



TMU-Research Center of Urology and Kidney

Monthly Meeting

Times : **2025/4/24(Thursday) 9:00-10:00**

Google meet link : <https://meet.google.com/ihn-wugo-jfv>

Meeting Chairperson : Kuan-Yu Hung

Participant :

【TMUH】Ming-Che Liu、Yao-Chou Tsai、Shauh-Der Yeh、Chien-Chih Wu、
Hsiao-Yu Lin、Jeng-Cheng Wu、Ching-Hsin Chang、Wei-Chieh
Chen、Fang-Yu Ku、Shih-Hsiu Lo、Te-Chao Fang、Hsi-Hsien Chen、
Yen-Chung Lin、Chih-Chin Kao、Ching-Yi Chen、Shu-Ching Yeh、
TING-EN TAI

【WFH】Yu-Ching Wen、Liang-Ming Lee、Ke-Hsun Lin、Yung-Wei Lin、
Chi-Hao Hsiao、Syuan-Hao Syu、Chung-Howe Lai、Yung-Ho Hsu、
Chih-Chen Hsu、Tso-Hsiao Chen、Cho-Hsing Chung、Chung-Yi
Cheng、Chung-Te Liu、Yun-Hong Yang、Ming-Che Lee、Yueh-Lin
Wu、I-Wen Wu

【SHH】Mai-Szu Wu、Chia-Chang Wu、Chia-Hung Liu、Yi-Te Chiang、Kai-Yi
Tzou、Wei-Tang Kao、Su-Wei Hu、Wen-Ling Wu、Mei-Yi Wu、
Lie-Yee Hung、Cai-Mei Zheng、Yu-Wei Chen、Chia-Te Liao、
Cheng-Hsien Chen、Hui-Wen Chiu、Po-Han Yu、Tze-Wah Kao、
Kuan-Hung Lin

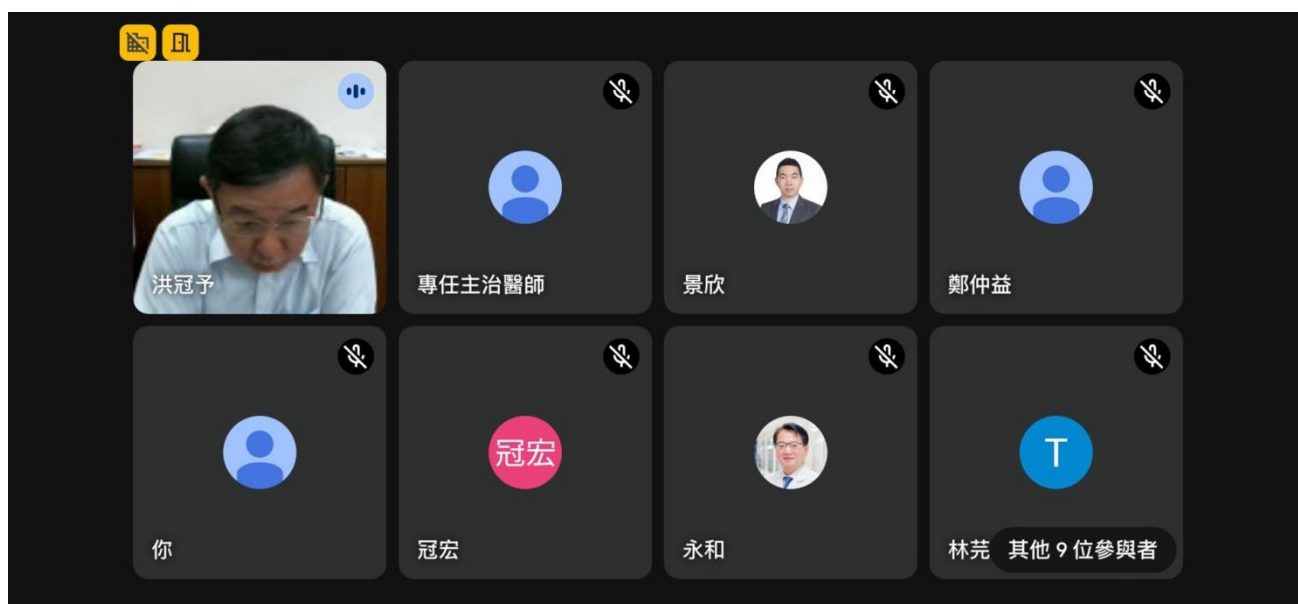
【SKMH】Yuh-Mou Sue、Chu-Lin Chou

Chief : Mai-Szu Wu (President, TMU)、Chih-Cheng Hsu (Professor, NHRI)、
Ke-Hung Tsui (Vice President, SHH)、Shing-Hwa Lu

Agenda :

1. Progress report on the renal and urinary precision health plan and biological sample database

2. Kidney Transplant Team
3. Chronic Kidney Disease Team
4. Urology Innovation Technology and Surgical Team





臺北醫學大學
TAIPEI MEDICAL UNIVERSITY

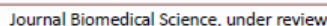


臺北醫學大學
泌尿腎臟研究中心
TMU Research Center of
Urology and Kidney

腎臟泌尿精準健康計畫及生物檢體資料庫進度報告

報告人：吳逸文 副教授

114年4月24日



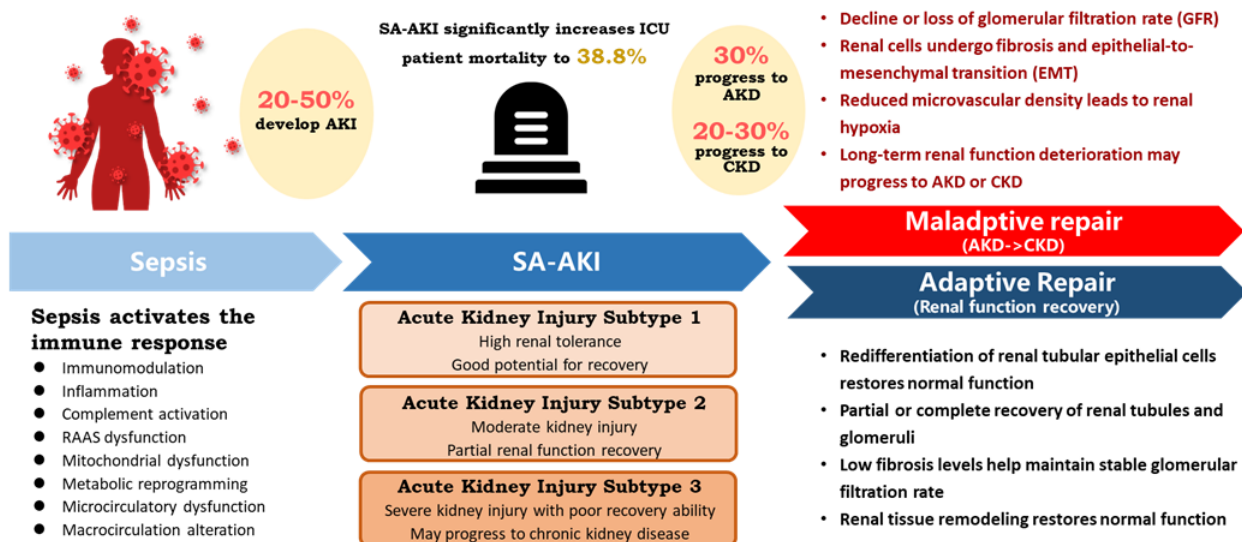
<https://tmu.surveycake.biz/s/NwVWe>

RCUK

Exploring the Immune Modulation of NK Cells in Sepsis-associated AKI-AKD-CKD continuum Through Membrane Technology, Metabolomics, and CRISPR Gene Editing.

Mei-Yi Wu
2025.03.13

Pathophysiology of Sepsis-Associated AKI (SA-AKI)



Risk Factors : Severity/frequency of AKI, albuminuria, age, gender, Pre-existing CKD, hypoalbuminemia, arterial hypertension, heart failure, obesity and diabetes mellitus.

Cell Therapy and Immune Modulation

CAR-T Therapy

A therapy using genetically modified T cells to target cancer cells.



MSC Therapy

Involves stem cells that can differentiate into various cell types and modulate immune responses.



Industrial Applications

Focuses on how these therapies are being integrated into healthcare and commercial settings.



NK Cell Therapy

Utilizes natural killer cells to attack tumors and infected cells.



Challenges

Addresses obstacles such as regulatory, technical, and ethical issues in therapy development.



Future Research Directions

Explores potential innovations and research avenues to improve therapies.



