

Transperineal Biopsy Under Local Anesthesia Tips and Tricks: Dr Bott’s method

This document aims to share information about transperineal prostate fusion biopsy under local anesthesia, with Koelis Trinity™ system. The following information relies on observations and advice from Dr Bott, an urologist from Frimley Park Hospital, Camberley, United Kingdom.

Moreover, some information is drawn from congress workshops, such as during AUA19: “Introduction to Office-Based Transperineal Prostate Intervention: MR/US Fusion biopsy” with Transperineal rationale (Chad Ellimootti, MD MS); Transperineal biopsy techniques (Arvin K. George, MD).

Table of content

1.	Materials check-list	2
2.	Preparation before patient arrival	3
	Steady Pro™	3
	Probe holder.....	3
	Probe preparation	4
	Probe – Probe holder assembly	5
	Anesthetic preparation	6
	Example of room preparation	6
3.	After patient arrival.....	6
	Patient management.....	6
	Anesthesia process.....	Erreur ! Signet non défini.
	Peri-prostatic anesthesia.....	7
4.	KOELIS Workflow.....	9
	Beginning of a cartography session.....	9
	Targeted biopsies	9
	Systematic biopsies	9

1. Materials check-list

The following tab summarizes the items used to perform **transperineal prostate biopsies**.

- **Disposable products**

Material	Designation	Manufacturer	Reference	Function
Needle	Microlance 3	BD	300400 or 300800 (1)	Subcutaneous anesthesia
Needle	Chiba	Temno	CHI2220	Peri-prostatic anesthesia
Coaxial needle (2)	TruGuide	Bard	C1816A	Skin perforation before biopsy needle insertion
20mL syringe	Luer-lok	BD	300629	Anesthetic injection
Biopsy-gun	Max-Core	Bard	MC1825	Tissue harvesting
Probe protection with little elastic bands	PROcovers	CIVCO	610-213	Protection and lubrication
Sterile gel for ultrasound	20mL	EDM Medical Imaging	PC020	Lubrication and US transmission
Cupula / cups	60mL, graduated	Asterie	1729003A	Betadine container
Betadine				Skin disinfection
Waterproof table protection				Avoid table stain from betadine
Cotton balls				Perineal area disinfection
Biopsy pads				Samples biopsy storage
Anapathology pots				Sample conservation
Cassettes for samples				Storage
Large tape				Fix patient testicles
medical mob cap or sterile protection				<u>Optional</u> . Sterile manipulation of the mouse
Endoscope sterile drape	Camera drape (universal)	Premier Guard	10-1112	<u>Optional</u> . Sterile manipulation of Steady Pro®

(1) Longest subcutaneous needle as possible.

(2) Koelis recommendation

- Reusable products

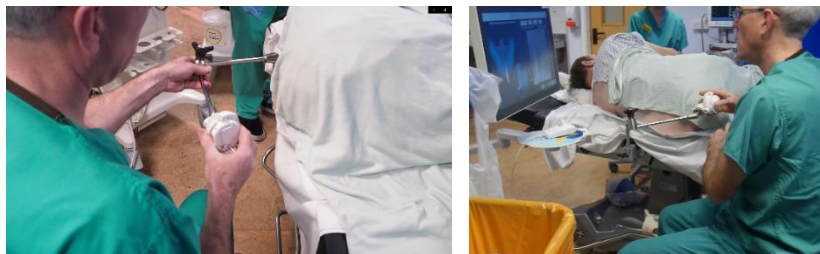
Material	Designation	Manufacturer	Reference	Function
Steady Pro®	Steady Pro®	Koelis		Probe holder
Side-fire probe	3D endocavity side-fire Probe	Koelis	K3DEL00	Needle and organs visualization
Transperineal guide	<i>Perine Grid® 18G or Perine full Grid®</i>	Koelis	KRNG.EL1.18-5 or KRNG.EL4.18-5	Guide the needle through perineum
Stirrups (boot shape)				Lift patient legs
Trolley				Sterile products preparation
Bin				Throw disposables component

2. Preparation before patient arrival

Steady Pro™

How to set **Steady Pro™** well on the hospital bed (Lateral position)?

