SUMMARY OF SAFETY AND EFFECTIVENESS DATA

AMERICAN MEDICAL SYSTEMS'
UROLUME® ENDOURETHRAL PROSTHESIS

I. GENERAL INFORMATION

DEVICE GENERIC NAME:	Permanent Urethral Stent
DEVICE TRADE NAME:	UroLume® Endoprosthesis For Detrusor-External Sphincter Dyssynergia (DESD)
APPLICANT NAME:	American Medical Systems, Inc. 10700 Bren Road West Minnetonka, MN 55343
PREMARKET APPROVAL (PMA) APPLICATION NUMBER:	P920023/S7
DATE OF PANEL RECOMMENDATION:	Not Panel Reviewed
DATE OF NOTICE OF APPROVAL TO THE APPLICANT:	MAR 29 1999

On May 6, 1996, the UroLume® was originally approved for the indication for use in men to relieve urinary obstruction secondary to recurrent benign bulbar urethral strictures less than 3.0 cm in length located distal to the external sphincter and proximal to the bulbar scrotal junction. The UroLume® prosthesis is not intended as an initial treatment for bulbar urethral strictures nor for the treatment of strictures outside the bulbar urethra. The UroLume® prosthesis is an alternative treatment for the patient in whom previous treatment methods (dilation, urethrotomy or urethroplasty) have been unsuccessful (i.e., treatment was not effective initially in relieving stricture disease or there has been recurrence of stricture formation necessitating further treatment).

The UroLume® was also approved on April 11, 1997, for the indication to relieve prostatic obstruction secondary to benign prostatic hyperplasia (BPH) in men at least 60 years of age, or men under 60 who are poor surgical candidates, and whose prostates are at least 2.5 cm in length.

The sponsor submitted this supplement to expand the clinical indications to include the data to support the expanded indication, relief of urinary obstruction due to detrusor-external sphincter dyssynergia (DESD). For more information on the data which supported the original indication, the original Summary of Safety and Effectiveness Document to the original PMA should be referenced and can be obtained from the FDA Freedom of Information Office, 5600 Fisher Lane, HFI-35, Rockville, Maryland 20850 under Docket #96M-0356. For the supplemental PMA application for BPH indication refer to Docket #98M-0050. This information can also be accessed via the FDA CDRH internet home page located at http://www.fda.gov/cdrh/pmapage.html.

II. INDICATIONS FOR USE

The American Medical Systems UroLume® Endourethral Prosthesis (hereinafter called UroLume®) is intended for use in men to relieve urinary obstruction due to detrusor-external sphincter dyssynergia (DESD).

III. DEVICE DESCRIPTION

The UroLume® is a braided mesh cylinder designed to radially expand after deployment to hold open sections of the external sphincter that obstruct the flow of urine. It is designed to hold open the external sphincter mechanism from the verumontanum to the bulbar urethra. The UroLume® Endoprosthesis is intended as a long term (not temporary) stent. The stent is made from Elgiloy®, a non-ferromagnetic metal alloy composed of cobalt, chromium, nickel, molybdenum, iron, and trace amounts of manganese, carbon, silicon, phosphorous, sulfur, and beryllium. The stent is delivered cystoscopically using a specially designed insertion tool intended to deploy the prosthesis in a controlled manner. Upon deployment, the stent expands in diameter and shortens in length. Its final dimensions are determined by the size and resistance of the

external sphincter opening. The stent is supplied sterile in 2, 2.5, and 3 cm lengths and opens to a maximum expanded diameter of 14 mm (42 French).

The prosthesis is sterile and packaged pre-loaded in a specialized, disposable delivery tool. The clinical study used 2 different tool designs, however only the second design will be marketed and it consists of two concentric stainless steel tubes with an outer diameter of approximately 7 mm (21 French). The tool includes two security buttons; the first button partially deploys the prosthesis without complete release from a retractable clamp, while the second security button fully retracts the delivery tool's outer shaft, opens the retaining clamp and completely releases the prosthesis. The outer shaft has windows to allow visualization of the urethra and the constrained prosthesis.

