Prostate Cutting Device

CLIENT: DR. WEI HUANG, UW-DEPARTMENT OF PATHOLOGY

ADVISOR: PROFESSOR WILLIS TOMPKINS

MARCH 5, 2010

CO-LEADER: REBECCA CLAYMAN

CO-LEADER: JOHN CHEADLE

COMMUNICATOR: TERRA GAHLMAN

BSAC: KATIE POLLOCK

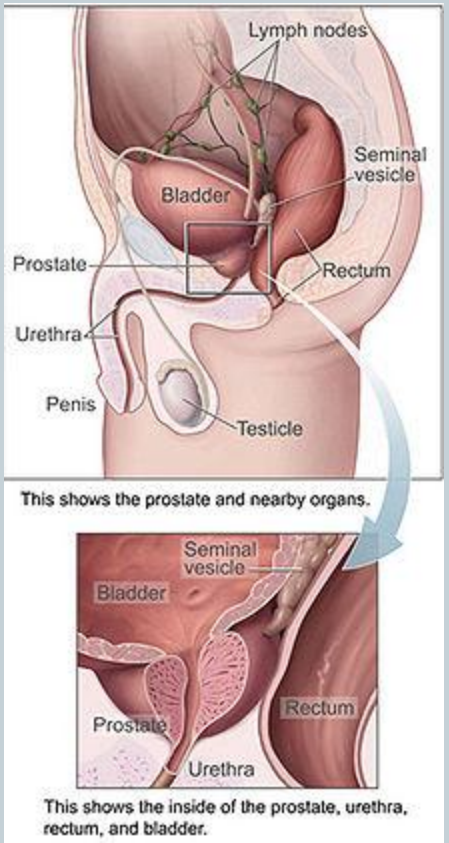
BWIG: KIM SAFARIK

Overview

- Background-Prostate Cancer
- Problem Statement
- Client Requirements
- Design Alternatives
- Final Design Choice
- Future Work

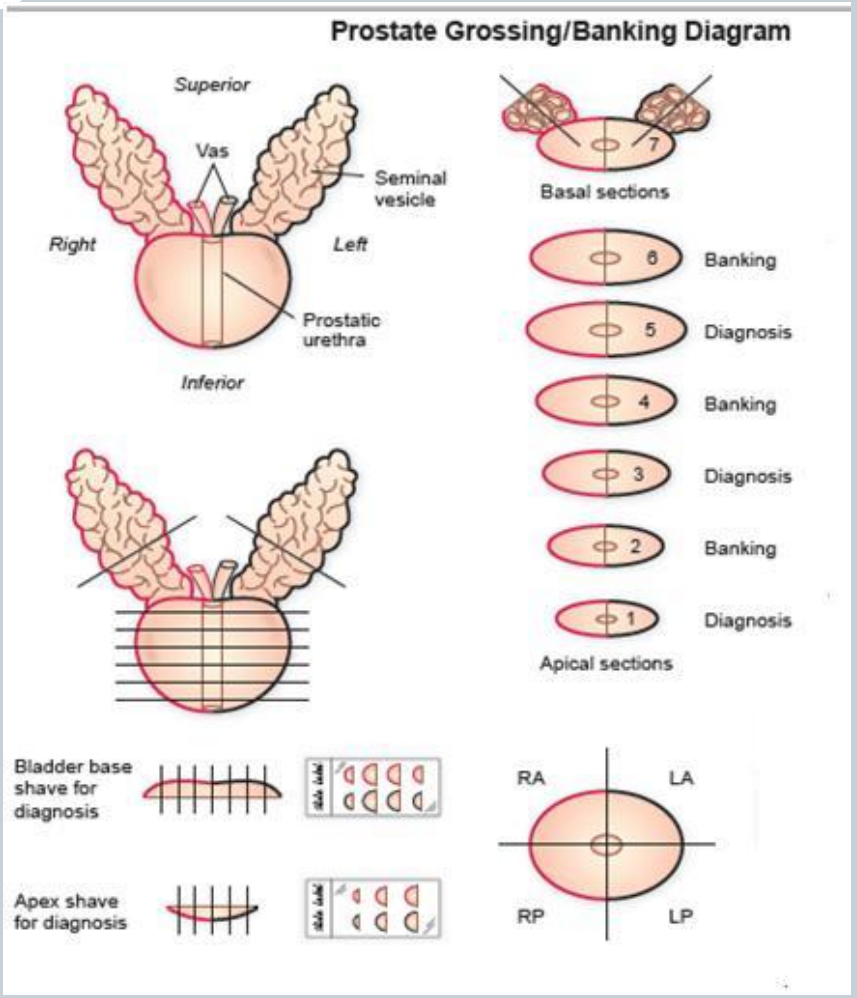
Prostate Cancer

- Prostate assists in the male reproductive system
- Prostate cancer is the most common cancer present among men
- Enlarged Prostate (<100g)
- Treatments vary in success

