Full-Cycle Model for Robotics Education, Training, Assessment and Surveillance

Institute for Surgical Excellence
The Institute for Surgical Excellence (ISE) is a 501(c)3 non-profit organization dedicated to improving surgical care and patient outcomes.

ISE’s mission is to support the implementation of safer solutions to complex surgical interventions and emerging technologies.

ISE utilizes a systems-based approach to bring together key stakeholders to:

- Identify issues
- Set clearly defined goals
- Facilitate collaboration
- Assess and fill gaps
- Develop education and training curricula and assessment tools
- Better inform healthcare consumers
ISE Leadership – Board of Directors

Jeffrey Levy, MD  
*Co-Founder*  
*Interim Executive Director*

Martino Martin, MD  
*Co-Founder*  
*Board Member*

Nazema Siddiqui, MD  
*Co-Founder*

John R. Porterfield, MD  
*Board Member*

Carla Pugh, MD  
*Board Member*

Dimitrios Stehanidis, MD  
*Board Member*
ISE Leadership – Advisory Board

- Eli Adashi, MD, MS, MA, (Ob/Gyn)
- Richard Angelo, MD (Orthopedics)
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- Bradley Champagne, MD (Colorectal)
- Sanket Chauhan, MD (Urology)
- Michael J. Consuelos, MD (Pediatrics)
- Michael Ferrandino, MD (Urology)
- Jeffrey M. Fowler, MD (Ob/Gyn)
- Isabel Green, MD (Ob/Gyn)
- Gregory Kainz, MD (Ob/Gyn)
- Kenneth Kim, MD (Ob/Gyn)
- Mario Leitao, Jr., MD (Ob/Gyn)
- Veronica Lerner, MD (Ob/Gyn)
- Javier Magrina, MD (Ob/Gyn)
- Roberto Manson, MD (Vascular)

- Jorge Marcet, MD (Colorectal)
- George L. Maxwell, MD (Ob/Gyn)
- Gaby Moawad, MD (Ob/Gyn)
- Erik D. Muther (Non-profit)
- Vincent Obias, MD (Colorectal)
- Robert Pedowitz, MD (Orthopedics)
- Matthew A. Powell, MD (Ob/Gyn)
- Andrew Ralston, Jr. (Legal)
- Paul Sobotka, MD (Cardiology)
- Hooman Soltanian, MD (Plastic Surgery)
- Howard Stevens (Legal)
- Michael Stifelman, MD (Urology)
- Robert Sweet, MD (Urology)
- Ed Verrier, MD (Cardiothoracic)
- Jason Wright, MD (Ob/Gyn)
Full-Cycle Model for Robotics

Process drives outcomes!

Outcome Measures & Metrics  Curriculum Development  Simulation Development  Curriculum Validation  High Stakes Examination  Outcome Registries
Fundamentals of Robotic Surgery (FRS)

- Develop a validated multi-specialty, technical skills competency based curriculum for surgeons to safely and efficiently perform basic robotic-assisted surgery.
- Proficiency-based progression model
FRS Participants

