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(Scuola SIUMB Catania)

Il valore aggiunto dell'ecografia nei principali setting critici

Setting «critici»

« formali »
- Rianimazione
- Terapie intensive
- Terapie semintensive
- DEA

« informali »
- **Medicine Interne**
- **Geriatrie per Acuti**

Criticità del Pz = **Instabilità + Complessità** → Alto rischio aggravamento **+ Esiti sfavorevoli** → Diagnosi e Cure **+ tempestive + mirate + accurate**

Pz critici, complessi e con esame obiettivo… «difficile»

Anziani:
atipia clinica → ritardo diagnostico → + esiti sfavorevoli

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Problemi clinici causa di criticità:

Diagnosi differenziale + Diagnosi multiple o multifattoriali

- Dispnea e/o dolore torace	Cardiaca vs respiratoria, causa
- Shock / ipotensione	Insufficienza cardiaca, ipovolemia, versamenti
- SIRS / Sepsi	Ricerca di eventuale focolaio settico
- Insufficienza renale acuta	DD pre- Intra- post-renale, causa
- Dolore addominale	Ampio ventaglio di possibili diagnosi

Ecografia → integrazione e/o «surrogato» dell'esame obiettivo

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April 2018

Time to Add a Fifth Pillar to Bedside Physical Examination

Inspection, Palpation, Percussion, Auscultation, and Insonation

Jagat Narula, MD, PhD[1]; Y. Chandrashekhar, MD[2]; Eugene Braunwald, MD[3]

» Author Affiliations

JAMA Cardiol. 2018;3(4):346-350. doi:10.1001/jamacardio.2018.0001

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The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

CURRENT CONCEPTS

Point-of-Care Ultrasonography

Christopher L. Moore, M.D., and Joshua A. Copel, M.D.

N Engl J Med 2011;364:749-57.

Table 1. Selected Applications of Point-of-Care Ultrasonography, According to Medical Specialty.*

Specialty	Ultrasound Applications
Anesthesia	Guidance for vascular access, regional anesthesia, intraoperative monitoring of fluid status and cardiac function
Cardiology	Echocardiography, intracardiac assessment
Critical care medicine	Procedural guidance, pulmonary assessment, focused echocardiography
Dermatology	Assessment of skin lesions and tumors
Emergency medicine	FAST, focused emergency assessment, procedural guidance
Endocrinology and endocrine surgery	Assessment of thyroid and parathyroid, procedural guidance
General surgery	Ultrasonography of the breast, procedural guidance, intraoperative assessment
Gynecology	Assessment of cervix, uterus, and adnexa; procedural guidance
Obstetrics and maternal–fetal medicine	Assessment of pregnancy, detection of fetal abnormalities, procedural guidance
Neonatology	Cranial and pulmonary assessments
Nephrology	Vascular access for dialysis
Neurology	Transcranial Doppler, peripheral-nerve evaluation
Ophthalmology	Corneal and retinal assessment
Orthopedic surgery	Musculoskeletal applications
Otolaryngology	Assessment of thyroid, parathyroid, and neck masses; procedural guidance
Pediatrics	Assessment of bladder, procedural guidance
Pulmonary medicine	Transthoracic pulmonary assessment, endobronchial assessment, procedural guidance
Radiology and interventional radiology	Ultrasonography taken to the patient with interpretation at the bedside, procedural guidance
Rheumatology	Monitoring of synovitis, procedural guidance
Trauma surgery	FAST, procedural guidance
Urology	Renal, bladder, and prostate assessment; procedural guidance
Vascular surgery	Carotid, arterial, and venous assessment; procedural assessment

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Ecografia nei Setting Critici

