

Data Supplement S1: Complete Survey Results

| I. Background Knowledge | | | | |
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| <u>Curriculum Element</u> | <u>Round 1 Mean (SD)</u> | <u>Round 1 Level of Agreement</u> | <u>Round 2 Mean (SD)</u> | <u>Round 2 Level of Agreement</u> |
| a. Benefits to Providers | | | | |
| Decrease ED Length of Stay | 3.92 (0.73) | Low | 3.92 (1.08) | Medium |
| Relieving Pain | 4.77 (0.42) | High | 4.85 (0.38) | High |
| Needle Tracking Skills | 4.08 (0.73) | Low | 4.46 (0.52) | High |
| Knowledge of Anatomy | 3.77 (0.58) | Low | 3.85 (1.07) | Medium |
| Consultant Relationships | 3.54 (0.84) | Low | 3.23 (0.93) | Low |
| b. Benefits to Patients | | | | |
| Decrease Opioid Use | 4.77 (0.42) | High | 4.77 (0.44) | High |
| Avoid Opioid Risk | 4.77 (0.42) | High | 4.69 (0.63) | High |
| Avoid Sedation Risk | 4.54 (0.63) | High | 4.69 (0.63) | High |
| Relief of Pain | 4.62 (0.49) | High | 4.92 (0.28) | High |
| Prevention of Complications | 4.46 (0.63) | High | 4.23 (0.73) | High |
| Improve Functional Outcomes | 4.08 (0.73) | Low | 3.54 (1.13) | Low |
| c. Risks of UGRA Procedures | | | | |
| Intravascular Injection | 4.62 (0.62) | High | 4.69 (0.48) | High |
| Intraneural Injection | 4.38 (0.74) | Medium | 4.46 (0.52) | High |
| Syrinx Formation | 3.62 (1.00) | Low | 3.46 (0.97) | Low |
| Causing Compartment Syndrome | 3.85 (1.03) | Low | 3.38 (1.19) | Low |
| Vascular Injury and Bleeding | 4.08 (0.62) | Medium | 4.08 (0.76) | Medium |
| Post-procedure Infection | 3.54 (0.93) | Low | 3.23 (0.93) | Low |
| Anesthetic Allergy | 4.15 (0.86) | Low | 4.31 (0.63) | High |
| Phrenic Nerve Paralysis | 4.15 (0.86) | Medium | 4.08 (0.76) | High |
| Limb Injury | 4.00 (0.68) | Low | 3.67 (1.07) | Low |
| Signs of LAST | 4.85 (0.36) | High | 5.00 (0.00) | High |
| Monitoring for LAST | 4.77 (0.42) | High | 4.92 (0.28) | High |
| Management of LAST | 4.69 (0.61) | High | 5.00 (0.00) | High |
| Indications for Intralipid | 4.62 (0.62) | High | 4.92 (0.28) | High |
| Dosing of Intralipid | 4.46 (0.84) | High | 4.62 (0.65) | High |
| d. Indications for UGRA | | | | |
| Fracture and Dislocation Reduction | 4.62 (0.62) | High | 4.85 (0.38) | High |
| Laceration repair | 4.38 (0.62) | High | 4.54 (0.66) | High |
| Facilitation of procedures | 4.38 (0.62) | High | 4.46 (0.66) | High |
| Pain Control | 4.85 (0.36) | High | 4.85 (0.38) | High |
| e. Contraindications to UGRA | | | | |
| Neurovascular Compromise | 4.69 (0.61) | High | 4.69 (0.63) | High |
| Risk of Compartment Syndrome | 4.23 (0.70) | Medium | 4.23 (0.93) | High |
| Allergy to Anesthetic | 4.62 (0.49) | High | 4.46 (0.66) | High |
| Delay of other Interventions | 3.54 (0.93) | Low | 3.00 (1.08) | Low |

