

Awareness and compliance of urologists in the Middle East with minimally invasive surgical devices for the management of benign prostate hyperplasia

Raed A. Azhar¹, Mohamed Elkoushy², Mohnna Subahi³, Mahmoud Faisal^{3,4}, Abdulaziz Bakhsh⁵, Majed Sejiny⁶, Salim Bagasi³, Waseem Tayeb³

¹Department of Urology, Faculty of Medicine, King Abdulaziz University, ⁶Department of Urology, College of Medicine, University of Jeddah, Jeddah, ³Department of Urology, King Abdullah Medical City, Makkah, ⁵Department of Urology, College of Medicine, Taibah University, Madinah, Saudi Arabia, ²Department of Urology, Faculty of Medicine, Suez Canal University, Ismailia, ⁴Department of Urology, Faculty of Medicine, Al Azhar University, Cairo, Egypt

Abstract

Objectives: The objective is to assess urologists' awareness of and compliance with available minimally invasive devices (MIDs) for the management of benign prostate hyperplasia (BPH).

Methods: An online Internet-based survey was sent to urologists through E-mail. Baseline characteristics included age, location and duration of practice, and number of prostatectomies performed in the previous 12 months. Awareness is based on the surgeons' opinions about their advantages and drawbacks.

Results: A total of 308 participants responded to the survey; 87.0% were most aware of Rezūm, followed by Urolift (59.1%), Aquablation (33.1%), and combined temporary implantable nitinol device (iTIND), and Zenflow (17%). In the past 12 months, 84.1% used MIDs in their practice. A total of 47.1% of respondents believe that these devices have comparable outcomes with the traditional interventions, 52.9% are unsure of their long-term benefits, and 71% feel that it is too early to judge. Forty-three percent believe that these devices are reserved only for high-risk patients, and 52% recommend that they should be available in their centers. Most respondents (90.9%) prefer Rezūm, Urolift (28.2%), and Aquablation (12.6%) because they are less invasive, less time-consuming, and have few complications. Interestingly, 59% recommend MIDs to their family members.

Conclusions: Most respondents are more aware of Rezūm, Urolift, and Aquablation than iTIND and Zenflow. In addition, most respondents agree that these MIDs and traditional prostate interventions have comparable outcomes despite the former lacking long-term outcome assessment. High cost and no long-term data may influence the widespread acceptance of these MIDs.

Keywords: Aquablation, awareness, benign prostate hyperplasia, minimally invasive, rezūm, temporary implantable nitinol device, Urolift, zenflow

Address for correspondence: Dr. Waseem Tayeb, Department of Surgery, Division of Urology, King Abdullah Medical City at Holy Capital, Makkah, Saudi Arabia.

E-mail: waseemtayeb@yahoo.com

Received: 25.10.2023, **Accepted:** 19.01.2024, **Published:** 18.04.2024.

Access this article online	
Quick Response Code:	Website: www.urologyannals.com
	DOI: 10.4103/ua.ua_106_23

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Azhar RA, Elkoushy M, Subahi M, Faisal M, Bakhsh A, Sejiny M, *et al.* Awareness and compliance of urologists in the Middle East with minimally invasive surgical devices for the management of benign prostate hyperplasia. *Urol Ann* 2024;16:175-83.

INTRODUCTION

Bothersome lower urinary tract symptoms (LUTS) secondary to benign prostatic hyperplasia (BPH) are a common urologic condition among elderly men, with a prevalence of approximately 80% in men in their 90s.^[1] Most patients for whom medical therapy for LUTS failed are offered alternative treatment options, ranging from minimally invasive procedures to open prostatectomy. However, most traditional surgical techniques may be associated with significant complications, including retrograde ejaculation in 65%–75% of patients, erectile dysfunction, and transient or permanent urine incontinence.^[2]

Several new minimally invasive devices (MIDs) have been introduced to achieve comparable functional outcomes and preserve sexual function. These MIDs include water steam injection devices (Rezūm), mechanical devices (prostatic urethral lift), prostatic tissue fractionation (Aquablation), Zenflow spring devices, and temporary implantable nitinol devices (iTINDs).^[3]

