IBM Watson Health™

WHITE PAPER

# The Medical Episode Grouper: Applications and methodology

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# Introduction

In the mid-1980s, the concept of episodes of care emerged from academic literature into the realm of economic profiling of healthcare services. Hornbrook et al.[1] observed that healthcare is typically provided in a series of separate, but related, services and that all of these services should be included to produce a comprehensive analysis of healthcare delivery.

Based on this observation, an episode of care describes a series of related healthcare services for the treatment of a given occurrence of a condition. Episodes can be comprised of professional and facility inpatient and outpatient services, as well as prescription drugs.

The Medical Episode Grouper (MEG) is the proprietary episode grouping methodology of Truven Health Analytics®, now IBM Watson Health™. MEG was developed by Truven Health (then MEDSTAT) in the early 1990s and first released commercially in 1998. Today, more than 150 health plans, employers and state Medicaid agencies use MEG to compare and contrast medical and surgical options and costs in the treatment of diseases and medical conditions. Although the current healthcare market represents primarily healthcare payers, recent national trends in the delivery and management of healthcare have created an increasing interest in episode grouping among health systems as well.[2]

MEG was developed and is maintained according to the following core principles:

- An episode of care considers all care for one medical condition for one patient.
- An episode should be described by the condition for which the patient was diagnosed, not the treatment the patient received for that condition.
- Different levels of severity within a condition should be accounted for by an episode grouper, as these affect treatment decisions.
- Over time, a patient’s diagnosis may either evolve or become clearer. An episode grouper should recognize and accommodate an evolving diagnosis within a single episode of care.

– An episode classification system should be clinically meaningful to providers.
– An episode of care system should be comprehensive, yet parsimonious and transparent. The system should use episode construction logic that is consistent from condition to condition.

In this white paper, we describe the most typical applications of MEG. We also explain the MEG methodology, including both the clinical underpinnings and the functional algorithm used to define episodes of care.

## MEG applications

### Population profiling

MEG provides a solid basis for analyzing overall payment and utilization patterns across a patient population. The ability to assign healthcare services to a manageable number of clinically meaningful categories facilitates insights into the drivers of cost and utilization. Simple questions, such as these regarding a population, can all be efficiently answered using MEG:

– What is the prevalence of particular conditions?
– What conditions are driving healthcare resource consumption?
– What conditions result most often in hospitalization?

MEG then makes it possible to answer more complex questions by drilling further into the underlying data.

By organizing healthcare events into consistently defined episodes of care, MEG also allows users to compare and contrast the care provided for similar conditions across segments of the population. These segments may be based on geography, demographics or other patient attributes. The ability to analyze characteristics of treatment across these population segments is one of the most common applications of MEG.

### Provider profiling

In addition to facilitating comparisons across patient groups, MEG provides an excellent foundation for provider performance evaluation. The MEG methodology includes assignment logic that attributes both a primary and managing physician to each episode of care. By using MEG to create episodes of care that are homogenous with respect to clinical severity, one can compare reimbursement, treatment and outcomes across providers while accounting for the type and severity of cases being attributed to the providers.

### Process of care analysis

Each episode of care retains information regarding the detailed services provided to the patient, including both diagnostic and therapeutic procedures as well as prescription drugs. However, the treatment provided does not dictate the grouping logic used by MEG. Instead, the MEG methodology uses a completely diagnostically driven grouping algorithm. The diagnostically based grouping allows one to compare variation in treatments provided for the same condition at a similar level of severity. For example, the episode group “Intervertebral Disc Disorders: Lumbar and Lumbosacral” provides the ability to compare rates of surgical intervention versus a more conservative therapeutic approach to treatment, while still accounting for the severity of the low-back condition. Similar comparisons of interest might include pharmaceutical versus therapeutic treatment for mental health conditions, rates of prenatal care provided in high-risk deliveries or the use of major imaging to diagnose various musculoskeletal disorders.

### Care management

Several elements of the MEG methodology help facilitate the ability to assess the effectiveness of care management programs. First, the ability to clearly distinguish patients diagnosed with a specific condition—and to assess the severity of that condition—can assist in identifying potential program candidates. Secondly, the episode severity measurement allows for the tracking of disease progression (or the lack of progression) within a condition for a particular patient or group of patients. Finally, the methodology allows for the identification of acute flare-ups of certain chronic conditions, which can provide insight into the effectiveness of chronic condition management.