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| Patient Unable to Consent | 3.69 (0.99) | Low | 3.92 (0.95) | Low |
| Presence of Soft Tissue Infection | 3.92 (0.73) | Low | 4.08 (0.64) | High |
| Bleeding Issue/Anticoagulation | 3.54 (0.75) | Low | 3.46 (0.88) | Low |
| Preexisting Neuropathy | 3.62 (0.92) | Low | 3.46 (0.97) | Low |
| <u>f. Ultrasound Knowledge and Skills</u> | | | | |
| Physics Principles | 3.69 (0.91) | Low | 3.38 (0.87) | Low |
| Probe Selection | 4.42 (0.76) | Low | 4.46 (0.66) | High |
| Probe Size | 3.69 (0.72) | Low | 3.08 (0.86) | Low |
| Depth | 4.31 (0.82) | Low | 4.46 (0.52) | High |
| Gain | 4.31 (0.82) | Low | 4.46 (0.52) | High |
| Frequency | 3.92 (0.83) | Low | 3.77 (0.93) | Low |
| Beam Width | 3.46 (0.93) | Low | 2.85 (0.69) | Low |
| Resolution | 3.77 (1.19) | Low | 3.08 (0.86) | Low |
| Focus Position | 3.54 (1.08) | Low | 3.23 (0.83) | Low |
| Time Gain Compensation | 3.31 (1.07) | Low | 3.15 (0.99) | Low |
| Appearance: Nerve | 4.92 (0.27) | High | 4.85 (0.38) | High |
| Appearance: Muscle | 4.54 (0.63) | High | 4.77 (0.44) | High |
| Appearance: Adipose | 4.15 (0.86) | Low | 4.31 (0.63) | High |
| Appearance: Vessel | 4.69 (0.46) | High | 4.77 (0.44) | High |
| Appearance: Fascia | 4.85 (0.36) | High | 4.92 (0.28) | High |
| Anisotropy | 4.15 (0.86) | Low | 4.31 (0.75) | High |
| Reverberation Artifact | 4.15 (0.77) | Low | 4.15 (0.69) | High |
| Bayonet Artifact | 3.00 (1.18) | Low | 2.54 (0.66) | Low |
| Posterior Acoustic Enhancement | 3.31 (0.99) | Low | 2.92 (0.76) | Low |
| Doppler | 2.85 (0.86) | Low | 2.46 (1.05) | Low |
| Probe Movements | 4.15 (1.03) | Low | 4.23 (0.73) | High |
| In-plane/Out-of-plane Techniques | 4.69 (0.61) | High | 4.92 (0.28) | High |
| Hydrodissection Technique | 4.77 (0.42) | High | 4.92 (0.28) | High |
| <u>g. Equipment and Materials</u> | | | | |
| Ultrasound Machine | 4.38 (0.74) | Medium | 4.23 (0.73) | High |
| Probe Types | 4.46 (0.75) | Medium | 4.54 (0.52) | High |
| Needle Types | 4.31 (0.61) | High | 4.46 (0.66) | High |
| Sterile Tubing | 3.85 (0.86) | Low | 3.23 (1.09) | Low |
| Syringe Types | 3.85 (0.95) | Low | 3.23 (1.01) | Low |
| Monitoring Equipment | 4.23 (0.89) | Medium | 4.31 (0.48) | High |
| Perineural Catheters | 3.23 (1.05) | Low | 2.15 (0.69) | Low |
| Nerve Stimulators | 2.31 (1.14) | Low | 1.69 (0.48) | Low |
| <u>h. Local anesthetics</u> | | | | |
| Weight Based Dosing | 4.69 (0.46) | High | 4.85 (0.38) | High |
| Maximum Allowable Dose | 4.77 (0.58) | High | 4.85 (0.38) | High |

