臺北醫學大學 泌尿腎臟研究中心 會議記錄

時間：**114 年 4 月 24 日(星期四) 9:00-10:00**

地點：視訊會議- (請以正式全名登入會議室，以利進行會議簽到)

使用 Google Meet (會議前 10 分鐘即開啟會議室)

會議室連結： https://meet.google.com/ihn-wugo-jfv

(敬略稱位)

會議主席：洪冠予

與會人員：

【附醫】劉明哲、葉劭德、吳建志、林孝友、吳政誠、張景欣、羅詩修、林敬哲、吳致寬、方德昭、吳逸文、陳錫賢、林彥仲、高治圻、陳靜怡、葉曙慶、邵月珠、周安琪

【萬芳】溫玉清、李良明、林克勳、林雍偉、蕭志豪、許軒豪、賴宗豪、鍾卓興、許永和、鄭仲益、陳作孝、劉崇德、楊韻紅、吳岳霖

【雙和】吳佳璋、陳冠州、劉家宏、江怡德、鄒凱亦、高偉棠、胡書維、魏汶玲、吳美儀、李明哲、洪麗玉、鄭彩梅、廖家德、游博翰、陳正憲、邱惠雯、高芷華、林冠宏

【新國民】蘇裕謀、鄒居霖

長官指導：

吳麥斯校長、許志成教授、陳瑞明所長、盧星華副院長、許永和副院長

議程：

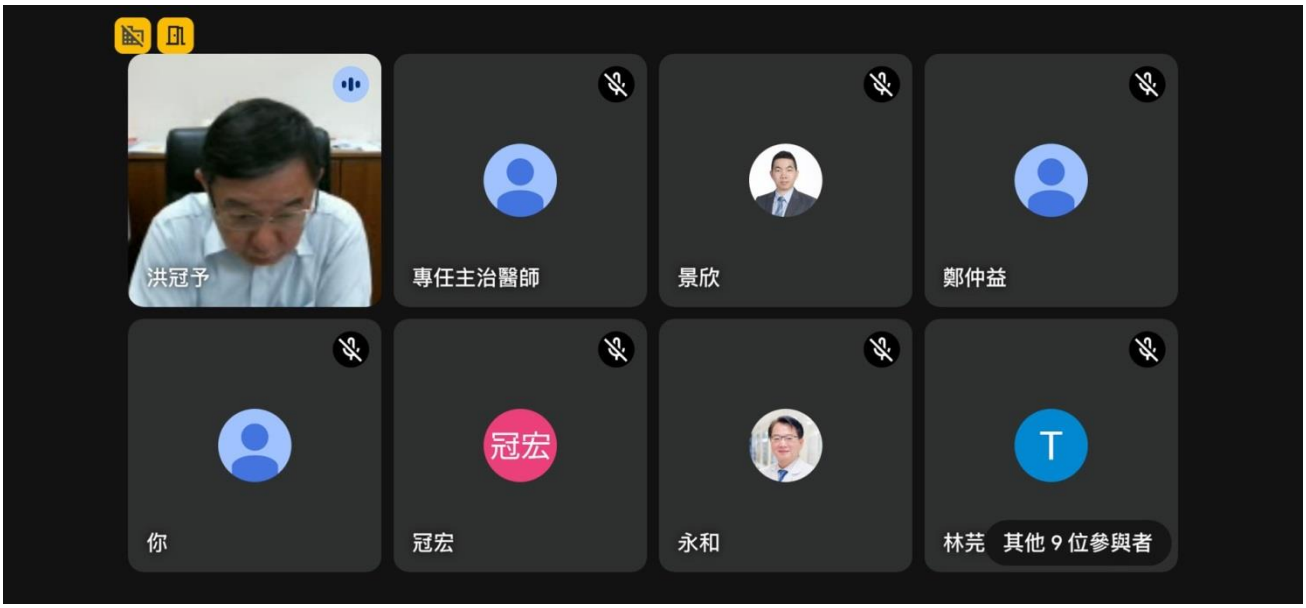
一、 腎臟泌尿精準健康計畫及生物檢體資料庫進度報告(吳逸文主任)

二、 團隊報告

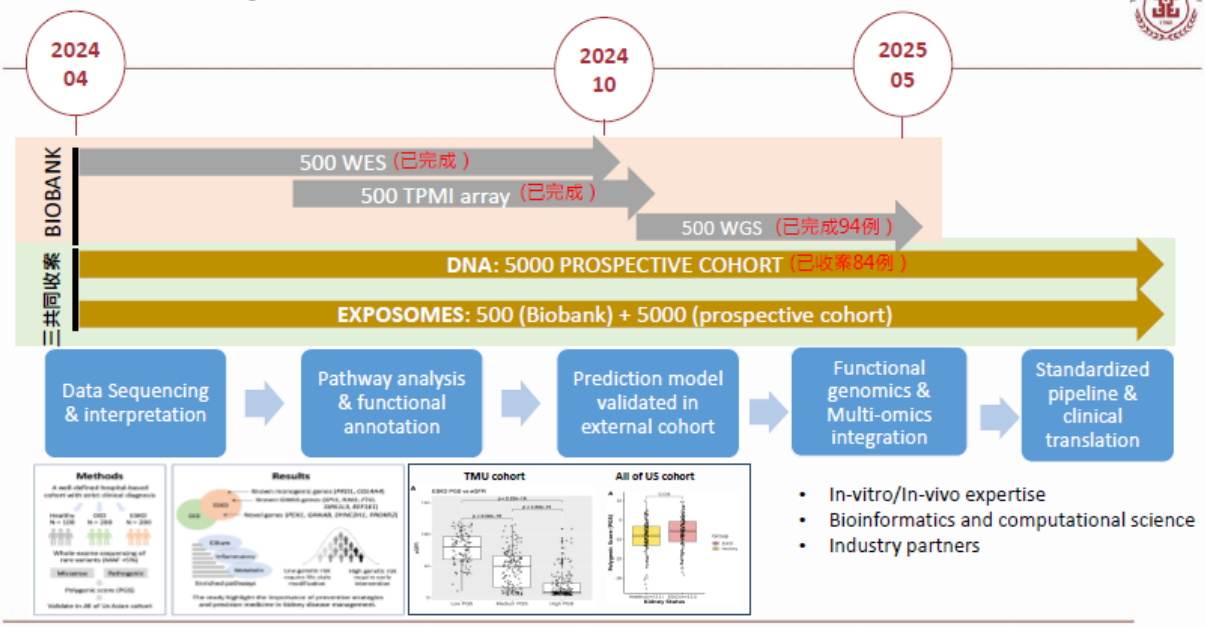
1. 腎移植團隊(雙和吳美儀副院長)

2. 慢性腎病團隊(萬芳鄭仲益主任)

3. 泌尿創新技術與手術團隊(萬芳楊宇祥醫師)



精準腎臟健康計畫進度及未來方向：



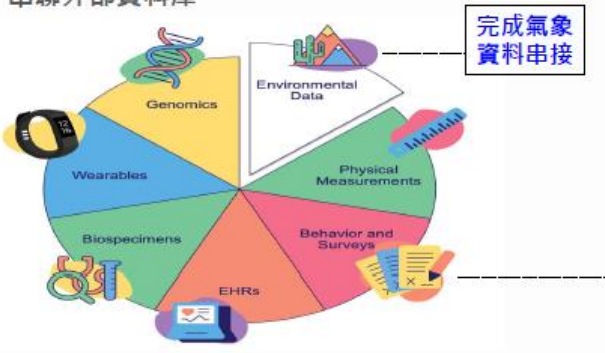
- In-vitro/In-vivo expertise
- Bioinformatics and computational science
- Industry partners

Journal Biomedical Science, under review

建置暴露體數據平台：優化腎病健康及環境問卷

Gene-Environment interaction:

從代謝疾病及肺癌開始(有基因數據)
在HIS架構下建立個人的暴露體資料
在數據處建置暴露體數據資料庫
串聯外部資料庫



完成氣象資料串接

SurveyCake 問卷平台

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

目前成果

- **教育部高教深耕計畫**：腎病精準醫學計畫（2024, 2025）
- **國際研討會**：台灣腎臟醫學會：台馬泰國際研討會 (2024/12)
- **國內研討會**：台基盟X國衛院：2025 精準論壇 (2025/04)
- **論文**： Polygenic Score for Kidney Function and Clinical Management through Whole-Exome Sequencing in the Taiwanese Population (審查中)
- **計畫:**
- 國科會：2 件（審查中）
- 國衛院計畫：2 件（審查中）

