

Overview of the sprain/strain/non-operative fracture episodes of care: shoulder, wrist, knee, and ankle

State of Ohio

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1. CLINICAL OVERVIEW AND RATIONALE FOR DEVELOPMENT OF THE SPRAIN/STRAIN/NON-OPERATIVE FRACTURE EPISODES

1.1 Rationale for development of the sprain/strain/non-operative fracture episodes of care

This concept paper describes the rationale and design of four distinct episodes: (1) *shoulder* sprain, strain, non-operative fracture, and other relevant diagnoses; (2) *wrist* sprain, strain, non-operative fracture, and other relevant diagnoses; (3) *knee* sprain, strain, non-operative fracture, and other relevant diagnoses; and (4) *ankle* sprain, strain, non-operative fracture, and other relevant diagnoses. They are collectively described in a single concept paper because they share similar designs. In practice, each of these episodes would be implemented as separate episodes, with separate reporting, separate risk adjustment, and separate thresholding. Herein, these episodes are collectively referred to as the “sprain/strain/non-operative fracture” episodes.

Sprains, strains, non-operative fractures, and other relevant diagnoses (e.g., tear/rupture, dislocation, tendonitis, synovitis) are major types of musculoskeletal injuries. In the United States, there are more than 65.8 million musculoskeletal injuries¹ presenting in the medical system annually. The total cost of musculoskeletal injuries increased from \$94.7 billion in 1996-1998 to \$176.1 billion in 2009-2011. Aside from direct medical cost, musculoskeletal injuries are a primary cause of lost work days in the labor force, with a median of 11 days away from work. Additionally, many patients experiencing injuries such as sprains, strains, or non-operative fractures don't present at offices, emergency departments, or other health care facilities and are not captured within the medical system.²

Sprains and strains are the most common musculoskeletal injuries. There are approximately 200,000 shoulder sprains/strains and 200,000 wrist sprains/strains presenting in emergency departments in the United States each year, which account together for nearly 70% of all upper extremity sprains/strains.³ Ankle sprain/strain is

¹ “Sprain, strain, non-operative fracture, and other relevant diagnoses” is a subset of musculoskeletal injuries, which is a broader concept.

² United States Bone and Joint Initiative: The Burden of Musculoskeletal Diseases in the United States (BMUS), Third Edition, 2014. Rosemont, IL. Available at <http://www.boneandjointburden.org>. Accessed on December 11, 2017.

³ Ootes D, Lambers KT, Ring DC. The Epidemiology of Upper Extremity Injuries Presenting to the Emergency Department in the United States. *Hand (N Y)*. 2012;7(1):18–22.

one of the most common injuries in the United States, with nearly one million acute cases presenting in emergency departments each year, accounting for an estimated \$1 billion in medical cost.⁴ Knee sprains/strains present with less volume than ankle cases, having 300,000 occurrences annually, but account for 42% of knee injuries presenting in emergency departments in the United States.⁵

As recognized by the American Academy of Orthopaedic Surgeons (AAOS), sprains/strains, non-operative fractures, and other related diagnoses present with similar symptoms and requiring similar treatments. This range of diagnoses are included together within these episodes because of clinical similarities, which will be discussed in more detail in section 1.2. Among Medicaid beneficiaries in Ohio over a one-year period, there were over 30,000 outpatient shoulder sprain/strain/non-operative fracture, which represents over \$9.5 million in spend and a median episode cost of approximately \$177. Additionally, there were over 27,000 outpatient wrist sprain/strain/non-operative fracture, which represents about \$8 million in spend and a median episode cost of approximately \$202. Approximately 23,000 outpatient knee sprain/strain/non-operative fracture episodes were present, representing about \$7 million in spend and a median episode cost of approximately \$177. Lastly, over 50,000 outpatient ankle sprain/strain/non-operative fracture episodes occurred, which represents approximately \$14 million in spend and a median episode cost of approximately \$165.⁶

There are many opportunities to improve guideline-concordant care in order to support optimal patient outcomes. Evidence-based clinical guidelines recommended by the American Academy of Orthopaedic Surgeons outline several best practices for clinicians to improve quality of care and outcomes for patients with sprains/strains and other relevant diagnoses.⁷ For mild to moderate sprains/strains, the R.I.C.E. protocol (rest, ice, compression, elevation), and physical therapy exercises in certain cases are recommended, in addition to bracing. For relevant diagnoses such as tendonitis, rest, anti-inflammatory medications, steroid injections, splinting, or

⁴ Shah S, Thomas AC, et al. Incidence and cost of ankle sprains in United States emergency departments. *Sports Health*. 2016;8(6):547-52. Mean emergency department charges were calculated based on the charge data provided for each visit including necessary inpatient expenses.

⁵ Gage BE, McIlvain NM, et al. Epidemiology of 6.6 million knee injuries presenting to United States emergency departments from 1999 through 2008. *Acad Emerg Med* 2012;19(4):378-85.

⁶ Analysis of Ohio Medicaid claims data for episodes ending between October 1, 2014 and September 30, 2015.

⁷ AAOS. Sprains, Strains and Other Soft-Tissue Injuries-OrthoInfo - AAOS. 2015. Available at <http://orthoinfo.aaos.org/topic.cfm?topic=a00111>. Accessed on December 11, 2017.

exercises may be recommended. For non-operative fractures, splinting, immobilization, or physical therapy may be recommended.^{8,9}

Different conditions share similarities in evaluation and treatment: (1) all would expect physical examination and potential imaging in evaluation; (2) all may require rest and potential follow-up visits; (3) in terms of treatment, all may include pain medications, immobilization, and physical therapy. Patient journeys are similar enough across these conditions to be grouped into the same episode, with risk adjustment performed to achieve fair comparison across providers.

Sprains/strains, fractures, and pain are some of the most common diagnoses associated with opioid pain medications.¹⁰ These conditions are often treated by primary care providers and orthopedic surgeons, who are among the highest prescribing specialists in the U.S.¹¹ However, there is no clear evidence that early opioid prescriptions for musculoskeletal disorders lead to better patient outcomes. Some studies suggest that these early opioid prescriptions are associated with prolonged work disability.¹²

Multiple studies suggest that imaging is inappropriately utilized during the evaluation of sprains and strains. It is estimated that 80-98% of patients visiting emergency departments for ankle sprains undergo a radiologic exam, while only 15% of those patients are diagnosed with fractures that would necessitate the imaging.¹³ There are well-established and highly reliable Ottawa Ankle Rules¹⁴ and Ottawa Knee Rules¹⁵ that can be adopted to promote appropriate usage of x-rays for sprains and strains.

Despite these clinical guidelines, treatment practices of a sprain, strain, non-operative fracture, or a relevant diagnosis vary widely from one provider to another. Unique patient needs will necessitate a certain level of variation in treatment practice;

⁸ AAOS. Tibia (Shinbone) Shaft Fractures -OrthoInfo - AAOS. 2010. Available at <http://orthoinfo.aaos.org/topic.cfm?topic=A00522>. Accessed on December 11, 2017.

⁹ AAOS. Fractures (Broken Bones) -OrthoInfo - AAOS. 2010. Available at <http://www.orthoinfo.org/topic.cfm?topic=A00139>. Accessed on December 11, 2017.

¹⁰ Hoppe JA, Nelson LS, et al. Opioid prescribing in a cross section of US emergency departments. *Ann Emerg Med*. 2015;66(3):253-9.

¹¹ AAOS. The opioid epidemic and its impact on orthopaedic care. Press release. May 7, 2015. Available at <http://newsroom.aaos.org/media-resources/Press-releases/the-opioid-epidemic-and-its-impact-on-orthopaedic-care.htm>. Accessed on December 11, 2017.

¹² Carnide N, Hogg-Johnson S, et al. Early prescription opioid use for musculoskeletal disorders and work outcomes: A systematic review of the literature. *Clin J Pain* 2016;33(7):647-58.

¹³ Shah S, Thomas AC, et al. Incidence and cost of ankle sprains in United States emergency departments. *Sports Health*. 2016;8(6):547-52.

¹⁴ Bachmann LM, Kolb E, et al. Accuracy of Ottawa ankle rules to exclude fractures of the ankle and mid-foot: systematic review. *BMJ*. 2003;326(7386):417.

¹⁵ Empananza JI, Aginaga JR. Validation of the Ottawa knee rules. *Ann Emerg Med*. 2001;38(4):364-8.

however, practice variation due to reasons not related to the patient may lead to poor patient outcomes, unnecessary costs to the system, or both.

The sprain/strain/non-operative fracture episodes will complement other orthopedic episodes (e.g., total joint replacement, knee arthroscopy) and Ohio's Comprehensive Primary Care (CPC) program to help reduce unnecessary practice variation and incentivize evidence-based care. For example, the CPC program quality metrics encourage initiation of alcohol and drug dependence treatments¹⁶ while quality and utilization metrics in the orthopedic episodes encourage providers to minimize unnecessary opioid prescriptions.

1.2 Clinical overview and typical patient journey for the sprain/strain/non-operative fracture episodes

For the purpose of these episodes, a sprain is considered any condition involving an overstretch or tear of ligaments, and a strain is any condition involving an overstretch or tear of tendons or muscles. A non-operative fracture is a closed fracture that does not require surgical treatment. Relevant diagnoses include conditions such as tendonitis (inflammation of a tendon), synovitis (inflammation of the synovial membrane), closed dislocations (joint is forced out of position), tears, and ruptures (injuries to tendon). The signs and symptoms of those conditions may include pain, swelling, bruising, or limited ability to move and use the affected area.

