Biofeedback and Electrical Stimulation Therapy for Treating Urinary Incontinence and Voiding Dysfunction: One Center’s Experience

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Millions of people are afflicted with disorders of urinary bladder control. This problem is not age specific nor gender oriented (O’Donnell, 1997). Many people do not discuss their incontinence problem with their health care provider (Davila, 1996). Those who have sought treatment may have failed pharmacologic therapies or a surgical procedure may not be candidates for surgery, or may prefer to try a nonsurgical approach for treating their incontinence. Biofeedback and electrical stimulation therapy is such an approach.

Though biofeedback has been in use for many years for treating other health problems, its use for treating bladder control problems is more recent. Biofeedback and electrical stimulation therapy is considered a behavioral technique used to provide awareness or “feedback” about a bodily function [National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC), 1998]. “By using electronic devices or diaries to track when your bladder and urethral muscles contract, you can gain control over these muscles” (NKUDIC, 1998). We have found that the use of these therapies can provide patients with control or relief of their urinary incontinence (UI), as well as associated symptoms of frequency or urgency.

In 1997, The Bladder Control Center began providing biofeedback therapy and urodynamic testing as a mobile service for the physicians of The Urology Group. In August 1998, The Urology Group, a corporation comprising 32 urologists, opened the doors to The Urology Center. The Urology Center is a state-of-the-art ambulatory surgery center, housing two operating rooms, two cystoscopy suites, a Storz lithotriptor, complete anesthesia coverage, x-ray, a physician office, The Urology Group Research Department, and The Bladder Control Center.

At The Bladder Control Center, urodynamic testing and biofeedback and electrical stimulation therapy are provided. This center consists of a urodynamic lab, two biofeedback rooms, and two offices. Four registered nur-

Uroincontinence affects 13 million Americans at a cost of $11.2 billion annually to the community. With an aging population, these numbers are expected to increase substantially in coming years. At the Bladder Control Center in Cincinnati, staff have completed over 3,600 biofeedback sessions with encouraging results.
es, with 40 years of combined urology experience, staff the Bladder Control Center. Presently, an average 142 sessions of biofeedback therapy are conducted per month, with an average of 14 new patients per month. Since January 1998, over 3,600 sessions of biofeedback have been completed. The referral base of patients allows the opportunity to monitor the effectiveness of biofeedback and electrical stimulation therapy in a large population.

**Patient Demographics**

The Bladder Control Center treated 470 patients with biofeedback and electrical stimulation therapy between September 1998 and June 2000. The youngest patient was a 14-year-old male with nocturnal enuresis and the oldest patient was a 91-year-old female with mixed incontinence. The most common diagnosis treated was mixed incontinence (36.2%), followed by female stress incontinence (29.4%); 12.5% of patients were males with stress incontinence, usually post-prostatectomy. In recent months, we have begun to see men for Kegel instructions pre-prostatectomy. Urge incontinence (11.5%), urinary frequency (3.8%), nocturia (2.8%), and interstitial cystitis (1%) are among the other diagnoses treated.

**Visit Progression**

Biofeedback training generally consists of three consecutive weekly sessions, followed by a physician office visit to assess progress and fulfill Medicare requirements. At the time of the physician visit, the patient is usually referred back for three more sessions.

Each session consists of a 10-minute biofeedback-training period, sometimes called physical therapy for the pelvic floor, at which time the patient is instructed in the correct performance of Kegel exercises. An abdominal EMG is used to monitor incorrect abdominal muscle usage and a vaginal sensor (a rectal sensor in males) to assess presence and strength of the pelvic floor muscle contraction. Immediate results are visualized on a computer screen by the patient and nurse to enhance the patient’s performance and compliance. The cycle usually begins with 5 seconds work and 10 seconds rest, working up to a cycle of 10 seconds work and 10 seconds rest over the course of treatment.

Following the biofeedback training, electrical stimulation therapy is used to treat the patient’s symptoms of urgency/frequency, urgency and stress incontinence, and interstitial cystitis. The electrical stimulation therapy program may be designed in a variety of ways to enhance the patient’s outcome. For urgency, frequency, and incontinence, the electrical stimulation therapy is set for a 5-second on/5-second off cycle, lasting a total of 15 minutes. The electrical stimulation therapy is administered through the same vaginal or rectal sensor used for biofeedback. The settings are 12.5 HZ for urgency/frequency, or urge incontinence, and 100 HZ for stress UI. Interstitial cystitis may be treated at 12.5 HZ, but for 20 minutes, with a 2-second on/4-second off cycle. Each session also contains designated patient teaching topics, such as behavioral modification, bladder irritants, and bladder retraining.

