

Overview of the skin and soft tissue infection episode of care

State of Ohio

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1. CLINICAL OVERVIEW AND RATIONALE FOR DEVELOPMENT OF THE SKIN AND SOFT TISSUE INFECTION EPISODE OF CARE

1.1 Rationale for development of the skin and soft tissue infection episode of care

Skin and soft tissue infections (SSTI) are commonly occurring conditions in the United States, with over 14 million annual visits to clinician offices and emergency departments (ED).¹ The incidence of SSTIs has increased dramatically over the past 20 years due largely to the emergence of community acquired methicillin-resistant *Staphylococcus Aureus* (CA-MRSA). This strain of bacteria has led to infections of increased severity with more abscess formation, inadequate antibiotic treatment, and increased hospitalizations.^{2,3,4} In addition, there is evidence that the increase in SSTIs has disproportionately affected the Medicaid population nationwide. This may be due to factors that co-exist in the Medicaid population and are known risk factors for CA-MRSA, such as living in public housing, poor sanitation, intravenous drug use, and incarceration. Finally, receiving care in safety-net hospitals where CA-MRSA is prevalent may perpetuate this issue.⁵

SSTIs comprise a diverse set of diseases and etiologies, but most present similarly and have comparable disease and treatment courses. They can be generally classified

¹ Hersh A, et al. (2008). National Trends in Ambulatory Visits and Antibiotic Prescribing for Skin and Soft-Tissue Infections. *Arch Intern Med*, 168(14): 1585-1591

² Ray G, et al. (2013). Incidence, microbiology, and patient characteristics of skin and soft-tissue infections in a U.S. population: a retrospective population-based study. *BMC Infectious Disease*, 13:252.

³ Edelsberg J, et al. (2009). Trends in US hospital Admissions for Skin and Soft Tissue infections. *Emerging Infectious Diseases*, 15(9): 1516-1518

⁴ King M, et al. (2006) Emergence of Community-Acquired Methicillin-Resistant staphylococcus aureus USA 300 Clone as the Predominant Cause of Skin and Soft-Tissue Infections. *Annals of Internal Medicine*, 114(5):309-317

⁵ Hersh A, et al., op. cit., p. 1

as simple or complicated, depending on the type of infection, strain of bacteria, presence or degree of systemic symptoms, and host factors.^{6,7} Simple infections, such as cellulitis and erysipelas, typically affect the upper and lower layers of the skin and the subcutaneous fat; they can be managed in the outpatient setting. Complicated infections, such as deep abscesses and necrotizing fasciitis, extend into the underlying deep tissues and often present with systemic symptoms such as fever or sepsis, which typically require inpatient care. The scope of this episode is limited to simple SSTIs in order to address the common range of clinical presentations among patients who have a similar patient journey. Complicated infections are considered to be outside the scope of this episode.

The Infectious Diseases Society of America has published a standard set of clinical guidelines for the evaluation and management of simple SSTIs across a spectrum of diseases and causative pathogens.⁸ Despite clear guidelines, clinician practice varies widely from one provider to another.⁹ Unique patient presentations and needs will necessitate variation in medical practice; however, practice variation due to reasons not related to the patient may lead to sub-optimal patient outcomes, higher than necessary costs, or both. Additionally, the over-use of broad-spectrum antibiotics in treating SSTIs has furthered the development of antibiotic-resistant strains leading to increased difficulty in treating future infections.¹⁰

Each year in Ohio, there are approximately 110,000 SSTI episodes among Medicaid beneficiaries (approximately 3 percent of Medicaid beneficiaries develop an SSTI in a given year). This collectively represents approximately \$25 million in spend (or 0.2 percent of total Ohio Medicaid Spend). As one example of potential resource overutilization, while there is clear evidence that non-ultrasound imaging for simple infections are rarely indicated, about 13 percent of SSTI episodes in Ohio receive it.¹¹

⁶ Stevens D, et al. (2014) Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America. *Clinical Infectious Diseases*, ciu296

⁷ Kalyanakrishnan R, et al. (2015). Skin and Soft Tissue Infections. *American Family Physician*, 92.6: 474-483

⁸ Stevens, D, et al., op. cit., p. 2

⁹ Yarbrough, P, et al. (2015). Evidence-based care pathway for cellulitis improves process, clinical, and cost outcomes. *Journal of Hospital Medicine*, 10(12): 780-786

¹⁰ Stevens, D, et al., op. cit., p. 2

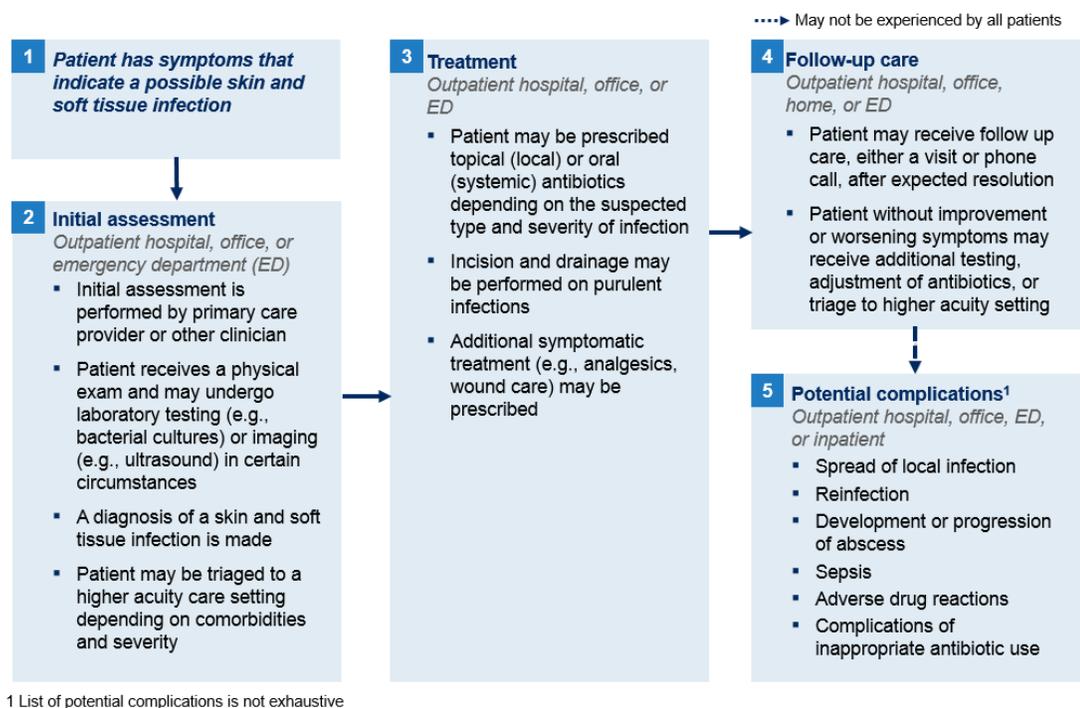
¹¹ Based on analysis of Ohio Medicaid claims data between 2014-10-01 and 2015-09-30.

Implementing the SSTI episode will incentivize evidence-based, guideline-concordant care through an outcomes-based payment model. Alongside other episodes of care and patient centered medical homes, the SSTI episode will contribute to a model of care delivery that benefits patients through improved care quality, clinical outcomes, and a lower overall cost of care.

1.2 Clinical overview and typical patient journey for the SSTI episode

As depicted in Exhibit 1, the patient journey begins when a patient presents to an office, urgent care center, or ED setting with signs and symptoms indicating an SSTI. These are typically localized to the site of infection and include redness, tenderness, warmth, and swelling. Patients are often children or older individuals with comorbidities, such as diabetes or peripheral vascular disease.

