La gestione del paziente con nodulo polmonare: Ruolo dello pneumologo

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TUMORE DEL POLMONE:
dallo screening al trattamento

Venerdì 11 novembre 2022

SEDE: *Sala Convegni "Fr. Francesco Perez"*
IRCCS Sacro Cuore - Don Calabria
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37024 Negrar di Valpolicella - Verona

- Stratificazione del rischio e inquadramento clinico
- Diagnosi e follow up
- Valutazione funzionale respiratoria e valutazione preoperatoria

Stratificazione del rischio di malignità

- Storia di fumo
- Età avanzata
- BPCO, Fibrosi polmonare
- Esposizione ad asbesto, radon, uranio ecc
- Familiarità

Clinical Review & Education

JAMA | Review

Evaluating the Patient With a Pulmonary Nodule
A Review

Peter J. Mazzone, MD, MPH; Louis Lam, MD

Table 1. Society Guidelines for the Management of Pulmonary Nodules

Nodule diameter	American College of Chest Physicians[15a]	Fleischner Society[14a]	Lung-RADS[16b]
Up to 6 mm	≤4 mm: Low-risk: patient discussion, optional follow-up High-risk: follow-up CT scan at 12 mo (if stable no further follow-up) >4 to 6 mm: Low-risk: follow-up CT scan at 12 mo (if stable, no further follow-up) High-risk: follow-up CT scan at 6-12 mo (if stable, follow-up at 18-24 mo)	<6 mm/<100 mm³: Low-risk: No follow-up High-risk: Optional follow-up CT in 12 mo	<6 mm at baseline (or new nodule <4 mm on follow-up): return to annual screening (category 2)
6 to 8 mm	>6 to <8 mm: Low-risk: follow-up CT scan at 6-12 mo (if stable, follow-up at 18-24 mo) High-risk: follow-up CT scan 3-6 mo (if stable, then 9-12 mo and 24 mo)	6 mm to 8 mm/100 mm³ to 250 mm³: Low-risk: follow-up CT in 6-12 mo, then consider follow-up scan at 18-24 mo High-risk: follow-up CT in 6-12 mo, then repeat scan in 18-24 mo	≥6 mm to <8 mm at baseline (or new nodule 4 mm to <6 mm on follow-up): LDCT in 6 mo (category 3)
8 mm or greater	≥8 mm: Assess surgical risk and determine pretest probability of malignancy: Pretest probability <5%: surveillance CT in 3 mo Pretest probability 5%-65%: PET/CT scan to determine continued surveillance, nonsurgical biopsy, or surgical biopsy/resection Pretest probability >65%: referral for surgical biopsy or resection after appropriate staging workup	8 mm/>250 mm³: Low-risk: consider follow-up CT at 3 mo, PET/CT, or tissue sampling High-risk: consider follow-up CT at 3 mo, PET/CT, or tissue sampling	≥8 mm to <15 mm at baseline (or growing <8 mm or new nodule 6 mm to <8 mm on follow-up): 3-mo LDCT or PET/CT (category 4A) ≥15 mm (new or growing ≥8 mm): CT, PET/CT, and/or tissue sampling depending on probability of malignancy and comorbidities (category 4B)

Box 1. Commonly Asked Questions

Are there any situations in which a pulmonary nodule does not require subsequent imaging or further evaluation?

If a pulmonary nodule has a very low probability of being malignant, further follow-up with imaging is not warranted. Examples include patients with prior imaging showing that the nodule has been stable for 2 years or longer; a nodule that has imaging features confirming a benign diagnosis (eg, dense central calcification, fat density within the nodule); or a solid o a pure ground-glass nodule <6 mm in diameter in an individua without any lung cancer risk factors.

Are there scenarios where practice guidelines do not apply?

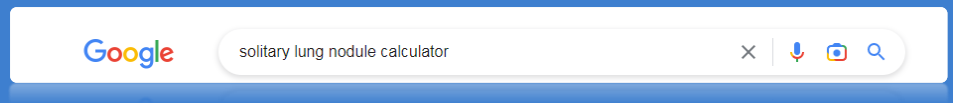
Practice guidelines may not apply to patients for whom the risk of malignancy differs from the general population. For example, patients with a known malignancy or recent history of malignancy; patients with organ transplant or other immunocompromised state; or patients aged <35 years. For these individuals, referral to a pulmonologist or to a multidisciplinary pulmonary nodule specialty clinic may be warranted.

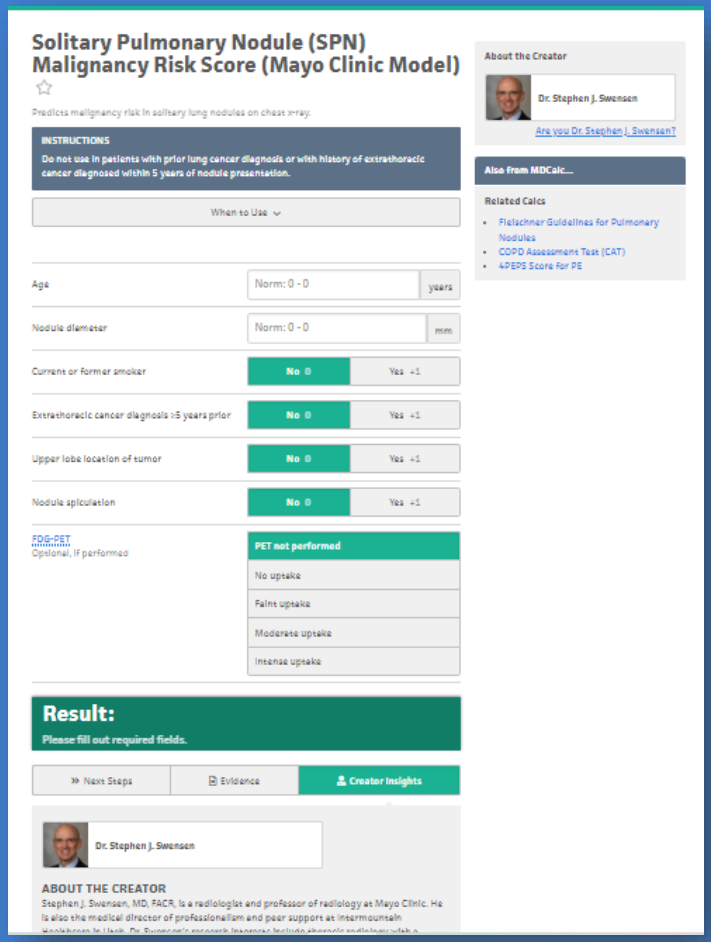
When should a primary care physician consider referring a patient with a pulmonary nodule to a specialist?

Primary care physicians should refer a patient for specialty evaluation when they are uncomfortable with or uncertain about the most optimal evaluation plan. In addition, primary care physicians should consider referring patients with a large solid pulmonary nodule (≥8-30 mm) or a subsolid pulmonary nodule due to their higher risk of malignancy.

Table 2. Validated Risk Prediction Models for Evaluation of Pulmonary Nodules

Risk prediction model	Mayo Clinic model[17]	Herder model[18]	VA model[19]	Brock University model[2]	Cleveland Clinic model[20]
Nodule detection	Incidental nodule on chest radiograph	Incidental nodule on chest radiograph and PET scan was performed for further evaluation	Incidental nodule seen on chest radiographic confirmed on CT imaging +/− PET scan	Nodules detected on LDCT as part of lung cancer screening program	Incidental nodules referred to biopsy or resection
% Of nodules that were malignant in the cohort used to develop the model	23	57	54	5.5	66.5
Model variables	Age Smoking history History of extrathoracic malignancy ≥5 y ago Nodule diameter Spiculation Upper lobe location	Mayo Clinic model + FDG-PET uptake	Age Smoking history Time since quitting smoking Nodule diameter	Age Sex Family history of lung cancer Emphysema Nodule Size Nodule type Location Nodule count	Age Smoking history Upper lobe location Solid and irregular/spiculated nodule edges Emphysema FDG-PET avidity History of cancer other than lung
Area under the curve	0.83	0.88	0.79	≥0.94	0.75-0.81 (C-index)


