

Supplement Table 1: Categorization of body systems and distribution of **symptoms at** index ED visit and **reported** MOIDs.

Body System	Symptoms	Diagnoses/Conditions (MOIDS & Final)
Allergy/Immunology	Hives	Anaphylaxis
Behavioral/Psychiatric	Anxiety	Conversion Disorder
Cardiology	Chest Pain Syncope	Anomalous left coronary artery from the pulmonary artery Arrhythmia Bacterial Endocarditis Cardiac tamponade Coarctation of aorta Hypoplastic heart Myocarditis Pericardial effusion Pulmonary artery stenosis Viral Myocarditis
Central Nervous System (CNS)	Headache Seizure Loss of sensation Altered mental status	Abscess, Intracranial Acute flaccid myelitis AV Malformation Botulism Chorea Meningitis Multiple Sclerosis Oculogyric crisis Pseudo tumor cerebri Seizure Shunt Malfunction Stroke Thrombosis of Basilar artery Venous sinus thrombosis
Dermatology	Rash	Impetigo Non-Specific rash
Gastrointestinal (GI)	Abdominal Pain Vomiting Constipation Diarrhea Blood in stool Dark Stool Difficulty swallowing	Acute Gastroenteritis Appendicitis Bowel Obstruction Crohn's Disease Cystic Mass Foreign Body GERD Hirschsprung's Disease Intestinal Invagination Intussusception Liver Failure

		<p>Malrotation Meckel Diverticulum Malfunction of G-tube Necrotizing enterocolitis Pancreatitis Periappendicial abscess Pyloric Stenosis Volvulus</p>
Genitourinary (GU)	<p>Dysuria Flank pain Hematuria Infrequent menses Proteinuria Testicular pain Vaginal discharge</p>	<p>Abscess pelvic Acute renal failure Chlamydia Hematocolpos Hemolytic uremic syndrome Hyperkalemia Imperforate hymen Nephrotic syndrome Ovarian torsion Pregnancy, intrauterine Single kidney renal failure Testicular torsion Urachal cyst Urinary Tract Infection (UTI)</p>
Hematology/Oncology	<p>Anemia Nosebleed</p>	<p>Acute lymphoblastic leukemia Acute Myeloid Leukemia Aplastic anemia crisis Hemophagocytic lymphohistiocytosis Burkitt's lymphoma Cancer of the ovaries Ewing Sarcoma Immune thrombocytopenia Neutropenia Henoch-Schonlein purpura Splenic sequestration Tumor Abdomen Tumor anterior mediastinum Tumor Brain Tumor spinal cord</p>
Infection	<p>Fever Congestion Cough Runny nose Sore throat</p>	<p>Abscess Abdominal Abscess Cerebral Abscess Neck Abscess Retropharyngeal Abscess Thigh Bacterial meningitis Clostridium Perfringens</p>

		Disseminated HSV sepsis Lemierre's disease Lyme disease Malaria Mastoiditis Measles Osteomyelitis Peripheral neuropathy Pertussis Sepsis Septic arthritis Septic Hip Syphilis Toxic shock syndrome Wound Infection
Inflammation	Knee pain Limp Shoulder pain	Kawasaki disease Transient synovitis of the hip
Musculoskeletal	Arm pain Back pain Elbow Swelling Leg pain Limp Swelling of chest	Pectus carinatum Perthes disease Slipped Capital Femoral Epiphysis (SCFE)
Ophthalmology	Eye swelling Red eye	Conjunctivitis Keratitis
Respiratory	Respiratory distress Cough Difficulty breathing Difficulty swallowing Noisy breathing Stridor Wheezing	Pneumonia Airway Foreign body Pulmonary embolism Bacterial tracheitis Pneumothorax Aspiration Pneumonia Empyema Bronchiolitis Abscess Retropharyngeal
Trauma	Arm pain Back pain Bruise Chest injury Contusion Fall Head injury Knee pain Laceration Limp Motor vehicle injury	Fracture Clavicular Fracture Elbow including supracondylar fracture Fracture Femur Fracture Hip Fracture Radius Fracture Radius Ulna Fracture Skull Fracture Tibia Fracture Wrist Fracture Humerus

