Radiology

Claims Data Snapshot

2023

MedPro Group

MLMIC
MLMIC Insurance Company
a Berkshire Hathaway company

Introduction

This publication begins with insight into frequency and financial severity profiles by specialty. Then follows an analysis of aggregated data from clinically coded cases opened between 2012-2021 in which Radiology is identified as the primary responsible service.

Of note, Interventional Radiology, Neuroradiology and Nuclear Medicine are included.

See page 6 for more detail related to overall case volume.

Keep in mind…

A clinically coded malpractice case can have more than one responsible service, but the "primary responsible service" is the specialty that is deemed to be most responsible for the resulting patient outcome.

Our data system, and analysis, rolls all claims/suits related to an individual patient event into one case for coding purposes. Therefore, a case may be made up of one or more individual claims/suits and multiple defendant types such as hospital, physician, and other healthcare professionals.

Cases that involve attorney representations at depositions, State Board actions, and general liability cases are not included.

This analysis is designed to provide insured doctors, healthcare professionals, hospitals, health systems, and associated risk management staff with detailed case data to assist them in purposefully focusing their risk management and patient safety efforts.
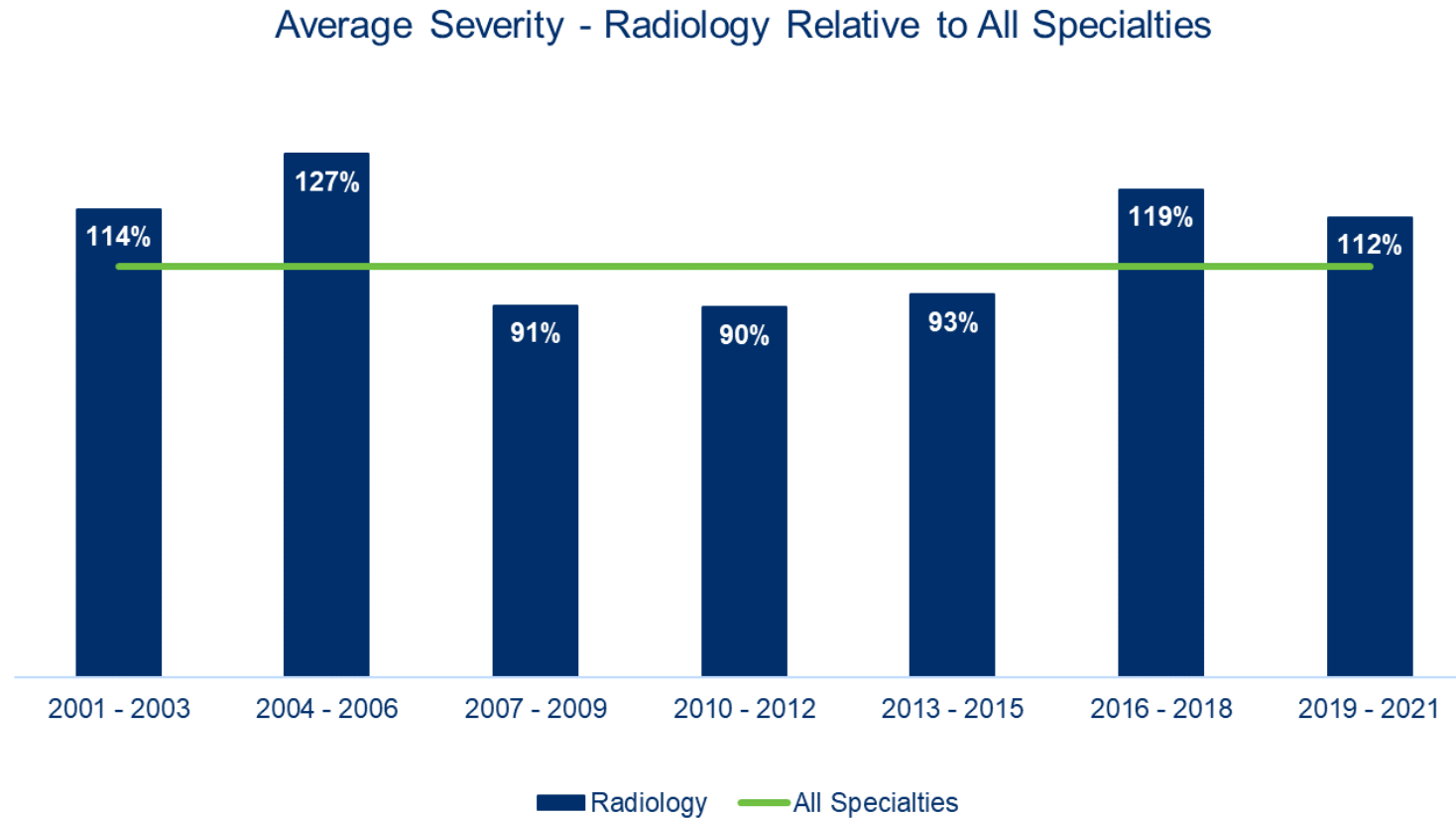
Specialty benchmarking

Specialties have different frequency and financial severity profiles which combine to produce differing risk levels.

Severity Tier				
	High	Hematology/Oncology, Pathology, Pediatrics	Anesthesiology, Neurology	Emergency Medicine, Neurosurgery, OB/GYN
	Medium	Family Medicine, Nephrology, Physiatry, Urgent Care	Cardiology, ENT, Gastroenterology, Internal Medicine	Cardiovascular Surgery, General Surgery, Orthopedic Surgery, Radiology, Urology
	Low	Allergy, Dermatology, Occupational Medicine, Psychiatry, Rheumatology	Ophthalmology, Plastic Surgery, Pulmonology	Hospitalists
		Low	**Medium**	**High**
		Frequency Tier		

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Specialty trends – Radiology

Radiology has an average financial severity per case and a higher claim frequency compared to all specialties.