Google
solitary lung nodule calculator


Solitary Pulmonary Nodule (SPN) Malignancy Risk Score (Mayo Clinic Model)
Predicts malignancy risk in solitary lung nodules on chest x-ray.
INSTRUCTIONS
Do not use in patients with prior lung cancer diagnosis or with history of extrathoracic cancer diagnosed within 5 years of nodule presentation.
When to Use
Age
Norm: 0 - 0
years
Nodule diameter
Norm: 0 - 0
mm
Current or former smoker
No 0
Yes +1
Extrathoracic cancer diagnosis ≥5 years prior
No 0
Yes +1
Upper lobe location of tumor
No 0
Yes +1
Nodule spiculation
No 0
Yes +1
FDG-PET
Optional, if performed
PET not performed
No uptake
Faint uptake
Moderate uptake
Intense uptake
Result:
Please fill out required fields.
Next Steps
Evidence
Creator Insights
Dr. Stephen J. Swensen
ABOUT THE CREATOR
Stephen J. Swensen, MD, FACR, is a radiologist and professor of radiology at Mayo Clinic. He is also the medical director of professionalism and peer support at Intermountain
About the Creator
Dr. Stephen J. Swensen
Are you Dr. Stephen J. Swensen?
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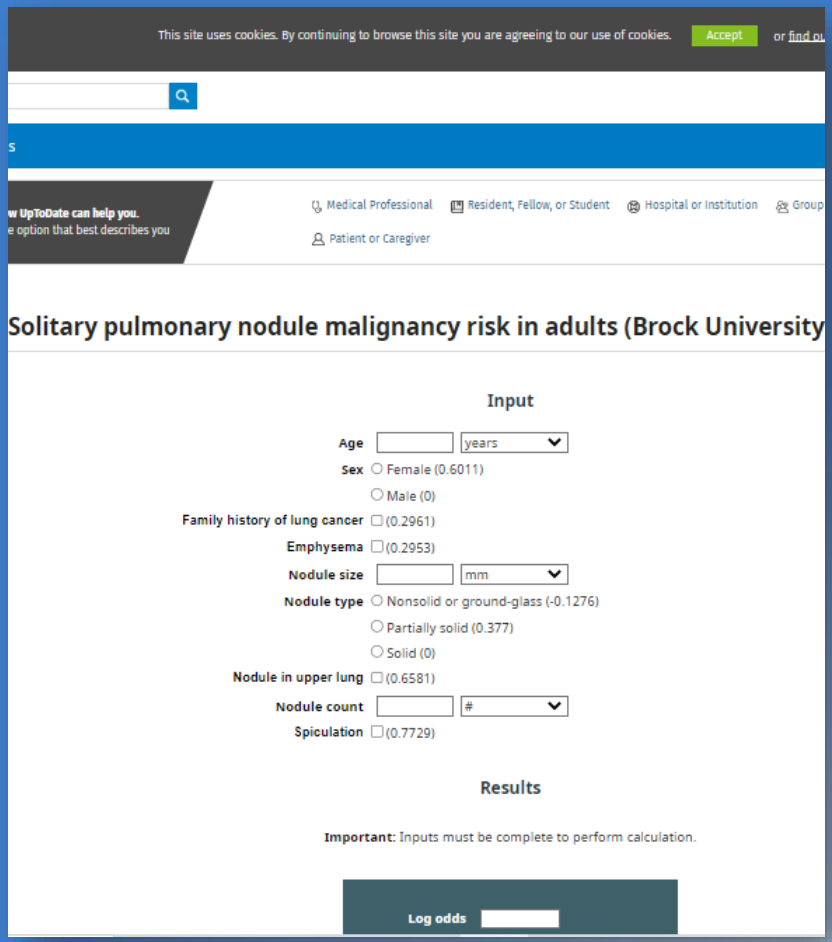
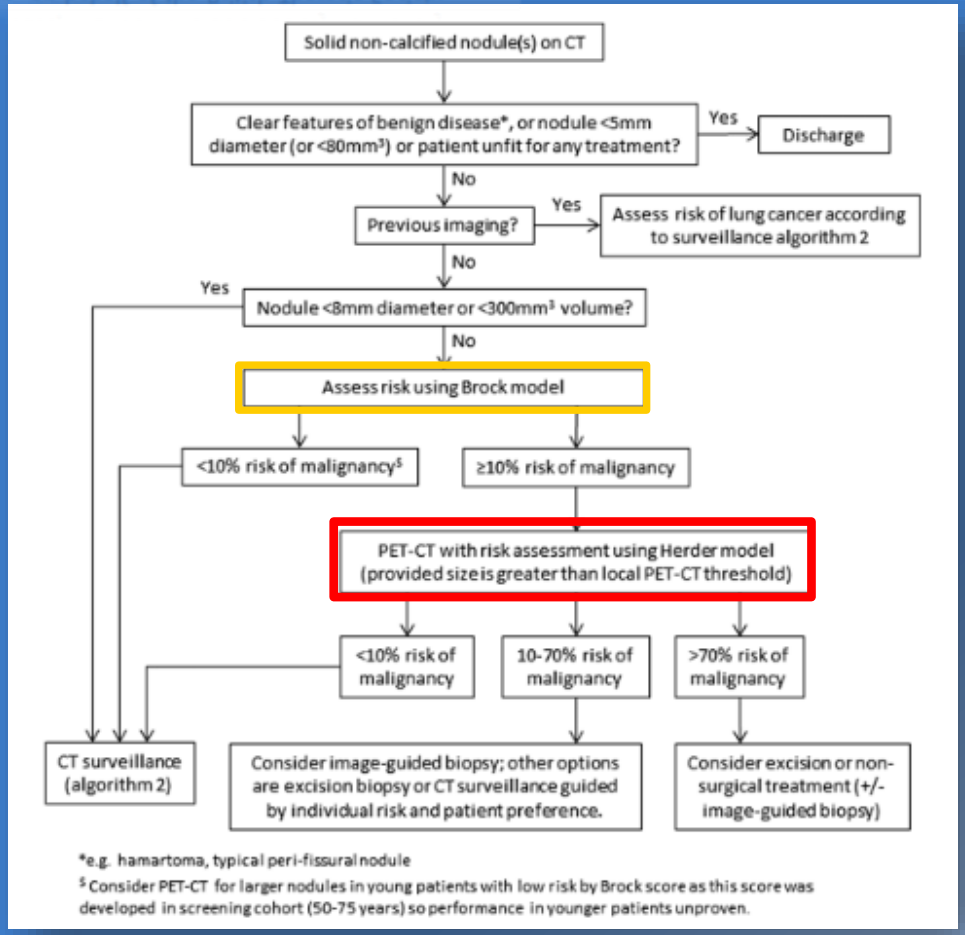
Related Calcs
Fleischner Guidelines for Pulmonary Nodules
COPD Assessment Test (CAT)
4PEPS Score for PE


This site uses cookies. By continuing to browse this site you are agreeing to our use of cookies.
Accept
Medical Professional
Resident, Fellow, or Student
Hospital or Institution
Patient or Caregiver
Solitary pulmonary nodule malignancy risk in adults (Brock University
Input
Age
years
Sex
Female (0.6011)
Male (0)
Family history of lung cancer
(0.2961)
Emphysema
(0.2953)
Nodule size
mm
Nodule type
Nonsolid or ground-glass (-0.1276)
Partially solid (0.377)
Solid (0)
Nodule in upper lung
(0.6581)
Nodule count
#
Spiculation
(0.7729)
Results
Important: Inputs must be complete to perform calculation.
Log odds

British Thoracic Society guidelines for the investigation and management of pulmonary nodules

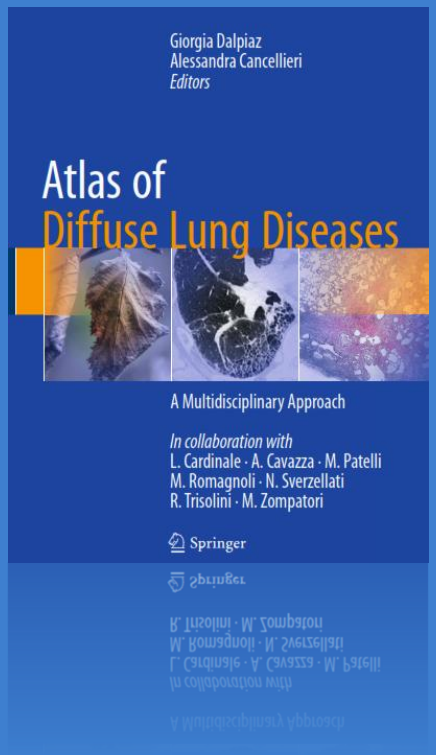
M E J Callister,[1] D R Baldwin,[2] A R Akram,[3] S Barnard,[4] P Cane,[5] J Draffan,[6] K Franks,[7] F Gleeson,[8] R Graham,[9] P Malhotra,[10] M Prokop,[11] K Rodger,[12] M Subesinghe,[13] D Waller,[14] I Woolhouse,[15] British Thoracic Society Pulmonary Nodule Guideline Development Group, on behalf of the British Thoracic Society Standards of Care Committee

