CRITERI RECIST E IMAGING

Negrar 11 ottobre 2017

L. ROMANO – E. DEMOZZI

CRITERI RECIST 1.1

- Tecnica standardizzata per la misura dei Tumori
- Scopo: garantire l'obiettività e ridurre la variabilità inter-osservatore
- Strumento per confrontare risultati di studi differenti
- **Linguaggio Comune a livello internazionale**

- **R**ESPONSE
- **E**VALUATION
- **C**RITERIA
- **I**N
- **S**OLID
- **T**UMORS

•*Sono utilizzati per la valutazione della risposta sui tumori solidi negli studi clinici*

•*Permettono registrazione delle variazioni dimensionali dei T.primitivi e delle Metastasi*
•*per valutare l'attività delle terapie CT*

•***1979*** *formulata dal WHO la prima versione*
•***2000*** *Recist 1.0*
•***2009*** *Recist 1.1*

Revised RECIST Guideline Version 1.1: What Oncologists Want to Know and What Radiologists Need to Know

Mizuki Nishino[1]
Jyothi P. Jagannathan
Nikhil H. Ramaiya
Annick D. Van den Abbeele

OBJECTIVE. The objectives of this article are to review the new Response Evaluation Criteria in Solid Tumors (RECIST) guideline, version 1.1, highlighting the major changes in the new version compared with the original RECIST guideline (version 1.0), and to present case examples with representative imaging.

CONCLUSION. Familiarity with the revised RECIST is essential in day-to-day oncologic imaging practice to provide up-to-date service to oncologists and their patients. Some of the changes in the revised RECIST affect how radiologists select, measure, and report target lesions.

Eur Radiol (2010) 20: 1456–1467
DOI 10.1007/s00330-009-1685-y

ONCOLOGY

Els L. van Persijn van Meerten
Hans Gelderblom
Johan L. Bloem

RECIST revised: implications for the radiologist. A review article on the modified RECIST guideline

I CRITERI RECIST1.1

✓Stesso metodo di valutazione

✓Stesso tipo di esame per la Valutazione Basale

✓Valutazione Basale eseguita più vicino possibile all'inizio CT (non più di 4 wks)

✓Follow-up

I CRITERI RECIST

METODI DI VALUTAZIONE

- TC Metodica più accurata e riproducibile
- RMN Può essere usata ma ha diversi parametri di acquisizione che possono incidere sulle misurazioni.
- RMN non applicabile sul torace

I CRITERI RECIST

METODI DI VALUTAZIONE

- RX Torace solo per lesioni ben definite e circondate da parenchima areato

- Lesioni superficiali solo per diametro superiore a 10mm e misurate con regolo

- Ecografia non utilizzabile

I CRITERI RECIST

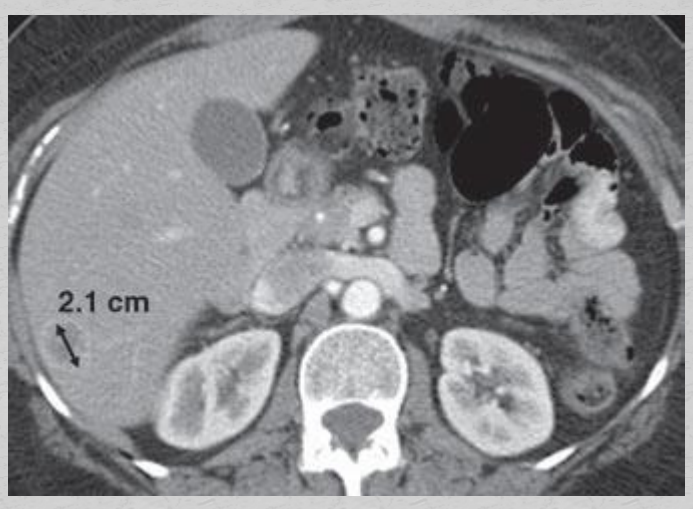
METODI DI VALUTAZIONE

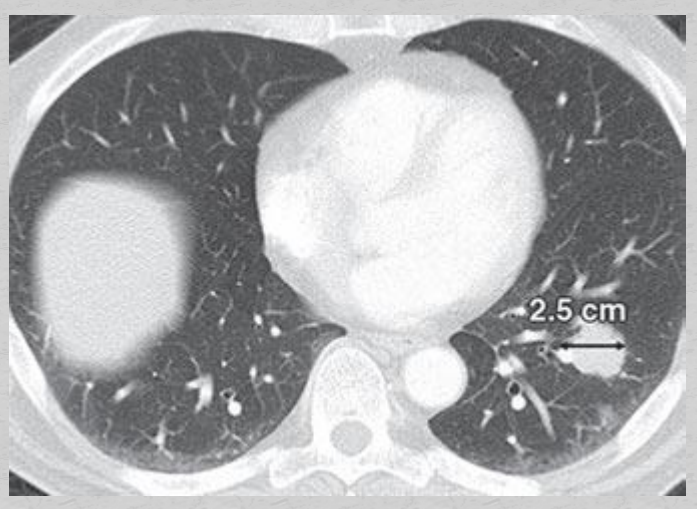
- Markers tumorali non possono essere utilizzati nella valutazione della risposta
- Esami isto-patologici utilizzati in rari casi
- Teciche endoscopiche non consigliate

METODI DI VALUTAZIONE

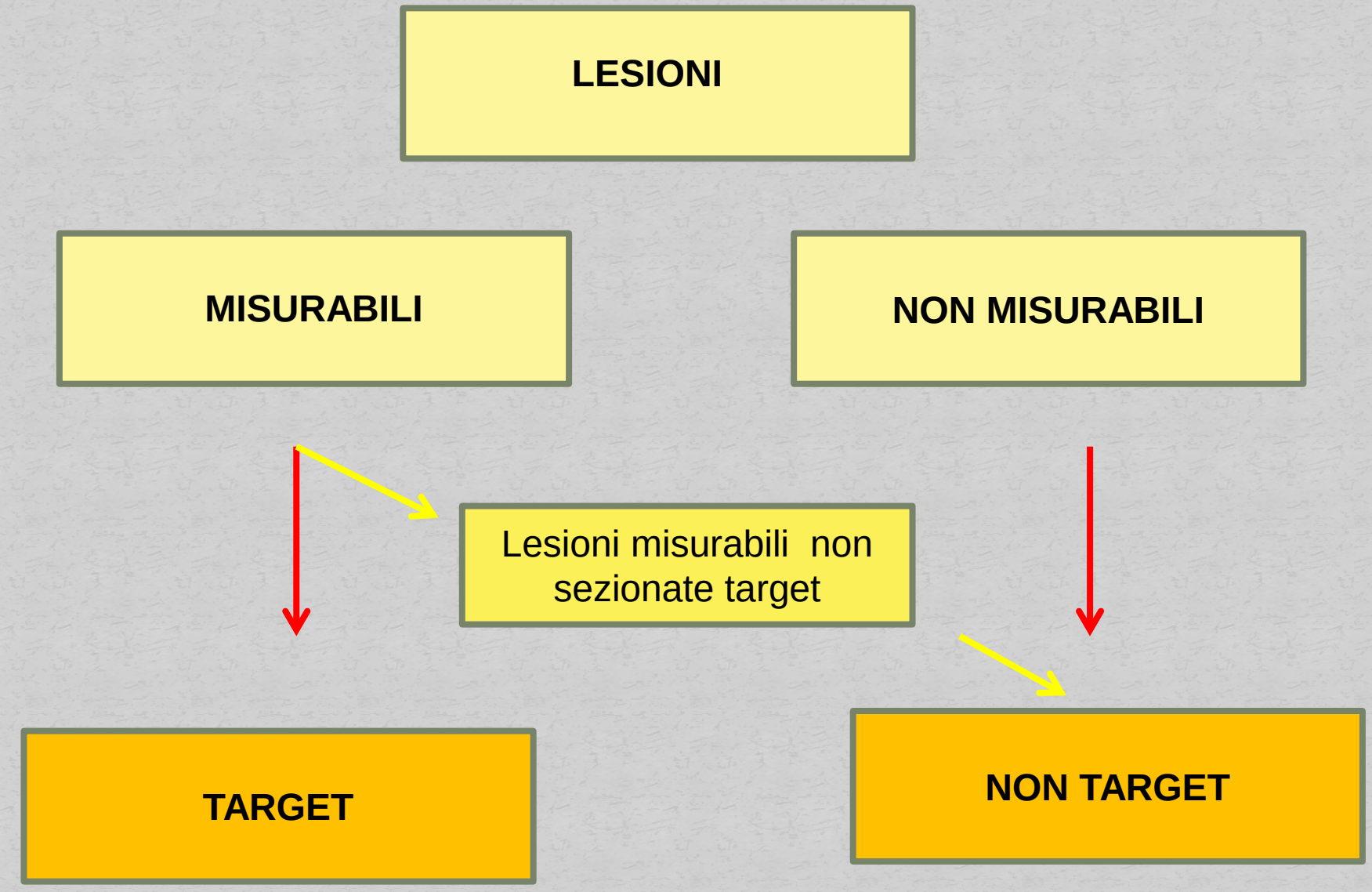
TC Metodica più accurata e riproducibile