Arnold Advincula, MD, FACS
Rajesh Aggarwal, MBBS
Abdulla Ali Al Ansari, MD, FRCS
David M. Albala, MD
Richard L. Angelo, MD
Mehran Anvari, MD
John Armstrong, MD, FACS
Garth Ballantyne, MD, MBA
Michele Billia, MD
James F. Borin, MD
David M. Bouchier-Hayes, MD
Timothy C. Brand, MD, FACS
Jan Cannon-Bowers, PhD
Sanket Chauhan, MD
Rafael F. Coelho, MD
Geoff Coughlin, MD
Alfred Cuschieri, MD
Prokar Dasgupta, MD
Ellen Deutsch, MD
Gerard Doherty, MD
Brian J. Dunkin, MD, FACS
Susan G. Dunlop, MD
Gary Dunnington, MD
Ricardo Estape, MD
Peter Fabri, MD
Vicenzo Ficarra, MD
Marvin Fried, MD
Gerald Fried, MD
Vicenzo Ficarra, MD
Anthony G. Gallagher, PhD
Larry R. Glazerman, MD, MBA
Teodor Grantcharov, MD, PhD, FACS
Piero Giulianiotti, MD
David Hananel
James C. Hebert, MD, FACS
Robert Holloway, MD
Santiago Horgan, MD
Jacques Hubert, MD
Wallace Judd, PhD
Lenworth Jacobs, MD
Arby Kahn, MD
Keith Kim, MD, FACS
Sara Kim, PhD
Michael Koch, MD, FACS
Timothy Kowalewski, PhD
Rajesh Kumar, PhD
Kevin Kunkler, MD
Gyunsung Lee, PhD
Thomas S. Lendvay, MD
Raymond J. Leveillee, MD
Jeffrey S. Levy, MD
C.Y. Liu, MD
Fred Loffer, MD
Guy Maddern, FRACS
Scott Magnuson, MD
Javier Magrina, MD
Michael Marohn, MD
David Maron, MD
Martin A. Martino, MD, FACOG
W. Scott Melvin, MD
Francesco Montorsi, MD
Alex Mottrie, MD
Paul Neary, MD, FRCSI
Kenneth Palmer, MD
Eduardo Parra-Davila, MD, FACS
Ceana Nezhat, MD
Manuela Perez, MD, PhD
Cyril Perrenot, MD
Gary Poehling, MD
Vipul R. Patel, MD
Sonja L. Ramamoorthy, MD, FACS
Koon Ho Rha, MD, FACS, PhD
Judith Riess, PhD
Bernardo M. Rocco, MD
COL Robert Rush, MD
Richard Satava, MD, FACS
Brendan Satava, MD
Daniel J. Scott, MD
Steve Schweitzberg, MD
Neal Seymour, MD
Nazema Siddiqui, MD
Mika Sinanan, MD, PhD, FACS
Roger D. Smith, PhD
Hooman Soltanian, MD
Dimitrios Stefanidis, MD, PhD, FACS
Chandru Sundaram, MBBS
Robert Sweet, MD, FACS
Amir Szold, MD
Raju Thomas, MD
Oscar Traynor, MD
Edward Verrier, MD, FACS
Gregory S. Weinstein, MD
Thomas Whalen, MD
FRS Consensus Conferences

1. Outcomes Measures
2. Curriculum Outline
3. Curriculum Development
4. Validation Criteria
Outcome Measures & Metrics

- Curriculum Development
- Simulation Development
- Curriculum Validation
- High Stakes Examination
- Outcome Registries
<table>
<thead>
<tr>
<th>Outcome Measures &amp; Metrics</th>
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</thead>
<tbody>
<tr>
<td>1. Situation Awareness</td>
</tr>
<tr>
<td>2. Eye-Hand Instrument Coordination</td>
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<tr>
<td>3. Needle Driving</td>
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<tr>
<td>4. Atraumatic Handling</td>
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<td>5. Safety of Operative Field</td>
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<td>6. Camera</td>
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<td>7. Clutching</td>
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<td>8. Dissection-Fine &amp; Blunt</td>
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<td>9. Closed Loop Communication</td>
</tr>
<tr>
<td>10. Docking</td>
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<tr>
<td>11. Knot tying</td>
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<tr>
<td>12. Instrument Exchange</td>
</tr>
<tr>
<td>13. Suture Handling</td>
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<tr>
<td>14. Energy sources</td>
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<tr>
<td>15. Cutting</td>
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<tr>
<td>16. Foreign Body Management</td>
</tr>
<tr>
<td>17. Ergonomic Position</td>
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<tr>
<td>18. Wrist Articulation</td>
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<tr>
<td>19. Robotic trocars</td>
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<tr>
<td>20. System Setting</td>
</tr>
<tr>
<td>21. Multi-Arm Control</td>
</tr>
<tr>
<td>22. Operating Room Set-Up</td>
</tr>
<tr>
<td>23. Respond to Robot System Error</td>
</tr>
<tr>
<td>24. Undocking</td>
</tr>
<tr>
<td>25. Transition to Bedside Assist</td>
</tr>
</tbody>
</table>
Participating Societies

- American Academy of Orthopedic Surgeons
- American Academy of Otolaryngology – Head and Neck Surgery
- American Association of Gynecologic Laparoscopists
- American Association for Thoracic Surgery
- American Board of Surgeons
- American Board of Urology
- American College of Surgery
- American College of Obstetricians and Gynecologists
- American Hernia Society
- American Society of Colon & Rectal Surgeons
- American Society of Plastic Surgeons
- American Urological Association
- American Urogynecologic Society
- Arthroscopy Association of North America
- Asia Pacific Hernia Society
- Association for Surgical Education

