

Appendix 4 Brief description of clinical details of adverse events occurring in 211 admissions, by corresponding maximum degree of preventability as judged by INAES physician reviewers*

Case	Description of adverse event†
<i>Virtually certain evidence of preventability</i>	
1	New onset atrial fibrillation, no anti-thrombotic therapy prescribed. Readmission with arterial embolism.
2	Pre-cardiac surgery, patient developed diarrhoea and antibiotic-resistant bacteraemia. Intra-operative perforation of ventricular wall. Post-operative sepsis; patient died.
3	Frank haematuria post traumatic catheterisation requiring longer duration of in-dwelling catheterisation. Patient also suffered infectious diarrhoea; norovirus positive.
4	Delayed diagnosis of ureteric calculus; multiple presentations with flank pain.
5	Pneumonia post laparotomy. Readmission with acute renal failure after vomiting and diarrhoea. Delayed diagnosis coeliac disease.
6	Delayed diagnosis bladder tumour; readmission for anaemia and per vaginal bleeding, with history of haematuria and previous ultrasound showing possible bladder tumour.
7	Delayed diagnosis Crohn's disease; multiple admissions with abdominal pain.
8	Delayed diagnosis small bowel obstruction; delay in repeat laparotomy despite persistent gastrointestinal signs and symptoms and abnormal abdominal radiographs.
9	Readmission for repeat surgery on metacarpal. Check radiograph requested after surgery but not performed.
10	Post-operative spinal wound infection and dehiscence requiring readmission and several wound washouts.
11	Missed diagnosis pneumothorax. Patient discharged home from emergency department with severe pleuritic chest pain, dyspnoea and no definitive diagnosis; subsequent review of initial chest radiograph revealed a pneumothorax.
12	Readmission with digoxin toxicity after inadequate monitoring of serum digoxin levels in the community and outpatient clinic.
13	Multiple readmissions with poor diabetic control in the setting of ongoing tooth abscesses and delay in definitive management.
14	Persistent/recurrent <i>Clostridium difficile</i> diarrhoea. Multiple admissions.
15	Multiple admissions with unstable angina whilst awaiting coronary artery bypass surgery.
16	Methicillin resistant <i>Staphylococcus aureus</i> (MRSA) colonisation during admission for urinary tract infection, no eradication action documented.
17	Delayed diagnosis of uterine adenocarcinoma in a patient with post-menopausal bleeding. Histology at hysteroscopy recommended further investigations which were not carried out.
18	Failure to adequately investigate original presenting symptoms led to readmission and a delayed diagnosis of diverticular disease and unnecessary appendicectomy.
19	Delay in diagnosis of pulmonary emboli. Initial admission with shoulder/back pain and haemoptysis treated as a respiratory tract infection, computerised pulmonary angiogram (CTPA) not performed. Readmitted with severe pleuritic

shoulder tip pain and haemoptysis – bilateral pulmonary emboli diagnosed on CTPA.

