Appendix A: Adverse Event Definitions

**Flagged outcome:** death, unscheduled admission to hospital, unscheduled emergency department visit, unscheduled hospital clinic visit within 30 days.

**Adverse event:** an adverse outcome associated with emergency department management

**Preventable adverse event:** an adverse event caused by a health care management problem such as a diagnostic issue, management issue, unsafe disposition decision or suboptimal follow-up

**Diagnostic issue:** not acting on documented signs, symptoms, laboratory tests or imaging or not ordering an indicated diagnostic test

**Management issue:** suboptimal management plan despite accurate diagnosis or based on an inaccurate diagnosis

**Unsafe disposition decision:** patient placed at unnecessary risk of experiencing death or major disability by being sent home

**Suboptimal follow-up:** problems with follow-up arrangements led to the development of new symptoms, unnecessary prolongation of symptoms, an unscheduled return visit to the emergency department or a subsequent unscheduled hospitalization. (this could be due to inadequate availability of follow-up appointment, or due to inappropriate follow-up arrangements)

**Medication adverse effect:** patient experiences a symptom related to a medication regardless of whether the medication was appropriately prescribed or taken

**Procedural complication:** patient experiences adverse consequences of a procedure
Appendix B: ED Physician’s Discharge Decision Rationale

- Clinical judgement: 65.3%
- Specific clinical criteria: 22.1%
- Evidence-based guidelines: 9.6%
- Consulted literature: 3.0%
Appendix C: Description of Adverse Events

1. 67 year old palliative patient with ovarian cancer presented with 2 weeks of shortness of breath on minimal exertion. No chest pain, cough, sputum, hemoptysis, previous DVT or pulmonary embolism, peripheral edema. Well’s score 1.0. Discharged after normal cell count and electrolytes and chest x-ray showing moderate pleural effusion. Diagnosis: shortness of breath secondary to pleural effusion. Returned 20 days later with left leg edema, worsening shortness of breath and died in ED of pulmonary embolism.

2. 42 year old patient with history of schizophrenia, resident of psychiatric hospital presented with acute abdominal pain for one hour. No fever, nausea or vomiting. Nurse notes “red colour” in urine. Patient noted to be drowsy, uncooperative with exam but tender suprapubically. Elevated white blood cells of 13.8 but otherwise normal electrolytes and liver function tests. Urine dip showed only ketones. Abdominal x-ray showed moderate stool, nil else. Patient given soap suds enema with result and discharged with diagnosis of constipation. Returned following day with blood in stool, worsening abdominal pain and diagnosed by CT abdomen with colitis of undetermined etiology.

3. 44 year old patient with history of Crohn’s disease presented with 48 hours of right lower quadrant pain (10/10). No fever, nausea or vomiting. No change in bowel habit. Decreased appetite. Tachycardic (110) on exam, abdomen tender in right lower quadrant but no peritoneal signs. Complete blood count and electrolytes were normal and urine dip was negative. Abdominal x-ray showed moderate stool and a few air fluid levels but no obstruction. Patient treated with analgesics and discharged with diagnosis of abdominal pain not yet diagnosed. Patient returned 12 days later with increasing pain and not passing gas per rectum. Diagnosed with large bowel obstruction and referred to General Surgery.

4. 78 year old patient presented with fever (38.2), feeling unwell and generally weak with urinary irritative symptoms. No nausea and vomiting and able to eat and drink. Febrile in ED, HR 92 and blood pressure normal. Looked well, bilateral CVA and suprapubic tenderness. Urine dip positive for leukocytes, ketones, nitrates and blood. Given one dose of intravenous antibiotics and discharged with oral antibiotics, diagnosis: pyelonephritis. Returned 9 days later with generalized weakness and
**5.** 88 year old patient presented with chest pain, shortness of breath and palpitations. No fever, cough or vomiting. History of pacemaker insertion 3 days prior set for HR 70-110, with metoprolol dose reduced by half in previous week. Patient was tachycardic (153) with normal blood pressure. Clear chest, pitting edema bilaterally. ECG showed atrial fibrillation with ST depression in V5 and V6, chest x-ray was unremarkable. Serial cardiac enzymes negative. Patient treated with ASA and metoprolol with return to normal sinus rhythm. Cardiology consulted and refused. Patient discharged with diagnosis of rapid atrial fibrillation and possible pacemaker malfunction. Patient returned 7 hours later with nausea and palpitations. Daughter requesting admission for observation and respite. ECG showed atrial fibrillation with no ischemic changes. White blood cells high at 19, remaining cell count and electrolytes normal. Patient was given metoprolol and discharged with social work follow-up.

