

Appendix A1. A bundle used by the Department of Ophthalmology to identify intraoperative complications mentioned in the surgeons' notes. This bundle has one search term and 51 additional terms and phrases to exclude to reduce the number of false positives when searching through the notes for a set of patients during a specified month.

Bundle Name: Surgical complications for ophthalmology

Description: To detect mentions of intraoperative surgical complications

Terms to include in search:

Complications

Terms to exclude from search:

"without any significant complications"
"low risk for any perioperative cardiac complications"
"risk of major cardiac complications"
"no history of anesthesia or operative complications"
"associated with postoperative pulmonary complications"
"no significant increased risk for postoperative pulmonary complications"
"complications of diabetes"
"uncontrolled, with neurologic complications"
"prevent other medical complications"
"Biomedical conditions and complications"
"cognitive conditions and complications"
"complications of surgery and staying"
"you can prevent these complications"
"type 2 with complications"
"Complications: No"
"Diabetes with neurologic complications"
"complications from influenza"
"complications, benefits"
"Intra-Sedation Complications Sedation Discharge Criteria"
"complications can occur"
"no postoperative complications"
"COMPLICATIONS: No complications"
"Denies complications"
"care was exercised to prevent any complications"
"no obvious complications"
"no apparent complications"

"no immediate complications"
"complications: no immediate complications"
"problems or complications"
"without any immediate complications"
"complications and alternatives"
"no preoperative or postoperative complications"
"risk and complications"
"risks and complications"
"low risk for any complications"
"risk of complications"
"risk of recurrence and complications"
"complications of the surgery were discussed"
"no operative complications"
"no intraoperative complications"
"complications were discussed"
"complications of surgery were discussed"
"or other complications"
"reduce side-effects and complications"
"without any complications"
"without complications"
"no complications"
"complications: (none)"
"complications: 0"
"complications: none"
"No post-op complications"

Appendix A2. A bundle showing 28 terms used to identify symptoms of apathy or indifference in a study looking at neuropsychiatric symptoms in dementia patients. The creator of this bundle had met with geriatric psychiatrists to obtain input about the kinds of behaviors/symptoms that they would mention in their notes. In this bundle the colors were assigned by the system.

Bundle Name: Apathy or Indifference

Description: These terms refer to apathy or indifference.

Terms to include in search:

- "flat mood"
- unmotivated
- apathy
- indifference
- indifferent
- unhappiness
- "lack of motivation"
- withdrawn
- "isolating self"
- isolate*
- Motivation
- motivate
- passivity
- passive
- disengaged
- "not engaged"
- Engaged
- "couch potato"
- Uninterested
- Disinterested
- Interested
- "flat affect"
- "lost interest"
- "does not initiate"
- Initiate
- Initiative
- "look* forward"
- Participate

Terms to exclude from search: None

Appendix A3. A bundle developed by the hematopoietic cell transplant (HCT) team to identify patients with infections for a study. Some of the terms representing similar concepts are grouped by color. This bundle contains 70 search terms.

Bundle Name: HCT-CI Infection

Description: hematopoietic cell transplant-comorbidity index - infection

Terms to include in search:

culture

abscess

"Quanti Feron"

PPD

"TB-Gold"

Mantoux

"TB Gold"

TST

"Tuberculin skin test"

"Tuberculin sensitivity test"

QuantiFeron

"Quanti-Feron"

"asymptomatic bacteriuria"

"symptomatic bacteriuria"

bacturia

"bacteria in the urine"

"urine bacteria"

bacteriuria

empiric

"acid fast bacilli"

"acid fast bacillus"

"acid-fast bacilli"

"acid-fast bacillus"

AFB

"TB test"

"purified protein derivative"

"positive PPD"

bacterimia

septic

bacteraemia

septicemia

setpecemia
septicemia
"positive blood culture"
"positive blood cultures"
"severe sepsis"
bactermia
"septic shock"
toxemia
urosepsis
bacterimic
bacteremic
sepsis
pneuonia
pneumonia
pnuemonia
pnemonia
peumonia
pnenomia
pneumona
pneumonaie
pneumonai
PNA
"miliary TB"
"Mycobacterium tuberculosis"
^"TB"
tuberculoma
"miliary tuberculosis"
Mycobacterium
"Tubercles Bacillus"
"disseminated TB"
mycobacteria
"disseminated tuberculosis"
tuberculosis
"fungal infection"
"fungal PNA"
"fungal pneumonia"
"fever of undertermined origin"