How to Maintain a Leading Position in the Cell Therapy Industry

Disruptive Innovation in Cell Technology

- Understanding the mechanisms of cell therapy in disease repair
- Selecting the most promising cells
- Establishing a comprehensive patent portfolio

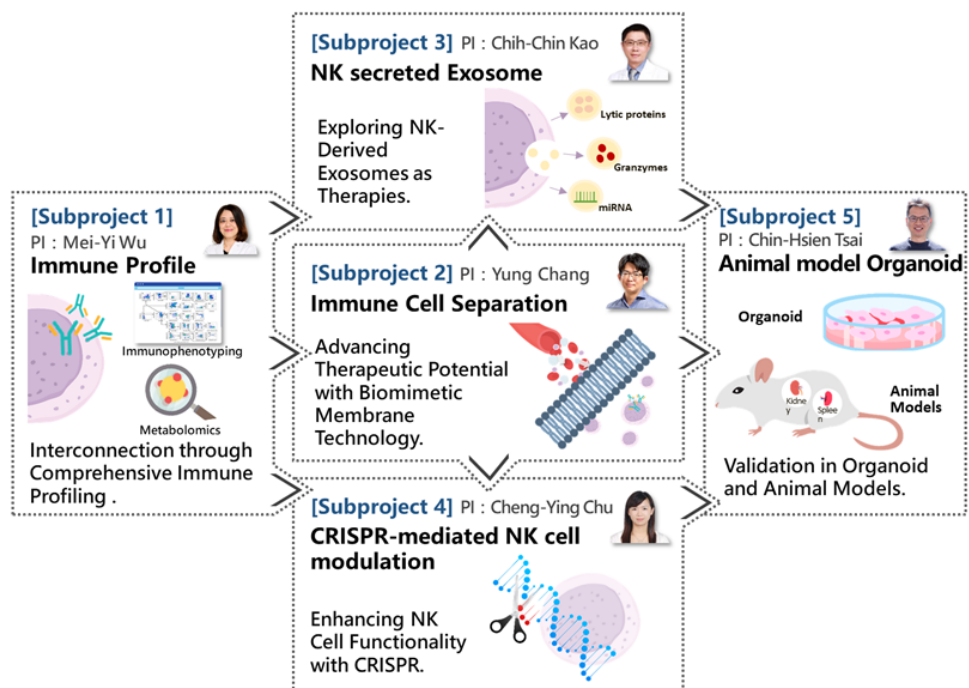
Commercialization of Cell-Based Products

- Developing stable and scalable manufacturing processes
- Ensuring products are ready-to-use
- Familiarity with regulatory requirements
- Establishing comprehensive insurance coverage

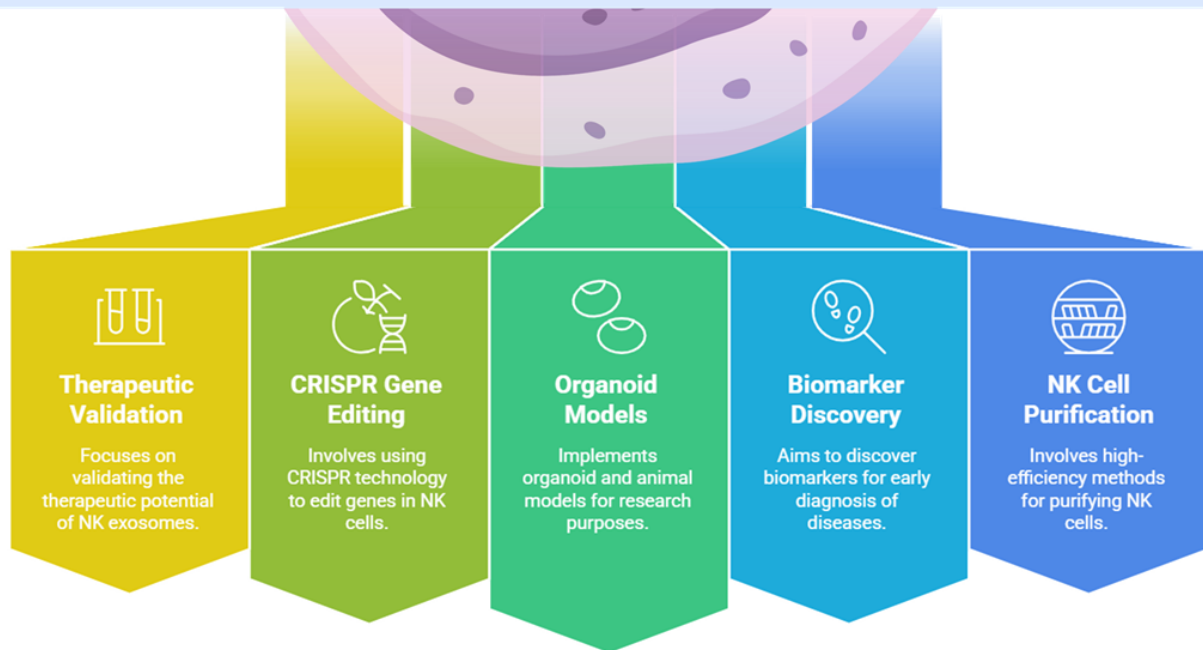
Enhancing the Value of Cell-Based Products

- Focusing on severe or life-threatening diseases
- Setting reasonable pricing strategies
- Expanding clinical data applications to multiple indications
- Completing clinical trials for multiple indications

Execution Methods



Expected Outcomes of the Research Project



6



慢性腎病團隊

報告人：鄭仲益醫師 (萬芳醫院)

114.04.24

慢性腎病團隊



鄭仲益



許永和



吳岳霖



陳正憲



林彥仲



高治圻



陳錫賢



吳美儀



鄭彩梅



高芷華



廖家德



蘇裕謀



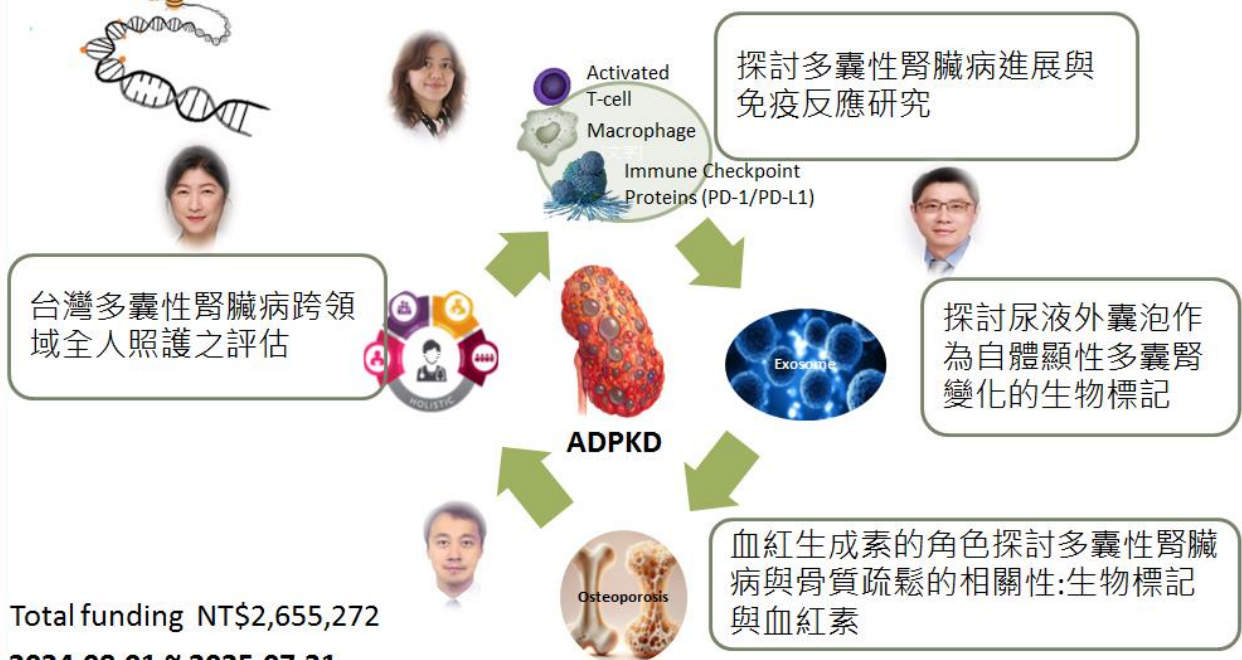
鄒居霖

2

三院整合型計畫



多面向探討顯性遺傳型多囊性腎臟病之惡化及綜合照護



3

計畫目標

- 三院一起收案增加病人數
-  • 跨領域全人照護: questionnaire
-  • 多囊腎免疫反應: serum
-  • 外泌體在多囊腎的生物標記角色: plasma, urine
-  • 釐清多囊腎病人在骨生成過程中的生理機制: serum

收案流程

- ≥ 18 years ADPKD 病人, PKD1 or PKD2
- Exclusion criteria:
 1. 接受過腎移植的病人
 2. 癌症患者或過去五年接受癌症治療的患者
 3. eGFR < 15 ml/min/1.73m²
- 驗血、驗尿與問卷(全人照護)
- SHH central lab. for urine and serum storage
- 目前收案**50人**



探討多囊性腎臟病與骨質疏鬆的相關性



- Disrupted Ca-Pi homeostasis
- Impaired bone formation
- Enhanced bone resorption
- Altered bone matrix quality
- Defective **polycystins** lead to abnormal Ca signaling
- **Chronic inflammation**

