Identification of Inappropriate Medication Use in Elderly Patients with Frequent Emergency Department Visits

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Background

- From 2005-2006, Canada spent a combined total of $1.8 billion on emergency departments (EDs)[1].

- The average cost of an ED visit to a hospital in the Toronto Central LHIN is estimated to be $219, the highest out of all of the Ontario LHINs[1].

- More than 1 in 9 ED visits are linked to drug-related adverse events, more than half of which are preventable[2].

- Approximately 1 out of 4 patients presenting to the ED with a drug-related adverse event is elderly[2].

- The STOPP (Screening Tool of Older Persons' potentially inappropriate Prescriptions) criteria has been validated for use in both hospital and primary care settings[3,4].

- Potentially inappropriate medications (PIMs), as defined by the STOPP criteria (but not as defined by the Beers criteria), have been significantly associated with drug-related adverse events that can cause or contribute to hospitalization[5,6].

Objectives

1. To describe the demographic and health care characteristics of elderly FHT patients who are frequent users of the ED.

2. To determine the prevalence of PIMs prescribed, as defined by the STOPP criteria, in the above population.

3. To determine the incidence of medications commonly implicated in drug-related adverse events leading to hospitalizations in the above population.

Methods

Design

Retrospective chart review

Setting

The Toronto Western FHT is affiliated with the University Health Network (UHN). It serves a population of approximately 14 000 patients in the heart of western downtown Toronto. The FHT consists of family physicians, residents, pharmacists, nurses, dieticians, and other health professionals.
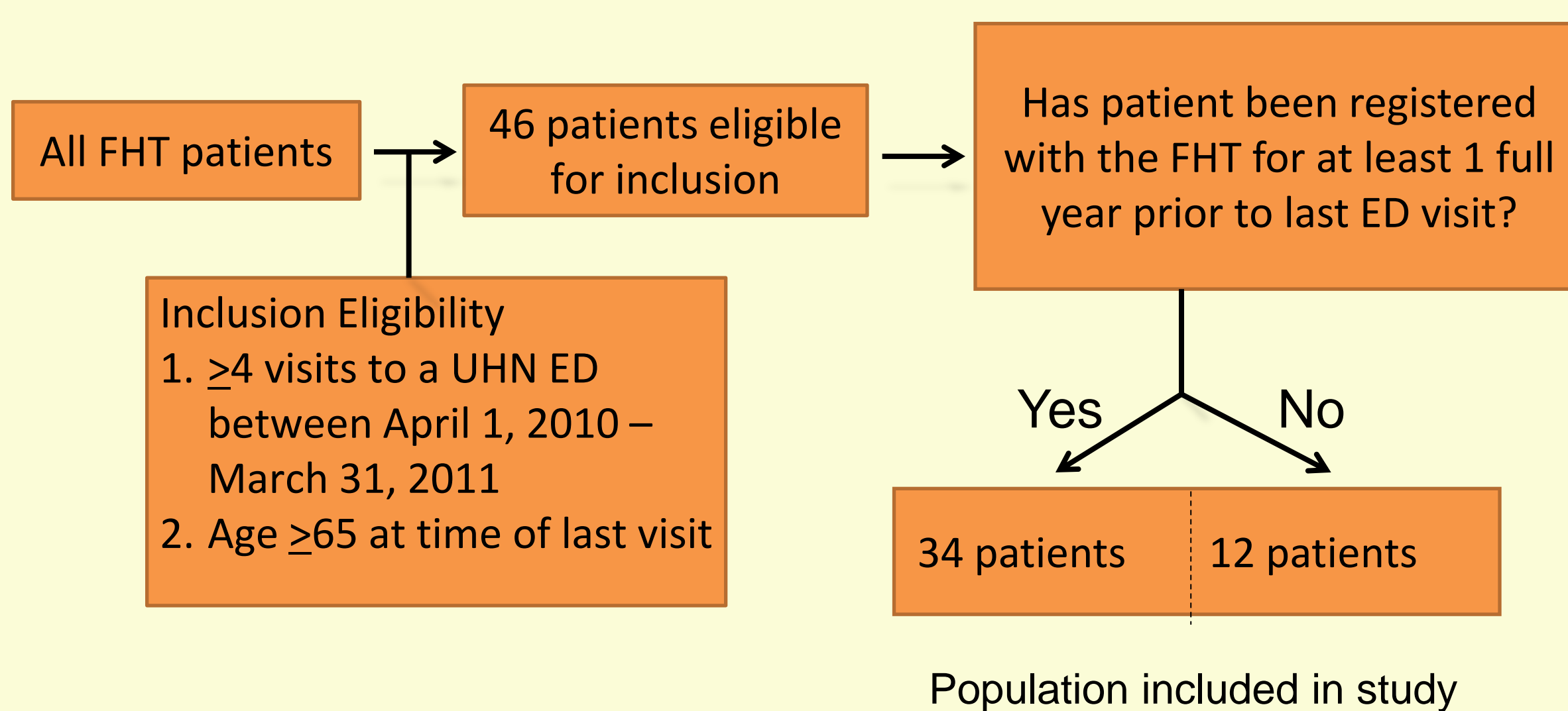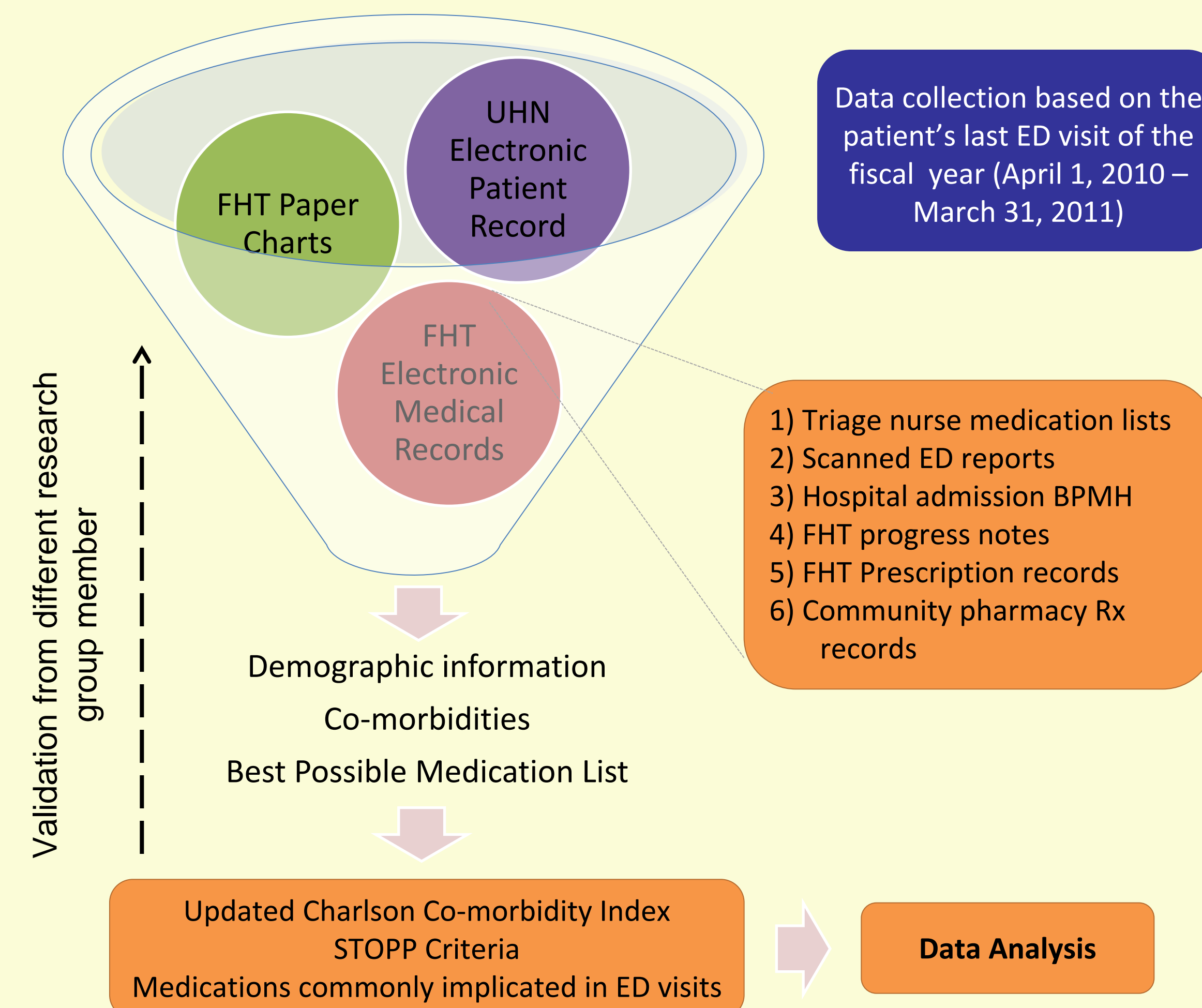

