Northwestern University Feinberg School of Medicine: Department of Surgery Resident Robotic Curriculum

Introduction:

The Robotic Assisted Laparoscopic Surgery platform now in use was first introduced in 2000. Rapid growth and widespread acceptance of the Robotic Surgery platform was first seen in the field of Urology, as Robotic Assisted Laparoscopic Prostatectomy quickly replaced open Prostatectomy as the standard of care. Robotic Assisted Surgery is now widely used in the fields of Cardiac Surgery, Colorectal Surgery, General Surgery, Gynecology, Otolaryngology, and Thoracic Surgery.

The use of Robotic Assisted Surgery at Northwestern Memorial Hospital has grown 78% in the past three years, and most notably in the fields of Colorectal Surgery, General Surgery, and Thoracic Surgery. The number of Robotic surgical cases performed at Northwestern Memorial Hospital will continue to dramatically increase, as the fleet of Intuitive Robotic systems has been increased from five to eight in 2020.

Due to the increasing demand and widespread use of robotic assisted surgery in the United States, most Northwestern Surgery Residents will continue to perform robotic surgery in Fellowship training and/or in their eventual practice setting. For this reason, it is important that Northwestern Surgery Residents become proficient in their knowledge and clinical skills on the Robotic platform. To facilitate Resident training, all of our Robotic systems have a dual console, and there is access to a robotic simulator(s) at both NMH and the VA. The following robotic curriculum will provide structure and guidance for your Robotic training during Residency.

Course Learning Objectives:

1. Recognize surgical cases that are appropriate/inappropriate for Robotic Surgery
2. Determine indications and contraindications to Robotic Surgery
3. Outline advantages and disadvantages unique to Robotic Surgery compared to Open and Laparoscopic Surgery
4. Develop a working knowledge of the components of the Robotic system and various robotic instruments
5. Become proficient in steering the Robot, docking the Robot to the patient, perform targeting, and inserting and exchanging the camera and instruments
6. Complete 10 cases as the bedside assistant
7. Develop a working knowledge of the components of the console and the control screen of the console
8. Become proficient in camera control, instrument manipulation, and clutching
9. Perform 30 cases as console Surgeon (see activities by post graduate year section for expected cases to be performed at each level of Resident training)

Activities by Post-Graduate Year:
PGY-1:
1. Attend **mandatory** *Robotic Introduction Workshop* (see details in *Robotic Introduction Workshop* Section)
2. Sign up for and complete Intuitive online training (assistance provided by Intuitive representative at Boot Camp or see Instructions for Online Training Section)
3. Observe Robotic cases and after completing online training perform bedside assisting while on MIS and Blue Service
4. Practice exercises on simulator (see list of mandatory simulator exercises)

PGY-2:
1. Attend **mandatory** Robotic Advanced Workshop (see details in Robotic Advanced Workshop Section)
2. Complete bedside assistant cases (total of 10)
3. Complete all mandatory simulator exercises (see list of mandatory simulator exercises)
4. After completing all of the above- perform Robotic Inguinal/Ventral hernia repairs and Cholecystectomies while on Mueller and VA service

PGY-3:
1. Review online training and/or attend a Robotic Advanced Workshop if needed for review
2. Continue practice on simulator
3. Perform Robotic rectopexies and portions of mobilization and anastomosis in colectomies while on Colorectal Service

PGY-3 continued
4. Perform Robotic cases on Thoracic Surgery
5. Perform Robotic cases while on Surgical Oncology and Blue Service

PGY-4:
1. Review online training and/or attend a Robotic Advanced Workshop if needed for review
2. Continue practice on simulator
3. Perform Robotic rectopexies and portions of mobilization and anastomosis in colectomies while on Colorectal Service
4. Perform additional Inguinal/Ventral hernias and Cholecystectomies

PGY-5:
1. Review online training and/or attend a Robotic Advanced Workshop if needed for review
2. Continue practice on simulator and complete advanced exercises
3. Perform portions of mobilization and Anastomosis in Colectomies
4. Perform additional Robotic Inguinal/Ventral hernia repairs and Cholecystectomies while on MIS and VA service
5. Attending evaluation of 5 console Surgeon cases to assess skills and competency

Requirements for completing Robotic Training:

1. Complete online Robotic training at www.davincisurgerycommunity.com
2. Attend one mandatory *Robotic Introduction Workshop* (PGY-1) and one mandatory *Robotic Advanced Workshop* (PGY-2)
3. Complete all required Robotic simulator exercises with a minimum score of 90%
4. Complete a minimum of 10 bedside assistant cases. Resident is responsible for logging cases on attached worksheet and turn in worksheet to Dr. Mueller.
5. Complete a minimum of 30 console surgeon cases. Resident is responsible for logging cases on attached worksheet and turn in worksheet to Dr. Mueller.
6. Be evaluated by attending surgeon on 5 console surgeon cases. Resident is responsible for logging cases on attached worksheet and turn in worksheet to Dr. Mueller.
7. On completion of #1-6 above you will receive both a Letter of Verification of robotic training from Northwestern's Program Director and a Certificate of DaVinci System Training from Intuitive Surgical

