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# Surgery for early stage lung cancer

**Gaetano Rocco, MD, FRCSEd, FETCS**

**Istituto Nazionale Tumori, IRCCS**

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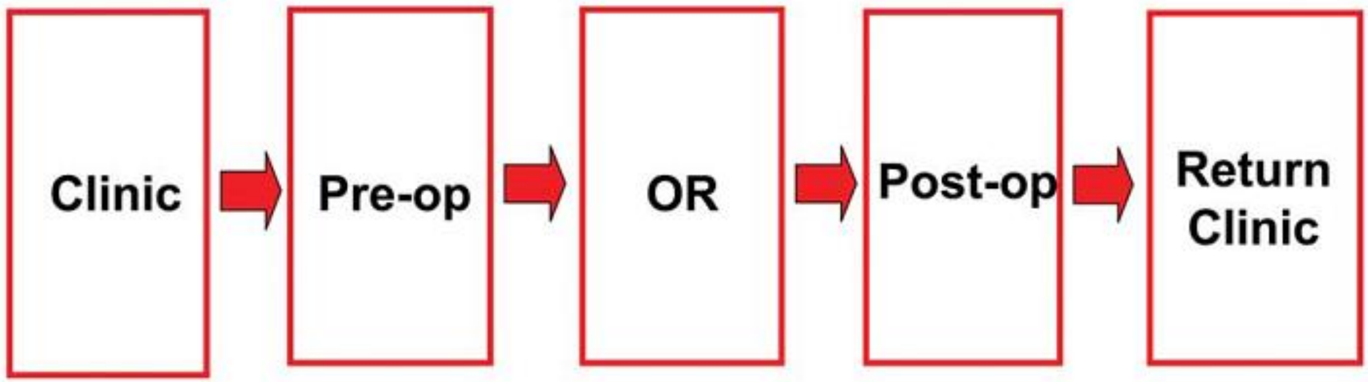
# ProvenCare® Elective Pulmonary Resection: Process Flow with Examples of Best Practices




**Clinic**
- PET/CT
- Clinical Stage
- PFTs
- EKG (age≥50)
- Smoking status

**Pre-op**
- Antibiotics
- DVT prevention
- "Time Out"

**OR**
- Bronchoscopy
- Mediastinoscopy
- R0 resection
- ≥3 lymph nodes

**Post-op**
- CXR ≤4 hrs
- Pain protocol
- Pulmonary plan
- DVT prevention
- Follow-up plan

**Return Clinic**
- Final Stage
- Oncology plan
- Smoking status

FIGURE 3. ProvenCare Lung Cancer Process Flow. Pre-op indicates preoperative; OR, operating room; Post-op, postoperatively; PET, positron emission tomography; CT, computed tomography; PFTs, pulmonary function tests; EKG, electrocardiogram; DVT, deep vein thrombosis; CXR, chest x-ray.

CA Cancer J Clin 2011;00:000–000. ©2011 American Cancer Society, Inc.

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# Why surgery

- Local control
- Biomolecular tissue
- Correct staging
- Minimally invasive
- Conservative parenchymal resection
- After SABR

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# Why surgery

- Local control
- Biomolecular tissue
- Correct staging
- Minimally invasive
- Conservative parenchymal sacrifice
- Screening

(J Thorac Cardiovasc Surg 2014;147:747-53)



# Patterns of survival and recurrence after surgical treatment of early stage non–small cell lung carcinoma in the ACOSOG Z0030 (ALLIANCE) trial

Stacey Su, MD,[a] Walter J. Scott, MD,[a] Mark S. Allen, MD,[b] Gail E. Darling, MD,[c] Paul A. Decker, MS,[b] Robert J. McKenna, MD,[d] and Bryan F. Meyers, MD[e]

**TABLE 1. Characteristics of patients in the American College of Surgeons Oncology Group Z0030/Alliance trial by clinical classification (n = 1023)**

| Clinical classification | n | % |
|---|---|---|
| T stage | | |
| cT1 | 578 | 57 |
| cT2 | 440 | 43 |
| Pathologic stage | | |
| IA | 423 | 41 |
| IB | 418 | 41 |
| IIA | 37 | 4 |
| IIB | 97 | 9 |
| IIIA | 26 | 3 |
| IIIB | 19 | 2 |

**TABLE 3. Patterns of recurrences in the American College of Surgeons Oncology Group Alliance trial Z0030 data set, by clinical stage**

| | T1 (n = 542) | T2 (n = 409) |
|---|---|---|
| Local | 7 (1) | 13 (3) |
| Regional | 22 (4) | 13 (3) |
| Distant | 68 (13) | 99 (24) |
| Local/regional | 2 (0.4) | 3 (0.7) |
| Local/distant | 10 (2) | 9 (2) |
| Regional/distant | 12 (2) | 13 (3) |
| Local/regional/distant | 4 (0.7) | 5 (1) |
| Total No. of patients with recurrences | 125 | 156* |

Data are presented as n (%), unless otherwise indicated. *Location of recurrence was not indicated for 1 subject.

Organisers
IASLC International Association for the Study of Lung Cancer
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**Su S et al. The Journal of Thoracic and Cardiovascular Surgery**
Volume 147, Issue 2 , Pages 747-753, February 2014

# Definitions of recurrence in Z0030 trial

- Local failure:
  - adjacent lung parenchyma, bronchial stump, or in the hilum adjacent to the bronchial stump.
- Regional failure:
  - hilum separate from bronchial stump, in the mediastinum, chest wall, or ipsilateral pleura.
- Distant failure:
  - separate lobe of ipsilateral lung, contralateral thorax, supraclavicular lymph nodes, or distant organ.

(J Thorac Cardiovasc Surg 2014;147:747-53)

**TABLE 2. Long-term outcomes in patients with clinical stage T1 and T2 tumors**

| | T1 (n = 578) | | T2 (n = 440) | | | | |
|---|---|---|---|---|---|---|---|
| | Median | 5-year survival (95% CI) | Median | 5-year survival (95% CI) | HR | 95% CI | *P* |
| Overall survival | 9.1 | 72 (68-76) | 6.5 | 55 (51-60) | 1.64 | 1.36-1.99 | <.001 |
| Disease-free survival* | NA | 77 (73-81) | NA | 58 (53-64) | 1.88 | 1.49-2.38 | <.001 |
| Local disease-free survival† | NA | 95 (93-97) | NA | 91 (88-94) | 1.96 | 1.14-3.37 | .015 |
| Local/regional disease-free survival‡ | NA | 88 (85-91) | NA | 84 (80-88) | 1.46 | 1.01-2.11 | .044 |
| Distant disease-free survival§ | NA | 83 (79-86) | NA | 66 (61-71) | 1.99 | 1.53-2.61 | <.001 |
| New primary‖ | 9 | 83 (79-86) | NA | 84 (80-87) | 0.84 | 0.61-1.16 | .29 |

*HR*, Hazard ratio; *CI*, confidence interval; *NA*, median survival not achieved. *Disease-free survival (n = 542 (125 events) in the T1 group and n = 409 (156 events) in the T2 group): deaths are censored. †Local disease-free survival (n = 542 [23 events] in the T1 group and n = 409 [30 events] in the T2 group): deaths and regional/distant recurrence are censored. ‡Local/regional disease-free survival (n = 542 [57 events] in the T1 group and n = 409 [56 events] in the T2 group): deaths and distant recurrence are censored. §Distant disease-free survival (n = 542 [94 events] in the T1 group and n = 409 [126 events] in the T2 group): deaths and local/regional recurrence are censored. ‖New primary (n = 564 [101 events] in the T1 group and n = 432 [57 events] in the T2 group): deaths are censored.

# Z0030 cohort analysis

- Median OS was 9.1y (pT1); 6.5y (pT2).
- 5y disease-free survival was 77% (pT1); 58% (pT2).
- 5y local disease-free survival was 95% (pT1); 91% (pT2).
- There was no significant difference in long-term outcomes between VATS and open lobectomy in propensity matched analysis.