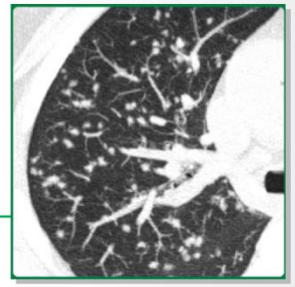


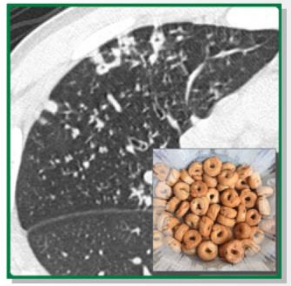
Callister MEJ, *et al*. *Thorax* 2015;**70**:ii1–ii54. doi:10.1136/thoraxjnl-2015-207168

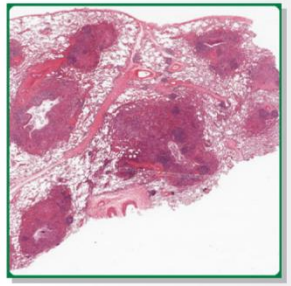
Diagnostica

- Esclusione cause infettive e/o infiammatorie
  - Tubercolosi, micobatteriosi
  - Micosi (aspergillosi, histoplasmosi, coccidioidomicosi)
  - Sarcoidosi
  - OP
  - Artrite reumatoide
  - Istiocitosi a cellule di Langherarns
  - IBD
  - Iper IgG4
- Tecniche endoscopiche di diagnostica dei noduli polmonari periferici









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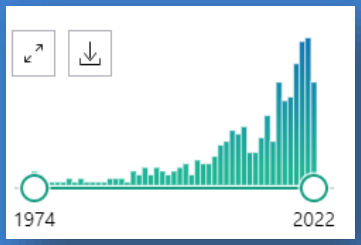
peripheral lung nodule and bronchoscopy

Search



tomography

MDPI

Article

Efficacy and Safety of Cone-Beam CT Augmented Electromagnetic Navigation Guided Bronchoscopic Biopsies of Indeterminate Pulmonary Nodules

Shreya Podder, Sana Chaudry, Harpreet Singh, Elise M. Jondall, Jonathan S. Kurman and Bryan S. Benn *

Advancements in navigational bronchoscopy for peripheral pulmonary lesions: A review with special focus on virtual bronchoscopic navigation

Mohan Giri[1†], Haiyun Dai[1†], Anju Puri[2], Jiaxin Liao[1] and Shuliang Guo[1*]

Received: 21 July 2022 | Accepted: 13 August 2022

DOI: 10.1111/1759-7714.14629

ORIGINAL ARTICLE

WILEY

Radial-EBUS and virtual bronchoscopy planner for peripheral lung cancer diagnosis: How it became the first-line endoscopic procedure

Samy Lachkar[1] | Loic Perrot[1] | Diane Gervereau[1] | Marielle De Marchi[1] | Helene Morisse Pradier[1] | Edouard Dantoing[1] | Nicolas Piton[2,3] | Luc Thiberville[4] | Florian Guisier[4] | Mathieu Salaün[4]

INTERNAL MEDICINE JOURNAL

RACP Specialists. Together

doi:10.1111/imj.15833

ORIGINAL ARTICLE

Cryobiopsy with radial-endobronchial ultrasound (Cryo-Radial) has comparable diagnostic yield with higher safety in comparison with computed tomography-guided transthoracic biopsy for peripheral pulmonary lesions: an exploratory randomised study

Samantha Herath[1,2,3,4] Conroy Wong,[5] Paul Dawkins,[5] Andrew Veale,[5] Elaine Yap,[5] Jonathan Williamson,[3,6] Irene Low,[5] Hema Mahajan,[7,8,9] Tania Prvan,[3] Stuart Barnard,[5] Stewart Hawkins,[5] Dan Cookson,[5] Tushar Singh[10,11] and Alvin Ing[3]

Gestione del paziente con nodulo polmonare e patologia respiratoria

- Patologia ostruttiva
- Patologia restrittiva

Research Article

Cancer Prevention Research

Will That Pulmonary Nodule Become Cancerous? A Risk Prediction Model for Incident Lung Cancer

Barbara Nemesure[1], Sean Clouston[1,2], Denise Albano[3], Stephen Kuperberg[4], and Thomas V. Bilfinger[3]

Table 1. Characteristics of incident lung cancer cases and those who remained cancer-free during the observation period, LCEC 2002 to 2016

Patient characteristic	Incident cancer diagnosis ($N = 171$)	No cancer yet ($N = 2,753$)
Female sex	54.4	51.7
Age in years, mean (SD)	68 (10.7)	60.9 (14.4)[a]
Ln pack-years, mean (SD)	2.7 (1.8)	0.7 (1.4)[a]
Number of lesions, mean (SD)	1.4 (0.8)	1.2 (0.5)[a]
Largest nodule size, mean (SD)	12.5 (11)	7.4 (10.4)[a]
Asbestos exposure	9.36	2.80[a]
Family history of lung cancer	8.19	3.16[a]
Family history of other cancer	18.13	8.50[a]
Personal history of other cancer	21.05	6.39[a]
Chronic obstructive pulmonary disorder	21.64	2.32[a]
Ground glass opacity	8.19	1.85[a]
Spiculated	17.54	2.80[a]
Upper lobe	40.94	13.77[a]

NOTE: All statistics report percentages (%) or, when noted, means (SD). Ln, transformed using the natural logarithm. Results for categorical variables used χ^2 tests whereas results for continuous variables (reporting means and SD above) used 2-tailed t tests.
[a]$P < 0.001$ when adjusting for the FDR.

Table 2. Multivariable-adjusted hazard ratios and 95% CIs examining cumulative incidence of lung cancer using Cox proportional hazards modeling for variables that passed exclusion criteria in the replication sample, LCEC 2002 to 2016

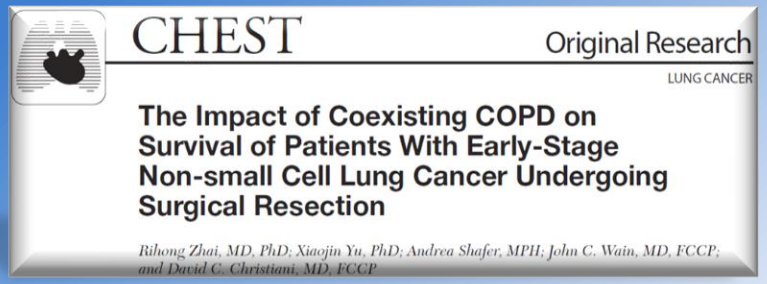
Patient characteristic	Adjusted HR (95% CI)
Ln age in years[a]	8.79 (2.44–31.71)[a]
Ln pack-years of smoking	1.59 (1.39–1.82)[a]
Personal history of other cancer	2.31 (1.38–3.89)[a]
Chronic obstructive pulmonary disorder	3.15 (1.76–5.64)[a]
Ground glass opacity	2.45 (1.04–5.80)[a]
Spiculated	1.99 (1.08–3.69)[a]
Size of largest node	1.02 (1.00–1.04)

Abbreviation: Ln, transformed using the natural logarithm.
[a]Statistically significant associations after accounting for the FDR. Baseline cumulative hazard was 0.0134037; baseline survival was 0.9866759.