- China Hernia Society
- Latin American Association of Laparoscopic Surgery
- Latin American Hernia Foundation
- Minimally Invasive Robotic Association
- National Institute for Health Research, UK
- Resident Review Committee – Surgery
- Resident Review Committee – Urology
- Royal Australasian College of Surgeons
- Royal College of Surgeons, Ireland
- Society of American Gastrointestinal and Endoscopic Surgeons
- Society of Laparoendoscopic Surgeons
- United States Department of Defense
- Veterans Health Administration, National SimLEARN Center
A Consensus-Based Framework for Design, Validation, and Implementation of Simulation-Based Training Curricula in Surgery

Boris Zevin, MD, Jeffrey S Levy, MD, FACS, Richard M Satava, MD, FACS,
Teodor P Grantcharov, MD, PhD, FACS

BACKGROUND:
Simulation-based training can improve technical and nontechnical skills in surgery. To date, there is no consensus on the principles for design, validation, and implementation of a simulation-based surgical training curriculum. The aim of this study was to define such principles and formulate them into an interoperable framework using international expert consensus based on the Delphi method.

METHODS:
Literature was reviewed. A international experts were queried, and consensus conference of national and international members of surgical societies was held to identify the items for the Delphi survey. Forty-five international experts in surgical education were invited to complete the online survey by ranking each item on a Likert scale from 1 to 5. Consensus was predefined as Cronbach’s $\alpha \geq 0.80$. Items that 80% of experts ranked as $\geq 4$ were included in the final framework.

RESULTS:
Twenty-four international experts with training in general surgery ($n = 11$), orthopaedic surgery ($n = 2$), obstetrics and gynaecology ($n = 3$), urology ($n = 1$), plastic surgery ($n = 1$), pediatric surgery ($n = 1$), otolaryngology ($n = 1$), vascular surgery ($n = 1$), military ($n = 1$), and doctorate-level education ($n = 2$) completed the iterative online Delphi survey. Consensus among participants was achieved after one round of the survey (Cronbach’s $\alpha = 0.91$). The final framework included predevelopment analysis: cognitive, psychomotor, and team-based training; curriculum validation; evaluation and improvement; and maintenance of training.

CONCLUSIONS:
The Delphi methodology allowed for determination of international expert consensus on the principles for design, validation, and implementation of a simulation-based surgical training curriculum. These principles were formulated into a framework that can be used internationally across surgical specialties as a step-by-step guide for the development and validation of future simulation-based training curricula. (J Am Coll Surg 2012;215:580–586. © 2012 by the American College of Surgeons)
Modules of the FRS Curriculum

Module 1: Introduction to Robotic Surgery

Module 2: Didactic Instructions

Module 3: Psychomotor Skills Curriculum

Module 4: Team Training and Communication Skills
Simulation Development

- Outcome Measures & Metrics
- Curriculum Development
- **Simulation Development**
- Curriculum Validation
- High Stakes Examination
- Outcome Registries
Physical Dome Prototype Development

Prototype Concept

Prototype 1

Prototype 2

Prototype 3

Prototype 4

Prototype 5

CAD Design

1st 3-D Printed Model

FLS
FUNDAMENTALS
of LAPAROSCOPIC SURGERY
7 FRS Tasks

Final Physical Model  Abdominal Shell  Instrument Insertion

Ring Tower Transfer  Knot Tying  Railroad Track

4th Arm Cutting  Puzzle Piece Dissection  Vessel Dissection/Division
Physical Model vs. VR Simulation

Physical Model

Prototype Concept Only

Simulation Model
Basic and Specialty-Specific Curricula

- Advanced Specialty Procedures
  - Hysterectomy
  - Lobectomy
  - Nephrectomy
  - Hysterectomy
  - Thyroidectomy
  - Oophorectomy
  - Valve Repair
  - Cystectomy
  - Sacrocolpopexy
  - Parathyroidectomy

- Advanced Specialty Curricula
  - FGYNRS Advanced
  - FCTRS Advanced
  - FURORS Advanced
  - FCOLORS Advanced
  - FOTORS Advanced

- Specialty-Specific Curricula
  - FGYNRS
  - FCTRS
  - FURORS
  - FCOLORS
  - FOTORS

