

Hospitalizations Related to Cytopenias Among the Multiple Myeloma Adult Inpatient Population in the United States

Poster Code: EPH236

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Background

- Multiple Myeloma (MM), a cancer of the plasma cells, contributed to an estimated 34,290 new cancer diagnosis and 12,410 deaths in the United States in 2021.¹
- MM incidence has risen over the past few decades alongside an increased understanding of MM and a series of advancements in diagnosis, prognosis, and targeted treatments contributing to improved patient outcomes.¹
- Cytopenias, characterized by the development of one or more blood cell type that is lower than usual,² are an adverse event associated with both MM cancer and subsequent treatments.
- While drug trial studies have shown cytopenia prevalence among the MM population receiving a treatment in a clinical trial, there are currently no national estimates for the prevalence of cytopenias among the MM population.
- Active MM patients with cytopenias may experience greater resource utilization than those without

Objective

- To identify annual counts, prevalence estimates, and hospitalization length of stay (LOS) associated with cytopenia-related hospitalizations among US patients with MM.

Methods

Study Population

- US hospitalized adults with active MM and a cytopenia ICD-10 code present in a primary or secondary position on the hospitalization claim (Figure 1).

Data Source

- The 2019 Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS) was utilized for this retrospective study.³
- A cytopenia-related MM hospitalization was determined if a cytopenia was present in the primary or secondary position on the hospitalization claim and an active MM ICD-10 code was present in any diagnostic column.
- To identify the exact cytopenia at admission, the first cytopenia code listed on the hospitalization claim was counted for that specific cohort.

Primary Outcomes

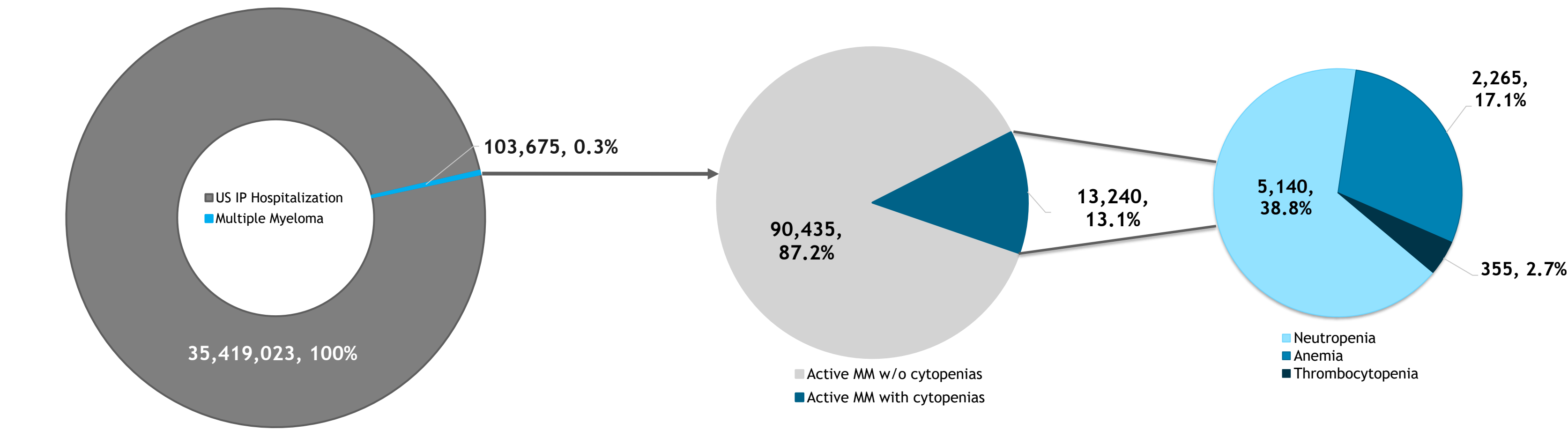
- Frequency and prevalence estimates for total MM and stratified MM and cytopenia cohorts.
- Inpatient hospitalization LOS for identified MM and cytopenia observations by specified stratifications.

Statistical Analysis

- Descriptive statistics such as frequency counts and epidemiologic measures such as prevalence estimates were calculated for each studied cohort.
- Prevalence was calculated by dividing the total number of cases in each cohort by the total US hospitalized population.
- Descriptive statistics including mean, median, IQR, range, standard deviation, and standard error was calculated for inpatient hospitalization LOS for each stratified cohort.
- Characteristics including age, race, gender, insurance status, patient location, and hospital status were assessed by count and percentage for each stratified MM cohort
- For all above measures, national estimates were calculated using provided sample weights from HCUP NIS.

Results

Figure 2. MM hospitalization frequencies and prevalence by cytopenia, 2019



Frequency and Prevalence

- Out of about 35 million inpatient admissions in 2019, the prevalence of an active MM diagnostic code was 0.3% representing 103,675 claims (Figure 2).
- About 13.1% of those with MM had some type of cytopenia code present on the hospitalization claim.
- Neutropenia was the most frequent cytopenia being hospitalized for (5,140, 38.8%) followed by anemia (2,265; 17.1%), and thrombocytopenia (355 [2.7%]).
- About half of all hospitalizations for patients with neutropenia also displayed a fever or infection diagnostic code which may be indicative of febrile neutropenia, a more severe cytopenia.
- Other frequently coinciding hospitalization codes among the neutropenia without a fever/infection code cohort included acute kidney failure, chemotherapy induced cytopenias, and dehydration.

