



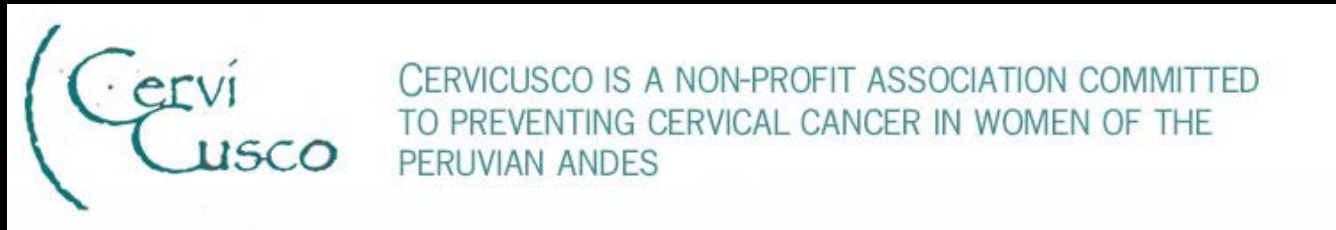
# PORTABLE CERVICAL CANCER SCREENING TABLE

Project Sponsor: Dr. Kochersberger

Team Members: Vishal Sangam, Marshall Rice, Linda Kim, Maunesh Patel &  
Sydney Ulrich-Dogonniuck

# BRIEF DESCRIPTION

- **Project Goal**: Develop a lightweight, portable table to be used for cervical cancer screening exams and surgical procedures.
- International Client: CerviCusco



- This is the first year this project has been done
  - This concept could be replicated for other developing countries, especially those that Virginia Tech already has relationships with such as Malawi.
- This is a one year project.

# REQS + SPECS

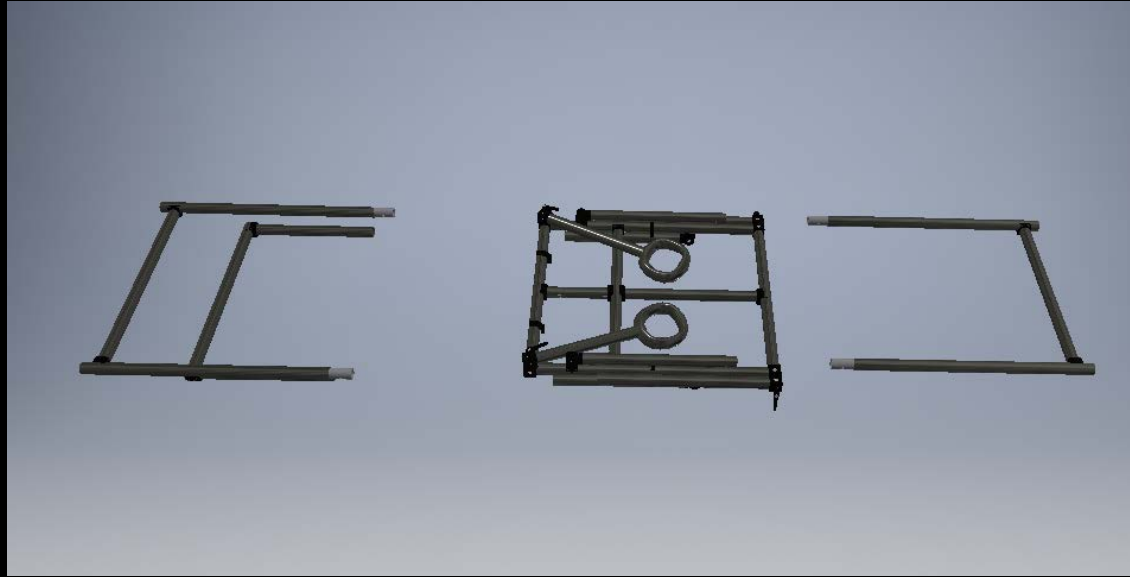
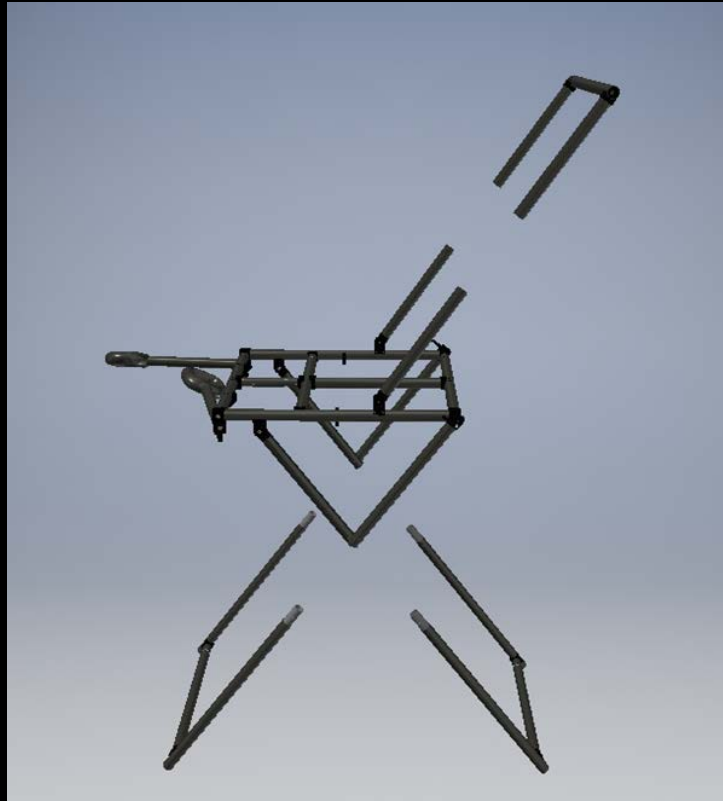
**Target Specifications Table**