- Core Curriculum
  - FRS

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FRGS Consensus Conference

**Ob/Gyn Societies**
- ACOG
- CREOG
- ABOG
- AAGL
- SGO
- AUGS
- ASRM
- SGS
- AMA
- JCAHO

**Robotic Training Network**
1. Beth Israel Deaconess
2. Cleveland Clinic
3. Duke
4. Johns Hopkins
5. UMDNJ
6. Lehigh Valley Health Network
7. U. Central Florida
8. U. of North Carolina-Chapel Hill
9. Wright State University

60 hospital users
<table>
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<tr>
<th>Activity</th>
<th>ACGME Core Competency</th>
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<tbody>
<tr>
<td><strong>Phase I</strong></td>
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<tr>
<td><strong>(Bedside)</strong></td>
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<tr>
<td>Self-learning</td>
<td>Medical Knowledge</td>
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<tr>
<td>Dry Lab/Simulation</td>
<td>Practice-based learning &amp; improvement</td>
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<tr>
<td>Operating Room</td>
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<tr>
<td>• Assessment of skill</td>
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<tr>
<td>• Quality improvement exercise</td>
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<tr>
<td>• Assessment of professionalism</td>
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<tr>
<td><strong>Phase II</strong></td>
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<td><strong>(Console)</strong></td>
<td></td>
</tr>
<tr>
<td>Self-learning</td>
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<td>Dry Lab/Simulation</td>
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<td></td>
</tr>
<tr>
<td>• Assessment of professionalism</td>
<td></td>
</tr>
</tbody>
</table>
RTN Skill Drills

1. Tower transfer
   Transfer of rubber band from inner small towers to outer graduated height towers

2. Roller coaster
   Manipulate rubber band around wire loop

3. Big dipper
   Place needle into sponge in various arcs through pre-specified dot pattern

4. Train tracks
   Place a running suture with needle entering and exiting through dots

5. Figure of eight
   Place a figure of eight stitch with needle entering and exiting through dots followed by a square knot.
RTN Skills Simulation
Merger of 2 Major Robotic Initiatives

- Fundamentals of Robotic Surgery (FRS)
- Robotic Training Network
- Fundamentals of Robotic Gynecologic Surgery (FRGS)
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6/13/2017
FRGS Simulations

4 Specialty Specific Tasks for FRGS

- Bladder Flap
- Colpotomy
- Vaginal Cuff
- Ureter Dissection
Basic and Specialty-Specific Curricula

Advanced Specialty Procedures
- Hysterectomy
- Lobectomy
- Nephrectomy
- Hysterectomy
- Thyroidectomy
- Oophorectomy
- Valve Repair
- Cystectomy
- Sacrocolpopexy
- Parathyroidectomy

Advanced Specialty Curricula
- FGYNRS Advanced
- FCTRS Advanced
- FURORS Advanced
- FCOLORS Advanced
- FOTORS Advanced

Specialty-Specific Curricula
- FGYNRS
- FCTRS
- FURORS
- FCOLORS
- FOTORS

Core Curriculum
- FRS
Curriculum Validation

- Outcome Measures & Metrics
- Curriculum Development
- Simulation Development
- Curriculum Validation
- High Stakes Examination
- Outcome Registries
FRS Validation Study Participants

- The largest proficiency-based surgical skills study with over 200 subjects

1. Athens University - Athens, Greece
2. CAMLS – USF - Tampa FL
3. Carolinas – Charlotte, NC
4. Duke University – Raleigh, NC
5. EndoCAS – Pisa, Italy
6. Hartford Hospital– Hartford, CT
7. Imperial College - London, UK
8. Lahey Clinic - Boston, MA
9. Lehigh Valley – Allentown, PA
10. Madigan Army – Tacoma/Seattle, WA
11. MITIE - Houston, TX
12. U. of Pennsylvania - Philadelphia, PA
FRS Validation Study Design
High Stakes Examination

- Outcome Measures & Metrics
- Curriculum Development
- Simulation Development
- Curriculum Validation
- High Stakes Examination
- Outcome Registries
Successful Examples

- The FLS program
  - Comprehensive, web-based educational module and assessment tool designed to teach the fundamental knowledge, judgment and technical skills required in basic laparoscopic general surgery.
  - The learning and application of these fundamentals will help ensure a minimum standard of care for all patients undergoing laparoscopic surgery.
  - FLS consists of cognitive learning, hands-on skills training and a high stakes proctored exam developed by SAGES and required by ABS.