Severity of Chronic Obstructive Pulmonary Disease and Its Relationship to Lung Cancer Prognosis after Surgical Resection*

Yasuo Sekine[1] Hidemi Suzuki[1] Yoshito Yamada[2] Eitetsu Koh[1] Ichiro Yoshino[2]

- Stessi fattori di rischio (fumo!)
- Incidenza del tumore del polmone 5 volte maggiore nei pazienti con BPCO a parità di età e sigarette fumate
- Rischio inversamente proporzionale al FEV1
- Associate a peggiore prognosi a breve e lungo termine

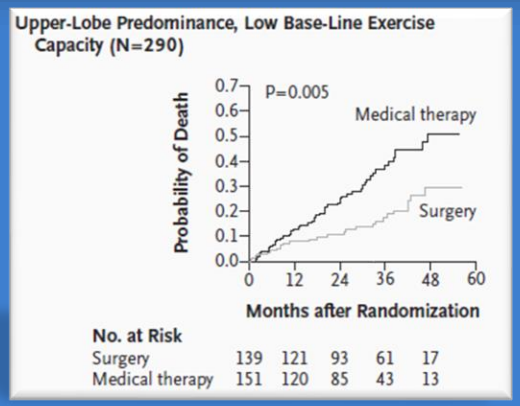


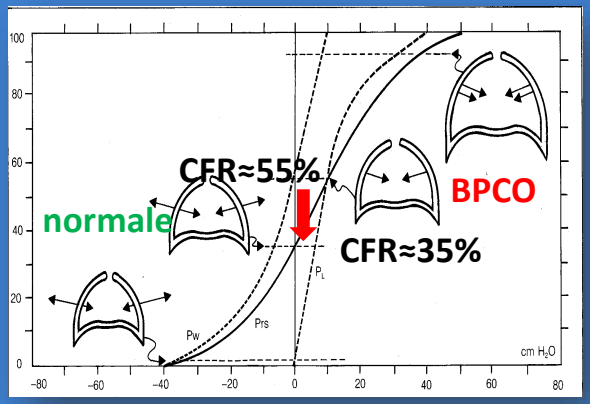
Enfisema e effetto "Lung Volume Reduction"

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MAY 22, 2003 VOL. 348 NO. 21

A Randomized Trial Comparing Lung-Volume–Reduction Surgery with Medical Therapy for Severe Emphysema





Riduzione FEV1 post lobectomia

- 30% nei pazienti con FEV1 preoperatorio >70%
- 12% nei pazienti con FEV1 preoperatorio<70%

Il 17% dei pazienti con BPCO migliora il proprio FEV1 dopo lobectomia

- riduzione delle resistenze
- aumento del ritorno elastico

doi:10.1510/icvts.2005.096347

INTERACTIVE CARDIOVASCULAR AND THORACIC SURGERY

Interactive CardioVascular and Thoracic Surgery 4 (2005) 61-65

www.icvts.org

Institutional report - Thoracic general

A model to predict the decline of the forced expiratory volume in one second and the carbon monoxide lung diffusion capacity early after major lung resection☆

Alessandro Brunelli*, Armando Sabbatini, Francesco Xiume', Majed Al Refai, Alessandro Borri, Michele Salati, Rita Daniela Marasco, Aroldo Fianchini

Unit of Thoracic Surgery, 'Umberto I°' Regional Hospital, Ancona, Italy

Received 15 August 2004; received in revised form 26 November 2004; accepted 14 December 2004

Diagnosis and Treatment of Lung Cancer in the Setting of Interstitial Lung Disease

Dane A. Fisher, MD[a], Mark C. Murphy, MB, BCh, BAO[a], Sydney B. Montesi, MD[b], Lida P. Hariri, MD, PhD[c], Robert W. Hallowell, MD[b], Florence K. Keane, MD[d], Michael Lanuti, MD[e], Meghan J. Mooradian, MD[f], Florian J. Fintelmann, MD[a,*]

Table 1
Survival of non-small cell lung cancer by stage and the presence of idiopathic pulmonary fibrosis

Stage	IPF (%)	Non-IPF (%)
IA	59	87
IB	42	74
IIA	43	62
IIB	29	50
IIIA	25	41
IIIB	17	28
IV	17	28

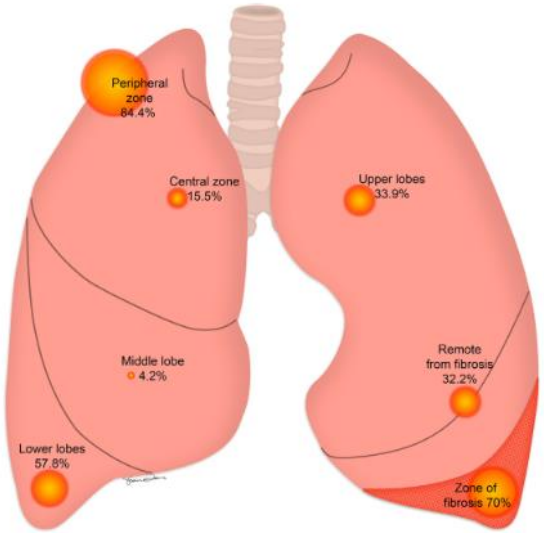


Fig. 1. Distribution of lung cancers in patients with interstitial lung disease.

Table 3
Comparison of available lung cancer treatments in the setting of interstitial lung disease

Treatment	Definitive Therapy?	Benefits	Risk of acute exacerbation	Unique Risks
Surgery	Yes	Gold standard	0%–20%, increases with extent of resection and perioperative factors	Most invasive; permanent reduction in lung function
Stereotactic body radiotherapy	Yes	Noninvasive	18%–20.5%	neumonitis; can reduce lung function
Percutaneous thermal ablation	Yes	Minimally invasive, no permanent decrease in lung function (in absence of acute exacerbation)	18%	ess invasive and risky than surgery
Systemic therapy	No	Noninvasive	13%–50%	Immunosuppression from certain agents/regimens

Radiol Clin N Am 60 (2022) 993–1002

Contents lists available at ScienceDirect

Respiratory Medicine

journal homepage: www.elsevier.com/locate/rmed

Review article

Acute exacerbation of interstitial lung disease after procedures

William H. Amundson[a], Emilian Racila[b], Tadashi Allen[c], H. Erhan Dincer[a], Rade Tomic[d], Maneesh Bhargava[a], David M. Perlman[a], Hyun Joo Kim[a,*]

Table 1
ILDs in which AE-ILD have been reported.

ILDs in which AE-ILD have been reported:
Idiopathic pulmonary fibrosis (IPF) [10,15,16,22,23]
Rheumatoid arthritis associated ILD (RA-ILD) [6]
Connective tissue disease related ILD (CTD-ILD) or Collagen vascular disease related ILD (CVD-ILD) [6,9]
Fibrotic NSIP [8,10]
Cryptogenic organizing pneumonia (COP) [10]

Table 2
Summary of reports of AE-ILD after bronchoscopic or lung surgical procedures.

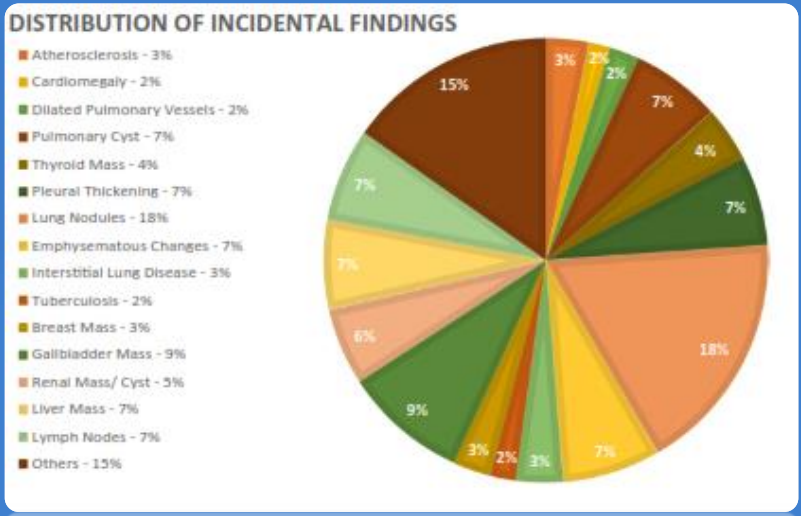
Study	Procedure	Number of patients	Number of AEs	Rate
Samejima 2015	VATS	285	3	1.05%
Plones 2013	VATS (43), Open wedge (2)	45	1	2.22%
Kondoh 2006	VATS (137), Open wedge (99)	236	5	2.12%
Bando 2009	VATS	113	2	1.77%
Rotolo 2015	VATS (151), open wedge (10)	161	3	1.86%
Park 2007	Surgical lung biopsy	200	3	1.50%
Fibla 2012	Surgical lung biopsy	311	23	7.40%
Sakamoto 2011	Lobectomy for cancer resection (48), biopsy for diagnosis (20)	68	3	4.41%
Maeda 2017	Lobectomy for cancer resection	86 (70 idiopathic interstitial pneumonitis, 16 collagen vascular disease-ILD)	7 total: 6 (IIP) 1 (CVD-ILD)	8.14% total: 8.57% (IIP) 6.35% (CVD-ILD)
Shintani 2010	Surgery for lung cancer resection	40	6	15.00%
Sato 2014	Lung cancer resection	1763	164	9.30%
Nanako 1994	BAL	124 (IPF only)	3	2.42%
Sakamoto 2012	BAL	201 (IPF only)	4 (3 fatal)	1.99%
Casoni 2014	Cryoprobe biopsy	69	1	1.45%
Bango-Alvarez 2017	Cryoprobe biopsy	106	0	0.00%
Dhooria 2017	Cryoprobe biopsy	128	3 (all fatal)	2.34%

