of women\*

No of factors precipitating urinary incontinence	Gynaecological operations other than hysterectomy and repair (n=166)	No gynaecological operations (n=657)
0	66 (40)	414 (63)
1	33 (20)	91 (14)
2	28 (17)	69 (11)
3	22 (13)	40 (6)
4	11 (7)	22 (3)
5	4 (2)	12 (2)
≥6	2 (1)	9 (1)

\*Excludes 10 women who had had hysterectomy.

For women with symptoms of urinary incontinence  $\chi^2=35.6$ ,  $df=6$ ,  $p<0.0005$ ; Mann-Whitney two tailed test,  $p<0.0001$ .

Altogether 30 (17%) of the 181 nulliparous women were incontinent; eight (31%) of the 26 nulliparous women aged under 25 were incontinent. This compared with 313 (49%) of the 652 parous women ( $\chi^2$  test,  $df=1$ ,  $p<0.0001$ ). The incidence of urinary incontinence increased with parity, being 42% (66/157), 48% (129/268), 53% (72/136), and 56% (8/15) after one, two, three and four pregnancies, respectively. There was no association between incontinence and type of delivery, but women who had had perineal suture after delivery were more likely to have symptoms of incontinence than the who had not (table III).

A higher proportion of women who had done daily postnatal exercises (261/450; 58%) experienced leakage than of those who had not (73/197; 37% (Mann-Whitney two tailed test,  $p<0.0001$ ). Furthermore, a lower proportion of women who had done daily exercises for less than six weeks (47/89; 53%) reported symptoms than of those who had done them for long (73/101; 73%) (Mann-Whitney two tailed test,  $p=0.00057$ ).

Urinary symptoms were significantly more common in premenopausal than postmenopausal women, being present in 302 of the 479 (63% premenopausal women compared with 175 of the 344 (51%) postmenopausal women (Mann-Whitney two tailed test,  $p=0.0017$ ). Altogether 225 (47% of the premenopausal women had episodes of incontinence compared with 120 (35%) of the postmenopausal women.

Hysterectomy (in 10 women) made no difference to the prevalence of symptoms, but symptoms were significantly more common among the



# Diagnosis and management of female urinary incontinence in general practice

JACQUELINE V. JOLLEYS

**SUMMARY.** In response to an invitation sent to women who had complained previously of regular incontinence, 65 women with regular incontinence were seen by their general practitioner. A diagnosis was made using a personally administered questionnaire and appropriate examination. Patients were placed in one of three diagnostic/management categories — stress, urge or stress/urge incontinence — and were given an appropriate treatment programme. Fifty six women were recruited as matched controls from non-responders while attending the surgery for other reasons. They underwent identical entry procedures but were not offered a treatment programme. All the patients were reassessed after 12 weeks at which time significant improvement in incontinence was reported by the treated women in the stress and urge categories compared with the controls. There was no significant difference in reported efficacy of treatment between age groups and treatment was shown to be effective irrespective of the duration of incontinence.

This study shows that for the majority of women reporting incontinence the condition can be diagnosed by a general practitioner and significantly improved by appropriate intervention.

## Introduction

HAVING established that 41% of the women patients in the author's practice suffered from regular urinary incontinence (two or more episodes per month),<sup>1</sup> a response to the demand for treatment was needed. Currently a range of hospital based services are available for the incontinent. There are continence clinics staffed by consultants and nurses with a special interest in incontinence but appointments are limited and demand means there is a long waiting list. Gynaecologists see female patients complaining of incontinence and assess them by urodynamics. Treatment consists mainly of pelvic floor faradism with surgery reserved for the more severely affected. Physiotherapists work in conjunction with both gynaecologists and continence clinics but their services are not always directly available to patients referred by general practitioners.

Because of these constraints and the high prevalence of urinary incontinence it was decided to treat all patients in the setting of general practice, at least initially. A literature search revealed no studies assessing the treatment of incontinence in general practice although a number of hospital studies have been reported.<sup>2-7</sup> Bhatia and Ostergard<sup>2</sup> reported clinical cure of stress incontinence by retropubic urethropexy and Kegel<sup>3</sup> and Jones<sup>4</sup> reported studies assessing the efficacy of pelvic floor exercises in stress incontinence.

This study aimed to determine whether a general practitioner could successfully diagnose and treat incontinent female patients without the need for special training or resources. Subjective

outcome criteria were adopted since more objective urodynamic measures are not readily available to general practitioners.

## Method

All 343 women patients who had reported regular incontinence of urine in a rural general practice<sup>1</sup> were sent an invitation to discuss their incontinence problem. Of the 78 who replied, 67 kept their appointments. Since the remaining 11 respondents were unable to attend during the study period they were not included in the study. All patients were interviewed by the author using a personally administered questionnaire. This was designed to confirm urine leakage, provide information on the type and severity of the incontinence and determine when episodes of incontinence had started. Abdominal and vaginal examination was performed and a diagnosis of the type of incontinence made. Uristix examination of the urine was carried out and a mid-stream urine sample sent for microscopy and culture. Confirmed urinary tract infection was treated and the patient reassessed using the same questionnaire.

## Classification of incontinence

Patients were placed in one of three diagnostic/management categories:

1. Stress incontinence — loss of urine on exertion, without active bladder contraction. It may imply that urethral sphincter incompetence is present.
2. Urge incontinence — involuntary loss of urine associated with a strong desire to void. This may be accompanied by a detrusor contraction.
3. Stress/urge incontinence — a combination of (1) and (2).

## Exclusion criteria

Patients with any of the following were offered consultant referral and excluded from the study: vesico-vaginal fistula; palpable bladder after micturition; disease of the central nervous system — multiple sclerosis, neurogenic bladder; certain gynaecological conditions — procidentia, rectocele, cystocele or fibroids of a severity requiring surgery; no diagnosis.

## Management of stress incontinence

Patients with stress incontinence were taught pelvic floor exercises. They were instructed to breathe normally while actively contracting the levator anus muscles ensuring that no simultaneous contraction of the abdominal, gluteal or adductor muscles occurred. Active contraction was confirmed by vaginal examination. The patients were given a regular exercise programme. Patients were given dietary advice if they were overweight (body mass index >23.9<sup>8</sup>). Advice on reducing the amount of lifting and the correct way to lift was also given.

## Management of urge incontinence

Patients with urge incontinence kept a urinary output diary for two days. Habit retraining was initiated and fluid intake regulated. After two weeks the patient was reassessed. If nocturia was reported to occur at intervals of less than two hours or frequency was less than hourly treatment with terodiline hydrochloride 12.5 mg (one or two tablets twice daily) was

J.V. Jolleys, MRCCGP, lecturer in general practice, University of Leicester.

© Journal of the Royal College of General Practitioners, 1989, 39, 277-279.

started. Habit retraining was continued and at reassessment the need for medication was reconsidered. Marked atrophic vaginitis at pelvic examination was treated with oestriol 0.5 mg pessaries, one daily for 15 days. At review patients with severe atrophic vaginitis were considered for hormone replacement therapy. Weight reduction advice was given if the patient was overweight.

#### Management of stress/urge incontinence

These women were treated as for both stress and urge incontinence.

All patients were reassessed at 12 weeks using the questionnaire and their opinion was sought of change in their condition. The assessment was conducted by the practice manager to minimize bias. Patients dissatisfied with lack of improvement were offered further help or consultant referral.

A control group of women with reported incontinence was recruited from surgery attenders who had not replied to the initial letter. The control group were interviewed and a diagnosis of the type of incontinence made but they received no treatment. Study patients and controls were matched for age, parity, type of incontinence, duration of symptoms, body mass index and range of body mass index. The control group was also reassessed at 12 weeks.

#### Results

Of the 67 women attending for appointments two were offered referral since they had one of the exclusion conditions. All 56 women approached to be controls consented to be in the study. The incidence of the three categories of incontinence is shown in Table 1 and indicates a close match between subjects and controls. A total of 10 women had undergone hysterectomy. One subject had a confirmed urinary tract infection on analysis of a mid-stream urine sample and on reassessment still had stress incontinence. Five subjects were treated for atrophic vaginitis and had subsequent improvement of urge incontinence.

Table 1. Incidence of the three categories of incontinence for subjects and controls.

	Number (%) of women	
	Subjects (n = 65)	Controls (n = 56)
Stress incontinence	41 (63)	41 (73)
Urge incontinence	16 (25)	10 (18)
Stress/urge incontinence	8 (12)	5 (9)

n = total number of women.

Twelve of the 121 women (10%) reported being incontinent since childhood and 10 of these women had stress incontinence. Onset of incontinence was reported as during the first pregnancy by 33 women (27%), during the second by 18 (15%) and during the third by eight (7%). Seven women (6%) attributed their incontinence to hysterectomy (five suffered urge incontinence) and one to another gynaecological operation. The remaining 42 women could not recall the onset of incontinence — 20 of the 82 reporting stress incontinence (24%), 19 of the 26 reporting urge incontinence (73%) and three of the 13 reporting stress/urge (23%). The onset was not directly related to patients' parity. There was no significant difference in the reported time of onset of incontinence between the subject and control groups.