- FRS for hospital credentialing and privileging.
High Stakes Examination

Outcome Measures & Metrics
Curriculum Development
Simulation Development
Curriculum Validation
High Stakes Examination
Outcome Registries
This landmark meeting brought together 44 key opinion leaders through a public – private partnership

- Robotic surgery experts
- Registry experts
- Government representatives (FDA)
- Society representatives
- Industry representatives

- Sarfraz Ahmad, PhD
- Karen Ariemma
- Leila Bahreinian, MD
- Roberto Bergamaschi, MD
- Jack Bonasera
- Linda Bradley, MD
- John de Csepel, MD
- Myriam Curet, MD
- Danica Marinac-Dabic, MD
- Stephanie Fitts
- David Flum, MD
- Bob Holloway, MD
- Farid Gharagozloo, MD
- Joseph Tepas, MD
- Jim Hu, MD
- Keith Kim, MD
- Myoung Kim, PhD, MA, MBA
- Steve Knych, MD
- Mario Leitao, MD
- Jeffrey Levy, MD
- Martin Martino, MD
- Shilpa Mehendale

- Gaby Moawad, MD
- Deborah Nagle, MD
- Keith Nahigian
- Vip Patel, MD
- Ajita Prabhu, MD
- Jay Redan, MD
- Colleen Riley
- Sachin Sankholkar
- Richard Satava, MD
- Art Sedrakyan, MD
- Phil Shadduck, MD
- Roger Smith, PhD
- Dimitrios Stefinitis, MD
- Li-Ming Su, MD
- Patricia Sylla, MD
- Ken Turner, PhD
- Joe Uddo, MD
- Emily Weber LeBrun, MD
- Paul Wetter, MD
- Erika Wolff, PhD
- Stephanie Zajac
- Jennifer Brennan
Data Elements (“Optimal” Data Set)

- **Background Information**
  - Procedure type
  - Robot information
  - Robotic instruments used during procedure
    - Surgeon robotic experience
  - Procedure Times
  - Audiovisual information

- **Preoperative Adverse Events**
  - Positioning of the equipment and robot setup
  - Positioning of patient
  - Systems check
  - The Ergonomic positioning errors

- **Intraoperative Adverse Events**
  - Adverse event capture
  - Other device, system, instrument errors
  - Docking Errors
  - Trocar insertion
  - Instrument Insertion
  - Other instrument usage issues
  - Preventing Injury
  - Organ/tissue injury
  - Device Use Error
  - Emergency undocking had to be performed

- **Postoperative Adverse Events**
  - Safe Removal of Instruments
  - Undocking
  - OR Team Information
  - Team experience
  - Team-based errors
  - Team STEPPS Protocol errors
# Delphi Process ("Minimal" Data Set)

## Part 1: Background Information

### 1. Procedure Type

<table>
<thead>
<tr>
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<th>Not very important</th>
<th>Moderately important</th>
<th>Very important</th>
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<tbody>
<tr>
<td>Robotic assisted</td>
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<tr>
<td>Hybrid</td>
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<tr>
<td>Comments</td>
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### 2. Robot Information

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<th>Moderately important</th>
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<tbody>
<tr>
<td>System Make</td>
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<tr>
<td>Model</td>
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<tr>
<td>Maintenance History</td>
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<tr>
<td>Instrument Life, Use History, Reuse History, Duty Cycle</td>
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<tr>
<td>Comments</td>
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### 3. Robotic instruments used during procedure (choose all that apply)

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<tr>
<td>Scissors</td>
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<tr>
<td>Monopolar scissors</td>
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<tr>
<td>Bipolar Maryland</td>
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<tr>
<td>Large needle drivers</td>
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<tr>
<td>Double fenestrated graspers</td>
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<tr>
<td>Long tip forceps</td>
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<tr>
<td>Iris Leveler</td>
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<td>Ovals</td>
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<tr>
<td>Reusable, ultrasonic, molecular or other imaging (LKnife, etc.)</td>
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</tbody>
</table>
Robotic Registry Pilot (10 hospitals)

Possible Registry Partners
- ACS
  - NSQIP*
  - NCDB
- STS
- SGO
- AHSQC
- Other societies

Other Data Sources
- EMR
- PCORI Database
- OPTUM
- United
- Premier
- Medicare
- State Claims
- SEER Medicare

*Insert Robotic Data set into NSQIP as a pilot study

Registry of the future
Full-Cycle Model for Robotics

Process drives outcomes!