Indian Journal of Surgical Oncology
https://doi.org/10.1007/s13193-022-01669-6

ORIGINAL ARTICLE

Incidental Findings in CT Scans on Screening for COVID-19

Shruti Valluri[1] · Harish Neelamraju Lakshmi[2] · Chinnababu Sunkavalli[2]



3191 TC, 277 noduli polmonari, 92 hanno richiesto follow up, 6 neoplasie

CASE REPORT Open Access

Lung cancer surgery after COVID-19 infection in a patient with severe interstitial pneumonia and restrictive ventilatory impairment

Hiroaki Komatsu*, Nobuhiro Izumi, Takuma Tsukioka, Hidetoshi Inoue, Ryuichi Ito, Satoshi Suzuki and Noritoshi Nishiyama

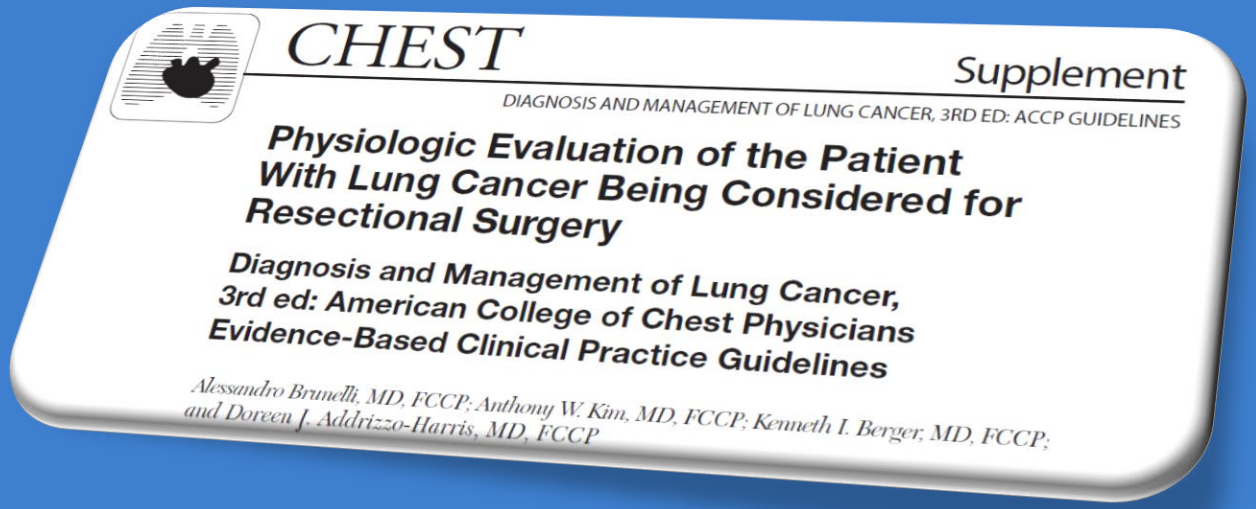
Table 1 Pulmonary function test results before and after COVID-19 infection and 6 and 12 weeks after surgery

	VC (ml)	%VC (%)	%DLco (%)
Before COVID-19 infection	2070	71.9	74.9
7 weeks after COVID-19 infection	1700	59.6	51.9
6 weeks after surgery	1500	52.6	53.1
12 weeks after surgery	1510	53.0	61.7

%VC % vital capacity, %DLco % diffusing capacity for carbon monoxide

Valutazione funzionale respiratoria e preoperatoria

- Complicanze cardio-respiratorie perioperatorie
- Disabilità e qualità della vita a lungo termine
- Aspettativa di vita e riduzione della sopravvivenza dovuta a inadeguato trattamento della neoplasia



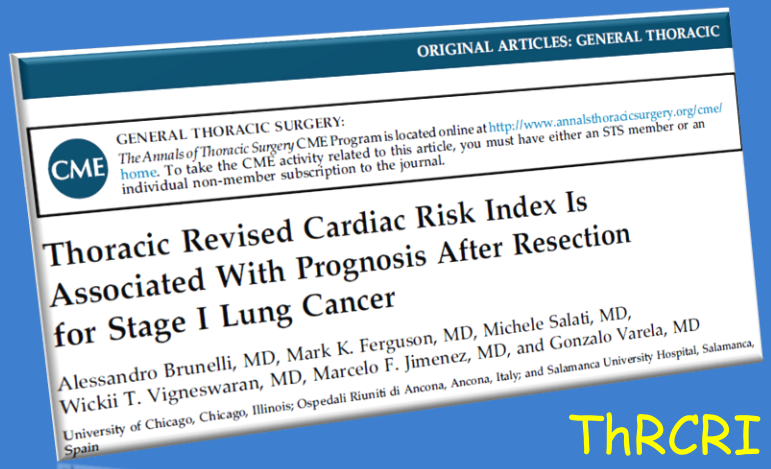
Tutti i pazienti con tumore del polmone in stadio precoce suscettibili di intervento chirurgico "curativo" dovrebbero essere considerati operabili purché correttamente valutati per il rischio perioperatorio, informati e motivati.

Stratificazione del rischio

- Età
- Comorbidità
- Rischio cardiovascolare
- Funzione polmonare
- Capacità d'esercizio
- Tipo di intervento
- Terapie alternative

Team multidisciplinare

Rischio cardiovascolare



ORIGINAL ARTICLES: GENERAL THORACIC

GENERAL THORACIC SURGERY:
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Thoracic Revised Cardiac Risk Index Is Associated With Prognosis After Resection for Stage I Lung Cancer

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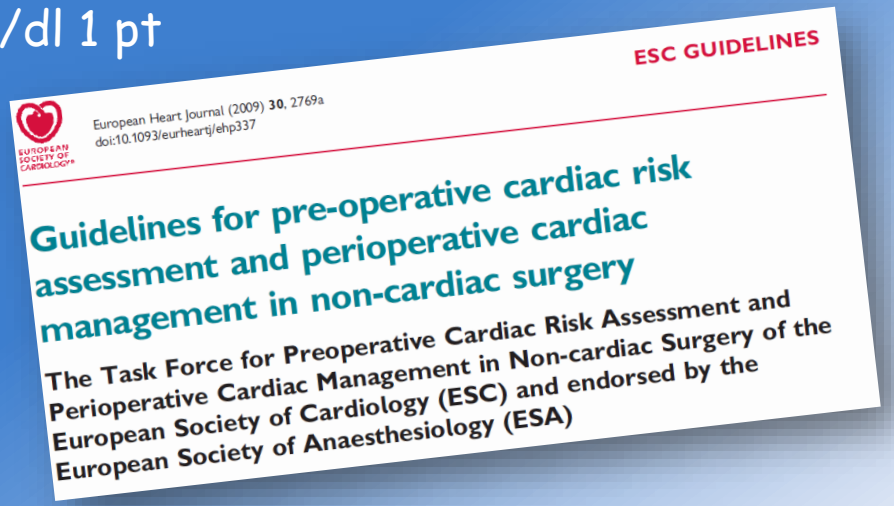
ThRCRI (thoracic Revised Cardiac Risk Index)

- Pneumonectomia 1,5 pt
- Cardiopatia ischemica 1,5 pt
- Pregresso ictus o TIA 1,5 pt
- Creatinina ≥ 2mg/dl 1 pt