At the 12 week follow up statistically significant cure or improvement was reported by women treated for stress and urge incontinence but not for stress/urge incontinence when com-

Table 2. Reported outcome at 12 weeks for patients with stress, urge or stress/urge incontinence.

	Number of patients			
	Cured	Improved	Not improved	Deteriorated
<i>Stress incontinence</i>				
Subjects	17	19	5	0
Controls	0	1	33	7
$\chi^2 = 64, df = 1, P < 0.01$				
<i>Urge incontinence</i>				
Subjects	12	4	0	0
Controls	0	0	9	1
$\chi^2 = 26, df = 1, P < 0.01$				
<i>Stress/urge incontinence</i>				
Subjects	2	4	2	0
Controls	0	0	4	1
Not significant				

pared with the controls (Table 2). Although not statistically significant the outcome of treatment of the stress/urge incontinence group indicated a trend towards success. There was no significant difference in the efficacy of treatment by age group (less than 35 years, 35–54 years and 55 years or over) or by the duration of incontinence.

Of the 82 women reporting stress incontinence only 40% demonstrated it by cough voiding. All these women had some control of pelvic floor muscles on vaginal examination.

Habit retraining alone was not adequate in 10 out of the 16 subjects with urge incontinence and terodiline hydrochloride was prescribed to assist bladder control. In all but two patients the dose was reduced and stopped after four to eight weeks when total bladder control was regained.

Seven subjects were offered referral to a consultant but none accepted. The majority of the subjects (94%) expressed satisfaction at having a diagnostic label and treatment plan and this was not related to whether or not a cure was achieved.

#### Discussion

This study found that 36 of the 41 patients with stress incontinence receiving treatment (88%) had improved after 12 weeks of pelvic floor exercises and 17 (41%) reported total cure. Kegel<sup>1</sup> found that 75% of women who had partial control of the pelvic floor muscles experienced complete relief of symptoms after seven to eight weeks of pelvic floor exercises, confirmed by objective assessment with a perineometer. Kegel also reported that older people could be successfully treated by pelvic floor exercises. This was borne out by this study which showed that pelvic floor exercises taught in general practice can cure or ameliorate stress incontinence in a well motivated population irrespective of age, achieving comparable results to those obtained by hospital departments. Twelve of the women in the study (10%) reported inappropriate urine leakage since childhood and 10 of these had stress incontinence indicating primary urethral sphincter incompetence or pelvic floor weakness. The biased selection may have spuriously raised the prevalence of primary enuretics who have never obtained total bladder control. Nevertheless the true prevalence of primary enuresis may be higher than previously suspected.

Although parity is a factor in stress incontinence<sup>1,9</sup> the reported onset of incontinence in this study was not directly

related to parity. Ten patients who had undergone hysterectomy were included in the study and seven of these attributed the onset of incontinence to the operation, five reporting urge incontinence. Although the numbers are too small for conclusions to be drawn, further study of post-hysterectomy patients should be carried out. More women could not recall the onset of urge incontinence (73%) than stress incontinence (24%), perhaps indicating a more insidious onset to the former complaint.

Although adjuvant drug therapy may assist the patient to regain bladder control initially for 80% of the patients with urge incontinence who received drug therapy it was unnecessary for the maintenance of continence.

None of the patients receiving treatment requested referral to a consultant when this was offered. Satisfaction at having a diagnostic label and treatment plan was expressed by the majority of women irrespective of whether or not a cure was achieved.

This study shows that the majority of women reporting incontinence can be diagnosed and treated to their satisfaction by a general practitioner with no specialized resources and only minimal training in incontinence management. Effective and readily available treatment for incontinence in the setting of general practice is essential in view of the high prevalence of this common, embarrassing and inconvenient condition. Furthermore, successful community based treatment reduces consultant referral, is convenient for patients and increases job satisfaction for the general practitioner.

## References

1. Jolleys JV. Reported prevalence of urinary incontinence in women in a general practice. *Br Med J* 1988; 296: 1300-1302.
2. Bhatia NN, Ostergard DR. Urodynamics in women with stress incontinence. *Obstet Gynaecol* 1982; 60: 552-559.
3. Kegel AH. Physiologic therapy for urinary stress incontinence. *JAMA* 1951; 146: 915-917.
4. Jones EG. Non-operative treatment of stress incontinence. *Obstet Gynaecol* 1965; 6: 220-235.
5. Moore T, Schofield PF. Treatment of stress incontinence by maximum perineal electrical stimulation. *Br Med J* 1967; 3: 150-151.
6. Fliegner JR, Glenning PP. Seven years experience in the evaluation and management of patients with urge incontinence of urine. *Aust NZ J Obstet Gynaecol* 1979; 19: 42-44.
7. Glenning PP, Fliegner JR. A stress incontinence clinic: review of 5 years experience. *Aust NZ J Obstet Gynaecol* 1976; 16: 177-181.
8. Royal College of Physicians. Obesity report. *J R Coll Physicians Lond* 1983; 17: 5-63.
9. Yarnell JWG, Voyle GJ, Sweetnum PM, et al. Factors associated with urinary incontinence in women. *J Epidemiol Community Health* 1982; 36: 58-63.

## Acknowledgements

I thank Miss A. Highton, the practice manager, my partner Dr J.C.W. Jolleys and my surgery staff; Dr C. Jagger for statistical assistance, Richard Wakeford and Professor R.C. Fraser for advice and help.

## Address for correspondence

Dr J.V. Jolleys, The Surgery, Mill Lane, Belton, Nr Loughborough, Leics LE12 9UJ.

## RCGP

Courses  
and  
Conferences



## ANNUAL SYMPOSIUM 1989

AGAINST THE TIDE:  
PROACTIVE CARE IN A  
REACTIVE SOCIETY

This year's Annual Symposium is being held on Friday 17 November, at Kensington Town Hall, and will focus on the problem of sustained anticipatory care of whole groups at high risk, at a time when State policy favours demand-led choice by individual consumers. Speakers have been chosen with experience of planned and verified approaches to hospital referral, shared care of diabetes, and anticipatory and preventive approaches to coronary heart disease, in the difficult social conditions of North-East and East London.

It is hoped that the Symposium will be of interest to practice teams and to community and hospital physicians interested in the interface between primary and secondary care.

Conference fees for the Symposium are: £45 for doctors and £25 for non-doctors. Section 63 zero-rated approval has been granted for the Symposium.

Further details and application forms are available from Projects Office, Royal College of General Practitioners, 14 Princes Gate, Hyde Park, London SW7 1PU. Telephone: 01-823 9703.

## INTERNATIONAL SCIENTIFIC MEETING OF GENERAL PRACTICE

The Beijing Society of General Practice, founded on 23 January 1989, is holding its first International Scientific Meeting of General Practice on 1-7 November 1989 in Beijing, China.

The venue is the luxurious Kuntun Hotel.

Topics to be discussed include:

- The role of Family Physicians in achieving Health for All by the Year 2000.
- Recent development in General/Family Practice.
- New approaches and ideas in Vocational Training.
- Training in Clinical, Community and Emergency Medicine.
- Evaluation of competency.
- New Technology.
- Study tours to Chinese medical institutions.

The excursion programme includes visits to the Great Wall, Ming Tombs, Forbidden City, Temple of Heaven and Tian An Men Square, etc.

The official languages are Chinese and English.

For further details write to: The Secretariat, First International Scientific Meeting of General Practice, c/o Beijing Society of General Practice, Chinese Medical Association, 42 Dongsi Xidajie, Beijing 100710, China.

# The reported prevalence of urinary symptoms in women in one rural general practice

JACQUELINE V JOLLEYS

**SUMMARY.** In May 1989 a questionnaire to determine the prevalence of urinary symptoms and vaginal discharge in the community was sent to all women patients born before May 1962 who had been registered with one rural practice for the previous two years. The response rate was 97%. The patients' clinical records were used to validate the replies of those who claimed to have consulted the doctor with these symptoms together with a sample of those who claimed not to have consulted. The reported prevalence of dysuria among the women over the previous two years was 27% and the prevalence of frequency was 34%. However, only 8% of women had received treatment for vaginal infections and 15% treatment for urinary symptoms (10% had confirmed bacteruria). Thirty four per cent of women said they would treat themselves prior to consulting a doctor and 17% would buy proprietary medicines. When asked how long they would wait between the onset of symptoms and seeking medical advice the responses ranged from one to 20 days, with 36% of women reporting that they would wait five days or longer before consulting. Fifty eight per cent of the women patients did not believe that urinary tract infections could have serious consequences and this figure increased to 76% among women who had consulted previously for a urinary tract infection. Patients with recurrent urinary symptoms did not consult any earlier than other women or treat themselves any less often. It can be concluded that there is a need for increased patient education in this area.

