

MANUFACTURING PROCESS FOR INFECTION PREVENTING CATHETER

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Objective/Key Requirements

- Refine current catheter redesign
- Create a device that can catch the flushing fluid
- Create a manufacturing process for the catheter
- Create a manufacturing process for the fluid catching device

Background

- Roughly 23% of patients in hospitals require an indwelling catheter
- Indwelling catheters lead to the most common nosocomial infection
- These CAUTIs cost hospitals approximately 450 million USD each year

Value Proposition

Team Manity's goal is to create a manufacturing process and design a fluid catching device for the catheter. Our work will move this catheter into the market where it can save lives and money!

Estimated costs for outsourcing cups:

- \$1600 for designing
- \$1500-\$3000 for prototyping tools
- Individual units cost (first 500): \$0.07
- Individual units cost (after 500): \$0.02-0.04\$

Estimated costs for catheter:

- \$5000-\$12000 for multi-cavity machined mold
- \$150-\$200 per kilogram of medical grade silicone
- Individual unit cost \$1-4

Budget:

- Allocated budget: \$2500
- Budget used: \$171
- Budget left: \$2329

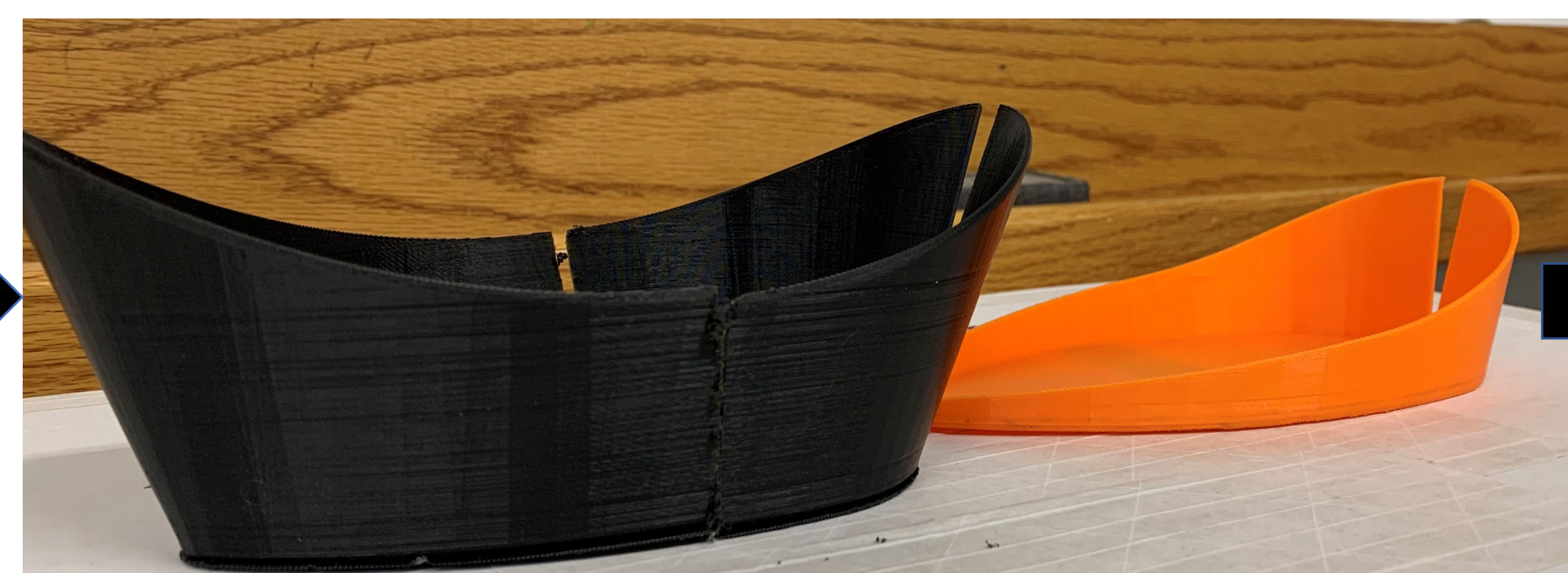
Concept Development

- Sport cup to 3D printing
- 1st cup: too big/wrong shape
- 2nd cup: too long/angle of wall
- 3rd cup: sharp angle, add fillet
- Final product: molded pulp