- Sempre dopo infusione di m.d.c. anche per il follow-up
- per diatesi allergica TC senza m.d.c. o RMN



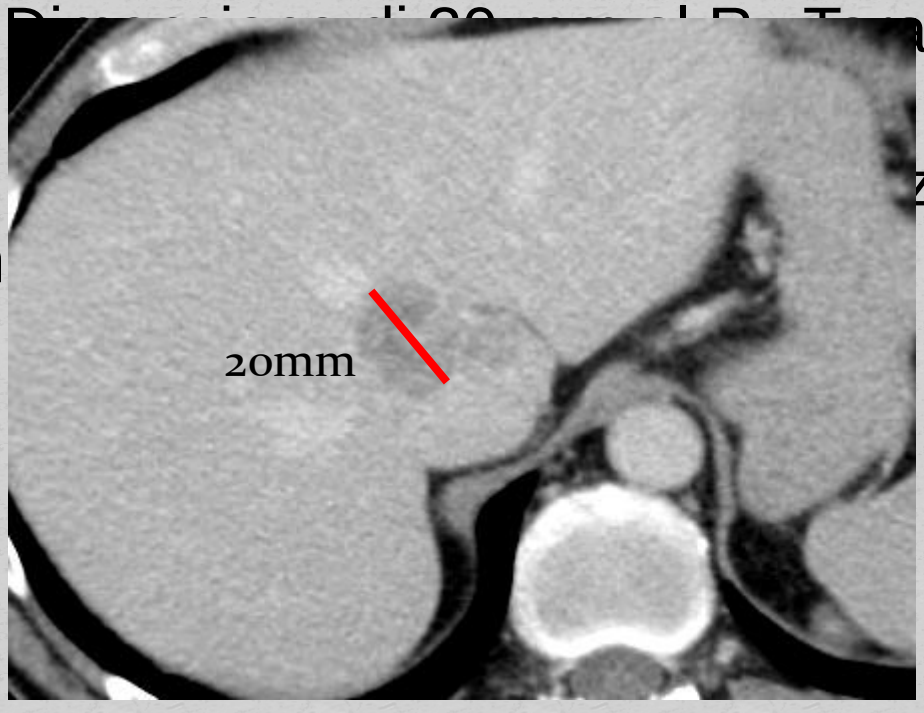


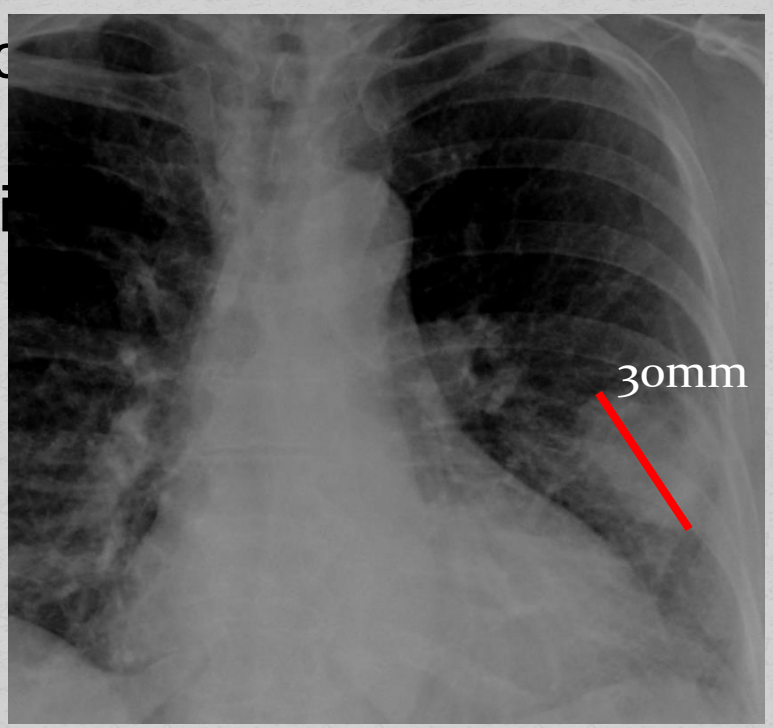
METODI DI VALUTAZIONE



LESIONI MISURABILI

- Misurazione del diametro maggiore della lesione
- Dimensione minima di 10 mm con spessore di ricostruzione non superiore a 5mm
- [illegible]
- [illegible]

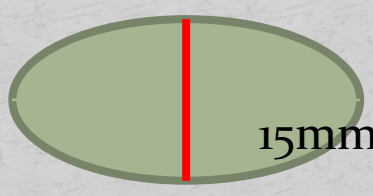


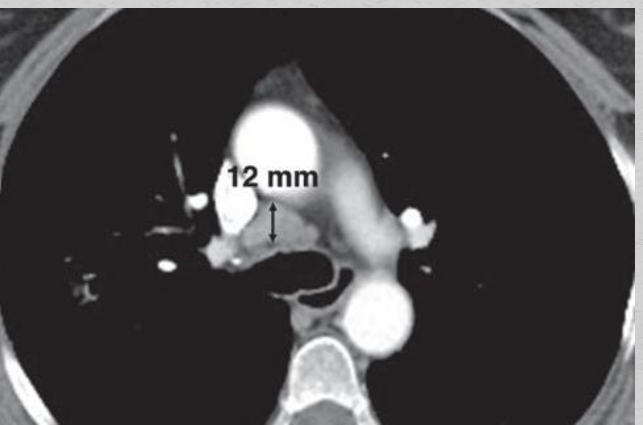


LESIONI MISURABILI

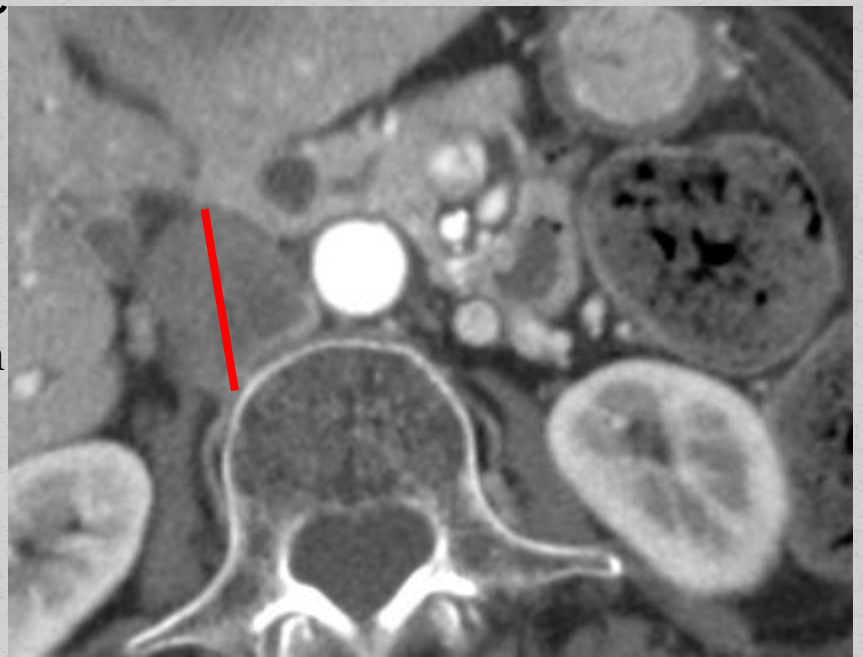
- Linfonodi patologici considerati tali quelli con diametro minore ≤ 15mm