EXHIBIT 1 – SKIN AND SOFT TISSUE INFECTION PATIENT JOURNEY



Source: Stevens D, et al. (2014). Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America. *Clinical Infectious Diseases*, ciu296.
Kalyanakrishnan R, et al. (2015). Skin and Soft Tissue Infections. *American Family Physician*, 92.6: 474-483.

While diagnosis is predominantly based on clinical assessment, laboratory testing and imaging may be used in certain circumstances, for example, to evaluate whether an underlying blood clot is causing leg swelling or to delineate the extent of an abscess. Depending on comorbidities and severity, the patient may be triaged to a higher

acuity care setting. Patients are typically prescribed oral antibiotics for a course of 5-14 days, depending on the suspected type of infection. If the infection is purulent, an incision and drainage (I&D) procedure may be performed. The clinician may also prescribe additional symptomatic treatment and supportive care, such as wound care or analgesia.

For most patients, the SSTI improves within a few days of antibiotic therapy. Approximately one week after the initial visit, the patient may receive follow-up care, by phone or by in-person visit, to assess the patient's progress. Patients without improvement or with worsening symptoms may receive additional testing, adjustment of antibiotics, and/or triage to a higher acuity care setting.

Some patients may develop complications, resulting in additional office, urgent care center, or ED visits with the possibility of an inpatient stay. Complications from the SSTI include the spread of infection locally, development or progression of abscess, end organ infection, and sepsis. Complications from medications include adverse drug reactions, as well as sequelae from inappropriate antibiotic use, such as the development of drug resistant infections and *Clostridium difficile* colitis.

1.3 Potential sources of value within the SSTI patient journey

Within the SSTI episode of care, providers have several opportunities to improve the quality of care and reduce unnecessary spend associated with the episode (see Exhibit 2). Important sources of value include appropriate use of laboratory testing and imaging, following evidence-based guidelines for antibiotic treatment choice and duration, and utilizing a coordinated antimicrobial stewardship program. Other sources of value include appropriate decision-making in patient triage, including performing indicated procedures in the office setting whenever possible. Additionally, providers may increase efficiency and clinical outcomes through timely follow-up care, which in certain circumstances, may be a phone call or other telemedicine follow-up. Taken together, these improvements may help to reduce potentially avoidable complications and overall spend.

EXHIBIT 2 – SKIN AND SOFT TISSUE INFECTION SOURCES OF VALUE



2. OVERVIEW OF THE SSTI EPISODE DESIGN

2.1 Episode Trigger

The SSTI episode is triggered in one of two ways: either by an ED, urgent care center, or office visit with a primary diagnosis of a simple SSTI (e.g., cellulitis, erysipelas) or by an ED, urgent care center, or office visit with a secondary diagnosis of a simple SSTI coupled with a primary diagnosis of one of the following: a local sign or symptom (e.g., swelling, redness of limb); a systemic sign or symptom (e.g., fever); another relevant condition (e.g., sebaceous cyst); a common comorbidity (e.g., diabetes, peripheral vascular disease); or a routine visit (e.g., well-child visit). See Tables 1a and 1b in the Appendix for the list of SSTI trigger diagnosis codes and the list of contingent trigger codes for relevant conditions. Episodes that present to the

inpatient setting are not in scope.¹² As previously mentioned, complicated SSTIs (e.g., necrotizing fasciitis, gas gangrene) are not included as 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 SSTI episode, the PAP is the clinician diagnosing the SSTI that triggered the episode. 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 during its treatment. (See Exhibit 4 in the Appendix for the distribution of average non-risk-adjusted spend by PAP.)

2.3 Episode Duration

The SSTI episode begins on the first documented diagnosis of an SSTI (called the “trigger window”) and continues for 30 days (called the “post-trigger window”). A 30-day care period captures the vast majority of spend, including uncomplicated outcomes, any complications, and follow-up treatments.

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 an SSTI 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 SSTI episode is comprised of two distinct windows for the purpose of spend inclusions: a trigger window and a post-trigger window. During both windows, this includes specific associated care (e.g., spend associated with a relevant diagnosis), imaging and testing (e.g., ultrasounds, bacterial cultures), specific medications (e.g., Clindamycin), and medical and surgical procedures (e.g., incision and drainage of an

¹² Episodes that present to the inpatient setting or are triaged into an inpatient setting within one day of a simple SSTI diagnosis are triggered and then excluded. In doing so, the algorithm does not have the potential to trigger an outpatient SSTI episode during normal follow-up visits for the same patient.

abscess). In addition, in the post-trigger window only, specific associated care for a complication (e.g., end organ damage) is included.

The total episode spend is calculated by adding up the spend amounts on all of the individual claims that were included in each of the episode windows. To make more comparable the episodes that start in the ED with those that do not, the facility spend for ED episodes is excluded from the total episode spend. This is consistent with other acute, non-emergent episodes of care, such as upper respiratory infection and non-traumatic headache.

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. In the context of episode design, risk factors are attributes or underlying clinical conditions that are likely to impact a patient's course of care and the spend associated with a given episode. Exclusions are attributes or clinical conditions that cannot be adequately risk adjusted and that indicate either a distinct patient journey or incomparably high or low episode spend.

Risk factors are selected via a standardized and iterative risk-adjustment process based on Ohio-specific regression analysis that gives due consideration to clinical relevance, statistical significance, and other contextual factors.¹³ 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, which is the spend on which providers are compared to each other. (See Table 2 in the Appendix for the list of risk factors and Exhibit 6 in the Appendix for analysis of these risk factors.) Examples of risk factors include diabetes mellitus, obesity, peripheral vascular disease, and a history of MRSA.

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. These are selected independently for the SSTI episode. 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

¹³ Garrett B, et al. Risk adjustment for retrospective episode-based payment: Guiding principles and proposed methodology. McKinsey Healthcare Systems and Services Practice. 2014. <http://healthcare.mckinsey.com/risk-adjustment-retrospective-episode-based-payment>

implementation (e.g., overlapping episodes) during the comparison period. Episodes that have no exclusions are known as “valid” episodes and are the episodes that are used for provider comparisons.

For the SSTI episode, both business and clinical exclusions apply. Several of the business and clinical exclusions are standard across most episodes while others relate to the scope of the episode design. Standard clinical exclusions include the presence of HIV or active cancer. Episode specific clinical exclusions include an SSTI where initial triage results in an inpatient hospitalization, complicated SSTIs (e.g., necrotizing fasciitis, gas gangrene) during the trigger window, and the presence of ulcers and post-surgical wounds up to 30 days prior to the start of the episode. (See Table 3 in the Appendix for a list of business and clinical exclusions and Exhibit 7 in the Appendix for analysis of these exclusions.)

2.6 Quality Metrics

To ensure the episode model incentivizes quality care, the SSTI episode has select quality metrics. These are calculated for each PAP meeting the minimum threshold for valid episodes.

The SSTI episode has five quality metrics. Two are linked to performance assessment, meaning that performance thresholds on these metrics must be met for the episodes to be eligible for positive incentive payments within the episode model. The specific threshold amount will be determined during the informational reporting period. Three of the quality metrics are for informational purposes only. The metrics tied to positive incentive payments are the rate of bacterial cultures obtained of episodes where an I&D was performed and the rate of episodes receiving a first-line antibiotic out of all episodes receiving antibiotics. (See Table 4a in the appendix for the list of first-line antibiotics). Informational metrics include the percentage of episodes receiving a second antibiotic during the second half of the post-trigger window, the rate of ultrasound imaging, and the rate of non-ultrasound imaging. (A detailed description of all the quality metrics is in Table 4b in the Appendix and analysis of these quality metrics is in Exhibit 8.)

