

Regional Anaesthesia Curriculum Resources

This document contains a series of resources designed to assist trainees in attaining the Key Capabilities required to meet each Stage Learning Outcome of the new 2021 Royal College of Anaesthetists' curriculum.

The material provided below has been curated by Regional Anaesthesia UK with input also from the Obstetric Anaesthetists' Association (OAA) and the British Ophthalmic Anaesthesia Society (BOAS). Suggested content for each Key Capability of each Stage Learning Outcome is provided, along with supplementary reading for those interested. Free online resources can vary in quality, and what is included below has been reviewed and recommended by national experts who believe this reflects contemporary, best practice. Whilst not an exhaustive list, we hope the content herein will facilitate achievement of the High Level Outcome which ultimately is to provide safe and effective regional anaesthesia. The document has been generated with approval from the Royal College of Anaesthetists (RCoA) but the content is not formally endorsed as such.

Types of resource

"Knowledge based" Key Learning Capabilities

- Contemporary publications
- Relevant national standards or guidelines from the RCoA, Association of Anaesthetists (AA) or other bodies.
- Links to RA-UK approved documents and other international society guidance
- Links to appropriate e-LA modules and other e-learning (practice has evolved since some e-learning modules were designed; those not reflecting current practice are marked with an asterisk - we are aware the modules are being updated)
- RA-UK handbook
- Online RA resources
- Links to any relevant previous RA-UK ASM lectures and webinars or RCoA/AA webinars on the topic
- Links to educational material developed by the [OAA](#) and [BOAS](#)
- Link to Raising the Standards: RCoA Quality Improvement Compendium

"Procedural" Key Learning Capabilities

For procedural Key Learning Capabilities, background reading material is provided to help understand anatomy, sonoanatomy and the principles of each block. Basic transferable knowledge and skills required to safely and effectively perform any ultrasound guided nerve block are included in Stage 1E.

- Anatomy and sonoanatomy resources
- Video tutorials
- E-learning modules
- Links to regional anaesthesia courses can be found at www.ra-uk.org

Index

Stage 1	Page
A. Risks and benefits of regional anaesthesia	4
B. Indications and contraindications to regional anaesthetic techniques	6
C. Practice measures to avoid wrong-site blocks	8
D. Performs spinal anaesthesia for ASA 1-3 patients independently	9
E. Performs simple peripheral nerve blocks with ultrasound	10
F. Performs ultrasound guided femoral or fascia iliaca independently	12
G. Obstetric anaesthesia: complications of regional anaesthesia including systemic local anaesthetic toxicity, high spinal and dural puncture headache	13
H. Obstetric anaesthesia: provides epidural or CSE analgesia for labour in ASA 1-3 obstetric patient and offers other forms of pain relief where neuraxial analgesia is contraindicated	15
I. Obstetric anaesthesia: provides neuraxial anaesthesia for operative delivery and other obstetric procedures in ASA 1-3 and manages inadequate block	17
J. Discusses scientific basis of ultrasound and generation of images	18
K. Discusses drugs and equipment used in regional anaesthesia	19

Stage 2

A. Performs ultrasound guided brachial plexus blocks	21
B. Performs ultrasound guided fascial plane blocks for chest and abdominal wall	23
C. Demonstrates how to achieve an optimal ultrasound image and recognises common ultrasound artefacts	24
D. Describes ophthalmic blocks for patients undergoing awake ophthalmic surgery	25
E. Involves the patient in planning and understanding potential complications of regional anaesthesia	26
F. Assesses when a regional technique not appropriate	28
G. Manages inadequate block in the awake patient and in recovery if used as an adjunct to general anaesthesia	30
H. Describes the longer term management of complications of regional anaesthesia	32
I. Discusses the use of regional anaesthesia in the presence of abnormalities of coagulation	33

Stage 3

A. Tailors regional anaesthesia techniques to patients undergoing day surgery	34
B. Manages regional anaesthesia and analgesia safely in the perioperative period in all settings	35
C. Performs US guided RA for the chest wall independently	37
D. Performs US guided RA for the abdomen independently	38
E. Performs US guided blocks for lower limb surgery independently	39

- F. Performs ultrasound brachial plexus blocks independently 40

Stage 3i 41

- A. Can independently practice safely a wide range of regional techniques for all upper limb and shoulder surgery under block alone, including the management of continuous nerve catheters for post-operative analgesia
- B. Can independently practice safely a wide range of regional techniques for lower limb surgery, including the management of continuous nerve catheters for post-operative analgesia
- C. Can independently practice safely a wide range of regional techniques for chest and abdominal wall surgery
- D. Ability to independently organise, lead and evaluate the effectiveness and efficiency of an operating list planned under regional anaesthesia alone
- E. Supervises and advises colleagues on the suitability and delivery of regional anaesthesia in complex cases
- F. Can evaluate the place of regional anaesthesia, and any developments, within the patient perioperative pathway and advise on potential changes in practice

Please note - embedded hyperlinks are provided where possible in each section

Version	2.0
Date	April 2024
Review date	September 2026
Society Author Leads	Alan Macfarlane (RA-UK) Nuala Lucas (OAA) Dr Santhana Kannan (BOAS)

Stage 1

Key capabilities

1A. Explains clearly to patients the risks and benefits of regional anaesthesia

(for obstetrics please see 1G, 1H and 1I)

Benefits

Publications	RA and outcomes. <i>BJA Ed</i> 2018; 18 : 52-56 Which patients benefit from RA? <i>Curr Op Anesth</i> 2016; 29 : 620-625
National guidance/standards	-
RA-UK/ESRA/ASRA guidance	-
e-learning	eLA modules 05b_03_01 Spinals and epidurals: indications and contraindications 05b_04_02 Indications and contraindications for/to peripheral nerve blocks
RA-UK Handbook	-
Online resources	-
Webinars	-
RCoA QI Compendium	1.1 Patient information for anaesthesia 1.4 Consent in anaesthesia 1.5 Shared decision making in perioperative care

Risks

Publications	RA: risk, consent and complications. <i>Anaesthesia</i> 2021; 76 S1: 18-26 Complications of regional anaesthesia. <i>Anaesth Int Care</i> 2019; 20 : 210-214 Nerve injury after PNB – current understanding and guidelines <i>BJA Ed</i> 2018; 18 : 384-390
National guidance/standards	AA guideline. Regional Anaesthesia for lower leg trauma and the risk of acute compartment syndrome (2021) AA guideline. Regional anaesthesia and patients with abnormalities of coagulation (<i>Note this is in the process of being updated</i>)
RA-UK/ESRA/ASRA/OAA guidance	RA-UK Peripheral nerve block follow-up Practice Advisory for the Prevention, Diagnosis, and Management of Infectious Complications Associated with Neuraxial Techniques: An Updated Report by the American Society of Anesthesiologists Task Force on Infectious Complications Associated with Neuraxial Techniques and the American Society of Regional Anesthesia and Pain Medicine. <i>Anesthesiology</i> 2017; 126 : 585–601 Regional Anaesthesia in patients on antithrombotic drugs. Joint ESAIC/ESRA guidelines. <i>Eur J Anaesthesiol</i> ; 2022; 39 : 100-132 Evidenced based clinical practice guidelines on postdural puncture headache: a consensus report from a multisociety group. <i>Reg Anes Pain Med</i> 2023; 0 : 1-31
e-learning	eLA modules 05b_03_04 Complications of spinals and epidurals

	05b_04_06 Complications of peripheral nerve blocks*
RA-UK Handbook	-
Online resources	RCoA Anaesthesia risk leaflets RA Risks infographic
Webinars	RAUK Webinars (free) <i>Mon 19th June 2023 Consent for RA</i> <i>6th February 2024 Anticoagulants and RA</i> <i>6th February 2024 Complications of RA in obstetrics (See later also)</i> <i>5th March 2024 Nerve injury</i> <i>2nd April 2024 LAST</i>
RCoA QI Compendium	-

Supplementary reading/online material

Defining success in RA. *Anaesthesia* 2021; **76**: S1 40-52

Updates in our understanding of LA toxicity: a narrative review. *Anaesthesia* 2021; **76**: 27-39

The second ASRA practice advisory on neurologic complications associated with RA and pain medicine *Reg Anes Pain Med* 2015; **40**: 401-430

Neurological injury following peripheral nerve blocks: a narrative review of estimates of risks and the influence of ultrasound guidance. *Reg Anes Pain Med* 2023; **49**:122-132

Relevant [Cochrane reviews](#) from Cochrane RA collection

- RA versus conventional analgesic techniques
- Neuraxial blockade for the prevention of postoperative mortality and major morbidity and mortality
- Multiple Cochrane reviews examining RA in orthopaedics (hip fracture, TKA, THA, shoulder surgery), vascular surgery and cardiac surgery.

The [PROSPECT guidance](#) contains useful recommendations about analgesia (including regional techniques) for specific procedures.

Online videos – Neuraxial Blockade Modern Anaesthetic Practice (Parts 1, 2, 3)

Nerve injury in regional anaesthesia. *Anaesthesia* tutorial of the week (TOTW) 422

The second ASRA evidence-based medicine assessment of ultrasound guided RA *Reg Anes Pain Med* 2016; **41**: 181-94

The role of regional anaesthesia and multimodal analgesia in the prevention of chronic postoperative pain: a narrative review. *Anaesthesia*. 2021;**76** Suppl 1: 8-17

* Good module. Evidence now suggests LA toxicity and intravascular injection is reduced by ultrasound.