### Bundled payments

Questions frequently arise regarding the use of MEG to identify groups of services subject to bundled payment arrangements. When designing bundles that address chronic conditions, MEG is useful in identifying typical patterns of treatment and/or core components of care involved in the treatment of these chronic conditions. However, many current bundled payment arrangements are tied to (and triggered by) certain procedures rather than specific diagnoses. In addition, procedural bundled payments can cross diagnostic categories (for example, a post-operative infection is a different diagnostic episode than the condition that resulted in the original surgery). Therefore, for procedurally-based bundled payments, MEG is generally not the most appropriate tool for analytic use.

## MEG logic

### Clinical classification

Disease Staging is the condition classification system that forms the basis of MEG episode groups. First developed in 1983 in partnership with Jefferson Medical College, it is now in its fifth edition and includes more than 570 disease categories. It uses clinical findings to describe conditions and clinical severity. Patients with similar clinical characteristics are often likely to require comparable treatments and may have similar outcomes. MEG can be used to help assess quality of care, analyze clinical outcomes, review utilization of resources and assess the effectiveness of alternative treatments, all while accounting for patient severity.

Disease Staging provides a system that not only identifies the particular condition, but also its severity. Every one of the 570+ conditions identified by Disease Staging has an associated series of severity levels, or stages. Each condition/stage is defined using a set of criteria developed by clinicians to describe the disease and its likely progression, independent of treatment. The stages within each condition describe the biological severity, where severity is defined as the risk of organ failure or death. The classification is based on the severity of the pathophysiologic manifestations of the disease:

- Stage 0: History of, or exposure, to the disease
- Stage 1: The disease is present, but has no complications
- Stage 2: The disease has local complications
- Stage 3: The disease involves multiple sites or has systemic complications
- Stage 4: The disease has resulted in death

While the stage values follow the above outline, they are more granular in nature. Each integer-level stage shown above may have one or more substages for a given condition. For example, Table 1 shows the stages for Episode Group 6 (Cardiac Arrhythmias).

Table 1: Stages for Episode Group 6 (Cardiac Arrhythmias)

| Stage | Description |
|---|---|
| 1.01 | Atrial premature contractions or sinus arrhythmia or junctional rhythm |
| 1.02 | Asymptomatic unifocal ventricular premature contractions |
| 1.03 | Wolff-Parkinson-White syndrome or Lown-Ganong- Levine syndrome |
| 1.04 | Asymptomatic multifocal ventricular premature contractions |
| 2.01 | Paroxysmal atrial fibrillation or flutter |
| 2.02 | Atrial fibrillation or flutter |
| 2.03 | Sick sinus syndrome |
| 2.04 | Supraventricular tachycardia |
| 2.05 | Symptomatic ventricular ectopy |
| 3.01 | Arrhythmias with ventricular fibrillation or flutter or shock |
| 4.00 | Arrhythmias with death |

There may be as few as one stage/substage for a simple condition (such as lipid abnormalities or hypotension) and as many as 20 stages defined for a more complex condition (such as a spinal cord injury or cancer).

In addition to the stages of the disease, each criteria set includes a specification of clinical findings that can be used to evaluate the presence of the disease and stage level. The clinical findings include physical findings, radiological and laboratory results and pathological and operative reports. Because the diagnostic findings are clinical descriptors of disease rather than being tied to a particular coding scheme, Disease Staging lends itself well to the application of raw clinical data, such as that available in electronic medical records.

Disease Staging performs two functions within MEG: defining conditions and identifying the clinical progression of the disease through different stages. For claims data, this process is based on the array of diagnosis codes present on the claim record.

