

## **Email Message**

**Dear all,**

**We have decided to work with Dr. Paniello on designing a stent to treat subglottic stenosis, which is a narrowing of the airways below the vocal cords. Our group met with Dr. Paniello on Monday, where he gave us information on the problem as well background information on the anatomy of the airway. Subglottic stenosis is most often caused by scarring of the cricoid cartilage, which narrows the airway, so our design is going to focus on creating a device that puts pressure on the cartilage to expand the airway. Currently, we are all doing research to get a better understanding of the disease and looking into the stents that are being used now. Hopefully, in the next week or so we are going to visit Dr. Paniello in the OR, so we can see a patient with subglottic stenosis as well as their treatment options. I have also attached this weeks electronic notebook. When I created the report, the images we have in the results section were displayed; however, when I exported the report as a PDF they no longer showed up, but you are able to see where they are supposed to go. For this week, I attached the images separately to the email, but in the next week we will figure out how to display images so this won't be a problem for the rest of our reports.**

**Sincerely,**

**Kyle Sachdev, Brian Dallesasse, Taylor Hughes**

Project created on 06.09.2016 02:03.

# Report for project Senior Design

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Task created on 22.09.2016 21:52.

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## Meeting Notes w/ Dr. Paniello

*No due date*

\*Paniello's general comments\* Subglottic stenosis (SGS): scarring beneath vocal cords - > narrowing of trachea, airway obstruction Severe cases: tracheostomy to help patient with breathing Less severe: tracheostomy not needed \*Proposed solution\* Stent: tissue expander via chronic pressure Raise pressure for 10 min, let rest for 10 min (time estimates) Inflate up to 7-8 atm (estimate), motor for stent dilation can rest of patients exterior on skin Stent would be left in for 1 or 2 months (consider FDA regulations) \*Goal\* With chronic pressure, scar tissue that narrowed the airway is pushed to side, making the airway larger again Focus on designing a stent for those w/ tracheostomy. A separate stent would be needed for less severe cases Ideally, increase airway by ~30% \*Design Specs\* Consider differences in anatomy for male/female/pediatric (slightly more common in female) Sizing of cricoid cartilage (target area, structure beneath vocal cords) Height ~ 3-4 cm (male) diameter ~ 20-24 cm (male) Device diameter ~ 4 mm? Device has to stay in place! Need to think of ways to do so (suture tied on like a button on skin?) Can't squash vocal cords Consider allowing air through stent to reach vocal cords for speech, although not critical Material: biocompatible, able to tolerate high pressure Current dilators being used are very hydraulically strong (filled w/ water, saline, etc) Top of device to match shape of conus, otherwise it won't stay in place Cartilage will thin, but it needs to retain integrity and be supportive \*Separate Note will be uploaded including anatomical diagrams from meeting\*

Task tags: *No tags*

### Meeting Notes 2 [ File\_001.jpeg ]

Uploaded by Taylor Hughes on 23.09.2016 12:06.

#### Comments for result Meeting Notes 2


*Kyle Sachdev on 23.09.2016 at 15:26:* Kyle Sachdev, Brian Dallesasse, and Taylor Hughes were all present at the meeting

### Meeting Notes 1 [ File\_000.jpeg ]

Uploaded by Taylor Hughes on 23.09.2016 12:05.

#### Comments for result Meeting Notes 1

*No comments*

 Activity of task Meeting Notes w/ Dr. Paniello

22.09.2016 21:52 *Brian* created task **Meeting Notes w/ Dr. Paniello**.

22.09.2016 22:11 *Brian* changed task **Meeting Notes w/ Dr. Paniello's** description.

22.09.2016 22:12 *Brian* changed task **Meeting Notes w/ Dr. Paniello's** description.

23.09.2016 12:05 *Taylor Hughes* added file result **Meeting Notes 1**.

23.09.2016 12:06 *Taylor Hughes* added file result **Meeting Notes 2**.

23.09.2016 15:26 *Kyle Sachdev* commented on result **Meeting Notes 2**.