Strong evidence of preventability

- 20 Gluteus medius tendon avulsion post total hip joint replacement; readmitted for surgery.
- 21 Readmission with symptomatic hypertension. No management plan for hypertension discovered during previous admission for surgery.
- 22 Readmission with pneumonia, acute cholecystitis and congestive cardiac failure after discharge following surgery for hip fracture. Developed diarrhoea (*Clostridium difficile* positive) and pseudo-aneurysm of profunda femoris artery (adjacent to hip screw) requiring embolisation.
- 23 Diarrhoea after starting ciprofloxacin for urinary tract infection, *Clostridium difficile* negative, previous episode of diarrhoea with ciprofloxacin.
- 24 Patient developed norovirus infection and *Clostridium difficile* positive diarrhoea during admission for chronic obstructive pulmonary disease (COPD). Patient also found to be MRSA positive.
- 25 Readmission with pulmonary emboli and septicaemia; patient died. Failure to administer indicated prophylaxis for venous thromboembolism in previous admission.
- 26 Readmission with acute on chronic subdural haemorrhage after fall; patient died. During previous admission for acute subdural haemorrhage antiplatelet therapy was withheld and then restarted.
- 27 Readmission with haematuria and urinary tract infection after inappropriate removal of long-term indwelling urinary catheter and untreated urinary tract infection.
- 28 Delay in application of abduction brace after hip dislocation leading to delayed mobilisation. Delay in treatment of urinary tract infection despite symptoms and positive report.
- 29 Confusion after surgery, pain relief medication likely cause. Patient also had a post-operative lower respiratory tract infection and was readmitted with pneumonia.
- 30 Delayed surgery due to rapid atrial fibrillation, poor management of cardiac condition and communication between relevant specialties.
- 31 Loose stools; infectious diarrhoea. Patient desaturated during physiotherapy; lower lobe collapse. Warfarin stopped during admission. Readmission with stroke in atrial fibrillation; patient died.
- 32 Readmitted with an upper gastrointestinal bleed secondary to oesophageal varices. Warfarinised in previous admission for deep vein thrombosis despite new diagnosis of oesophageal varices.
- 33 Readmission with recurrent small bowel obstruction and persistent collapse/consolidation in both lower lobes; patient died. Inadequate follow-up plan from previous admission.
- 34 Several readmissions with grand mal seizures on background of alcohol abuse, not fully investigated, no anti-convulsant therapy prescribed on previous admission.
- 35 Hospital-acquired MRSA in the respiratory tract. Several readmissions for exacerbation of COPD with MRSA in sputum.
- 36 Readmission for treatment of dehydration and hypotension after previous admission for repair of fistula and ileostomy.
- 37 Septic arthritis post wiring of fracture.
- 38 Post-operative restlessness treated with haloperidol. Patient also developed
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	rapid atrial fibrillation (new onset), wound infections and pleural effusions. Patient was readmitted for aspiration of pleural effusion.
39	Post peripheral vascular surgery, neuropathic pain attributed to nerve damage intra-operatively.
40	Readmission for surgery after unsuccessful manipulation under anaesthetic for fractured wrist. Restricted range of movement and development of carpal tunnel syndrome at follow-up.
41	Recovery post abdominal surgery complicated by a fall and wrist fracture, pulmonary emboli and a sub-acute bowel obstruction.
42	<i>Escherichia coli</i> bacteraemia after catheterisation.
43	Delayed diagnosis of appendiceal mass over multiple presentations to hospital.
44	Post-operative wound haematoma and readmission for infection.
45	Delayed cholecystitis diagnosis leading to readmission.
46	MRSA colonisation of supra-pubic catheter.
47	Readmission with unresolved abdominal pain post trauma, not actively investigated during a previous admission and no definitive diagnosis made.
48	Post-operative MRSA wound infection; inappropriate antibiotic therapy resulted in a prolonged hospital stay and contributed to readmission.
49	Post-operative abdominal wound infection.
50	Abdominal surgery complicated by ischaemic necrosis of the anastomosis requiring return to theatre and abdominal wound infection.
51	Multiple readmissions post spinal surgery with wound infection.
52	Delayed diagnosis and management of strangulated hernia. Patient deteriorated after surgery and died of a likely pulmonary embolus.
53	Poor peri-operative management resulted in re-intubation due to respiratory acidosis (abnormal chest radiographs pre- and post-operatively without evidence of anaesthetic review), plus confusion, vomiting and diarrhoea.
54	Peri-operative pulmonary oedema and readmissions for <i>Clostridium difficile</i> diarrhoea.
55	Perforated gastric ulcer in a patient with cancer, on prednisone but no gastro-protection prescribed. Patient deteriorated despite surgery and died.
56	Upper gastrointestinal bleed after the patient was started on aspirin and the proton pump inhibitor stopped during admission for ischaemic stroke. Also developed <i>Clostridium difficile</i> diarrhoea.
57	Readmission with chest pain whilst awaiting appointment for coronary angiography.
58	Hospital-acquired pneumonia during admission; admission prolonged while waiting for a permanent pacemaker.
59	Readmission with confusion soon after discharge from surgical admission during which intermittent confusion was noted but required further investigation and discharge planning.
60	Readmission with anaemia and collapse soon after discharge from previous admission with similar symptoms.
61	Pulmonary embolism in patient with prior deep vein thrombosis and sub-therapeutic international normalised ratio (INR).
62	Repeat laparotomy for fistula repair and mesh removal (initial injury was small bowel perforation during lower section caesarean section).
63	Subclavian and axillary vein thrombosis likely due to inadequate care of central venous catheter.
64	Premature discharge home post laparotomy with abnormal serum electrolyte results indicating metabolic acidosis. Readmitted with severe sepsis secondary

