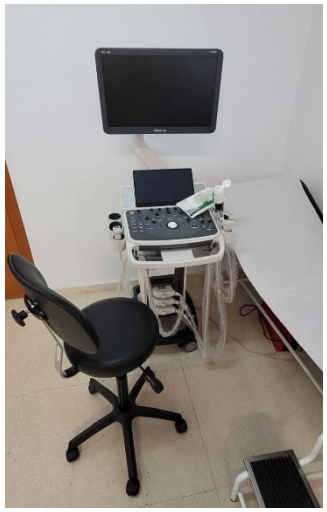
“Ecografía Y Médicos de Familia”



Dr. Antonio Calvo Cebrián

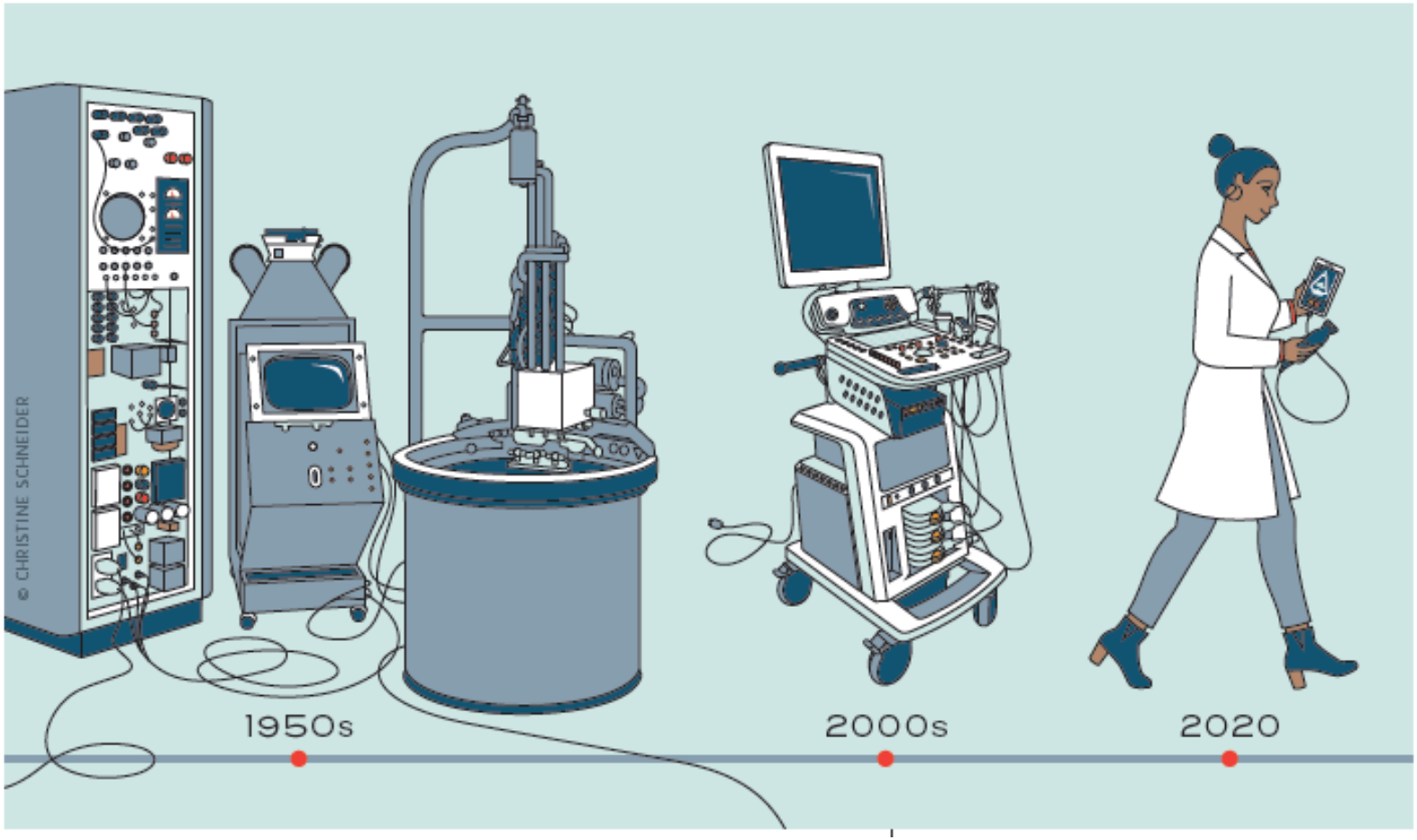
Médico de Familia

CS Robledo de Chavela

Grupo de Trabajo Ecografía SoMaMFyC y semFYC

¿Es útil la ecografía en AP?

Point-of-Care Ultrasound: A Practical Guide for Primary Care



Shen-Wagner J, Deutchman M. Point-of-Care Ultrasound: A Practical Guide for Primary Care. *Fam Pract Manag*. 2020;27(6):33-40.

“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 PRIMIARA. 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 sabemos que:

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

Escenarios clínicos de la Ecografía en Medicina Familiar. GTE SEMFYC 2016 Ediciones SEMFYC. ISBN: 978-84-15037-58-3.

Alonso Roca R, Díaz Sánchez S. LA ECOGRAFIA EM ATENCIÓN PRIMIARA. Médicos de Familia 2012. 2(14). 28-30

SITUACIÓN ACTUAL

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

Pinceladas de Ecografía:

- Point of Care Ultrasound (**POCUS**)
- Accesibilidad “universal” Sin demora.
- Equipos portátiles… Domicilio
- **Protocolos** que permiten **optimizar su rendimiento**
  - Exploraciones *sistematizadas y sencillas*, con *evidencia científica*, pero más breves y con *menos cortes*, de contrastada *eficacia y fiabilidad*.
  - Gran *demanda de Formación* POCUS
  - NO SUPLANTAN a especialistas (accesibilidad restringida)

American Academy of Family Physician 2014 http://www.aafp.org

- **Point-of-Care Ultrasound Examinations**: expoloraciones *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*

PoCUS

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.

NEJM 2011, 364;8: 749-57

Lessons Learned in Primary Care Ultrasound http://www.aafp.org

- Family Physicians 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***

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 the medical student curriculum
  - FM and Internal Medicine Residencies are adding POCUS to the residency curriculum

AAFP NATIONAL CONFERENCE

MAYO CLINIC

REVIEW

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