- Sia al controllo basale che al follow-up misurato il diametro inferiore



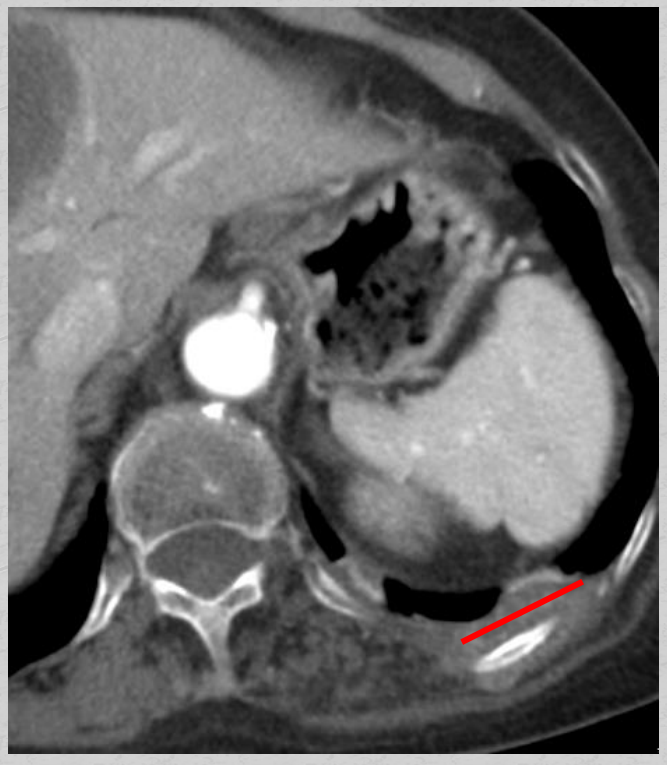


27mm



LESIONI MISURABILI

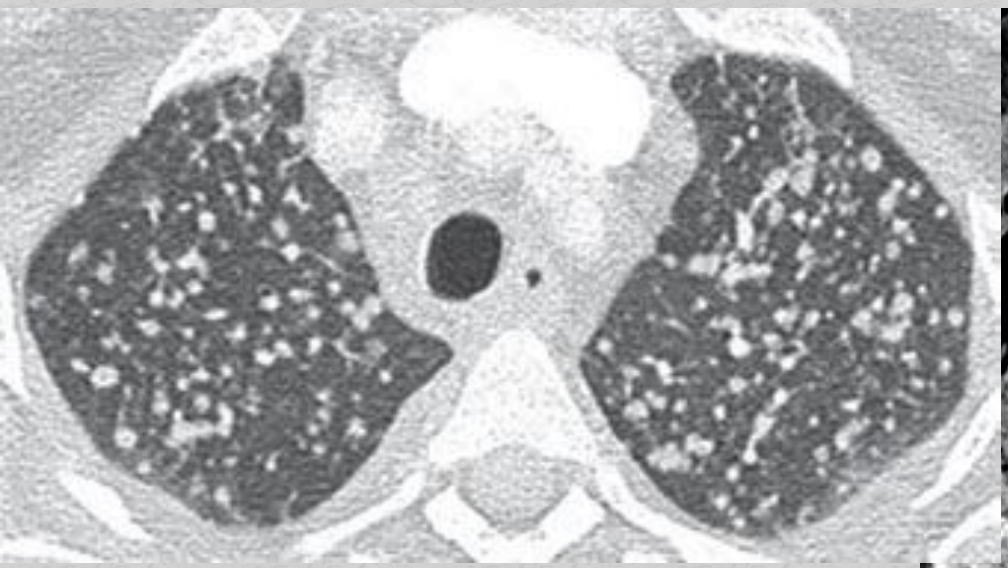
- Lesioni ossee o miste (litico-blastiche) con coinvolgimento dei tessuti molli che possa essere valutata secondo i criteri di misurabilità .