One campus: 共同收案，共享資料，共同發表

- **Prospective Genomic Cohort Establishment:**

高治圻/吳逸文

IgA nephropathy

廖家德/林冠宏

Polycystic kidney disease

Diabetic kidney disease

吳岳霖

Other kidney disease

年度	月份	腎臟科_雙和_血液	腎臟科_附醫_血液	腎臟科_萬芳_血液
2024	7	0	1	0
2024	8	0	2	0
2024	9	0	7	0
2024	10	0	13	0
2024	11	0	11	0
2024	12	0	18	0
2025	1	0	12	0
2025	2	0	10	1
2025	3	2	10	0

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)

20-50% develop AKI

SA-AKI significantly increases ICU patient mortality to 38.8%

30% progress to AKD

20-30% progress to CKD

- Decline or loss of glomerular filtration rate (GFR)
- Renal cells undergo fibrosis and epithelial-to-mesenchymal transition (EMT)
- Reduced microvascular density leads to renal hypoxia
- Long-term renal function deterioration may progress to AKD or CKD

Sepsis

Sepsis activates the immune response

- Immunomodulation
- Inflammation
- Complement activation
- RAAS dysfunction
- Mitochondrial dysfunction
- Metabolic reprogramming
- Microcirculatory dysfunction
- Macrocirculation alteration

SA-AKI

Acute Kidney Injury Subtype 1
High renal tolerance
Good potential for recovery

Acute Kidney Injury Subtype 2
Moderate kidney injury
Partial renal function recovery

Acute Kidney Injury Subtype 3
Severe kidney injury with poor recovery ability
May progress to chronic kidney disease

Maladptive repair (AKD->CKD)

Adaptive Repair (Renal function recovery)

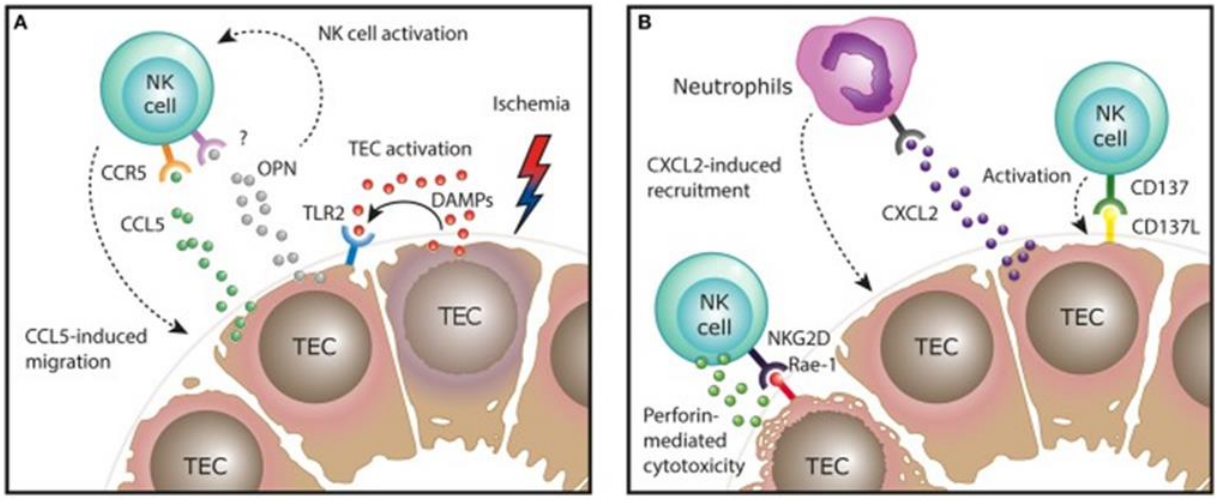
- Redifferentiation of renal tubular epithelial cells restores normal function
- Partial or complete recovery of renal tubules and glomeruli
- Low fibrosis levels help maintain stable glomerular filtration rate
- Renal tissue remodeling restores normal function

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

1.Journal of Nephrology. 2020 ; 2.Nature Reviews Nephrology. 2023 ; 3.https://www.who.int/zh/news-room/fact-sheets/detail/sepsis.

NK cell function

Function of NK cells in the ischemia/reperfusion mouse model of AKI.



Front Immunol. 2019

NK cell roles in sepsis

Role of NK Cells in Sepsis

- Derived from CD34+ stem cells and an essential component of innate immunity.
- Capable of killing cancer cells, virus-infected cells, and aged or stressed cells.

5-10%

Proportion of NK cells among lymphocytes in human blood

90%

Proportion of NK cells in peripheral blood mononuclear cells (CD56+dim CD16+ NK cells)

NK^{bright} vs. NK^{dim} Cells

NK^{bright} Cells

Immune Regulation

- **High CD56 Expression**
- **Cytokine Production:** Produces immunoregulatory cytokines (IFN-γ, TNF-α, and GM-CSF), playing a key role in immune modulation and shaping the adaptive immune response.
- **Location:** Primarily distributed in lymphoid tissues such as lymph nodes and the spleen.

NK^{dim} Cells

Strong Cytotoxic Activity

- **Low CD56 Expression**
- **Cytotoxic Activity:** Directly kills virus-infected or abnormal cells by releasing cytotoxic granules containing perforin and granzyme, inducing target cell death.
- **Location:** $CD56^{+}$dim NK cells are predominantly found in peripheral blood and represent the major NK cell subset.

Cellular Changes and Therapeutic Strategies

Better Control of Early Sepsis Infections

Target for Therapy

Enhancing NKbright Cell Function

- Strengthen NKbright cell activity to improve early infection control.
- Provide cytokines such as IL-12 and IL-18 to promote activation.

Avoid Overactivation

- Excessive activation may lead to a cytokine storm.

Strategically Enhancing Cytotoxic Function for More Effective Infection Clearance

Enhancing NKdim Cell Cytotoxicity

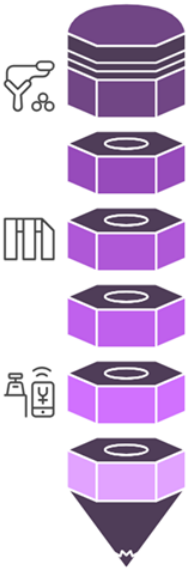
- Boost cytotoxic function to efficiently eliminate infections.
- Use specific stimulating factors (e.g., IL-15) to activate NKdim cells.
- Improve infection-fighting capability through targeted activation.

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

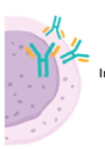
Disruptive Innovation in Cell Technology
- Understanding the mechanisms of cell therapy in disease repair
- Selecting the most promising cells
- Establishing a comprehensive patent portfolio

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

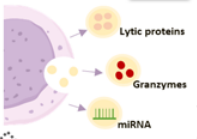
[Subproject 1]
PI：Mei-Yi Wu
Immune Profile



Interconnection through Comprehensive Immune Profiling .

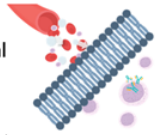
[Subproject 3] PI：Chih-Chin Kao
NK secreted Exosome

Exploring NK-Derived Exosomes as Therapies.



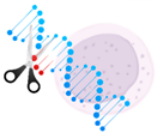
[Subproject 2] PI：Yung Chang
Immune Cell Separation

Advancing Therapeutic Potential with Biomimetic Membrane Technology.

