



University of Idaho

College of Engineering

CONCEPT DESIGN REVIEW

TEAM INFECTION PROTECTION

INNOVATIVE CATHETER COULD PREVENT INFECTION AND SAVE LIVES



80% of catheterized patients develop a CAUTI



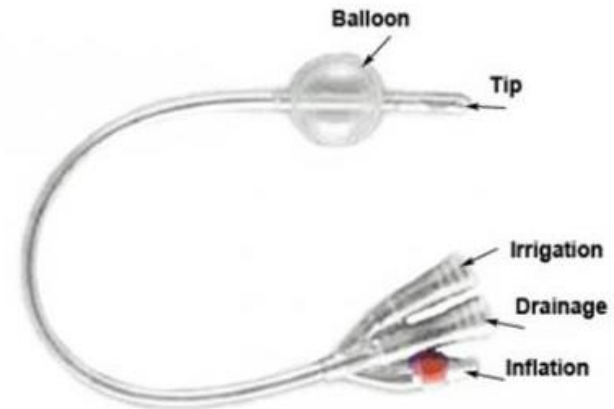
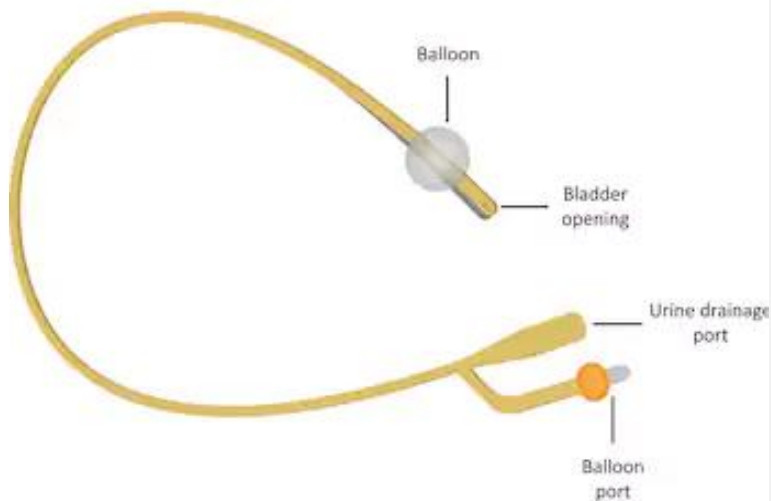
13,000 deaths every year



> \$400M increased cost to hospitals

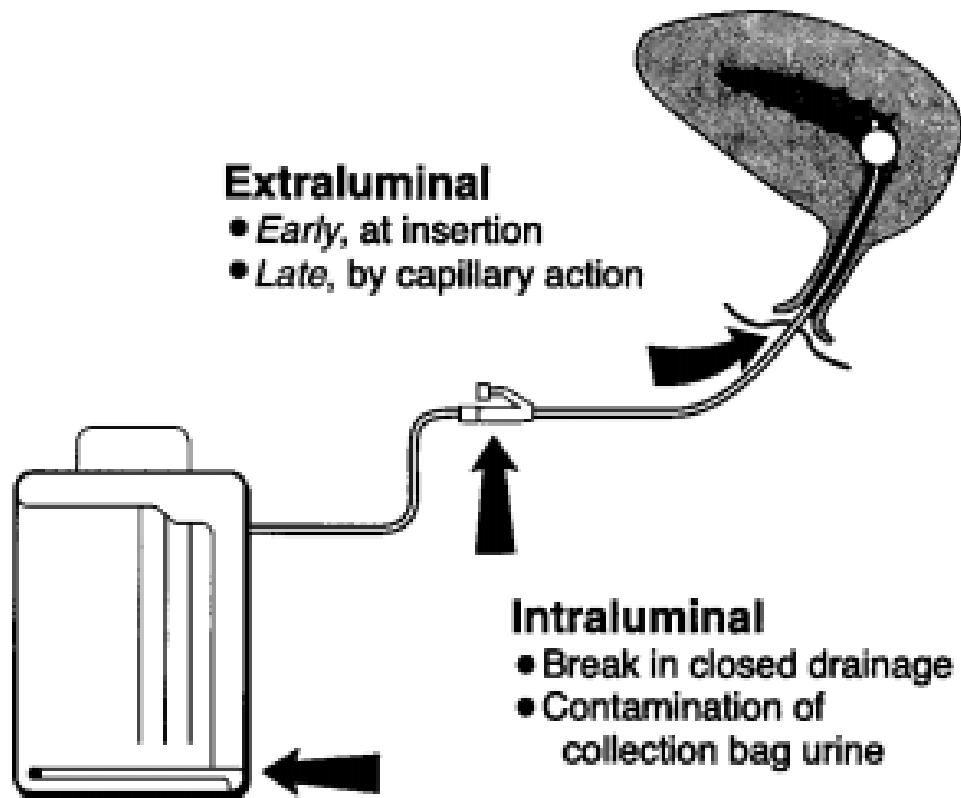
CONSIDERING CURRENT DESIGN FEATURES

Foley Catheter



Foley Catheter (3-Way)