All FHT patients → 46 patients eligible for inclusion → Has patient been registered with the FHT for at least 1 full year prior to last ED visit?

Inclusion Eligibility
1. ≥4 visits to a UHN ED between April 1, 2010 – March 31, 2011
2. Age ≥65 at time of last visit

Yes → 34 patients   No → 12 patients

Population included in study

Chart Review Methodology

Data collection based on the patient's last ED visit of the fiscal year (April 1, 2010 – March 31, 2011)

Validation from different research group member

1) Triage nurse medication lists
2) Scanned ED reports
3) Hospital admission BPMH
4) FHT progress notes
5) FHT Prescription records
6) Community pharmacy Rx records

Demographic information
Co-morbidities
Best Possible Medication List

Updated Charlson Co-morbidity Index
STOPP Criteria
Medications commonly implicated in ED visits

Data Analysis

Figure 1: Schematic outline of methodology

Preliminary Results

Patient Sample (N = 46)

Table 1: Demographic characteristics	
Gender	
Male, n (%)	23 (50%)
Female, n (%)	23 (50%)
Age	
Mean (years ± SD)	76.3 ± 6.6
Range (years)	65-90
Primary Care Provider (PCP)	
Staff MD	23 (50%)
Resident MD	23 (50%)

Table 2: Usage of Primary Care in the 1 year prior to the last ED visit	
All visits to the FHT	
Mean (# ± SD)	10.4 ± 8.6
Range	0-39
Visits to see PCP	
Mean (# ± SD)	5.6 ± 3.9
Range	0-14
Medication assessment by FHT RPh	
Yes, n (%)	9 (20%)
No, n (%)	37 (80%)

Total # of ED visits = 284

Table 3: Mean # of visits	
Overall	6.2
Registered for <1 year	7.29*
Registered for ≥1 year	5.79