"fever of unknown origin"

FUO

Terms to exclude from search: None

Appendix B. Peer-reviewed publications assisted with the use of EMERSE, 2007–2014

Publication Title	The way EMERSE was used	Journal	Year of Publishing	PubMed Identifier
Anticoagulant Complications in Facial Plastic and Reconstructive Surgery	Data abstraction from operative and other notes for wound healing, infection, bleeding, return to the operating room, and other factors.	JAMA Facial Plast Surg	2014	25541679
Proton pump inhibitors and histamine 2 blockers are associated with improved overall survival in patients with head and neck squamous carcinoma.	To identify mentions of medications taken by the patients in the study.	Cancer Prev Res	2014	25468899
Transcutaneous biopsy of adrenocortical carcinoma is rarely helpful in diagnosis, potentially harmful, but does not affect patient outcome	To obtain data about staging, reason for biopsy, number of biopsies, institution performing the biopsy, complications, and other factors.	Eur J Endocrinol	2014	24836548
Engraftment syndrome after allogeneic hematopoietic cell transplantation predicts poor outcomes	To identify patients with engraftment syndrome using a set of 82 search terms	Biol Blood Marrow Transplant	2014	24892262
Osteochondromas after radiation for pediatric malignancies: a role for expanded counseling for skeletal side effects	To identify patient who developed osteochondromas after hematopoietic stem cell transplant and total body irradiation	J Pediatr Orthop	2014	23965908
Unbiased identification of patients with disorders of sex development	Chart reviews to locate features described in the notes that helped identify patients with disorders of sex development	PLoS One	2014	25268640
Changes in characteristics of hepatitis C patients seen in a liver centre in the United States during the last decade	Medical records review which included treatment status and clinical status at the time of presentation	J Viral Hepat	2014	25311830
Symptomatic subcapsular and perinephric hematoma following ureteroscopic lithotripsy for renal calculi	Chart review of clinical notes to identify patients whose surgery was complicated by a symptomatic hematoma	J Endourol	2014	25025758
Comparison of Second-Echelon Treatments for Ménière's Disease	Data abstraction for and identification of patients with Ménière's Disease	JAMA Otolaryngol Head Neck Surg	2014	25057891
A Combined Paging Alert and Web-Based Instrument Alters Clinician Behavior and Shortens Hospital Length of Stay in Acute Pancreatitis	Finding data of interest for chart reviews.	Am J Gastroenterol	2014	24594946
Adjuvant therapies, patient and tumor characteristics associated with survival of adult patients with adrenocortical carcinoma	Chart reviews for a variety of clinical parameters including stage, pathology data, evaluation of hormone secretion, surgical approach, and treatment modalities.	J Clin Endocrinol Metab	2014	24302750
Population-based incidence and prevalence of systemic lupus erythematosus: The Michigan Lupus Epidemiology & Surveillance (MILES) Program	Data abstraction for a variety of clinical characteristics for patients with systemic lupus erythematosus.	Arthritis Rheum	2014	24504809