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| Pediatric Dosing | 4.69 (0.46) | High | 4.69 (0.63) | High |
| Properties of Ropivacaine | 4.38 (0.74) | Medium | 4.54 (0.52) | High |
| Properties of Bupivacaine | 4.62 (0.62) | High | 4.62 (0.51) | High |
| Properties of Lidocaine | 4.54 (0.63) | High | 4.62 (0.51) | High |
| Properties of Mepivacaine | 3.38 (0.92) | Low | 2.69 (0.95) | Low |
| Properties of Chlorprocaine | 3.23 (0.80) | Low | 2.62 (0.96) | Low |
| Properties of Procaine | 3.15 (0.86) | Low | 2.62 (0.96) | Low |
| Properties of Etidocaine | 3.15 (0.86) | Low | 2.62 (0.96) | Low |
| Use of Epinephrine | 4.38 (0.74) | Medium | 4.08 (1.26) | High |
| Use of Sodium Bicarbonate | 3.69 (1.26) | Low | 2.92 (1.19) | Low |
| <u>i. Procedural knowledge</u> | | | | |
| Anatomy Identification | 4.85 (0.36) | High | 5.00 (0.00) | High |
| Optimal Patient Positioning | 4.69 (0.61) | High | 4.85 (0.38) | High |
| Marking the Site | 3.46 (1.01) | Low | 3.08 (1.12) | Low |
| Obtaining Informed Consent | 4.23 (0.70) | Medium | 4.38 (0.65) | High |
| Discussion with Consultants | 4.23 (0.58) | High | 4.38 (0.77) | High |
| Documenting Exam Before Procedure | 4.62 (0.62) | High | 4.62 (0.51) | High |
| Placing Patient on Monitor | 4.38 (0.62) | High | 4.46 (0.52) | High |
| Performing a Time Out | 4.15 (0.77) | Low | 3.85 (1.07) | Medium |
| Needle Trajectory | 4.77 (0.58) | High | 4.77 (0.44) | High |
| Risk and Severity of Possible Complications | 4.62 (0.62) | High | 4.77 (0.44) | High |
| Management of Possible Complications | 4.77 (0.58) | High | 4.85 (0.38) | High |
| Injection Pressure Monitoring | 3.08 (1.27) | Low | 2.69 (1.03) | Low |
| Two-person Technique | 3.54 (1.08) | Low | 3.54 (0.97) | Low |
| Perineural catheter Placement | 2.46 (1.15) | Low | 2.00 (0.71) | Low |
| Nerve Stimulation Technique | 1.92 (1.14) | Low | 1.42 (0.51) | Low |
| Documenting Repeat Examination | 4.31 (0.72) | Medium | 4.31 (0.75) | High |
| Documentation Requirements | 4.23 (0.58) | High | 4.31 (0.63) | High |
| Billing for UGRA Procedures | 3.92 (0.73) | Low | 3.85 (0.80) | Medium |
| <u>j. Sterile technique</u> | | | | |
| Skin Sterilization | 4.46 (1.08) | Medium | 4.54 (0.66) | High |
| Use of Sterile Gloves | 4.15 (1.10) | Low | 4.31 (0.75) | High |
| Use of Sterile Field | 3.85 (1.17) | Low | 3.92 (1.12) | Medium |
| Use of Probe Cover | 4.31 (0.72) | Medium | 4.46 (0.78) | High |
| <u>k. Educational resources</u> | | | | |
| Organizational Guidelines | 4.08 (0.73) | Low | 4.31 (0.63) | High |
| Landmark Studies | 4.08 (0.62) | Medium | 3.92 (0.49) | High |
| Textbooks | 3.62 (0.49) | Low | 3.23 (0.93) | Low |
| FOAMEd Resources | 3.69 (0.46) | Low | 3.77 (0.83) | Low |
| Use of Phantoms | 3.69 (0.82) | Low | 4.00 (0.58) | High |
| <u>l. Institutional factors</u> | | | | |

