

2.

The Problem of Urinary Incontinence

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This chapter presents information on the problem of urinary incontinence, its prevalence in the

U.S. population, and the array of modalities available to manage and treat the problem.

PREVALENCE OF INCONTINENCE

Several studies have examined the prevalence of urinary incontinence. Most of the recently published studies are summarized in table 2-1. They vary in sample population, definition of incontinence, and methods used to collect data. Estimates of incontinence prevalence range from less than 1 percent in young, community-dwelling persons to greater than 50 percent in elderly populations in long-term care institutions.

Despite the variability in study designs and estimates of prevalence, some general conclusions can be drawn from the table. Incontinence is most common among individuals over age 65. Between 10 and 20 percent (2 to 4 million) of community-dwelling elderly have some degree of urinary incontinence. The prevalence increases to nearly 50 percent of those elderly in nursing homes (600,000 to 700,000 people). Although incontinence is less prevalent in younger populations, there are as many, if not more, younger persons with the condition. Despite the dearth of studies to establish the prevalence of incontinence in younger populations, the available data suggest that between 1 and 5 percent of those under 65 years have a persistent problem with urinary incontinence (between 2 and 10 million people). These numbers are probably underestimates, because individuals often deny this problem. Moreover, these numbers reflect only those persons affected at any one time: incontinence is a transient phenomenon in up to one-third of affected individuals (178).

The severity of incontinence varies considerably. The frequency and amount of urinary leakage are often important considerations in the management of the condition. In younger populations, incontinence involves either very small amounts of urinary leakage, as would be the case in young

women with stress incontinence, or complete loss of control over excretory function, usually in younger individuals with neurologic disorders (e.g., Spinal Cord abnormalities, multiple sclerosis, or traumatic paraplegia). Many young children also persistently wet the bed (enuresis). In older persons, the severity of incontinence can vary from infrequent losses of drops of urine (as in stress incontinence) to occasional or frequent losses of large volumes of urine (as in urge incontinence), to continuous leakage of urine and associated stool incontinence (as in people with severe dementia or other neurologic disorders or surgical or traumatic injury to sphincter mechanisms). Although incontinence of both urine and stool is relatively uncommon in community-dwelling persons, close to 50 percent of those in nursing homes who are incontinent of urine also have episodes of fecal incontinence (67,112). Most patients with urinary and fecal incontinence (double incontinence) have severe impairments of mental and/or physical functioning. (The causes and treatment of fecal incontinence are beyond the scope of this study and are reviewed elsewhere (87).)

Other studies' findings on the prevalence of incontinence are germane. Health professionals commonly do not recognize the presence of incontinence or they fail to note it as a problem; consequently they do not pursue an evaluation (112). In addition, studies in Great Britain indicate that incontinent individuals often do not use services available to them, such as incontinence nurses, incontinence clinics, and laundry services (153,160,178,179). Thus, it appears that both health professionals and incontinent individuals tend to underreport and underevaluate incontinence and, as a result, probably manage the condition suboptimally.