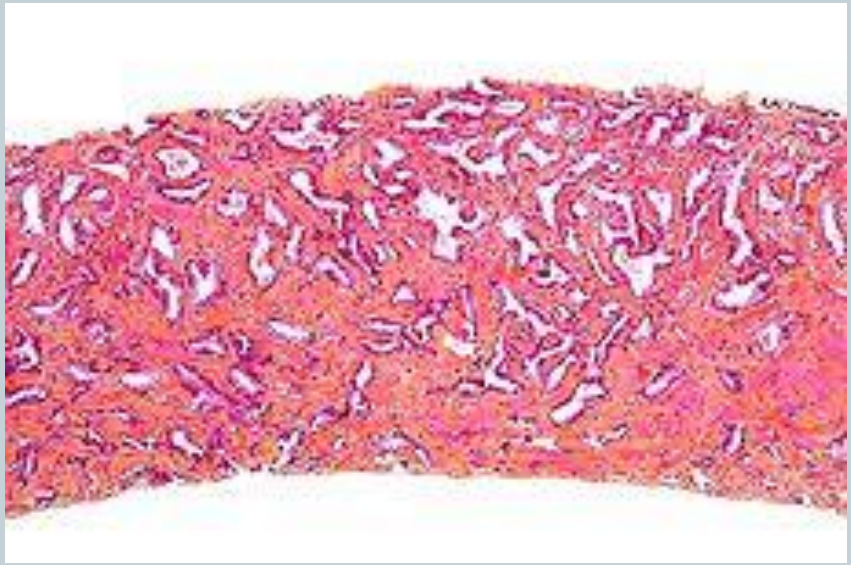


Pathological Analysis

- Prostate removed or biopsied
- Dyed
- ~3mm slices taken
- Grossing/Banking slices
- Allows for correct diagnosis and analysis of spread



Problem Statement

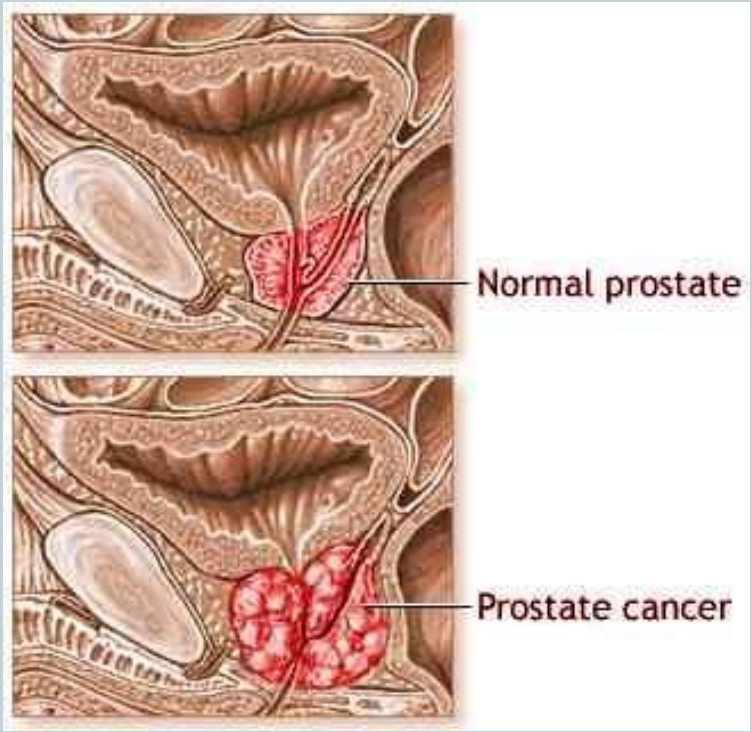


http://en.wikipedia.org/wiki/Prostate_cancer

- Current method: manual slicing with scalpel.
- Problems with accuracy, safety
- Project: Design cutting device to improve process