## Introduction

SYMPTOMS suggesting urinary tract infection occur commonly in women and many episodes result in consultations with general practitioners. In the UK approximately four in 100 new consultations with all patients in general practice are for symptoms suggesting urinary tract infection.<sup>1</sup> In the 1981-82 national study of morbidity statistics from general practice<sup>2</sup> the consultation rate for cystitis and urinary infection among female patients was 62.5 per 1000 women at risk. This rate is similar to that found in a study in the Netherlands which reported that six out of every 100 women seen in general practice complained of frequency and dysuria.<sup>3</sup> The majority of these episodes respond satisfactorily to treatment with antibiotics although 50% of women presenting with these symptoms do not have a bacterial infection.<sup>4,5</sup> Despite evidence to the contrary,<sup>6</sup> many doctors do not believe that it is possible to distinguish clinically between urinary tract infection and urethral syndrome, even using uristix and labstix, without the results of the mid-stream urine analysis.

Lower urinary tract disorders in women fall into three categories: asymptomatic bacteruria, symptomatic urinary tract infection and urethral syndrome (frequency and dysuria, no bacteruria). The prevalence of frequency and dysuria in women in the community has rarely been studied,<sup>5,7</sup> even though urinary tract infection is the commonest condition in adults for

which general practitioners prescribe antibiotics.<sup>8</sup>

This paper reports a study of the pattern and prevalence of dysuria and frequency in women in a general practice community, with special reference to the use of self care and primary medical care.

## Method

The study subjects were women born before 1 May 1962 who were registered with a rural Leicestershire general practice on 1 May 1987 and remained registered for the next two years.

A pilot questionnaire was sent to 100 randomly selected women registered with the practice and modified in the light of the results. The validated postal questionnaire sought information about occupation and whether the respondent had experienced 'stinging of urine' and/or 'need to pass urine more frequently than usual' (excluding frequency owing to diuretics) for more than a few days in the previous two years. The respondents were also asked whether they had consulted the doctor for these symptoms, whether they had received treatment for urinary tract infections and vaginal infections, how long they would suffer the symptoms before seeking a medical opinion, whether they would use self medication and whether they believed that urinary symptoms could have serious consequences. A reminder was sent after one month and those not wishing to take part were asked to confirm this by returning a blank form.

The patients' clinical records were used to validate all the replies of those who claimed to have consulted the doctor or to have been treated by the doctor for urinary tract infection or vaginal discharge/infection in the previous two years. In addition, the replies of 20% of those who did not claim to have consulted or received treatment were checked. Confirmation of the patients' claims was found in 98% of cases.

Patients were allocated a study number and data from the questionnaire were coded using a prepared coding manual. The data were analysed using a standard SPSS-X package. Results were analysed using the chi-squared and Mann-Whitney tests. Patients were grouped in 10 year age bands for the purposes of analysis. Details of occupation were used to allocate the patients to social class groupings according to the registrar general's classification.

## Results

Of the 684 questionnaires sent out, 661 were completed and returned (response rate 97%), while 20 questionnaires (3%) were returned blank.

Episodes of frequency were reported by 234 of the 661 women (35%) and episodes of dysuria by 179 (27%) (Table 1). Thirty seven women (6%) reported that episodes of frequency lasting several days had occurred on more than 12 occasions in the two year period while eight women (1%) reported a similar incidence of dysuria. However, on most occasions these symptoms had

Table 1. Reported prevalence of urinary symptoms among 661 women during a two year period.

Number of episodes in 2 years	Number (%) of women with:	
	Frequency	Dysuria
>12	37 (6)	8 (1)
7-12	57 (9)	29 (4)
1-6	140 (21)	142 (21)
0	427 (65)	482 (73)

J V Jolleys, MRCP, general practitioner, Belton, Leics and lecturer in general practice, University of Leicester.

Submitted: 27 November 1989; accepted: 5 February 1990.

© British Journal of General Practice, 1990, 40, 335-337.

not resulted in a consultation. The 38 women reporting frequency or dysuria on more than 12 occasions consulted between one and three times over the two year period for symptoms suggesting urinary tract infection (total 59 occasions, mean 1.6 consultations per woman). The infection was confirmed in 51 of the 59 cases (86%).

Younger age groups reported significantly more episodes of frequency and dysuria and they also suffered significantly more episodes of urinary tract infection and vaginal infections than older age groups, the prevalences bearing an inverse relationship to increasing age (Table 2). The younger age groups (25–34 and 35–44 years) did not report any association between urinary symptoms and the menses or recent intercourse.

Over the two year period 100 women had been treated for urinary tract infection (15%) and 64 (10%) had confirmed bacteruria on laboratory testing of a mid-stream urine sample. Forty eight women had been treated for vaginal infection (7%), diagnosed by the clinical presentation of unpleasant vaginal discharge and soreness or itching of the vagina. In 37 cases a high vaginal swab confirmed infection with either candida (34 cases) or trichomonas (three cases).

Four hundred and ninety four women replied to the question 'How long would you wait between the onset of symptoms and seeking medical advice?' The range of responses was one to 20 days. Sixty one patients (12%) said that they would seek immediate attention, 99 (20%) would consult by the second day, 101 (20%) by the third, 49 (10%) by the fourth, 52 (11%) by the fifth and 107 (22%) one week after the onset of symptoms. Only 15 women (3%) said that they would wait longer than two weeks before seeking medical advice. There was no statistically significant difference in the delay in consultation between social classes or between women who had received treatment for a urinary tract infection in the past and those who had not.

When asked about self medication 225 of the 661 women (34%) said that they would treat themselves with fluids and/or proprietary medicines before seeking medical advice. One hundred and fifty nine women (24%) said that they would increase their fluid intake and 109 (16%) stated specifically that they would drink lemon barley water. A total of 113 patients (17%) would buy proprietary medicine. Significantly more 25–34 year olds would purchase over-the-counter medicines than 55–64 year olds and those aged 65 years and over (47% versus 16% and 8% respectively;  $\chi^2 = 26.1$ ,  $df=4$ ,  $P<0.001$ ). Those aged 45–54 years were more likely to drink lemon barley water than the older (55–64 and 65+ years) and younger (25–34 and 35–44 years) age groups (37% versus 16%, 14% and 13%, 20% respectively;  $\chi^2 = 14.1$ ,  $df=4$ ,  $P<0.01$ ). The proportion of women who would treat their symptoms by increasing their fluid intake bore an inverse relationship to their age (38%, 42%, 39%, 18% and 16%;  $\chi^2 = 21.9$ ,  $df=4$ ,  $P<0.001$ ). More women in social classes 1 and 2 combined (40%) would treat themselves than those in social classes 3 and 4 (33%) and social class 5 (21%) (Table 3). Similarly more women in social classes 1 and 2 combined (23%) would purchase medicines than those in social classes 3 and 4 (16%) and social class 5 (11%) (Table 3). No significant association was found between the level of self medication and previous treatment by a general practitioner for a urinary tract infection.

Six hundred and one women replied to the question 'Do you believe that urinary tract infections could have serious consequences?' —381 women (63%) said 'no' and 220 (37%) said 'yes'. This pattern of response was repeated in all age bands. Surprisingly, a significantly lower proportion of women who had previously consulted for a urinary tract infection (24%, 23/96) believed that urinary infections could have possible serious sequelae than women who had not (39%, 197/505) ( $\chi^2 = 7.2$ ,  $df=1$ ,  $P<0.01$ ).

Table 2. Reported prevalence of urinary symptoms, urinary tract infections (UTI) and vaginal infections by age group.

Age group (years)	Number of women	% of women with:			
		Frequency	Dysuria	UTI	Vaginal infections
25–34	88	43	37	26	19
35–44	186	37	30	15	10
45–54	131	39	31	13	5
55–64	101	31	20	15	2
65+	155	29	20	12	2
		$\chi^2 = 24.8$ $P<0.001$	$\chi^2 = 11.3$ $P<0.05$	$\chi^2 = 10.3$ $P<0.05$	$\chi^2 = 46.6$ $P<0.001$

Table 3. Reported use of self-treatment and purchased medicines by social class.

Social class	Number of women	% who would self-treat	% who would purchase medicines
1	23	30	13
2	139	42	25
3	282	36	18
4	151	28	12
5	66	21	11
Total	661	34	17

## Discussion

In the two year study period 35% of women reported that they had experienced episodes of frequency lasting several days, and 27% reported dysuria. Walker and colleagues<sup>5</sup> found that 22% of women aged 20–54 years had suffered dysuria in the previous year. The difference between this figure and that found in this study may be explained by the difference in length of the study period and in the age range studied.

This study confirms the already documented<sup>2</sup> trend for younger, sexually active women to suffer more urinary symptoms and infections than their older and less sexually active counterparts. However, the true morbidity and mortality resulting from these infections is difficult to assess. Urinary tract infection is an important cause of days lost from work by women employees; an American survey conducted by the Department of Health and Education and Science in 1970 found that 45 days were lost per 100 female employees per year. Urinary tract infection encompasses a wide variety of clinical conditions with microbial invasion of any tissues of the urinary tract. Even though the infection may be limited to a single site initially (the bladder (cystitis) or the urethra (urethritis)) the entire urinary tract is at risk of bacterial invasion.