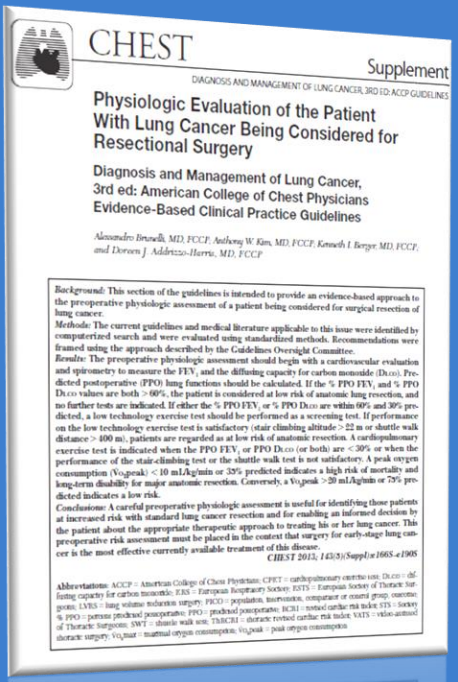


ESC GUIDELINES

European Heart Journal (2009) **30**, 2769a
doi:10.1093/eurheartj/ehp337

Guidelines for pre-operative cardiac risk assessment and perioperative cardiac management in non-cardiac surgery

The Task Force for Preoperative Cardiac Risk Assessment and Perioperative Cardiac Management in Non-cardiac Surgery of the European Society of Cardiology (ESC) and endorsed by the European Society of Anaesthesiology (ESA)



CHEST

Supplement

DIAGNOSIS AND MANAGEMENT OF LUNG CANCER, 3RD ED: ACCP GUIDELINES

Physiologic Evaluation of the Patient With Lung Cancer Being Considered for Resectional Surgery

Diagnosis and Management of Lung Cancer, 3rd ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines

Alessandro Brunelli, MD, FCCP; Anthony W. Kim, MD, FCCP; Kenneth I. Berger, MD, FCCP; and Doreen J. Addrizzo-Harris, MD, FCCP

Background: This section of the guidelines is intended to provide an evidence-based approach to the preoperative physiologic assessment of a patient being considered for surgical resection of lung cancer.

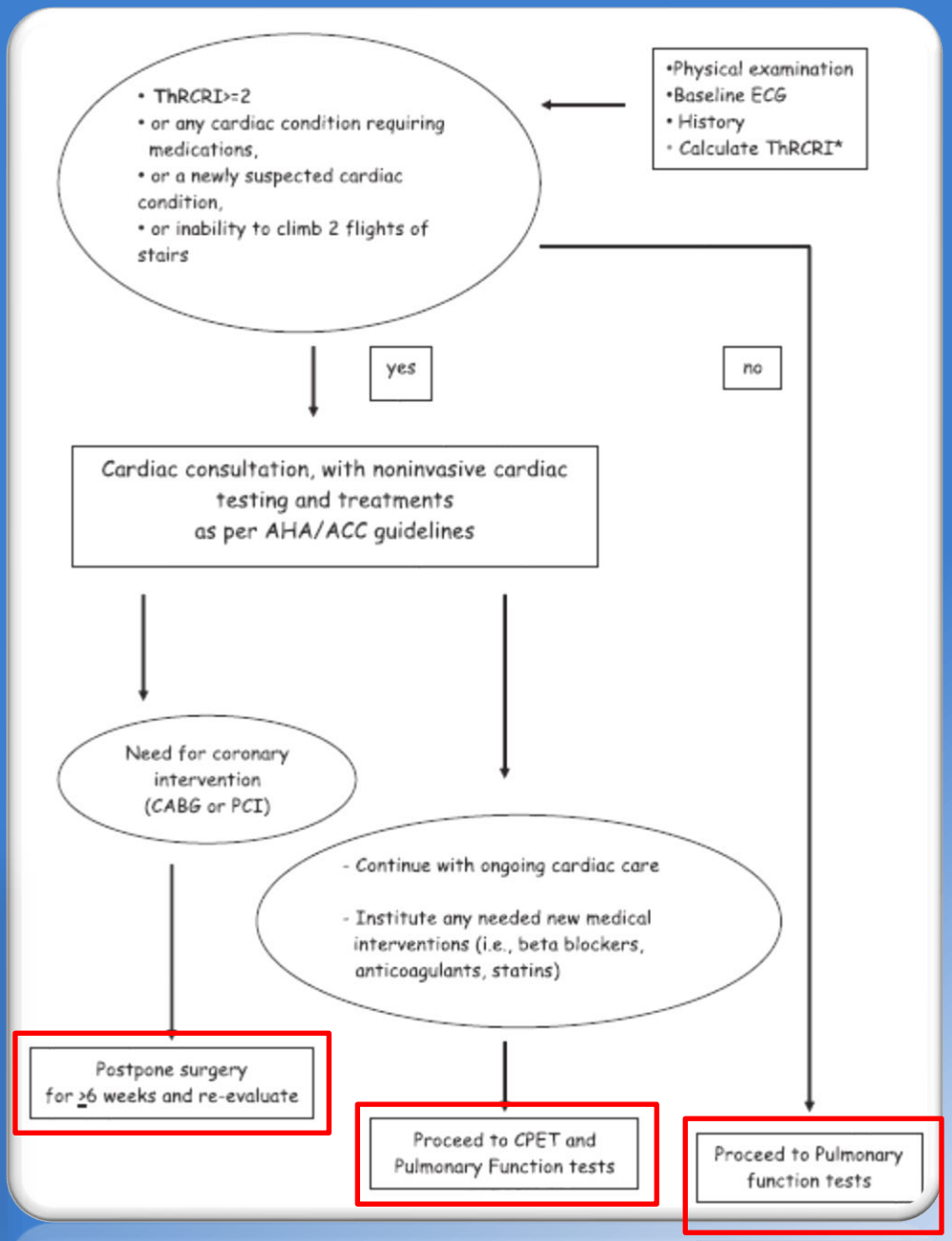
Methods: The current guidelines and medical literature applicable to this issue were identified by computerized search and were evaluated using standardized methods. Recommendations were framed using the approach described by the Guidelines Oversight Committee.

Results: The preoperative physiologic assessment should begin with a cardiovascular evaluation and spirometry to measure the FEV_1 and the diffusing capacity for carbon monoxide (D_LCO). Predicted postoperative (PPO) lung functions should be calculated. If the % PPO FEV_1 and % PPO D_LCO values are both >60%, the patient is considered at low risk of anatomic lung resection, and no further tests are indicated. If either the % PPO FEV_1 or % PPO D_LCO are within 60% and 30% predicted, a low technology exercise test should be performed as a screening test. If performance on the low technology exercise test is satisfactory (stair climbing altitude > 22 m or shuttle walk distance > 400 m), patients are regarded as at low risk of anatomic resection. A cardiopulmonary exercise test is indicated when the PPO FEV_1 or PPO D_LCO (or both) are <30% or when the performance of the stair-climbing test or the shuttle walk test is not satisfactory. A peak oxygen consumption (Vo_2peak) < 10 mL/kg/min or 35% predicted indicates a high risk of mortality and long-term disability for major anatomic resection. Conversely, a Vo_2peak >20 mL/kg/min or 75% predicted indicates a low risk.

Conclusions: A careful preoperative physiologic assessment is useful for identifying those patients at increased risk with standard lung cancer resection and for enabling an informed decision by the patient about the appropriate therapeutic approach to treating his or her lung cancer. This preoperative risk assessment must be placed in the context that surgery for early-stage lung cancer is the most effective currently available treatment of this disease.

