Venue™ Family

Real-Time Documentation

A white paper by

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Work Smarter, Not Harder

Key Points

1. No need to manually label images or type findings, simply assign a finding from a prepopulated list that correlates with images.

2. Assess and document patient status, by intuitively mapping key areas of the body aligned to clinical workflows.

3. A single view diagram of anatomical segments with one click image storing, providing easy follow up.

Real-Time Documentation

Background

Point of Care ultrasound (PoCUS) is defined as a directed and focused examination with the goal of answering a specific clinical question in real time. PoCUS may be conducted as a one-time examination, performed repeatedly to reassess the patient or evaluate the therapeutic effect and help guide immediate clinical management.[1]

Clinical ultrasound examinations are promptly interpreted and, in addition to images and clips that are immediately relevant, the findings are expected to be available for the entire healthcare team in a written report that is preserved in the patient's medical record. [1]

Problem Statement

PoCUS is becoming increasingly prevalent across a wide range of medical specialties and clinical settings and is being integrated into the daily work and training curricula. [1, 2, 3, 4] Unfortunately documentation of examination results is somewhat limited or absent. Physicians and patients will benefit from documenting the examination in real time in daily clinical practice.[1]

Why is documentation so critical?

PoCUS is frequently used to assist with diagnostic workup and clinical decision making, affecting patient management. It may be used to monitor changes in the patient's condition, enabling comparison of the clinical state over time. Therefore, precise documentation of PoCUS is crucial. It is important to record the actual time when scans were performed due to the dynamic nature of a patient's condition and the findings that can be detected with PoCUS,[3] leading to high-quality patient care.

How is documentation carried out today?

A substantial number of PoCUS scans are being performed without written documention of the results.[3] In some institutions, documentation of PoCUS findings is done freehand into the patient notes and then scanned into the electronic medical record system.

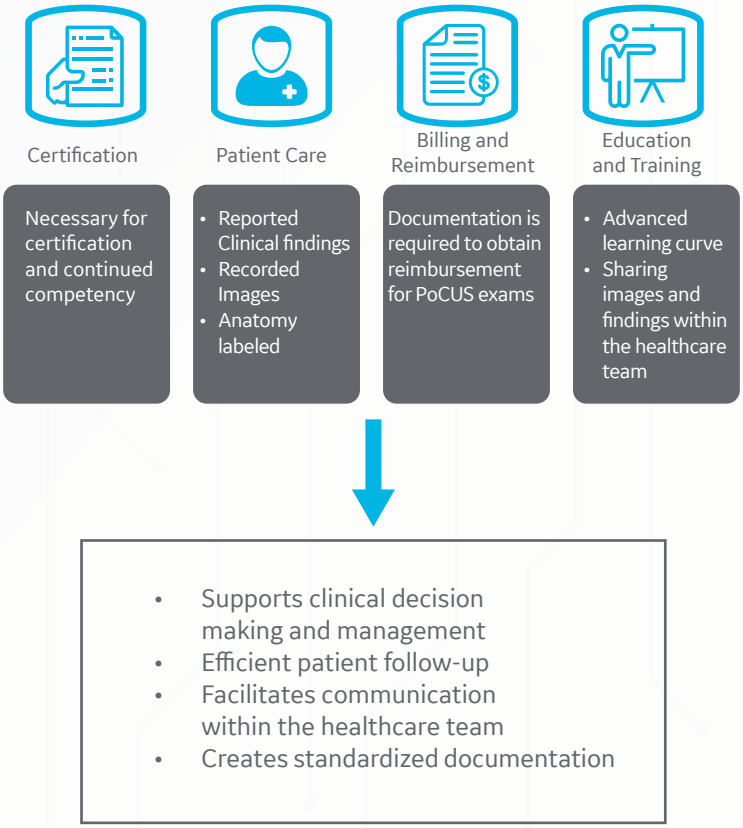
Why don't physicians document their scanning? Some common reasons for poor documentation include the well-known problem of having too many items on the provider's to-do list and the requirement to log in to a different operating system.[3]

What can help physicians complete documentation?

Clinicians find that documenting is simpler using diagrams because the acquired data may be easily mapped into different zones within the diagram.[3]

Among the list of components required for a complete documentation, one of the key factors is the examination findings.

Why is documentation required? [1, 5]



What is the main documentation problem we face today?

Poor records may have a negative impact on the clinical decision making, delivering low-quality and unsafe patient care. Verbal handovers might be misinterpreted or the information given may be limited, not recalled accurately or even missing. This may have medicolegal consequences since 'If it was not written down, it did not happen'. [3]

Solution

Real Time Documentation with Diagrams

The Diagrams, available exclusively on the Venue™ family of systems, enable real time documentation of findings relevant to the active zone, in each examination type. The diagrams available today include Lung, eFast and Renal.

How does it work?

