PRELIMINARY REVIEW OF THE INTEGRATED RESIDENCY PROGRAM IN CARDIOTHORACIC SURGERY

Conducted by the Joint Council on Cardiothoracic Surgery and the Thoracic Surgery Directors Association

Executive Summary

The six year integrated residency option (I-6) in Cardiothoracic Surgery was initiated in 2007. In June of 2012, two residents completed their 5th year in this new training algorithm, 2 completed their 4th year, 4 completed their third year, 12 completed their second year, and 20 completed their first year. The Joint Council on Thoracic Surgery Education contacted all 40 of these residents and surveyed their experience to date. Four areas of interest were discussed using a qualitative approach: general satisfaction, quality of rotations, operative experience, and curricular resources.

In general the residents are very pleased with this educational option and would choose the same option again if they had it to do over again. Most chose the integrated option because it was shorter in duration compared to the traditional approach of completing a general surgery residency first and the I-6 was a more focused, direct path to their ultimate goal in thoracic surgery. Most were pleased with their rotations and only a few believe that categorical GS residents obtained preferred rotation. Most meet with their TS program director on at least a biyearly basis and that rotations have improved due to timely feedback over the duration of their experience. Most seem excited about new rotations in areas not often seen in traditional resident approaches (interventional cardiology, catheter based vascular surgery). Operative experience has been somewhat varied and one program has had to redirect their residents to a private hospital to obtain open GS cases. Most believe they will achieved the 125 cases/year required by the ABTS and TS-RRC averaged over their first 3 years to meet Board eligibility requirements. Allowing residents to count parts or components of more complex cases (like opening/closing/arterial and venous cannulation/endoscopy, etc.) has been important to meet those numbers. Simulation is increasingly being introduced and valued by the residents. Curricular efforts have not changed dramatically over this time frame although most integrated residents believe an attempt has been made to provide a curriculum for the integrated programs. The traditions approaches to curriculum using power point lectures, journal club, optional use of the assigned TSDA resources, SESAT questioning, and mock oral exams, appear well entrenched in our didactic curricular efforts and have not changed dramatically over this time frame. Many residents have used the General Surgery SCORE curriculum as an educational resource but few have ever even heard of Fundamentals in Surgery as a first year educational adjunct. Most believe the integrated curriculum could be improved.

At year five of the experiment to introduce an alternative to the traditional 5 year general surgery residency followed by a 2 or 3 year dedicated cardiothoracic residency, implementation of this program is going smoothly and on the whole there have been no major deficiencies noted. Going ahead, monitoring case volumes will be important and providing alternative curricular approaches would be well received.
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July 2012

The specialty of Cardiothoracic Surgery (CT) introduced an alternative residency option in 2007. Residents could be recruited out of medical school directly and would bypass a prerequisite general surgery (GS) residency. The new “integrated” residency (I-6) would be 6 years in length in contrast to the “traditional” approach of a 2-3 year residency in CT surgery following completion of a 5 year GS residency. The integrated program would shorten the total time in resident training and allow the I-6 resident to sit for the CT Board exam but not the GS Board exam. The following 13 training programs have adopted the integrated program and we now have 40 residents who have completed at least one year of I-6 training: (1) Stanford, (2) the Medical College of Wisconsin, (3) University of South Carolina, (4) University of Maryland, (5) New York Presbyterian Hospital-Columbia, (6) University of Texas, San Antonio, (7) University of Pennsylvania, (8) Mount Sinai Hospital, (9) University of Rochester, (10) University of Virginia, (11) University of North Carolina, (12) Northwestern University, and the (13) University of Washington. Stanford University was the first program to be credentialed in 2006 and currently have 2 residents who have completed 5 years in this new training algorithm. The following programs will begin their first class in July 2012; University of Southern California, University of California, Davis, Emory University School of Medicine, College of Medicine, Mayo Clinic, and University of Pittsburg. These programs have been excluded from the survey since they have not graduated a first year class to date (see Appendix A).