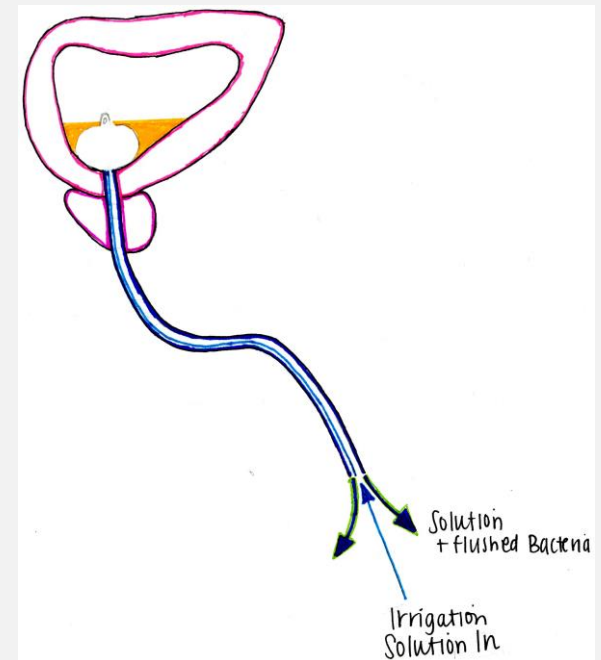
FOCUSING ON THE ROOT CAUSE OF THE CAUTI



DESIGN GOALS

NEEDS

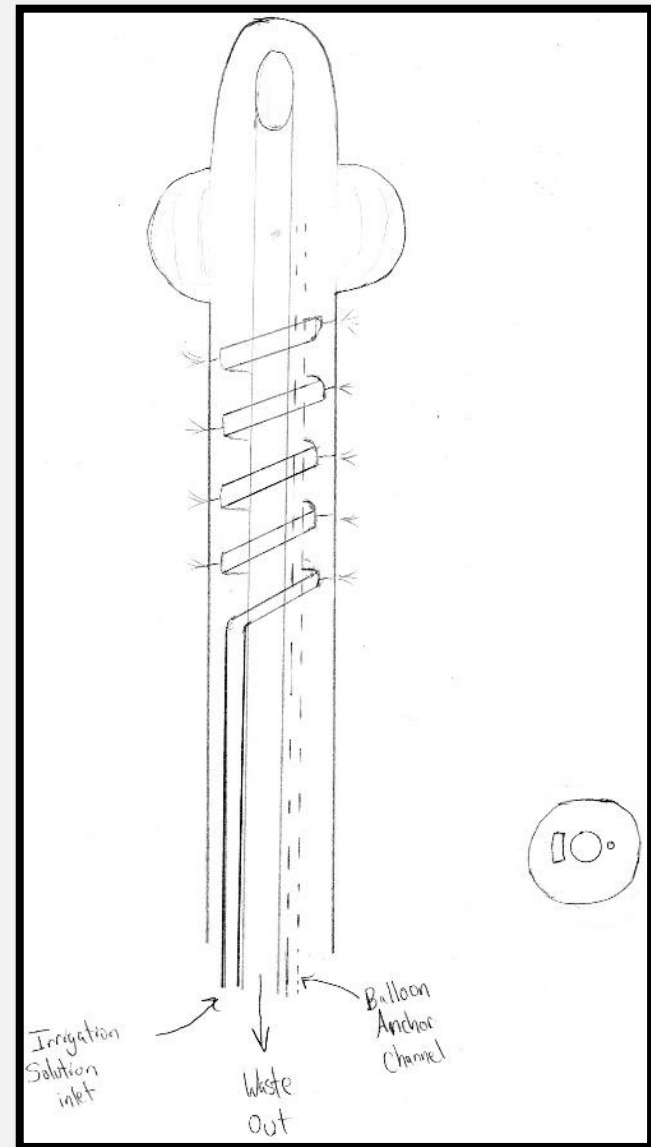
- I Allow for comfortable insertion and removal
- I Deploys an anchor in bladder to prevent slipping
- I Ability to irrigate urethra to flush bacteria
 - More closely mimics natural function
- I Ability to drain bladder with minimal stagnant urine