Table 2-1.—Prevalence of Incontinence

Study	Population sample	Definition of Incontinence	Method of data collection	Prevalence (percent)				Comments																																																
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Studies done in the community:																																																								
Yarnell and St. Leger (1979)	Random sample of community elderly (over age 65) drawn from two medical practices in South Wales (N = 388)	Was there any leakage of urine in the previous 12 months? If yes; what was the frequency and the time of day?	Personal interview and questionnaire given at home to subject, the next of kin or daily attendant		17	11	14	Urinary Incontinence was related to a history of cerebrovascular disease, surgical procedures for prostatic conditions, or utero-vaginal prolapse. One-third had incontinence for only a short time (less than 6 months). Nearly half those severely incontinent preferred to buy their own supplies of incontinence pads from their pharmacists rather than approach their general practitioner with the problem.																																																
Thomas, et al. (1980)	Individuals aged 5 and older from 12 general practices in Britain (N = 18,084)	Leakage of urine in inappropriate places and at inappropriate times, at least twice a month, regardless of quantity ("regular" incontinence). Considered "occasional" if less than twice a month.	Postal questionnaire; parents responded for children under 15. Also interviewed 237 adults with regular incontinence (from one general practice).	<table border="1"> <thead> <tr> <th colspan="4">Percentage with regular incontinence</th> </tr> <tr> <th>Age</th> <th>Female</th> <th>Male</th> <th>All</th> </tr> </thead> <tbody> <tr> <td>5-14</td> <td>5</td> <td>7</td> <td>6</td> </tr> <tr> <td>15-64</td> <td>9</td> <td>2</td> <td>5</td> </tr> <tr> <td>65+</td> <td>11</td> <td>7</td> <td>10</td> </tr> <tr> <td>All</td> <td>8</td> <td>3</td> <td>6</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="4">Percentage with any incontinence</th> </tr> <tr> <th>Age</th> <th>Female</th> <th>Male</th> <th>All</th> </tr> </thead> <tbody> <tr> <td>5-14</td> <td>16</td> <td>18</td> <td>17</td> </tr> <tr> <td>15-64</td> <td>27</td> <td>5</td> <td>16</td> </tr> <tr> <td>65+</td> <td>25</td> <td>15</td> <td>21</td> </tr> <tr> <td>All</td> <td>25</td> <td>9</td> <td>17</td> </tr> </tbody> </table>				Percentage with regular incontinence				Age	Female	Male	All	5-14	5	7	6	15-64	9	2	5	65+	11	7	10	All	8	3	6	Percentage with any incontinence				Age	Female	Male	All	5-14	16	18	17	15-64	27	5	16	65+	25	15	21	All	25	9	17	Prevalence in females significantly higher than in males. Prevalence of regular incontinence (as opposed to occasional incontinence) increased with increasing age after 35. Women who had more than four babies were most likely to report regular incontinence. Less than one-third were getting health or social services for their incontinence. Those with minimal incontinence generally saw no reason to seek help.
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Feneley, et al. (1974)	One group practice in Great Britain, ages 5 and older (N = 7,000)	Involuntary excretion or leakage of urine in inappropriate places or at inappropriate times at least twice a month, regardless of quantity.	Postal questionnaire; parents responded for children under 15.	<table border="1"> <thead> <tr> <th>Age</th> <th>Female</th> <th>Male</th> <th>All</th> </tr> </thead> <tbody> <tr> <td>5-14</td> <td>4</td> <td>6</td> <td>—</td> </tr> <tr> <td>14-64</td> <td>8</td> <td>2</td> <td>—</td> </tr> <tr> <td>65+</td> <td>14</td> <td>6</td> <td>—</td> </tr> <tr> <td>All</td> <td>8</td> <td>3</td> <td>5</td> </tr> </tbody> </table>				Age	Female	Male	All	5-14	4	6	—	14-64	8	2	—	65+	14	6	—	All	8	3	5	81% has urinary incontinence only. 20% had both urinary and stool incontinence. 7% had stool incontinence only.																												
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Vetter, Jones, and Victor (1981)	Community elderly (age 70+) from two general practices in South Wales (N = 1,280)	"Do you ever wet yourself if you are unable to get to the lavatory as soon as you need to or when you are asleep at night or if you cough or sneeze?" "How often does this happen?" "Is it a few drops or more?"	Structured interview		18	7	14	5% were severely incontinent (daily or more), 8% were less severely incontinent. Prevalence increased with age. Housebound and clinically anxious persons were more likely to be severely incontinent. Incontinent subjects were more likely than continent subjects to be in contact with family members and less likely to be visited by friends. One-third of incontinent individuals used no aids. 36% of severely incontinent used some type of protection, whereas only 2% of less severely incontinent used any protection.																																																