The European dialysis transplant registry<sup>9</sup> showed that chronic pyelonephritis, the possible end result of recurrent urinary tract infection, accounted for 12% of cases of end-stage kidney failure. The American Medical Association also reported that 13% of renal transplants were due to pyelonephritis.<sup>10</sup> However, for the most part infection is superimposed on a major underlying abnormality which predisposes the kidney to infection. Although a causal association has been demonstrated between bacteruria in early pregnancy and the development of acute pyelonephritis later in pregnancy,<sup>11</sup> prospective studies in non-pregnant women have failed to show that bacteria leads to chronic pyelonephritis which progresses to renal impairment.

This study has demonstrated a lack of knowledge about urinary tract infections among women; only 37% believed that



these infections could have serious consequences. The use of self-medication including over-the-counter medicines is widespread among the women studied, resulting in a delay in seeking medical advice. Furthermore, the study showed that the majority of women who had presented with a urinary tract infection in the past remained unaware of the possible serious sequelae of the condition. This suggests that the opportunity to assess the patient's knowledge of the condition and educate accordingly is not being taken by general practitioners in the consultation.

**References**

1. Office of Health Economics. *Compendium of health statistics*. London: OHE, 1989: 35.
2. Royal College of General Practitioners, Office of Population Censuses and Surveys and Department of Health and Social Security. *Morbidity statistics from general practice. Third national study 1981-82*. London: HMSO, 1986: 159.
3. Gaymans R, Valkenburg HA, Havekorn MJ, Goslings WRO. A prospective study of urinary tract infections in a Dutch general practice. *Lancet* 1976; 2: 674-677.
4. Waters WE. Prevalence of symptoms of urinary tract infection in women. *Br J Soc Med* 1969; 23: 264-266.
5. Walker M, Heady JA, Shaper AG. The prevalence of dysuria in women in London. *J R Coll Gen Pract* 1983; 33: 411-415.
6. O'Dowd TC, Smail JE, West RR. Clinical judgement in the diagnosis and management of frequency and dysuria in general practice. *Br Med J* 1984; 288: 1347-1352.
7. Waters WE, Elwood PC, Abernethy M. Clinical significance of dysuria in women. *Br Med J* 1970; 2: 754-757.
8. Brooks D, Mallick N. *Renal medicine and urology*. Edinburgh: Churchill Livingstone, 1982: 56.
9. Laurent G, Caemard E, Charra B. Long-term dialysis: a review of 15 years' experience in one centre 1968-1983. *Proc Eur Dial Transplant Assoc* 1983; 20: 122-135.
10. American Medical Association. 12th report of the Human Renal Transplant Registry. *JAMA* 1975; 233: 787.
11. Williams JD, Reeves DS, Brumfitt W, Condie AP. The effects of bacteruria in pregnancy on maternal health. In: Brumfitt W, Asscher AW (eds). *Urinary tract infection*. Oxford University Press, 1973: 103-107.

**Acknowledgements**

I wish to thank Anne Heighton, Alison Kitchener, Christina Armitage and Dorothy Clarke for their work in collecting the data, Carol Jagger for statistical and computing assistance, Profesor Robin Fraser for his advice and comment, and my partner John Jolleys for his continued help and encouragement.

**Address for correspondence**

Dr J V Jolleys, The Surgery, Mill Lane, Belton, near Loughborough, Leics LE12 9UJ.

**MRCGP COURSE**

10th - 12th September 1990

to be held at

The Royal College of General Practitioners  
14 Princes Gate, Hyde Park, London SW7 1PU

The aim of the course is to help general practitioners to prepare for the MRCGP examination, and in so doing, to look critically at their own standards of practice. Speakers will be examiners, and all candidates will be allowed to participate fully, particularly in the small groups based upon the oral examination.

For further details please apply to: Dr Thelma Thomas, 20 Eastmead Avenue, Greenford, Middlesex UB6 9RB. Telephone 081-578 1244.



**MRCGP Examination**

The dates for the next two examinations for Membership of the College are as follows:

*October/December 1990*

Written papers: Tuesday 30 October 1990 at centres in London, Manchester, Edinburgh, Newcastle, Cardiff, Belfast, Dublin, Liverpool, Ripon, Birmingham, Bristol and Sennelager. Oral examinations in Edinburgh on Monday and Tuesday, 10 and 11 December and in London from Wednesday to Saturday, 12-15 December inclusive. The closing date for the receipt of applications is Friday 7 September 1990.

*May/July 1991*

Written papers: Wednesday 8 May 1991. Oral examinations in Edinburgh from Monday to Wednesday, 24-26 June and in London from Thursday 27 June to Saturday 6 July inclusive. The closing date for the receipt of applications is Friday 22 February 1991.

Further details about the examination and an application form can be obtained from the Examination Department, Royal College of General Practitioners, 14 Princes Gate, London SW7 1PU.

**RCGP**

Courses  
and  
Conferences



Annual Symposium —  
16 November 1990

**HOW TO PUT MEDICAL  
AUDIT INTO YOUR  
PRACTICE**

General practitioners and their practice managers are invited to join a Study Day to be held at Princes Gate, aimed at clarifying the nature of Medical Audit and devising some sensible ways of putting it into practice. There will be short presentations to introduce different approaches to the subject, but most of the day will involve working in small groups. Expert help will be available to assist each group to devise their own standards and to develop practical methods for auditing their own work.

The Study Day is limited to 80 participants, so an early application is recommended. The fee for the day is £40 for general practitioners and £30 for practice managers. The day is approved for the Postgraduate Education Allowance. If you would like to attend then please contact: The Projects Office, Royal College of General Practitioners, 14 Princes Gate, Hyde Park, London SW7 1PU. Tel: 071-823 9703 (direct line for courses).

# Factors associated with regular episodes of dysuria among women in one rural general practice

JACQUELINE V JOLLEYS

**SUMMARY.** The aim of this study was to ascertain the factors associated with frequency-dysuria (urethral) syndrome in a population of women. The study included all women aged 25 years and over on 1 May 1987 who had been registered with one rural, dispensing practice over the study period, 1 May 1985 to 1 May 1989. A self-administered questionnaire was sent to the women on 1 May 1987 and a second, similar, questionnaire was sent two years later. A total of 721 women responded to the two questionnaires (response rate 97%). Regular symptoms of frequency and dysuria were reported by 8% of women in 1987 and 14% in 1989. Four per cent of women reported symptoms throughout the four year study period. Symptoms were found to be least common in the 55–74 years age group. Although none of the women who were sexually inactive reported regular symptoms no association was reported between recent sexual intercourse and symptoms. Neither was an association demonstrated between type of contraception used and symptoms. However, it was found that premenopausal women reported significantly more symptoms than postmenopausal women. The number of women involved in this study was too small to allow the importance of change of sexual partner to be determined. Significantly more of the women who reported regular symptoms had been treated for urinary tract infection than of those who did not report regular symptoms.

Although a history of regular frequency and dysuria points to a diagnosis of urethral syndrome, general practitioners must assess each case in order to exclude urinary tract infection.

## Introduction

THE Medical Research Council's definition of urethral syndrome is a clinical syndrome, often called cystitis, consisting of frequency and dysuria. Women complaining of frequency and dysuria, but who do not have evidence of urinary tract infection, that is, pure growth bacteriuria of greater than  $10^3$  organisms per litre and/or a leucocyte concentration of more than  $10^6$  per litre of urine, are said to have urethral syndrome or the frequency-dysuria syndrome.

The prevalence of urinary frequency and dysuria in women is known.<sup>1,4</sup> Previous work has established the prevalence of the frequency-dysuria syndrome,<sup>3</sup> postulated its causes,<sup>6-8</sup> suggested, compared and assessed treatment regimens,<sup>9-11</sup> and attempted to define associated factors.<sup>7,12,13</sup> The natural history of the complaint, however, has not been addressed other than to state that it is a self-limiting condition.<sup>3</sup>

Symptoms suggestive of urinary tract infection and cystitis account for six consultations a year for every 100 women at risk.<sup>2</sup> Nearly 50% of women patients who complain of frequency and dysuria, however, have no evidence of infection in

their urine.<sup>3,4,13,14</sup> The aetiology of urethral syndrome is obscure and has been attributed to associated anxiety neurosis,<sup>7,8</sup> *Chlamydia trachomatis* infection<sup>15,16</sup> or slow growing, CO<sub>2</sub> dependent, gram positive pathogenic organisms.<sup>6</sup> Other studies have demonstrated no causative association between the urethral syndrome and *Chlamydia trachomatis*, fastidious organisms or *Neisseria gonorrhoea*.<sup>5,13,17,18</sup> The aim of this study was to examine the natural history and possible aetiological factors in recurrent urethral syndrome.

## Method

The study was carried out in a rural, dispensing practice with two partners. The study subjects were women born before 1 May 1962 who were registered with the practice over the study period (1 May 1985 to 1 May 1989). For all women registered with the practice a record was kept of consultations for urinary symptoms and vaginal discharge over the study period. Results of mid-stream urine analyses and high vaginal swabs were also recorded. Reported changes in the marital status of all women were noted.