Point-of-care = Bedside

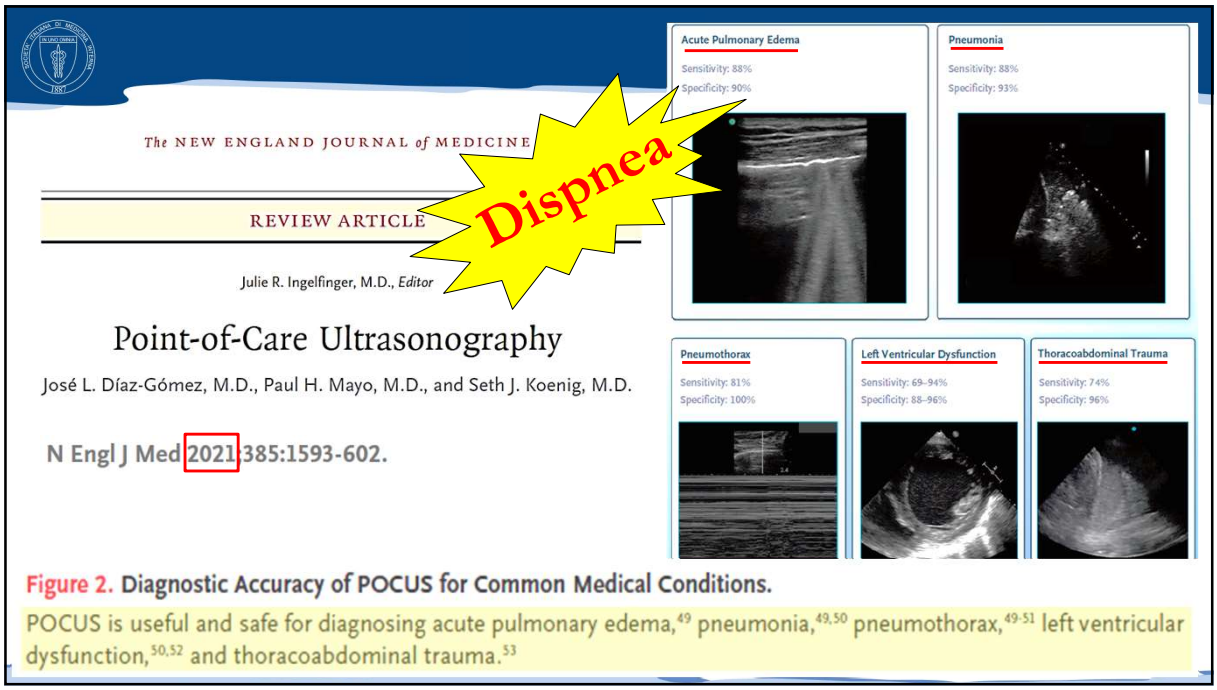
Ecografia clinica → eseguita dal **Clinico** nello stesso **setting di cura**

Tipologie applicative

- Ecografia convenzionale *(Standard SIUMB, JUS 2009)*
- Protocolli applicativi *(Standard «mirati» a specifici problemi clinici)*

Protocolli ecografici

Protocollo	Indicazione	Strutture esaminate
BLUE	DD dispnea	Polmone (Linee A, B, sliding)
FALLS Fluid administration limited by lung sonography	Causa shock e monitor fluidoterapia	Cuore, polmone (linee B)
SESAME	Arresto cardiaco, shock	BLUE + FALLS + CUS + Versamento add.
FAST Focused Assessment with Sonography for Trauma	Traumi	Versamento pericardio, periepatico, perisplenico, pelvico
«Triplice»	Sospetta embolia polmonare	Cuore (Ø VD) + Polmone + CUS femorale
ECHO-RCP Rene, Cava, Pelvi renale	Insufficienza renale (DD: pre, intra, post)	Cava, Reni, pelvi renale
FASE Foocused Assessment with Sonography in Elderly	Integrazione EO nell'Anziano	Scansioni standard su torace e addome
……	……	……


The NEW ENGLAND JOURNAL of MEDICINE
REVIEW ARTICLE
Julie R. Ingelfinger, M.D., Editor
Point-of-Care Ultrasonography
José L. Díaz-Gómez, M.D., Paul H. Mayo, M.D., and Seth J. Koenig, M.D.
N Engl J Med 2021;385:1593-602.
Dispnea
Acute Pulmonary Edema
Sensitivity: 88%
Specificity: 90%
Pneumonia
Sensitivity: 88%
Specificity: 93%
Pneumothorax
Sensitivity: 81%
Specificity: 100%
Left Ventricular Dysfunction
Sensitivity: 69–94%
Specificity: 88–96%
Thoracoabdominal Trauma
Sensitivity: 74%
Specificity: 96%
Figure 2. Diagnostic Accuracy of POCUS for Common Medical Conditions.
POCUS is useful and safe for diagnosing acute pulmonary edema,[49] pneumonia,[49,50] pneumothorax,[49-51] left ventricular dysfunction,[50,52] and thoracoabdominal trauma.[53]