Sport Cup



1st Prototype



2nd Prototype



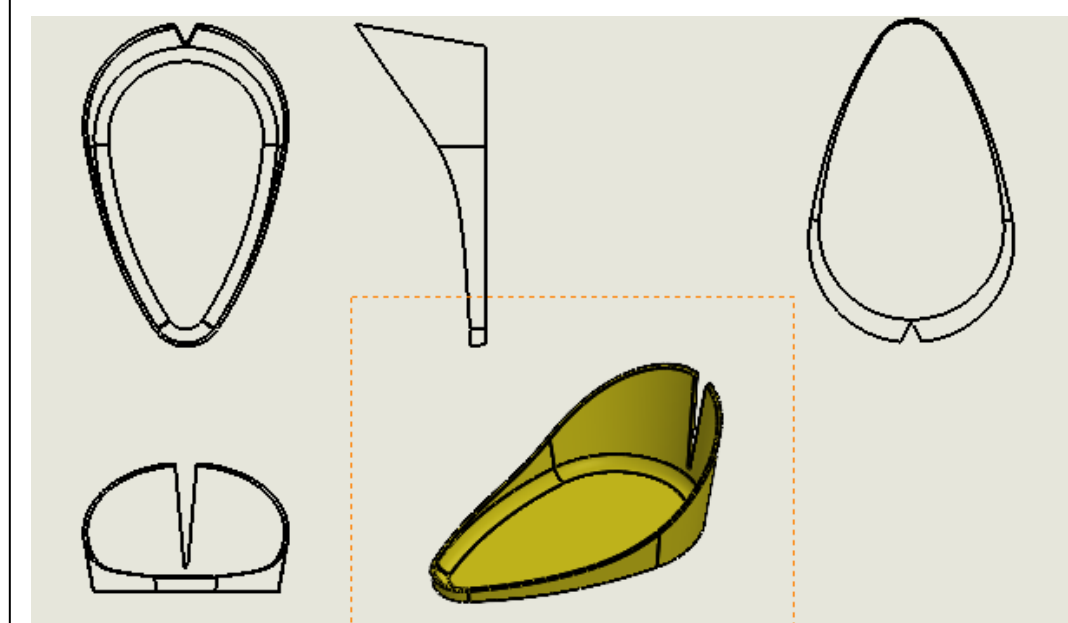
