Web Application for Surgeons

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Main Tasks

- -We were asked to design a web application for use by surgeons to assist fellow surgeons
- -Interface should be simple, easy to navigate
- -Users should be able to add steps or tips to procedures
- -Adding steps or tips should be quick and easy

Problem statement: Design a simplistic and editable web application for surgeon-use only to assist in surgical education

Old System

	E		G	Н	I	J	K	L	M	N	0
Procedural Steps			Procedural Variation	Teaching	Critical Decisions	Attention shifts (looking for frequency or density of shifts of primarily visi					
ARATION											
A1 Ins	ert Foley,	drain bladder									
To Ente	r: patient p	repped and drape	ed								
A1	1a Identify the urethra										
						Upward Traction with hand retracting labia may help to visualize urethra		urethra			
A1	b					See image A1b - Better to have hand positioned ventrally to be out of the way for the Foley insertion		foley in one hand:			
A1	С	cather throu	ugh urethra into bladder			way for the Foley insertion		loley in one nand,			
A1		balloon	-			Be sure balloon is beyond urethra					
_		1d2 At the same	time, hold valve to make								
A1	e										
	A	1e1 Urine draina	age stopes when bladder is draine	d							
further	flow of urin	ne	e location; slight tension to check	balloon is filled and secure; no							
A2		sites									
						to curl around pubic bone to identify anatomy (pubic bone, retropubic space); If obese, make sure skin is "neutral", ie not pulling down or pushing up to make marks					
\perp						Use clitoris to help identify midline					
A2		identify retr	opubic exit sites								
		sides just ce	phalad to pubic bone			See Image A2b					
A2	с		ral stab incision on marked								
To Evit	Confirm m										
	ARATION A1 Ins TO Enter A1. A1. A1. A1. A1. A1. A1. A1	ARATION A1 insert Foley, To Enter; patient pr A1a A1b A1c A1d A1c A1c	ARATION A1 Insert Foley, drain bladder To Enter: patient prepped and drapt A1a Identify the A1a Identify the A1b Separate lai between cili A1c Place close cather throu A1d Use 10 cc, balloco balloco A1d1 Hold Foley A1 A1d2 At the same sure you st A1e Visualize or cather catheter To Exit: Visualize Foley in appropriat further flow of urine A2 Mark retropuble exit sites To Enter: Foley placed A2a Identify put A2b Identify put A2b Using a mar identify put A2b Using a mar identify com A2b Mark 2 cm identify com A2c Mark Pathon A2 Cm identify for A2b Mark 2 cm identify com A2c Mark Pathon A2 Cm identify com A2b Mark 2 cm identify com A2c Mark Pathon A2c A2c	ARATION A1 Insert Foley, drain bladder To Enter: patient prepped and draped A1a Identify the urethra A1b Separate labia to visualize structure between clitoris and vagina A1c Place closed ended portion of Foley cather through urethra into bladder A1d Use 10 cc syringe of saline to fill Foley balloon A1d1 Hold Foley to make sure in far enough A1d2 A1d2 At the same time, hold valve to make sure you stabilize a visualize through urethra flow of urine A1d2 Urine drainage stopes when bladder is drained to further flow of urine A2 Mark retropuble exit sites To Enter: Foley placed A2a Identify public bone and retropublic space identify public bone and retropublic space A2b Identify midline A2b Using a marker place dot or line to identify retropublic exit sites Mark 2 cm lateral from midline on both sides just cephalad to public bone A2c Mark A2 cm lateral from midline on both sides just cephalad to public bone Make bilateral stab incision on marked sites	AA1 Insert Foley, drain bladder To Enter: patient prepaged and draped A12 Identify the urethra A13 Identify the urethra A14 Separate labia to visualize structure between clitoris and vagina A16 Place closed ended portion of Foley cather through urethra into bladder A17 Use 10 cc syringe of saline to fill Foley balloon A17 A17 Hold Foley to make sure in far enough A17 A18 Visualize urine emptying through cathered to make sure in far enough A19 A19 Visualize urine emptying through catheter A10 Urine drainage stopes when bladder is drained To Exit: Visualize Foley in appropriate location; slight tension to check balloon is filled and secure; no further flow of urine A2 Mark retropuble exit sites To Enter: Foley placed A2 A2 A3 Identify public bone and retropublic space A2 A3 Identify public bone and retropublic space A2 A3 Identify public bone and retropuble capace A2 A3 Identify retropuble exit sites A2 A3 Identify retropuble iexit sites A4 D4 Identify retropuble iexit sites A2 B4 Identify retropuble iexit sites A3 B4 Identify retropuble iexit sites A4 Identify retropuble iexit sites A5 Identify retropuble iexit sites A6 Identify retropuble iexit sites A7 Identify