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Heart failure clinic inclusion and exclusion criteria: cross-sectional study of clinic's and referring provider's perspectives

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ABSTRACT

Objectives There are substantial variations in entry criteria for heart failure (HF) clinics, leading to variations in whom providers refer for these life-saving services. This study investigated actual versus ideal HF clinic inclusion or exclusion criteria and how that related to referring providers' perspectives of ideal criteria.

Design, setting and participants Two cross-sectional surveys were administered via research electronic data capture to clinic providers and referrers (eg, cardiologists, family physicians and nurse practitioners) across Canada.

Measures Twenty-seven criteria selected based on the literature and HF guidelines were tested. Respondents were asked to list any additional criteria. The degree of agreement was assessed (eg, Kappa).

Results Responses were received from providers at 48 clinics (37.5% response rate). The most common actual inclusion criteria were newly diagnosed HF with reduced or preserved ejection fraction, New York Heart Association class IIIB/IV and recent hospitalisation (each endorsed by >74% of respondents). Exclusion criteria included congenital aetiology, intravenous inotropes, a lack of specialists, some non-cardiac comorbidities and logistical factors (eg, rurality and technology access). There was the greatest discordance between actual and ideal criteria for the following: inpatient at the same institution (κ=0.14), congenital heart disease, pulmonary hypertension or genetic cardiomyopathies (all κ=0.36). One-third (n=16) of clinics had changed criteria, often for non-clinical reasons. Seventy-three referring providers completed the survey. Criteria endorsed more by referrers than clinics included low blood pressure with a high heart rate, recurrent defibrillator shocks and intravenous inotropes—criteria also consistent with guidelines.

Conclusions There is considerable agreement on the main clinic entry criteria, but given some discordance, two levels of clinics may be warranted. Publicising evidence-based criteria and applying them systematically at referral sources could support improved HF patient care journeys and outcomes.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The challenge of low and inequitable access to heart function clinics was studied from the perspective of multiple stakeholders and juxtaposed in relation to international guideline recommendations for the first time.
⇒ The results hold practical implications for improving the flow and organisation of outpatient heart failure care.
⇒ Generalisability is limited in Canada due to the poor response rate from clinics in some provinces and the low response to the referring provider survey, but importantly, generalisability to privately funded healthcare systems is also unknown.

INTRODUCTION

It is estimated that there are 64 million people living with heart failure (HF) globally.[1] It is a growing epidemic, associated with high mortality, morbidity and healthcare costs.[2] Optimal medical therapy, device therapy (where indicated) and patient self-management across multiple health behaviours can improve HF outcomes and quality of life.[3 4]

Given the complexity of HF management, patient-centred, comprehensive and multidisciplinary care is needed.[5] Although there is wide variation in composition and services provided, heart function clinics (HFCs) are outpatient subspecialty centres staffed by a multidisciplinary team, typically offering timely care access to stabilise, optimise and prevent acute decompensation.[6 7] There is compelling evidence supporting reduced all-cause mortality and HF hospitalisations in patients receiving care in HFCs, with even greater benefits seen in patients having a recent emergency department visit or hospital admission.[8] HFCs are also shown to be cost-effective.[9] Despite these established benefits, their utilisation is low and disparate.[10–13]

It has previously been suggested that challenges in the appropriate use of HFCs relate to limited clinic capacity, discordance between clinic referral or entry criteria (ie,

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inclusion, exclusion or reasons for rejection) and patient profile, variation in clinic services (and correspondingly limited referring clinician's knowledge of the type of care a clinic provides), selection bias towards younger patients who may benefit from advanced therapies or perceived patient-level barriers, among other factors.[14] Indeed, one of the main access barriers identified in a recent audit of HFCs[15] as well as a survey of referring clinicians[16] in Canada was entry eligibility criteria, and hence a lack of clarity on which patients are appropriate to refer.

There is some guidance on HFC referral criteria in Canada and other jurisdictions,[3 13 17] as well as some explicit guidance from the American College of Cardiology, American Heart Association and Heart Failure Society of America (ie, I-NEED-HELP).[11 18] This guidance is not fully consistent, however, with regard to criteria. The audit showed, for example, that only 56% of clinics had explicit criteria—which resulted in many referrals being declined—but 40% would accept all-comers.[15] Moreover, only 51% of clinics reported accepting recently discharged patients, diminishing the value of clinics in mitigating exacerbations during that critical period.[19] This audit,[15] therefore, concluded with a call for more explicit guidance on risk-based HFC inclusion and exclusion criteria. Thus, with consideration of clinical practice guideline recommendations,[13] the objectives of this study were to characterise the perceptions of providers at clinics regarding actual versus ideal HFC inclusion and exclusion criteria and how that relates to referring clinician perspectives of ideal criteria.