**Su S et al. The Journal of Thoracic and Cardiovascular Surgery**
Volume 147, Issue 2 , Pages 747-753, February 2014

Long term outcomes in patients with T1 and T2 tumors (Z0030) versus RTOG 0236

| | T1 (n=578) | | T2 (n=440) | | RTOG0236 (n=55) | |
|---|---|---|---|---|---|---|
| | | 5 year survival | | 5 year survival | | 3 year survival |
| | Median | (95% CI) | Median | (95% CI) | Median | (95% CI) |
| Overall survival | 9.1 | 72 (68-76) | 6.5 | 55 (51-60) | 4.0 | 56 (42-68) |
| Disease free survival | NA | 77 (73-81) | NA | 58 (53-64) | 2.9 | 48 (34-61) |
| Local disease free survival | NA | 95 (93-97) | NA | 91 (88-94) | | 91 (76-97) |
| Local/regional disease free survival | NA | 88 (85-91) | NA | 84 (80-88) | | 87 (71-95) |
| Distant disease free survival | NA | 83 (79-86) | NA | 66 (61-71) | | 78 (62-88) |

*JAMA. 2010;303(11):1070-1076*

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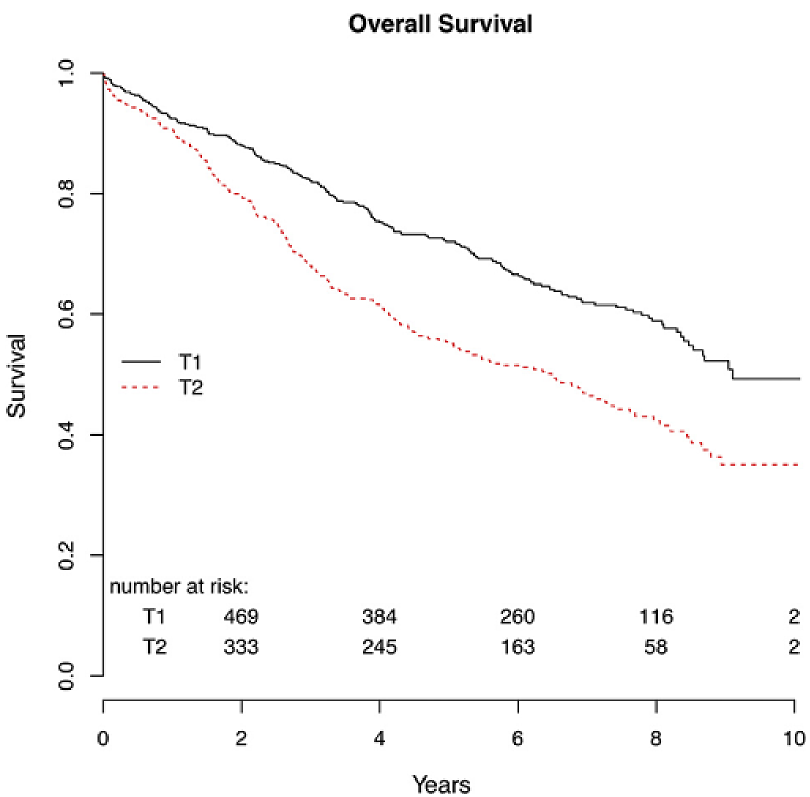


**FIGURE 1.** Overall survival, by cancer stage (T1 vs T2).

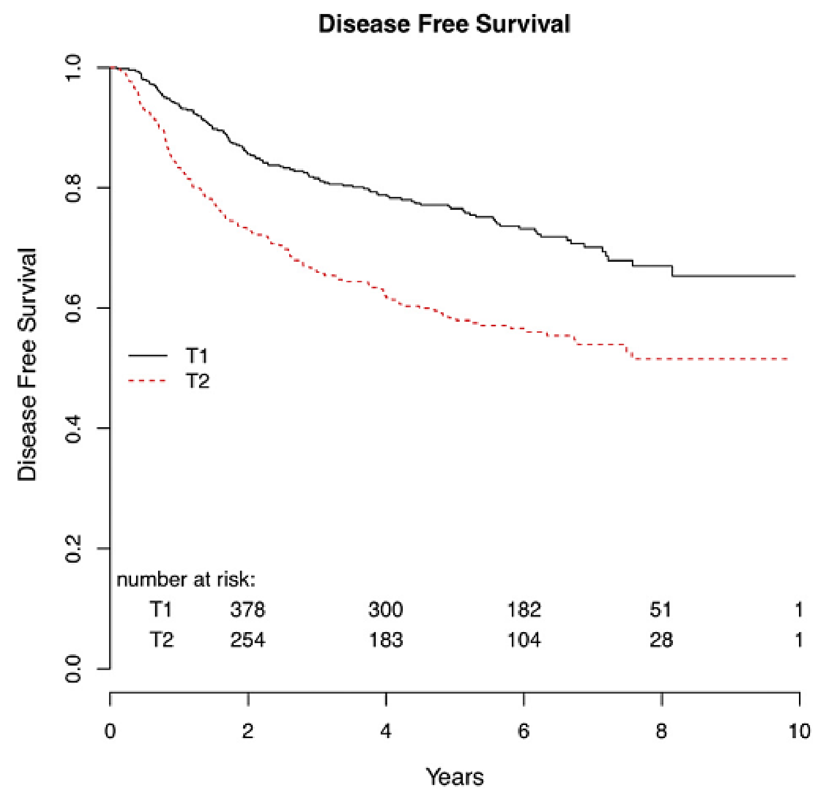


**FIGURE 2.** Disease-free survival, by cancer stage (T1 vs T2).

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Clinical Investigation

# Comparative Effectiveness of 5 Treatment Strategies for Early-Stage Non-Small Cell Lung Cancer in the Elderly

Shervin M. Shirvani, MD,[*] Jing Jiang, MS,[†] Joe Y. Chang, MD, PhD,[*] James W. Welsh, MD,[*] Daniel R. Gomez, MD,[*] Stephen Swisher, MD,[‡] Thomas A. Buchholz, MD,[*] and Benjamin D. Smith, MD[*]

*Departments of [*]Radiation Oncology, [†]Biostatistics and Applied Mathematics, and [‡]Thoracic and Cardiovascular Surgery, University of Texas MD Anderson Cancer Center, Houston, Texas*



Red Journal, 2012

**Purpose:** The incidence of early-stage non-small cell lung cancer (NSCLC) among older adults is expected to increase because of demographic trends and computed tomography-based screening; yet, optimal treatment in the elderly remains controversial. Using the Surveillance, Epidemiology, and End Results (SEER)-Medicare cohort spanning 2001-2007, we compared survival outcomes associated with 5 strategies used in contemporary practice: lobectomy, sublobar resection, conventional radiation therapy, stereotactic ablative radiation therapy (SABR), and observation.

**Methods and Materials:** Treatment strategy and covariates were determined in 10,923 patients aged ≥66 years with stage IA-IB NSCLC. Cox regression, adjusted for patient and tumor factors, compared overall and disease-specific survival for the 5 strategies. In a second exploratory analysis, propensity-score matching was used for comparison of SABR with other options.

**Results:** The median age was 75 years, and 29% had moderate to severe comorbidities. Treatment distribution was lobectomy (59%), sublobar resection (11.7%), conventional radiation (14.8%), observation (12.6%), and SABR (1.1%). In Cox regression analysis with a median follow-up time of 3.2 years, SABR was associated with the lowest risk of death within 6 months of diagnosis (hazard ratio [HR] 0.48; 95% confidence interval [CI] 0.38-0.63; referent is lobectomy). After 6 months, lobectomy was associated with the best overall and disease-specific survival. In the propensity-score matched analysis, survival after SABR was similar to that after lobectomy (HR 0.71; 95% CI 0.45-1.12; referent is SABR). Conventional radiation and observation were associated with poor outcomes in all analyses.

**Conclusions:** In this population-based experience, lobectomy was associated with the best long-term outcomes in fit elderly patients with early-stage NSCLC. Exploratory analysis of SABR

Clinical Investigation

## Comparative Effectiveness of 5 Treatment Strategies for Early-Stage Non-Small Cell Lung Cancer in the Elderly

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*Departments of *Radiation Oncology, †Biostatistics and Applied Mathematics, and ‡Thoracic and Cardiovascular Surgery, University of Texas MD Anderson Cancer Center, Houston, Texas*

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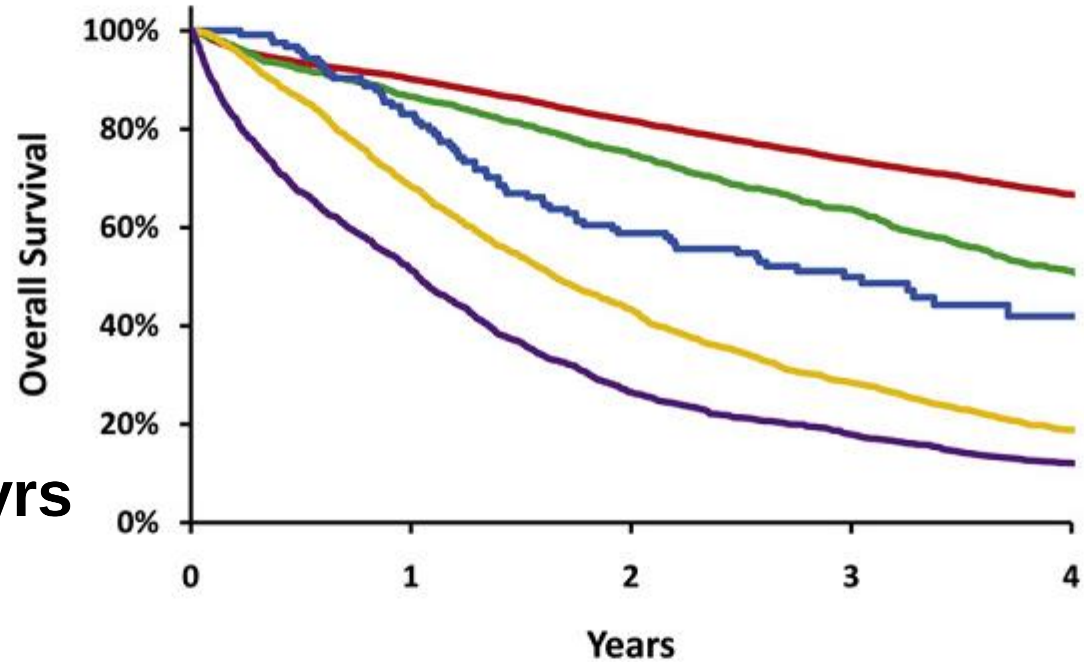


