

“Ecografía Y Médicos de Familia”

DR. ANTONIO CALVO CEBRIÁN

MÉDICO DE FAMILIA

CS GALAPAGAR (MADRID)

GRUPO DE TRABAJO ECOGRAFÍA SOMAMFYC





¿Es útil la ecografía en AP?

Ventajas de la Ecografía

- Indolora, no invasiva
- No ionizante
- En Tiempo real.
- Órganos en movimiento
- Múltiples planos
- Portátil
- Excelente resolución en estructuras superficiales
- Doppler: evaluación cuantitativa y cualitativa del flujo sanguíneo
- Útil en exploraciones secuenciales.

Desventaja

- ▶ la Ecografía es una prueba de carácter **técnico-dependiente**, por lo que necesariamente el resultado de la ecografía, en gran medida depende del profesional que está llevándola a cabo.
- ▶ **SEAMOS CONSCIENTES DE NUESTROS LÍMITES**

La Ecografía...

- ▶ Es una técnica Segura para el paciente.
- ▶ Complementa y mejora la precisión diagnóstica de la Exploración Física.
- ▶ Aplicaciones de la ecografía han crecido exponencialmente en los últimos años y cubren una amplia variedad de escenarios clínicos manejables en la Atención Primaria.

“UTILIDAD EN AP”

- ▶ Utilidad en cualquier entorno clínico ¹.
- ▶ Se debate la "idoneidad" desde hace más de 20 años (Concordancia elevada en Eco Abdominal) ²
- ▶ Elevado impacto sobre derivaciones a Rx y solicitud de PC (Reducciones de hasta 50%) ³⁻⁴

1. Escenarios clínicos de la Ecografía en Medicina Familiar. GTE SEMFYC 2016 Ediciones SEMFYC. ISBN: 978-84-15037-58-3.
2. Alonso Roca R, Díaz Sánchez S. LA ECOGRAFIA EM ATENCIÓN PRIMARIA. Médicos de Familia 2012. 2(14). 28-30
3. Wordsworth S, Scott A. Ultrasound scanning by general practitioners: Is it worthwhile? J Public Health Med. 2002;24:88---94.
4. Speets AM, Hoes AW, van der Graaf Y, Kalmijn S, de WitNJ, Alexander D, et al. Upper abdominal ultrasound in general practice: indications, diagnostic yield and consequences for patient management. Fam Pract. 2006;23:507---11.

Los Médicos de Familia estamos convencidos de que:

- ▶ En determinados contextos clínicos **mejora** nuestras decisiones y actuaciones.
- ▶ **Mejora** tras periodos de aprendizaje secuenciales, la precisión diagnóstica y la capacidad resolutive del médico clínico.
- ▶ **Facilita**: Rechazar, confirmar o matizar nuestras sospechas iniciales y decidir la mejor estrategia en el plazo de tiempo más adecuado.

SITUACIÓN ACTUAL

- ▶ Experiencia docente de elevado nivel en el ámbito de la AP
- ▶ Accesibilidad a los Ecógrafos.
- ▶ Apuesta clara de las Sociedades Científicas
- ▶ CAM: prioridad
 - ▶ Comisión de Seguimiento del Proyecto de Implantación de la Ecografía
 - ▶ Actividad formativa de alto nivel
 - ▶ Jornadas Autonómicas

Pinceladas de Ecografía:

- ▶ Bedside Ultrasound o Point of Care Ultrasound (POCUS)
- ▶ Accesibilidad “universal” Sin demora.
- ▶ Equipos portátiles... Domicilio
- ▶ **Protocolos** que permiten **optimizar su** rendimiento mediante maniobras exploratorias sistematizadas y sencillas, basadas en la evidencia científica, pero más breves y con menos cortes que los estudios reglados, de contrastada eficacia y fiabilidad. A la vez muchos médicos se están formando en el empleo de la misma, en todo caso sin caer en el error de pretender suplantar a otros especialistas mucho más preparados y experimentados, cuyo papel y protagonismo no está en tela de juicio, pero que tienen accesibilidad limitada y a quienes no siempre se les puede encontrar en el momento clínico justo

American Academy of Family Physician 2014

<http://www.aafp.org>

- ▶ **Point-of-Care Ultrasound Examinations:**
exploraciones ecográficas cortas y dirigidas, que responden una pregunta clínica concreta: ¿hay colelitiasis?, ¿es normal la función miocárdica?, ¿hay una tvp?, ¿hay signos de uropatía obstructiva, hidronefrosis?... etc.
- ▶ Complementa pero no reemplaza una buena historia clínica y una adecuada EF.
- ▶ Procedimientos eco-guiados

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

* FAST denotes focused assessment with sonography for trauma.