Average Severity - Radiology Relative to All Specialties

Year	Radiology
2001 - 2003	114%
2004 - 2006	127%
2007 - 2009	91%
2010 - 2012	90%
2013 - 2015	93%
2016 - 2018	119%
2019 - 2021	112%

■ Radiology — All Specialties

Frequency Tier
High
Medium
Low

Source: MedPro Group Physician & Surgeon Claim Experience & Analysis

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Key Points - Clinically Coded Data

- **Diagnosis-related allegations** account for almost three-fourths of radiology case volume and the majority of dollars paid*. Cancers are most commonly missed, followed by fractures and traumatic injuries. These cases commonly reflect breaks all along the diagnostic process of care continuum, but most often during the diagnostic process phase of test performance, interpretation and communication of results.

- **Medical treatment allegations most often involve procedural-related issues.** Mammogram-related cases, stent placements, safety issues arising before/during/after MRIs, and breast biopsies are most common. These procedural cases can be impacted by delayed recognition of complications, while management cases most often reflect issues with selection of the most appropriate procedure for the patient, and appreciating and reconciling symptoms and test results.

- **Patient environment cases,** while only accounting for 6% of the case volume, **should still be considered in terms of ensuring adequate patient safety processes are in place** to protect patients from falls, burns, and other injuries during the performance of procedures and diagnostic testing.

- **Contributing factors, which are multi-layered issues or failures in the process of care that appear to have contributed to the patient's outcome**, and/or to the initiation of the case, provide valuable insight into risk mitigation opportunities. Clinical judgment factors, specifically misinterpretation of diagnostic studies, inadequate patient assessment processes, and also events arising during night/weekend/holiday shifts are key drivers of both clinical and financial Radiology case severity.

Major Allegations & Financial Severity

INTRODUCTION | KEY POINTS | **GENERAL DATA ANALYSIS** | CONTRIBUTING FACTORS | FOCUSED DATA ANALYSIS | CASE EXAMPLES | RISK MITIGATION

Each case reflects one major allegation category. Categories are designed to enable the grouping and analysis of similar cases and to drive focused risk mitigation efforts. The coding taxonomy includes detailed allegation sub-categories; insight into these is noted later in this report.

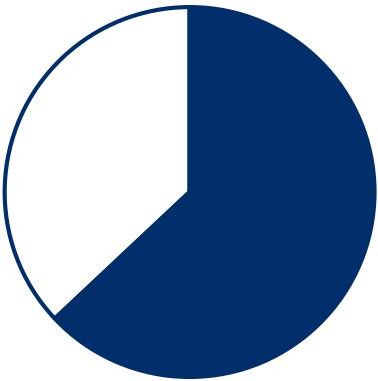See footnote below for the distribution of Radiology specialties included in this analysis.
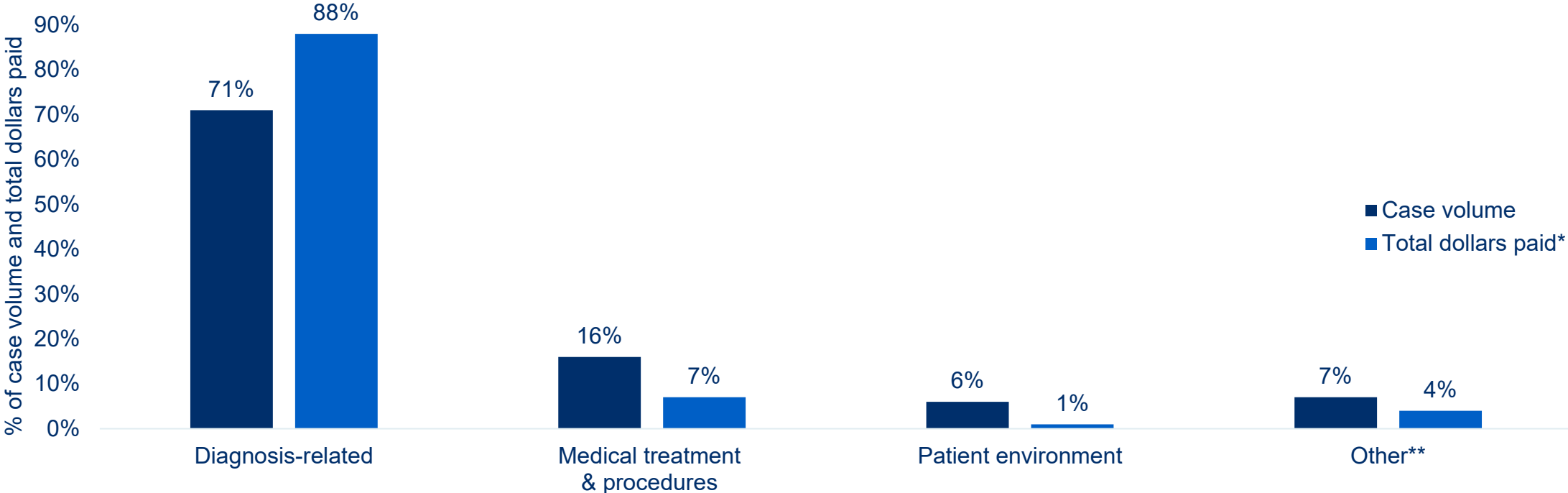
MedPro Group + MLMIC cases opened 2012-2021, Radiology as responsible service (**total N=1240**; Radiology=1099; Interventional Radiology=133; Interventional Neuroradiology=6; Nuclear Medicine=2)); *Total dollars paid = expense + indemnity; **Other includes allegations for which no significant case volume exists
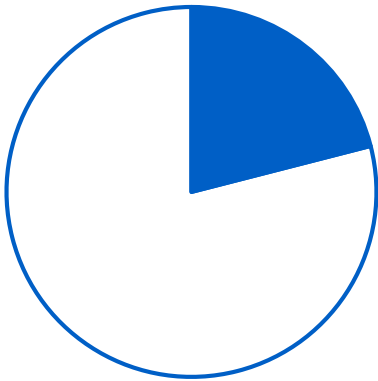
Clinical Severity*

