

Standard Reporting Guidelines: Ultrasound for Procedure Guidance

Reviewed by the ACEP Board of Directors

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Introduction and Statement of Purpose

Developed by members of the ACEP Emergency Ultrasound Section

These guidelines represent the product of a working group that was formed based on discussions at the Industry Roundtable subcommittee of the American College of Emergency Physicians (ACEP) Emergency Ultrasound Section. The impetus for these guidelines emerged from discussions with emergency ultrasound leaders and industry, both ultrasound manufacturers and electronic medical record (EMR) companies that indicated a need for a more structured method to report and communicate the findings of point-of-care (POC) emergency ultrasound (EUS).

This document serves as a resource to clinicians with a wide range of experience, and as such may contain fields or terms that may not be appropriate in all situations or by all clinicians. It is important to note that these guidelines **in no way represent required elements of reporting**. In fact, in general these guidelines err on the side of including more fields than may be used by most emergency physicians, and it is expected that many fields may remain unused depending on the situations.

The purpose of these guidelines is to define fields that may be helpful for POC EUS in a consistent order, with consistent definitions, and in a method that may be easily coded into electronic communications and computer databases. The goal of this document is to accurately report the findings that commonly result from an ultrasound performed by a clinician in the emergency department and to avoid confusion with reports generated by other specialties.

We hope to eventually use these guidelines to work with existing reporting structures such as DICOM and initiatives through the Integrated Health Enterprise (IHE) to develop consistent non-proprietary methods of reporting and communicating POC EUS examination findings.

FORMAT

All diagnostic examinations should include:

- Patient/exam demographics
- Indications for examination
- Views
- Findings
- Interpretation
- Quality assurance

The first and last portions should be consistent across exam types and are presented here.

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Bar Code/Patient Identifier: _____

Hospital Name: _____

Date and time of exam: ___ / ___ / ___

Exam type:

- Diagnostic
- Educational
- Procedural

Clinical category:

- Resuscitative
- Symptom based
- Therapeutic
- Unknown/other

- Initial exam
- Repeat exam

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Quality assurance:

Suggested Quality Assurance Grading Scale

Image quality	1	2	3	4	5				
Accuracy of interpretation of images as presented						TP	TN	FP	FN
Accuracy of interpretation of images as compared to gold standard (ie, CT, operative report)						TP	TN	FP	FN

Comments: _____

	1	2	3	4	5
Grading Scale Definitions	No recognizable structures, no objective data can be gathered	Minimally recognizable structures but insufficient for diagnosis	Minimal criteria met for diagnosis, recognizable structures but with some technical or other flaws	Minimal criteria met for diagnosis, all structures imaged well and diagnosis easily supported	Minimal criteria met for diagnosis, all structures imaged with excellent image quality and diagnosis completely supported

Ultrasound for Procedural Guidance: Pericardiocentesis

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Date and time of exam: ___ / ___ / ___

Exam type:

Diagnostic

Educational (N/A)

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Indication(s) for exam:

Cardiac arrest

Cardiac tamponade

Pericardial effusion

Pulsus paradoxus

Other indication: _____

Preparation:

Anesthesia:

Local

Procedural sedation

Other: _____

Equipment:

Needle Type:

18 gauge spinal needle

Other: _____

Catheter Type:

Single Lumen

Multi Lumen: _____

Other (*Cordis): _____

None

Technique:

Sterile

Emergent (minimal sterility)

Needle Insertion Approach:

In-Plane Approach

Out-of-Plane Approach

Subxiphoid Approach

Parasternal Approach

Apical Approach

Other _____

Number of Attempts:

One

Two

Three

> Three

Fluid Aspiration:

Fluid Appearance (check all that apply)

- | | |
|--|-------------------------------------|
| <input type="checkbox"/> Colorless | <input type="checkbox"/> Bloody |
| <input type="checkbox"/> Straw-like | <input type="checkbox"/> Not bloody |
| <input type="checkbox"/> Purulent | <input type="checkbox"/> Cloudy |
| <input type="checkbox"/> Amber | <input type="checkbox"/> Not cloudy |
| <input type="checkbox"/> Comments/ other findings: _____ | |

Fluid Volume

- | | |
|------------------------------------|--------------------------------------|
| <input type="checkbox"/> <5 mL | <input type="checkbox"/> 5-50 mL |
| <input type="checkbox"/> 50-500 mL | <input type="checkbox"/> 500-1000 mL |
| <input type="checkbox"/> >1000 mL | |