Lessons Learned in Primary Care Ultrasound

<http://www.aafp.org>

- ▶ Primary Care Practitioners are **busy**
- ▶ Applications need to be **practical and quick** to perform
- ▶ Ultrasound can be **learned regardless of years from training**
- ▶ Ultrasound can **add autonomy** to the practice
- ▶ Ultrasound can **add to the attractiveness** of a practice and enhance revenue
- ▶ Ultrasound can **aid in patient education**
- ▶ Ultrasound can **make a difference in patient care**



POCUS

The Future is Now !

Point Of Care UltraSound
Workshop



History of POCUS

- 1990's - Family Physicians start using US in office for obstetrical care
- Late 1990's - Emergency Physicians start using US in the ED with Trauma
- 2010's
 - Internal Medicine and Family physicians start using POCUS in their offices and hospital rounding.
 - Sports Medicine doctors are commonly using US in the office and field
- Now
 - Medical Schools are adding POCUS to the medical student curriculum
 - FM and Internal Medicine Residencies are adding POCUS to the residency curriculum

AAFP NATIONAL CONFERENCE

Point-of-Care Ultrasonography for Primary Care Physicians and General Internists

Anjali Bhagra, MBBS; David M. Tierney, MD; Hiroshi Sekiguchi, MD;
and Nilam J. Soni, MD, MSc

Abstract

Point-of-care ultrasonography (POCUS) is a safe and rapidly evolving diagnostic modality that is now utilized by health care professionals from nearly all specialties. Technological advances have improved the portability of equipment, enabling ultrasound imaging to be executed at the bedside and thereby allowing internists to make timely diagnoses and perform ultrasound-guided procedures. We reviewed the literature on the POCUS applications most relevant to the practice of internal medicine. The use of POCUS can immediately narrow differential diagnoses by building on the clinical information revealed by the traditional physical examination and refining clinical decision making for further management. We describe 2 common patient scenarios (heart failure and sepsis) to highlight the impact of POCUS performed by internists on efficiency, diagnostic accuracy, resource utilization, and radiation exposure. Using POCUS to guide procedures has been found to reduce procedure-related complications, along with costs and lengths of stay associated with these complications. Despite several undisputed advantages of POCUS, barriers to implementation must be considered. Most importantly, the utility of POCUS depends on the experience and skills of the operator, which are affected by the availability of training and the cost of ultrasound devices. Additional system barriers include availability of templates for documentation, electronic storage for image archiving, and policies and procedures for quality assurance and billing. Integration of POCUS into the practice of internal medicine is an inevitable change that will empower internists to improve the care of their patients at the bedside.

TABLE. Test Characteristics of Physical Examination vs Point-of-Care Ultrasonography

Test characteristics	Physical examination ³¹					Point-of-care ultrasonography				
	Finding	Sensitivity	Specificity	LR+	LR-	Finding	Sensitivity	Specificity	LR+	LR-
Pulmonary										
Pleural effusion	Percussion dullness	89%	81%	4.8	0.1	Pleural fluid visualization ³²	93%	96%	23	0.07
	Decreased breath sounds	88%	83%	5.2	0.1					
Pulmonary edema	Crackles	19%-64%	82%-94%	3.4	NS	B lines (bilateral) ³³	94%	92%	10.4	0.06
Pneumonia	Bronchial breath sounds	14%	96%	3.3	NS	Consolidation pattern ^{34,35}	94%-95%	90%-96%	13.5	0.06
	Egophony	4%-16%	96%-99%	4.1	NS					
	Crackles	19%-67%	36%-94%	1.8	0.8					
Cardiac										
Elevated LV filling pressures	4th Heart sound	37%-71%	50%-70%	NS	NS	PCWP ≥ 17 if IVC > 2.0 ³⁶	75%	83%	4.4	0.3
						IVCCI $< 45\%$ ³⁶	83%	71%	2.9	0.24
Elevated CVP > 8 cm H ₂ O	Neck vein inspection	47%-92%	93%-96%	9.7	0.3	For CVP > 10 mm Hg IVC size > 2 cm ³⁷	73%	85%	4.9	0.32
						with IVCCI $< 50\%$ ³⁸	87%	82%	4.8	0.16
						For CVP < 10 mm Hg IVC < 2 cm ³⁹	85%	81%	4.4	0.2
						with IVCCI $> 50\%$ ³⁹	47%	77%	2.1	0.7
Reduced ejection fraction $< 50\%$	3rd Heart sound	11%-51%	85%-98%	3.4	0.7	I/V aspect ratio for CVP < 8 ⁴⁰	78%	77%	3.5	0.3
						LV systolic dysfunction ⁴¹⁻⁴³	84%-91%	85%-88%	6.5	0.14
Congestive heart failure	Crackles	12%-23%	88%-96%	NS	NS	B lines bilateral ²⁶	97%	95%	19.4	0.03
	Elevated JVP	10%-58%	96%-97%	3.9	NS	For CVP > 10 mm Hg IVC size > 2 cm ³⁷	73%	85%	4.9	0.32
						with IVCCI $< 50\%$ ³⁸	87%	82%	4.8	0.16
	Abdominojugular test	55%-84%	83%-98%	8.0	0.3					
	Edema	10%	93%-96%	NS	NS	CVP < 10 mm Hg IVC < 2 cm ³⁹	85%	81%	4.4	0.2
						with IVCCI $> 50\%$ ³⁹	47%	77%	2.1	0.7