Clinical Severity Categories	Sub-categories	% of case volume
LOW	Emotional Injury Only	4%
	Temporary Insignificant Injury	
MEDIUM	Temporary Minor Injury	36%
	Temporary Major Injury	
	Permanent Minor Injury	
HIGH	Significant Permanent Injury	60%
	Major Permanent Injury	
	Grave Injury	
	Death	

Typically, the higher the clinical severity, the higher the indemnity payments are, and the more frequently payment occurs.

MedPro Group + MLMIC cases opened 2012-2021, Radiology as responsible service (N=1240); *Severity codes reflect National Association of Insurance Commissioners (NAIC) injury severity scale
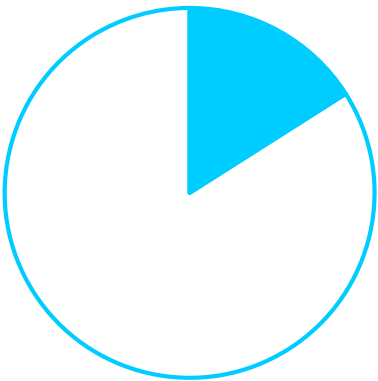
Claimant Type & Location

Top Locations	% of case volume
Radiology	38%
Imaging*	30%
Emergency department	15%
Other special procedure areas**	4%

Ambulatory
63%

Emergency
21%

Inpatient
16%

MedPro Group + MLMIC cases opened 2012-2021, Radiology as responsible service (N=1240); *Includes CT & echocardiogram; **Includes angiography and interventional radiology

Contributing Factors

"Contributing factors reflect both provider and patient issues. They denote breakdowns in technical skill, clinical judgment, communication, behavior, systems, environment, equipment/tools, and teamwork. The majority are relevant across clinical specialties, settings, and disciplines; thus, they identify opportunities for broad remediation."

Contributing Factors

Despite best intentions, processes designed for safe patient outcomes can, and do, fail.

Contributing factors are multi-layered issues or failures in the process of care that appear to have contributed to the patient's outcome, and/or to the initiation of the case, or had a significant impact on case resolution.
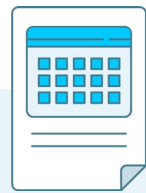
Multiple factors are identified in each case because generally, there is not just one issue that leads to these cases, but rather a combination of issues.

| Administrative | Behavior-related | Clinical environment | Clinical judgment | Clinical systems | Communication | Documentation | Supervision | Technical skill |

Contributing Factor Category Definitions

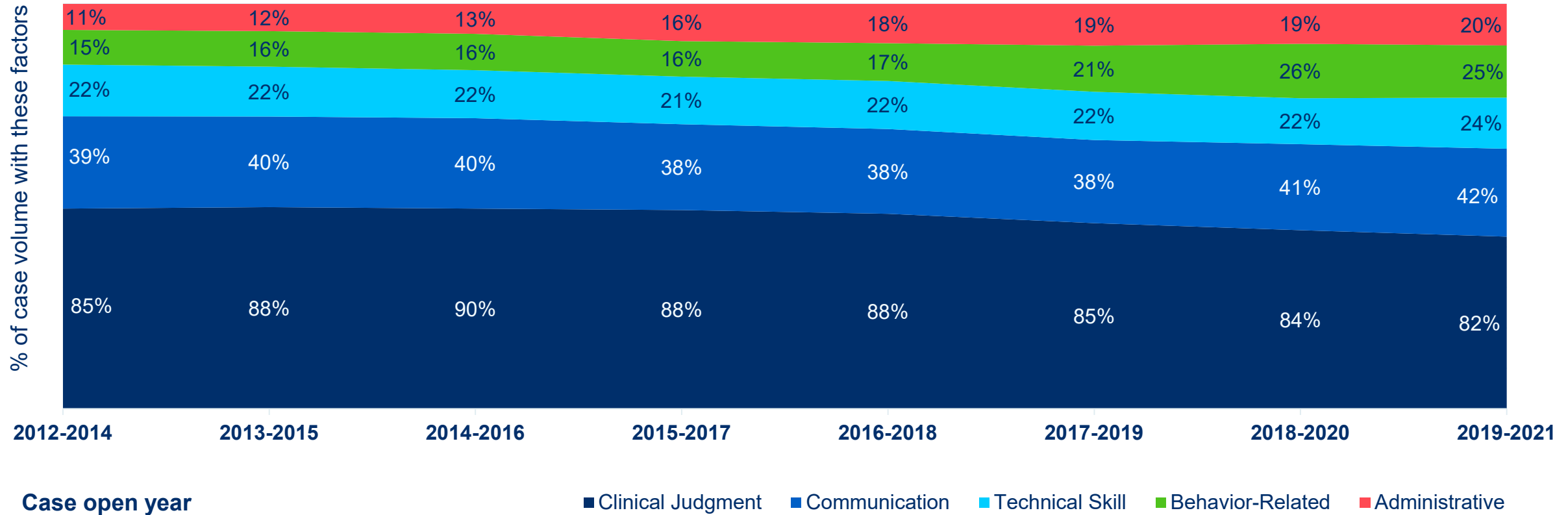| Category	Definition
Administrative	Factors related to medical records (other than documentation), reporting, staff, ethics, policy/protocols, regulatory
Behavior-related	Factors related to patient nonadherence to treatment or behavior that offsets care; also provider behavior including breach of confidentiality or sexual misconduct
Clinical environment	Factors related to workflow, physical conditions and "off-hours" conditions (weekends/holidays/nights)
Clinical judgment	Factors related to patient assessment, selection and management of therapy, patient monitoring, failure/delay in obtaining a consult, failure to ensure patient safety (falls, burns, etc), choice of practice setting, failure to question/follow an order, practice beyond scope
Clinical systems	Factors related to coordination of care, failure/delay in ordering test, reporting findings, follow-up systems, patient identification, specimen handling, nosocomial infections
Communication	Factors related to communication among providers, between patient/family and providers, via electronic communication (texting, email, etc), and telehealth/tele-radiology
Documentation	Factors related to mechanics, insufficiency, content
Supervision	Factors related to supervision of nursing, house staff, advanced practice clinicians
Technical skill	Factors related to improper use of equipment, medication errors, retained foreign bodies, technical performance of procedures