3. APPENDIX: SUPPORTING ANALYSES

Table 1a – Episode triggers: Specific SSTI diagnoses

| Trigger Category | Diagnosis code | Code type | Description |
|-----------------------|----------------|--------------------------|---|
| Carbuncle or furuncle | 6800 | ICD-9 | Carbuncle And Furuncle Of Face |
| | 6801 | ICD-9 | Carbuncle And Furuncle Of Neck |
| | 6802 | ICD-9 | Carbuncle And Furuncle Of Trunk |
| | 6803 | ICD-9 | Carbuncle And Furuncle Of Upper Arm And Forearm |
| | 6804 | ICD-9 | Carbuncle And Furuncle Of Hand |
| | 6805 | ICD-9 | Carbuncle And Furuncle Of Buttock |
| | 6806 | ICD-9 | Carbuncle And Furuncle Of Leg Except Foot |
| | 6807 | ICD-9 | Carbuncle And Furuncle Of Foot |
| | 6808 | ICD-9 | Carbuncle And Furuncle Of Other Specified Sites |
| | 6809 | ICD-9 | Carbuncle And Furuncle Of Unspecified Site |
| | L0202 | ICD-10 | Furuncle of face |
| | L0203 | ICD-10 | Carbuncle of face |
| | L0212 | ICD-10 | Furuncle of neck |
| | L0213 | ICD-10 | Carbuncle of neck |
| | L02221 | ICD-10 | Furuncle of abdominal wall |
| | L02222 | ICD-10 | Furuncle of back [any part, except buttock] |
| | L02223 | ICD-10 | Furuncle of chest wall |
| | L02224 | ICD-10 | Furuncle of groin |
| | L02225 | ICD-10 | Furuncle of perineum |
| | L02226 | ICD-10 | Furuncle of umbilicus |
| | L02229 | ICD-10 | Furuncle of trunk, unspecified |
| | L02231 | ICD-10 | Carbuncle of abdominal wall |
| | L02232 | ICD-10 | Carbuncle of back [any part, except buttock] |
| | L02233 | ICD-10 | Carbuncle of chest wall |
| | L02234 | ICD-10 | Carbuncle of groin |
| | L02235 | ICD-10 | Carbuncle of perineum |
| | L02236 | ICD-10 | Carbuncle of umbilicus |
| | L02239 | ICD-10 | Carbuncle of trunk, unspecified |
| | L0232 | ICD-10 | Furuncle of buttock |
| | L0233 | ICD-10 | Carbuncle of buttock |
| L02421 | ICD-10 | Furuncle of right axilla | |

| Trigger Category | Diagnosis code | Code type | Description |
|-----------------------------------|----------------|-----------|---|
| | L02422 | ICD-10 | Furuncle of left axilla |
| | L02423 | ICD-10 | Furuncle of right upper limb |
| | L02424 | ICD-10 | Furuncle of left upper limb |
| | L02425 | ICD-10 | Furuncle of right lower limb |
| | L02426 | ICD-10 | Furuncle of left lower limb |
| | L02429 | ICD-10 | Furuncle of limb, unspecified |
| | L02431 | ICD-10 | Carbuncle of right axilla |
| | L02432 | ICD-10 | Carbuncle of left axilla |
| | L02433 | ICD-10 | Carbuncle of right upper limb |
| | L02434 | ICD-10 | Carbuncle of left upper limb |
| | L02435 | ICD-10 | Carbuncle of right lower limb |
| | L02436 | ICD-10 | Carbuncle of left lower limb |
| | L02439 | ICD-10 | Carbuncle of limb, unspecified |
| | L02521 | ICD-10 | Furuncle right hand |
| | L02522 | ICD-10 | Furuncle left hand |
| | L02529 | ICD-10 | Furuncle unspecified hand |
| | L02531 | ICD-10 | Carbuncle of right hand |
| | L02532 | ICD-10 | Carbuncle of left hand |
| | L02539 | ICD-10 | Carbuncle of unspecified hand |
| | L02621 | ICD-10 | Furuncle of right foot |
| | L02622 | ICD-10 | Furuncle of left foot |
| | L02629 | ICD-10 | Furuncle of unspecified foot |
| | L02631 | ICD-10 | Carbuncle of right foot |
| | L02632 | ICD-10 | Carbuncle of left foot |
| | L02639 | ICD-10 | Carbuncle of unspecified foot |
| | L02821 | ICD-10 | Furuncle of head [any part, except face] |
| | L02828 | ICD-10 | Furuncle of other sites |
| | L02831 | ICD-10 | Carbuncle of head [any part, except face] |
| | L02838 | ICD-10 | Carbuncle of other sites |
| | L0292 | ICD-10 | Furuncle, unspecified |
| | L0293 | ICD-10 | Carbuncle, unspecified |
| Cellulitis or superficial abscess | 6819 | ICD-9 | Cellulitis And Abscess Of Unspecified Digit |
| | 6820 | ICD-9 | Cellulitis And Abscess Of Face |
| | 6821 | ICD-9 | Cellulitis And Abscess Of Neck |
| | 6822 | ICD-9 | Cellulitis And Abscess Of Trunk |
| | 6823 | ICD-9 | Cellulitis And Abscess Of Upper Arm And Forearm |

| Trigger Category | Diagnosis code | Code type | Description |
|------------------|----------------|-----------|--|
| | 6824 | ICD-9 | Cellulitis And Abscess Of Hand Except Fingers And Thumb |
| | 6825 | ICD-9 | Cellulitis And Abscess Of Buttock |
| | 6826 | ICD-9 | Cellulitis And Abscess Of Leg Except Foot |
| | 6827 | ICD-9 | Cellulitis And Abscess Of Foot Except Toes |
| | 6828 | ICD-9 | Cellulitis And Abscess Of Other Specified Sites |
| | 6829 | ICD-9 | Cellulitis And Abscess Of Unspecified Sites |
| | 67500 | ICD-9 | Infections Of Nipple Associated With Childbirth Unspecified As To Episode Of Care |
| | 67501 | ICD-9 | Infections Of Nipple Associated With Childbirth Delivered With Or Without Antepartum Condition |
| | 67502 | ICD-9 | Infections Of Nipple Associated With Childbirth Delivered With Postpartum Complication |
| | 67503 | ICD-9 | Antepartum Infections Of Nipple |
| | 67504 | ICD-9 | Postpartum Infections Of Nipple |
| | 67510 | ICD-9 | Abscess Of Breast Associated With Childbirth Unspecified As To Episode Of Care |
| | 67511 | ICD-9 | Abscess Of Breast Associated With Childbirth Delivered With Or Without Antepartum Condition |
| | 67512 | ICD-9 | Abscess Of Breast Associated With Childbirth Delivered With Postpartum Complication |
| | 67513 | ICD-9 | Antepartum Abscess Of Breast |
| | 67514 | ICD-9 | Postpartum Abscess Of Breast |
| | 67520 | ICD-9 | Nonpurulent Mastitis Associated With Childbirth Unspecified As To Episode Of Care |
| | 67521 | ICD-9 | Nonpurulent Mastitis Associated With Childbirth Delivered With Or Without Antepartum Condition |
| | 67522 | ICD-9 | Nonpurulent Mastitis Associated With Childbirth Delivered With Postpartum Complication |

