

Team Members: Kedar Krishnan, Wendy Yang, Kenzi Griffith, Devashree Gupta, Grace Noh, Mahmoud Radwan, Benjamin Wen, Dylan Zhu

Committee Members: Polly Ma, Alex Hassan, Neha Rajan, Dr. Nicholas Durr, Dr. David Aaronson, Dr. Marshall Strother, and Dr. Nirmish Singla

pinnacle

Background

- Early detection to Prostate cancer is vital and screenings are performed by testing for prostate-specific antigen (PSA) levels with levels higher than 2.5 ng/mL for men in their 40s indicating prostate cancer.
- PSA is collected through transrectal or tranperineal biopsies.
- The process involves retrieving at least 12 core samples from different regions of the prostate and histologic analysis of the tissue

2nd

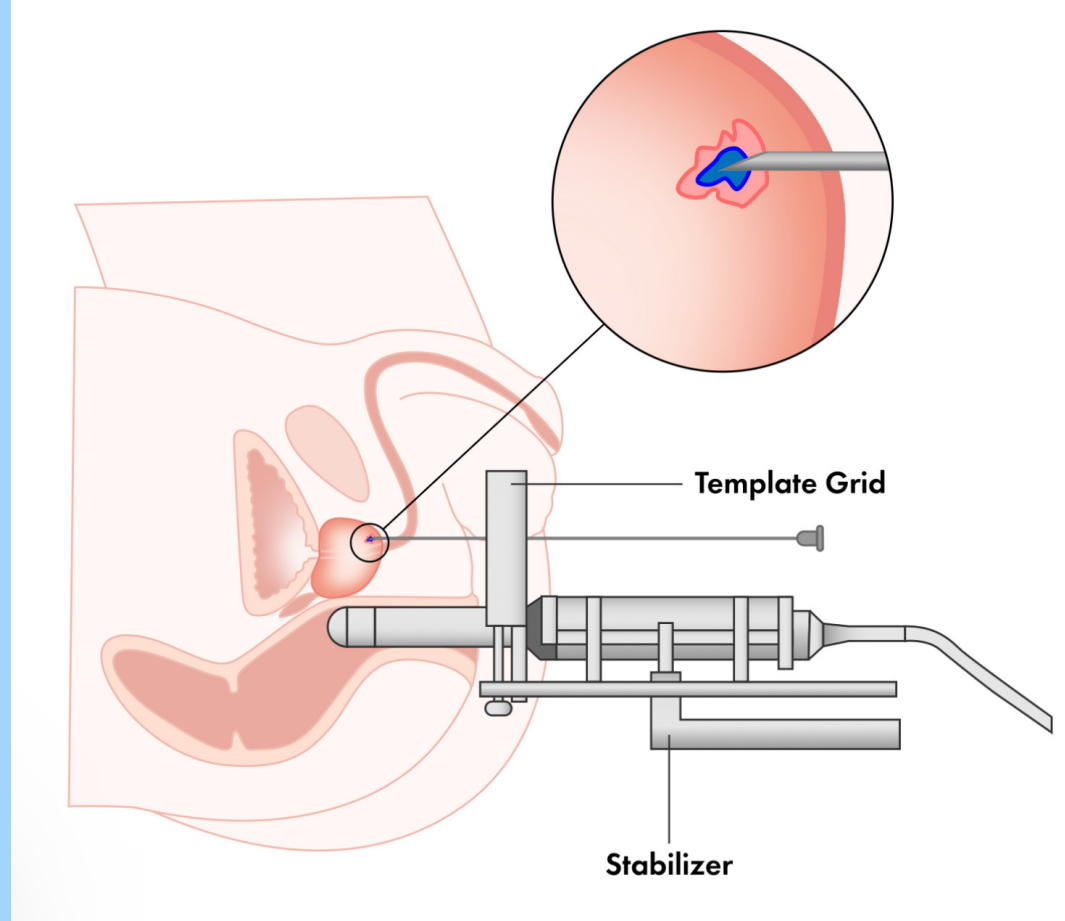
Most commonly diagnosed cancer among men worldwide