A self-administered postal questionnaire was sent to the women on 1 May 1987<sup>19</sup> and a second, similar, questionnaire on 1 May 1989. The questionnaires related to the previous two year period and asked for the women's age, marital status and any change in marital status, parity, sexual activity, method of contraception, and date of last menstrual period. The women were also asked whether they had had episodes of urinary frequency and/or dysuria ('need to pass urine more frequently than usual' and/or 'stinging of urine') lasting two days or more, how often they had suffered from these symptoms in the previous two years (more than 12 times, seven to 12 times, one to six times or never), whether they had had a urinary tract infection or vaginal infection, whether they had received treatment for vaginal discharge or a urinary tract infection, and whether they had noticed any association between symptoms and recent sexual intercourse. Responses to questions relating to consultation with the doctor for urinary tract infection or vaginal discharge were validated using the patients' clinical records. All the records of those women who replied positively were checked together with a random 20% sample of those who reported that they had not consulted.

At the time of the validation a letter was sent to the women whose records were validated requesting a mid-stream urine sample. The sample was examined in the surgery for protein, blood and nitrites to identify infection. Those samples which proved positive for protein, blood or nitrites were sent to the laboratory for further analysis.

The replies to the two questionnaires were compared and the data analysed using a standard SPSS-X package. Patients were initially grouped in 10 year age bands for the purposes of analysis but were later aggregated further because of the small numbers involved.

## Results

A total of 744 women patients fulfilled the selection criteria and of these 721 responded to the two questionnaires (response rate of 97%). The patients' claims relating to consultations were validated by the medical records in 98% of cases. Urine analysis was performed for 219 of the 254 women (86%) and in only

J V Jolleys, MRCP, general practitioner, Belton, Leicestershire and lecturer in general practice, University of Nottingham. Submitted: 26 July 1990; accepted: 8 November 1990.

one case was urinary tract infection confirmed by the laboratory.

For the period 1985–87 60 of the 721 women (8%) reported regular episodes of both urinary frequency and dysuria (seven times or more in two years). A total of 101 women (14%) reported regular symptoms for the period 1987–89. Twenty nine women (4%) reported that they had suffered symptoms regularly throughout the four year period. Thus, 31 women (4%) who reported regular symptoms in the first questionnaire improved during the second study period while 72 women (10%) who reported no regular symptoms initially deteriorated and reported regular dysuria and frequency in the second questionnaire.

The relationship between age and reported episodes of the urethral syndrome is shown in Table 1. Significantly more women in the younger age groups (25–34 and 35–54 years) reported persistent recurrent symptoms and fewer reported no regular symptoms than those in the older age groups (55–74 and 75 years plus).

Table 1. Relationship between reported episodes of urethral syndrome and the women's age, whether they were pre- or post-menopausal, their parity and the type of contraceptive used.

	% of women reporting regular symptoms			
	In both questionnaires	In second questionnaire	In first questionnaire	In neither questionnaire
<b>Age (years)</b>				
25–34 (n = 145)	6	12	3	78
35–54 (n = 331)	5	10	7	78
55–74 (n = 194)	1	7	1	91
75+ (n = 51)	2	12	2	84
	$\chi^2 = 44.9, df = 21, P < 0.001$			
<b>Pre/post menopause</b>				
Premenopausal (n = 426)	5	12	5	78
Postmenopausal (n = 295)	2	8	3	87
	$\chi^2 = 9.8, df = 3, P < 0.05$			
<b>Parity</b>				
Nulliparous (n = 154)	1	7	3	88
Parous (n = 567)	5	11	5	80
	$\chi^2 = 8.9, df = 3, P < 0.001$			
<b>Type of contraception</b>				
None (n = 269)	4	17	6	73
Oral contraceptive pill (n = 69)	4	10	6	80
Coil (n = 27)	11	15	0	74
Sheath (n = 98)	8	8	3	81
Cap (n = 7)	14	0	0	86
Sterilization (n = 91)	3	9	8	80

n = total number of women.

Of the 721 women 159 (22%) were not sexually active. None of these women reported regular symptoms. However, of the 562 women who were sexually active 32 (23%) reported regular symptoms in one or both questionnaires. This difference was significant ( $P < 0.001$ ).

Premenopausal women reported significantly more symptoms than postmenopausal women (Table 1) while significantly fewer nullipara reported regular urinary symptoms than parous women (Table 1).

There was no significant difference in reported episodes of the urethral syndrome among women using different forms of

contraception (Table 1). Women using the coil, sheath or cap were more likely to have persistent symptoms than those who were taking the oral contraceptive pill, were sterilized or were using no contraception. Those women who used no contraception or were fitted with a coil were least likely to be totally free of regular symptoms.

Only two of the 132 women who reported regular symptoms of frequency and dysuria during the study felt that recent sexual intercourse related to their symptoms.

From the practice consultation records it was found that more of the women who reported regular frequency and dysuria (17/132, 13%) had been treated for vaginal discharge than of the women who did not (43/589, 7%). However, this difference was not significant. Of the 60 women who received treatment for vaginal discharge, 29 had a proven vaginal infection. During the four years, 123 women had been treated for urinary tract infection (confirmed by analysis of a mid-stream urine sample in 60% of these cases). Of those women who reported regular urinary symptoms 50% had been treated for urinary tract infection compared with only 10% of those women who did not report regular symptoms ( $P < 0.001$ ).

Among the 132 women who reported regular urinary symptoms 17 (13%) reported a change in their marital circumstances (widowed, separated, married, new partner) during the four years. The rate of recorded change for all women registered with the practice was 4% per year which is similar.

## Discussion

This study has shown that young women (25–54 years) suffer more from the frequency–dysuria syndrome than older women and that sexually active women suffer more than those who are not sexually active. The decrease in reported symptoms among women aged 55–74 years is probably due to decreasing sexual activity while the rising prevalence of urinary symptoms among women aged 75 years and over may be explained by postmenopausal atrophic changes. This symptom prevalence is echoed in the third national study of morbidity statistics from general practice,<sup>2</sup> which reports a high constant consultation rate for urinary symptoms by women aged 15–44 years and a lower rate for those aged 45–74 years; the rate rises sharply again in women aged 75 years and over. In general postmenopausal women suffer fewer urinary symptoms than those who are premenopausal. In a larger study it would be interesting to subdivide the postmenopausal women into groups according to the number of years since the menopause. It seems likely that the prevalence of symptoms would rise substantially as the number of years since the menopause increased.

This study also indicates that recurrent as well as acute<sup>5</sup> urethral syndrome is a self-limiting condition. It may be that it has a natural periodicity in younger women as its incidence seems unrelated to type of contraception, change in sexual partners and recent sexual intercourse. In order to assess these factors, further study is required on larger numbers of women.

Of the 721 women in this study 29 (4%) reported persistent, recurrent frequency and dysuria. This is similar to the annual incidence of 4.8% reported by Brooks for women over 15 years old.<sup>20</sup> However, the overall reported incidence of regular symptoms of dysuria and frequency in this study was 8% in the first two year period and 14% in the second which is considerably greater than that reported by Brooks or the annual figure of 1.5% found by O'Dowd and colleagues.<sup>5</sup> However, in the study by O'Dowd and colleagues all of the women had sought medical help for their symptoms. In this study 183 women consulted with urinary symptoms during the four year study period of whom 74 proved to have a confirmed urinary tract infection and 29 had vaginal infection with discharge. Thus 80 women had con-



women who had had other gynaecological operations (table IV). Eight women had undergone surgical repairs for urinary incontinence and two required a ring pessary for a prolapsed uterus.

### Discussion

Incontinence was reported by 31% of nulliparous women under 35 years old, which is comparable with the finding of Crist *et al* of 30%.<sup>4</sup> The overall prevalence of incontinence in nulliparous women, however, was 17%, suggesting that the prevalence in older nulliparous women is lower. This contrasts with prevalences of 51% and 52% found in hospital based studies by Wolin and by Nemir and Middleton, respectively.<sup>9</sup> Brocklehurst *et al* reported that 57% of women aged 45-64 had urinary incontinence<sup>8</sup> whereas this study showed a prevalence of 60% in women aged 45-54 and 39% in those aged 55-64. The lower prevalence of incontinence with increasing age in postmenopausal women confirms a previous report of a decrease in incontinence with age.<sup>4</sup>

The overall prevalence of incontinence found in this study was supported by the results of the telephone validation study, which confirmed that most of the women who had reported having symptoms sometimes or often were regularly incontinent according to the definition used by Thomas *et al*<sup>7</sup> (twice or more per month). As urinary incontinence in women is so common it could perhaps be placed within the definition of normal urine control. However, the minority who require sanitary protection to avoid the embarrassment caused by inappropriate urine loss have clinical stress incontinence. Some women can usually cope adequately with incontinence but find that under certain circumstances—for example, during sporting activity—it becomes embarrassing. For them normal incontinence merges with the unacceptable clinical incontinence.

