x congresso nazionale

simeu

NAPOLI 18-20 NOVEMBRE 2016

L'ECOGRAFIA DEL DIAFRAMMA NEL PAZIENTE CRITICO

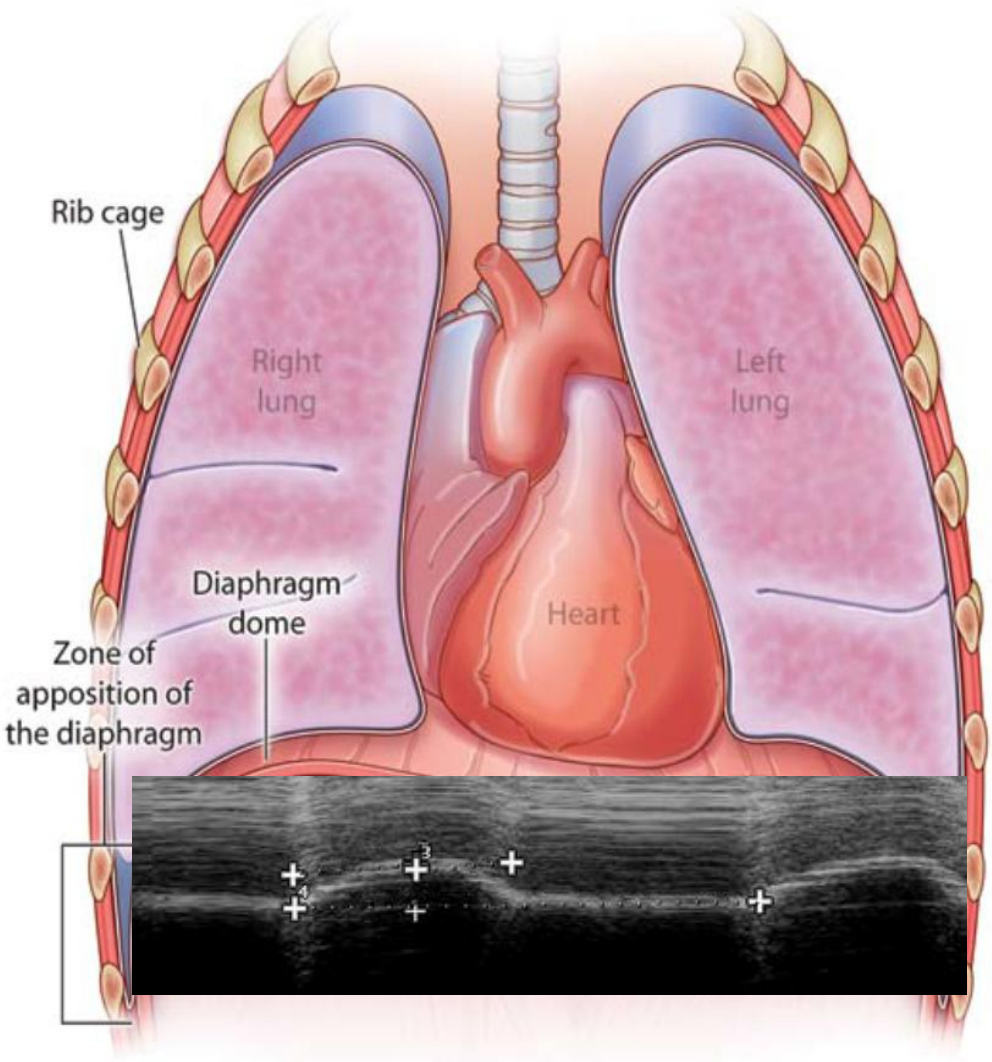
Morelli Lucia *Med d'Urg ,PS,OBI OSP San Paolo Napoli**

Guarino Mario *ET,PS,OBI Osp San Paolo Napoli*

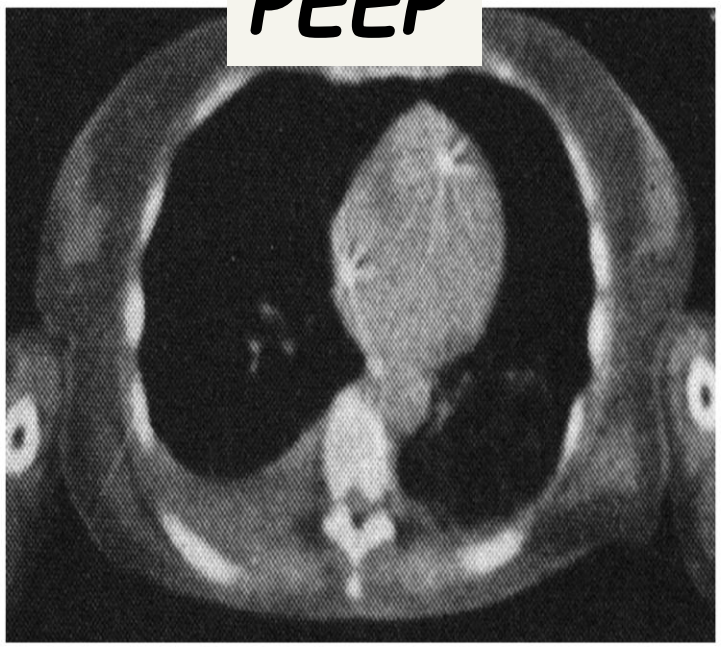
**Gruppo SIMEU Campania di Ecografia clinica in Emergenza Urgenza .*

Heart-lung and Diaphragmatic interactions

Michael R. Pinsky Curr Opin Crit Care 2007



PEEP



EUROPEAN RESPIRATORY SOCIETY

ERS INTERNATIONAL CONGRESS 2015

AMSTERDAM netherlands, 26–30 september

To demostrate if the study of diaphragmatic motility in ED with US ,is useful for patients in ARF

L Morelli **ED** *S.Paolo Hospital,Naples,Italy*

ULTRASOUND M-MODE ASSESSMENT OF DIAPHRAGMATIC KINETICS BY ANTERIOR TRANSVERSE SCANNING IN HEALTHY SUBJECTS

AMERICO TESTA,* GINO SOLDATI,† ROSANGELA GIANNUZZI,* SILVIA BERARDI,* GRAZIA PORTALE,* and NICOLÒ GENTILONI SILVERI*

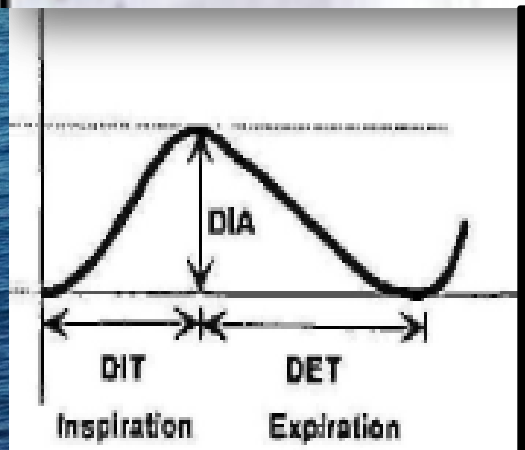
*Department of Emergency Medicine, A. Gemelli University Hospital, Rome, Italy; and †Operative Unit of Emergency Medicine, Castelnuovo Garfagnana Hospital, Lucca, Italy