## Episode construction

Episodes are constructed by first identifying claims for a patient that represent a particular condition (as defined by Disease Staging), then organizing these claims into periods of treatment, or episodes. The following points briefly describe the logic used in this algorithm:

- **Trigger:** An episode can only be triggered by claims with a reliable diagnosis. Claims representing potential "rule-out" diagnoses (for example, lab, radiology) or potentially unreliable diagnoses (for example, transportation, durable medical equipment) are not allowed to trigger an episode, although they may join episodes already started, even if the related episode starts up to 15 days after the service.
- **Assignment:** Claims for the same patient/condition are combined into episodes based on proximity. For acute conditions, a single patient may have one or more episodes for a given condition, depending on the amount of time that has passed between two treatments. Each condition is ascribed a specific "clean period," which defines the amount of time that must pass between treatments for them to be considered two separate episodes. Various options exist with regard to the assignment of claims to chronic condition episodes, but generally the selected option involves creation of year-long episodes that include care related to the chronic condition during that time period, with advanced logic used to separately identify acute flare-up episodes of chronic conditions.
- **Inclusion:** Patients may have multiple concurrent episodes representing different conditions. However, specialized processing rules help ensure that two initially independent episodes that may actually represent the same condition are combined into a single episode of care. This feature, known as Inclusion Logic, helps ensure that episodes representing nonspecific diagnoses (for example, abdominal pain) are appropriately included into a more specific episode (for example, appendicitis) if the proximity implies that they are likely to be related.
- **Pharmacy assignment:** Once the episodes are built based on medical claims, pharmacy claims are assigned to appropriate episodes based on their proximity and clinical relativity to the episode condition.

## Risk adjustment

Comparing the costs of treating patients for specific episodes of care is not straightforward. Much of the variance in treatment of a particular condition may be warranted.

Physicians' treatment decisions are based on a number of patient characteristics, including the disease to be treated, the severity of the disease, the presence of unrelated and co-occurring diseases and the age and gender of the patient. To compare provider performance, these differences, or risks, need to be taken into account before making inferences about the efficiency and effectiveness of care. Since no two patients are identical, it is only after patient risk factors are identified and controlled that differences in provider economic performance can be said to reasonably reflect differences in treatment patterns and resource use.

Because MEG utilizes Disease Staging as its underlying clinical categorization methodology, the severity of conditions is essentially "built in" to the episode structure. Each episode is assigned a stage representing the highest level of severity recorded for the disease during that particular episode of care. In this method, the "expected" cost or utilization is adjusted based on the type and severity of episodes being compared. The level of granularity available in categorizing severity in Disease Staging is specific enough to explain a significant level of variation observed in cost and utilization across episodes using this method.

To further account for variability, MEG offers an additional adjustment option that not only takes into account the severity (stage) of the episode being measured, but also the overall illness burden of the patient being treated. Diagnostic Cost Groups (DCGs) are the foundation of a family of risk adjustment payment and profiling methodologies developed by an industry leader.[3] The illness burden, as measured by DCGs—together with the severity of the particular episode condition—can provide a conceptually appealing risk-adjustment methodology.

### Qualified episodes

Despite the innovative algorithms used to build episodes, ultimately the results are dependent on the diagnosis coding present on claims which, traditionally, can be subject to inaccuracies and inconsistencies. When utilizing episodes as the basis for comparing providers or analyzing outcomes or process of care, it is important that the episodes for a condition being analyzed represent a homogeneous patient population, and that episodes that are significantly unlike others (for the same disease/severity) can be excluded. Qualified Episode Logic is a methodology that supports this ability by flagging each episode as being "qualified" or not. An episode is qualified based on very specific rules describing the minimal activity that must be present within the episode. For example, a qualified acute myocardial infarction (AMI) episode must include an inpatient stay, since it is highly unlikely that a patient being treated for an AMI would not have received inpatient care. The qualification rules, which are condition- and stage-specific, were defined by clinicians who applied their clinical expertise to empirical analysis across hundreds of thousands of episodes of care. We believe the ability to exclude nonqualified episodes represents a significant advantage when utilizing claims data as the basis of a comparison.

## Summary

In this paper, we have described typical applications of MEG and explained the methodology used to build episodes of care. We have explained that the rule-based clinical underpinnings of MEG are designed to provide an easily understood approach to classifying care, while the functional algorithm used to define the episodes can accommodate both the strengths and weaknesses of administrative claims data.

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For more information on IBM Watson Health, visit: ibm.com/watsonhealth

Footnotes

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