| Trigger Category | Diagnosis code | Code type | Description |
|------------------|----------------|-----------|---|
| | 67523 | ICD-9 | Antepartum Nonpurulent Mastitis |
| | 67524 | ICD-9 | Postpartum Nonpurulent Mastitis |
| | 67580 | ICD-9 | Other Specified Infections Of The Breast And Nipple Associated With Childbirth Unspecified As To Episode Of Care |
| | 67581 | ICD-9 | Other Specified Infections Of The Breast And Nipple Associated With Childbirth Delivered With Or Without Antepartum Condition |
| | 67582 | ICD-9 | Other Specified Infections Of The Breast And Nipple Associated With Childbirth Delivered With Postpartum Complication |
| | 67583 | ICD-9 | Other Specified Antepartum Infections Of The Breast And Nipple |
| | 67584 | ICD-9 | Other Specified Postpartum Infections Of The Breast And Nipple |
| | 67590 | ICD-9 | Unspecified Infection Of The Breast And Nipple Associated With Childbirth Unspecified As To Episode Of Care |
| | 67591 | ICD-9 | Unspecified Infection Of The Breast And Nipple Associated With Childbirth Delivered With Or Without Antepartum Condition |
| | 67592 | ICD-9 | Unspecified Infection Of The Breast And Nipple Associated With Childbirth Delivered With Postpartum Complication |
| | 67593 | ICD-9 | Unspecified Antepartum Infection Of The Breast And Nipple |
| | 67594 | ICD-9 | Unspecified Postpartum Infection Of The Breast And Nipple |
| | 68100 | ICD-9 | Unspecified Cellulitis And Abscess Of Finger |
| | 68101 | ICD-9 | Felon |
| | 68102 | ICD-9 | Onychia And Paronychia Of Finger |
| | 68110 | ICD-9 | Unspecified Cellulitis And Abscess Of Toe |
| | 68111 | ICD-9 | Onychia And Paronychia Of Toe |
| | K122 | ICD-10 | Cellulitis and abscess of mouth |
| | L0201 | ICD-10 | Cutaneous abscess of face |
| | L0211 | ICD-10 | Cutaneous abscess of neck |
| | L02211 | ICD-10 | Cutaneous abscess of abdominal wall |

| Trigger Category | Diagnosis code | Code type | Description |
|------------------|----------------|-----------|--|
| | L02212 | ICD-10 | Cutaneous abscess of back [any part, except buttock] |
| | L02213 | ICD-10 | Cutaneous abscess of chest wall |
| | L02214 | ICD-10 | Cutaneous abscess of groin |
| | L02215 | ICD-10 | Cutaneous abscess of perineum |
| | L02216 | ICD-10 | Cutaneous abscess of umbilicus |
| | L02219 | ICD-10 | Cutaneous abscess of trunk, unspecified |
| | L0231 | ICD-10 | Cutaneous abscess of buttock |
| | L02411 | ICD-10 | Cutaneous abscess of right axilla |
| | L02412 | ICD-10 | Cutaneous abscess of left axilla |
| | L02413 | ICD-10 | Cutaneous abscess of right upper limb |
| | L02414 | ICD-10 | Cutaneous abscess of left upper limb |
| | L02415 | ICD-10 | Cutaneous abscess of right lower limb |
| | L02416 | ICD-10 | Cutaneous abscess of left lower limb |
| | L02419 | ICD-10 | Cutaneous abscess of limb, unspecified |
| | L02511 | ICD-10 | Cutaneous abscess of right hand |
| | L02512 | ICD-10 | Cutaneous abscess of left hand |
| | L02519 | ICD-10 | Cutaneous abscess of unspecified hand |
| | L02611 | ICD-10 | Cutaneous abscess of right foot |
| | L02612 | ICD-10 | Cutaneous abscess of left foot |
| | L02619 | ICD-10 | Cutaneous abscess of unspecified foot |
| | L02811 | ICD-10 | Cutaneous abscess of head [any part, except face] |
| | L02818 | ICD-10 | Cutaneous abscess of other sites |
| | L0291 | ICD-10 | Cutaneous abscess, unspecified |
| | L03011 | ICD-10 | Cellulitis of right finger |
| | L03012 | ICD-10 | Cellulitis of left finger |
| | L03019 | ICD-10 | Cellulitis of unspecified finger |
| | L03031 | ICD-10 | Cellulitis of right toe |
| | L03032 | ICD-10 | Cellulitis of left toe |
| | L03039 | ICD-10 | Cellulitis of unspecified toe |
| | L03111 | ICD-10 | Cellulitis of right axilla |
| | L03112 | ICD-10 | Cellulitis of left axilla |
| | L03113 | ICD-10 | Cellulitis of right upper limb |
| | L03114 | ICD-10 | Cellulitis of left upper limb |
| | L03115 | ICD-10 | Cellulitis of right lower limb |
| | L03116 | ICD-10 | Cellulitis of left lower limb |
| | L03119 | ICD-10 | Cellulitis of unspecified part of limb |
| | L03211 | ICD-10 | Cellulitis of face |

| Trigger Category | Diagnosis code | Code type | Description |
|------------------|----------------|-----------|--|
| | L03221 | ICD-10 | Cellulitis of neck |
| | L03311 | ICD-10 | Cellulitis of abdominal wall |
| | L03312 | ICD-10 | Cellulitis of back [any part except buttock] |
| | L03313 | ICD-10 | Cellulitis of chest wall |
| | L03314 | ICD-10 | Cellulitis of groin |
| | L03315 | ICD-10 | Cellulitis of perineum |
| | L03316 | ICD-10 | Cellulitis of umbilicus |
| | L03317 | ICD-10 | Cellulitis of buttock |
| | L03319 | ICD-10 | Cellulitis of trunk, unspecified |
| | L03811 | ICD-10 | Cellulitis of head [any part, except face] |
| | L03818 | ICD-10 | Cellulitis of other sites |
| | L0390 | ICD-10 | Cellulitis, unspecified |
| | O91011 | ICD-10 | Infection of nipple associated w pregnancy, first trimester |
| | O91012 | ICD-10 | Infection of nipple associated w pregnancy, second trimester |
| | O91013 | ICD-10 | Infection of nipple associated w pregnancy, third trimester |
| | O91019 | ICD-10 | Infection of nipple associated w pregnancy, unsp trimester |
| | O9102 | ICD-10 | Infection of nipple associated with the puerperium |
| | O9103 | ICD-10 | Infection of nipple associated with lactation |
| | O91111 | ICD-10 | Abscess of breast associated with pregnancy, first trimester |
| | O91112 | ICD-10 | Abscess of breast associated w pregnancy, second trimester |
| | O91113 | ICD-10 | Abscess of breast associated with pregnancy, third trimester |
| | O91119 | ICD-10 | Abscess of breast associated with pregnancy, unsp trimester |
| | O9112 | ICD-10 | Abscess of breast associated with the puerperium |
| | O9113 | ICD-10 | Abscess of breast associated with lactation |
| | O91211 | ICD-10 | Nonpurulent mastitis associated w pregnancy, first trimester |
| | O91212 | ICD-10 | Nonpurulent mastitis assoc w pregnancy, second trimester |

| Trigger Category | Diagnosis code | Code type | Description |
|------------------------------|----------------|-----------|--|
| | O91213 | ICD-10 | Nonpurulent mastitis associated w pregnancy, third trimester |
| | O91219 | ICD-10 | Nonpurulent mastitis associated w pregnancy, unsp trimester |
| | O9122 | ICD-10 | Nonpurulent mastitis associated with the puerperium |
| | O9123 | ICD-10 | Nonpurulent mastitis associated with lactation |
| Erysipelas | 35 | ICD-9 | Erysipelas |
| | A46 | ICD-10 | Erysipelas |
| Folliculitis | 7048 | ICD-9 | Other specified diseases of hair and hair follicles |
| | L73.9 | ICD-10 | Folliculitis |
| Impetigo | 684 | ICD-9 | Impetigo |
| | L0100 | ICD-10 | Impetigo, unspecified |
| | L0101 | ICD-10 | Non-bullous impetigo |
| | L0102 | ICD-10 | Bockhart's impetigo |
| | L0103 | ICD-10 | Bullous impetigo |
| | L0109 | ICD-10 | Other impetigo |
| Infected bites and scratches | L011 | ICD-10 | Impetiginization of other dermatoses |
| | 783 | ICD-9 | Cat-Scratch Disease |
| | 9105 | ICD-9 | Insect Bite Nonvenomous Of Face Neck And Scalp Except Eye Infected |
| | 9115 | ICD-9 | Insect Bite Nonvenomous Of Trunk Infected |
| | 9125 | ICD-9 | Insect Bite Nonvenomous Of Shoulder And Upper Arm Infected |
| | 9135 | ICD-9 | Insect Bite Nonvenomous Of Elbow Forearm And Wrist Infected |
| | 9145 | ICD-9 | Insect Bite Nonvenomous Of Hand(S) Except Finger(S) Alone Infected |
| | 9155 | ICD-9 | Insect Bite Nonvenomous Of Fingers Infected |
| | 9165 | ICD-9 | Insect Bite Nonvenomous Of Hip Thigh Leg And Ankle Infected |
| | 9175 | ICD-9 | Insect Bite Nonvenomous Of Foot And Toe(S) Infected |
| | 9195 | ICD-9 | Insect Bite Nonvenomous Of Other Multiple And Unspecified Sites Infected |
| | A281 | ICD-10 | Cat-scratch disease |