*includes the patient with 27 ED visits
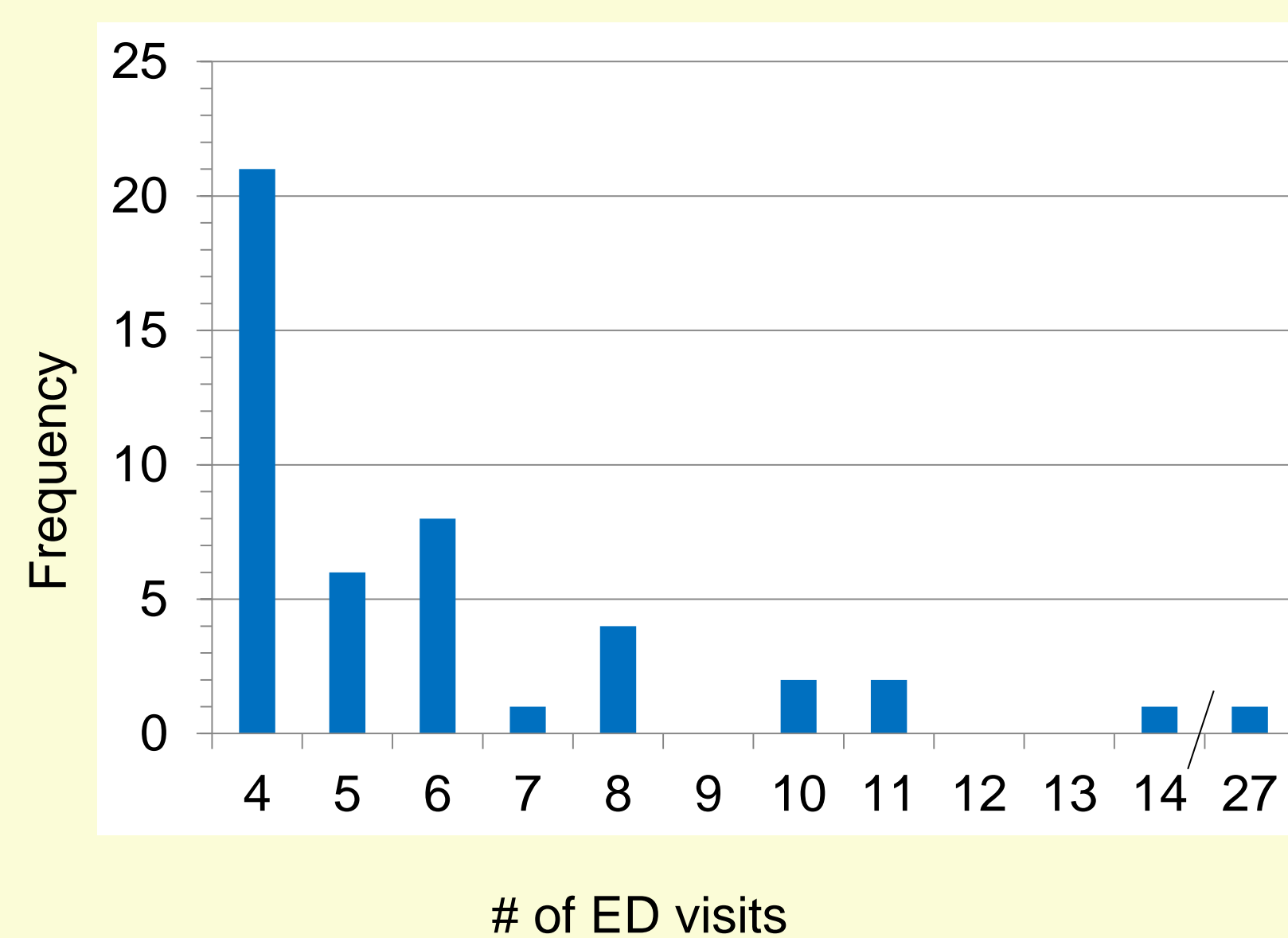
Figure 2: Number of ED visits in the fiscal year