otion Studied by M-Mode

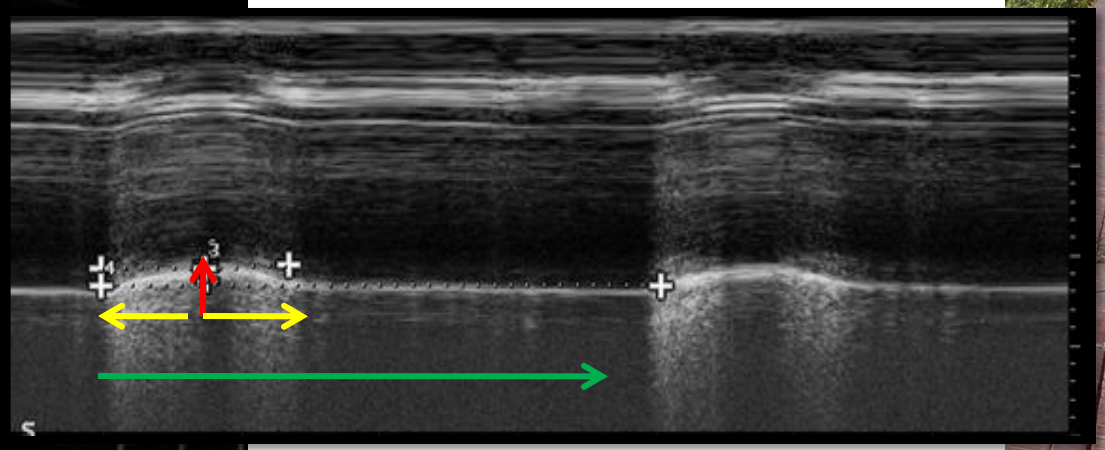
le and Philippe Blanc

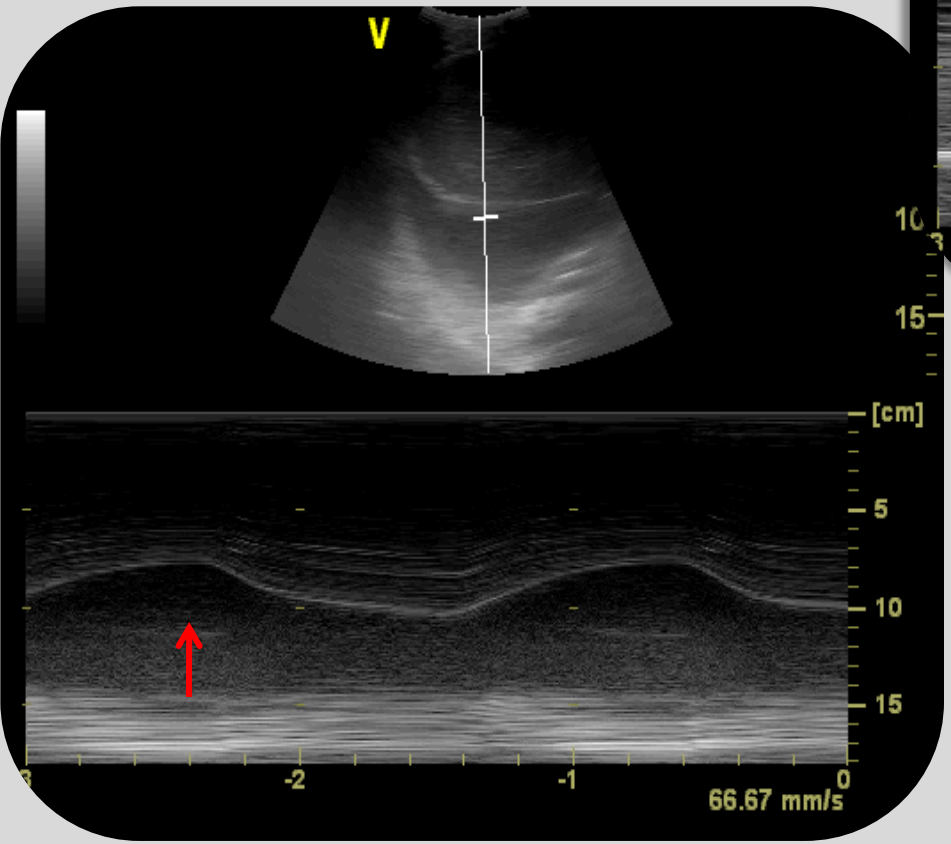
republished online November 18, 2008;

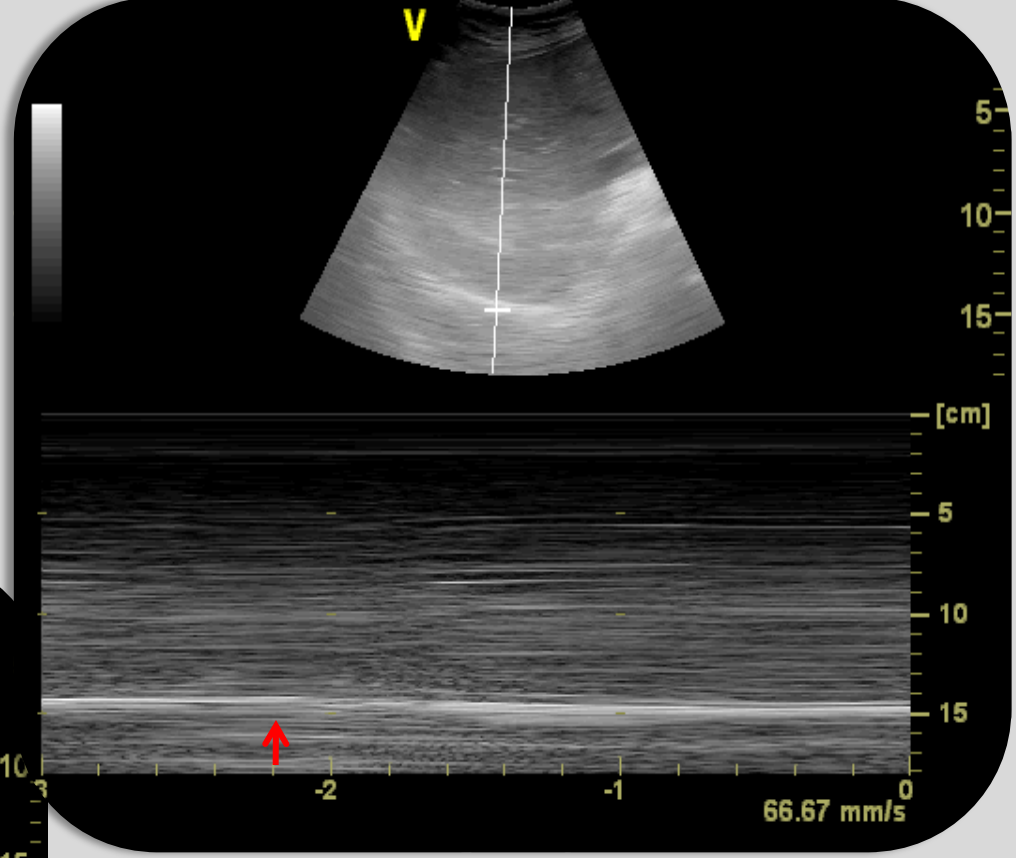
Shifting .2.5-3cm (±1.6)-1.8*m*)