| Trigger Category | Diagnosis code | Code type | Description |
|-----------------------------|----------------|---|---|
| Infected superficial injury | 9101 | ICD-9 | Abrasion Or Friction Burn Of Face Neck And Scalp Except Eye Infected |
| | 9103 | ICD-9 | Blister Of Face Neck And Scalp Except Eye Infected |
| | 9107 | ICD-9 | Superficial Foreign Body (Splinter) Of Face Neck And Scalp Except Eye Without Major Open Wound Infected |
| | 9109 | ICD-9 | Other And Unspecified Superficial Injury Of Face Neck And Scalp Infected |
| | 9111 | ICD-9 | Abrasion Or Friction Burn Of Trunk Infected |
| | 9113 | ICD-9 | Blister Of Trunk Infected |
| | 9117 | ICD-9 | Superficial Foreign Body (Splinter) Of Trunk Without Major Open Wound Infected |
| | 9119 | ICD-9 | Other And Unspecified Superficial Injury Of Trunk Infected |
| | 9121 | ICD-9 | Abrasion Or Friction Burn Of Shoulder And Upper Arm Infected |
| | 9123 | ICD-9 | Blister Of Shoulder And Upper Arm Infected |
| | 9127 | ICD-9 | Superficial Foreign Body (Splinter) Of Shoulder And Upper Arm Without Major Open Wound Infected |
| | 9129 | ICD-9 | Other And Unspecified Superficial Injury Of Shoulder And Upper Arm Infected |
| | 9131 | ICD-9 | Abrasion Or Friction Burn Of Elbow Forearm And Wrist Infected |
| | 9133 | ICD-9 | Blister Of Elbow Forearm And Wrist Infected |
| | 9137 | ICD-9 | Superficial Foreign Body (Splinter) Of Elbow Forearm And Wrist Without Major Open Wound Infected |
| | 9139 | ICD-9 | Other And Unspecified Superficial Injury Of Elbow Forearm And Wrist Infected |
| | 9141 | ICD-9 | Abrasion Or Friction Burn Of Hand(S) Except Finger(S) Alone Infected |
| 9143 | ICD-9 | Blister Of Hand(S) Except Finger(S) Alone Infected | |
| 9147 | ICD-9 | Superficial Foreign Body (Splinter) Of Hand(S) Except Finger(S) Alone Without Major Open Wound Infected | |

| Trigger Category | Diagnosis code | Code type | Description |
|-------------------------------------|----------------|-----------|---|
| | 9149 | ICD-9 | Other And Unspecified Superficial Injury Of Hand(S) Except Finger(S) Alone Infected |
| | 9151 | ICD-9 | Abrasion Or Friction Burn Of Fingers Infected |
| | 9153 | ICD-9 | Blister Of Fingers Infected |
| | 9157 | ICD-9 | Superficial Foreign Body (Splinter) Of Fingers Without Major Open Wound Infected |
| | 9159 | ICD-9 | Other And Unspecified Superficial Injury Of Fingers Infected |
| | 9161 | ICD-9 | Abrasion Or Friction Burn Of Hip Thigh Leg And Ankle Infected |
| | 9163 | ICD-9 | Blister Of Hip Thigh Leg And Ankle Infected |
| | 9167 | ICD-9 | Superficial Foreign Body (Splinter) Of Hip Thigh Leg And Ankle Without Major Open Wound Infected |
| | 9169 | ICD-9 | Other and unspecified superficial injury of hip, thigh, leg, and ankle, infected |
| | 9171 | ICD-9 | Abrasion Or Friction Burn Of Foot And Toe(S) Infected |
| | 9173 | ICD-9 | Blister Of Foot And Toe(S) Infected |
| | 9177 | ICD-9 | Superficial Foreign Body (Splinter) Of Foot And Toe(S) Without Major Open Wound Infected |
| | 9179 | ICD-9 | Other And Unspecified Superficial Injury Of Foot And Toes Infected |
| | 9191 | ICD-9 | Abrasion Or Friction Burn Of Other Multiple And Unspecified Sites Infected |
| | 9193 | ICD-9 | Blister Of Other Multiple And Unspecified Sites Infected |
| | 9197 | ICD-9 | Superficial Foreign Body (Splinter) Of Other Multiple And Unspecified Sites Without Major Open Wound Infected |
| | 9199 | ICD-9 | Other And Unspecified Superficial Injury Of Other Multiple And Unspecified Sites Infected |
| Pyoderma, not including gangrenosum | 68600 | ICD-9 | Pyoderma Unspecified |
| | 68609 | ICD-9 | Other Pyoderma |
| | L080 | ICD-10 | Pyoderma |

| Trigger Category | Diagnosis code | Code type | Description |
|--|----------------|-----------|--|
| Skin and soft tissue infection, other or unspecified | 6868 | ICD-9 | Other Specified Local Infections Of Skin And Subcutaneous Tissue |
| | 6869 | ICD-9 | Unspecified Local Infection Of Skin And Subcutaneous Tissue |
| | L0889 | ICD-10 | Oth local infections of the skin and subcutaneous tissue |
| | L089 | ICD-10 | Local infection of the skin and subcutaneous tissue, unsp |

Table 1b – Episode triggers: Example contingent diagnoses for SSTI¹

| Trigger category | Example |
|-------------------------------|---|
| Bacteremia, sepsis, and shock | Bacteremia, Streptococcal septicemia, Staphylococcal septicemia, sepsis |
| Bacterial infection | Staphylococcus infection unspecified site, infection with microorganisms with resistance to macrolides, MRSA infection unspecified site |
| Bites and scratches | Dog bite, human bite, insect bite, cat scratch disease |
| Comorbidity causing visit | Diabetes, peripheral vascular disease, venous insufficiency |
| Dermatitis | Contact dermatitis, atopic dermatitis |
| Folliculitis | folliculitis |
| Lymph node presentation | Lymphadenopathy, lymphadenitis |
| Open wound | Open wound of hand uncomplicated, open wound of foot uncomplicated |
| Local signs and symptoms | Pain in limb, swelling of limb, changes in skin texture, edema |
| Other systemic presentations | Fever, chills, dehydration, hypotension |
| Routine visit | Routine infant or child health check, routine general medical examination at a health care facility |
| Superficial cyst | Epidermal cyst, sebaceous cyst, other follicular cyst |
| Superficial fungal infection | Dermatophytosis, candidiasis of the skin |
| Superficial injury | Abrasion, blister, splinter |

¹ The complete list of contingent diagnosis codes is available in the episode configuration file.

