



PROGRAMMA DIDATTICO • MODULO 3  
OSTEOPOROSI POSTMENOPAUSALE: ORGANIZZIAMO LE AZIONI  
MODERATORE: *M. Zini (Reggio Emilia)*



La diagnosi: radiologia, densitometria, laboratorio.  
Utilità, ruolo e limiti

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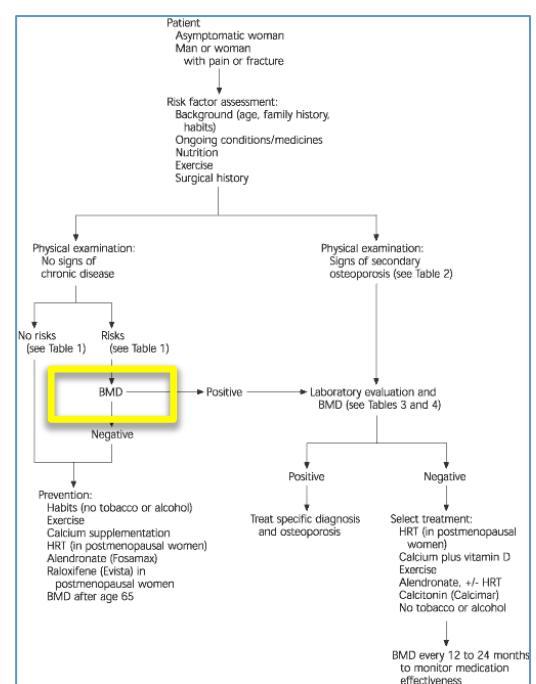
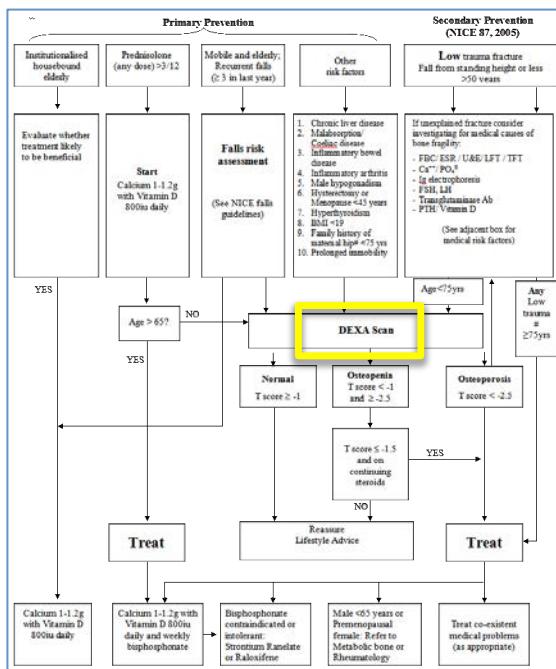
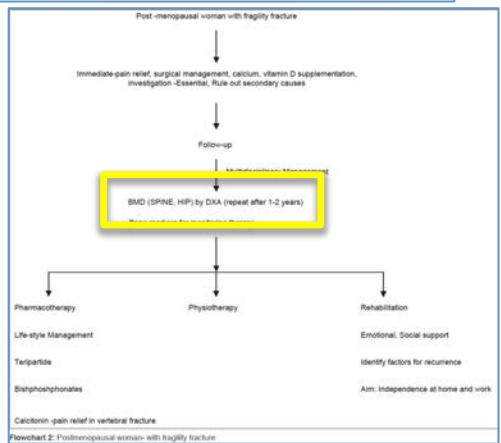
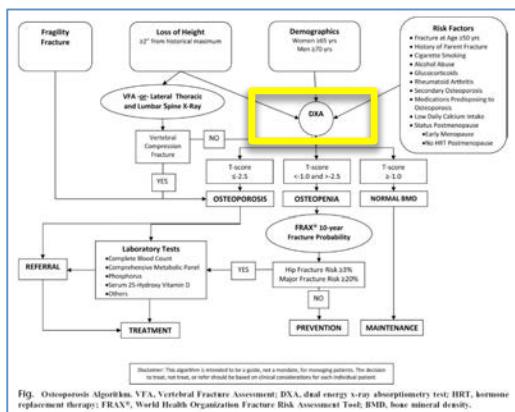
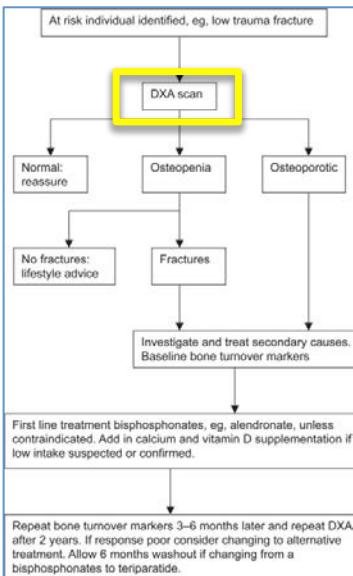
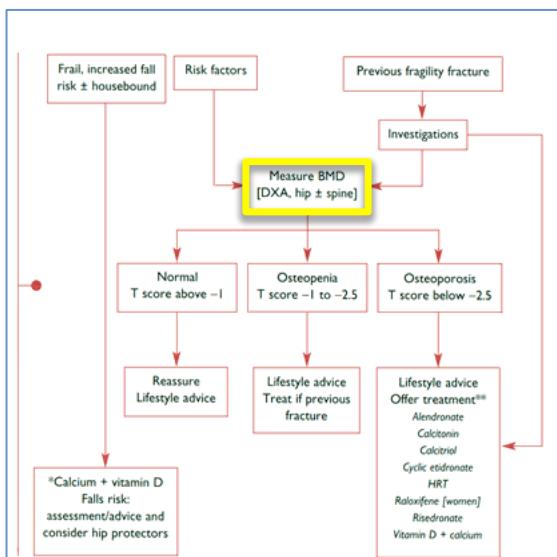
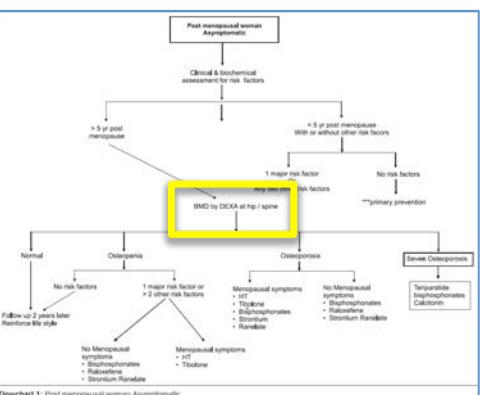
U.O. di Reumatologia e  
Metabolismo Minerale Osseo

**V Corso Aggiornamento Ame**  
**in Endocrinologia Clinica**

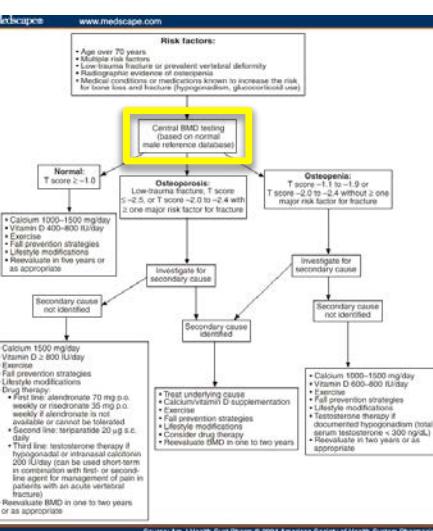
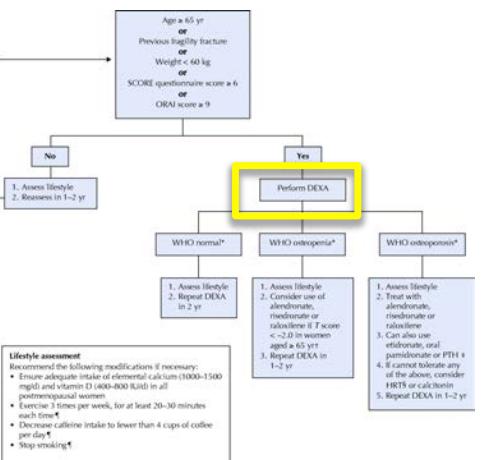
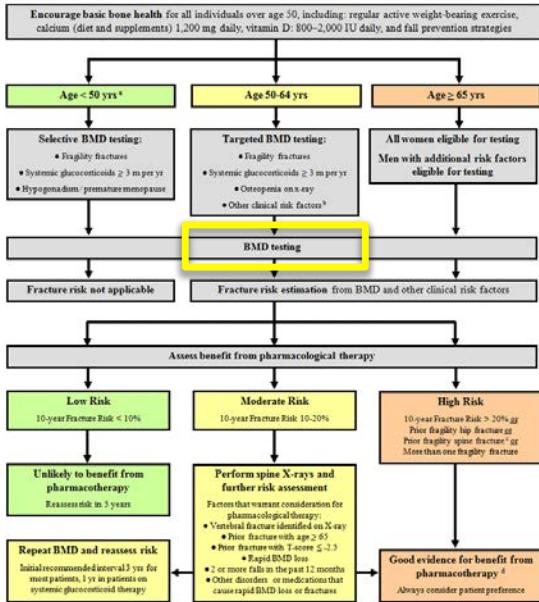
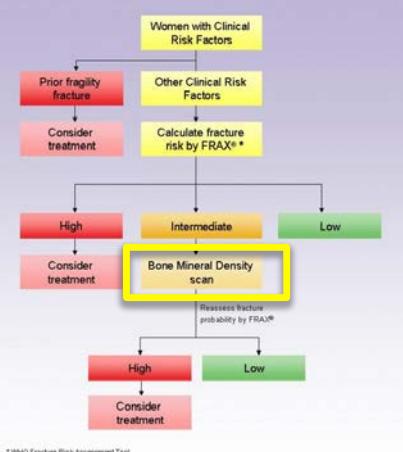
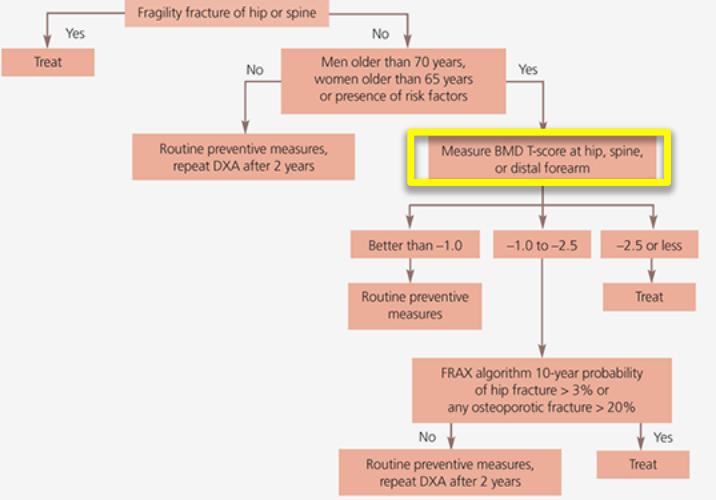


**20/22  
MARZO  
2014**

**20 marzo** Museo Archeologico di Agrigento  
**21-22 marzo** Hotel Baglio della Luna



**Figure 2 – Treatment algorithm for postmenopausal women or men older than 50 years**

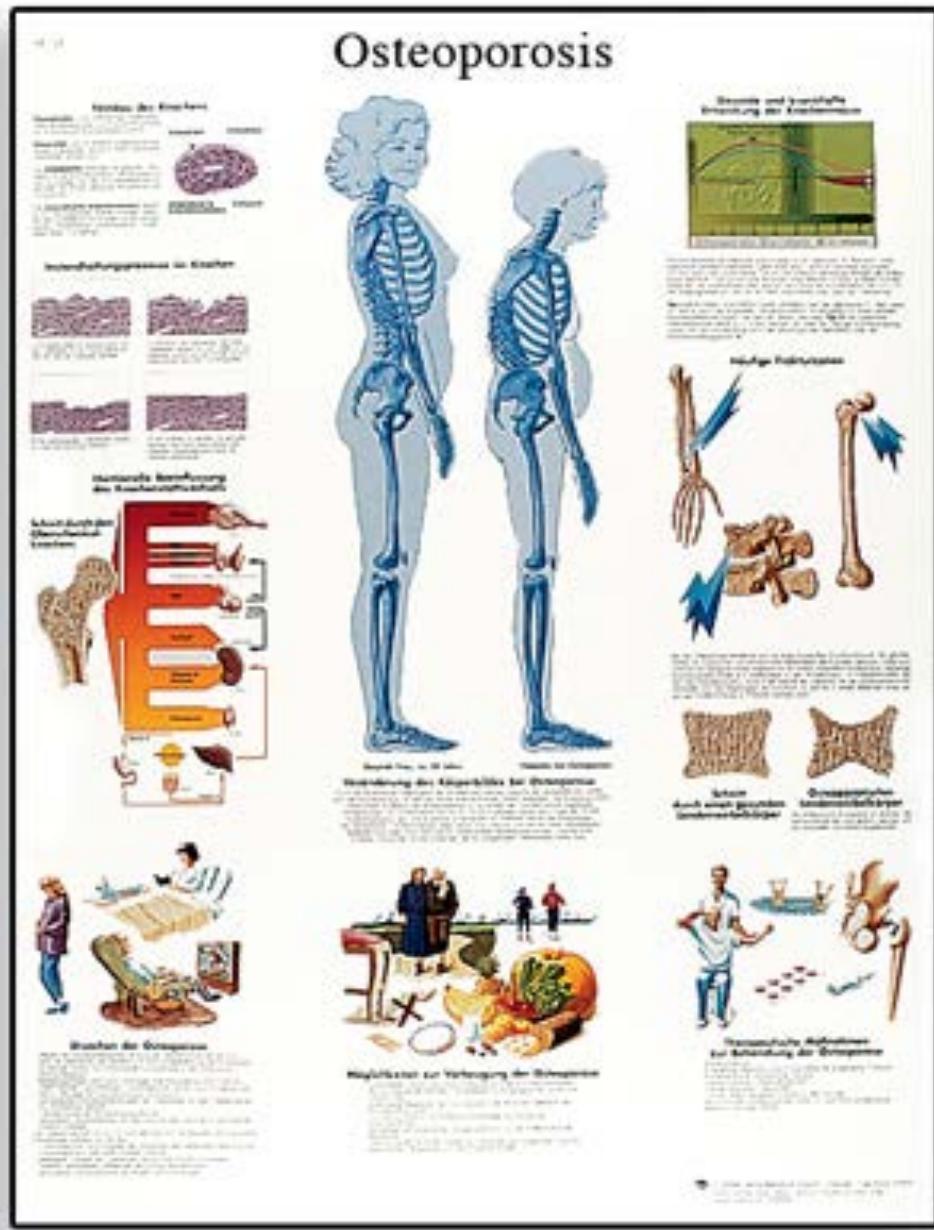


**2013 CLINICIAN'S GUIDE TO PREVENTION AND TREATMENT OF OSTEOPOROSIS**



## Diagnosis

The diagnosis of osteoporosis is established by measurement of BMD or by the occurrence of adulthood hip or vertebral fracture in the absence of major trauma (such as a motor vehicle accident or multiple story fall).



# Osteoporosis Is a Common Disease with Increased Fracture Risk Across the Entire Skeleton

## Definition of osteoporosis:

- Compromised bone strength predispose persons to increased risk of fracture
- Bone strength reflects the integration of bone density and bone quality

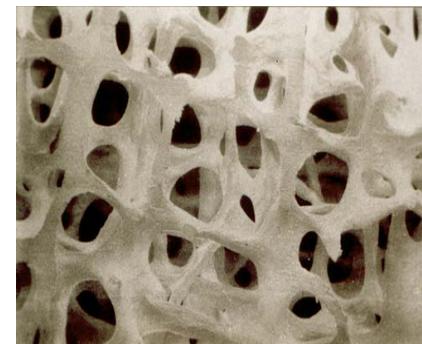
“Osteoporosis is one of the most common and debilitating chronic diseases, and a global healthcare problem.”

International Osteoporosis Foundation

“Osteoporosis has financial, physical, and psychosocial consequences, all of which significantly affect the individual, the family, and the community.”

NIH Consensus Statement

**Normal**

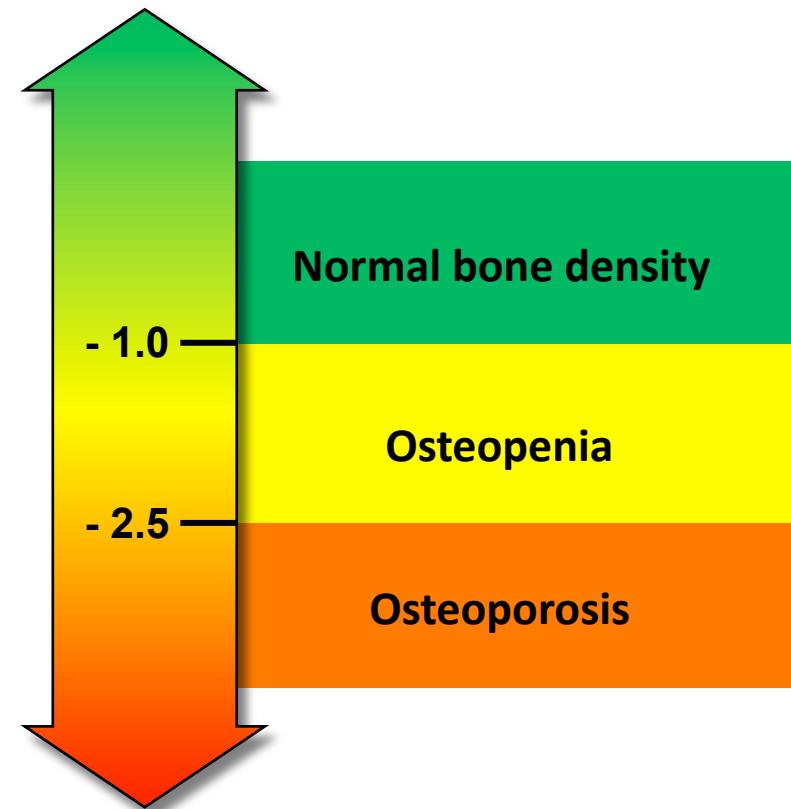


**Osteoporosis**



# Diagnosis of Osteoporosis Using Central DXA: WHO Definition

- DXA = Dual Energy **X-ray** Absorptiometry
- Used in clinical practice to diagnose osteoporosis
- BMD measurement, mainly for spine and hip
- T-score compares the patient's BMD with the mean in a healthy young reference population



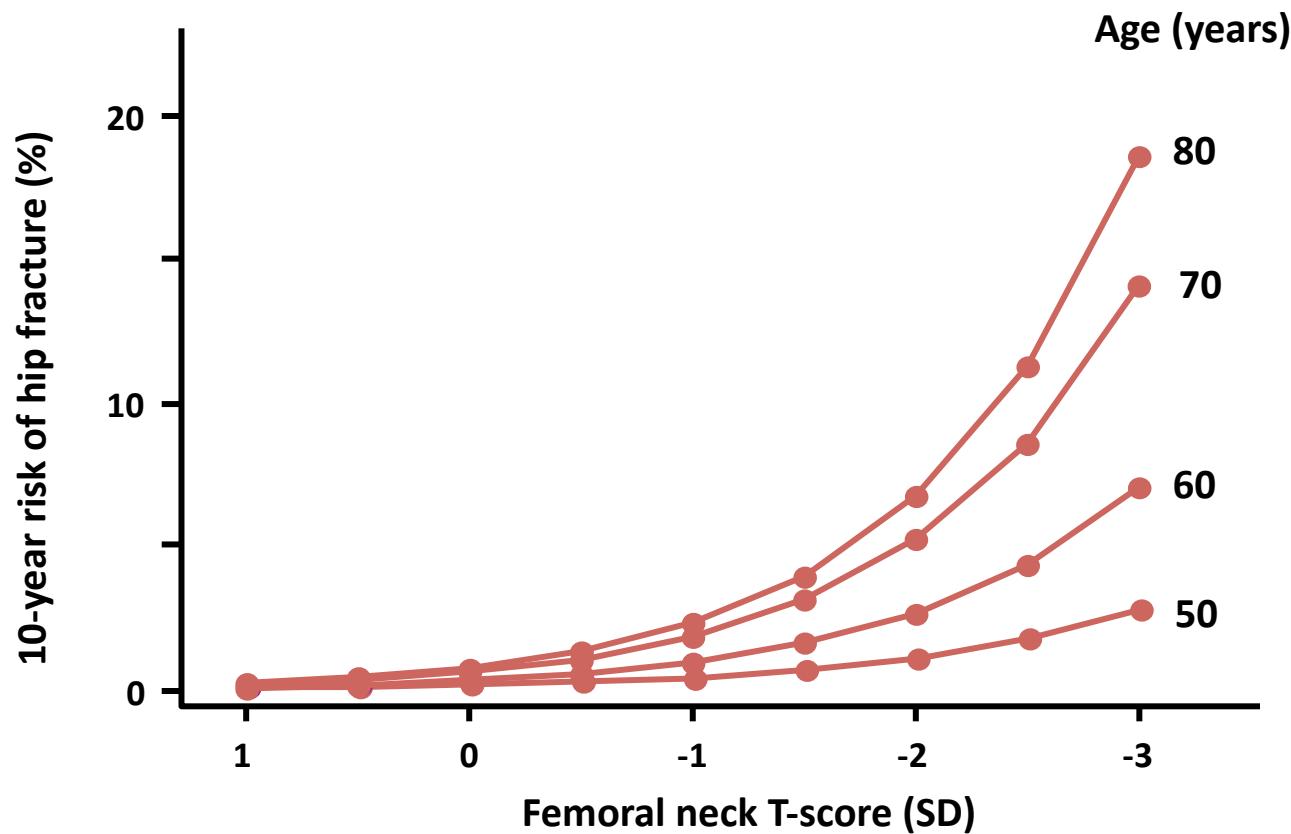
World Health Organization. Technical Report Series 921. Prevention and Management of Osteoporosis: Report of a WHO Scientific Group. 2003.