IV. CONTRAINDICATIONS

The following conditions contraindicate use of the UroLume® Endoprosthesis for the treatment of DESD.

1. Meatal or urethral strictures which cannot be opened to at least 24 Fr by dilation, urethrotomy or meatotomy.
2. Patients with an active urinary tract infection.
3. Patients with other urinary conditions requiring transurethral manipulation within eight weeks of UroLume® Endoprosthesis placement.
4. Patients with known or suspected prostate cancer.
5. Presence of urethral squamous cell carcinoma.
6. Patients with bladder cancer.
7. Patients with untreated bladder stones.
8. Patients with untreated bladder neck obstruction.
9. Patients with untreated obstructive benign prostatic hyperplasia.
10. Presence of fistula at the proposed prosthesis location.

Refer to the UroLume® for DESD labeling for a list of the warnings and precautions.

V. ADVERSE EFFECTS OF THE DEVICE ON HEALTH

There were six patient deaths during the open label study. The primary causes of death were cardiopulmonary arrest due to arteriosclerotic heart disease, recurrent aspiration pneumonia and respiratory failure, suicide, cerebrovascular accident, pulmonary insufficiency with complications of anticoagulant therapy and sepsis of non-urologic origin, cardiopulmonary collapse due to urosepsis. One patient death in the randomized study was due to sequelae of chronic traumatic quadriplegia. None of the deaths were considered to be device related.

Adverse Event	Open Label	Randomized	Total
Urinary Tract Infection (UTI)	71% (113/160)	65% (20/31)	70% (133/191)
Tissue Response	8%(13/160)	61% (19/31)	17% (32/191)
Autonomic Dysreflexia (AD)	34% (55/160)	45% (14/31)	36% (69/191)
Hematuria	33% (53/160)	39% (12/31)	34% (65/191)
Migration	24% (38/160)	16% (5/31)	23% (43/191)
Bladder Neck Obstruction	23% (36/160)	36% (11/31)	25% (47/191)
Inadequate Sphincter Coverage	21% (33/160)	29% (9/31)	22% (42/191)
Urosepsis	13% (20/160)	3% (1/31)	11% (21/191)
Bladder Stone	0.6% (1/160)	13% (4/31)	3% (5/191)
Encrustation	12% (19/160)	0% (0/31)	10% (19/191)
Temporary Retention	10% (16/160)	16% (5/31)	11%(21/191)
Post Operative Fever	4% (6/160)	16% (5/31)	6% (11/191)
Stents Removed Based on Total Stents Inserted	29% (81/279)	35% (18/51)	30% (99/330)
Additional Stents	21% (58/279)	10% (5/51)	19% (63/330)

Refer to the Summary of Clinical Investigations (Section IX) for additional details on the adverse events.

VI. ALTERNATE PRACTICES AND PROCEDURES

DESD is treated using surgical techniques, pharmacological interventions, and external manipulation. The surgical techniques include: sphincterotomy, dorsal rhizotomy with external neural stimulation, cystectomy/urinary diversion, balloon dilation, suprapubic catheterization, or indwelling urethral catheterization. The pharmacological interventions include: anticholinergics muscle relaxants, alpha-adrenolytics, enkephalin blockers, botulinum toxin, bethanechol chloride, and neural block and stimulation. The external manipulation techniques include: clean intermittent self catheterization, crede maneuver/valsalva maneuver/suprapubic compression, or anal stretch.

VII. MARKETING HISTORY

The UroLume® is available throughout most of Europe, Canada, the Middle East, Africa, Latin America, Australia, and the Pacific Rim. The UroLume® has been available in the United States since May 6, 1996. To date, the UroLume® has not been withdrawn from any market for any reason related to the safety or effectiveness of the device.

VIII. SUMMARY OF PRECLINICAL STUDIES

The preclinical studies were identical to those performed for the previously approved bulbar urethral stricture indication and the BPH indication of the UroLume®. Refer to the original Summary of Safety and Effectiveness Document (Docket # 96M-0356).