Table 2 –Episode risk factors

| Risk factor | Relevant time period |
|--------------------|--|
| Age under 3 years | N/A |
| Age 26 to 55 years | N/A |
| Anemia | During the episode or up to 365 days before the start of the episode |

| Risk factor | Relevant time period |
|--|--|
| Arthritis | Up to 365 days before the start of the episode |
| Chronic kidney disease | During the episode or up to 365 days before the start of the episode |
| Coagulopathy | During the episode or up to 365 days before the start of the episode |
| Congestive heart failure | During the episode or up to 365 days before the start of the episode |
| Crushing injury | During the episode or up to 365 days before the start of the episode |
| Delirium and dementia | During the episode or up to 365 days before the start of the episode |
| Diabetes | During the episode or up to 365 days before the start of the episode |
| Folliculitis | During the trigger window |
| Fractures | During the episode or up to 365 days before the start of the episode |
| Hepatitis | During the episode or up to 365 days before the start of the episode |
| History of cancer, other primary (includes malignant neoplasms of the eye, malignant histiocytosis, malignant mastocytosis) | During the episode or up to 365 days before the start of the episode |
| History of MRSA | Up to 365 days before the start of the episode |
| Immunocompromised | During the episode or up to 365 days before the start of the episode |
| Impetigo | During the trigger window |
| Injury (e.g., crushing or internal) | During the episode or up to 365 days before the start of the episode |
| Lower GI disorders (includes appendicitis, ulcerative colitis, obstructions, diverticulitis, peritonitis and intestinal abscesses) | During the episode or up to 365 days before the start of the episode |
| Lymph node presentation | During the episode or up to 365 days before the start of the episode |
| MRSA presentation | During the trigger window |
| Neuropathy | During the episode or up to 365 days before the start of the episode |
| Obesity | During the episode or up to 365 days before the start of the episode |
| Open wound | During the trigger window |
| Other cerebrovascular disease (includes cerebral atherosclerosis, cerebral arteritis) | During the episode or up to 365 days before the start of the episode |

| Risk factor | Relevant time period |
|---|--|
| Other heart disease (Coronary aneurysms, cardiomegaly, Takotsubo syndrome, and other unspecified heart disorders) | During the episode or up to 365 days before the start of the episode |
| Pulmonary heart disease | During the episode or up to 365 days before the start of the episode |
| Peripheral vascular disease | During the episode or up to 365 days before the start of the episode |
| Substance abuse | During the episode or up to 365 days before the start of the episode |
| Systemic sign or symptom | During the trigger window |
| Venous insufficiency | During the episode or up to 365 days before the start of the episode |

Table 3 –Episode exclusions

| Exclusion type | Episode exclusion | Description | Relevant time period |
|----------------|-------------------------|---|---------------------------|
| | Dual | An episode is excluded if the patient had dual coverage by Medicare and Medicaid | During the episode window |
| | FQHC/RHC | An episode is excluded if the PAP is classified as a federally qualified health center or rural health clinic | During the episode window |
| | Incomplete episodes | An episode is incomplete if the total episode spend is less than the spend from the minimum services required to treat an episode | During the episode window |
| | Inconsistent enrollment | An episode is excluded if the patient has gaps in full Medicaid coverage | 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 which overlap the episode window | 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 |
| | Multi Payer | An episode is excluded if a patient changes enrollment | During the episode window |

| Exclusion type | Episode exclusion | Description | Relevant time period |
|-----------------------------|-----------------------|---|---|
| Business exclusion | | between FFS and an MCP or between MCPs | |
| | No PAP | An episode is excluded if the PAP cannot be identified | During the episode window |
| | Out of state | An episode is excluded if the PAP operates out of state | N/A |
| | Third party liability | An episode is excluded if third-party liability charges are present on any claim or claim detail line or if the patient has relevant third-party coverage at any time | During the episode window |
| Standard clinical exclusion | Age | An episode is excluded if the patient is 65 years old or older | N/A |
| | Cardiac arrest | An episode is excluded if the patient has a diagnosis of cardiac arrest | During the episode window |
| | Cancer Treatment | An episode is excluded if the patient has a diagnosis of cancer and procedures for active management of cancer | During the episode window or up to 90 days before the start of the episode |
| | Coma | An episode is excluded if the patient has a diagnosis of coma during the episode | During the episode window or up to 365 days before the start of the episode |
| | Cystic Fibrosis | An episode is excluded if the patient has a diagnosis of cystic fibrosis during the episode | During the episode window or up to 365 days before the start of the episode |
| | Death | An episode is excluded if the patient has a discharge status of “expired” on any inpatient or outpatient claim | During the episode window |
| | ESRD | An episode is excluded if the patient has a diagnosis or procedure for end stage renal disease | During the episode window or up to 365 days before the start of the episode |
| | HIV | An episode is excluded if the patient has a diagnosis of HIV | During the episode window or up to 365 days before the |

| Exclusion type | Episode exclusion | Description | Relevant time period |
|-------------------------------------|-----------------------------------|---|--|
| | | | start of the episode |
| | Left Against Medical Advice | An episode is excluded if the patient has a discharge status of “left against medical advice” | During the episode window |
| | Meningitis and encephalitis | An episode is excluded if the patient has a diagnosis of meningitis or encephalitis | During the episode window |
| | Multiple Sclerosis | An episode is excluded if the patient has a diagnosis of multiple sclerosis | During the episode window or during 365 days before the start of the episode |
| | Paralysis | An episode is excluded if the patient has a diagnosis of paralysis | During the episode window or up to 365 days before the start of the episode |
| | Transplant | An episode is excluded if a patient has received an organ transplant | During the episode window or up to 365 days before the start of the episode |
| | Tuberculosis | An episode is excluded if the patient has a diagnosis of tuberculosis | During the episode window |
| Episode-specific clinical exclusion | Admission on initial presentation | Episode is triggered by an inpatient admission, or the patient is admitted within one day of the triggering diagnosis | During the trigger window or one day afterwards |
| | Sepsis or shock on presentation | An episode is excluded if the patient has a diagnosis of diagnosis of sepsis or shock | During the trigger window |
| | Complicated SSTIs | An episode is excluded if the patient has a diagnosis of a complicated SSTI (e.g., necrotizing fasciitis) | During the trigger window or up to 30 days before the start of the episode |
| | Diabetic or pressure ulcer | An episode is excluded if the patient has a diagnosis of a diabetic or pressure ulcer | During the trigger window or up to 30 days before the start of the episode |

| Exclusion type | Episode exclusion | Description | Relevant time period |
|----------------|--------------------------------|--|---|
| | Gangrene | An episode is excluded if the patient has a diagnosis of gangrene | During the trigger window or up to 30 days before the start of the episode |
| | Post-surgical wound infections | An episode is excluded if the patient has a diagnosis of a post-surgical wound infection or complication | During the trigger window or up to 30 days before the start of the episode |
| | Second or third degree burns | An episode is excluded if the patient has a diagnosis of a second or third degree burn | During the trigger window or up to 30 days before the start of the episode |
| | Multiple myeloma | An episode is excluded if the patient has a diagnosis of multiple myeloma | During the episode window or up to 365 days before the start of the episode |
| | Congenital immunodeficiency | An episode is excluded if the patient has a diagnosis of congenital immunodeficiency | During the episode window or up to 365 days before the start of the episode |

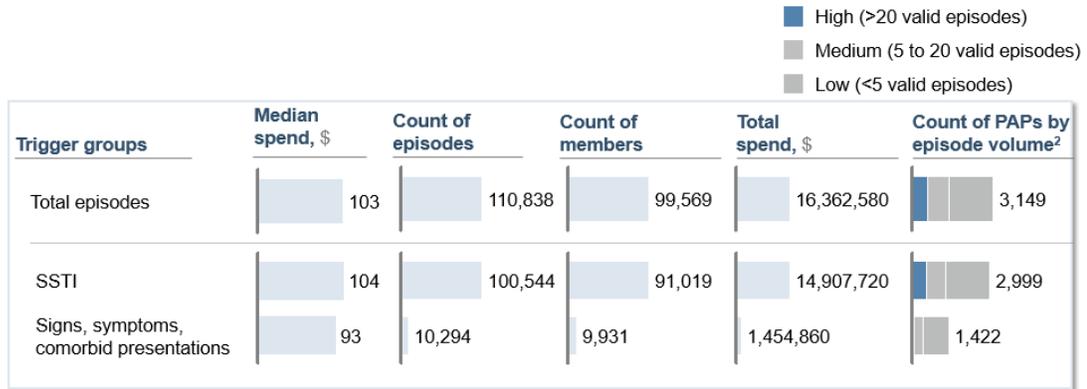
Table 4a – First-line antibiotics

| Antibiotic class | Example |
|---|--------------|
| Penicillin (W1A) | Amoxicillin |
| Tetracyclines (W1C) | Doxycycline |
| Macrolides (W1D) | Azithromycin |
| Lincosamides (W1K) | Clindamycin |
| Cephalosporins – 1 st generation (W1W) | Cephalexin |
| Sulfonamides (W2A) | TMP/SMX |