Most Common Contributing Factor Categories by Allegation
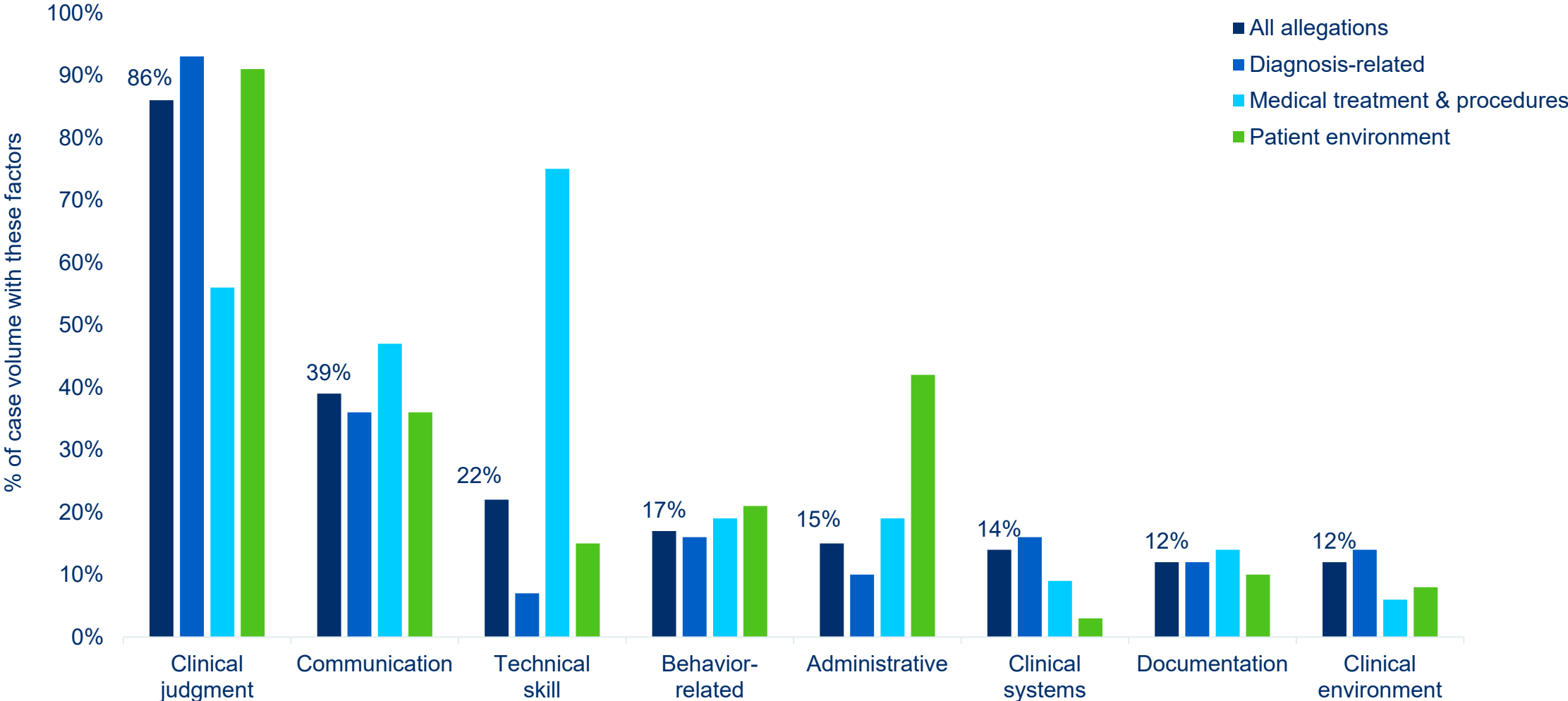
MedPro Group + MLMIC cases opened 2012-2021, Radiology as responsible service (N=1240); More than one factor per case, therefore totals >100%

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Distribution of Top Five Factor Categories Over Time

% of case volume with these factors

	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018	2017-2019	2018-2020	2019-2021
Administrative	11%	12%	13%	16%	18%	19%	19%	20%
Behavior-Related	15%	16%	16%	16%	17%	21%	26%	25%
Technical Skill	22%	22%	22%	21%	22%	22%	22%	24%
Communication	39%	40%	40%	38%	38%	38%	41%	42%
Clinical Judgment	85%	88%	90%	88%	88%	85%	84%	82%

Case open year

■ Clinical Judgment ■ Communication ■ Technical Skill ■ Behavior-Related ■ Administrative

While the distribution of these top (most common) factors across rolling three-year timeframes is relatively consistent, take note of even slight increases over time as indicators of emerging risk issues.