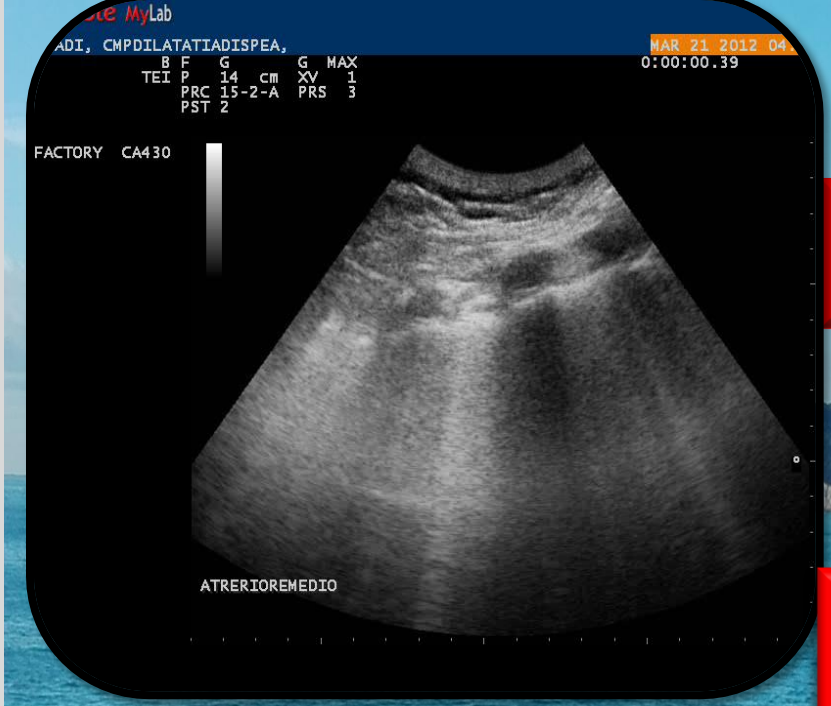


E
Ti
Te
Ttot
Dome

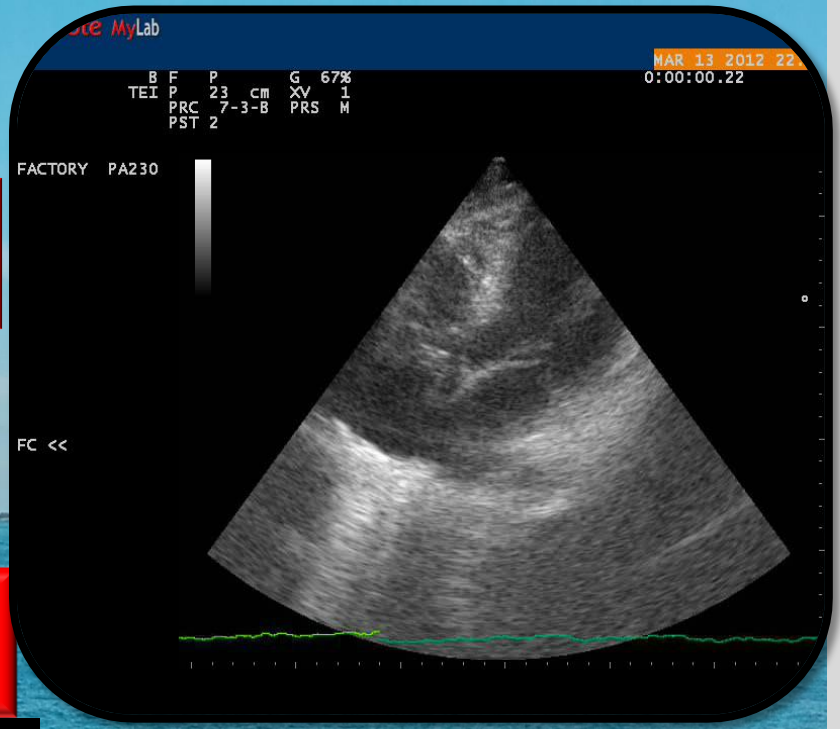



V
[cm]
5
10
15
-2
-1
0
66.67 mm/s


V
[cm]
5
10
15
-2
-1
0
66.67 mm/s

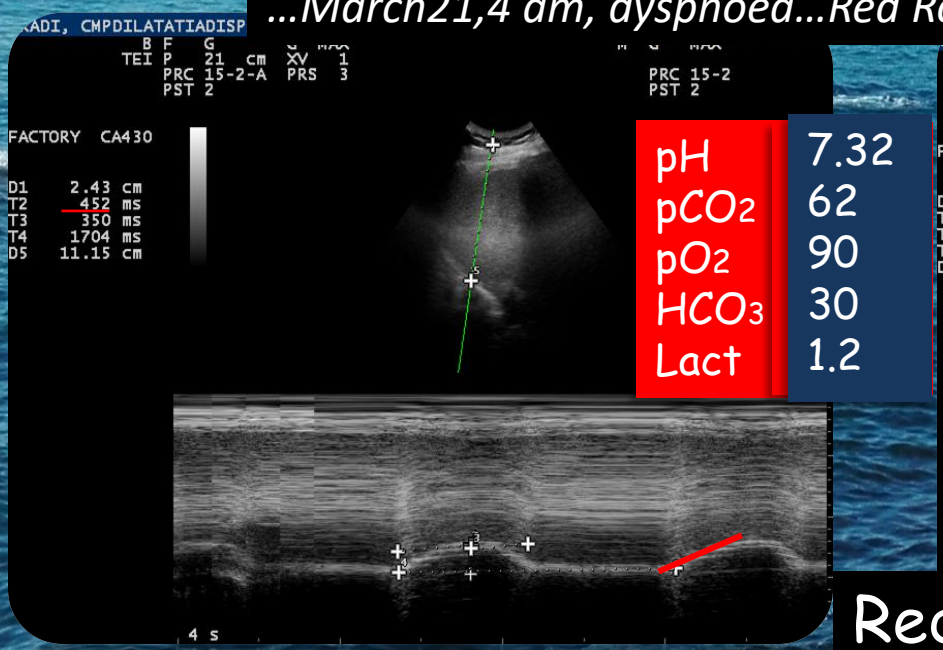


AHF

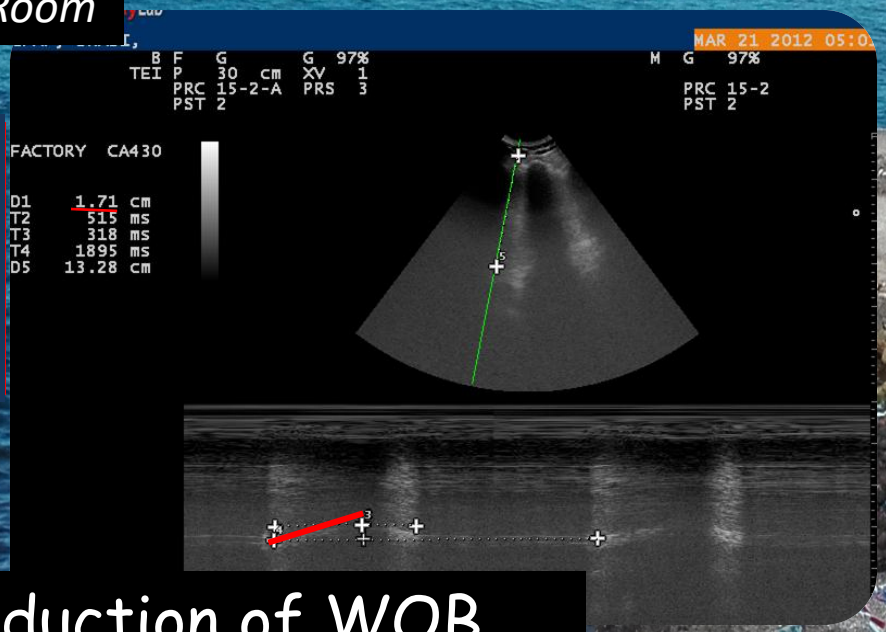


CPAP
PEEP 7.5

...March21,4 am, dyspnoea...Red Room



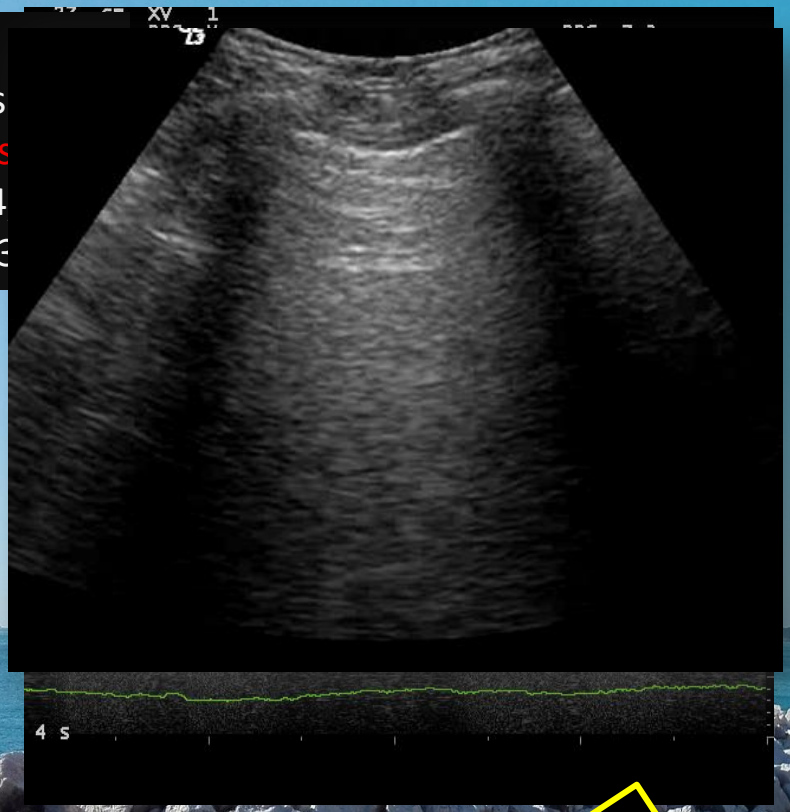
pH	7.32
pCO_2	62
pO_2	90
HCO_3	30
Lact	1.2



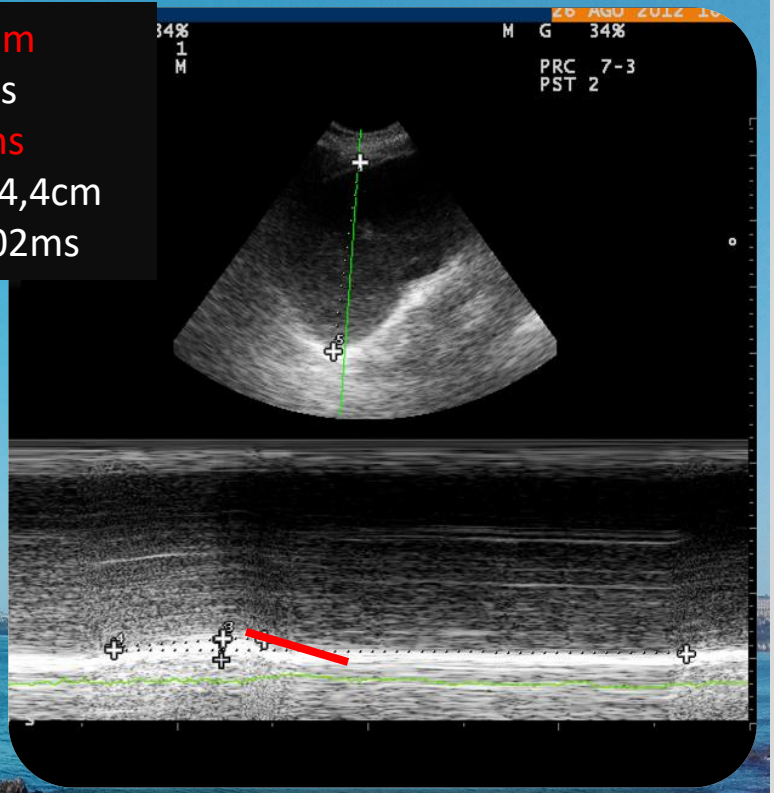
Reduction of WOB

...1 hour later

E:24mm
Ti:496ms
Te:178ms
Dome:14
Ttot:2213



E:15.7mm
Ti:566ms
Te:216ms
Dome:14,4cm
Ttot:3002ms



pH	7.28
pCO_2	91
pO_2	84
HCO_3	39.9
Lact	1.9

'EASY WEANED'