Each diagram enables the clinician to accomplish the following:

- Scan the anatomical zones, either sequentially or in any desired order.
- Store images or clips to a specific zone, while scanning, by using a visual anatomical diagram on the scanning screen. (In each zone, a camera symbol indicates that at least one image or loop was stored in a particular zone. This enables the user to track exam progress and confirms image documentation per zone).
- Automatically label each zone with the relevant finding while scanning.
- View a summary review screen, at any time during or after the examination, showing the stored images superimposed over the anatomical diagram in the location matching the zone from which they were acquired.
- The review screen allows immediate access to the full-sized images and has the capability to toggle between examination dates so the user would be able to compare diagrams and images from different examinations.

Lung Diagram Workflow:

When performing a lung assessment examination using the Lung Diagram (Fig. 3), it is possible to view patterns related to different levels of lung aeration, on various zones of the lungs, and convey these aeration levels as a score. The patterns for each lung-zone may be divided into 4 levels corresponding to increasing loss of aeration.

Score	Description
0	Normal tissue showing horizontal A-lines patterns beyond the pleural line. Up to 2 well-separated B-Lines may appear.
1	3 or 4 B-lines
2	5 or more B-lines, or coalescent B-lines
3	Presence of lung consolidation

It's possible to manually enter or edit a Lung Score for each lung zone. An additional option is to activate the Auto B-lines tool per lung zone, which will populate the Lung Score accordingly to the number of B-lines detected by the tool.

A cumulative lung score is calculated by summing up the individual scores assigned to each of the lung zones, providing a total score for the lung exam.

Two different lung diagrams are currently available to support different methods of scanning the lungs (Fig. 1, Fig. 2):

Figure 1: 4X2 diagram

Figure 2: 6X2 diagram

Steps to complete a lung examination:

1. Select Lung Preset
2. Tap on zone
3. Scan
4. Activate Auto B-lines or enter/edit score manually.
5. Tap on Store
6. Tap on Review

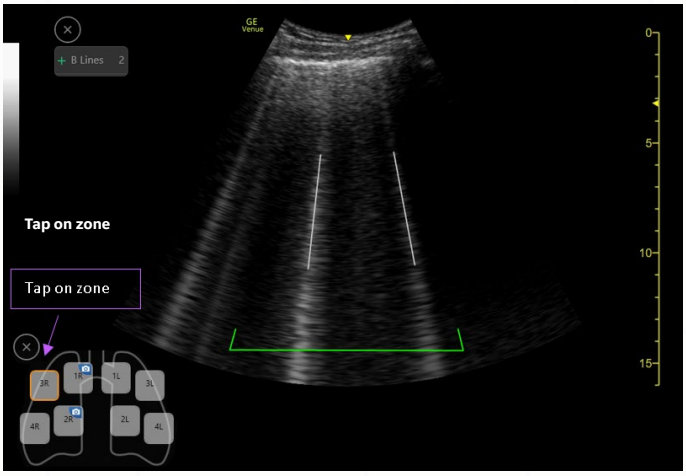


Figure 3: Lung Diagram screen layout

In the diagram review page (Fig. 4), if Auto B-lines was activated, the B-lines will be highlighted per zone while displaying the frame with the highest B line count. The score of every zone and total score on top will be displayed.

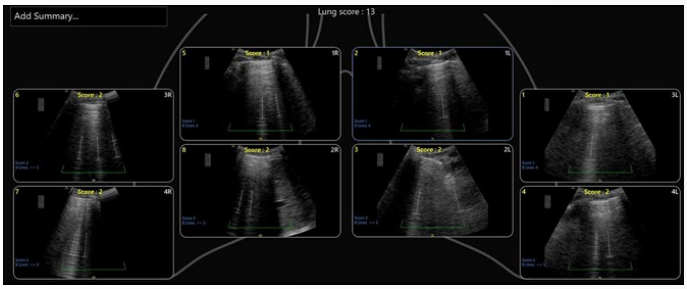


Figure 4: Lung Diagram Review layout

eFAST diagram workflow:

The eFAST protocol is useful in trauma situation where the physician needs to assess the injured patient and identify free fluid in the pericardium and abdomen. In addition, Pneumothorax may be detected in the trauma patient in the anterior lungs.

The eFAST exam is performed to identify the presence of free fluid in the following areas (Fig. 5):

- RUQ (perihepatic space)
- LUQ (perisplenic space)
- Pericardium
- Pelvis
- Bilateral lungs

In addition, it assists in documenting pneumothorax in the anterior lung portions.

Steps to complete the eFAST protocol:

1. Select eFAST application
2. Tap on zone
3. Scan
4. Select a finding from prepopulated list above the diagram ('Free fluid' if the selected zone is RUQ, LUQ, Cardiac, Pelvis, lateral lung or 'PTX' if anterior lung is selected)
5. Tap on Store
6. Tap on Review (Fig. 6)