- Outcome Measures & Metrics
- Curriculum Development
- Simulation Development
- Curriculum Validation
- High Stakes Examination
- Outcome Registries

Institute for Surgical Excellence
Full-Cycle Model for Robotics

Process drives outcomes!

- Outcome Measures & Metrics
- Curriculum Development
- Simulation Development
- Curriculum Validation
- Train-the-Trainer
- High Stakes Examination
- Outcome Registries
Train-the-Trainer Faculty

Steering Committee:
- Jeffrey Levy, MD – Interim Executive Director, ISE, US
- Justin Collins, MD – Urology, Sweden
- Richard Satava, MD – General Surgery, US
- Anders Ericsson, PhD – Psychology, Conradi Eminent Scholar, US
- Anthony Gallagher, PhD – International Expert in Surgical and VR Research, Ireland

Faculty
- Kamran Ahmed, MD, PhD – Urology, UK
- Anne Arnold, MS – Director of Education Programs, ACOG, US
- Marc Auerbach, MD – Pediatric/Emergency Medicine, Co-Chair INSPIRE, US
- Jean-Marc Baste, MD - Cardiothoracic Surgery, France
- Roberto Bergamaschi, MD – Colorectal Surgery, US
- Gianluca Casali, MD – Thoracic Surgery, UK
- Tom Cecil, MD – Colorectal Surgery, UK
- Mark Coleman, MD – Colorectal Surgery, UK
- Joel Dunning, MD – Thoracic Surgery, UK
- David Earle, MD – General Surgery, US
- Richard Feins, MD – Cardiothoracic Surgery, US
- Eric Friedman – Aviation Safety Inspector, Federal Aviation Administration, US
- Ahmed Ghazi, MD – Urologic Oncology, US
- Marcos Gomez, MD – Colorectal Surgery, Spain
- LTC Imad Haque, MD - General Surgery, Madigan Army, US
- Andrew Hung, MD – Urology, US
- Martin Martino, MD – Gynecologic Oncology, US
- Owen Montgomery, MD – Ob/Gyn, US
- Alex Mottrie, MD – Urology, Belgium
- Johan Pratschke, MD – Transplant Surgery, Germany
- Carla Pugh, MD – General Surgery, US
- Dimitrios St芬initis, MD – Bariatric Surgery, US
- Carlos Vaz, MD – Bariatric Surgery, Portugal
- Peter Wiklund, MD – Urology, Sweden
### Train-the-Trainer Agenda

#### THURSDAY, JUNE 22, 2017 (WORKING DINNER)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Facilitator(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 pm</td>
<td>Meeting Registration at Sofitel Hotel</td>
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<tr>
<td>6:30 pm</td>
<td>Welcome and Goals for the Meeting</td>
<td>Dr. Jeffrey Levy</td>
</tr>
<tr>
<td>6:45 pm</td>
<td>Full-Cycle Education, Training, Assessment and Long-Term Surveillance</td>
<td>Dr. Jeffrey Levy</td>
</tr>
<tr>
<td>7:00 pm</td>
<td>Expert Performance</td>
<td>Dr. Anders Ericsson</td>
</tr>
<tr>
<td>7:30 pm</td>
<td>Dinner served</td>
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<tr>
<td>7:45 pm</td>
<td>Important Definitions</td>
<td>Dr. Richard Satava</td>
</tr>
<tr>
<td>8:00 pm</td>
<td>Delphi Process Review</td>
<td>Dr. Justin Collins</td>
</tr>
<tr>
<td>8:15 pm</td>
<td>Individual Table Discussions</td>
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<tr>
<td>9:15 pm</td>
<td>Adjourn</td>
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#### FRIDAY, JUNE 23, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Facilitator(s)</th>
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<tbody>
<tr>
<td>7:30 am</td>
<td>Breakfast</td>
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<tr>
<td>8:00 am</td>
<td>Overview of the Day</td>
<td>Dr. Jeffrey Levy</td>
</tr>
<tr>
<td>8:15 am</td>
<td>Essential Components of Communication and Non-Technical Skills</td>
<td>Dr. Kamin Ahmed</td>
</tr>
<tr>
<td>8:45 am</td>
<td>Preference Based Progression Model</td>
<td>Dr. Anthony Gallagher</td>
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<td>9:05 am</td>
<td>Defining Effective Feedback, Avoiding Errors &amp; Benefits of Standardization</td>
<td>Dr. Anders Ericsson</td>
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<tr>
<td>9:35 am</td>
<td>Latest Developments in Simulation Training (Basic &amp; Advanced)</td>
<td>Dr. Justin Collins</td>
</tr>
<tr>
<td>10:00 am</td>
<td>Break</td>
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<tr>
<td>10:15 am</td>
<td>Setting the Standard for Train-the-Trainer Curriculum</td>
<td>Dr. Jeffrey Levy</td>
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<tr>
<td>10:30 am</td>
<td>Examples of Train-the-Trainer Curricula</td>
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<tr>
<td></td>
<td>• Experience in Aviation</td>
<td>Eric Friedman</td>
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<tr>
<td></td>
<td>• Experience in Military</td>
<td>Dr. Imad Sadeque</td>
</tr>
<tr>
<td></td>
<td>• Experience in Surgery in the United States</td>
<td>Dr. Richard Ferras</td>
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<td></td>
<td>• Experience in Europe</td>
<td>Dr. Dimitrios Sotiarns</td>
</tr>
<tr>
<td></td>
<td>• Experience in Low Income Countries</td>
<td>Dr. Alexander Motre</td>
</tr>
<tr>
<td></td>
<td>• Experience in Low Income Countries</td>
<td>Dr. Mark Coleman</td>
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<tr>
<td></td>
<td>• Experience in Low Income Countries</td>
<td>Dr. Owen Montgomery</td>
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<tr>
<td>12:30 pm</td>
<td>Lunch</td>
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<tr>
<td>1:30 pm</td>
<td>Curriculum Development Introduction</td>
<td>Dr. Jeffrey Levy</td>
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#### 1:45 pm – 3:45 pm