National Osteoporosis Foundation. Clinician's Guide to Prevention and Treatment of Osteoporosis. 2008

# RISCHIO FRATTURATIVO

BMD and Age Are Independent Risk Factors for Fracture

Ten-year risk of hip fracture by BMD and age in women



Kanis JA, et al. *Osteoporos Int* 2001;12:989-995. Kanis JA, et al. *Osteoporos Int* 2001;12:417-427.

Kanis JA, et al. *Osteoporos Int* 2005;16:581-589.

# INCIDENZA DI FRATTURE OSTEOPOROTICHE

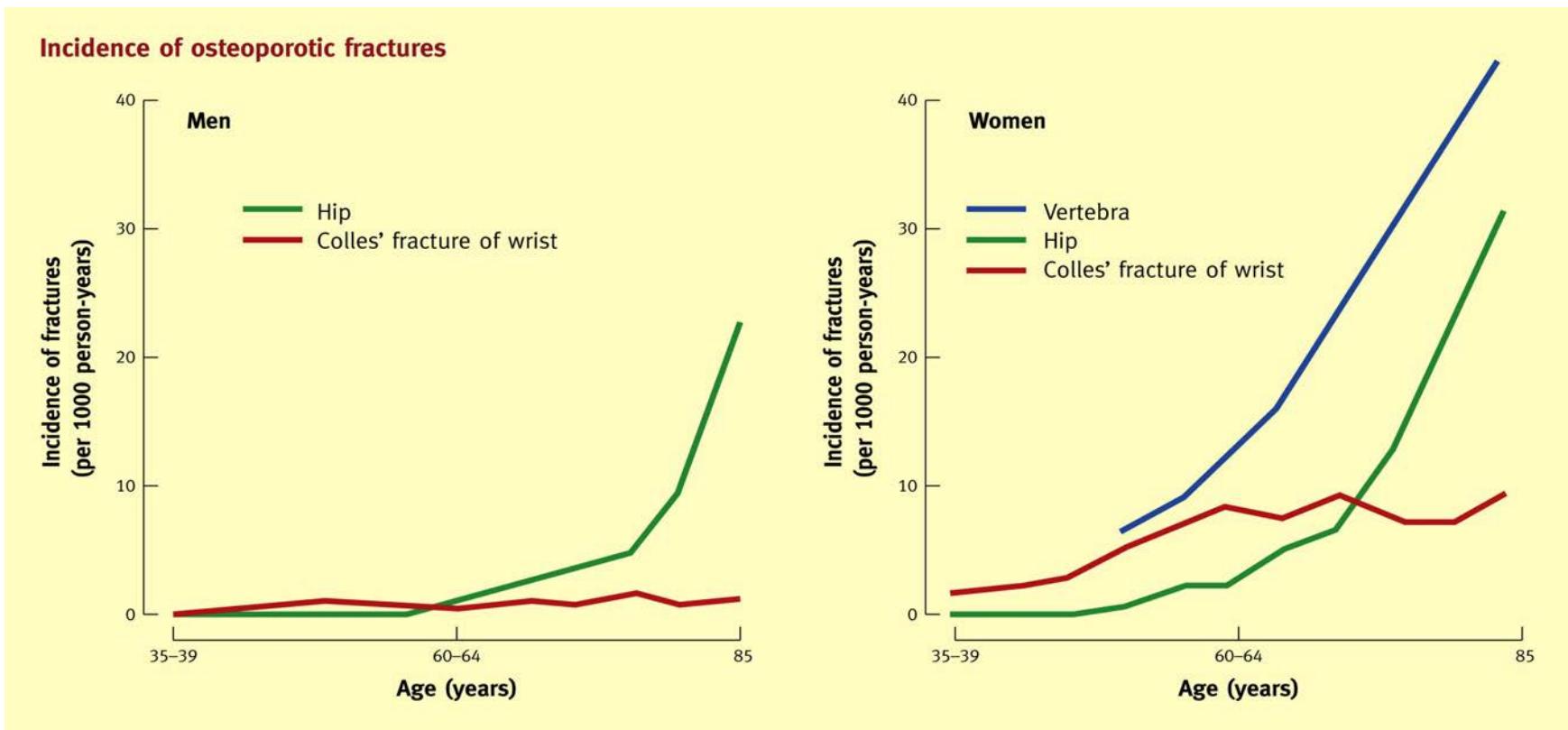


Figure 2 Incidence of osteoporotic fractures.

Richard Eastell

**Identification and management of osteoporosis in older adults**  
Medicine Volume 41, Issue 1 2013 47 - 52



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Siberian Paradise | Mixed Blessing of Fertilizer  
NGM.COM MAY 2013

# NATIONAL GEOGRAPHIC

## THIS BABY WILL LIVE TO BE 120\*



\*It's not just hype.  
New science  
could lead to  
very long lives.

# Further Independent Risk Factors for Fracture

Risk factors:

- Age
- Low BMD
- Previous fractures
- Low BMI
- Prior history of fracture
- Family history of hip fracture
- Current smoking
- High intake of alcohol
- Rheumatoid arthritis
- Glucocorticoid therapy



All risk factors add to the 10 – year probability of fracture that can be estimated using FRAX®



<b>Environmental risk factors</b>	
Lack of assistive devices in bathrooms	Obstacles in the walking path
Loose throw rugs	Slippery conditions
Low level lighting	
<b>Medical risk factors</b>	
Age	Medications causing oversedation (narcotic analgesics, anticonvulsants, psychotropics)
Anxiety and agitation	Orthostatic hypotension
Arrhythmias	Poor vision and use of bifocals
Dehydration	Previous fall
Depression	Reduced problem solving or mental acuity and diminished cognitive skills
Female gender	Urgent urinary incontinence
Impaired transfer and mobility	Vitamin D insufficiency [serum 25-hydroxyvitamin D (25(OH)D) < 30 ng/ml (75 nmol/L)]
Malnutrition	
<b>Neurological and musculoskeletal risk factors</b>	
Kyphosis	Reduced proprioception
Poor balance	Weak muscles
<b>Other risk factors</b>	
Fear of Falling	

From: *Health Professional's Guide to the Rehabilitation of the Patient with Osteoporosis*<sup>14</sup>



# Trends in Endocrinology & Metabolism



What comes first?

Cell  
PRESS

Cell  
PRESS

# DIAGNOSTICA DI LABORATORIO

## INDAGINI DI PRIMO LIVELLO

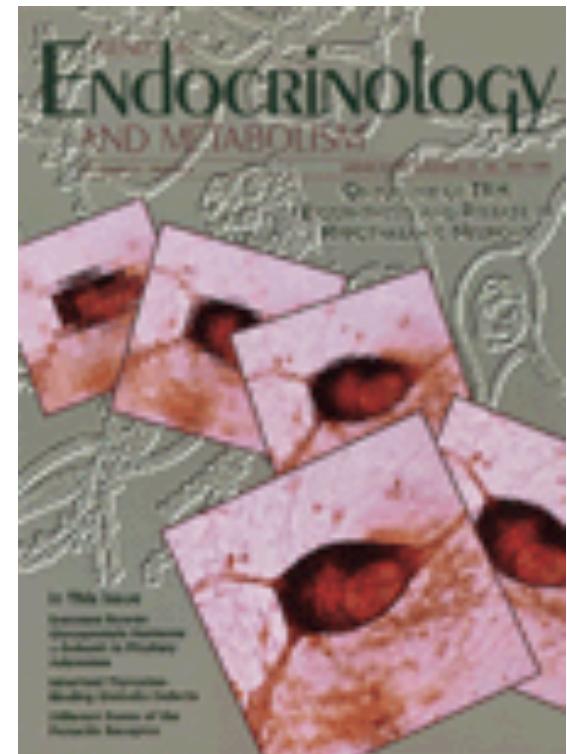
- **VES**
- **Emocromo completo**
- **Elettroforesi delle proteine**
- **Calcemia**
- **Fosforemia**
- **Fosfatasi alcalina totale**
- **Creatininemia**
- **Calciuria delle 24 ore**
- **Transaminasi**

## INDAGINI DI SECONDO LIVELLO

- **PTH intatto**
- **25 idrossivitamina D**
- **Ormoni specifici (cortisolo ore 8.00-24.00, cortisoluria 24 ore, TSH)**
- **Biopsia ossea**
- **Markers ossei**
- **Testosterone libero nei maschi**
- **Elettroforesi proteine urinarie**
- **Anticorpi anti-gliadina e anti-endomiosio**
- **Marcatore specifico di turnover osseo**
- **Esami specifici per patologie associate**

## MARKERS BIOCHIMICI DI RIMODELLAMENTO OSSEO

- **Markers di neoformazione**  
dosabili nel siero:
  - fosfatasi alcalina isoenzima osseo
  - osteocalcina
  - propeptide aminoterminale del collagene di tipo I
  - propeptide carbossiterminale del collagene di tipo I
- **Markers di riassorbimento:**  
dosabili nel siero:
  - telopeptide carbossiterminale del collagene di tipo I
  - piridinolina e deossipiridinolina  
dosabili nelle urine:
  - idrossipiridinolina libera e totale
  - desossipiridinolina libera e totale
  - Rapporto calcio/creatinina a digiuno
  - Telopeptide animoterminal del collagene di tipo I
  - Telopeptide carbossiterninale del collagene di tipo I

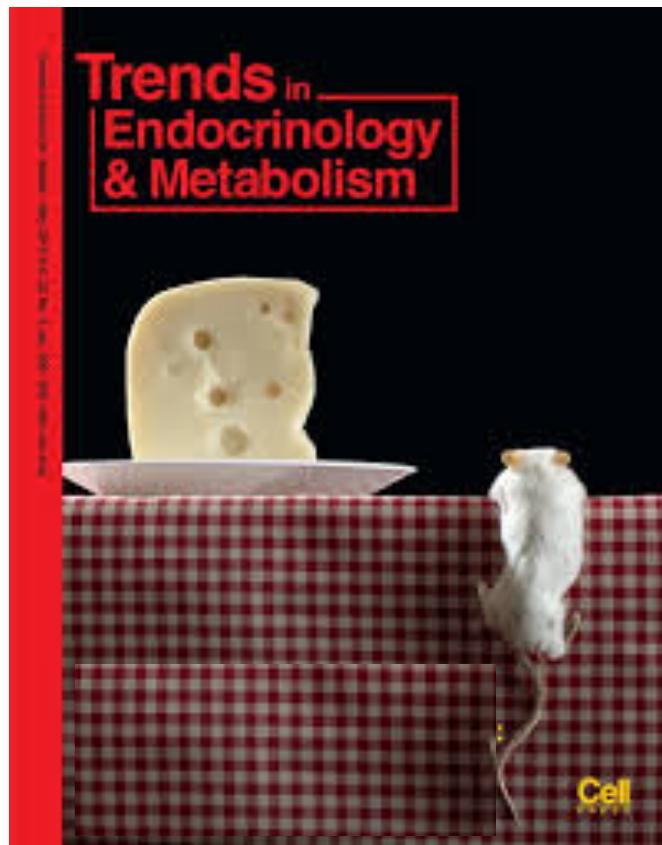


## PRINCIPALI INDICAZIONI ALL' IMPIEGO CLINICO DEL MARKERS OSSEO

- Valutare l' entità del turnover scheletrico in condizioni normali
- Valutare il rischio di frattura
- Valutare gli effetti della terapia



Lifestyle factors		
Alcohol Abuse	High salt intake	Falling
Low calcium intake	Inadequate physical activity	Excessive thinness
Vitamin D insufficiency	Immobilization	
Excess vitamin A	Smoking (active or passive)	
Genetic factors		
Cystic fibrosis	Homocystinuria	Osteogenesis imperfecta
Ehlers-Danlos	Hypophosphatasia	Parental history of hip fracture
Gaucher's disease	Idiopathic hypercalcioruria	Porphyria
Glycogen storage diseases	Marfan syndrome	Riley-Day syndrome
Hemochromatosis	Menkes steely hair syndrome	
Hypogonadal states		
Androgen insensitivity	Hyperprolactinemia	Premature ovarian failure
Anorexia nervosa and bulimia	Premature menopause	Athletic amenorrhea
Endocrine disorders		
	Adrenal insufficiency	Cushing's syndrome
	Diabetes mellitus (Types 1 & 2)	Hyperparathyroidism
Gastrointestinal disorders		
	Celiac disease	Inflammatory bowel disease
	Gastric bypass	Malabsorption
	GI surgery	Pancreatic disease
Hematologic disorders		
	Multiple myeloma	Monoclonal gammopathies
	Hemophilia	Leukemia and lymphomas
	Thalassemia	
Rheumatologic and autoimmune diseases		
	Ankylosing spondylitis	Lupus
	Other rheumatic and autoimmune diseases	
Central nervous system disorders		
	Epilepsy	Parkinson's disease
	Multiple sclerosis	Spinal cord injury
Miscellaneous conditions and diseases		
	AIDS/HIV	Congestive heart failure
	Alcoholism	Depression
	Amyloidosis	End stage renal disease
	Chronic metabolic acidosis	Hypercalciuria
	Chronic obstructive lung disease	Idiopathic scoliosis
Medications		
	Aluminum (in antacids)	Cyclosporine A and tacrolimus
	Anticoagulants (heparin)	Depo-medroxyprogesterone (premenopausal contraception)
	Anticonvulsants	Glucocorticoids ( $\geq 5$ mg/d prednisone or equivalent for $\geq 3$ months)
	Aromatase inhibitors	GnRH (Gonadotropin releasing hormone) antagonists and agonists
	Barbiturates	Lithium
	Cancer chemotherapeutic drugs	Methotrexate
	From: The Surgeon General's Report <sup>1</sup> , with modification	



**Table 4: Exclusion of Causes of Secondary Osteoporosis**

<b>Consider the Following Diagnostic Studies for Causes of Secondary Osteoporosis</b>	
<b>Blood or Serum</b>	
• Complete blood count (CBC)	
• Chemistry levels (Calcium, renal function, phosphorus and magnesium)	
• Liver function tests	
• Thyroid-stimulating hormone (TSH) level	
• Serum 25(OH)D level	
• Parathyroid hormone (PTH)	
• Total testosterone and gonadotropin levels in younger men	
<i>Consider in selected patients</i>	
– Serum protein electrophoresis (SPEP), serum immunofixation, serum free light chains	
– Tissue transglutaminase antibodies	
– Iron and ferritin levels	
– Homocysteine in select cases	
– Tryptase	
<b>Urine</b>	
• 24-hour urinary calcium	
<i>Consider in selected patients</i>	
– Protein electrophoresis (UPEP)	
– Urinary free cortisol level	
– Urinary histamine	

# MORFOMETRIA VEREBRALE

E' UNA TECNICA CHE VALUTA LE DEFORMITA' VEREBRALI.