Catheter Insertion:

- Permanent Catheter Temporary Catheter None

Outcome(s):

- Successful pericardial fluid aspiration
- Unsuccessful pericardial fluid aspiration
- Successful catheter insertion
- Unsuccessful catheter insertion

Complication(s):

- | | | |
|-------------------------------|--|--|
| <input type="checkbox"/> None | <input type="checkbox"/> Pneumothorax | <input type="checkbox"/> Myocardial injury |
| | <input type="checkbox"/> Hemopericardium | <input type="checkbox"/> Other: _____ |

Quality assurance:

- Adequacy of individual views
- Accuracy of interpretation of individual views
- Gold standard interpretation based on images
- Overall adequacy of examination

Ultrasound for Procedural Guidance: Thoracentesis

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Date and time of exam: ___ / ___ / ___

Exam type:

Diagnostic

Educational (N/A)

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Indication(s) for exam:

Therapeutic

Diagnostic

 Chest pain

Dyspnea/Tachypnea/Hypoxia

Hemothorax

Pneumothorax

Empyema

Chylothorax

Malignant effusion

Pleural effusion

Other indication: _____

Preparation:

Anesthesia:

Local

Procedural sedation

Other: _____

Equipment:

Needle Type:

16 gauge needle

18 gauge needle

Other: _____

Catheter Type:

Single Lumen

Multi Lumen: _____

None

Technique:

Sterile

Emergent (minimal sterility)

Needle Insertion Approach:

Right thorax

Left thorax

Position

Sitting/Posterior Approach

- Lateral Decubitus/Posterior Approach
- Supine/Lateral Approach
- Other: _____

Guidance

- Real Time Guidance
 - In-Plane Approach
 - Out-of-Plane Approach
- Pre-Procedure Marking

Number of Attempts:

- One
- Two
- Three
- > Three

Fluid Aspiration:

Fluid Appearance (check all that apply)

- Colorless
- Straw-like
- Purulent
- Amber
- Comments/ other findings: _____
- Bloody
- Not bloody
- Cloudy
- Not cloudy

Fluid Volume

- <5 mL
- 5-50 mL
- 50-500 mL
- 500-1000 mL
- >1000 mL

Catheter Insertion:

- Permanent Catheter
- Temporary Catheter
- None

Outcome(s):

- Successful pleural fluid aspiration
- Unsuccessful pleural fluid aspiration
- Successful catheter insertion
- Unsuccessful catheter insertion

Complication(s):

- None
- Active Bleeding
- Hemothorax
- Pneumothorax
- Other: _____

Quality assurance:

- Adequacy of individual views
- Accuracy of interpretation of individual views
- Gold standard interpretation based on images
- Overall adequacy of examination

Ultrasound for Procedural Guidance: Paracentesis

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Date and time of exam: ___ / ___ / ___

Exam type:

Diagnostic

Educational (N/A)

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Indication(s) for exam:

Therapeutic

Diagnostic

 Cirrhosis

Fever

Abdominal Pain/Tenderness

Malignancy

Alcoholism

Dyspnea

Other indication: _____

Preparation:

Anesthesia:

Local

Procedural sedation

Other: _____

Equipment:

Needle Type:

16 gauge needle

18 gauge needle

Other: _____

Catheter Type:

Single Lumen

Multi Lumen: _____

None

Technique: Sterile

Needle Insertion Approach:

In-Plane Approach

Out-of-Plane Approach

Needle Insertion Location:

Midline infraumbilical

Right paracolic gutter

Left paracolic gutter

Other: _____

Guidance

- Real Time Guidance
 - In-Plane Approach
 - Out-of-Plane Approach
- Pre-Procedure Marking

Number of Attempts:

- One Two Three > Three

Fluid Aspiration:

Fluid Appearance (check all that apply)

- Colorless Bloody
- Straw-like Purulent
- Cloudy Amber
- Comments/ other findings: _____

Fluid Volume

- <5 mL 5-50 mL
- 50-500 mL 500-1000 mL
- >1000 mL

Catheter Insertion:

- Permanent Catheter Temporary Catheter None

Outcome(s):

- Successful peritoneal fluid aspiration
- Unsuccessful Peritoneal fluid aspiration
- Successful catheter insertion
- Unsuccessful catheter insertion

Complication(s):

- None Active bleeding Bladder perforation
- Bowel perforation Other: _____

Quality assurance:

Adequacy of individual views
Accuracy of interpretation of individual views
Gold standard interpretation based on images
Overall adequacy of examination

Ultrasound for Procedural Guidance: Arthrocentesis

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Date and time of exam: ___ / ___ / ___

Exam type:

Diagnostic

Educational (N/A)

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Indication(s) for exam:

Therapeutic

Diagnostic

 Joint swelling

Restricted range of motion

Joint pain

Fever

Other indication: _____

Preparation:

Anesthesia:

Local

Procedural sedation

Other: _____

Equipment:

Needle Type:

16 gauge needle

18 gauge needle

Other: _____

Technique: Sterile

Needle Insertion Approach:

Right

Left

Joint Aspirated

Shoulder

Elbow

Wrist

Hip

Knee

Ankle

Digit(s): _____

Other: _____

Guidance

Real Time Guidance

In-Plane Approach

Out-of-Plane Approach

Pre-Procedure Marking

Number of Attempts:

- One Two Three > Three

Fluid Aspiration:

Fluid Appearance (check all that apply)

- Colorless Bloody
 Straw-like Purulent
 Cloudy Amber
 Comments/ other findings: _____

Fluid Volume

- <5 mL 5-10 mL
 10-20 mL 20-30 mL
 > 40 mL

Outcome(s):

- Successful joint fluid aspiration
 Unsuccessful joint fluid aspiration

Complication(s):

- None Active bleeding Hematoma
 Nerve injury Other: _____

Quality assurance:

Adequacy of individual views
Accuracy of interpretation of individual views
Gold standard interpretation based on images
Overall adequacy of examination

Ultrasound for Procedural Guidance: Lumbar Puncture

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Date and time of exam: ___ / ___ / ___

Exam type:

Diagnostic

Educational (N/A)

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Indication(s) for exam:

Therapeutic

Diagnostic

 Headache

Fever

Unexplained weakness

Acute neurologic change

Other: _____

Preparation:

Anesthesia:

Local

Procedural sedation

Other: _____

Equipment:

Needle Type:

20 gauge needle: blunt cutting

22 gauge needle: blunt cutting

Other: _____

Technique:

Sterile

Needle Insertion Approach:

Position:

Sitting

Lateral Decubitus

Level:

L3-L4

L4-L5

Guidance

Real Time Guidance

In-Plane Approach

Out-of-Plane Approach

Pre-Procedure Marking

Number of Attempts:

- One Two Three > Three

Fluid Aspiration:

Fluid Appearance (check all that apply)

- Colorless Bloody
 Straw-like Purulent
 Cloudy Amber
 Comments/ other findings: _____

Outcome(s):

- Successful CSF fluid aspiration
 Unsuccessful CSF fluid aspiration

Complication(s):

- None Active bleeding Hematoma
 Post spinal headache Nerve injury Other: _____

Quality assurance:

Adequacy of individual views
Accuracy of interpretation of individual views
Gold standard interpretation based on images
Overall adequacy of examination

Ultrasound for Procedural Guidance: Vascular Access

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Date and time of exam: ___ / ___ / ___

Exam type:

Diagnostic

Educational (N/A)

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Indication(s) for exam:

Hypotension

Blood pressure monitoring

Frequent lab draws

Difficult IV access

Vasopressor use

Other: _____

Preparation:

Anesthesia:

Local

Procedural sedation

Other: _____

Equipment:

Needle Type:

18 gauge needle

20 gauge needle

22 gauge needle

Other: _____

Technique:

Sterile

Emergent (minimal sterility)

Non-sterile

Needle Insertion Approach:

Right

Left

Vein:

Central

Internal Jugular

Femoral

Subclavian

Peripheral

Antecubital

Basilic

Brachial

Cephalic

Other: _____

Artery:

- Femoral Radial
- Guidance
- Real Time Guidance
- In-Plane Approach Out-of-Plane Approach
- Pre-Procedure Marking

Number of Attempts:

- One Two Three > Three

Compressibility and Visualized Patency:

- Compressible Partially compressible
- Non-compressible Patent thrombus seen

Outcome(s):

- Successful blood aspiration
- Unsuccessful blood aspiration
- Successful catheter insertion
- Unsuccessful catheter insertion
- Saline flush confirmation
- Saline FLUSH with right atrium bubbles confirmation

Complication(s):

