

LASER MEDICINE. NEWS

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Issue 02/25
Topic: Urology

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TOP NEWS

Maximum Versatility of minimally invasive Laser Therapies in Urology

The fact that urology opens up many possibilities for lasers prompted biolitec® to build the most versatile portfolio, covering lithotripsy, bladder tumors, BPH, prostate cancer, soft tissue treatment, and more – including comprehensive laser and fiber solutions for maximum clinical flexibility. The safety and efficacy of these cost-effective technologies empower surgeons to treat an ever-wider range of patients and are confirmed by numerous studies.

For stone management in lithotripsy, biolitec® offers the new Thulium Fiber Laser LEONARDO® Duster for superior dusting and faster removal of all stone types. In European Urology (2022) Øyvind Ulvik et al. consider TFL to be the emerging laser of choice for stone lithotripsy, as significantly more patients with renal stones achieved stone-free status and fewer intraoperative complications. According to Taratkin et al. in World Journal of Urology (2023) at 3 months follow-up, 100% of TFL-treated patients were stone free (defined as no residual stone fragments of ≥ 3 mm).

Management of recurring bladder tumors is enabled by TULA® DUAL transurethral laser ablation – a quick, safe and easy outpatient

Clear advantages of Thulium Fiber Laser compared to Holmium:YAG for Ureteroscopic Lithotripsy

86 % stone free rate (SFR) for renal stones

49 % (SFR) for renal stones

5 % intraoperative complications

22 % intraoperative complications

■ TFL ■ Ho:YAG

Figures based on: Ulvik, Øyvind et al.: Thulium Fibre Laser versus Holmium:YAG for Ureteroscopic Lithotripsy: Outcomes from a Prospective Randomised Clinical Trial; European Urology 82 (1); July 2022; pages 73-79;

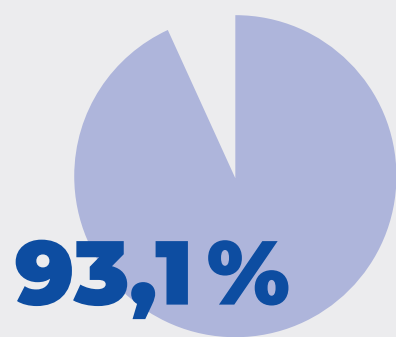
procedure with excellent vaporization and hemostasis. As C.P.Y. Ng et al. substantiated in BJUI Compass (2025), TULA® is a safe, minimally invasive treatment with long-term efficacy for elderly and comorbid patients with recurrent NMIBC, offering excellent long-term overall and cancer-specific survival. Compared to TURBT, N.N. Deacon et al. in Cancers (2024) attest – based on patient-reported outcome – that TULA® has a lower early symptom burden and a lower risk of complications.

BPH can be treated minimally invasively with the LEONARDO® Duster, XCAVATOR® and TWISTER fibers. Endoscopic contact laser vaporization of the prostate (CVP) can be performed safely and effectively even in patients undergoing continuous antithrombotic therapy, as shown by T. Sanjo et al. in the Asian Journal of Endoscopic Surgery (2022). F. Yamamichi et al. confirm in LUTS (2024) that CVP using the new XCAVATOR® fibers is a minimally invasive surgical procedure without severe complications and favorable outcomes. Regarding BPH enucleation treatment using Thulium Fiber Laser, the results of a systematic review & meta-analysis by A. Uleri et al. presented in European Urology Focus (2024) confirm that at 3 months post-op, Thulium Fiber Laser enucleation of the prostate (ThuFLEP) showed a better International Prostate Symptom Score (IPSS) than Holmium Enucleation of the Prostate (HoLEP).

The biolitec® portfolio also includes solutions for soft tissue ablation, partial nephrectomy and treatment of prostate tumors. Laser therapy in urology offers precise, minimally invasive treatment with less bleed-

High rates of Progression Free Survival with TULA® treatment of NMIBC

Progression Free Survival (PFS) high-risk NMIBC treated with TULA®



Figures based on: C.P.Y. Ng et al.: Long-term outcome of transurethral laser ablation for recurrent non-muscle invasive bladder cancer: An EORTC risk-matched study; BJUI 6 (7); July 2025

ding, faster recovery, and broad applicability across conditions such as BPH, kidney stones, and tumors. Newer lasers like Thulium Fiber Laser (TFL) provide improved efficiency, lower maintenance, and easier learning curves compared to older technologies. As healthcare shifts toward outpatient care, organ preservation, and high patient expectations, laser therapy will become increasingly central in modern urology.