CKD

Polycystin-1 function as a mechanosensor molecule and its signaling pathways

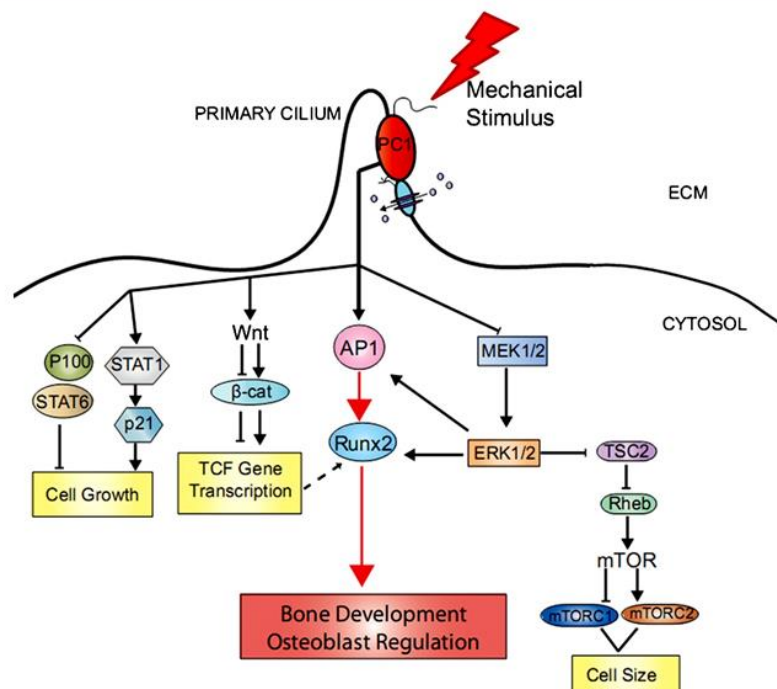
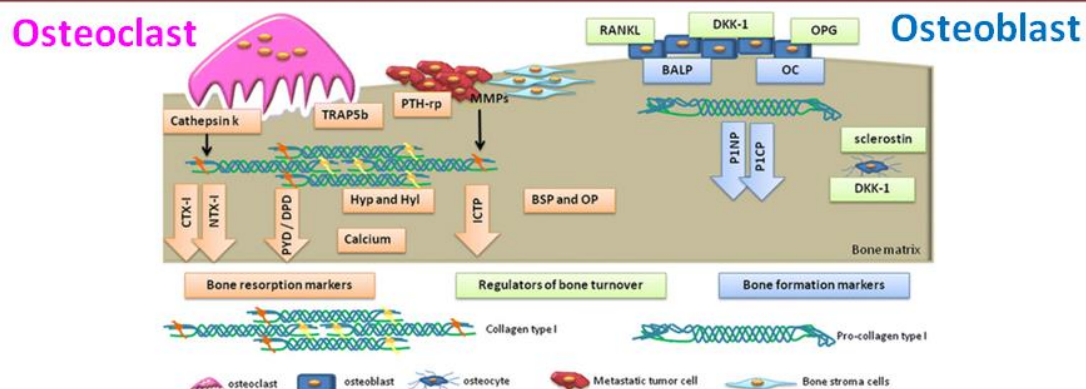


Table 1

Demographic and biochemical characteristics of ADPKD patients

Characteristics N = 50	
Age, yrs	53.7 ± 10.6
Female : Male	19 : 27
Body mass index, kg/m ²	23.3 ± 2.9
Renal function	
Creatinine, mg/dl	1.5 ± 0.8
eGFR (CKD-EPI equation), ml/min per 1.73 m ²	52.8 ± 22.7
Ca, mg/dl	9.3 ± 0.4
Pi, mg/dl	3.5 ± 0.7
ALP, IU/l	69.8 ± 39.2

Biochemical biomarkers of bone turnover



Bone resorption markers

Type I collagen degradation products

- Pyridinium crosslink (**PYD** and **DPD**)
- C- and N- telopeptides (**CTX**, **ICTP**, **NTX**)

Enzymes

- Tartrate-resistant acid phosphatase (**TRAP**) 5b
- **Cathepsin K**
- Matrix metalloproteinase (**MMPs**)

Bone formation

Matrix proteins

- Procollagen Type 1 propeptides
- C-terminal (**PICP**)
- N-terminal (**PINP**)
- **Osteocalcin (OC)**

Enzymes

- Bone isoform of alkaline phosphatase (**BALP**)

未來工作

擴大樣本與追蹤：

擴大多囊腎患者收案數，進行長期追蹤

建立完整的生物資料庫（serum, plasma, urine, exosome）

資料整合：

結合問卷、生化、外泌體與骨代謝資料進行系統性分析

嘗試使用 AI 或機器學習分析複雜交互關係

深化機轉探討：

利用細胞與動物模式驗證外泌體與免疫反應的角色

研究多囊腎與骨代謝間潛在調控路徑

臨床應用轉譯：

建立跨科整合照護模式：腎臟科、免疫科、骨科與營養團隊

發展個人化照護建議與疾病預測模型

爭取國際合作與發表：

發表於具影響力期刊，拓展國際合作機會

10

各院區個人發展- 國科會計畫



萬芳醫院

代謝體學導出的營養介入療法: 以色胺酸為模型揭示營養素阻止急性腎損傷至急性腎臟病的轉變

多年期: 2024-2027



北醫附設醫院

慢性腎臟病患之智慧醫療、AI早期偵測血管鈣化及評估復健延緩認知與身體機能衰退

一年期: 2024



雙和醫院

Etelcalcetide經由調控 DUSP4和TRAF3路徑於慢性腎臟疾病-礦物質骨病變可改善硫酸吡哆酚引起的低骨轉換率

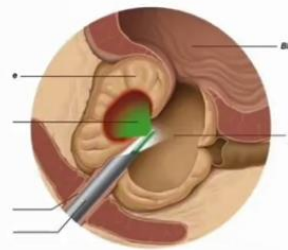
多年期: 2021-2024

Why MIST?



Medication

Noninvasive
adherence challenges
adverse effects
limited effectiveness



Surgery therapies

Great de-obstruction efficacy
Ejaculatory dysfunction 65%
TURP-related complications
Anesthesia risk