pH	7.35
pCO_2	55
pO_2	83
HCO_3	35
Lact	0.4

RR 32
O2 4L\min

...March21,4 am, dyspnoea...Red Room

NIV PSVST
IPAP 18 EPAP 6
O2 3L\min

Intensive Care Med
DOI 10.1007/s00134-013-2823-1

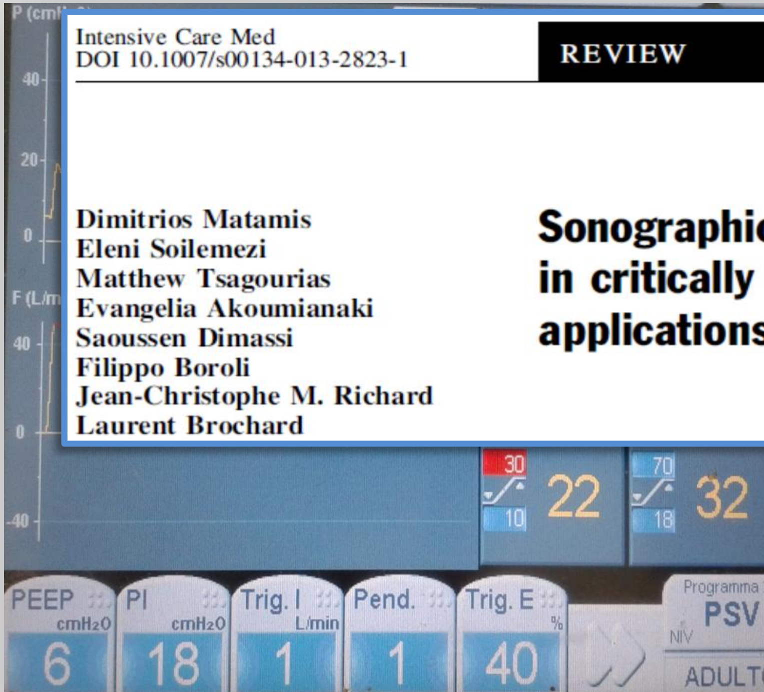
REVIEW

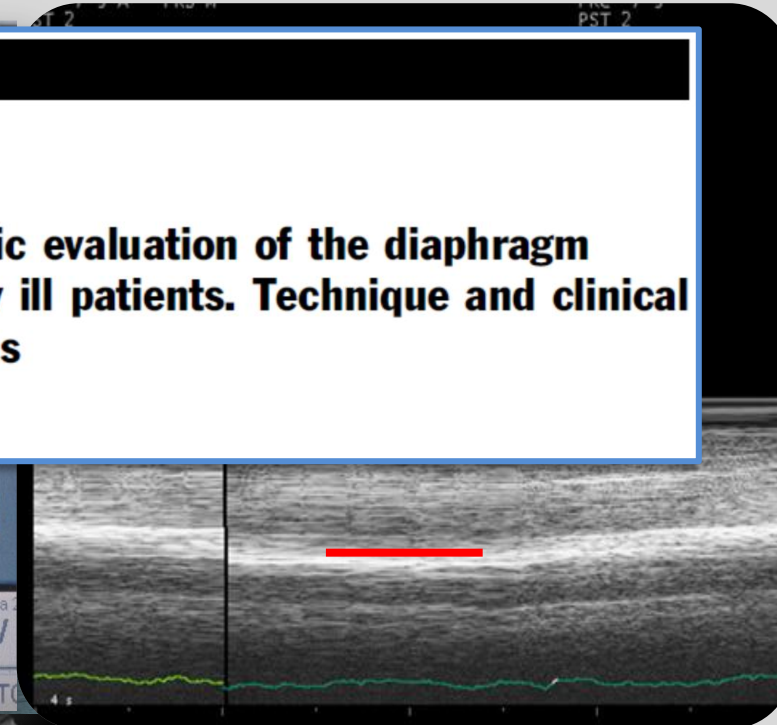
Dimitrios Matamis
Eleni Soilemezi
Matthew Tsagourias
Evangelia Akoumianaki
Saoussen Dimassi
Filippo Boroli
Jean-Christophe M. Richard
Laurent Brochard

Sonographic evaluation of the diaphragm in critically ill patients. Technique and clinical applications

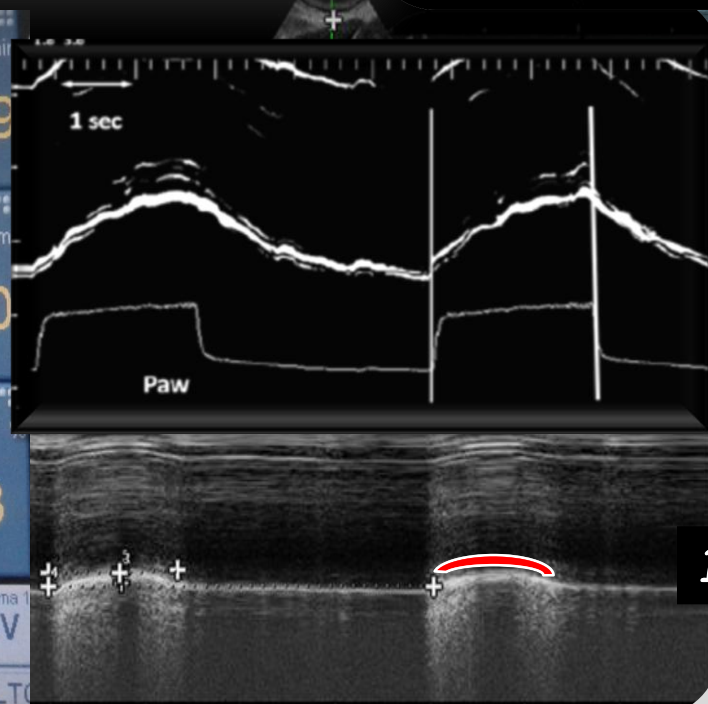
RR 35 FiO_2 30%

pH	7.23
pCO_2	91
pO_2	74
HCO3	38.1
Lact	0.4





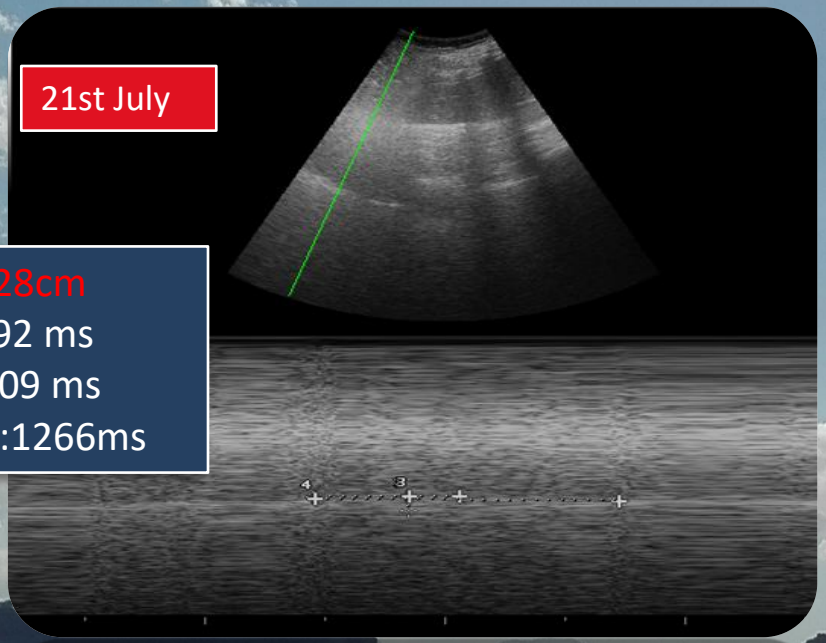
Trig I-PI



pH	7.32
pCO_2	73
pO_2	76
HCO3	37.1
Lact	0.7

1 hour later.. RR 18

21st July



E:1.28cm
Ti:392 ms
Te:209 ms
Ttot:1266ms

Levosimendan 40mcg\kg bolus*

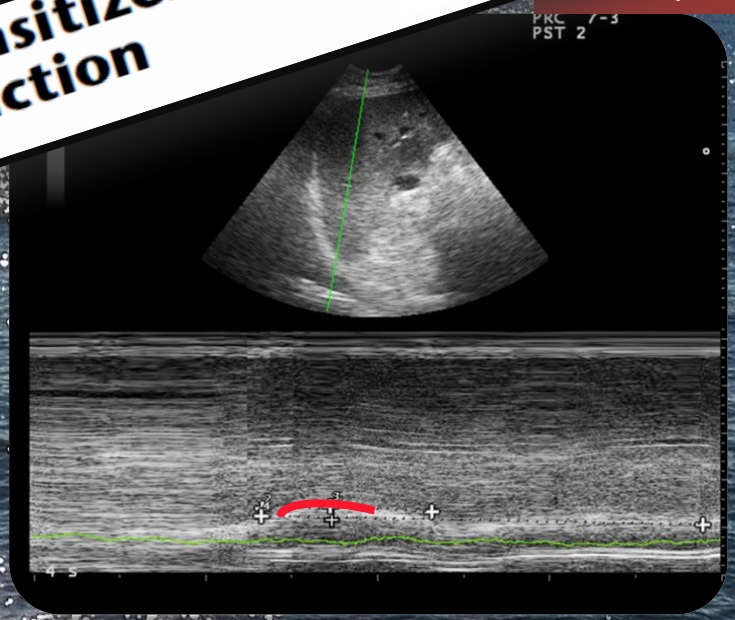
(followed 0.1mcg\kg\min)