**Median age 75 yrs**
**Overall**

**Number at Risk**

| | | | |
|---|---|---|---|
| Lobectomy | 6531 | 5338 | 3321 |
| Sublobar Resection | 1278 | 958 | 488 |
| SBRT | 124 | 73 | 14 |
| Conventional Rad. | 1614 | 702 | 229 |
| No Treatment | 1378 | 366 | 128 |

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Clinical Investigation

## Comparative Effectiveness of 5 Treatment Strategies for Early-Stage Non-Small Cell Lung Cancer in the Elderly

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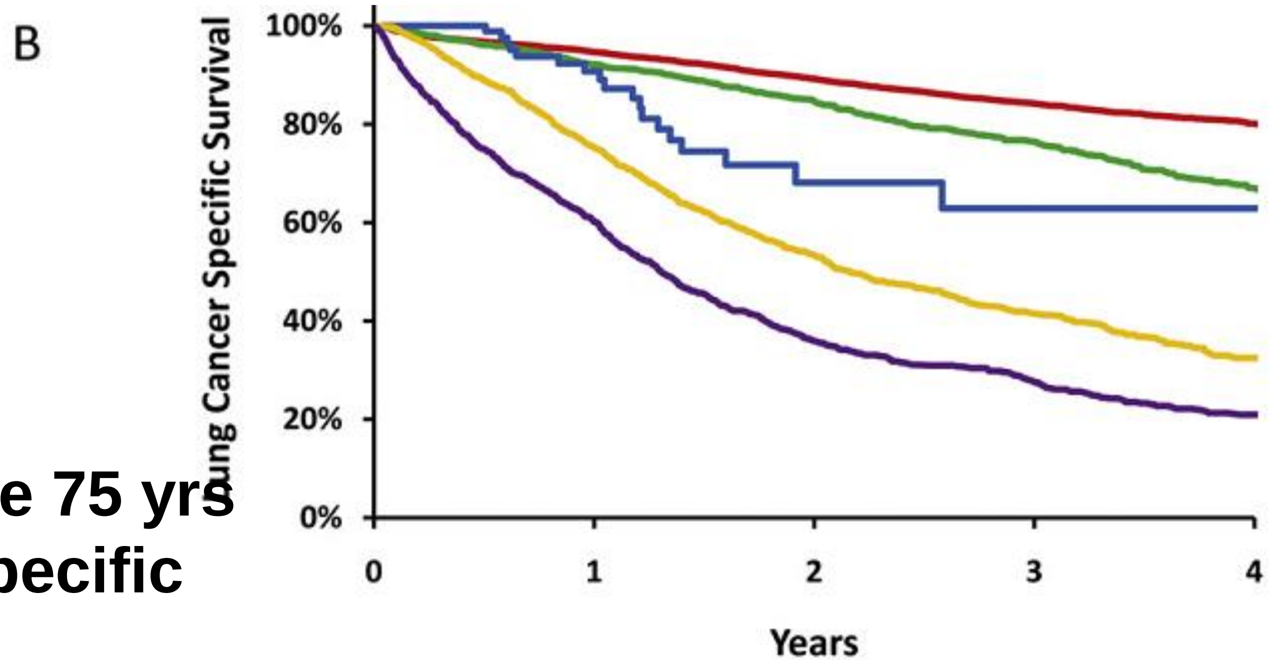


**Median age 75 yrs**
**Disease specific**

| Number at Risk | | | |
|---|---|---|---|
| Lobectomy | 6531 | 3783 | 1824 |
| Sublobar Resection | 1278 | 647 | 262 |
| SBRT | 124 | 17 | <11 |
| Conventional Rad. | 1614 | 492 | 118 |
| No Treatment | 1378 | 251 | 64 |

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# Why surgery

- Local control
- Biomolecular tissue
- Correct staging
- Minimally invasive
- Conservative parenchymal resection
- After SABR

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 8, 2012

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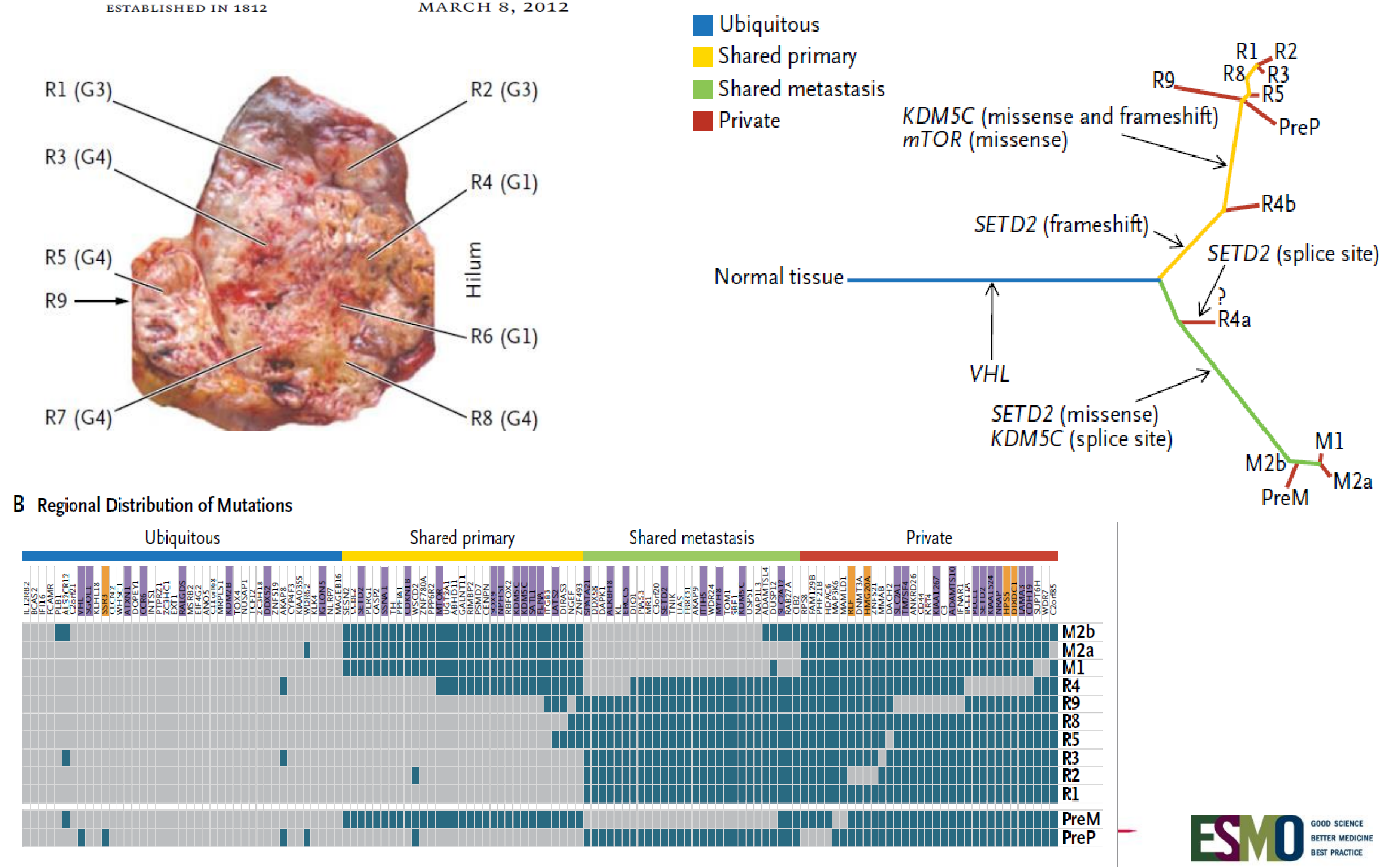


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Gerlinger M et al. N Engl J Med 2012;366:883-892