retropuble iexit sites A8 Identify retropuble iexit sites A8 Identify retropuble iexit sites A9 Identify retropuble iexit sites A8 Identify retropuble iexit sites A8 Identify retropuble iexit sites A9 Identify retropuble iexit sites	AT Insert Foley, drain bladder To Enter; patient prepped and draped A1 Insert Foley, drain bladder To Enter; patient prepped and draped A1a Identify the urethra A1b Separate labia to visualize structure between clitoris and vagina Place closed ended portion of Foley cather through urethra into bladder A1d Use 10 cc syringe of saline to fill Foley balloon A1d1 Hold Foley to make sure in far enough A1d2 At the same time, hold valve to make sure you stabilize A1e Visualize urine emptying through catheter A1e Urine drainage stopes when bladder is drained To Exitt Visualize Foley in apportiate locationy, slight tension to check balloon is filled and secure; no further flow of urine A2 Max fetropublic exit sites To Enter; Foley placed A2a Identify public bone and retropublic space Identify public bone and retropublic space A2b Lack Confirm make stab incisions on marked sites A2b Wark 2 cm lateral from midline on both sides just ccephalad to public bone Make bilateral stab incision on marked sites To Exit; Confirm marks are accurate	ARATION A1 insert Foley, drain bladder To Enter; patient prepped and draped A1 a	ARATION At Insert Foley, drain bladder To Enter-patient prepped and draped Ala Identify the urethra Identify the urethra Ala Separate labia to visualize structure between citior's and vagina Ala Upward Traction with hand retracting labia may help to visualize urethra See image Ala - Better to have hand positioned ventrally to be out of the way for the Foley insertion Ala Place closed ended portion of Foley cather through urethra into bladder Ald Use 10 c syringe of saline to fill Foley bladloon Ald Hold Foley to make sure in far enough Ald Hold Foley to make sure in far enough Ald Ald At the same time, hold valve to make sure was sure you stabilize sure you stabilize sure you stabilize sure you stabilize cathered. Ale Visualize urine emptying through cathered Foley in appropriate location; slight tension to check balloon is filled and secure; no further flow of urine A. Mark Fertpublic exist tes To Enter- Foley placed A. A2a Identify public bone and retropubic space To Enter- Foley placed A. A2a Identify public bone and retropubic space In A2a Identify midline Use ditoris to help identify in midline Use ditoris to help identify midline Use ditoris to help identify midline Use ditoris to help identify midline To Exit. Confirm marks are acrossine. To Exit. Confirm marks are acrossine.	Al I mert foley, train bladder To Enter: patient prepped and draped Al I mert foley, train bladder To Enter: patient prepped and draped Al I default by the urethra Al I be Separate labia to visualize structure between clitoris and vagina Al C Place closed ended portion of Foley cather through urethra into bladder Al C Place closed ended portion of Foley cather through urethra into bladder Al C Use yings of saline to file foley Al C Use I better to have been and portion of the service of th	All Insert foley drain bladder To Enter: patient prepped and draped All Separate labia to visualize structure (a) All Descriptions and vagina (b) Separate labia to visualize structure (b) Better to have hand positioned ventrally to be out of the way for the foley insertion (c) All Cell Place dosed ended portion of Foley (c) Cetter through unerthin aims bladder (c) Ald Cell Hold Foley to make user in fer enough (d) Ald Lell Hold Foley to make user in fer enough (e) Ald Hold Foley to make user in fer enough (e) Ald Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make bladder is drained (f) Cotative from called and the foley to make user in fer enough (e) Ald Cell Hold Foley to make bladder is drained (f) Cotative from called and the foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer enough (e) Ald Cell Hold Foley to make user in fer	ARATION All Insert felley, dain bladder To Enter, patient prepped and draped All All Separate blabs to visualize structure Comment of the separate blabs to visualize structure Determined and visualize structure and visualize structure Determined and visualize structure and vi

Design

- -Our design would consist of three main pages:
 - A login screen
 - All Surgeries/Procedures Page
 - Main page with all the information pertaining to the surgery/procedure.
- -The login page is to protect the data on the site so that the general public cannot see or add information
- -After logging in, the user should be taken to the search screen where all procedures are listed
 - -The user can search via a search box or via an alphabet menu

Design Cont.