Session one consists of an introduction to personnel and equipment, with a general overview of the treatment plan (see Patient Guide). Urodynamics test results, physician office notes, and a patient history taken on site aid in customizing a treatment plan for the individual patient. After the introduction, patients receive their first biofeedback training session, which includes instruction on how to correctly perform Kegel exercises. Following this they receive their first electrical stimulation therapy session, and are provided with bladder diaries to complete and return at their next appointment. They are also instructed on an exercise regimen to follow at home, and are provided with other pertinent literature.

Session two consists of another biofeedback training period, followed by electrical stimulation therapy. Bladder diaries are reviewed and appropriate suggestions made for necessary behavior modification. Beginning with this session, a review of the previous week’s progress is discussed, including number of incontinent episodes, number of pad changes, improvement in any frequency/urgency patterns, and compliance with proposed exercise regimen. Patient questions are also addressed at this juncture.

Session three consists of another biofeedback training period, followed by electrical stimulation therapy. Bladder retraining, frequency, and urgency control techniques may be discussed, and treatment of constipation addressed if appropriate. After this session, a physician office visit may be necessary (to fulfill Medicare regulations) and to assess the need for three more sessions.

Sessions four through six also consist of biofeedback training, electrical stimulation therapy, and general reinforcement of all patient teaching previously mentioned. At visit five, additional bladder diaries may be given to the patient to complete and compared against those completed after the first visit. This diary comparison helps demonstrate progress in terms of episodes of frequency and urgency, and to assess compliance with dietary modifications. At visit six, a survey is given to the patient to complete and return (see Patient Survey). At this time the patient is referred back to the physician for appropriate followup. A 4-month followup survey is also sent to each patient.

**Patient Education: Behavior Modification**

Behavioral changes are often essential for a successful outcome (Burgio et al., 1998). We found that most patients with impaired continence will improve dramatically with instruction in appropriate fluid intake, dietary changes to
P A T I E N T  G U I D E

Biofeedback Therapy for Urinary Incontinence

Why Did My Doctor Recommend Biofeedback Therapy for My Incontinence Problem?
Biofeedback training works to develop the muscles of your pelvic floor which control urination and defecation. It is an alternative treatment, natural, generally easy to learn, and can be 54%-95% effective for improvement in symptoms.

How Is it Done?
You will be scheduled to come to the urology center once a week for 6 weeks. Each session will last approximately an hour. A nurse will insert a vaginal (female) or rectal (male) probe which stays in place for the session. You will also have electrodes attached to your abdomen. A computer screen will be visible for you to watch. You will be asked to squeeze your pelvic muscles around the probe without using your abdomen muscles. You will see your progress on the computer screen. There will be relaxation and work periods. You will be encouraged to do these pelvic floor exercises at home and given written instructions.

What Is Electrical Stimulation? Does it Hurt?
Electrical stimulation uses a current through the same probe to cause a contraction of the muscles which control urination and defecation. The level of intensity is slowly increased by the nurse until you feel a good contraction but no discomfort. This therapy cycles on and off for 15 minutes. The electrical stimulation serves to strengthen the pelvic floor muscles, helps to identify them, and in some people, relaxes an over-active bladder.

Are There Any Reasons Why I Can Not Do Biofeedback or Electrical Stimulation?
Infection of the bladder or vagina, pregnancy, colorectal or genitourinary cancer, cystocele blocking the vagina, pacemaker, urinary retention, bleeding between periods. The therapy may be performed during a woman’s menstrual period if there is no cramping.

Will My Insurance Cover the Sessions?
Medicare and private insurances have been paying for part or all so that the cost to you varies depending on your coverage. However, you are responsible for your deductible or your co-payment. If you have any questions regarding coverage, please direct them to your physician’s office.

This Patient Guide may be photocopied for patient education purposes.

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Dear Patient,
Thank you for attending Biofeedback and Electrical Stimulation sessions at The Urology Center. In an effort to provide the highest quality of care for our patients, we are requesting that you complete this survey and return it to us in the attached envelope. We sincerely hope that the Biofeedback and Electrical Stimulation sessions provided you with some degree of improvement. We greatly appreciate your taking the time to complete this questionnaire.

1. Did you notice improvement with the therapy?
   No Improvement/Slightly Improved/Mostly Improved/Greatly Improved

2. Have you continued to do the Kegel exercises at home?
   Yes/No

3. If yes, how often do you do them?
   Every day/2 to 3 times a week/Once a week/Less than once a week

4. Would you consider repeating sessions?
   Yes/No

5. Would you recommend this type of treatment to a relative or friend?
   Yes/No

6. On a scale of 1 to 10, how would you rate your overall satisfaction?
   
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Comments: ________________________________________________________________
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Patient account number: ________________________  Dr’s. Name: ________________________

Patient’s age: (yrs) _______ Sex: M  F  Primary diagnosis: ________________________

Number of episodes per day: 1 to 2  more than 2  Secondary diagnosis: ________________________

Treatment period: Baseline/6wks/6months  Date of treatment: (mm/dd/yy) ________________

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eliminate bladder irritants, change in voiding habits, and education regarding prescription medications and their side effects.