IX. SUMMARY OF CLINICAL INVESTIGATIONS

Study Design

The UroLume® clinical investigation was conducted in accordance with an approved investigational device exemptions (IDE) application (G900145). This original study was a baseline controlled study (i.e., it was not controlled against any another treatment for DESD) and is referred to as the "open label study" in this summary. The investigation began on August 22, 1990, and data generated from this study was collected between January 10, 1991, and May 1, 1998. The total study enrollment that resulted was 120 patients at 10 United States investigational sites and 40 patients at 5 Canadian investigational sites. Although 15 investigational sites participated in the open label study, 65% (105/160) of the patients were enrolled at 5 investigational sites.

FDA recommended that the sponsor conduct a separate study which randomly assigned patients to receive transurethral sphincterotomy (TUS) or the UroLume®. The randomized study protocol began on July 22, 1993, and data generated from this study was collected between August 26, 1993, and May 1, 1998. Total enrollment at three investigational sites in the United States for this randomized study protocol was 57 patients, 31 who received the UroLume® and 26 who received TUS. There were four patients, one UroLume® and three TUS, who refused the treatment assigned. Approximately 80% (46/57) of the patients under the randomized study were enrolled at two investigational sites.

A. Objectives

The objectives of the open label study were: 1) to assess the ease and reliability of endoscopically inserting and positioning the stent within the external urinary sphincter, 2) to demonstrate that the prosthesis successfully holds open the external urinary sphincter to relieve symptoms of DESD, 3) to assess the urothelialization of the stent and its effect on the stent and external urinary sphincter, and 4) to assess any adverse events, their incidence, and management.

The randomized study was designed to evaluate the effectiveness of the UroLume® relative to TUS, the standard treatment for patients with DESD. The study was intended to demonstrate: equivalent effectiveness to TUS, fewer procedural complications when compared to TUS, and comparable follow-up safety experience when compared to TUS.

B. Inclusion and Exclusion Criteria

Open Label Study

Included in the study are male patients, 21 years and older, with: 1) detrusor-external sphincter dyssynergia, 2) absence of bladder neck obstruction, 3) adequate detrusor contraction, and 4) adequate bladder compliance. The patients must also be acceptable surgical candidates and candidates for surgical sphincterotomy.

Excluded from the study are patients with: active urinary tract infection, bladder cancer or bladder stones, urethral strictures, inadequate detrusor contraction or poor bladder compliance, and bladder neck obstruction. Also excluded from the study were patients who were unable to understand or unwilling to sign consent and patients unwilling to return for follow-up studies. Due to an unforeseen adverse event in the BPH investigation of the UroLume®, an additional exclusion criteria was added: patients who suffer from thrombocytopenia or hemophilia, and/or patients who have received blood products for the treatment of a bleeding disorder may be excluded if there are other alternative treatment options that would put the patient at less risk of bleeding than that associated with the UroLume®.

Randomized Study

The inclusion criteria for the randomized study differed from the open label study in that the patients only needed to be 18 years or older and did not have to have adequate bladder compliance. The exclusion criteria for the randomized study was the same as the open label study except that the randomized study also excluded patients with an artificial urinary sphincter, and patients on alpha blocker medication.

C. Protocol

Prior to the UroLume® implantation the length of the external sphincter from the distal end of the sphincter to the verumontanum is measured during cystourethroscopy using a specially marked measuring catheter. Under visual guidance the UroLume® is then implanted across the external sphincter sometimes using multiple/overlapping stents, if needed to adequately bridge from the external sphincter to the verumontanum.

The open label study assessed detrusor leak point pressure (LPP) and post-void residual urine volume (PVR) as primary effectiveness variables. Also measured were the maximum cystometric capacity, presence of hydronephrosis, presence of autonomic dysreflexia (AD), catheter usage for bladder management, and urothelialization of the prosthesis as secondary effectiveness variables. Note that catheter usage, presence of hydronephrosis, and presence of AD were analyzed as both safety and effectiveness variables.