MedPro Group + MLMIC cases opened 2012-2021, Radiology as responsible service (N=1240); More than one factor per case, therefore totals >100%

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Focus on Most Common Drivers of Clinical and Financial Severity
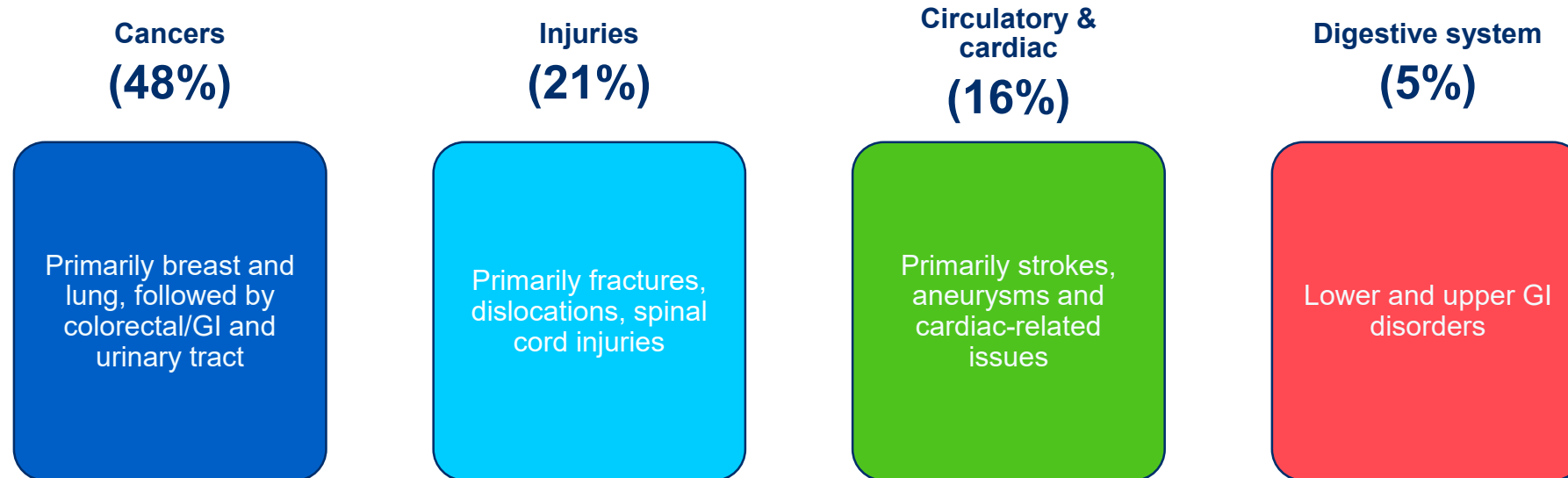
Factors associated with high clinical severity outcomes	(CJ) misinterpretation of diagnostic studies (72%)	**% of high severity case volume**
	(CJ) failure to appreciate/reconcile signs/symptoms/test results (28%)	
	(CJ) failure/delay in ordering diagnostic test (22%)	
	(CJ) failure/delay in obtaining consult/referral (21%)	
	(CO) suboptimal communication among providers about patient condition (20%)	
Factors associated with the costliest indemnity payments	(CE) weekends/nights/holidays (39%)	**% more expensive than the average indemnity payment***
	(CJ) narrow diagnostic focus (27%)	
	(CJ) failure to appreciate/reconcile signs/symptoms/test results (15%)	
	(CJ) failure/delay in ordering diagnostic test (12%)	
	(CJ) inadequate assessment resulting in premature discharge from care (11%)	

Clinical judgment factors, specifically misinterpretation of diagnostic studies, inadequate patient assessment processes, and also events arising during night/weekend/holiday shifts are key drivers of both clinical and financial Radiology case severity.

AD: administrative; BR: behavior-related; CE: clinical environment; CJ: clinical judgment; CO: communication; CS: clinical systems; DO: documentation; SU: supervision; TS: technical skill
MedPro Group + MLMIC cases opened 2012-2021, Radiology as responsible service (N=1240); More than one factor per case, therefore totals >100%; *limited to factors associated with >/= 15 cases

Focus on Diagnosis-Related Allegations

Diagnosis-related allegations encompass wrong diagnoses, failures/delays, and misdiagnoses. See below for the top diagnoses* noted in these cases.

Cancers (48%)

Primarily breast and lung, followed by colorectal/GI and urinary tract

Injuries (21%)

Primarily fractures, dislocations, spinal cord injuries

Circulatory & cardiac (16%)

Primarily strokes, aneurysms and cardiac-related issues

Digestive system (5%)

Lower and upper GI disorders

MedPro Group + MLMIC cases opened 2012-2021, Radiology as responsible service (N=1240); *as a percentage of all diagnosis-related allegations

Focus on Diagnosis-Related Allegations

Diagnosis-related allegations encompass wrong diagnoses, failures/delays, and misdiagnoses. Note the key opportunities to reduce diagnostic errors along the diagnostic process of care* below.