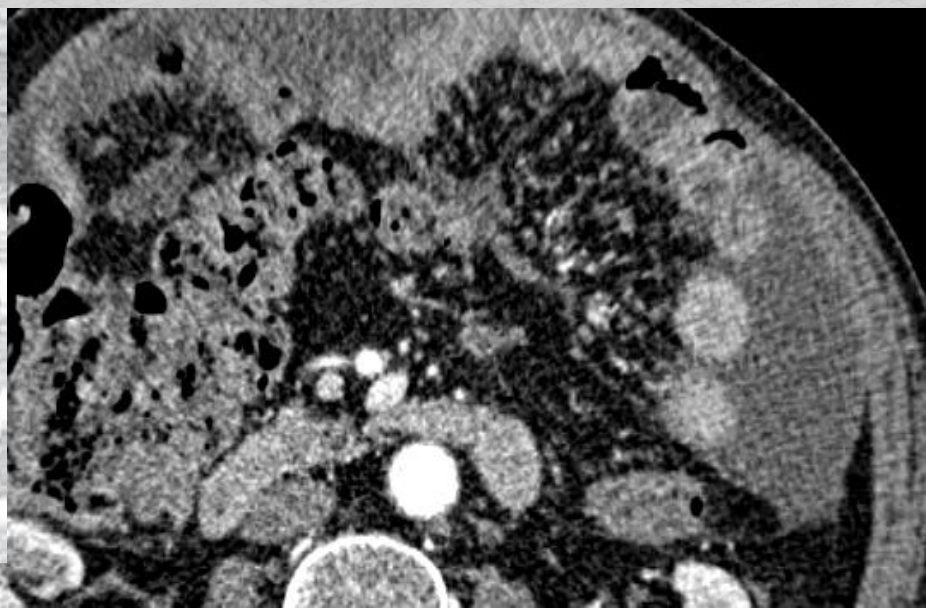


- Lesioni cistiche ritenute metastasi possono essere considerate se misurabili

LESIONI NON MISURABILI

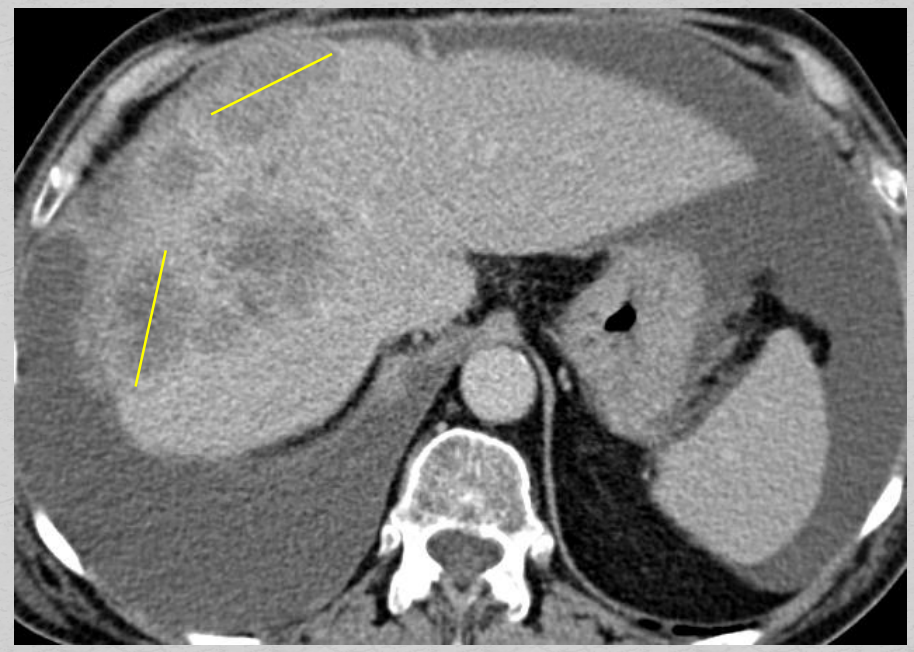
- Tutte le lesioni piccole e i linfonodi patologici con diametro minore ≤ 15mm
- Lesioni leptomeningee,ascite e versamento pleurico
- Lesioni solo ossee
- Lesioni già trattate a meno che non in progressione





LESIONI TARGET

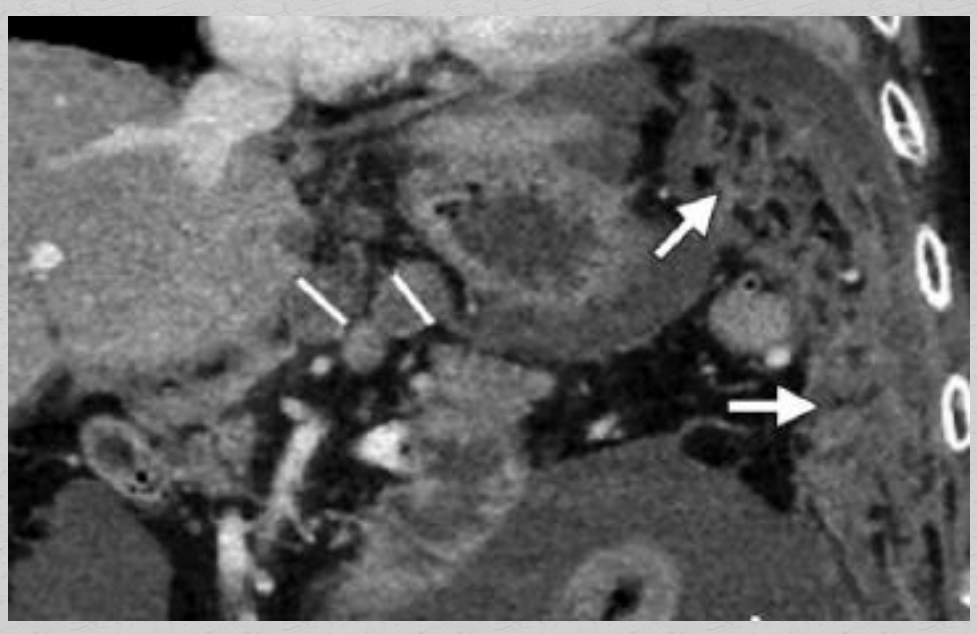
- Tutte le misurabili fino a un max di 2 x organo e 5 in totale x tutti gli organi
- Selezionate in base alle dimensioni (diametro max lungo)
- La somma dei diametri di tutte le lesioni Target compresi i Lnf calcolata per la **valutazione basale**



LESIONI NON TARGET

- Tutte le lesioni non Target devono essere registrate alla **valutazione basale**

- La loro misura non è necessaria e vanno descritte come presenti o assenti o in progressione



CRITERI DI RISPOSTA

RISPOSTA COMPLETA: scomparsa di tutte le lesioniTarget. Tutti i LNF patologici con diametro inferiore < a 10mm

RISPOSTA PARZIALE :almeno una diminuizione del 30% nella somma dei Ɵ delle lesioni Target alla valutazione basale

MALATTIA STABILE: riduzione o aumento nella somma dei Ɵ insufficente per definirsi risposta parziale

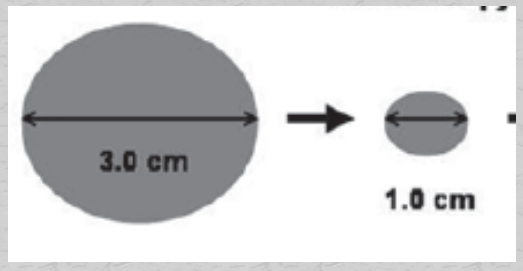
PROGRESSIONE DI MALATTIA:aumento del 20 % nella somma dei Ɵ delle lesioni Target alla valutazione basale

CRITERI DI RISPOSTA

LESIONI TARGET

- Per i LNF Target riportare la misura del Θ minore anche se < a 10mm

Esame base *Follow-up*



- Se le lesioni Target diventano troppo piccole si assegna Θ 5 mm

- Per lesioni che si frammentano calcolare i Θ maggiori di ogni frammento

CRITERI DI RISPOSTA

LESIONI NON TARGET

- *RISPOSTA COMPLETA*: scomparsa di tutte le lesioni non Target.Normalizzazione dei Markers tumorali se valutati Tutti i LNF patologici con diametro inferiore < a 10mm

- NON RC/ NON PD: persistenza di una o più lesioni non Target e/o markers alterati

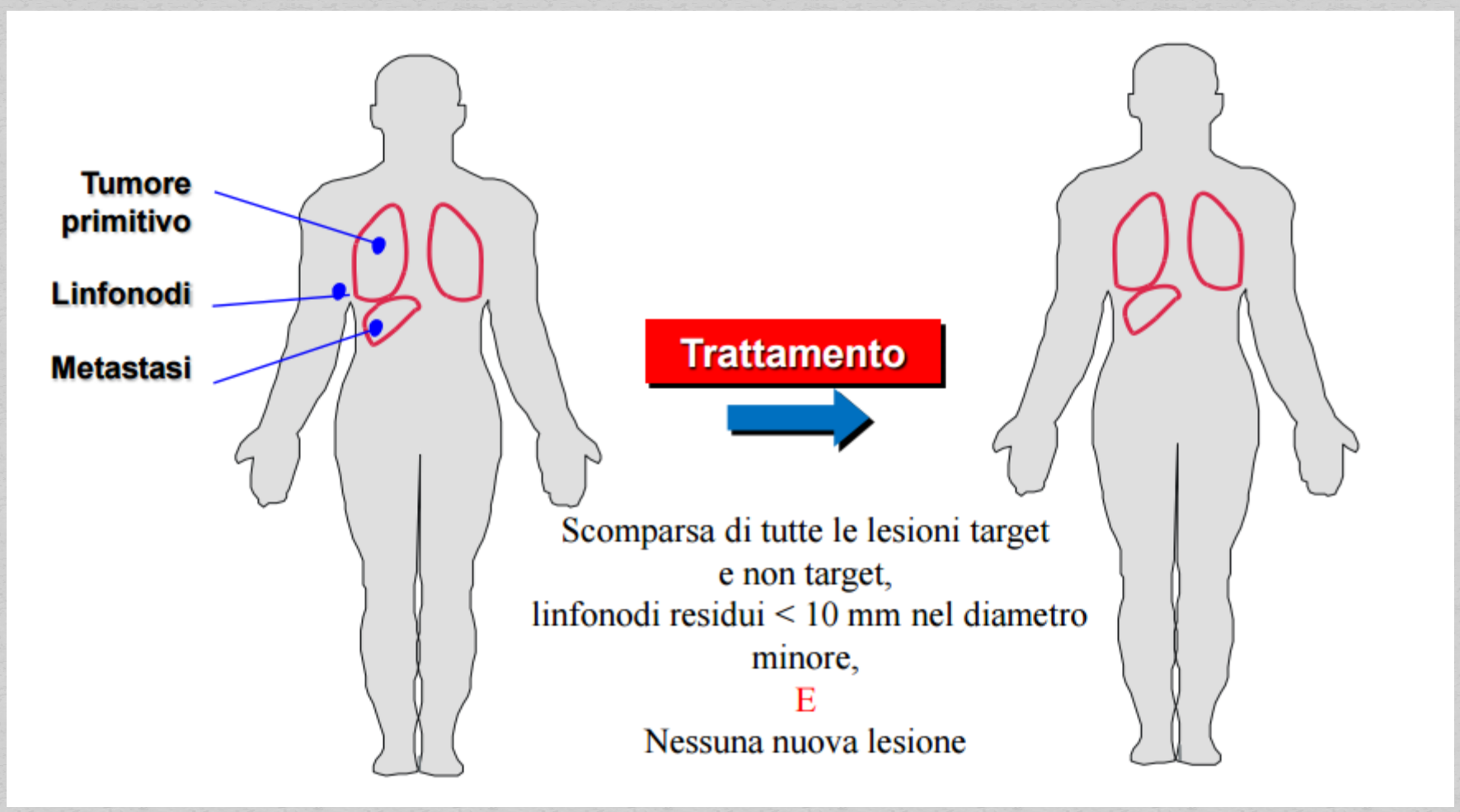
- PROGRESSIONE DI MALATTIA :incremento lesioni non Target