At the Bladder Control Center, a patient history is taken at the initial visit with a detailed listing of the patient's chief complaint and a symptom review that includes:

- Number of incontinent episodes per day/week.
- Approximate amount of urine loss.
- Pad usage.
- Description of frequency, urgency, and nocturia patterns.
- A brief medical, surgical, and obstetric history.
- A list of current medications.
- Previous therapies or treatments for incontinence.

This history enables the nurse to devise a patient care plan individualized to each patient's specific needs, as well as provide an opportunity to educate the patient about the side effects of his/her medications, for example diuretics and psychotropics.

Bladder diaries are provided to patients at their initial visit. These consist of three random days of recording fluid intake (type and amount), voiding frequency, urine loss, and wet pad changes. These data are evaluated at subsequent visits and appropriate dietary and behavior modifications are planned and discussed. Emphasis is placed on avoiding bladder irritants and maintaining appropriate fluid intake. Many patients tend to restrict their fluid intake at the onset of continence difficulties, in some as little as 25 ounces daily, resulting in dehydration and concentrated urine that becomes an irritant to the bladder. Far fewer patients will overhydrate, as much as 150 to 300 ounces a day. We suggest that patients consume 50 to 70 ounces daily, adjusting this to meet the needs of their physique and activity levels. A suggestion is made to restrict fluids in the evening if nocturia is a complaint. Dietary changes can be difficult for patients with years of habitual use (abuse) of irritants. Suggestions to decrease or eliminate alcoholic beverages, caffeine (coffee and tea, carbonated beverages and soda, chocolate, etc.), milk and milk products, citrus fruits and juices, spicy foods, tomatoes and tomato-based foods, and artificial sweeteners may be met with resistance, requiring patience and persuasion on the part of the nurse. Even decaffeinated coffee, tea, and sodas can be problematic for some patients.

Other behavioral considerations include weight reduction, regulation of bowel habits, cessation of cigarette smoking, and assurance that Kegel exercises are becoming a regular part of the patient's daily routine, at least 5 minutes three times daily. Avoiding nylon underwear, perfumed toilet tissue and sanitary napkins, detergent, and bath additives in women may also be important.

A return to normal voiding habits is essential in helping patients resume a lifestyle not centered on the next visit to the bathroom. Urodynamic studies, if available, are very helpful in designing the individual patient's care plan. Relying on a careful history, office notes from the physician, and talking and listening to the patient are invaluable resources. At the first visit, if incomplete emptying is suspected, a post-void residual may be measured by ultrasound bladder scan. Complete bladder emptying and double voiding may be discussed if indicated.

Bladder training is very effective for those with frequency and urgency problems, as well as urgency, stress, and mixed UI. Techniques to inhibit the sense of urgency or delay voiding are useful for those with frequency and urgency. Voiding by the clock rather than by the urge assists toward a goal of normal voiding patterns: voiding once every 2 to 4 hours is desirable. Timed voiding is recommended for those who void infrequently. This decreases the amount of incontinence associated with overflow.

Encouragement by the nurse is crucial as the patient begins to break old, sometimes lifelong habits. The reward felt personally as he or she progresses toward bladder control empowers the patient to take an active role in bladder rehabilitation. For behavioral changes to be lifelong, patients must be willing and motivated to maintain an active role in their continence (Karlowicz, 1995).

Survey Results

When patients complete a course of biofeedback and electrical stimulation therapy they are provided with a patient satisfaction questionnaire in a postage-paid envelope. An average of 73% of the surveys are completed and returned to the Bladder Control Center. The most recent quarterly tabulation of these data indicate that 92% of the patients have some degree of improvement; 35% state they are mostly improved; 95% responding continue to do their Kegel exercises; and 90% would recommend the treatments to a friend or relative. On a scale of 1 to 10, 81% rate their overall satisfaction at 7 or above.

To evaluate long-term progress, another questionnaire is mailed 4 months after patients complete their therapy. The results are encouraging and similar to the initial surveys. An average of 68% of the surveys are returned with 96% of the patients indicating improvement; 85% continue to do their Kegel exercises; and the overall satisfaction rating is 70%, at or above 7 on a scale of 1 to 10.

Conclusion

Biofeedback and electrical stimulation therapy are noninvasive, cost-effective treatment options for persons suffering from UI. Many patients prefer this treatment to medication or surgery. The intensive effort put forth by the staff of the Bladder Control Center has produced gratifying results, results that

continued on page 410
General Clinical Practice

have proven to be durable for at least 4 months following therapy. The overall improvement and satisfaction ratings have convinced even some of our more skeptical physicians that biofeedback and electrical stimulation therapy for the pelvic floor has a definite and legitimate place in the care of the patients with bladder control problems.

References