The association between race and gender, treatment attitudes, and antidepressant treatment adherence	Eligibility determination based on chart review by considering factors such as clinically significant depression and having a new recommendation for antidepressant treatment.	Int J Geriatr Psychiatry	2014	23801324
Aneurysms in abdominal organ transplant recipients	To identify patients with mention of an arterial aneurysm in the clinical documentation among patients undergoing liver or kidney transplants over an 11 year period.	J Vasc Surg	2014	24246534
Suicide risk assessment received prior to suicide death by Veterans Health Administration patients with a history of depression	Data abstraction to identify suicide attempts and suicidal ideation	J Clin Psychiatry	2013	23561227
Head and neck squamous cell carcinoma in pregnant women	To identify all women who had a head and neck squamous cell carcinoma during pregnancy.	Head Neck	2013	22422571
Primary care for adults with Down syndrome: adherence to preventive healthcare recommendations	To identify patients who had Downs syndrome and one of several comorbidities including congenital heart disease, hypothyroidism, and atlanto-axial instability.	J Intellect Disabil Res	2013	22463763
Health care in adults with Down syndrome: a longitudinal cohort study	To identify patients with Down syndrome and one of several comorbidities.	J Intellect Disabil Res	2013	22775057
Rapid reduction of central line infections in hospitalized pediatric oncology patients through simple quality improvement methods	Data abstraction related to positive blood cultures in pediatric oncology patients with central line infections.	Pediatr Blood Cancer	2013	22522576
Hypertension, obesity and prostate cancer biochemical recurrence after radical prostatectomy	To identify patients who had hypertension or diabetes before their diagnosis of prostate cancer.	Prostate Cancer Prostatic Dis	2013	22907512
Risk factors for surgical site infection in pediatric cardiac surgery patients undergoing delayed sternal closure	To identify children who had delayed sternal closure among a larger cohort who had cardiac surgery.	J Thorac Cardiovasc Surg	2013	23102685
Prevalence and natural history of arachnoid cysts in adults	Data abstraction for adults with arachnoid cysts. EMERSE was used to search over 48,000 patient records.	J Neurosurg	2013	23140149
The factors associated with high-quality communication for critically ill children	To identify documentation of prognostic, goals-of-care conversations for patients in the pediatric intensive care unit.	Pediatrics	2013	23457155
Risk models for post-endoscopic retrograde cholangiopancreatography pancreatitis (PEP): smoking and chronic liver disease are predictors of protection against PEP	Data abstraction for factors such as alcohol and tobacco use, presence of cardiovascular disease, body mass index, and aspirin use.	Pancreas	2013	23532001
Racial differences in adherence to antidepressant treatment in later life	To aid in recruitment for patients with depression to study antidepressant adherence.	Am J Geriatr Psychiatry	2013	23602306
Utility of a clinical practice guideline in treatment of chylothorax in the postoperative congenital heart patient	To identify patients who had a chylothorax among those who had undergone congenital heart surgery.	Ann Thorac Surg	2013	23915583
Fidelity of administrative data when researching down syndrome	To identify patients with Downs syndrome who had not been classified as such with administrative codes.	Med Care	2013	23358384

A comparison of particulate and onyx embolization in preoperative devascularization of juvenile nasopharyngeal angiofibromas	Data abstraction for tumor stage, resection approach, blood transfusion requirements, blood loss, and other clinical outcomes.	Neuroradiology	2013	23748913
Describing the relationship between cat bites and human depression using data from an electronic health record	Verification of patients who had cat bites as well as determining other factors such how the cat was known to the person being bit.	PLoS One	2013	23936453
Accuracy of hospital administrative data in reporting central line-associated bloodstream infections in newborns	Identification of patients with central line associated bloodstream infections using a list of 22 terms and phrases.	Pediatrics	2013	23457153
Is early clinical evidence of autonomic shift predictive of infection after aneurysmal subarachnoid hemorrhage	To identify infectious complications in patients who had an Aneurysmal Subarachnoid Hemorrhage	J Stroke Cerebrovasc Dis	2013	24189451
Outcomes associated with balloon angioplasty for recurrent coarctation in neonatal univentricular and biventricular Norwood-type aortic arch reconstructions	To identify patient who developed a coarctation requiring intervention using six distinct terms and phrases.	Catheter Cardiovasc Interv	2013	24323365
Retrospective chart review of catatonia in child and adolescent psychiatric patients	Searched for key terms to identify patients with aggression, agitation, reduced or stereotyped movements, reduced speech, loss of appetite, and other clinical concepts.	Acta Psychiatr Scand	2012	22040029
Validation of key behaviourally based mental health diagnoses in administrative data: suicide attempt, alcohol abuse, illicit drug abuse and tobacco use	To identify patients with suicide attempts. Tobacco use, alcohol use, abuse, or dependence and illicit drug use was also sought.	BMC Health Serv Res	2012	22270080
Plasma biomarkers of lower gastrointestinal and liver acute GVHD	Data abstraction for clinical characteristics in a study seeking biomarkers to identify acute graft versus host disease.	Blood	2012	22286196
Natural history and imaging prevalence of cavernous malformations in children and young adults	Collected clinical and imaging data by searching through 15,000 patient records to identify patients with cavernous malformations.	J Neurosurg Pediatr	2012	22295927
TNF-inhibition with etanercept for graft-versus-host disease prevention in high-risk HCT: lower TNFR1 levels correlate with better outcomes	Data abstraction for patient characteristics and outcomes related to a study to prevent graft versus host disease.	Biol Blood Marrow Transplant	2012	22469883
Junctional ectopic tachycardia after infant heart surgery: incidence and outcomes	To identify patients who had junctional ectopic tachycardia and then conduct a chart review for further inclusion and exclusion criteria.	Pediatr Cardiol	2012	22585344
Triple receptor-negative breast cancer: imaging and clinical characteristics	To determine when the patients were last seen at the health system.	AJR Am J Roentgenol	2012	22826413
Predictors of suicide in patient charts among patients with depression in the Veterans Health Administration health system: importance of prescription drug and alcohol abuse	Data abstraction from the Veterans Affairs system for patients who had committed suicide. Clinical characteristics included diagnoses, substance abuse, life stressors, suicide attempts, and prior treatments.	J Clin Psychiatry	2012	23140657
Sleep-disordered breathing in multiple sclerosis	To search for polysomnographic reports among patients who had been seen at a multiple sclerosis clinic.	Neurology	2012	22895593