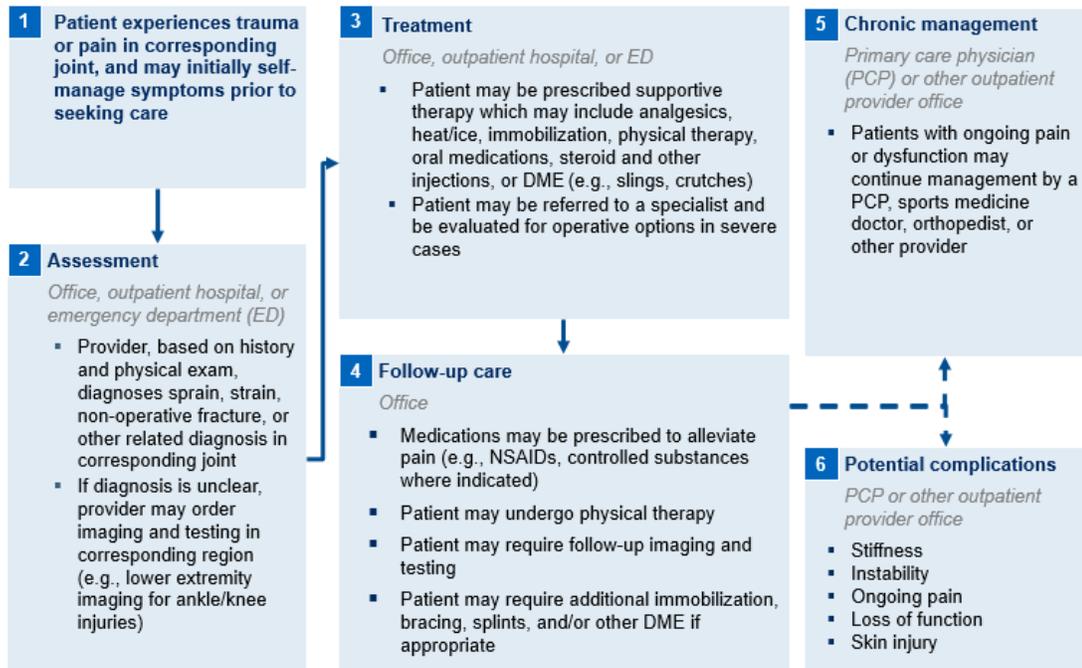
As depicted in Exhibit 1, the patient journey begins when a patient presents with signs or symptoms of a sprain, strain, non-operative fracture, or other relevant diagnosis. Clinicians may use a physical exam and review of patient history to diagnose the patient. In some cases, imaging may be used to assess potential fractures or to evaluate more complex cases. To treat the condition, the clinician may apply R.I.C.E. guidelines, or prescribe immobilization, steroid injections, or other therapies or equipment. Some patients may also be prescribed analgesic medications or undergo physical therapy. For severe cases, patients may be referred to a specialist and/or undergo an evaluation for potential surgical treatment.

Following their initial diagnosis and care, patients may be prescribed additional medications, imaging and testing, or physical therapy for recovery. If the pain or dysfunction in the corresponding joint persists, chronic management may be provided by a primary care provider, sports medicine provider, orthopedist, or another

¹⁶ See, for example, the inclusion of the metric "Initiation of alcohol and other drug dependence treatment" in the quality metrics of the CPC program. Available at <http://www.medicaid.ohio.gov/Portals/0/Providers/PaymentInnovation/CPC/qualityMetricSpecs.pdf>. Accessed on December 11, 2017.

provider. Potential complications could include stiffness, instability, ongoing pain, loss of function, or skin injury at the corresponding joint.

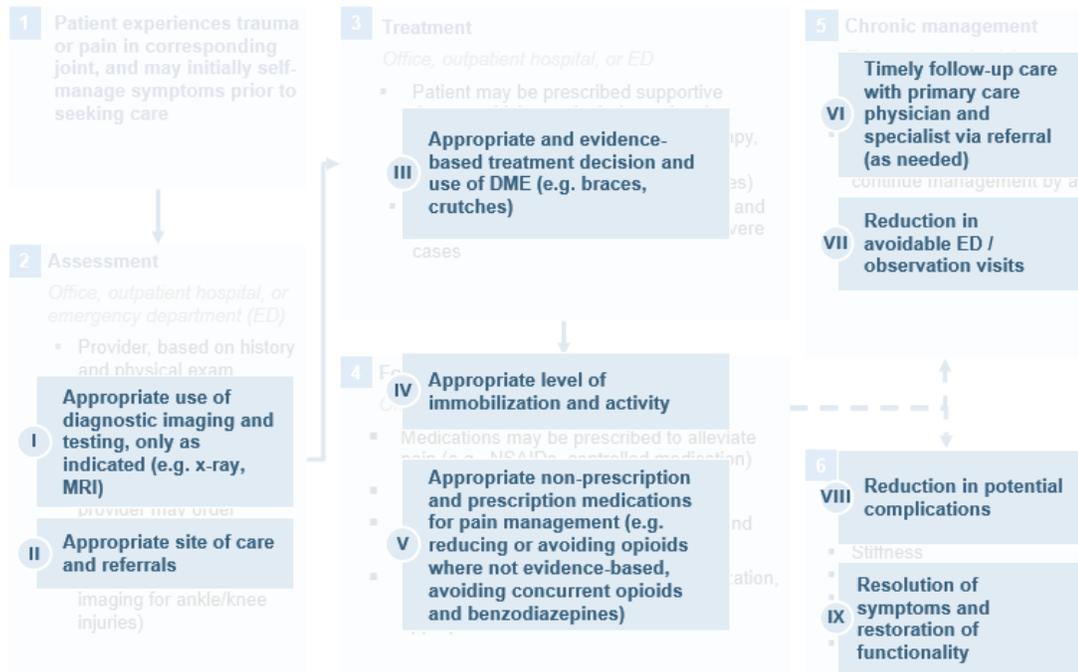
EXHIBIT 1 – SPRAIN/STRAIN/NON-OPERATIVE FRACTURE PATIENT JOURNEY



1.3 Potential sources of value within the patient journey

Within the sprain/strain/non-operative fracture episodes, providers have several opportunities to improve the quality of care and reduce unnecessary spend associated with the episode (see Exhibit 2). For example, providers may order imaging only when indicated and use only the appropriate modality of imaging. Providers can also use only the most appropriate treatment approach, including proper usage of durable medical equipment (DME). Additionally, providers can prescribe the appropriate pain relief medications and limit the usage of narcotics. There is also an opportunity for the provider to improve patient education and/or counseling, which could help patients to resolve symptoms, restore full functionality, and avoid repeat injuries.

EXHIBIT 2 – SPRAIN/STRAIN/NON-OPERATIVE FRACTURE SOURCES OF VALUE



2. OVERVIEW OF THE SPRAIN/STRAIN/NON-OPERATIVE FRACTURE EPISODE DESIGN

2.1 Episode Trigger

The overview below continues to refer to the “sprain/strain/non-operative fracture episodes.” Although the designs of these four episodes (sprain/strain/non-operative fracture of the shoulder, wrist, knee, and ankle) are similar, each will be implemented in an independent manner.

The sprain/strain/non-operative fracture episodes are triggered by a professional claim for an evaluation and management visit having a primary diagnosis of a sprain, strain, fracture, or a relevant diagnosis in an outpatient setting. The episodes can also be triggered by a professional claim having a primary diagnosis of pain and a secondary diagnosis from the previously defined trigger codes.

Triggering diagnoses for the shoulder sprain/strain/non-operative fracture episode include diagnoses for shoulder sprains/strains, shoulder capsulitis, closed dislocations of the shoulder, closed fractures of the humerus, closed fractures of the scapula,

shoulder synovitis, shoulder tears, shoulder tendonitis, and shoulder pain (contingent on a previously mentioned diagnosis).

Triggering diagnoses for the wrist sprain/strain/non-operative fracture episode include diagnoses for wrist sprains/strains, hand sprains/strains, closed dislocations of the hand, closed fractures of the wrist, closed fractures of the hand, closed fractures of the radius/ulna shaft, hand synovitis, wrist synovitis, wrist tear, wrist tendonitis, and forearm pain.

Triggering diagnoses for the knee sprain/strain/non-operative fracture episode include diagnoses for knee sprains/strains, knee bursitis, closed dislocations of the knee, closed dislocations of the patella, closed fractures of the femoral condyle, closed fractures of the patella, closed fractures of the tibia/fibula, stress fractures of the tibia/fibula, lower leg/thigh synovitis, knee tears, knee tendonitis, and lower leg pain.

Triggering diagnoses for the ankle sprain/strain/non-operative fracture episode include diagnoses for ankle sprains/strains, foot sprains/strains, closed fractures of the ankle, closed fractures of the fibula, ankle synovitis, ankle tears, ankle tendonitis, and ankle pain.

See Tables 1A-1D in the Appendix for the lists of triggering ICD-9 diagnosis codes and Exhibit 3 in the Appendix for the analyses of triggers.

2.2 Principal Accountable Provider

The principal accountable provider (PAP) is the person or entity best positioned to influence the patient journey and the clinical decisions made throughout the course of the episode. For the sprain/strain/non-operative fracture episodes, the PAP is the provider who diagnosed the patient, which may be a primary care provider. Because this provider is directly involved in the diagnosis, he or she is in the best position to promote adherence to guidelines, prevent complications, and influence other sources of value (See Exhibit 4 in the Appendix for the distribution of average risk-adjusted spend by PAP).

2.3 Episode Duration

The sprain/strain/non-operative fracture episodes begin with the triggering encounter where the diagnosis of sprain/strain/non-operative fracture is made, and ends 30 days afterwards. The rationale for the 30-day post-trigger window relates to which services are included and is described in greater detail in section 2.4.

2.4 Included Services

The episode model is designed to address spend for care and services directly related to the diagnosis, treatment, and immediate recovery phase for patients with a sprain/strain/non-operative fracture diagnosis. Each period of the patient journey, or episode “window”, has a distinct claim inclusion logic derived from two major criteria: 1) that the type of included care and services must correspond to that period of the patient journey and 2) that the included care and services are understood to be directly or indirectly influenced by the PAP during that period.

The sprain/strain/non-operative fracture episodes are each comprised of a trigger window and a post-trigger window for the purpose of spend inclusions, which includes specific related care (e.g., relevant diagnoses such as sprain or pain in the corresponding joint), evaluation and management encounters, imaging and testing (e.g., x-ray, MRI), specific medications (e.g., NSAIDS), and DME (e.g., crutches). The facility The total episode spend is calculated by adding up the spend amounts on all of the individual claims that were included in each window.

The sprain/strain/non-operative fracture episodes are each comprised of a trigger window and a post-trigger window for the purpose of spend inclusions. Inclusions in the different episode windows are as follows:

- Trigger window (when the initial visit and any associated outpatient stay occurs): specific related care (e.g., relevant diagnoses such as sprain or pain in the corresponding joint), evaluation and management encounters, imaging and testing (e.g., x-ray, MRI), specific medications (e.g., NSAIDS), and DME (e.g., crutches) are included. The facility fee for any emergency department visit is excluded from episode spend.
- Post-trigger window (one through 30 days following the trigger visit): specific related care (e.g., relevant diagnoses such as sprain or pain in the corresponding joint), evaluation and management encounters, imaging and testing (e.g., x-ray, MRI), specific medications (e.g., NSAIDS), and DME (e.g., crutches) are included.

The total episode spend is calculated by adding up the spend amounts on all of the individual claims that were included in the episode window.

2.5 Episode Exclusions and Risk Factors

To ensure that episodes are comparable across patient panels, select risk factors and exclusions are applied before assessing PAP performance. Risk factors are applied to episodes to make spend more comparable across different patient severities, while

episode exclusions are applied when a clinical factor deems the patient too severe (and too high spend) for risk adjustment to be possible.

In the context of episode design, risk factors are attributes (e.g., age) or underlying clinical conditions (e.g., heart conditions) that are likely to impact a patient's course of care and the spend associated with a given episode. Risk factors are selected via a standardized and iterative risk-adjustment process which gives due consideration to clinical relevance, statistical significance, and other contextual factors. Based on the selected risk factors, each episode is assigned a risk score. The total episode spend and the risk score are used to arrive at an adjusted episode spend. This value is used to calculate a provider's average risk-adjusted spend across all episodes, which is the measure across which providers are compared to each other.¹⁷ Tables 2A-2D in the Appendix list risk factors, and Exhibit 5 presents analyses of these risk factors.