5th

Leading cause of cancer death among men worldwide

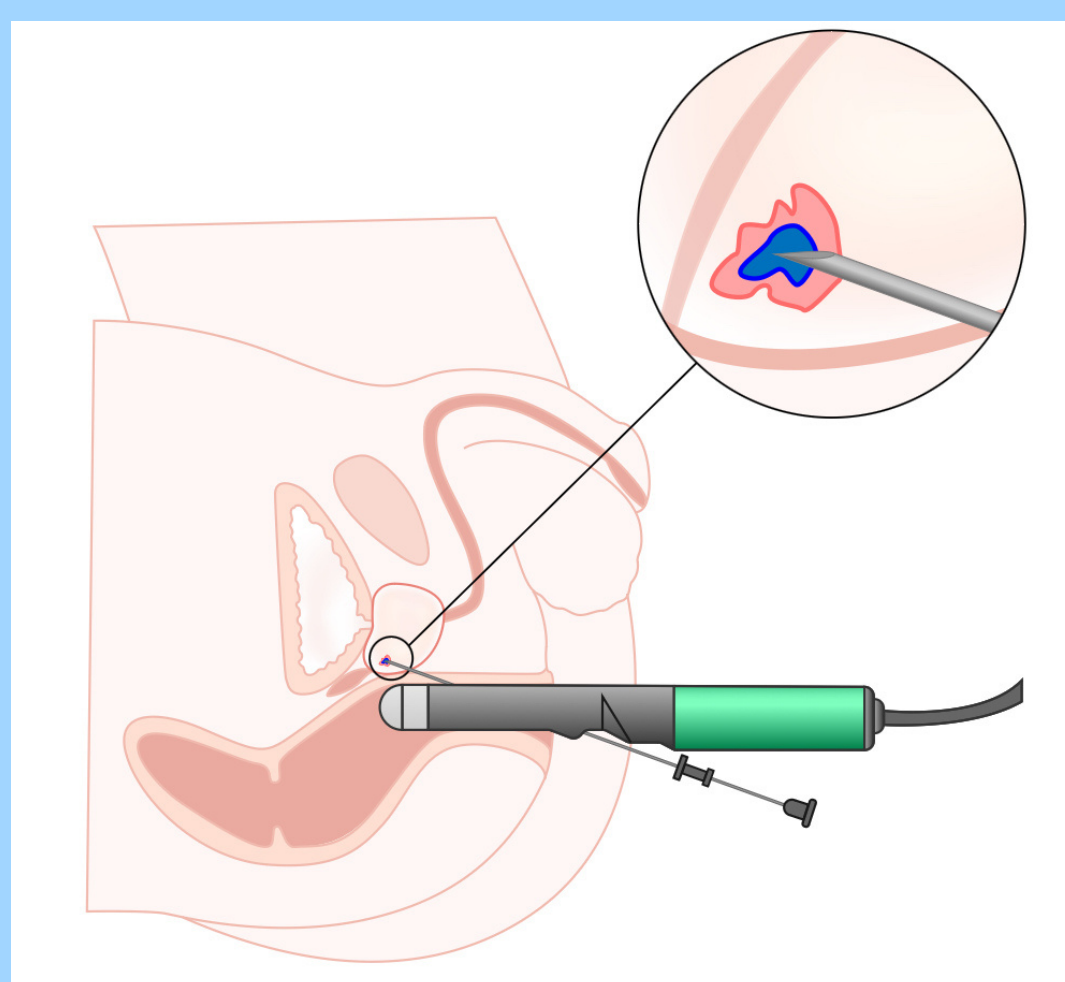
One Million

Prostate biopsies performed each year in the US



Transrectal Biopsy

- Procedural time: **15 Min**
- requires localised anaesthesia
- higher rate of infection



Transperineal Biopsy

- Procedural time: **30 Min**
- requires general anaesthesia, increasing patient discomfort
- lower rate of infection

Birtch, Nicola. "Transrectal vs. Transperineal Approach for Prostate Biopsy." Focal Healthcare, 18 Apr. 2023, focalhealthcare.com/transperineal-vs-transrectal-approach-for-prostate-biopsy/

Needs Statement

Urologists need a method with a low task-load index for reducing procedural time to decrease patient discomfort and enable the use of both transperineal and transrectal approaches