CHEST 2013; 143(5)(Suppl):e166S–e190S

Abbreviations: ACCP = American College of Chest Physicians; CPET = cardiopulmonary exercise test; D_LCO = diffusing capacity for carbon monoxide; ERS = European Respiratory Society; ESTS = European Society of Thoracic Surgeons; LVRS = lung volume reduction surgery; PICO = population, intervention, comparator or control group, outcome; % PPO = percent predicted postoperative; PPO = predicted postoperative; RCRI = revised cardiac risk index; STS = Society of Thoracic Surgeons; SWT = shuttle walk test; ThRCRI = thoracic revised cardiac risk index; VATS = video-assisted thoracic surgery; Vo_2max = maximal oxygen consumption; Vo_2peak = peak oxygen consumption



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Funzionalità polmonare

Spirometria

FEV1

- Basso rischio se >60%
- Alto rischio se < al 30%

DLCO

- Miglior predittore di mortalità e di qualità della vita a lungo termine
- Il 40% dei pazienti con FEV1 normale hanno una DLCO <80%

Ospedale Classificato Equiparato
Sacro Cuore - Don Calabria
Presidio Ospedaliero Accreditato - Regione Veneto
FISIOPATOLOGIA RESPIRATORIA - ENDOSCOPIA TORACICA
Dr. Carlo Pomari

Spirometria Globale e Capacità Diffusiva Polmonare

	Teor	Pre	Pre /Teor	Post	Post /Teor	Post Chg...
FVC	4.46	4.36	98	4.48	100	97
FEV1	3.58	3.03	84	3.19	89	95
FEV1%F	77.92	69.32	89	71.31	92	97
FEV1%M	82.68	69.32	84			
PEF	8.74	7.49	86	7.41	85	101
MFEF	3.90	1.77	45	2.10	54	84
FIV1		1.18		3.34		35
FE%FIF						
ISOFEF		1.77		2.45		72
VC	4.64	4.36	94			
IC	3.17	1.99	63			
ERV	1.59	2.26	142			
TLC	6.98	6.61	95			
RV	2.21	2.25	102			
RV%TLC	34.09	33.99	100			
ITGV	3.49	4.62	133			
R tot	0.30	0.32	108			
sGRaw	0.85	1.34	158			
DLCO_SB	10.13	5.38	53			
DLCOcSB	10.16	5.28	52			
VA_SB	6.98	5.55	79			
KCO	1.45	0.97	67			
KCOc	1.45	0.95	65			
IC_SB	3.37					
TLC-SB	6.98					
RV-SB	2.20	1.42	65			
RV%TLC	34	26	76			
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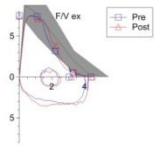
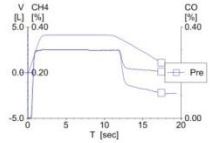
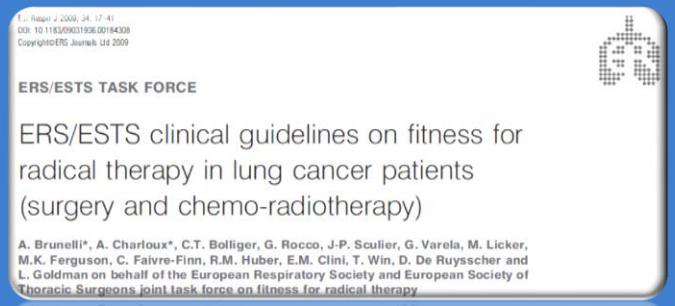




INTERPRETAZIONE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ERS/ESTS TASK FORCE

ERS/ESTS clinical guidelines on fitness for radical therapy in lung cancer patients (surgery and chemo-radiotherapy)

A. Brunelli*, A. Charloux*, C.T. Bolliger, G. Rocco, J-P. Sculier, G. Varela, M. Licker, M.K. Ferguson, C. Faivre-Finn, R.M. Huber, E.M. Clini, T. Win, D. De Ruysscher and L. Goldman on behalf of the European Respiratory Society and European Society of Thoracic Surgeons joint task force on fitness for radical therapy

FEV1 >2L pneumonectomia
FEV1 >1,5L lobectomia

Chirurgia

SI

FEV1 e DLCO >80%

NO

ppoFEV1
ppoDLCO

Lobectomia

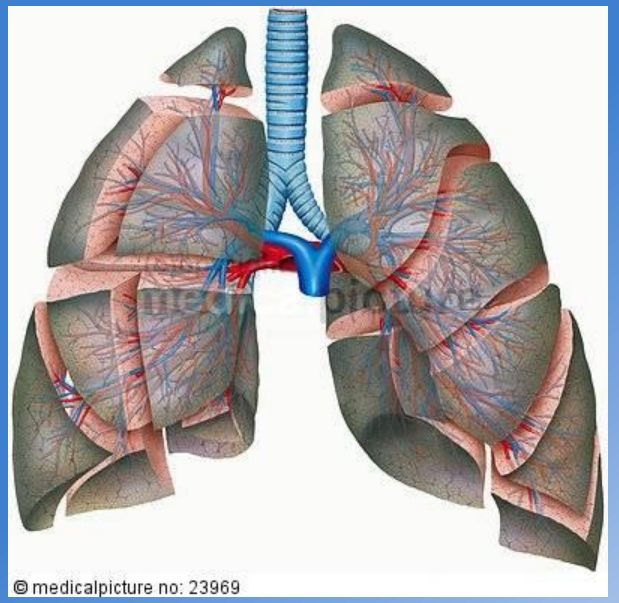
Metodo anatomico

- ppoFEV1= preFEV1 x (1-a/b)
- ppoDLCO= preDLCO x (1-a/b)

a= n° di segmenti non ostruiti da asportare
b= n° totale di segmenti

19 segmenti polmonari totali

- 10 polmone dx
  - 3 lobo superiore
  - 2 lobo medio
  - 5 lobo inferiore
- 9 polmone sx
  - 5 lobo superiore e lingula
  - 4 lobo inferiore



Amputazione funzionale conseguente ad intervento di chirurgia toracica

- segmentectomia 5 - 10 %
- lobectomia superiore 20 - 25 %
- lobectomia inferiore 30 - 35 %
- pneumonectomia 50 %

Capacità di esercizio

Test a "bassa tecnologia"

- Test del cammino nei 6 minuti (6MWT)
- Shuttle test
- Stair climbing

Test ad "alta tecnologia"

- Test da sforzo cardiopolmonare (CPET)

6MWT

- Non standardizzato
- Scarsa correlazione con le complicanze post-operatorie
- Attualmente non raccomandato nella valutazione preoperatoria

Shuttle test

- Basso rischio se distanza > 400mt o 25 shuttles
- Tende a sottostimare la capacità di esercizio

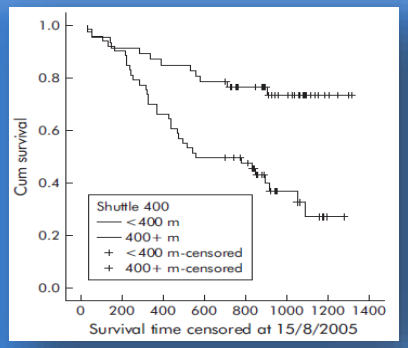
Stair climbing

- 3 rampe FEV1> 1,5L, 5 rampe FEV1> 2L
- Altezza >22mt basso rischio
- altezza <12mt alto rischio

LUNG CANCER

Comparison of shuttle walk with measured peak oxygen consumption in patients with operable lung cancer

T Win, A Jackson, A M Groves, L D Sharples, S C Charman, C M Laroche



Performance at Symptom-Limited Stair-Climbing Test is Associated With Increased Cardiopulmonary Complications, Mortality, and Costs After Major Lung Resection

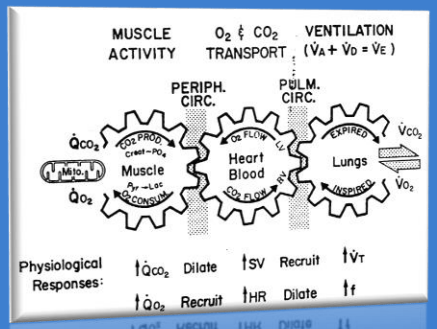
Alessandro Brunelli, MD, Majed Refai, MD, Francesco Xiumé, MD, Michele Salati, MD, Valeria Sciarra, MD, Laura Socci, MD, and Armando Sabbatini, MD

Unit of Thoracic Surgery, Umberto I Regional Hospital, Ancona, Italy

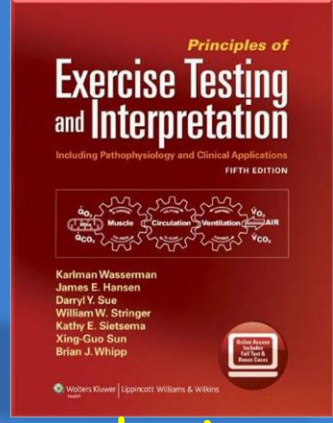
Table 4. Morbidity, Mortality, Postoperative Stay, and Costs Stratified by Height Reached at Stair-Climbing Test

Outcome Measures[a]	<12 m (n = 54)	12–22 m (n = 294)	>22 m (n = 292)	*p* Value
Mortality	7 (13)	11 (3.7)	3 (1)	<0.0001[b]
Cardiopulmonary morbidity	20 (37)	84 (29)	46 (16)	<0.0001[c]
Post-op hospital stay, days	10.9 ± 10.8	9.4 ± 6	8.2 ± 4	<0.0001[d]
Post-op costs, $	7012 ± 18,000	3591 ± 6400	2838 ± 2550	<0.0001[d]

[a] Continuous data are expressed as means ± standard deviations; categoric data as number (%). [b] Fisher's exact test. [c] χ^2 test. [d] Analysis of variance.