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Chara… …njury
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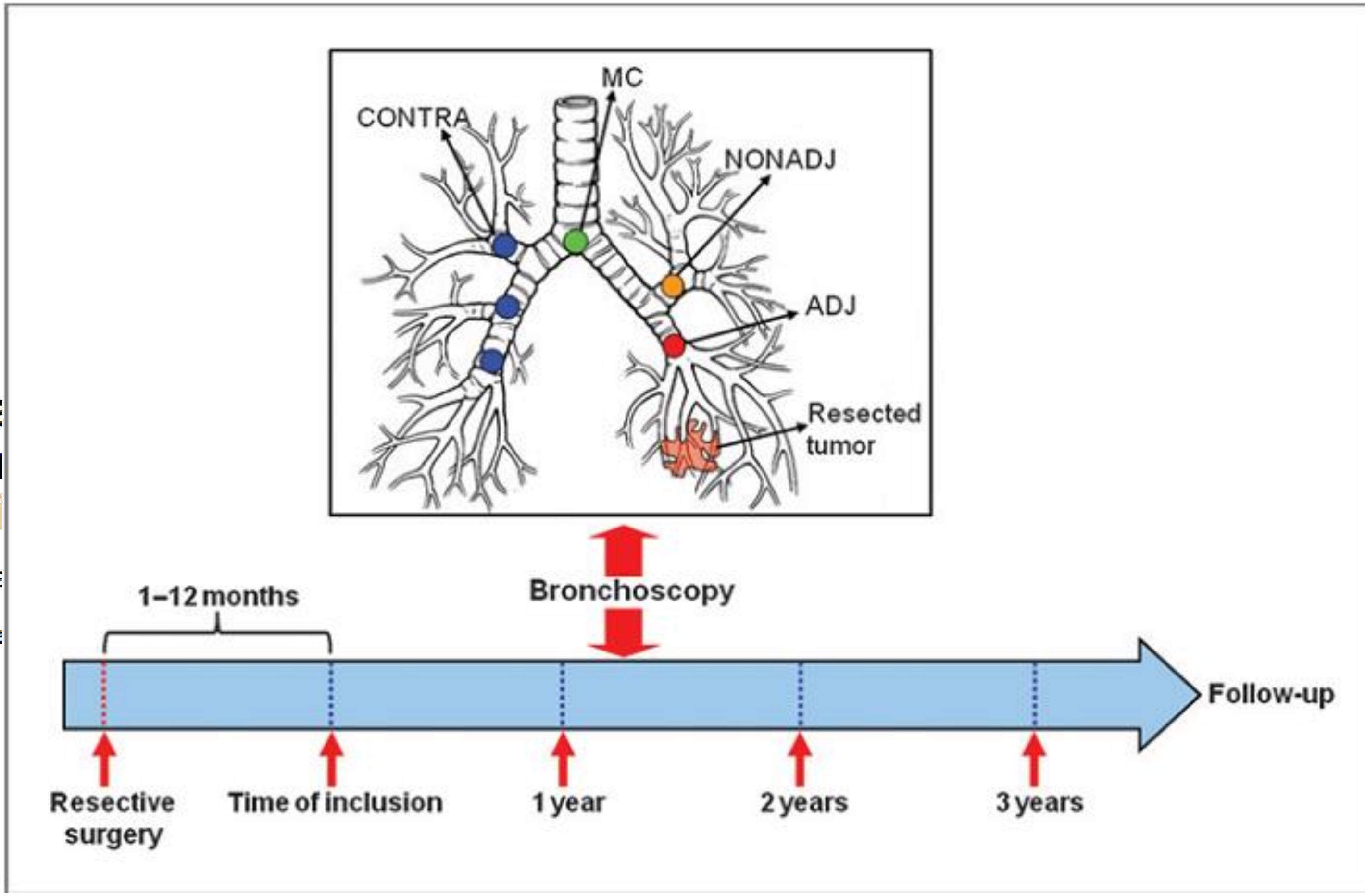
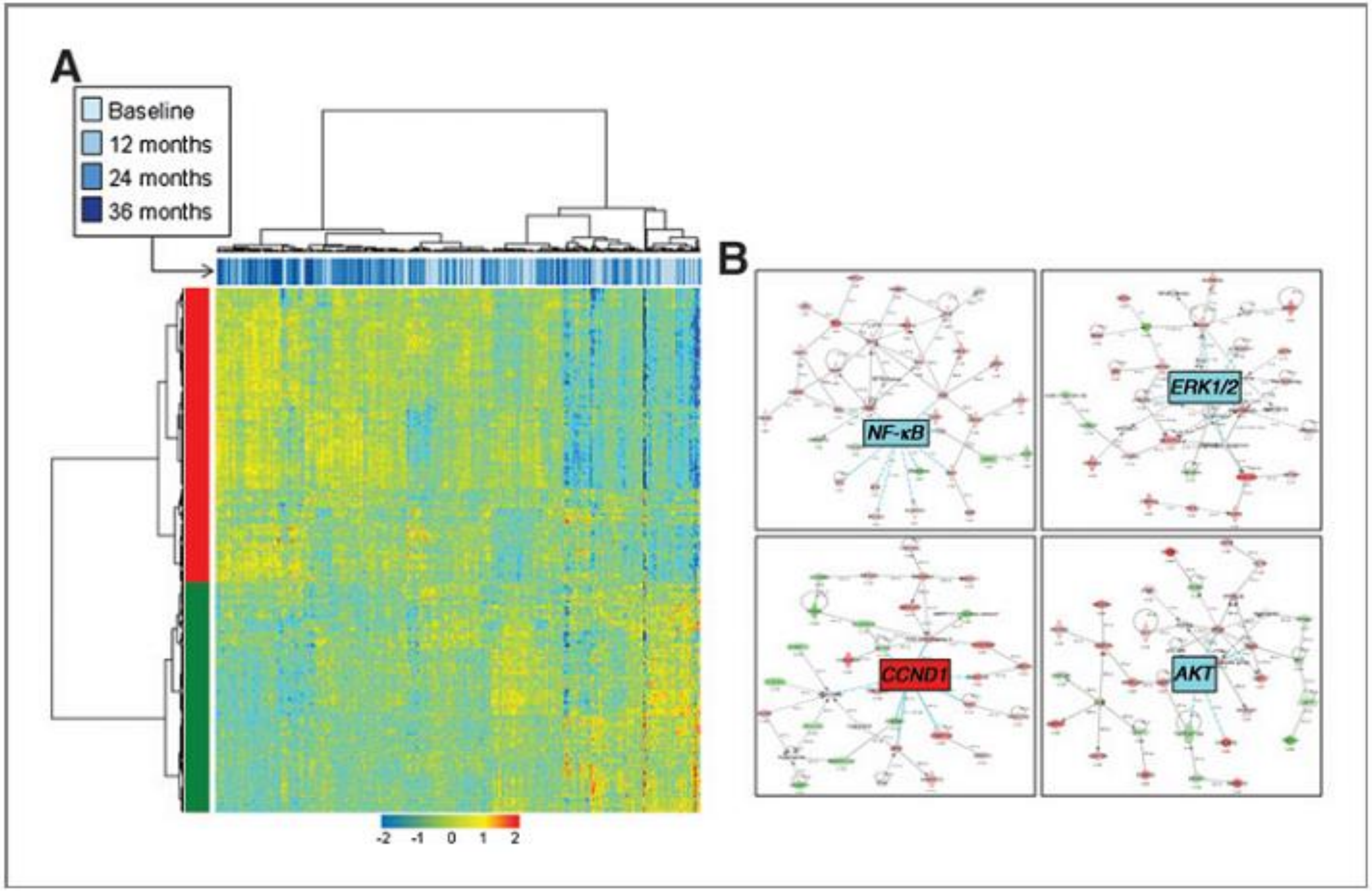
Humam Ka…

*Cancer Pre…*




**Spatial and temporal modulation of genetic expression in the field of injury close to the previously resected area**




**Spatial and temporal modulation of genetic expression in the field of injury close to the previously resected area**

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JOURNAL OF CLINICAL ONCOLOGY — ORIGINAL REPORT

# Clinical Utility of a Plasma-Based miRNA Signature Classifier Within Computed Tomography Lung Cancer Screening: A Correlative MILD Trial Study

*Gabriella Sozzi, Mattia Boeri, Marta Rossi, Carla Verri, Paola Suatoni, Francesca Bravi, Luca Roz, Davide Conte, Michela Grassi, Nicola Sverzellati, Alfonso Marchiano, Eva Negri, Carlo La Vecchia, and Ugo Pastorino*

**Results**

The diagnostic performance of MSC for lung cancer detection was 87% for sensitivity and 81% for specificity across both arms, and 88% and 80%, respectively, in the LDCT arm. For all patients, MSC had a negative predictive value of 99% and 99.86% for detection and death as a result of disease, respectively. LDCT had sensitivity of 79% and specificity of 81% with a false-positive rate of 19.4%. Diagnostic performance of MSC was confirmed by time dependency analysis. Combination of both MSC and LDCT resulted in a five-fold reduction of LDCT false-positive rate to 3.7%. MSC risk groups were significantly associated with survival ($\chi^2_1 = 49.53$; $P < .001$).