EDITORIAL

Laser as a Driver of Outpatient Transformation in Urology

Dear Readers,

Welcome to the second edition of Laser Medicine.News – this time the focus is on the latest innovations and applications of laser technology in urology. Cost pressures in healthcare are driving a shift toward outpatient care, including in urology. However, thanks to the development of modern laser technology, many treatments can now be performed minimally invasively and on an outpatient basis. Lasers therefore contribute significantly to reducing costs. With Transurethral Laser Ablation (TULA®) for

the treatment of bladder cancer, biolitec® is setting innovative benchmarks in this field. Also, biolitec® has introduced the new LEONARDO® Duster, the thulium fiber laser for lithotripsy, benign prostatic hyperplasia, and soft tissue treatment. This versatile and precise solution will redefine laser therapy in urology. biolitec® offers the most comprehensive laser portfolio, combined in the state-of-the-art LEONARDO® product family, along with the broadest fiber portfolio, covering the entire spec-

trum of urological applications – aiming at greater quality and cost efficiency for the benefit of patients.

In this issue, you will learn everything about laser applications in urology-Including the latest evidence and the key findings from the most important current studies. In the interview, Dr. Sachin Agraval (Ashford and St. Peter's Hospitals NHS Foundation Trust) reports on the advantages of TULA® in the context of the outpatient transformation in the UK. In another interview, Dr. Dr. habil.

Christopher Netsch, Chief Physician of Urology at the Asklepios Clinic in Barmbek, highlights the advantages of the thulium fiber laser over alternative procedures. What's more, you'll find information on outpatient care not only in the UK, but also in Spain and Germany.

Join us on this exciting journey into the world of urological laser therapy.

Yours sincerely,
CARSTEN BUCHMÜLLER

CARSTEN BUCHMÜLLER

Managing Director of biolitec biomedical technologies GmbH





INTERVIEW

Transurethral Laser Ablation (TULA®) and its Advantages for Patients and Cost Savings

Dr. Sachin Agrawal

Dr. Sachin Agrawal is Consultant Urological Surgeon at Ashford and St. Peter's Hospitals NHS Foundation Trust, with specialist interests in renal cancer, endourology, stones and non-muscle invasive bladder cancer. He has over 10 years of experience in private health care covering all aspects of urology, and is the NHS GIRFT TULA® Chair.

Dr. Agrawal, why did you start working with TULA®?

We wanted to find a different way of treating bladder cancer in our elderly and our frail patients and needed a solution where those patients could avoid a general anesthetic, i.e. where they could be treated on an outpatient basis. After we developed the procedure and techniques, we performed the first TULA® in 2013. At my current center we started with TULA® in 2017 and now perform about 600 procedures annually.

TULA®'s scope has expanded in terms of what you can treat safely under local anesthetics and has expanded to younger fitter patients with low/intermediate risk disease. You can treat larger and higher-grade tumors if a general anesthetic is too high-risk. TULA® makes a real difference. For patients, it means avoiding general anesthesia and hospital admission.w

Which patients are suitable for TULA®?

TULA® is ideal for patients with low to intermediate risk, as well as for elderly and frail patients with high-risk disease, where it has

yielded good outcomes. Comparing the outcomes to EORTC risk groups, we found that our risk of progression and recurrence is nearly identical to that of a typical TURBT case. According to the UK guidelines I recently co-authored, indications have been expanded to include low-risk disease, intermediate-risk based on user experience rooted in patients factors, and disease volume. TULA® allows us to “see and treat” a tumor straight away when we see it during (flexible) cystoscopy, avoiding a second procedure.

You just mentioned the new UK guidelines. What specifically do they recommend regarding TULA®?

TULA® is now included in the NHS GIRFT (Getting It Right First Time) Guidelines, with specific recommendations published about two months ago covering key topics and the learning curve as well as logistics/ set up, information on patient groups and a flow chart describing this. Expert opinion has identified several diagnostic, surveillance and treatment groups suitable for TULA®, including bladder “red patch” diagnosis, recurrent low to intermediate risk lesions in all patients as well as post-BCG/intravesical therapy surveillance. The UK NICE Guidelines for TULA® also confirms UK experience, safety and efficacy. (see QR-Code: GIRFT TULA® Recommendations)

How are the outcomes in your center?