These devices are commonly used in an in-office or outpatient setting and typically require a short recovery time as there is no need for general or prolonged anesthesia, and the morbidity rate is low as the risk of adverse events is lower than that of invasive interventions.^[4] Some practitioners believe that Rezūm, Urolift, and iTIND are superior to transurethral resection of the prostate (TURP) in terms of feasibility as day surgery, less blood loss, faster recovery, lower incontinence rate, shorter catheterization time, and less ejaculatory dysfunction.^[4,5] However, others believe that these MIDs are potentially inferior to traditional procedures for BPH and would be most appropriate for patients who would like to maintain sexual function or those who are medically unfit for general or prolonged anesthesia.^[3]

MIDs would likely become essential resources in the management of BPH, especially in centers offering a variety of surgical treatment options for BPH, which provide a tailored option for individual patients. Furthermore, according to the American Urological Association's (AUA) amended guidelines, these devices should be offered to patients who want to preserve their sexual function.^[6] Nevertheless, there are limited data describing practitioners' awareness of these MIDs and their compliance with their use. Therefore, the present survey aimed to assess urologists' awareness of and compliance with these newly available MIDs for the management of BPH.

METHODS

A well-planned online Internet-based questionnaire was sent to urologists through their own E-mails. The questionnaire inquired about demographic data, surgical experience in prostate procedures, and awareness and compliance of urologists with the new off-shelf MIDs for the management of BPH.

Baseline data included age, sex, geographical region, current level of training, location and duration of practice, and number of prostatectomies performed in the previous 12 months. Awareness and use of MIDs were measured based on the surgeons' opinions about their advantages and drawbacks [Appendix 1].

In addition, surgeons were asked if they would recommend these MIDs for the treatment of BPH patients requiring interventions, consider it important to have any of these devices in their hospitals, and prefer certain MIDs over others. Furthermore, surgeons were asked whether they would choose an MID if they or a family member needed a surgical intervention for BPH and if so, which they would prefer. An open-ended question was posed on the bottom line of the questionnaire so that respondents could make further comments [Appendix 1].

Data analysis

Data were analyzed using the commercially available Statistical Package for the Social Sciences software (SPSS Inc., Chicago, IL, USA), version 23. Continuous variables are presented as the means (standard deviations) and were compared with Student's *t*-test. Categorical variables are presented as numbers and percentages and were compared with Fisher's exact test. Two-tailed $P < 0.05$ were considered statistically significant.

RESULTS

Demographics and practice patterns

Three hundred and eight participants responded to the survey. Most respondents (93.8%) were males, 63% were aged 30–50 years, and 30.8% had been in practice for more than 20 years. Urology fellows and trainees represented 17.5% of all responders, whereas the majority was qualified general urologists or endourologists. Almost one-third of respondents were practicing in academic or university hospitals, while 61% were working at public hospitals [Table 1].

Awareness and compliance with the prostate minimally invasive device

Most respondents (87.0%) were more aware of Rezūm than Urolift (59.1%), Aquablation (33.1%), and iTIND and

Zenflow (17.2%) combined, while 18.5% were not aware of some of these MIDs [Figure 1].

In the past 12 months, 49% of respondents performed more than 25 prostate interventions, while 84.1% used some MIDs in their practice. Seventy percent usually perform these procedures in the main theater under spinal anesthesia (73%) [Table 2].

A total of 47.1% of respondents believed that these devices and traditional interventions had comparable outcomes, whereas 52.9% were unsure of their long-term benefits, and 71% felt that it was too early to judge. Although 47% of respondents would recommend these MIDs for use in the treatment of all patients with BPH, 54% would recommend these devices for only high-risk patients. Fifty-two percent reported that they felt it was important to make MIDs available in their centers, including Rezūm (90.9%), Urolift (28.2%), and Aquablation (12.6%),

Table 1: The respondent's demographic characteristics and length of clinical practice

Variable (n=308)	n (%)
Age/years	
<30	54 (17.5)
30-50	194 (63)
>50	60 (19.5)
Sex	
Male	289 (93.8)
Female	19 (6.2)
Years practicing urology	
<5	74 (24.0)
5-20	139 (45.1)
>20	95 (30.8)
Current practice	
Qualified general urologist	158 (51.3)
Qualified endourologist	58 (18.8)
Urologist in another subspecialty	38 (12.3)
Fellows/urology trainees	54 (17.5)
Location of practice	
Public hospital	188 (61.0)
Academic/university hospital	105 (34.1)
Private hospital	98 (31.8)