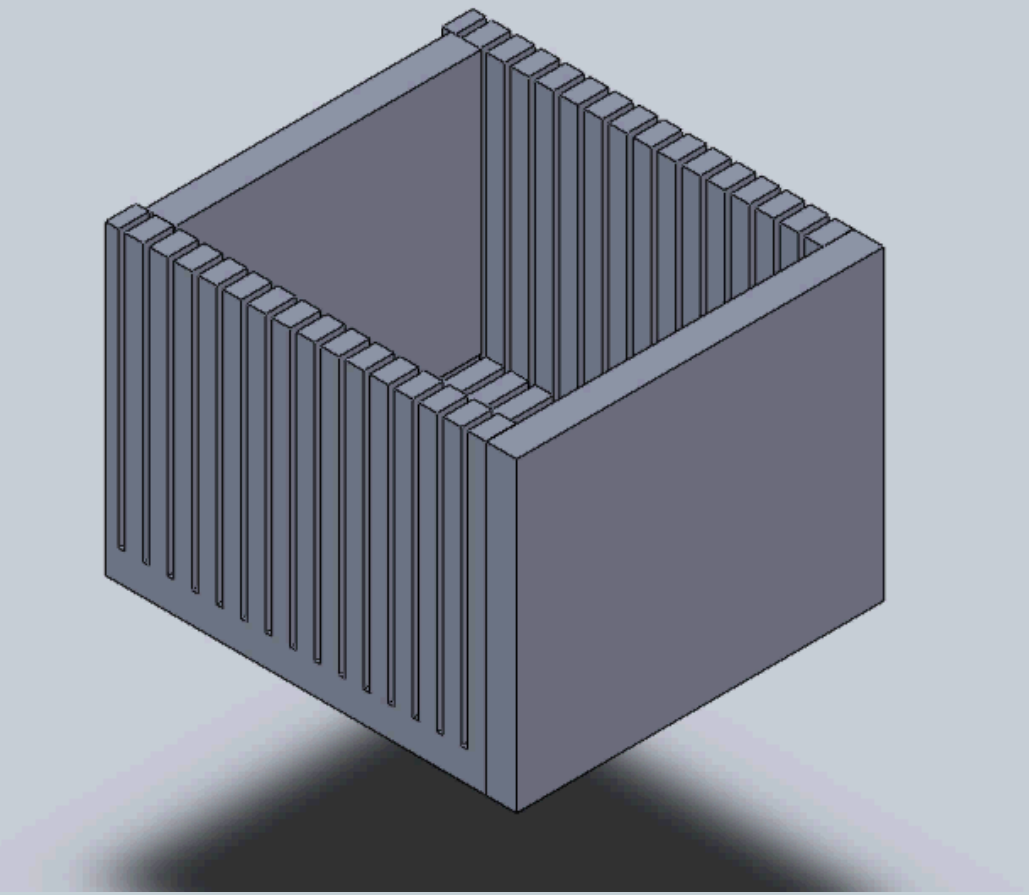
Client Requirements

- Secures the prostate
- 3mm segments
- 3-4 slices
- Adjustable
- Margin intact



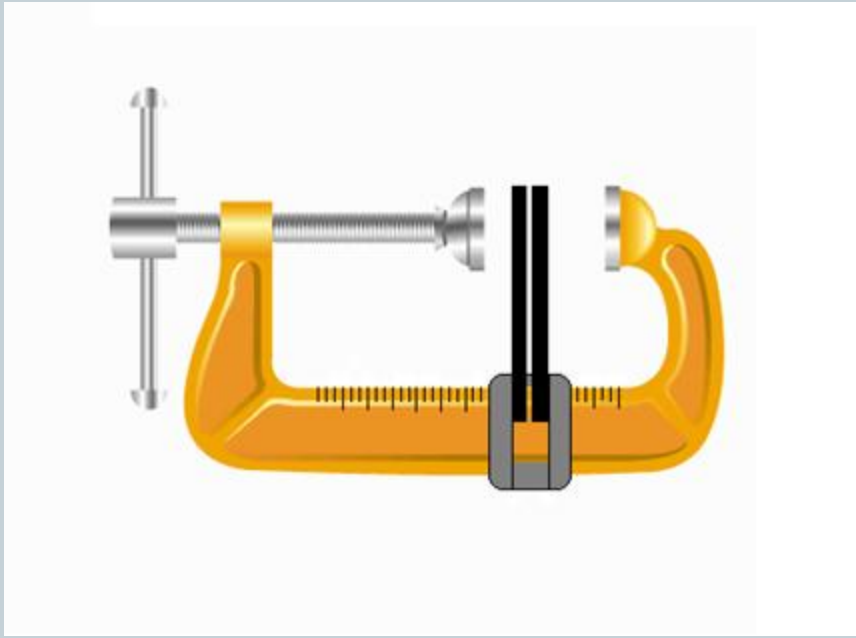
Snap-On Slider

- Sliding wall
- 2-Sided blade guides
- Locking track on sides of base
- Does not conform to prostate shape