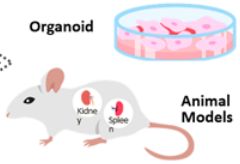


[Subproject 4] PI：Cheng-Ying Chu
CRISPR-mediated NK cell modulation

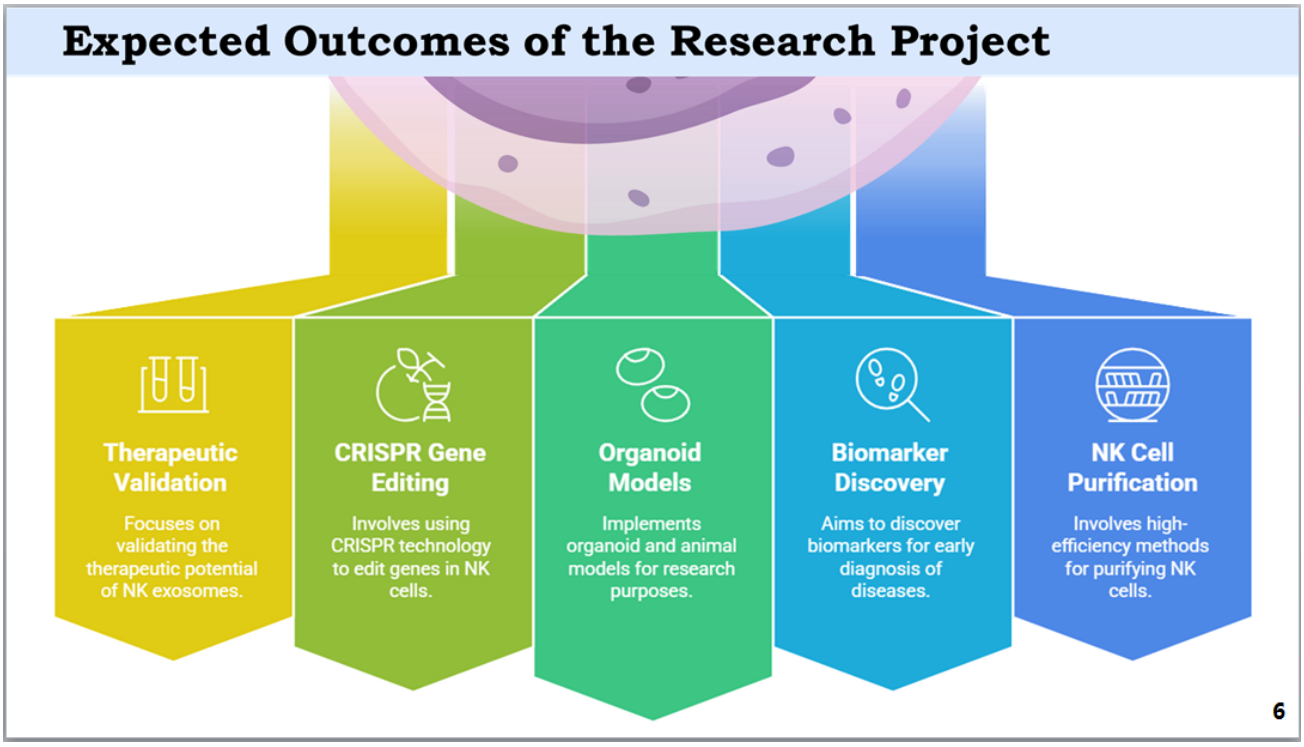
Enhancing NK Cell Functionality with CRISPR.



[Subproject 5]
PI：Chin-Hsien Tsai
Animal model Organoid



Validation in Organoid and Animal Models.



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

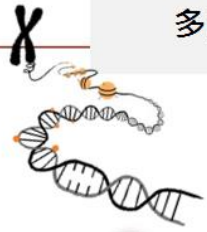

廖家德

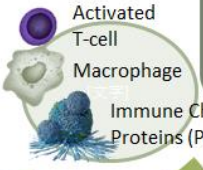

蘇裕謀


鄒居霖

三院整合型計畫

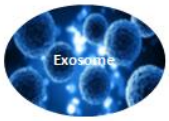
多面向探討顯性遺傳型多囊性腎臟病之惡化及綜合照護





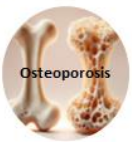
探討多囊性腎臟病進展與免疫反應研究

台灣多囊性腎臟病跨領域全人照護之評估



探討尿液外囊泡作為自體顯性多囊腎變化的生物標記

ADPKD



血紅生成素的角色探討多囊性腎臟病與骨質疏鬆的相關性:生物標記與血紅素

Total funding NT$2,655,272

2024.08.01 ~ 2025.07.31

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/1.73m^2
- 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**

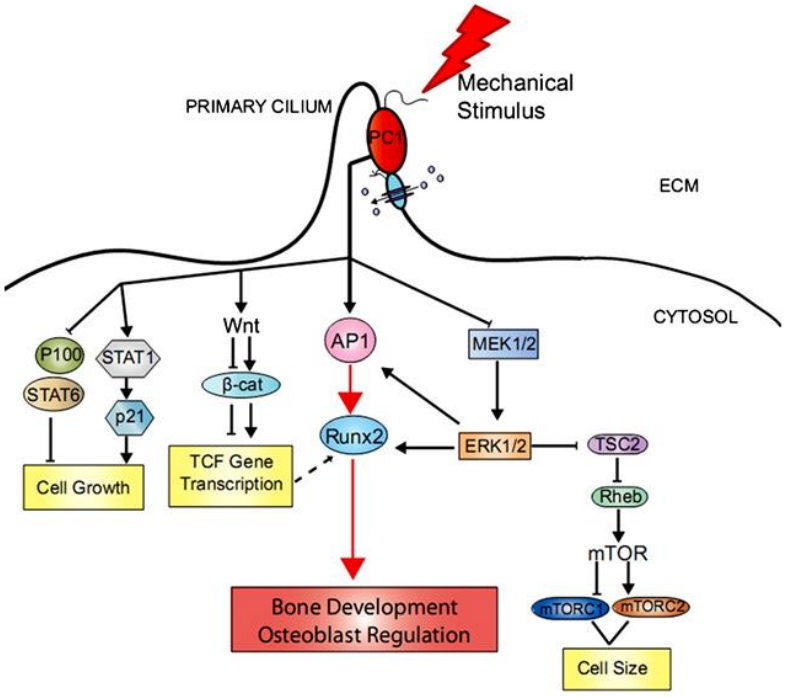
探討多囊性腎臟病與骨質疏鬆的相關性

- Disrupted Ca-Pi homeostasis
- Impaired bone formation
- Enhanced bone resorption
- Altered bone matrix quality

CKD

- Defective **polycystins** lead to abnormal Ca signaling
- **Chronic inflammation**

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



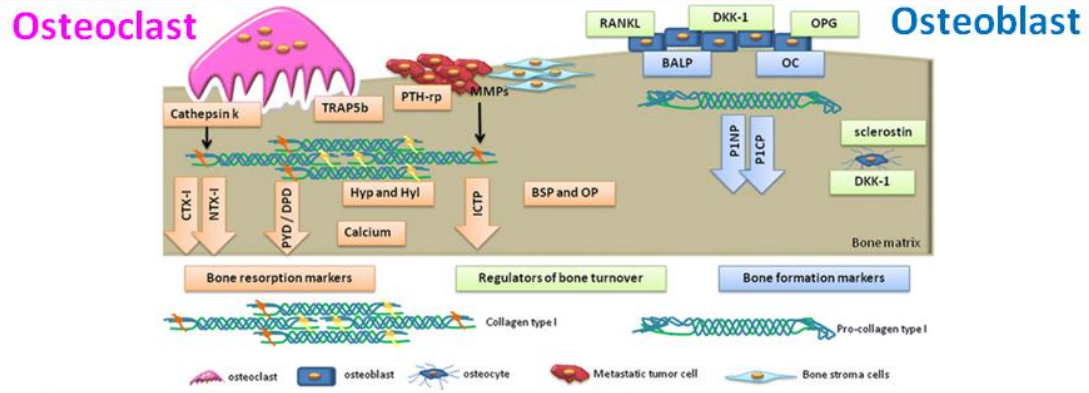
Dalagiorgou G et al. 2010 Oct. *Int J Biochem & Cell Bio*; 42: 1610-1613

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	**Bone formation**
Type I collagen degradation products	**Matrix proteins**
- Pyridinium crosslink (**PYD** and **DPD**)	- Procollagen Type 1 propeptides
- C- and N- telopeptides (**CTX**, **ICTP**, **NTX**)	C-terminal (**PICP**)
	N-terminal (**PINP**)
	- Osteocalcin (**OC**)
Enzymes	**Enzymes**
- Tartrate-resistant acid phosphatase (**TRAP**) 5b	- Bone isoform of alkaline phosphatase (**BALP**)
- **Cathepsin K**	
- Matrix metalloproteinase (**MMPs**)	

Kuo T-R and Chen C-H. *Biomark Res* 2017 May 18:5:18

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

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

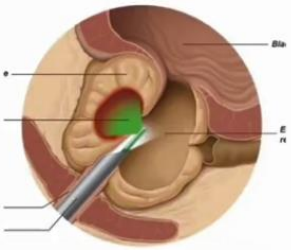
一年期: 2024

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吲哚酚引起的低骨轉換率

多年期: 2021-2024

Why MIST?