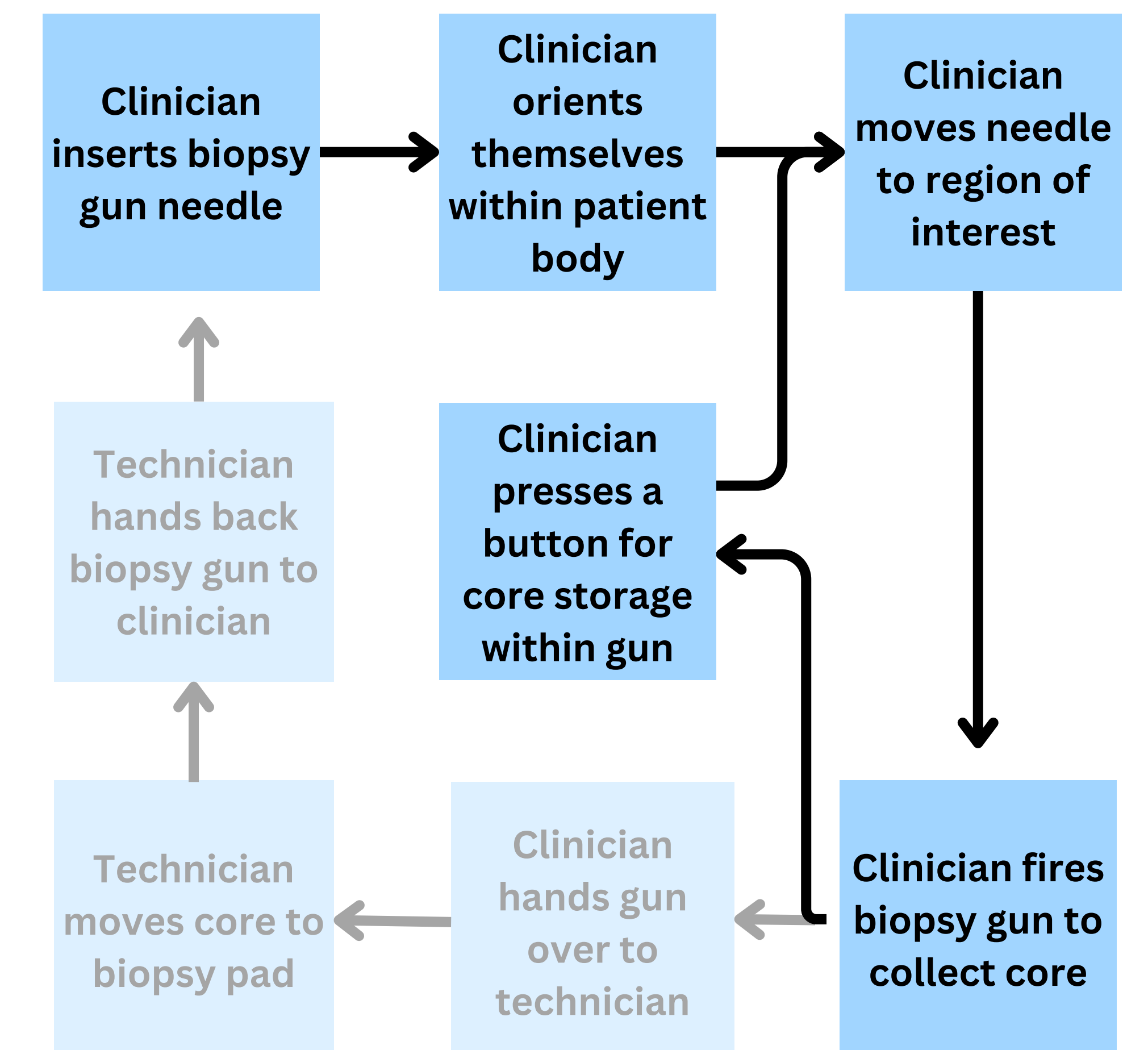
User Needs and Design Requirements

- Should **maintain** the clinician's accuracy and obtain **high-quality cores**
- Biopsy time should be **<13 minutes** with 1 minute per core retrieval time
- Should **not increase** the existing cognitive **burden** on clinicians
- Post-biopsy cores should be **traceable** to their sample region within the patient
- Should not require more than **20 procedures** for clinicians to become **proficient**.

Pinnacle enables seamless core collection without unnecessary gun removals, lowering patient pain and ultimately benefiting patient outcomes



Prostate Biopsy Workflow



Current Standard

96 Step Procedure

Pinnacle Biopsy Gun

38 Step Procedure

Testing Pathway

- ✓ Allow Correlation Between Sampled Region and Biopsy Collection Order
- ✓ Enable Core Visualization Mid-Procedure
- ✓ Confirm Core Cutting Quality
- Verify Procedural Accuracy
- Confirm Faster Procedural Time