Need(s)	Metrics	Importance	Units	Maximum Marginal Value	Maximum Ideal Value
1,2,3,4,9	Ergonomic Design	1	Scale 1-10	7	10
2,5,6,7,8	Coating/Material	2	Pass/Fail	Pass: Chair needs to be wiped down and dry with sterile solution with some effort	Pass: Chair needs to be wiped down completely without any remaining solution
1,5,8	Drop Height	3	ft	2	3
4,9,10	Articulating Motion	4	Degrees	0-45	0-90
2,3,5,9	Minimal # of Seperate Parts	5	Number of Parts	15	8
6,7	Material Porosity	6	Pass/Fail	Pass: Chair needs to be wiped down and dry with sterile solution with some effort	Pass: Chair needs to be wiped down completely without any remaining solution
3,9	Modular	7	Pass/Fail	Includes provider chair only	Includes provider's chair and stool/seat for the doctor
1,2,3,5	Weight	9	lbs	20	10

# FINAL PRODUCT—FULL ASSEMBLY



# CHAIR SUB-ASSEMBLIES



# STOOL SUB-ASSEMBLIES




Test/Validation Plan


Test Name	Test Plan	Instrumentation	Pass/Fail
Ergonomics Test	Have test subjects sit in the chair and rate the ergonomics.	People	Rate comfort on a scale from 1-10, with a 7 or higher passing.
Sterility Test	Pour water onto the chair and then it wipe away after 10 seconds. Measure if the chair repels the water or absorbs any of it.	Water, towels	The test will pass if the chair is completely dry and does not absorb any water.
Articulating Motion Test	Rotate the chair back to different angle settings.	Person	If the chair can rotate between 0-45 degrees the test will pass.
Minimal parts # Test	Count the number of separate parts on the chair (not including bolts and screws).	Person	The test will pass if the chair has no more than 15 separate parts.
Weight Test	Weigh the final product to determine its weight.	Scale	The test will pass if the total weight of the table is less than 20 lbs.



# ERGONOMICS

Testing will be done  
at the CerviCusco  
clinic using surveys  
and verbal feedback

CerviCusco – Clinical Member	
We are committed to providing you with the best experience possible, so we welcome your comments. Please fill out this questionnaire and return it to us. Thank you.	
Please rate the comfort level of the product. <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Disappointing <span style="float: right;">Exceptional</span>	
Please rate the product's ease of use and assembly. <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Disappointing <span style="float: right;">Exceptional</span>	
The provided manual is... Easy to follow? <input type="checkbox"/> Yes   <input type="checkbox"/> No Compressive? <input type="checkbox"/> Yes   <input type="checkbox"/> No Prompt and efficient? <input type="checkbox"/> Yes   <input type="checkbox"/> No	
Please rate the ease of cleaning the product. <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Disappointing <span style="float: right;">Exceptional</span>	
Please rate the overall experience with this product. <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Disappointing <span style="float: right;">Exceptional</span>	
What percentage of time will this product be used? <input type="checkbox"/> 0% <input type="checkbox"/> 25% <input type="checkbox"/> 50% <input type="checkbox"/> 75% <input type="checkbox"/> 100%	
What can we do to improve this product? <div style="border: 1px solid black; height: 100px; width: 100%;"></div>	
	