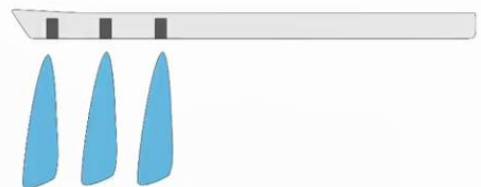
0424 RCUK

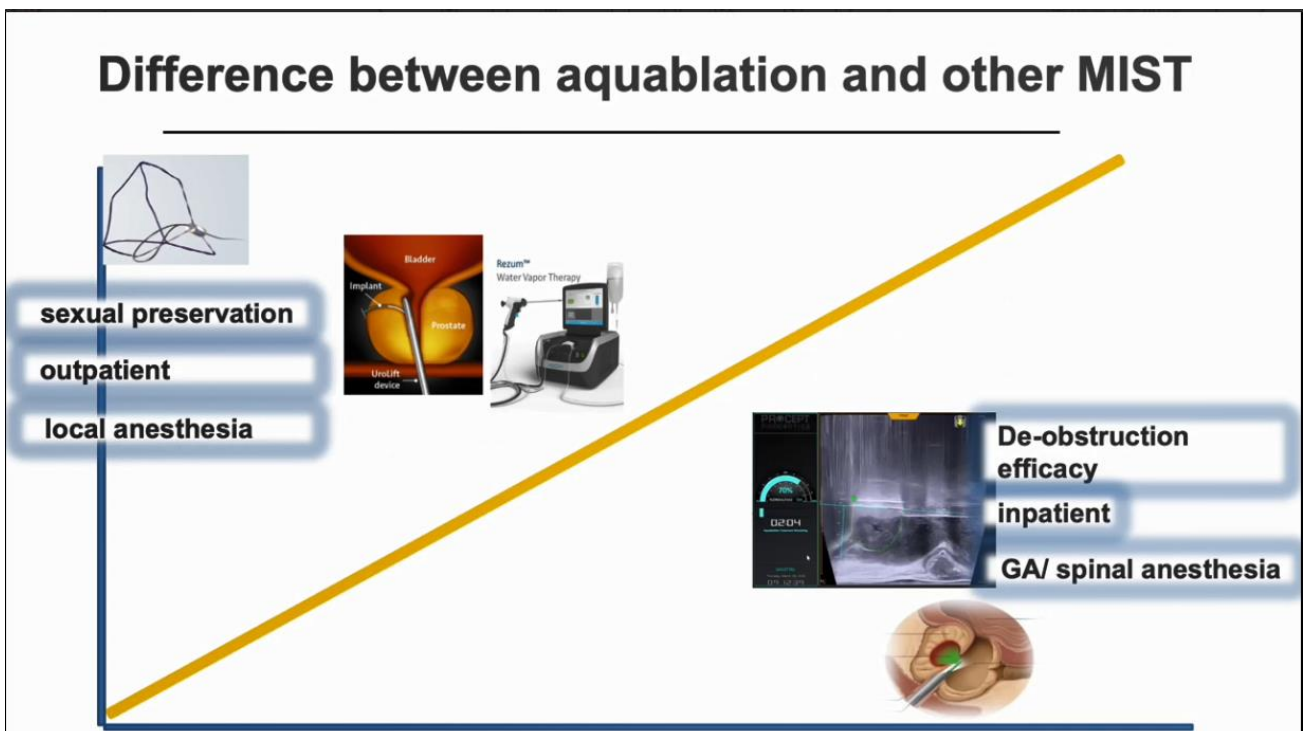
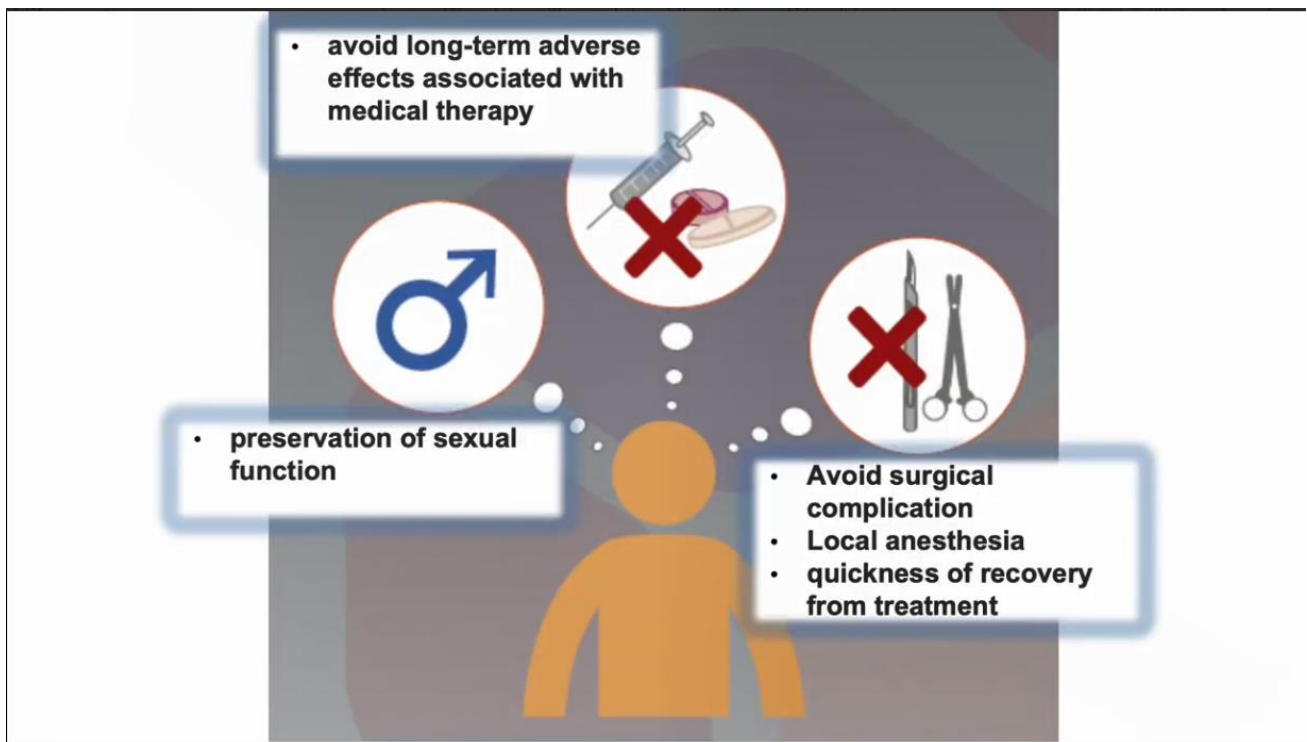
泌尿創新技術與手術團隊報告

-Aquablation微創攝護腺水刀治療

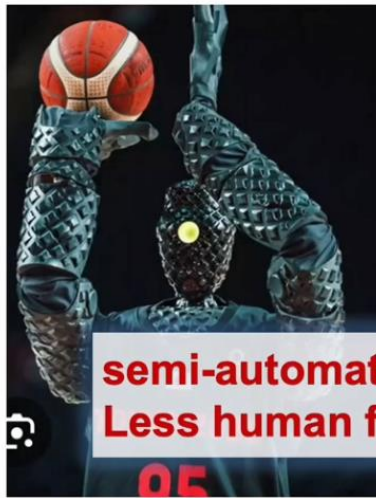
Presenter

萬芳醫院楊宇祥醫師





Key element for aquablation



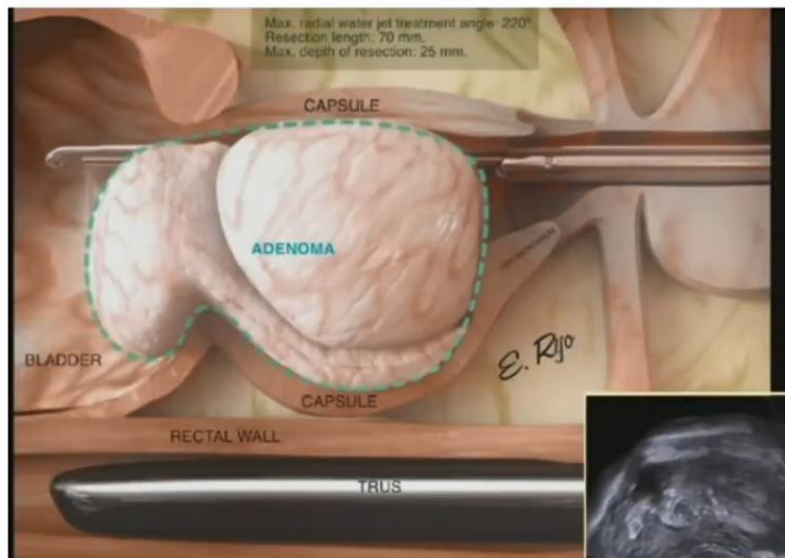
semi-automatic
Less human factor? better?

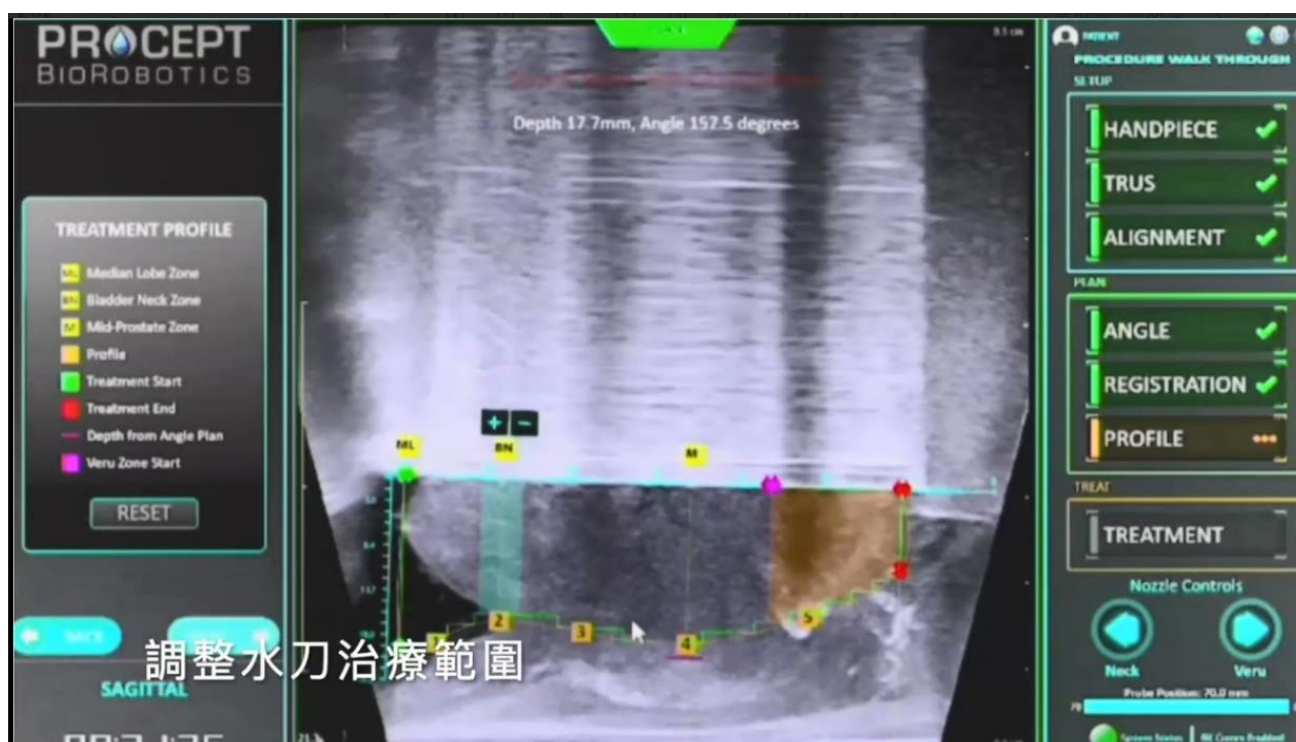
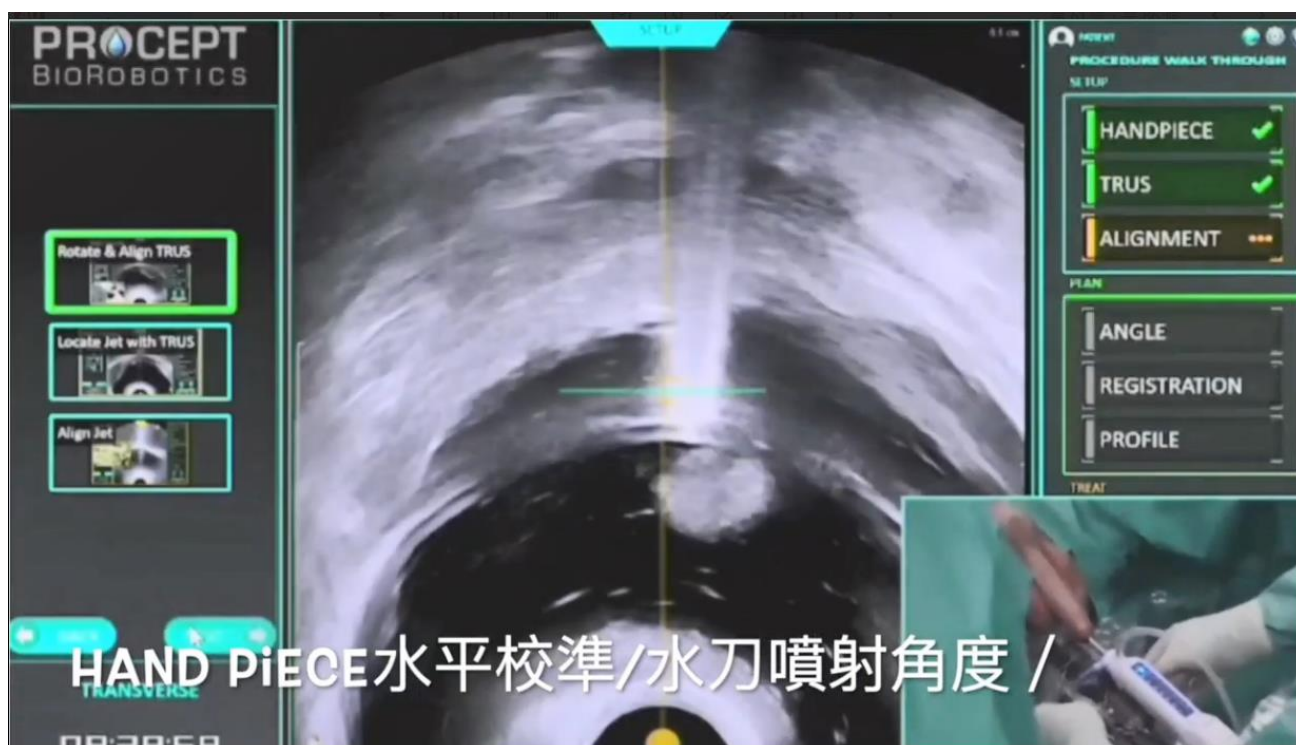
3pt :62.5%

