

## APPENDICES

**Appendix 1.** The shortlist of 92 summary questions used for the prioritisation survey (i.e. those from which respondents were asked to choose their ten most important research priorities)

Theme	Summary question
MATERNITY	How can <b>pain relief during childbirth</b> be improved?
MATERNITY	How do epidurals affect <b>progress and outcomes</b> of labour (childbirth), and how can <b>adverse effects</b> be minimised?
MATERNITY	How can detection and management of <b>maternal bleeding</b> during childbirth be improved?
MATERNITY	How do anaesthetic interventions during pregnancy or around the time of birth <b>affect the baby</b> ?
MATERNITY	How can anaesthesia for <b>Caesarean sections</b> be improved?
MATERNITY	What anaesthetic strategies can reduce complications and deaths in <b>higher risk pregnancies</b> ?
CHILDREN	How can we reduce <b>pain after surgery</b> in children and newborns?
CHILDREN	How can we <b>reduce anxiety</b> in children undergoing surgery?
CHILDREN	What are the effects of anaesthesia on the <b>developing brain</b> ?
CHILDREN	How can <b>pre-operative assessment</b> for children be improved?
CHILDREN	How can we improve outcomes through <b>better monitoring</b> of children around the time of surgery?
CHILDREN	What <b>intravenous fluids</b> should we give children having surgery?
CHILDREN	What are the <b>long-term effects</b> of anaesthesia in babies?
CHILDREN	What can we do to improve outcomes for <b>higher risk children</b> having surgery?
CHILDREN	What is the best way to <b>organise anaesthetic and surgical services</b> for children?
ELDERLY CARE	How can the anaesthetic team improve outcomes for <b>hip fracture patients</b> ?
ELDERLY CARE	How can we reduce the effects of anaesthesia on <b>brain function</b> , particularly in the elderly?

ELDERLY CARE	What are the consequences of <b>low blood pressure</b> around the time of surgery, particularly in the elderly?
ELDERLY CARE	How can we reduce the <b>risks</b> of anaesthesia in elderly patients?
ELDERLY CARE	How can we <b>improve recovery</b> from surgery for elderly patients?
PERIOPERATIVE CARE DELIVERY	How can protocols, guidelines, checklists and care pathways <b>improve the safety and effectiveness</b> of anaesthesia?
PERIOPERATIVE CARE DELIVERY	How can operating <b>theatre efficiency</b> be improved?
PERIOPERATIVE CARE DELIVERY	How can patient care around the time of <b>emergency surgery</b> be improved?
PERIOPERATIVE CARE DELIVERY	What is the best way to <b>organise specialist surgical services</b> ?
PERIOPERATIVE CARE DELIVERY	How can <b>patient data</b> be used to improve perioperative care?
PERIOPERATIVE CARE DELIVERY	What <b>outcomes</b> should we use to <b>measure the 'success'</b> of anaesthesia and perioperative care?
PERIOPERATIVE CARE DELIVERY	How do we decide which <b>clinicians</b> should deliver the different elements of perioperative care?
TRAINING	How can we most effectively deliver training to improve <b>quality and safety</b> in anaesthesia and perioperative care?
TRAINING	Should anaesthetists receive more training on caring for patients with <b>specific medical problems</b> (eg Ehlers Danlos syndrome?)
TRAINING	Would greater use of <b>Physician's Assistants (Anaesthesia)</b> be beneficial?
TRAINING	What training or resources could improve perioperative care in <b>developing countries</b> ?
PAIN	How can anaesthesia and pain relief be improved for patients with <b>Ehlers Danlos Syndrome</b> ?
PAIN	How can pain control be improved in patients with <b>longstanding medical conditions</b> ?
PAIN	How can we better <b>predict the severity</b> of pain immediately after surgery?
PAIN	How can we improve our use of <b>drugs</b> to provide better pain relief before and after surgery?
PAIN	How can we use <b>non-drug therapies</b> to provide better pain relief before and after surgery?
PAIN	How can we better <b>assess perioperative pain</b> in adults and children?