The protocol noted the occurrence and resolution of all adverse events. The safety variables or risks associated with insertion of the UroLume® include bleeding, improper placement, need for a suprapubic catheter, risks of anesthesia, and urethral injury. The safety risks associated with having a UroLume® within the external sphincter include: UTI, hydronephrosis, AD, encrustation, erosion, stent fracture, migration, stent contraction, obstructive hyperplasia within the stent, unusual cell growth requiring biopsy, incontinence, need for a condom catheter, epididymitis, and sexual dysfunction.

The randomized protocol was designed to collect the same type of information and compare it to the results from the TUS patient group. It also included a measure of overall patient satisfaction.

D. Critiques of Study and Analysis

The protocol deviations reported for the open label study included patient selection deviations related to age and concomitant diseases, a procedural deviation related to informed consent, and patient evaluation deviations related to data collection. These deviations were explained or justified so data from these patients were included in all analyses and not analyzed as a separate cohort.

Although the randomized study effectiveness data did suggest similar clinical results for both UroLume® and TUS, due to the limited amount of data available, many of the results from the randomized study were not statistically significant.

E. Statistical Tests

All demographic and descriptive information collected from the clinical data forms were summarized and presented in a tabular or graphic format. Continuous variables are summarized as a mean, number of observations, minimum, maximum, and standard deviation. Categorical data are summarized as the number of responses for that category and as a percentage. All descriptive analyses and statistical tests were calculated and evaluated using SAS statistical software. Statistical tests with a p-value of 0.05 or less were considered statistically significant. All time related Analysis of Variance testing (ANOVA) was conducted as a Repeated Measures Analysis. Data were evaluated using either a One-Way Repeated Measures Analysis of Variance (ANOVA) test or a Chi-square test. If the ANOVA indicated a significant difference between more than two groups, the Bonferroni or Dunnett multiple comparison procedure was used to identify significant differences. The primary and secondary objectives were tested to at least the 12-Month follow-up visit.

F. Pretreatment Characteristics

The following table presents a summary of the pretreatment characteristics.

Characteristic	Open Label Study	Randomized Study	
		UroLume®	TUS
Age (Mean±Standard Deviation)	36±12	39±12	35±10
Etiology	150 SCI patients 8 MS, 2 Other	31 SCI	24 SCI, 2 Other
SCI Location: Cervical	118[1]	22	18
Thoracic	33	9	8
Lumbar	3	NA	NA
Duration of Disease (Years)	9±9.4[2]	8±5.3	8.8 ±6.6
Years Since Diagnosis:			
> 2 years	80%(128/160)[3]	90% (28/31)	92%(24/26)
≤ 2 years	19% (31/160)	10% (3/31)	8%(2/26)
Urinary Tract Procedures:			
Sphincterotomy	46	1	5
TURP	11	1	1
BN Resection	11	1	0
BN Incision	4	1	3
Bladder Management Method:			
Indwelling Catheter	41[4]	11	11
Intermittent Catheter	38	6	2
Suprapubic Catheter	7	1	0
No Intervention	38	5	6
Crede/Straining/Reflex	27	8	7
Pharmacological	9	0	0
Detrusor LPP: Mean	75 cm H_20	96 cm H_20	98 cm H_20
≥ 40 cm H_2O	91%(127/140)[5]	100%(31/31)	100%(26/26)
≥ 60 cm H_2O	76%(106/140)	90%(28/31)	92% (24/26)
PVR: Mean	205±150 cc	168 ±113 cc	212±163 cc
> 100 cc Residual	67% (87/130)[6]	81% (25/31)	62% (16/26)
Maximum Cystometric Capacity (Mean ± Standard Deviation)	269 ± 156 cc[7]	251 ± 145 cc	245 ± 158 cc
Hydronephrosis	20% (30/150)[8,9]	20% (6/30)	12%(3/26)
Vesicoureteral Reflux	13% (20/160)	NA	NA
History of AD	72% (115/160)	58% (18/31)	62% (16/26)
History of UTI	96% (153/160)	54% (15/28)	40% (10/25)

[1] Since some patients had multiple injuries 154 total SCI locations were recorded.