Medication

Surgery therapies

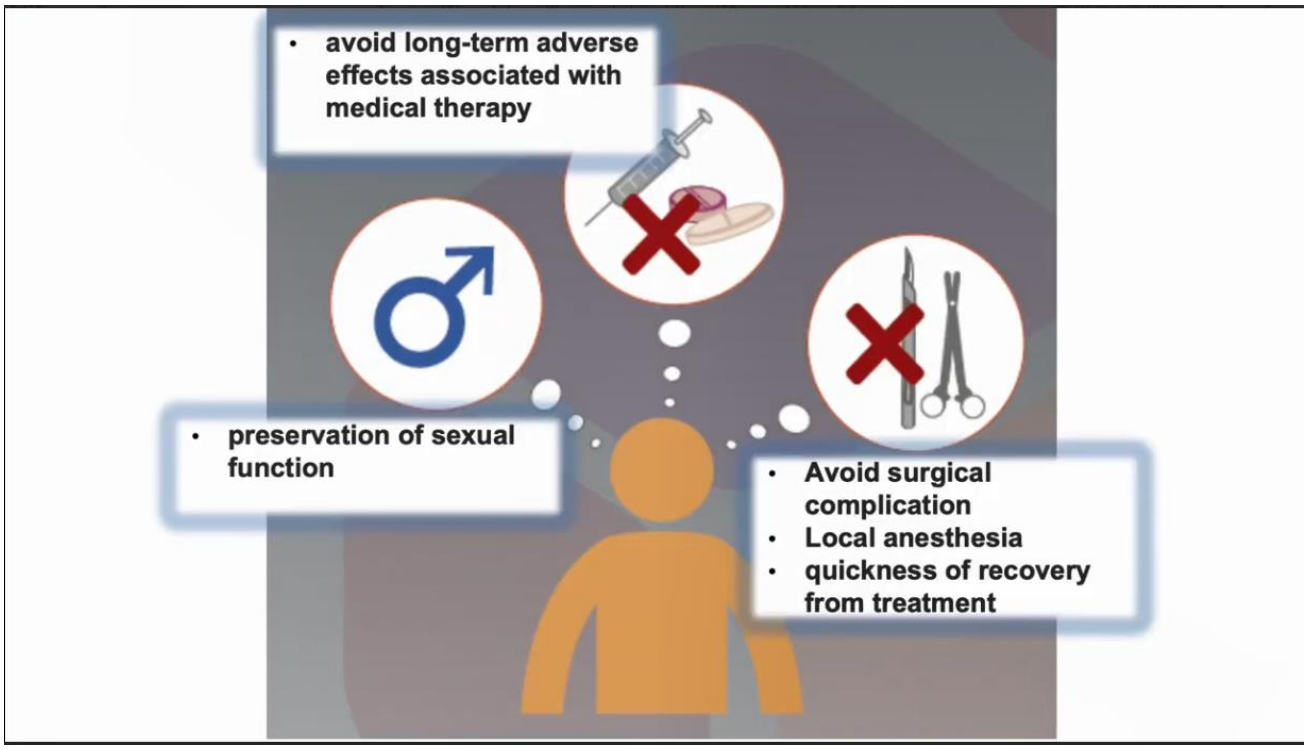
Noninvasive	Great de-obstruction efficacy
adherence challenges	Ejaculatory dysfunction 65%
adverse effects	TURP-related complications
limited effectiveness	Anesthesia risk

0424 RCUK

泌尿創新技術與手術團隊報告

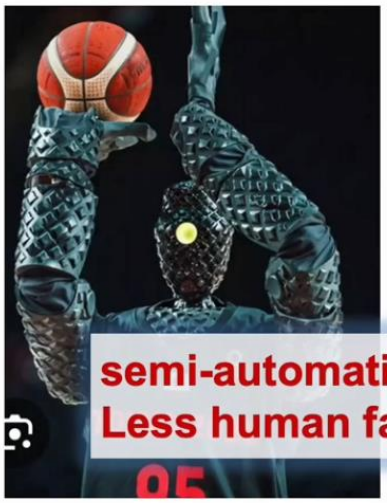
-Aquablation微創攝護腺水刀治療

Presenter
萬芳醫院楊宇祥醫師



Difference between aquablation and other MIST

Key element for aquablation

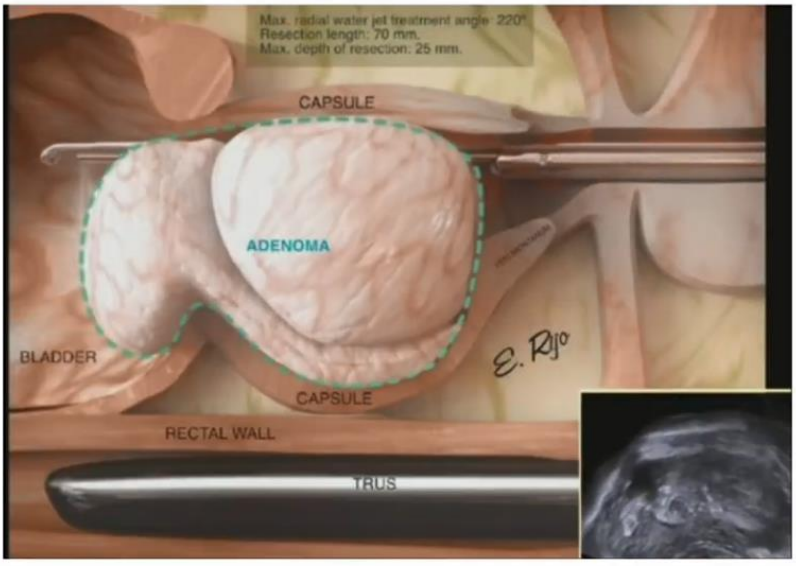


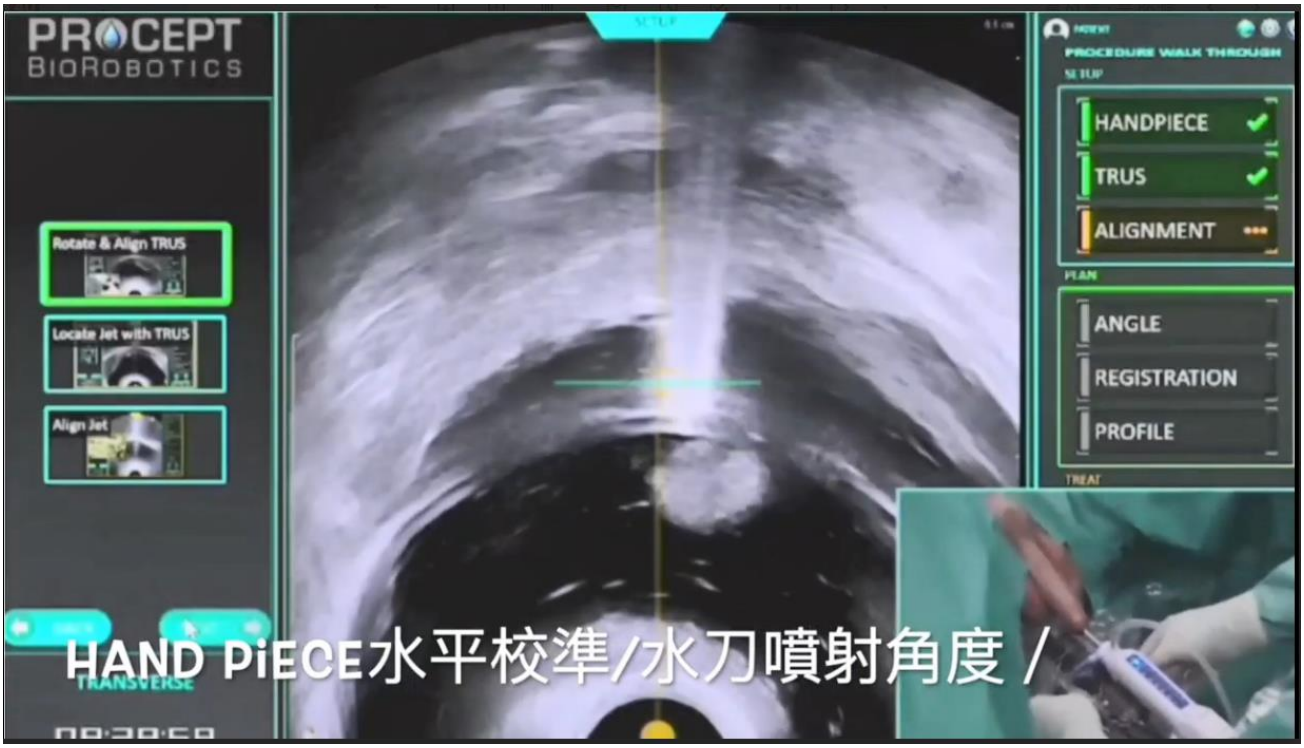
semi-automatic
Less human factor? better?