PAIN	What are the risk factors for developing <b>chronic pain</b> after surgery?
PAIN	What can we do to stop patients developing <b>chronic pain</b> after surgery?
PAIN	What can we do to reduce the <b>side effects</b> of pain relief medications?
REGIONAL ANAESTHESIA	What are the risks and benefits of <b>epidural and spinal injections</b> for major abdominal surgery?
REGIONAL ANAESTHESIA	How can the effectiveness of <b>epidural and spinal injections</b> be improved?
REGIONAL ANAESTHESIA	How do we improve <b>involvement of patients</b> in decision-making about regional anaesthesia?
REGIONAL ANAESTHESIA	How can the <b>effectiveness</b> of regional (local) anaesthetic techniques (other than epidural and spinal injections) be improved?
REGIONAL ANAESTHESIA	For <b>which patients</b> does regional (local) anaesthesia give <b>better outcomes</b> than general anaesthesia?
REGIONAL ANAESTHESIA	How can the <b>risks and side effects</b> of regional (local) anaesthesia be minimised?
COMPLEMENTARY MEDICINE	How can <b>acupuncture</b> be used to improve recovery from surgery?
COMPLEMENTARY MEDICINE	How can <b>hypnosis</b> help control anxiety and improve recovery around the time of surgery?
COMPLEMENTARY MEDICINE	How can complementary medicine <b>help with recovery</b> from surgery?
COMPLEMENTARY MEDICINE	How can <b>psychological techniques</b> improve post-operative patient outcomes and satisfaction?
COMMUNICATION	How can we improve communication <b>between the teams</b> looking after patients having surgery?
COMMUNICATION	How could we improve communication between <b>healthcare staff and patients</b> before and after surgery?
COMMUNICATION	How can we promote <b>compassion and empathy</b> among staff caring for patients having surgery?
COMMUNICATION	What are the benefits of increased <b>patient and carer involvement</b> in perioperative care?
ACCIDENTAL AWARENESS	What is the best method for monitoring the <b>depth of anaesthesia</b> ?
ACCIDENTAL AWARENESS	How can accidental awareness under general anaesthesia be <b>detected and avoided</b> ?
ACCIDENTAL AWARENESS	What is the best way to <b>reduce the harm</b> caused by accidental awareness under general anaesthesia if it occurs?

LONG-TERM EFFECTS	How can anaesthetic technique and perioperative care help reduce the risk of <b>cancer recurrence</b> ?
LONG-TERM EFFECTS	What can be done to <b>speed up recovery</b> from anaesthesia?
LONG-TERM EFFECTS	What <b>long-term harm</b> may result from anaesthesia, in particular following <b>repeated anaesthetics</b> ?
ANXIETY / STRESS	How can we <b>reduce</b> anxiety and stress <b>before</b> an operation?
ANXIETY / STRESS	How can we <b>reduce</b> anxiety and stress <b>at the start</b> of an anaesthetic?
ANXIETY / STRESS	How can we <b>reduce</b> a patient's anxiety and stress immediately <b>after</b> an operation?
ANXIETY / STRESS	What can we do to help patients with <b>needle phobia</b> ?
ANXIETY / STRESS	Should patients routinely be offered <b>sedation for minor procedures</b> ?
PATIENT EXPERIENCE	How can the patient's experience <b>before</b> surgery be improved?
PATIENT EXPERIENCE	What should be <b>discussed with patients</b> before surgery, and what is the best <b>setting</b> for this discussion?
PATIENT EXPERIENCE	How can we better implement fasting guidelines to avoid <b>excessive pre-operative fasting</b> and improve the patient experience?
PATIENT EXPERIENCE	How can better information improve patients' <b>expectations of pain</b> after surgery?
PREPARING FOR SURGERY	What <b>fasting guidelines</b> should patients follow before surgery?
PREPARING FOR SURGERY	How can we improve medical assessment to determine the <b>risk of harm</b> after surgery?
PREPARING FOR SURGERY	How can <b>pre-operative assessment</b> for adults be improved?
PREPARING FOR SURGERY	How can <b>patient education programmes</b> improve outcomes after surgery?
PREPARING FOR SURGERY	How can <b>weight loss programmes</b> improve outcomes after surgery?
PREPARING FOR SURGERY	How can preoperative <b>nutritional modifications</b> improve outcomes after surgery?
PREPARING FOR SURGERY	How can preoperative <b>exercise or fitness training</b> , including physiotherapy, improve outcomes after surgery?
PREPARING FOR SURGERY	Does treating <b>pre-operative anaemia</b> improve outcomes after surgery?