Table 2-1.- Prevalence of Incontinence—Continued

Study	Population sample	Definition of Incontinence	Method of data collection	Prevalence (percent)				Comments
				Age	Female	Male	Overall	
Wolin (1969)	Single nursing students in the U S. who have never borne children (ages 17-25) (N = 4,211)	Stress incontinence = accidental passing of urine when intra-abdominal pressure increases, unrelated to voiding	Questionnaire author discussed questions first					15% had some Incontinence, 16% had daily Incontinence Daily stress Incontinence was related to urinary tract infection but not to age or regularity of sexual Intercourse
Yarnell, et al (1981)	Random sample of women older than 18 in South Wales (N = 1,060)	Loss of urine on the way to the toilet or with cough, laugh, sneeze, etc	Personal interwew by nurse using standardized questionnaire	Age	Female	Male	All	Half those Incontinent had stress symptoms alone, 15% had urge only. 35% had both In most, urinary loss was small and Infrequent, 5% had to change clothes, 3% had to change clothes daily 3% felt Incontinence Interfered with social or domestic life, but only half sought medical advice
				18-64	42	NA	-	
				65-74	43	NA	-	
				75+	59	NA	-	
				All	45	NA	-	
Studies done in both community and institutions: Thomas, et al (1980)	All those over age 15 in the London boroughs short- and long-stay hospitals, psychiatric wards, day-care centers. ordinary and special schools, multiple sclerosis and spina bifida societies; and pad and laundry services (estimated total population of the study area = 359,000)	Involuntary excretion or leakage of urine in inappropriate places or at inappropriate times and at least twice monthly, regardless of quantity	Nurses and administrators of the institutions and community services filled out a questionnaire that asked for age, sex, address, and details about type of Incontinence of people under their care	Age	Female	Male	All	Considering only community residents, less than 1 % of those under 65 and 1 % of those over 65 were reported as Incontinent
				15-64	02	01	02	
				65+	30	10	20	
				All	1	1	03	
							1.0	
Feneley, et al. (1979)	All those over age 15 m Bristol who were under care of general practitioners, community nurses, hospital nurses, social and welfare services, or m old people's homes	Involuntary excretion or leakage of urine in inappropriate places or at inappropriate times and at least twice monthly, regardless of quantity	Incontinent patients were registered by general practitioners, community nurses, hospitals, old people's homes, and social and welfare services over the course of a year (details of process not specified)					Overall prevalence rate of 1 % reported
Studies done in long-term care facilities: Ouslander, Kane, and Abrass (1982)	Patients 65+ m 7 U S nursing homes (4 proprietary, 3 nonprofit) (N = 842)	Any uncontrolled leakage of urine, regardless of amount or frequency	Incontinent patients identified by nurses and verified by interviews with patients and nurses		50	48	50	Of those who were Incontinent, 34% had frequent Incontinence (more than one episode per day), 28% had occasional Incontinence, 10% had an external catheter, 28% had an In-dwelling catheter 64% had concomitant fecal Incontinence 64% were Incontinent on admission to the nursing home Most had severe Impairments of cognitive function and/or mobility 45% had Complications irritation, urinary Infections) Physicians noted or sought underlying cause of incontinence in less than 15%

Table 2-1.—Prevalence of Incontinence—Continued

Study	Population sample	Definition of incontinence	Method of data collection	Prevalence (percent)			Comments	
				Age	Female	Male		Overall
Jewett, et al. (1981)	New admissions to geriatric long-term care facility in Canada (N = 277)	Involuntary loss of urine that was a social or hygienic problem and was objectively demonstrated	Research nurse completed questionnaire		36	40	38	27% had mental disorders 30% could not give a history of their health status Urge incontinence most common
U.S. Department of Health, Education, and Welfare, Public Health Service (1975)	15 randomly selected patients in each of 288 nursing homes in Medicare/Medicaid program (N = 4,320) Total nursing home population = 283,914	Involuntary loss of urine or feces at least occasionally	Assessment form completed by nursing-home staff				55	6% had an in-dwelling or external device
Ouslander and Fowler (1983)	All patients in 90 VA nursing-home care units (N = 7,853)	Any uncontrolled leakage of urine regardless of amount or frequency	Survey questionnaire completed by nursing-home nurse supervisors				41	Of the incontinent patients: 96% were male; 70% were age 65 or older, 22% had an in-dwelling catheter; 37% had an external catheter (worn continuously); only 10% had less than one episode per day; 55% also had episodes of fecal incontinence

SOURCE J Ouslander and R Kane, University of California at Los Angeles, 1984

TYPES AND CAUSES OF INCONTINENCE

Normal urination is a complex and dynamic process involving several anatomic structures and the coordination of numerous physiologic processes. In addition to the structures of the lower genitourinary tract (including the bladder itself, the urethra, the pelvic floor musculature, and, in men, the prostate gland), the brain, spinal cord, and peripheral nerves are all involved in the control of urination. Disruption in the normal function of any of these anatomic components can lead to problems with incontinence (174).

