



# ROLE OF THE ER IN INITIAL DIAGNOSTIC PATHWAY OF MULTIPLE MYELOMA PATIENTS

## A RETROSPECTIVE REVIEW OF PRESENTATIONS AT A REGIONAL HOSPITAL

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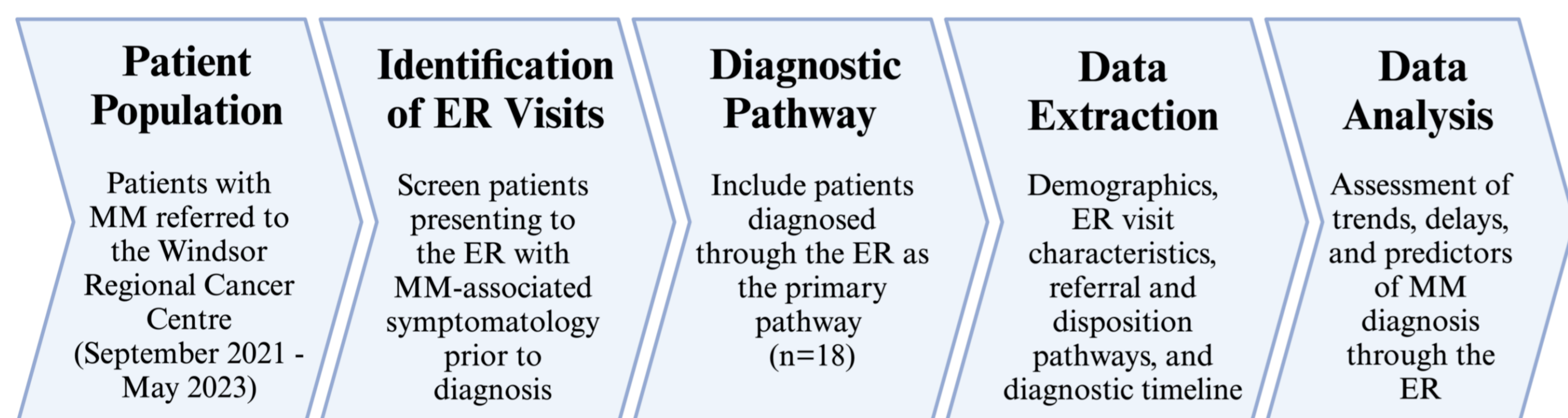
### BACKGROUND

Delayed diagnosis is a common challenge in multiple myeloma and can significantly impact patient outcomes and survival.<sup>1-5</sup> Although multiple myeloma often first presents in primary care, research indicates that a substantial proportion of cases follow complex diagnostic pathways, with nearly one-third diagnosed in acute care or emergency room (ER) settings.<sup>4,5</sup> Such diagnostic delays may exacerbate progressive bone disease, fractures, chronic disability, and pain, ultimately impacting prognosis and reducing patients' quality of life.

After development of symptomatic disease, there may be delay in getting appropriate specialist input and definitive diagnosis. A recent landmark report by Myeloma UK, surveying 1324 patients and carers, reported average time from first symptom to diagnosis was 163 days, one of the longest of any cancer, with 25% waiting longer than one year.<sup>5</sup> In accordance, minimizing diagnostic delay is a key concern for Canadian patients.