**Conclusion**

This large validation study indicates that MSC has predictive, diagnostic, and prognostic value and could reduce the false-positive rate of LDCT, thus improving the efficacy of lung cancer screening.

*J Clin Oncol 32. © 2014 by American Society of Clinical Oncology*

# Why surgery

- Local control
- Biomolecular tissue
- Correct staging
- Minimally invasive
- Conservative parenchymal resection
- After SABR

European Journal of Cardio-Thoracic Surgery (2014) 1–12
doi:10.1093/ejcts/ezu028

GUIDELINE

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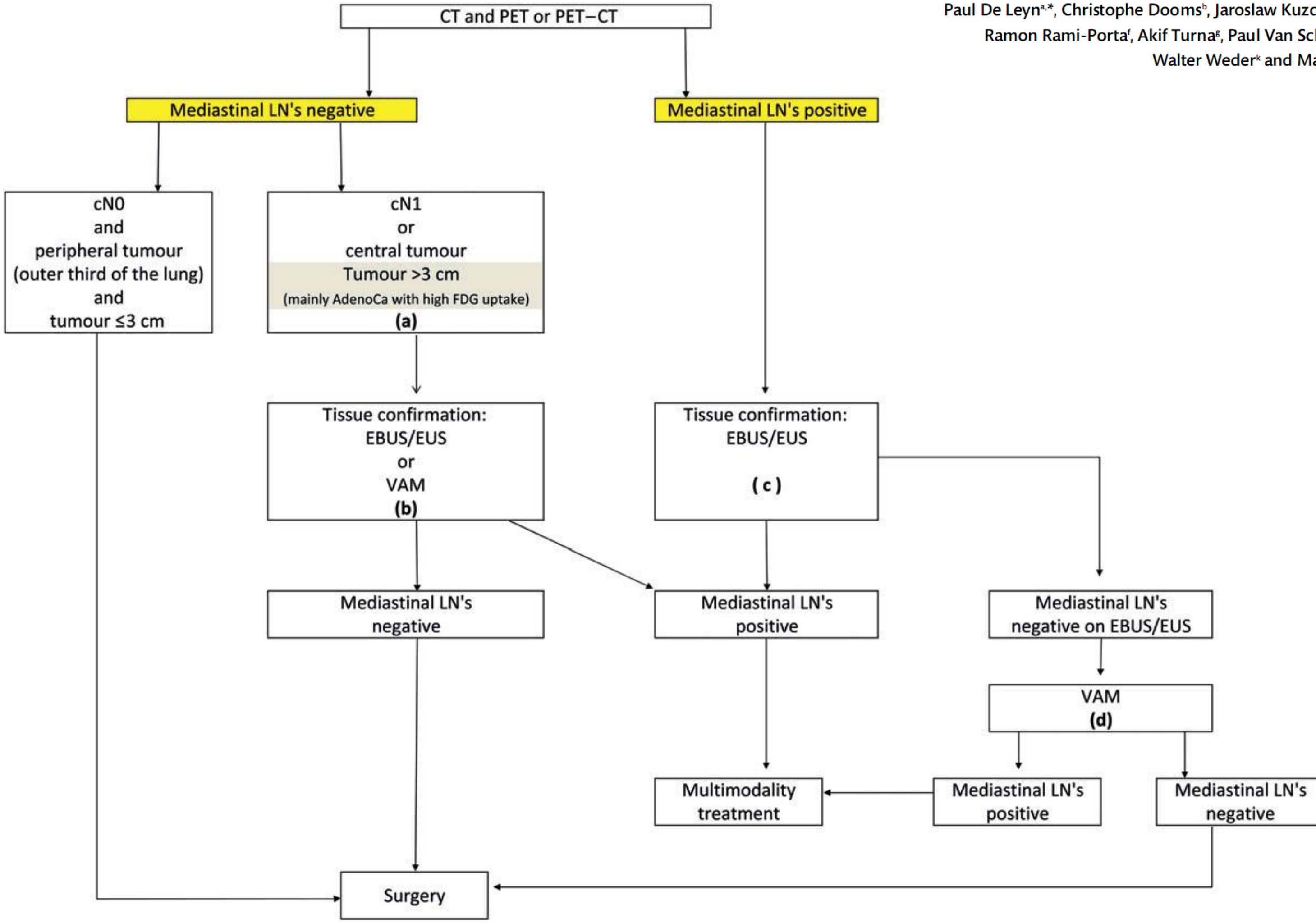
# Revised ESTS guidelines for preoperative mediastinal lymph node staging for non-small-cell lung cancer†

Paul De Leyn[a,*], Christophe Dooms[b], Jaroslaw Kuzdzal[c], Didier Lardinois[d], Bernward Passlick[e], Ramon Rami-Porta[f], Akif Turna[g], Paul Van Schil[h], Frederico Venuta[i], David Waller[j], Walter Weder[k] and Marcin Zielinski[l]




**(a)** : In tumours > 3 cm (mainly in adenocarcinoma with high FDG uptake) invasive staging should be considered
**(b)** : Depending on local expertise to adhere to minimal requirements for staging
**(c)** : Endoscopic techniques are minimally invasive and are the first choice if local expertise with EBUS/EUS needle aspiration is available
**(d)** : Due to its higher NPV, in case of PET positive or CT enlarged mediastinal LN's, videoassisted mediastinoscopy (VAM) with nodal dissection or biopsy remain indicated when endoscopic staging is negative. Nodal dissection has an increased accuracy over biopsy

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# Doubts? Use MITS

- VATS for T3/4
- VATS for N2/3
- EBUS for N2/3
- Videomediastinoscopy – VAMLA for N2/3
- Exploratory thoracotomy should be avoided

# Intraoperative protocol

- Selected lymph node biopsy
- Sampling
- Systematic nodal dissection
  - at least three mediastinal nodal stations
  - the nodes are separately labeled and examined histologically
- Lobe-specific systematic node dissection
- Extended lymph node dissection (through median sternotomy and cervicotomy)



*D. Lardinois et al. / European Journal of Cardio-thoracic Surgery 30 (2006) 787–792*

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e

For complete resection of non-small cell lung cancer, a systematic nodal dissection is recommended in all cases [18,19]. Ideally, this should be done as an en-bloc resection, when possible of the upper mediastinal nodes on the right side (stations 2R and 4R), the limits of which are as follows: cranially, brachiocephalic trunk; medially, the ascending aorta and origin of aortic arch; anteriorly, the superior vena cava; posteriorly, the esophagus; and inferiorly, the pulmonary artery. Any visible nodes in front of the superior vena cava and/or posterior to the trachea should be removed (stations 3a and 3p). We can recommend the en-bloc resection of the lower mediastinum, including the fatty tissue from the diaphragm to the subcarinal space (stations 7, 8, and 9). On the left side, removal of the subaortic (station 5), para-aortic (station 6) and inferior paratracheal (4 L) lymph nodes is minimally required. For a complete nodal dissection of the left upper mediastinum, division of the ligamentum arteriosus allowing mobilization of the aortic arch is recommended, with special care not to injure the left recurrent laryngeal nerve.



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*D. Lardinois et al. / European Journal of Cardio-thoracic Surgery 30 (2006) 787–792*

# Exceptions to the rule

- pT1N0 peripheral epidermoid: lobar specific nodal dissection acceptable
- At least six nodes from the following:
  - right upper and middle lobe: 2R, 4R and 7;
  - right lower lobe: 4R, 7, 8 and 9;
  - left upper lobe: 5, 6 and 7;
  - left lower lobe: 7, 8 and 9.
- Induction treatment
- High risk patients



*D. Lardinois et al. / European Journal of Cardio-thoracic Surgery 30 (2006) 787–792*