CRITERI DI RISPOSTA

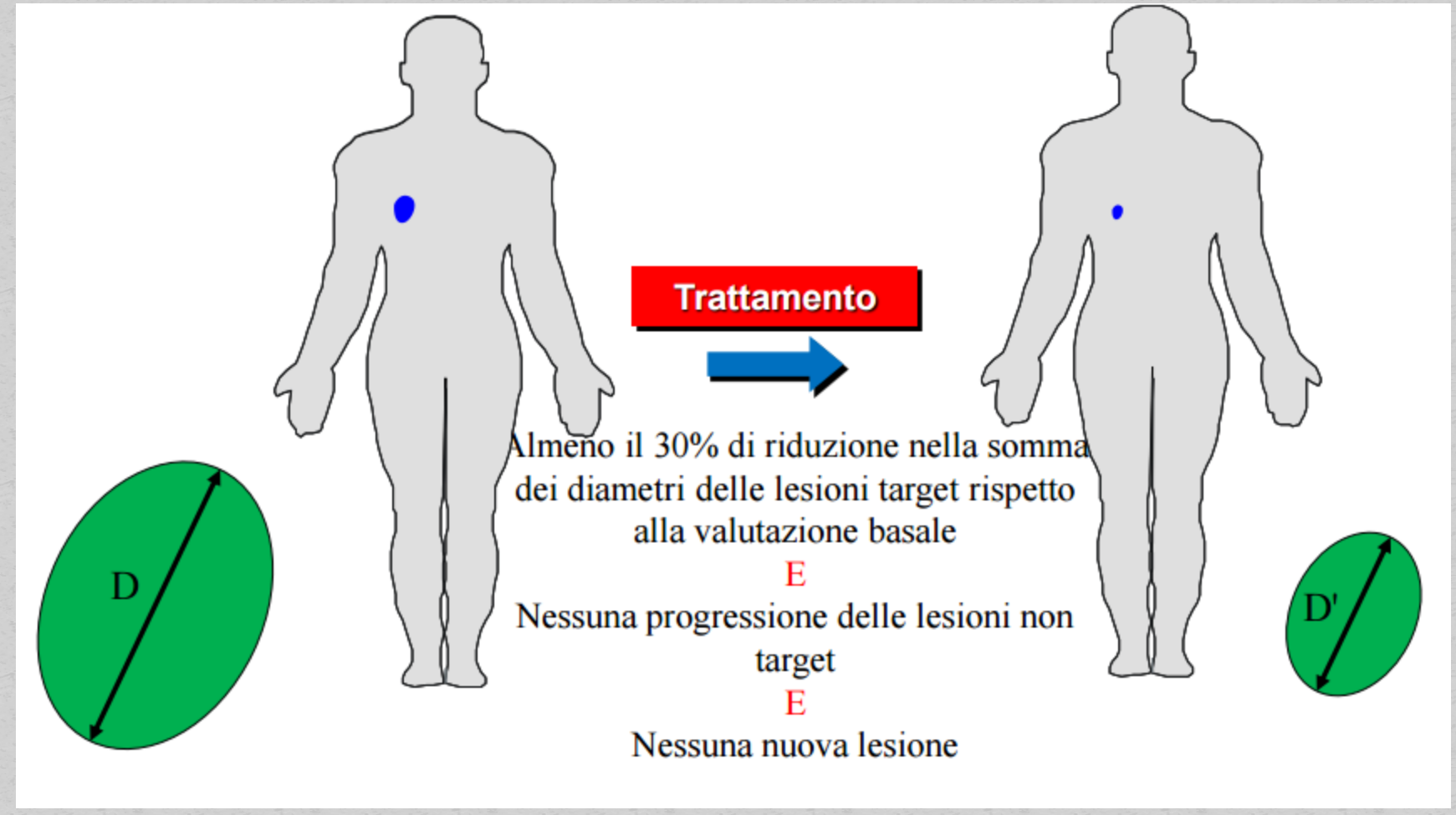
NUOVE LESIONI:PROGRESSIONE DI MALATTIA

- L’identificazione di nuove lesione deve essere inequivocabile . Diagnosi differenziale con altre patologie.
- Per lesione dubbia (es. dimensioni ridotte) continuare la terapia e valutare l’evoluzione
- Una lesione identificata nei follow-up in una sede anatomica non studiata alla valutazione globale è una nuova lesione