L' ANALISI MORFOMETRICA CONSISTE NELLA MISURAZIONE DELLA ALTEZZA ANTERIORE, MEDIA, POSTERIORE DEL CORPO VERTEBRALE ED IN BASE AI VALORI DEI LORO RAPPORTI CONSENTE DI CLASSIFICARE LE DEFORIMTA' VEREBRALI

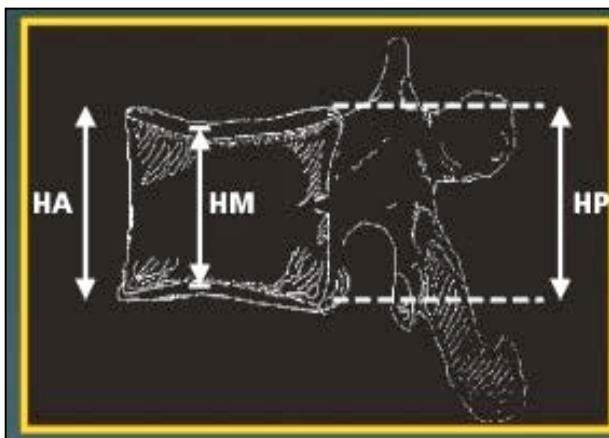


SONO CONSIDERATE FRATTURE LE RIDUZIONI DI UNA DELLE ALTEZZE DEL CORPO VERTEBRALE MAGGIORI DEL 20% O UNA RIDUZIONE MAGGIORE DI 4MM IN ASSOLUTO RISPETTO ALLE VERTEBRE VICINE

HA = altezza anteriore

HM = altezza media

HP = altezza posteriore





# LE FRATTURE VERTEBRALI DA OSTEOPOROSI SONO SOTTODIAGNOSTICATE (DAI CLINICI E DAI RADIOLOGI )

UNDERDIAGNOSIS OF VERTEBRAL FRACTURES IS A  
WORLDWIDE PROBLEM

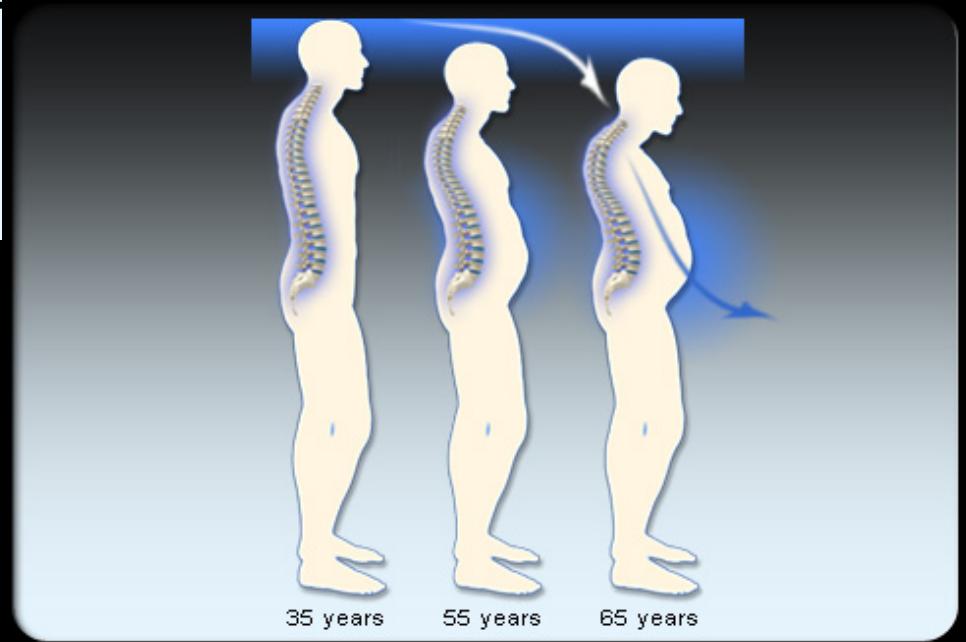
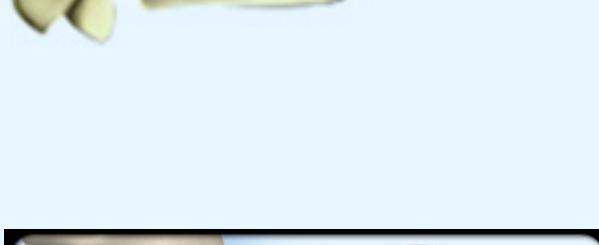
**DELMAS PD J BONE MINER RES 2001**

SOTTODIAGNOSI DAL 27 AL 60 % DI FRATTURE ANCHE SEVERE ATTRIBUITE A

- FILM DI QUALITÀ INADEGUATA
- TERMINOLOGIA AMBIGUA DEI REFERTI RADIOLOGICI

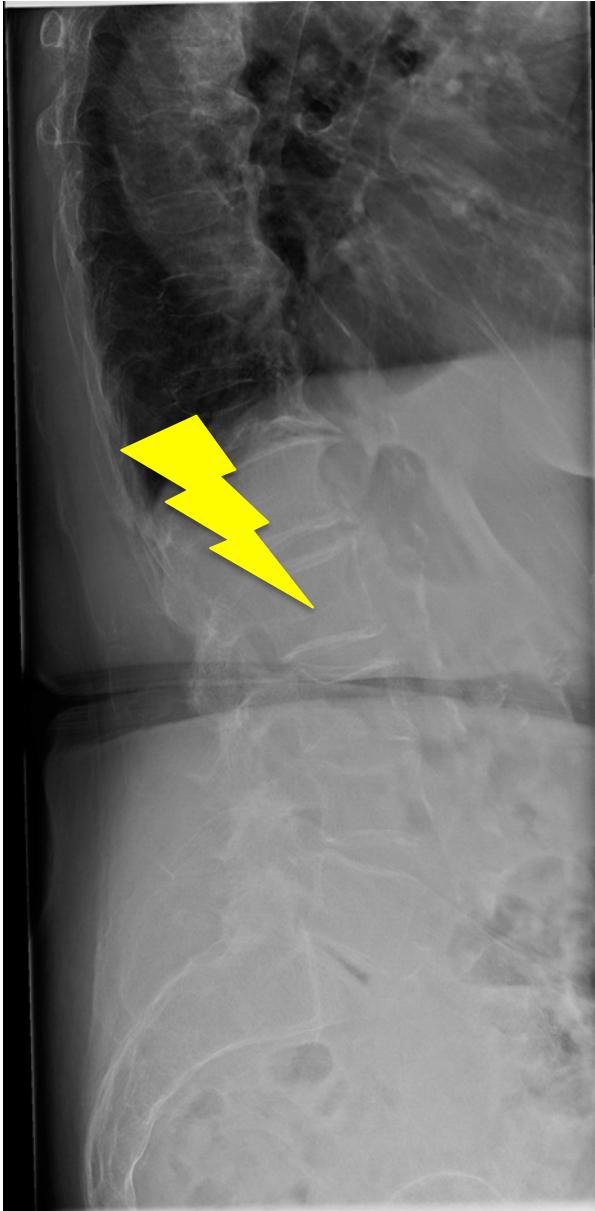
QUESTI RISULTATI LIMITANO FORTEMENTE L' UTILIZZO CLINICO DELLA  
RADIOGRAFIA NELLA DIAGNOSI DI FRATTURA VERTEBRALE

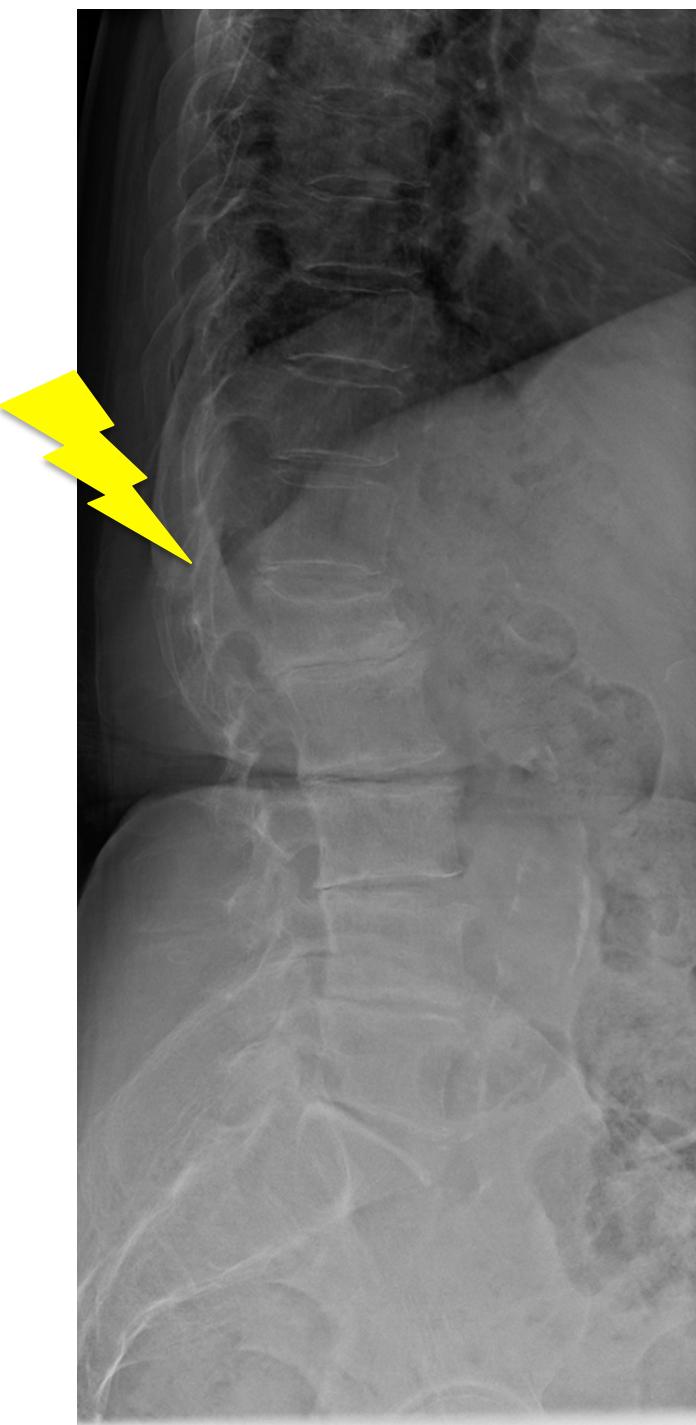
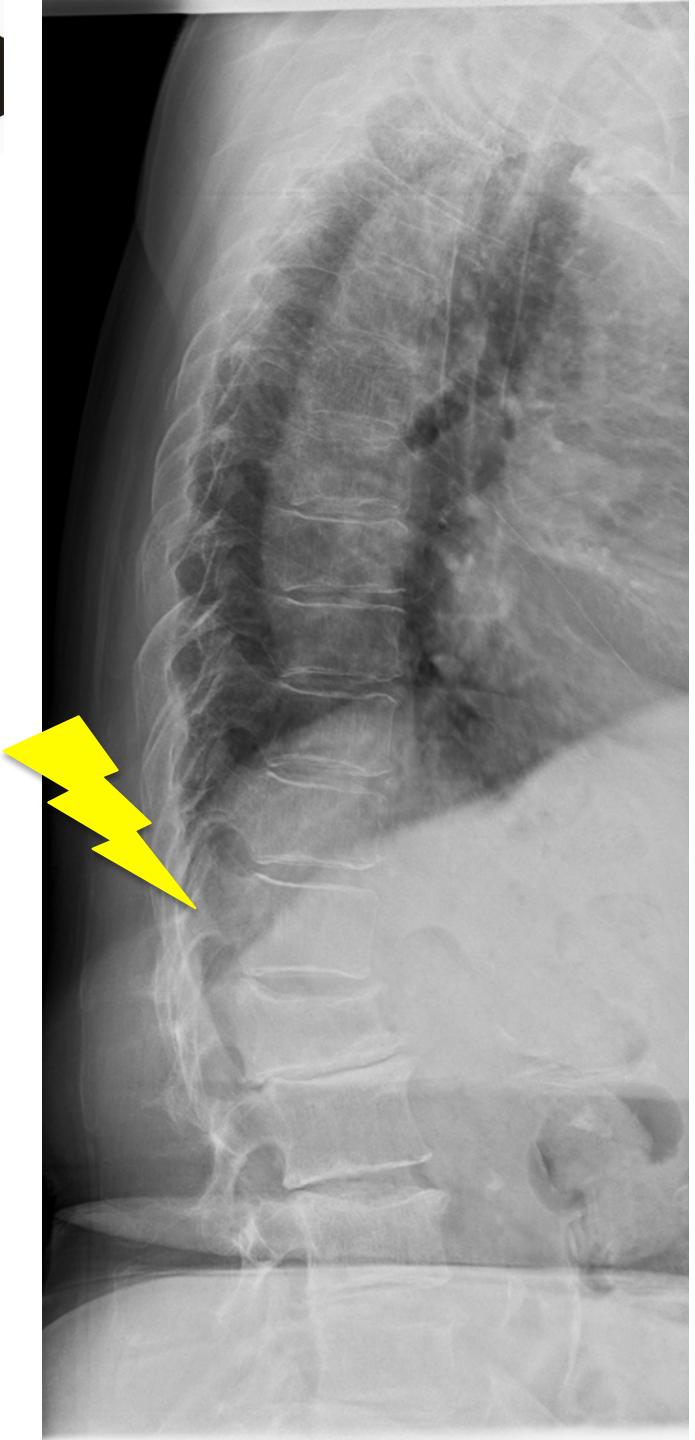
# EFFETTO DOMINO

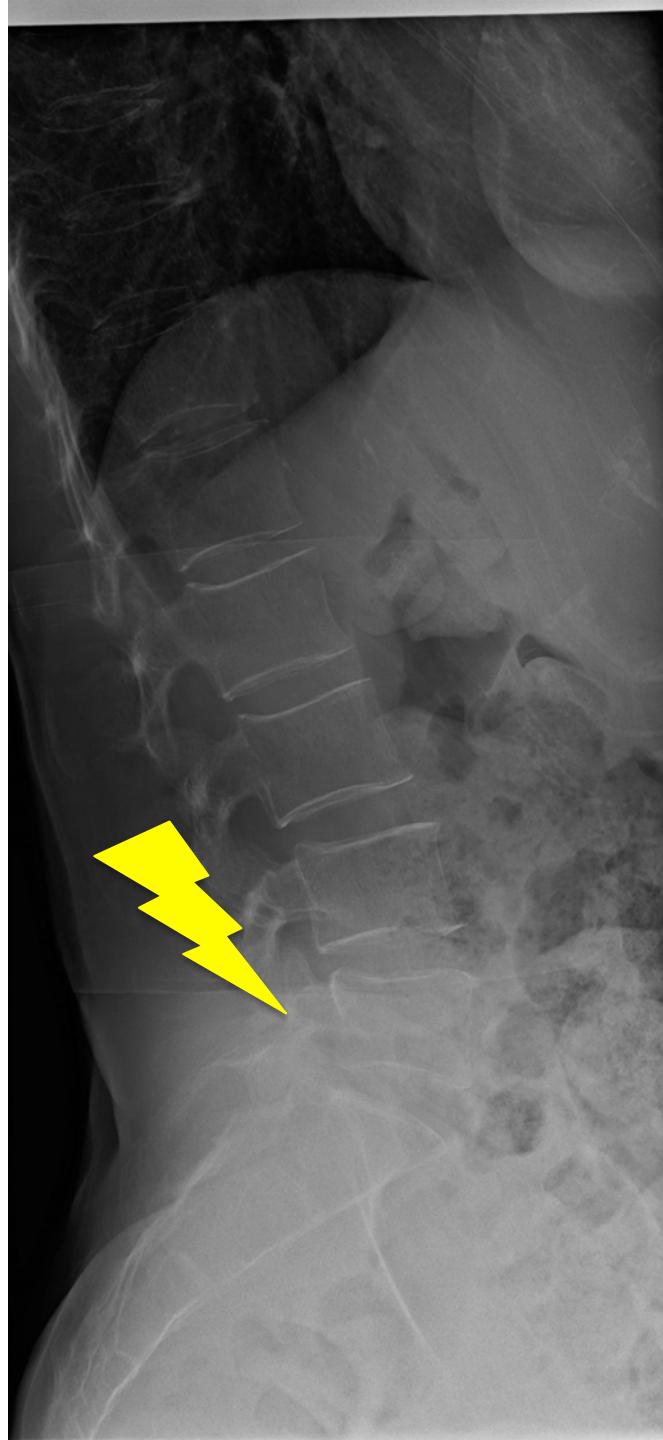
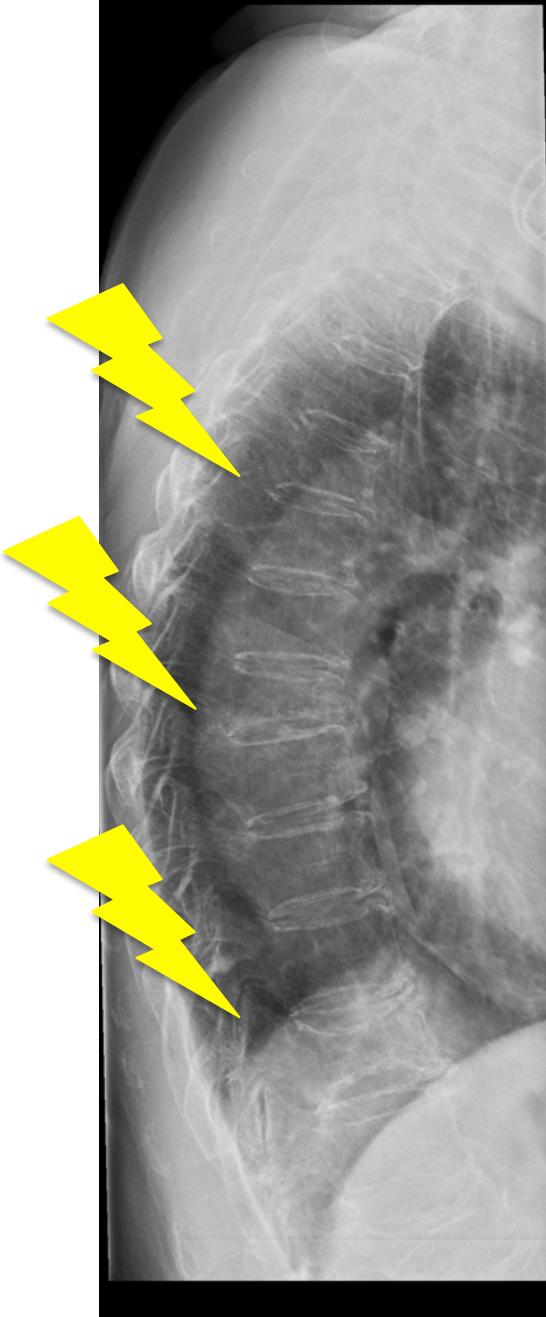