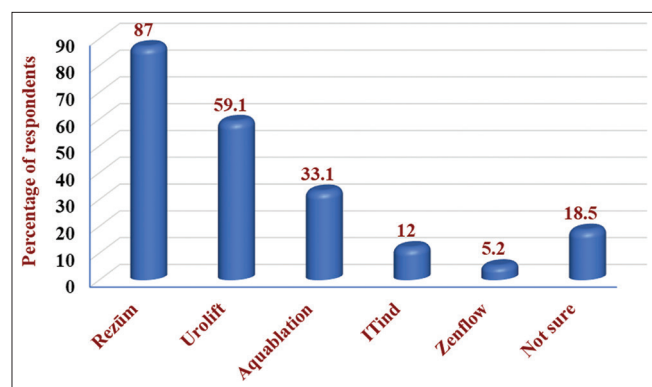


Figure 1: Respondents' awareness of currently available minimally invasive prostate devices

and 38% believed that these devices are good alternatives for BPH surgery [Table 2].

Most respondents (87%) felt that these MIDs are advantageous in that they are less invasive, have fast operability (68%) and a low incidence of adverse events (55%), and can be used in the outpatient or office setting (42%). On the other hand, 82% of respondents reported that the main disadvantage was the unavailability of long-term outcomes, followed by their high cost (56%), unavailability in their hospitals (37%), and lack of awareness or training [Figure 2]. Interestingly, 59% would use MIDs themselves or recommend them to their family members, and 67% of them preferred Rezūm [Table 2].

DISCUSSION

A considerable percentage of patients are nonadherent to the pharmacologic regimens for BPH or choose to discontinue their prostate medications due to insufficient relief of LUTS or adverse effects, including sexual dysfunction.^[7] Persistent bothersome LUTS may significantly influence the patient's quality of life, resulting in sleeplessness, depression, sexual dysfunction, and social isolation.^[8]

Early prostate intervention may be warranted in some patients with failed medical treatment for BPH to avoid progressive bladder remodeling secondary to prolonged bladder outlet obstruction.^[9] TURP has long been considered the standard BPH intervention, but it has been continuously challenged by new surgical approaches due to the associated perioperative complications. Therefore, MIDs seem to be good alternatives to traditional surgical options, especially for patients with failed medical therapy, patients seeking surgical prostate intervention and those who may benefit from early surgical intervention.

Based on the AUA guideline recommendations, Rezūm and Urolift have been widely accepted worldwide as important

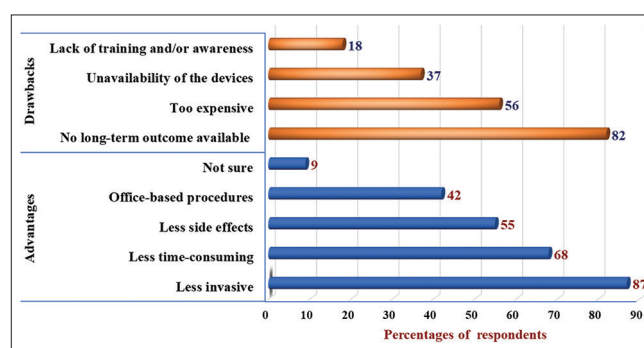


Figure 2: The respondents' opinions regarding the advantages and drawbacks of prostate devices

Table 2: Participant's compliance with minimally invasive surgical devices for the management of BPH