Robotic Introduction Workshop:

Offered in July and January of PGY 1 year:

In-person dry lab orientation to the daVinci Robotic platform by Dr. Mueller and Intuitive Representative

-**Mandatory for PGY1 residents to attend a minimum of <u>one</u> course**

1. Introduction to components of the daVinci Robot
2. Introduction to Robotic instrumentation
3. Hands-on instruction of docking, targeting, and instrument exchange
4. Introduction of simulator exercises
5. Peg transfer, pattern cut, endoloop, suturing and knot tying, etc.

Goals for PGY 1s: To be prepared to begin performing bedside assisting cases during PGY 1 year or start of PGY 2 year, while continuing simulator training in preparation for performing console cases during PGY 2 year.

*PGY 1 Residents who complete all online training and attend one *Robotic Introduction Workshop* should contact Dr. Mueller to arrange to set up bedside assisting cases when appropriate.

Robotic Advanced Workshop:

Offered in July, November and March of PGY 2 year

-In person dry lab instruction by Dr. Mueller and Intuitive representative

-**Mandatory for PGY2 residents to attend a minimum of <u>one</u> course**

-Limit of 6 residents per course

-Course open to upper level Residents as space allows

-Course to include:

1. Videos/lecture on common Robotic surgical cases
2. Suturing and knot tying
3. Box simulator, abdominal and inguinal hernia model
4. Peg transfer and pattern cut competitions

*In addition to the courses at NMH each PGY 2 Resident when rotating at the VA will have an Intuitive representative review the robotic system and training simulator.

Expectations for ALL PGY 2 residents before finishing VA rotation:

-Attend Robotic Advanced Workshop

-Complete Intuitive online training

-Complete all mandatory simulator exercises

Instructions for Intuitive Online Training:

1. Go to
   https://www.davincisurgerycommunity.com
   to create your personal online community profile by clicking **Join the Community** on the home page.
2. Once you have created your online profile hover over **Training** in the top menu and click **Intuitive Learning.**
3. Next, select preferred language, platform type (daVinci Xi) software version (select latest software option).
4. Enroll in learning plan: "Xi Multiport for Residents and Fellows"
5. Once you have completed the online learning plan, you will be able to download your online training certificate that will eventually be submitted for your equivalency certificate.

If you have questions or need assistance with online training or simulator training please contact:

Chrissa Kannady (Northwestern Intuitive representative)
chrissa.kannady@intusurg.com
Cell: (312) 882-0409

Caitlin Rathjen (VA Intuitive Representative)
Caitlin.rathjen@intusurg.com
Cell: (815) 621-0301

Instructions for Using the Robotic Simulator:

You will have access to an Intuitive SimNow Simulator at NMH (Feinberg 6th floor outside the surgery resident room) and at the VA.

1. Make sure you have already created your community profile
2. Go to the following link https://www.davincisurgerycommunity.com
3. Click the SimNow Link on the top line.
4. Creating a SimNow account will allow you access to the simulator and to track your progress and see the leaderboard
5. On step 6, use this serial number for our simulator
-NMH Simulator serial # SU0927
-VA Simulator serial # SU1056
6. On step 7 keep notifications and leaderboard visibility "ON"
7. Create and remember your 4 digit PIN and Sim User Name and save it to log in at the actual SimNow Simulator
8. On the SimNow Simulator find your username and type in your PIN and you may begin performing simulator exercises

Mandatory SimNow Simulator Exercises:

Residents are encouraged to explore any and all SimNow exercises, but the following list below are required. You need to achieve a 90% or greater score on each exercise to meet the requirement.
Once you have completed all mandatory simulator exercises with a 90% or greater score please email Dr. Mueller (kmueller@nm.org) that you have completed all mandatory exercises.