By contrast, an episode is excluded from a patient panel when the patient has clinical factors that suggest he or she has experienced a distinct or different journey and/or that drive very significant increases in spend relative to the average patient. In addition, there are several "business-related" exclusions relating to reimbursement policy (e.g., whether a patient sought care out of state), the completeness of spend data for that patient (e.g., third-party liability or dual eligibility), and other topics relating to episode design and implementation, such as overlapping episodes, during the comparison period. Episodes with no exclusions are known as "valid" and used for provider comparisons. Episodes that have one of any of the exclusions are known as "invalid" episodes.

For the sprain/strain/non-operative fracture episode, both business and clinical exclusions apply. Several of the business exclusions (e.g., dual Medicare and Medicaid eligibility, patient left against medical advice) are standard across most episodes while clinical exclusions relate to the scope of the episode design. The episode specific clinical exclusions include severe trauma (e.g., sprains in three or more different body parts), surgeries (e.g., repair, reconstruction, or arthroscopy on the same joint),¹⁸ and inpatient admissions. To address overlaps across the four sprain/strain/non-operative fracture episodes, patients with two concurrent episodes would be included in the more clinically complex episode, and excluded from the lesser episode. The hierarchy of complexity, from high complexity to low complexity, is shoulder, knee, ankle, then wrist, with the hierarchy determined by

¹⁷ For a detailed description of the principles and process of risk adjustment for the episode-based payment model see the document, "Supporting documentation on episode risk adjustment." A current version of this document is available here:

<http://www.medicare.ohio.gov/Portals/0/Providers/PaymentInnovation/Episodes/Episode-Risk-Adjustment.pdf>. Accessed on December 11, 2017.

¹⁸ Surgical exclusions also include knee arthroscopy and total joint replacement, addressing overlaps with those surgical orthopedic episodes.

clinical complexity and episode spend. The list of business and clinical exclusions is included in Table 3, and Exhibit 6 presents analyses of these exclusions in the Appendix.

2.6 Quality and Utilization Metrics

To ensure the episode model incentivizes quality care, the sprain/strain/non-operative fracture episodes have eight quality and utilization metrics. One is linked to performance assessment, meaning that performance thresholds on this metric must be met in order for a PAP to be eligible for positive incentive payments. The specific threshold amount will be determined during the informational reporting period. Seven of the quality and utilization metrics are for informational purposes only.

The metric tied to positive incentive payments is the average difference in morphine equivalent dose (MED) per day between the pre-trigger opioid window and the post-trigger opioid window. Informational metrics include the average MED per day during the pre-trigger opioid window, the average MED per day during the post-trigger opioid window, the percentage of episodes triggered by a strain or sprain that had x-ray imaging, the percentage of episodes with an MRI where the patient received an x-ray or an ultrasound within the 60 days prior to the MRI, the percentage of episodes where the patient had a relevant ED visit in the post-trigger window, the percentage of episodes where the patient filled prescriptions for both an opioid and a benzodiazepine, and the percentage of episodes where the patient had not filled a prescription for opioids within the 90 days before the episode who received opioids during the episode window.

The first three opioid metrics above, which are standard across many episodes (orthopedic and otherwise), aim to raise awareness of prescribing patterns of the PAP and other prescribers. A complete list of quality and utilization metrics is provided in Table 4, and Exhibit 7 presents an analysis of these quality and utilization metrics in the Appendix.

3. APPENDIX: SUPPORTING INFORMATION AND ANALYSES

Table 1A – Episode triggers for shoulder sprains/strains/non-operative fractures¹⁹

Trigger category	Trigger codes	Code type	Description
Capsulitis, shoulder	7260	ICD-9 Dx	Adhesive Capsulitis Of Shoulder
Closed dislocation, shoulder	71821	ICD-9 Dx	Pathological Dislocation Of Joint Of Shoulder Region
	71831	ICD-9 Dx	Recurrent Dislocation Of Joint Of Shoulder Region
	83100	ICD-9 Dx	Closed Dislocation Of Shoulder Unspecified Site
	83101	ICD-9 Dx	Closed Anterior Dislocation Of Humerus
	83102	ICD-9 Dx	Closed Posterior Dislocation Of Humerus
	83103	ICD-9 Dx	Closed Inferior Dislocation Of Humerus
	83104	ICD-9 Dx	Closed Dislocation Of Acromioclavicular (Joint)
	83109	ICD-9 Dx	Closed Dislocation Of Other Site Of Shoulder
Closed fracture, humerus	81200	ICD-9 Dx	Fracture Of Unspecified Part Of Upper End Of Humerus Closed
	81201	ICD-9 Dx	Fracture Of Surgical Neck Of Humerus Closed
	81202	ICD-9 Dx	Fracture Of Anatomical Neck Of Humerus Closed

¹⁹ To be concise, only ICD-9 diagnosis codes are presented here. The full list of diagnosis codes, including the ICD-10 diagnosis codes are available in the code sheet for each episode.

Trigger category	Trigger codes	Code type	Description
	81203	ICD-9 Dx	Fracture Of Greater Tuberosity Of Humerus Closed
	81209	ICD-9 Dx	Other Closed Fractures Of Upper End Of Humerus
	81220	ICD-9 Dx	Fracture Of Unspecified Part Of Humerus Closed
	81221	ICD-9 Dx	Fracture Of Shaft Of Humerus Closed
Closed fracture, scapula	81100	ICD-9 Dx	Closed Fracture Of Scapula Unspecified Part
	81101	ICD-9 Dx	Closed Fracture Of Acromial Process Of Scapula
	81102	ICD-9 Dx	Closed Fracture Of Coracoid Process Of Scapula
	81103	ICD-9 Dx	Closed Fracture Of Glenoid Cavity And Neck Of Scapula
	81109	ICD-9 Dx	Closed Fracture Of Other Part Of Scapula
Pain, shoulder¹	71941	ICD-9 Dx	Pain In Joint Involving Shoulder Region
Sprains/strains, shoulder	8400	ICD-9 Dx	Acromioclavicular (Joint) (Ligament) Sprain
	8401	ICD-9 Dx	Coracoclavicular (Ligament) Sprain
	8402	ICD-9 Dx	Coracohumeral (Ligament) Sprain
	8403	ICD-9 Dx	Infraspinatus (Muscle) (Tendon) Sprain
	8404	ICD-9 Dx	Rotator Cuff (Capsule) Sprain
	8405	ICD-9 Dx	Subscapularis (Muscle) Sprain

Trigger category	Trigger codes	Code type	Description
	8406	ICD-9 Dx	Supraspinatus (Muscle) (Tendon) Sprain
	8408	ICD-9 Dx	Sprain Of Other Specified Sites Of Shoulder And Upper Arm
	8409	ICD-9 Dx	Sprain Of Unspecified Site Of Shoulder And Upper Arm
Tear, shoulder	72613	ICD-9 Dx	Partial Tear Of Rotator Cuff
	72761	ICD-9 Dx	Complete Rupture Of Rotator Cuff
	72762	ICD-9 Dx	Nontraumatic Rupture Of Tendons Of Biceps (Long Head)
Tendonitis, shoulder	72610	ICD-9 Dx	Disorders Of Bursae And Tendons In Shoulder Region Unspecified
	72611	ICD-9 Dx	Calcifying Tendonitis Of Shoulder
	72612	ICD-9 Dx	Bicipital Tenosynovitis
	72619	ICD-9 Dx	Other Specified Disorders Of Bursae And Tendons In Shoulder Region

1 To be a trigger, there must be a secondary diagnosis from one of the other trigger categories.

Table 1B – Episode triggers for wrist sprains/strains/non-operative fractures

Trigger category	Trigger codes	Code type	Description
Closed dislocation, hand	83303	ICD-9 Dx	Closed Dislocation Of Midcarpal (Joint)
	83304	ICD-9 Dx	Closed Dislocation Of Carpometacarpal (Joint)
	83305	ICD-9 Dx	Closed Dislocation Of Metacarpal (Bone) Proximal End

Trigger category	Trigger codes	Code type	Description
	81401	ICD-9 Dx	Closed Fracture Of Navicular (Scaphoid) Bone Of Wrist
	81402	ICD-9 Dx	Closed Fracture Of Lunate (Semilunar) Bone Of Wrist
	81403	ICD-9 Dx	Closed Fracture Of Triquetral (Cuneiform) Bone Of Wrist
	81404	ICD-9 Dx	Closed Fracture Of Pisiform Bone Of Wrist
	81405	ICD-9 Dx	Closed Fracture Of Trapezium Bone (Larger Multangular) Of Wrist
	81406	ICD-9 Dx	Closed Fracture Of Trapezoid Bone (Smaller Multangular) Of Wrist
	81407	ICD-9 Dx	Closed Fracture Of Capitate Bone (Os Magnum) Of Wrist
	81509	ICD-9 Dx	Closed Fracture Of Multiple Sites Of Metacarpus
	81602	ICD-9 Dx	Closed Fracture Of Distal Phalanx Or Phalanges Of Hand
	71824	ICD-9 Dx	Pathological Dislocation Of Hand Joint
Closed fracture, radius/ulna	81381	ICD-9 Dx	Fracture Of Unspecified Part Of Radius (Alone) Closed
	81382	ICD-9 Dx	Fracture Of Unspecified Part Of Ulna (Alone) Closed
	81383	ICD-9 Dx	Fracture Of Unspecified Part Of Radius With Ulna Closed
Closed fracture, wrist	73312	ICD-9 Dx	Pathological Fracture Of Distal Radius And Ulna
	81341	ICD-9 Dx	Colles' Fracture Closed

Trigger category	Trigger codes	Code type	Description
	81342	ICD-9 Dx	Other Closed Fractures Of Distal End Of Radius (Alone)
	81343	ICD-9 Dx	Fracture Of Distal End Of Ulna (Alone) Closed
	81344	ICD-9 Dx	Fracture Of Lower End Of Radius With Ulna Closed
	81409	ICD-9 Dx	Closed Fracture Of Other Bone Of Wrist
Pain, forearm¹	71943	ICD-9 Dx	Pain In Joint Involving Forearm
Sprain, hand	84210	ICD-9 Dx	Sprain Of Unspecified Site Of Hand
	84211	ICD-9 Dx	Sprain Of Carpometacarpal (Joint) Of Hand
	84212	ICD-9 Dx	Sprain Of Metacarpophalangeal (Joint) Of Hand
	84213	ICD-9 Dx	Sprain Of Interphalangeal (Joint) Of Hand
	84219	ICD-9 Dx	Other Hand Sprain
Sprain, wrist	84200	ICD-9 Dx	Sprain Of Unspecified Site Of Wrist
	84201	ICD-9 Dx	Sprain Of Carpal (Joint) Of Wrist
	84202	ICD-9 Dx	Sprain Of Radiocarpal (Joint) (Ligament) Of Wrist
	84209	ICD-9 Dx	Other Wrist Sprain
Tear, wrist	72763	ICD-9 Dx	Nontraumatic Rupture Of Extensor Tendons Of Hand And Wrist
	72764	ICD-9 Dx	Nontraumatic Rupture Of Flexor Tendons Of Hand And Wrist
Tendonitis, wrist	7264	ICD-9 Dx	Enthesopathy Of Wrist And Carpus