The Calcium Sensitizer Levosimendan Improves Human Diaphragm Function

*Am J Resp Crit Care Jun 1,2012

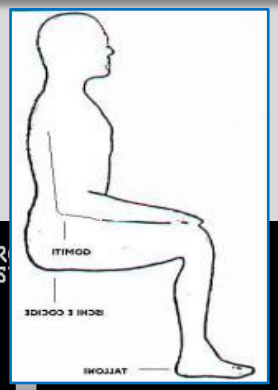
pH	7.25
pCO_2	80
pO_2	98
HCO_3	34.9
Lact	0.5

24th July



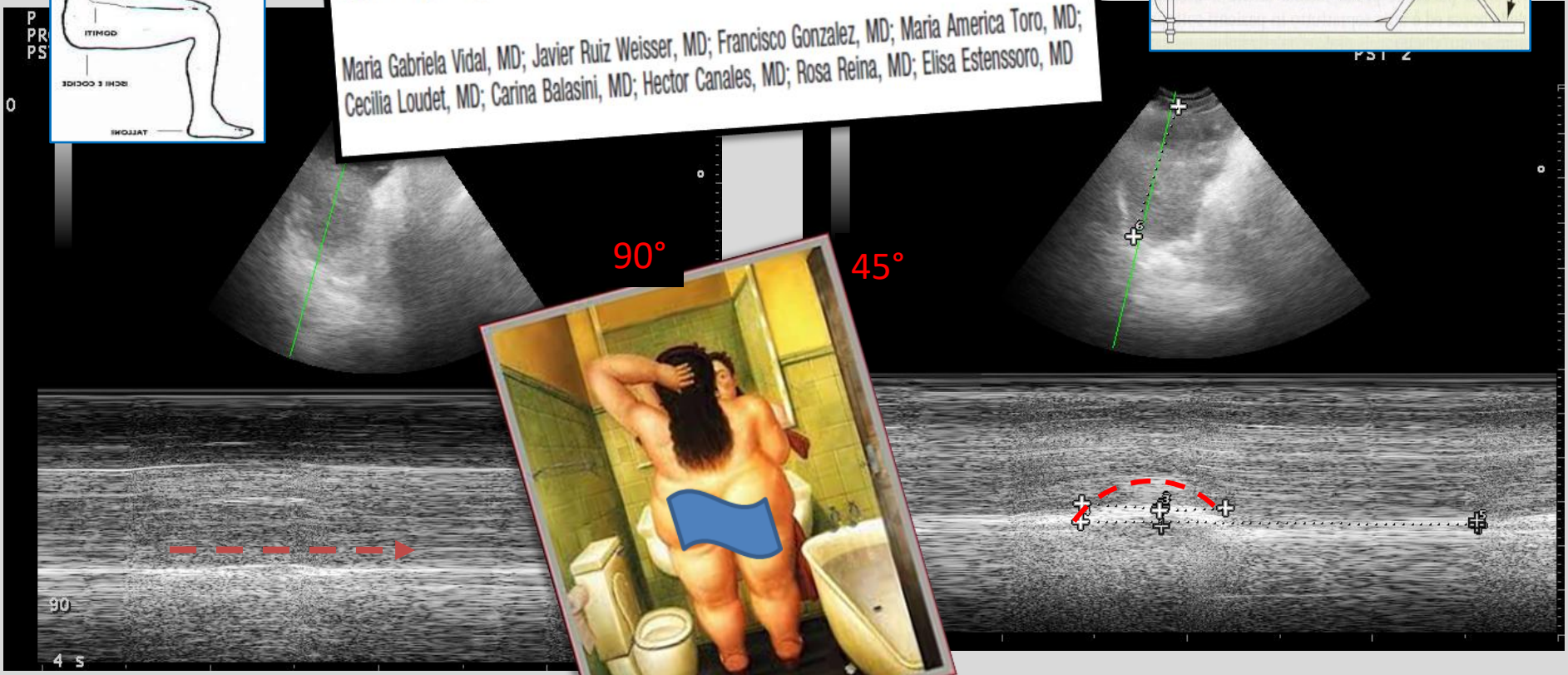
E:1.38cm
Ti: 401 ms
Te: 591 ms
Ttot:2569ms

The effect of body positioning on IAP and Diaphragmatic excurtion



Incidence and clinical effects of intra-abdominal hypertension in critically ill patients

Maria Gabriela Vidal, MD; Javier Ruiz Weisser, MD; Francisco Gonzalez, MD; Maria America Toro, MD; Cecilia Loudet, MD; Carina Balasini, MD; Hector Canales, MD; Rosa Reina, MD; Elisa Estenssoro, MD



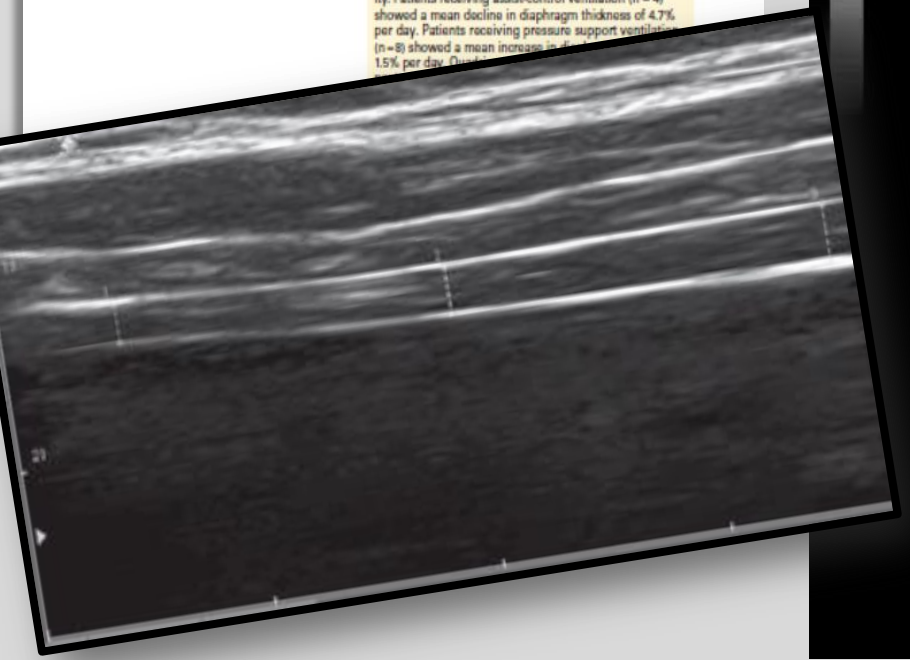
Min Yz et al.”The evaluation of the effect of body positioning on IAP measurement”. Journal of Critical Care 2012

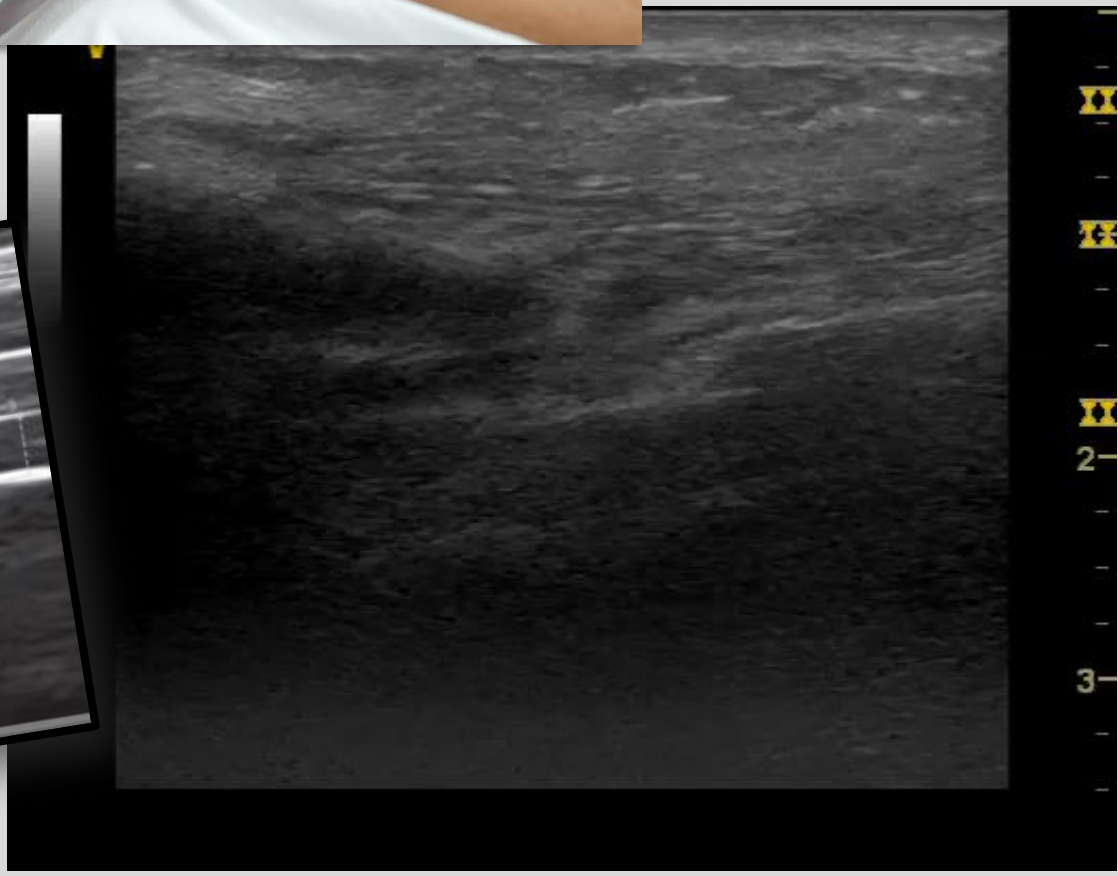
…c'è dell'altro…

Ultrasonographic Evaluation of Diaphragm Thickness During Mechanical Ventilation in Intensive Care Patients