DESIGN CONCEPTS

EMBEDDED SPIRAL FOR IRRIGATION

- I Irrigation channel as spiral, disperses fluid evenly
- I Pros:
 - No change to traditional profile
 - Same procedure for insertion/removal
- I Cons:
 - No space creation for fluid flow
 - Requires higher pressure for irrigation fluid discharge

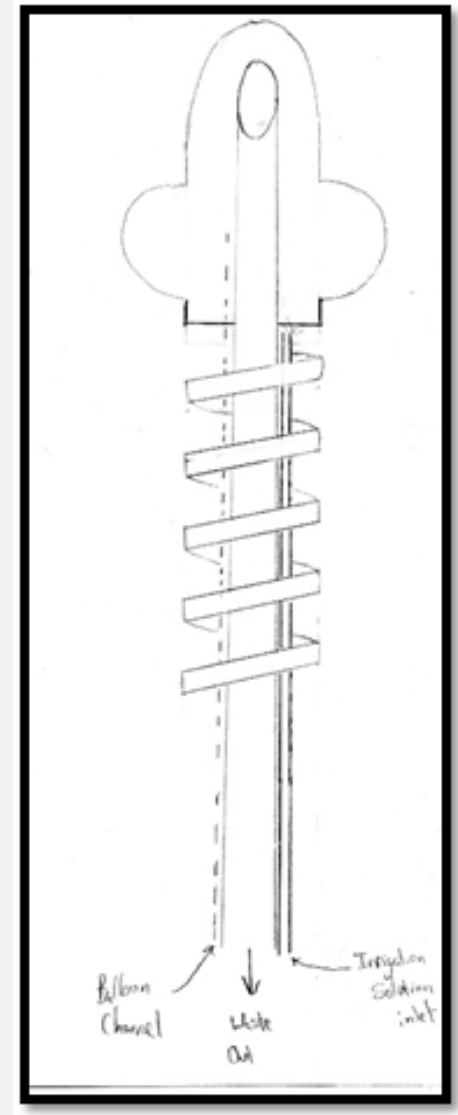


DESIGN CONCEPTS

OUTER SPIRAL FOR SPACING

- I 3 internal straight channels
- I 1 outer spiral, to create space between tight urethra walls

- I Pros:
 - Creates space for fluid to flush urethra
 - Only one irrigation point at top
- I Cons:
 - Possible discomfort to patient
 - Displeasing profile
 - Added surface area for bacteria growth



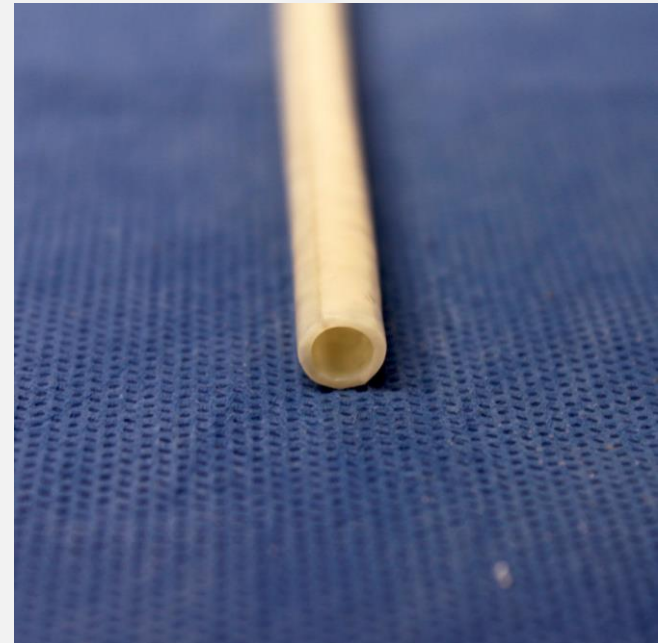
PROTOTYPING STRATEGIES

- I Liquid latex dip
 - Create features layer by layer
- I Next Step: 3D printed mold
 - Water-soluble PVA material



TESTING METHODS

- I Surrogate urethra options
 - Nylon tubing
 - LifeLike BioTissue hydrogel urethra
- I Flow testing in surrogate urethra
 - Efficiency of flushing process
 - Simulate bacteria on outer catheter wall



RISKS & POTENTIAL SOLUTIONS

- Prototyping to scale
 - Understanding thickness of each dip, temperature effects, etc.
 - Molding to control diameter and shape





LOOKING AHEAD

- 12/9 • 3D Print Mold/Prototype
- 2/1 • Design Finalized
- 2/9 • Detailed Design Review
- 3/10 • Final Prototype Complete
- 4/12 • Final Testing Complete
- 4/26 • Engineering Design Expo



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