[2] Duration of disease ranged from 5 months to 47 years in the open label study.

[3] Years since diagnosis was unknown in 1 patient in the open label study.

[4] 72% (115/160) of the open label patients used a condom catheter before the stent.

[5-8] Excludes 20[5], 30[6], 13[7] , 10[8] patients where the data were not obtained.

[9] 15% (23/150) on the right side, 19% (28/149) on the left side.

H. Effectiveness Analysis

The table below is a summary of the effectiveness results from both studies.

Measurement	Open Label Study	Randomized Study	
		UroLume®	TUS
Mean Detrusor LPP[1]:			
Approximate Drop	35 cm H_2O	24 cm H_2O	39 cm H_2O
Less than 40 cm H_2O	≥ 50%	≥ 20%	≥ 29%
Less than 60 cm H_2O	≥ 74%	≥ 60%	≥ 76 %
PVR	NS[2]	NC	NC
Max. Cystometric Capacity	NC	NC	NC
Catheter Use:			
At Baseline	54% (86/160)	71% (22/31)	50% (13/26)
12 Months	10% (13/130)	4% (1/23)	12% (2/17)
Hydronephrosis	6% (7/119)[3]	NC	NC
Autonomic Dysreflexia			
Absent at 1 year	70% (88/125)	NC	NC
Absent at 3 years	59% (47/80)	NC	NC
None after stent [4]	33 of 115	13 of 18	9 of 16
Urothelialization[5]:			
3 Months	50% (65/132)	79% (19/24)[6]	NA
6 Months	75% (100/133)	82% (19/23)[7]	NA
12 Months	83% (105/126)	95% (21/22)[8]	NA
Maximum Coverage	97% of Patients [10]	100% (20/20)[9,11]	NA
UTI	NS	NS	NS
Quality of Life	NA	Satisfied	Satisfied
Sexual Function	NC	NC	NC

NC – No Significant Change, NS – Not Statistically Significant, NA – Not Applicable

[1] Change from baseline over all follow-up available.

[2] Due to inherent variability of this measurement, no statistical conclusions could be drawn however the data indicate approximately a 100 cc PVR decrease post insertion.

[3] Only pertains to those patients with hydronephrosis data available at 12 months. Hydronephrosis was 5% (6/119) on the right side and 3% (4/117) on the right side.

[4] Larger number is the number of patients at baseline who reported a history of AD.

[5] Urothelial tissue growth covering 90% to 100% of the stent surface.

[6-9] Urothelialization unknown in 7[6], 8[7], 9[8], and 11[9]patients.

[10-11] Measured at 4 years[10] and 2 years[11].

The change in mean detrusor LPP indicates a clear and clinically significant decrease. As expected, the UroLume® did not have an effect on the maximum cystometric capacity. Catheter use decreased compared to the baseline historical measure. Hydronephrosis decreased compared to baseline. Autonomic dysreflexia decreased compared to the baseline historical measure and a few patients no longer had AD who had it at baseline. Urothelialization occurred fairly rapidly. From the randomized study the patients were satisfied with the assigned treatments. The UroLume® does not effect sexual function.

The sponsor was asked to perform an analysis of stents in and stents out of a patient for any reason. The reasons for stents out included a variety of categories. Removal is taking a stent(s) out of a patient where other stent(s) remain in the patient. Replacement is taking a stent out with immediate placement of another stent(s), not at the time of initial stent insertion. Retrieval is taking a stent out during the insertion procedure. Note that retrievals refer to stents released from the insertion tool which were immediately taken out of the patients, distinguished and accounted for separately than stents taken out due to insertion difficulties which only include stents that were never released from the insertion tool. Explant refers to the taking out all stents from a patient. Reinsertion is stent placement in a patient who was previously explanted.

Using those definitions, in the open label study, 279 total stents were inserted into 160 patients and 81 stents were taken out (37 explants, 24 retrievals -13 which were replaced during the procedure at which they were retrieved, 12 insertion difficulties, 6 replacements, and 2 removals). Based on the number of stent insertions attempted, 29% (81/279) of the stents were either taken out or had insertion difficulties. Based on the number of patients in the open label study, 33% (52/160) of patients had stents taken out.