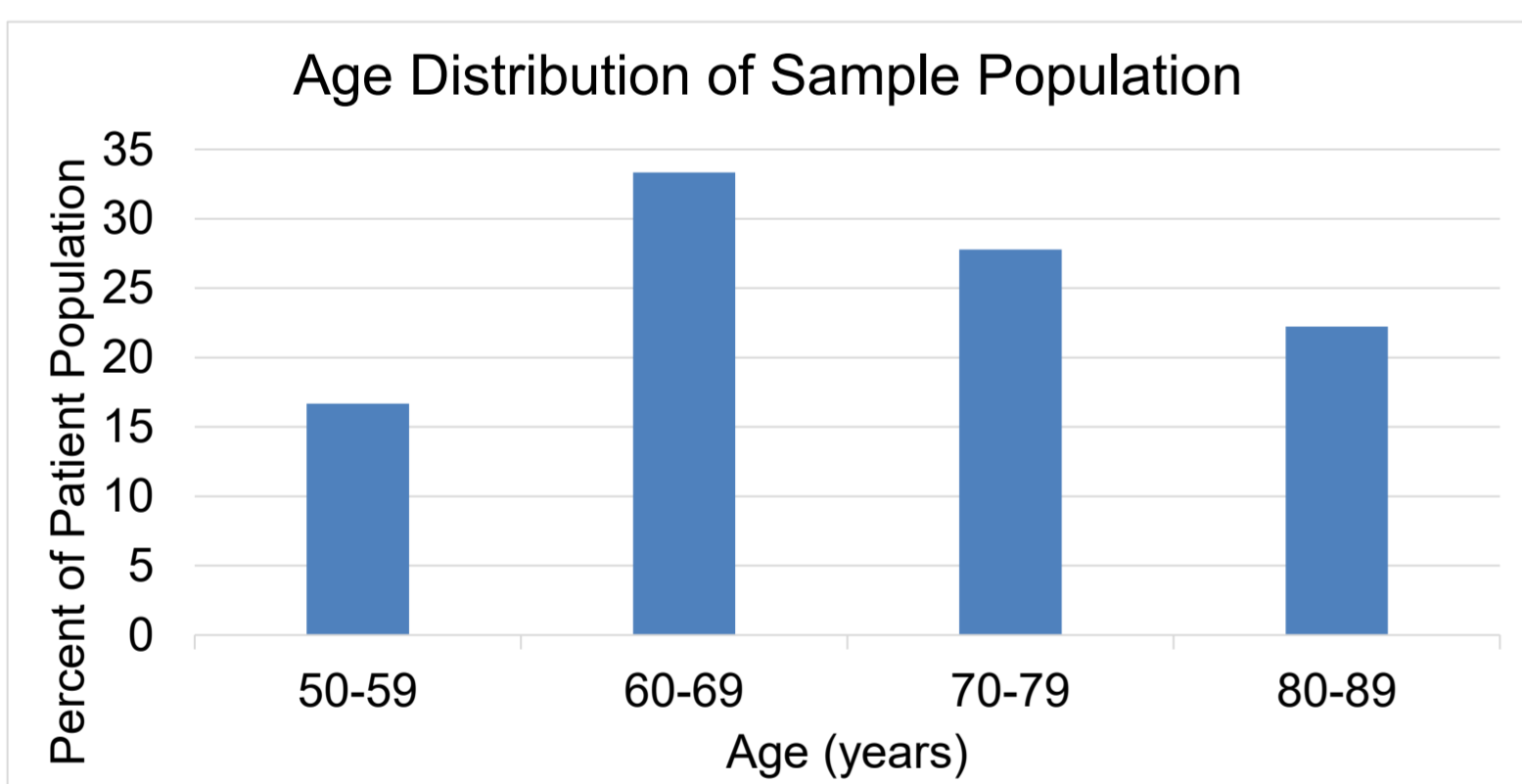
This study seeks to determine the proportion of multiple myeloma (MM) patients presenting to the ER at or before initial diagnosis and assess the nature of both acute and sub-acute presentations. In doing so, a knowledge base is cultivated to inform strategies for more timely diagnosis that enhance future patient outcomes and quality of life.