Variable (n=308)	n (%)
Number of prostate interventions performed in the past 12 months	
<25 cases	157 (51)
25–50 cases	102 (33)
>50 cases	49 (16)
Number of MIDs in the past 12 months	
<25 cases	148 (48.1)
25–50 cases	80 (26.0)
>50 cases	31 (10.1)
Not applicable	49 (15.9)
Where do you usually perform these MID procedures?	
Office-based clinic	19 (6)
Daycare unit	108 (35)
Main theater	216 (70)
What type of anesthesia usually used for these procedures?	
Local anesthesia	53 (17)
Regional block/prostatic block	34 (11)
Sedation	61 (19.8)
Spinal anesthesia	225 (73)
General anesthesia	109 (35)
Do you think these devices and traditional interventions have comparable effects?	
Yes	145 (47.1)
No	91 (29.5)
Not sure	72 (23.4)
Do you expect long-term benefits of these devices?	
Yes	98 (31.8)
No	47 (15.3)
Not sure	163 (52.9)
Perception of these devices in the treatment of surgically indicated BPH	
As good as TURP, open and laser	66 (21.4)
Better than TURP, open and laser	11 (3.6)
Too early to judge	219 (71.1)
Discouraging/avoiding the procedure	12 (3.9)
Do you recommend these devices for BPH treatment?	
Yes, for all patients	145 (47.1)
Only for high-risk patients	138 (44.8)
Only for old age patients	20 (6.5)
No, I don't recommend	5 (1.6)
How important is it to have MIDs in your hospital?	
Important to be available	160 (51.9)
Good alternative	117 (38.0)
Not sure	31 (10.1)
Costly and fancy	30 (9.7)
If you decide to have MIDs in your hospital, which would you prefer?	
Rezūm	280 (90.9)
Urolift	87 (28.2)
Aquablation	39 (12.7)
iTIND/Zenflow	0
If you or one of your family members needs a BPH intervention, which would you recommend?	
MIDs	147 (47.7)
Laser prostatectomy	90 (29.2)
TURP	31 (10.1)
Robotic prostatectomy	40 (13.0)
If you chose a prostate device, what would you prefer?	
Rezūm	205 (66.6)
Urolift	54 (17.5)
Aquablation	29 (9.4)
ITEND	0.0
Zenflow	0.0
Not applicable	20 (6.5)

BPH: Benign prostate hyperplasia, MI: Minimally invasive, MIDs: Minimally invasive devices, iTIND: Temporary implantable nitinol device, TURB: Transurethral resection of the prostate

minimally invasive treatment alternatives for BPH.^[6] Therefore, the present study aimed to evaluate urologists' awareness of and compliance with these off-shelf MIDs for the management of BPH. Most respondents were

qualified urologists, and almost one-third of them had been in practice for more than 20 years. Almost half had performed more than 25 prostate interventions in the previous 12 months, while 84% had used some MIDs in

their recent practice. This length of practice may reflect the extent of the urologists' clinical experience, particularly in treating prostate surgery, which would further validate their responses.

Most respondents were most aware of Rezūm (87%), followed by Urolift (59%) and Aquablation (33%), and only 17% were familiar with iTIND and Zenflow. Rezūm and Urolift were proven to have a low perioperative morbidity rate, and ambulatory surgery feasibility, minimal blood loss, and faster postoperative recovery are consistent with the recommendations in the AUA guidelines.^[5,6,10] Interestingly, 18% of participants had no prior knowledge of these devices nor clinical experience with using any of these devices. However, this percentage is lower than the 30% previously reported by Cheng *et al.* in their study of minimally invasive surgical therapy for BPH.^[5]

Contrary to our report, most participants in the latter study were unfamiliar with Aquablation. This may be explained by the low response rate in Cheng *et al.*'s study,^[5] in which <30% of participants did not complete the whole survey because of its length. Moreover, more than half of the participants in the latter survey are practicing in academic institutions, reflecting the poor participation of urologists working in public hospitals or private sectors. Furthermore, Aquablation was not classified in the AUA guidelines as a minimally invasive procedure due to the increased need for general anesthesia.

Other factors may have influenced whether urologists were aware of these MIDs, including equipment availability, cost, perceived clinical effectiveness, technique selection, and patient and surgeon preferences.^[11] The association of conflicts of interest and industrial sponsorship with favorable surgery outcomes has been reported in a recent systematic review.^[12] In addition, surgeon experience and training and patient preferences may have influenced the choice of a specific procedure. Thirty-seven percent of respondents reported that equipment unavailability influenced their awareness of these MIDs and 56% reported that high cost was an influencing factor.

Although almost half of our respondents believed that these MIDs and traditional prostate interventions led to comparable functional outcomes, most of them felt it was too early to judge their role in the management of BPH. The comparable outcomes of these devices and traditional prostate surgeries were consistent with a recent survey in which more than 40% of participants believed that Urolift and Rezūm were superior to TURP, in terms of lower blood loss, faster recovery, shorter duration of catheterization

and lower incidences of postoperative incontinence and ejaculatory dysfunction.^[5] Most of our participants felt it was too early to judge the role of these MIDs, which may have been due to the lack of comparative trials of these devices and standard TURP,^[13] which would have impacted the urologists' confidence in appropriately answering these questions.