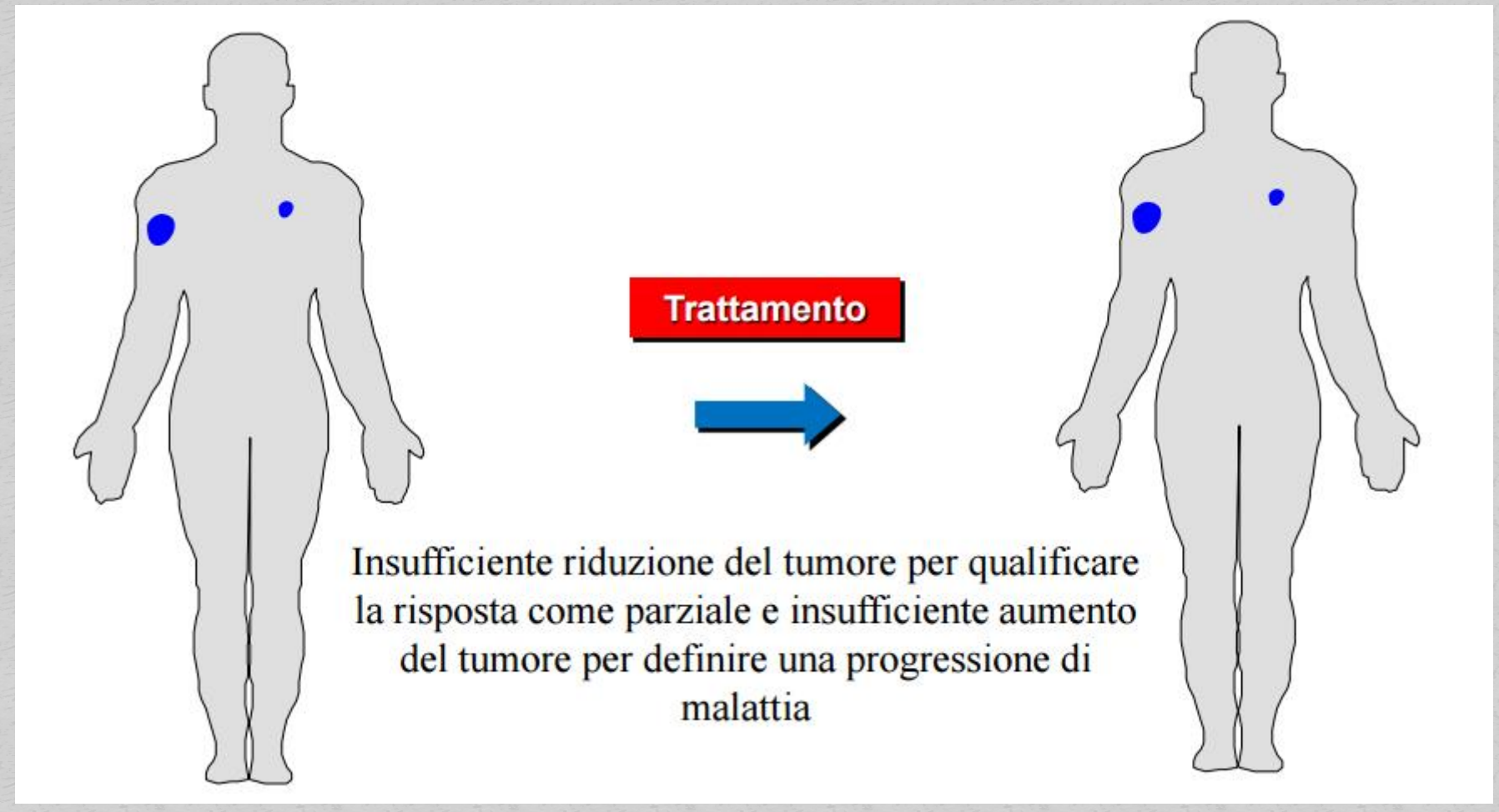
RISPOSTA COMPLETA



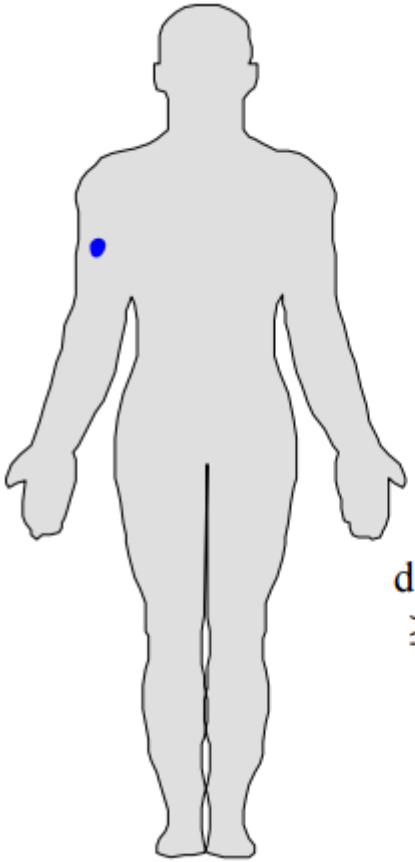
RISPOSTA PARZIALE



STABILITA’ DI MALATTIA



PROGRESSIONE DI MALATTIA



Trattamento

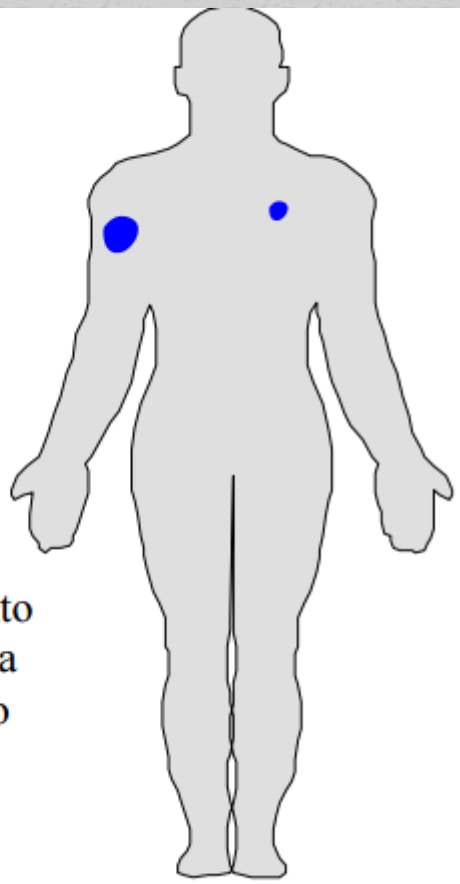
Almeno 20% di aumento nella somma dei diametri delle lesioni target, E aumento assoluto ≥ 5 mm nella somma dei diametri, relativi alla somma più piccola dall'inizio del trattamento