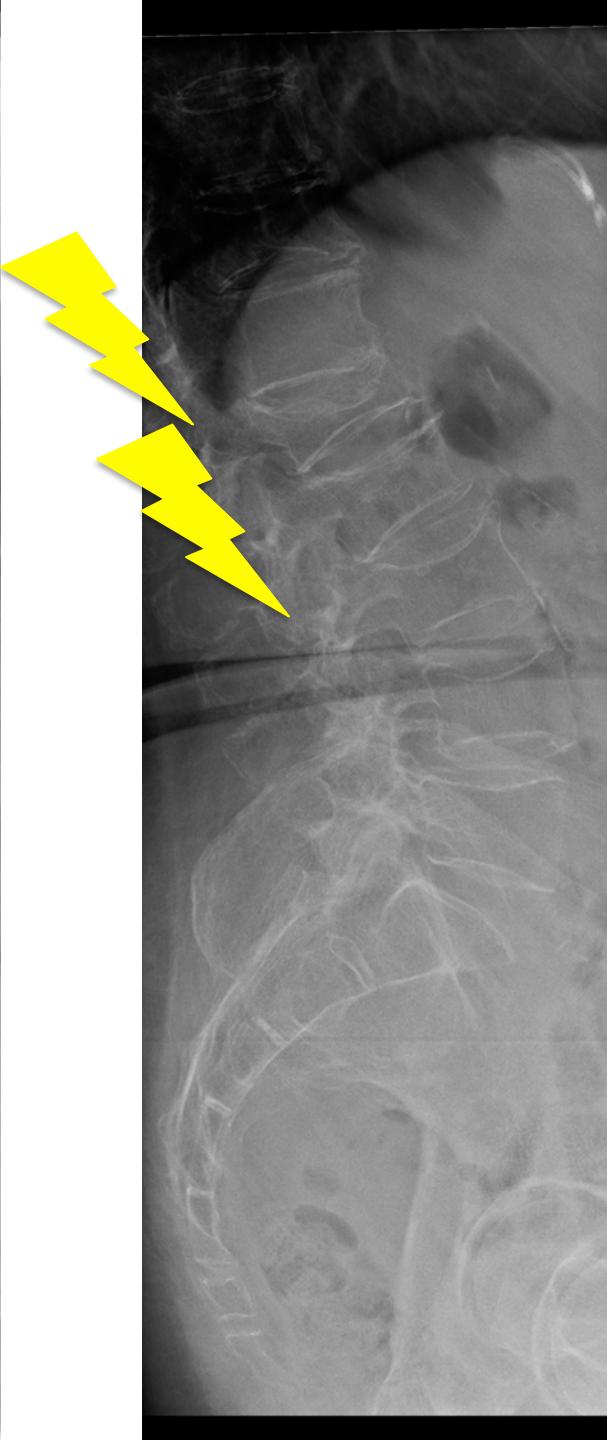
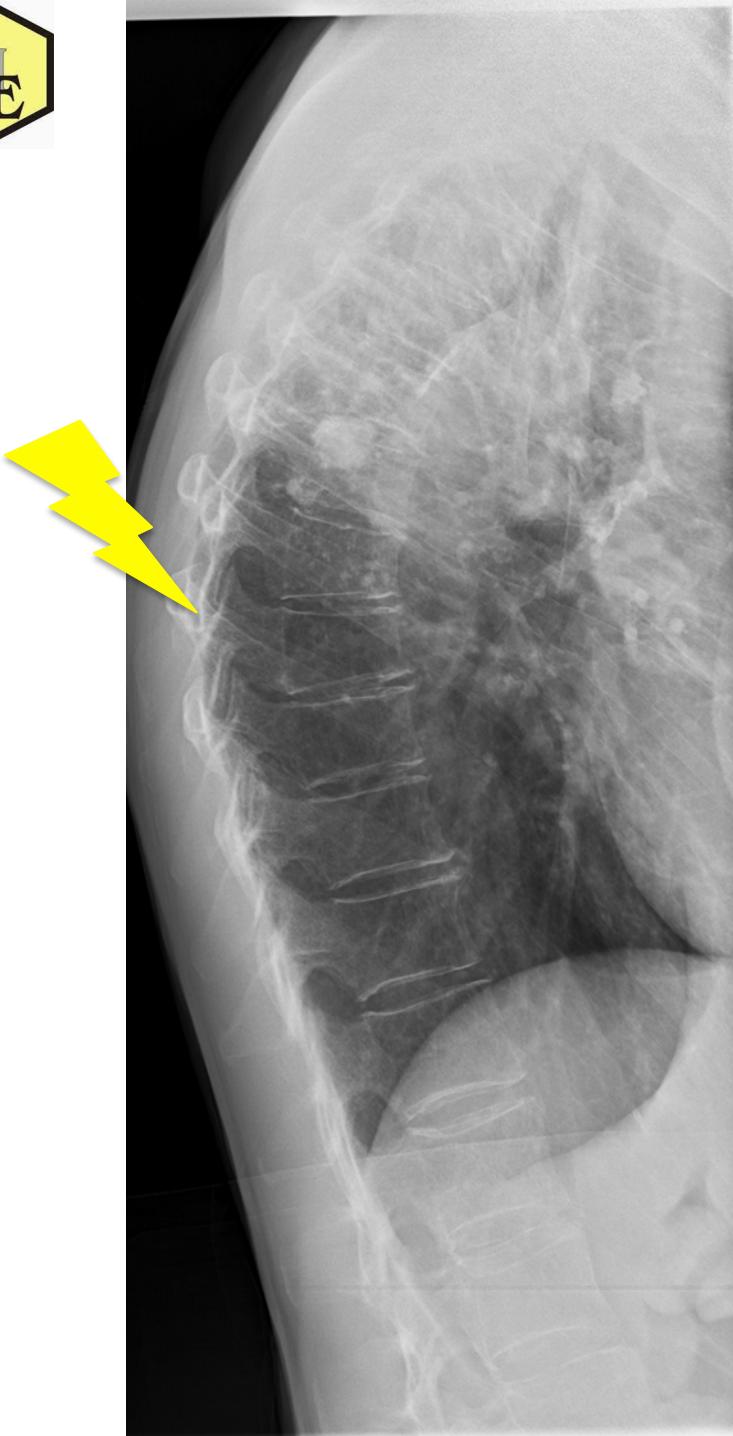
# MORFOMETRIA VEREBRALE







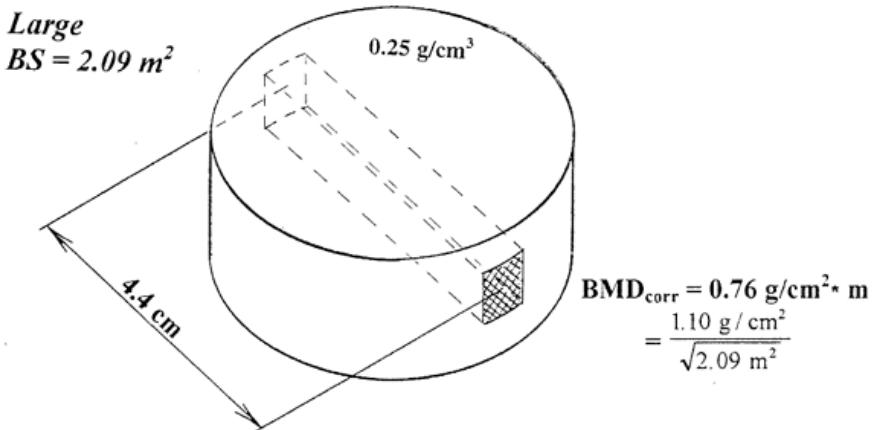
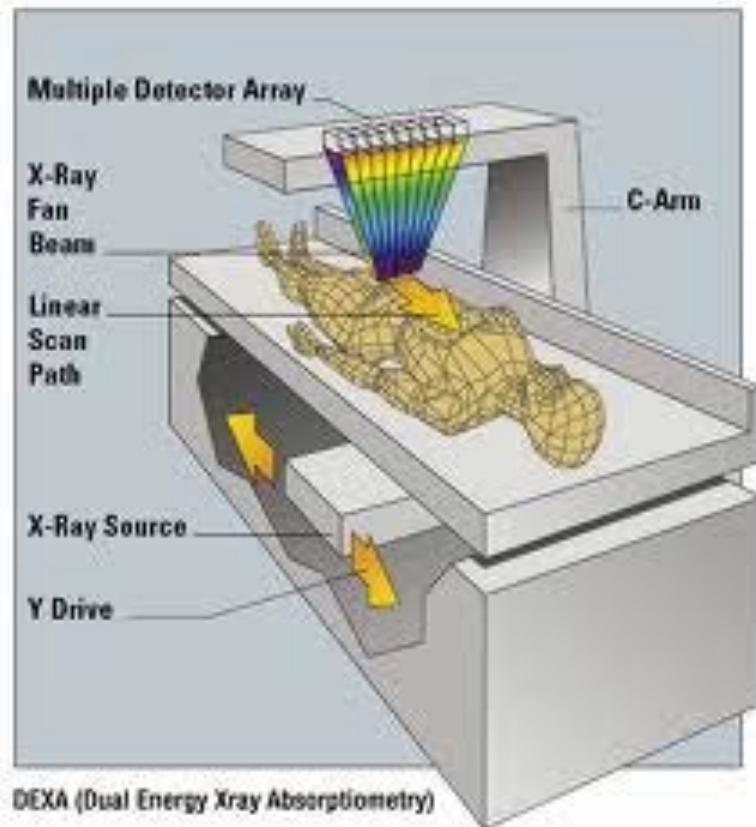




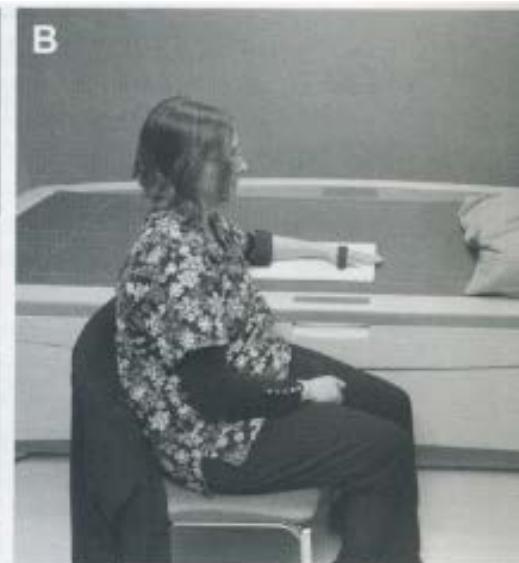
# IL DENSITOMETRO DEXA

Misura la BMD areale in g/cm<sup>2</sup> usando radiazioni ionizzanti con raggio fotonico a 2 diversi gradi di energia.

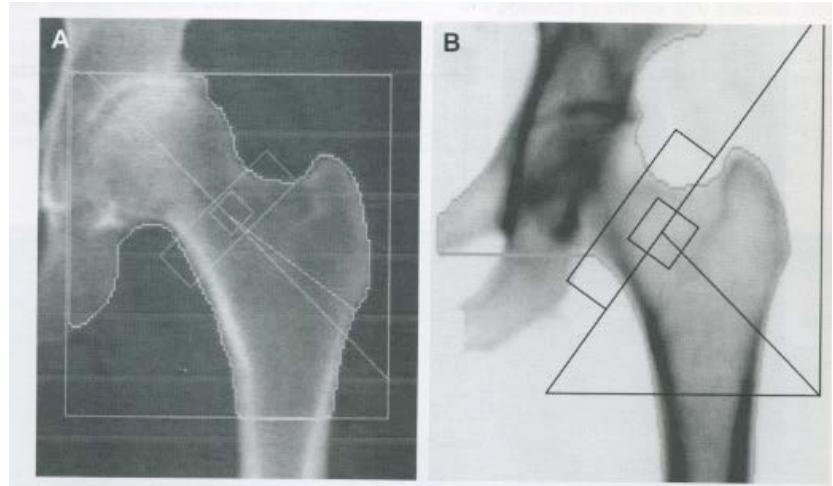
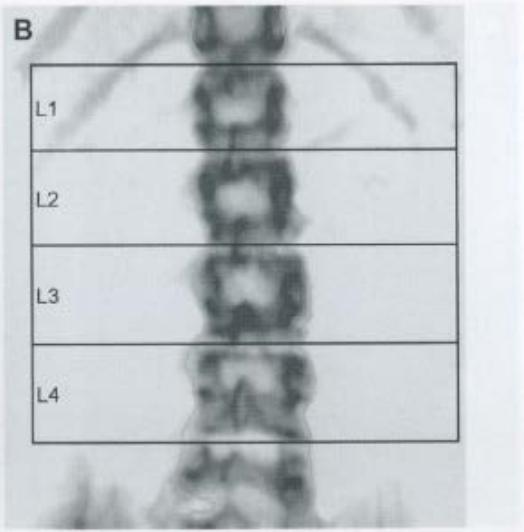
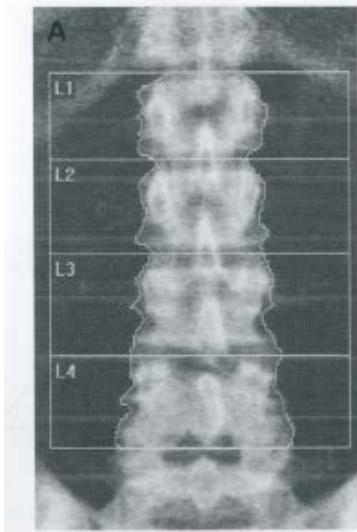
La diversa attenuazione dei raggi che attraversano l'osso o gli altri tessuti corporei permette una misura quantitativa della BMD



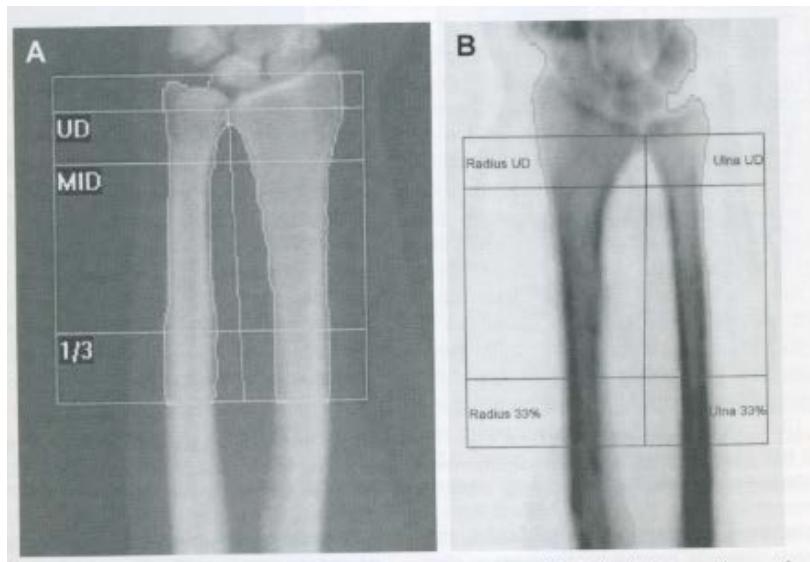
# SITI DI MISURAZIONE



# FEMORE

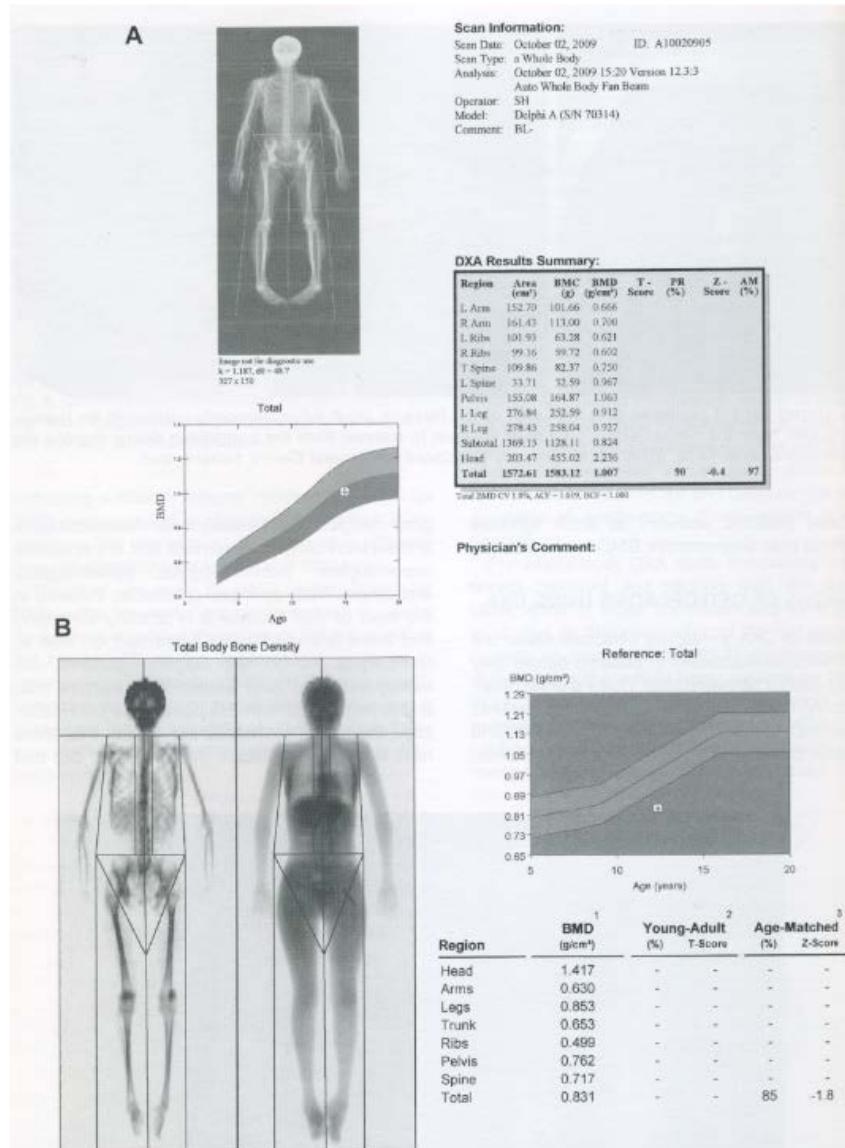


# COLONNA VERTEBRALE



# RADIO

# TOTAL BODY



# DENSITOMETRO DEXA

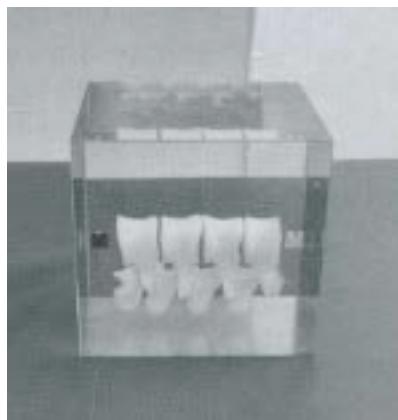
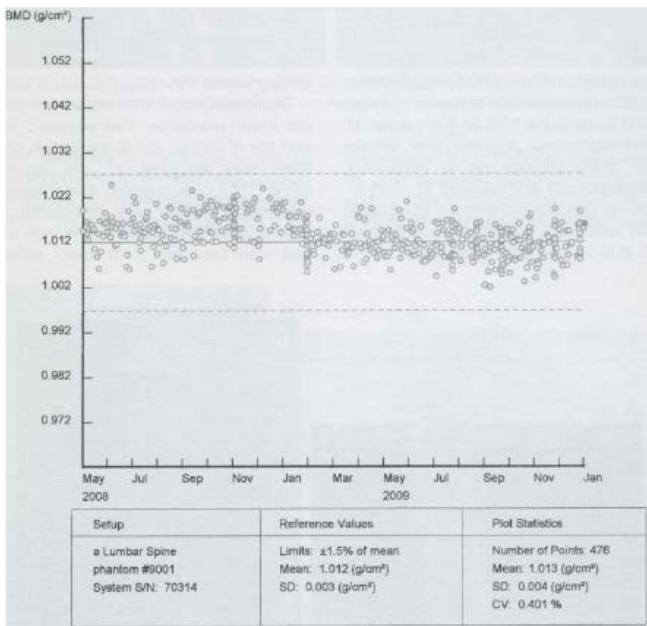
- Contenuto costo di esercizio
- Accurata (misurazione della BMD è esatta)
- Precisa (riproducibile con insignificante margine di errore): coefficiente di variazione soddisfaciente (in vitro dello 0.5-0.8% ed in vivo dell' 1-1.5%)
- Può essere eseguita in diversi siti scheletrici (colonna vertebrale, femore, radio, intero scheletro)
- Rapida esecuzione
- Vengono utilizzate radiazioni a basso dosaggio (da 1 a 3 mRem), e tramite l'immagine della colonna toraco-lombare, può essere valutata la presenza di fratture vertebrali (VFA)

# DENSITOMETRO DEXA

Il controllo di qualità (QC) dell'apparecchiatura deve essere eseguito secondo le indicazioni della ditta costruttrice.

In ogni caso devono essere osservate le seguenti procedure:

- Eseguire una periodica (almeno settimanale) scansione del fantoccio



- Visualizzare sul grafico i dati della scansione per verificare la corretta calibrazione dell'apparecchiatura

**TRAMITE UNA SCANSIONE DEXA  
OTTENIAMO  
LA MISURAZIONE DELLA BMD**



# BMD

- La BMD esprime il rapporto fra la massa e l' area del segmento osseo esaminato (in g/cm<sup>2</sup>)
- Si ritiene che la BMD renda conto del 60-80% della resistenza ossea ai traumi, mentre la restante quota dipenda dall'integrità della microarchitettura ossea.
- L'utilità clinica della misurazione della massa ossea è giustificata dalla possibilità di:
  1. diagnosticare l'osteoporosi
  2. predire il rischio di frattura del soggetto
  3. decidere l'indirizzo terapeutico
  4. monitorare l'effetto della terapia medica

# SITI SCHELETRICI

Siti scheletrici da sottoporre a misurazione:

**MISURARE LA BMD  
SIA A LIVELLO VERTEBRALE CHE FEMORALE  
IN TUTTI I PAZIENTI**

La misurazione della BMD a livello radiale deve essere eseguita solo nei seguenti casi:

- Sia la colonna che il femore non possono essere misurati/interpretati.
- Iperparatiroidismo
- Pazienti gravemente obesi (oltre il limite di peso tollerato dal tavolo DEXA)



6 January 2005

International weekly journal of science

# nature

£10.00

[www.nature.com/nature](http://www.nature.com/nature)

A close-up photograph of a person's eyes, looking directly forward with a neutral expression. The lighting is dramatic, with the eyes appearing bright against a dark background.