### METHODS

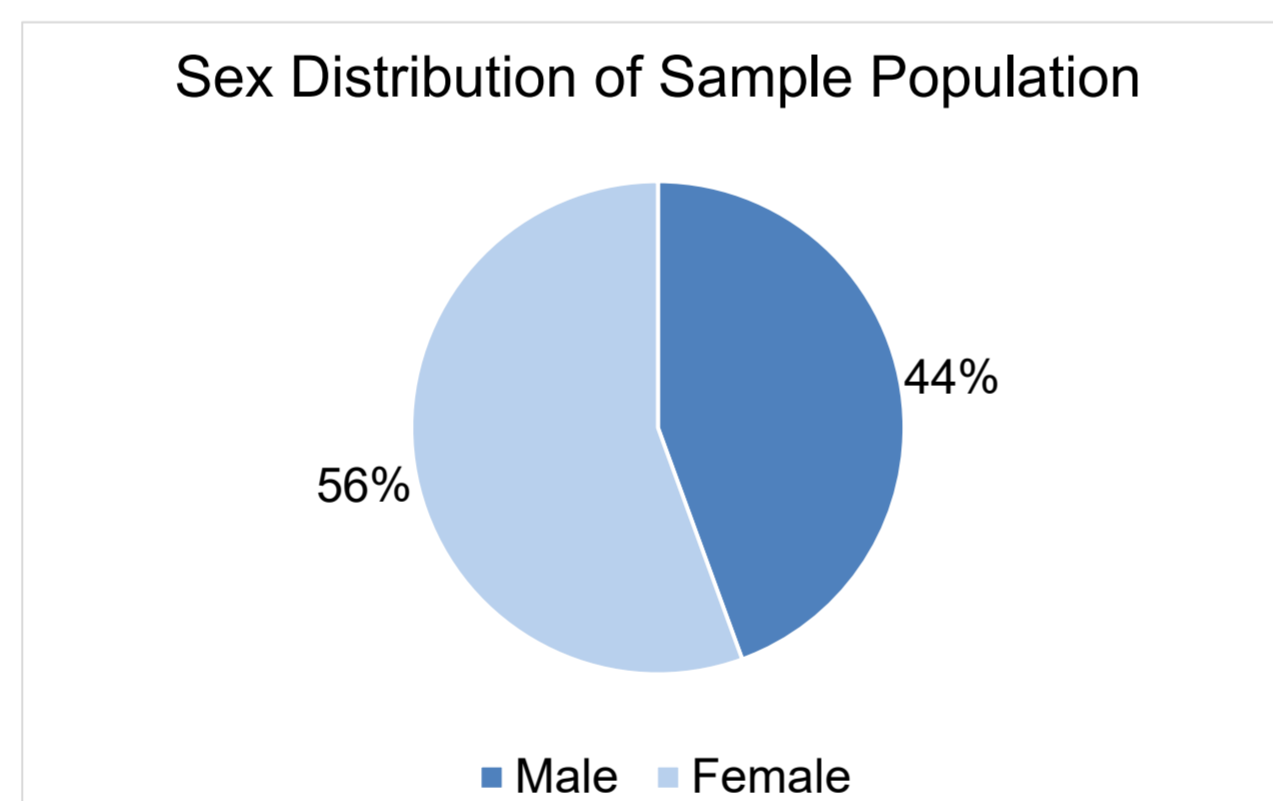


A retrospective chart review is being conducted on multiple myeloma patients with a histopathological diagnosis within 4 years. The target sample is 70–80 patients with one or more ER visits. Data is recorded on REDCap, a secure application for data management.

### PRELIMINARY RESULTS



**Figure 1. Age distribution of patient population:** 3 patients out of 18 are in the 50-59 age category (16.67%), 6 patients out of 18 are in the 60-69 age category (33.33%), 5 patients out of 18 are in the 70-79 age category (27.78%), and 4 patients out of 18 are in the 80-89 age category (22.22%).