	to an abscess.
65	Hepatic duct injury during laparoscopic cholecystectomy.
66	Wound infection post hydrocele repair. Scrotal area noted to be inflamed but no antibiotic therapy given. Readmitted with a necrotic wound.
67	Delayed diagnosis colon cancer; symptoms of constipation and rectal bleeding not investigated in previous acute surgical admission. Readmitted with perforated colon cancer and metastases.
68	Unsuccessful laparoscopy for tubal pregnancy; readmission for laparotomy and partial salpingectomy.
69	Chronic ulcer infected with MRSA during admission for ascites.
70	Inadequate discharge planning - ongoing vaginal bleeding in a patient on anticoagulation. Readmitted with further bleeding.
71	Post spinal surgery wound infection requiring wound washouts and a prolonged course of antibiotics.
72	Delayed diagnosis of hip fracture; admitted, no fracture seen, no follow up radiograph, continued pain, readmitted and fracture diagnosed.
73	Inadequate follow-up of renal profile post discharge; readmission with severe dilutional hyponatremia and recurrence of congestive cardiac failure.
74	Readmission in acute pulmonary oedema after chemotherapy admission and intravenous fluids to prevent side effects from tumour lysis.
75	Several episodes of sepsis attributed to central line infection, aspiration pneumonia and diarrhoea secondary to <i>Clostridium difficile</i> .
76	Delayed diagnosis of oesophageal candidiasis and benign stricture; inadequate investigation of gastrointestinal symptoms during previous admission, readmission with vomiting, dehydration and acute kidney injury.
77	Dislocation of intravenous access device and <i>Enterococcus</i> detected in blood culture.
78	Delay in definitive management of ischaemic heart disease resulted in myocardial infarction and several readmissions with cardiac failure.
79	Delayed diagnosis of hyperparathyroidism; multiple presentations with similar symptoms and admissions for ureteric calculi.
	<i>Preventability more than likely; more than 50-50 but close call</i>
80	Post-surgical upper lobe collapse and antibiotic-resistant bacteraemia. Readmission with high stoma output and acute renal failure.
81	Non-union and elbow stiffness post open reduction and internal fixation.
82	Pain post knee replacement; overhang of plate, requiring revision.
83	Readmission with pre-syncope; hypotensive in previous admission, medications not adjusted.
84	Readmission with recurrent pilonidal sinus.
85	Lobar pneumonia and aspiration post bowel surgery for adenocarcinoma; patient died.
86	Readmission with wound infection post incisional hernia repair.
87	Re-do open reduction and internal fixation fracture; displaced metalwork.
88	Readmission with recurrent pneumonia, no outpatient radiograph performed.
89	Melaena and rectal bleeding whilst on chemotherapy and an inappropriately high dose of heparin.
90	Several readmissions with vomiting and epigastric pain – known oesophagitis on gastro-protection but also receiving multiple gastric irritant drugs.
91	Several readmissions with atrial tachycardia and cardiac failure, eventual successful ablation.
92	Hospital-acquired <i>Pseudomonas</i> lower respiratory tract infection during

	admission for acute exacerbation of COPD.
93	Readmission with pneumonia and positive blood cultures. Reduced breath sounds noted on respiratory examination prior to discharge from previous admission.
94	Readmission with pneumonia and cardiac failure following admission for atrial fibrillation and cardiac failure; patient died.
95	Readmission post laparotomy with abdominal wound infection.
96	Pain secondary to screw migration at site of fracture; readmitted for removal of screw.
97	Post-operative fever, diarrhoea and vomiting.
98	Post lumbar puncture headache, admitted for blood patch.
99	<i>Clostridium difficile</i> diarrhoea and urinary tract infections during admission for hip fracture.
100	Readmission with infected knee post-operatively.
101	Readmission with colitis post abdominal surgery for ulcerative colitis; inadequate discharge planning - lack of gastroenterology follow-up.
102	In-hospital fall causing groin pain during admission for fall and confusion. Delay in orthopaedic review and access to hip protectors.
103	Readmissions for post-operative hydrocephalus and malfunctioning shunt after previous surgery for brain tumour.
104	Readmissions with abdominal pain and swelling at stoma site (multiple surgeries for Crohn's disease), requiring open drainage of frank pus.
105	Post nephrectomy wound infection and collection.
106	Intra-operative and post-operative blood loss after breast surgery, multiple readmissions for recurrent seroma.
107	Readmission with deep vein thrombosis after surgery for pathological fracture of femur.
108	Seizures (sub-therapeutic phenytoin level and sleep deprivation) and post-operative pleural effusions following cardiac surgery.
109	Recurrent admissions for cellulitis over graft site post coronary artery bypass surgery.
110	Delayed diagnosis and readmission with peripheral neuropathy; no neurology referral during first admission.
111	Post lumbar puncture headache.
112	Readmission post colectomy with nausea and vomiting.
113	Post-operative lower respiratory tract infection and MRSA-infected wound sinus; absence of follow-up MRSA screening caused postponement of the next stage of surgery.
114	Readmission following transurethral resection of the prostate with acute urinary retention and haematuria.
115	Urinary retention requiring intermittent self-catheterisation for a number of months post colorectal surgery.
116	Hypocalcaemia post sub-total thyroidectomy and cellulitis at a pressure point.
117	Post-operative lower respiratory tract infection.
118	Readmission with arterial thrombus post endarterectomy; subsequent bypass surgery complicated by compartment syndrome, ongoing wound healing problems and graft stenosis.
119	Readmission post repair of fractured elbow with wound infection.
120	Readmission with wound infection post anterior resection.
121	Readmission with pneumonia; likely healthcare-associated infection. MRSA acquired in previous admission.