Trigger category	Trigger codes	Code type	Description
	72704	ICD-9 Dx	Radial Styloid Tenosynovitis
	72705	ICD-9 Dx	Other Tenosynovitis Of Hand And Wrist

1 To be a trigger, there must be a secondary diagnosis from one of the other trigger categories.

Table 1C – Episode triggers for knee sprains/strains/non-operative fractures

Trigger category	Trigger codes	Code type	Description
Bursitis, knee	72661	ICD-9 Dx	Pes Anserinus Tendonitis Or Bursitis
	72662	ICD-9 Dx	Tibial Collateral Ligament Bursitis
	72663	ICD-9 Dx	Fibular Collateral Ligament Bursitis
	72665	ICD-9 Dx	Prepatellar Bursitis
Closed dislocation, patella	8363	ICD-9 Dx	Dislocation Of Patella Closed
Closed fracture, femoral condyle	82121	ICD-9 Dx	Fracture Of Femoral Condyle Closed
Closed fracture, patella	8220	ICD-9 Dx	Closed Fracture Of Patella
Closed fracture, tibia/fibula	73316	ICD-9 Dx	Pathological Fracture Of Tibia Or Fibula
	82300	ICD-9 Dx	Closed Fracture Of Upper End Of Tibia
	82301	ICD-9 Dx	Closed Fracture Of Upper End Of Fibula
	82302	ICD-9 Dx	Closed Fracture Of Upper End Of Fibula With Tibia

Trigger category	Trigger codes	Code type	Description
Pain, lower leg¹	71946	ICD-9 Dx	Pain In Joint Involving Lower Leg
Sprain/strain, knee	8440	ICD-9 Dx	Sprain Of Lateral Collateral Ligament Of Knee
	8441	ICD-9 Dx	Sprain Of Medial Collateral Ligament Of Knee
	8442	ICD-9 Dx	Sprain Of Cruciate Ligament Of Knee
	8443	ICD-9 Dx	Sprain Of Tibiofibular (Joint) (Ligament) Superior Of Knee
	8448	ICD-9 Dx	Sprain Of Other Specified Sites Of Knee And Leg
	8449	ICD-9 Dx	Sprain Of Unspecified Site Of Knee And Leg
Stress fracture, tibia/fibula	73393	ICD-9 Dx	Stress Fracture Of Tibia Or Fibula
Tear, knee	7170	ICD-9 Dx	Old Bucket Handle Tear Of Medial Meniscus
	7171	ICD-9 Dx	Derangement Of Anterior Horn Of Medial Meniscus
	7172	ICD-9 Dx	Derangement Of Posterior Horn Of Medial Meniscus
	7173	ICD-9 Dx	Other And Unspecified Derangement Of Medial Meniscus
	71740	ICD-9 Dx	Derangement Of Lateral Meniscus Unspecified
	71741	ICD-9 Dx	Bucket Handle Tear Of Lateral Meniscus
	71742	ICD-9 Dx	Derangement Of Anterior Horn Of Lateral Meniscus

Trigger category	Trigger codes	Code type	Description
	71743	ICD-9 Dx	Derangement Of Posterior Horn Of Lateral Meniscus
	71749	ICD-9 Dx	Other Derangement Of Lateral Meniscus
	7175	ICD-9 Dx	Derangement Of Meniscus Not Elsewhere Classified
	71781	ICD-9 Dx	Old Disruption Of Lateral Collateral Ligament
	71782	ICD-9 Dx	Old Disruption Of Medial Collateral Ligament
	71783	ICD-9 Dx	Old Disruption Of Anterior Cruciate Ligament
	71784	ICD-9 Dx	Old Disruption Of Posterior Cruciate Ligament
	71785	ICD-9 Dx	Old Disruption Of Other Ligaments Of Knee
	8360	ICD-9 Dx	Tear Of Medial Cartilage Or Meniscus Of Knee Current
	8361	ICD-9 Dx	Tear Of Lateral Cartilage Or Meniscus Of Knee Current
	8362	ICD-9 Dx	Other Tear Of Cartilage Or Meniscus Of Knee Current
Tendonitis, knee	72660	ICD-9 Dx	Enthesopathy Of Knee Unspecified
	72664	ICD-9 Dx	Patellar Tendonitis
	72669	ICD-9 Dx	Other Enthesopathy Of Knee

1 To be a trigger, there must be a secondary diagnosis from one of the other trigger categories.

Table 1D – Episode triggers for ankle sprains/strains/non-operative fractures

Trigger category	Trigger codes	Code type	Description
Closed fracture, ankle	8240	ICD-9 Dx	Fracture Of Medial Malleolus Closed
	8242	ICD-9 Dx	Fracture Of Lateral Malleolus Closed
	8248	ICD-9 Dx	Unspecified Fracture Of Ankle Closed
Closed fracture, fibula	82321	ICD-9 Dx	Closed Fracture Of Shaft Of Fibula
Pain, ankle¹	71947	ICD-9 Dx	Pain In Joint Involving Ankle And Foot
Sprain/strain, ankle	84500	ICD-9 Dx	Unspecified Site Of Ankle Sprain
	84501	ICD-9 Dx	Deltoid (Ligament) Ankle Sprain
	84502	ICD-9 Dx	Calcaneofibular (Ligament) Ankle Sprain
	84503	ICD-9 Dx	Tibiofibular (Ligament) Sprain Distal
	84509	ICD-9 Dx	Other Ankle Sprain
Sprain/strain, foot	84510	ICD-9 Dx	Unspecified Site Of Foot Sprain
	84511	ICD-9 Dx	Tarsometatarsal (Joint) (Ligament) Sprain
	84512	ICD-9 Dx	Metatarsophalangeal (Joint) Sprain
	84513	ICD-9 Dx	Interphalangeal (Joint) Toe Sprain
	84519	ICD-9 Dx	Other Foot Sprain
Tear, ankle	72767	ICD-9 Dx	Nontraumatic Rupture Of Achilles Tendon
	72768	ICD-9 Dx	Nontraumatic Rupture Of Other Tendons Of Foot And Ankle
Tendonitis, ankle	72670	ICD-9 Dx	Enthesopathy Of Ankle And Tarsus Unspecified

Trigger category	Trigger codes	Code type	Description
	72671	ICD-9 Dx	Achilles Bursitis Or Tendonitis
	72672	ICD-9 Dx	Tibialis Tendonitis
	72679	ICD-9 Dx	Other Enthesopathy Of Ankle And Tarsus
	72706	ICD-9 Dx	Tenosynovitis Of Foot And Ankle

1 To be a trigger, there must be a secondary diagnosis from one of the other trigger categories.

Table 2A – Episode risk factors for shoulder sprains/strains/non-operative fractures

Risk factor	Relevant time period
Risk Factor 001 Acute renal failure	During the episode window and 365 days before episode window
Risk Factor 002 Anemia	During the episode window and 365 days before episode window
Risk Factor 003 Arthritis	During the episode window and 365 days before episode window
Risk Factor 004 Chronic kidney disease	During the episode window and 365 days before episode window
Risk Factor 005 COPD	During the episode window and 365 days before episode window
Risk Factor 006 Diabetes with complications	During the episode window and 365 days before episode window
Risk Factor 007 Dual-injury	During the episode window
Risk Factor 008 Epilepsy	During the episode window and 365 days before episode window
Risk Factor 009 Immunity disorders	During the episode window and 365 days before episode window
Risk Factor 010 Multi-injury	During the episode window and 365 days before episode window
Risk Factor 011 Obesity	During the episode window and 365 days before episode window
Risk Factor 012 Other hereditary or degenerative neurological disorders	During the episode window and 365 days before episode window
Risk Factor 013 Peripheral neuropathy	During the episode window and 365 days before episode window
Risk Factor 014 Spinal deformity	During the episode window and 365 days before episode window

Risk factor	Relevant time period
Risk Factor 015 Tobacco use disorder	During the episode window and 365 days before episode window
Risk Factor 016 Triggered by shoulder dislocation	During the trigger window
Risk Factor 017 Triggered by fracture of humerus	During the trigger window
Risk Factor 018 Triggered by fracture of scapula	During the trigger window
Risk Factor 019 Age Range - Under 5	During the episode window
Risk Factor 020 Age Range - Over 14 Under 20	During the episode window
Risk Factor 021 Age Range - Over 29 Under 35	During the episode window
Risk Factor 022 Age Range - Over 34 Under 40	During the episode window
Risk Factor 023 Age Range - Over 39 Under 45	During the episode window
Risk Factor 024 Age Range - Over 44 Under 50	During the episode window
Risk Factor 025 Age Range - Over 49 Under 55	During the episode window
Risk Factor 026 Age Range - Over 54 Under 60	During the episode window
Risk Factor 027 Age Range - Over 59 Under 65	During the episode window

Table 2B – Episode risk factors for wrist sprains/strains/non-operative fractures

Risk factor	Relevant time period
Risk Factor 001 Anemia	During the episode window and 365 days before episode window

Risk factor	Relevant time period
Risk Factor 002 Arthritis	During the episode window and 365 days before episode window
Risk Factor 003 COPD	During the episode window and 365 days before episode window
Risk Factor 004 Diabetes with complications	During the episode window and 365 days before episode window
Risk Factor 005 Dual-injury	During the episode window
Risk Factor 006 Epilepsy	During the episode window and 365 days before episode window
Risk Factor 007 Triggered by hand fracture	During the trigger window
Risk Factor 008 Obesity	During the episode window and 365 days before episode window
Risk Factor 009 Other hereditary or degenerative neurological disorders	During the episode window and 365 days before episode window
Risk Factor 010 Triggered by radius ulna fracture	During the trigger window
Risk Factor 011 Spinal deformity	During the episode window and 365 days before episode window
Risk Factor 012 Tobacco use disorder	During the episode window and 365 days before episode window
Risk Factor 013 Triggered by wrist dislocation	During the trigger window
Risk Factor 014 Triggered by wrist fracture	During the trigger window
Risk Factor 015 Age Range - Over 4 Under 10	During the episode window

