

Hand-Carried Ultrasound Performed
by a Hospitalist to Assist with
Clinical Decisions in Medicine
Inpatients: a Case Series

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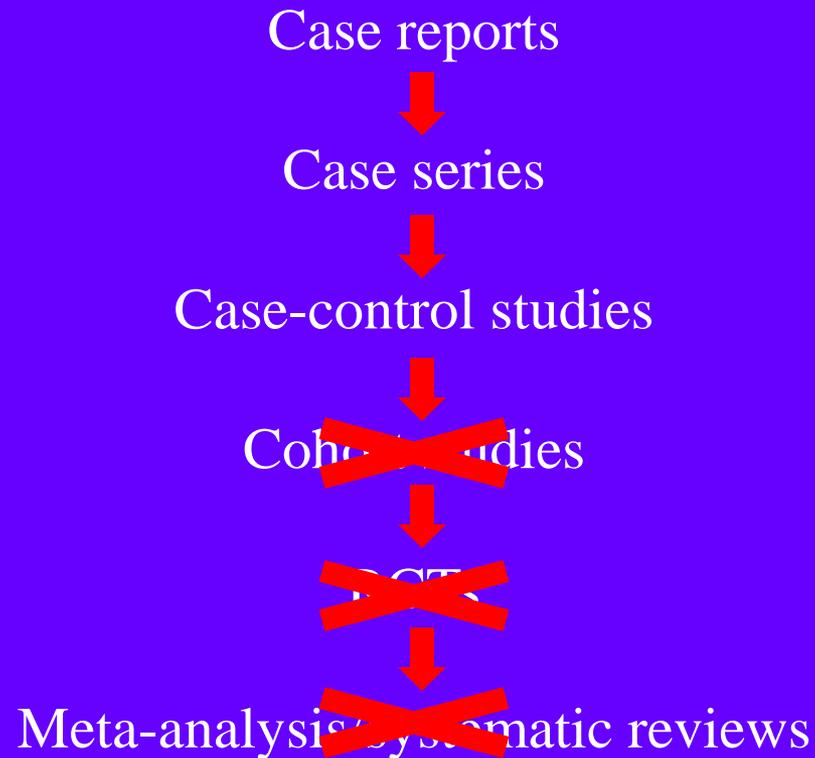
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Chicago, Illinois

Introduction

Unanswered question:

Does hand-carried ultrasound (HCU) performed by hospitalists change management?

The Hierarchy of Evidence



Methods

Large public teaching hospital

Five patients selected retrospectively from a teaching inpatient service

HCU was performed to assist in clinical decision

SonoSite MicroMaxx with 5-1 MHz transducer

Methods

A single hospitalist

Experience in abdominal sonography from another country

Limited echocardiography training in the USA as part of a study



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ORIGINAL RESEARCH

**Diagnostic Accuracy of Hospitalist-Performed Hand-Carried
Ultrasound Echocardiography After a Brief Training Program**

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Patient 1

78 ♂ with DM, BPH

Complaining of chills, malaise, urinary frequency.

Exam

T 101.5° F

Normal general exam

CBC and urinalysis normal

Clinical reasoning

UTI likely

UTI possible with normal UA if obstruction

Patient 1

HCU

no hydronephrosis

normal post-void residual volume

Antibiotics were withheld

Final diagnosis - acute viral syndrome

Urine culture (-)

Analysis

HCU kidneys

HCU bladder and post-void residual volume

HCU – *not a miraculous method*

Assisted in the clinical decision

Provided *supportive* diagnostic evidence

Patient 2

68 ♂

Transferred from the MICU after recovering from sepsis
Plan for BKA because of severe arterial insufficiency
and gangrene

Again became acutely ill:

↓ BP, ↑ HR

T 100.5° F

Anuria

Warm perfused skin

Palpable urinary bladder

Patient 2

Clinical reasoning

Probable Sepsis

HCU

distended urinary bladder

small collapsible IVC

Vigorous EF

Treatment

Aggressive intravenous fluid resuscitation

Insertion of a urinary catheter

Antibiotics

Improved in the matter of several hours

Analysis

HCU for fluid resuscitation

HCU for DDx of sepsis

HCU for investigating the source of sepsis

Patient 3

40 ♀

PMH of liver cirrhosis

Admitted with:

ETOH withdrawal

Jaundice, total bilirubin 5 mg/dL

Profuse gum bleeding, HgB 8.8 mg/dL

thrombocytopenia , Plt 22K

No physical findings of ascites

Patient 3

Clinical reasoning

If she has ascites, she will benefit from antibiotic prophylaxis of SBP in the setting of blood in the GI tract

HCU - no ascites

No antibiotics

Analysis

Is the physical examination good enough to rule out ascites?

Patient 4

24 ♂

PMH

Neurogenic bladder

Intermittent self-catheterization

Partially resolved quadriplegia after ADEM

Admitted for

urinary tract infection

newly elevated creatinine of 2.9 mg/dL

Patient 4

Assessment

UTI

Probable hydronephrosis

HCU

Bilateral hydronephrosis

Treatment

Urinary catheter insertion

Antibiotics

Analysis

Renal ultrasound for renal dysfunction

Acute or chronic

Kidney size and kidney volume for chronicity

Excludes post-renal

Maybe over utilized

Patient 5

87 ♂

PMH of HTN

C/o chronic leg swelling, DOE

To be admitted from the ED for suspected heart
failure

Patient 5

No physical findings of heart failure

ECG normal

CXR normal heart, tortuous aorta, blunting of CP angles

TnI 0.047

Clinical reasoning:

Heart failure unlikely

Patient 5

HCU:

EF normal

left atrial size normal

IVC diameter normal, respirophasic collapse > 50%

Admission was prevented

Final diagnosis

Deconditioning

Lower extremity edema due to venous insufficiency

Analysis

HCU performed by non-cardiologists

Many studies

Good diagnostic accuracy

Outperforms the traditional clinical examination

In patients with known heart failure

measure of the volume status

non-invasive hemodynamic monitoring

Discussion

Limitations of HCU

Overreliance

HCU \neq a comprehensive sonographic study

No hard evidence

No credentialing

Lack of financial incentives

Conclusion - HCU

Not a miraculous method

Assists in the clinical decision

Provides *supportive* diagnostic evidence

HCU intuitively seems useful in the hospital
practice

Evidence from prospective trials is needed

Thank you