For the most part survey was independently conducted by two students at the University of Washington not familiar with CT residency issues as part of a summer project. The data assimilated was then interpreted by the Surgical Director of Education for the Joint Council on Thoracic Surgery Education. This is a short, informal, qualitative survey meant to internally assess the current status of our integrated residency experiment at year 5. It does not replace any more formal review that might be undertaken by the American Board of thoracic Surgery or the ACGME Residency review process. The areas of interest in this survey include 4 broad areas: general information, residency rotation experience & satisfaction, preliminary operative experience, and curriculum issues. All 40 current residents in I-6 programs who have finished at least one year of training were contacted and responded (100%).
CRITIQUE: Not every resident answered every question. Since this was first attempt, some questions were not as clear as others. Because the intent of this survey was more qualitative rather than quantitative, some interpretation of answers was occasionally necessary. The answers are more heavily weighted towards more junior resident as there were only 2 residents completing their 5th year, 2 completing their 4th year, 4 completing their 3rd year, 12 completing their 2nd year and 20 completing their 1st year.

RESULTS:

General Introductory Questions

There are currently 13 training programs in the U.S. that have adopted an integrated resident training program with at least one year of experience. Here is the breakdown of the 40 residents included in this survey (transitioning refers to the fact that traditional residents are currently still at the institution but institutional commitment is for all future training to be modeled after the integrated approach:

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Year of I6 Inception</th>
<th>Resident Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stanford University</td>
<td>2008</td>
<td>2 2 2 4</td>
</tr>
<tr>
<td>Medical College of Wisconsin</td>
<td>2009</td>
<td>1 1 1</td>
</tr>
<tr>
<td>Mount Sinai Hospital</td>
<td>2009</td>
<td>1 1 1</td>
</tr>
<tr>
<td>University of Maryland</td>
<td>2009</td>
<td>1 1 1</td>
</tr>
<tr>
<td>University of Texas San Antonio</td>
<td>2009</td>
<td>2 1 1</td>
</tr>
<tr>
<td>Hospitals of the University of Pennsylvania</td>
<td>2010</td>
<td>1 1</td>
</tr>
<tr>
<td>Medical University of South Carolina</td>
<td>2010</td>
<td>1 1</td>
</tr>
<tr>
<td>New York Presbyterian Hospital-Columbia</td>
<td>2010</td>
<td>2 2</td>
</tr>
<tr>
<td>University of North Carolina Memorial Hospital</td>
<td>2010</td>
<td>1 1</td>
</tr>
<tr>
<td>University of Rochester</td>
<td>2010</td>
<td>1 1</td>
</tr>
<tr>
<td>University of Washington</td>
<td>2010</td>
<td>1 1</td>
</tr>
<tr>
<td>Northwestern University</td>
<td>2011</td>
<td>1</td>
</tr>
<tr>
<td>University of Virginia Hospital</td>
<td>2011</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>17 13 6 4</td>
</tr>
</tbody>
</table>
a. One resident / year...transitioning to I-6 curriculum  
2. Two residents / year...both transitioning to I-6 curriculum  
3. Two residents / year... one traditional, one transitioning to I-6  
4. Three residents / year...two traditional, one transitioning to I-6  
5. Four residents /year...three traditional, one transitioning to I-6,

When asked what was the most compelling reason for choosing a thoracic surgery integrated residency option for your surgical training, almost all replied this was the most direct pathway to CT 48%; (19/40), the shorter pathway to completing training (18%;7/40), and better, more focused training (23%; 9/40).

When asked if they were happy with their decision ninety-five per cent (95%; 38/40) were either happy or extremely happy with their decision for an integrated program with only 2 noting unsure (1/40) or some regrets (1/40). Similarly, ninety-five per cent (38/40) would make the same decision with only one person being unsure and one probably not making the same decision.