1B. Explains clearly to patients the Indications and contraindications to regional anaesthesia

(for obstetrics please see 1G, 1H and 1I)

Indications

Publications	Regional anaesthesia and outcomes. <i>BJA Ed</i> 2018; 18: 52-56 Best practices for safety and quality in peripheral regional anaesthesia. <i>BJA Ed</i> 2020; 20: 341-347 Regional anaesthesia for trauma: an update. <i>BJA Ed</i> 2013; 14: 136-141 General principles of regional anaesthesia in children. <i>BJA Ed</i> 2019; 19: 342-348 Which patients benefit from RA? <i>Curr Op Anesth</i> 2016; 29: 620-625
National guidance/standards	AA guideline. Anaesthesia for day-case surgery 2019 AA guideline. Management of hip fractures 2020 GMC Decision making and consent 2020
RAUK/ESRA/ASRA guidance	Consent for Peripheral Nerve Blocks
e-learning	eLA modules • 05b_03_01 Spinals and Epidurals: Indications and Contraindications* • 05b_04_02 Indications and Contraindications for/to Peripheral Nerve Blocks (PNBs)* • 05b_05_03 Practical Regional Anaesthesia 1: Which Blocks for which Operations?*
RA-UK Handbook	-
Online resources	RCOA leaflet: Your spinal anaesthetic RCOA leaflet: Anaesthetic choices for hip or knee replacement RCOA leaflet: Epidural pain relief after surgery RCOA leaflet: Nerve blocks for surgery on the shoulder, arm or hand PROSPECT- evidence based guidelines for post operative pain management
Webinars	RAUK Webinars (free) <i>Mon 19th June 2023 Consent for RA</i>
RCOA QI Compendium	1.5 Shared decision making in perioperative care 1.13 Enhanced recovery after surgery 1.14 Individualised perioperative pain management

Contraindications

Publications	Regional anaesthesia in patients at risk of bleeding. <i>BJA Ed</i> 2021; 21 : 84-94
National guidance/standards	AA guideline. Regional anaesthesia and patients with abnormalities of coagulation (<i>Note this is in the process of being updated</i>) AA guideline. Regional Anaesthesia for lower leg trauma and the risk of acute compartment syndrome (2021)

RA-UK/ESRA/ASRA guidance	Regional anesthesia in the patient receiving antithrombotic or thrombolytic therapy. <i>Reg Anes Pain Med</i> 2018; 43: 263–309 Practice Advisory for the Prevention, Diagnosis, and Management of Infectious Complications Associated with Neuraxial Techniques: An Updated Report by the American Society of Anesthesiologists Task Force on Infectious Complications Associated with Neuraxial Techniques and the American Society of Regional Anesthesia and Pain Medicine. <i>Anesthesiology</i> 2017; 126: 585–601 Regional Anaesthesia in patients on antithrombotic drugs. Joint ESAIC/ESRA guidelines. <i>Eur J Anaesthesiol</i>; 2022; 39: 100-132
e-learning	eLA module 5b • 05b_03_01 Spinals and Epidurals: Indications and Contraindications* • 05b_04_02 Indications and Contraindications for/to Peripheral Nerve Blocks (PNBs)*
RA-UK Handbook	-
Online resources	RCoA leaflets as before
Webinars	RAUK Webinars (free) <i>Mon 19th June 2023 Consent for RA</i> <i>6th February 2024 Anticoagulants and RA</i> RAUK Webinar Confronting the dark side of regional anaesthesia 2021
RCoA QI Compendium	1.5 Shared decision making in perioperative care 1.13 Enhanced recovery after surgery 1.14 Individualised perioperative pain management

Supplementary reading/online material

Future directions in regional anaesthesia: not just for the cognoscenti. *Anaesthesia* 2020; **75**: 293-7

Online videos – Neuraxial Blockade Modern Anaesthetic Practice (Parts 1, 2, 3)

ANZCA Acute Pain Management: Scientific Evidence 5th Edition 2020 *Chapter 5.8*

AA guideline. Consent for anaesthesia 2017

The incidence of potentially serious complications [during](#) non-obstetric anaesthetic practice in the United Kingdom: an analysis from the 7th National Audit Project (NAP7) activity survey. *Anaesthesia* 2024; **79**: 43–53

IgE-mediated allergy to local anaesthetics: separating fact from perception: a UK perspective. *Br J Anaesth* 2012; **108**: 903-911

Resistance to local anaesthetics: a literature review *Br J Anaesth* 2022; **129**: E43-45

* Some of the CNB and PNB ‘indication’ evidence a little dated now (see Stage 1A) but still good modules.

*¹ Still a useful module but some newer trunk blocks not mentioned obviously and also newer, more motor sparing block alternatives for knees and hips not mentioned.

1C. Practice measures to avoid wrong-site blocks

Publications	Prep, stop, block': refreshing 'stop before you block' with new national guidance. <i>Anaesthesia</i> 2022; 77 : 372-375
National guidance/standards	Prep Stop Block
RA-UK/ESRA/ASRA guidance	Prep Stop Block
e-learning	-
RA-UK Handbook	-
Online resources	YouTube Prep Stop Block demonstration video
Webinars	RAUK Webinars (free) 5 th March 2024 Prep Stop Block
RCoA QI Compendium	2.2. Conduct of Regional Anaesthesia

Supplementary reading/online material

[HSIB investigation report](#) into wrong side block: analysis and recommendations

Further reducing the risk of wrong site block. *Anaesthesia* 2015; **70**: 1453

Wrong-site regional anaesthesia: review and recommendations for prevention? *Curr Op Anaesth* 2015; **28**: 670–84

NB. Mock before you block has not gained widespread acceptance, however the following papers contain excellent discussion around the risks and prevention of wrong sided block and are co-authored by Professor JJ Pandit Chair of the Safe Anaesthesia Liaison Group.

“Mock before you block”: an in-built action-check to prevent wrong-side anaesthetic nerve blocks. *Anaesthesia* 2017; **72**: 150-5

Mock before you block. *Anaesthesia* 2017; **72**: 661-2

Exploring performance of, and attitudes to, Stop- and Mock-Before-You-Block in preventing wrong-side blocks. *Anaesthesia* 2018; **73**: 421–7

1D. Performs spinal anaesthesia for SA 1-3 surgical patients independently

Publications	Intrathecal drug spread. <i>BJA</i> 2004; 93 : 568-578 Failed spinal anaesthesia; mechanisms, management and prevention <i>BJA</i> 2009; 102 : 739-748
National guidance/standards	AA Safety guideline: skin antisepsis for central neuraxial blockade AA Recommendations for standards of monitoring during anaesthesia and recovery AA Regional anaesthesia and patients with abnormalities of coagulation (for further detail see Stage 2, Key Learning Capability I)
RA-UK/ESRA/ASRA guidance	-
e-learning	eLA modules • 05b_03_01 Spinals and epidurals indications and contraindications* • 05b_03_03 Performing spinal and epidural injections • 07e_11_01 Spinal needles • Neuraxial blockade
RA-UK Handbook	-
Online resources	Virtual spine – virtual lumbar spine anatomy (includes US also) Fundamentals of technical performance of spinal anaesthesia
Webinars	For day case spinals webinar see Stage 3 Also RAUK Webinars (free) <i>6th February 2024 Ambulatory spinals</i>
RCOA QI Compendium	-

Supplementary reading/online material

Spinal anaesthesia for ambulatory surgery. *BJA Ed* 2019; **19**: 321-328 (Stage 3)

Poots C, Chin KJ. Strategies for successful lumbar neuraxial anaesthesia and analgesia in patients with challenging anatomy. *BJA Educ* 2024; **24**: 46-56

ASRA guidance anticoagulation *Reg Anes Pain Med* 2018; **43**:263-309

NYSORA neuraxial techniques

Neuraxial US is a more advanced technique and not required for Stage 1. For further information see:

- USG Lumbar spinal anaesthesia. *BJA Ed* 2016; **16**: 213-220
- Ultrasound Imaging of the Spine for Central Neuraxial Blockade: a Technical Description and Evidence Update. *Curr Anesthesiol Rep* 2021; **11**: 326–339
- OAA learning zone
- Multiple neuraxial US videos by Ki Jinn Chin

* Some of the CNB ‘indication’ evidence a little dated now (see Stage 1A) but still good modules.

1E. Performs simple peripheral nerve blocks with ultrasound

Publications	Ultrasound-guided brachial plexus blocks <i>CEACCP</i> 2014; 14: 185-191 Ultrasound-guided peripheral nerve blocks of the upper limb <i>BJA Ed</i> 2015; 15: 160-165 Regional anaesthesia for shoulder surgery. <i>BJA Ed</i> 2019; 19: 98-104 Clinical anatomy of the nerve supply to the upper limb. <i>BJA Ed</i> 2021; 21: 462-471 Ultrasound-guided femoral and sciatic nerve blocks. <i>CEACCP</i> 2013; 13: 136-40 The sciatic nerve block <i>BJA Ed</i> 2020; 20: 312-20 Regional anaesthesia for foot and ankle surgery. <i>BJA Ed</i> 2022; 22:424-431 Challenges solutions and advances in ultrasound guided RA. <i>BJA Ed</i> 2016; 16: 374-380 Best practices for safety and quality in peripheral regional anaesthesia. <i>BJA Ed</i> 2020; 20: 341-347
National guidance/standards	Association of Anaesthetists. Recommendations for standards of monitoring during anaesthesia and recovery, 2021. Ergonomics in the workplace. <i>Anaesthesia</i> 2021 doi:10.1111/anae.15530 (section on regional anaesthesia)
RA-UK/ESRA/ASRA guidance	RA-UK guidelines on supervision of patients during peripheral regional anaesthesia
e-learning	eLA modules • 10_01_01 - Ultrasound for regional anaesthesia • 10_04_01 - Introduction to the brachial plexus • 10_04_02 - Interscalene block • 10_04_03 - Supraclavicular block • 10_04_04 - Infraclavicular block • 10_04_05 - Axillary block • 10_04_06 - Peripheral nerve blocks of the forearm
RA-UK Handbook	Chapters 3,4,5 & 6
Online resources	Plan A block videos AoA Education Shots Plan A blocks video Dr Ki-Jinn Chin YouTube channel: Core Regional Anaesthesia Techniques Regional Anesthesiology and Acute Pain Medicine YouTube channel
Webinars	RA-UK / RCoA Plan-A Block Webinar RA-UK Webinar Series (<i>each webinar is one of the seven plan A blocks</i>)
RCoA QI Compendium	-

Supplementary reading/online material

Future directions in regional anaesthesia: not just for the cognoscenti. *Anaesthesia* 2020; **75** :293-7

Lower limb regional anaesthesia - essentials of our current understanding *Reg Anes Pain Med* 2019; **44**: 143-180

Essentials of our current understanding: Abdominal wall blocks *Reg Anes Pain Med* 2017; **42**: 133-183

Upper extremity regional anesthesia: essentials of our current understanding 2008 *Reg Anes Pain Med* 2009; **34**: 134-170

<http://www.nysora.com/>

www.usra.ca

Anaesthesia TOTW. 400 (interscalene); 401 (popliteal); 326 (axillary); adductor canal (301); femoral (284)