METHODS

Design and procedure

Two separate cross-sectional surveys were administered online through Research electronic data capture (REDCap)[20 21]: the first to providers at HFCs and the second to clinic-referring providers across Canada. To optimise the response rate, the surveys were re-sent to non-responders maximum of three times. Expert panel members also supported data collection by personally contacting indicated colleagues to optimise generalisability. The surveys were administered from March to April 2020 and then from May to December 2022; recruitment was paused in the interim due to the COVID-19 pandemic.

Participants

For the HFC survey, clinics were self-defined. Previous literature suggested there were approximately 128 HFCs across Canada: 47 in Quebec, 36 in Ontario, 22 in British Columbia, 11 in Alberta, three in Saskatchewan, four in each of New Brunswick and Nova Scotia and one in Manitoba serving parts of Northern Ontario and Nunavut.[13] It is believed there are no clinics in Newfoundland and Labrador, Prince Edward Island, the Yukon or the Northwest Territories. One administrator or provider from each HFC was invited to complete the survey. Email contacts for programmes in Ontario were available from a previous environmental scan.[22] Programmes in other provinces were contacted through our expert panel members (eg, put in touch with the coordinator for all clinics in Alberta, British Columbia HF Physician Lead) and by searching on the internet. For some jurisdictions, new HFCs were identified for surveying, but others had potentially closed as emails were no longer valid.

For the clinic referrer's survey, healthcare providers (ie, family and emergency room physicians, internists, cardiologists and nurse practitioners) working in any setting (eg, inpatient, outpatient) across Canada treating patients with HF and eligible to refer to HFCs were included. Providers who indicated that they did not treat patients with HF were excluded. Provider email addresses were purchased from a private company by specialty (TargetNXT). Overall, 2325 email addresses were acquired: 750 cardiologists (academic and non-academic; all available emails), 200 family physicians, 200 emergency medicine physicians, 200 internists (subspecialty unknown) and 435 nurse practitioners (although specialty was not known; all available emails). In addition, faculty directories of relevant departments at medical schools in Canada were searched for email addresses to optimise generalisability. Information about the representativeness of the sample is reported elsewhere.[16]

Measures

The first part of the HFC survey assessed clinic characteristics (eg, location, staff, components offered and institution). Then, 28 clinic referral criteria were assessed. The criteria were chosen following a review of clinical practice guideline recommendations (see online table 2 at https://sgrace.info.yorku.ca/publications/)[13] and with input from members of the expert panel. For each item, respondents were asked whether the item was a clinic inclusion (yes/no) or exclusion (yes/no) criterion. They were also asked for each criterion, whether it should ideally be considered an inclusion or exclusion criterion or whether it should not be considered.

Respondents were also asked if there were any other criteria relevant to their clinic that they perceived should be considered. They were also asked whether their clinic referral criteria were explicitly stated or posted and whether they had ever changed their criteria due to volume issues. When they responded yes to each, they were to specify in an open-ended fashion.

The referring providers' survey was prefaced with investigator-generated items querying respondent's sociodemographic and occupational characteristics. Thereafter, the same criteria were listed except one (ie, the referred patient was an inpatient at the institution where your clinic resides). Response options ranged from 1 'this should definitely not be considered' to 5 'this should definitely be considered'.

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Figure 1 Map showing clinic survey response rate by Canadian Province/ or territory, n=48. AB, Alberta; BC, British Columbia; MB, Manitoba; NB, New Brunswick; NL, Newfoundland and Labrador; NS, Nova Scotia; NT, Northwest Territories; NU, Nunavut, ON, Ontario; PE, Prince Edward Island; QC, Quebec; SK, Saskatchewan; YT, Yukon Territories. Note: there are no known heart function clinics in NL, NT, PE and YT.

Statistical analysis

IBM SPSS V.28 was used for the analysis. All initiated surveys that had any data were included. Descriptive statistics were applied for all closed-ended items in the surveys (ie, frequencies with percentages, means and SD). For the former, percentages were computed, with the denominator being the number of responses for a specific item. Open-ended responses were content analysed.[23] Kappa statistics were computed to calculate the concordance between each actual clinic inclusion or exclusion criteria and their perceived ideal criteria.

Patient and public involvement

An eight-member expert panel was convened, comprised of a representative of an HF patient organisation, an HF administrator, HF physician subspecialists, an HFC provider and members of leading HF committees in the country, among others. Panelists supported the development of the research questions, methods and interpretation of the results.