Almost half of our respondents would recommend these MIDs for all patients with BPH, including themselves or their relatives, while 45% believed that these devices should be reserved for only high-risk patients. Fifty-two percent felt that it was important to have MIDs in their centers, including Rezūm (90%), followed by Urolift and Aquablation. Interestingly, almost half of the respondents would recommend MIDs for themselves or their family members, and 67% of them preferred Rezūm instead of the other procedures. Thus, a high proportion of participants believed that Rezūm had more benefits than other MIDs, and most of the respondents reported that would use the devices themselves in case they needed an intervention for the prostate. However, the incidence of late adverse events, reoperation, and retreatment for the management of recurrent LUTS may be reflected in long-term data. Such occurrences usually challenge the choice of surgery for BPH. Moreover, the increased financial costs associated with reoperation would significantly increase the economic burden on the health-care system.

As expected in all survey designs, the current study may be limited by selection and recall biases, which may limit the generalizability of the results. Respondents may have been more inclined to participate due to their interest, with the possible overestimation of the number of prostate procedures performed. Nevertheless, the adequate number of participants may partially compensate for these expected biases.

CONCLUSIONS

Most respondents were more aware of Rezūm, Urolift, and Aquablation than iTIND or Zenflow. One-third of respondents believed that these MIDs and traditional prostate interventions had comparable outcomes despite being unsure about their long-term outcomes, and most of them felt that it was too early to judge. These devices have many advantages, but their high cost and lack of long-term data may influence their widespread acceptance. Almost half of the respondents would use MIDs themselves or recommend them to their family members who needed surgery for BPH. Most of them preferred Rezūm over other procedures.

Compliance with ethical standards

This is a survey study in which the authors had no contact with any patients or animals. However, all the procedures performed in the studies involving human participants were performed in accordance with the ethical standards of the institutional and/or National Research Committee and with the 1964 Helsinki Declaration and its later amendments.

Author contributions

- Azhar RA: Planning, writing, reviewing, and editing
- Subahi M: Planning, methodology, writing, and editing
- Faisal M: Planning, methodology, writing, and editing
- Bakhsh A: Writing and editing
- Sejiny M: Writing and editing
- Baqasi S: Writing and editing
- Tayeb W: Project administration, planning, methodology, writing, and editing
- Elkoushy MA: Planning, methodology, writing, statistical analysis, reviewing and editing.

Availability of data and materials

Yes.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Lim KB. Epidemiology of clinical benign prostatic hyperplasia. *Asian J Urol* 2017;4:148-51.
2. British Association of Urological Surgeons (BAUS). Transurethral Prostatectomy (TURP) for Benign Disease. Information on Your Procedure by The British Association of Urological Surgeons (BAUS); 2021. Available from: https://www.baus.org.uk/_userfiles/pages/files/Patients/Leaflets/TURP%20for%20benign.pdf. [Last accessed on 2023 Apr 04].
3. Pascoe J, Fontaine C, Hashim H. Modern advancements in minimally invasive surgical treatments for benign prostatic obstruction. *Ther Adv Urol* 2021;13:1-17.
4. Chung AS, Woo HH. Update on minimally invasive surgery and benign prostatic hyperplasia. *Asian J Urol* 2018;5:22-7.
5. Kwun-Chung CB, Kar-Kei YS, Castellani D, Wroclawski ML, Zhao H, Chiruvella M, *et al.* Defining minimal invasive surgical therapy for benign prostatic obstruction surgery: Perspectives from a global knowledge, attitude, and practice survey. *Asian J Urol*. 2024;11:55-64. doi: 10.1016/j.ajur.2022.02.011.
6. Parsons JK, Dahm P, Köhler TS, Lerner LB, Wilt TJ. Surgical management of lower urinary tract symptoms attributed to benign prostatic hyperplasia: AUA guideline amendment 2020. *J Urol* 2020;204:799-804.
7. Verhamme KM, Dieleman JP, Bleumink GS, Bosch JL, Stricker BH, Sturkenboom MC. Treatment strategies, patterns of drug use and treatment discontinuation in men with LUTS suggestive of benign prostatic hyperplasia: The Triumph project. *Eur Urol* 2003;44:539-45.
8. Roehrborn CG, Barkin J, Gange SN, Shore ND, Giddens JL, Bolton DM, *et al.* Five year results of the prospective randomized controlled prostatic urethral L.I.F.T. Study. *Can J Urol* 2017;24:8802-13.
9. Fusco F, Creta M, De Nunzio C, Iacovelli V, Mangiapia F, Li Marzi V, *et al.* Progressive bladder remodeling due to bladder outlet obstruction: A systematic review of morphological and molecular evidences in humans. *BMC Urol* 2018;18:15.
10. Tzeng M, Basourakos SP, Lewicki PJ, Hu JC, Lee RK. New endoscopic in-office surgical therapies for benign prostatic hyperplasia: A systematic review. *Eur Urol Focus* 2022;8:522-31.
11. Wilson CB. Adoption of new surgical technology. *BMJ* 2006;332:112-4.
12. Porpiglia F, Fiori C, Bertolo R, Giordano A, Checucci E, Garrou D, *et al.* 3-Year follow-up of temporary implantable nitinol device implantation for the treatment of benign prostatic obstruction. *BJU Int* 2018;122:106-12.
13. Wettstein MS, Pazhepurackel C, Neumann AS, Woon DT, Herrera-Caceres JO, Kozomara M, *et al.* Photoselective vaporization of the prostate: Study outcomes as a function of risk of bias, conflicts of interest, and industrial sponsorship. *World J Urol* 2020;38:741-6.