When risk-matching low and intermediate risk group patients against EORTC in terms

of progression or recurrence we find that there's no difference in over 2,000 patients. Patients in the higher and very high-risk groups have a slightly increased risk of progression and recurrence, but these are mainly elderly and frail patients, where we have an almost palliative focus on managing symptoms – preventing bleeding, infection, and tumor growth. Patients unfit for TURBT or other therapies receive endoscopic management with TULA®. We know in these groups, only 1 to 2% die of bladder cancer whereas the majority die of unrelated disease. The progression rate-especially muscle invasion was low and reassuring. Long-term overall survival and cancer-specific survival remained excel-

especially when accounting for opportunity benefits. TULA® also saves costs for the patient, as it is an outpatient procedure and he or she only needs to visit the hospital once.

What kind of laser and settings do you use?

In the UK outpatient setting, most units primarily use the LEONARDO® Dual Mini Diode Laser, because it is very small and portable, and offers the advantage of dual wavelengths. We also use a thulium laser, but that is more theatre-based. My diode laser is typically set at 1470 nm with 3 watts, keeping energy low.

TULA® allows us to “see and treat” a tumor straight away when we see it during (flexible) cystoscopy, avoiding a second procedure.

Dr. Sachin Agrawal

lent, according to data we recently published on this topic. (see QR-Code: TULA®-Study)

Are there additional advantages of the TULA® therapy?

TURBT or cystodiathermy and other operative procedures require inpatient or day-case beds, whereas with TULA®, you simply come in for your treatment and go home. With TULA®, we perform six cases in an afternoon instead of six theatre procedures in a whole day, which increases efficiency, frees up theatre capacity, and avoids secondary procedures for most patients – resulting in significant cost savings from an organizational perspective. By performing 1,000 procedures, we save over £1,000,000 in costs through lower cost to the fee payer, reduced beds costs and improved efficiencies. Although the tariff is lower, we deliver care more cost-effectively, still making a profit. Additionally, freeing up beds, theatre time, and staff offers further organizational benefits. This adds up, so the laser device and setup pay for themselves within the first 50 procedures. After that, follow-up procedures yield significant organizational cost savings,

Do you have any tips for colleagues starting to work with TULA®?

We host workshops and courses where visitors can see our setup, watch presentations, and learn about outcomes and techniques from various groups.

As outlined in the GIRFT guidelines, I would recommend graded skill progression: start small with biopsies, then treat tumors up to one centimeter, progress to larger tumors, anticoagulated patients, and finally advanced techniques like resection and en bloc procedures.

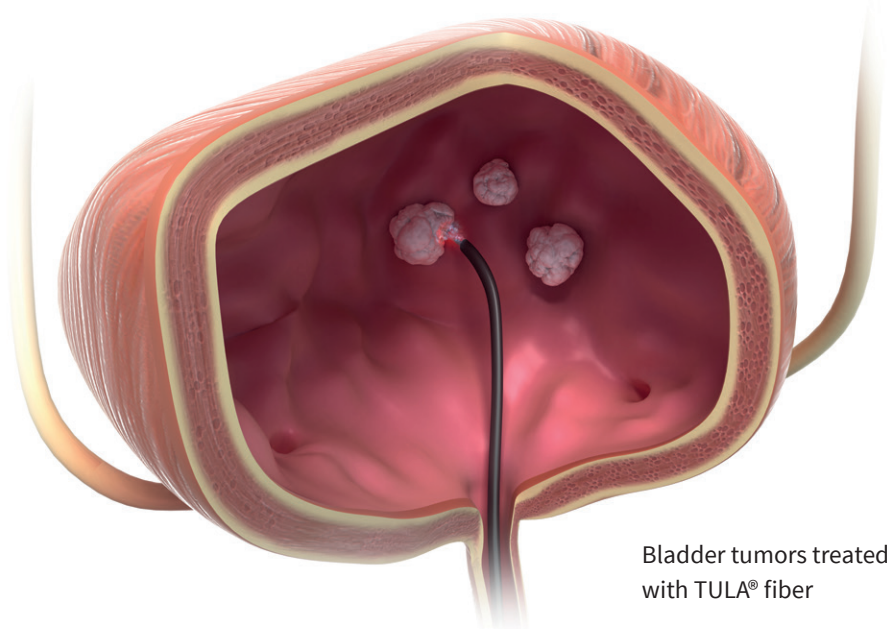
Thank you very much for the interview Dr. Agrawal.