- None Active bleeding Vascular injury Hematoma
- Nerve injury Pneumothorax Bladder aspiration
- Other: _____

Quality assurance:

- Adequacy of individual views
- Accuracy of interpretation of individual views
- Gold standard interpretation based on images
- Overall adequacy of examination

Ultrasound for Procedural Guidance: Regional Nerve Block

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Date and time of exam: ___ / ___ / ___

Exam type:

Diagnostic

Educational (N/A)

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Indication(s) for exam:

Major laceration

Joint dislocation

Joint fracture

Other: _____

Preparation:

Anesthesia:

Local

Procedural Anesthetic

Lidocaine

Lidocaine with epinephrine

Bupivacaine

Other: _____

Equipment:

Needle Type:

18 gauge needle

20 gauge needle

Other: _____

Technique:

Sterile

Needle Insertion Approach: nerve(s) identified and anesthetic solution was infiltrated in the usual fashion with ultrasound assistance.

Right

Left

Location

Interscalene

Supraclavicular

Infraclavicular

Axillary

Median

Ulnar

Radial

Femoral

Sciatic

Tibial

Peroneal

Other: _____

Guidance

Real Time Guidance

- In-Plane Approach Out-of-Plane Approach
 Pre-Procedure Marking

Number of Attempts:

- One Two Three > Three

Outcome(s):

- Successful anesthetic placement Unsuccessful anesthetic placement

Complication(s):

- None Active bleeding Vascular injury Hematoma
 Nerve injury Pneumothorax
 Other: _____

Quality assurance:

Adequacy of individual views
Accuracy of interpretation of individual views
Gold standard interpretation based on images
Overall adequacy of examination

Ultrasound for Procedural Guidance: Abscess

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Date and time of exam: ___ / ___ / ___

Exam type:

Diagnostic

Educational (N/A)

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Indication(s) for exam:

Redness

Swelling

Pain

Difficult IV access

Vasopressor use

Other: _____

Preparation:

Anesthesia:

Local

Procedural sedation

Other: _____

Equipment:

Needle Type:

18 gauge needle

20 gauge needle

22 gauge needle

Other: _____

Technique: Sterile

Needle Insertion Approach:

Right

Left

Location

Abdominal wall

Axilla

Breast

Chest wall

Extremities

Upper: _____

Lower: _____

Lower Back

Neck

Pelvic wall

Upper Back

Other: _____

Guidance

- Real Time Guidance
 In-Plane Approach Out-of-Plane Approach
 Pre-Procedure Marking

Number of Attempts:

- One Two Three > Three

Fluid Appearance (check all that apply)

- Colorless Bloody
 Straw-like Purulent
 Cloudy Amber
 Comments/ other findings: _____

Fluid Volume

- <5 mL 5-50 mL
 > 50 mL

Outcome(s):

- Successful aspiration
 Unsuccessful aspiration
 Successful incision and drainage
 Unsuccessful incision and drainage

Complication(s):

- None Active bleeding Vascular injury Hematoma
 Nerve injury Other: _____

Quality assurance:

Adequacy of individual views
Accuracy of interpretation of individual views
Gold standard interpretation based on images
Overall adequacy of examination

Ultrasound for Procedural Guidance: Other (Miscellaneous)

Patient/ exam demographics:

Patient name: _____

Patient gender: M F

DOB: ___ / ___ / ___

MR#: _____

Date and time of exam: ___ / ___ / ___

Exam type:

Diagnostic

Educational (N/A)

Initial exam

Primary person obtaining/ interpreting images: _____

Secondary person obtaining/ interpreting images: _____

Additional person(s) obtaining/ interpreting images: _____

Indication(s) for exam:

Other: _____

Preparation:

Anesthesia:

Local

Procedural sedation

Other: _____

Equipment:

Needle Type:

18 gauge needle

20 gauge needle

Other: _____

Technique:

Sterile

Emergent (minimal sterility)

Non-sterile

Needle Insertion Approach:

Right

Left

Location

Other: _____

Guidance

Real Time Guidance

In-Plane Approach

Out-of-Plane Approach

Pre-Procedure Marking

Number of Attempts:

One

Two

Three

> Three

Outcome(s):

- Successful _____
 Unsuccessful _____

Complication(s):

- None Active bleeding Vascular injury Hematoma
 Nerve injury Other: _____

Quality assurance:

- Adequacy of individual views
Accuracy of interpretation of individual views
Gold standard interpretation based on images
Overall adequacy of examination