Phase 1

Initial diagnostic assessment

62% of cases

- Patient notes problem & seeks care
- History & physical
- Patient assessed, symptoms evaluated
- Differential diagnosis established
- Diagnostic testing ordered

Phase 2

Testing and results processing

88% of cases

- Performance of diagnostic tests
- Interpretation of diagnostic test results
- Test results transmitted to/received by ordering provider

Phase 3

Follow-up and coordination

50% of cases

- Physician follows-up with patient
- Referrals/Consults
- Patient information communicated among care team
- Patient compliance with follow-up plan

MedPro Group + MLMIC cases opened 2012-2021, Radiology as responsible service (N=1240); *each step reflects a combination of contributing factors; diagnostic process of care algorithm courtesy of Candello, a division of CRICO Strategies

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Focus on Medical Treatment Allegations

Top allegation details

% of medical treatment case volume

- Improper performance of treatment/procedure: 64%
- Improper management course of treatment: 10%
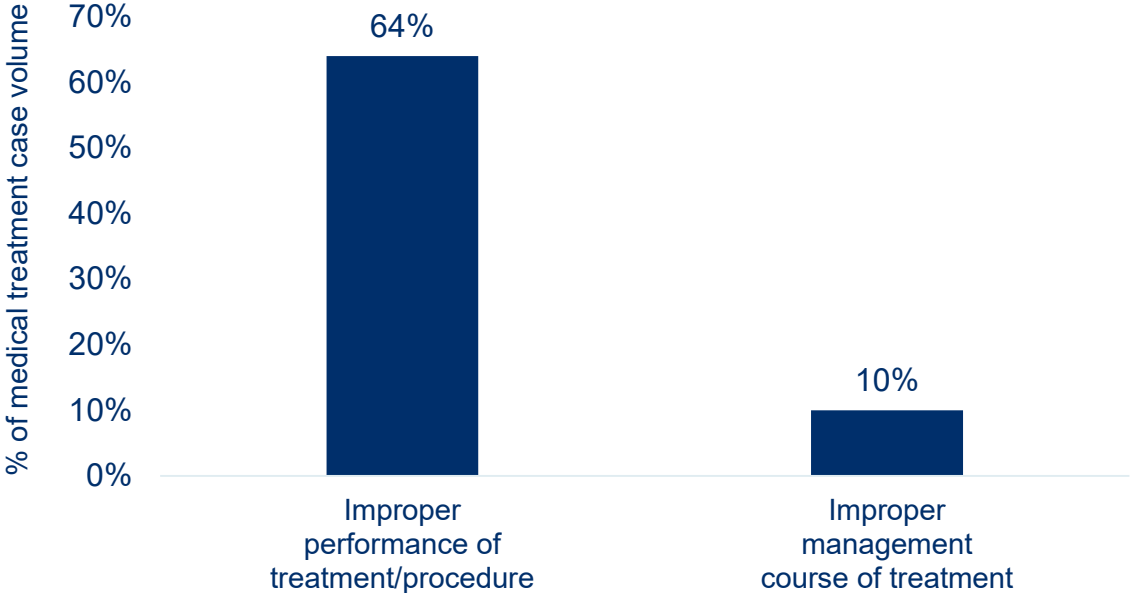
Top procedures involved

% of medical performance-related case volume

- Mammography: 42%
- Stent placement: 11%
- MRI*: 7%
- Breast biopsies: 7%
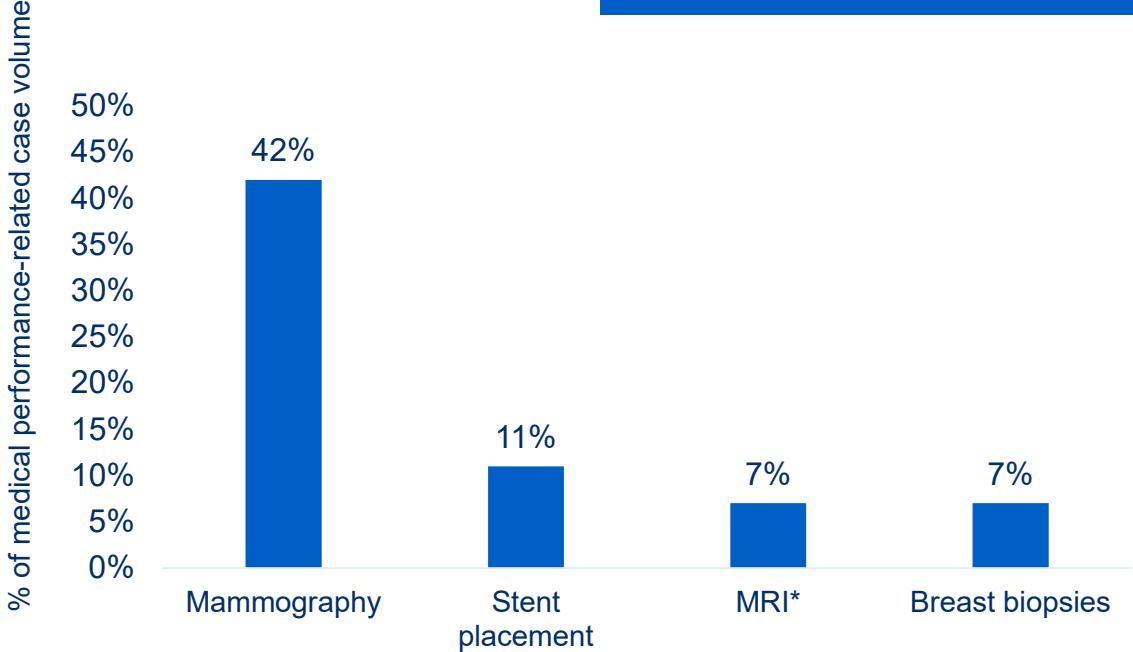
Procedural performance cases can be impacted by delayed recognition of complications, while management cases most often reflect issues with selection of the most appropriate course of treatment for the patient, and appreciating and reconciling symptoms and test results.