Continued on next page

TABLE. Continued

Test characteristics	Physical examination ³¹					Point-of-care ultrasonography				
	Finding	Sensitivity	Specificity	LR+	LR–	Finding	Sensitivity	Specificity	LR+	LR–
Abdomen										
Hepatomegaly	Percussion	61%-92%	30%-43%	NS	NS	Hepatomegaly (≤ 13 or ≥ 15.5 cm) ⁴⁴	82%	90%	8.2	0.2
	Palpation	39%-71%	56%-85%	1.9	0.6					
Splenomegaly	Percussion	25%-85%	32%-94%	1.7	0.7	Splenomegaly ⁴⁵	100%	74%	3.8	0
	Palpation	18%-78%	89%-99%	8.5	0.5					
Bladder volume >400 mL	Palpation	82%	56%	1.9	0.3	US bladder volume >600 mL (transverse diameter >9.7 cm) ⁴⁶	96%	75%	3.84	0.05
Ascites	Bulging flanks	73%-93%	44%-70%	1.9	0.4	Ascites visualization ⁴⁷	96%	82%	32	0.04
	Flank dullness	80%-94%	29%-69%	NS	0.3					
	Shifting dullness	60%-87%	56%-90%	2.3	0.4					
	Fluid wave	50%-80%	82%-92%	5.0	0.5					
Vascular										
Lower extremity DVT	Calf swelling >2 cm	61%-67%	69%-71%	2.1	0.5	Compression venous ultrasonography ⁴⁸	96%	97%	32	0.04
	Homans' sign	10%-54%	39%-89%	NS	NS					
	Wells score (high probability)	38%-87%	71%-99%	6.3	NA					

CVP = central venous pressure; DVT = deep vein thrombosis; IJV = internal jugular vein; IVC = inferior vena cava; MCCI = IVC collapsibility index; JVP = jugular venous pressure; LR+ = positive likelihood ratio; LR– = negative likelihood ratio; LV = left ventricle; NA = not applicable; NS = not significant; PCWP = pulmonary capillary wedge pressure; US = ultrasound.



“A medida que surjan nuevas investigaciones clínicas y educativas, nuestra comprensión de cómo integrar POCUS en la práctica clínica mejorará y su uso rutinario establecerá nuevos estándares de atención.”

The benefits of doing ultrasound exams in your office

Family medicine ultrasound is more accurate, more cost-effective, and less time-consuming than you might imagine. Here's how it can improve your care.

Peter Steinmetz, MD, CCFP;
Sharon Oleskevich, PhD
Department of Family
Medicine (Drs. Steinmetz
and Oleskevich); Steinberg
Centre for Simulation
and Interactive Learning (Dr.
Steinmetz); McGill University,
Montreal, Canada

 peter.steinmetz@mcgill.ca

*The authors reported no
potential conflict of interest
relevant to this article.*

FAMUS

- ▶ Screening AAA
 - ▶ También estudios en España
- ▶ Ambito Obstétrico
 - ▶ Utilidad en FC fetal, huevo huero, E Ectópico, Mola y estimación edad gestaciona.
- ▶ Musculo Esquelético
 - ▶ Rotura Manguito Rotadores. Roturas muscular, tendinitis, bursitis, infiltraciones ecoguiadas
- ▶ Demostrada utilidad
 - ▶ Epigastralgia y dolor en cuadrante sup dcho. Detección colelitiasis
 - ▶ Residuo postmiccional en pacientes STUI
- ▶ Cardiología. Función ventricular
- ▶ Detección:
 - ▶ Alteraciones que se escapan a la EF entre un 22- 31%

FAMUS

- ▶ Formación Grado – Postgrado – FMC
- ▶ Australia, Austria, Canadá, China, Alemania, Francia, USA, UK (Falta España)
- ▶ USA, 2015 → 2,2% programas de residencia de MF tienen un circuito de formación en ECO. Pero... 29% han iniciado formación en ECO
- ▶ CANADA → se ofrece formación a todos los residentes de MF 1 o 2 días.
- ▶ CME con gran variedad de cursos de 1-3 días 1000-2000 \$
- ▶ Falta → demostrar en estudios resultados en salud y estandarizar indicaciones y formación.

- ▶ El medico es su propia tecnología (un par de oídos, un par de ojos y un par de manos) cuando trata con personas y no con enfermedades. La anamnesis es más importante que las pruebas complementarias para el diagnostico.

Dr. Ian McWhinney