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COMMENTARY

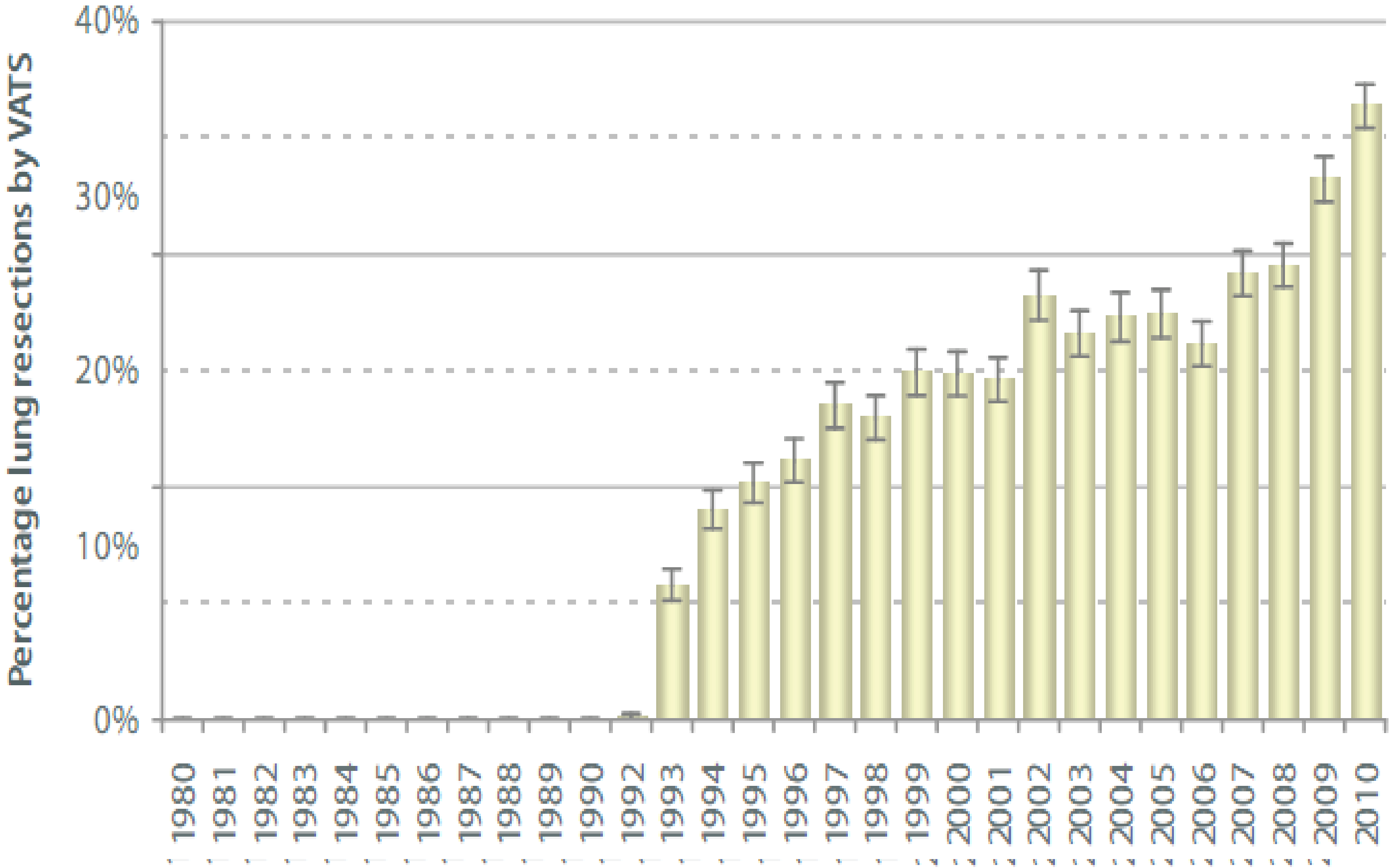
# The best that surgery has to offer

Thomas A. D'Amico, MD

J Thorac Cardiovasc Surg 2013;145:699-701

Fig. 1.A.6

## Lung resection: the use of VATS (n=155,885)



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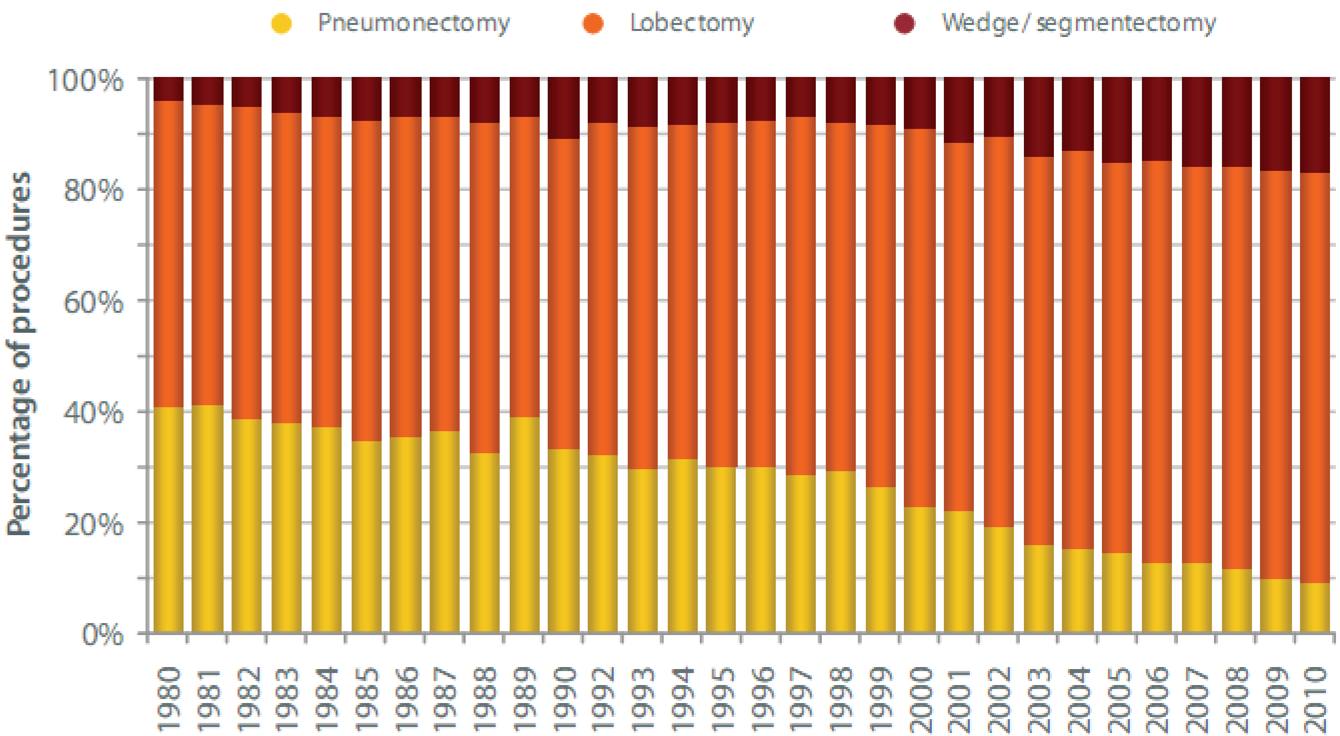
National activity

Fig. 1.A.10 **Type of resection for primary lung cancer (n=107,502)**




26-29 March 2014, Geneva, Switzerland

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VOLUME 25 · NUMBER 31 · NOVEMBER 1 2007

JOURNAL OF CLINICAL ONCOLOGY

ORIGINAL REPORT

# Video-Assisted Thoracic Surgery Lobectomy: Report of CALGB 39802—A Prospective, Multi-Institution Feasibility Study

*Scott J. Swanson, James E. Herndon II, Thomas A. D'Amico, Todd L. Demmy, Robert J. McKenna Jr, Mark R. Green, and David J. Sugarbaker*

**Conclusion**
A standardized approach to VATS lobectomy as specifically defined with avoidance of rib spreading is feasible.

*J Clin Oncol 25:4993-4997. © 2007 by American Society of Clinical Oncology*

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**Table 2.** Perioperative Outcomes of the 21 Trials Included in the Present Systematic Review