Maintaining continence depends on the normal physiologic function of the lower genitourinary tract, normal innervation and neurologic control over genitourinary function, mental awareness of the need to void, and the mental and physical capacities to reach a toilet or toilet substitute at the appropriate time. Thus, disorders of the genitourinary tract, neurologic disorders, psychological disturbances, and limitations in mobility or environmental factors (e. g., physical restraints or drugs) can all contribute to the development and persistence of incontinence.

The normal function of the lower genitourinary tract includes two basic processes: the storage of urine and its emptying. Problems that interfere with these functions can cause incontinence. In order to store urine, the bladder must accommodate increasing volumes of fluid under low pressure (i. e., it must be compliant). The sensation of bladder fullness must be perceived at an appropriate time, the bladder must have an adequate capacity (normally 300 to 600 ml, or about 1 pint), and the bladder must not contract involuntarily. In order to empty urine, the bladder must have the capability to contract voluntarily. There must be a coordinated lowering of resistance in the bladder outlet as the bladder contracts, and there can be no anatomic obstruction to urine flow. Any condition that impairs these normal functions of the lower genitourinary tract can cause incontinence.

Incontinence can be classified into several types (table 2-2). From a clinical and therapeutic viewpoint, there are important differences between

causes of acute versus established (or persistent) incontinence. *Acute incontinence* refers to the sudden onset of episodes of involuntary loss of urine, which is usually associated with an acute illness or environmental factors that impair the mental or physical ability to reach a toilet or toilet substitute. This phenomenon is especially common in hospitalized elderly persons. Many elderly persons have the frequent and urgent need to void and often arrange their activities to be near a bathroom at the appropriate time. With the onset of an acute illness, incontinence can be precipitated by impairment of mobility (e.g., a hip fracture or cardiovascular decompensation) or confinement to a bed with bedrails and other restraints. Many elderly individuals also become confused with the onset of acute illness and admission to a hospital; their awareness of the need to void and their ability to find a toilet may therefore be impaired. Too often, elderly hospitalized persons who recognize the need to void but cannot obtain timely help in getting to the toilet are labeled incontinent by their nurses and physicians.

Other factors that can precipitate acute forms of incontinence include acute urinary tract infections with bladder inflammation, metabolic disorders (e. g., diabetes) that increase urine flow, fecal impaction which may either mechanically obstruct the normal emptying of the bladder or cause reflex involuntary contraction of the bladder, and a variety of drugs. Drugs that can precipitate incontinence include diuretics which increase urine flow, sedative, hypnotic, and anti-psychotic agents which may diminish the mental awareness required for the maintenance of continence, and drugs that influence normal lower genitourinary functioning such as anticholinergic drugs (which inhibit the bladder from contracting) and certain antihypertensive agents (which decrease resistance in the bladder outlet) (14,122).

Established or persistent incontinence (i.e., repeated episodes of involuntary loss of urine not associated with an acute condition) can be divided into four types. *Stress incontinence* implies leakage of small, and sometimes large, amounts of

Table 2-2.—Types of Incontinence

Type	Definition	Causes	Population(s) affected
<i>Acute:</i>	Incontinence of sudden onset associated with an acute illness (and/or other factors) that subsides once the acute condition has been resolved or other factors have been removed	Acute illnesses associated with one or more of the following: (a) immobility and/or environmental factors that diminish the ability to get to and use a toilet; (b) impaired mental function that diminishes toileting ability; (c) fecal impaction. Acute urinary tract infections Drugs: (a) those that increase urine flow (e.g., diuretics); (b) those that inhibit bladder contractions and cause urinary retention and overflow (e.g., anticholinergics); (c) those that decrease mental awareness (e.g., sedatives, hypnotics) Metabolic—increased urine flow (polyuria) associated with poorly controlled diabetes	Elderly, usually in acute hospitals
<i>Established:</i> Stress	Leakage of small amounts of urine with increases of intra-abdominal pressure (e. g., coughing, sneezing, laughing, exercise)	Weakened supporting tissue surrounding bladder outlet and urethra associated with: (a) lack of estrogen in postmenopausal women; (b) previous vaginal deliveries; (c) previous pelvic surgery (e.g., hysterectomy)	Women, especially those over age 40
Urge	Leakage of urine caused by inability to delay voiding long enough to reach the toilet after urge to void is felt	Neurological diseases such as stroke, dementia, Parkinsonism, multiple sclerosis, spinal cord diseases Genitourinary disorders such as unstable bladder (“detrusor instability”), bladder stones, diverticuli of urethra and bladder, atrophic urethritis, vaginitis (females), chronic cystitis, mild outflow obstruction (usually males)	Men and women of any age; most common in the elderly
Overflow	Leakage of small amounts of urine associated with obstruction to urine flow	Hypotonic or acontractile bladder associated with diabetic neuropathy; spinal cord injury; or drugs such as anticholinergics (which inhibit bladder contractions), smooth muscle relaxants, narcotics, and alcohol Anatomic obstruction associated with prostatic enlargement or urethral stricture	Older men with prostatic enlargement Diabetics
Functional	Inability or unwillingness to reach a toilet in time	Impaired mobility Impaired mental function Inaccessible toilets (or caregivers) Psychological disorders such as depression, psychosis, anger, or hostility	Elderly in acute hospitals and nursing homes and those with acute or severe psychiatric illness