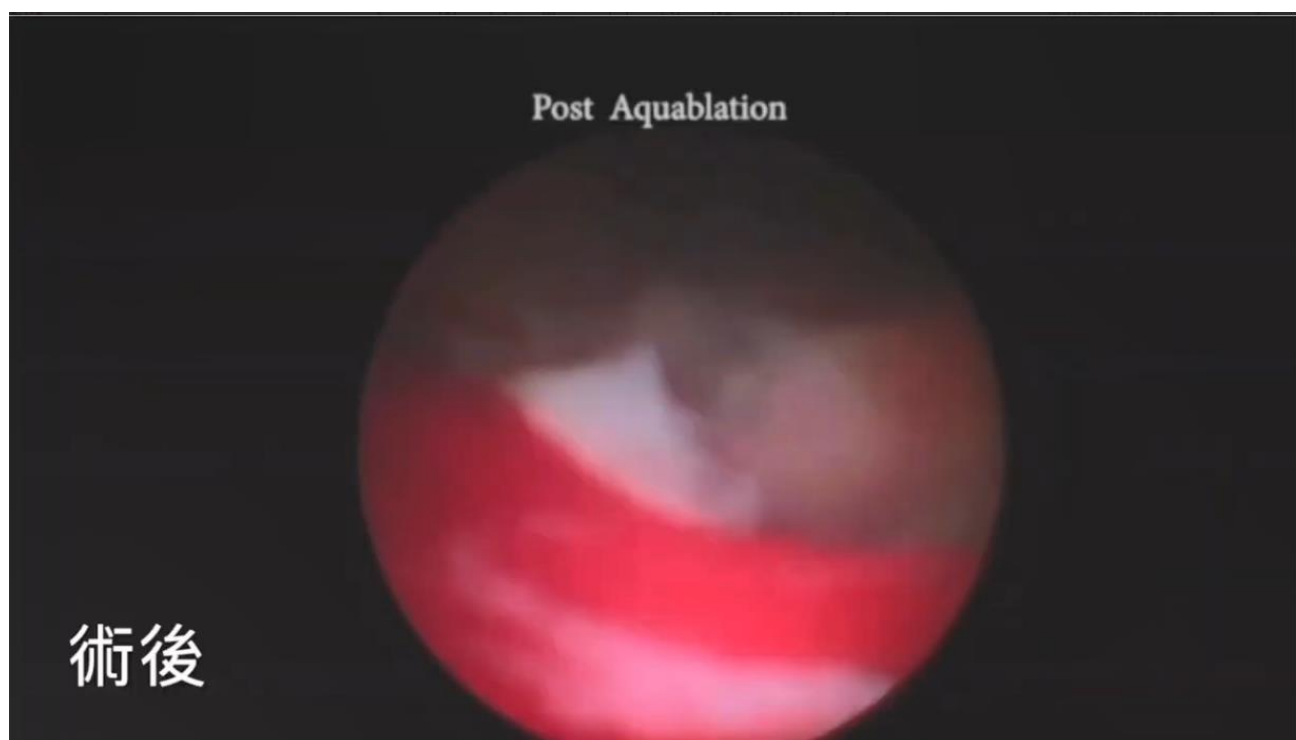
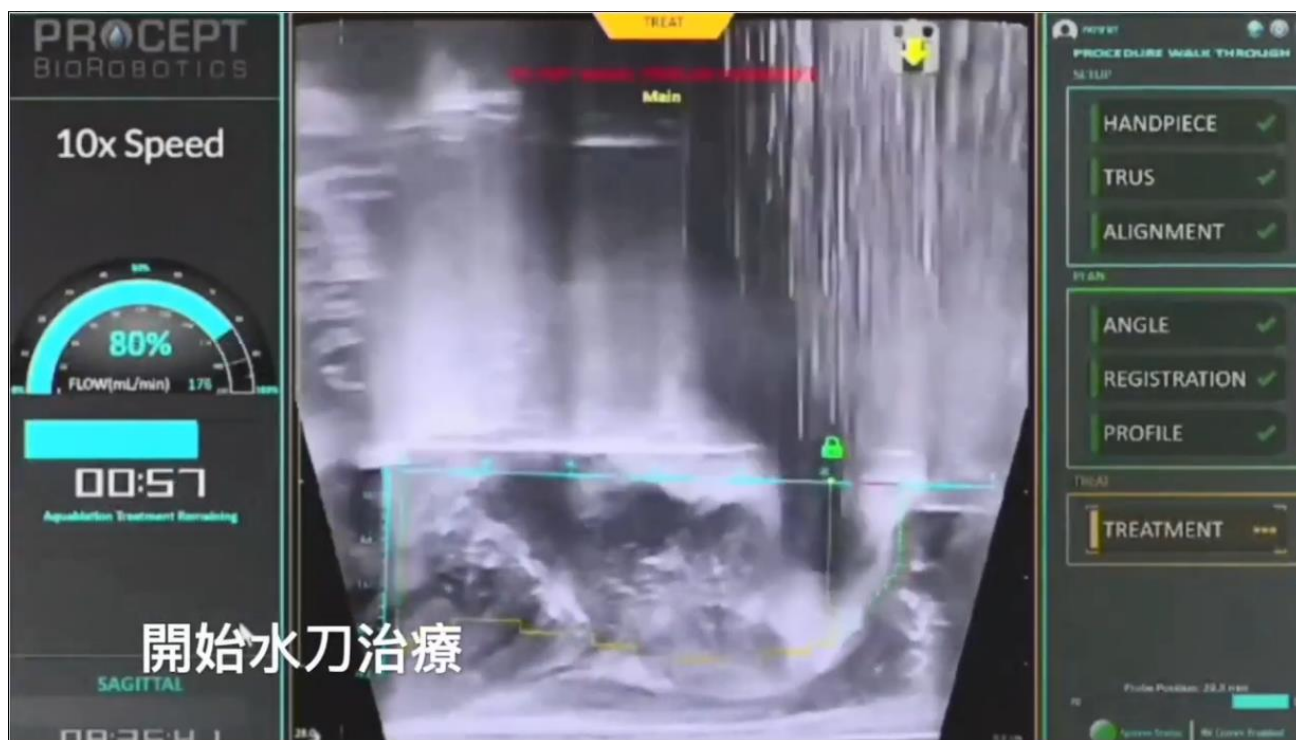