Sample Characteristics

- Males were more likely than females to be seen with an MM diagnosis among hospitalized patients (56.2% vs 43.8% respectively).
- Average age for an MM and cytopenia hospitalization is 66.9 years.
- Hospitalized MM patients were predominantly White and Black; 63.6% and 19.9% respectively.

Figure 3. Average Hospitalization LOS for MM Patients, 2019

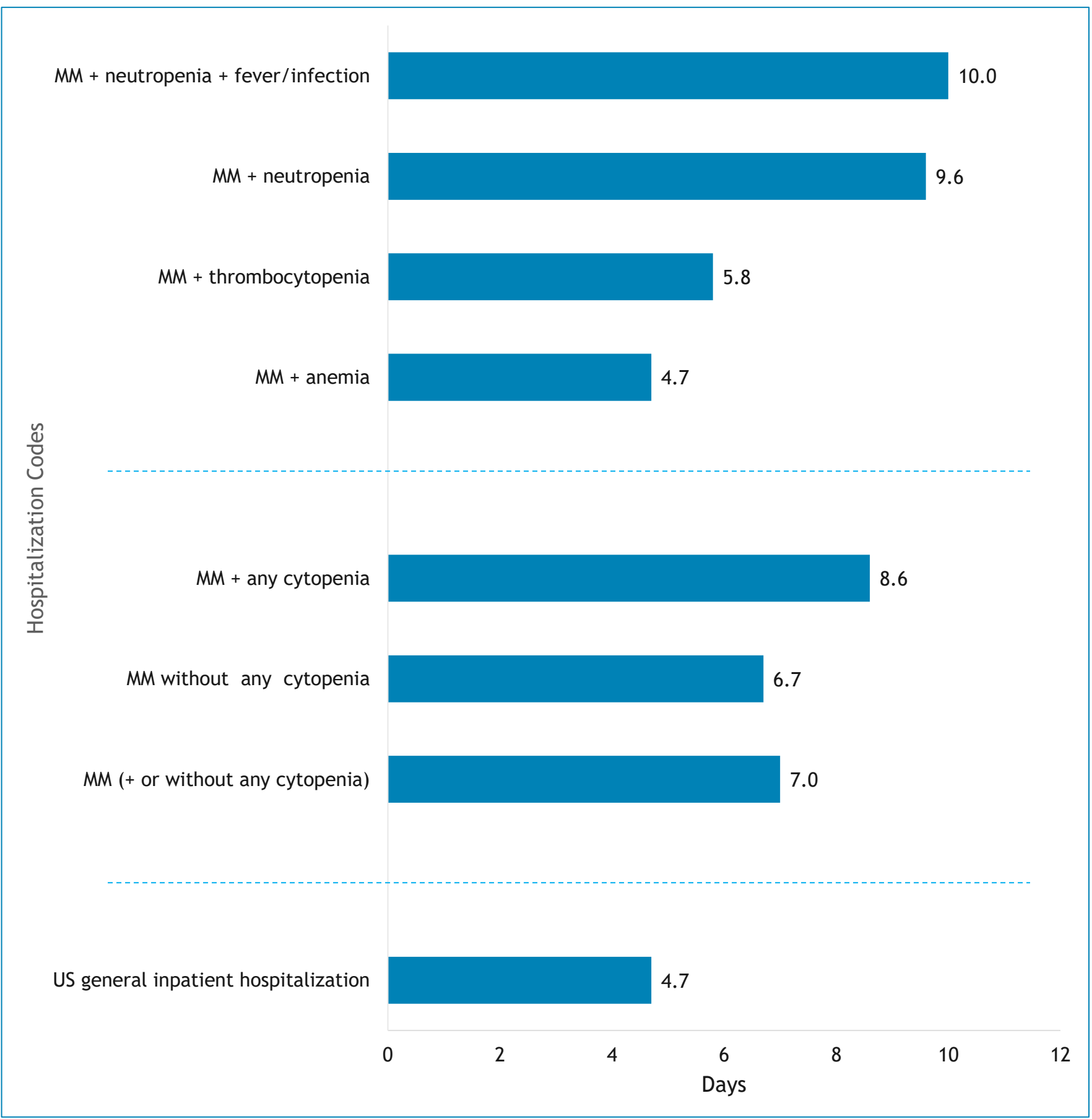
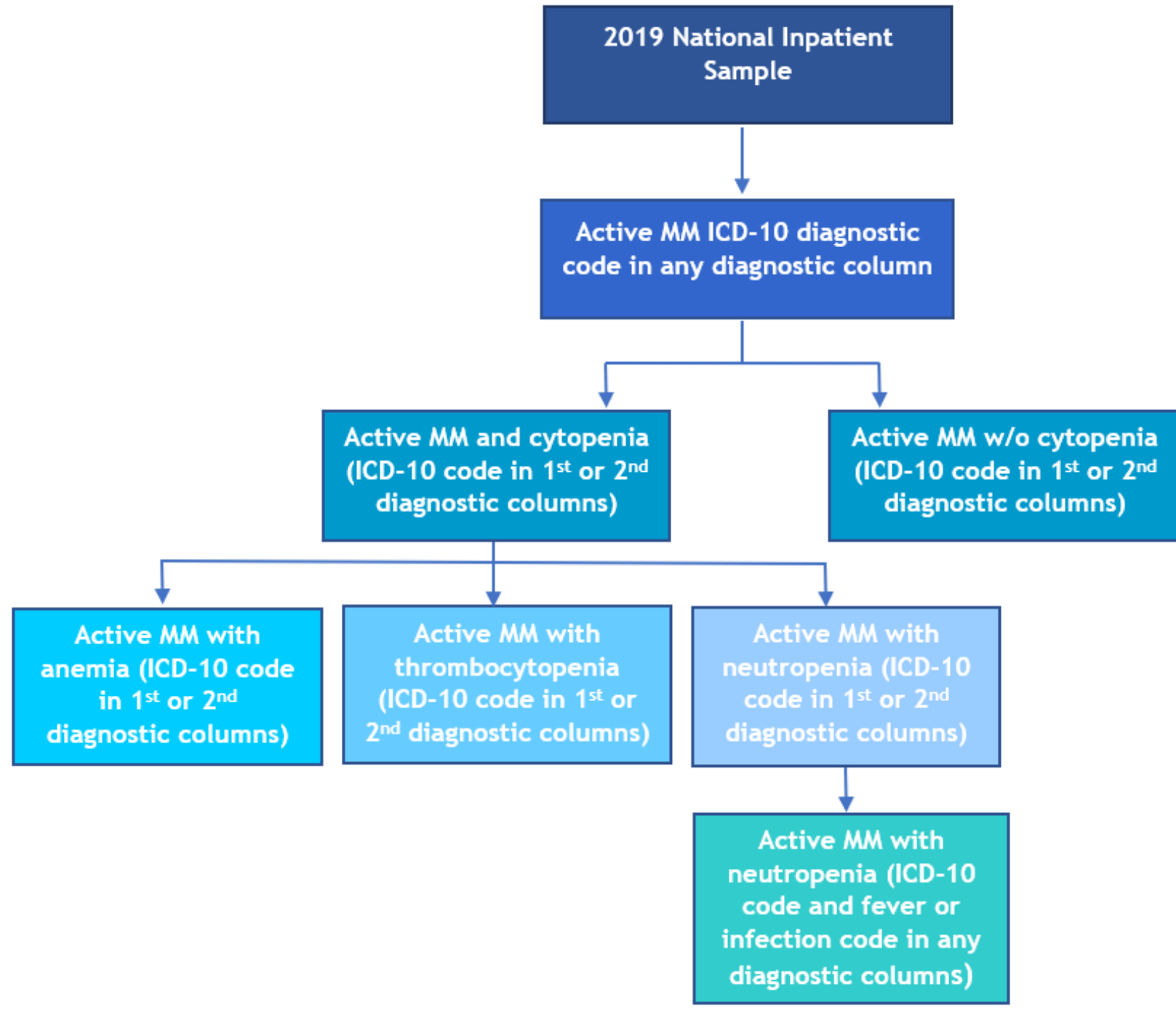


