Evaluation of the prescribing pattern for angiotensin receptor neprilysin inhibitor (ARNI) among eligible HFrEF patients in general internal medicine units at St. Paul's Hospital

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Background

- The 2017 Canadian Cardiovascular Society (CCS) Heart Failure with reduced Ejection Fraction (HFrEF) guideline recommends switching to an angiotensin receptor neprilysin inhibitor (ARNI) in patients who remain symptomatic despite being on angiotensin converting enzyme inhibitor/angiotensin receptor blocker (ACEi/ARB), beta blockers (BB), and mineralocorticoid receptor antagonist (MRA)
- ARNI reduces mortality, HF re-hospitalization, and HF symptoms
- At St. Paul's Hospital (SPH), it has been observed that ARNI is infrequently initiated for eligible HFrEF patients on the General Internal Medicine (GIM) unit

Objectives

- **Part 1:** To determine the proportion of eligible HFrEF patients who were appropriately initiated on ARNI during their admission to GIM units at SPH
- **Part 2:** To describe the prescribing practices of SPH GIM prescribers regarding ARNI, identify perceived barriers to prescribing ARNI, and propose strategies to improve rates of ARNI prescribing in eligible HFrEF patients admitted to GIM unit

Methods

- **Part 1: Retrospective healthcare record review**
  - Data Source: using Cerner electronic medical records, identified patients admitted to GIM in SPH between January – September 2020 who were assigned HF-related ICD codes
  - Inclusion criteria: chief complaint of HF, LVEF ≤40% including recovered EF, and on ACEi/ARB and BB for at least 4 weeks
  - Exclusion criteria: LVEF>40%, eGFR <30 ml/min/1.73m^2, K+ >5.4mmol/L, history of angioedema with ACEi, NYHA Class I
  - Analysis: using Microsoft Excel 2013, performed descriptive statistics for categorical variables, means and standard deviations for normally distributed continuous variables

Part 2: Electronic survey of SPH GIM prescribers

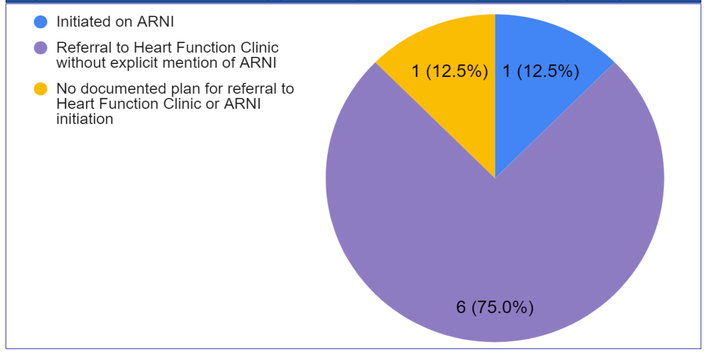
- Administered via UBC Qualtrics Online Survey Tool
- A 15-item online survey distributed to all SPH GIM medical residents and internists via a pre-existing emailing list
- Survey responses were collected between 1 February 2021 – 5 March 2021; one email reminder sent to potential participants

Part 1 - Results

Table 1: Characteristics of patients for retrospective chart review (N = 8)

Age — year, mean	63.9 (±13.6)
Male sex — no. (%)	8 (100.0)
Systolic blood pressure — mmHg, mean	119 (±30)
HR — beats/min, mean	72 (±36)
SCr —umol/L, mean	96.0 (±24.7)
Clinical features of heart failure	
LVEF — (%), mean	26 (±7)
NT-proBNP —ng/L, mean	13788 (±22973)
NYHA functional class — no. (%)	
II	2 (25)
III	4 (50)
IV	2 (25)
Treatments — no. (%)	
ACEi/ARB	8 (100)
BB	8 (100)
Spironolactone	5 (62.5)

Figure 1: Course of therapy for eligible HFrEF patients (N = 8)



Part 2 - Results

Table 1: Demographics of Survey Respondents (N = 25)

Medical Resident	16
Internist	9
Response Rate = (25 / 180) = 14%	

Figure 2: How often do you prescribe ARNI in GIM units at SPH?