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<th><strong>6.</strong> 63 year old patient presented with abdominal pain and 5 days of diarrhea and vomiting. No blood. Also fatigue, decreased appetite, fever, chills and 10lbs weight loss in 2 weeks. Associated gait imbalance and dizziness. History of ventriculo-peritoneal shunt inserted 6 months prior for hydrocephalus. On exam patient was tachycardic (97) with a generally tender abdomen. Normal neurological exam. Normal complete cell count and electrolytes. CT head and shunt surveys unremarkable. Discharged with diagnosis of diarrhea not yet diagnosed and plan to follow-up with neurosurgery in one week. Patient returned 19 days later with confusion, increased unsteady gait, blurred vision and headache. Admitted to Neurosurgery with shunt infection.</th>
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<td><strong>7.</strong> 44 year old patient with history of hepatitis C and chronic abdominal pain presented with severe abdominal pain for 2 days with associated obstipation and vomiting. Feverish, no change in bowel habit. Tachycardic (108), normal blood pressure. On examination, in obvious pain, abdomen diffusely tender. White blood cells elevated at 13.5, otherwise unremarkable cell count and electrolytes, serum lactate 2.3. CT abdomen reported as negative. Improved after analgesia and discharged with chronic abdominal pain. Returned following day with increasing abdominal pain, nausea and...</td>
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vomiting, admitted to General Surgery for exploratory laparatomy.

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<td>40 year old patient presented with palpitations and exertional chest pain for 2 days, burning and heavy with no radiation. No cardiac risk factors other than 10 packyr history of smoking. No pulmonary embolism risk factors. Tachycardic (111) normal blood pressure and unremarkable physical examination. EKG NSR 81, PR depression and PR increased in aVR. Chest x-ray unremarkable and cardiac enzymes negative. No pericardial fluid on bedside ultrasound. Discharge diagnosis: query pericarditis, prescribed ibuprofen and cardiology follow up in a few weeks. Returned 5 days later referred by family doctor to ED for ongoing pain, shortness of breath and looking unwell. Patient concerned about tender thyroid nodule. Patient had a history of a thyroid nodule with previously normal biopsy and TSH. Complete cell count, electrolytes, d-dimer and cardiac enzymes negative. TSH low (0.02) EKG normal sinus rhythm 91. Admitted to Internal Medicine with hyperthyroidism.</td>
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<td>9.</td>
<td>57 year old patient with history of breast cancer being treated with radiation presented with fever, nausea, abdominal pain and loose stools for 4 days. Febrile in ED, otherwise normal vital signs and unremarkable physical examination. White blood cells borderline low (4.8) and anemic (Hb 113). Sodium and potassium low (139, 3.3), creatinine normal. Urine dip positive for nitrates, negative for leukocytes. Staff notes no dysuria or back pain but likely upper urinary tract infection. Discharged with diagnosis: UTI and antibiotics. Patient returns 3 weeks later with ongoing fever, malaise, chills and suprapubic pain. Left arm swollen and painful for one day. Blood culture drawn on initial visit was positive but never followed up. Patient admitted to Internal Medicine.</td>
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<td>10.</td>
<td>83 year old patient with history of coronary artery disease presented with 24 hours of sharp, pleuritic, non-radiating chest pain without any associated symptoms. Relieved by nitroglycerin. Normal vital signs, tender anterior chest. EKG and Chest X-ray unremarkable. Single set of cardiac enzymes negative. Discharged with diagnosis of musculoskeletal chest pain. Returned to ED 3 subsequent times and 6 days later on 4th visit is diagnosed with a non-ST elevation myocardial infarction and admitted to Cardiology for percutaneous coronary intervention.</td>
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