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| Interdepartmental Politics | 4.08 (0.73) | Low | 3.85 (0.80) | Medium |
| Delineation of Privileges | 4.08 (0.73) | Low | 3.69 (0.75) | Low |
| Provider Group Comfort | 3.46 (0.93) | Low | 3.69 (0.95) | Medium |
| II. Ultrasound Guided Regional Anesthesia Techniques | | | | |
| <u>a. Head and Neck</u> | | | | |
| Supraorbital Nerve | 2.67 (1.18) | Low | 1.92 (0.64) | Low |
| Infraorbital Nerve | 2.92 (1.19) | Low | 1.92 (0.64) | Low |
| Mental Nerve | 2.50 (1.04) | Low | 1.85 (0.55) | Low |
| Maxillary Nerve | 2.42 (0.86) | Low | 1.85 (0.55) | Low |
| Greater Occipital Nerve | 2.58 (1.26) | Low | 1.92 (0.64) | Low |
| Lesser Occipital Nerve | 2.42 (1.19) | Low | 2.08 (0.86) | Low |
| Greater Auricular Nerve | 2.58 (1.19) | Low | 2.08 (0.86) | Low |
| Superior Laryngeal Nerve | 2.08 (1.11) | Low | 1.62 (0.65) | Low |
| Translaryngeal | 1.92 (0.76) | Low | 1.54 (0.66) | Low |
| Superficial Cervical Plexus | 3.92 (1.04) | Low | 3.77 (1.17) | Medium |
| Stellate Ganglion | 2.17 (0.80) | Low | 1.63 (0.63) | Low |
| Deep Cervical Plexus | 2.17 (0.99) | Low | 1.67 (0.65) | Low |
| <u>b. Upper Extremity</u> | | | | |
| Interscalene Brachial Plexus | 4.67 (0.47) | High | 4.62 (0.65) | High |
| Supraclavicular Brachial Plexus | 4.50 (0.65) | Medium | 4.62 (0.65) | High |
| Superior Trunk of the Brachial Plexus | 3.17 (1.21) | Low | 2.38 (0.87) | Low |
| Infraclavicular Brachial Plexus | 3.17 (1.28) | Low | 2.54 (1.13) | Low |
| RAPTIR Brachial Plexus | 3.58 (1.19) | Low | 2.77 (1.09) | Low |
| Suprascapular Brachial Plexus | 2.83 (1.40) | Low | 2.08 (0.64) | Low |
| Axillary Brachial Plexus | 3.25 (1.36) | Low | 2.69 (0.85) | Low |
| Axillary (Deltoid) Nerve | 3.00 (1.00) | Low | 2.54 (0.66) | Low |
| Musculocutaneous Nerve | 2.92 (1.38) | Low | 2.38 (0.87) | Low |
| Radial Nerve (elbow) | 4.00 (.108) | Low | 3.77 (0.93) | Low |
| Median Nerve (elbow) | 3.67 (1.11) | Low | 3.69 (0.85) | Low |
| Ulnar Nerve (elbow) | 3.67 (1.11) | Low | 3.69 (0.85) | Low |
| Radial Nerve (forearm) | 4.50 (0.76) | Low | 4.54 (0.66) | High |
| Median Nerve (forearm) | 4.67 (0.62) | Medium | 4.54 (0.66) | High |
| Ulnar Nerve (forearm) | 4.58 (0.76) | Low | 4.54 (0.66) | High |
| Digital Block | 2.83 (1.52) | Low | 1.85 (0.69) | Low |
| Transthecal Digital Nerve | 2.67 (1.60) | Low | 1.85 (0.69) | Low |
| <u>c. Thoracic, Lumbar, and Abdominal</u> | | | | |
| PECS I Plane | 2.50 (1.04) | Low | 1.92 (0.64) | Low |
| PECS II Plane | 2.58 (1.04) | Low | 1.92 (0.64) | Low |
| Serratus Anterior Plane | 4.69 (0.46) | High | 4.85 (0.38) | High |
| Intercostal Nerve | 3.75 (1.30) | Low | 3.00 (1.47) | Low |