| Study | Conversion Rate (%) | Surgery Time (hours) | | Blood Loss (ml) | | Chest Drain (days) | | Hospital Stay (days) | |
|---|---|---|---|---|---|---|---|---|---|
| | | VATS | Open | VATS | Open | VATS | Open | VATS | Open |
| Kirby (1995)[1] | 10 | 2.7 | 2.9 | NR | NR | 4.6 | 6.5 | 7.1 | 8.3 |
| Sugi (2000)[2] | 4 | NR | NR | NR | NR | NR | NR | NR | NR |
| Giudicelli 1994[3] | 10.2 | 2.2 | 1.8 | 84 | 112 | 8.0 | 10.0 | 12.0 | 15.0 |
| Ohbuchi 1998[4] | 0 | 3.6 | 3.3 | 82 | 126 | 5.3 | 7.6 | 15.4 | 24.0 |
| Sugiura 1999[5] | 12 | 3.8 | 3.3 | 150 | 300 | NR | NR | 23 | 22 |
| Inada (2000)[6] | NR | 4.7 | 3.7 | 201 | 244 | 6.5 | 5.7 | 15.4 | 12.2 |
| Yim (2000)[7] | 0 | 1.3 | 1.4 | NR | NR | 3.2 | 4.1 | 4.1 | 5.3 |
| Nomori (2001)[8] | 13.1 | 4.7 | 4.5 | 176 | 250 | 1.2 | 1.5 | 7.3 | 7.9 |
| Nagahiro (2001)[9] | NR | 4.2 | 3.1 | 187 | 216 | 3.8 | 3.6 | NR | NR |
| Koizumi (2002)[10] | NR | 4.7 | 4.5 | 253 | 443 | NR | NR | NR | NR |
| Tatsumi (2003)[11] | 5.6 | 3.7 | 3.8 | 129 | 253 | NR | NR | 19.5 | 24.9 |
| Tashima (2005)[12] | 6.9 | 2.9 | 3.1 | 110 | 165 | NR | NR | 13.3 | 14.5 |
| Muraoka (2006)[13] | 8.5 | 4.8 | 4.9 | 151 | 362 | 3.0 | 3.9 | NR | NR |
| Shigemura (2006)[14] | NR | 3.6 | 2.7 | 107 | 163 | NR | NR | 13.1 | 17.9 |
| Shiraishi (2006)[15] | 14.7 | 3.8 | 3.7 | 142 | 204 | NR | NR | NR | NR |
| Sawada (2007)[16] | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Sakuraba (2007)[17] | 7.6 | NR | NR | NR | NR | NR | NR | NR | NR |
| Petersen (2007)[18] | 5 | NR | NR | NR | NR | 3.1 | 4.7 | 4.2 | 5.3 |
| Whitson (2007)[19] | 15.7 | 3.8 | 3.5 | 251 | 255 | 5.0 | 6.1 | 6.4 | 7.7 |
| Tajiri (2007)[20] | NR | 4.3 | 4.2 | 72 | 226 | 4.9 | 7.1 | NR | NR |
| Park (2007)[21] | NR | 3.7 | 3.0 | NR | NR | NR | NR | 4.9 | 7.2 |
| Minimum | 0 | 1.3 | 1.4 | 72 | 82 | 1.2 | 1.5 | 4.1 | 5.3 |
| Maximum | 15.7 | 4.8 | 4.9 | 253 | 443 | 8.0 | 10.0 | 24.0 | 24.9 |
| Median | 8.1 | 3.7 | 3.6 | 146 | 235 | 4.6 | 5.3 | 12.0 | 12.2 |

# Ten-Year E... ng Single-Port Thoracosco...

Gaetano Rocco, M... ),
David R. Jones, M...
Arturo Cuomo, M...

Division of Thoracic Surgery ... Service, National
Cancer Institute, Pascale Fo... ttesville, Virginia

... 2013;96:434–8)
... racic Surgeons

*Table 2. Histology From 146 Nodules Resected With Uniportal Video-Assisted Thoracic Surgery*

| Diagnosis | No. |
|---|---|
| • Primary epidermoid | 19 |
| • Primary adenocarcinoma | 40 |
| • Primary carcinoid | 4 |
| • Primary others | 6 |
| • Breast cancer | 6 |
| • Colon | 15 |
| • Sarcoma | 6 |
| • Lymphoma | 1 |
| • Melanoma | 10 |
| • Renal cell | 4 |
| • Bladder cancer | 1 |
| • Parotid cancer | 1 |
| • Benign | 33 |

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# Uniportal Video-Assisted Thoracoscopic Lobectomy: Two Years of Experience

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# Why surgery

- Local control
- Biomolecular tissue
- Correct staging
- Minimally invasive
- Conservative parenchymal resection
- Screening

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# Clinical Statement on the Role of the Surgeon and Surgical Issues Relating to Computed Tomography Screening Programs for Lung Cancer*

Gaetano Rocco, MD (Chair), Mark S. Allen, MD, Nasser K. Altorki, MD, Hisao Asamura, MD, Matthew G. Blum, MD, Frank C. Detterbeck, MD, Carolyn M. Dresler, MD, MPA, Dominique Gossot, MD, Sean C. Grondin, MD, Michael T. Jaklitsch, MD, John D. Mitchell, MD, Joseph R. Newton, Jr, MD, Paul E. Van Schil, MD, PhD, Thomas K. Waddell, MD, MSc, PhD, and Douglas E. Wood, MD

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Ann Thorac Surg 2013;96:357–60 • 0003-4975/$36.00
http://dx.doi.org/10.1016/j.athoracsur.2013.05.067

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# Minimally Invasive Thoracic Surgery

- CT screening programs have ready access to minimally invasive diagnostic/therapeutic procedures, such as transbronchial and percutaneous techniques and minimally invasive thoracic surgery
- The STS recommends **the least parenchymal resection compatible with current diagnostic and oncologic principles performed through the least invasive surgical approach** for the diagnosis and treatment of screen-detected nodules
- The STS strongly encourages the use of MITS, inclusive of both **video-assisted thoracoscopic and robotic** approaches, whenever available and feasible, for the diagnosis and treatment of screen-detected pulmonary nodules.



Ann Thorac Surg 2013;96:357–60 • 0003-4975/$36.00
http://dx.doi.org/10.1016/j.athoracsur.2013.05.067

## American College of Chest Physicians and Society of Thoracic Surgeons Consensus Statement for Evaluation and Management for High-Risk Patients With Stage I Non-small Cell Lung Cancer

### *Sublobar Resection*

5. Segmentectomy or extended wedge resection with margins > 1 cm or equal to the tumor diameter with hilar and mediastinal nodal evaluation is suggested as a safe and effective alternative to lobectomy in high-risk patients with stage I NSCLC.
6. In patients with stage I NSCLC > 75 years of age, segmentectomy or extended wedge resection is suggested as an effective and potentially beneficial alternative to lobectomy.
7. Anatomic segmentectomy is preferred when possible to wedge resection in patients who undergo sublobar resection for stage I NSCLC.

*CHEST 2012; 142(6):1620–1635*

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# Ten-Year Experience on 644 Patients Undergoing Single-Port (Uniportal) Video-Assisted Thoracoscopic Surgery

Gaetano Rocco, MD, FRCSEd, Nicola Martucci, MD, Carmine La Manna, MD, David R. Jones, MD, Giuseppe De Luca, MD, Antonello La Rocca, MD, Arturo Cuomo, MD, and Rosanna Accardo, MD

Division of Thoracic Surgery, Department of Thoracic Surgery and Oncology; Division of Anesthesiology and Pain Service, National Cancer Institute, Pascale Foundation, Naples, Italy; Division of Cardiothoracic Surgery, University of Virginia, Charlottesville, Virginia

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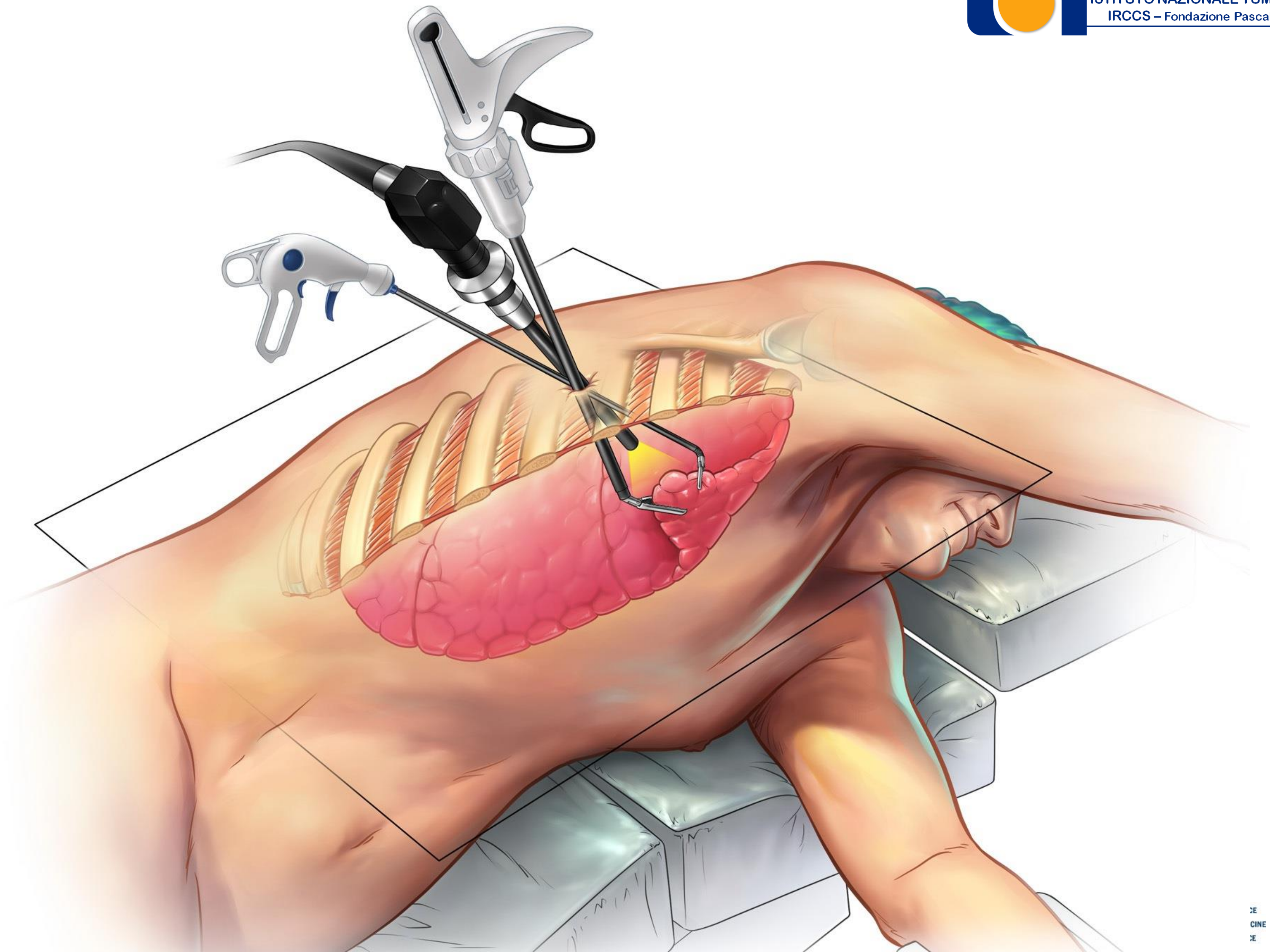