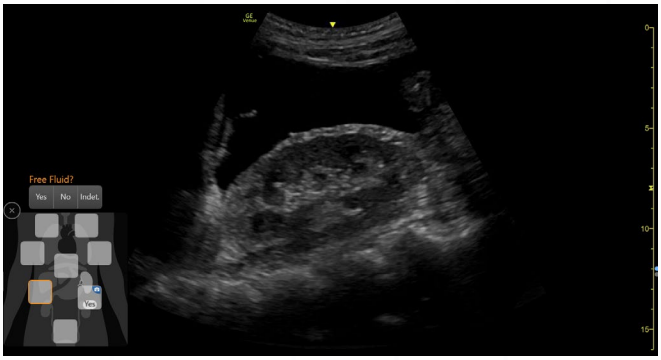


Figure 5: eFAST diagram screen layout

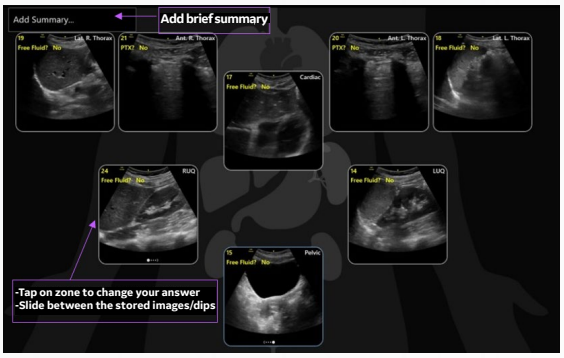


Figure 6: eFAST Diagram Review layout

A recent study compared manual documentation in a traditional eFAST exam vs. utilizing the eFAST diagram method. The results showed that the eFAST Diagram can provide an 80% reduction in key strokes while documenting. [6]

Renal Diagram Workflow:

The Renal Diagram allows the user to assess the grade of hydronephrosis in the kidneys. The Renal Diagram provides a graphical grading set of buttons for assessing hydronephrosis, allowing the user to indicate and grade this finding while scanning (Fig. 7). The workflow is similar to the eFAST Diagram workflow.

Steps to complete a Renal examination:

1. Select Abdomen/Renal/Ped preset
2. Tap on zone
3. Scan
4. Select a the hydronephrosis grade from the prepopulated list above the diagram (if kidney zone is selected).
5. Tap on Store
6. Tap on Review (Fig. 8)

Figure 7: Renal Diagram screen layout

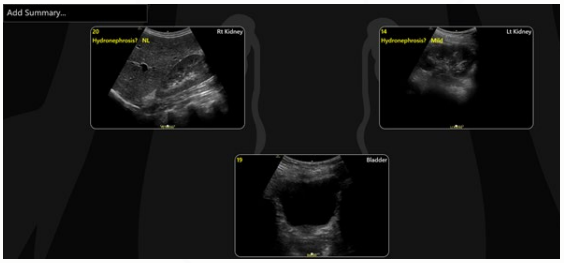


Figure 8: Renal Diagram Review layout

"Diagrams make it easy to document findings in real time and saves me time by labeling the zones. No need to scroll to review, all images are displayed in one page for easy follow up."

Dr. Lior Fuchs, Soroka University Medical Center

What is Auto Increment?

When Auto Increment is activated, the zone advances automatically (without tapping on the screen) to the next zone following Image/clip store & finding (if relevant).

If Auto zone increment is OFF, the current zone is selected manually.

How to add the diagram to your Report?

Every Diagram review page can be stored as a snapshot that can be used in a report by a 1-tap on Store button. This snapshot can be transferred to PACs or printed out to be attached to a patient's medical record.

Diagram Key Benefits

Easy attachment of label & findings to segment

- Auto labeling once a segment in a diagram is selected, saving manual typing effort and potentially reducing medical errors
- Attach finding to segment by 1-click, saving menu search & scroll effort
- Anatomical diagram assists in navigating between required segments, reduces forgotten documentation

Potentially reduce medical errors by using graphical documentation

- Anatomical segment view of requested diagram on one screen

Conclusion

Documentation in a PoCUS exam using a traditional manual approach, might be prone to error, tedious, complex and time consuming. The Venue Family diagrams help clinicians quickly assess and document patient status in real time by mapping key areas of the body in a way that is intuitive and aligned with clinical workflows. There is no longer a need to manually type in the labels of the zones or findings. Simply select a zone and assign a finding from a prepopulated list that correlates with the images. The diagrams also help the user keep track of their segmental assessments and can be helpful in showing trends in response to therapy. Real time documentation is the key to success.

What diagram do you want to see next?

References

1. PoCUS Practice Guidelines, SPOCUS The Society of Point of Care Ultrasound
2. "A road map for point-of-care ultrasound training in internal medicine residency", Charles M. LoPresti Et. al, The Ultrasound Journal, 2019 May, 11, Article number: 10
3. "Improving the documentation quality of point-of-care ultrasound scans in the emergency department", Shadman Aziz et. al, BMJ Open Quality 2020;9:e000636. doi:10.1136/ bmjoq-2019-000636
4. "Recommended Curriculum Guidelines for Family Medicine Residents, Point of Care Ultrasound", American Academy of Family Physicians (AAFP), AAFP Reprint No. 290D
5. "Recommendations for the Use of Point-of-Care Ultrasound (PoCUS) by Emergency Physicians in Canada", David Lewis et.al, Canadian Journal of Emergency Medicine, 2019 Nov;21(6):721-726.doi: 10.1017/cem.2019.392.
6. eFAST Comparison Study: Manual vs. Venue Automation. GE internal study. (DOC2222911)

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