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| Erector Spinae Plane | 3.54 (1.28) | Low | 3.31 (1.11) | Low |
| Parasternal | 2.46 (1.15) | Low | 1.77 (0.73) | Low |
| Tranversus Thoracis Plane | 2.00 (0.91) | Low | 1.92 (0.76) | Low |
| Thoracic Paravertebral | 2.33 (1.18) | Low | 1.85 (0.55) | Low |
| Lumbar Paravertebral | 2.25 (1.09) | Low | 1.69 (0.48) | Low |
| Subcostal Tranversus Abdominis Plane | 2.92 (0.86) | Low | 2.46 (0.88) | Low |
| Lateral Tranversus Abdominis Plane | 3.23 (0.70) | Low | 2.62 (0.96) | Low |
| Anterior Tranversus Abdominis Plane | 3.23 (0.97) | Low | 2.85 (1.14) | Low |
| Posterior Tranversus Abdominis Plane | 3.00 (0.88) | Low | 2.85 (1.14) | Low |
| Rectus Sheath Plane | 2.50 (0.87) | Low | 2.38 (1.04) | Low |
| Transmuscular Quadratus Lumborum (QL) | 2.33 (0.85) | Low | 1.77 (0.60) | Low |
| Type I QL | 2.08 (0.76) | Low | 1.69 (0.48) | Low |
| Type II QL | 2.08 (0.76) | Low | 1.69 (0.48) | Low |
| Ilioinguinal nerve | 2.33 (1.18) | Low | 1.69 (0.48) | Low |
| Iliohypogastric nerve | 2.17 (1.07) | Low | 1.62 (0.51) | Low |
| Spermatic Cord | 2.15 (1.03) | Low | 1.62 (0.51) | Low |
| Dorsal Penile Nerve | 2.77 (1.31) | Low | 2.23 (0.83) | Low |
| <u>d. Lower Extremity</u> | | | | |
| Lateral Femoral Cutaneous Nerve | 3.31 (1.20) | Low | 2.77 (0.93) | Low |
| Fascia Iliaca Plane | 4.92 (0.27) | High | 4.85 (0.38) | High |
| Supra-inguinal Fascia Iliaca | 3.69 (1.32) | Low | 2.92 (1.19) | Low |
| Femoral Nerve | 4.92 (0.27) | High | 4.77 (0.44) | High |
| Obturator Nerve | 3.33 (1.11) | Low | 2.54 (0.78) | Low |
| Lumbar Plexus | 2.23 (1.19) | Low | 1.85 (0.69) | Low |
| Posterior Femoral Cutaneous Nerve | 2.50 (1.12) | Low | 1.85 (0.69) | Low |
| Saphenous Nerve (adductor) | 2.58 (1.38) | Low | 2.08 (0.76) | Low |
| Saphenous Nerve (thigh) | 2.83 (1.34) | Low | 2.08 (0.64) | Low |
| Saphenous Nerve (knee) | 2.75 (1.16) | Low | 2.31 (0.95) | Low |
| Saphenous Nerve (ankle) | 2.67 (1.18) | Low | 2.15 (0.69) | Low |
| Sciatic Nerve | 3.69 (1.20) | Low | 2.92 (1.26) | Low |
| Anterior Approach to the Sciatic Nerve | 2.58 (1.04) | Low | 2.31 (0.75) | Low |
| Popliteal Sciatic Nerve | 4.31 (0.91) | Medium | 4.38 (0.87) | High |
| Posterior Tibial Nerve | 4.69 (0.61) | High | 4.77 (0.44) | High |
| Deep Peroneal Nerve | 3.31 (1.32) | Low | 2.69 (1.25) | Low |
| Superficial Peroneal Nerve | 3.00 (1.41) | Low | 2.62 (1.04) | Low |
| Sural Nerve | 2.83 (1.14) | Low | 2.38 (1.04) | Low |

UGRA – Ultrasound-Guided Regional Anesthesia

LAST – Local Anesthetic Systemic Toxicity

FOAMEd – Free and Open Access Medical Education

RAPTIR – Retroclavicular Approach to the Infraclavicular Region

PECS - Pectoralis nerve