When asked about the most favorable or unfavorable unexpected experience or consequence of the integrated residency here is a representative sampling of replies:

POSITIVE:

“individual support and staff appreciation…”

“how smoothly the program was run and how the department felt like family…”

“the network of other attending and residents in the non-surgical fields that developed as a result of having rotation in echo, anesthesia, cardiology, and imaging... my relationship with cardiology division very favorable…”

“pleasantly surprised by the # of cases available…”

“has created some tension with the more senior level GS residents”

“feel better prepared than traditional residents I am familiar with…”

“operating at advanced paced, CABG skin to skin as R-2…”

“good surprise: faculty commitment…”

“the intensity. It doesn’t get any better than this…”

“very steep learning curve but worth it…”

“the autonomy I have been given and the amount I have learned on non-surgical services…”

NEGATIVE OR AMBIGUOUS:

“knowledgeable and excellent attendings who did not realize many of the nuances of teaching residents who have not already done general surgery, ...faculty not prepared for what they are undertaking…”
“lack of mentorship, disconnect between traditional and I-6 residents…”

“bad surprise: lack of early OR exposure…”

“guinea pig syndrome, some programs simply not prepared. Growing pains…”

“not resident-centric, old school hierarchy…”

“lack of entry level teaching by CT surgery…”

“lack of general surgery operative opportunity…”

“the structure of the program is different than originally designed... some resistance to I-6 residents…”

I-6 Residency Rotations

It appears that in just over half of programs the junior resident rotations have been selected by thoracic surgery (53%; 21/40) or previously negotiated between general surgery and thoracic surgery (35%; 14/40). The residents perceive that thoracic surgery is in charge of even junior rotations (68%; 27/40) and the residents have had the ability to influence the selection of rotations in the early years (78%; 31/40). Only 12.5% (5/40) of the resident noted no ability to influence rotations.

The question of whether some of the more desirable junior resident rotations had been given to categorical resident in preference to integrated CT residents showed a more variable response. Twenty-three of the 40 residents (58%) responded unequivocally “No” whereas 23% (9/40) responded yes. Two residents noted an initial problem which was corrected. Three residents thought that the integrated residents actually got the best rotations. Twenty of the 40 residents (50%) responding, noted an integrated vascular surgery integrated program in their institution; 73% (29/40) noted an integrated plastic surgery program.

Twenty-one of the 40 residents (53%) responded that they have never met with the general surgery program director, whereas 40% (16/40) responded they met with the GS Program Director either once / year, twice / year, not formally but only when the need arises, or they don’t remember. When asked if certain junior rotations should be eliminated or added 53% (21/40) answered no, 33% (13/40) said yes, 2 suggested minor changes, one thought there was simply too much GS, and one thought there still was too much floor work. The average number of months that integrated residents spent on thoracic rotations in the first year was 4.66 (n=33, high 12 months, low 1 month); in the second year the average # of months on CT rotations reported was 4.7 months (n =26, high 9, low 1) and in the third year the average reported was 5.95 months (n = 21, high 10, low 3).

With regards to evaluations of the rotations, Ninety five per cent (38/40) noted they write out evaluations for every rotation: 35% (14/40) noted that the evaluations were reviewed by either TS or GS depending on the rotation and 58% (23/40) noted the evaluations were only reviewed by TS. Most of
the responding 40 residents (93%; 37/40) noted they frequently met with their TS program director; most met either monthly (18%; 7/40), quarterly (25%; 10/40), or biannually (30%; 12/40). Almost the exact same percentage noted that they discussed the curriculum with the PD at that time. When asked how often the resident discusses rotations with their TS program director the answers included yearly (5%; 2/40), quarterly (45%; 18/40), biannually (25%; 10/40), and after each rotation (25%; 10/40). Twenty-three residents (58%) report that such discussions of rotation quality with the TS program director led to changes in the rotation.

When asked about new rotations 50% (20/40) noted rotations in interventional cardiology, 68% (27/40) noted rotations in catheter based vascular surgery skills, 63% (25/40) noted exposure on cardiac anesthesia, and 15% (6/40) noted such interventional rotations planned for later years. Of note, only 3 residents noted any new rotations in thoracic surgery with the new I-6 resident curriculum compared to the traditional resident curriculum.