The randomized study used the same definitions as the open label study to evaluate the number of stents placed and taken out of the patients. The 51 stents put into 31 patients included 18 stents taken out for the following reasons: 8 explants, 8 retrievals, 1 insertion difficulty, and 1 replacement. Based on the number of stent insertions attempted, 35% (18/51) of the stents were either taken out or had insertion difficulties.

Under the open label study 58 additional stents, or 21% (58/279) of all stents used, were inserted into 41 patients. This indicates that 26% (41/160) of patients can expect to need additional stents inserted for the DESD application of the UroLume®.

During the randomized study, 5 additional stents were needed in 5 patients, or 16% (5/31) of those patients. Only 1 TUS patient underwent repeat sphincterotomy.

I. Safety Analysis

Open Label Study

The adverse event listings include many different complications that occurred during the clinical trial. The open label study included 1383 anticipated adverse events and 8 additional unanticipated adverse events over 9,405 months of device use. The incidence of any anticipated adverse event is (1383 events/160 patients) or 8.6 events per patient. Forty-three percent, 43% (589/1383), of these events occurred in the first 12 months.

The table below identifies the adverse events that occurred most frequently in the open label study.

Adverse Event	Percentage of Patients	Number of Incidents	Number w/in 1st year
UTI	71% (113/160)	563	206
AD	34% (55/160)	109	47
Hematuria	33% (53/160)	73	47
Migration	24% (38/160)	49	36
Bladder Neck Obstruction	23% (36/160)	41	23
Inadequate Coverage	21% (33/160)	40	24
Urosepsis	13% (20/160)	28	14
Encrustations	12% (19/160)	23	3
Temporary Retention	10%(16/160)	18	11

The 8 unanticipated events included: two early distal migrations, stent unraveled during removal with proximal migration, condom catheter complications, broken stent wires attributed to rigid penile prosthesis that rubbed on the stent, squamous metaplasia, urethral perforation during removal which caused scrotal enlargement, and penile implant infection.

For the safety analyses, the 1383 adverse events were classified as either stent position events, stent events related to the urinary tract, or non-urologic events. The 96 stent position events occurred in 44% (71/160) of patients and included 40 inadequate coverage events in 20% (33/160) of patients. Insertion of an additional stent to resolve inadequate stent coverage is supported by the fact that of 20 separate patients who received an additional stent to solve inadequate sphincter coverage, 18 of those patients did not require further intervention. The sponsor attributes the inadequate coverage to transitional tissue distal to the external sphincter which remains active and stent contraction upon radial expansion.

Of the 49 migration events in 24% (38/160) of patients, 36 occurred before 1 year (29 before 6 months). Additional stents were used to address migration in 22 of those cases, and 20 of them did not need further intervention. Migration was attributed to involuntary contractions of the external sphincter and manipulation of the stent prior to adequate urothelialization.

The stent events related to the urinary tract accounts for 1316 anticipated adverse events. These adverse events were grouped into 11 categories for analysis: upper tract (kidneys, ureters), bladder, bladder neck, prostate, urethra, sexual organs, infection, micturition, catheter use, autonomic dysreflexia, and pain.

Conditions of the upper urinary tract accounted for 56 adverse events in 36 patients and included 27 hydronephrosis events in 20 patients. The 45 adverse events of the bladder

were occurred in 32 patients. There were 41 bladder neck obstruction events in 36 patients, which occurred before 1 year in 54% (22/41) patients. The 15 prostate events in 14 patients were resolved with TURP in 4 of the cases. Urethral events account for 99 events (54 outside the stent and 45 inside it) which included 23 encrustations of the stent in 19 patients and 23 strictures located beyond the stent boundaries in 13 patients. Note that urethral events includes a subcategory of events termed "tissue response" which included 3 inflammation/granulation events, 4 squamous metaplasia events, 3 cases of polyps, and 3 events of hyperplasia within the stent. There were 69 patients who experienced 94 sexual organ adverse events which were classified into 15 different categories, of which the most frequently occurring is 32 events of epididymitis/epididymo-orchitis in 21 patients and 23 skin breakdown events in 16 patients. The 620 infection events, classified into 8 categories, included all 160 patients and was one of the largest adverse event categories. Micturition events occurred 113 times in 86 patients and included 73 hematuria events in 53 patients. There were 13 catheter use events in 12 patients. The 109 autonomic dysreflexia events in 55 patients occurred before 1 year in 85% (47/55) of those patients. There were 9 pain events in 9 patients also recorded.