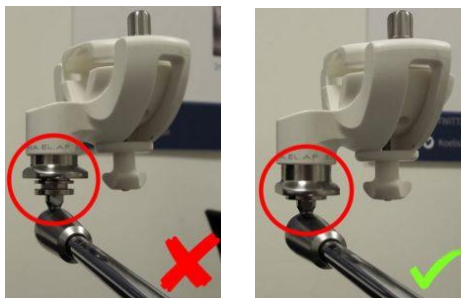
When the patient is in decubitus lateral position (cf patient management) **Steady Pro™** must be horizontally-oriented like below. You can use the “I” fixation of your **Steady Pro™** to elevate the arm at rectum height.



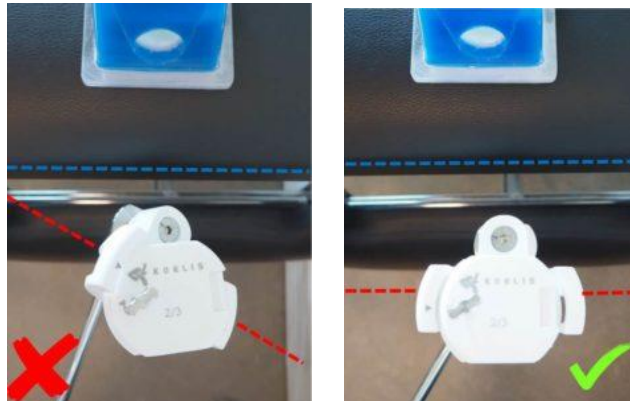
Probe holder

Find below further information about the different steps to set up and probe installation (**dorsal decubitus only**).

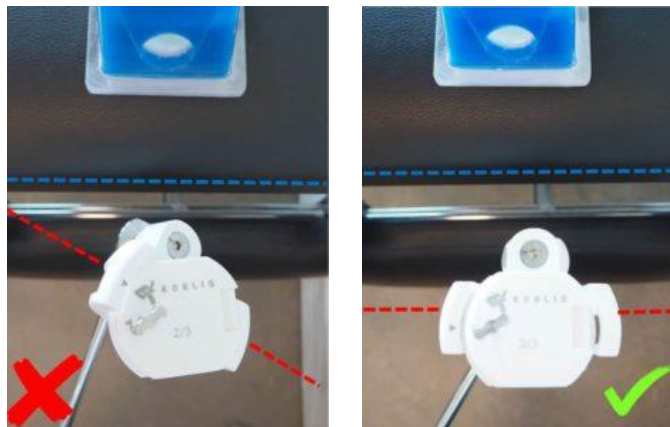
1- You can easily see if the external part is well locked as described below:



- 2- Check the probe holder alignment with the bed, from above. Find below further information about the different steps to set up and probe installation:



- 3- Then check the horizontal alignment of the probe holder with the bed:



KOELIS Advice:

First, you must **assemble the probe holder** (white parts). Position the internal piece so that Koelis logo is facing you. Note that **the big screw linking the articulated arm and the holder is toward the patient**. Two little arrows are facing each other (on the left) to confirm that the internal part is correctly positioned on the external one. Keep in mind to not drop the holder white screw while sterile manipulation. The screw being upside down, screwing direction is reversed.

Secondly, take some time to train yourself at the assembly and locking of the probe holder Steady Pro™ articulated arm.

Probe preparation

Put some ultrasound gel inside the protection before inserting the probe, to avoid air interface. The amount depends on the probe protection you will use:

- One drop is enough for large and thin protection.
- More for classic protection

With the help of the nurse, the protection can be set on the probe in a complete sterile way. Moreover, you can add elastic bands to tighten and secure the protection. Add them from the head

of the probe to the base, to avoid bubble creation. Unroll the protection until the base, to lock it in the probe holder.



Finally, you can unlock the **Steady Pro™** black screw and move the probe on the side of the bed, in a security position to avoid any damages caused by the patient during his installation. Moreover, it is more comfortable for the patient to not see the probe, avoiding him to be anxious.



KOELIS Advice:

Make sure to **remove all the air bubbles between the probe and the protection**: the probe head can be positioned **toward the bottom** and the doctor **rubbed the protection toward the top** (using sterile gloves).

Probe – Probe holder assembly

Put the probe inside the internal part of the probe holder and fully lock the screw n°1.