Retrospective database research in pediatric cardiology and congenital heart surgery: an illustrative example of limitations and possible solutions	To identify and conduct chart reviews in patients with junctional ectopic tachycardia.	World J Pediatr Congenit Heart Surg	2012	23804858
Do clinical characteristics predict the presence of small bowel angioectasias on capsule endoscopy?	Data abstraction for a variety of clinical parameters including history of anti-inflammatory therapy, presence of hypertension, and the presence of arteriovenous malformations.	Dig Dis Sci	2011	21153439
The effect of age on arteriovenous malformations in children and young adults undergoing magnetic resonance imaging	To identify patients with arteriovenous malformations from a set of nearly 15,000 patients.	Childs Nerv Syst	2011	21442267
Clinical course of sepsis in children with acute leukemia admitted to the pediatric intensive care unit	To identify patients admitted to the pediatric intensive care unit, as well as to identify those who had sepsis.	Pediatr Crit Care Med	2011	21478790
Prevalence and natural history of pineal cysts in adults	Data abstraction for adults with pineal cysts. EMERSE was used to search over 48,000 patient records.	J Neurosurg	2011	21780858
Chiari malformation Type I and syrinx in children undergoing magnetic resonance imaging	Data abstraction regarding Chiari Type I malformations and syrinx in children, by searching over 14,000 patient records.	J Neurosurg Pediatr	2011	21806364
Natural history of Chiari malformation Type I following decision for conservative treatment	Data abstraction for clinical outcomes in patients with Chiari malformations Type I.	J Neurosurg Pediatr	2011	21806365
Clofarabine and busulfan conditioning facilitates engraftment and provides significant antitumor activity in nonremission hematologic malignancies	Data abstraction for clinical characteristics.	Blood	2011	21841163
Regenerating islet-derived 3-alpha is a biomarker of gastrointestinal graft-versus-host disease	Data abstraction for clinical outcomes in a study to determine if regenerating islet-derived 3-alpha is a biomarker for graft versus host disease.	Blood	2011	21979939
Progression of noncirrhotic portal hypertension in a pediatric population	Data abstraction.	Journal of Clinical and Experimental Hepatology	2011	*
Should heart, lung, and liver transplant recipients receive immunosuppression induction for kidney transplantation?	Data abstraction for clinical characteristics about patients who had a liver, lung, or heart transplant.	Clin Transplant	2010	19222505
Obesity and angiolymphatic invasion in primary breast cancer	Data abstraction for clinical and pathology information for patients with breast cancer.	Ann Surg Oncol	2010	19898898
The natural history of pineal cysts in children and young adults	Data abstraction for clinical characteristics of patients with pineal cysts.	J Neurosurg Pediatr	2010	20121364
Frequency of CD4(+)CD25(hi)FOXP3(+) regulatory T cells has diagnostic and prognostic value as a biomarker for acute graft-versus-host-disease	Data abstraction to obtain clinical characteristics on patients with graft versus host disease.	Biol Blood Marrow Transplant	2010	20302964
Elafin is a biomarker of graft-versus-host disease of the skin	Data abstraction for patient characteristics in a study to identify a biomarker for graft versus host disease.	Sci Transl Med	2010	20371463