Urinary incontinence is believed to be associated with parity. Thomas *et al* reported a higher prevalence in women who had had up to three babies compared with nulliparous women, but no appreciable difference occurred within that parous group.<sup>8</sup> Incontinence was more common among women who had had four or more babies. This study found a linear increase in incontinence with increasing parity. Interestingly, most of the older women of high parity had never been incontinent. In the past women wore supporting garments, did more heavy work in the home, and "lay in" for longer in the puerperium. Perhaps these historical differences in practices associated with pregnancy could explain this finding.

There seemed to be no difference in the prevalence of incontinence after normal childbirth compared with forceps delivery or caesarean section. The pregnancy and not the mode of delivery seems to predispose women to incontinence. Results relating to type

of delivery were inconclusive as the number of abnormal deliveries was small and only the first birth could accurately be associated with the onset of incontinence.

The seemingly adverse effect of exercises for the pelvic floor gives rise to concern. The prevalence of incontinence increased when these exercises were done daily and over a long time. Possibly women who had pre-existing leakage conscientiously did the exercises whereas women without problems were less conscientious. The effectiveness of such exercises needs to be re-examined. Perhaps they should be taught differently and supervised while being done. Were urinary incontinence identified during pregnancy or at preconception counselling the exercises could be started earlier, which might ameliorate urinary incontinence. Further study is required to determine the effectiveness of prenatal exercises. As minor gynaecological surgery is related to an increased prevalence of incontinence operative techniques may damage the pelvic floor.

These results have several implications for clinical practice. If general practitioners asked about incontinence more cases would be detected and this embarrassing and inconvenient complaint, necessitating permanent protection against leakage in 6% of all women, could be alleviated.

I thank Alison Kitchener and Anne Heighton for collecting the data; Carol Jagger for help with statistics and computing; Professor Robin Fraser, Professor Mark Castleden, and Richard Wakeford for their advice and help, my partner, John Jolleys, for his invaluable help and encouragement; and Bernadette Hayes for typing the report.

### References

- 1 Holding U, Pedersen KH, Sidenius K, Hedegard L. Urinary incontinence in 45 year old women—an epidemiological survey. *Scand J Urol Nephrol* 1986;20:183-6.
- 2 Samsioe G, Jansson I, Mellstrom D, Svanborg A. Occurrence, nature and treatment of urinary incontinence in a 70 year old female population. *Manuscr* 1985;7:335-42.
- 3 Campbell AJ, Reinken J, McCash L. Incontinence in the elderly: prevalence and prognosis. *Age Ageing* 1985;14:65-70.
- 4 Crist T, Singleton HM, Koch GG. Stress incontinence and the nulliparous patient. *Obstet Gynecol* 1972;40:13-7.
- 5 Wolin LH. Stress incontinence in the young healthy nulliparous female subject. *J Urol* 1969;102:545-9.
- 6 Brocklehurst JC, Fry J, Griffiths LL, Kalton G. Urinary infection and symptoms of dysuria in women aged 45-65 years: their relevance to similar findings in the elderly. *Age Ageing* 1972;1:41-7.
- 7 McGrother C, Clarke M, Castleden M, Duffin H. Do the elderly need better incontinence services? *Community Med* 1987;9:62-7.
- 8 Thomas TN, Plymat KR, Blannin J, McCade TW. Prevalence of urinary incontinence. *Br Med J* 1980;281:1243-5.
- 9 Nemir A, Middleton RP. Stress incontinence in young nulliparous women. *Am J Obstet Gynecol* 1984;68:1166-8.

(Accepted 26 January 1988)

## **References.**

### References.

Abramson J.H. Survey methods in Community Medicine 1976 Churchill Livingstone.  
Edinburgh. p 29, 55

Ahktar H.R., Andrews G.R., Caird F.I., Fallon R.J. Urinary tract infection in the elderly: A  
population study. Age and Ageing. 1972; 1: 48 - 54

American Medical Association. 12th report of the Human Renal Transplant Registry.  
J.A.M.A. 1975; 233: 787.

Anderson J.E. Initial treatment decisions in urinary tract infection. Can. Fam. Physician.  
1981; 27: 1909 - 12

Anonymous. The urethral syndrome. Br. Med. J. 1977; ii: 593 - 4.

Bashi S.A. The urethral syndrome. Int. Urol. Nephrol. 1988; 20 (4): 367 -74.

Bergman A., Karram M., Bhatia N.N. Urethral syndrome: A comparison of different  
treatment modalities. J. Reprod. Med. 1989; 34 (2): 157 - 60.

Bhatia N.N. , Ostergard D.R. Urodynamics in women with stress incontinence. Obstet.  
Gynaecol. 1982; 60: 552 - 559.

Bodner D.R. The urethral syndrome. Urol. Clin. North Amer. 1988; 15(4): 699 - 704

Boscia J.A., Kobasa W.D., Arbutyn E., Levinson M.E., Kaplan A.M., Kaye D. Lack of association between bacteriuria and symptoms in the elderly. Am. J. Med. 1986; 81: 979 - 82

Brink C.A., Wells T.J., Diokno A.C. Urinary incontinence in women. Public Health Nurs. 1987; 4: 114 - 9

Brocklehurst J.C. Dysuria in old age. J.Am. Geriat. Soc. 1971; 19: 582 - 91

Brocklehurst J.C., Dillane J.B., Griffiths L., Fry J. The prevalence and symptomatology of urinary infection in an aged population. Gerontol. Clin. 1968; 10: 242 - 253

Brocklehurst J.C., Fry J., Griffiths L.L., Kalton G. Urinary infection and symptoms of dysuria in women aged 45 - 65 years: their relevance to similar findings in the elderly. Age Ageing: 1972; 1: 41 - 47.

Brooks D. A general practitioner's view of the laboratory examination of urine. in Meers P. ed. The bacteriological examination of urine: report on a workshop of the needs and methods. Public Health Labs. Service: H.M.S.O. 1978: 39 - 44.

Brooks D., Mallick N. Infections of urine and urinary tract. ex Renal Medicine and Urology. 1982. Churchill Livingstone. Edinburgh. p.56.

Brooks D., Mauder A. Pathogenesis of the urethral syndrome in women and its diagnosis in general practice. Lancet 1972; ii: 893 - 8

Brumfitt W. How to improve the treatment of UTIs: treatment of recurrent infection. Mims mag. 1.11.1988

Brumfitt W. The mysterious 'urethral syndrome'. Br. Med. J. 1991; 303; 1 - 2

Brumfitt W., Hamilton Miller J.M., Ludlam H., Gooding A. Lactobacilli do not cause frequency dysuria syndrome. Lancet. 1981; ii: 393 - 5.

Burnley P., Marson W.S., Evans M., Forsey T. Chlamydia trachomonas and lower urinary tract symptoms among women in one general practice. Br. Med. J. 1983; 286: 1550 - 2.

Burns P.A., Marecki M.A., Dittmar S.S., Bullough B. Kegel's exercises with biofeedback for treatment of stress incontinence Nurse-Pract. 1985;10:2:28, 33 - 4,46

Campbell A.J., Reinken J., McCosh L. Incontinence in the elderly: prevalence and prognosis. Age Ageing. 1985; 14: 65 - 7

Cardozo L.D., Stanton S.L., Bennett A.E. Design of a urodynamic questionnaire. Br. J. Urol. 1978; 50: 269 -74

Carson C.C., Sepura J.W., Osborne D.M. Evaluation of the female urethral syndrome.

J. Urol. 1980; 124: 609 - 10.

Catell W.R., Brooks H.L., McSherry M.A, North J., O'Grady F. Approach to the

frequency dysuria syndrome. Kidney Int. 1975; 8 supp: 138 - 43

Clarke M., Clarke s., Odell A., Jagger C. The elderly at home : Health and social status.

Health Trends 1984; 16: 3 - 7

Crist T., Singleton H.M., Koch G.G. Stress incontinence and the nulliparous patient.

Obstet. Gynaecol. 1972; 40: 13 - 17.

Dobbs F.F., Fleming D.M. A simple scoring system for evaluating symptoms, history  
and urine dipstick testing in diagnosis of urinary tract infection. J. Roy. Col. Gen. Pract.

37; 100 - 104

Dontas A.S., Papanayiotou P.C., Papanicolaou N.T. The effect of bacteriuria on renal

function patterns in old age. Clin. Sci. 1968; 34: 73 - 81

Eastwood H.D.H. Urodynamic studies in the management of urinary incontinence in

the elderly. Age Ageing 1979; 8: 41 - 8

Exton - Smith A.N., Norton D., McLaren R. An investigation of geriatric nursing

problems in hospital 1962. Edinburgh. Churchill Livingstone.

Exton - Smith A.N., Overstall P.W. Geriatrics: guidelines in medicine. 1979 Lancaster. MTP press.

Fall M., Frankenberg S., Frisen M., Larsson B., Petren M. 456 000 Swedes may have urinary incontinence ; only every fourth person seeks help for the disorder.

Lakartidningen 1985; 82: 2054 - 6

Fleming D.M. Diagnosing urinary tract infection. J. Roy. Coll. Gen. Pract. 1987; 37: 273

Fliegner J.R., Glenning P.P. Seven years experience in the evaluation and management of patients with urge incontinence of urine. Aust. NZ. Obstet. Gynaecol. 1979; 19: 42 - 44.