Comments on the value of these new rotations:

**POSITIVE**

“these rotations have been helpful as they have been on a 1 to 1 basis with selected attendings, emphasis on education > scut work…”

“these rotations have been very valuable, even simulation time... duty rules do necessitate too many cooks in the kitchen looking for piecemeal slices, definitely competing with other residents…”

“our vascular surgery rotations include significant interventional experience and the vascular surgeon have been welcoming and willing to teach., cardiology has also been enthusiastic”

“I will spend 3 month with the interventional cardiologists at a cath lab referral and TAVI site that does not have fellows, the I-6 program will not work if competing with other interventional fellows…”

“vascular surgery attendings have taken an interest in us…”

“great exposure, performing diagnostic and therapeutic procedures in both IR, IC, and vascular rooms. Treated well by services, though a lot of residents on the vascular service was a little difficult…”

“cardiac anesthesia was useful early…”

**NEGATIVE OR AMBIGUOUS:**

“being on a Cardiology rotation as a surgeon can provide challenges in terms of getting actual hands on experience, mostly just watching to date…”

“the vascular surgery faculty don’t want us till the third year level or above. Similarly we plan cardiology intervention for year 4…”
“most of the time these rotations are low yield... could put all of these rotations into one month and achieve the same results...”

“interventional cardiology was the same diagnostic caths every day for 2 months, did no actual”

“intervention rotations are of value but cannot compare to time spent / education value of surgical rotations”

“interventions... int rad was Ok but seems less helpful in retrospect...”

**OPERATIVE EXPERIENCE:**

Overall, the residents were pleased with their operative experience to date. Most felt they were on track to meet the ABTS and RRC requirements (125 cases / year averaged over 1st three years). One program has had to move the residents out of their primary teaching hospital for GS in order to achieve adequate operative numbers (too much competition for cases/ too few cases available for junior residents). Almost every resident is aware of the operative requirements (83%; 33/40) and only 3 (8%) noted they will have difficulty achieving those requirements. When asked if the resident believed such operative case requirements are important in an I-6 training program 60% (24/40) said yes. When asked if such operative requirements should change there were a variety of responses: increase 12.5%; (5/40), decrease 5% (2/40), stay the same: 28% (11/40), can’t tell 17.5% (7/40), decrease GS: 10% (4/40), increase GS early: 3% (1/40).

When asked about simulation experience, 60% (24/40) answered yes, 10% (4/40) noted wet labs only, and 10% (4/40) noted in preparation. Only 4 answered none. It was unclear in the survey how much simulation experience was organized by general surgery Vs. thoracic surgery. When asked if simulation was valuable in their training 65% (26/40) believes it is valuable and another 23% (9/40) says it’s too early to determine its value. Only 5% (2/40) said simulation is of no value.

Comments on Operative experience:

**POSITIVE:**

“many procurements, >60 CT cases in first year”

“fantastic, amazing... 350 procurements in first year with > 225 as primary surgeon, did CABG and TVR in year one...”

“have done some components of cardiac operations in first year...”

“~150 cases first year, ~ 50 CT cases...”

“met all of my TS requirements ½ way through 5th year...”

“excellent breath and complexity...”
“getting bulk of cardiac now as chief, but comfortable being primary surgeon for most straightforward cases in both cardiac and thoracic surgery (end of 4th year), hope to use last 2 years for complex and redo surgeries...”

“505 cases by end of 4th year...need more valve and aortic surgery...”

“I have done CABG, AVR, lobectomies as primary surgeon (2nd yr) and first assisted on complex cardiac and congenital cases...”

“At end of second year have done 350 cases with huge variability...”

“PG1-2 have been very operative heavy with one year spent on a general / vascular surgery service at a community hospital...”

“lots of small procedures, maybe a dozen larger procedures, assisting and watching on most larger cases with active teaching by the faculty in anticipating of being able to build up to larger cases... the main shortages will be in non-component CT cases (though might be in track of this but it will be close) and the lap and open abdominal cases... operative requirements should be decreases, our PD believes the requirement for CT are more stringent than GS and there has been some discussion of whether we would need private practice rotations to meet these requirements...”

“the operative experience as an intern was minimal but picking up dramatically as a second year resident...”

“case requirements aren’t that important...the focus should be on institutions ensuring their residents obtain the technical skills and operative maturity / decision making... I think component cases are a fantastic idea...”