	Physical examination[31]					Point-of-care ultrasonography				
Test characteristics	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_2O	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
						IJV aspect ratio for CVP <8[40]	78%	77%	3.5	0.3
Reduced ejection fraction <50%	3rd Heart sound	11%-51%	85%-98%	3.4	0.7	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; IV = internal jugular vein; IVC = inferior vena cava; IVCCI = 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.

JAMA Cardiology | Special Communication

Time to Add a Fifth Pillar to Bedside Physical Examination
Inspection, Palpation, Percussion, Auscultation, and Insonation

Jagat Narula, MD, PhD; Y. Chandrashekhar, MD; Eugene Braunwald, MD

Inspection, palpation, percussion, and auscultation have been the 4 pillars of clinical bedside medicine. Although these basic methods of physical examination have served us well, traditional bedside examination, for a number of reasons including diminishing interest and expertise, performs well less than what is required of a modern diagnostic strategy. Improving the performance of physical examination is vital given that it is crucial to guide diagnostic possibilities and further testing. Current efforts at improving physical examination skills during medical training have not been very successful, and incorporating appropriate technology at the bedside might improve its performance. Selective use of bedside ultrasound (or *insonation*) can be one such strategy that could be incorporated as the fifth component of the physical examination. Seeing pathology through imaging might improve interest in physical examination among trainees, and permit appropriate downstream testing and possibly superior decision making. Current ultrasound technology makes this feasible, and further miniaturization of ultrasound devices and reduced cost will allow for routine use at the bedside. It is time to have a wider debate and a possible consensus about updates required to enhance current paradigms of physical examination.