GIRFT TULA®

Recommendations



TULA®-Study



Bladder tumors treated with TULA® fiber

Advantages of Thulium Fiber Lasers (TFL) in Urology

Dr. Christopher Netsch

Dr. Christopher Netsch is Chief Physician of Urology at the Asklepios Clinic in Barmbek. He is a specialist in urology with a focus on endourology, DaVinci surgery, and the treatment of incontinence. In his role, he is responsible for managing urology at the Barmbek site and implementing state-of-the-art minimally invasive techniques.

Dr. Netsch, how long have you been working with thulium lasers and TFL, and how many procedures do you perform each year?

I have been working with continuous wave (cw) thulium:YAG lasers since 2008 and with TFL since 2018/19. We perform around 220 PCNLs (mostly with laser), approx. 600 ureteroscopies (mostly with laser) and around 680 laser enucleations for BPH every year – a total of around 1,500 laser procedures per year.

What motivated you to start using TFL at your center in 2018?

In 2018, we were approached by developers from a company that launched the first TFL. At that time, they presented us with completed in vitro studies on stone and prostate treatment. Compared to holmium:YAG and continuous wave thulium:YAG lasers, TFL proved to be clearly superior. That was the starting point. Now, TFL devices are available from various suppliers.

Where do you see the advantage of TFL over alternative procedures today?

The fundamental problem with holmium lasers remains their size and noise level, which are inherent to their design – especially in high-power machines (>70 watts). The latter requires a high-voltage power connection in the operating room. The thulium fiber laser is significantly more compact, quieter, and portable, requiring only a standard power connection. When operating room utilization is high, these factors should not be overlooked.

Pure continuous wave thulium:YAG lasers will disappear from the market because they are mainly suitable for tissue treatment – stone treatment is hardly possible. The only pulsed Thulium:YAG laser that, to the best of my knowledge, is currently available is relatively loud. While it has a higher peak pulse energy than TFL, this also increases retropulsion during the treatment of ureteral stones. This latter characteristic is also exhibited by the Holmium:YAG laser: significantly higher retropulsion during lithotripsy of ureteral stones. Therefore, I

ultimately see the advantage with TFL again. Compared to ultrasonic or pneumatic lithotripsy, TFL offers the advantage of greater versatility, as lithotriptors can only be used for stones. The TFL is a device for multiple indications, including urinary stone therapy, stricture treatment, BPH therapy, and the treatment of ureteral and bladder tumors, which is naturally advantageous in terms of space and cost. You have a tidier operating room and a smaller pool of surgical equipment, with the advantage of lower maintenance costs.

What should be considered when selecting patients for TFL treatment?

According to US guidelines for the treatment of benign prostatic hyperplasia, the thulium laser can be used to treat any prostate volume. In other words, the advantage of the laser is its versatility. Today, for BPH, there are many alternative treatments, known as minimally invasive surgical therapies (MIST), which, although they cause hardly any complications as they do not involve tissue removal, often require a “real” surgery or resurgery after a latency period.

Compared to ultrasonic or pneumatic lithotripsy, TFL offers the advantage of greater versatility.

Dr. Christopher Netsch

Here too, laser surgery on the prostate is the most cost-effective option, as over a five-year period it requires fewer reoperations due to the more extensive tissue removal, and the recurrence rates are significantly lower than with alternative therapies. In summary, the indication spectrum for BPH therapy is significantly broader than for the alternative minimally invasive therapies, which, for example, deliver markedly poorer results in the presence of a median lobe of the prostate and often only work for certain prostate volumes (>80 ml).

In the treatment of bladder tumors, superficial tumors are removed with a laser in some countries – for which the thulium fiber

laser is very well suited. Personally, however, I prefer to obtain a complete tissue sample in cases of bladder tumors and therefore am reluctant to rely on laser vaporization.

As far as urinary stones are concerned, the laser can be used throughout the entire urinary tract. Kidney stones in the ureter can be easily accessed via the urethra using a rigid or flexible ureterorenoscope. Bladder stones can also be effectively treated transurethrally with the laser. The TFL is also very well suited for percutaneous urolithiasis treatment and offers advantages over low-power holmium lasers (<50 watts): the operation is significantly faster.

Are there any restrictions on the use of the laser in patients receiving anticoagulation therapy or with other comorbidities?

Aspirin is unproblematic in prostate surgery, and treatment can also be safely performed under clopidogrel. Under platelet inhibition, procedures on the prostate, bladder tumors, and urinary stones – transurethral or percutaneous – are easily possible. The situation becomes more critical with oral anticoagulants such as Warfarin (Marcumar)

or direct oral anticoagulants (DOACs), as the risk of bleeding increases significantly. I would not recommend performing prostate surgery or percutaneous kidney stone procedures under continued DOAC therapy, as the risk of bleeding is too high.