NEGATIVE OR AMBIGUOUS:

“interns don’t operate much, trying to improve early exposure, challenging to get GS cases...”

“Not as much as I would like to... too many fellows, little change in culture to allow more junior residents to do more, why would we make a new program to keep everything the way it was...”

“have spent a lot of time standing and watching in first year...”

Curriculum

Most integrated residents identify an identifiable curriculum for their I-6 residency (63%; 25/40) with others responding not yet (15%; 6/40), partially (5%; 2/40) or no (5%; 2/40). Most felt the curriculum in the first three years was mostly left to TS resources (45%; 18/40), some combination of TS and GS resources that were well defined (20%; 8/40), loosely defined (8%; 3/40) or mostly left to GS (10%;
Eighteen (45%) residents said the curriculum was the same for the traditional residents and the integrated residents whereas Twenty-five percent (10/40) stated the curriculum were different. Forty-three per cent (17/40) responded that they participated in every TS curriculum effort and thirty-five per cent (14/40) participated in TS curriculum efforts only when on a cardiothoracic surgery rotation. Ninety per cent (36/40) residents noted that they took the thoracic surgery in service exam every year. In contrast only sixty per cent (24/40) noted they took the GS (ABSITE) exam either every year for the first three years (25%; 10/40) or only in their first year (35%; 14/40). When asked about the General Surgery curriculum resource SCORE (Surgical Council on Resident Education), 38% (15/40) stated that they were not familiar with SCORE as an educational resource. Twenty-five residents did comment about the SCORE general surgery curriculum: Twenty-eight percent (11/40) stated that SCORE was used for the integrated residency, 10% (4/40) were familiar with SCORE but only used as supplement, or 25% (10/40) commented that SCORE should be used more or should include more TS. The $100/year fee to use SCORE is mostly supported by general surgery (30%; 12/40) and to a less degree by CT surgery (12.5%; 5/40). Fundamentals of Surgery is not used as an educational resource by the integrated residents with only 12.5% (5/40) even knowing about it and 87.5% (35/40) not familiar with Fundamentals at all. When asked how the integrated residents use the TSDA weekly curriculum format most stated it was an available supplemental resource (45%; 18/40), some (15.5%; 7/40) noted it to be an encouraged adjunct to SCORE, and 12.5% (5/40) said it was required weekly participation. A number of thoracic surgery curricular resources were listed and the residents were ask to note which ones were used in their program (max 4 answers / resident).

- Monthly journal club: 25
- Monthly combined M & M for TS/adult cardiac: 21
- One total conference / week for TS, adult cardiac, congenital: 19
- Mock oral sessions at least biannually: 17
- Simulation sessions: 16
- TSDA weekly curriculum outline: 14
- Separate M&M for TS and adult cardiac: 11
- Two total conferences / week for TS and adult cardiac: 8
- Monthly research conference: 6
- Three conferences /week for TS, adult cardiac and congenital: 5
- Textbooks: 2
- Visiting professorships: 1
A similar question was asked about local resource priorities with the following responses. By far and away the most common approach was power point lectures either given by the faculty, invited lecturers or by the residents.

- Faculty power point lectures locally: 21
- SESAT question reviews: 12
- Resident power point lectures based on local curriculum: 9
- Close following of the national TSDA curriculum: 9
- Local augmentation of national TSDA curriculum: 7
- Use of CTS.Net educational resources: 6
- Journal club model: 6
- Simulation technical skills training: 5
- Mock oral format: 2
- Primary use of textbook reading assignments: 1
- Question bank: 1
- Mostly self-study: 1

Finally, when asked what the greatest curricular needs were in cardiothoracic surgery education, no dominant message or theme emerged:

- A better defined globally accepted national curriculum: 12
- Improved quality of current TSDA curriculum lectures: 9
- More emphasis on cognitive skill development: 7
- Help in introduction of technical skills: 7
- More definition or direction with curricular efforts: 7
- Better assessment tools for learning: 7
- New formats for resident education besides power point: 6
- More basic curriculum in 1st two years: 6
- Better navigation tools for current TS educational content: 5
- More quantity of up-to-date power point TSDA lectures: 3
- More simulation: 3
- SCORE type curriculum in TS: 2