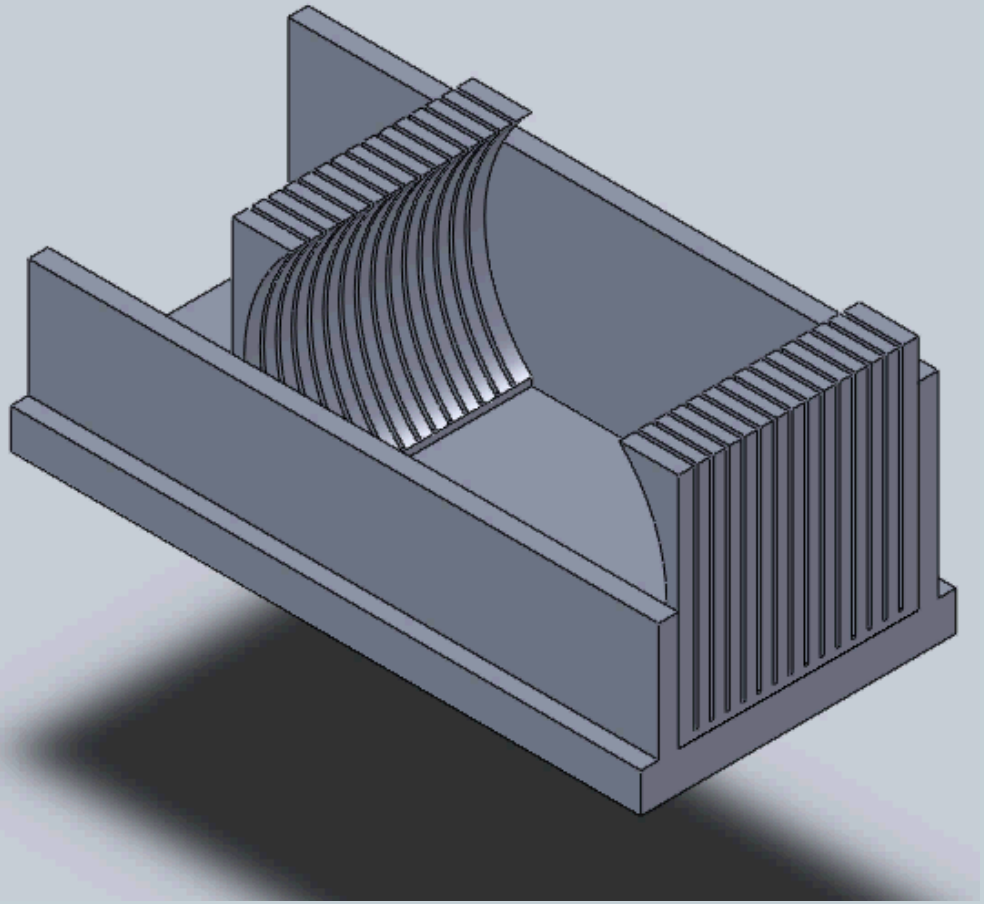


C-Clamp Cutter

- C-clamp for prostate size adjustment
- Sliding knife guide (surrounds prostate)
- Allows for adjustable slice thickness
- Prostate suspended – have to re-clamp for each slice