Table 2C – Episode risk factors for knee sprains/strains/non-operative fractures

Risk factor	Relevant time period
Risk Factor 001 Anemia	During the episode window and 365 days before episode window
Risk Factor 002 Arthritis	During the episode window and 365 days before episode window
Risk Factor 003 Cruciate ligament knee sprain	During the episode window
Risk Factor 004 Dual-injury	During the episode window
Risk Factor 005 Obesity	During the episode window and 365 days before episode window
Risk Factor 006 Other hereditary or degenerative neurological disorders	During the episode window and 365 days before episode window
Risk Factor 007 Triggered by patella dislocation	During the trigger window
Risk Factor 008 Triggered by patella fracture	During the trigger window
Risk Factor 009 Triggered by tear	During the trigger window
Risk Factor 010 Triggered by tibia fibula fracture	During the trigger window
Risk Factor 011 Tobacco use disorder	During the episode window and 365 days before episode window
Risk Factor 012 Age Range - Over 39 Under 45	During the episode window

Table 2D – Episode risk factors for ankle sprains/strains/non-operative fractures

Risk factor	Relevant time period
Risk Factor 001 Acute renal failure	During the episode window and 365 days before episode window
Risk Factor 002 Anemia	During the episode window and 365 days before episode window
Risk Factor 003 Arthritis	During the 180 days before episode window
Risk Factor 004 Congenital musculoskeletal disorders	During the episode window and 365 days before episode window
Risk Factor 005 COPD	During the episode window and 365 days before episode window
Risk Factor 006 Crushing injury	During the episode window and 365 days before episode window
Risk Factor 007 Diabetes with complications	During the episode window and 365 days before episode window
Risk Factor 008 Dual-injury	During the episode window
Risk Factor 009 Congestive heart failure	During the episode window and 365 days before episode window
Risk Factor 010 Epilepsy	During the episode window and 365 days before episode window
Risk Factor 011 Immune disorders	During the episode window and 365 days before episode window
Risk Factor 012 Multi-Injury	During the episode window and 365 days before episode window
Risk Factor 013 Osteomyelitis	During the episode window and 365 days before episode window
Risk Factor 014 Sex - Female	During the episode window
Risk Factor 015 Triggered by ankle fracture	During the trigger window

Risk factor	Relevant time period
Risk Factor 016 Triggered by tibia fracture	During the episode window
Risk Factor 017 Age Range - Over 14 Under 20	During the episode window
Risk Factor 018 Age Range - Over 19 Under 25	During the episode window
Risk Factor 019 Age Range - Over 24 Under 30	During the episode window
Risk Factor 020 Age Range - Over 34 Under 40	During the episode window
Risk Factor 021 Age Range - Over 39 Under 45	During the episode window
Risk Factor 022 Age Range - Over 44 Under 50	During the episode window
Risk Factor 023 Age Range - Over 29 Under 35	During the episode window
Risk Factor 024 Age Range - Over 54 Under 60	During the episode window
Risk Factor 025 Age Range - Over 59 Under 65	During the episode window

Table 3 –Episode exclusions

Exclusion type	Episode exclusion	Description	Relevant time period
Business exclusion	Out of state	PAP operates out of state	N/A
	FQHC/RHC	PAP is classified as a federally qualified health center or rural health clinic	N/A
	No PAP	An episode is excluded if the PAP cannot be identified	During the episode window
	Enrollment	Patient is not enrolled in Medicaid	During the episode window
	Third party liability	An episode is excluded if third-party liability charges are present on any claim or claim detail line during the episode window or if the patient has relevant third-party coverage at any time during the episode window.	During the episode window
	Multi payer	An episode is excluded if a patient changes enrollment between FFS and an MCP or between MCPs	During the episode window
	Dual	An episode is excluded if the patient had dual coverage by Medicare and Medicaid	During the episode window
	No DRG	An episode is excluded if a DRG-paid inpatient claim is missing the APR-DRG and severity of illness	During the episode window
	Long admission	An episode is excluded if the patient has one or more hospital admissions for a duration greater than 30 days	During the episode window
Long term care	An episode is excluded if the patient has one or more long-term care claim detail lines	During the episode window	

Exclusion type	Episode exclusion	Description	Relevant time period
		which overlap the episode window	
	Incomplete episodes	An episode is excluded if the non-risk-adjusted episode spend is less than the incomplete episode threshold.	During the episode window
Standard clinical exclusion	Age	An episode is excluded if the patient is older than 64 (>64) years of age.	During the episode window
	Left against medical advice	Patient has discharge status of “left against medical advice”	During the episode window
	Death	An episode is excluded if the patient has a discharge status of “expired” on any inpatient or outpatient claim	During the episode window
	Cancer treatment	Patient has diagnosis of cancer and procedures for active management of cancer	During the episode or up to 90 days before the start of the episode
	ESRD	Patient has diagnosis or procedure for end stage renal disease	During the episode or up to 365 days before the start of the episode
	Cystic fibrosis	Patient has diagnosis of cystic fibrosis during the episode	During the episode or up to 365 days before the start of the episode
	Multiple sclerosis	Patient has diagnosis of multiple sclerosis	During the episode window or during 365 days before the start of the episode
	Coma	Patient has diagnosis of coma during the episode	During the episode or up to

Exclusion type	Episode exclusion	Description	Relevant time period
			365 days before the start of the episode
	Transplant	An episode is excluded if a patient has an organ transplant	During the episode or up to 365 days before the start of the episode
	Paralysis	Patient has diagnosis of paralysis	During the episode or up to 365 days before the start of the episode
	HIV	Patient has diagnosis of HIV	During the episode or up to 365 days before the start of the episode
Episode-specific clinical exclusion	Multi-injury	Patient has diagnosis of sprain/strain/fractures in 3 or more different body parts	During the episode
	Inpatient admission	Patient has an admission	During the trigger window
	Operative treatments	Patient has a procedure code of related procedures on the same joint	During the episode window
	Overlapped sprains	For patients with two or more sprain episodes of different types, an exclusion will be applied in the following hierarchy based on average episode spend: shoulder>knee>ankle>wrist. Patients will be included in the higher-ranked episode and excluded from the lower-ranked episode	During the episode or up to 30 days before the start of the episode

Exclusion type	Episode exclusion	Description	Relevant time period
	Knee arthroscopy (only for knee sprain/strain/non-operative fracture episode)	Patient has a knee arthroscopy procedure	During the episode or up to 30 days before the start of the episode

Table 4 – Episode quality and utilization metrics

Metric type	Quality or utilization metric	Description	Relevant time period
Tied to incentive payments	Difference between average MED / day in the pre-trigger opioid window and the post-trigger opioid window ²⁰	Difference between average MED / day in the pre-trigger opioid window and the post-trigger opioid window	During the pre-trigger opioid window and post-trigger opioid window
Informational	Average MED / day during the pre-trigger opioid window	Average MED per day during the pre-trigger opioid window among patients with an opioid prescription	During the pre-trigger opioid window
	Average MED / day during the post-trigger opioid window	Average MED per day during the post-trigger opioid window among patients with an opioid prescription	During the post-trigger opioid window
	X-ray for sprain / strain episodes	Percentage of episodes triggered by a sprain or strain that had x-ray imaging	During the episode window
	Incremental imaging rate	Percentage of episodes with an MRI where the patient received an x-ray or ultrasound within the 60 days prior to the MRI	During the episode window
	Post-trigger ED visit rate	Percentage of episodes where the patient had a relevant ED visit in	During the post-trigger window

²⁰ The pre-trigger opioid window and post-trigger opioid window are specific time periods that are defined in the detailed business requirements.

Metric type	Quality or utilization metric	Description	Relevant time period
		the post-trigger window	
	Concurrent opioid and benzodiazepine	Percentage of episodes where the patient filled prescriptions for both an opioid and a benzodiazepine	During the episode window
	New opioid prescription	Percentage of episodes where the patient had not filled a prescription for opioids within the 90 days before the episode who received opioids during the episode window	During the episode window

EXHIBIT 3 – SPRAIN/STRAIN/NON-OPERATIVE FRACTURE TRIGGER GROUPS¹

Shoulder sprain/strain/non-operative fracture

■ High (>20 valid episodes) ■ Medium (5 to 20 valid episodes) ■ Low (<5 valid episodes)

Trigger groups	Median spend per episode ² , \$	Count of episodes	Count of members	Total spend, \$	Count of PAPs by episode volume ³
Shoulder sprain/strain/non-operative fracture	177	31,733	26,101	9,511,849	1,446
Sprain, shoulder	150	16,308	15,001	4,136,383	1,023
Tendinitis, shoulder	187	7,451	6,218	2,184,298	809
Pain, shoulder	214	2,816	2,501	921,513	398
Closed dislocation, shoulder	363	1,976	1,624	1,028,772	367
Capsulitis, shoulder	225	1,171	890	379,942	232
Closed fracture, humerus	371	1,171	980	584,389	262
Tear, shoulder	181	689	564	214,884	173
Closed fracture, scapula	256	151	131	61,668	95

Wrist sprain/strain/non-operative fracture

■ High (>20 valid episodes) ■ Medium (5 to 20 valid episodes) ■ Low (<5 valid episodes)

Trigger groups	Median spend per episode ² , \$	Count of episodes	Count of members	Total spend, \$	Count of PAPs by episode volume ³
Wrist sprain/strain/non-operative fracture	202	27,217	25,312	8,052,345	1,126
Sprain, wrist	171	8,642	8,400	2,088,457	659
Sprain, hand	137	6,663	6,493	1,324,655	576
Closed fracture, wrist	449	4,529	4,181	2,537,700	383
Tendonitis, wrist	142	3,707	3,357	805,205	609
Closed fracture, hand	284	2,262	2,149	759,576	342
Pain, forearm	180	784	750	204,819	187
Closed fracture, radius/ulna	442	538	507	303,879	155
Tear, wrist	85	55	47	10,023	39
Closed dislocation, hand	305	37	31	18,007	24

Knee sprain/strain/non-operative fracture

■ High (>20 valid episodes) ■ Medium (5 to 20 valid episodes) ■ Low (<5 valid episodes)

Trigger groups	Median spend per episode ² , \$	Count of episodes	Count of members	Total spend, \$	Count of PAPs by episode volume ³
Knee sprains/strains/non-operative fractures	177	23,875	21,228	7,070,244	1,225
Sprain, knee	167	15,346	14,277	4,301,664	931
Tear, knee	213	2,676	2,371	898,356	392
Pain, lower leg	238	2,041	1,908	719,273	343
Tendinitis, knee	133	1,426	1,315	310,464	395
Closed dislocation, patella	231	759	665	257,943	205
Closed fracture, tibia/fibula	368	609	522	278,481	180
Bursitis, knee	149	569	533	134,407	237
Closed fracture, patella	369	289	252	126,739	142
Stress fracture, tibia/fibula	158	140	119	34,932	65
Closed fracture, femoral condyle	350	20	19	7,985	17

Ankle sprain/strain/non-operative fracture

■ High (>20 valid episodes) ■ Medium (5 to 20 valid episodes) ■ Low (<5 valid episodes)