-The procedure page was originally supposed to have 4 sections (Main steps, Micro steps, Tips and Red Flags)

-However, the client decided that we should not include red flags, only tips

-The procedure page would have three columns for each section. Originally they were equally sized and individually scrollable.

Process of Design

- -After meeting with potential users, we had to change some aspects of our design.
- -The users wanted to focus on one specific procedure, however we discussed the usefulness of keeping the functionality for additional procedures. Our final design includes this functionality.
- -The procedures page was changed to highlight the "Tips" portion of the screen because this will be their main focus.

User Studies

- Client: Dr. Littleton
- Users: Surgeons in Missouri and the West Coast
- We conducted three interviews/meetings with the client and the potential user.
- Every meeting the requirements changed
- Core functionality of the system remained the same i.e. Tips should be highlighted
- More of a learning/aiding system than implementing in critical scenarios

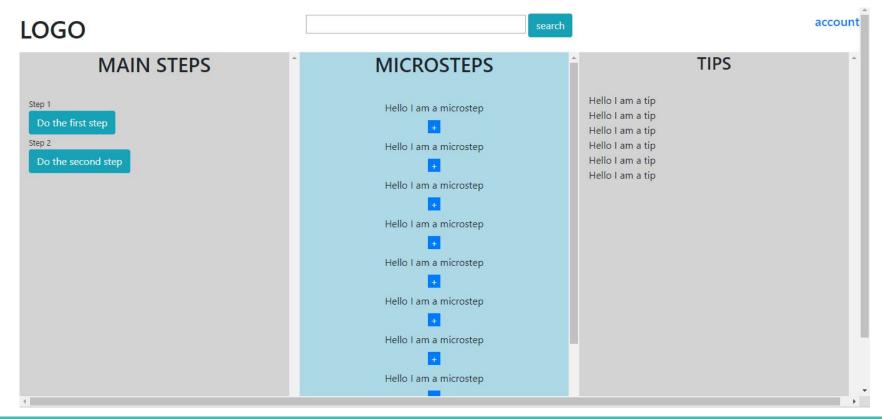
Task Analysis

Task: View teaching tips associated with various surgery steps

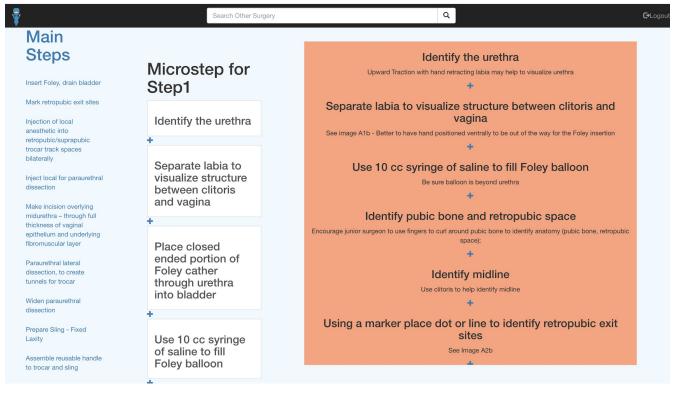
- 1) Login to authenticate
- 2) Search and Select Procedure
 - a) Add Procedures: Done through Edit-A-thon Events
- 3) Follow Main Steps
 - a) Add Main steps while adding procedure, main steps cannot be modified after a procedure is made
- 4) Follow Micro Steps associated with Main Steps
 - a) Add Micro Steps: Submitted for review
- 5) View Teaching tips associated with Micro Steps
 - a) Add Teaching Tips: Submitted for review
- 6) Log out

Plan: 2 -> 3 ->4, follow substeps if needed but not necessary for learning

Procedure Page Draft (Before meeting with users)



Procedure Page Final (After meeting with users)



Challenges

- -Starting from scratch was more time consuming than expected
 - -We had to create both front-end design and back-end functionality
- -User needs changed continuously from our original design
 - -Challenging to meet their needs while also creating a nice-looking and intuitive design
- -Wanted to add social rating feature for user-created additions
- -In future versions of this project, this should be added to allow users to rate new steps or tips as good/bad or helpful/unhelpful

Project Demo