2-Comb Scoop

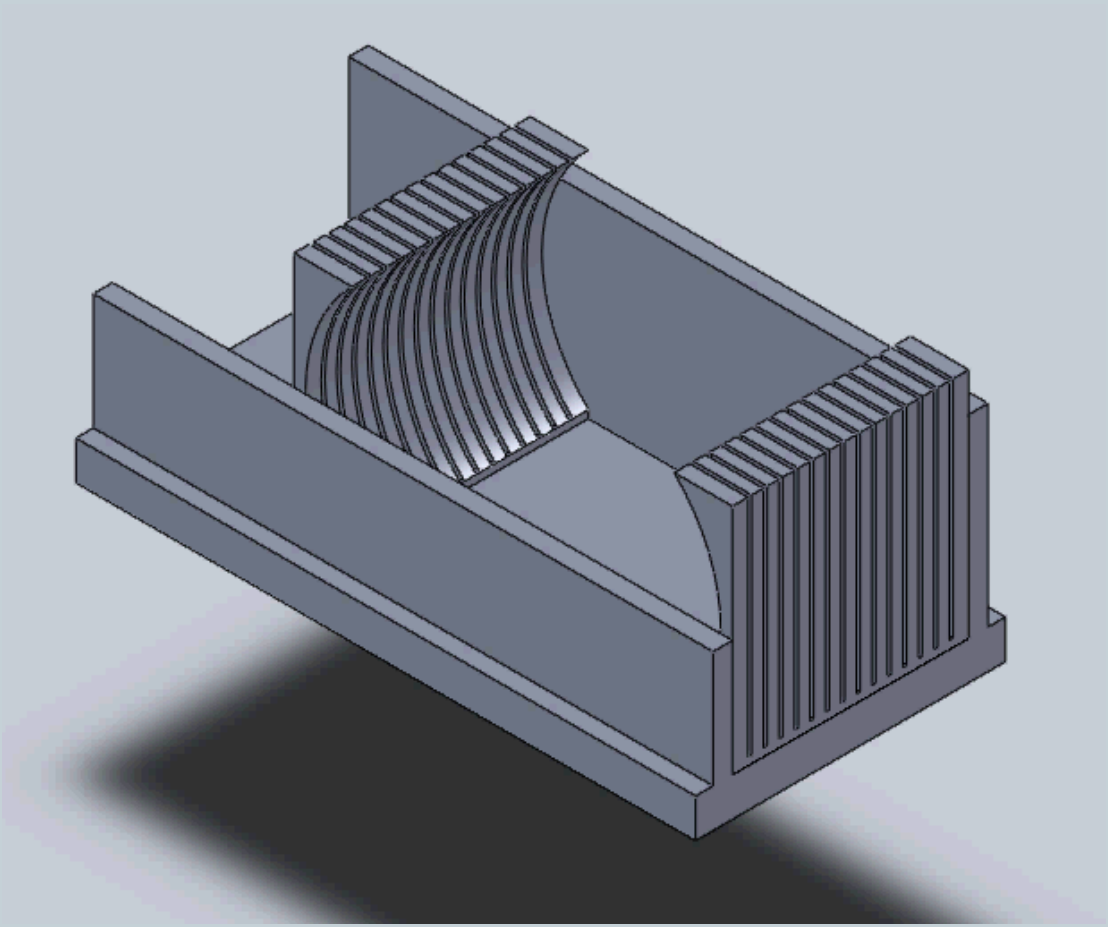


- Maximum security/stability
- Comb on track
- Scoops contour to shape of prostate

Design Matrix

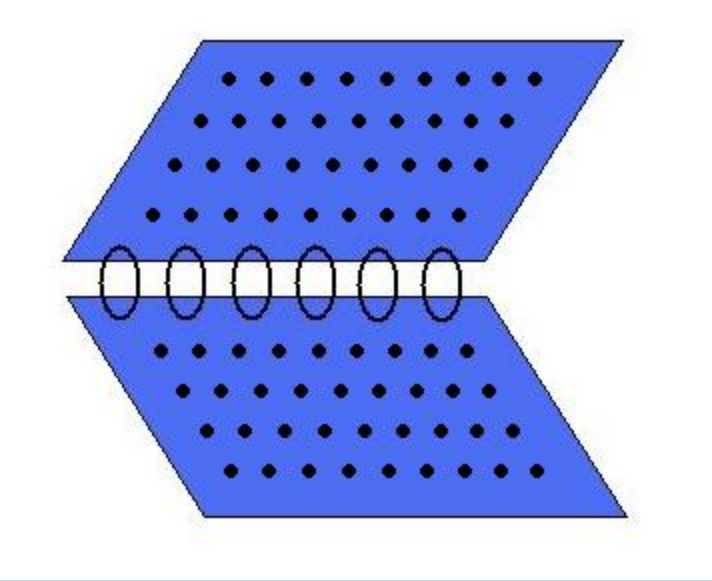
	Safety (10)	Ease of Use (20)	Ease of Construction (15)	Aesthetics (5)	Precision (25)	Security (20)	Cost (5)	Total (100)
Snap-On Slider	9	16	12	5	23	15	3	83
2-Comb Scoop	9	17	9	5	23	19	3	85
C-Clamp Cutter	5	12	11	4	19	12	5	68

Final Design



Future Work

- Contract out for fabrication
  - CNC Mill
- Materials selection
- Accessory clamp



References and Acknowledgements

Professor Willis Tompkins

Dr. Wei Huang- UW
Pathology Department