Emergency Department Visits

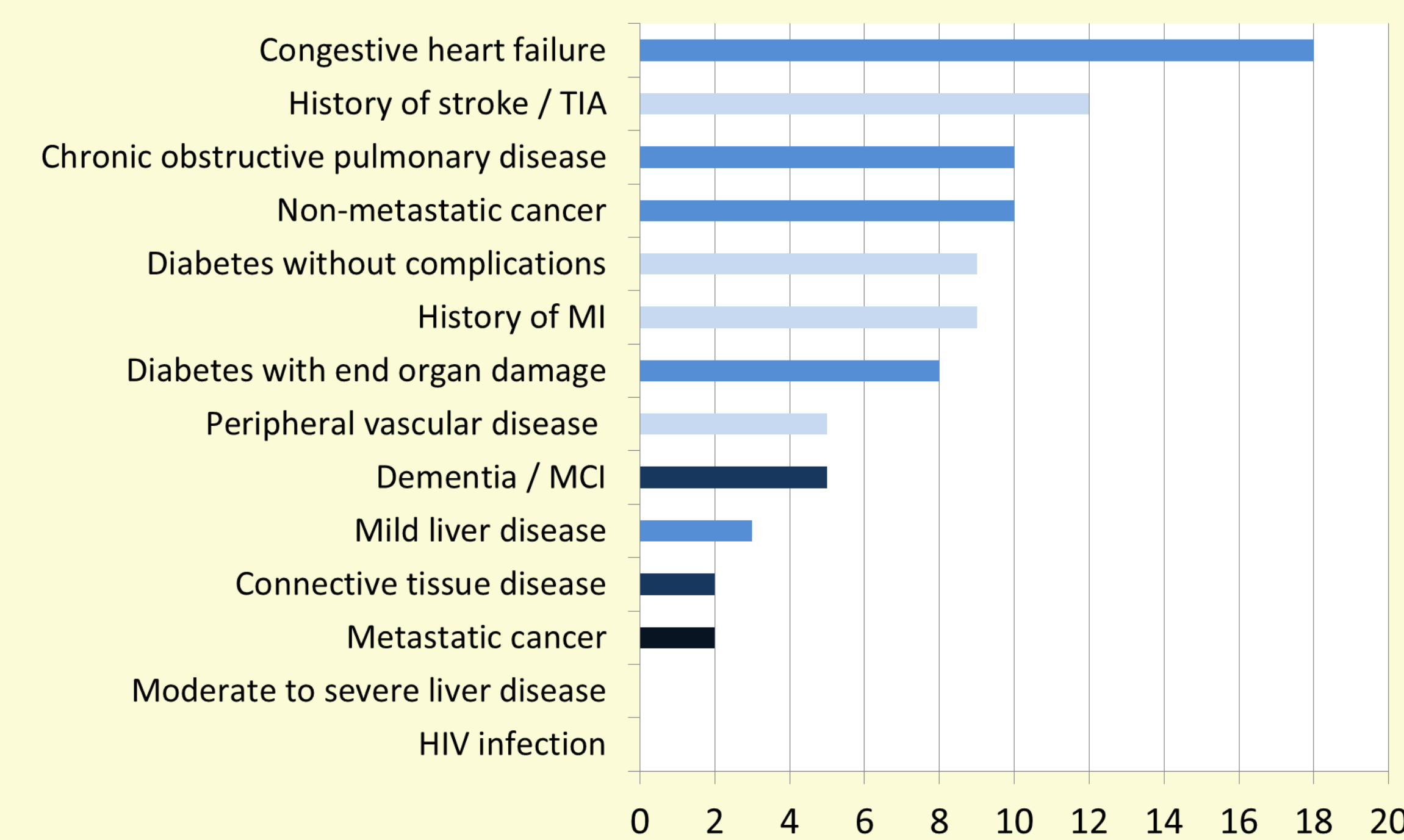| Table 4: Healthcare demographics at time of ED presentation			
# of days since last ED visit		**Medications**	
Mean (# ± SD)	61.5 days ± 67.1	Mean (# ± SD)	12.1 ± 5.8
Median	37.5 days	Range	1-27
Time of ED registration		**Co-morbidities**	
During FHT hours, n (%)	27 (59%)	Mean Charlson Score (# ± SD)	3.7 ± 2.6
After FHT hours, n (%)	19 (41%)	Range	0-12