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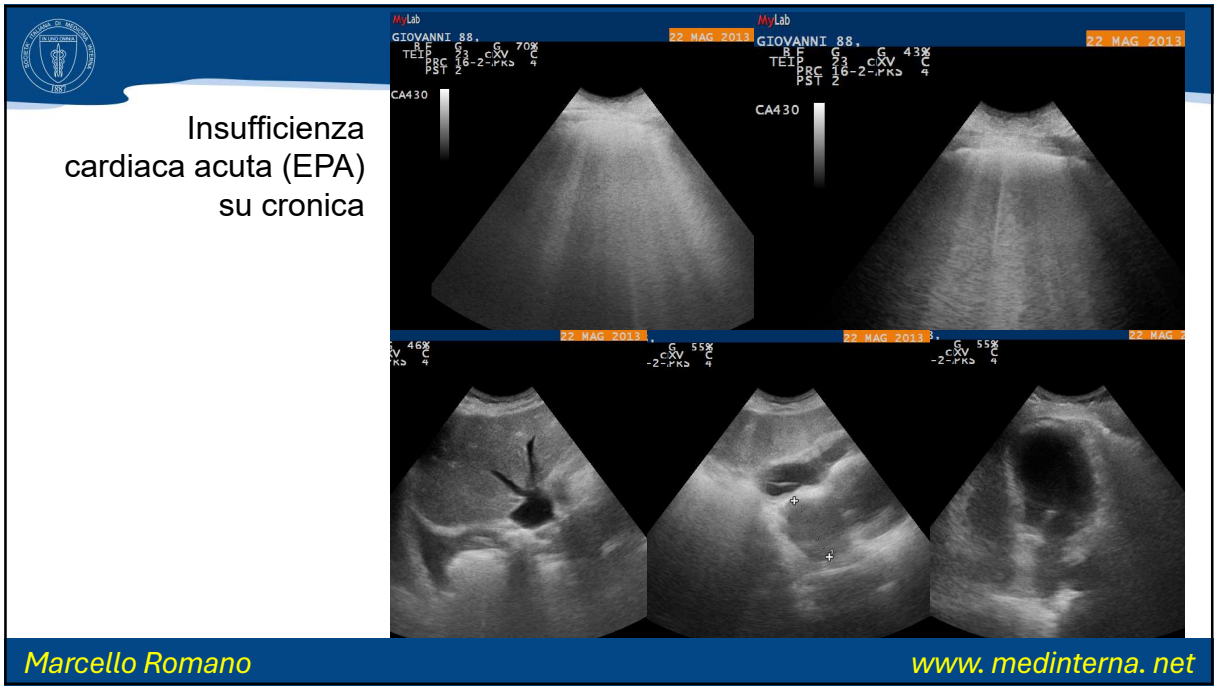
Insufficienza cardiaca acuta (EPA) su cronica
MyLab
GIOVANNI 88.
22 MAG 2013
CA430
Marcello Romano
www. medinterna. net