MedPro Group + MLMIC cases opened 2012-2021, Radiology as responsible service (N=1240); *Patient safety events happening before/during/after an MRI

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Focus on Patient Environment Allegations

Top allegation details

While patient falls are most commonly noted in the patient environment allegations, the "other" category reflects scenarios such as burns sustained during procedures or improper positioning resulting in musculoskeletal injuries.

Contributorily Responsible

Although this analysis is focused on cases reflecting Radiology as the primarily responsible service, another 936 Radiology* cases identify Radiology as contributorily responsible. The primary services in these cases are varied, reflecting the myriad of providers who care for patients along the healthcare continuum. The most common primary services, and a comparison of top allegation categories, are shown below.

Emergency medicine 22%	General surgery 9%	Family medicine 8%	Internal medicine 8%	Orthopedic surgery 7%	Nursing staff 5%	Neurosurgery 4%

MedPro Group + MLMIC cases opened 2012-2021, Radiology (*and all subspecialties) as contributorily responsible (N=936)

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Case Examples
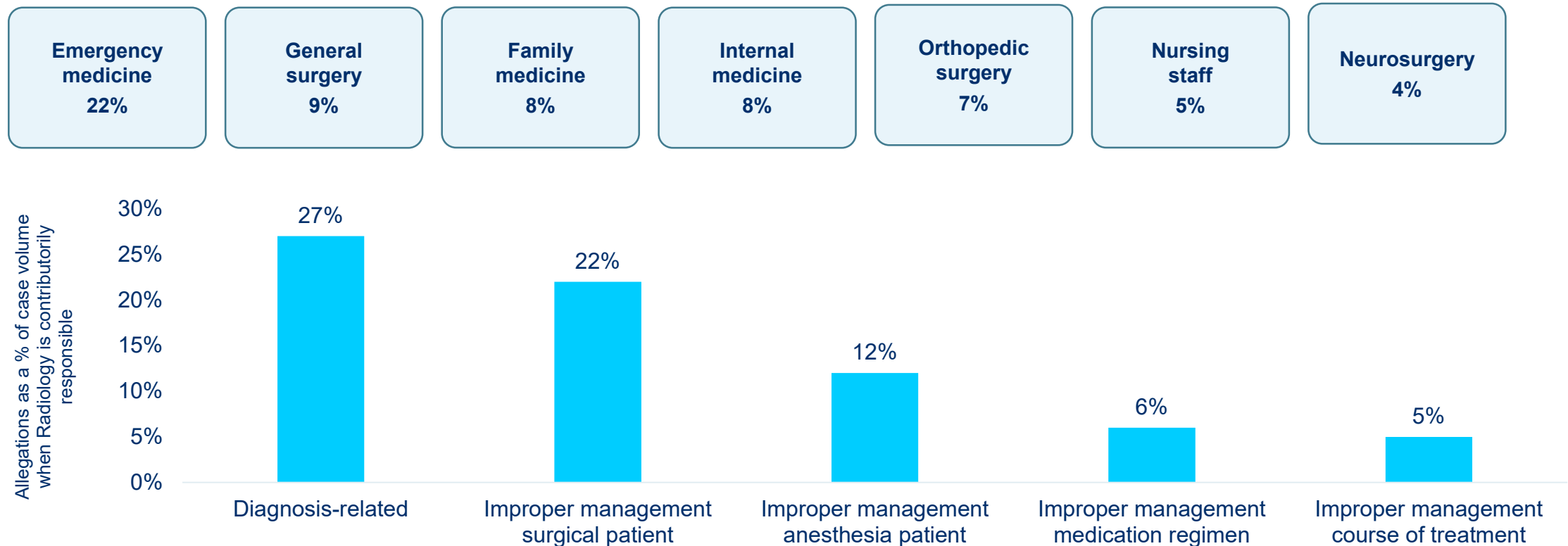
The following stories are reflective of the allegations and contributing risk factors which drive cases brought against Radiologists.

We're relaying these true stories as lessons to build understanding of the challenges that you face in day-to-day practice. Learning from these events, we trust that you will take the necessary steps to either reinforce or implement best practices, as outlined in the section focused on risk mitigation strategies.

Case Examples

SETTLED

$3.0M

CONTRIBUTING FACTORS

Behavior-related

Suboptimal communication of extent of complaints when making follow-up appointment

Clinical environment

Weekend/nightshift

Clinical judgment
Narrow diagnostic focus; inadequate assessment resulting in premature discharge from care; inadequate response to patient's symptoms; misinterpretation of diagnostic studies

Communication
Failure to read the medical record (MRI report)

FAILURE TO DIAGNOSE SPINAL FRACTURE RESULTING IN CORD COMPRESSION AND PARAPLEGIA

A 51 year-old female was **involved in an automobile accident** and was taken by ambulance to the emergency department (ED) with complaints of back, shoulder and neck pain. A CT of the C-spine was ordered by the emergency physician (EM-A). **The radiologist noted 5mm of anterolisthesis (upper vertebral body slipped forward onto the vertebra below). C7-T1 were splayed with tiny bone fragments; the radiologist but did not mention "facet fractures" in the report.** Findings were noted to be from either acute injury or related to chronic changes.

The radiologist reported by phone to the emergency department's nurse practitioner (NP) that the patient had a broken neck and **recommended an MRI be done** (in the subsequent malpractice action, the NP denied being told of an acute fracture). MRI of cervical spine was read by the same radiologist who, in the body of the report, **noted stenosis at C7-T1 related to anterior displacement of C7 "that is severe enough to be potentially clinically significant", but also noted "no evidence of an acute fracture"** and "chronic post-op changes throughout most of C-spine" in the Impressions section of report. **Radiologist did not call EM-A or the NP to discuss findings.** By phone, EM-A reviewed CT and MRI results with a **neurosurgeon (NS), who recommended discharge with a cervical collar (doesn't stabilize C7-T1)** and follow-up in two days. NS claimed he was not told of "anterior slippage" and did not go to the ED to evaluate the patient.