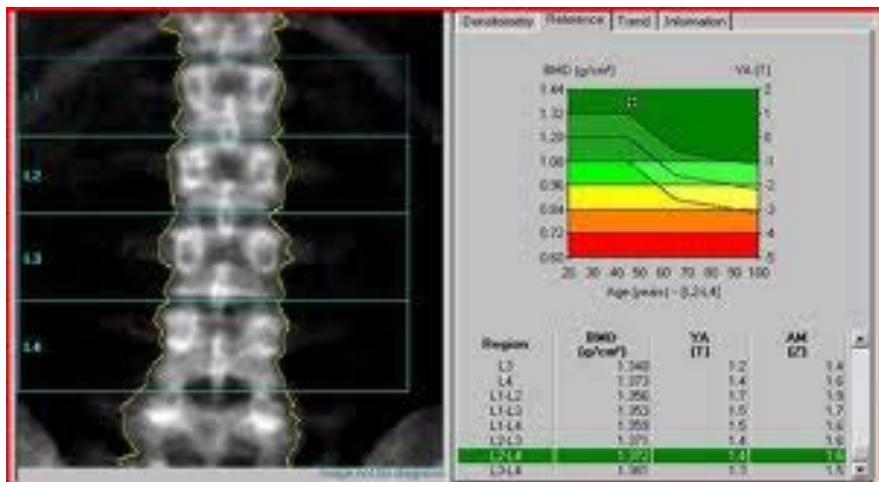
**The look of fear**

How the brain detects emotions

## QUALI SITI SCHELETRICI?

### Regioni di interesse anatomico della colonna (ROIs)

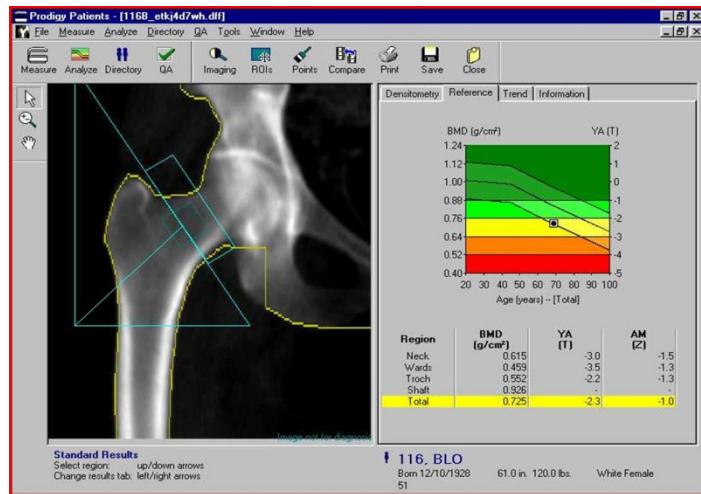
- Utilizzare la misurazione AP da L1-L4
- Utilizzare tutte le vertebre valutabili ed escludere le vertebre affette da modificazioni strutturali o artefatti. Utilizzare 3 vertebre se non si possono utilizzare tutte e 4, utilizzare 2 vertebre se 3 non possono essere usate. Escludere le vertebre con una differenza di T-score superiore a 1.0 rispetto alle vertebre adiacenti.
- Non si può considerare diagnostica una BMD calcolata su una singola vertebra, bisogna scegliere un diverso sito anatomico



## QUALI SITI SCHELETRICI?

### Regioni di interesse anatomico del femore (ROIs)

- Usare il collo femorale o il femore totale, in base al valore più basso.
- La BMD dovrebbe essere misurata ad entrambi i femori



### Regioni di interesse anatomico del radio (ROIs)

- Utilizzare il terzo radiale del braccio non dominante

# COMPARE

Software in grado di confrontare l'esame DEXA con i precedenti esami  
 Esprime in percentuale le variazioni della BMD

L1-L3	
Rate of Change/yr $\pm$ SD**	% Change $\pm$ % /yr $\pm$ SD
+0.0201 0.0021	+2.78 0.29

Source: Hologic

DXA Results Summary: L4					
Scan Date	Age	BMD (g/cm <sup>2</sup> )	T - Score	BMD Change vs Baseline	BMD Change vs Previous
12.04.2005	77	0.684	-3.9	14.3%#	9.4%#
26.11.2003	75	0.625	-4.5	4.5%*	0.4%
07.10.2002	74	0.623	-4.5	4.2%*	-6.1%*
01.06.2001	73	0.663	-4.1	10.9%*	6.5%*
19.04.2000	72	0.623	-4.5	4.1%*	4.1%*
24.07.1997	69	0.598	-4.7		

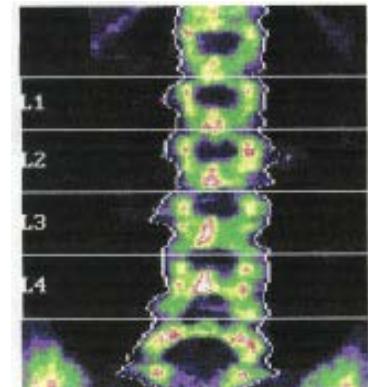
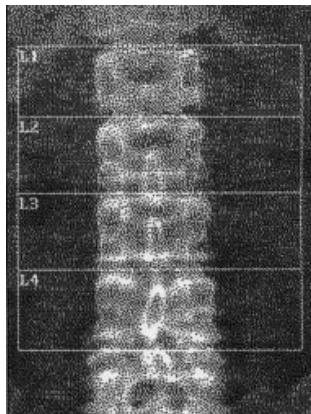
Total BMD CV 1.0%  
 \* Denotes significant change at the 95% confidence level.  
 # Denotes dissimilar scan types or analysis methods.  
 Rate of change results reflect vertebral levels common to all scans.



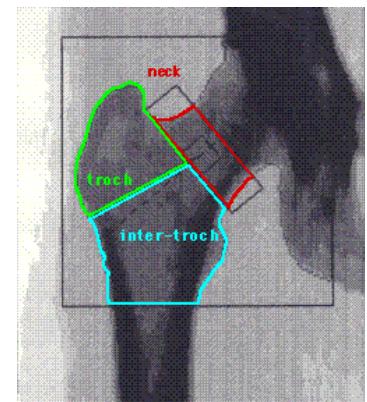
# DEXA PITFALLS

**MOVIMENTI DEL PAZIENTE**

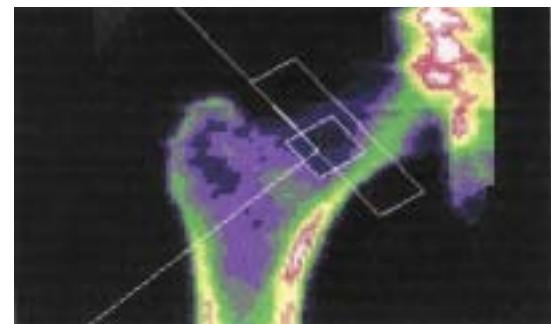
**PRINCIPALI ERRORI NEL  
POSIZIONAMENTO DEL PAZIENTE**



**PRINCIPALI ERRORI ANALITICI  
DELLA COLONNA VERTEBRALE**

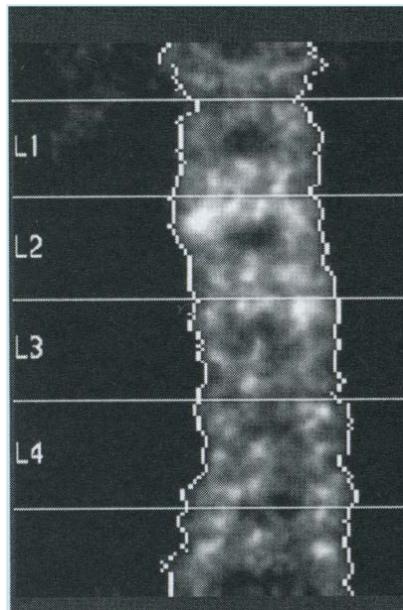
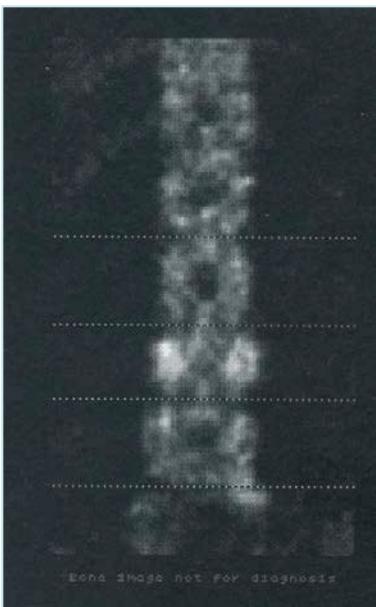


**PRINCIPALI ERRORI ANALITICI  
DEL FEMORE**

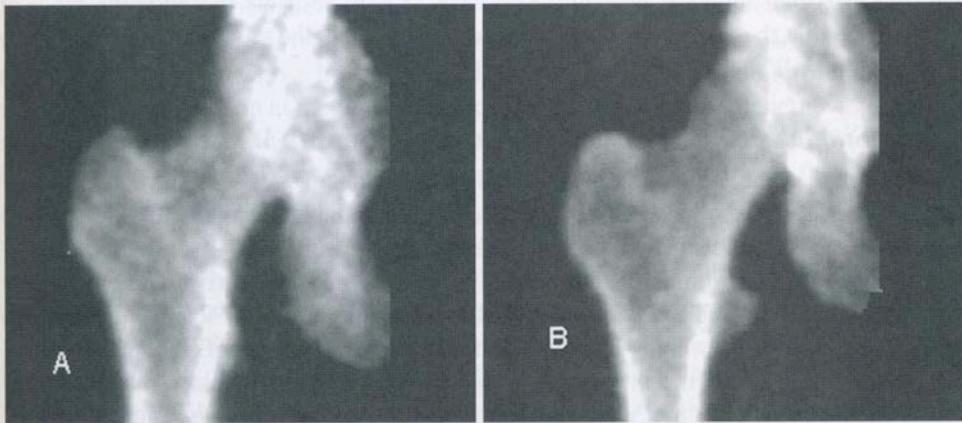




# DEXA PITFALLS



**PRINCIPALI ARTEFATTI  
DELLA COLONNA VERTEBRALE**

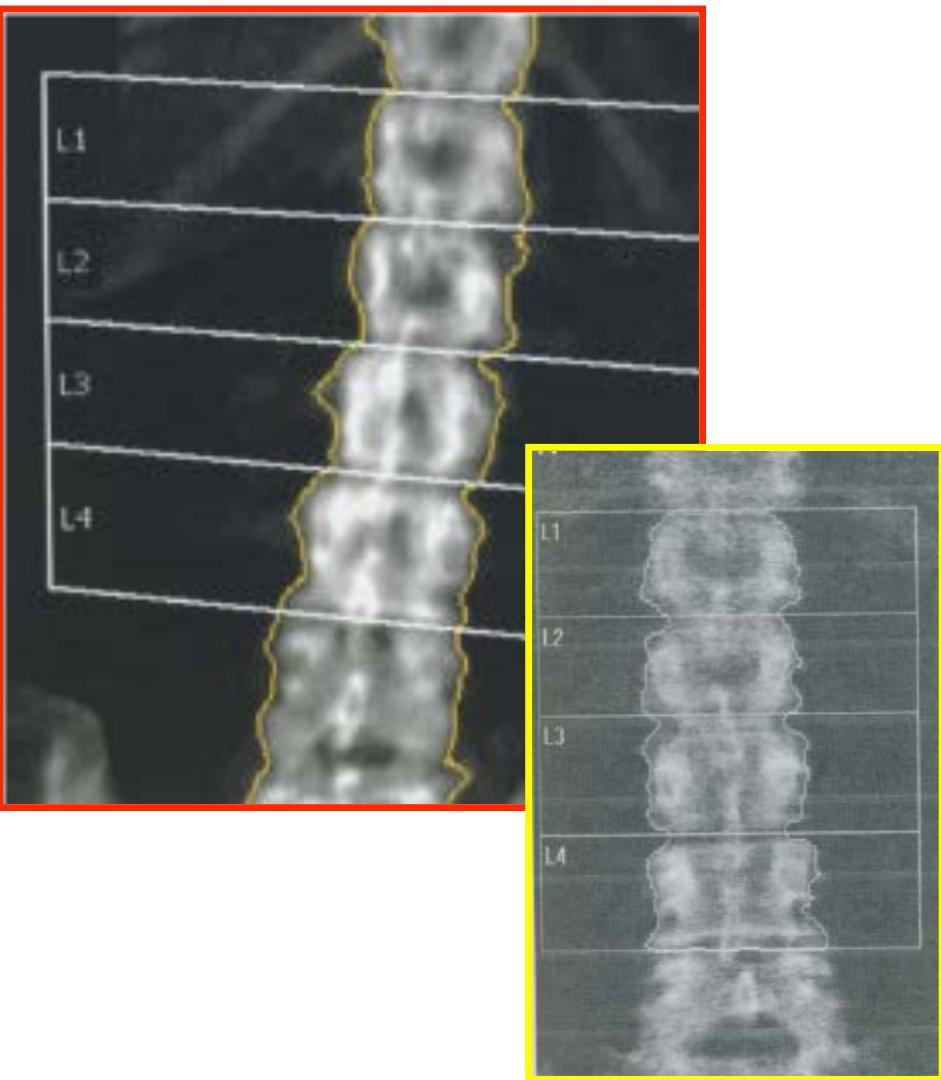


**PRINCIPALI ARTEFATTI  
DEL FEMORE**

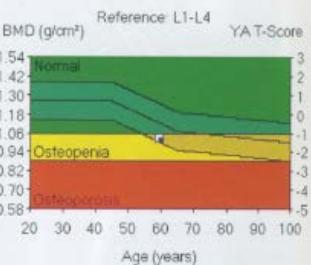
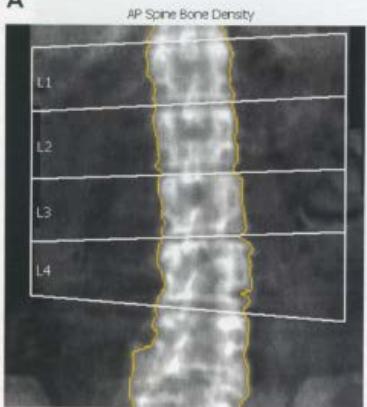


# DEXA PITFALLS

## ERRORI DI POSIZIONAMENTO

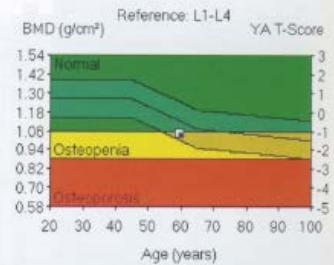
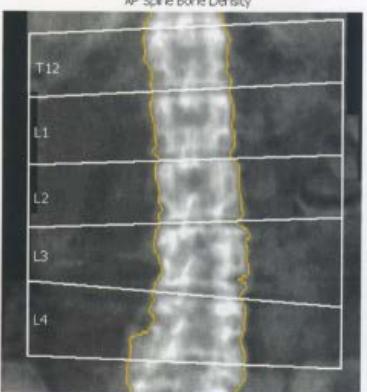


A



Region	<sup>1</sup> BMD ( $\text{g}/\text{cm}^2$ )	<sup>2</sup> Young-Adult (%)	<sup>3</sup> Age-Matched (%)
		T-Score	Z-Score
L1	0.996	88	-1.1
L2	1.025	85	-1.5
L3	1.066	89	-1.1
L4	1.040	87	-1.3
L1-L2	1.011	88	-1.2
L1-L3	1.029	88	-1.2
L1-L4	1.032	87	-1.2
L2-L3	1.045	87	-1.3
L2-L4	1.043	87	-1.3
L3-L4	1.051	88	-1.2

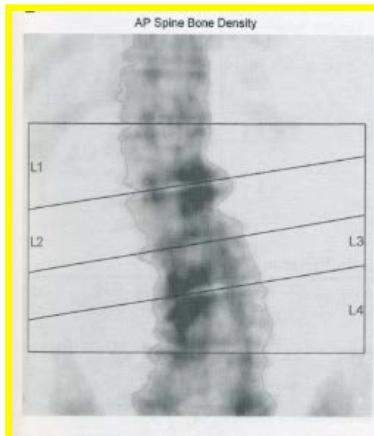
B



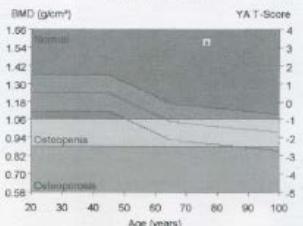
Region	<sup>1</sup> BMD ( $\text{g}/\text{cm}^2$ )	<sup>2</sup> Young-Adult (%)	<sup>3</sup> Age-Matched (%)
		T-Score	Z-Score
L1	1.025	91	-0.9
L2	1.066	89	-1.1
L3	1.040	87	-1.3
L4	1.043	87	-1.3
L1-L2	1.045	91	-0.9
L1-L3	1.043	89	-1.1
L1-L4	1.043	88	-1.1
L2-L3	1.051	88	-1.2
L2-L4	1.048	87	-1.3
L3-L4	1.041	87	-1.3



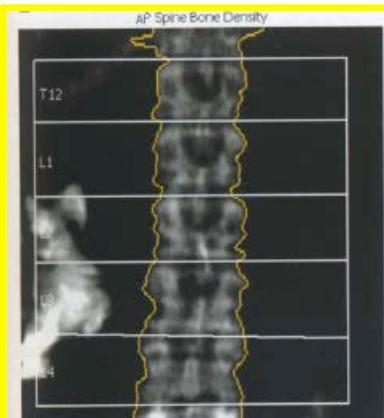
# ARTEFATTI



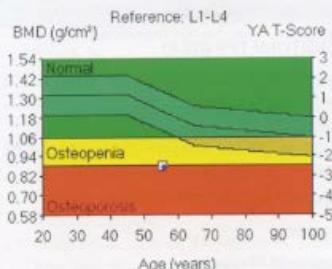
Reference: L1-L4



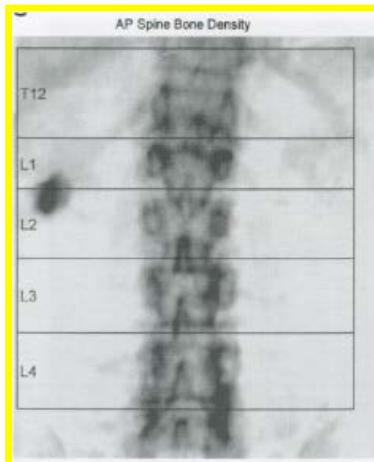
Region	<sup>1</sup> BMD ( $\text{g/cm}^2$ )	<sup>2</sup> Young-Adult (%)	<sup>2</sup> T-Score	<sup>3</sup> Age-Matched (%)	<sup>3</sup> Z-Score
L1	1.315	116	1.5	135	2.8
L2	1.623	135	3.5	156	4.8
L3	1.739	145	4.5	167	5.8
L4	1.609	134	3.4	154	4.7
L1-L4	1.570	133	3.3	153	4.6