aincontinence is Persistent and unrelated to an acute illness.

SOURCE J Ouslander and R Kane, University of California, Los Angeles, 1984

urine with increases in intra-abdominal pressure, such as would occur with exercise, straining, coughing, laughing, or sneezing. This type of incontinence usually occurs in women, especially those who have had multiple vaginal deliveries or pelvic surgery. It is generally related to weakened musculature of the pelvic floor and subsequent loss of resistance in the bladder outlet.

Urge incontinence involves leakage of varying amounts of urine (usually larger volumes than in stress incontinence) because of the inability to delay voiding long enough to reach a toilet or toilet substitute; it can be caused by a variety of genitourinary and neurologic disorders. This type of incontinence is often (but not always) associated with an unstable bladder (in the past referred to

by many names, including uninhibited neurogenic bladder, detrusor hyperreflexia, and detrusor instability). The final common pathway involves the involuntary contraction of the bladder at low or normal bladder volumes. It is the most common abnormality found in elderly incontinent individuals and is often responsive to drug treatment (22,32,81,174). (Drugs, however, have limitations in the management of incontinence, especially in the elderly.) People with urge incontinence generally empty their bladder completely, although some patients retain urine. (Urine is considered to be retained if more than 50 to 100 ml are left in the bladder after voiding). Any condition that causes local irritation in the lower genitourinary tract, such as chronic inflammation of the bladder or urethra, stones, tumors, or diverticula (outpocketings) of the bladder, can precipitate urge incontinence. Correcting the condition will often cure the incontinence. Neurologic disorders that impair central nervous system and spinal-cord control over bladder contraction (e.g., stroke, dementia, Parkinsonism, and multiple sclerosis) can also cause involuntary bladder contraction and urge incontinence. Nonetheless, a substantial proportion of individuals with urge incontinence have no demonstrable neurologic or genitourinary abnormality.

Overflow incontinence is caused by anatomic obstruction to bladder emptying and/or inability of the bladder to contract, with subsequent leakage of small amounts of urine. Most common in older men when benign prostatic hyperplasia anatomically obstructs urine flow, it can also be related to diabetic neuropathic bladders (which contract poorly), spinal cord injuries (which impair the innervation that causes bladder contraction), and a variety of drugs that impair bladder contraction. This type of incontinence usually requires either the surgical removal of the anatomic obstruction or chronic or intermittent catheter drainage to prevent recurrent urinary tract infections and renal failure, both of which can result from chronic urinary retention.

functional incontinence occurs in individuals who have chronic impairments of either mobility or mental function, are unable to toilet themselves independently and do not have sufficient help with this task, or who, because of psychological disturbances, are unwilling to maintain continence. Functional incontinence can also be related to a variety of iatrogenic factors such as environmental barriers, inaccessible toilets and caregivers, and psychotropic medication.

