

## Supplement 1 Procedural training survey

### Procedure skills and supervision survey

#### Medical Education Regional Network

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**1. My program is:**

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Internal medicine

Family medicine

Medicine/pediatrics

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**2. I am a:**

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PGY-1

PGY-2

PGY-3

PGY-4

Other, please specify

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**3. I am a:**

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M

F

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**4. My career as I see it now  
is:**

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Non-clinical (consulting,  
pharmaceutical, *etc.*)

General internal medicine  
(clinic based)

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General internal medicine  
(hospital based)  
Non-invasive subspecialty  
(endocrine, ID, rheum)  
Invasive procedure sub-  
specialty (Cardiology,  
Pulm/ICU, GI, Renal)

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**5. How many of the following procedures have you performed during residency (approximately)?**

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Paracentesis:

Thoracentesis:

Lumbar Puncture:

IJ/Subclavian Line

Placement:

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**6. How many of the following procedures have you performed on a simulator during residency including during orientation (approximately)?**

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Paracentesis:

Thoracentesis:

Lumbar Puncture:

IJ/Subclavian Line

Placement:

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**7. How often do you do the following when performing a paracentesis, thoracentesis, lumbar puncture? Answer N/A if you have never performed a bedside procedure.**

Review steps of procedure beforehand w/ supervisor	Never	~25%	~50%	~75%	Always	N/A
Review steps of the procedure in the literature	Never	~25%	~50%	~75%	Always	N/A
Obtain Informed Consent	Never	~25%	~50%	~75%	Always	N/A
Observe Universal Protocol of a "Time Out" - identify patient, procedure, & site	Never	~25%	~50%	~75%	Always	N/A
Have supervision by a dedicated proceduralist	Never	~25%	~50%	~75%	Always	N/A
Verbalization of steps during the procedure with your supervisor	Never	~25%	~50%	~75%	Always	N/A
Receive constructive feedback	Never	~25%	~50%	~75%	Always	N/A
Write a Procedure Note	Never	~25%	~50%	~75%	Always	N/A

**8. How often do you use bedside ultrasound guidance in the following procedures? Answer N/A only if you have never done this procedure before.**

Paracentesis	Never	~25%	~50%	~75%	Always	N/A
Thoracentesis	Never	~25%	~50%	~75%	Always	N/A
Femoral Line	Never	~25%	~50%	~75%	Always	N/A
Internal Jugular Line	Never	~25%	~50%	~75%	Always	N/A
Subclavian Line	Never	~25%	~50%	~75%	Always	N/A

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**9. I am comfortable \*performing\* the following procedures with indirect supervision (a supervisor is available but not present):**

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Paracentesis:		Strongly	Disagree	Agree	Strongly
		y	ee		Agree
		Disagree			
		e			
Thoracentesis:		Strongly	Disagree	Agree	Strongly
		y	ee		Agree
		Disagree			
		e			
Lumbar Puncture:		Strongly	Disagree	Agree	Strongly
		y	ee		Agree
		Disagree			
		e			
IJ/Subclavian	Line	Strongly	Disagree	Agree	Strongly
Placement		y	ee		Agree
		Disagree			
		e			

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**10. I am comfortable \*supervising\* the following procedures independently:**

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Paracentesis:		Strongly	Disagree	Agree	Strongly
		Disagree	ee		Agree
Thoracentesis:		Strongly	Disagree	Agree	Strongly
		Disagree	ee		Agree
Lumbar Puncture:		Strongly	Disagree	Agree	Strongly
		Disagree	ee		Agree

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IJ/Subclavian Placement	Line	Strongly Disagree	Disagree	Agree	Strongly Agree
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**11. I have supervised the following procedures before feeling comfortable with the proper technique: Answer "never supervised" if you have never supervised this procedure before.**