Trigger groups	Median spend per episode ² , \$	Count of episodes	Count of members	Total spend, \$	Count of PAPs by episode volume ³
Ankle sprain/strain/non-operative fracture	165	50,769	44,967	14,124,493	1,694
Sprain, ankle	162	28,698	26,811	7,453,301	1,330
Tendinitis, ankle	163	9,490	7,722	2,788,777	936
Sprain, foot	130	7,129	6,961	1,576,372	661
Closed dislocation, shoulder	383	3,788	3,352	1,780,744	506
Pain, ankle	193	1,295	1,194	402,095	278
Closed fracture, humerus	173	279	231	83,512	100
Closed fracture, fibula	367	90	86	39,694	55

1 For valid episodes across all PAPs; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g., cancer, ESRD)

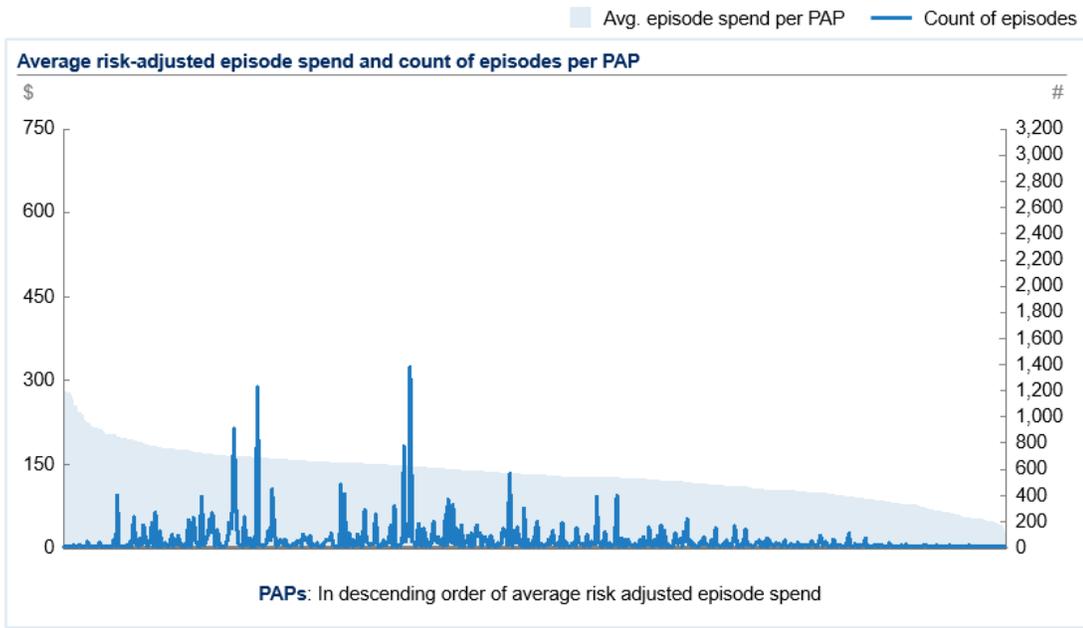
2 Median of non-adjusted spend based on the current episode algorithm

3 Low volume is defined as PAPs with less than five valid episodes, Medium volume as PAPs with five to 20 valid episodes and High volume as PAPs with more than 20 valid episodes

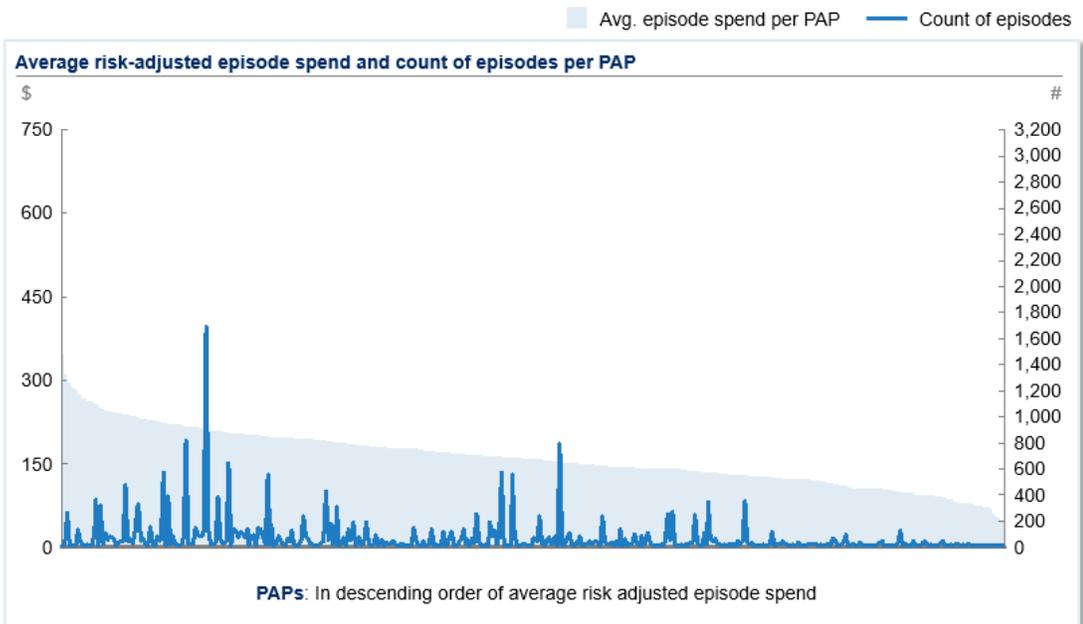
SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 4 – DISTRIBUTION OF RISK-ADJUSTED AVERAGE EPISODE SPEND AND COUNT BY PAP¹

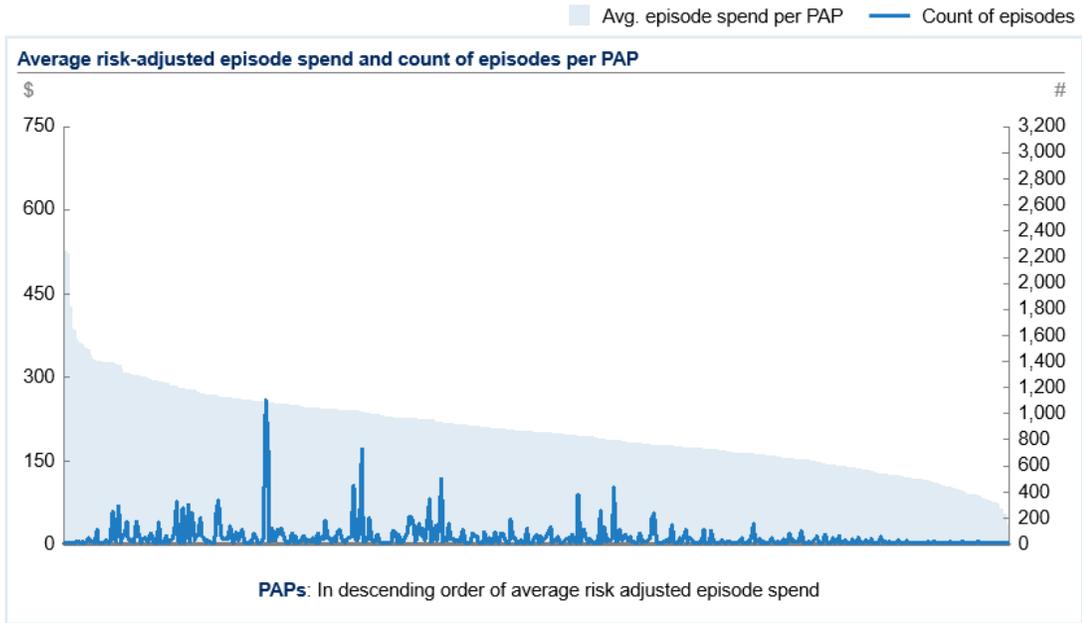
Shoulder sprain/strain/non-operative fracture



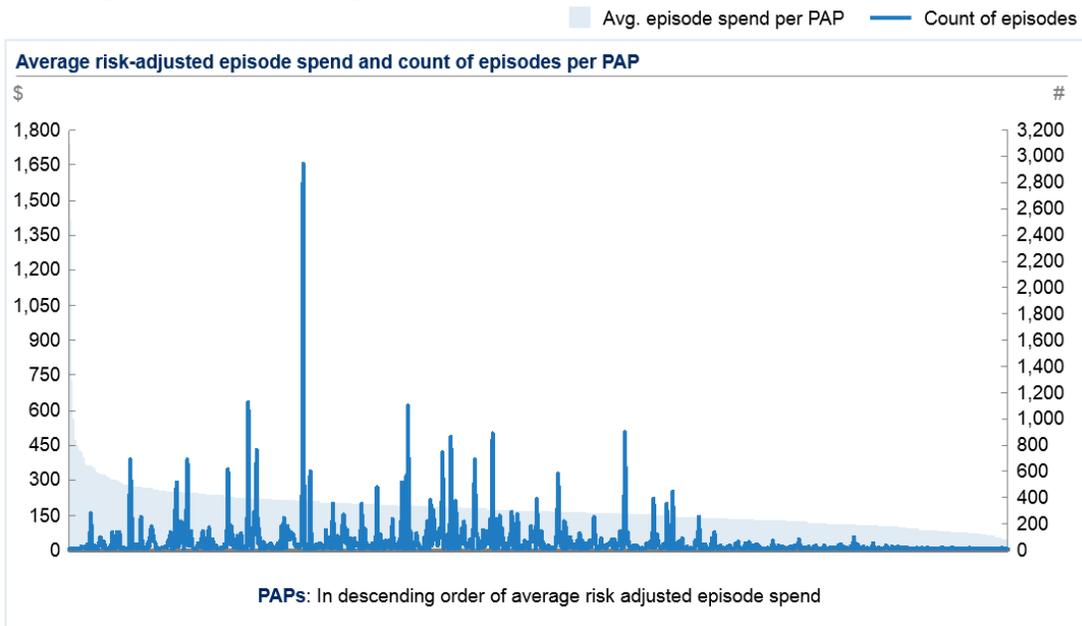
Wrist sprain/strain/non-operative fracture



Knee sprain/strain/non-operative fracture



Ankle sprain/strain/non-operative fracture



1 For valid episodes across PAPs with 5 or more valid episodes; valid episodes for PAPs with 4 or less episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g., cancer, ESRD)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 5 – EPISODE COUNT AND SPEND BY EPISODE RISK FACTOR¹

Shoulder sprain/strain/non-operative fracture

Median episode spend for valid episodes, \$	Episode risk factor	Count of episodes ²	Episodes with risk factor, %	Median Spend ² , \$
177	Tobacco use	15,542	49	195
	Arthritis	10,218	32	244
	Obesity	5,334	17	218
	Dual-injury	4,304	14	257
	Diabetes with complication	2,558	8	250
	Anemia	2,527	8	236
	Triggered by shoulder dislocation	2,176	7	351
	Multi-injury	1,876	6	218
	Other neurological disorders	1,840	6	263
	Peripheral neuropathy	1,454	5	262
	COPD	1,429	5	245
	Epilepsy	1,429	5	262
	Triggered by humerus fracture	1,231	4	369
	Spinal deformity	798	3	229
	Chronic kidney disease	517	2	288