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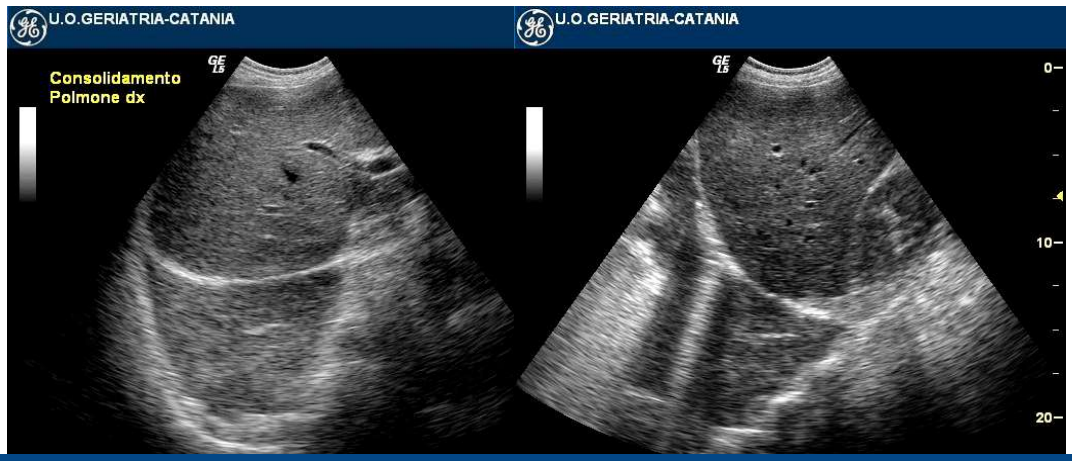
Polmonite basale dx



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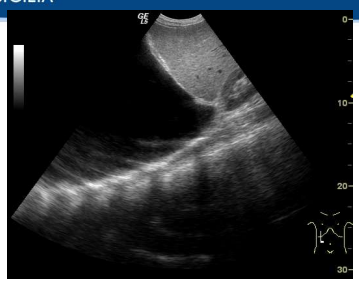
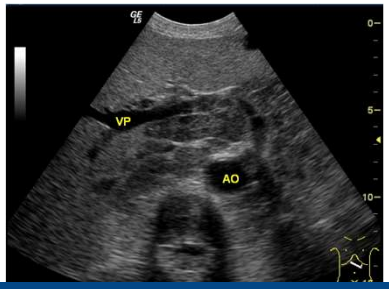
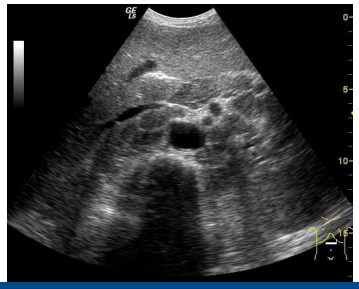
♂ 71 aa:

- astenia a dispnea ingravescente da 1 settimana
- ipofonesi emitorace dx







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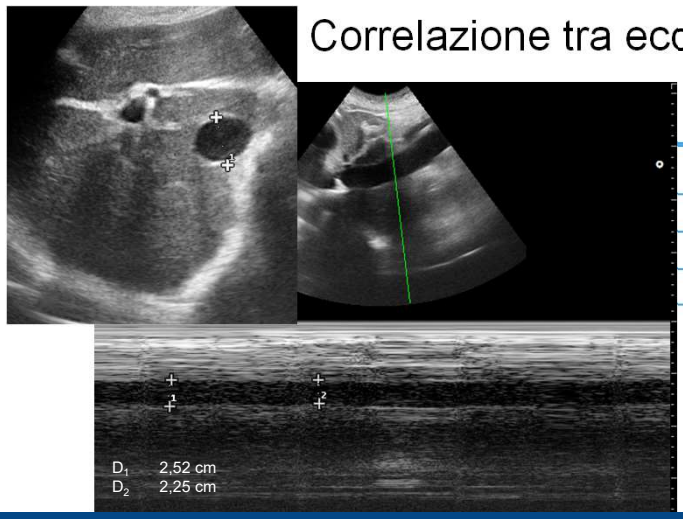
Correlazione tra ecografia VCI e P atriale dx



Misura AP	Riduzione inspiratoria	PVC
< 1.5 cm	collasso	0-5 mmHg
1.5-2.0 cm	>50%	5-10 mmHg
1.5-2.0 cm	33-50%	10-15 mmHg
2.0-2.5 cm	0-33%	15-20 mmHg
2.5 cm	assente	>20 mmHg

Mpdificata da: Otto CM. Textbook of clinical echocardiography. WB Saunders 2000, Philadelphia PA

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Annals of Internal Medicine® Volume 174, Number 7 • https://doi.org/10.7326/M20-5504

Reviews | 27 April 2021

Point-of-Care Ultrasonography in Patients With Acute Dyspnea: An Evidence Report for a Clinical Practice Guideline by the American College of Physicians FREE

L'ACP suggerisce che i medici possono utilizzare l'ecografia point-of-care in aggiunta al percorso diagnostico standard quando c'è incertezza diagnostica nei pazienti con dispnea acuta in pronto soccorso o in contesti ospedalieri (raccomandazione condizionale; evidenza a bassa certezza).