Fry J., Williams J.B., Joiner C., Williams J.D. Acute urinary infections. Their course and out come in general practice. Lancet. 1962; i: 1318 - 1321.

Furner P.M., Roccasalva L., Fallica L., Tempera G. Efficacy of miocamycin in the therapy of non specific genital infection (NSGI) non gonococcal urethritis (NGU) and acute urethral syndrome. (AUS) Int. J. Clin. Pharmacol. Res. 1988; 8(2): 111 - 6.

Gallagher D.J., Montgomerie J.Z., North J.D. Acute infections of the urinary tract and the urethral syndrome in general practice. Br. Med. J. 1965; 1: 622 - 626.

Gaymans R., Valkenburg H. A., Havekorn M.J., Goslings W.R.O. A prospective study of

urinary tract infections in a Dutch general practice. Lancet. 1976; ii: 674 - 677.

Gillespie W.A., Henderson E.P., Linton K., Smith P.J. Microbiology v  
of the urethral ( frequency dysuria ) syndrome. A controlled study with a 5 year review.  
Br. J. Urol. 1989; 64(3): 270 - 4

Giesy J.D. Voiding problems in women. One physician's perspective on evaluation  
and therapy. Post grad. Med. 1986; 79(1): 271 - 8

Glenning P.P., Fliegner J.R. A stress incontinence clinic: review of five years  
experience. Aust. NZ. Obstet. Gynaecol. 1976; 16: 177 - 181.

Gray L.A., Pingleton W.B. Pathological lesions of the female urethra. J.A.M.A. 1956;  
162: 1361 - 5.

Gosling J.A. The structure of the bladder and urethra in relation to function. Urol. Clin.  
North America. 1979; 6: 31 - 8

Hanley H.G. The late urological complications of total hysterectomy. Br. J. Urol. 1969;  
41(6): 682 - 4

Harrison S. Physiotherapy in the treatment of stress incontinence. Nurs, Mirror  
Midwives 1975; Jul 10: 141(2); 52 - 3





Henderson J.S., Taylor K.H. Age as a variable in an exercise program for the treatment of simple urinary stress incontinence. J. Obstet. Gynaecol. Neonatal Nurs. 1987; 16: 4: 266-72

Hendrickson L.S. The frequency of stress incontinence in women before and after the implementation of an exercise program. Issues Health Care Women. 1981;3; 2; 81 - 92

Herzog R.A., Fultz N.H., Normolle D.P., Brock B.M., Diokno A.C. Methods used to manage urinary incontinence by older adults in the community. J.Am. Geriat. Soc. 1989; 37: 339 - 47

Holding U., Pedersen K.H., Sidenius K., Hederguard L. Urinary incontinence in 45 year old women - an epidemiological survey. Scand. J. Urol. Nephrol. 1986; 20: 183 - 6.

Howie J. Clinical judgement and antibiotic use in general practice. Br. Med. J. 1976; ii: 1061 - 4

Hutch J.A. A new theory of the anatomy of the internal sphincter and the physiology of micturition. Inv. Urol. 1965; 3: 36 - 58.

Isaacs B., Livingstone M. and Neville Y Survival of the unfittest: a study of geriatric patients in Glasgow. 1972 London. Routledge and Kegan Paul.

Isaacs B, Walkey F.A. A survey of incontinence in elderly hospital patients.

Gerontology. 1964; 6: 367 - 76

Jarvis G.J. An assessment of urodynamic examination in incontinent women. Br. J.

Obstet. Gynaecol. 1980; 87 : 893

Jequier A.M. Urinary symptoms and total hysterectomy Br. J. Urol. 1976; 48: 437 - 41

Jewes L. and Spencer R. How to improve the treatment of UTIs.: when to test for UTI.

Mims mag. 1.11.1988

Jeter K.F., Wagner D.B. Incontinence in the American home. J. Am. Geriat. Soc. 1990;

38: 379 - 83

Jolleys J.V. Reported prevalence of urinary incontinence in women in a general

practice. Br. Med. J. 1988; 296: 1300 - 1302.

Jolleys J.V. Diagnosis and management of female urinary incontinence in general

practice. J. Roy. Coll. Gen. Pract. 1989; 39: 277 - 279

Jolleys J.V. The reported prevalence of urinary symptoms in women in one rural

general practice. Br. J. Gen. Pract. 1990; 40: 335 - 7

Jolleys J.V. A study of women who report regular episodes of dysuria and frequency.

Br. J. Gen. Pract..1991; 41; 241 - 243

Jones E.G. Non - operative treatment of stress incontinence. Obstet. Gynaecol. 1965;  
6: 220 - 235.

Kass E.H. Asymptomatic infections of the urinary tract. Transactions, American  
Association of Physicians. 1956; 69: 56 - 63

Kass E. H. Bacteriuria and the diagnosis of infections of the urinary tract . Arch. Int.  
Med. 1957; 100: 709 - 713

Kasviki - Charvati P., Drolette - Kefakis B., Papanayiotou P.C. et al. Turnover of  
bacteriuria in old age. Age and Ageing. 1982; 11: 169

Kegel A.H. Physiologic therapy for urinary stress incontinence. J.A.M.A. 1951; 146:  
915 - 917.

Kilpatrick S.J. Statistical Principles in Health Care Information. 2nd. Ed. 1977  
University Park Press .Baltimore USA pp61

Klarskov P., Belving D., Bischoff N., Dorph S., Gerstenberg T., Okholm B., Pedersen  
P.H., Tikjob G., Wormslev M., Hald T. Pelvic floor exercise versus surgery for female  
urinary stress incontinence. Urol. Int. 1986; 41; 2: 129 - 32

Kuhns - Hastings J. Management of female incontinence with Kegel exercises.

AAOHN-J. 1988; 36: 2: 78 - 83

Kraft J.K., Stamey T.A. The natural history of symptomatic recurrent bacteriuria in women. Medicine (Baltimore) 1977; 56: 55

Lagro - Janssen T.L.M., Debruyne F.M.J., Smits A.J.A., van Weel C. Controlled trial of pelvic floor exercises in the treatment of urinary stress incontinence in general practice. Br. J. Gen. Pract. 1991; 41; 445 - 449

Laurent G., Calemard E., Charra B. Long term dialysis: a review of 15 years experience in one centre. 1968 - 83. Proc. Eur. Dial. Transplant Assoc. 1983; 20: 122 - 135.

Lawson D.H., Clarke A., Mc Farlane D.B., Mc Allister T.A., Linton A.L. Urinary tract symptomatology in general practice. J.R.Col. Gen. Pract. 1973; 23: 548 - 55

Laycock J. Graded exercises for the pelvic floor muscles in the treatment of urinary incontinence. Physiotherapy 1987; 73: 7: 371 - 3

Logan W.P.D., Cushion A.A. Morbidity statistics from general practice. General studies on medical and population subjects. 1958 HMSO London. No. 14; 1.

Loudon I., Greenlagh G.P. Urinary tract infections in general practice. Lancet. 1962; ii:

1246 - 1248.

Mandlestam D. Stress incontinence. *Nursing* 1980; Oct 18: 787 - 8

Mandlestam. *Incontinence and its Management*. 2nd. ed.1986. London. Croom Helm.

Mann A.H. Psychiatric illness in residential homes for the elderly: a survey in one London borough. *Age and Ageing* 1984; 13: 257 - 65

Maskell R. Chronic interstitial cystitis. *Lancet*. 1979; i: 1058 - 9

Maskell R. A new look at the diagnosis of infection of the urinary tract and its adjacent structures. *J. of Infect.* 1989; 19; 207 - 217

Maskell R., Pead L., Allen J. The puzzle of urethral syndrome: a possible answer? *Lancet* 1979; i: 1058 - 9.

Mason E., McLean P., Cox J. Psychosocial aspects of the urethral syndrome in women. *J. Ir. Med. Assoc.* 1977; 70: 335 - 7

Medical Research Council Bacteriuria Committee. Recommended terminology of urinary tract infections. *Br. Med. J.* 1979; 2: 717

McCauley A.J., Stern R.S., Holmes D.N., Stanton S.L. Micturition and the mind:

psychological factors in the aetiology and treatment of urinary symptoms in women. Br. Med. J. 1987; 294: 540 - 43.

McGrother C., Castleden C.M., Duffin H., Clarke M. A profile of disordered micturition in the elderly at home. Age Ageing. 1987; 16: 105 - 10

McGrother C., Clarke M., Castleden M., Duffin H. Do the elderly need better continence services? Community Med. 1987; 9: 62 - 7.

Milne J.S., Williamson J., Maule M.M., Wallace E.T. Urinary symptoms in older people. Mod. Geriat. 1972; 2: 198 - 212

Mitterness L.S. So what do you expect when you're 85? Urinary incontinence late in life. In Research in the sociology of Health Care. JAI press inc. 1987; 6: 177 - 219

Mohr J.A., Rogers J., Brown T.N., Starkweather G. Stress urinary incontinence : a simple and practical approach to diagnosis and treatment. J. Am. Geriat. Soc. 1983; 31: 476 - 8

Mond N.C., Percival A., Williams J.D., Brumfitt W. Presentation, diagnosis and treatment of urinary tract infection in general practice. Lancet. 1965; i: 514 - 6.