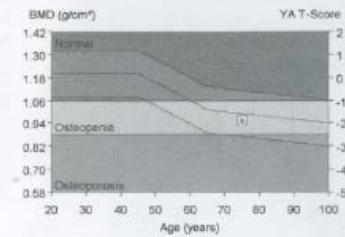
Reference: L1-L4



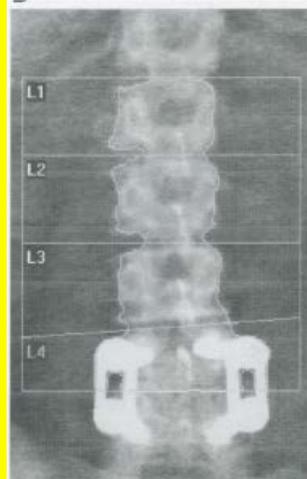
Region	<sup>1</sup> BMD ( $\text{g/cm}^2$ )	<sup>2</sup> Young-Adult (%)	<sup>2</sup> T-Score	<sup>3</sup> Age-Matched (%)	<sup>3</sup> Z-Score
L1	0.766	68	-3.0	66	-3.3
L2	0.911	76	-2.4	74	-2.7
L3	0.890	73	-2.7	71	-3.0
L4	0.967	81	-1.9	78	-2.3
L1-L2	0.836	73	-2.6	71	-2.9
L1-L3	0.852	73	-2.6	71	-2.9
L1-L4	0.884	75	-2.5	73	-2.8
L2-L3	0.894	75	-2.5	72	-2.9
L2-L4	0.920	77	-2.3	74	-2.6
L3-L4	0.924	77	-2.3	75	-2.6



Reference: L1-L4



Region	<sup>1</sup> BMD ( $\text{g/cm}^2$ )	<sup>2</sup> Young-Adult (%)	<sup>2</sup> T-Score	<sup>3</sup> Age-Matched (%)	<sup>3</sup> Z-Score
L1	0.943	83	-1.6	100	0.0
L2	0.865	72	-2.8	86	-1.2
L3	1.021	85	-1.5	101	0.1
L4	0.992	83	-1.7	98	-0.2
L1-L4	0.960	81	-1.8	97	-0.3


Image not for diagnostic use  
L = 1.5AT, 40 = 4C6

## Scan Information:

Scan Date: December 21, 2009 ID: A1221090F

Scan Type: a Lumbar Spine

Analysis: December 21, 2009 14:52 Version 12.3.3

Lumbar Spine

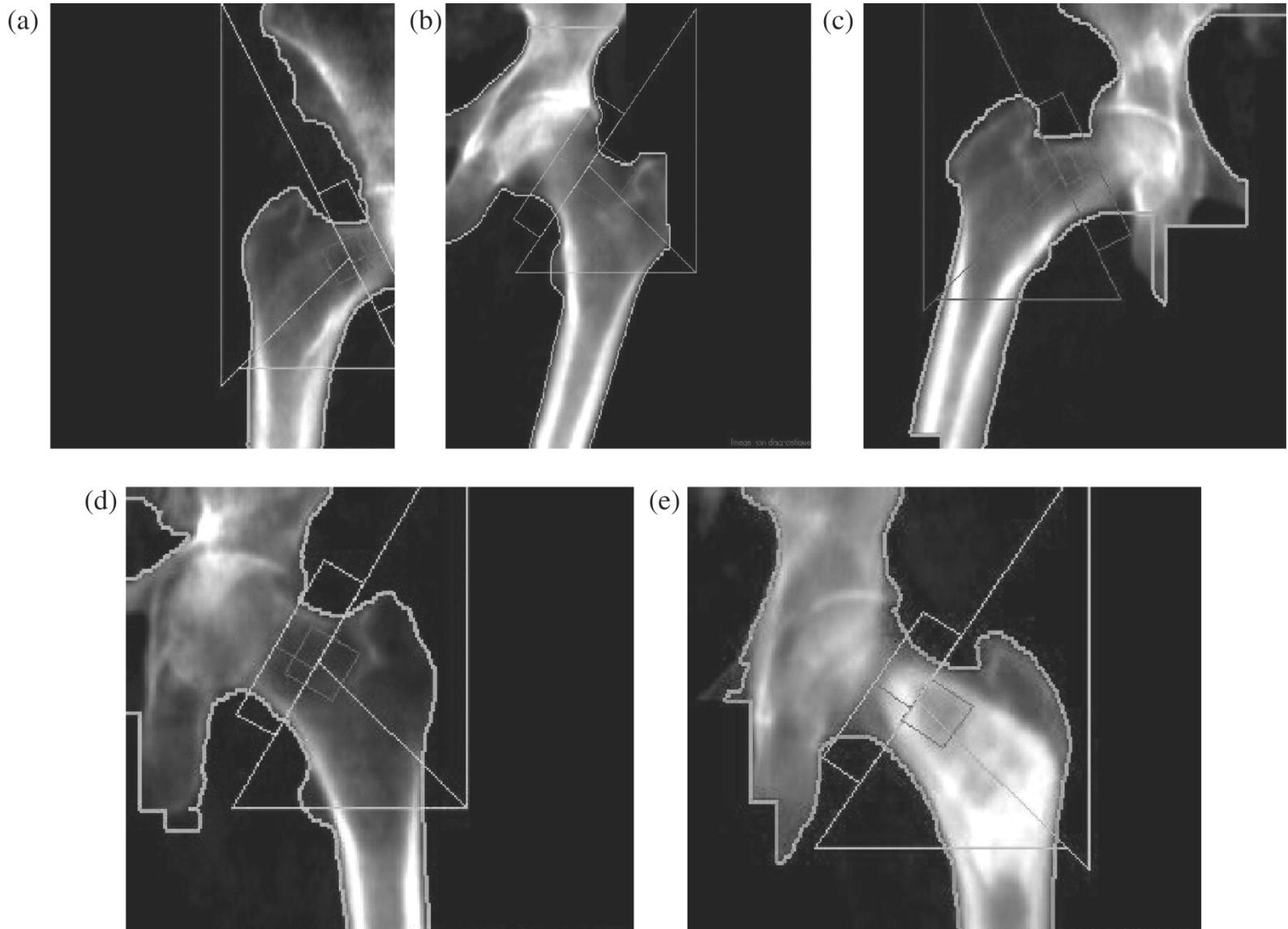
Operator: SH

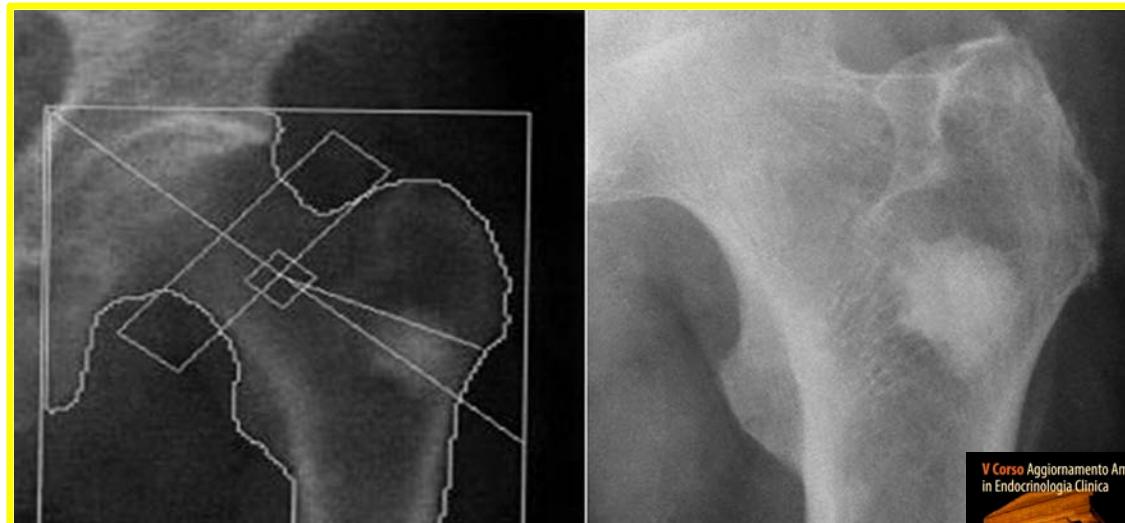
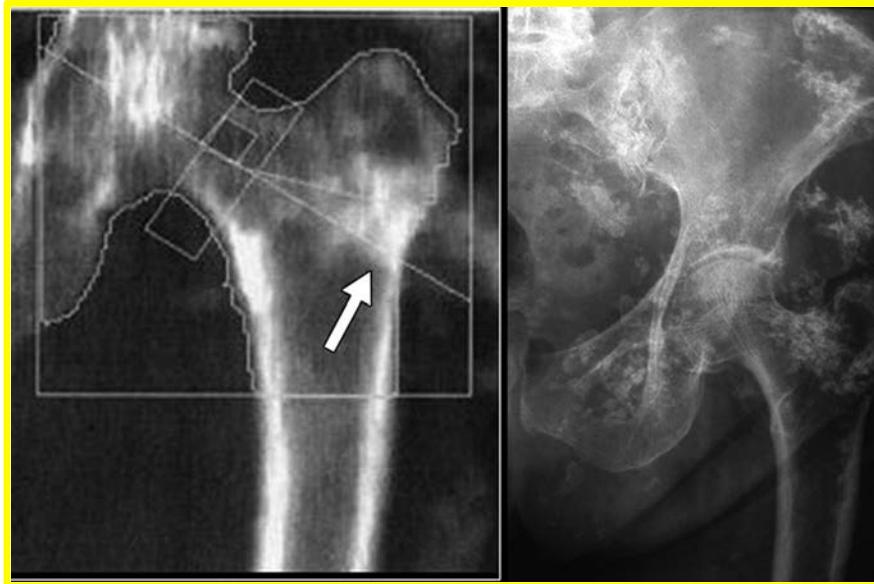
Model: Delphi A (S/N 70314)

Comment: BL-

## DXA Results Summary:

Region	Area ( $\text{cm}^2$ )	BMC ( $\text{g}$ )	BMD ( $\text{g}/\text{cm}^2$ )	T - Score	PR (%)	Z - Score	AM (%)
L1	11.88	8.21	0.691	-2.1	75	-1.1	86
L2	13.81	11.30	0.818	-1.9	80	-0.7	91
L3	14.30	13.29	0.929	-1.4	86	-0.1	98
Total	39.99	32.79	0.820	-1.8	81	-0.6	92



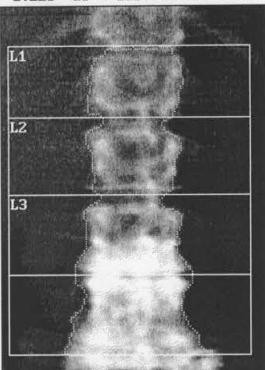


# DEXA - CONCLUSIONI

- Serial BMD testing can be used to determine whether treatment should be started on untreated patients, because significant loss may be an indication for treatment.  
**INIZIO TERAPIA**
- Serial BMD testing can monitor response to therapy by finding an increase or stability of bone density.  
**RISPOSTA ALLA TERAPIA**
- Serial BMD testing can evaluate individuals for non-response by finding loss of bone density, suggesting the need for reevaluation of treatment and evaluation for secondary causes of osteoporosis.  
**NON RISPOSTA ALLA TERAPIA**

# ISTITUTO AUXOLOGICO ITALIANO IRCCS

$k = 1.228$   $d\theta = 116.7(0.999H)$  6.298



•12.Apr.2001 11:19 [113 x 136]  
Hologic QDR-2000 (S/N 2330)  
Array Spine Hi-Res V4.76H:1

Q04120123 Thu 12.Apr.2001 11:14

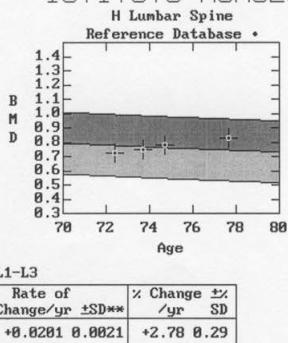
Name:  
Comment: 59 MP FIS NO E  
I.D.: 95AX14260000 Sex: F  
S.S.#: 023-01-8712 Ethnic: W  
ZIPCode: Height: 160.18 cm  
Scan Code: 03 Weight: 57.00 kg  
BirthDate: 07.Aug.23 Age: 77  
Physician: ZENONI  
Image not for diagnostic use

TOTAL BMD CV FOR L1 - L4 1.0%

C.F. 0.972 0.967 1.000

Region	Est.Area (cm <sup>2</sup> )	Est.BMC (grams)	BMD (gms/cm <sup>2</sup> )
L1	11.55	6.95	0.602
L2	12.16	8.24	0.678
L3	14.36	16.28	1.133
TOTAL	38.08	31.47	0.826

# ISTITUTO AUXOLOGICO ITALIANO IRCCS



\*\* $1.96 \times \text{SD} = 95\% \text{ Confidence Interval}$

\* Age and sex matched

T = peak BMD matched

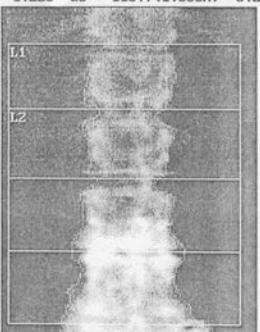
Z = age matched

TK 25 Oct 91

HOLOGIC

# ISTITUTO AUXOLOGICO ITALIANO IRCCS

$k = 1.228$   $d\theta = 116.7(1.000H)$  6.298



•17.Apr.2001 13:41 [113 x 136]  
Hologic QDR-2000 (S/N 2330)  
Array Spine Hi-Res V4.76H:1

Q04120123 Thu 12.Apr.2001 11:14

Name:  
Comment: 59 MP FIS NO E  
I.D.: 95AX14260000 Sex: F  
S.S.#: 023-01-8712 Ethnic: W  
ZIPCode: Height: 160.18 cm  
Scan Code: 03 Weight: 57.00 kg  
BirthDate: 07.Aug.23 Age: 77  
Physician: ZENONI  
Image not for diagnostic use

TOTAL BMD CV FOR L1 - L4 1.0%

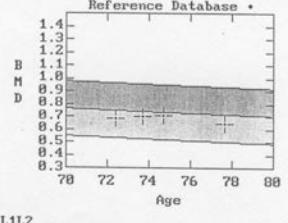
C.F. 0.972 0.967 1.000

Region	Est.Area (cm <sup>2</sup> )	Est.BMC (grams)	BMD (gms/cm <sup>2</sup> )
L1	11.55	6.95	0.602
L2	12.16	8.24	0.678
TOTAL	23.72	15.19	0.641

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# ISTITUTO AUXOLOGICO ITALIANO IRCCS

## H Lumbar Spine Reference Database \*



Q04120123 Thu 12.Apr.2001 11:14  
Name: GRASSI Giancarla  
Comment: 59 MP FIS NO E  
I.D.: 95AX14260000 Sex: F  
S.S.#: 023-01-8712 Ethnic: W  
ZIPCode: Height: 160.18 cm  
Scan Code: 03 Weight: 57.00 kg  
BirthDate: 07.Aug.23 Age: 77  
Physician: ZENONI

Date of Scan	Age	BMD(L1L2)
02 Jan 96	72.4	0.681
30 Apr 97	73.7	0.695
21 Apr 98	74.7	0.784
12 Apr 01	77.7	0.641

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\*\* $1.96 \times \text{SD} = 95\% \text{ Confidence Interval}$

\* Age and sex matched

T = peak BMD matched

Z = age matched TK 25 Oct 91



# ISTITUTO AUXOLOGICO ITALIANO IRCCS

Via Ariosto 13  
20145 MILANO

Telephone: 02/61911.1

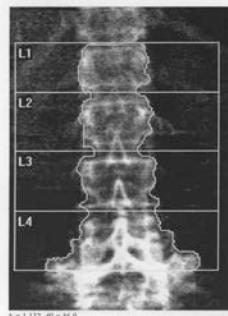
E-Mail: boneunit@auxologico.it

Fax: 02/61911.2429

Patient ID: 96AX14880000  
DOB: 07 November 1917

Referring Physician: DH ARIOSTO 9

Sex: Female  
Ethnicity: White  
Height: 160.0 cm  
Weight: 50.0 kg  
Age: 87

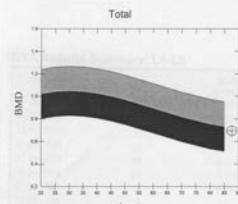


**Scan Information:**  
Scan Date: 16 June 2005 ID: A06160504  
Scan Type: a Lumbar Spine  
Analysis: 16 June 2005 07:52 Version 12.3  
Lumbar Spine  
Operator: FL  
Model: Discovery A (S/N 80533)  
Comment:

## DXA Results Summary:

Region	Area (cm <sup>2</sup> )	BMC (g)	BMD (g/cm <sup>2</sup> )	T-Score	PR (%)	Z-Score	AM (%)
L1	10.19	5.30	0.520	-3.7	56		
L2	12.00	6.52	0.543	-4.4	53		
L3	13.76	8.19	0.595	-4.4	55		
L4	20.53	19.17	0.934	-1.7	84		
Total	56.48	39.18	0.694	-3.2	66		

Total BMD CV 1.0%, ACF = 1.026, BCF = 1.000, TH = 6.603



## Physician's Comment:

# ISTITUTO AUXOLOGICO ITALIANO IRCCS

Via Ariosto 13  
20145 MILANO

Phone: 02/61911.1

E-Mail: boneunit@auxologico.it

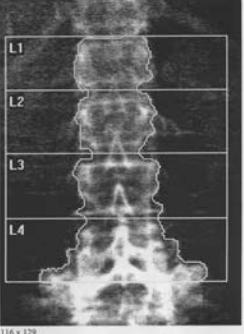
Fax: 02/61911.2429

Patient ID: 96AX14880000  
DOB: 07 November 1917

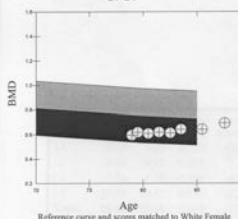
Referring Physician: DH ARIOSTO 9

### Scan Information:

Scan Date: 16 June 2005 ID: A06160504  
Scan Type: a Lumbar Spine  
Analysis: 16 June 2005 07:52 Version 12.3  
Lumbar Spine  
Operator: FL  
Model: Discovery A (S/N 80533)  
Comment:



### DXA Results Summary: L1-L4



### DXA Results Summary: L1-L4

Scan Date	Age	BMD (g/cm <sup>2</sup> )	T-Score	vs Baseline	BMD Change vs Previous
16.06.2005	87	0.694	-3.2	16.4%*	7.8%*
05.05.2003	85	0.644	-3.7	8.0%*	-0.1%
23.05.2001	83	0.644	-3.7	8.1%*	4.9%*
25.05.2000	82	0.614	-3.9	3.1%	-1.0%
07.05.1999	81	0.621	-3.9	4.2%*	1.8%
08.05.1998	80	0.610	-4.0	2.4%	-1.5%
22.05.1997	79	0.620	-3.9	3.9%*	3.9%*
25.10.1996	78	0.596	-4.1		

Total BMD CV 1.0%  
Denotes significant change at the 95% confidence level.  
Denotes dissimilar scan types or analysis methods.