**Train-the-Trainer Curriculum Development for Robotic Surgery and Other Minimally Invasive Procedures - Group Break Outs**

- Group 1: Curriculum Development - Cognitive Component
- Group 2: Curriculum Development - Psychomotor Component
- Group 3: Assessment Tools and Scoring Systems

**Facilitators**
- Kamin Ahmed
- Justin Collins
- Richard Satava
- Dimitrios Sotiarns
- Anthony Gallagher
- Mark Coleman

#### 3:45 pm – 4:00 pm

**Break**

#### 4:00 pm – 5:30 pm

**Train-the-Trainer Curriculum Development for Robotic Surgery and Other Minimally Invasive Procedures - Group Break Outs**

- Group 1: Curriculum Development - Cognitive Component
- Group 2: Curriculum Development - Psychomotor Component
- Group 3: Assessment Tools and Scoring Systems

**Facilitators**
- Kamin Ahmed
- Justin Collins
- Richard Satava
- Dimitrios Sotiarns
- Anthony Gallagher
- Mark Coleman

#### 5:30 pm – 6:00 pm

**Curriculum Development Group Preliminary Summary Reports**

- Group 1: Curriculum Development - Cognitive Component
- Group 2: Curriculum Development - Psychomotor Component
- Group 3: Assessment Tools and Scoring Systems

**Facilitators**
- Kamin Ahmed
- Justin Collins
- Richard Satava
- Dimitrios Sotiarns
- Anthony Gallagher
- Mark Coleman

#### SATURDAY, JUNE 24, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:30 am</td>
<td>Breakfast</td>
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<tr>
<td>8:00 am</td>
<td>Objectives for the Day</td>
<td>Dr. Jeffrey Levy</td>
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<tr>
<td>8:15 am</td>
<td>Train-the-Trainer Curriculum Development for Robotic Surgery and Other Minimally Invasive Procedures - Group Edits and Wrap Up</td>
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<tr>
<td></td>
<td>• Group 1: Curriculum Development - Cognitive Component</td>
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<td>• Group 2: Curriculum Development - Psychomotor Component</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Group 3: Assessment Tools and Scoring Systems</td>
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<tr>
<td>9:15 am</td>
<td>In Person Modified Delphi Process (Phase 1)</td>
<td>Dr. Justin Collins</td>
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<tr>
<td>10:00 am</td>
<td>Validation Method Discussion</td>
<td>Dr. Anthony Gallagher</td>
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<tr>
<td>10:15 am</td>
<td>Integration of Current and Future Technologies</td>
<td>Dr. Jeffrey Levy</td>
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<tr>
<td>11:30 am</td>
<td>Closing Thoughts</td>
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<tr>
<td>12:30 pm</td>
<td>Closing Thoughts</td>
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Questions