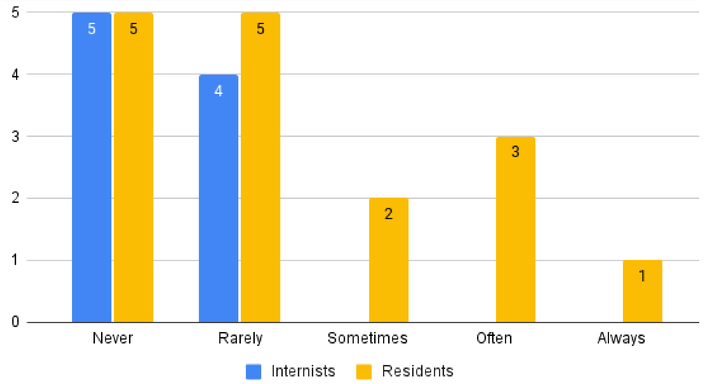


Figure 3: How familiar are you with the evidence for using ARNI in HFrEF patients?

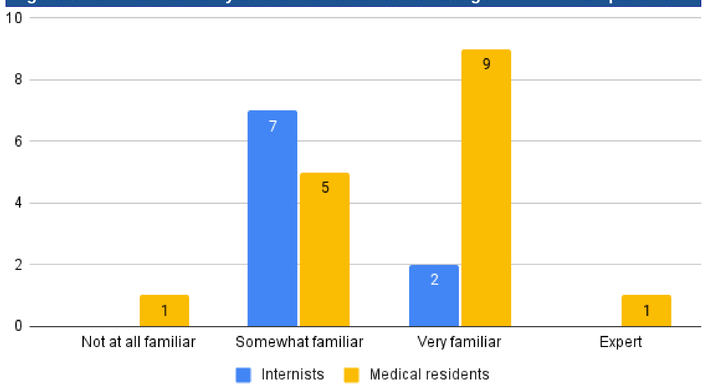


Table 2: What are the perceived barriers to prescribing ARNI in GIM units at SPH?

	N (%)
BC Special Authority process is too complicated	12 (48)
Patient Cost concerns	12 (48)
Risk of adverse effects (e.g., hyperkalemia, hypotension)	7 (28)
Need for monitoring	7 (28)
Unfamiliar on how to switch from ACEi/ARB to ARNI	6 (24)
Not on the hospital formulary	5 (20)
Outside my scope of practice	4 (16)
Increased pill burden	3 (12)
Drug interactions	3 (12)
Not a priority	2 (8)
Compliance concerns (e.g., previous documented history of medication non-compliance)	0 (0)
Other	7 (28)

Table 3: Qualitative Summary of Survey Text Response

Categories	Representative Quotes
Concerns about clinical stability	"While [ARNI is] great, I find it difficult to prescribe it in an inpatient setting, because of the necessary washout periods, as well as mandatory observation on maximum dose of [ACEi/ARB, BB, and MRA] before consideration."
Socioeconomic concerns	"Most of our patients are living in poverty, have low medical literacy, and live with comorbid psychiatric and mental health diagnoses. I prioritize the simplicity of my medical plans, including the streamlining of their medications."
Lack of familiarity with ARNI	"I think the momentum [for using ARNI] is building. [Prescribers] just need more awareness."

Limitations

- Fewer eligible patients for healthcare record review than expected based on the search strategy: most HF patients were excluded for EF > 40% (excluding patients with recovered EF)
- Low survey response rate (14%) did not meet the estimated *a priori* sample size of 72 (40%)
- Potential lack of generalizability to other sites or clinical areas
- Potential threats to trustworthiness in the analysis of qualitative component of the study

Conclusion

- ARNI is infrequently prescribed in eligible HFrEF patients who are admitted to SPH GIM units
- Medical residents appear to be more likely to prescribe ARNI than Internists in SPH GIM units
- Common reasons for not prescribing ARNI are concerns around cost/coverage and clinical stability and appropriateness of prescribing ARNI in acute care settings

Next Steps & Recommendation

Since the initiation of this project, the 2021 CCS HFrEF guideline update recommends ARNI as frontline standard therapy along with BB, MRA, and SGLT-2 inhibitors.

Recommendations

1. Clinical pharmacists could prepare formal or informal teaching sessions on ARNI for SPH GIM prescriber regarding its evidence for use in HFrEF
2. The medical field is hierarchical – it may be valuable to target opinion leaders (internists) with strategies to promote the optimal use of ARNI
3. SPH GIM prescribers could collaborate with clinical pharmacists to initiate BC PharmaCare Special Authorization process for all patients who are eligible and/or initiated on ARNI