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# ISTITUTO AUXOLOGICO ITALIANO IRCCS

Via Ariosto 13  
20145 MILANO

Telephone: 02/61911.1

E-Mail: boneunit@auxologico.it

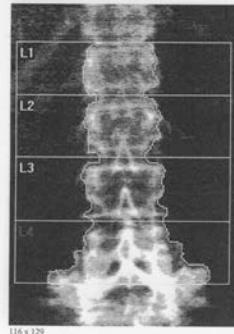
Fax: 02/61911.2429

Patient ID: 96AX14880000  
DOB: 07 November 1917

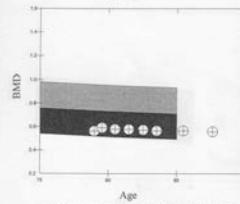
Referring Physician: DH ARIOSTO 9

### Scan Information:

Scan Date: 16 June 2005 ID: A06160504  
Scan Type: a Lumbar Spine  
Analysis: 21 June 2005 13:55 Version 12.3  
Lumbar Spine  
Operator: FL  
Model: Discovery A (S/N 80533)  
Comment:



### L1-L3



### DXA Results Summary: L1-L3

Scan Date	Age	BMD (g/cm <sup>2</sup> )	T-Score	vs Baseline	BMD Change vs Previous
16.06.2005	87	0.556	-4.2	-1.0%*	-1.5%*
05.05.2003	85	0.565	-4.1	0.6%	0.2%
23.05.2001	83	0.564	-4.1	0.3%	-1.3%
25.05.2000	82	0.571	-4.1	1.6%	-0.8%
07.05.1999	81	0.576	-4.0	2.5%	-0.3%
08.05.1998	80	0.577	-4.0	2.7%	-2.1%
22.05.1997	79	0.589	-3.9	4.9%*	4.9%*
25.10.1996	78	0.562	-4.1		

Total BMD CV 1.0%  
\* Denotes significant change at the 95% confidence level.  
# Denotes dissimilar scan types or analysis methods.

V Corso Aggiornamento Amel in Endocrinologia Clinica



AGRIGENTO

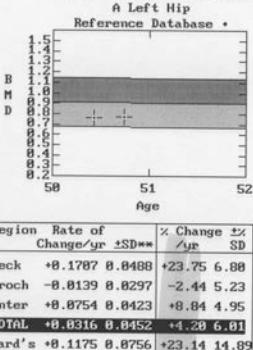
## ISTITUTO AUXOLOGICO ITALIANO IRCCS



Q11090007 Thu 09.Nov.2000 08:24  
Name: REDACTED 45 MP FIS SI E  
Comment: REDACTED  
I.D.: 00AX00002210 Sex: F  
S.S.#: 023-01-1324 Ethnic: W  
ZIPCode: Height: 160.00 cm  
Scan Code: 02 Weight: 58.00 kg  
BirthDate: 12.Feb.58 Age: 50  
Physician: USSL  
Image not for diagnostic use  
TOTAL BMD CV 1.8%  
C.F. 0.972 0.967 1.000  
Region Est.Area Est.BMC BMD  
(cm<sup>2</sup>) (grams) (gms/cm<sup>2</sup>)  
Neck 4.37 3.36 0.778  
Troch 10.83 6.18 0.563  
Inter 18.46 16.17 0.876  
TOTAL 33.66 25.63 0.761  
Ward's 1.87 0.58 0.543  
Midline (112,180)-(196, 58)  
Neck -49 x 15 at [ 23, 141  
Troch 16 x 41 at [ 8, 81  
Ward's -11 x 11 at [ 8, 41

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## ISTITUTO AUXOLOGICO ITALIANO IRCCS



\*\*1.96xSD = 95% Confidence Interval

\* Age and sex matched

T = peak BMD matched

HLX 25 Oct 91

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## ISTITUTO AUXOLOGICO ITALIANO IRCCS

$k = 1.234 \quad d\theta = 122.0(0.997H) \quad 5.736$



Q11090007 Thu 09.Nov.2000 08:24

Name: REDACTED 45 MP FIS SI E  
Comment: REDACTED  
I.D.: 00AX00002210 Sex: F  
S.S.#: 023-01-1324 Ethnic: W  
ZIPCode: Height: 160.00 cm  
Scan Code: 02 Weight: 58.00 kg  
BirthDate: 12.Feb.58 Age: 50  
Physician: USSL  
Image not for diagnostic use

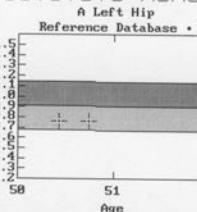
TOTAL BMD CV 1.8%  
C.F. 0.972 0.967 1.000

Region	Est.Area (cm <sup>2</sup> )	Est.BMC (grams)	BMD (gms/cm <sup>2</sup> )
Neck	4.72	3.37	0.715
Troch	9.83	5.48	0.557
Inter	17.67	15.37	0.878
TOTAL	32.22	24.22	0.752
Ward's	1.86	0.57	0.534

Midline (106,180)-(188, 64)  
Neck -49 x 15 at [ 24, 181  
Troch 14 x 43 at [ 8, 81  
Ward's -11 x 11 at [ 8, 41

HOLOGIC

## ISTITUTO AUXOLOGICO ITALIANO IRCCS



Q11090007 Thu 09.Nov.2000 08:24  
Name: PRIORE Ida  
Comment: 45 MP FIS SI E  
I.D.: 00AX00002210 Sex: F  
S.S.#: 023-01-1324 Ethnic: W  
ZIPCode: Height: 160.00 cm  
Scan Code: 02 Weight: 58.00 kg  
BirthDate: 12.Feb.58 Age: 50  
Physician: USSL

Date	Age	BMD Neck	BMD Troch	BMD Inter	BMD TOTAL	BMD Ward
22 Jul 00	58.4	0.719	0.567	0.853	0.752	0.588
09 Nov 00	58.7	0.775	0.557	0.878	0.752	0.534

Region	Rate of Change/yr	$\pm SD**$	% Change /yr	$\pm SD$
Neck	+0.1787	0.8488	+23.75	6.88
Troch	-0.8139	0.8297	-2.44	5.23
Inter	+0.8754	0.8423	+8.84	4.95
TOTAL	+0.0316	0.0452	+1.28	6.01
Ward's	+0.1175	0.8756	+23.14	14.89

\*\*1.96xSD = 95% Confidence Interval

\* Age and sex matched

T = peak BMD matched

HLX 25 Oct 91

HOLOGIC

ISTITUTO AUXOLOGICO ITALIANO IRCCS



Q10890033 Mon 09.Oct.2000 15:33

Name: INVERNIZZI NELLY MP.58

I.D.: 00AX00003313 Sex: F

S.S.#: 023-00-0000 Ethnic: W

ZIPCode: Height: 154.00 cm

Scan Code: 01 Weight: 71.58 kg

BirthDate: 13.Aug.39 Age: 61

Physician:

Image not for diagnostic use

TOTAL BMD CV FOR L1 - L4 1.0%

C.F. 0.972 0.967 1.000

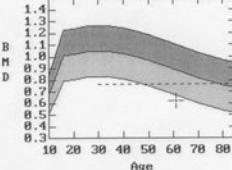
Region	Est.Area (cm <sup>2</sup> )	Est.BMC (grams)	BMD (gms/cm <sup>2</sup> )
L1	9.38	5.82	0.548
L2	18.77	6.49	0.683
L3	12.56	8.88	0.643
L4	13.85	9.28	0.664
TOTAL	46.47	28.78	0.619

HOLOGIC

ISTITUTO AUXOLOGICO ITALIANO IRCCS

A Lumbar Spine

Reference Database \*



Q10890033 Mon 09.Oct.2000 15:33

Name: INVERNIZZI NELLY MP.58

Comment: MP.58

I.D.: 00AX00003313 Sex: F

S.S.#: 023-00-0000 Ethnic: W

ZIPCode: Height: 154.00 cm

Scan Code: 01 Weight: 71.58 kg

BirthDate: 13.Aug.39 Age: 61

Physician:

Age and sex matched

T = peak BMD matched

Z = age matched

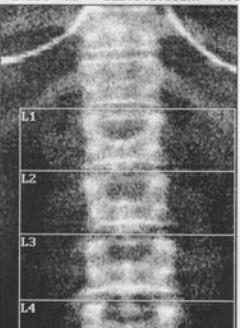
Region	BMD	T(38.8)	Z
L1	0.548	-3.58	58x -2.18 69z
L2	0.683	-3.87	59x -2.48 78z
L3	0.643	-4.81	59x -2.46 78z
L4	0.664	-4.11	60x -2.52 71z
L1-L4	0.619	-3.89	59x -2.48 78z

\* Age and sex matched  
T = peak BMD matched  
Z = age matched

TK 04 Nov 91

ISTITUTO AUXOLOGICO ITALIANO IRCCS

k = 1.214 dB = 112.0(1.000H) 7.917



Q10890033 Mon 09.Oct.2000 15:33

Name: INVERNIZZI NELLY MP.58

Comment: MP.58

I.D.: 00AX00003313 Sex: F

S.S.#: 023-00-0000 Ethnic: W

ZIPCode: Height: 154.00 cm

Scan Code: 01 Weight: 71.58 kg

BirthDate: 13.Aug.39 Age: 61

Physician:

Image not for diagnostic use

TOTAL BMD CV FOR L1 - L4 1.0%

C.F. 0.972 0.967 1.000

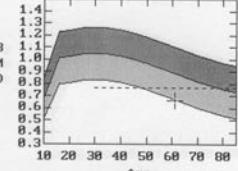
Region	Est.Area (cm <sup>2</sup> )	Est.BMC (grams)	BMD (gms/cm <sup>2</sup> )
L1	10.93	6.49	0.594
L2	12.73	8.23	0.646
L3	14.68	9.35	0.637
L4	15.84	11.67	0.736
TOTAL	54.28	35.74	0.659

• 30.Oct.2000 20:36 [113 x 133]  
Hologic QDR-2000 (S/N 2338)  
Dowm Spline Medium 0.4 76x:1

ISTITUTO AUXOLOGICO ITALIANO IRCCS

A Lumbar Spine

Reference Database \*



Q10890033 Mon 09.Oct.2000 15:33

Name: INVERNIZZI NELLY MP.58

Comment: MP.58

I.D.: 00AX00003313 Sex: F

S.S.#: 023-00-0000 Ethnic: W

ZIPCode: Height: 154.00 cm

Scan Code: 01 Weight: 71.58 kg

BirthDate: 13.Aug.39 Age: 61

Physician:

Age and sex matched

T = peak BMD matched

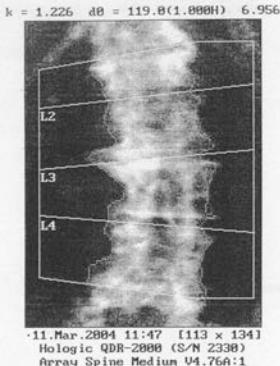
Z = age matched

TK 04 Nov 91

HOLOGIC

HOLOGIC

## ISTITUTO AUXOLOGICO ITALIANO IRCCS

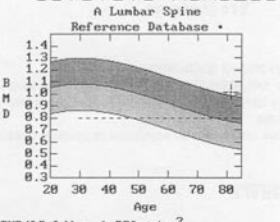


Q8311841D  
Name:  
Comment:  
I.D.: 04AX00000466 Sex: F  
S.S.#: 020-00-9912 Ethnic: W  
ZIPCode: Height: 169.00 cm  
Scan Code: 81 Weight: 54.00 kg  
BirthDate: 18.Aug.22 Age: 81  
Physician: ASL  
Image not for diagnostic use

TOTAL BMC CV FOR L1 - L4 1.08  
C.F. 0.962 0.955 1.000

Region	Est.Area (cm <sup>2</sup> )	Est.BMC (grams)	BMD (gms/cm <sup>2</sup> )
L2	15.74	14.44	0.917
L3	16.35	16.79	1.027
L4	17.78	18.94	1.065
TOTAL	49.86	58.17	1.086

## ISTITUTO AUXOLOGICO ITALIANO IRCCS



BMD(L2-L4) = 1.086 g/cm<sup>2</sup>

Region	BMD	T(30.0)	Z
N/A			
L2	0.917	-1.00	89%
L3	1.027	-0.52	95%
L4	1.065	-0.46	95%
L2-L4	1.086	-0.66	93%

\* Age and sex matched  
T = peak BMD matched  
Z = age matched

## ISTITUTO AUXOLOGICO ITALIANO



ISTITUTO DI RICOVERO E CURA A CARATTERE SCIENTIFICO

Istituto Scientifico San Michele  
20145 Milano - Via Ariosto, 13 Tel. 02-619111 Fax 02-619112429

### MANCA DI VILLAHERMOSA MARIA CATERINA

VIA VOLTA 7  
MILANO - 20100 MI  
Cartella: 1021 del 11/03/2004

Milano, 11/03/2004

### M.O.C. VERTEbrale

L'esame è stato condotto sulla sola sede vertebrale non essendo valutabile la densità ossea femorale in presenza di impianto protesico bilaterale.  
I valori di densità ossea del tratto vertebrale L2-L4 risultano sensibilmente sovrastimati per concomitanti fenomeni spondilo-artrosici pertanto, pur apparentemente conservati nei limiti di norma, vanno considerati scarsamente affidabili in termini diagnostici.

Lo Specialista  
DOTT. SERGIO ORTOLANI

rc 16/03/2004

### VALORI DI RIFERIMENTO

BMD totale:

L1 - L4 0.830 - 1.350 (g/cm<sup>2</sup>)  
L2 - L4 0.850 - 1.350 (g/cm<sup>2</sup>)

"N.B. Si consegnano con l'originale del referto le relative immagini e/o i relativi tracciati"

## ISTITUTO AUXOLOGICO ITALIANO IRCCS

Via Ariosto 13  
20145 MILANO

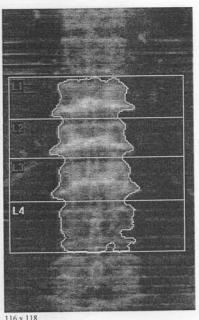
Telephone: 02/61911.1

E-Mail: boneunit@auxologico.it

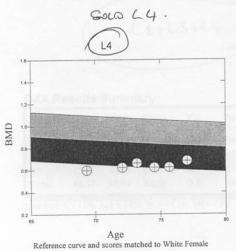
Fax: 02/61911.2429

Patient ID: 97AX15470000  
DOB: 21 March 1928

Referring Physician: DH ARIOSTO 9



**Scan Information:**  
Scan Date: 12 April 2005 ID: A0412050D  
Scan Type: a Lumbar Spine  
Analysis: 12 April 2005 14:02 Version 12.1  
Lumbar Spine  
Operator: DL  
Model: Discovery A (S/N 80533)  
Comment:



Reference curve and scores matched to White Female

Source: Hologic

### DXA Results Summary: L4

Scan Date	Age	BMD (g/cm²)	T- Score	BMD Change vs Baseline	BMD Change vs Previous
12.04.2005	77	0.684	-3.9	14.3%*	9.4%#
26.11.2003	75	0.625	-4.5	4.5%*	0.4%
07.10.2002	74	0.623	-4.5	4.2%*	-6.1%*
01.06.2001	73	0.663	-4.1	10.9%*	6.5%*
19.04.2000	72	0.623	-4.5	4.1%*	4.1%*
24.07.1997	69	0.598	-4.7		

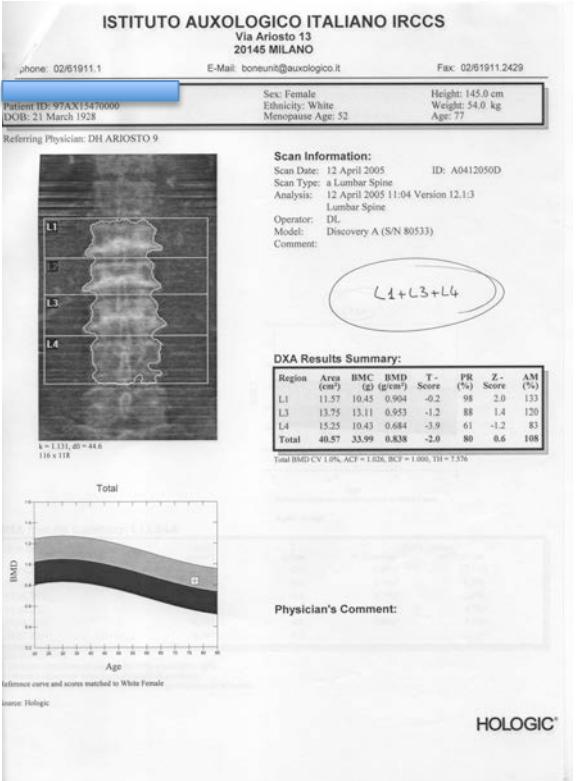
Total BMD CV 1.0%

\* Denotes significant change at the 95% confidence level.

# Denotes dissimilar scan types or analysis methods.

Rate of change results reflect vertebral levels common to all scans.

HOLOGIC



## ISTITUTO AUXOLOGICO ITALIANO IRCCS

Via Ariosto 13  
20145 MILANO

Phone: 02/61911.1

E-Mail: boneunit@auxologico.it

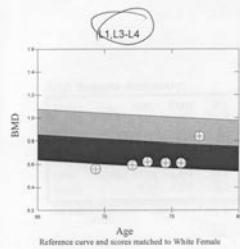
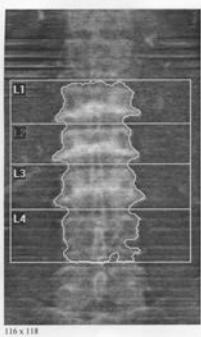
Fax: 02/61911.2429

Patient ID: 97AX15470000 DOB: 21 March 1928

Referring Physician: DH ARIOSTO 9

### Scan Information:

Scan Date: 12 April 2005 ID: A0412050D  
Scan Type: a Lumbar Spine Analysis: 12 April 2005 11:04 Version 12.1  
Lumbar Spine Operator: DL Model: Discovery A (S/N 80533)  
Comment:



Reference curve and scores matched to White Female

Source: Hologic

### DXA Results Summary: L1,L3-L4

Scan Date	Age	BMD (g/cm²)	T- Score	BMD Change vs Baseline	BMD Change vs Previous
12.04.2005	77	0.838	-2.0	49.6%#	37.1%#
26.11.2003	75	0.611	-4.0	9.1%*	-0.0%
07.10.2002	74	0.611	-4.0	9.1%*	-1.6%
01.06.2001	73	0.621	-3.9	10.9%*	4.7%*
19.04.2000	72	0.593	-4.2	3.9%*	5.9%*
24.07.1997	69	0.560	-4.5		

Total BMD CV 1.0%

\* Denotes significant change at the 95% confidence level.

# Denotes dissimilar scan types or analysis methods.

Rate of change results reflect vertebral levels common to all scans.

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## ISTITUTO AUXOLOGICO ITALIANO IRCCS

Via Ariosto 13  
20145 MILANO

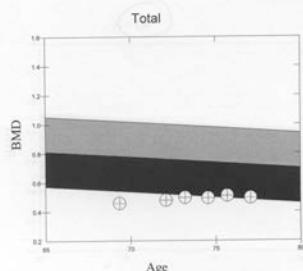
Telephone: 02/61911.1

E-Mail: boneunit@auxologico.it

Fax: 02/61911.2429

Patient ID: 97AX129470000  
DOB: 21 March 1928

Referring Physician: DH ARIOSTO 9



Reference curve and scores matched to White Female

Source: Hologic

### DXA Results Summary:

Scan Date	Age	BMD (g/cm²)	T - Score	BMD Change vs Baseline	BMD Change vs Previous
12.04.2005	77	0.494	-4.0	7.8%*	-2.8%#
26.11.2003	75	0.509	-3.9	11.0%*	3.1%
07.10.2002	74	0.494	-4.0	7.7%*	-0.7%
01.06.2001	73	0.497	-4.0	8.4%*	3.9%
19.04.2000	72	0.478	-4.1	4.4%	4.4%
24.07.1997	69	0.458	-4.3		

Total BMD CV 1.0%

\* Denotes significant change at the 95% confidence level.