3pt:40%

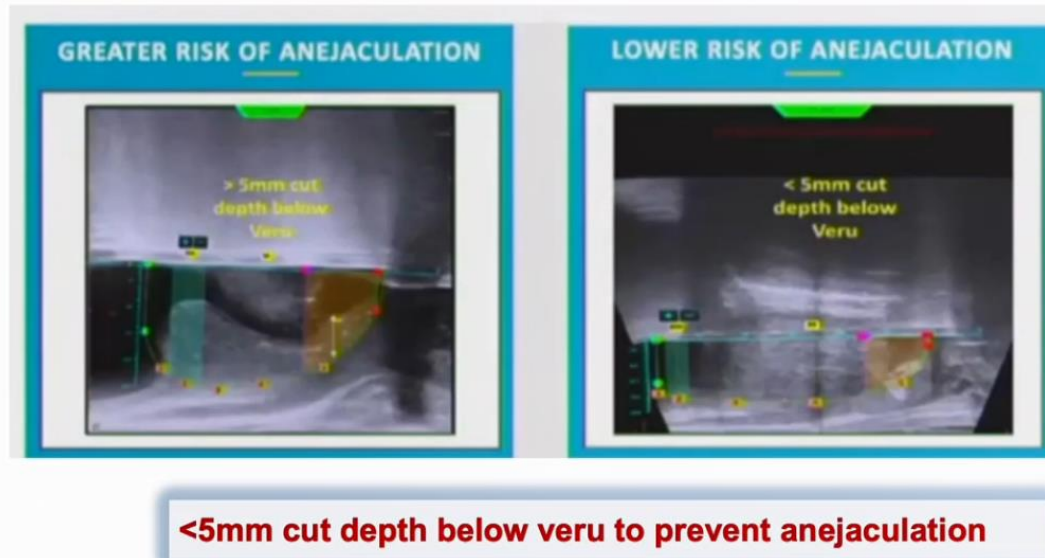
Aquablation (AquaBeam)







Ejaculation preservation technique



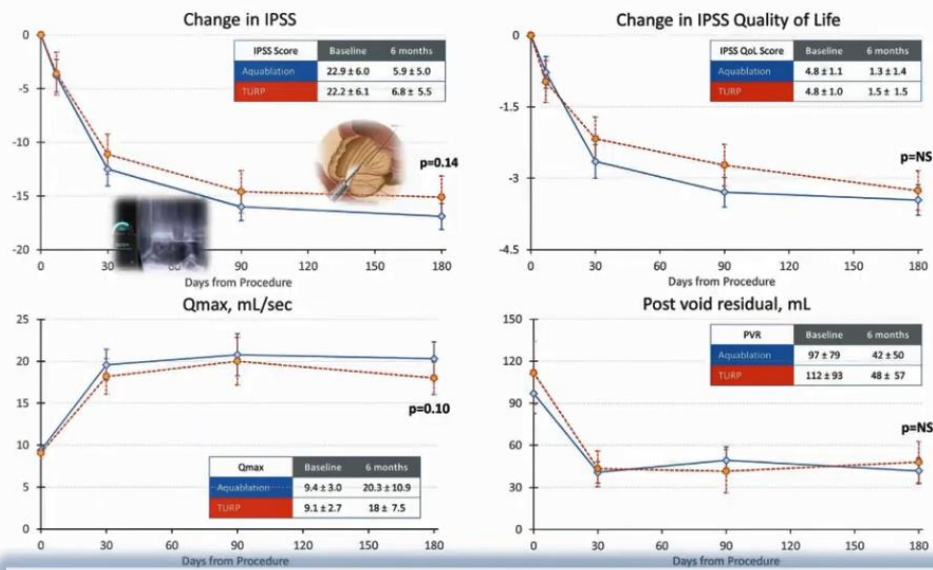
THE JOURNAL of UROLOGY
Official Journal of the American Urological Association (auajournals.org/journal)

WATER: A Double-Blind, Randomized, Controlled Trial of Aquablation vs Transurethral Resection of the Prostate in Benign Prostatic Hyperplasia

double-blind, multicenter, prospective, randomized, controlled trial (non inferior)

 181 pt - Age 45-80 - IPSS>12 - Prostate 30-80ml - Qmax≤15 14/17 sites had no previous aquablation experience	Aquablation	TURP
	 N=116	 N=65
Mean operative time	33min	36min
	p = 0.275	
Mean resection time	4min	27min
	p <0.0001	

Gilling P, Barber N, Bidair M, et al. WATER: A Double-Blind, Randomized, Controlled Trial of Aquablation® vs Transurethral Resection of the Prostate in Benign Prostatic Hyperplasia. J Urol. 2018;199(5):1252-1261. doi:10.1016/j.juro.2017.12.065



Noninferior to TURP in IPSS, QoL, Qmax, PVR

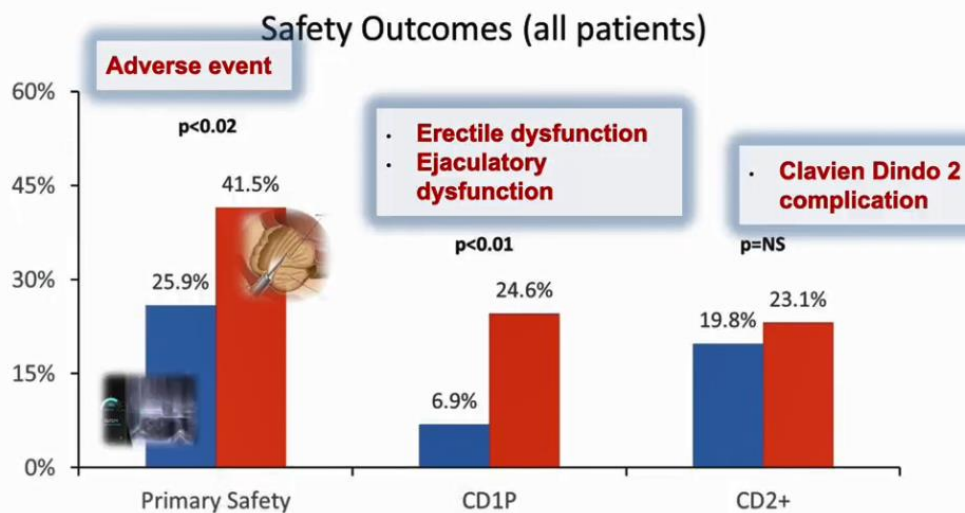
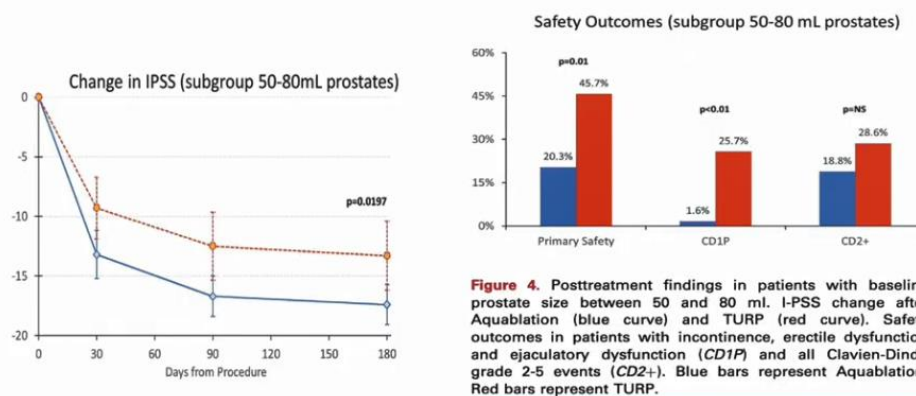


Figure 3. Safety outcome in all patients. *CD1P*, incontinence, erectile dysfunction and ejaculatory dysfunction. *CD2+*, all Clavien-Dindo grade 2-5 events. *NS*, not significant.



Larger prostates (≥ 50 mL) demonstrated a larger safety and efficacy benefit for Aquablation over TURP.