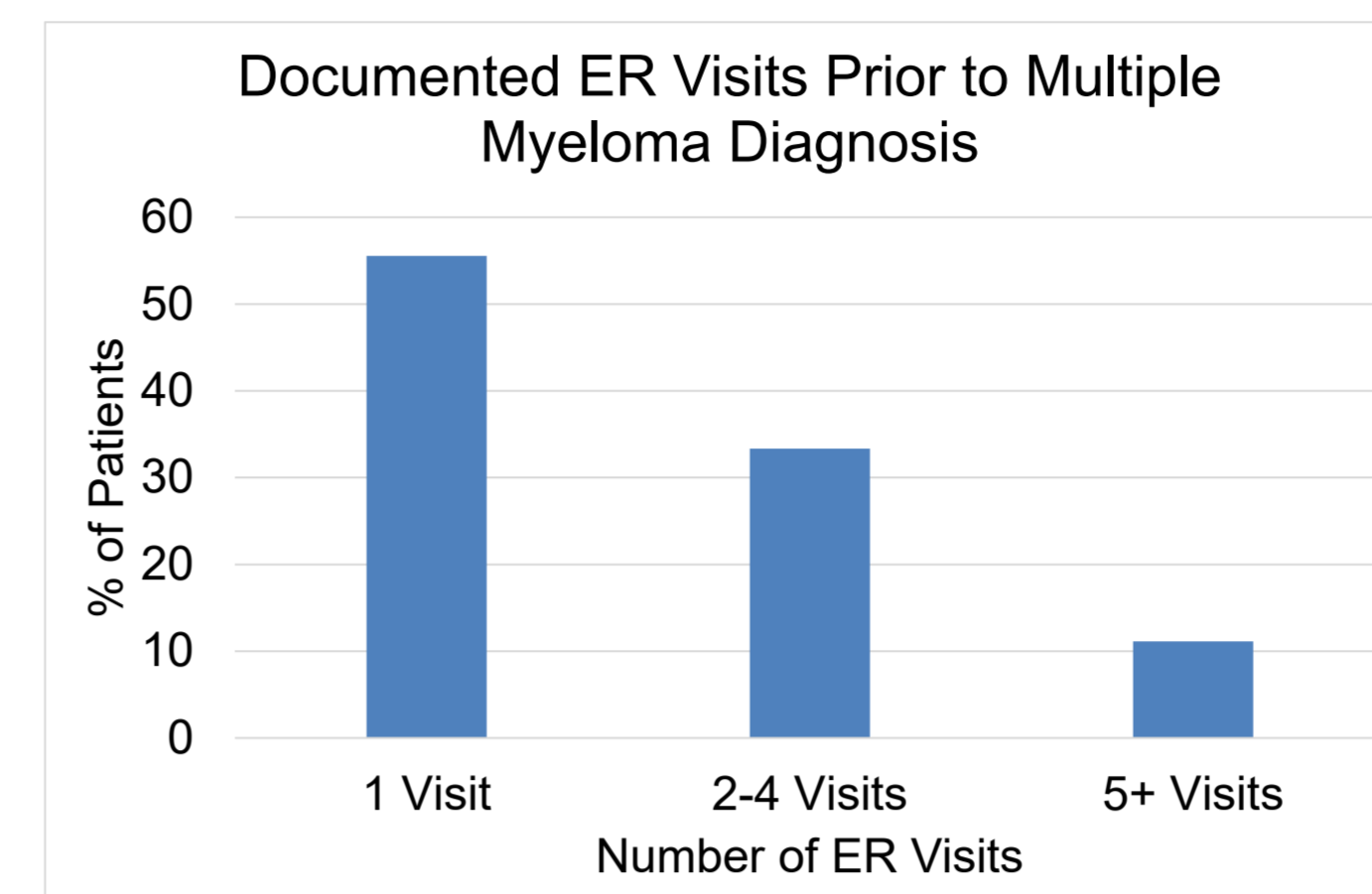
**Figure 2. Male to Female Ratios.** 8 patients out of 18 are male (44.44%), and 10 out of 18 patients are female (55.56%).

Variable	No. of ER Visits	% of ER Visits	Admitted	Not Admitted	% Admitted
<b>Reason for ER Presentation</b>					
Abnormal Labs	4	10.26	3	2	75
Bone Pain	24	61.54	12	13	50
Constitutional Symptoms	6	15.38	4	2	66.67
Other Symptoms	26	66.67	8	18	30.77
<b>Abnormalities Identified in the ER</b>					
Abnormal Labs	12	30.77	10	2	83.33
Pathological Fracture	10	25.64	7	3	70
Lytic Lesion	10	25.64	8	2	80
Renal Impairment	7	17.95	6	1	85.71