Figure 3: Frequency of Charlson Co-morbidity Score conditions
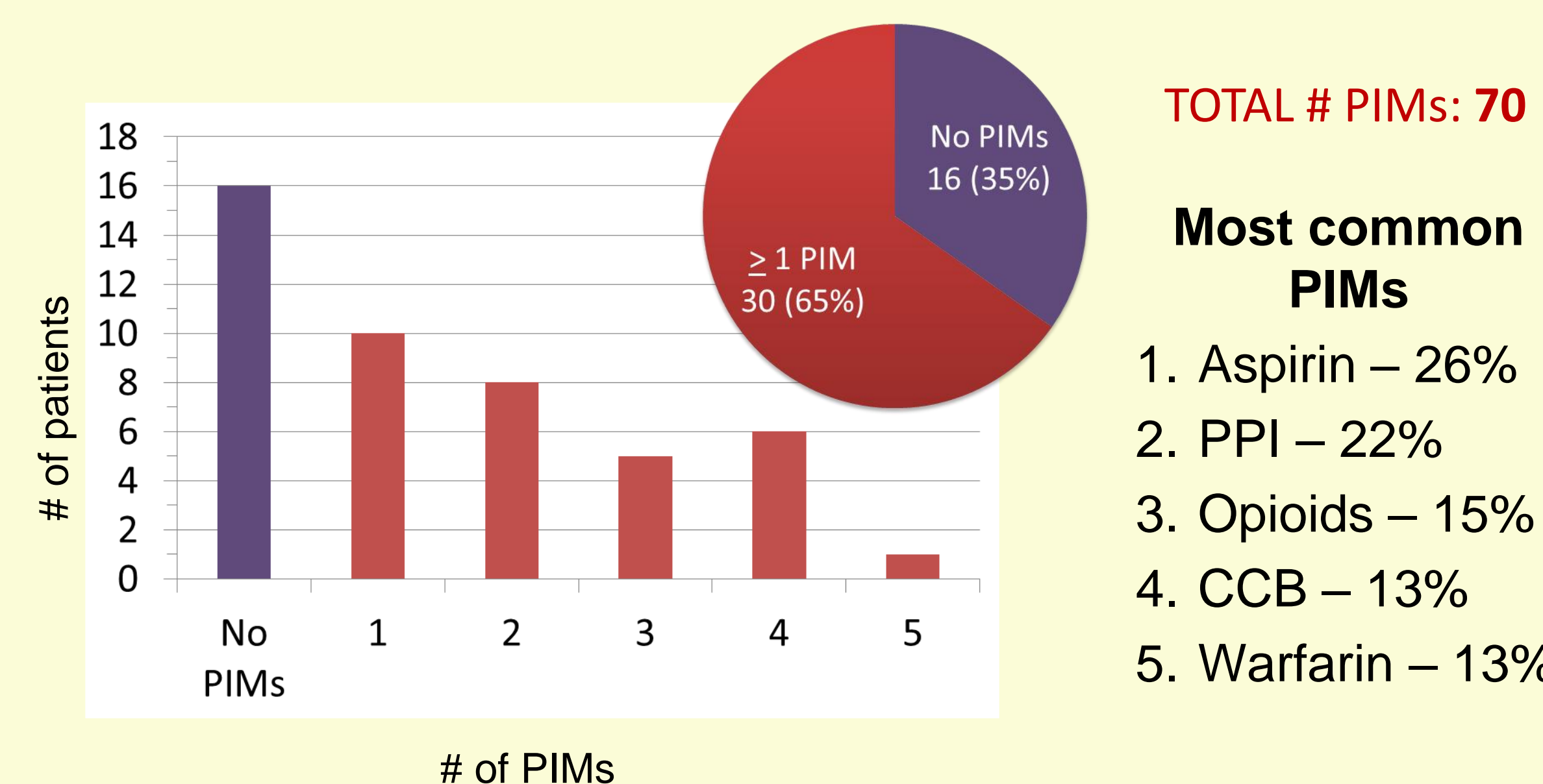
Potentially Inappropriate Medications

TOTAL # PIMs: 70

No PIMs 16 (35%)
≥1 PIM 30 (65%)