International consensus on anatomical structures to identify on ultrasound for the performance of basic blocks in UGRA. *Reg Anes Pain Med* 2022; 47: 106-112

1F. Performs ultrasound guided femoral or fascia iliaca blocks independently

Publications	Fascia Iliaca compartment block. <i>BJA Ed 2019; 19: 191-7</i> Ultrasound-guided femoral and sciatic nerve blocks. <i>CEACCP 2013; 13: 136–40</i>
National guidance/standards	AA Recommendations for standards of monitoring during anaesthesia and recovery AA Regional anaesthesia and patients with abnormalities of coagulation (for further detail see Stage 2, Key Learning Capability I) RCEM Monitoring after a Fascia Iliaca Block
RA-UK/ESRA/ASRA guidance	Fascia iliaca blocks and non-physician practitioners
e-learning	eLA modules 05b_04_09 Sample Lower Limb Block: Femoral Nerve Block* 05b_04_05 Performing Safe Peripheral Nerve Blocks*¹
RA-UK Handbook	Femoral Nerve Block
Online resources	NYSORA: Ultrasound-guided fascia iliaca nerve Block NYSORA: Ultrasound-guided femoral nerve blocks Ki-Jinn Chin: Ultrasound-guided femoral nerve block Duke Regional Anesthesiology and Acute Pain Medicine: Femoral nerve block
Webinars	RAUK Webinars (free) <i>7th November 2023 Femoral Nerve block</i>
RCoA QI Compendium	4.5 Anaesthesia for patients with fractured neck of femur

Supplementary reading/online material

Systematic review of the effects of fascia iliaca compartment block on hip fracture patients before operation. *BJA* 2018; **120**: 1368-80

Peripheral nerve blocks for hip fractures in adults. Cochrane Database Systematic Reviews 2020 Issue 11. Art. No.: CD001159. DOI: 10.1002/14651858.CD001159.pub3. Accessed April 2024.

Anaesthesia TOTW. Femoral (284); Fascia iliaca (193)

* Femoral nerve block module describes landmark and nerve stimulation technique only.

*¹ Module useful but does not contain some of the more contemporary evidence

1G. Obstetric anaesthesia: Identifies and initiates initial management of complications of regional anaesthesia including systemic local anaesthetic toxicity, high spinal and dural puncture headache



Publications	The <u>OAA learning zone</u> is regularly updated and includes relevant publications on each topic
National guidance/standards	• AA Guideline – Severe local anaesthetic toxicity • AA Guideline – High central neuraxial block • AA / OAA / RAUK Guideline: skin antisepsis for central neuraxial blockade • AA/ RAUK Guideline: Regional Anaesthesia and Patients with Abnormalities of Coagulation. • OAA / MBRRACE / Resuscitation Council UK Guideline. Obstetric Cardiac Arrest. • Prevention and management of intra-operative pain during caesarean section under neuraxial anaesthesia: a technical and interpersonal approach • Safety guideline: neurological monitoring associated with obstetric neuraxial block 2020 • Guidelines for the provision of anaesthetic services (GPAS) for an obstetric population. Organisation and administration • Treatment of obstetric post-dural puncture headache. Part 1: conservative and pharmacological management • Treatment of obstetric post-dural puncture headache. Part 2: epidural blood patch • Royal College of Obstetricians & Gynaecologists (RCOG) Green-top Guideline No. 56. Maternal Collapse in Pregnancy and the Puerperium • National Institute for Healthcare and Excellence. Caesarean Birth. Clinical Guideline NG192. London: NICE; 2021. • OAA / AA Guidelines for Obstetric Anaesthetic Services, 2013.
• RA-UK/ESRA/ASRA guidance	• Consensus practice guidelines on postdural puncture headache from a multi-society, International working group: a summary Report • International consensus statement on the management of hypotension with vasopressors during caesarean section under spinal anaesthesia • The Society for Obstetric Anesthesia and Perinatology Consensus Statement on the Management of Cardiac Arrest in Pregnancy • The Society for Obstetric Anesthesia and Perinatology Interdisciplinary Consensus Statement on Neuraxial Procedures in Obstetric Patients With Thrombocytopenia • Practice guidelines for obstetric anesthesia: an updated report by the American Society of Anesthesiologists task force on obstetric anesthesia and the Society for Obstetric Anesthesia and Perinatology

	• The third ASRA practice advisory on local anesthetic systemic toxicity. <i>Reg Anesth Pain Med</i> 2018; 43: 113-23 • ASRA local anesthetic toxicity checklist • Practice Advisory for the Prevention, Diagnosis, and Management of Infectious Complications Associated with Neuraxial Techniques: An Updated Report by the American Society of Anesthesiologists Task Force on Infectious Complications Associated with Neuraxial Techniques and the American Society of Regional Anesthesia and Pain Medicine. <i>Anesthesiology</i> 2017; 126: 585–601 • The second ASRA practice advisory on neurologic complications associated with RA and pain medicine. <i>Reg Anesth Pain Med</i> 2015; 40: 401-430
e-learning	eLA modules • 04a Obstetrics • 08 Obstetrics – Intermediate Level
RA-UK handbook	-
Online resources	In addition to <u>OAA Learning Zone</u> as above: • AA/OAA safety guideline summary poster. Neurological monitoring after spinal / epidural • OAA Labour Pains infographic. Risks of Regional Anaesthesia (Epidurals & Spinals) and General Anaesthesia Explained • OAA Labour Pains leaflet. Headache after an epidural or spinal injection? What you need to know
Webinars	See OAA Learning Zone Also RAUK Webinars (free) <i>6th February 2024 Complications of RA in obstetrics</i>
RCOA QI Compendium	7.10 Postnatal obstetric anaesthetic; adverse effects and complications

Supplementary reading/online material

There is a wealth of additional information on the OAA learning zone.

- Lucas, D.N., Kursumovic, E., Cook, T.M., Kane, A.D., Armstrong, R.A., Plaat, F. and Soar, J. (2024), Cardiac arrest in obstetric patients receiving anaesthetic care: results from the 7th National Audit Project of the Royal College of Anaesthetists. *Anaesthesia*. <https://doi.org/10.1111/anae.16204>
- NAP3: The 3rd National Audit Project of the Royal College of Anaesthetists. Major Complications of Central Neuraxial Block in the United Kingdom. London: RCoA; 2009
- MBRRACE-UK: Saving Lives, Improving Mothers' Care. Lessons learned to inform maternity care from the UK and Ireland confidential enquiries into maternal deaths and morbidity. 2019-2021.
- Madden AM, Meng ML. Cardiopulmonary resuscitation in the pregnant patient. *BJA Ed* 2020; **20**: 252-8
- Hyperthermia after epidural analgesia in obstetrics *BJA Ed* 2021; **21**: 26-31
- Anaesthesia TOTW. Complications post neuraxial anaesthesia in obstetric patients (395)

1H. Obstetric anaesthesia: Provides epidural or combined spinal-epidural analgesia for labour in the ASA 1-3 obstetric patient, and offers other forms of pain relief when neuraxial analgesia is contraindicated



Publications	The OAA learning zone is regularly updated and includes relevant publications on each topic
National guidance/standards	- National Institute for Health and Care Excellence. Intrapartum Care. Clinical Guideline NG235. London: NICE; 2023. - RCOG. Care of Women with Obesity in Pregnancy. Green-top Guideline No. 72 - AA/ RAUK Guideline: Regional Anaesthesia and Patients with Abnormalities of Coagulation. - AA / OAA Guideline. Neurological monitoring associated with obstetric neuraxial block 2020. - Guidelines for the provision of anaesthetic services (GPAS) for an obstetric population 2024. - OAA / AA Guidelines for Obstetric Anaesthetic Services, 2013.
RA-UK/ESRA/ASRA/OAA guidance	- The Society for Obstetric Anesthesia and Perinatology interdisciplinary consensus statement on neuraxial procedures in obstetric patients with thrombocytopenia - Practice guidelines for obstetric anesthesia: an updated report by the American Society of Anesthesiologists task force on obstetric anesthesia and the Society for Obstetric Anesthesia and Perinatology
e-learning	eLA modules 04a Obstetrics 08 Obstetrics – Intermediate Level
RA-UK Handbook	-
Online resources	- Labour pains. Pain relief and anaesthesia choices during labour. - Labourpains.org. Epidural advice and information. - OAA learning zone. Epidural analgesia in labour. - OAA learning zone. Remifentanyl.
Webinars	See OAA learning zone .
RCoA QI Compendium	7.1 Information for women about analgesia and anaesthesia during delivery 7.4 Regional analgesia during labour <i>Section 9.9 of the GPAS obstetric document is important, addressing patient communication and information, with a focus on translation and interpreting services.</i>

Supplementary reading / online material

There is a wealth of additional information on the OAA learning zone.

- NAP3: The 3rd National Audit Project of the Royal College of Anaesthetists. Major Complications of Central Neuraxial Block in the United Kingdom. London: RCoA; 2009
- Jones L, Othman M, Dowswell T, Alfirevic Z, Gates S, Newburn M, Jordan S, Lavender T, Neilson JP. Pain management for women in labour: an overview of systematic reviews. *Cochrane Database Syst Rev*. 2012 Mar 14;2012(3):CD009234. doi: 10.1002/14651858.CD009
- Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database Syst Rev* 2018; **5**:CD000331
- Simmons SW et al. *Combined spinal-epidural versus epidural analgesia in labour*. *Cochrane Database Syst Rev*. 2012 Oct 17;10(10):CD003401
- Anaesthesia TOTW. The Labour epidural: ambulatory neuraxial analgesia (446); The labour epidural – the basics (365); The labour epidural – troubleshooting (366)
- Shatil B, Smiley M. Neuraxial analgesia for labour. *BJA Ed* 2020; **20**: 96-102
- Halliday L, Nelson SM, Kearns RJ. Epidural analgesia in labor: A narrative review. *Int J Gynecol Obstet* 2022; **159**: 356–364
- Wilson MJA, MacArthur C, Hewitt CA, Handley K, Gao F, Beeson L, Daniels J; RESPITE Trial Collaborative Group. Intravenous remifentanyl patient-controlled analgesia versus intramuscular pethidine for pain relief in labour (RESPITE): an open-label, multicentre, randomised controlled trial. *Lancet*. 2018; **25**; 392(10148): 662-672.
- Van de Velde M, Carvalho B. Remifentanyl for labor analgesia: an evidence-based narrative review. *Int J Obstet Anesth*. 2016; **25**: 66-74.