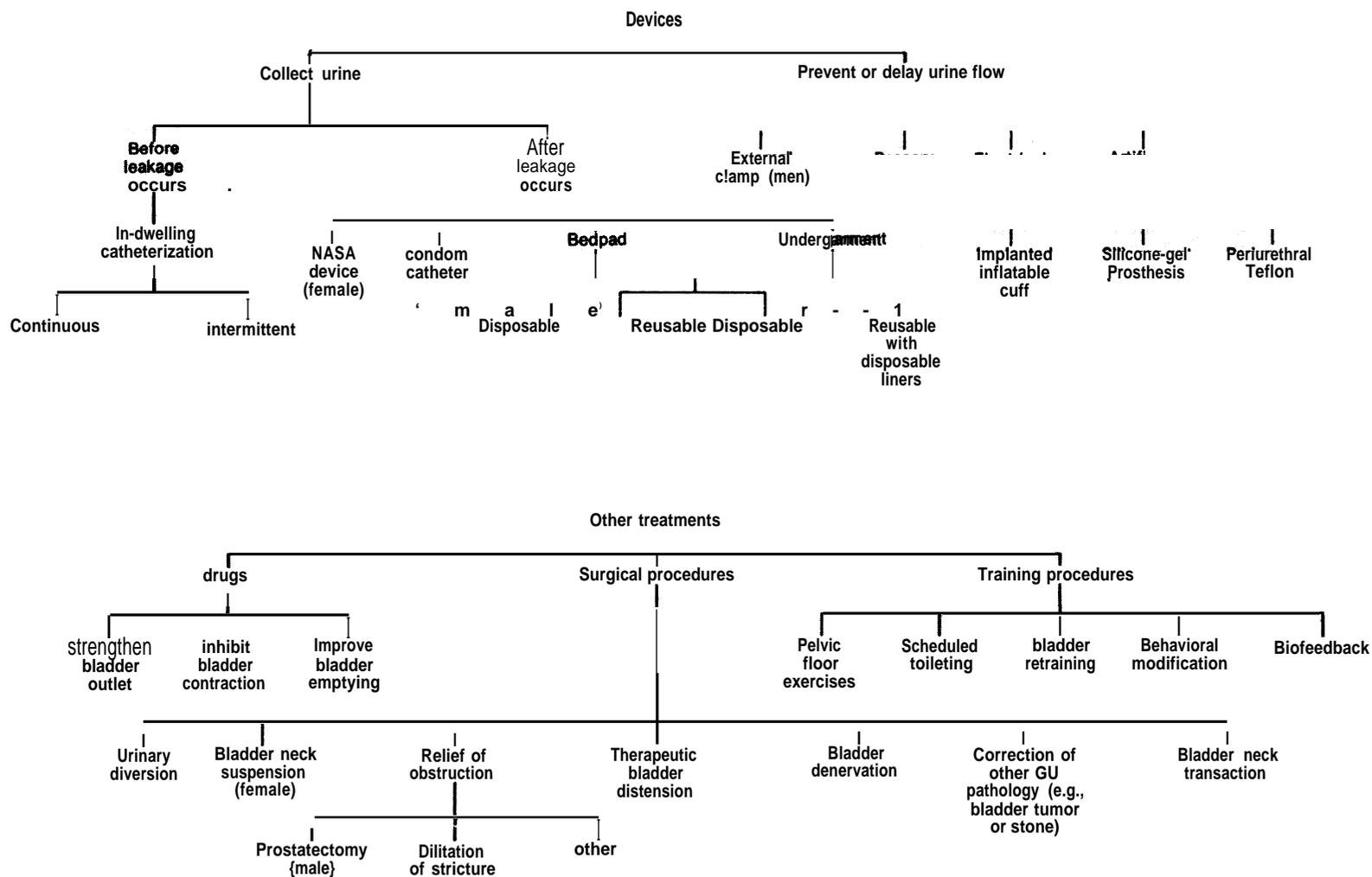
TREATMENTS FOR URINARY INCONTINENCE

The most appropriate treatment for a patient with urinary incontinence depends on a thorough evaluation of all the relevant factors (genitourinary, neurological, psychological, and environmental) that could cause or contribute to the condition. Most treatments discussed in this case study (sphincters, electrical stimulators, drugs-, training procedures, and surgery) are applicable to a specific type or types of incontinence and are attempts to cure the incontinence. Thus, a diagnostic evaluation to identify specific conditions is critical to the appropriate use of these treatments.