1. Camera control combo exercise
2. 30 degree scope swap
3. Endowrist manipulation combo exercise
4. Ring rollercoaster 4
5. FRS ring tower transfer
6. Clutching combo exercise
7. Energy pedals 2
8. Three arm relay 3
9. Anterior needle driving-vertical
10. Anterior needle driving-around the world
11. FRS railroad track
12. Big dipper needle driving
13. FRS knot tying
14. Procedure simulation-inguinal hernia: anatomy, guided incision and dissection, and freehand incision and dissection

Robotic Case Log- Bedside Assistant (Minimum of 10)

Patient MRN	Date	Attending	Operation

_____   _____

Resident Name   **Resident Signature**

Robotic Case Log #1- Console Surgeon (Minimum of 30)

Patient MRN	Date	Attending	Operation

_____ _____

Resident Name **Resident Signature**

Robotic Case Log #2- Console Surgeon (Minimum of 30)

Patient MRN	Date	Attending	Operation

_____   _____

Resident Name   **Resident Signature**

Robotic Case Log #3- Console Surgeon (Minimum of 30)

Patient MRN	Date	Attending	Operation

_____   _____

Resident Name   **Resident Signature**

Attending Evaluation of Resident Console Surgeon Case # 1

Patient MRN	Date	Resident Name	Operation

SKILL	PASS	FAIL
Demonstrates correct spacing and placement of robotic trocars		
Demonstrates ability to dock robot in an efficient manner		
Proficient in targeting and control of endoscope		
Demonstrates appropriate clutching and ability to maintain hands in an ergonomic workspace		
Demonstrates ability to use third arm and perform instrument switching		
Moves instruments safely and always under direct visualization		
Able to recognize tissue response to evaluate grip strength and handles/dissects tissues appropriately		
Demonstrates ability to troubleshoot robotic system and coordinate with bedside assistant		

Comment on strengths:

Comment on areas for improvement:

Does resident demonstrate competency on the robotic system? Yes No

_____   _____

Attending Name Printed   Attending Signature

Attending Evaluation of Resident Console Surgeon Case # 2

Patient MRN	Date	Resident Name	Operation

SKILL	PASS	FAIL
Demonstrates correct spacing and placement of robotic trocars		
Demonstrates ability to dock robot in an efficient manner		
Proficient in targeting and control of endoscope		
Demonstrates appropriate clutching and ability to maintain hands in an ergonomic workspace		
Demonstrates ability to use third arm and perform instrument switching		
Moves instruments safely and always under direct visualization		
Able to recognize tissue response to evaluate grip strength and handles/dissects tissues appropriately		
Demonstrates ability to troubleshoot robotic system and coordinate with bedside assistant		

Comment on strengths:

Comment on areas for improvement:

Does resident demonstrate competency on the robotic system? Yes No

_____   _____

Attending Name Printed   Attending Signature

Attending Evaluation of Resident Console Surgeon Case # 3

Patient MRN	Date	Resident Name	Operation

SKILL	PASS	FAIL
Demonstrates correct spacing and placement of robotic trocars		
Demonstrates ability to dock robot in an efficient manner		
Proficient in targeting and control of endoscope		
Demonstrates appropriate clutching and ability to maintain hands in an ergonomic workspace		
Demonstrates ability to use third arm and perform instrument switching		
Moves instruments safely and always under direct visualization		
Able to recognize tissue response to evaluate grip strength and handles/dissects tissues appropriately		
Demonstrates ability to troubleshoot robotic system and coordinate with bedside assistant		

Comment on strengths:

Comment on areas for improvement:

Does resident demonstrate competency on the robotic system? Yes No

_____   _____
Attending Name Printed   Attending Signature

Attending Evaluation of Resident Console Surgeon Case # 4

Patient MRN	Date	Resident Name	Operation

SKILL	PASS	FAIL
Demonstrates correct spacing and placement of robotic trocars		
Demonstrates ability to dock robot in an efficient manner		
Proficient in targeting and control of endoscope		
Demonstrates appropriate clutching and ability to maintain hands in an ergonomic workspace		
Demonstrates ability to use third arm and perform instrument switching		
Moves instruments safely and always under direct visualization		
Able to recognize tissue response to evaluate grip strength and handles/dissects tissues appropriately		
Demonstrates ability to troubleshoot robotic system and coordinate with bedside assistant		

Comment on strengths:

Comment on areas for improvement:

Does resident demonstrate competency on the robotic system? Yes No

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Attending Name Printed   Attending Signature

Attending Evaluation of Resident Console Surgeon Case # 5

Patient MRN	Date	Resident Name	Operation

SKILL	PASS	FAIL
Demonstrates correct spacing and placement of robotic trocars		
Demonstrates ability to dock robot in an efficient manner		
Proficient in targeting and control of endoscope		
Demonstrates appropriate clutching and ability to maintain hands in an ergonomic workspace		
Demonstrates ability to use third arm and perform instrument switching		
Moves instruments safely and always under direct visualization		
Able to recognize tissue response to evaluate grip strength and handles/dissects tissues appropriately		
Demonstrates ability to troubleshoot robotic system and coordinate with bedside assistant		

Comment on strengths:

Comment on areas for improvement:

Does resident demonstrate competency on the robotic system? Yes No

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Attending Name Printed   Attending Signature