Prevalence and natural history of arachnoid cysts in children	Data abstraction regarding characteristics of arachnoid cysts. The authors scanned the records of over 11,700 patients using EMERSE.	J Neurosurg Pediatr	2010	20515330
Combination of thiopurines and allopurinol: adverse events and clinical benefit in IBD	Data abstraction for patients with irritable bowel disease who had received both thiopurines and allopurinol, including infections and other diagnoses.	J Crohns Colitis	2010	21122542
Implementation of the Quality Oncology Practice Initiative at a university comprehensive cancer center.	Data abstraction for cancer quality measures.	J Clin Oncol	2009	19487377
A biomarker panel for acute graft-versus-host disease	Data abstraction for clinical characteristics of patients with graft versus host disease.	Blood	2009	18832652
Marijuana use in potential liver transplant candidates	Data abstraction for patients with organ transplants.	Am J Transplant	2009	19067667
Outcomes after auto-SCT in African Americans with multiple myeloma	Data abstraction for clinical characteristics of patients with multiple myeloma.	Bone Marrow Transplant	2009	19139731
Alcohol use and cigarette smoking as risk factors for post-endoscopic retrograde cholangiopancreatography pancreatitis	Data abstraction using a wide variety of search terms related to smoking, pancreatitis, and other comorbid conditions.	Clin Gastroenterol Hepatol	2009	19168153
Long-term outcomes following myeloablative allogeneic transplantation for multiple myeloma compared to autologous transplantation and the impact of graft-versus-myeloma effect.	Data abstraction to identify factors related to survival in patients with graft versus host disease.	Bone Marrow Transplant	2009	19204708
Right-sided congenital diaphragmatic hernia: high utilization of extracorporeal membrane oxygenation and high survival	Data abstraction for patient with a congenital diaphragmatic hernia regarding birth history, anatomy, extracorporeal membrane oxygenation use, details about the surgery, and outcomes.	J Pediatr Surg	2009	19433162
Chylothorax after congenital diaphragmatic hernia repair	Data abstraction for patients with congenital diaphragmatic hernia including details about the surgery and outcomes.	J Pediatr Surg	2009	19524736
Combination drug therapy improves compliance of the neurogenic bladder	Data abstraction for patient information including neurological disease status and function, and urological surgeries.	J Urol	2009	19616807
Etanercept plus methylprednisolone as initial therapy for acute graft-versus-host disease	Data abstraction for clinical outcomes related to a trial to treat graft-versus-host disease.	Blood	2008	18042798
Incremental costs of post-liver transplantation complications	Data abstraction to determine outcomes related solid organ transplantation.	J Am Coll Surg	2008	18155573
Biliary complications following liver transplantation in the model for end-stage liver disease era: effect of donor, recipient, and technical factors	Data abstraction for liver transplant patients.	Liver Transpl	2008	18161843
Comparison of histidine-tryptophan-ketoglutarate and University of Wisconsin preservation in renal transplantation	Data abstraction for factors related to organ transplants.	Am J Transplant	2008	18162093

The effects of donor and recipient practices on transplant center finances	Data abstraction about medical conditions and other donor characteristics related to organ transplants.	Am J Transplant	2008	18294154
Financial implications of surgical complications in pediatric liver transplantation	Data abstraction for patient characteristics regarding pediatric solid organ donor transplantation.	Pediatr Transplant	2008	18307665
Early urologic complications after pediatric renal transplant: a single-center experience	Data abstraction regarding kidney donor and recipient characteristics.	Transplantation	2008	19077890
Is routine ureteral stenting cost-effective in renal transplantation?	Data abstraction for patients with urinary complications.	J Urol	2007	17937936

* Article not in PubMed. DOI: 10.1016/S0973-6883(11)60234-X