In your experience, what are the recurrence and success rates for prostate and stone treatments?

The recurrence rate after laser prostate enucleation is only 3–5% over five years, which is significantly lower than that of alternative therapies, which can reach 7–30% depending on the procedure. In prostate artery embolization, for example,

the recurrence rate after one year is already 20%. This should be taken into account when counseling patients.

When it comes to stones, success rates always depend on the type of imaging used and how stone-free is defined. Since 1-2 mm is often considered the threshold for stone-free status today, the stone-free rate for ureteroscopy in the case of a 1 cm kidney stone, for example, is approximately 80%, as fine particles remain in the urine after laser treatment, which appear as residual stones on CT scans. The procedure is similar for percutaneous removal of urinary stones. A CT scan immediately after surgery is therefore not very useful – it should be performed after about 4 weeks.

Do you prefer trying to dust or fragment stones?

I prefer dusting – also for cost reasons. When fragmenting stones in the ureter or kidney, a basket is usually required, which is not necessary when dusting. In flexible URS, up to five single-use materials may be used (sheath, single-use URS device, laser fiber, basket, wires), all of which are deducted from the hybrid DRG. Dusting eliminates the need for a basket, and I don't use single-use URS devices either – that's two items less.

How will lasers develop in urology in the coming years?

Laser applications in urology will increase in the treatment of urinary stones and BPH – both conditions are becoming more prevalent due to the aging population in Western Europe. In urinary stone therapy, there are additional factors that increase the occurrence of urinary stones: climate change (temperature increase correlates with the number of urinary stone events), the rise in the number of patients with metabolic syndrome (positively correlated with the occurrence of urinary stones), and migration of patients from regions of the world with a higher incidence of urinary stones are increasing the number of urinary stone patients in Western Europe. Laser applications will remain dominant in endourology over the next 10 years.

Thank you very much for talking to us, Dr. Netsch.

Urology is going ambulatory

The shift toward outpatient care is transforming urology across Europe. Studies from the UK, Spain, and Germany highlight how outpatient laser therapies such as TULA® reduce costs and promote efficient resource use in bladder cancer care and beyond.

The trend toward outpatient care is increasingly shaping healthcare across Europe. Motivations are cost reductions, limited bed and OR capacity, and more efficient use of resources. Innovations like lasers enable many treatments to be performed safely and effectively on an outpatient basis. Also, in urology lasers contribute to outpatient transformation. For patients, outpatient care means often fast, satisfactory results with shorter recovery times.

In the UK, the advantages of outpatient care in urology, and particularly in the treatment of bladder cancer, are highlighted by the GIRFT (Getting It Right First Time) initiative of the NHS. According to GIRFT, many urology departments have already moved toward performing more non-muscular invasive bladder cancer (NMIBC) interventions in an outpatient setting. Minimally invasive TULA® laser therapy has made an important contribution towards reducing admissions by 16% by performing procedures in the outpatient setting. There are significant cost savings in outpatient laser treatment compared to inpatient or day case bladder tumor surgery due to saving theater space and time, increased productivity, and shorter waiting times. This approach is particularly suitable for low-risk disease. TULA® should be available in all units that provide bladder cancer diagnostics, surveillance, and treatment, GIRFT recommends.¹

For Spain the economic advantages of outpatient TULA® treatment compared to transurethral resection are evidenced by concrete numbers in a study by the Urology Department of the Cabueñes University Hospital (HUCAB). TULA® treatments were performed with a LEONARDO® Mini Laser. Costs foreseen for this kind of treatment are set by the relevant health authorities at €143.81 for cystoscopy, €351 for the laser fiber, €0.98 for the probe,

and €1.60 for five ampoules of lidocaine, corresponding to a price per procedure of €497.39. Compared to €5,305.49 for inpatient transurethral resection procedure, this represents a saving of €4,500 per procedure. Based on the total of 74 outpatient procedures performed between February 2023 and January 2024, the savings would even exceed €330,000.² According to the authors of the study, TULA® is “a safe procedure with a low rate of minor complications” that “was well tolerated and accepted by all patients who underwent it.”