Table 4b – Episode quality metrics (PAP level)

| Metric type | Quality metric | Description | Relevant time period |
|----------------------------|---------------------------------------|--|---|
| Tied to incentive payments | Bacterial cultures when I&D performed | Number of valid episodes where bacterial cultures were obtained divided by the number of valid episodes where an I&D was performed | During the episode window |
| Tied to incentive payments | Rate of first-line antibiotic usage | Number of valid episodes where a first-line antibiotic (see Table 4A) was prescribed divided by the number of valid episodes where any antibiotic was prescribed | During the first seven days of the episode window |
| Informational | Rate of infection recurrence | Number of valid episodes where a second antibiotic was prescribed during days 16-30 of the episode window divided by the number of valid episodes receiving an antibiotic during days 0-15 of the episode window | Days 16-30 of the episode window; days 0-15 of the episode window |
| Informational | Rate of ultrasound imaging | Number of valid episodes where ultrasound imaging was obtained divided by the total number of valid episodes | During the episode window |
| Informational | Rate of non-ultrasound imaging | Number of valid episodes where non-ultrasound imaging was obtained (where the primary indication was for an SSTI, sign, or symptom) divided by the total number of valid episodes | During the episode window |

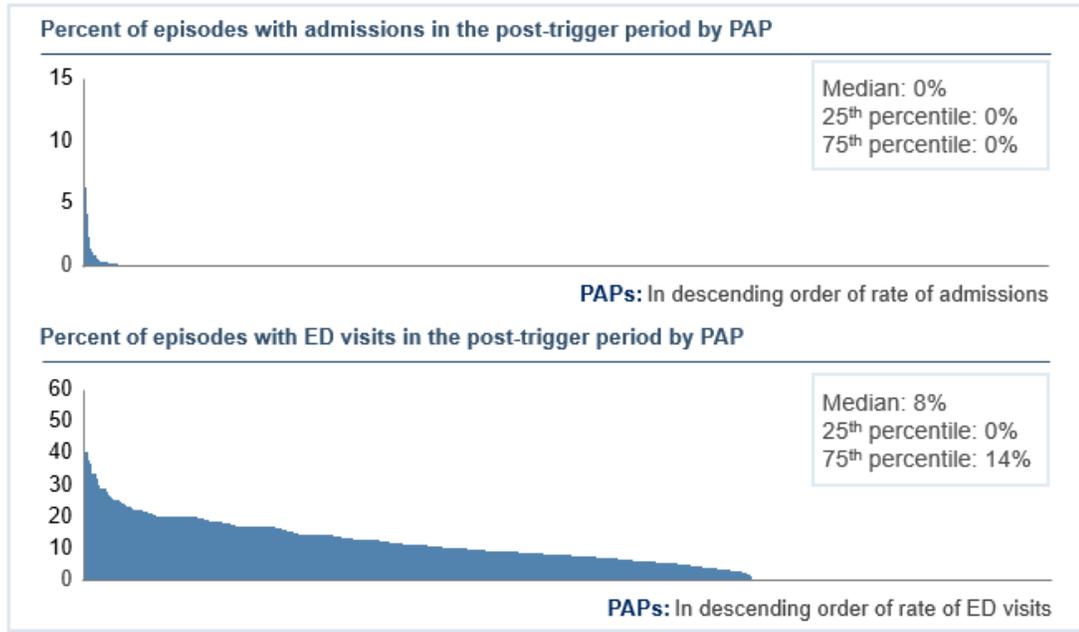
EXHIBIT 3 – SPEND AND VOLUME BY TRIGGER GROUPS¹



¹ For valid episodes (110,838) across all PAPs (3,149); valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g., coma, severe burns)

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

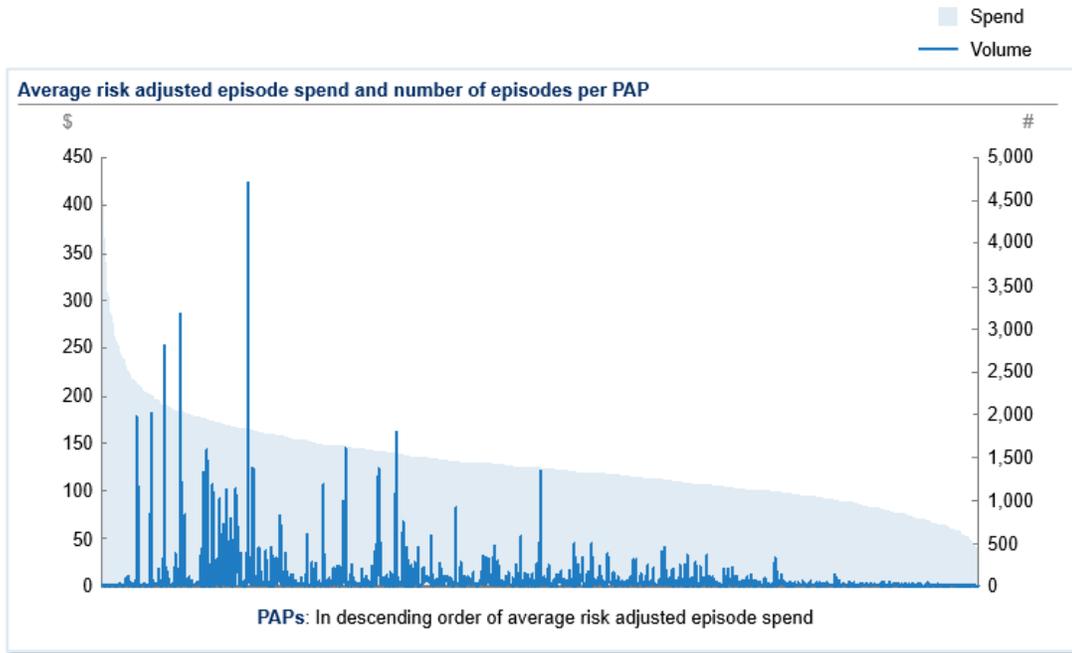
EXHIBIT 4 – VARIATION IN ADMISSION RATES AND ED VISIT RATES BY PAP¹



¹ For valid episodes (110,838) across PAPs with 5 or more valid episodes (1,431); valid episodes for PAPs with 4 or fewer 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. coma, severe burns); top PAP by average episode spend removed for improved visualization