Then, check that after unlocking the screw n°2, the probe and the internal part of the probe holder can rotate inside the external one.

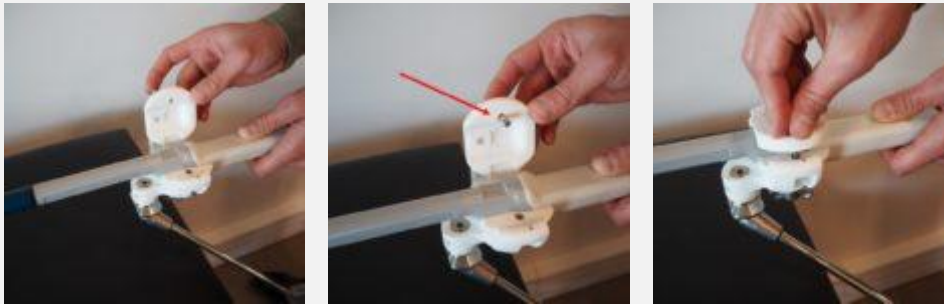
Disposable and reusable products preparation by Dr. Bott:

<https://youtu.be/w4wakhp6QnA>



KOELIS Advice:

While closing the upper part of the holder, it could be interesting **to maintain the grey screw** toward the inside of it, so that the screw orients **perfectly towards the screw thread**. (See pictures below). At this step, it could be interesting **to grab the probe handle and the holder together with one hand** (thumb on the handle, hand palm below the holder, white screw-locked, black screw fully unlocked), to keep the whole **in the axis** and **adjust it if needed**.



Anesthetic preparation

Prepared by the nurse, the anesthetic solution is filled in two different syringes:

- **20mL** of xylocaine 1% in **cutaneous anesthesia syringe**
- **20mL** of xylocaine 1% in **periprostatic anesthesia syringe**

Example of room preparation

Office preparation:

1. Trinity™ system
2. Steady Pro™
3. Ultrasound side-fire probe
4. Stirrups
5. Waterproof table protection
6. Pillow
7. Bin: moves between patient and surgeon during the exam, to throw disposables.
8. Surgeon seat



3. After patient arrival

Patient management

At the patient entry, follow the **regular medical procedure control**:

- Urine examination (ECBU)
- Rectal enema
- MRI
- EMLA cream
- prophylaxis

- Etc ...

Then you can install the patient in the bed.

Note that two patient positions are possible to perform **transperineal biopsy under local anesthesia**:

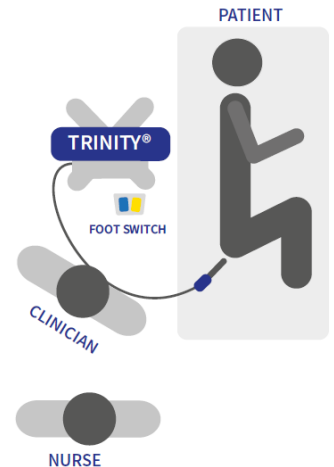
- The **dorsal decubitus**, also known as lithotomy position, is the most commonly used.
- The **lateral decubitus**, performed by few physicians in some medical centers, compatible with **KOELIS Perine Grid™ 18G only**.

Dr Bott opted for the **lateral decubitus**:

- Buttock on the edge of the table
- Legs **bent toward the head**, with a pillow between the knees.
- Testicles pulled **in front of the patient**.

Before any needle introduction, **disinfect the skin with betadine**, make sure to cover a wide area.

Patient management by Dr. Bott: <https://youtu.be/PavDGOUdq60>



KOELIS Advice:

You can consider **shaving the perineum**, to avoid hair introduction in the patient wound.

Peri-prostatic anesthesia

Anesthesia targets the perineum deeper plane which contains a nervous plexus, responsible for its sensibility.

Before performing anesthesia, you must prepare a 3D prostate exam for your patient, registered in Trinity™ system:

- Start the Trinity™ system.
- Go to **“Prostate cartography”**
- Click on the **patient’s name** (if needed, create a new one)
- Go to **“Mapping”**
- Choose either:
 - “Import” if you want to import MRI,
 - “1st look” if images are already loaded.
 - “2nd look” if you want to perform new biopsies over previous 3D map.
- To **improve ultrasound image quality and avoid any artifacts**, add ultrasound gel on above the ultrasound active part of the probe (blue head) and then insert **the probe into patient’s rectum**.