Summary:

Clearly, the sample size is small in the later years (3-5) and only represents one training program (Stanford University). The majority on integrated program have completed only one or two years of training. For the most part the residents are very happy with this new training paradigm and have no regrets. Residents seem happy with their rotations but a few could be eliminated or improved as might be expected. The programs directors appear to be responsive to resident evaluation of rotations and changes have been documented. Residents are getting exposed to new skills in interventional based techniques but there is an exploratory phase on these typically non-surgical rotations in other to optimize experience and new skills development. In speaking with or independently polling these residents, one gets the impression that there is still considerable watching time rather than actual technical skills training time. Very few residents are actually performing diagnostic catheterizations or vascular interventions to date. It is clear that little new is happening in thoracic surgery either in terms of skill development, rotations, or curriculum. Operative experience has been a challenge but is
Little operative experience occurs in the early years of GS. Residents seem to be getting the majority of their operative experience by performing components of thoracic surgical cases on the TS rotations. In some instances programs have turned to the community setting or are exploring that type of alternative approach to get their residents more operative experience (especially GS) to meet the ABTS / RRC case volume requirements. Once again, the residents believe they will meet or be very close to meeting those requirements when averaged over the first three years (375 cases). Current curricular approaches do not appear to have changed significantly compared to the traditional techniques over the last few years since the introduction of the integrated paradigm. Power point lectures, journal clubs and morbidity and mortality conferences appear to dominate as the primary educational tools. About 30% of the respondents use the TSDA weekly curricular approach as an important primary or adjunct curriculum and over half of the residents use SCORE in some fashion in their early years of training. Very few use Fundamentals of Surgery. There does appear to be a need for a better or more clearly defined curriculum specifically for the integrated residencies.

Areas to watch might include:

- Operative experience in general surgery
- Value of component cardiothoracic cases for early operative training
- Value, skills training and responsibility on non-surgical rotations
- Volume of operative cases in first 3 years
- Need for more cohesive national curriculum for integrated residencies

This survey is basically the first of many steps that must occur to determine the value of a new training algorithm. As defined in Kirkpatrick’s Taxonomy of Training Criteria, this would fall at the bottom of the pyramid. Since the Integrated residency training structure will expand to 18 programs in 2012, we will have over 100 residents to poll in spring 2014 with at least 4 having completed their training at Stanford by that time.
Appendix A:

REPORTS - PROGRAMS BY SPECIALTY

List of programs within a particular specialty for current academic year and those newly accredited programs with future effective dates

(Year ending June 30th, 2013)

Thoracic surgery - integrated

Program Number / Name / Address Specialty Director Phone / Fax / Email

[4610512074] University of Southern California/LAC+USC Medical Center Program
University of Southern California Hospital
1520 San Pablo Street
Suite 4300
Los Angeles, CA 90033
Thoracic surgery - integrated
Craig J. Baker, MD (323)442-6878
(323)442-6199

[4610521016] Stanford University Program
Stanford University School of Medicine
Department of Cardiothoracic Surgery
Falk Cardiovascular Research Building
Stanford, CA 94305-5407
Thoracic surgery - integrated
Michael P. Fischbein, MD, PhD
(650)723-5771

[4610546105] University of California (Davis) Health System Program
University of California (Davis) Health System
2221 Stockton Blvd.
Rm 2112
Sacramento, CA 95817
Thoracic surgery - integrated
J. Nilas Young, MD (916)734-3861
(916)734-3066

[4611246103] Emory University School of Medicine Program
The Emory Clinic
1365 Clifton Rd NE
Suite A2223
Atlanta, GA 30322
Thoracic surgery - integrated
Robert A. Guyton, MD (404)778-3836
(404)778-5039

[4611621045] McGaw Medical Center of Northwestern University
Program
Northwestern University, Feinberg School of Medicine
201 East Huron Street
Galter 11-140
Chicago, IL 60611
Thoracic surgery - integrated
Richard Lee, MD, MBA (312)695-4867
ricklee@nmh.org