<b>PREPARING FOR SURGERY</b>	How should a patient's <b>existing drug regime</b> be modified before and after surgery?
<b>ANAESTHETIC PRACTICE</b>	How can we minimise the <b>risk of physical injury</b> in patients undergoing anaesthetic?
<b>ANAESTHETIC PRACTICE</b>	How can the anaesthetist help reduce the risk of <b>complications after surgery</b> ?
<b>ANAESTHETIC PRACTICE</b>	What is the best choice of <b>intravenous fluids</b> to improve outcomes after surgery?
<b>ANAESTHETIC PRACTICE</b>	How can we better detect and treat <b>major bleeding</b> ?
<b>ANAESTHETIC PRACTICE</b>	Does <b>cardiac output monitoring</b> improve outcomes after surgery? How can we improve cardiac output monitoring?
<b>ANAESTHETIC PRACTICE</b>	How can we make <b>airway management</b> safer?
<b>RECOVERING FROM SURGERY</b>	What causes <b>nausea and vomiting</b> after surgery?
<b>RECOVERING FROM SURGERY</b>	How can we <b>prevent nausea and vomiting</b> after surgery? What is the <b>best treatment</b> if it occurs?
<b>RECOVERING FROM SURGERY</b>	What is the <b>impact of nausea and vomiting</b> after surgery on a patient's overall recovery?
<b>RECOVERING FROM SURGERY</b>	How can we <b>reduce complications</b> (adverse events) after surgery?
<b>RECOVERING FROM SURGERY</b>	Does post-operative <b>intensive care</b> improve outcomes in <b>higher risk patients</b> having major surgery?
<b>RECOVERING FROM SURGERY</b>	How should we <b>plan discharge</b> from hospital after surgery, and what would help patients recover at home after discharge?
<b>RECOVERING FROM SURGERY</b>	How can we <b>improve patient recovery</b> from surgery?
<b>RECOVERING FROM SURGERY</b>	How can we minimise the <b>side effects</b> patients experience after surgery and anaesthesia?
<b>RECOVERING FROM SURGERY</b>	Do <b>enhanced recovery programmes</b> (fast track surgery to speed up patient recovery) improve short and long-term outcomes?