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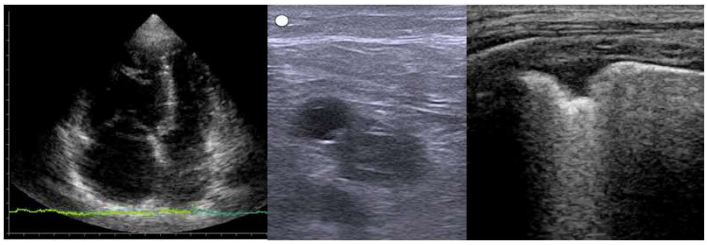
Embolia / Infarto polmonare

Nei Pz con sospetto clinico, «triplice» combinazione ecografica *bedside*:

- CUS femorale
- Ecocardio
- Ecografia torace

Accuratezza diagnostica per TEV >90%



Mathis G et al. Chest 2005
Niemann E et al. Ultraschall Med 2009
Nazerian e Al. Chest 2014

Dolore addominale non traumatico

Accuratezza diagnostica dell'ecografia **70%**

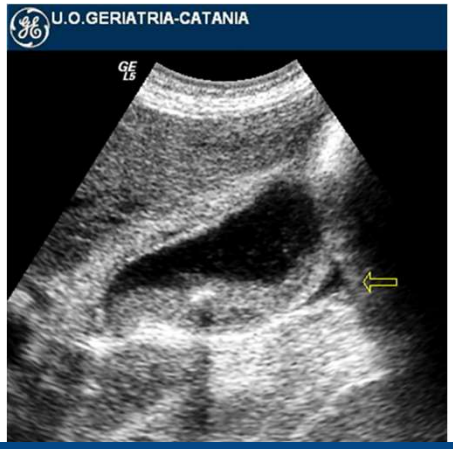
- **TC addominale** → casi con US non diagnostica o conclusiva

Lameris W e Coll. BMJ 339:b2431, 2009

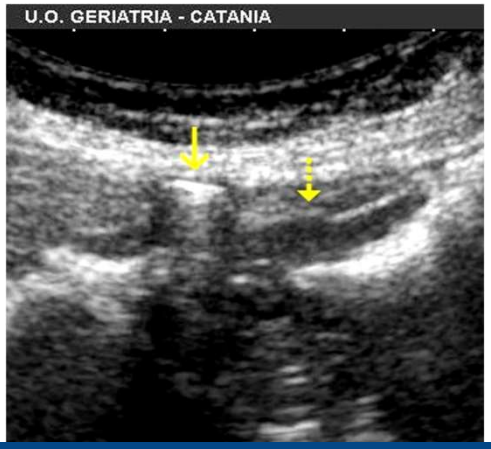
Ecografia nel **paziente critico**:

- spesso non trasportabile per difficoltà logistiche e rischio clinico
- possibile diagnosi *bedside*

Colecistite acuta calcolotica



Diverticolite colon



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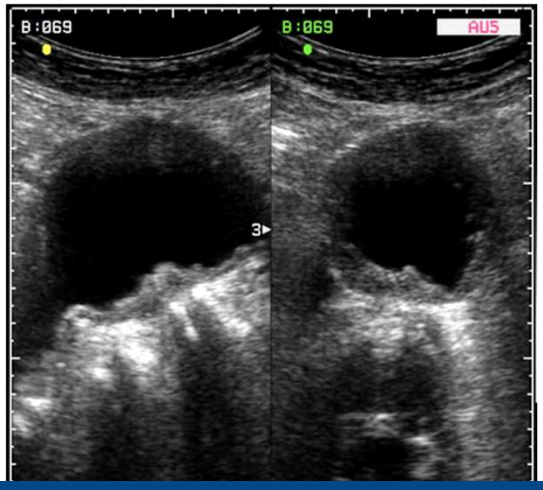
AAA