Neuraxial US is a more advanced technique and is not required for Stage 1. For further information see:

- OAA Learning Zone
- Sadeghi A, Patel R, Carvalho JCA. Ultrasound-facilitated neuraxial anaesthesia in obstetrics. *BJA Ed* 2021; **21**: 369-375.
- Multiple neuraxial US videos by Ki Jinn Chin

1I Obstetric anaesthesia: provides neuraxial anaesthesia for operative delivery and other obstetric procedures in ASA 1-3 patients and manages the inadequate neuraxial block



Publications	The OAA learning zone is regularly updated and includes relevant publications on each topic
National guidance/standards	• National Institute of Health and Care Excellence. Caesarean section: Clinical guidelines [CG132], 2011 • Royal College of Obstetricians and Gynaecologists, Royal College of Anaesthetists. Classification of Urgency Of Caesarean Section: A Continuum Of Risk. Good Practice Guide 11. London: RCOG; 2010 • Prevention and management of intra-operative pain during caesarean section under neuraxial anaesthesia: a technical and interpersonal approach • AA / OAA Guideline. Neurological monitoring associated with obstetric neuraxial block 2020 • AA/ RAUK Guideline: Regional Anaesthesia and Patients with Abnormalities of Coagulation. • OAA / AA Guidelines for Obstetric Anaesthetic Services, 2013.
RA-UK/ESRA/ASRA/OAA guidance	• PROSPECT guideline for elective caesarean section: updated systematic review and procedure-specific postoperative pain management recommendations • Practice Guidelines for Obstetric Anesthesia. An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia and Society for Obstetric Anesthesia and Perinatology. <i>Anesthesiology</i> 2016; 124: 270–300 • American College of Obstetrics & Gynecology (ACOG) Consensus No. 1. Pharmacologic Stepwise Multimodal Approach for Postpartum Pain Management • Consensus Statement Collaborators. International consensus statement on the management of hypotension with vasopressors during caesarean section under spinal anaesthesia. <i>Anaesthesia</i> 2018; 73: 71-92 • The Society for Obstetric Anesthesia and Perinatology interdisciplinary consensus statement on neuraxial procedures in obstetric patients with thrombocytopenia
e-learning	eLA modules • 04a Obstetrics • 08 Obstetrics – Intermediate Level
RA-UK Handbook	-
Online resources	In addition to OAA learning zone as above OAA learning zone: epidural top up for caesarean section

	OAA Labour Pains. Caesarean section information
Webinars	See OAA learning zone
RCOA QI Compendium	7.6 Caesarean section anaesthesia: technique and failure rate

Supplementary reading / online material

There is a wealth of additional information on the OAA learning zone

- Fettes PD, Jansson JR, Wildsmith JA. Failed spinal anaesthesia; mechanisms, management and prevention *BJA* 2009; **102**: 739-748
- Neall G, Bampoe S, Sultan P. Analgesia for Caesarean section. *BJA Educ.* 2022; **22**: 197-203.
- Desai N, Carvalho B. Conversion of labour epidural analgesia to surgical anaesthesia for emergency intrapartum Caesarean section. *BJA Ed* 2019; **20**: 26-31
- Bower JR, Kinsella SM. Preventing and treating hypotension during spinal anaesthesia for caesarean section. *BJA Ed* 2020; **11**: 360-361
- Adshead D, Wrench I, Woolnough M. Enhanced recovery for elective Caesarean section. *BJA Ed* 2020; **20**: 354-357
- Afolabi BB, Lesi FEA. Regional versus general anaesthesia for caesarean section. Cochrane Database of Systematic Reviews 2012, Issue 10. Art. No.: CD004350. DOI: 10.1002/14651858.CD004350.pub3

1J. Discusses scientific basis of ultrasound and generation of images

Publications	Practical knobology for ultrasound guided images <i>Reg Anesth Pain Med</i> 2010; 35 : S68-73 Essential notes on physics of doppler ultrasound <i>BJA Ed</i> 2020; 20 : 122-3 Resolution in ultrasound imaging <i>CEACCP</i> 2011; 11 : 186-192
National guidance/standards	-
RAUK/ESRA/ASRA guidance	-
e-learning	eLA module 10_01_01 Ultrasound for RA
RA-UK Handbook	Chapter 1 Principles of Ultrasound Guided Regional Anaesthesia Chapter 2 The Physics of Ultrasound
Online resources	www.usra.ca www.nysora.com Image acquisition in UGRA (Part 1, Part 2 and Part 3) Anaesthesia TOTW. Physics of US Part 1 (199); physics of US Part 2 (218) Essentials in Ultrasound Guided Regional Anaesthesia
Webinars	-
RCoA QI Compendium	-

Supplementary reading/online material

Artefacts and pitfalls associated with UGRA Part 1 *Reg Anesth Pain Med* 2007; **32**: 412-418

Artefacts and pitfalls associated with UGRA Part 2 *Reg Anesth Pain Med* 2007; **32**: 419-433

(these are covered in Stage 2C)

1K. Discusses drugs and equipment used in regional anaesthesia

Publications	Challenges, solutions, and advances in ultrasound-guided regional anaesthesia. <i>BJA Ed</i> 2016; 11 : 374–380 Basic pharmacology of local anaesthetics. <i>BJA Ed</i> 2020; 20 : 34-41 Perineural adjuncts for peripheral nerve block. <i>BJA Ed</i> 2019; 19 : 276-282
National guidance/standards	LA Toxicity AAGBI Safety Guideline AA Standards of Monitoring Ergonomics in the workplace. <i>Anaesthesia</i> 2021 doi:10.1111/anae.15530 (section on regional anaesthesia)
RA-UK/ESRA/ASRA guidance	-
e-learning	eLA modules • 05b_01_01 The Pharmacology of Local Anaesthetics Part 1 • 05b_01_02 The Pharmacology of Local Anaesthetics Part 2 • 05b_01_03 Systemic Local Anaesthetic Toxicity* • 07e_11_01 Spinal Needles • 07e_11_02 Equipment used In Epidural Anaesthesia • 07e_11_03 Equipment for Peripheral Nerve Block
RA-UK Handbook	Chapter 1 Principles of Ultrasound Guided Regional Anaesthesia Chapter 2 The Physics of Ultrasound
Online resources	NYSORA Equipment Section NYSORA Pharmacology Section
Webinars	RA-UK Ambulatory Spinal Webinar RAUK Webinars (free) <i>2nd April 2024 LA choice and additives</i>
RCoA QI Compendium	2.2 Conduct of regional anaesthesia 11.8 Check and challenge: severe local anaesthetic systemic toxicity

Supplementary reading/online material

NRFit resources (NHS England)

* Useful but see 1A for more contemporary information about LAST

Stage 2

Key capabilities

2A Performs ultrasound guided brachial plexus blocks

The recommended Plan A brachial plexus blocks are interscalene and axillary plexus blocks. Supraclavicular and infraclavicular (especially useful for catheter placement) blocks are also discussed here however given this is Stage 2.

Publications	Ultrasound-guided peripheral nerve blocks of the upper limb. <i>BJA Ed</i> 2015; 15: 160–165 Anaesthesia for shoulder surgery. <i>BJA Ed</i> 2019; 19: 98-104 Ultrasound-guided upper and lower extremity nerve blocks in children. <i>BJA Ed</i> 2020; 20: 42-50 Infraclavicular brachial plexus blocks. <i>CEACCP</i> 2009; 9: 139-143
National guidance/standards	https://www.rcoa.ac.uk/gpas/chapter-6 (2.19) https://rcoa.ac.uk/gpas/chapter-16 (4.4)
RA-UK/ESRA/ASRA guidance	Standardizing nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus of upper and lower limb nerve blocks. <i>Reg Anes Pain Med</i> 2023; 0: 1-11
e-learning	eLA modules (in addition to those in 1E) • 05b_04_08 Sample upper limb block: coracoid brachial plexus block* • 05b>new Regional anaesthesia sessions 2023>regional anaesthesia of the upper limb • 07a_03_07 Brachial plexus, nerve supply to the arm and hand • 07a_06_02 Surface anatomy of the neck and clavicular region
RA-UK Handbook	Chapter 3 Upper Limb
Online resources	RA-UK Plan A videos • Plan A Interscalene block • Plan A Axillary block USRA.ca site • Interscalene, supraclavicular, infraclavicular, axillary, mid-humeral, peripheral nerve blocks Duke Regional Anaesthesia and Pain Medicine site • Interscalene, supraclavicular, forearm blocks
Webinars	RAUK Webinars (free) <i>Mon 19th June 2023 Axillary block</i> <i>Mon 17th July 2023 Interscalene block</i> <i>Mon 17th July Phrenic sparing shoulder blocks</i> Joint RCoA/RA-UK Plan A blocks webinar: Upper Limb blocks from 7 minutes
RCoA QI Compendium	-

Supplementary material

Anatomy of the brachial plexus and its implications for daily clinical practice: regional anesthesia is applied anatomy. *Reg Anes Pain Med* 2020; **45**: 620-627

Upper Extremity Regional Anesthesia: Essentials of Our Current Understanding *Reg Anes Pain Med* 2009; **34**: 134-70

NYSORA website: Upper extremity blocks

Block it Like Its Hot podcasts (blocks for shoulders; brachial plexus blocks; forearm blocks) – for links to these see at end of document

For RA courses covering brachial plexus blocks see www.ra-uk.org

* Useful but doesn't contain contemporary ultrasound infraclavicular approaches

2B. Performs ultrasound guided fascial plane blocks for the chest or abdominal wall

Common trunk blocks include rectus sheath, ESP, TAP, ilioinguinal/iliohypogastric, quadratus lumborum and superficial/deep serratus plane. Paravertebral is an important trunk block but it is not a block for novices. RA-UK include rectus sheath and ESP in the Plan A block list as being the two trunk blocks of most value, taking into account both safety and efficacy.