122	MRSA colonisation after multiple previous admissions for ischaemic heart disease.
123	Revision of hip surgery due to displacement during original admission for hip fracture.
124	Urticarial rash secondary to pain relief medication prescribed post-operatively.
125	Pyrexia and generalised skin rash post-operatively; probable adverse drug reaction to antibiotics.
126	Delayed assessment by senior medical staff and delay in transfer to intensive care followed by rapid deterioration; patient died.
127	Acute myocardial infarction a few days after infliximab infusion.
128	Post-operative pneumonia, pulmonary oedema and respiratory failure. Hospital-acquired infection later in admission.
129	<i>Clostridium difficile</i> diarrhoea.
130	Post laparotomy wound dehiscence requiring return to theatre. Post-operative pulmonary oedema and ventilator-associated pneumonia.
131	Readmission post pilonidal sinus excision for further surgery.
132	Recurrent inguinal hernia requiring further admissions for surgery after initial repair.
133	Readmission with dizziness following admission with postural hypotension and blood pressure medications not altered.
134	Readmission with pneumonia following hospitalisation for exacerbation of COPD.
135	Readmission with pneumonia following prior admission for head injury.
136	Readmission with <i>Clostridium difficile</i> diarrhoea.
137	MRSA colonisation after recurrent hospital admissions.
138	Readmission with sepsis and <i>Clostridium difficile</i> diarrhoea after abdominal surgery.
139	Intravenous access device infection resulting in readmission.
140	Uterine perforation during tubal ligation and low blood pressure post-operatively.
141	Readmission with pulmonary oedema and lower respiratory tract infection (healthcare-associated infection).
142	Hospital-acquired pneumonia (?aspiration) during admission for falls and chronic subdural haematoma.
143	Readmissions for caesarean section wound infection and dehiscence.
144	Healthcare-associated pneumonia during admission for urinary sepsis.
145	Recent admission for delirium and dementia; admitted with fracture, developed MRSA septicaemia; patient died.
146	MRSA colonisation during admission for fractured hip.
147	Haematoma, wound infection and subsequent dehiscence at graft site after coronary artery bypass surgery.
148	Readmission after breast reconstruction surgery with wound haematoma.
149	Acute admission for inguinal hernia repair after repeat presentations to the Emergency Department with severe abdominal pain.
150	Femoral artery injury during cardiac surgery requiring laparotomy and blood transfusion; sequelae included anuric acute tubular necrosis and sepsis.
151	Pre-operative traumatic urinary catheterisation, patient required a suprapubic catheter post-operatively.
152	Post-surgery for a fractured hip, patient developed several pressure sores.
153	Prolonged admission for septic shock from severe subcutaneous tissue infection. Complications included healthcare-associated pneumonia, infectious

