

# A WHOLE-BODY POINT-OF-CARE ULTRASOUND (POCUS) PROTOCOL REDUCES MORTALITY

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## Background

Point-of-care ultrasound (POCUS) has shown promise in improving clinical outcomes, especially in intensive care unit (ICU); however, no study has demonstrated a reduction in mortality when POCUS is used. The primary aim of this study is to evaluate whether a head-to-toe functional POCUS protocol within the first 12 hours from ICU admittance could reduce mortality compared with the standard assessment. Secondary outcomes include the change in primary diagnosis, the need for further diagnostic investigations, changes in therapy management or invasive procedures indication.

## Material and Methods

This is a before-after clinical study conducted on critical care patients admitted into a mixed-ICU; patients admitted between February 2014 and December 2014 were evaluated by standard assessment (control group); between January 2015 and December 2016 a POCUS protocol including transorbital, lung, heart, and abdominal evaluation was added to the clinical practice (treatment group). Data were propensity matched for age, sex, length of hospital stay and SOFA, using SPSS (IBM, Armonk, NY) to ensure that the groups were similar.

## Results

After propensity matching a total of 446 patients were evaluated, divided in equal parts in the control and treatment group. The mortality at 60 days in the treatment group was 38.1% vs 47.5% in the control group ( $p = 0.036$ ). In the treatment group POCUS protocol changed the admission diagnosis in 27.8% of cases, the medical treatment in 22.2%, the indication for an invasive procedure in 16.0% (avoiding it in 1.2% and indicating it in 14.8%) and prompted further testing in 5.6%.

	Total patients	Without US protocol	With US protocol	p-value
<b>Sex, n (%)</b>				
Male	262 (58.7%)	132 (59.2%)	130 (58.3%)	$p = 1.000$
Female	184 (41.3%)	91 (40.8%)	93 (41.7%)	
<b>Age, years</b>				
Mean	69.00	69.00	69.00	$p = 0.366$
Range	14.0 – 93.0	15.0 – 93.0	14.0 – 93.0	
<b>Diagnosis, n (%)</b>				
Surgical	18 (4.0%)	9 (4.0%)	9 (4.0%)	$p = 1.000$
Medical	330 (74.0%)	165 (74.0%)	165 (74.0%)	
Neurological	98 (22.0%)	49 (22.0%)	49 (22.0%)	
<b>SOFA score, pts</b>				
Mean	7.0	7.0	7.0	$p = 0.644$
Range	0.0 – 15.0	0.0 – 15.0	1.0 – 15.0	
<b>Hospital stay, days</b>				
Mean	17	17	17	$p = 0.501$
Range	1.0 – 151.0	1.0 – 124.0	1.0 – 151.0	
<b>ICU event in 60 days, n (%)</b>				
Alive	255 (57.2%)	117 (52.5%)	138 (61.9%)	$p = 0.036$
Dead	191 (42.8%)	106 (47.5%)	85 (38.1%)	
<b>Overall</b>	446	223	223	

Table 1: Characteristics of patients. Abbreviations: US, ultrasonography; n, numbers; %, percentage; pts, points.

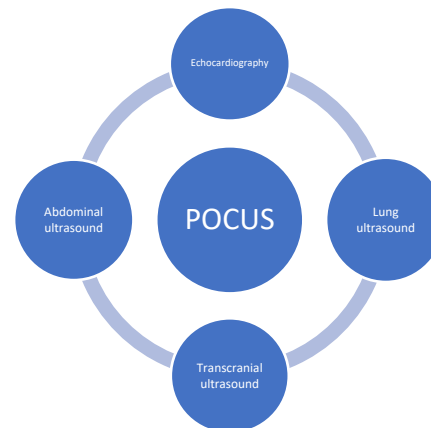


Figure 1: Point-of-care ultrasound protocol.

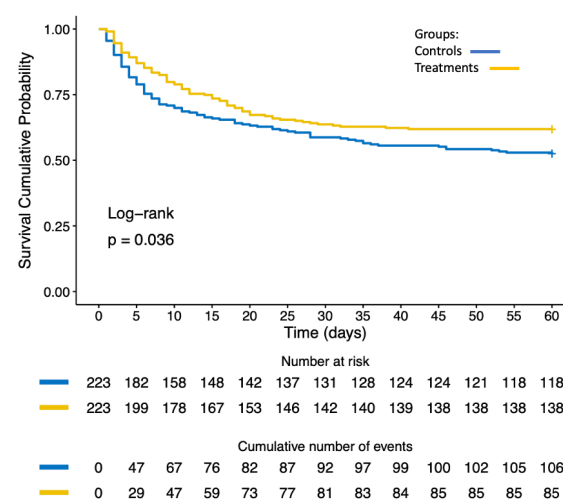


Figure 2: Kaplan-Meier, survival probability at 60 days in the group undergoing ultrasound protocol (treatments) VS the control group (controls);  $p = 0.036$ .

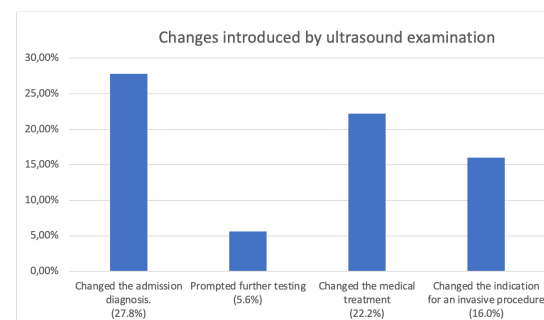


Figure 3: changes introduced by ultrasound examination in the group of patients undergoing ultrasound protocol.

## Conclusions

Through rapid comprehensive patient assessment, our ultrasonographic protocol has improved the quality of health care by reducing mortality, improving diagnostic capability and enhancing both medical and interventional treatment approaches.

## References

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