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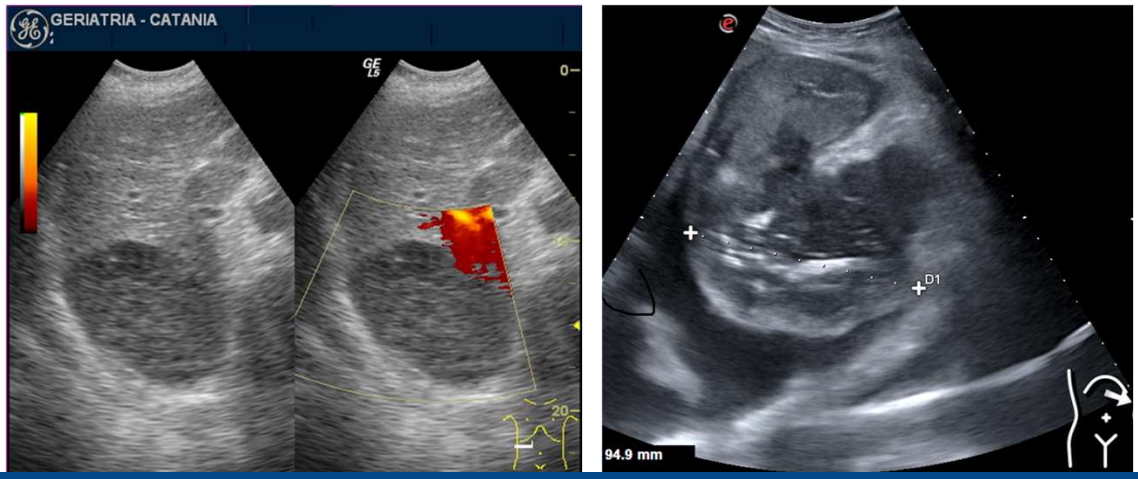
SIRS ndd



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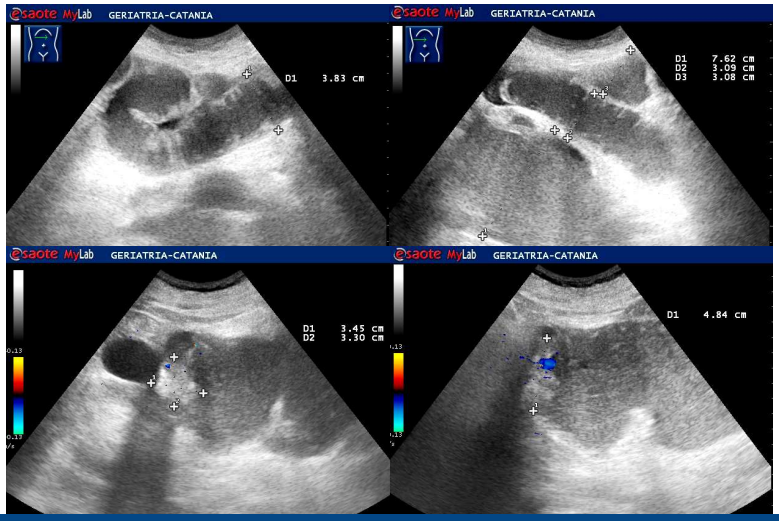
Occlusione intestinale
Neoplasia colon dx



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XXIII Congresso Nazionale della Società Scientifica FADOI, Bologna 12-15 maggio 2018

Point-of-care ultrasound in hospitalized elderly patients with renal failure: *ECHO-**RPC Protocol***

Giulia Romano, Antonio Digiacomo, Fabio Di Stefano, Antonio Granata, Alberto LoGullo, Guido Perracchio, Raffaella Romano, Marcello Romano

Background: to define at least the **pre-, intra- or post-renal pattern**

The following three ultrasound patterns were considered (Echo-RPC Protocol).