Publications	Abdominal wall blocks for intraabdominal surgery. <i>BJA Ed</i> 2018; 18 : 317-22 (podcast also) Rectus sheath catheter analgesia for patients undergoing laparotomy <i>BJA Ed</i> 2018; 18 : 166-172 Paravertebral blocks and novel alternatives <i>BJA Ed</i> 2020; 20 : 158-165 Nerve blocks of anterior abdominal wall <i>BJA Ed</i> 2010; 10 : 182-186
National guidance/standards	-
RA-UK/ESRA/ASRA guidance	-
e-learning	eLA module 05b_02_02 Innervation of the trunk
RA-UK Handbook	Section 4 – trunk blocks
Online resources	Anatomy and sonoanatomy (in addition to articles above) Rectus sheath LA demonstration - Duke Regional Anesthesia and Pain Medicine site - Rectus, ESP, serratus plane, paravertebral - USRA.ca site - Ilioinguinal/iliohypogastric, paravertebral, TAP
Webinars	RAUK Webinars (free) 19 th September ESP blocks 5 th December Rectus Sheath blocks
RCoA QI Compendium	-

Supplementary material

Essentials of our current understanding: abdominal wall blocks. *Reg Anes Pain Med* 2017; **42**: 133-183

Ultrasound guided fascial plane blocks of the chest wall – a state of the art review. *Anaesthesia* 2021; **76**: S1 110-126

NYSORA website TAP and Quadratus Lumborum blocks

NUSGRA e- module on paravertebral and ESP blocks

NUSGRA lecture on abdominal wall blocks

Review of peripheral nerve blocks for caesarean delivery analgesia. *Reg Anes Pain Med* 2020; **45**: 52–62

PROSPECT guideline for elective caesarean section (2022)

Abdominal Wall Blocks for Surgery - How To Choose the Right Technique? – Ki-Jinn Chin

Block it Like Its Hot podcasts (ESP; breast surgery) – for links to these see at end of document

For RA courses covering trunk blocks see www.ra-uk.org

2C Demonstrates how to achieve an optimal image and recognises common ultrasound artefacts

Refer also to 1J for further material on scientific basis of ultrasound and image generation

Publications	Ultrasound-guided regional anaesthesia. <i>CEACCP</i> 2007; 7: 20-24 Challenges, solutions, and advances in USGRA <i>BJA Ed</i> 2016; 16: 374–380 Practical Knobology for Ultrasound-Guided Regional Anesthesia. <i>Reg Anes Pain Med</i> 2010; 35: S68-S73 Needle-related ultrasound artifacts and their importance in anaesthetic practice. <i>BJA</i> 2014; 112: 794–80
National guidance/standards	NICE: Ultrasound-guided regional nerve block. Interventional procedures guidance 2009
RA-UK/ESRA/ASRA guidance	The Second ASRA Evidence Based Medicine Assessment of UGRA: Executive Summary. <i>Reg Anes Pain Med</i> 2016; 41 : 181-94
e-learning	eLA module • 04 04 Finding nerves: clicks, paraesthesias, nerve stimulation, LORTS and ultrasound* • General principles
RA-UK Handbook	The Physics of Ultrasound The Principles of UGRA
Online resources	As per section 1J. Also : Essentials in USGRA Image acquisition in UGRA (Part 1, Part 2 and Part 3)
Webinars	-
RCoA QI Compendium	-

Supplementary material

European Society of Anaesthesiology and Intensive Care Guidelines on peri-operative use of ultrasound for regional anaesthesia (PERSEUS regional anesthesia): Peripheral nerves blocks and neuraxial anaesthesia. *Eur J Anaesth* 2021; **38**: 219-250

Needle Visualization in Ultrasound-Guided Regional Anesthesia: Challenges and Solutions. *Reg Anes Pain Med* 2008; **33**: 532-44.

Artefacts and pitfalls associated with UGRA Part 1 *Reg Anesth Pain Med* 2007; **32**: 412-418

Artefacts and pitfalls associated with UGRA Part 2 *Reg Anesth Pain Med* 2007; **32**: 419-433

For RA courses covering Knobology and Basic Ultrasound see www.ra-uk.org

* Very little ultrasound is covered in this module - primarily discusses landmark and PNB techniques

2D. Describes ophthalmic blocks for patients undergoing awake ophthalmic surgery

This section has been prepared by the British Ophthalmic Anaesthesia Society www.boas.org

Publications	A literature review of the sub-Tenon technique. <i>Ophthalmic Anaesthesia</i> 2018; 8 : 17-22 Regional anaesthesia for ophthalmic surgery <i>BJA Ed</i> 2017; 17: 221-27 Local anaesthesia for your eye operation. Information for patients. RCoA
National guidance/standards	Guidelines for the Provision of Ophthalmic Anaesthesia Services RCoA Local anaesthesia for ophthalmic surgery: Joint guidelines from the Royal College of Anaesthetists and the Royal College of Ophthalmologists 2012
RAUK/ESRA/ASRA guidance	
e-learning	eLA modules • 09_01_01 Anatomy for Ophthalmic Anaesthesia • 09_01_06 Regional Anaesthesia for Ophthalmic Surgery
RA-UK Handbook	-
Online resources	BOAS.org website which has copies of the BOAS journal Ophthalmic Anaesthesia Sub-Tenon block: ABCs of anaesthesia
Webinars	RAUK Webinars (free) <i>2nd April Blocks for Eye surgery</i>
RCoA QI Compendium	-

2E. Involves the patient in planning and understanding potential complications of regional anaesthesia

Material from 1A and 1B relevant here also

Publications	Neurological injury following peripheral nerve blocks: a narrative review of estimates of risks and the influence of ultrasound guidance. <i>Reg Anes Pain Med</i> 2024; 49: 122-132 RA: risk, consent and complications. <i>Anaesthesia</i> 2021; 76: S1 18-26 Complications of regional anaesthesia. <i>Anaesth Int Care</i> 2022; 23: 146-150 Nerve injury after PNB – current understanding and guidelines <i>BJA Ed</i> 2018; 18: 384-390 Neurologic evaluation and management of perioperative nerve injury <i>Reg Anes Pain Med</i> 2015; 40: 491-501 Updates in our understanding of LA toxicity: a narrative review. <i>Anaesthesia</i> 2021; 76: 27-39 Consent in Anaesthesia, Critical Care and Pain Medicine <i>BJA Ed</i> 2018; 18: 135-139 RA and outcomes. <i>BJA Ed</i> 2018; 18: 52-56
National guidance/standards	GMC - Decision making and consent GMC - Assessing mental capacity
RA-UK/ESRA/ASRA guidance	RA-UK Peripheral nerve block follow-up The second ASRA practice advisory on neurologic complications associated with RA and pain medicine <i>Reg Anes Pain Med</i> 2015; 40: 401-430 Practice advisory on the prevention and management of complications of pediatric regional anesthesia <i>J Clin Anes</i> 2022; 79 ASRA/ESRA recommendations on local anesthetics and adjuvant doses in pediatric regional anesthesia <i>Reg Anes Pain Med</i> 2018; 43: 211-216
e-learning	eLA modules: • 01_09_06 Risk and Consent • 02_21_01 Role of the Preoperative Visit • 04c_01_06 Consent and Autonomy • 05b_05_01 Consent for Regional Anaesthesia* • 05b_04_05 Performing Safe Peripheral Nerve Blocks*¹ • 05b_03_04 Complications of spinals and epidurals • 05b_04_06 Complications of peripheral nerve blocks*²
RA-UK Handbook	-
Online resources	RCoA Patient information leaflets: Nerve blocks for surgery on the shoulder arm or hand Epidural pain relief after surgery Anaesthetic choices for hip and knee replacement Nerve Blocks: An information video for patients RA Risks infographic Nerve damage associated with peripheral nerve block
Webinars	RAUK Webinars (free) 6th February 2024 <i>Complications of RA in obstetrics</i> 5th March 2024 <i>Nerve injury</i> 2nd April 2024 <i>LAST</i>

RCoA QI Compendium	1.1 Patient information for anaesthesia 1.4 Consent in anaesthesia 1.5 Shared decision making in perioperative care 1.14 Individualised perioperative pain management 1.15 Patient experience and outcome measures 7.1 Information for mothers about analgesia and anaesthesia during delivery
---------------------------	---

Supplementary reading/online material

RA-UK Patient consent for peripheral nerve blocks

Does regional anaesthesia improve outcome? *BJA* 2015; **115** S2: ii26-ii35

Peripheral regional anaesthesia outcomes; lessons learned from the last 10 years *BJA* 2015; **114**: 728-745

Informed consent for regional anaesthesia *Curr Op Anesth* 2018; **31**: 614-621

Complications of peripheral nerve blocks *BJA* 2010; **105** (S1): i97-i107

* References now a little dated and more contemporary evidence exists but remains useful to read.

*¹ Module useful but does not contain some of the more contemporary evidence

*² Good module. Evidence now suggests LA toxicity and intravascular injection is reduced by ultrasound

2F Assesses when a regional technique is not appropriate

Whether a nerve block is appropriate depends on many factors, and most importantly the wishes of the patient. Section 1A and 1B already contain resources outlining risks and benefits of RA, as well as indications and contraindications. Any decision about performing a block must take into account the risks and benefits of the block for the individual patient and the specific procedure. This must then be compared with the risks and benefits of alternative options. One approach is to consider patient factors (consent, capacity, absolute and relative contraindications such as pre-existing neurological disease, coagulopathy, comorbidities), surgical factors and anaesthetic factors when making a decision in conjunction with the patient. In addition to the table below further discussion is provided in the supplemental material.

