

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

Stefan Tchernodrinski, MD

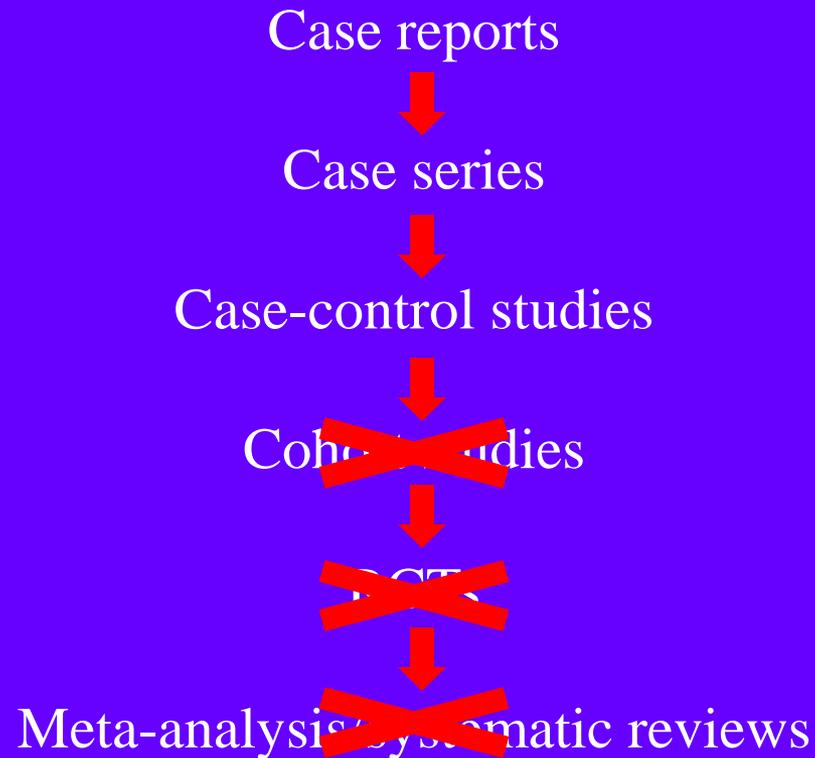
Cook County Hospital  
Chicago, Illinois

# 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



Journal of  
**HOSPITAL MEDICINE**

www.journalofhospitalmedicin

**ORIGINAL RESEARCH**

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

Brian P. Lucas, MD, MS  
Carolina Candotti, MD  
Bosko Margeta, MD  
Arthur T. Evans, MD, MPH  
Benjamin Mba, MBBS, MRCP

Department of Medicine, Stroger Hospital of Cook County and Rush Medical College, Chicago, Illinois.

Funded by the Department of Medicine, Stroger Hospital of Cook County and Rush Medical College, Chicago, IL.

# 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