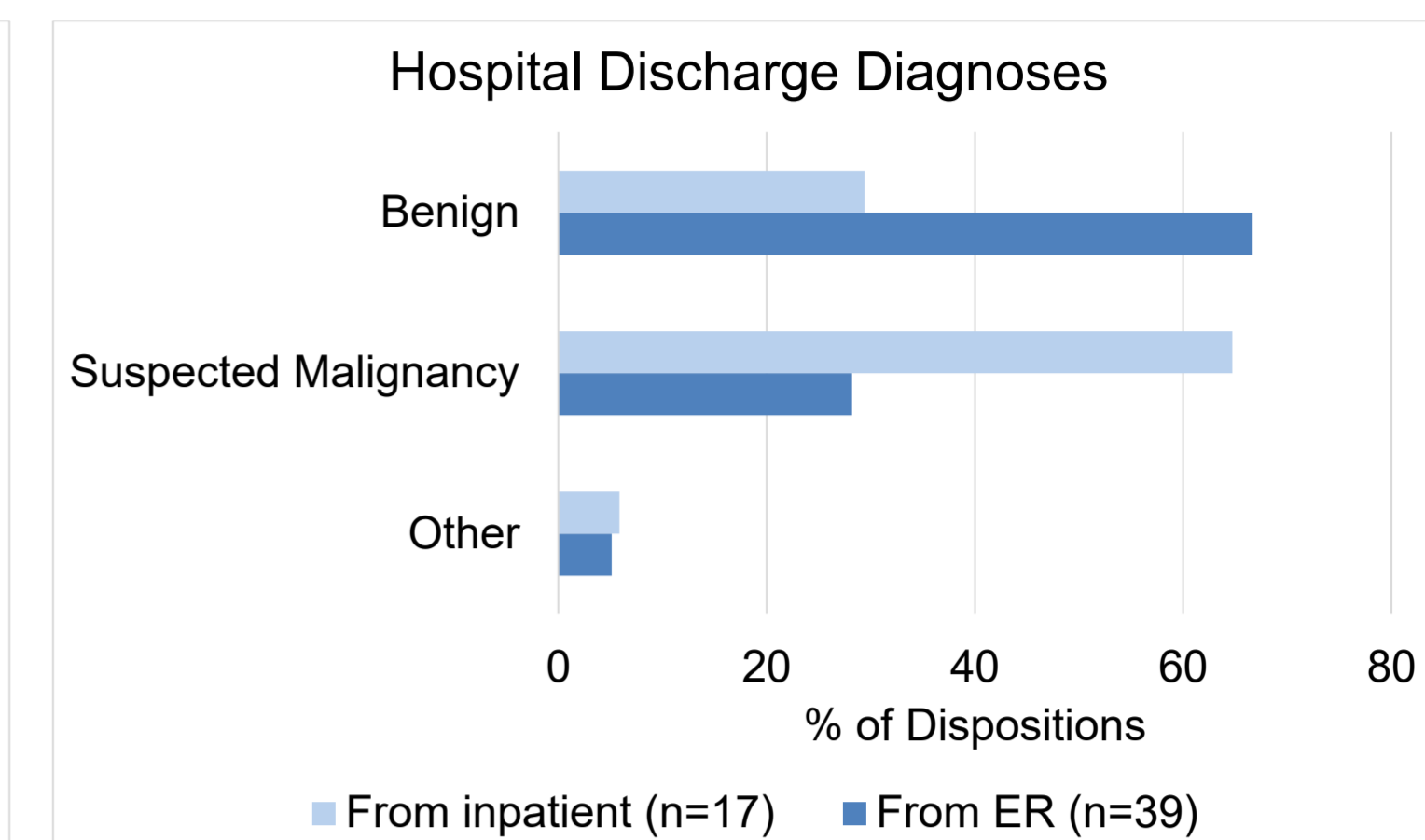
**Table 1. Breakdown of ER Presentations:**

**Reason for ER Presentation:** Abnormal labs accounted for 10.26% (4 ER visits of 39) of total ER visits, with 75% (3 of 4 of these visits) leading to admission. Bone pain accounted for 61.54% (24 ER visits of 39) of total ER visits, with 50% (12 of 24 of these visits) leading to admission. Constitutional symptoms were present in 15.58% (6 ER visits of 39) of total ER visits, with 66.67% (4 of 6 of these visits) leading to admission. Other symptoms were reported in 66.67% (26 ER visits of 39) of visits, with 30.77% (8 of 26 of these visits) leading to admission.