OPPURE

Progressione delle lesioni non target

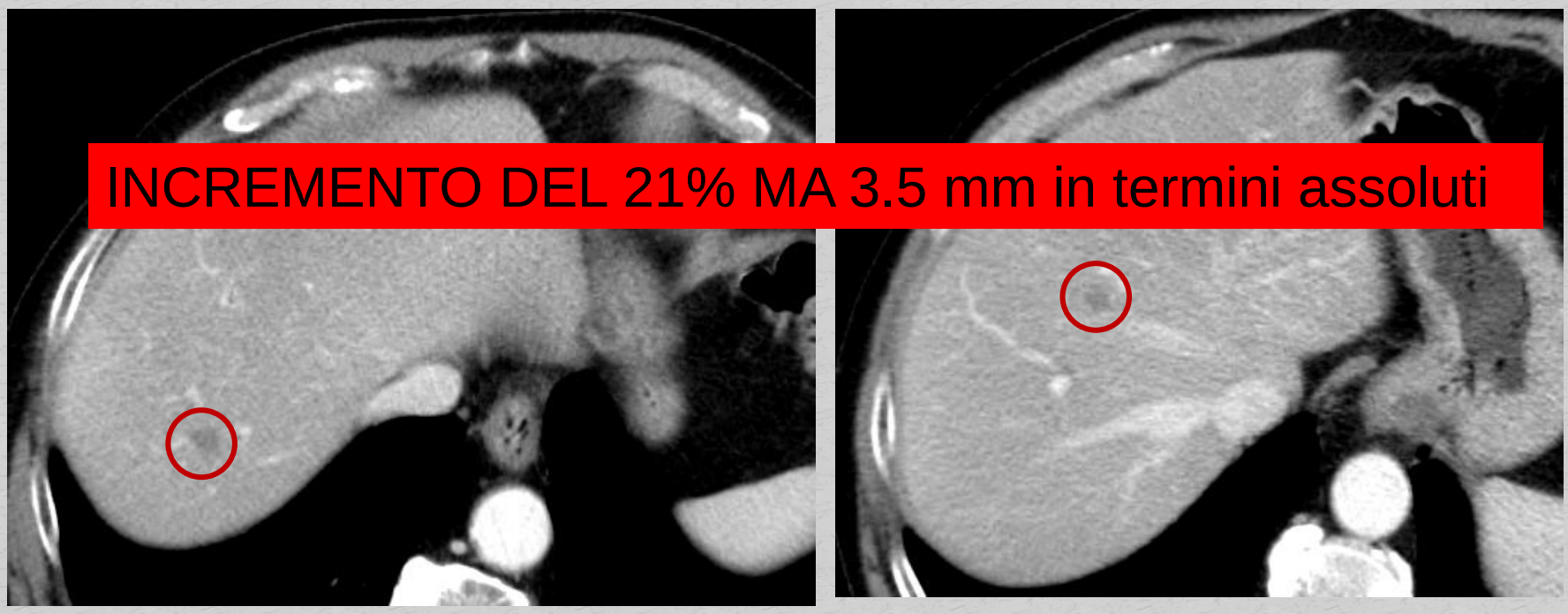
OPPURE

Nuova lesione

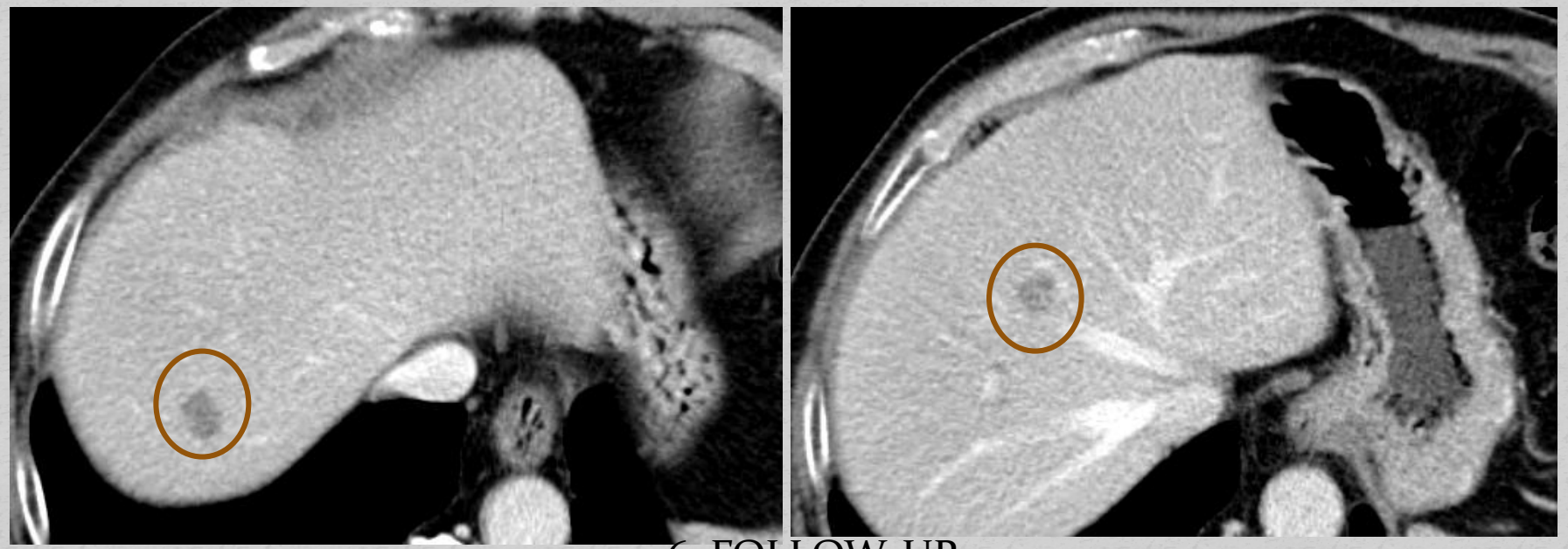


Summary of Key Changes for WHO, RECIST 1.0, and RECIST 1.1 Criteria

Criterion	WHO	RECIST 1.0	RECIST 1.1
Definition of "measurable" lesions	Should be measurable in two dimensions, no minimum lesion size	Minimum size = 10 mm at spiral CT, 20 mm at conventional CT	Minimum size = 10 mm at CT
Method of measurement	SPD	Longest diameter	Longest diameter (except in lymph nodes)
Lymph nodes	Unspecified	Unspecified	Short axis: target lesions ≥15 mm, nontarget lesions = 10–15 mm, nonpathologic lesions <10 mm
Definition of progressive disease	≥25% increase in SPD	20% increase in SLD or new lesions, unequivocal progression considered to indicate progressive disease	>20% increase in SLD; ≥5-mm increase in size; new lesions; detailed description of unequivocal progression
Number of lesions measured	N/A	10 lesions (≤5 in any one organ)	Five lesions (≤2 in any one organ)
New lesions	N/A	N/A	Provides guidance as to when a lesion is considered new (ie, representative of progressive disease)
Guidance for imaging studies	N/A	CT, MRI, chest radiography	CT, MRI, FDG PET



17-6-2016 ESAME BASALE



27-9-2016 FOLLOW-UP

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RadioGraphics

Response Criteria in Oncologic Imaging: Review of Traditional and New Criteria[1]

Temel Tirkes, MD • Margaret A. Hollar, DO • Mark Tann, MD • Marc D. Kohli, MD • Fatih Akisik, MD • Kumaresan Sandrasegaran, MD

ONLINE-ONLY SA-CME

See www.rsna.org/education/search/RG

LEARNING OBJECTIVES

After completing this journal-based SA-CME activity, participants will be able to:

- Discuss imaging for the assessment of tumor response in oncology patients.
- List the criteria that would be most accurate for different tumor types.
- Describe tumor response to treatment on the basis of specific criteria.

TEACHING POINTS

See last page

There has been a proliferation and divergence of imaging-based tumor-specific response criteria over the past 3 decades whose purpose is to achieve objective assessment of treatment response in oncologic clinical trials. The World Health Organization (WHO) criteria, published in 1981, were the first response criteria and made use of bidimensional measurements of tumors. The Response Evaluation Criteria in Solid Tumors (RECIST) were created in 2000 and revised in 2009. The RECIST criteria made use of unidimensional measurements and addressed several pitfalls and limitations of the original WHO criteria. Both the WHO and RECIST criteria were developed during the era of cytotoxic chemotherapeutic agents and are still widely used. However, treatment strategies changed over the past decade, and the limitations of using tumor size alone in patients undergoing targeted therapy (including arbitrarily determined cutoff values to categorize tumor response and progression, lack of information about changes in tumor attenuation, inability to help distinguish viable tumor from nonviable components, and inconsistency of size measurements) necessitated revision of these criteria. More recent criteria that are used for targeted therapies include the Choi response criteria for gastrointestinal stromal tumor, modified RECIST criteria for hepatocellular carcinoma, and Immune-related Response Criteria for melanoma. The Cheson criteria and Positron Emission Tomography Response Criteria in Solid Tumors make use of positron emission tomography to provide functional information and thereby help determine tumor viability. As newer therapeutic agents and approaches become available, it may be necessary to further modify existing anatomy-based response-assessment methodologies, verify promising functional imaging methods in large prospective trials, and investigate new quantitative imaging technologies.

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ORIGINAL REPORT

Correlation of Computed Tomography and Positron Emission Tomography in Patients With Metastatic Gastrointestinal Stromal Tumor Treated at a Single Institution With Imatinib Mesylate: Proposal of New Computed Tomography Response Criteria

Haesun Choi, Chuslip Charnsangavej, Silvana C. Faria, Homer A. Macapinlac, Michael A. Burgess, Shreyaskumar R. Patel, Lei L. Chen, Donald A. Podoloff, and Robert S. Benjamin

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Presented at the 39th Annual Meeting of the American Society of Clinical Oncology, May 31-June 3, 2003, Chicago, IL; presented in part at the 9th Annual Meeting of the Connective Tissue Oncology Society, November 11-13, 2004, Montreal, Quebec, Canada.

Authors' disclosures of potential conflicts of interest and author contribu-

ABSTRACT

Purpose

Response Evaluation Criteria in Solid Tumors (RECIST) are insensitive in evaluating gastrointestinal stromal tumors (GISTs) treated with imatinib. This study evaluates whether computed tomography (CT) findings of GIST after imatinib treatment correlate with tumor responses by [^{18}F]fluorodeoxyglucose (FDG) positron emission tomography (PET) and develops reliable, quantitative, CT response criteria.