Most common PIMs

1. Aspirin – 26%
2. PPI – 22%
3. Opioids – 15%
4. CCB – 13%
5. Warfarin – 13%

Figure 4: Frequency of PIMs

3 out of 46 ED visits directly attributable to one of these medications
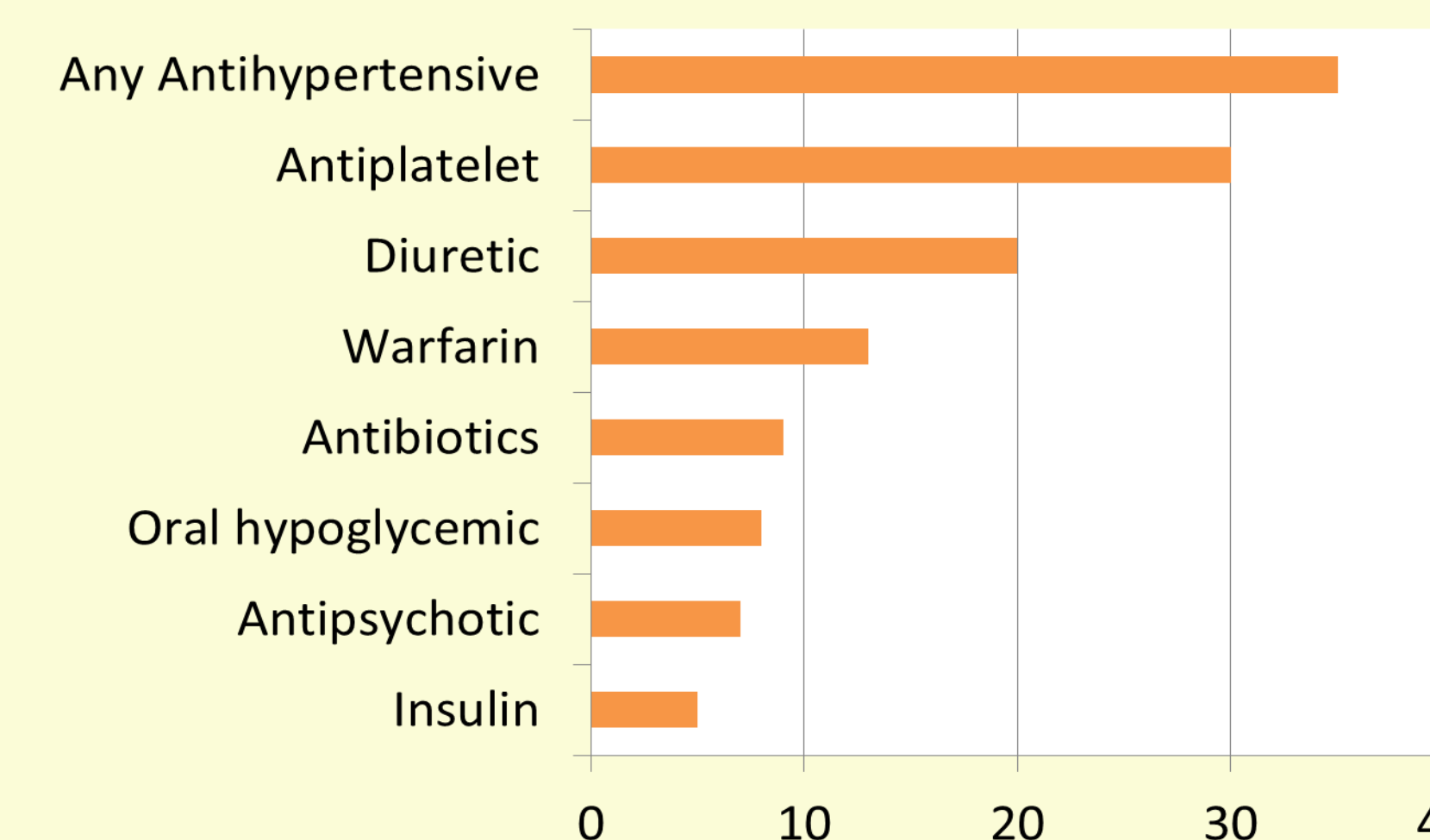
Figure 5: Frequency of "high risk" medication usage

Initial Analysis & Limitations

- There is a significant correlation between the number of PIMs and the number of ED visits (r=0.38, p<0.05).

  - No significant correlation in patients who have been registered with the FHT for ≥1 year.

- Most prevalent PIM criterion satisfied was the use of PPIs at full therapeutic dose for >8 weeks for GERD, PUD, or esophagitis.