3rd Prototype



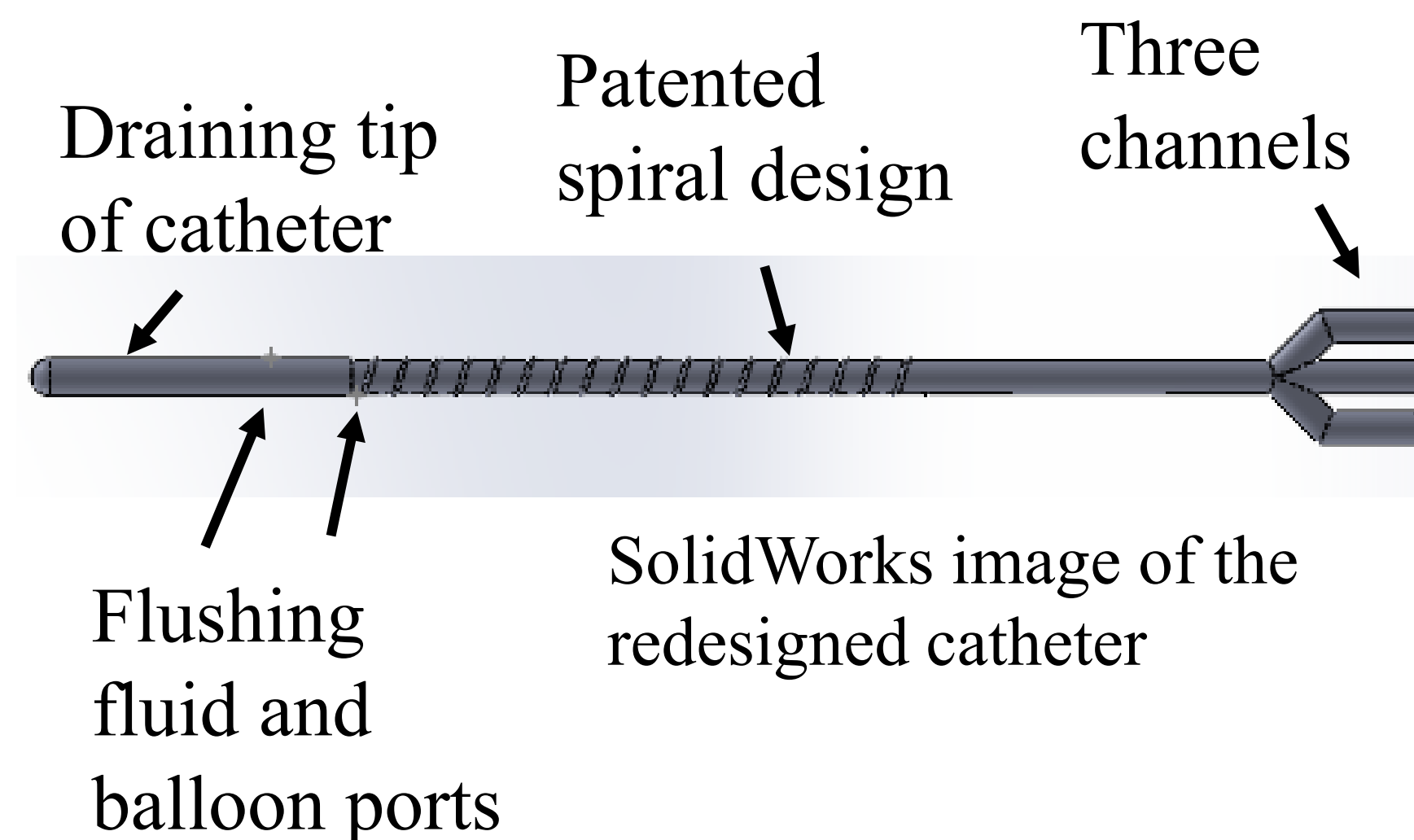
Final Product



Cup/Catheter Design:



CAD drawing of the cup

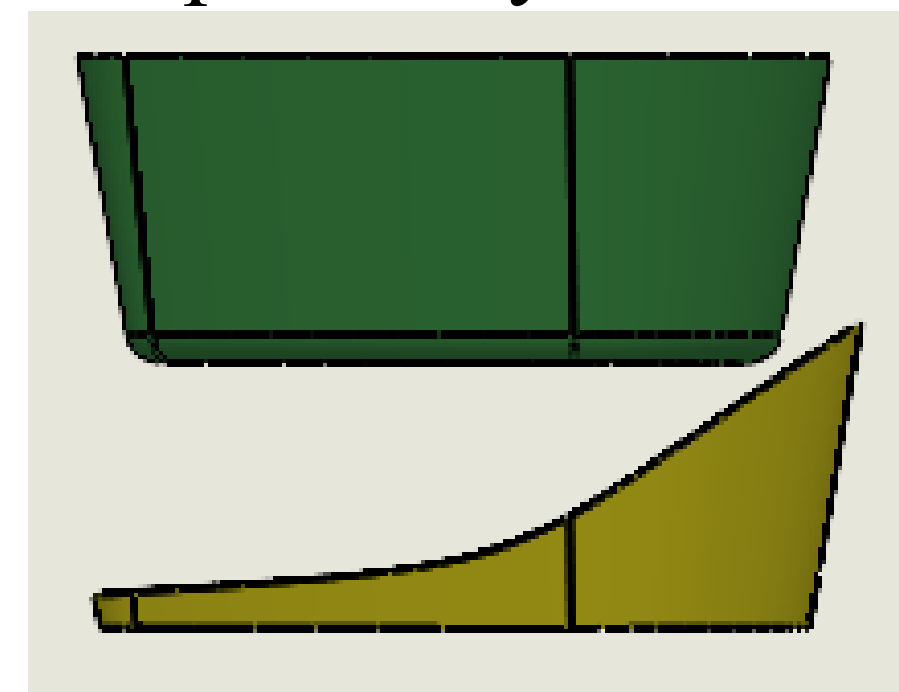


Draining tip of catheter
Flushing fluid and balloon ports

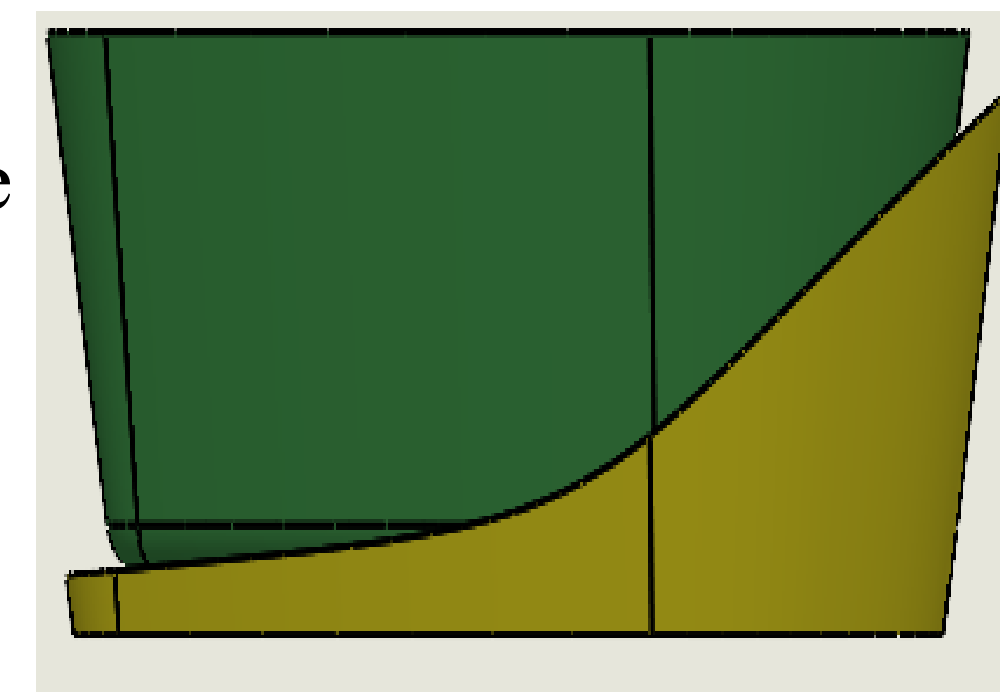
Patented spiral design
SolidWorks image of the redesigned catheter

Cup Manufacturing Process:

- Use a recycled molded pulp product for single use cups
- This is a semi-absorbent material
- Coating the outside in wax will reduce leaks and increase the cup's ability to absorb fluid before failing