Renal (R): **mean renal longitudinal diameter of the two kidneys <9 cm** or **> 13 cm** or **mean parenchymal thickness <12 mm** or **>18** (marker of intra-renal pathogenesis);

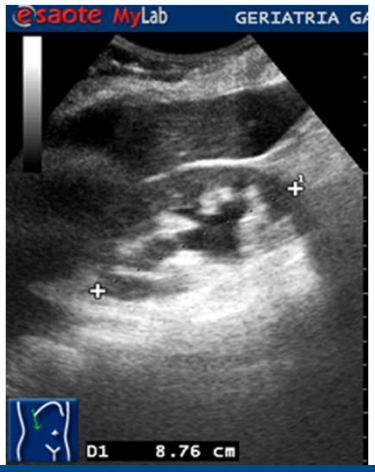
Pyelo-ureteral (P): mono- or bilateral **dilatation of the urinary tract** or renal pelvic diameter > 2.5 cm (marker of post-renal pathogenesis);

Caval venous (C): **maximum diameter** of the proximal inferior vena cava **<1.5 cm** (C1, marker of hypovolaemia) or **>2 cm** (C2, marker of venous hypertension).

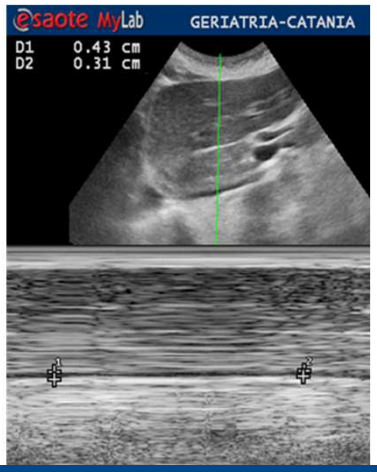
G.Romano e al.

*ECHO-**RPC Protocol***

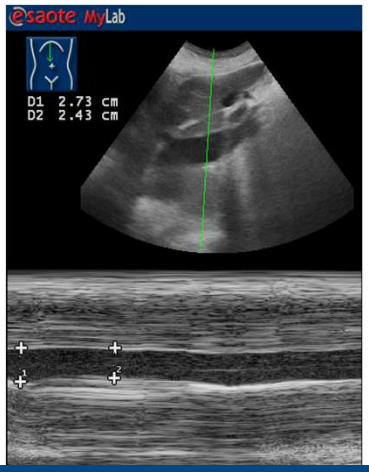
Patterns R (renal Ø <9 cm) and P (pelvic dilatation)



Patterns C1 (Ø of proximal inferior vena cava <1,5 cm)



Patterns C2 (Ø cava venous >2 cm)



Protocollo FASE *- Focused Assessment with Sonography in Elderly*

- US Bedside all'ammissione (max 24h)) di anziani in reparto per «acuti»
- Scansioni standard su torace, addome + CUS su quesiti mirati (s/n)

CHEST - consolidations, pleural effusion, multiple B-lines, pericardial effusion.
PERITONEUM - fluid effusion.
LIVER - Ø long., irregular profile, focal lesions, portal thrombus, biliary duct dilatation, hepatic vein dilatation.
GALLBLADDER - Ø transv., stones, echogenic bile, wall thickening or lesions.
SPLEEN - Ø long., focal lesions.
ABD. AORTA - Ø, patency, irregular walls, stenosis.
I.VENA CAVA - patent, Ø>2cm, Ø<1.5cm
RIGHT KIDNEY - Ø long., parenchymal thickness, dilatation of excretory tracts, stones, masses
LEFT KIDNEY - idem.
BLADDER - volume, wall thickness, wall irregularities, masses, stones.
PELVIS - masses, effusion, prostate enlargement, endometrial thickening.
INTESTINAL LOOP - dilatation, wall thickening.
VEINS (CUS) - femoral trunk thrombosis

- Revisione 47 pz consecutivi (EM: 84 aa):
- FASE vs EO: **modificato orientamento** clinico **iniziale** (diagnostico e terapeutico) in 35 Pz (**74%**)

Rilievi US (>100)

- Versamento pleurico (n=22)
- Consolidamento polmonare (n=8)
- VCI ↑ (n=11) o ↓ (n=6)
- ipotrofia renale (n=18)
- calcoli e/o +Ø biliare (n=13)
- cisti renali (n=37)

Romano M e Al.
Geriatric Care.
9(s1), 19-20, ***2023***

Grazie

e arrivederci su …

www. medinterna. net