- Patients with medication reviews within the 1 year prior to their ED visit did not have significantly fewer PIMs.

- Total number of medications and Charlson co-morbidity score were both correlated with higher acuity of ED visit (r=-0.30, p<0.05 and r=-0.42, p<0.05, respectively).

Canadian Triage And Acuity Scale (CTAS)

[1] Ressuscitation
[2] Emergent
[3] Urgent
[4] Less urgent
[5] Non urgent

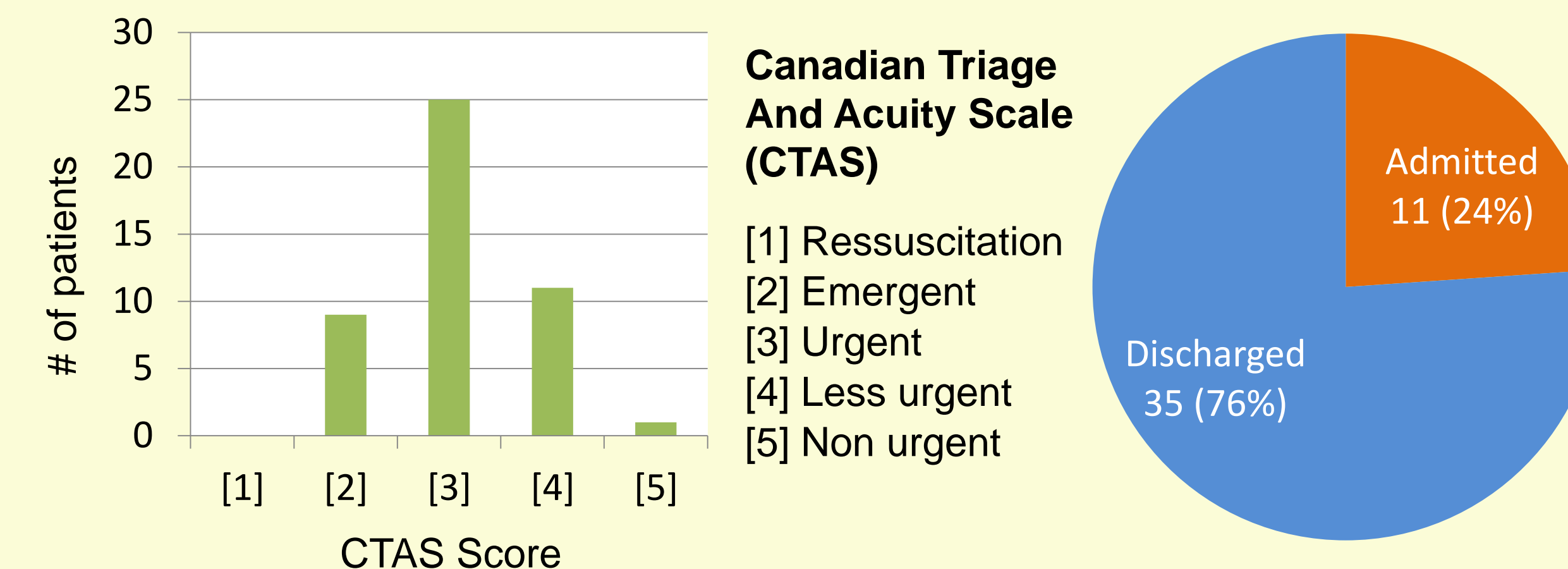Admitted 11 (24%)
Discharged 35 (76%)

Figure 6: Number of patients by acuity and by admission status

- Significant delay between discharge and next FHT visit is common (mean 36 days, median 13.4 days).

- Limitations: small sample, retrospective, 1 main data collector.

Future Work

Short-term
- Complete data analysis, correlations, and subgroup analysis.
- Determine areas of interest for FHT quality improvement.

Long-term
- Develop pilots to test interventions.
- Implement positive findings into daily FHT practice.

Potential impact:
- Improve follow-up at the primary care level.
- Reduced inappropriate medication usage and ED visits.

References
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