Montgomery E. Promoting continence: Pelvic power. Community Outlook. 1986; Sept. 10: 33 - 4

Moolgoaker A.S. Management of stress incontinence in women. *Geriatrics*. 1976; 31 (6): 60 - 4

Moore T., Schofield P.F. Treatment of stress incontinence by maximum perineal electrical stimulation. *Br. Med. J.* 1967; 3: 150 - 151.

Newman J.L. Old folks in wet beds. ch. 29 in *An ageing population* eds. Carver V. and Liddiard P. 1978 pp 259 - 65 Sevenoaks. Hodder and Stoughton.

Nemir A., Middleton R.P. Stress incontinence in young nulliparous women. *Am. J. Obstet. Gynaecol.* 1984; 68: 1166 - 8.

Norton P.A., MacDonald L.D., Sedgwick P.M., Stanton S.L. Distress and delay associated with urinary incontinence, frequency, and urgency in women. *Br. Med. J.* 1988; 297: 1187 - 9

O' Brian J., Austin M., Sthi P., O'Boyle P. Urinary incontinence: prevalence, need for treatment, and effectiveness of intervention by nurse. *Br. Med. J.* 1991; 303: 1308 - 1310

O'Dowd T. Irritable urethral syndrome: discussion. *J. Roy. Col. Gen. Pract.* 1985; 35: 140 - 41

O'Dowd T. How to improve the treatment of UTIs: the problem in general practice.

Mims mag. 1.12. 1988; 44 - 48

O'Dowd T., Pill R., Smail J. E., Harvard Davis R. Irritable urethral syndrome: Follow up study in general practice. Br. Med. J. 1986; 292: 30 - 2

O'Dowd T, Ribeiro C.D., Munro J., West R.R., Howells C.H., Harvard Davis R. Urethral syndrome: a self - limiting illness. Br. Med. J. 1984; 288: 1349 - 52.

O'Dowd T., Smail J.E., West R.R. Clinical judgement in the diagnosis and management of frequency and dysuria in general practice. Br. Med. J. 1984; 288: 1347 - 1349.

Office of Health Economics. Compendium of Health Statistics. London: Office of Health Economics, 1989.

Office of Population Censuses and Surveys. DHSS. Morbidity Statistics from general practice. Third National Study. London. Government statistical service. 1981 - 1982.

Office of population Censuses and Surveys DHSS 1981. Census of the population County report: Leicestershire. London

Osbourne J.L. Post menopausal changes in micturition habits and in urine flow and in urethral pressure studies in 'The Management of Menopause and Post-Menopausal Years.' 1976; ed. S. Campbell; pub. MTP pp 285-9



Panja S.K. Urethral syndrome in women attending a clinic for sexually transmitted diseases. Br. J. Vener. Dis. 1983; 59: 179 - 81.

Pappetropoulou M., Pappas A. The urethral syndrome in routine practice. J. Infect. 1987;14(2):113 - 8

Rees D., Farhoumand N. Psychiatric aspects of recurrent cystitis in women. Br. J. Urol. 1977; 49: 651 - 58

Registrar General's Classification of Occupation. 1970 ( new version Feb. 1990 )  
HMSO

Royal College of Physicians. Obesity report. J. R. Coll. Physicians Lond. 1983; 17: 5 - 63.

Samsioe G., Jansson I., Mellstrom D., Svanborg A. Occurrence, nature and treatment of urinary incontinence in a 70 year old female population. Maturitas 1985; 7: 335 - 42.

Sand P.K., Bowen L.W., Ostergard D.R., Bent A., Panganiban R. Cryosurgery versus dilatation and massage for the treatment of recurrent urethral syndrome. J. Reprod. Med. 1989; 34(8): 499 - 504.

Sanford J.P. Urinary tract symptoms and infections . Annu. Rev. Med. 1975; 26: 485

Scotti R.J., Ostergaard D. The urethral syndrome. Cl. Obs. Gynae. 1984; 27: 515 - 29.

Sourander L.B. and Kasanen A. A 5 year follow up of bacteriuria in the aged. Gerontol. Clin. 1972; 14: 274 - 281

Stamm W.E., Counts G.W., Running K., Fihn S., Turik M., Holmes K. The diagnosis of coliform infection in acute dysuria women. N. Eng. J. Med. 1982; 307: 463 - 68

Stamm W.E., Wagner K.E., Amsel R. et al. Causes of the acute urethral syndrome in women. N. Eng. J. Med. 1980; 303: 409 - 18.

Stanton S. L. , Cardozo L.D. Surgical treatment of incontinence in elderly women. Surg. Gynaecol. Obstet. 1980; 150: 555 - 7

Stanton S.L., Hilton P. Cardozo L.D., Annan H. Internal urethrotomy in the management of impaired voiding in the female. Proceedings of the 22nd British congress of obstetrics and gynaecology, 1980.

Stoddart G.D. Research project into the effect of pelvic floor exercises on genuine stress incontinence. Physiotherapy 1983; 69(5): 148 - 9

Sumners D., Kelsey M., Chait I. Psychological aspects of lower urinary tract infections in women. Br. Med. J. 1992; 304; 17 - 19.

Sussman M., Asscher A.W., Waters W.E. et al Asymptomatic bacteriuria in the non - pregnant woman. 1. Description of population. Br. Med.J. 1969; 1: 799 - 803

Tchou D.C., Adams C., Varner R.E., Denton B. Pelvic floor musculature exercises in treatment of anatomical urinary stress incontinence. Phys-Ther. 1988; 68:5: 652 - 5

Thomas T.N., Plymat K.R., Blannin J., Meade T.W. Prevalence of urinary incontinence. Br. Med. J. 1980; 281: 1243 - 5.

Turck M., Goffe B., Petersdorf R.G. Bacteriuria of pregnancy. Relation to socio - economic factors. N.Eng. J. Med. 1962; 266: 857 - 860

Veter N.J., Jones D.A., Victor C.R. Urinary incontinence in the elderly at home. Lancet. 1981; ii: 1275 - 7

Walker M., Heady J.A., Shaper A.G. The prevalence of dysuria in women in London. J. Roy. Col. Gen. Pract. 1983; 33: 411 - 415.

Waters W.E. Prevalence of symptoms of urinary tract infection in women. Br. J. Soc. Med. 1969; 23: 263 - 6.

Waters W.E., Elworthy P.C., Abernethy M. Clinical significance of dysuria in women. Br. Med. J. 1970; ii: 754 - 757.

Weatherall D.J., Ledingham J.G., Worrell D. Eds. Oxford Textbook of Medicine. 1983.  
Vol.2. 13.260. Oxford Univ. Press. Oxford.

Wilkins E.G., Payne S.R., Pead P.J., Moss S.T., Maskell R.M. Interstitial cystitis and the urethral syndrome: a possible answer. Br. J. Urol. 1989; 64: 39 - 44.

Williams J.D., Reeves D.S., Brumfitt W., Condie A.P. The effects of bacteruria in pregnancy on maternal health. In Urinary tract infection. Eds. W. Brumfitt and A. W. Asscher. 1973 Oxford University Press. London. p.103 - 107.

Williams J.D., Reeves D.S., Cordie A.P. et al Significance of bacteriuria in pregnancy. In Infection of the Urinary Tract. Eds. Kass E.H., Brumfitt W. Chicago: Univ. of Chicago. pp 8 - 18

Wiseman P., Malone - Lee J., Rai G. S. Terodiline with bladder retraining for treating detrusor instability in elderly people. Br. Med. J. 1991; 302: 994 - 996.

Wolin L.H. Stress incontinence in the young healthy nulliparous female subject. J. Urol. 1969; 102: 545 - 9.

Woodward M., Francis L. Statistics for Health Management and research . 1988  
London. Edward Arnold. pp 101 - 3.

Yarnell J.W.G., St. Leger A.S. The prevalence, severity, and factors associated with

urinary incontinence in a random sample of the elderly. *Age Ageing*. 1979; 8: 81 - 5

Yarnell J.W.G., Voyle G.J., Richards C.J., Stephenson T.P. The prevalence and severity of urinary incontinence in women. *J. Epidemiol. Comm. Health* 1981;35: 71 - 4

Yarnell J.W.G., Voyle G.J., Sweetnum P.M. et al. Factors associated with urinary incontinence in women. *J. Epidemiol. Community Health*. 1982; 36: 58 - 63.

Yates F. *Sampling methods for censuses and surveys*. 1981 4th Ed. Charles Griffin. High Wycombe, England. ch. 3,4.

Zufall R. Treatment of the urethral syndrome in women. *JAMA* 1963; 184: 894 -95

**Submitted for publication:**

Jolleys J. V. and Wilson J.V. Continence Promotion in General Practice - a National Survey. 1992.