	Neck pain Pain Shoulder Pain	Laceration Liver Laceration Non accidental trauma (NAT) Retained Foreign body Supracondylar fracture
Other	Abnormal blood test Choking Fussiness Irritability Persistent crying	Rickets Hypernatremic dehydration

Supplement Table 2: Distribution of Contributory factors for the entire study and stratified by participating networks

	All networks combined <i>n</i> (%)	PECARN (<i>n</i> =143, 35.2%)	PEMCRC (<i>n</i> =122, 30.1%)	PERC (<i>n</i> =67, 16.7%)	PERUKI (<i>n</i> =37, 9.1%)	RISeuP (<i>n</i> =28, 6.9%)	REPEM (<i>n</i> =9, 2.2%)
Patient-Provider Encounter	240 (59.1%)	97 (67.8%)	61 (50.0%)	45 (67.2%)	24 (64.9%)	10 (35.7%)	3 (33.3%)
a. Problems with history	166 (69.1%)	66 (68.0%)	48 (94.1%)	33 (73.3%)	14 (58.3%)	4 (40.0%)	1 (33.3%)
• Incomplete or inadequate history	84 (35.0%)	36 (37.1%)	21 (34.4%)	15 (33.3%)	8 (33.3%)	3 (30.0%)	1 (33.3%)
• Misinterpreted or ignored physical historical findings	82 (34.1%)	30 (30.9%)	27 (44.2%)	18 (40.0%)	6 (25.0%)	1 (10.0%)	0 (0.0%)
b. Problems with physical examination	188 (78.3%)	70 (72.2%)	47 (77.0%)	40 (88.8%)	20 (83.3%)	10 (100.0%)	1 (33.3%)
• Incomplete or inadequate physical exam	77 (32.1%)	33 (34.0%)	16 (26.2%)	16 (35.5%)	9 (37.5%)	2 (20.0%)	1 (33.3%)
• Historical findings misinterpreted or ignored	111 (46.3%)	37 (38.1%)	31 (50.8%)	24 (53.3%)	11 (45.8%)	8 (80.0%)	0 (0.0%)
c. Failure to review previous documentation	14 (5.8%)	3 (3.1%)	6 (9.8%)	2 (4.4%)	1 (4.1%)	1 (10.0%)	1 (33.3%)
d. Failed to order an indicated diagnostic test	94 (39.2%)	32 (32.9%)	25 (40.9%)	20 (44.4%)	12 (50.0%)	4 (40.0%)	1 (33.3%)
e. Other (such as unnecessary procedure/tests performed)	41 (17.1%)	18 (18.5%)	10 (16.3%)	6 (13.3%)	6 (25.0%)	1 (10.0%)	0 (0.0%)
Diagnostic Tests	155 (38.2%)	48 (33.6%)	58 (47.5%)	30 (44.8%)	9 (24.3%)	5 (17.9%)	5 (55.6%)
a. not performed at all	41 (26.4%)	12 (25.0%)	11 (18.9%)	9 (30.0%)	3 (33.3%)	4 (80.0%)	2 (40.0%)
b. not performed correctly	5 (3.2%)	1 (2.0%)	2 (3.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (40.0%)
c. not interpreted correctly	35 (22.5%)	9 (18.7%)	12 (20.6%)	12 (40.0%)	1 (11.1%)	1 (20.0%)	0 (0.0%)
d. Misidentification of sample	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
e. Misinterpretation of test results	26 (16.7%)	14 (29.1%)	6 (10.3%)	3 (10.0%)	1 (11.1%)	0 (0.0%)	2 (40.0%)
f. Other	51 (32.9%)	15 (31.2%)	24 (41.3%)	8 (26.6%)	3 (33.3%)	1 (20.0%)	0 (0.0%)
Patient-Related Factors	104 (25.6%)	39 (27.3%)	27 (22.1%)	19 (28.4%)	11 (29.7%)	4 (14.3%)	4 (44.4%)
a. Delay in seeking care	2 (1.9%)	0 (0.0%)	1 (3.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (25.0%)
b. Language barriers	12 (11.5%)	2 (5.1%)	5 (18.5%)	2 (10.5%)	3 (27.2%)	0 (0.0%)	0 (0.0%)
c. Caregiver factors (absent, adversarial, or incomplete history)	47 (45.1%)	17 (43.5%)	13 (48.1%)	11 (57.8%)	2 (18.1%)	1 (25.0%)	3 (75.0%)
d. Left against medical advice	1 (0.9%)	1 (2.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
e. Other	53 (50.9%)	19 (48.7%)	12 (44.4%)	9 (47.3%)	9 (81.8%)	3 (75.0%)	1 (25.0%)
Follow-Up Tracking	48 (11.8%)	13 (9.1%)	13 (10.7%)	8 (11.9%)	2 (5.4%)	10 (35.7%)	2 (22.2%)
a. Problems with follow-up of abnormal diagnostic test results	14 (29.1%)	3 (23.0%)	3 (23.0%)	4 (50.0%)	1 (50.0%)	2 (20.0%)	1 (50.0%)