Rocco G, in Dienemann H ed,” Chest wall surgery “ to be published 2014

# The new adenocarcinoma classification

- Pure GGO's: wedge
- Mixed GGO's with <25% solid component: wedge
- AAH and AIS/MIA with lepidic predominance
  - Sublobar resection: T1a wedge; T1b: segmentectomy

Travis W et l, JTO 2011
Rocco G et al. Ann Thorac Surg 2013
Tsutani Y et al. Chest 2014

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## MONDAY, JANUARY 27, 2014

*General Session I – Continued*

**7:35 AM** **Crystal Ballroom G-Q**

**J. Maxwell Chamberlain Paper for General Thoracic Surgery**

**A Comparative, Propensity-Matched Analysis of Wedge Resection and Stereotactic Body Radiation Therapy for Early Stage Non-Small Cell Lung Cancer (NSCLC)**

*J. Port, A. Nasar, P. C. Lee, S. Paul, B. M. Stiles, W. G. Andrews, N. K. Altorki*

*Weill Cornell Medical College, New York, NY*

**COMMERCIAL RELATIONSHIPS** J. Port: Consultant/Advisory Board, Covidien; Ownership Interest, RF Surgical Systems, Inc

***Discussant:*** *Richard I. Whyte, Boston, MA*

**Conclusions:** Clinical stage IA NSCLC patients treated by SBRT appear to have a significantly higher overall recurrence rate than those treated by wedge resection. It does not appear that the addition of brachytherapy lowers recurrence or improves overall survival compared to wedge alone.

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**8:30 AM** **Crystal Ballroom G-Q**

Richard E. Clark Paper for General Thoracic Surgery

**Wedge Resection Reduces the Incidence of Major Morbidity by Nearly 50% as Compared to Lobectomy: An STS General Thoracic Surgery Database Propensity-Matched Analysis**

*P. A. Linden[1], S. Sheng[2], P. Saha-Chaudhuri[2], M. Onaitis[2]*

*[1]University Hospitals Case Medical Center, Cleveland, OH, [2]Duke University, Durham, NC*

***Discussant:*** *Hiran C. Fernando, Boston, MA*

**COMMERCIAL RELATIONSHIPS** H. C. Fernando: Consultant/Advisory Board, CSA Medical, Inc; Other, Galil Medical, Medical Monitor for study

**Conclusions:** Wedge resection is much safer than lobectomy in these two matched populations. Further study is warranted to determine in which patients wedge resection yields the greatest benefit.

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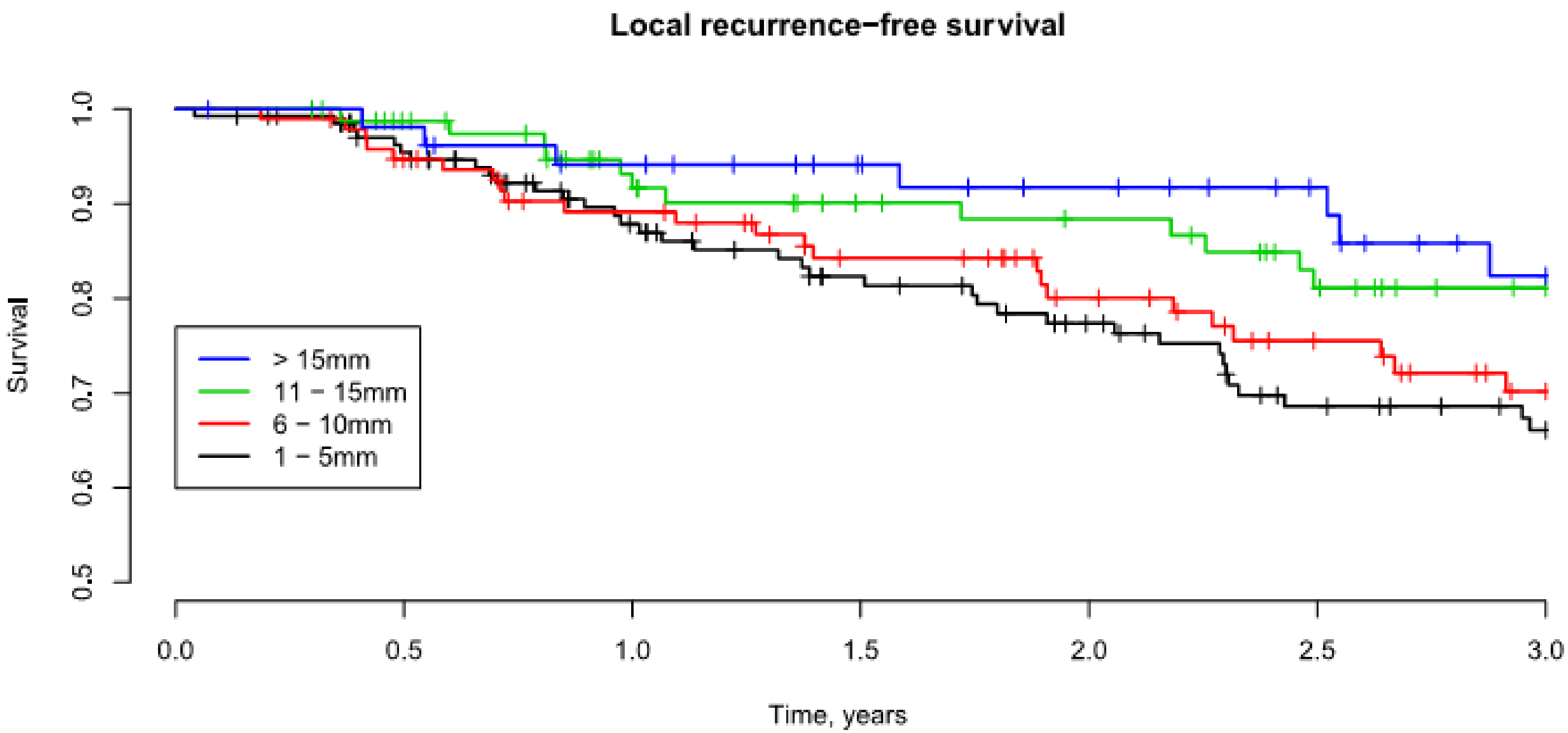

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# Why surgery

- Local control
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- Conservative parenchymal resection
- After SABR

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# Surgery after SABR

- Chen F, Matsuo Y, Yoshizawa A, et al. Salvage lung resection for non-small cell lung cancer after stereotactic body radiotherapy in initially operable patients. J Thorac Oncol 2010;5:1999–2002

- Neri S, Takahashi Y, Terashi T, et al. Surgical treatment of local recurrence following stereotactic body radiotherapy for primary and metastatic lung cancers. J Thorac Oncol 2010;5:2003–2007

- Van Schil P. Salvage surgery after stereotactic radiotherapy. A new challenge for thoracic surgeons. J Thorac Oncol 2010;5:1881-2

# Surgery after SABR

- Medically fit – refusing surgery after consultation with board certified thoracic surgeon
- Pretreatment  cyto/histological diagnosis of lung cancer
- Emergency (ie, hemoptysis, empyema)
- Possible parenchymal resection wider than before SABR – discuss with patient

# Surgery for early stage NSCLC

- The best modality for local control
- It serves the need for biomolecular assessment like no other diagnostic modalities
- Quality of surgery also means correct staging
- The most convenient minimally invasive approach for the least parenchymal resection compatible with oncologic adequacy
- Possible modality to correct SABR failures

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