



Enhancing Efficiency: Time Savings from Autopopulating Ultrasound Measurements

Dylan Sadowsky, MD, Resident, Tulane Radiology

Gautam Dua; Kelsey Berman, MD; Yousef Dawoud, DO; Mitchell Jackson, DO; Parisha Babuta; Mohammad Mousa, BS, RT(R); Matthew Parker, MD; Jane Ball, MD; Mandy Weidenhaft, MD; Jeremy Nguyen, MD, Matthew Abella, MD; Cynthia Hanemann, MD

Background/Problem Being Solved

Ultrasound reporting workflows, especially for abdominal ultrasounds—the most common type in many practices—are often inefficient. There is little data quantifying the time savings from automating the transfer of measurements in complete abdominal ultrasounds. Radiologists spend significant time manually dictating or inputting these measurements, a clerical task that takes time away from analyzing images and adds to cognitive load and burnout. Manual entry is also prone to errors, compromising report accuracy and requiring corrections. With increasing imaging volumes and a radiologist shortage, maximizing efficiency is essential. Automating the population of ultrasound measurements into reports allows radiologists to focus on high-value tasks, improve accuracy, and reduce burnout. This study aims to quantify the potential time savings for abdominal ultrasound procedures through automation.

Intervention(s)

This study implemented software to automate the transfer of ultrasound measurements into the reporting system. Automation was tailored to our complete abdominal ultrasound protocol, incorporating 13 standardized fields. Two radiologists manually dictated 30 measurements for complete abdominal ultrasound studies. They timed the process from the first to the last measurement and recorded any errors.

Barriers/Challenges

Configuring various ultrasound machines was a logistical challenge, as each required multiple adjustments to ensure proper transmission of structured data due to differing settings.

When technologists recorded multiple measurements for the same organ, we adjusted the protocol to avoid defaulting to the mean. Instead, technologists were required to select the most accurate value for the data sheet.

Outcome

In our study, manually dictating measurements for complete abdominal ultrasounds took an average of 1 minute and 38 seconds, with a standard deviation of 23.6 seconds. For institutions performing 50 studies daily, this totals approximately 81.7 minutes per day. Over a year this equals about 354 hours.

The study also revealed a 13.3% error rate in manual dictation, including:

Major digit omissions: e.g., "1.47" instead of "15.47" and "3.156" instead of "31.56."

Rounding or minor discrepancies: e.g., "208.54" instead of "208.51."

Substitution of qualitative terms: e.g., "5 point" instead of "5.8."

Significant errors, such as "1.47" instead of "15.47," could misrepresent findings and impact clinical interpretation, while even minor discrepancies require time-consuming corrections. Substituting qualitative terms further highlights the variability in manual transcription. Automating this process eliminates these risks, improving both efficiency and accuracy.

Conclusion/Statement of Impact/Lessons Learned

Automating the measurement process eliminates this error-prone step, improves reporting accuracy by 13.3%, reduces cognitive load, and decreases professional burnout. Recovering 354 hours annually and reducing errors can significantly enhance workflow efficiency.

Figure(s)

Radiologist 1 (seconds)	Radiologist 2 (seconds)
155	99
85	112
125	120
127	111
120	158
99	105
91	103
79	83
113	61
180	114
90	92
127	124
96	79
113	124
91	107
96	95
79	114
89	67
91	118
82	83
112	81
96	73
74	69
83	59
82	72
98	89
77	74
89	86
76	131
80	86
Average	98.1
Standard Deviation	23.8

Figure 1. Time Taken (in Seconds) by Radiologist 1 and Radiologist 2 to Dictate Ultrasound Abdomen Measurements, with Combined Average and Standard Deviation

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Liver
Portal Venous velocity
GB wall
CBD
R Kidney L X W X H
L Kidney L X W X H
Spleen L X W X H
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Figure 2. Automated Fields for Abdominal Ultrasound Measurements, Including Organ Dimensions and Key Parameters

Keywords

Administration & Operations; Applications; Clinical Workflow & Productivity; Organizational & Professional Development; Provider Experience; Quality Improvement & Quality Assurance; Systems Management