b. Problems with scheduling of appropriate and/or timely follow-up visits/referral	17 (35.4%)	1 (7.6%)	5 (38.4%)	3 (37.5%)	0 (0.0%)	6 (60.0%)	2 (100.0%)
c. Other	19 (39.5%)	8 (61.5%)	5 (38.4%)	1 (12.5%)	1 (50.0%)	4 (40.0%)	0 (0.0%)
Consultations	45 (11.1%)	10 (7.0%)	16 (13.1%)	5 (7.5%)	10 (27.0%)	3 (10.7%)	1 (11.1%)
a. Problems (lack of access or delays) in obtaining consultation	10 (22.2%)	4 (40.0%)	2 (12.5%)	1 (20.0%)	0 (0.0%)	2 (66.6%)	1 (100.0%)
b. Consultant or an "experienced expert" did not lay hands on patient	16 (35.5%)	3 (30.0%)	6 (37.5%)	0 (0.0%)	6 (60.0%)	1 (33.3%)	0 (0.0%)
c. Communication breakdown/Lack of appropriate response from consultants in the ED	14 (31.1%)	3 (30.0%)	3 (18.7%)	2 (40.0%)	6 (60.0%)	0 (0.0%)	0 (0.0%)
d. Contradictory recommendations from several members of same service	2 (4.4%)	0 (0.0%)	2 (12.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
e. Contradictory recommendations from different consulting services	6 (13.3%)	0 (0.0%)	3 (18.7%)	0 (0.0%)	1 (10.0%)	2 (66.6%)	0 (0.0%)
Miscellaneous Factors	133 (32.8%)	45 (31.5%)	42 (34.4%)	20 (29.9%)	11 (29.7%)	12 (42.9%)	3 (33.3%)
a. Workload	47 (35.3%)	14 (31.1%)	10 (23.8%)	12 (60.0%)	4 (36.3%)	8 (66.6%)	0 (0.0%)
• Workload was too high	47 (35.3%)	14 (31.1%)	10 (23.8%)	12 (60.0%)	4 (36.3%)	7 (58.3%)	0 (0.0%)
• Workload was too low	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (8.3%)	0 (0.0%)
b. Lack of resources – such as less nursing, respiratory therapists, etc.	12 (9.0%)	1 (2.2%)	5 (11.9%)	3 (15.0%)	3 (27.2%)	0 (0.0%)	0 (0.0%)
c. Workload was complex (high case severity mix in the ED)	33 (24.8%)	7 (15.5%)	14 (33.3%)	6 (30.0%)	2 (18.1%)	3 (25.0%)	1 (33.3%)
d. Patients who arrive with a "known" diagnosis or have been worked up for a diagnosis prior to the index ED visit, i.e. have been assigned a diagnostic label	59 (44.3%)	20 (44.4%)	18 (42.8%)	8 (40.0%)	6 (54.5%)	6 (50.0%)	1 (33.3%)
e. Distractions – too many phone calls/interruptions, etc.	22 (16.5%)	7 (15.5%)	6 (14.2%)	3 (15.0%)	3 (27.2%)	3 (25.0%)	0 (0.0%)
f. Institutional practices and policies	14 (10.5%)	4 (8.8%)	2 (4.7%)	3 (15.0%)	1 (9.0%)	2 (16.6%)	2 (66.6%)
g. Legal factors	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

The gray highlighted rows are the sum of participants who have selected the primary contributing factors for the MOID. For each primary contributing factor, the respondent had the option of specifying multiple sub-categories.

Within each column, percentages do not sum to 100% because participants could select more than one response.

Supplement Figure 1: Impact (harm) of MOID on the patient