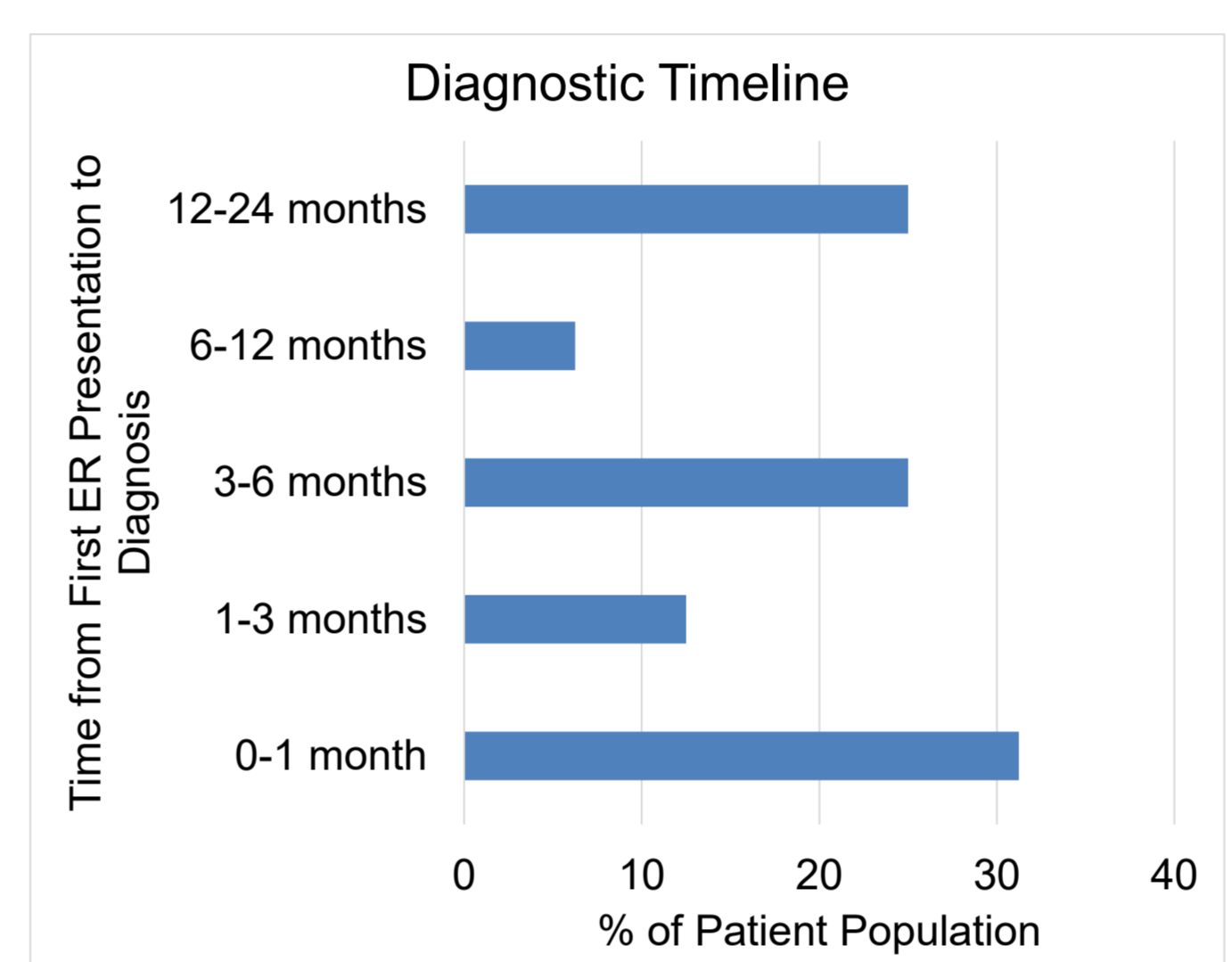
**Abnormalities Identified in ER:** Abnormal labs were identified in 30.77% (12 ER visits of 39) of total ER visits, with 83.33% (10 of 12 of these visits) leading to admission. Pathological fractures were identified in 25.64% (10 ER visits of 39) of total ER visits, with 70% (7 of 10 of these visits) leading to admission. Lytic lesions were identified in 25.64% (10 ER visits of 39) of total ER visits, with 80% (8 of 10 of these visits) leading to admission. Renal impairment was identified in 17.95% (7 ER visits of 39) of total ER visits, with 85.71% (6 of 7 of these visits) leading to admission.