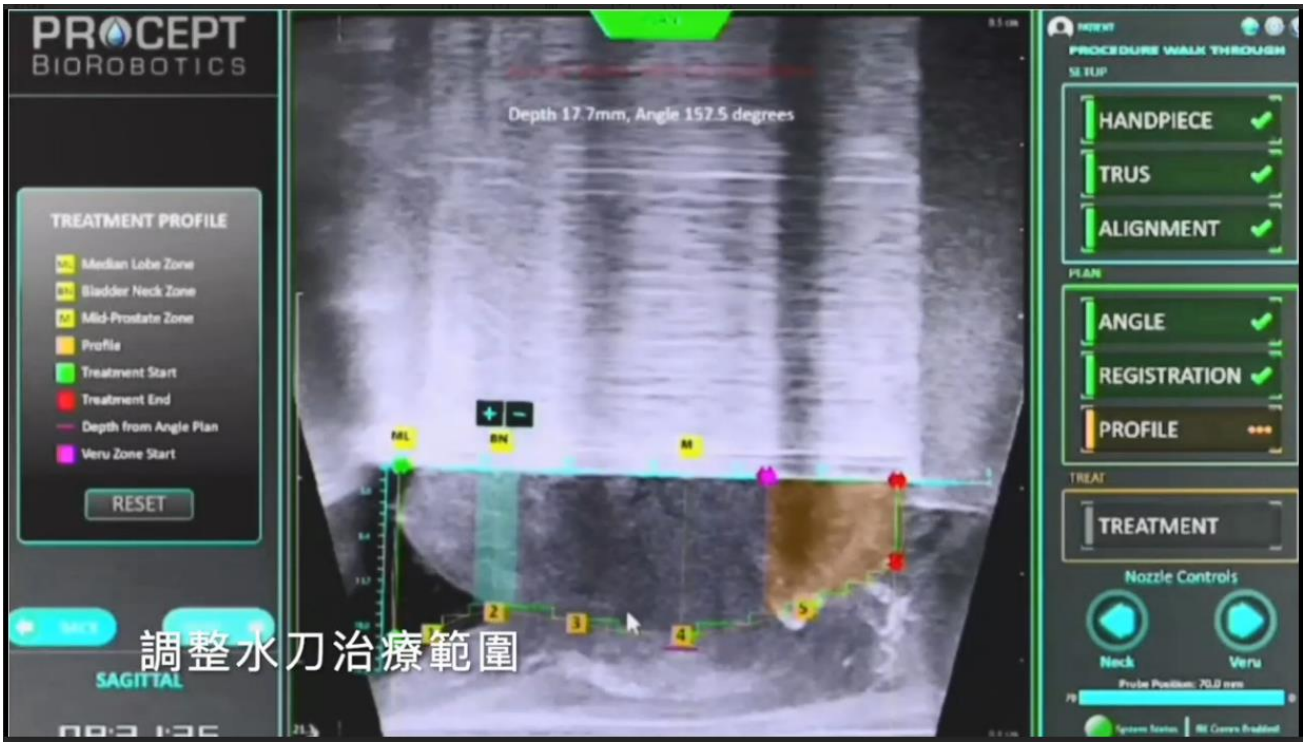
3pt :62.5%

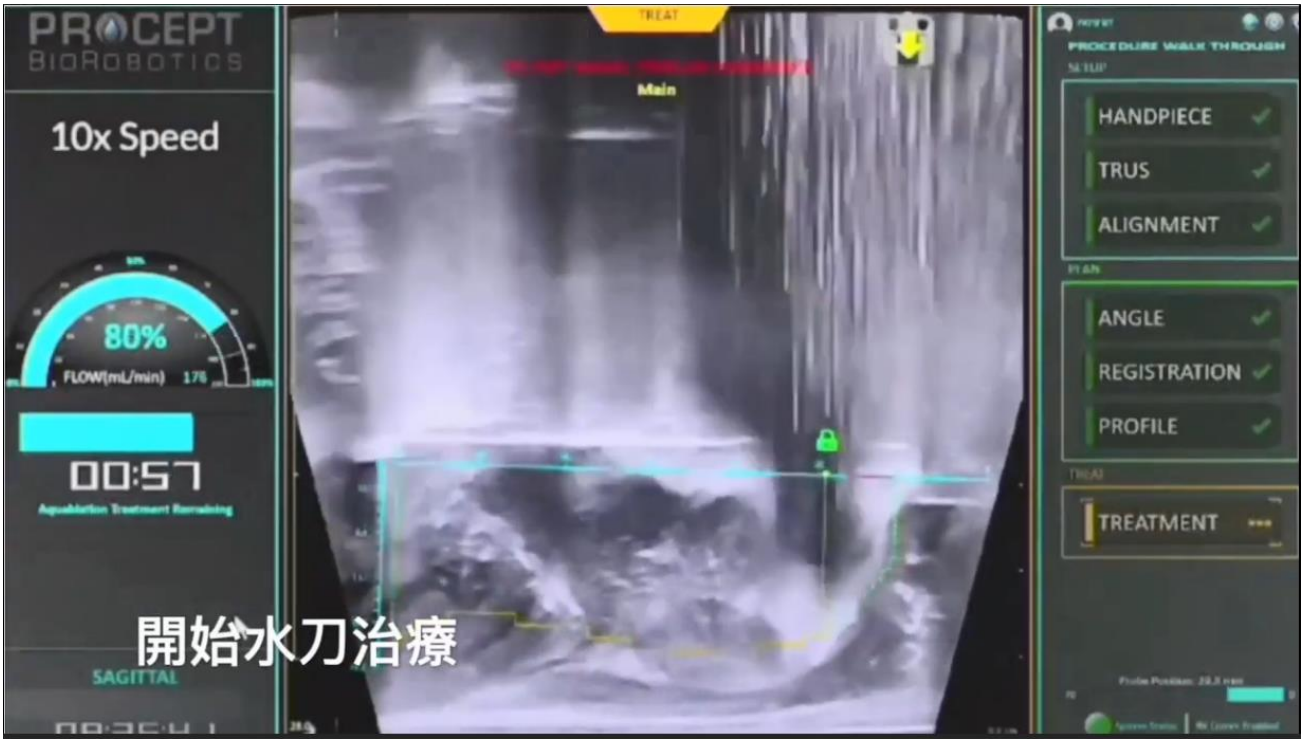
3pt:40%

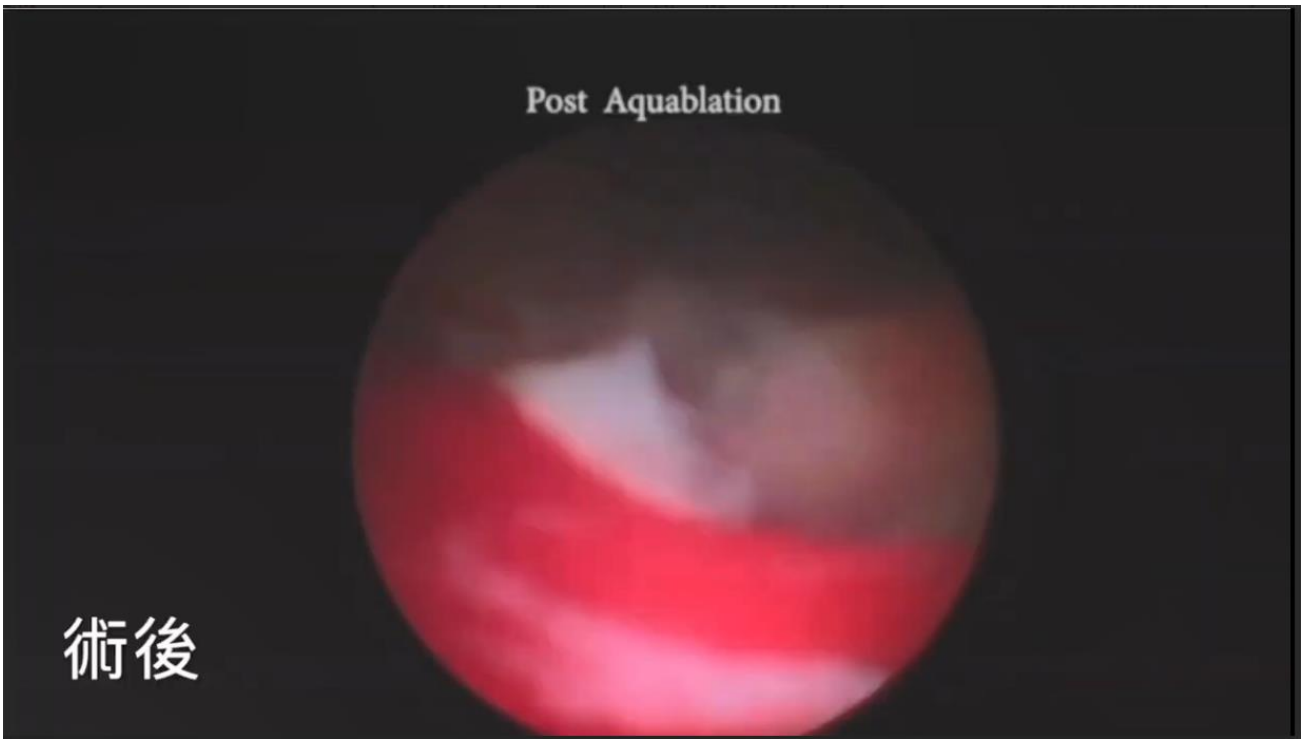
Aquablation (AquaBeam)



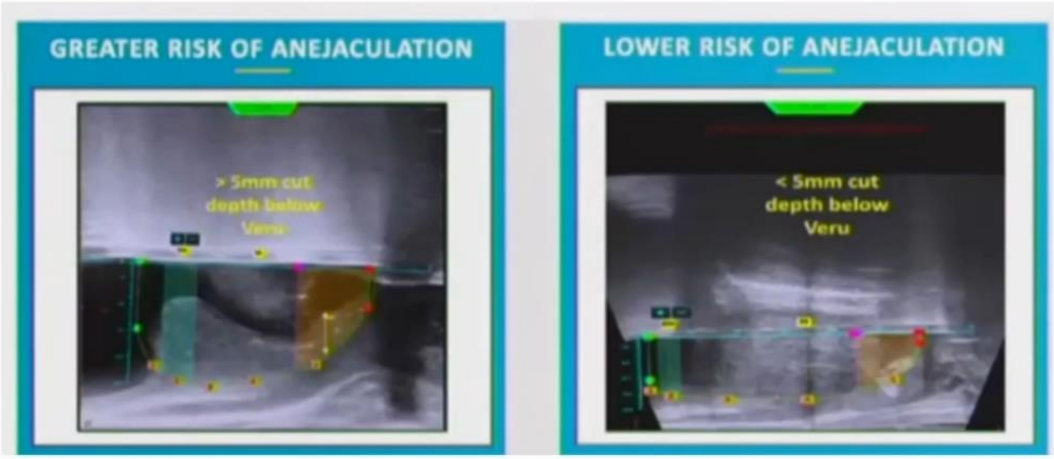

PROCEPT
BioRobotics
Rotate & Align TRUS
Locate Jet with TRUS
Align Jet
PROCEDURE WALK THROUGH
SETUP
HANDPIECE
TRUS
ALIGNMENT
PLAN
ANGLE
REGISTRATION
PROFILE
TREAT
HAND PiECE水平校準/水刀噴射角度 /


PROCEPT
BioRobotics
TREATMENT PROFILE
Median Lobe Zone
Bladder Neck Zone
Mid-Prostate Zone
Profile
Treatment Start
Treatment End
Depth from Angle Plan
Veru Zone Start
RESET
Depth 17.7mm, Angle 157.5 degrees
PROCEDURE WALK THROUGH
SETUP
HANDPIECE
TRUS
ALIGNMENT
PLAN
ANGLE
REGISTRATION
PROFILE
TREAT
TREATMENT
Nozzle Controls
Neck
Veru
調整水刀治療範圍


PROCEPT
BioRobotics
10x Speed
80%
FLOW(mL/min)
00:57