Five-year outcomes for Aquablation therapy compared to TURP: results from a double-blind, randomized trial in men with LUTS due to BPH

Peter J. Gilling, MD,¹ Neil Barber, MD,² Mohamed Bidair, MD,³
 Paul Anderson, MD,⁴ Mark Sutton, MD,⁵ Tev Aho, MD,⁶
 Eugene Kramolowsky, MD,⁷ Andrew Thomas, MD,⁸ Ronald P. Kaufman, Jr., MD,⁹
 Gopal Badlani, MD,¹⁰ Mark Plante, MD,¹¹ Mihir Desai, MD,¹²
 Leo Doumanian, MD,¹² Alexis E. Te, MD,¹³ Claus G Roehrborn, MD¹⁴

¹Tauranga Urology Research, Tauranga, New Zealand; ²Frimley Park Hospital, Frimley Health Foundation Trust, Surrey, United Kingdom; ³San Diego Clinical Trials, San Diego, California, USA; ⁴Royal Melbourne Hospital, Melbourne, Australia; ⁵Houston Metro Urology, Houston, Texas, USA; ⁶Addenbrooke's Hospital, Cambridge University Hospitals, Cambridge, United Kingdom; ⁷Virginia Urology, Richmond, Virginia, USA; ⁸Princess of Wales Hospital, Bridgend, Wales, United Kingdom; ⁹Albany Medical College, Albany, New York, USA; ¹⁰Wake Forest School of Medicine, Winston-Salem, North Carolina, USA; ¹¹University of Vermont Medical Center, Burlington, Vermont, USA; ¹²University of Southern California, Institute of Urology, Los Angeles, California, USA; ¹³Weill Cornell Medical College, New York, New York, USA; ¹⁴Department of Urology, UT Southwestern Medical Center, University of Texas Southwestern, Dallas, Texas, USA

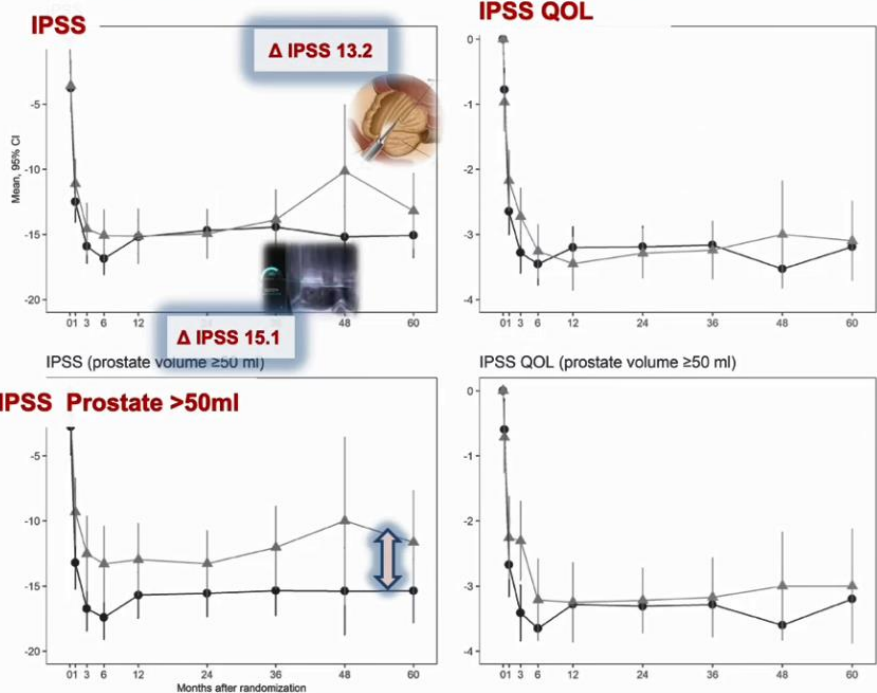


TABLE 2. Additional BPH therapy details per treatment group

	Aquablation n = 116	TURP n = 65
Year 1	1 BPH medication 2 TURP, 1 Laser	3 BPH medications 1 TURP
Year 2	2 TURP	2 BPH medications
Year 3		
Year 4		1 BPH medication
Year 5	1 TURP	1 BPH medication
Total	7 (6.0%)	8 (12.3%)

Retreatment 6%

Bigger prostate? (80–150 mL)

Aquablation for benign prostatic hyperplasia in large prostates (80–150 mL): 6-month results from the WATER II trial

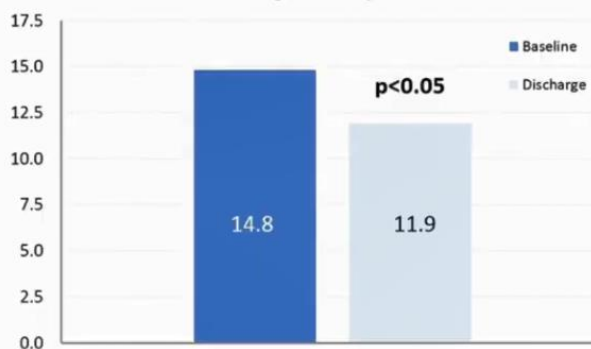
prospective, multicentre, single-arm, open-label

Aquablation	
 • 181 pt • Age 45-80 • IPSS > 12 • Prostate 85-100ml • Qmax ≤ 15	 N=101
IPSS	23.2 to 6.2
	P < 0.001
Qmax	8.7 to 18.8 mL/s
	p < 0.0001
Resection time(min)	7.8(3-15)
Length of stay(days)	1.6(0-6)
Clavien-Dindo grade > 2	29.7%
Bleeding complications	9.9%
Peri-operative transfusions	5.9%

Major Bleeding Events – WATER II

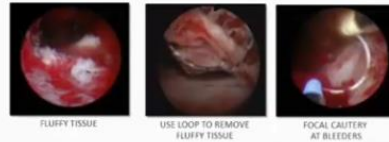
Major Events	Prior to Discharge	Discharge to Day 15	Day 16 to 1 Month	> 1 Month
Transfusion	6	2	2	0
Return to OR	1	2	1	0

Hemoglobin Drop



FOCAL BLADDER NECK CAUTERY METHODOLOGY

- Clot Evacuation
- Removal of “fluffy tissue”
- Cauterize around bladder neck



- **Post op bleeding is an issue**
- **Catheter traction**
- **2nd procedure: TUR coagulation may be needed**

	Mean (N = 2,089)
Transfusion Rate	0.8% (95% CI: 0.5-1.3)
Prostate Size	87 mL (20-363)
FBNC Time (handpiece removal to catheter insertion)	19.9 min



Elterman DS, Foller S, Ubrig B, et al. Focal bladder neck cautery associated with low rate of post-Aquablation bleeding. *Can J Urol.* 2021;28(2):10610-10613.



- robotic waterjet treatment (RWT) may be offered as a treatment option to patients with LUTS/BPH provided prostate volume 30-80cc. (Conditional Recommendation; Evidence Level: Grade C)



Summary of evidence	LE
Aquablation appears to be as effective as TURP both subjectively and objectively; however, there are still some concerns about the best methods of achieving post-treatment haemostasis.	1b
Recommendations	Strength rating
Offer Aquablation* to patients with moderate-to-severe LUTS and a prostate volume of 30-80 mL as an alternative to TURP.	Weak
Inform patients about the risk of bleeding and the lack of long-term follow-up data.	Strong

* Aquablation remains under investigation

Real word study?

Table 1 - A comparison of the efficacy, durability, and safety data between transurethral resection of the prostate and aquablation.

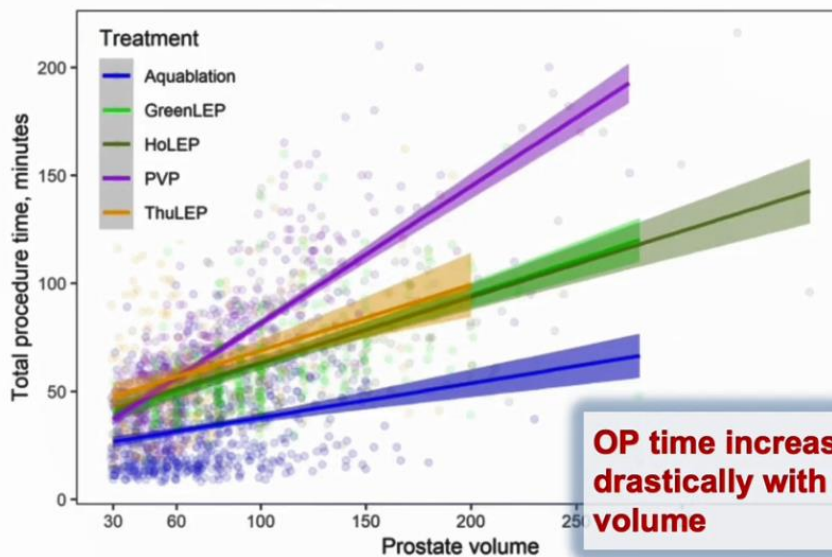
	M-TURP/B-TURP	Aquablation
Efficacy		
Qmax	+162%	+195%
IPSS	-70%	-75% overall (89% in prostates >50 ml)
QoL	-69%	-67%
PVR	-77%	-72%
Durability		
Re-do procedure	8.3% (within 8 y)	6% (within 5 y)
Side effect profile/Safety		
Transfusion rate	2%	0.8%
TUR syndrome	0.8%	Not applicable
Acute urinary retention	4.5%	9%
Urinary tract infection	4.1%	2%
Retrograde ejaculation	75%	7%
Erectile dysfunction	10%	0%
Basis for evidence	Large meta-analyses ³⁰⁻³²	3-mo follow-up of adverse effects, n = 117 ¹² 5-y follow-up study for aquablation, n = 116 ¹⁶

Similar Efficacy

**Less complication
Ejaculation
preservation**

Scholtz, David J. Aquablation: An overview of a novel, minimally invasive surgical modality to treat benign prostatic hyperplasia. Urological Science 35(1):p 9-18, March 2024.