Wrist sprain/strain/non-operative fracture

Median episode spend for valid episodes, \$	Episode risk factor	Count of episodes ²	Episodes with risk factor, %	Median Spend ² , \$
202	Tobacco use	8,592	32	225
	Triggered by wrist fracture	4,657	17	445
	Obesity	3,008	11	224
	Arthritis	2,844	10	246
	Triggered by hand fracture	2,316	9	283
	Anemia	1,375	5	241
	Dual-injury	1,025	4	293
	Epilepsy	838	3	243
	Other neurological disorder	640	2	246
	Triggered by radius ulna fracture	561	2	443
	COPD	509	2	281
	Spinal deformity	490	2	241
	Diabetes with complication	236	1	267
	Triggered by wrist dislocation	37	0	295
	Age 5 to 9 years	2,983	11	263

Knee sprain/strain/non-operative fracture

Median episode spend for valid episodes, \$	Episode risk factor	Count of episodes ²	Episodes with risk factor, %	Median Spend ² , \$
177	Tobacco use	8,577	36	209
	Arthritis	4,756	20	256
	Triggered by tears	3,726	16	228
	Obesity	3,673	15	221
	Cruciate ligament knee sprain	1,901	8	277
	Anemia	1,031	4	223
	Triggered by patella dislocation	890	4	237
	Triggered by tibia fibula fracture	641	3	368
	Other neurological disorder	523	2	253
	Triggered by patella fracture	304	1	366
	Dual-injury	111	0	176
	Age 40 to 44 years	1,716	7	202

Ankle sprain/strain/non-operative fracture

Median episode spend for valid episodes, \$	Episode risk factor	Count of episodes ²	Episodes with risk factor, %	Median Spend ² , \$
165	Sex - female	32,882	65	171
	Arthritis	7,257	14	237
	Triggered by ankle fracture	4,007	8	377
	Anemia	3,077	6	232
	Congenital musculoskeletal disorders	2,150	4	188
	Multi-injury	1,965	4	219
	Epilepsy	1,723	3	228
	COPD	1,004	2	269
	Diabetes with complications	682	1	247
	Crushing injuries	677	1	224
	Congestive heart failure	523	1	272

Median episode spend for valid episodes, \$	Episode risk factor	Count of episodes ²	Episodes with risk factor, %	Median Spend ² , \$
165	Acute renal failure	323	1	285
	Osteomyelitis	240	0	280
	Immune disorders	103	0	270
	Triggered by fibula tibia fracture	103	0	345
	Age 15 to 19 years	7,320	14	150
	Age 30 to 34 years	5,096	10	180
	Age 25 to 29 years	4,796	9	167
	Age 35 to 39 years	4,400	9	186
	Age 20 to 24 years	3,728	7	156
	Age 40 to 44 years	3,572	7	198
	Age 45 to 49 years	3,092	6	212
	Age 50 to 54 years	2,875	6	213
	Age 55 to 59 years	2,076	4	206

1 Valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g., cancer, ESRD)

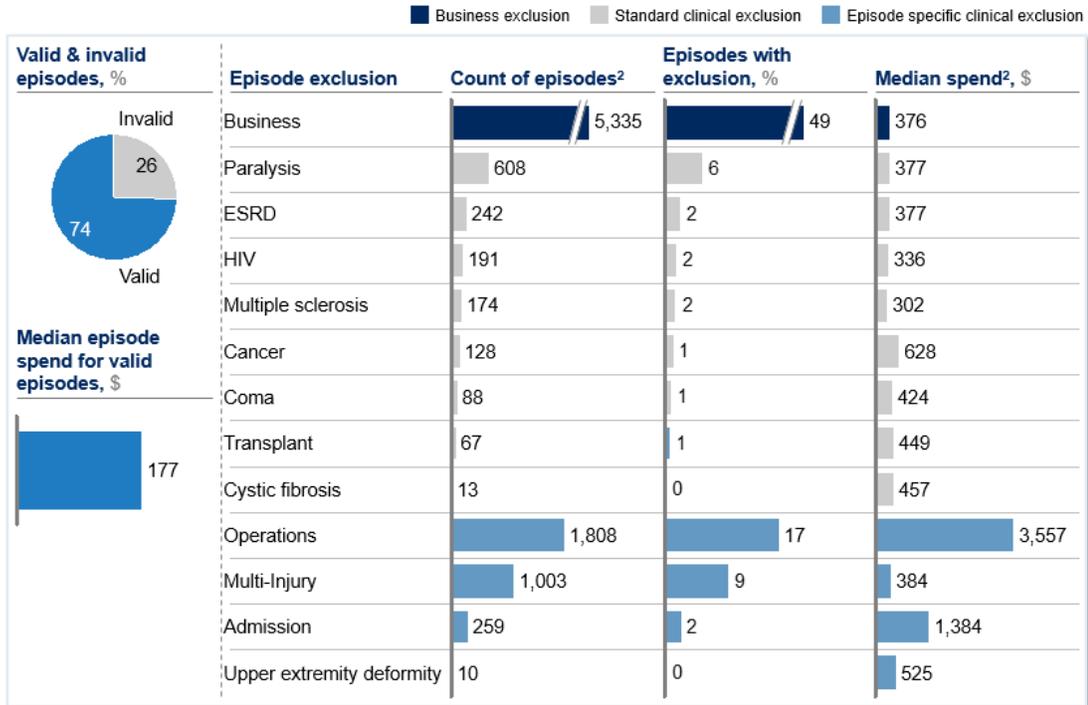
2 Non-adjusted spend for episodes with this potential risk factor; one episode can have multiple risk factors

3 Shoulder sprain/strain/non-operative fracture: Showing select 15 risk factors

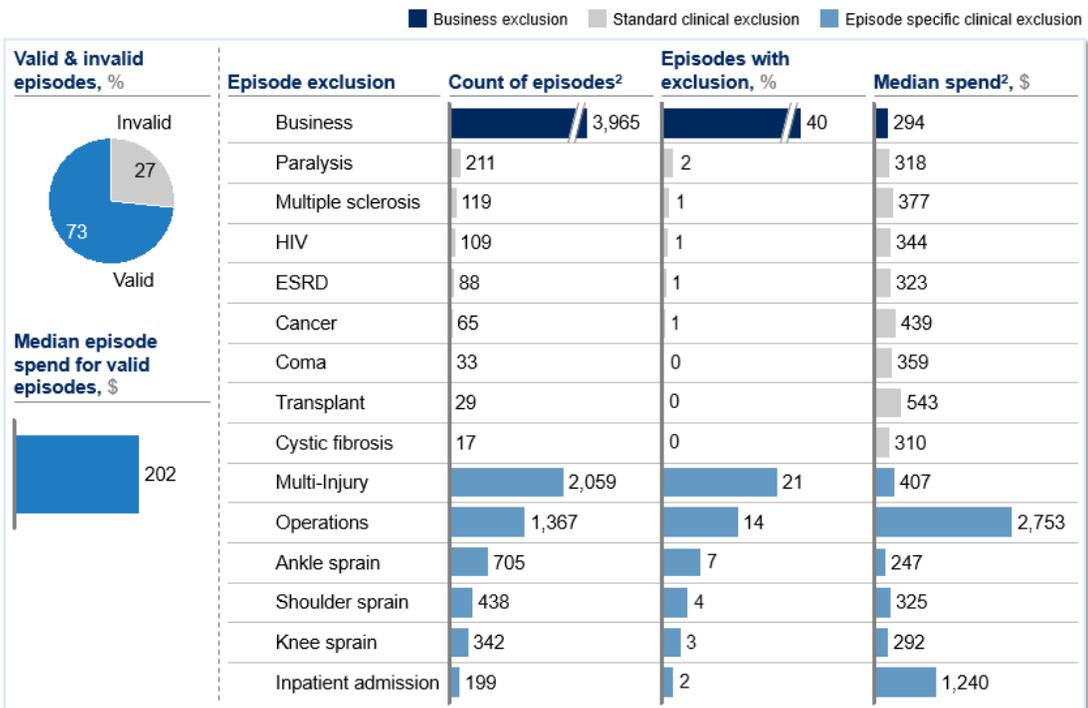
SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 6 – EPISODE COUNT AND SPEND BY EPISODE EXCLUSION¹

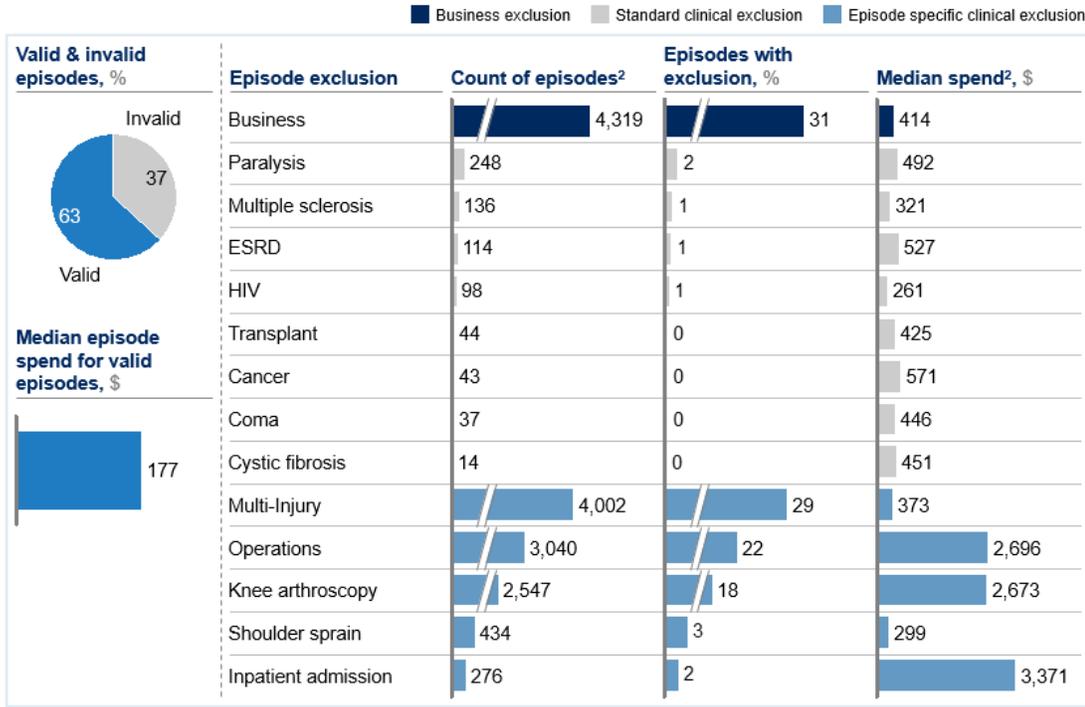
Shoulder sprain/strain/non-operative fracture