By Colin Anthony Francis, MSc, Joaquín Andrés Hoffer, PhD, and Steven Reynolds, MD, FRCPC

Background Mechanical ventilation is associated with atrophy and weakness of the diaphragm. Ultrasound is an easy noninvasive way to track changes in thickness of the diaphragm.
Objective To validate ultrasound as a means of tracking thickness of the diaphragm in patients undergoing mechanical ventilation by evaluating interobserver and interoperator reliability and to collect initial data on the relationship of mode of ventilation to changes in the diaphragm.
Methods Daily ultrasound images of the quadriceps and the right side of the diaphragm were acquired in 8 critically ill patients receiving various modes of mechanical ventilation. Thickness of the diaphragm and the quadriceps was measured, and changes with time were noted. Interoperator and interobserver reliability were measured.
Results Intraclass correlation coefficients between operators and between observers for thickness of the diaphragm and quadriceps were greater than 0.95, indicating excellent interoperator and interobserver reliability. Patients receiving assist-control ventilation (n = 4) showed a mean decline in diaphragm thickness of 4.7% per day. Patients receiving pressure support ventilation (n = 8) showed a mean increase in [illegible] 1.5% per day. [illegible]





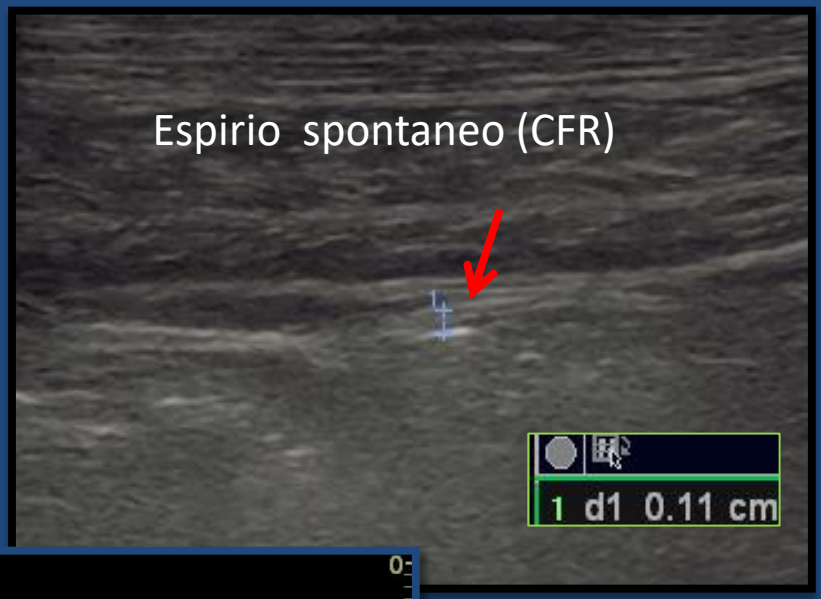
Diaphragm ultrasound as indicator of respiratory effort in critically ill patients undergoing assisted mechanical ventilation: a pilot clinical study

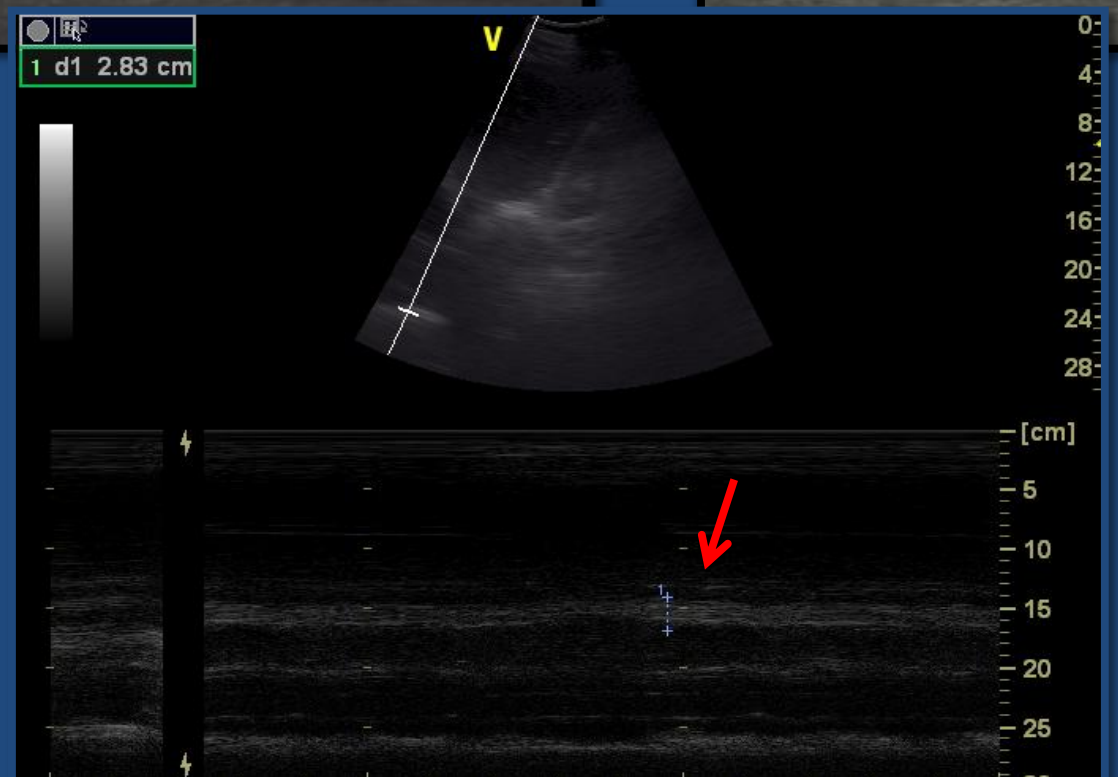
Michele Umbrello[1,2*], Paolo Formenti[1], Daniela Longhi[2], Andrea Galimberti[2], Ilaria Piva[2], Angelo Pezzi[1], Giovanni Mistraletti[1,2], John J Marini[3] and Gaetano Iapichino[1,2]

Conclusions: In patients undergoing in assisted mechanical ventilation, diaphragm thickening is a reliable indicator of respiratory effort, whereas diaphragm excursion should not be used to quantitatively assess diaphragm contractile activity.


V
5
10
15


Inspirio
1 d1 0.35 cm

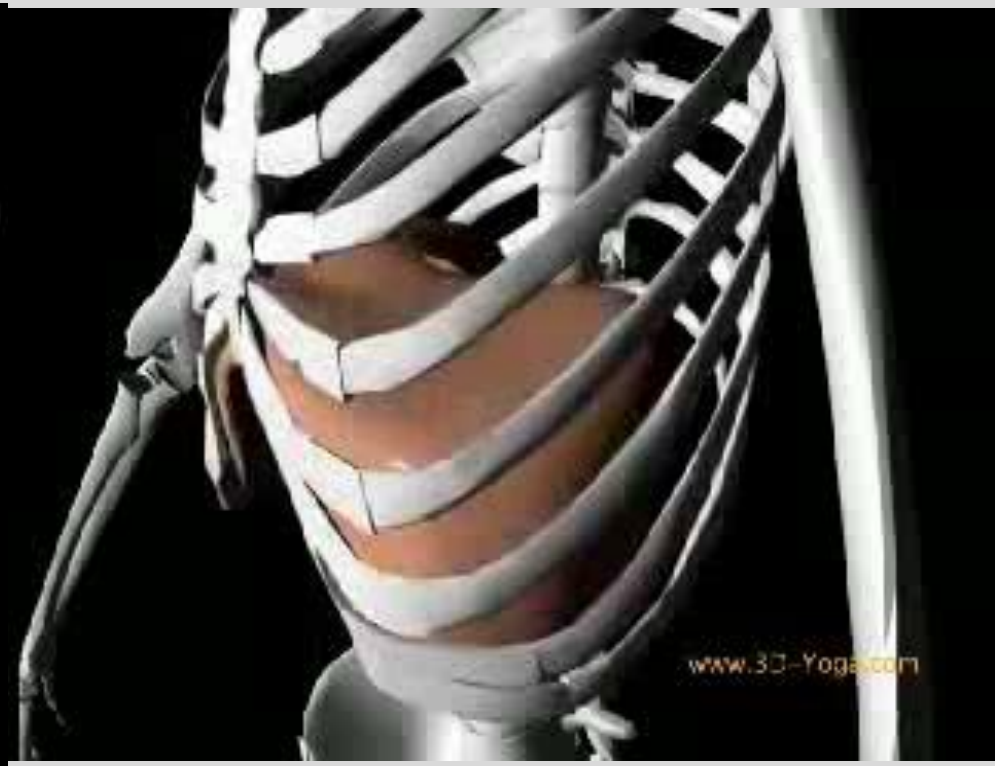

Espirio spontaneo (CFR)
1 d1 0.11 cm


1 d1 2.83 cm
V
0
4
8
12
16
20
24
28
[cm]
5
10
15
20
25

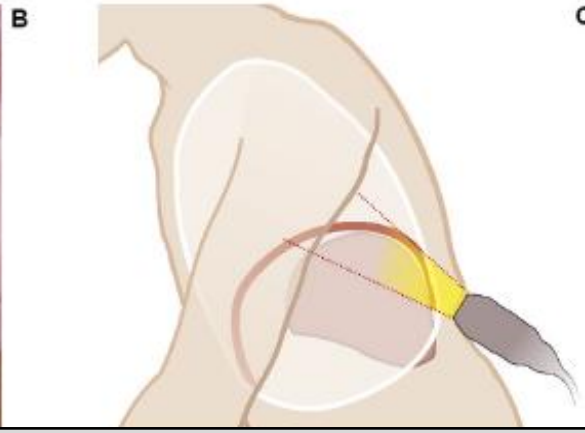
Muscle Nerve. 2013 March ; 47(3): 319–329. doi:10.1002/mus.23671.