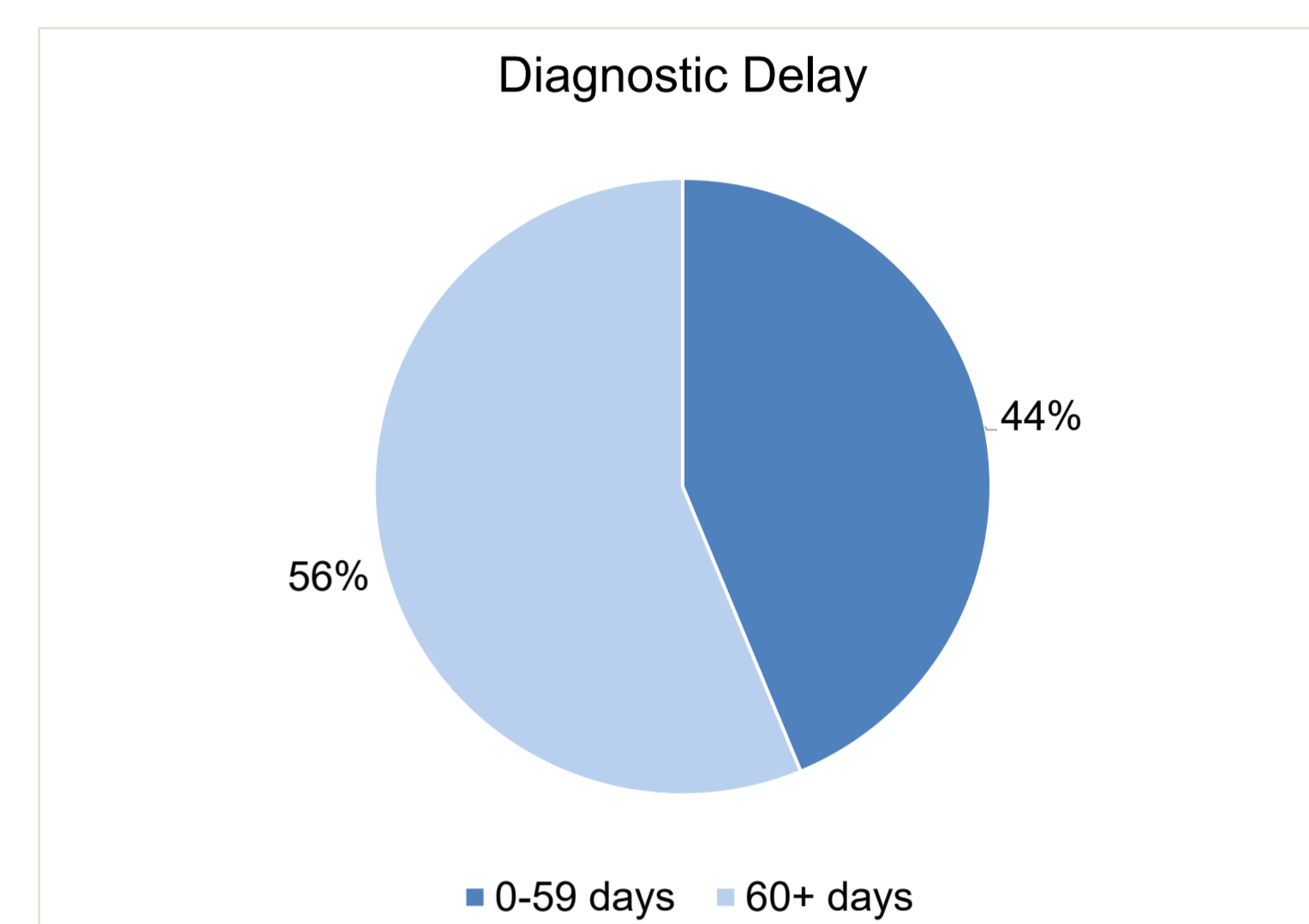
**Figure 3. Percent of documented ER visits prior to diagnosis:** 10 out of 18 (55.56%) patients presented once to the ER prior to MM diagnosis, 6 out of 18 (33.33%) patients presented to the ER 2-4 times prior to MM diagnosis, and 2 out of 18 (11.11%) patients presented to the ER 5+ times prior to MM diagnosis.