	diarrhoea, lymphoedema and neuropathic pain after extensive wound debridements.
154	Cardiorespiratory arrest possibly related to benzodiazepine treatment; patient died.
155	Febrile neutropenia secondary to chemotherapy treatment.
156	Readmission with anaemia and raised INR (warfarin continued at previous discharge despite anaemia). Further readmission with methicillin sensitive <i>Staphylococcus aureus</i> septicaemia.
157	Lower limb ulcers due to casting of leg in an at-risk patient, also diarrhoea and vomiting due to norovirus.
158	Hospital-acquired lower respiratory tract infection and septicaemia due to MRSA in an immunosuppressed patient; patient died.
159	Admission and readmission for <i>Clostridium difficile</i> diarrhoea and abdominal pain.
	<i>Preventability not quite likely; less than 50-50 but close call</i>
160	Recurrent hip prosthesis dislocations. Post-operative discharging hip sinus, glove tip excised from wound, readmissions for sepsis.
161	Peri-operative chest pain, anti-platelet medication stopped pre-operatively.
162	Post-operative bradycardia.
163	Post-operative haemorrhage; arterial bleeding noted in the muscle on the side of the incision.
164	Readmission post appendicectomy for pelvic collection.
165	Readmission post total abdominal hysterectomy with wound abscess.
166	Recurrent admissions for perineal wound infection post abdominoperineal resection.
167	Pneumothorax post bronchoscopy.
168	Post thyroidectomy hypocalcaemia.
169	Urinary retention and haematuria post transobturator tape surgery and cystoscopy.
170	Readmission for infected seroma post breast surgery.
171	Post open cholecystectomy wound collection.
172	Two healthcare-associated pneumonias during admission.
173	Methotrexate-induced pneumonitis in a patient with rheumatoid arthritis.
174	Autoimmune hepatitis and hypotension secondary to chemotherapy.
175	Readmission post tonsillectomy with secondary haemorrhage; bleeding vessel cauterised, aphthous ulcers noted.
176	Post-operative infection after open reduction and internal fixation of fracture; readmission for removal of plate.
177	Incisional hernia post abdominal surgery.
178	Readmission with recurrence of symptoms soon after previous admission for abdominal pain and dysuria.
179	Nausea and vomiting post chemotherapy.
180	Readmission for second hip dislocation (during physiotherapy).
181	Urinary retention post varicose veins surgery.
182	Anaemia and fever post laparoscopic appendicectomy for severe acute appendicitis. Pelvic floor mass noted on ultrasound, either haematoma or abscess.
183	Readmission with wound infection post excision of deep lesion on leg.
184	Drowsy post excision of recurrent pilonidal sinus under general anaesthesia.
185	Urinary retention; unsuccessful removal of indwelling catheter which had been inserted earlier on admission.

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- 186 Intra-operative haemorrhage and bile leak during excision of liver cyst.
187 Cerebrospinal fluid (CSF) leak and blood loss during spinal surgery. Post-operative infected CSF collection, meningitis, revision of surgery (teeth damaged during intubation). Readmission with low pressure headache and antibiotic-related neutropenia and nausea.

Slight to modest evidence for preventability

- 188 Post-operative nausea after daycase surgery for inguinal hernia repair under general anaesthetic.
189 Readmission with recurrence of epistaxis. History of raised blood pressure and ischaemic heart disease with stents, on antiplatelet therapy.
190 Multiple readmissions with discharging sinus after surgery for fistula.
191 Post-operative pneumonia and bilateral pleural effusions, and transfused for intra-operative blood loss following emergency surgery for perforated colon cancer.
192 Post-operative urinary tract infection.
193 Multiple episodes of urinary retention requiring catheterisation post vascular surgery, history of prostate cancer.

Virtually no evidence of preventability

- 194 Post septoplasty and turbinectomy nasal adhesions requiring further surgery.
195 Persistent post-operative finger numbness after wrist fixation for fracture.
196 Abdominal bleeding due to mesenteric tear during appendicectomy, noted to be secondary to inflammation of appendix to ileum mesentery.
197 Opioid-induced nausea during daycase procedure necessitated an overnight stay.
198 Multiple readmissions with wound infection after surgery on a comminuted fracture in an immuno-suppressed patient.
199 Post-chemotherapy anaemia, fever and transient rash.
200 Post-transrectal ultrasound biopsy leading to bacteraemia despite peri-procedure prophylactic antibiotics.
201 Readmission for polypectomy due to recurrent endometrial polyps on tamoxifen for breast cancer
202 Post cardiac surgery required circulatory support and suffered complications of pneumonia, pleural effusions, antibiotic-resistant bacteraemia; patient died.
203 Post cardiac surgery pleural fluid accumulation requiring readmission and drainage.
204 Readmission post thyroidectomy with minor thyroid cyst accumulation.
205 Neutropenic sepsis during admission for chemotherapy. Patient also developed muscle aches secondary to filgrastim.
206 Pneumothorax after fine needle aspiration of lung mass.
207 Readmission soon after discharge with new upper lobe pneumonia.
208 Post bronchoscopy fever, hypoxia and confusion, likely due to procedure as no organism identified.
209 Readmission with antibiotic-induced nausea.
210 Persistence of abdominal pain at outpatient follow-up after laparotomy and salpingo-oophorectomy
211 Intra-operative transient cardiac arrhythmias during daycase surgery resulted in need for observation overnight.

* Physician reviewers were asked to judge the evidence of preventability of adverse events using a 6-point scale, where 1 = virtually no evidence of preventability and 6 = virtually certain evidence for preventability (see Appendix 2). These judgements are based solely on the documentation contained in the patient chart and do not constitute a full investigation of the clinical scenario.

† An adverse event was defined as an unintended injury or complication resulting in disability at discharge, prolonged hospital stay or death, that was caused by healthcare management.