Publications	RA : risk, consent and complications. <i>Anaesthesia</i> 2021; 76 S1: 18-26 Complications of regional anaesthesia. <i>Anaesth Int Care</i> 2022; 23: 146-150 Regional Anaesthesia in Patients at risk of bleeding <i>BJA Ed</i> 2021;21 :84-94
National guidance/standards	AA guideline. Management of hip fractures 2020 AA guideline. Regional anaesthesia and patients with abnormalities of coagulation (2013) AA guideline. Regional Anaesthesia for lower leg trauma and the risk of acute compartment syndrome (2021) AA guideline. Consent for anaesthesia (2017)
RA-UK/ESRA/ASRA guidance	Regional anesthesia in the patient receiving antithrombotic or thrombolytic therapy. <i>Reg Anes Pain Med</i> 2018; 43: 263–309 Regional Anaesthesia in patients on antithrombotic drugs. Joint ESAIC/ESRA guidelines. <i>Eur J Anaesthesiol</i>; 2022; 39: 100-132 Regional Anesthesia and acute compartment syndrome: principles for practice 2021 Practice Advisory for the Prevention, Diagnosis, and Management of Infectious Complications Associated with Neuraxial Techniques: An Updated Report by the American Society of Anesthesiologists Task Force on Infectious Complications Associated with Neuraxial Techniques and the American Society of Regional Anesthesia and Pain Medicine. <i>Anesthesiology</i> 2017; 126: 585–601
e-learning	eLA modules • 05b_05_01 Consent for Regional Anaesthesia*¹ • 05b_03_01 Spinals and Epidurals: Indications and Contraindications*² • 05b_03_04 Complications of Spinals and Epidurals • 05b_04_02 Indications and contraindications for/to Peripheral Nerve Blocks (PNBs)*² • 05b_04_06 Complications of Peripheral Nerve Blocks*³
RA-UK Handbook	-
Online resources	RCoA leaflet: Your spinal anaesthetic RCoA leaflet: Anaesthetic choices for hip or knee replacement RCoA leaflet: Epidural pain relief after surgery RCoA leaflet: Nerve blocks for surgery on the shoulder, arm or hand

	Royal College of Anaesthetist Risk Leaflets - generic
Webinars	-
RCoA QI Compendium	1.1 Patient information for anaesthesia 1.2 Perioperative risk prediction 1.4 Consent in anaesthesia 1.5 Shared decision making in perioperative care

Supplementary material

Centre for Perioperative Care – Shared Decision Making for Clinicians

Regional Anesthesia in Patients with pre-existing neurological disease *Reg Anesth Pain Med* 2015;
40: 467-478

Whether a nerve block is appropriate depends on many factors, and most importantly the wishes of the patient. Section 1A and 1B already contain resources outlining risks and benefits of RA, as well as indications and contraindications. These therefore are not repeated here. Any decision about performing a block must take into account the risks and benefits of the block for the individual patient and the specific procedure. This must then be compared with the risks and benefits of alternative options. One approach is to consider patient factors, surgical factors and anaesthetic factors when making a decision in conjunction with the patient.

- Patient factors
 - Consent/patient wishes and capacity
 - Pre-existing absolute or relative contraindications to a block including
 - Neurological disease (see Section 1A and 1B, above and also ref 1 below) including diabetic neuropathy
 - Coagulopathy/antithrombotic drugs (see 2I)
 - Systemic or localised infection (ASRA practice advisory above)
 - Patients who are at higher risk of LA toxicity (see ref 2)
 - Specific side effects related to certain blocks and patients at risk e.g.
 - Pulmonary disease and brachial plexus approaches that risk phrenic nerve palsy or pneumothorax (see 1A/1B and also refs 3,4)
 - Fixed cardiac output for spinal anaesthesia
 - Pre-existing pain/anxiety/concerns
- Surgical factors
 - Anticipated pain?
 - Both early post-operatively and also the subsequent pain trajectory.
 - If the patient has chosen to have a general anaesthetic and block is just for analgesia need to decide is a block actually necessary for analgesia because anticipated pain is minimal or conversely is a single shot block sufficient and is a catheter technique required because the anticipated pain is such that a single shot block will be inadequate (or is anticipated pain higher in this individual patient due to pre-existing pain/anxiety etc)
 - Length of procedure?
 - Duration of single shot local anaesthetic (neuraxial or PNB) or is catheter technique necessary

- Can patient tolerate 'awake' procedure (even with sedation) if this is a prolonged procedure
 - Day case (patient needs to ambulate but may be able to use crutches) versus in patient?
 - Surgical territory (dermatomes/osteotomes/myotomes)?
 - Need to ensure block is appropriate and can it cover the surgical territory e.g. axillary surgery is very difficult (but not impossible) to cover for awake surgery. Knowledge of procedure and anatomy and blocks is key here!
 - Tourniquet?
 - Important if the regional technique is being used for anaesthesia rather than analgesia. Note for example an ankle tourniquet in awake patients is well tolerated even though this area is not anaesthetised by the block
 - Trauma and risk of compartment syndrome?
 - Needs discussion between anaesthetist and surgeon and patient (AoA document above)
 - Risk of post-operative hypotension following neuraxial techniques and concern re splanchnic perfusion (both secondary to hypotension or the use of vasopressors) and fluid balance. This is important in elective surgery but also in emergency patients who may be septic or fluid deplete in emergency surgery.
- Anaesthetic factors

Anaesthetic factors are generally not the sole reason why regional may not be appropriate unless operator experience is an issue. Clearly a well conducted GA is better than a poorly conducted regional technique. Anaesthetic factors in general when choosing a technique however include

 - Anaesthesia versus analgesia?
 - As above, if the procedure is minor procedure with little anticipated pain and the patient wishes a GA then the small risk of a block may outweigh any benefit
 - Neuraxial versus PNB? Is one potentially safer/better?
 - Sympathetic block associated with neuraxial techniques (See above)
 - Is it possible under PNB alone without the need for neuraxial?
 - Single shot versus catheter?
 - Additives, both PNB and neuraxial e.g. intrathecal opioid (ref 5)
 - Follow up, availability of appropriate monitoring either in ward or at home

References

1. PNB in the patient with pre-existing neuropathy (abstract and a reference list from a recent ESRA lecture)
2. Updates in our understanding of LA toxicity: a narrative review. *Anaesthesia* 2021; **76**: 27-39
3. Anaesthesia for shoulder surgery. *BJA Ed* 2019; **19**: 98-104
4. Phrenic nerve palsy and regional anesthesia for shoulder surgery *Anesthesiology* 2017; **127**: 173-91
5. Perineural adjuncts for peripheral nerve block. *BJA Ed* 2019; **19**: 276-284

*¹ References now a little dated and more contemporary evidence exists but remains useful to read.

*² Some of the CNB and PNB 'indication' evidence a little dated now (see Stage 1A) but still good modules.

*³ Good module. Evidence now suggests LA toxicity and intravascular injection is reduced by ultrasound.

2G Manages inadequate block in the awake patient and in recovery if used as an adjunct to general anaesthesia

Additional material on managing inadequate neuraxial block in section 1I

Publications	Failed spinal anaesthesia: mechanisms, management and prevention. <i>BJA</i> 2009; 102: 739-48 Failed epidural: causes and management. <i>BJA</i> 2012; 109: 144-54 Complications of peripheral nerve blocks. <i>BJA</i> 2010; 105 (S1): i97-i107 (Small section on incidence of block failure) The failed peripheral nerve block. <i>BJA Ed</i> 2023; 23: 92-100
National guidance/standards	-
RA-UK/ESRA/ASRA guidance	-
e-learning	-
RA-UK Handbook	-
Online resources	Anaesthesia TOTW • RA for awake hand surgery: block failure and troubleshooting issues (414) • The labour epidural: troubleshooting (366) Why blocks fail and what to do about it, video by Dr Ki-Jinn Chin NYSORA • Mechanisms and management of failed spinal anaesthesia
Webinars	RAUK Webinars (free) 5th March 2024 <i>Managing the failed block</i>
RCoA QI Compendium	2.2. Conduct of Regional Anaesthesia

Supplementary reading

-

2H Discusses longer term management of complications

A specific table has not been created here as complications of RA are mentioned elsewhere.

- Risks and benefits 1A, 2E, 2F
 - Generic complications
 - Neurological complications
 - Central and peripheral
 - LAST
 - Infectious
 - Bleeding related (2I)
 - Block specific
- Obstetric complications 1G (but also includes generic complications of neuraxial procedures)

2I Discusses the use of regional anaesthesia in the presence of abnormalities of coagulation

Publications	Regional anaesthesia in patients at risk of bleeding. <i>BJA Ed</i> 2021; 21 :84-94 Practice advisory on the bleeding risks for peripheral nerve and interfascial plane blockade: evidence review and expert consensus. <i>Can J Anaesth</i> 2019; 66 : 1356-1384
National guidance/standards	AA guideline. Regional anaesthesia and patients with abnormalities of coagulation (2013) (<i>Note that this is currently under review</i>)
RAUK/ESRA/ASRA guidance	Regional anaesthesia in the patient receiving antithrombotic or thrombolytic therapy. <i>Reg Anesth Pain Med</i> 2018; 43 : 263–309 Regional anaesthesia in patients on antithrombotic drugs Joint ESAIC/ESRA guidelines. <i>Eur J Anaesthesiol</i> 2022; 39 :100–132
e-learning	eLA modules • 05b_03_01 Spinals and Epidurals: Indications and Contraindications* • 05b_04_02 Indications and Contraindications for/to Peripheral Nerve Blocks (PNBs)*
RA-UK Handbook	-
Online resources	ASRA Coags app
Webinars	RAUK Webinars (free) <i>6th February 2024 Anticoagulants and RA</i>
RCOA QI Compendium	1.5 Shared decision making in perioperative care 1.13 Enhanced recovery after surgery 1.14 Individualised perioperative pain management

Supplementary reading/online material

New antiplatelet drugs and new oral anticoagulants. *Br J Anaesth* 2016; **117**: 74-84

Perioperative management of oral anticoagulation. *BJA Educ* 2018; **18**: 259-264

* Some of the CNB and PNB ‘indication’ evidence a little dated now (see Stage 1A) but still good modules.

STAGE 3

3A Tailors regional anaesthesia techniques to patients undergoing day surgery

Publications	Pain management in day case surgery. <i>BJA Ed</i> 2015; 15 : 18-83 Spinal anaesthesia for ambulatory surgery. <i>BJA Ed</i> 2019; 19 : 321-328 Regional anaesthesia for ambulatory surgery. <i>Best Pract Res Clin Anaesthesiol</i> 2023; 37 :397-408
National guidance/standards	GPAS Chapter 6: Guidelines for provision of anaesthesia services for day surgery 2021 AA and BADS Guidelines for Day Surgery 2019
RA-UK/ESRA/ASRA guidance	ASRA Guideline on management of post-operative pain (not specific to day surgery but contains some sections on RA) Standardizing nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus of upper and lower limb nerve blocks. <i>Reg Anes Pain Med</i> 2023; 0 : 1-11
e-learning	-
RA-UK Handbook	Chapter 3 Upper Limb blocks Chapter 4 Trunk blocks e.g. interpectoral/pectoserratus, ilioinguinal/iliohypogastric Chapter 5 Lower limb blocks e.g. femoral triangle/adductor canal, popliteal, ankle
Online resources	Ambulatory spinal handbook WFSA Tutorial 508 (2023) Day case hand and wrist surgery under RA
Webinars	RAUK Ambulatory spinal anaesthesia webinar RAUK Webinars (free) <i>6th February 2024 Ambulatory spinal anaesthesia</i>
RCOA QI Compendium	Chapter 5.5 Discharge protocols Chapter 5.6 Unplanned hospital admission after day surgery

Supplementary reading/online material

Peripheral nerve blocks for outpatient surgery: evidence-based indications. *Curr Op Anesthesiol* 2013; **26**: 467-474

NYSORA – peripheral nerve blocks for outpatient surgery

Ambulatory regional anaesthesia tips and tricks (summary from an ESRA session)

British Association of Day Surgery documents

- Spinal anaesthesia for day surgery

Block it Like Its Hot podcasts (blocks for shoulders; brachial plexus blocks; forearm blocks) – for links to these see end of document

3B Manages regional anaesthesia and analgesia safely in the perioperative period in all settings

A table has not been produced for this section. This section really encompasses all of the other sections of the document.