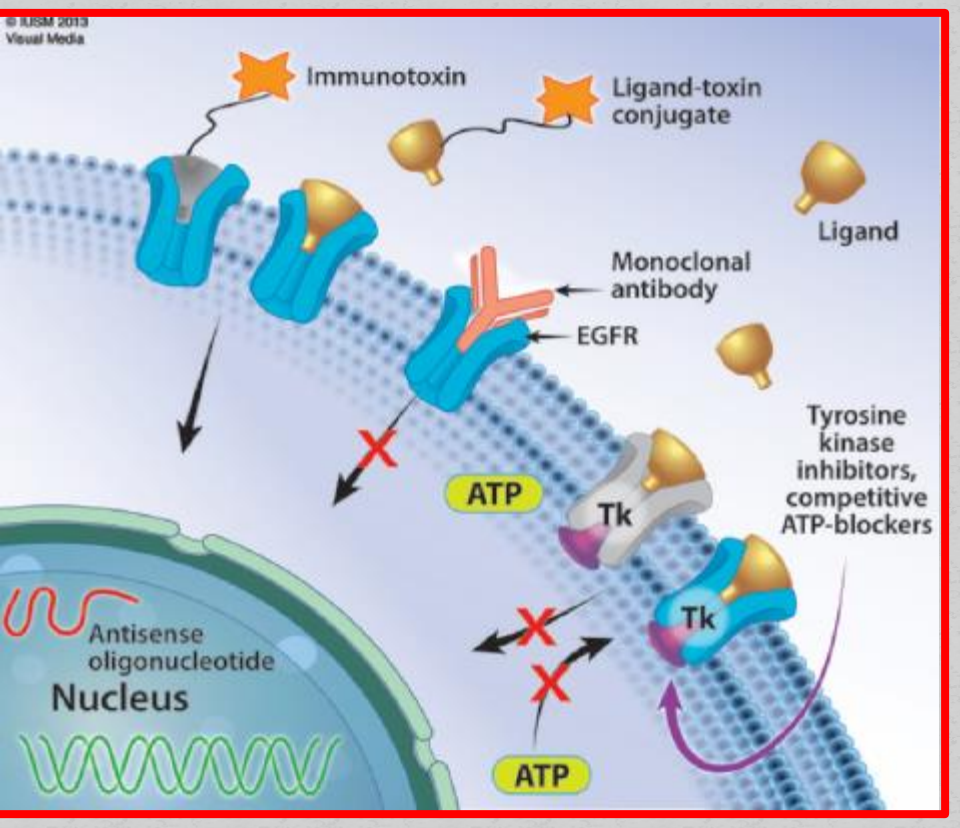
Patients and Methods

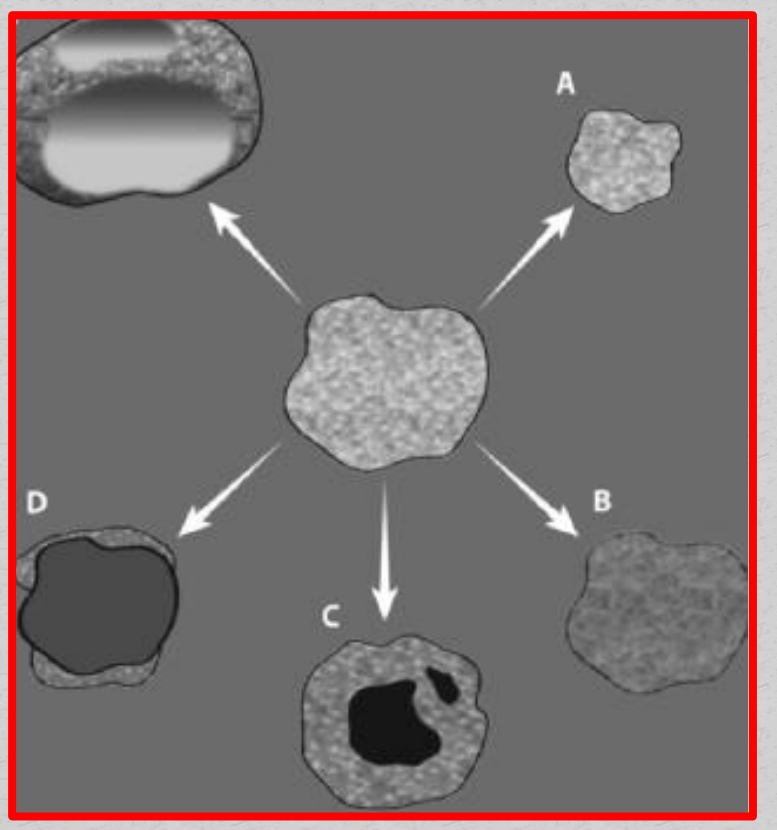
A total of 172 lesions selected by RECIST were evaluated in 40 patients with metastatic GISTs treated with imatinib. All patients had pretreatment and 2-month follow-up CTs and FDG-PETs. Multivariate analysis was performed using tumor size and density (Hounsfield unit [HU]) on CT and maximum standardized uptake value (SUV_{max}) on FDG-PET. Patients were observed up to 28 months.

Results

Mean baseline tumor size and density on CT were 5.3 cm and 72.8 HU, respectively, and mean baseline SUV_{max} on FDG-PET was 5.8. Thirty-three patients had good response on FDG-PET. A decrease in tumor size of more than 10% or a decrease in tumor density of more than 15% on CT had a sensitivity of 97% and a specificity of 100% in identifying PET responders versus 52% and

I CRITERI RECIST1.1





Farmaci anti-angiogenetici e inibitori delle tirosin-chinasi non inducono risposte radiologiche dimensionali

Clinical Cancer Research

CCR Translations

See related article by Kim et al., p. 1503

New Data Supporting Modified RECIST (mRECIST) for Hepatocellular Carcinoma

Riccardo Lencioni

The modified Response Evaluation Criteria in Solid Tumors (mRECIST) guideline has introduced specific amendments to standard RECIST to address the unique complexities involved in the evaluation of tumor response in hepatocellular carcinoma. A growing amount of data suggests that mRECIST, designed for response assessment in clinical trials, may translate into a tool for clinical practice. *Clin Cancer Res; 19(6); 1312–4.* ©2013 AACR.

[HCC]). Over the years, the WHO and RECIST criteria have been modified by combining changes in size and the morphologic and metabolic features of specific tumors to overcome the limitations of the traditional criteria.

Teaching Point

Response	WHO*	RECIST 1.1	Choi†	mRECIST‡	PERCIST§
Complete response	No lesions detected for at least 4 weeks	Disappearance of all target lesions or lymph nodes <10 mm in the short axis	Disappearance of all target lesions	Disappearance of arterial phase enhancement in all target lesions	Disappearance of all metabolically active tumors
Partial response	≥50% decrease in SPD (confirmed at 4 weeks)	>30% decrease in sum of longest diameters (SLD) of target lesions	≥10% decrease in tumor size or ≥15% decrease in tumor attenuation at computed tomography (CT); no new lesions	>30% decrease in SLD of "viable" target lesion (arterial phase enhancement)	>30% (0.8-unit) decline in SUL peak between the most intense lesion before treatment and the most intense lesion after treatment
Progressive disease	≥25% increase in SPD in one or more lesions; new lesions	>20% increase in SLD of target lesions with an absolute increase of ≥5 mm; new lesions	≥10% increase in SLD of lesions; does not meet the criteria for partial response by virtue of tumor attenuation, new intratumoral nodules, or an increase in the size of the existing intratumoral nodules	>20% increase in SLD of "viable" target lesion (arterial phase enhancement)	>30% (0.8-unit) increase in SUL peak or confirmed new lesions
Stable disease	None of the above	None of the above	None of the above	None of the above	None of the above

TAKE HOME MESSAGE

- *I criteri RECIST1.1 considerano solo le dimensioni*

- *Le variazioni dimensionali non corrispondono alla reale risposta alla terapia*

- *Necessità di criteri che tengano in considerazione anche le caratteristiche funzionali e che siano facilmente riproducibili e di rapida elaborazione*