Paracentesis	Strongly Disagree	Disagree	Agree	Strongly Agree	Never Supervised
Thoracentesis	Strongly Disagree	Disagree	Agree	Strongly Agree	Never Supervised
Lumbar Puncture	Strongly Disagree	Disagree	Agree	Strongly Agree	Never Supervised
Internal Jugular Line	Strongly Disagree	Disagree	Agree	Strongly Agree	Never Supervised
Subclavian Line	Strongly Disagree	Disagree	Agree	Strongly Agree	Never Supervised

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**12. In the last year, my supervisor for paracenteses, thoracenteses, lumbar punctures are most often:**

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No one, I perform these procedures independently

Senior Level Resident

Medicine Ward Attending

ICU fellow or attending

Other, please specify

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**13. In a non-emergency situation, non-code situation I have encountered the following complications when performing procedures:**

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I've encountered NO complications

Inadequate Analgesia

Bowel Perforation

Pneumothorax

Hemothorax

Spinal Hematoma

CSF Leak

Venous Hematoma

Arterial Puncture

Arterial Hematoma

Uncontrolled Bleeding

Patient Death

Other, please specify

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**14. These complications (non-code situation) may have been avoided by:**

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I have encountered NO complications

More time for preparation

Better characterization of anatomy

Use of ultrasound

Better analgesia/sedation

More adequate supervision

Better training in proper procedure technique

Better patient positioning

Better patient cooperation

No way to avoid these complications

Other, please specify

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**15. For procedures commonly performed by medicine residents (Paracentesis, Thoracentesis, Lumbar Puncture) how often have procedures been delayed due to resident inexperience/discomfort?**

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Never

Rarely

Sometimes

Often

Always

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**Why are procedures delayed?**

**What % of procedures are sent to interventional radiology?**

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**16. I am satisfied with the procedure training at my institution**

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Paracentesis, Thoracentesis, LP	Strongly Disagree	Disagree	Agree	Strongly Agree
/IJ/Subclavian Lines	Strongly Disagree	Disagree	Agree	Strongly Agree

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Adapted with permission from “Supervising the supervisors- Procedural Training and Supervision in Residency” Mourad *et al*, *J Gen Int Med* 2010.

**Supplement 2 Baseline laboratory values**

<i>n</i>	Control	Intervention	<i>P</i> - value
	39	46	
Sodium, mEq/L	132.3 (7.4)	133.5 (7)	0.5
Potassium, mEq/L	4.2 (1.2)	4.4 (0.9)	0.5
Chloride, mEq/L	99.6 (12)	102.8 (8.5)	0.5
BUN, mg/dL	32.2 (26)	43.8 (33.6)	0.8
Creatinine, mg/dL	1.99 (1.66)	2.5 (2.08)	0.2
eGFR, mL/min/1.73 m <sup>2</sup>	39.6 (22.9)	33.9 (21.1)	0.3
INR	2.03 (0.76)	2.02 (0.91)	1.0
White cell count, cells/L	8.9 (4.9)	7.6 (4.7)	0.2
Hemoglobin, g/dL	9.3 (2.1)	9.3 (2.2)	1.0



Platelets, /mL <sup>3</sup>	104.2 (59.9)	108.8 (70.4)	0.8
Total bilirubin, mg/dL	6.2 (6.7)	4.7 (5.9)	0.3
ALT, IU/L	37.3 (27.6)	41.4 (35.5)	0.6
AST, IU/L	69.9 (54.3)	83.4 (147.4)	0.6
Alkaline Phosphatase, IU/L	195 (203)	155 (91.4)	0.2
Total protein, g/L	6.1 (1.1)	6.2 (1)	0.7
Albumin, mg/dL	2.6 (0.5)	2.7 (0.6)	0.2
Lactic acid, mmol/L	2.3 (1.1)	2.5 (1.8)	0.8

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BUN: Blood urea nitrogen; eGFR: Estimated glomerular filtration rate; INR: International normalized ratio; ALT: Alanine aminotransferase; AST: Aspartate aminotransferase.