1. The process starts with the shared decision-making process of choosing the correct block for the correct operation for the correct patient.

- Indication for block (1A, see also 2F)
- Identify any absolute or relative contraindications (1B, 2F, 2I)
 - Neurological disease (see Section 1A and 1B) including diabetic neuropathy
 - Coagulopathy/antithrombotic drugs (see 2I)
 - Systemic or localised infection (ASRA practice advisory above)
 - Patients who are at higher risk of LA toxicity
 - Specific side effects related to certain blocks and patients at risk e.g.
 - Pulmonary disease and brachial plexus approaches that risk phrenic nerve palsy or pneumothorax (see 1A/1B)
 - Fixed cardiac output for spinal anaesthesia
 - Pre-existing pain/anxiety/concerns
- Discuss risks and benefits in that individual patient and alternatives (including no block)
- Consent (2E)
- 2F for other considerations
 - Surgical
 - Anticipated pain
 - Length of procedure
 - Ambulatory surgery? (3A)
 - Surgical territory
 - Tourniquet
 - Trauma and risk of compartment syndrome
 - Anaesthetic
 - Anaesthesia versus analgesia
 - Neuraxial versus PNB
 - Single shot versus catheter
 - Additives
 - COVID (refs 1, 2)

2. Block conduct depends on the specific block (1D, 1F, 1G-I, 2A, 2B, 2D, 3C, 3D, 3E, 3F)

- Generic factors are covered in:
 - 1C Measures to prevent wrong sided block
 - 1E Performs simple peripheral blocks with ultrasound
 - 1J Generate US guided image and 2C recognise artefacts
 - 1K Drugs and equipment

3. Intra-operative monitoring (1E)

- Management of inadequate block (2G)

4. Post-operative care and follow up

- Monitoring for complications (2H)
- Management of catheters – either epidural or peripheral (3iA, 3iB, 3iC)
- Analgesia to prevent rebound pain

5. Documentation (an ASRA-ESRA consensus document about documentation is due to be released soon)

Additional references

1. Neuraxial anaesthesia and peripheral nerve blocks during the COVID-19 pandemic: a literature review and practice recommendations. *Anaesthesia*. 2020; **75**: 1350-63
2. Regional anaesthesia and COVID-19: first choice at last? *BJA* 2020; **125**: 243-7
3. Advances in regional anaesthesia and acute pain management: a narrative review. *Anaesthesia* 2020; **75**: e101-e110
4. ASRA Pain Medicine consensus guidelines on the management of the perioperative patient on cannabis and cannabinoids." *Reg Anes Pain Med* 2023; 48: 97-117
5. Factors associated with rebound pain after peripheral nerve block for ambulatory surgery *BJA* 2021 **126**: 862-871

3C. Performs ultrasound guided regional anaesthesia for chest wall independently

Publications	Ultrasound guided fascial plane blocks of the chest wall – a state of the art review. <i>Anaesthesia</i> 2021; 76 S1: 110-126 Paravertebral blocks and novel alternatives <i>BJA Ed</i> 2020; 20 : 158-165 OK Rib fracture management, <i>BJA Ed</i> 2016; 16 : 26-32
National guidance/standards	-
RA-UK/ESRA/ASRA guidance	Standardising nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus study of abdominal wall, paraspinal and chest wall blocks. <i>Reg Anes Pain Med</i> 2021; 46 : 571-80
e-learning	eLA modules: 05b_04_10 Simple Peripheral Nerve Blocks of the Trunk*
RA-UK Handbook	Chapters 4.5, 6.1 and 6.3 OK
Online resources	Anaesthesia TOTW 424: Traumatic rib fractures Anaesthesia TOTW 427: Serratus plane Anaesthesia TOTW 414: The ESP block Anaesthesia TOTW 403: Anaesthesia for breast surgery Anaesthesia TOTW 376: Ultrasound guided paravertebral block Anaesthesia TOTW 346: PECS blocks ESP Plan A video Duke Regional Anesthesia and Pain Medicine site - Rectus, ESP, serratus, paravertebral - All chest wall blocks on Duke website USRA.ca site - Paravertebral NYSORA paravertebral
Webinars	Live demonstration paravertebral block What is the role of the ESP? RAUK Webinars (free) 19 th September ESP
RCoA QI Compendium	13.6 Pain control in thoracic surgery 13.7 Acute pain control after cardiac surgery

Supplementary reading/online material

PROSPECT guidance – includes recommendations on VATS, sternotomy and thoracotomy

NYSORA anatomy

Complications rates of US guided paravertebral block for breast surgery. *Reg Anes Pain Med* 2020; **45**: 813-817

Anatomical basis of fascial plane blocks. *Reg Anes Pain Med* 2021; **46**: 581-99

ESP block: a qualitative systematic review. *Minerva Anesthesiol* 2019; **85**: 308-19

PROSPECT guideline for oncological breast surgery: a systematic review and procedure specific post-operative pain management guidelines. *Anaesthesia* 2020; **75**: 664-73 OK

ESP block lecture by Ki Jinn Chin

Perioperative breast analgesia: a qualitative review of anatomy and regional techniques. *Reg Anes Pain Med* 2017; **42**: 609-31

Block it Like Its Hot podcasts (ESP; breast surgery) – for links to these see at end of document

* Good but doesn't contain ultrasound guided block descriptions or newer trunk blocks

3D Performs US guided RA for abdomen independently

Publications	Essentials of our current understanding: Abdominal wall blocks. <i>Reg Anes Pain Med</i> 2017; 42: 133-193 Abdominal wall blocks for intraabdominal surgery. <i>BJA Ed</i> 2018; 18: 317-22 (podcast also) Rectus sheath catheter analgesia for patients undergoing laparotomy <i>BJA Ed</i> 2018; 18: 166-172
National guidance/standards	-
RA-UK/ESRA/ASRA guidance	Standardising nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus study of abdominal wall, paraspinal and chest wall blocks. <i>Reg Anes Pain Med</i> 2021; 46 : 571-80
e-learning	eLA module 05b_02_02 - The innervation of the trunk
RA-UK Handbook	Chapter 4
Online resources	AA Education Shots Plan A blocks video USRA.ca - Ilioinguinal, TAP Duke Regional Anesthesia and Pain Medicine site - Rectus sheath
Webinars	RAUK Webinars (free) 5th December Rectus sheath block RA-UK Plan A Block Webinar (from 45 mins)
RCoA QI Compendium	-

Supplementary reading/online material

NYSORA anatomy

NYSORA – rectus sheath, TAP, ilioinguinal, iliohypogastric, QL blocks

Ki Jinn Chin Thoracic epidurals vs abdominal wall fascial plane blocks ([Part 1](#) and [Part 2](#))

PROSPECT guidance for Open colorectal surgery (2024), Caesarean section (2020), open liver resection (2019), inguinal hernia (2019), laparoscopic sleeve gastrectomy (2018), laparoscopic hysterectomy (2018), laparoscopic cholecystectomy (2017).

ERAS recommendations for elective colorectal surgery 2018

For RA courses covering abdominal regional techniques see www.ra-uk.org

3E Performs US guided blocks for lower limb surgery independently

Publications	Lower limb regional anaesthesia - essentials of our current understanding <i>Reg Anesth Pain Med</i> 2019; 44 : 143-180 The sciatic nerve block <i>BJA Ed</i> 2020; 20 : 312-20 Regional anaesthesia for foot and ankle surgery <i>BJA Ed</i> 2022; 22 : 424-431 Anaesthesia and analgesia for knee joint arthroplasty. <i>BJA Ed</i> 2018; 18 : 8-15 <i>See Stage 1F for USG Femoral or FI</i>
National guidance/standards	-
RA-UK/ESRA/ASRA guidance	Standardizing nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus of upper and lower limb nerve blocks. <i>Reg Anes Pain Med</i> 2023; 0 : 1-11
e-learning	eLA modules • 05b_04_07 Continuous regional analgesia – peripheral nerve catheters • 05b_04_09 Sample lower limb block: femoral nerve block* • US guided lower limb blocks
RA-UK Handbook	Section 5 Lower limb blocks
Online resources	NYSORA: Lower limb surgery USRA.ca : Lower limb blocks Duke Regional Anesthesia and Pain Medicine site • Fascia iliaca, Adductor canal, iPACK, PENG, genicular blocks, femoral and lat femoral cutaneous of thigh, ankle, popliteal
Webinars	RAUK Webinars (free) <i>7th November 2023 Femoral</i> <i>10th December 2023 Popliteal</i> <i>9th January 2024 Adductor Canal</i> RA-UK Plan A Block Webinar (femoral, adductor canal and popliteal)
RCoA QI Compendium	-

Supplementary reading/online material

NYSORA anatomy

ASRA News: How I Do It: Suprainguinal Fascia Iliaca Block 2020

ASRA News: How I Do It: iPACK block 2020

ASRA News: How I do it: Saphenous block 2020

Anaesthesia TOTW: 448 Motor-sparing regional anaesthesia blocks for knee surgery; 401 Popliteal block

Ultrasound visualization of the anatomy relevant for lumbar plexus block: comparison of the paramedian transverse and Shamrock scan technique *Reg Anes Pain Med* 2019; **44**: 573-577

Ki Jinn Chin videos: popliteal, ankle, PENG, femoral, fascia iliaca, obturator

Block it Like Its Hot podcasts (lower limb blocks and knee arthroplasty/hip arthroplasty) – for links to this see at end of document

* Does not discuss US guided technique – only landmark and peripheral nerve stimulation

For RA courses covering lower limb regional techniques see www.ra-uk.org

3F Performs US guided brachial plexus block independently

Material below is in addition to 2A content.