CerviCusco - Patient	
We are committed to providing you with the best experience possible, so we welcome your comments. Please fill out this questionnaire and return it to us. Thank you.	
How easy was it to get on/off the table? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Very Difficult <span style="float: right;">Very Easy</span>	
How stable does the table feel? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Not Stable <span style="float: right;">Very Stable</span>	
Does the table feel comfortable... For your Head? <input type="checkbox"/> No <input type="checkbox"/> Somewhat <input type="checkbox"/> Yes For your Back? <input type="checkbox"/> No <input type="checkbox"/> Somewhat <input type="checkbox"/> Yes Underneath you? <input type="checkbox"/> No <input type="checkbox"/> Somewhat <input type="checkbox"/> Yes	
How well do the stirrups provide support? <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Very Poor <span style="float: right;">Very Well</span>	
Please rate your overall experience with this product. <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 Disappointing <span style="float: right;">Exceptional</span>	
What can we do to improve this product? <div style="border: 1px solid black; height: 100px; width: 100%;"></div>	
	



# STERILITY

- Test: Water was left on vinyl cushion for 5 minutes
- Result: Vinyl successfully repelled water from absorbing into cushion



- Cleaning Procedure:
  - Wipe down with Alcohol wipes (This has been done successfully)
  - Diluted bleach or acetone solution (1:4 ratio with water is recommended)
  - Vinyl must be dried immediately with towel

# ARTICULATING MOTION

Table can be fixed at three different angles:

15 °



45 °



85 °

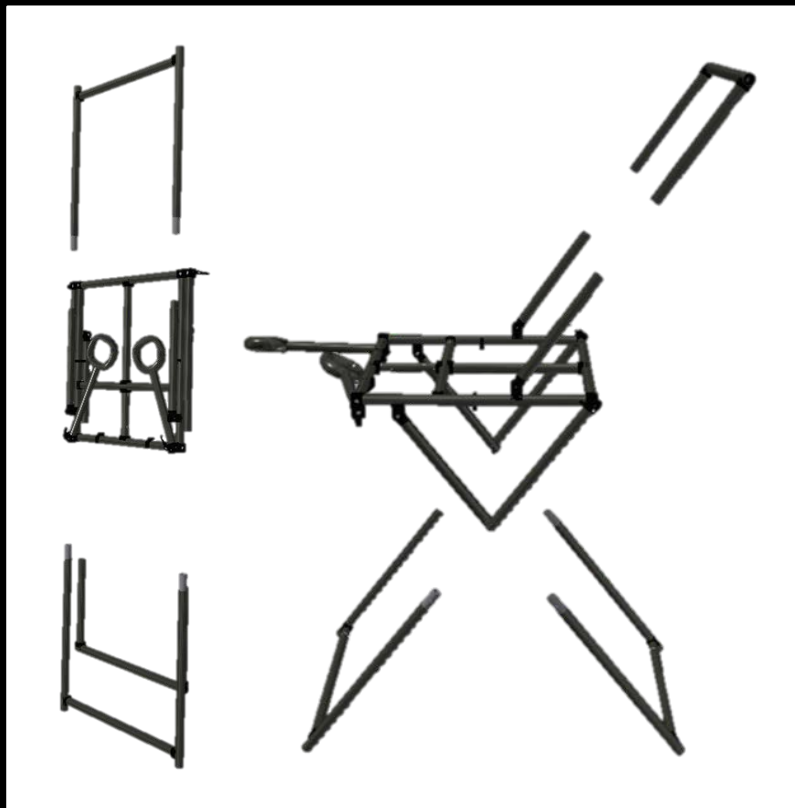


# MINIMAL PARTS

## Parts List

- Main Frame of Table
- Front Leg U-assembly
- Back Leg U-assembly
- Back Rest U-assembly
- Seat Cushion
- Leg Pins
- Doctor Stool
- Doctor Stool Pin
- Stepping Stool
- Backpack
- Rain Cover

Total Number of Parts: 12  
(Target was 15 parts)



# WEIGHT

- Table Weight: 20.0 lbs
- Stepping Stool Weight: 2.5 lbs
- Doctor Stool Weight: 2.5 lbs
- Backpack Weight: 4.5 lbs

Total Weight: 29.5 lbs





# COMMERCIALIZATION ANALYSIS

- Technology Readiness Scale: 9/9
  - Actual application of technology is in its final form – Technology proven through successful operations.



# FUTURE RECOMMENDATIONS

- Angle the stirrups upwards/add vertical adjustability for more support/comfort
- Consider variations of the main chair for other medical applications, such as a dental chair.
- Consider materials that are cheaper and could typically be sourced in a developing nation. (e.g. aluminum, wood)





THANK YOU