Ultrasound image is displayed on the right.

Make sure your probe is horizontally aligned with patient rectum before its insertion. The two probe holder screws are locked when you insert the probe in the patient. You can add further lubricant gel on the probe to make insertion easier.

Before starting periprostatic anesthesia:

- Start the panorama: acquire your **reference 3D ultrasound volume**.
- Check the whole gland is inside and confirm.
- Create the **prostate contour** on the software (follow each step displayed on the screen), **adjust it** to perfectly fit the patient gland and validate.
- Set up Perine Grid® on your probe, close to the perineum.

You are now ready to perform the periprostatic anesthesia. Dr. Bott, from Frimley Park Hospital, describes his following method:

Probe centered on the prostate. Inject anesthetic during needle insertion, mostly posterior to the patient.

Then, use “**Virtual biopsy**” feature to help you place your guide so that **it aims the middle of the target**: move your probe, try a virtual biopsy, if it’s not aiming the target, repeat previous steps until it does.

When you perfectly aim the target, you can inject a solution at the correct height to **anesthetize the whole area**.

The anesthesia of the other side of the prostate will be done after targeted biopsies, previously to systematic biopsies. **The prostate is anesthetized side by side.**

Regarding the amount of anesthetic, **around 5mL to 10mL are injected at each needle insertions**, depending on the planned area to puncture.

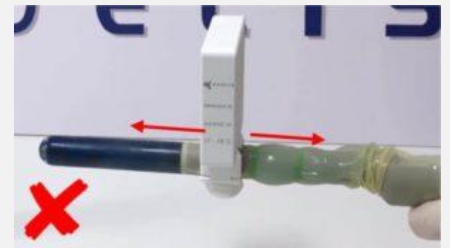
If systematic biopsies are very spaced, prefer **to re-inject a small amount of anesthetic in the area to be punctured**, to avoid patient pain.

Peri-prostatic anesthesia performed by Dr. Bott: <https://youtu.be/Qe-RLQplyT0>

KOELIS Advice:

Note that KOELIS Perine Grid™ has some particularities:

- *It can't be offset from the ultrasound plan thanks to the chamfer on the probe (both KOELIS Perine Grid™ 18G and KOELIS Perine Full Grid™ concerned).*
- *It hasn't back and front: both sides are printed so it can be reversed: Useful when the user wants to rotate the probe and the patient buttock interfere with the guide screw.*
- *Locking in 2 steps:*
 - *Open KOELIS Perine Grid™ hinge and position it on the probe (1)*
 - *Close the hinge and fix KOELIS Perine Grid™ in place (2)*



Note: don't move the guide over the protection to keep it in good condition

4. KOELIS Workflow

Beginning of a cartography session

This step marks the beginning of **Koelis workflow**. As you were using the **prostate cartography interface** to perform the anesthesia, you just have to check some points before launching the 3D acquisition:

- Make sure the prostate is included **in the yellow square**. Deepness and focal point can be changed in parameters if necessary.
- Fully **lock Steady Pro™** (black screw).
- There must be no **air artifacts on the ultrasound image**.

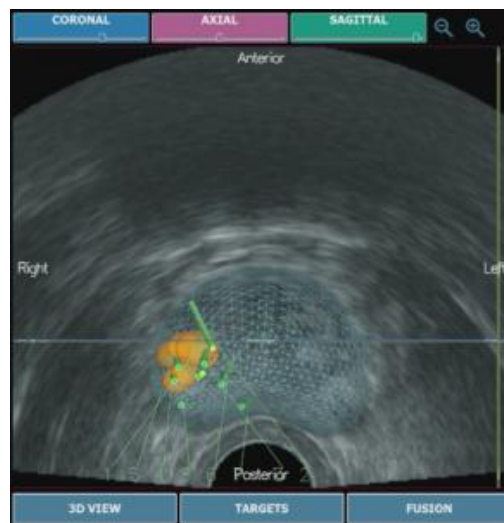
The reference ultrasound volume acquisition can be done.