Figure 1. Study Methodology



Inpatient Hospitalization Length of Stay

- LOS increased by ~1 day for those with MM and a cytopenia vs those with just a MM diagnosis code (Figure 3).
- Increase is greater for patients hospitalized with MM and neutropenia (~2.5 days) as compared to those with just a MM diagnosis.
- For patients hospitalized with a neutropenia and fever or infection code, hospitalization length of stay is ~3 days greater as compared to those with just a MM diagnosis.
- LOS increase was only observed for MM with neutropenia and MM with neutropenia and fever/infection codes indicating that the total MM with cytopenia LOS average may be higher when excluding MM with Anemia and MM with thrombocytopenia cases.

Conclusions

- A meaningful number of hospitalizations were related to the experience of cytopenias among patients with active MM.
- The most common cytopenia diagnosed was neutropenia and almost half of hospitalized patients also had a fever or infection code which is indicative of febrile neutropenia.
- Hospitalization LOS increased for the total cohort of MM patients with cytopenias and the increase was greatest for patients with a neutropenia diagnosis.
- While anemia and thrombocytopenia diagnoses did not drastically increase the hospitalization LOS, neutropenia diagnosed patients without fever/infection codes were hospitalized for serious, life-threatening conditions including kidney disease which may have contributed to the longer length of stay amongst the neutropenia cohort.
- Management of neutropenia/febrile neutropenia may be key to reducing hospitalizations and LOS in MM patients.
- Further exploration into potential drivers of HCRU, such as MM treatment type, in this population are warranted.

References

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