Publications	Anatomy of the brachial plexus and its implications for daily clinical practice: regional anesthesia is applied anatomy. <i>Reg Anes Pain Med</i> 2020; 45 : 620-627 Upper Extremity Regional Anesthesia: Essentials of Our Current Understanding <i>Reg Anes Pain Med</i> 2009; 34 : 134-70 Assessment of topographic brachial plexus nerves variation at the axilla using ultrasonography, <i>Br J Anaes</i> 2009; 103 : 606–12
National guidance/standards	-
RA-UK/ESRA/ASRA guidance	Standardizing nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus of upper and lower limb nerve blocks. <i>Reg Anes Pain Med</i> 2023; 0 : 1-11
e-learning	
RA-UK Handbook	Chapter 3 Upper limb
Online resources	USRA.ca site Duke Regional Anaesthesia and Pain Medicine site Ki Jinn Chin videos • Superior trunk block, supraclavicular, infraclavicular, axillary (Part 1 and Part 2), distal upper limb blocks (Part 1, Part 2 and Part 3)
Webinars	RAUK Webinars (free) <i>Mon 19th June 2023 Axillary</i> <i>17th July 2023 Interscalene</i> <i>17th July 2023 Phrenic Sparing blocks</i> RA-UK Plan A Block Webinar (Interscalene and axillary)
RCoA QI Compendium	2.2 Conduct of regional anaesthesia 11.7 Availability of ultrasound equipment in anaesthetic areas

Supplementary reading/online material

NYSORA anatomy

Diaphragm-sparing nerve blocks for shoulder surgery, revisited *Reg Anes Pain Med* 2020; **45**: 73-78

Surgical anesthesia for proximal arm surgery in the awake patient *Reg Anes Pain Med* 2021; **46**: 446–451

Duke Regional Anaesthesia and Pain Medicine site. In addition to Stage 2A – phrenic sparing blocks, costoclavicular, RAPTIR. Costoclavicular and RAPTIR in particular are advanced level blocks however and included simply for interest.

PROSPECT guidance rotator cuff surgery

Anaesthesia TOTW

- 414 RA for awake hand surgery: block failure and troubleshooting issues
- 400 Interscalene block
- 384 Supraclavicular
- 409 Infraclavicular
- 369 Anatomical variation of the brachial plexus and its clinical implications

Stage 3i

Many of these key learning capabilities are an extension of the topics covered in the previous sections. A table on catheters is included below given these have not been discussed as yet. This will help with 3iA and 3iB. 3D and 3E will be developed with increasing exposure and experience. A selection of references and general resources that may help are included also.

The [RA-UK link network](#) may be of use in advanced training if fellows wish to contact consultants in different hospitals/deaneries to observe specific techniques or list management strategies (e.g. a block room) not undertaken locally. Fellowship links are listed at the end of the document.

Perineural catheters

Publications	Continuous Peripheral Nerve blocks: An update of the published Evidence and Comparison with Novel, Alternative Analgesic Modalities <i>Anesth Analg</i> 2017; 124 : 308-335 Peripheral nerve catheter techniques. <i>Anaes Int Care Med</i> 2016; 17 :194-195
National guidance/standards	-
RA-UK/ESRA/ASRA guidance	Practice Advisory for the Prevention, Diagnosis, and Management of Infectious Complications Associated with Neuraxial Techniques: An Updated Report by the American Society of Anesthesiologists Task Force on Infectious Complications Associated with Neuraxial Techniques and the American Society of Regional Anesthesia and Pain Medicine. <i>Anesthesiology</i> 2017; 126 : 585–601
e-learning	eLA module 05b_04_07 Continuous Regional Analgesia-Peripheral Nerve Catheters
RA-UK Handbook	-
Online resources	- USRA.ca site - Catheter technique - NYSORA - Equipment for CPNB - Ki Jinn videos - Popliteal, infraclavicular, interscalene catheter - ATOW - Introduction to perineural catheters
Webinars	
RCoA QI Compendium	-

Supplementary reading/online material

Catheters

Promoting the use of peripheral nerve catheters: better catheter accuracy or more user friendliness? *Anaesthesia* 2017; **72**: 978-86

Advanced upper limb blocks/concepts

Intercostobrachial nerves

Ultrasound-Guided Selective Versus Conventional Block of the Medial Brachial Cutaneous and the Intercostobrachial Nerves: A Randomized Clinical Trial. *Reg Anes Pain Med* 2018; **43**: 832–837

Axillary nerve

Ultrasound-guided block of the axillary nerve: a volunteer study of a new method. *Acta Anaesth Scand* 2011; **55**: 565–70

WALANT

Wide awake surgery for flexor tendon primary repair: A literature review. *Orthopedic Reviews* 2020; **12** (s1): 8668

General resources

Regional anaesthesia collections

BJA Education regional anaesthesia collection

Anaesthesia 2021 Fundamental of regional anaesthesia issue

Cochrane reviews regional collection – Cochrane reviews examining regional anaesthesia

BJA Regional anaesthesia special edition 2024

Recommendations and guidelines

PROSPECT – evidence based, procedure specific post-operative pain management

ERAS Society Guidelines – enhanced recovery guidance. Not all recommend RA.

ICAROS group recommendations – rather than just examine effects of RA on analgesia and enhanced recovery these recommendations take into account potential morbidity benefits of RA.

- Neuraxial anaesthesia for THA and TKA
- PNBs for THA and TKA

Specific papers/themes

Greengional anaesthesia – environmental issues and RA

RA and cancer

- The role of regional anaesthesia in the emerging subspecialty of onco-anaesthesia: a state of the art review. *Anaesthesia* 2021; **76** (S1): 148–159
- The impact of anaesthetic technique upon outcome in oncological surgery. *BJA Ed* 2019; **19**: 14–20

Chronic post-surgical pain

- The role of regional anaesthesia and multimodal analgesia in the prevention of chronic post-operative pain: a narrative review. *Anaesthesia* 2021; **76** (S1): 8–17
- Local and regional anaesthesia at the time of surgery to prevent longer term persistent pain after surgery. *Cochrane Dat Syst Rev* 2023 Art. No.: CD007105

Anaesthesia for awake breast surgery. *BJA Ed* 2022; **22**: 452–55

Online lecture series and YouTube channels

Amit Pawa YouTube channel

Ki Jinn Chin YouTube channel

Duke University Regional and Acute Pain medicine YouTube channel

Vincent Roques YouTube channel

NYSORA YouTube channel

Podcasts

Block It Like It's Hot Podcast – Hosts Dr Amit Pawa & Dr Jeff Gadsden

Available at all Podcast Providers

Quick Links here:

- Spotify: <https://open.spotify.com/show/4JlV9JJiYEG9XnSqkNSfbt?si=f4d33dbecfc84fb3>
- Apple Podcasts: <https://podcasts.apple.com/gb/podcast/block-it-like-its-hot/id1657437198>
- Podbean hosting site: <https://blockitlikeitshot.podbean.com>

Topic Specific Links

Chest wall Blocks (Could go at Stage 2 B, Stage 3 C, Stage 3i C)

ESP Block

- Spotify: <https://open.spotify.com/episode/22qR3T9S8H5A1vbAiyiAi7?si=0208d243d6794331>
- Apple: <https://podcasts.apple.com/gb/podcast/block-it-like-its-hot/id1657437198?i=1000590260472>
- Podbean: <https://www.podbean.com/ew/pb-6atgd-133b85e>

Breast Surgery

- Spotify: <https://open.spotify.com/episode/2lgvbtidDJaif5l4ZuDK4?si=48017ee2727c4612>
- Apple: <https://podcasts.apple.com/gb/podcast/block-it-like-its-hot/id1657437198?i=1000600087648>
- Podbean: <https://www.podbean.com/ew/pb-4gvdu-13940e2>

Lower Limb Blocks (Could go at Stage 3 E, Stage 3i B)

Knee Arthroplasty

- Spotify: <https://open.spotify.com/episode/6LKWntdHLH5Kgt7WYEHpx?si=82f81e7ea88b4666>
- Apple: <https://podcasts.apple.com/gb/podcast/block-it-like-its-hot/id1657437198?i=1000591838901>
- Podbean: <https://www.podbean.com/ew/pb-ggx4b-135024a>

Hip Arthroplasty

- Spotify: <https://open.spotify.com/episode/1T9M9uPjWviJH9E4txN9AG?si=de7a599e633947ee>

- Apple: <https://podcasts.apple.com/gb/podcast/block-it-like-its-hot/id1657437198?i=1000597775761>
- Podbean: <https://www.podbean.com/ew/pb-3c7b8-137e15b>

Upper Limb Blocks (Could go at Stage 2 A, Stage 3 A, Stage 3i A)

Shoulder Blocks

- Spotify: <https://open.spotify.com/episode/3qKz9qhGdyB2Azz8H2VBaG?si=6c7a7e1b2aa642ac>
- Apple: <https://podcasts.apple.com/gb/podcast/block-it-like-its-hot/id1657437198?i=1000629606718>
- Podbean: <https://www.podbean.com/ew/pb-ivrt-14b987e>

Upper Limb Brachial Plexus

- Spotify: <https://open.spotify.com/episode/4btiEQ2bu3q43s7tsMqr2a?si=fdcbf1d19cfa42ab>
- Apple: <https://podcasts.apple.com/gb/podcast/block-it-like-its-hot/id1657437198?i=1000645938139>
- Podbean: <https://www.podbean.com/ew/pb-binte-1588c39>

Forearm Blocks

- Spotify: <https://open.spotify.com/episode/03cKfTsA1d8vMI8zePUcmV?si=3ee9c075c00143a0>
- Apple: <https://podcasts.apple.com/gb/podcast/block-it-like-its-hot/id1657437198?i=1000649302974>
- Podbean: <https://www.podbean.com/ew/pb-ui88i-15ae24b>

Fellowships

See RA-UK website for UK RA fellowships

International fellowship programmes

- <https://esraeurope.org/esra-approved-training-institutions/>
- <https://www.asra.com/the-asra-family/trainees/fellowship-directory>
- <https://www.aoraindia.com/fellowship-of-aora>
- <https://www.anaestheticfellowships.org/fellowships-by-country/australasia/australia>
- <https://usra.ca/meetings/fellowship.php>