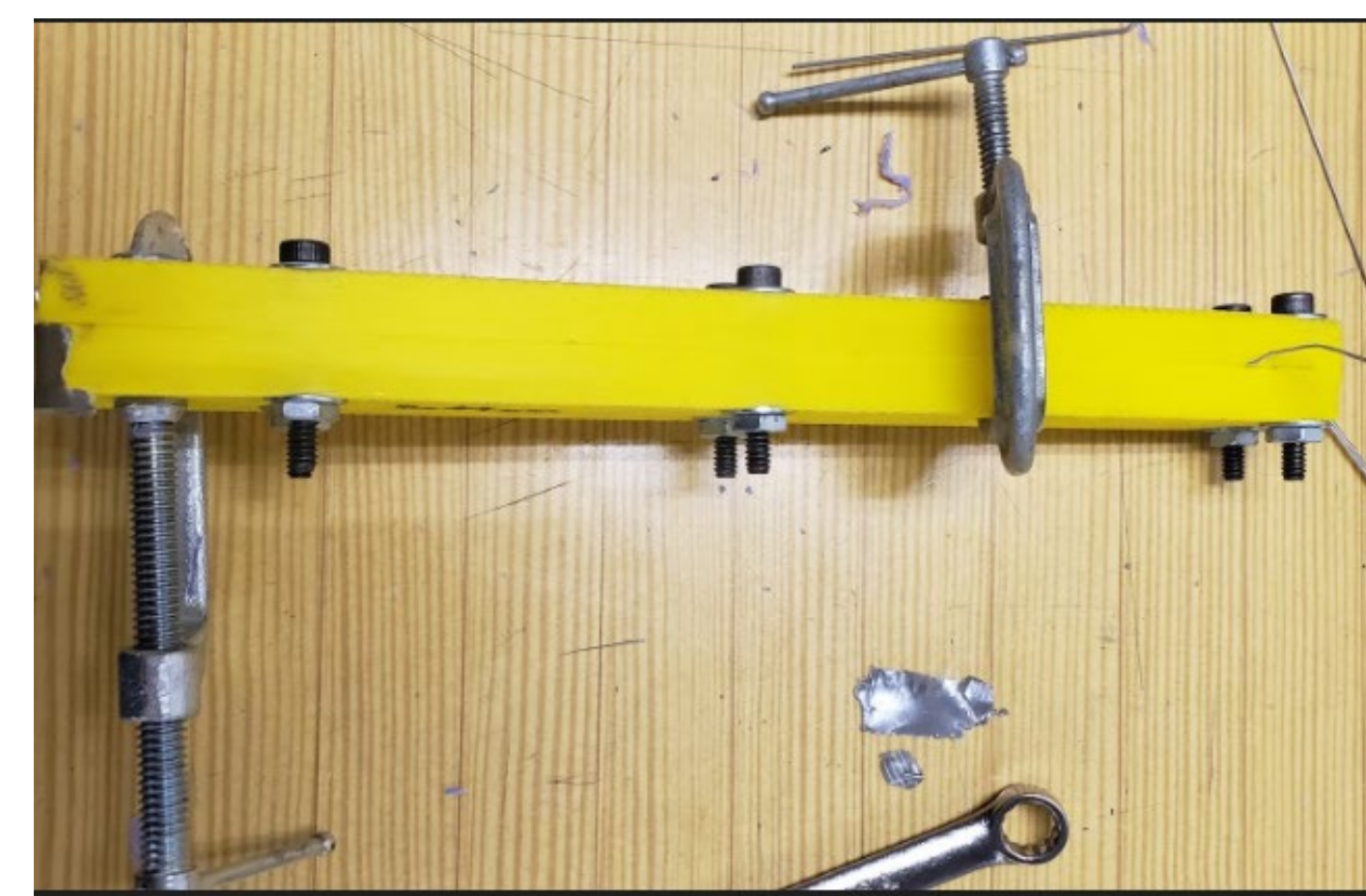
These photos show our current process to create our own molded pulp cup, creating an insert and pressing the pulp into the mold



Catheter Manufacturing Process:

- Use medical grade heat cured silicone (MED-5870) to injection mold in a clean room
- Latex dip to form balloon
- Autoclave process for sterilization
- Packaging and shipping

We currently use a 3D printed mold with pins and C-clamps to create the redesigned catheters



Manufacturing Validation Cup:

- Fits both male and female anatomies and is easy to use
- Molded pulp easily absorbs flushing fluid
- Can absorb up to 40 mL of liquid
- Absorbs 10 mL of liquid in ~40 seconds

Catheter:

- Injection molding is the cheapest and easiest way to manufacture medical grade catheters
- Process is used universally throughout the world
- This process is already approved by the FDA, and will be easier to be revalidated for safety

Final Cup Design

- Tapered slot to hold any size of catheter
- Body conforming shape for comfort
- Low-cost, recyclable, biodegradable, stackable, and durable material



Summary, Conclusions, and Recommendations

- Outsourcing the manufacturing will allow for the highest quality product and time efficiency
- This product will revolutionize the Foley catheter market

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