For the purposes of this case study, treatments for incontinence will be divided into devices and other treatments (fig. 2-1). Each type of treatment

is briefly described in table 2-3. Devices for incontinence can be divided into those that attempt to prevent or delay urine flow and those that collect urine before or after it leaves the bladder. Devices such as the pessary, a donut-shaped piece of inert material inserted into the vagina to support the bladder outlet in women with stress incontinence, and the external penile clamp are used relatively infrequently at the present time. Newer techniques, such as the artificial sphincter, which is an inflatable cuff surgically implanted around the urethra, and electrical stimulators, which contract muscles of the pelvic floor in stress incontinence and inhibit bladder contraction in urge incontinence, have been used increasingly over the last 10 to 15 years. These devices, however, can be used effectively only in carefully selected pa-

Figure 2-1.—Treatment Options for Urinary Incontinence



SOURCE J Ouslander and R Kane University of California at Los Angeles, 1984

Table 2-3.—Treatments for Urinary Incontinence

Type of treatment	Examples	Mechanism	Uses
Devices; To collect urine before leakage occurs	Catheters	A flexible tube is placed directly in the bladder and drains urine into a collecting bag. Can be used continually or intermittently.	Inability to empty bladder (urinary retention) that cannot be corrected by surgical or drug treatment. (This may or may not be associated with overflow incontinence) Incontinence associated with healing skin lesions
To collect urine after leakage occurs	NASA (female) Condom catheters (male) Bed pads	Outflow is trapped and drained into a collecting bag Pad protects individual and mattress from contact with urine. These pads are disposable or reusable	Any type of incontinence Any type of incontinence, especially useful as adjunctive therapy with other treatments
Prevent or delay urine outflow	Artificial sphincters Silicone-gel prosthesis Periurethral Teflon Electrical stimulators External clamp (male) Pessary (female)	Inflatable cuff is surgically implanted around urethra and inflated to prevent urine outflow Silicone-gel is inserted to replace existing urethra Teflon paste is injected into tissues surrounding urethra Device inserted into vagina; produces electric impulses that; (a) cause contraction of pelvic floor musculature; (b) inhibit bladder contractions Penis is clamped to prevent urine flow Device is inserted into vagina, supporting tissues below bladder and around urethra	Incontinence associated with sphincter weakness (usually stress incontinence or post prostatectomy) Incontinence associated with pelvic floor muscle weakness or bladder instability All types of male incontinence Female incontinence associated with prolapsed pelvic structures (usually stress incontinence)
Other treatments: Surgical procedures	Bladder-neck suspension Prostatectomy (transurethral resection and suprapubic) Therapeutic bladder-neck transection Selective bladder denervation (cystolysis) Therapeutic bladder distension Correction of other genitourinary pathology (e.g., bladder tumor or stone)	Urethra and bladder neck are restored to a more normal intra-abdominal position All obstructing portion of prostate is removed Bladder neck is surgically incised Nerves to upper bladder are cut so that there is no muscle control of bladder dome, but sphincter mechanism is intact Bladder is distended under anesthesia for at least 2 hours to a pressure close to systolic blood pressure Removal of irritative or obstructive factors	Female stress incontinence Male overflow incontinence associated with anatomic obstruction Urge incontinence associated with bladder instability Urge incontinence associated with bladder instability Urge incontinence Urge incontinence associated with bladder instability Overflow incontinence associated with outflow obstruction

Table 2-3.—Treatments for Urinary Incontinence—Continued

Type of treatment	Examples	Mechanism	Uses	
Drugs	Propantheline (Probanthine)	Diminish bladder contractions	Urge incontinence associated with bladder instability	
	Imipramine (Tofranil)	Diminish bladder contractions	Urge incontinence associated with bladder instability	
	Oxybutrin (Ditropan)	Diminish bladder contractions	Urge incontinence associated with bladder instability	
	Flavoxate (Urispas)	Diminish bladder contractions	Urge incontinence associated with bladder instability	
	Ephedrine (Sudafed)	Strengthen bladder outlet	Stress incontinence associated with sphincter weakness	
	Phenylpropranolamine (Ornade)	Strengthen bladder outlet	Stress incontinence associated with sphincter weakness	
	Estrogen (Premarin) Oral or topical	Increases supporting tissue around urethra	Stress incontinence	
	Bethanechol (Urecholine)	Promotes bladder contraction	Overflow incontinence	
	Training procedures	Habit training	Caretaker determines individual's pattern of incontinence and gets him/her to toilet accordingly	Urge incontinence
		Bladder retraining	Caretaker establishes routine of fluid administration and toileting with progressive lengthening of toileting intervals to increase bladder capacity or re-initiate normal voiding	Urge incontinence After catheter use
Pelvic floor exercises		Exercises to strengthen pelvic muscles	Overflow incontinence after overdistension injury	
Stress	Biofeedback	With specialized equipment, patient is trained to inhibit bladder contractions or contract pelvic muscles	Mainly urge incontinence associated with bladder instability and stress incontinence associated with sphincter weakness	
	Behavioral modification	Caretaker rewards incontinent individual for staying dry	Incontinence associated with underlying mental or emotional disorders; some forms of functional incontinence	