TREAT
Main
PROCEDURE WALK THROUGH
SETUP
HANDPIECE
TRUS
ALIGNMENT
PLAN
ANGLE
REGISTRATION
PROFILE
TREAT
TREATMENT
SAGITTAL
開始水刀治療


Post Aquablation
術後

Ejaculation preservation technique



<5mm cut depth below veru to prevent anejaculation

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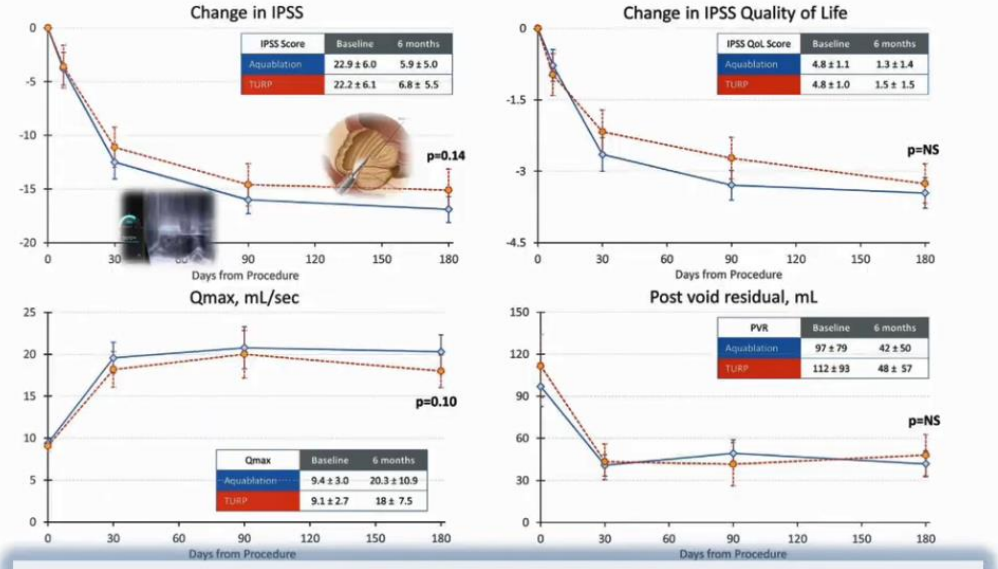
WATER: A Double-Blind, Randomized, Controlled Trial of Aquablation vs Transurethral Resection of the Prostate in Benign Prostatic Hyperplasia

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

	Aquablation	TURP
• 181 pt • Age 45-80 • IPSS>12 • Prostate 30-80ml • Qmax≤15 • 14/17 sites had no previous aquablation experience	 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

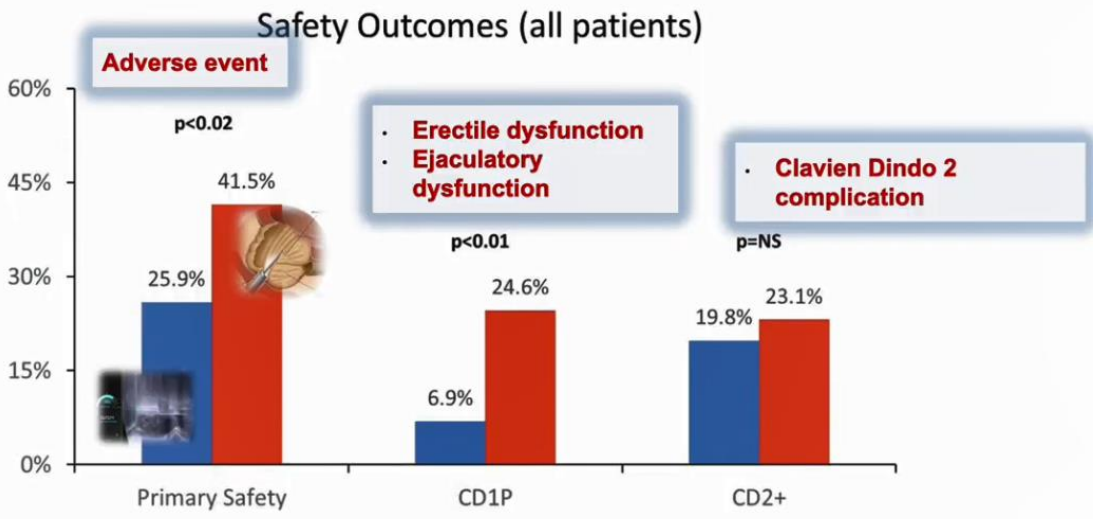
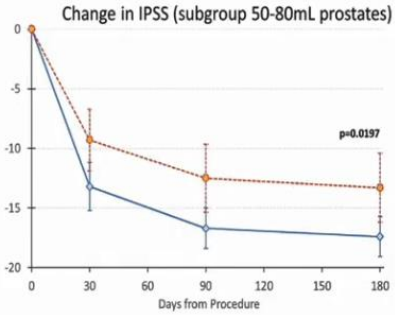