[4612311038] University of Maryland Program
University of Maryland Medical Center
22 South Greene Street
N4W94
Baltimore, MD 21201
Thoracic surgery - integrated
Bartley P. Griffith, MD (410)328-3822
(410)328-2750
bgriffith@smail.umaryland.edu

[4612631073] College of Medicine, Mayo Clinic (Rochester) Program
College of Medicine, Mayo Clinic
200 First Street SW
Thoracic surgery - integrated
Harold Burkhart, MD (507)255-7069
(507)255-7378
ACGME Accredited Program and Institutional Listing - Public Access
Rochester, MN 55905

[4613511064] Mount Sinai School of Medicine Program
Mount Sinai Medical Center
1190 Fifth Avenue
Box 1028
New York, NY 10029
Thoracic surgery - integrated
David H. Adams, MD (212)659-6864
(212)659-6818
david.adams@mountsinai.org

[4613521071] New York Presbyterian Hospital (Columbia Campus) Program
New York Presbyterian Hospital-Columbia Campus
177 Fort Washington Avenue
Milstein Hospital Building 7GN-435
New York, NY 10032
Thoracic surgery - integrated
Michael Argenziano, MD (212)305-0423
(917)591-8894
ma66@columbia.edu

[4613521075] University of Rochester Program
University of Rochester Medical Center  
601 Elmwood Avenue  
Rochester, NY 14642  
Thoracic surgery - integrated  
George L. Hicks, MD (585)275-5384  
(585)244-7171

[4613611069] University of North Carolina at Chapel Hill Program  
Univ. of North Carolina School of Medicine  
101 Manning Drive  
Chapel Hill, NC 27599-7065  
Thoracic surgery - integrated  
Michael R. Mill, MD (919)966-3381  
(919)966-3475

[4614121082] University of Pennsylvania Program  
Hospital of the University of Pennsylvania  
Division of Cardiothoracic Surgery  
3400 Spruce Street, 6 Silverstein  
Philadelphia, PA 19104  
Thoracic surgery - integrated  
Michael A. Acker, MD (215)349-8305  
(215)349-5798

[4614146104] UPMC Medical Education Program  
UPMC Presbyterian Dept of Cardiothoracic Surgery  
200 Lothrop Street  
Suite C800  
Pittsburgh, PA 15213  
Thoracic surgery - integrated  
James D. Luketich, MD (412)647-2911  
(412)647-0754  
careycr@upmc.edu

[4614521087] Medical University of South Carolina Program  
Medical University of South Carolina  
25 Courtenay Drive, Suite 7018  
MSC 295  
Charleston, SC 29425  
Thoracic surgery - integrated  
John S. Ikonomidis, MD, PhD  
(843)876-4840  
(843)876-4866

[4614821094] University of Texas Health Science Center at San Antonio Program  
University of Texas Health Science Center  
Department of Cardiothoracic Surgery, MC7841  
7703 Floyd Curl Drive  
San Antonio, TX 78229-3900  
Thoracic
surgery - integrated
John H. Calhoon, MD (210)567-2878
(210)567-2877

[4615113076] University of Virginia Program
University of Virginia
Thoracic Cardiovascular Surgery
PO Box 800679
Charlottesville, VA 22098
Thoracic surgery - integrated
Irving K. Kron, MD (434)924-2158
(434)982-3885
 ilk@virginia.edu

[4615413072] University of Washington Program
Thoracic surgery - integrated
Douglas E. Wood, MD (206)685-3228
(206)616-9063
ACGME Accredited Program and Institutional Listing - Public Access
University of Washington
1959 NE Pacific Street
Seattle, WA 98195
integrated

[4615621101] Medical College of Wisconsin Affiliated Hospitals Program
Medical College of Wisconsin
Froedtert Memorial Lutheran Hospital
9200 W Wisconsin Avenue - FEC 5555
Milwaukee, WI 53226
Thoracic surgery - integrated
Mario Gasparri, MD (414)955-6904
(414)955-6204
magasp@yahoo.com