Neuromuscular Ultrasound for Evaluation of the Diaphragm

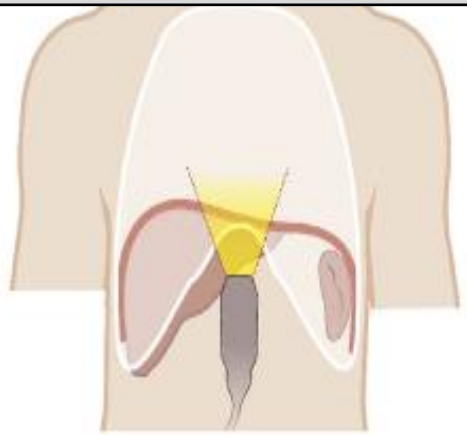
Aarti Sarwal, MD [Assistant Professor],
Neurology and Critical Care, Wake Forest School of Medicine



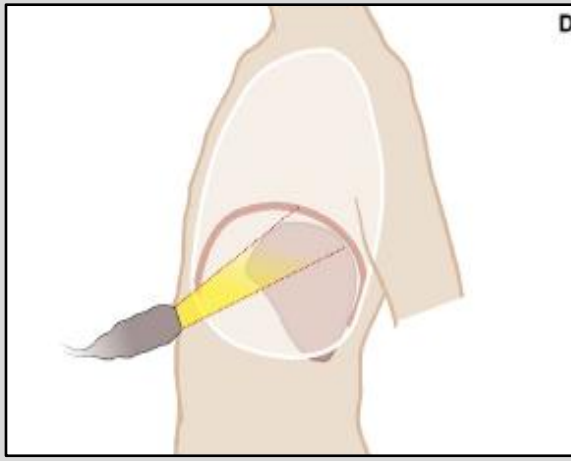
B



C



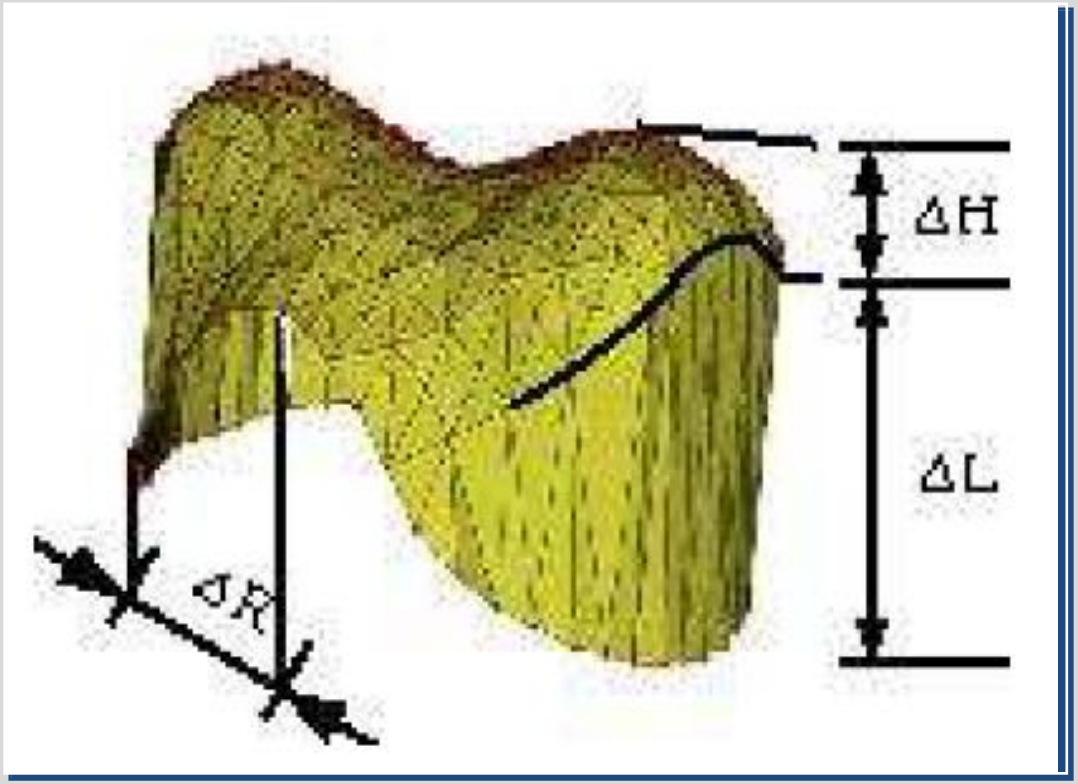
D



ESAIM: PROCEEDINGS, Vol. ?, 2008, 1-10
Editors: Will be set by the publisher

A 3D DISCRETE MODEL OF THE DIAPHRAGM AND HUMAN TRUNK*

Emmanuel Promayon[1] and Pierre Baconnier[1,2]



CC date
Name
Year
sx
SOFA .Diagnosis.Therapy

HEART

Vsx e FE
Vdx/Vsx
TAPSE
E\A
E\Ea
TVI
Other

LUNG

A\B pattern
Sliding Dx\Sx

Pleural eff dx\sx
Curtain Dx\Sx

DIAPHRAGM

E cm
Tins mm\sec/Tesp
Thickening insp/esp

VC(JV)

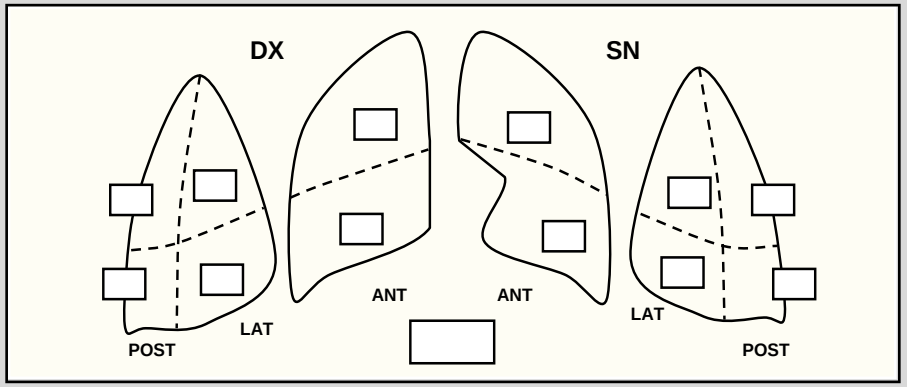
collapse
diameter

Cus

BUS San Paolo
Hospital Naples

I suggest:

1. *Try always to study diaphragmatic motility and thickening with US besdside in patient in ED (simple ,safe and non-invasive!!).*



SCORE
0 – normale
1 – linee B 3+
2 – linee B confluenti
3 – consolidamento

Numis *et al. Critical Ultrasound Journal* 2014, **6**(Suppl 2):A6
http://www.criticalultrasoundjournal.com/content/6/S2/A6

Critical Ultrasound Journal
a SpringerOpen Journal

MEETING ABSTRACT **Open Access**

Diaphragmatic motility assessment in COPD exacerbation, early detection of Non-Invasive Mechanical Ventilation failure: a pilot study

Fabio Giuliano Numis[1*], Lucia Morelli[1], Giorgio Bosso[1], Mario Masarone[2], Sara Cocozza[1], Anita Costanzo[1], Fernando Schiraldi[1]

From 7th WINFOCUS Italian Congress on Ultrasound in Emergency, Anaesthesiology and Critical Care
Lodi, Italy. 26-29 March 2014

US measurements of diaphragmatic performance may have a role in the early evaluation of exacerbation of COPD and in predicting the response to NIMV therapy, it should be included as a routine test in patients presenting to ED with ECOPD.