In Germany, the trend toward outpatient care is gaining momentum with the new hybrid DRGs, which promote this trend through cross-sector uniform remuneration for medical services. According to estimates by the Central Research Institute of Ambulatory Health Care (Zentralinstitut für kassenärztliche Versorgung), the predicted potential for outpatient care of up to three million inpatient treatment cases per year can easily be taken over by office based physicians.³ After internists, the second highest potential lies in urology, with 311,000 (42.4%) of a total of 734,000 inpatient cases that could be treated on an outpatient basis. 364 urologists who participated in a survey are already increasingly treating ureterorenoscopies for ureteral and kidney stones on an outpatient basis and expect this trend to continue.⁴ With short treatment times and significant potential savings, lasers can make a considerable contribution to further advancing the trend toward outpatient treatment in urology.

1. GIRFT Initiative / NHS: Urology: Towards better care for patients with bladder cancer. A practical guide to improving bladder cancer management; January 2022

2. Dr. Luis Rodríguez Villamil et al.: Estudio Observacional Prospectivo De Tratamiento Ambulatorio De Tumores Vesicales No Músculo Invasivos De Bajo E Intermedio Riesgo Mediante Ablación Transuretral Con Laser Diodo (TULA®); Urology Department. Cabueñes University Hospital (HUCAB); 2023

3. Publication by the Central Research Institute of Ambulatory Health Care Provision dated January 23, 2025: https://www.zi.de/detailsansicht/januar-2025?utm_source=chatgpt.com

4. Reimold, P. et al.: Wie verändern Hybrid-DRGs („diagnosis related groups“) die deutsche Urologie? Urologie, 20th Jan, 2025; 64(5): 453–461.



2025/26 Congress- and Workshop Calendar

17th Oct – 19th Oct	77th Congress of the German Society of Urology (DGU), Hamburg
15th Oct – 29th Oct – 12th Nov – 26th Nov – 10th Nov	Trans Urethral Laser Ablation (TULA®) Workshop with Dr. S. Agrawal, London
13th Nov – 16th Nov	Arab Association of Urology Congress (AAU), Muscat (Oman)
27th Nov – 29th Nov	1st International Conference on Endourology, Rome (ITA)
07th Jan – 21st Jan – 04th Feb – 04th Mar – 18th Mar	Trans Urethral Laser Ablation (TULA®) Workshop with Dr. S. Agrawal, London
25th Jan	37th Saudi Urological Association Conference, Jeddah (Saudi Arabia)
13th Mar – 16th Mar	41st Annual EAU Congress (European Association of Urology), London
15th Mar – 18th Mar	American Urological Association (AUA) Annual Meeting, Washington

Your One-Stop-Shop for Laser Urology

LEONARDO® DUSTER



LEONARDO® DUAL 200



LEONARDO® MINI



biolitec®, with expertise spanning over three decades, has fully integrated its value chain – evolving from laser and fiber R&D to in-house production and an unmatched service. This holistic approach allows us to deliver cutting-edge solutions across a broad spectrum of urological applications, making biolitec® your one-stop-shop for laser urology. The LEONARDO® Duster Fiber enables fast minimally invasive BPH enucleation with superior hemostasis, and treatment of all prostate sizes, plus shorter catheterization and hospital stays. XCAVATOR® and TWISTER fibers provide fast, efficient BPH vaporization with easy control, optimized visuals, and suitability for high-

risk patients, leading to quicker recovery. In TFL lithotripsy, the LEONARDO® Duster Fiber delivers superior dusting, good stone-free rates, minimal retropulsion, maximum flexibility, and less tissue damage. The LOMA Handpiece offers gentle, outpatient soft tissue ablation with smooth, scar-free results and cost-effective reuse. TULA® DUAL transurethral laser ablation treats recurring bladder tumors outpatient without general anesthesia, ideal for high-risk patients via dual wavelengths for excellent vaporization and hemostasis. biolitec®'s 1000 µm Bare Fiber supports precise, low-bleed partial nephrectomy reducing parenchymal damage in various surgical approaches. Using the

LITT Fiber allows MRI-guided focal laser ablation of prostate tumors with thermometry, sparing healthy tissue to preserve prostate function. All therapies use the reliable LEONARDO® diode lasers with intuitive touchscreens. The new 1940nm super-pulsed TFL LEONARDO® Duster will significantly improve urological laser treatments with high precision, efficiency and low retropulsion, combined with a cost-efficient and low-maintenance profile. LEONARDO® MINI, DUAL 200 and 45 combine 980 nm and 1470 nm wavelengths for a wide range of applications. The LEONARDO® laser family – ideal for urology!



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