**Figure 4. Discharge diagnosis from ER and inpatient admission:** Of the ER discharges, 26, 11, and 2 out of 18 patients (66.66%, 28.21%, 5.13%) had benign, suspected malignancy, or other diagnoses, respectively. Of the inpatient discharges, 5, 11, and 1 patient (29.41%, 64.71%, and 5.88%) had benign, suspected malignancy, or other diagnoses, respectively.



**Figure 5. Time from first documented ER presentation to final MM diagnosis:** Of the sample population, 5 out of 16 (31.25%), 2 out of 16 (12.5%), 4 out of 16 (25%), 1 out of 16 (6.25%) and 4 out of 16 (25%) waited 0-1 months, 1-3 months, 3-6 months, 6-12 months, and 12-24 months, respectively, from the time of initial documented ER presentation to final MM diagnosis.



**Figure 6. Proportion of patients experiencing diagnostic delay:** Diagnostic delay is defined as diagnosis greater than 60 days post presentation to the ER. Of the sample population, 7 out of 16 patients (43.75%) were diagnosed with cancer within 60 days of their first documented ER presentation and 9 out of 16 patients (56.25%) were diagnosed with cancer beyond 60 days of their first documented ER presentation.

### CONCLUSION & FUTURE DIRECTIONS

Bone pain was the predominant reason for emergency room presentation, accounting for 61.54% of ER visits, with a 50% admission rate (Table 1). Abnormal lab findings were the reason for ER presentation in 10.26% of visits, yet these led to the highest rate of hospital admission (75%). Abnormal labs, pathological fractures, and lytic lesions were frequently identified in ER tests (Table 1). Renal impairment, though less common at 17.95% of ER visits, was the most prevalent reason for hospital admission.

Just over half of patients (55.56%) had only one ER visit prior to their MM diagnosis, with one-third visiting 2-4 times before diagnosis and 11% presenting five or more times (Fig. 3). Diagnostic delay remains a challenge, with 56.25% of patients diagnosed more than 60 days after their initial ER presentation (Fig. 6) and 25% experiencing a delay of 12+ months (Fig. 5). Notably, two-thirds of patients discharged from the ER were initially given benign diagnoses, and it wasn't until patients were admitted that a majority of cases were categorized as suspected malignancy (Fig. 4). This clearly demonstrates that patients are leaving the ER without confirmed or suspected diagnosis despite demonstrating MM indicators.

Our preliminary findings suggest that ER presentations provide an early opportunity for multiple myeloma diagnosis, yet diagnostic delays remain common. Further research is needed to identify methods of optimizing timely diagnosis.

This study has collected data to begin identifying the nature of emergent presentations in newly diagnosed multiple myeloma patients, while defining demographic and disease-related characteristics that may serve as associated risk factors. Identifying common patterns along patients' diagnostic pathways, each starting with an emergency department visit, has highlighted the commonalities experienced by most patients. These similarities, such as bone pain or abnormal laboratory results, provide a basis from which to implement changes that facilitate more timely diagnosis to enhance patient outcomes and quality of life. Continued data collection will aid in clarifying opportunities for intervention.

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