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# Utilization of CT Scans and MRIs in an Insured Population with Migraine

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## Background
- Neuroimaging is a diagnostic tool that may be used to rule out a serious condition when a patient presents with head pain. It is not typically warranted for patients who have a normal neurologic exam, and may be over-utilized despite established practice parameters set by the American Academy of Neurology.
- A decision to use neuroimaging should consider the type of headache and presence of any clinical features that suggest a serious condition.
- Over-utilization of neuroimaging has cost and safety implications.
- The United States Headache Consortium, a panel of experts on migraine, set the guidelines for diagnosis and treatment in 2000. In alignment with these guidelines, the Migraine Quality of Care Measurement Set seeks to reveal patterns in CT and MRI utilization for migraine sufferers, which may inform future policy decisions at the health plan level.

## Migraine Quality of Care Measurement Set
- The Migraine Quality of Care Measurement Set was developed to examine utilization of services within a health plan to identify potential quality and safety concerns associated with care for the population identified with migraine.
- A set of measures were originally developed in 2007,8,9 by the Jefferson School of Population Health and the Jefferson Headache Center, with input from a national panel of advisors with clinical expertise in migraine.
- The measures and measurement specifications were updated in 2010 to align with current evidence.
- A pilot test of the 2010 measures was then conducted, using data from 10 health plans.

## Study Aims
- As part of the 10-plan pilot test of the measures, the aims of this study were:
  1. To examine the current utilization rates for CT scans and MRIs in the insured migraine population.
  2. To examine variability in CT and MRI utilization rates across health plans and establish national utilization benchmarks.

## Methods: Study Population
- Ten representative commercial and/or Medicaid health plans in the MedAssurant Medical Outcomes Research for Effectiveness and Economics Registry (MORE Registry™) were included in the study.
- The reporting year (the year of claims data on which measurement was based) was 2009.
- Only adult members between ages 18 and 64, with medical benefits, were eligible for inclusion (N = 2.9 million, across the 10 plans).
- The migraine population was identified through claims (ICD-9 and UB-04 codes) and pharmacy data (where available) as patients having at least one of the following criteria:
  - 1 or more claims/encounter for migraine, or
  - 2 or more "episodes" of headache reflected by multiple claims/encounters ("recurrent headache") ≥7 days apart, or
  - 1 or more prescription(s) for a triptan or migraine analgesic
- Individuals with a diagnosis of subarachnoid hemorrhage, brain tumor, and/or intracranial bleed were excluded.

## Identification of the Migraine Population

<table>
<thead>
<tr>
<th>Measure</th>
<th>Overall Finding (%)</th>
<th>Median Value across 10 Health Plans (%)</th>
<th>Range across 10 Health Plans (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA.1 CT Scan</td>
<td>24.50</td>
<td>1.07</td>
<td>23.24-24.86</td>
</tr>
<tr>
<td>RA.2 A CT scan of the head and/or sinuses for migraine</td>
<td>All patients with one or more claims/encounters for migraine</td>
<td>All patients in the Migraine Population</td>
<td></td>
</tr>
<tr>
<td>RA.3 CT Scan or MRI not associated with an ED visit</td>
<td>37.70</td>
<td>6.02</td>
<td>5.80-6.16</td>
</tr>
<tr>
<td>RA.4 A CT scan or MRI associated with an ED visit</td>
<td>8.77</td>
<td>6.02</td>
<td>5.80-6.16</td>
</tr>
<tr>
<td>RA.5 Multiple CT or MRI scans for migraine</td>
<td>2.23</td>
<td>1.07</td>
<td>0.80-1.30</td>
</tr>
</tbody>
</table>

*Percentage represents scans rather than patients

## Measures on Utilization of Radiologic Services

### Results

**Radiology Utilization Across 10 Health Plans**

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## Key Findings
- Twelve percent of the Migraine Population had a CT scan for migraine during the measurement year, and 8% had an MRI. While some variation in the utilization rate for MRIs was observed across the 10 plans (6-11%), far greater variation was seen for CT scans (8-25%).
- Seventy-three percent of all CT scans for migraine were completed within 48 hours of an emergency department (ED) visit, but again, significant variation across plans was noted.
- More than half of all neuroimaging tests (CT scans and MRIs) were not associated with an ED visit.
- A small portion of the Migraine Population (2%) had multiple CT and/or MRI scans during the one year examined.

## Discussion: The Migraine Quality of Care Measurement Set
- This examination of the radiologic services utilization measures included in the Migraine Quality of Care Measurement Set demonstrates the potential value of the measures to identify utilization trends.
- In addition to identifying a general concern about potential over-utilization of neuroimaging in the population with migraine, the pilot test demonstrates significant variation in the measures across health plans.
- The measures can be of value to health plans in identifying potential quality and safety issues and comparing their performance with national benchmarks.

## References

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