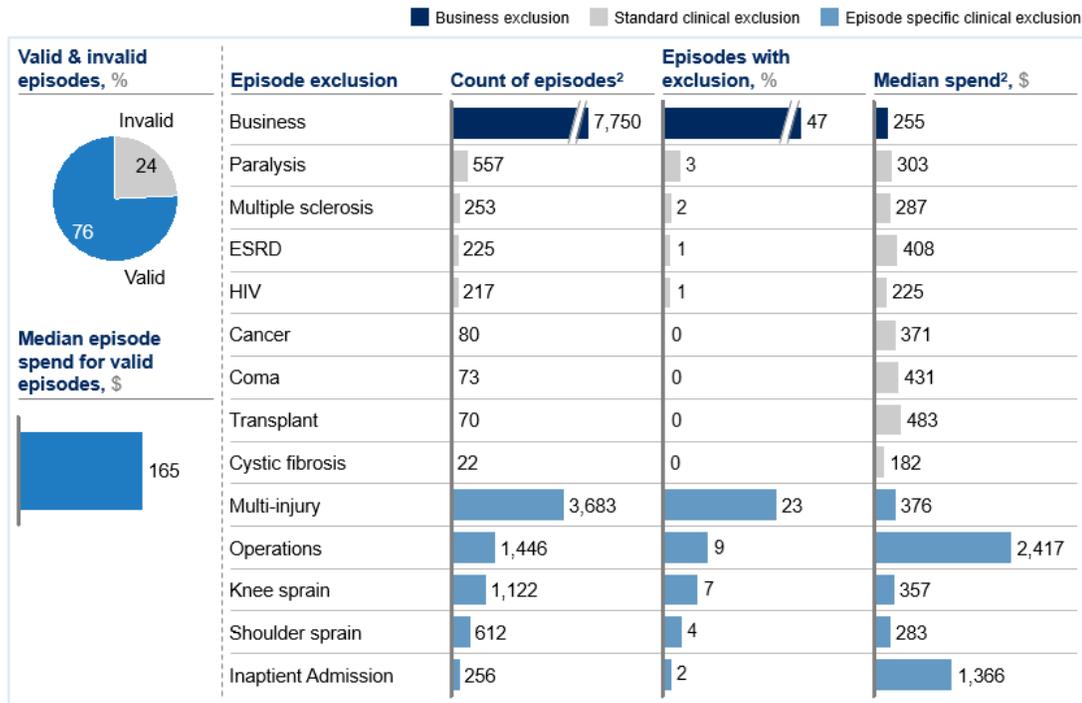
Wrist sprain/strain/non-operative fracture



Knee sprain/strain/non-operative fracture



Ankle sprain/strain/non-operative fracture

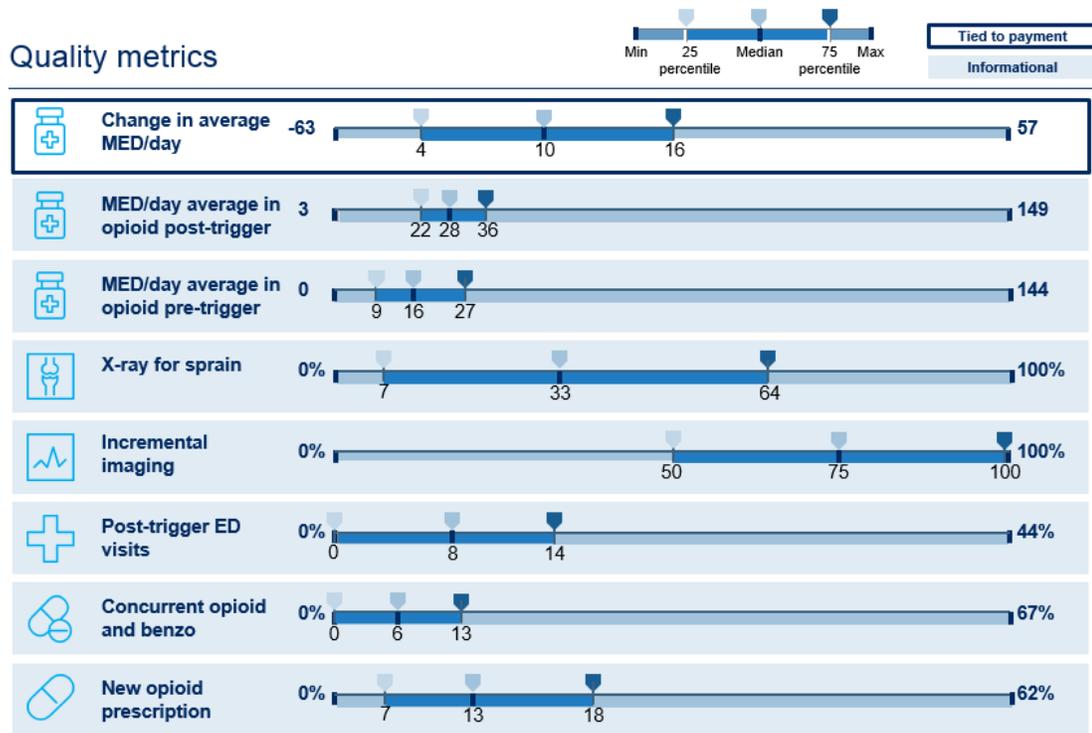


- 1 Individual business exclusions are collapsed into one row
- 2 Non-adjusted spend for episodes with this exclusion; one episode can have multiple exclusions
- 3 Multi-injury is defined as episodes with three diagnoses from different body parts

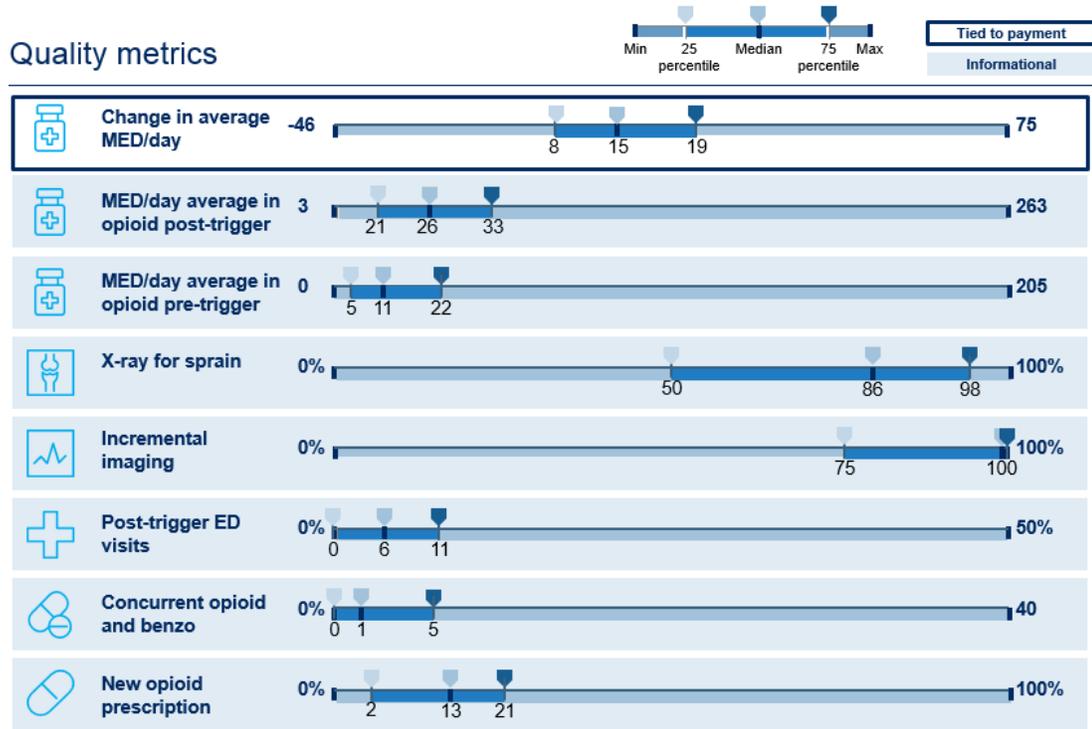
SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 7 - PAP PERFORMANCE ON EPISODE QUALITY AND UTILIZATION METRICS¹

Shoulder sprain/strain/non-operative fracture



Wrist sprain/strain/non-operative fracture



Knee sprain/strain/non-operative fracture

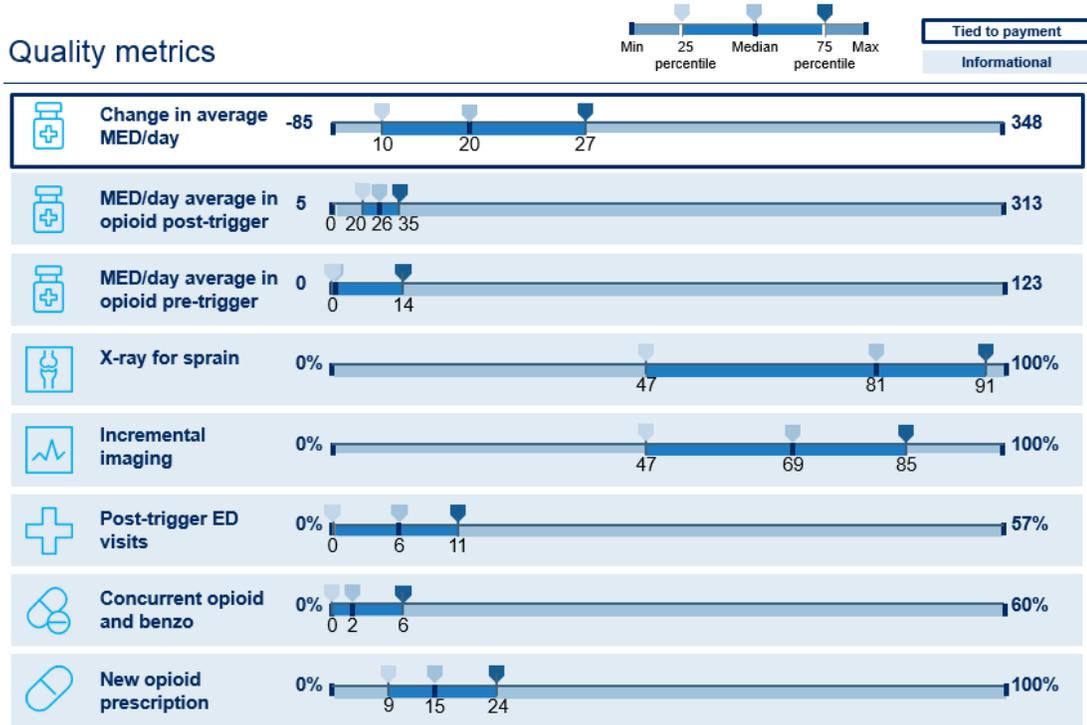
Quality metrics



Tied to payment
 Informational



Ankle sprain/strain/non-operative fracture



1 For valid episodes across PAPs with 5 or more valid episodes; valid episodes for PAPs with 4 or less episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g., cancer, ESRD)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015