Targeted biopsies

To perform his targeted biopsies, Dr. Bott uses “**Single Path**” technique:

- A **coaxial needle** (Bard TruGuide, ref: C1816A) is introduced through perineum muscles.
- All targeted biopsies are done by **inserting the biopsy needle inside the coaxial one**:
 - It **reduces the number of puncture** of the skin during biopsy session.
 - It also **enhances biopsy precision** by reducing needle deviation inside the perineum.

By doing this way, targeted biopsies are distributed from a single point, leaving **non-parallel** cores in the gland.



Targeted biopsies performed by Dr. Bott with Single Path technique: <https://youtu.be/JKbcNf26fLI>

Systematic biopsies

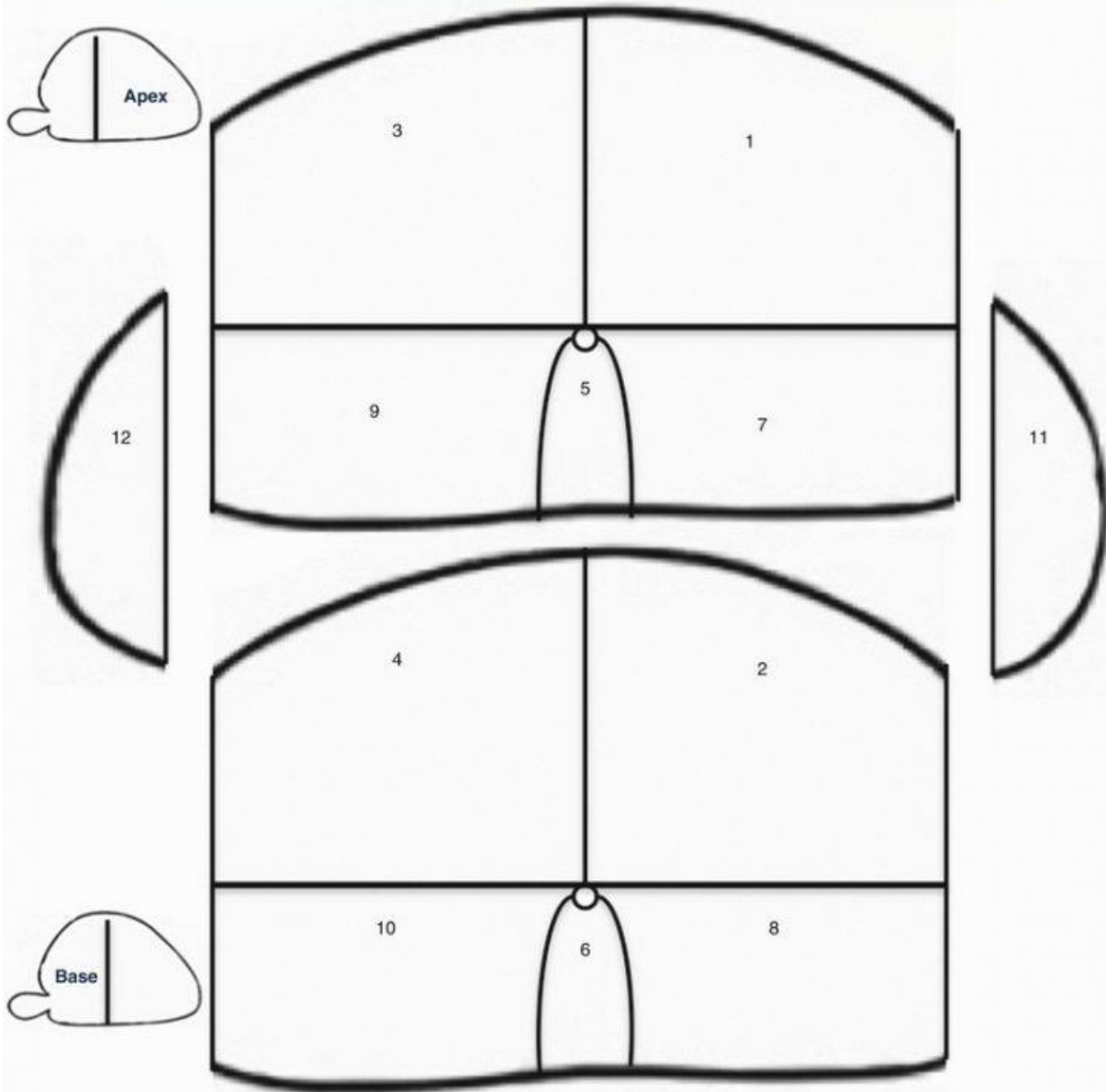
Biopsy cores can be labelled individually according to their **X, Y coordinates** on the grid and **Z coordinates** relating to whether it is **basal or apical**. The alternative is to divide the prostate into zones. There are also **several ways** to divide the prostate into **anatomical zones**. For examples, **Barzell et al.** initially divided the prostate into **octants** and then further divided them into **three zones**, yielding **26 separate specimen pots**.