The non-urologic events accounted for 72 adverse events in 63 patients. These events were not related to the presence of the stent.

Randomized Study

The randomized study included 423 adverse events in 57 total patients enrolled. In the UroLume® patients, the most frequently occurring adverse events were: 103 events of UTI in 65% (20/31) of patients, 22 events classified as "tissue response" in 61% (19/31) of patients, 15 hematuria cases in 39% (12/31) of patients, 11 cases of bladder neck obstruction in 36% (11/31) of patients, 14 cases of AD in 45% (14/31) of patients, 9 events of inadequate coverage in 29% (9/31) of patients, 7 cases of temporary retention in 16% (5/31) of patients, 6 bladder stone events in 13% (4/31) of patients, and 5 events of migration in 16% (5/31) of patients, and post operative fever in 16% (5/31) of patients. These events were similar to those presented in the open label study.

Analysis of the insertion data based on the total procedures performed, rather than on number of patients or stents, for both randomized treatments demonstrated that post-operative bleeding occurred in 38%(15/39) of the UroLume® patients and in 74%(20/27) of the TUS procedures. The average procedure length for the UroLume® was 34±39 minutes and 48±39 minutes for TUS. The hospitalization time needed for each treatment was more than 1 day for 63% (24/38) of the UroLume® procedures compared to 88% (24/27) of the TUS procedures.

X. CONCLUSIONS DRAWN FROM THE STUDIES

The laboratory, animal, and clinical data provide reasonable assurance of the safety and effectiveness of the UroLume® for the treatment of DESD when used as indicated, in accordance with the label.

The UroLume® benefits the patient since it can be removed and leave the patient available for alternative treatment options. Its beneficial effect on detrusor LPP was demonstrated in both clinical investigations.

The risks of the UroLume® include its possibility of migration, need for additional stents or explant. Additionally, the patient's susceptibility to UTI is not changed nor does the device improve the patient's post void residual levels.

XI. PANEL RECOMMENDATION

No meeting of the Gastroenterology/Urology Devices Advisory Panel was held on the basis of sufficient experience and knowledge of the prior applications of the device by CDRH reviewers and clinicians. The adverse event profile is comparable to the prior indications based on a comparison of the Summaries of Safety and Effectiveness.

The effectiveness data which are different than the other indications of the UroLume® include detrusor leak point pressure and maximum cystometric capacity. Although evaluation of the UroLume® performance using these two measurements is new, their values can be compared to their documented "normal" measurements. The new safety data that is different from data collected under the approved indications of the UroLume® include epididymitis, hydronephrosis and autonomic dysreflexia. These new data can be compared to the expected normal measures using the experience of the staff urological medical consultants.

XII. CDRH DECISION

The Conditions of Approval that accompanied the May 6, 1996, FDA approval order for the recurrent bulbar urethral strictures application and the April 17, 1997, approval order for the BPH application required the sponsor to conduct post-approval studies to further assess safety and effectiveness. CDRH determined that, based on the modified labeling and the ongoing post approval studies from prior applications of the UroLume®, the application was approvable without additional post approval studies.

FDA determined that the applicant's manufacturing facilities complied with the Good Manufacturing Practices Regulation.

CDRH issued an approval order for the application on MAR 29 1999

XIII. APPROVAL SPECIFICATIONS

Directions for Use: See labeling.

Hazards to Health from Use of the Device: see indications, contraindications, warnings, precautions and adverse events in the labeling.

Post Approval Requirements and Restrictions: see approval order.