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

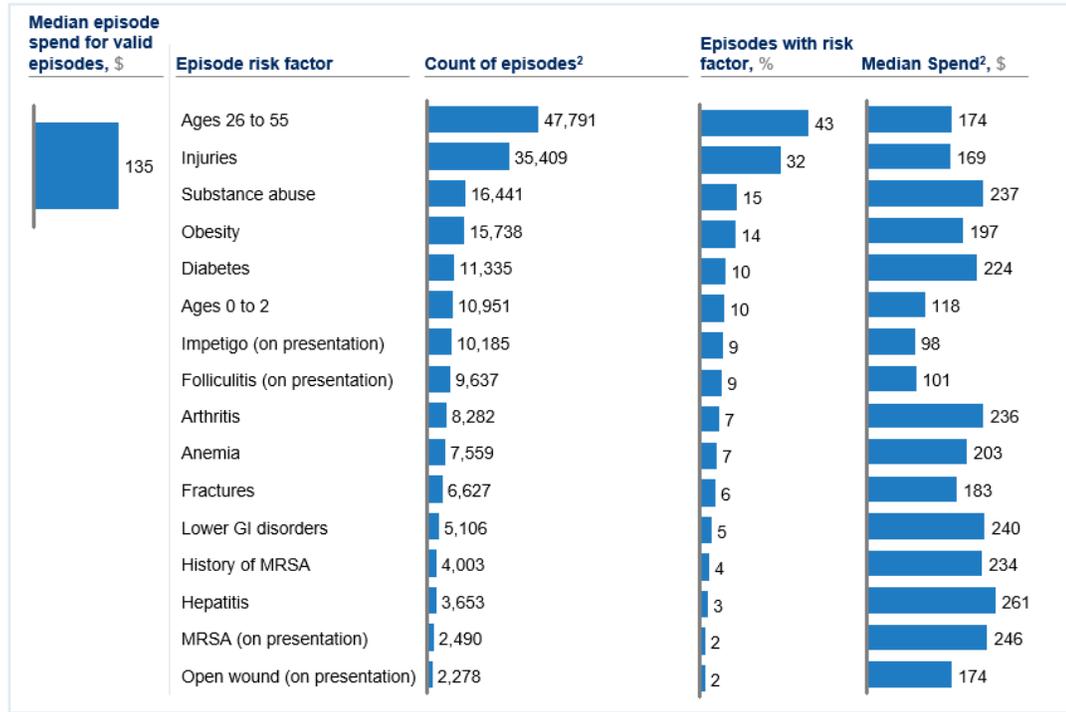
EXHIBIT 5 – DISTRIBUTION OF RISK-ADJUSTED AVERAGE EPISODE SPEND AND COUNT BY PAP¹



¹ For valid episodes (110,838) across PAPs with 5 or more valid episodes (1,431); valid episodes for PAPs with 4 or fewer 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. coma, severe burns); top PAP by average episode spend removed for improved visualization

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

EXHIBIT 6 – EPISODE COUNT AND SPEND BY EPISODE RISK FACTOR¹

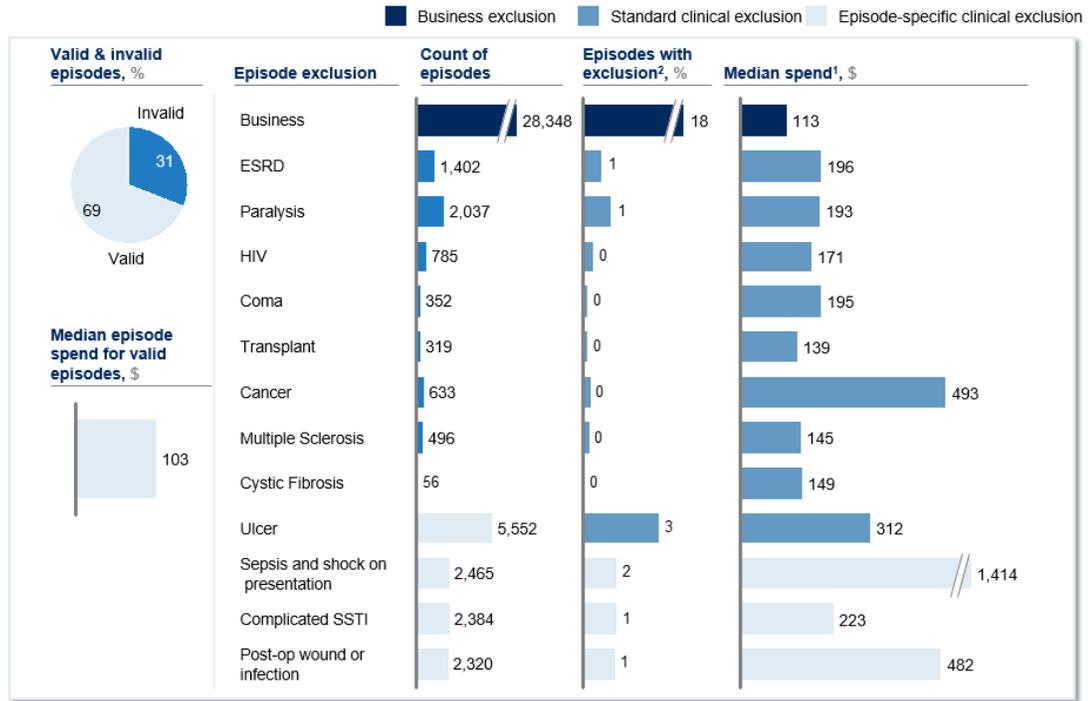


1 Only showing 16 selected risk factors; for valid episodes (110,838) across all PAPs (3,149); valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g., coma, severe burns)

2 For episodes with this risk factor; one episode can have multiple risk factors

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

EXHIBIT 7 – EPISODE COUNT AND SPEND BY EPISODE EXCLUSION¹

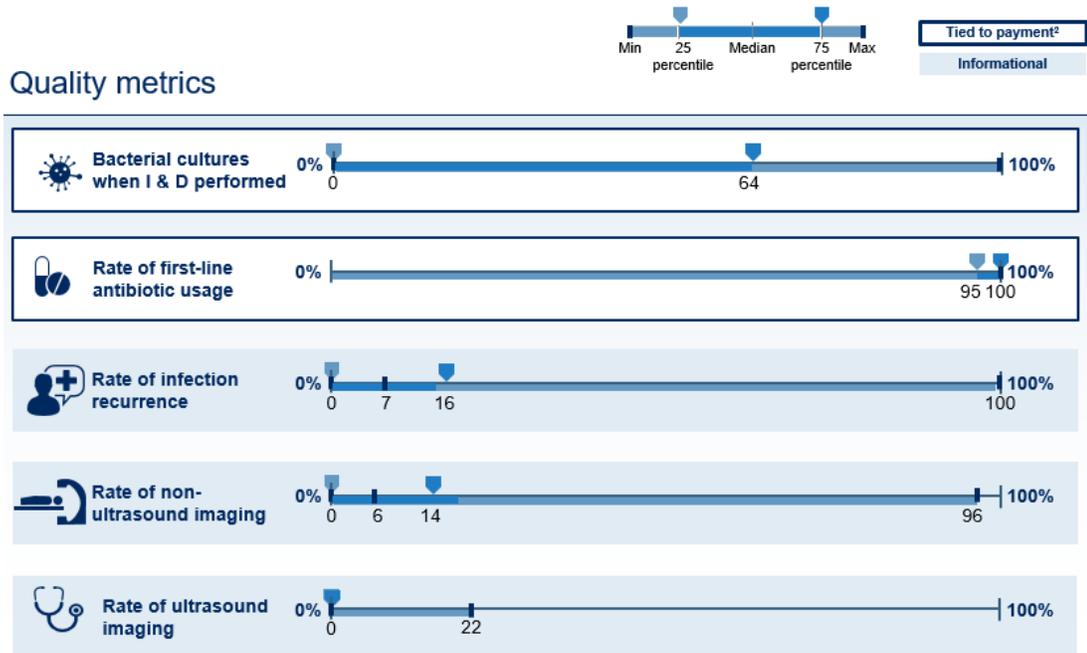


1 Only showing select episode exclusions; 110,838 valid episodes across all PAPs; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g. coma, severe burns)

2 For episodes with this exclusion; one episode can have multiple exclusions

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

EXHIBIT 8 –PAP PERFORMANCE ON EPISODE QUALITY METRICS¹



¹ For valid episodes (110,838) across PAPs with 5 or more valid episodes (1,431); valid episodes for PAPs with 4 or fewer 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. coma, severe burns)

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