APPENDIX

Appendix 1: The questionnaire

1. What is your age?
 - <30
 - 30–50
 - >50
2. Sex
 - Male
 - Female
3. Location of practice (please describe): -----
4. Approximately how many years have you been practicing?
 - <5
 - 5–20
 - >20
5. Which of the following best describes your current practice?
 - Qualified General Urologist
 - Qualified Endourologist.
 - Urologist on Fellowship program
 - Urologist on Fellowship program
 - Qualified Urologist in another Sub-Specialty
 - Resident in training.
6. Where do you practice? (Please choose all applicable)
 - Public Hospital
 - Academic/University Hospital
 - Private Hospital
7. In the last 12 months, how many prostate interventions (open, TURP, minimally invasive device, robotic) did you perform?
 - Less than 25
 - 25-50
 - More than 50
8. Which of the following device(s) are you aware of? (Please choose all applicable):
 - Water vaporization of the prostate (Rezūm)
 - Urolift
 - Aquablation
 - iTIND
 - Zenflow
 - Not sure
9. In the last 12 months, how many prostate MIDs, if any, have you used?
 - Fewer than 25
 - 25-50
 - More than 50
 - Not applicable

10. Where do you usually perform the prostate MIDs procedures? (Please choose all applicable):
 - Office-based clinic
 - Daycare unit
 - Main theater
11. What type of anesthesia do you usually use for these procedures? (Please choose all applicable):
 - Local anesthesia
 - Regional block/prostatic block
 - Sedation
 - Spinal anesthesia
 - General anesthesia
12. Do you think these new devices and traditional prostatic interventions have comparable outcomes?
 - Yes
 - No
 - Not sure
13. If yes, do you expect these new devices to have any long-term benefits?
 - Yes
 - No
 - Not sure
14. What is your perception of these new prostate devices in the treatment of surgically indicated BPH?
 - As good as TURP, open and laser
 - Better than TURP, open and laser
 - Too early to judge.
 - Discouraging/Avoid the procedure.
 - Not sure
15. Do you recommend these MIS devices in the treatment of BPH patients requiring interventions? (Please choose all applicable):
 - Yes, for all patients.
 - Only for high-risk patients
 - Only for old age patients
 - No, I don't recommend.
16. How important is having this device(s) in your hospital?
 - Important to be available.
 - Good alternative
 - Not sure
 - Not important at all
 - Costly and fancy
17. If you decide to have an MIS device in your hospital, which would you prefer? (Please choose all applicable):
 - Rezūm
 - Urolift
 - Aquablation
 - iTIND
 - Zenflow
18. In your opinion, what is/are the advantage(s) of these procedures? (Please choose all applicable):
 - Less invasive
 - Less time-consuming

- Office-based procedures
- Fewer side effects.
- Not sure

19. In your opinion, what is/are the drawback(s) of these minimally invasive prostate procedures? (Please choose all applicable):

- No long-term outcome available to date
- Too expensive
- Unavailability of the devices
- Lack of training and/or awareness
- Not sure

20. If you or one of your family members needs a BPH intervention, which would you recommend?

- Minimally invasive prostate devices
- Laser prostatectomy
- TURP
- Open/Robotic prostatectomy

21. If you choose a prostate device, which would you prefer?

- Rezūm
- Urolift
- Aquablation
- iTIND
- ZENFLOW
- Not applicable

22. Please, add your comments or recommendations: -----