**Appendix 2.** The 25 highest ranked questions from the prioritisation survey

<b>Research question</b>	<b>Overall rank</b>	<b>Clinician rank</b>	<b>Patient / carer rank</b>	<b>Theme</b>
How can we reduce the effects of anaesthesia on <b>brain function</b> , particularly in the elderly?	1	3	1	<b>ELDERLY CARE</b>
For <b>which patients</b> does regional (local) anaesthesia give <b>better outcomes</b> than general anaesthesia?	2	1	5	<b>REGIONAL ANAESTHESIA</b>
How can preoperative <b>exercise or fitness training</b> , including physiotherapy, improve outcomes after surgery?	3	5	3	<b>PREPARING FOR SURGERY</b>
Do <b>enhanced recovery programmes</b> (fast track surgery to speed up patient recovery) improve short and long-term outcomes?	4	2	14	<b>RECOVERING FROM SURGERY</b>
What <b>outcomes</b> should we use to <b>measure the 'success'</b> of anaesthesia and perioperative care?	5	4	12	<b>PERIOPERATIVE CARE DELIVERY</b>
Does post-operative <b>intensive care</b> improve outcomes in <b>higher risk patients</b> having major surgery?	6	7	7	<b>RECOVERING FROM SURGERY</b>
What are the effects of anaesthesia on the <b>developing brain</b> ?	7	9	4	<b>CHILDREN</b>
What are the consequences of <b>low blood pressure</b> around the time of surgery, particularly in the elderly?	8	8	11	<b>ELDERLY CARE</b>
What <b>long-term harm</b> may result from anaesthesia, in particular following <b>repeated anaesthetics</b> ?	9	12	2	<b>LONG-TERM EFFECTS</b>
Does <b>cardiac output monitoring</b> improve outcomes after surgery? How can we improve cardiac output monitoring?	10	6	33	<b>ANAESTHETIC PRACTICE</b>
What can we do to stop patients developing <b>chronic pain</b> after surgery?	11	13	8	<b>PAIN</b>
How can the anaesthetist help reduce the risk of <b>complications after surgery</b> ?	12	11	17	<b>ANAESTHETIC PRACTICE</b>
How can we <b>reduce complications</b> (adverse events) after surgery?	13	17	13	<b>RECOVERING FROM SURGERY</b>
How can we <b>improve recovery</b> from surgery for elderly patients?	14	19	9	<b>ELDERLY CARE</b>
How can operating <b>theatre efficiency</b> be improved?	15	10	27	<b>PERIOPERATIVE CARE DELIVERY</b>

What should be <b>discussed with patients</b> before surgery, and what is the best <b>setting</b> for this discussion?	16	28	6	<b>PATIENT EXPERIENCE</b>
How can we improve communication <b>between the teams</b> looking after patients having surgery?	17	27	10	<b>COMMUNICATION</b>
How can we most effectively deliver training to improve <b>quality and safety</b> in anaesthesia and perioperative care?	18	18	19	<b>TRAINING</b>
How can anaesthetic technique and perioperative care help reduce the risk of <b>cancer recurrence</b> ?	19	16	28	<b>LONG-TERM EFFECTS</b>
What is the best choice of <b>intravenous fluids</b> to improve outcomes after surgery?	20	15	32	<b>ANAESTHETIC PRACTICE</b>
How can patient care around the time of <b>emergency surgery</b> be improved?	21	14	37	<b>PERIOPERATIVE CARE DELIVERY</b>
How can we reduce the <b>risks</b> of anaesthesia in elderly patients?	22	21	23	<b>ELDERLY CARE</b>
How can <b>pre-operative assessment</b> for adults be improved?	23	20	35	<b>PREPARING FOR SURGERY</b>
How do epidurals affect <b>progress and outcomes</b> of labour (childbirth), and how can <b>adverse effects</b> be minimised?	24	24	30	<b>MATERNITY</b>
How can we <b>improve patient recovery</b> from surgery?	25	34	18	<b>RECOVERING FROM SURGERY</b>

**Appendix 3.** The top research priorities identified in the NIAA's 2009 research prioritisation exercise

1.	What interventions can prevent perioperative cardiac complications?
2.	Does a brief period of preoperative exercise training improve outcomes after major surgery?
3.	What perioperative management strategies improve outcome in head injury?
4.	What interventions prevent the development of chronic pain after surgery?
5.	Does an enhanced perioperative care package improve outcomes?
6.	Under what circumstances should aspirin be discontinued in the postoperative period?
7.	Would actively targeting preoperative blood pressure in the intraoperative period reduce the incidence of postoperative complications?
8.	Does conventional (as opposed to tight) glycaemic control improve perioperative outcome?
9.	What is the place of 'anti-neuropathic' pain medications in the treatment of postoperative pain?
10.	What are the best arrangements for the preoperative assessment of elective surgical patients?
11.	Would higher nurse to patient ratios during the first 48 h after operation reduce the complication rate after major abdominal surgery?
12.	What is the impact of same day surgery on primary care?
13.	How should patients for day surgery and 23 h surgery be selected?
14.	Does the use of locoregional anaesthesia prevent cancer recurrence?