Figure 3. Safety outcome in all patients. *CD1P*, incontinence, erectile dysfunction and ejaculatory dysfunction. *CD2+*, all Clavien-Dindo grade 2-5 events. *NS*, not significant.



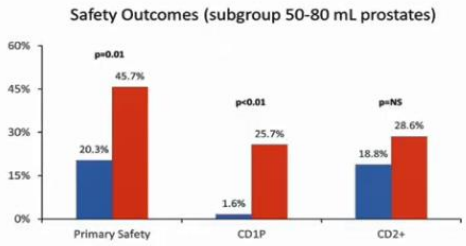


Figure 4. Posttreatment findings in patients with baseline prostate size between 50 and 80 ml. I-PSS change after Aquablation (blue curve) and TURP (red curve). Safety outcomes in patients with incontinence, erectile dysfunction and ejaculatory dysfunction (*CD1P*) and all Clavien-Dindo grade 2-5 events (*CD2+*). Blue bars represent Aquablation. Red bars represent TURP.

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, MD[14]

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

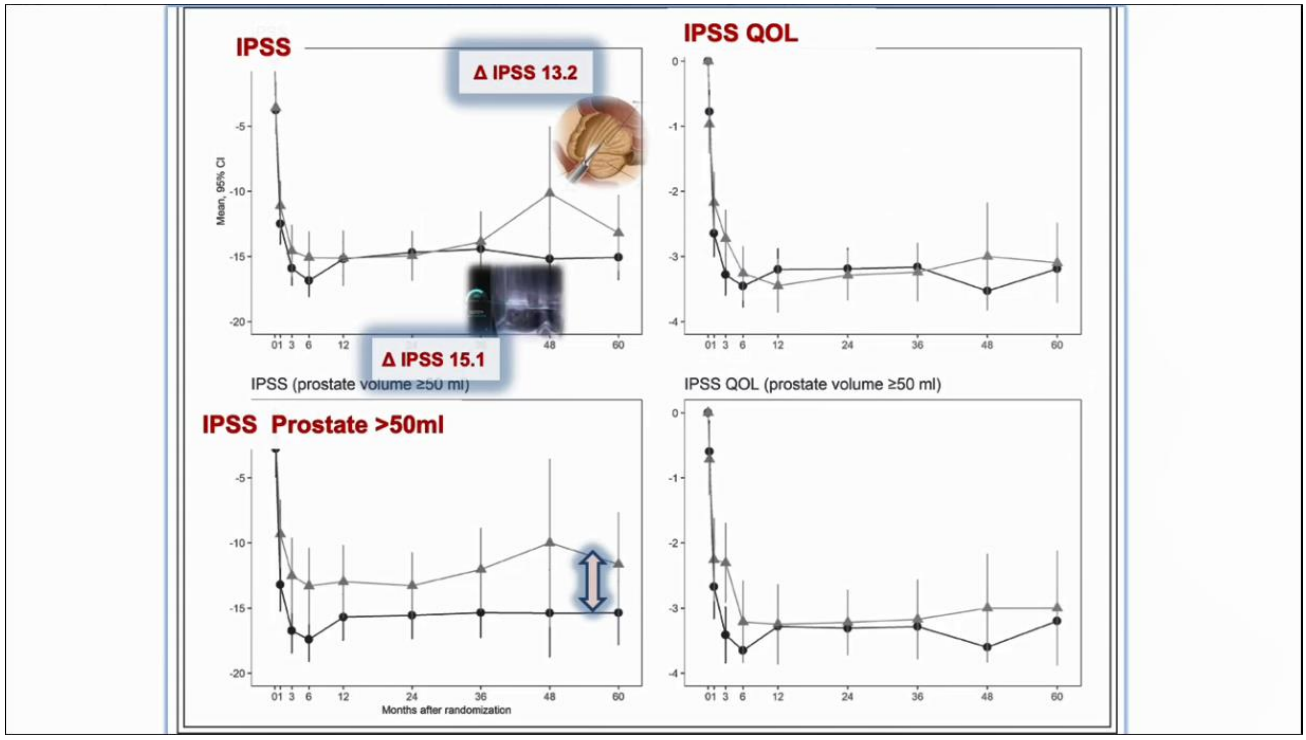


TABLE 2. **Additional BPH therapy details per treatment group**

	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%)**

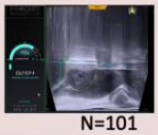
Retreatment 6%

BJUI
BJU International

Bigger prostate? (80–150 mL)

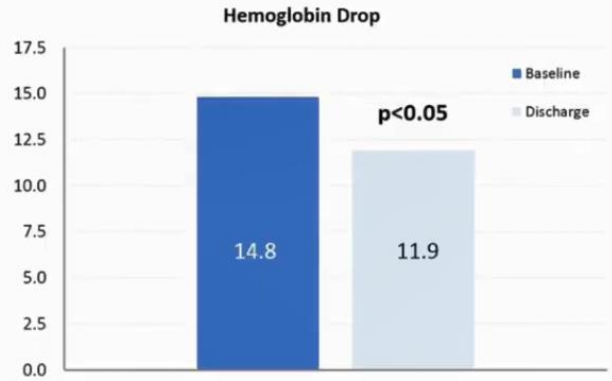
Aquablation for benign prostatic hyperplasia in large prostates (80–150 mL): 6-month results from the WATER II trial

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)
Legnth of stay(days)	1.6(0-6)
Clavien-Dindo grade>2	29.7%
Bleeding comlications	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



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.

American Urological Association

- 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)

eau

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.

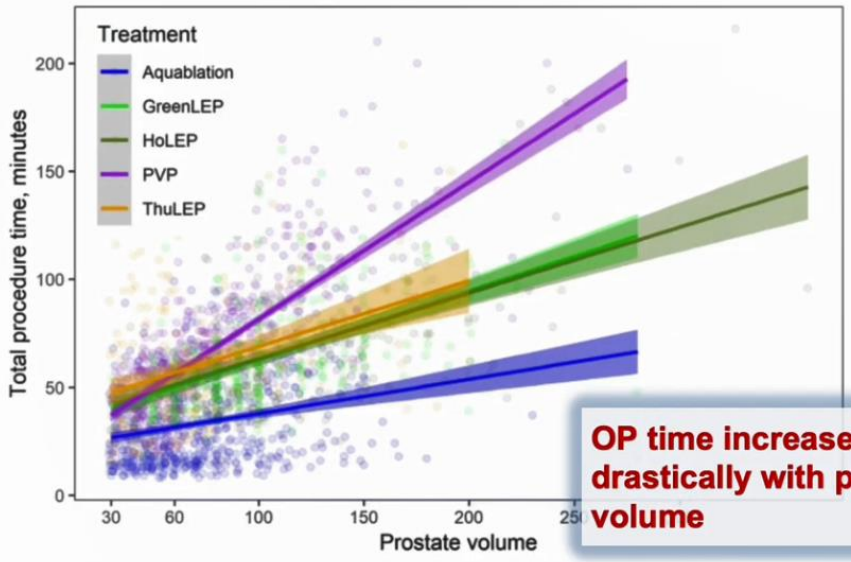
	M-TURP/B-TURP	Aquablation
Efficacy		
Qmax	+162%	+195%
IPSS	−70%	−75% overall (89% in prostates >50 m
QoL	−69%	−67%
PVR	−77%	−72%
Durability		
Re-do procedure	8.3% (within 8 y)	6% (within 5 y)
Side effect profile/Safety		
Transfusion rate	2%	0.8%
TUR syndrome	0.8%	Not applicable
Acute urinary retention	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?