2. *Diaphragmatic US helps to monitor the response to NIV*

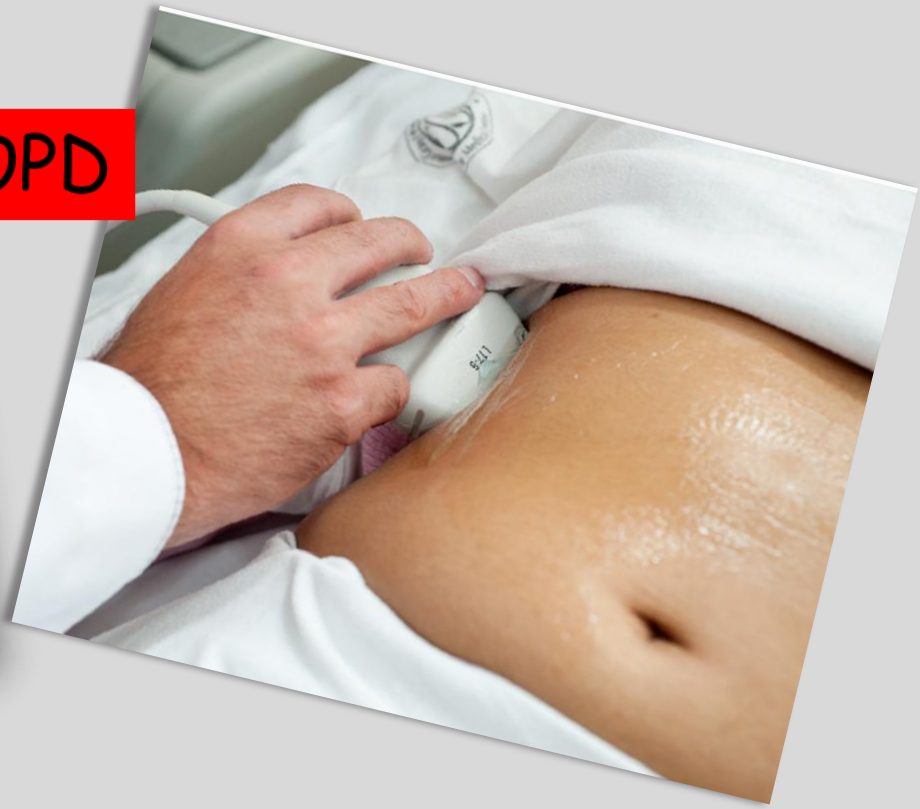
3) Detect rapidly

patients with very low diaphragmatic exscursion and/or very low thickening

so you could help in tailoring the therapies

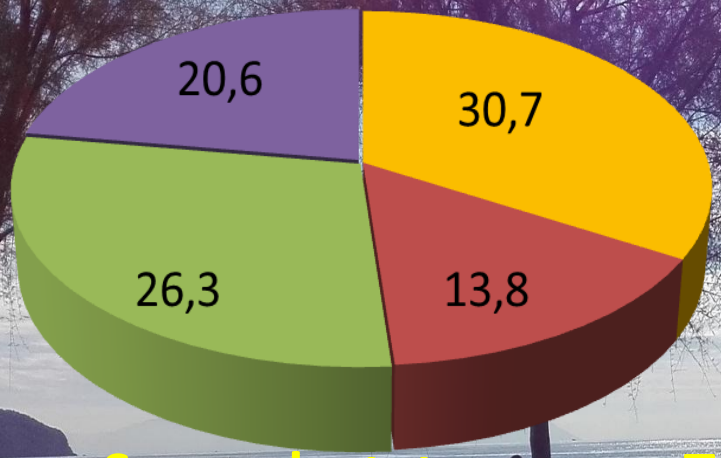
I suggest :

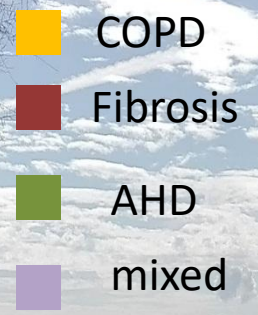
ECOPD

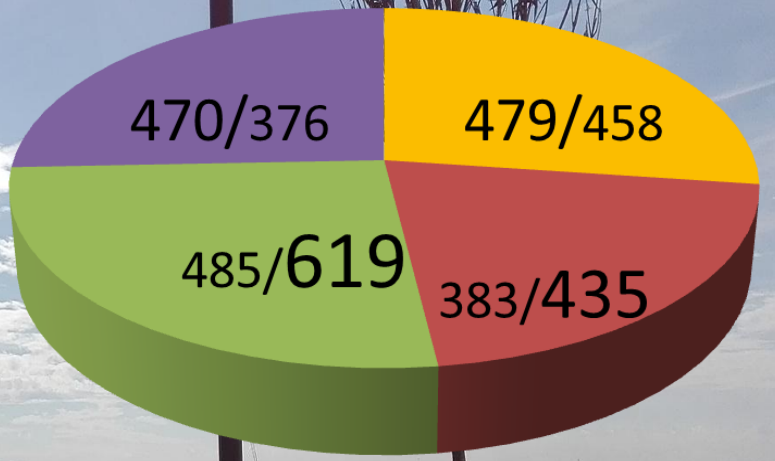


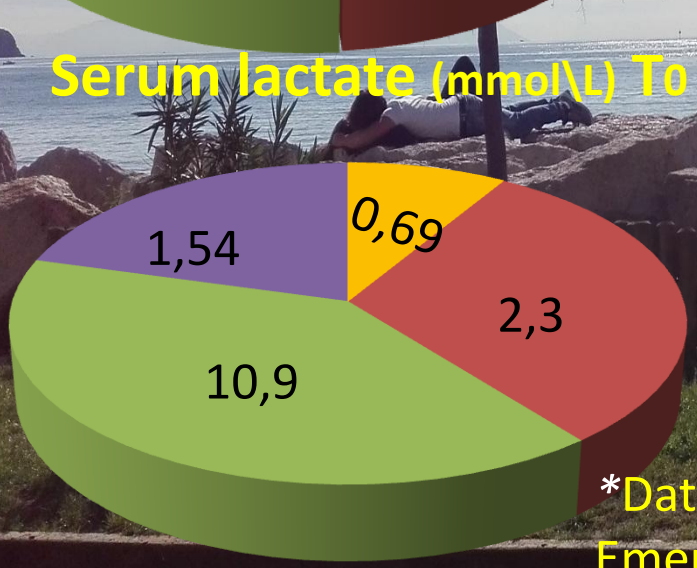
Pre NIV ,during NIV and during weaning

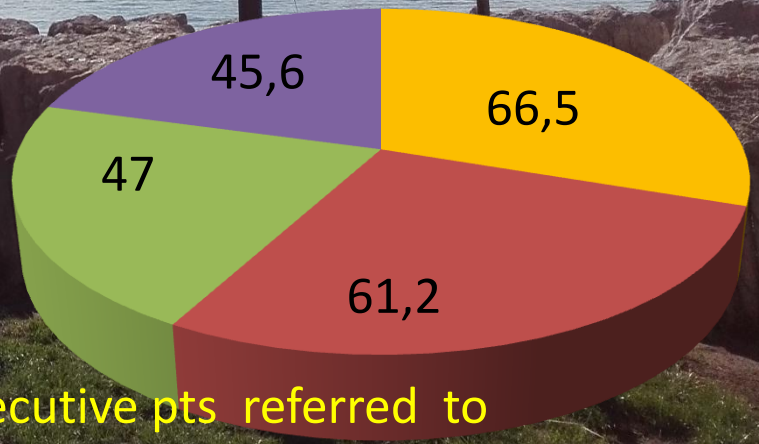
...I have a dream...





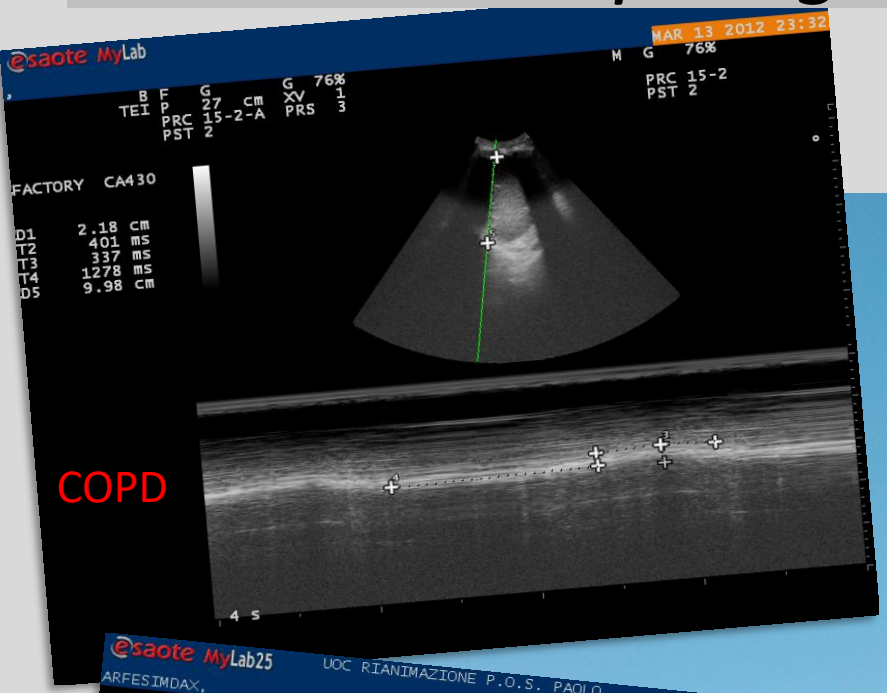






*Data of 32 consecutive pts referred to Emergency Departement with dyspnoea (blinded to our operator)

Diaphragmatic patterns



GRAZIE