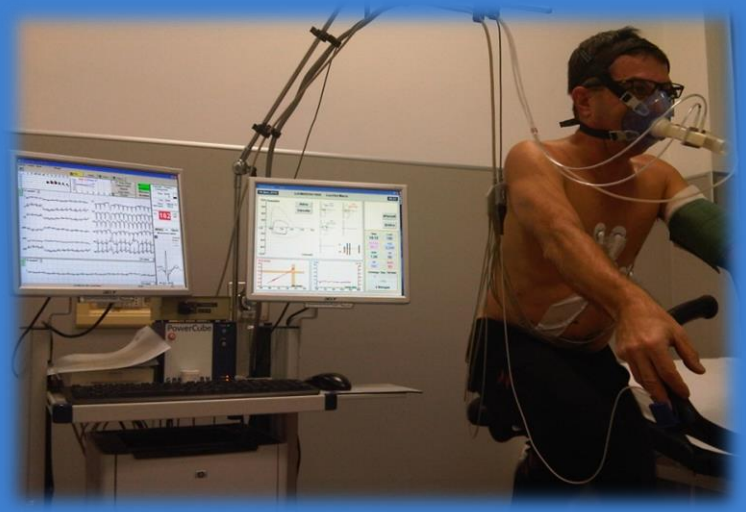
CPET

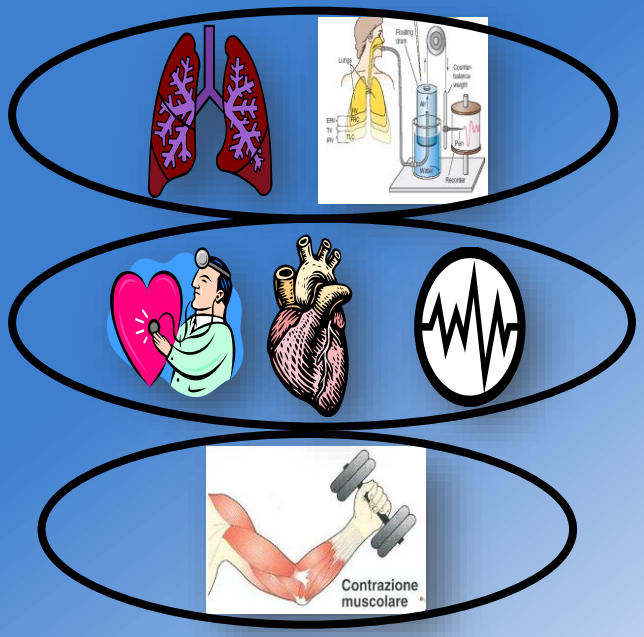


Metodica non invasiva ad alta complessità ed alta tecnologia

- Consente una valutazione integrata di tutti gli organi ed apparati coinvolti nell'adattamento allo sforzo fisico

- Fornisce informazioni spesso non derivabili dai tests funzionali a riposo





CPET e valutazione preoperatoria

Valutazione del rischio cardiovascolare

- Polso di O2
- ECG

VO2picco

- Consumo di ossigeno del soggetto al picco dell'esercizio
- Basso rischio se VO2picco >20ml/kg/min o >75% del predetto
- Alto rischio se VO2picco <10ml/kg/min o <35% del predetto

Altri parametri

- VE/VCO2
- DLCO durante lo sforzo

Minute Ventilation-to-Carbon Dioxide Output ($\dot{V}_E/\dot{V}_{CO_2}$) Slope Is the Strongest Predictor of Respiratory Complications and Death After Pulmonary Resection

Alessandro Brunelli, MD, Romualdo Belardinelli, MD, Cecilia Pompili, MD, Francesco Xiumé, MD, Majed Refai, MD, Michele Salati, MD, and Armando Sabbatini, MD

Algoritmi diagnostici

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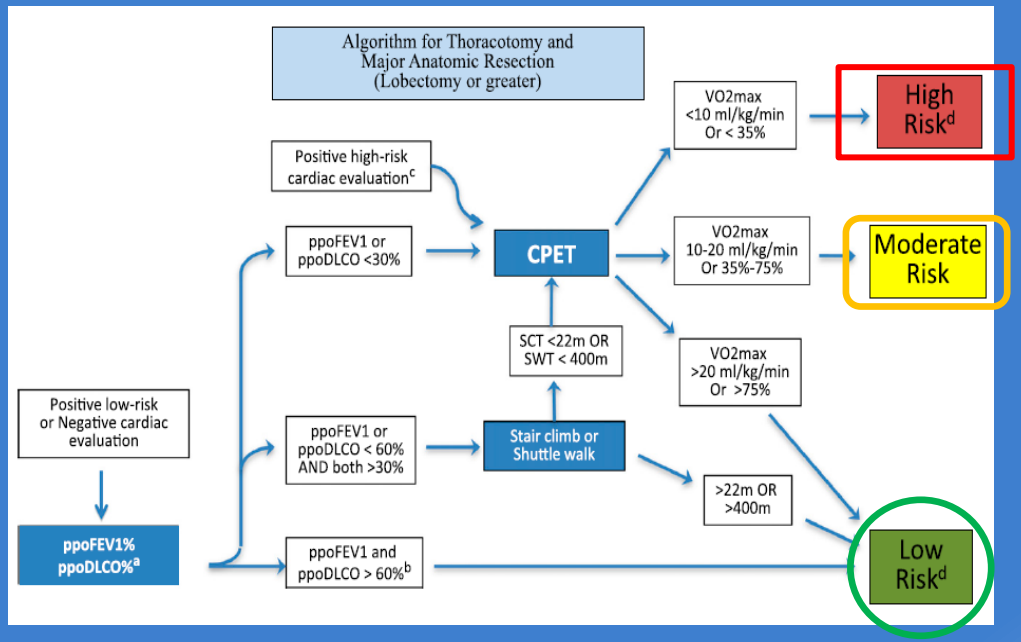

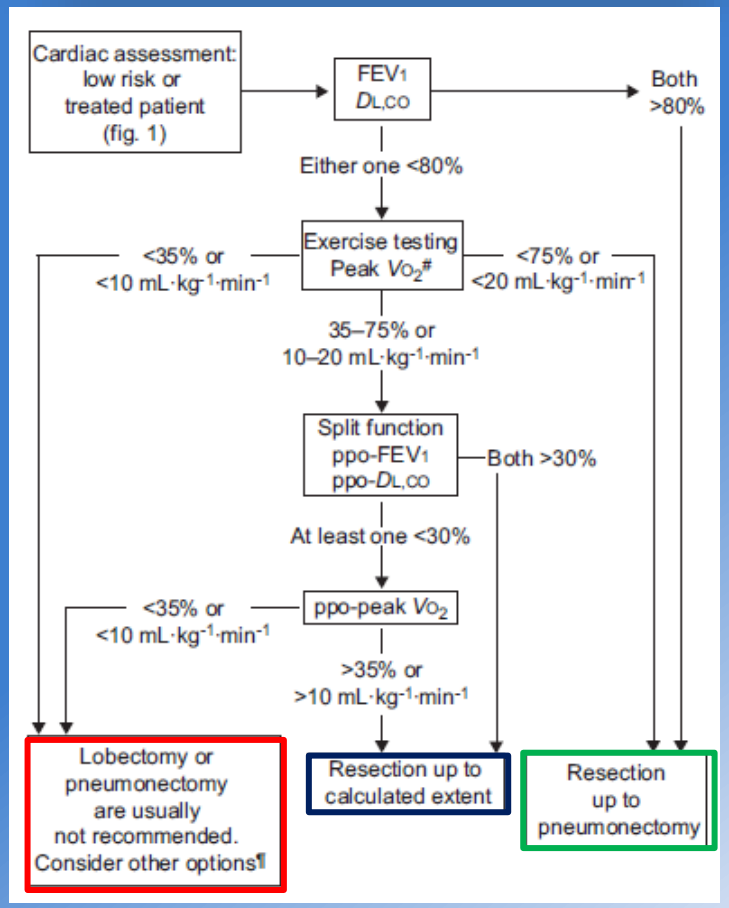


Grazie per
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