The main issue remained that this template **saturated the gland** with biopsies, that's why the **National Health Service (NHS)** introduced the **modified Barzell zones** where the prostate was segmented into **20 zones**. Then later, it was finally reduced **into 12 zones** only to **reduce the resource burden on pathology services**. However, **transperineal biopsies templates** are still under investigation and several templates raise among the scientific community, such as **Ginsburg biopsy protocol** or template from **Michigan Urological Surgery Improvement Collaborative – MUSIC Urology**.

Dr. Messas performing systematic biopsies: <https://youtu.be/TekxoeCKcbA>

Name:
Hospital Number:
Date of Birth:
Date:

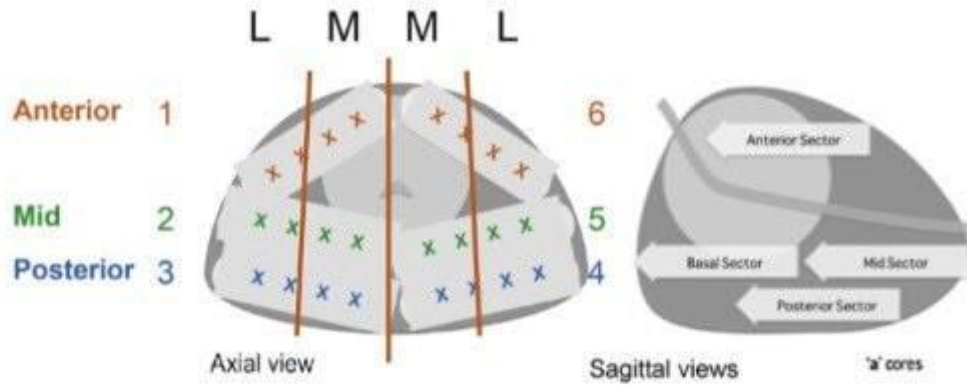
Template Mapping Biopsies



Modified Barzell Zones

- | | |
|-----------------------|-------------------------|
| 1 Left Anterior Apex | 7 Left Posterior Apex |
| 2 Left Anterior Base | 8 Left Posterior Base |
| 3 Right Anterior Apex | 9 Right Posterior Apex |
| 4 Right Anterior Base | 10 Right Posterior Base |
| 5 Midline Apex | 11 Left Lateral |
| 6 Midline Base | 12 Right Lateral |