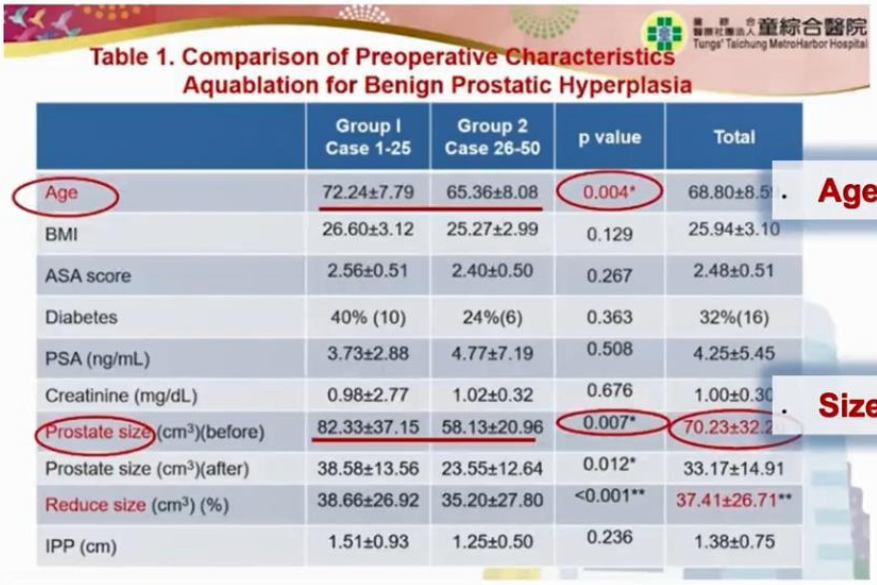


Table 1. Comparison of Preoperative Characteristics Aquablation for Benign Prostatic Hyperplasia

	Group I 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**

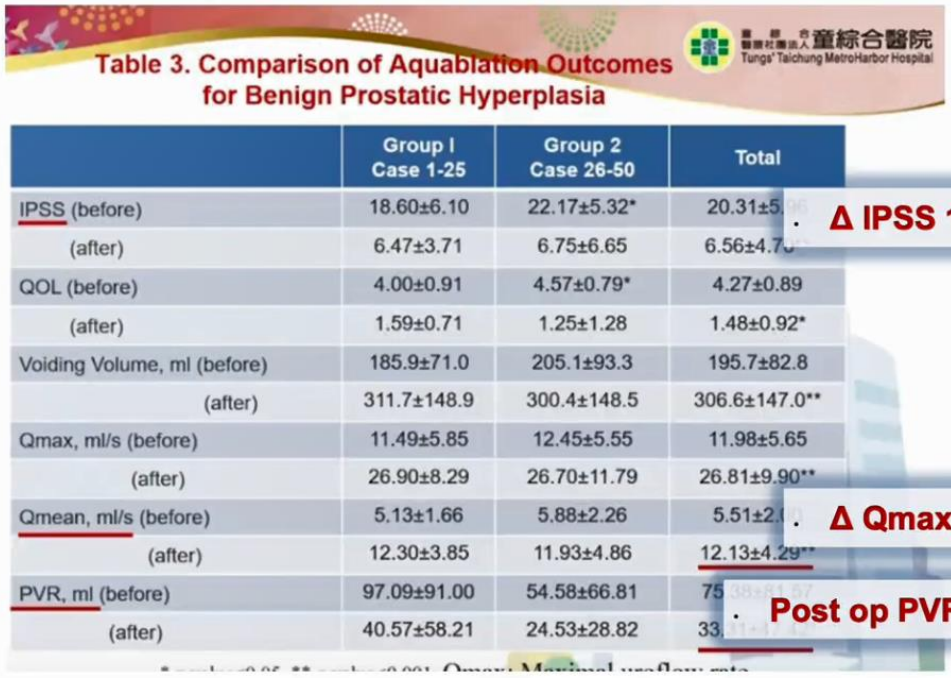


Table 3. Comparison of Aquablation Outcomes for Benign Prostatic Hyperplasia

	Group I Case 1-25	Group 2 Case 26-50	Total
IPSS (before)	18.60±6.10	22.17±5.32*	20.31±5.
(after)	6.47±3.71	6.75±6.65	6.56±4.7
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.
(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
(after)	40.57±58.21	24.53±28.82	33

- **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
Urolitft	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 CG, 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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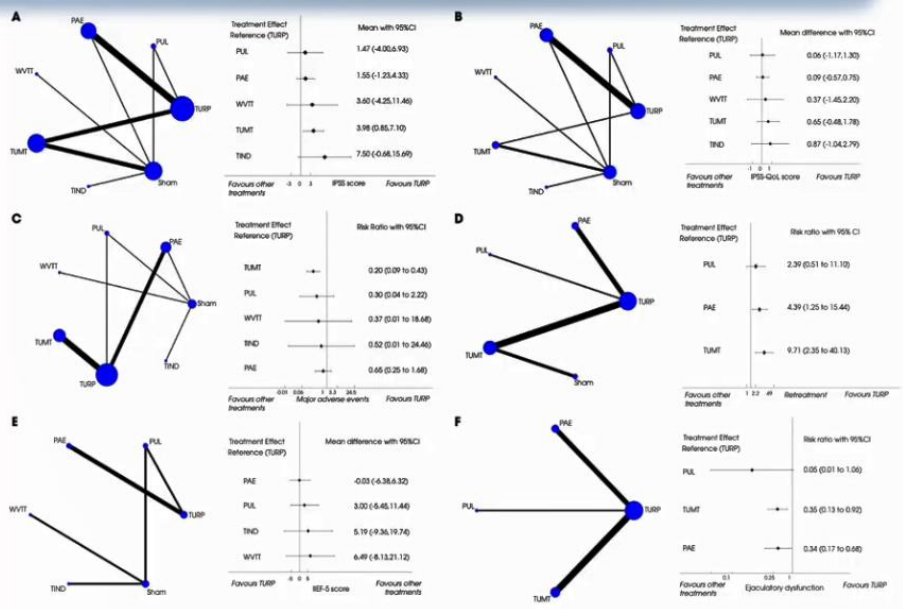
OML:Obstructive median lobe

TURP	**15**	**15**
Combo medication	**7**	**3.8**

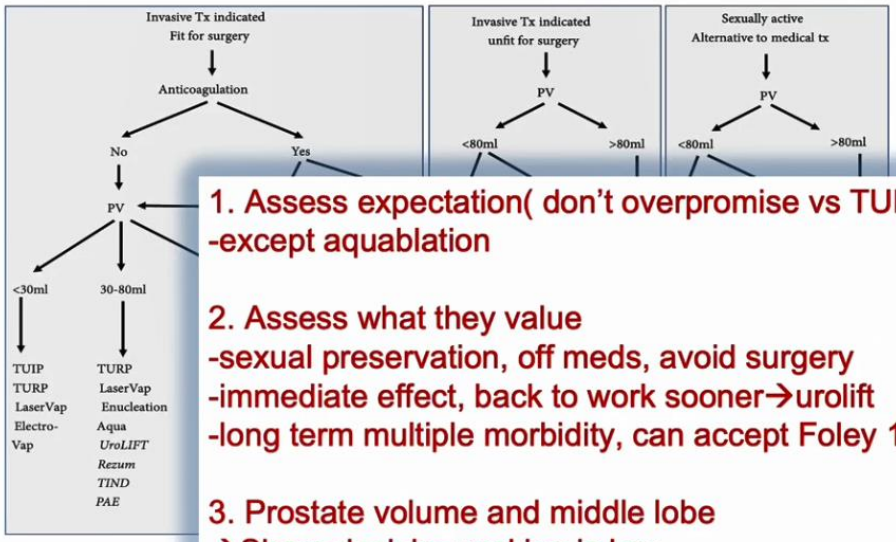
Madersbacher S, Roehrborn CG, Oelke M. The role of novel minimally invasive treatments for lower urinary tract symptoms associated with benign prostatic hyperplasia. BJU Int. 2020;126(3):317-326. doi:10.1111/bju.15154

- **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, vaporistaion.



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