SOURCE: J. Ouslander and R. Kane, University of California at Los Angeles, 1984.

tier-its. In addition, only a limited number of health care professionals are knowledgeable in their use, and, therefore, only a few patients have been treated with them.

Catheters are commonly used to manage incontinence, despite the well-known risks associated with their use, such as urinary tract infections, penoscrotal abscess and epididymitis in men, sepsis, and death (91,98,120,144,166). Continuous in-dwelling catheterization is justified for the short-term management of incontinence in acutely ill individuals, in those undergoing genitourinary surgical procedures, in patients with skin breakdown needing protection from incontinent urine, and in patients with urinary retention that cannot be corrected surgically or pharmacologically or managed by intermittent catheterization. The technique is inappropriately used for the long-term management of a substantial proportion of institutionalized incontinent individuals (98, 110). Intermittent catheterization can be used in carefully selected patients and may prevent the frequent infectious complications of continuous in-dwelling catheterization (92). External catheters (condom catheters) are most commonly used in elderly male incontinent patients; these devices require frequent changing by nursing staff or other caregivers and can result in serious complications (especially local skin irritations). Except for devices currently under development, only one female external-urine-collection device has been described in the literature (59).

Other treatments for urinary incontinence include surgical procedures, drugs, and a group of techniques that can be broadly labeled training procedures. As with the treatments mentioned above, surgical procedures are most useful if the nature of the underlying genitourinary pathology is understood. The most common surgical procedure used for incontinence is bladder neck suspension, which is used in women with stress incontinence (124). Other procedures, such as bladder denervation and bladder distention for the management of unstable bladder, are much less commonly used (44,114).

Drugs are most commonly used in the treatment of the unstable bladder, a common condition in patients with urge incontinence (14,109, 122). A variety of pharmacologic agents can in-

hibit bladder contraction and therefore are useful in the therapy for unstable bladder. Other drugs can strengthen the bladder outlet and can be used in the management of stress incontinence in females. Drugs used to treat stress incontinence are potentially toxic, especially in elderly women, and are generally less effective than surgical procedures (see table 2-3). Drug treatment to promote bladder contraction is used in the treatment of urinary retention with overflow incontinence.

Probably the most actively marketed products used to manage incontinence are undergarments and bedpads. In general, these products are designed with a layer of highly absorbent material sandwiched between layers designed to keep the patient and the bed or clothing dry (152). The majority of bedpads are disposable. Although several U.S. manufacturers offer reusable pads, the only specially designed reusable bedpad (the Kylie pad) has been developed and marketed in Australia, but is not yet available in the United States (24).

Several kinds of incontinence undergarments are currently marketed in this country (17,18). Some are completely disposable and resemble diapers; others have a launderable pant fitted with disposable liners. Although they are useful as adjuncts to other, more specific types of treatments and can help incontinent individuals remain dry, comfortable, and involved in social activities, these undergarments should be considered only as aids to management for incontinence until the patient has been evaluated and specific conditions and their treatments identified.

A wide variety of techniques, which we have labeled training procedures, have also been described in the management of incontinence (74, 171). Although the nomenclature for these procedures remains confusing (74), we have categorized the procedures into five basic techniques (fig. 2-1): pelvic floor (Kegel) exercises, biofeedback, bladder retraining, habit training, and behavioral modification. However, when one reads the literature on bladder training, especially that pertaining to nursing homes and other institutional settings, it becomes clear that most of these techniques have nothing to do with training the bladder; they generally involve training the staff to get the patient to the toilet on time (110).