# MRI-guided Targeted Prostate Intervention: Advantages of One Stop Procedure

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## Abstract

The common forms of prostate biopsy examinations include transurethral, transperineal, and transrectal ultrasound guided biopsy (TRUS). They remain the standard of care for diagnosis of prostate cancer, however, pose many setbacks as ultrasound cannot show suspicious lesion. A comparative study of literature helps highlight the benefits of using MR imaging for prostate cancer diagnosis and potentially on the spot treatment through focal therapy, as opposed to repeat procedures.

## Introduction

Main Methods of ultrasound guided prostate biopsy:

- Transrectal - a biopsy gun quickly projects a thin needle into suspect areas of the prostate gland, and small sections of tissue are removed for analysis.
- Transperineal - the biopsy needle through the perineal skin and into the prostate, rather than passing the biopsy needle through a potentially contaminated rectum
- Transurethral - a flexible tube is passed through the tip of the penis. It will be passed up through the tube to where the prostate sits.

MRI can identify lesions within the prostate

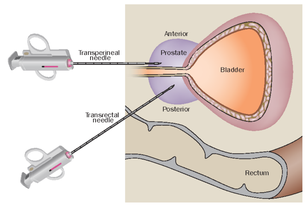


*Figure 1. Diagram depicting Transperineal and Transrectal prostate biopsy.*

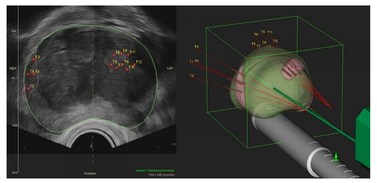

*Figure 2. Image depicting MRI Image of prostate with simulation of Robotic needle sample collection*

## Research Method

Information obtained from 15 literary and peer-reviewed articles compared in order to find limitations as well as benefits of various methods of biopsy for prostate.

## Literature Review

- MRI imaging is readily available and more accurate.
- MRI finds suspicious areas that are often missed during other forms of prostate cancer imagining. Once the MRI detects the suspicious lesion, a targeted biopsy and focal therapy can be performed
- Through MRI guided robot intervention, healthcare providers can deliver accurate, fast, and less-invasive procedures that cut back on the failures of standard ultrasound guided procedures

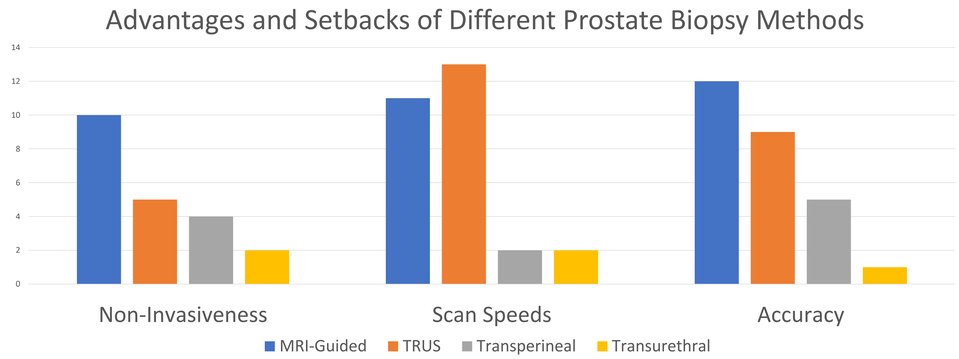


*Figure 3. Bar chart comparison of 15 articles review, and their conclusions of which biopsy method is preferred.*

## Discussion

- MRI scanners run 24/7, shifting to MRI guided prostate intervention would cut back on the energy wasted during the machine's idle time.
- Minimal visits to the hospital will cut back on energy used for transport and other energy sources
- Use of MRI guided targeted biopsy and potential one stop focal therapy could minimize cancer risk, time, and energy

## Conclusion

In men, prostate cancer is among the most common cancers and second leading cause of cancer death despite it being a slow growing cancer. Detecting these lesions early and treating locally with more accuracy MR imaging would allow more early prostate cancers to be treated before progression to later stages. MRI guided interventions can be less invasive compared to repeat ultrasound guided procedures, which could also promote quicker recovery.

## Limitations

- Not many literature articles dedicated solely to this area, rendering limited information through a literary approach.
- MRI-guided prostate interventions are often limited for research purposes.

## References

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