JAMA Cardiol. 2018;3(4):346-350. doi:10.1001/jamacardio.2018.0001
Published online February 28, 2018.

Invited Commentary page 351

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FAMUS

THE JOURNAL OF FAMILY PRACTICE

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

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

Steinmetz P, Oleskevich S. The benefits of doing ultrasound exams in your office. J Fam Practice 2016 Aug;65(8):517-23

FAMUS

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

Steinmetz P, Oleskevich S. The benefits of doing ultrasound exams in your office. J Fam Practice 2016 Aug;65(8):517-23

ECO CLINICA COMO HERRAMIENTA DIAGNÓSTICA

- ESTUDIO DANES. 30 GPs
- 22 Tipos de exploraciones ecográficas
- CUANTIFICAN:
  - 86% POCUS <10´
  - 87% POCUS “concluyentes”
  - POCUS aumenta la certeza diagnóstica en 2/3 de los casos
  - POCUS cambia el manejo en ¼ de los pacientes

Andersen CA, Frandsen AK, Valentiner-Branth C, Lykkegaard J, Løkkegaard T, Thomsen JL, Jensen MB, Hansen MP. Introducing point-of-care ultrasound in Danish general practice-elucidating the use through a medical audit. Fam Pract. 2021 Mar 29;38(2):80-87. doi: 10.1093/fampra/cmaa080. PMID: 32839822.

Andersen et al. BMC Fam Pract (2021) 22:116
https://doi.org/10.1186/s12875-021-01459-z

BMC Family Practice

RESEARCH Open Access

Patients' experiences of the use of point-of-care ultrasound in general practice – a cross-sectional study

Camilla Aakjær Andersen[1*], John Brodersen[2,3], Torsten Rahbek Rudbæk[4] and Martin Bach Jensen[1]

- **691** pacientes → 81% evaluable
- 98% → bien **informados antes** de la prueba
- 97% → bien **informados de los resultados**
- 29% → **no informados** de la **diferencia** entre eco clínica y eco realizada por especialista en Rx
- 99% → POCUS **integrado en la consulta** de su médico
- 95% → POCUS **mejora el nivel del servicio** prestado
- 94% → POCUS **mejora la calidad de los cuidados** en Medicina General
- Concluyen **experiencia positiva**

Andersen, C.A., Brodersen, J., Rudbæk, T.R. *et al.* Patients' experiences of the use of point-of-care ultrasound in general practice – a cross-sectional study. *BMC Fam Pract* **22**, 116 (2021). https://doi.org/10.1186/s12875-021-01459-z

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	Evidence rating	Comments
Screening for AAA can be performed accurately with POCUS.[4-8]	C	Multiple disease-oriented studies; meta-analysis
Lung ultrasonography is accurate for determining the source of acute respiratory distress.[24-28]	C	Disease-oriented studies; systematic reviews
Ultrasonography differentiates cellulitis from abscess more accurately than clinical evaluation and reduces inappropriate incision and drainage and failure to resolve post drainage.[17,36]	C	Systematic review of eight disease-oriented cohort studies; case-control studies; retrospective review
Ultrasonography can diagnose complete rotator cuff tears with the same accuracy as magnetic resonance imaging.[30]	C	Cochrane review of 20 disease-oriented studies
POCUS lacks the sensitivity to rule out appendicitis but is diagnostic with a positive scan.[39,40]	C	Systematic review; meta-analysis
POCUS can rule out ectopic pregnancy by intrauterine pregnancy visualization.[41]	A	Meta-analysis of 10 studies

AAA = abdominal aortic aneurysm; POCUS = point-of-care ultrasonography.

A = consistent, good-quality patient-oriented evidence; **B** = inconsistent or limited-quality patient-oriented evidence; **C** = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to https://www.aafp.org/afpsort.

Arnold MJ, Jonas CE, Carter RE. Point-of-Care Ultrasonography. *Am Fam Physician*. 2020;101(5):275-285.

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.*

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