# Denotes dissimilar scan types or analysis methods.

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## ISTITUTO AUXOLOGICO ITALIANO IRCCS

Via Ariosto 13  
20145 MILANO

Telephone: 02/61911.1

E-Mail: boneunit@auxologico.it

Fax: 02/61911.2429

Patient ID: 97AX15470000  
DOB: 21 March 1928

Referring Physician: DH ARIOSTO 9



k = 1.134, d0 = 52.0  
109 x 111

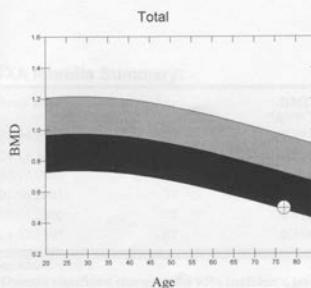
### Scan Information:

Scan Date: 12 April 2005 ID: A0412050C  
Scan Type: a Left Hip  
Analysis: 12 April 2005 14:09 Version 12.1:3  
Left Hip  
Operator: DL  
Model: Discovery A (S/N 80533)  
Comment:

### DXA Results Summary:

Region	Area (cm²)	BMC (g)	BMD (g/cm²)	T - Score	PR (%)	Z - Score	AM (%)
Neck	4.98	2.29	0.460	-4.3	51	-1.6	74
Troch	11.01	3.92	0.356	-4.1	49	-2.0	66
Inter	16.67	9.93	0.596	-3.9	52	-1.8	70
Total	32.66	16.14	0.494	-4.0	51	-1.9	68
Ward's	1.11	0.25	0.220	-5.2	28	-1.7	55

Total BMD CV 1.0%, ACF = 1.026, BCF = 1.000, TH = 5.282



Reference curve and scores matched to White Female

Source: Hologic

### Physician's Comment:

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Aggiornamento Ame  
Auxologia Clinica

AGRICENTO

USL-41 MILANO

Via Stromboli, 19 20144 MILANO (MI)  
Telefono : 02/33029928 Fax: 02/33029914

SERVIZIO DI RADIOLOGIA

**Mineralometria ossea computerizzata  
M.O.C. DEXA**

Distretto esaminato : Colonna

**DATI DI RIFERIMENTO**  
(BMD g/cm<sup>2</sup>) Colonna

Dati Paziente  
Misura effettuata il: 30.06.2002  
Cognome: LEN  
Nascita: 19-01-1949 Sesso: F Peso (kg): 69.0  
Altezza (cm): 165 Etnia: Caucasiche

Risultati Mineralometria

Regione	Bmd g/cm <sup>2</sup>	Bmc g	Area cm <sup>2</sup>	ZScore	TScore
L2	1.154	11.093	09.6	(120%) +1.52	(114%) +1.11
L3	1.034	12.482	12.1	(102%) +0.20	( 97%) -0.18
L4	0.966	11.502	11.9	( 94%) -0.38	( 90%) -0.75
				35.078	33.6

Riepilogo  
BMD Medio : 1.04 [0.86-1.13] Soglia rischio: 0.71 Zscore: (104%) +0.36 Tscore: ( 99%) -0.02

Conclusioni:  
VALORI NELLA NORMA. SCOLIOSI S ITALICA DORSO LOMBARE

JL Medico

Riportare alla visita di controllo

**IST. AUXOLOGICO - H.SAN LUCA - IRCCS**

A06040228 Tue 04.Jun.2002 16:04  
Name: Comment:  
I.D.: 02SL00002711 Sex: F  
S.S.#: 023-00-0000 Ethnic: U  
ZIPCode: Height: 168.00 cm  
Operator: SN Weight: 66.00 kg  
BirthDate: 19.Jan.49 Age: 53  
Physician: ASL  
Image not for diagnostic use

**TOTAL BMD CV FOR L1 - L4 1.8%**

C.F. 1.837 1.818 1.808

Region	Est.Area (cm <sup>2</sup> )	Est.BMC (grams)	BMD (gms/cm <sup>2</sup> )
L2	13.35	9.36	0.781
L3	12.87	9.99	0.777
L4	14.15	12.24	0.865
<b>TOTAL</b>	<b>48.36</b>	<b>31.59</b>	<b>0.783</b>

04.Jun.2002 16:04 [116 x 132]  
Hologic QDR-4500W (S/N 49447)  
Lumbar Spine V8.26a-S

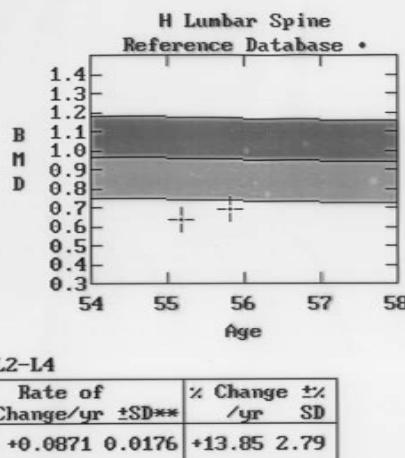
**IST. AUXOLOGICO - H.SAN LUCA - IRCCS**

A06040228 Tue 04.Jun.2002 16:04  
Name: FUSI GABRIELLA  
Comment:  
I.D.: 02SL00002711 Sex: F  
S.S.#: 023-00-0000 Ethnic: U  
ZIPCode: Height: 168.00 cm  
Operator: SN Weight: 66.00 kg  
BirthDate: 19.Jan.49 Age: 53  
Physician: ASL

**BMD(L2-L4) = 0.783 g/cm<sup>2</sup>**

Region	BMD	T(30.8)	Z
N/A			
L2	0.781	-2.97	68z -2.84
L3	0.777	-2.79	72z -1.81
L4	0.865	-2.28	78z -1.28
L2-L4	0.783	-2.69	73z -1.72

\* Age and sex matched  
T = peak BMD matched  
Z = age matched TX 25 Oct 91

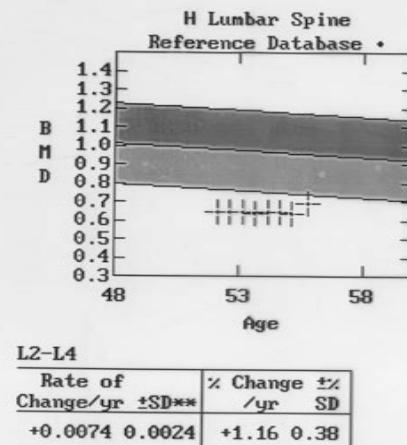


Q09309707 Tue 30.Sep.1997 10:39  
 Name:  
 Comment: 42 OVK  
 I.D.: 94AX01040000 Sex: F  
 S.S.#: 028-00-7024 Ethnic: W  
 ZIPCode: 001106 Height: 146.10 cm  
 Scan Code: 08 Weight: 46.10 kg  
 BirthDate: 28.Nov.41 Age: 55  
 Physician: DH ARIOSTO 9

Date of Scan      Age      BMD(L2-L4)

05 Feb 97	55.2	0.629
30 Sep 97	55.8	0.686

\*\*1.96xSD = 95% Confidence Interval  
 ♦ Age and sex matched  
 T = peak bone mass  
 Z = age matched      TK      25 Oct 91



Q09309707 Tue 30.Sep.1997 10:39  
 Name:  
 Comment: 42 OVK  
 I.D.: 94AX01040000 Sex: F  
 S.S.#: 028-00-7024 Ethnic: W  
 ZIPCode: 001106 Height: 146.10 cm  
 Scan Code: 08 Weight: 46.10 kg  
 BirthDate: 28.Nov.41 Age: 55  
 Physician: DH ARIOSTO 9

Date of Scan      Age      BMD(L2-L4)

09 Feb 94	52.2	0.637
21 Jul 94	52.6	0.638
08 Feb 95	53.2	0.637
26 Jul 95	53.7	0.635
07 Feb 96	54.2	0.640
29 Jul 96	54.7	0.636
05 Feb 97	55.2	0.629
30 Sep 97	55.8	0.686

\*\*1.96xSD = 95% Confidence Interval  
 ♦ Age and sex matched  
 T = peak bone mass  
 Z = age matched      TK      25 Oct 91

Non è possibile visualizzare l'immagine  
 ID paziente: 14AX00000428  
 Data di nascita: 12 May 1948

Sesso: Femmina  
 Etnia: Bianco  
 Menopause Age: 53

Altezza: 158.0 cm  
 Peso: 115.0 kg  
 Età: 65

Medico di riferimento: ASL

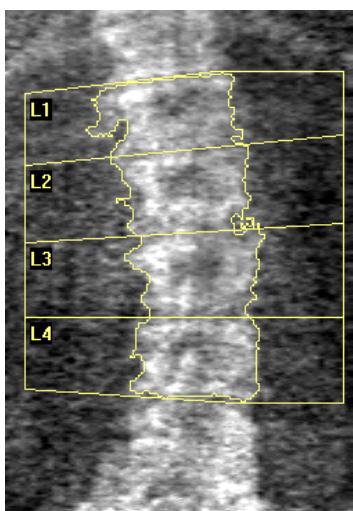


Immagine non per uso diagnostico  
 $k = 1.119$ ,  $d_0 = 39.8$   
 116 x 121

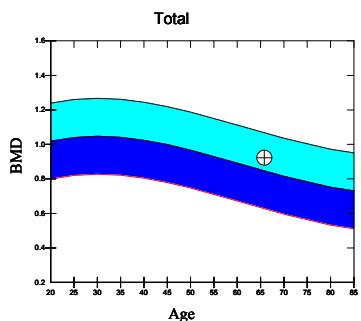
**Informazioni sulla scansione:**

Data scansione: 04 March 2014 ID: A0304140R  
 Tipo di scansione: a Lombare  
 Analisi: 04 March 2014 11:19 Versione 12.6.2:3  
 Operator: AI  
 Model: Discovery A (S/N 80533)  
 Commento:

**Riepilogo risultati DXA:**

Regione	Area (cm <sup>2</sup> )	BMC (g)	BMD (g/cm <sup>2</sup> )	T - Punti	PR (%)	Z - Punti	AM (%)
L1	12.67	10.62	0.838	-0.8	91	0.8	112
L2	13.33	12.50	0.937	-0.8	91	1.0	113
L3	12.80	11.46	0.895	-1.7	83	0.2	102
L4	12.80	13.04	1.019	-0.9	91	1.1	113
<b>Total</b>	<b>51.60</b>	<b>47.61</b>	<b>0.923</b>	<b>-1.1</b>	<b>88</b>	<b>0.7</b>	<b>109</b>

Totale BMD CV 1.0%, ACF = 1.029, BCF = 0.997, TH = 11.108



Curva di riferimento e punteggi corrispondenti a Bianco Femmina

Origine: Hologic

**Commento del medico:**

Telefono: 02/61911.1

E-mail: boneunit@auxologico.it

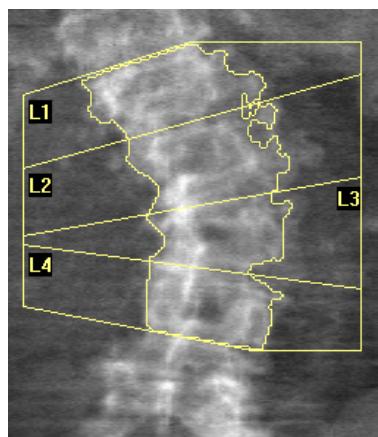
Fax: 02/61911.2429

 Nome:   
 ID paziente: 10AX00000084  
 Data di nascita: 07 July 1926

 Sesso: Femmina  
 Etnia: Bianco  
 Menopause Age: 55

 Altezza: 160.0 cm  
 Peso: 40.0 kg  
 Età: 87

Medico di riferimento: VOLPATO


 Immagine non per uso diagnostico  
 $k = 1.132$ ,  $d0 = 45.9$   
 116 x 106

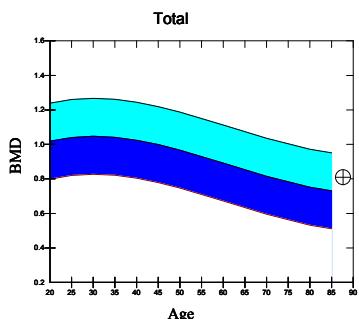
**Informazioni sulla scansione:**

 Data scansione: 04 March 2014 ID: A0304140V  
 Tipo di scansione: a Lombare  
 Analisi: 04 March 2014 11:58 Versione 12.6.2:3  
 Lombare  
 Operator: AI  
 Model: Discovery A (S/N 80533)  
 Commento:

**Riepilogo risultati DXA:**

Regione	Area (cm <sup>2</sup> )	BMC (g)	BMD (g/cm <sup>2</sup> )	T - Punti	PR (%)	Z - Punti	AM (%)
L1	12.52	10.98	0.877	-0.4	95		
L2	13.34	10.10	0.757	-2.5	74		
L3	9.72	7.42	0.763	-2.9	70		
L4	10.37	8.73	0.841	-2.5	75		
<b>Totale</b>	<b>45.96</b>	<b>37.22</b>	<b>0.810</b>	<b>-2.2</b>	<b>77</b>		

Totale BMD CV 1.0%, ACF = 1.029, BCF = 0.997, TH = 6.314



Curva di riferimento e punteggi corrispondenti a Bianco Femmina

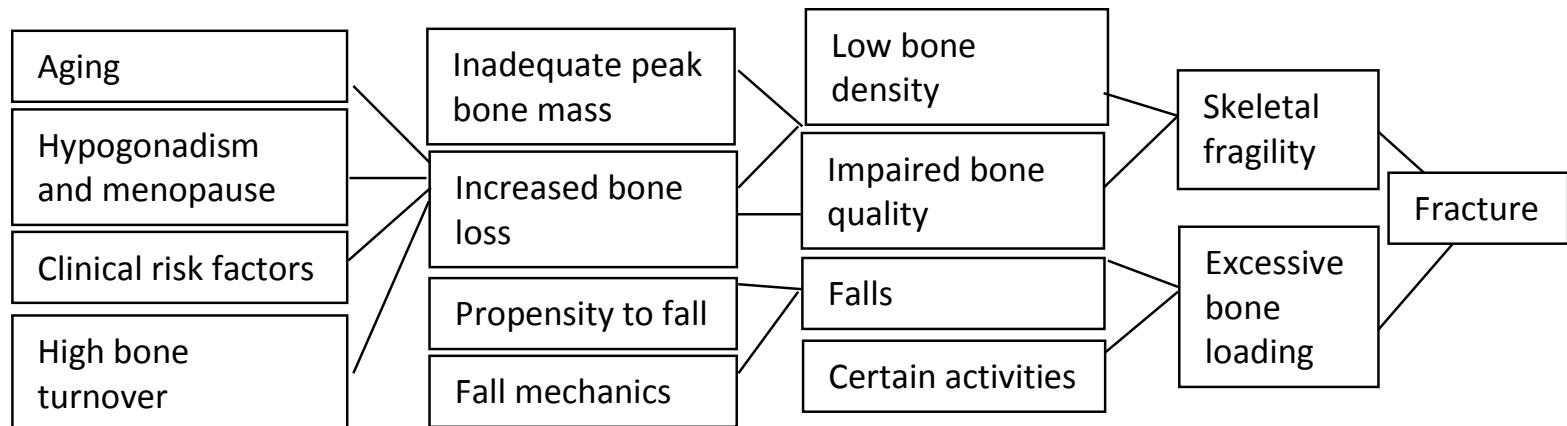
Origine: Hologic

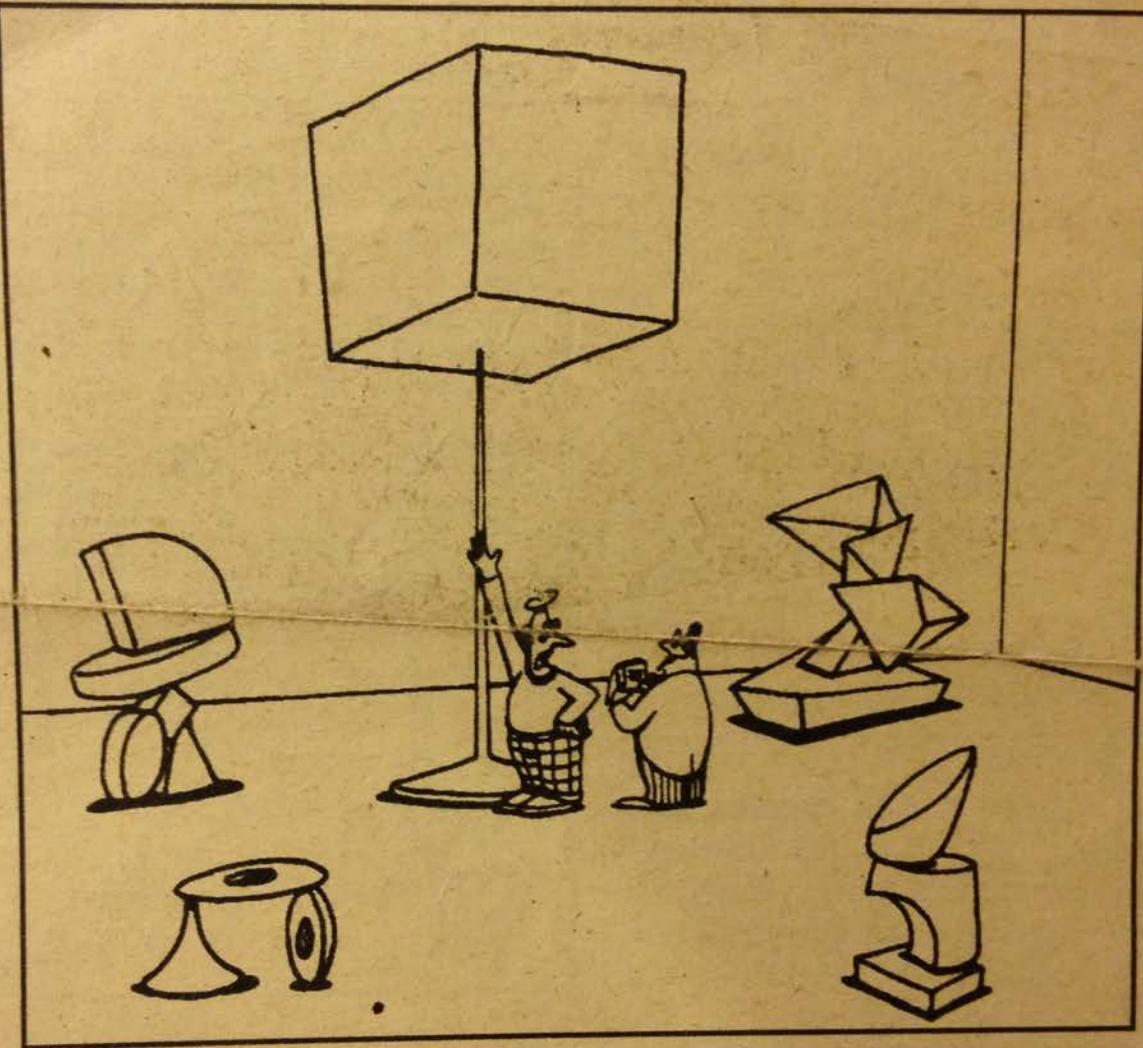
**Commento del medico:**

2013

## CLINICIAN'S GUIDE TO PREVENTION AND TREATMENT OF OSTEOPOROSIS

FIGURE 2. Pathogenesis of Osteoporosis-Related Fractures

From: Cooper C and Melton LJ, with modification.<sup>9</sup>



— E' uno dei miei pezzi migliori. L'ho chiamato «Aspettando Che L'Incidente Accada».