The patient returned to the ED late the next day, with complaints of inability to urinate and numbness/tingling in all extremities. EM-B noted exam within normal limits except for abdominal and lower back pain. CT of abdomen done (normal). **EM-B reviewed the radiology report, diagnosed a UTI** and discharged the patient with a Foley catheter in place and instructions to follow-up with urology. Patient was unable to walk to car so EM-B (now off shift) told a PA to have an MRI done (did not occur).

Patient's spouse made appointments for the patient to see both urology and neurosurgery for four days later, **but did not mention patient's increasing paralysis to providers**. Ultimately, the patient presented to a second ED one day after the most recent visit with increasing paralysis. **She was diagnosed with spinal fracture, dislocation of bilateral C7 facets, grade 2 spondylolisthesis of C7-T1 and paraplegia. Despite surgery and rehab, the patient is now paralyzed below the chest** and requires a feeding tube. Expert reviewers were critical of radiology, emergency medicine providers and neurosurgery.

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Case Examples

SETTLED

$900,000

CONTRIBUTING FACTORS

Clinical judgment

Selection of ultrasound- guided vs CT-guided procedure

Communication

Hierarchal issues (post-procedure, nurse verbalized lack of confidence in radiologist's technical proficiency)

Technical skill

Procedural inexperience; misidentification of anatomical structure (pre-procedure diagnostic testing revealed enlarged liver and spleen); poor procedural technique

IMPROPER PERFORMANCE OF ULTRASOUND GUIDED THORACENTESIS RESULTING IN REMOVAL OF SPLEEN

A 48 year-old male, with multiple co-morbidities including diabetes, hypertension, and obesity, presented to the emergency department with complaints of shortness of breath, sudden onset of flank pain and pleuritic chest pain. A CT revealed an enlarged spleen. The patient **was treated for probable pneumonia, pleurisy and pain** reported at 10/10. He was **discharged home with oxycodone and instructions to follow-up with his primary care provider**. Over the next week, **his symptoms worsened and he was admitted to the hospital for treatment of lobar pneumonia, loculated left pleural effusion and possible empyema**.

The patient consented to an **ultrasound-guided thoracentesis for drainage of pleural effusion**. Risks were described, including bleeding, infection, damage to pleura and surrounding organs. **During the procedure, poor visualization was noted, as was a hemothorax and bloody drainage from catheter**. 45 minutes into the procedure, the patient was sent for an urgent CT. **The pigtail drainage catheter was seen in splenic vein, 2-3 inches below intended target of pleural effusion**. Urgent transfer was made to a higher level of care facility. That evening, **an emergent splenectomy was performed**, leaving the patient with an incision from sternum to pubic bone. Infectious disease followed the patient during a 9-day admission. **Recovery was complicated by incisional dehiscence**, requiring 2 hernia repairs.

Expert reviewers noted "complicated effusion, with snow globe appearance" but couldn't support the radiologist. They contended ultrasound guidance was insufficient, and that CT guidance was indicated. They opined that the radiologist should have abandoned the procedure sooner, due to poor visibility.

The patient was out of work for three months, and now requires chronic treatment with antibiotics to avoid post-splenectomy-infection. His pre-existing increased due to worries about vulnerability to COVID-19 and limited treatment options.

Risk Mitigation Strategies

- **Ongoing evaluation of procedural skills and competency with equipment is critically important.**
- **Conduct a thorough assessment of the patient pre-procedure.**
  - Ensure that all testing and specialty evaluations are available for review prior to initiation of the procedure; in an ambulatory setting, these details might not always be as readily available as in the inpatient setting.
  - Maintain a consistent post-procedure assessment process.
- **Communicate with each other.**
  - Sometimes, small pieces of information that alone seem insignificant but in combination are crucial to the diagnostic process, can aid in the formation of differential diagnoses. For example, radiologists' access to the patient's medical history and to the ordering physician's clinical rationale for the test can be critically valuable.
  - Talk also to the patient/family, elicit a comprehensive patient history and conduct a thorough informed consent with the patient.
- **Engage patients as active participants in their care.**
  - Consider the patient's health literacy and other comprehension barriers.
  - Ensure adherence to processes designed so that patients are notified of test results.
  - Recognize that patient satisfaction with treatment outcomes can be influenced by a thorough informed consent and education process.
- **Document.**
  - Insufficient documentation about clinical findings, including the radiologist's documentation that ordering providers were notified of critical test results, can impact the defensibility of a subsequent malpractice case. Discrepancies or gaps in the details/timing make it much more difficult to build a supportive framework for defense against potential malpractice cases.

MedPro Group & MLMIC Data

MedPro and MLMIC are partnered with Candello, a national medical malpractice data collaborative and division of CRICO, the medical malpractice insurer for the Harvard-affiliated medical institutions.

Derived from the essence of the word candela, a unit of luminous intensity that emits a clear direction, Candello's best-in-class taxonomy, data, and tools provide unique insights into the clinical and financial risks that lead to harm and loss.

Using Candello's sophisticated coding taxonomy to code claims data, MedPro and MLMIC are better able to highlight the critical intersection between quality and patient safety and provide insights into minimizing losses and improving outcomes.

Leveraging our extensive claims data, we help our insureds stay aware of risk trends by specialty and across a variety of practice settings. Data analyses examine allegations and contributing factors, including human factors and healthcare system flaws that result in patient harm. Insight gained from claims data analyses also allows us to develop targeted programs and tools to help our insureds minimize risk.