Fig. 1



**OP time increased less
drastically with prostate
volume**

Nguyen, DD., Misraï, V., Bach, T. et al. Operative time comparison of aquablation, greenlight PVP, ThuLEP, GreenLEP, and HoLEP. World J Urol 38, 3227-3233 (2020).

Taiwan data?

**Table 1. Comparison of Preoperative Characteristics
Aquablation for Benign Prostatic Hyperplasia**

	Group 1 Case 1-25	Group 2 Case 26-50	p value	Total
Age	72.24±7.79	65.36±8.08	0.004*	68.80±8.5
BMI	26.60±3.12	25.27±2.99	0.129	25.94±3.10
ASA score	2.56±0.51	2.40±0.50	0.267	2.48±0.51
Diabetes	40% (10)	24%(6)	0.363	32%(16)
PSA (ng/mL)	3.73±2.88	4.77±7.19	0.508	4.25±5.45
Creatinine (mg/dL)	0.98±2.77	1.02±0.32	0.676	1.00±0.30
Prostate size (cm ³)(before)	82.33±37.15	58.13±20.96	0.007*	70.23±32.2
Prostate size (cm ³)(after)	38.58±13.56	23.55±12.64	0.012*	33.17±14.91
Reduce size (cm ³) (%)	38.66±26.92	35.20±27.80	<0.001**	37.41±26.71**
IPP (cm)	1.51±0.93	1.25±0.50	0.236	1.38±0.75

Age 65-72

Size 58-82

**Table 3. Comparison of Aquablation Outcomes
for Benign Prostatic Hyperplasia**

	Group 1 Case 1-25	Group 2 Case 26-50	Total
IPSS (before)	18.60±6.10	22.17±5.32*	20.31±5.96
(after)	6.47±3.71	6.75±6.65	6.56±4.70
QOL (before)	4.00±0.91	4.57±0.79*	4.27±0.89
(after)	1.59±0.71	1.25±1.28	1.48±0.92*
Voiding Volume, ml (before)	185.9±71.0	205.1±93.3	195.7±82.8
(after)	311.7±148.9	300.4±148.5	306.6±147.0**
Qmax, ml/s (before)	11.49±5.85	12.45±5.55	11.98±5.65
(after)	26.90±8.29	26.70±11.79	26.81±9.90**
Qmean, ml/s (before)	5.13±1.66	5.88±2.26	5.51±2.11
(after)	12.30±3.85	11.93±4.86	12.13±4.29**
PVR, ml (before)	97.09±91.00	54.58±66.81	75.38±63.97
(after)	40.57±58.21	24.53±28.82	33.11±44.14

Δ IPSS 12-16

Δ Qmax 6-7

Post op PVR 24-40ml

Summary

- Aquablation
 - Excellent short term(5 yr) outcome
 - **Only MIST that efficacy comparable to TURP**
 - Ejaculation function preservation
 - Good safety profile
 - Only watch out for bleeding
 - 2nd TUR coagulation needed(transfusion rate 0.8-4%)
 - **Semiautomatic/robotic**
 - **Less learning curve**
 - **OP time less effect by prostate size**
 - **Inpatient/GA/Spinal anesthesia**

Summary of MIST

MIST	Anesthetic requirement	Treatment setting	Consideration	Δ IPSS	Δ Qmax	Impact on sexual function	Retreatment rate
Aquablation	General/spinal	Inpatient (1~2 day)	Post op bleeding Robotic, less learning curve Large prostate	16	12	++	4.3% 5 yr
iTND	Local, transrectal block	Outpatient Flexible scope	Prostate<75ml Without OML Need insitu 5-7 days	8-12	4-6	none	8.6% 2yr
Urolift	Local, transrectal block	Outpatient	Prostate 30-80ml Without OML	8-12	4-6	none	13.6% 5 yr
Rezum	Local, transrectal block	Outpatient	Prostate 30-80ml Longer catheter time due to necrosis resorbing time	8-12	4-6	+	4.4% 5yr

OML:Obstructive median lobe

Madersbacher S, Roehrborn CO, Oelke M.
The role of novel minimally invasive
treatments for lower urinary tract
symptoms associated with benign prostatic
hyperplasia. *BJU Int*. 2020;126(3):317-326.
doi:10.1111/bju.15154

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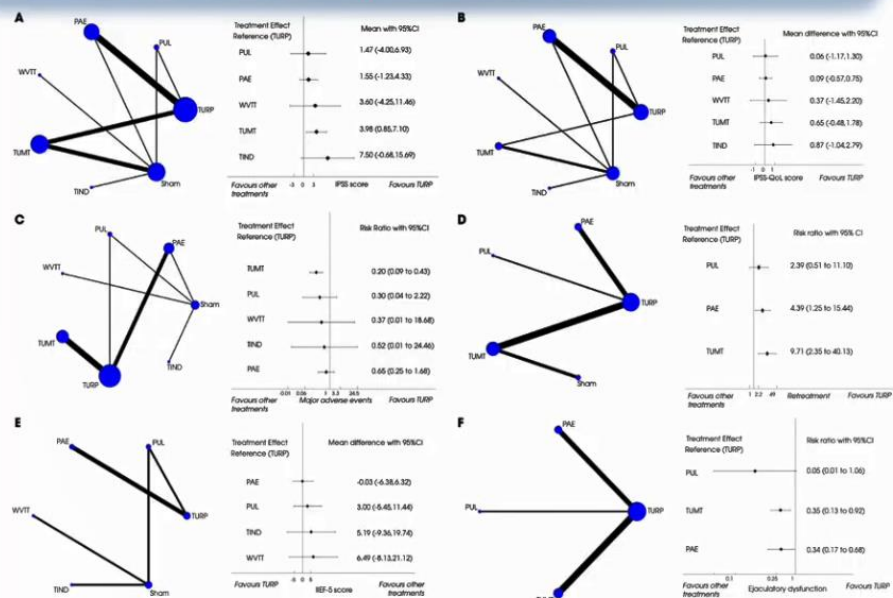
TURP

Combo medication

15 15
7 3.8

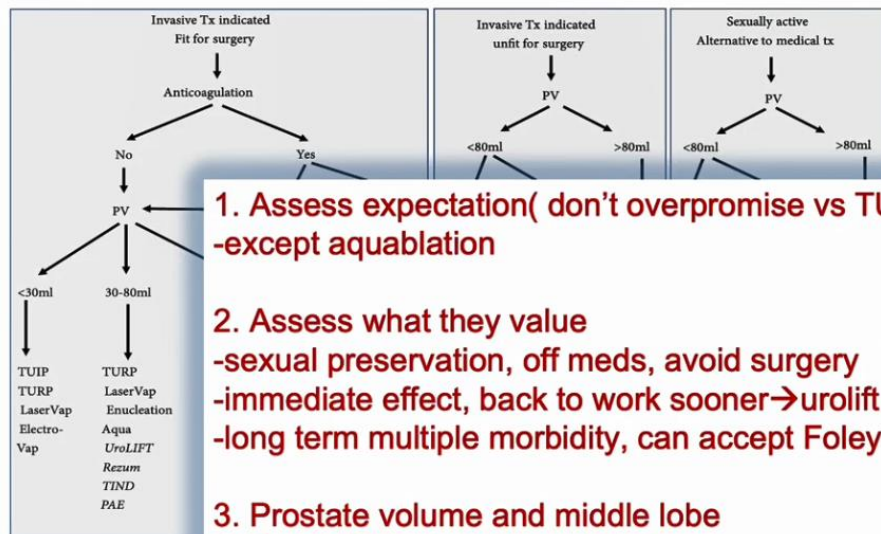
Meindersbach S, Roehrborn CG, Delle M. The role of novel minimally invasive treatments for lower urinary tract symptoms associated with benign prostatic hyperplasia. *BJU Int*. 2020;126(3):317-326. doi:10.1111/bju.15154

• Lack of head to head comparison between MIST



Franco JV, Jung JH, Imamura M, et al. Minimally invasive treatments for lower urinary tract symptoms in men with benign prostatic hyperplasia: a network meta-analysis. *Cochrane Database Syst Rev*. 2021;7(7):CD013656. Published 2021 Jul 15. doi:10.1002/14651858.CD013656.pub2

Fig. 1 Algorithm for minimal invasive and surgical management in different clinical scenarios. Aqua, aquablation; Lap, laparoscopic; Tx, treatment; Vap, vaporisation.



1. Assess expectation(don't overpromise vs TURP)
-except aquablation

2. Assess what they value

-sexual preservation, off meds, avoid surgery
-immediate effect, back to work sooner→urolift
-long term multiple morbidity, can accept Foley 1wk →rezum

3. Prostate volume and middle lobe

→Share decision making is key

*invasive treatments for lower urinary tract symptoms associated with
benign prostatic hyperplasia. BJU Int. 2020;126(3):317-326.
doi:10.1111/bju.15154*