# Improved, Safer Cautery Pen

Avoid contamination, difficult removal process of internals, and guarantee your operation's success!

## What are cautery pens?

- In surgery, incisions and tissue dissections are usually done with the help of a scalpel.
- For patients with bleeding disorders such as hemophilia and van Willebrand disease, scalpels are dangerous and may cause them to bleed out!

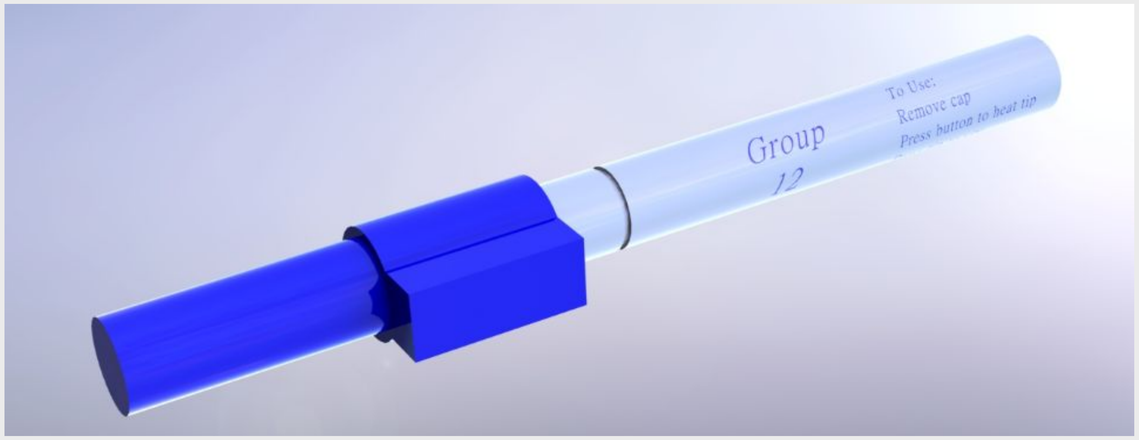
Here's how cautery pens can help!

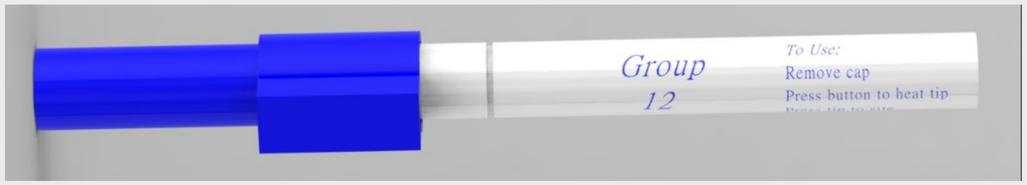
- Uses an electric current to heat the metal filament tip
- The high temperature can burn away or seal living tissue
- Allows for pinpoint hemostasis for minimal blood loss to the patient

## The problem with current designs

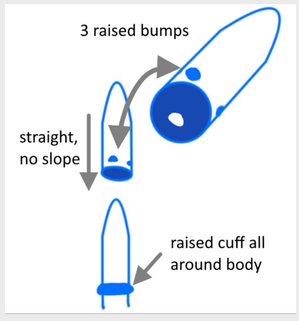

- Lack of guidance for how to dispose of the product
- Needs to be snapped in half to separate the product from its internals, resulting in damage to the user(s)
- Contaminated tip needs secondary device to be removed
- Disposable cautery pen only used for less than an hour, thus single-use plastic will highly impact the environment

Oregon State University




## Reimagining single-use, disposable cautery pen designs!



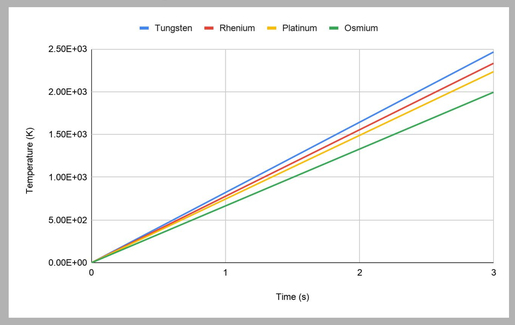

**Safer and easier disposal**

- *Add reliable cap locking mechanism to contain contaminated filament during and after breaking*
  - Our pen will feature three raised bumps around the inner diameter of the cap and a raised ring all around the body
- *Eliminate need for additional tools*
  - The cap safely contains the filament and after breaking the pen, the cap and the filament can be disposed of together!
- *Incorporate weakened break points into body design*
  - Features an indented line around the outer circumference of the body, providing a point for breaking the pen in half

**Reduce plastic waste**

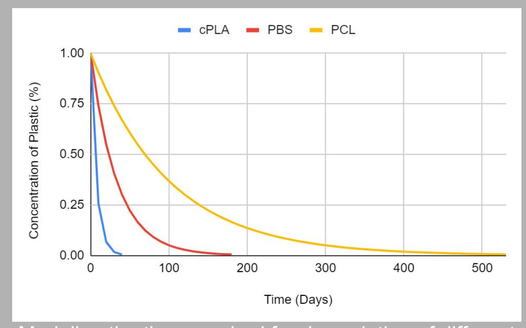
- Build cap and body from biodegradable/compostable plastics.
  - Cornstarch cPLA will be used for all plastic parts of the pen to ensure a lowered environmental impact and an overall eco-friendly design!


## Modeling and simulations

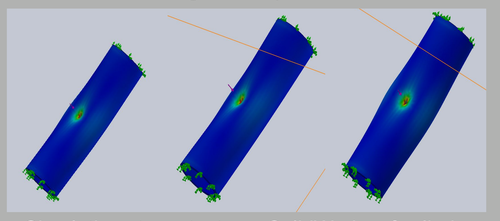



Modeling the amount of heat needed to bring different filaments up to cauterizing temperatures of 1700-2200'K.

- Tungsten, aluminum, copper, tin & aluminum bronze




Modeling the time required for degradation of different biodegradable plastics



Simulating stress tests on SolidWorks of cylinders composed of different biodegradable plastics

## Meet the team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