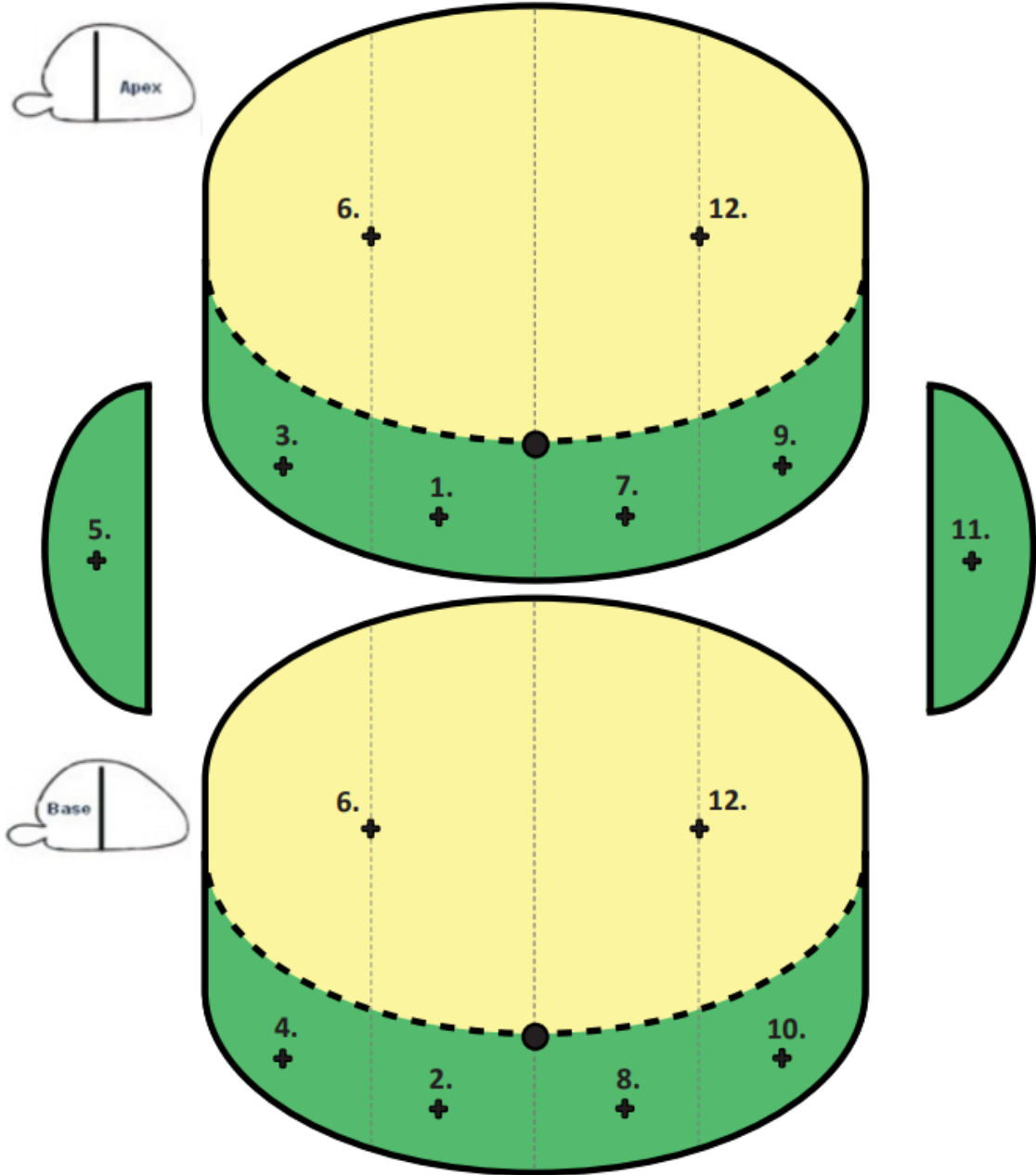
- HGPIN / atypical acini
- Clinically insignificant disease (G3+3 up to 3mm)
- Gleason = 3+4 AND/OR Max Cancer length 4-5mm
- Gleason \geq 4+3 AND/OR Max Cancer length \geq 6mm



Specimen name	Description	No. of Bx	MRI mapping equivalent
1M	Rt anterior med	1-2	13/14/15as
1L	Rt anterior lat	2	13/14/15as
2M	Rt mid med (apex)	1-2	5/3/(1)a
2L	Rt mid lat	2	6/4/2a
3M	Rt post med	1-2	5/3/1p
3L	Rt post lat	2	6/4/2p
4M	Lt post med	1-2	11/9/7p
4L	Lt post lat	2	12/10/8p
5M	Lt mid med (apex)	1-2	11/9/(7)a
5L	Lt mid lat	2	12/10/8a
6M	Lt anterior med	1-2	13/14/15as
6L	Lt anterior lat	2	13/14/15as

Bx = biopsy; lat = lateral; Lt = left; med = medial; MRI = magnetic resonance imaging; post = posterior; Rt = right.

Transperineal Biopsy Template



- | | |
|--------------------------|-------------------------|
| 1. Right Paramedian Apex | 7. Left Paramedian Apex |
| 2. Right Paramedian Base | 8. Left Paramedian Base |
| 3. Right Posterior Apex | 9. Left Posterior Apex |
| 4. Right Posterior Base | 10. Left Posterior Base |
| 5. Right Lateral | 11. Left Lateral |
| 6. Right Anterior | 12. Left Anterior |



Transition Zone Peripheral Zone