RESULTS

Respondent characteristics

Responses were received from 48 HF clinics (response rate: 37.5%; figure 1). Clinic characteristics are shown in table 1.

Of the 2325 provider email addresses, 432 bounced back as invalid, and 16 recipients emailed to state that they did not treat patients with HF and hence were excluded. Seventy-three referring providers completed the survey; their characteristics are shown in table 2.

HFC referral criteria

Nine (25.0%) clinics reported their referral criteria are fully and explicitly stated on their referral form, website and/or clinic marketing materials; 16 (44.4%) clinics reported some criteria are listed and 11 (30.6%) clinics responded that criteria are not declared for referring clinicians.

Actual HF clinic criteria are shown in table 3. As shown, the most common inclusion criteria were HF with reduced ejection fraction (HFrEF), New York Heart Association (NYHA) class IIIB/IV symptoms, recent hospitalisation due to HF, newly diagnosed HF and HF with preserved ejection fraction (HFpEF; each endorsed by >74% of respondents); the least common were recurrent defibrillator shocks, intravenous inotropes, low blood pressure and high heart rate, patient visiting providers with complaints of persistent shortness of breath at rest and persistently elevated natriuretic peptides (NTproBNP) (all endorsed by <46% of respondents). The most common exclusion criteria were that the patient's HF

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Table 1 Characteristics of HF clinic survey respondents, N=48

	n (%)/ mean±SD
Province	
Ontario	14 (29.2%)
Alberta	14 (29.2%)
British Columbia	9 (18.8%)
Quebec	5 (10.4%)
Nova Scotia	3 (6.3%)
Manitoba	1 (2.1%)
New Brunswick	1 (2.1%)
Saskatchewan	1 (2.1%)
Institution staff	
Multiple providers	42 (89.4%)
Single HF expert provider	5 (10.6%)
Components offered**	
Medication titration	45 (93.8%)
Patient education	42 (87.5%)
Supervised exercise	13 (27.1%)
Other	4 (8.3%)
Average duration patient in clinic (months)	24.6±16.1
Average number of in-person visits/patient	11.4±6.0
Type of institution	
Tertiary/quaternary hospital	13 (59.1%)
Community hospital	7 (31.8%)
Primary care	1 (4.5%)
Other	2 (9.1%)
Clinic also treats patients without HF	3 (13.6%)

*Check all that apply.
HF, heart failure; SD, Standard Deviation.

Table 2 Sociodemographic, occupational and institutional characteristics of clinic-referring provider survey respondents (n=73)

	N (%) or mean±SD
Sex	
Female	25 (35.2%)
Male	45 (63.4%)
Profession	
Physician	63 (91.3%)
Nurse practitioner	6 (8.7%)
Years of practice	22.5±11.3
Type of institution	
Hospital	58 (82.9%)
Outpatient only	12 (17.1%)
Primary specialty	
Cardiologist	34 (54.8%)
Internal medicine	17 (27.4%)
Emergency medicine	7 (11.3%)
Family physician	4 (6.5%)
Institution has an HF clinic	60 (85.7%)
Province of practice	
Ontario	49 (71.0%)
British Columbia	7 (10.1%)
Alberta	5 (7.2%)
Quebec	5 (7.2%)
Nova Scotia	2 (2.9%)
Newfoundland and Labrador	1 (1.4%)

HF, heart failure; SD, Standard Deviation.

was secondary to congenital heart disease or pulmonary hypertension (16.1%), required intravenous inotropes (9.1%) and evaluation for cardiac transplantation consideration (9.7%).

Four (13.3%) clinics reported other inclusion / exclusion criteria applied. For inclusion, these were NYHA class II but the patient needs drug or device optimisation and the patient has a specialist to whom the clinic can discharge them. For exclusion, they included long-term care placement; patients undergoing dialysis; dementia diagnosis; rural patients, particularly those without reliable phone or internet access and patients having no fixed address.

Clinics most commonly perceived the following factors should be clinic referral inclusion criteria: new diagnosis of HF, suboptimal drug therapy, recent hospitalisation due to HF, NYHA class IIIB/IV and patient at risk of hospital admission (table 3; all ≥70%). Sixteen (32.7%) clinics reported they had changed their referral criteria at some point. They described restricting their entry criteria due to volume issues or to facilitate regional standardisation, accepting patients with HFpEF, elevated NTproBNP, adding a requirement that the patient must be seen by a cardiologist before acceptance, no direct referral acceptance from an internist or family physician, focusing on patients at risk of rehospitalisation upon request from the institution, re-referring patients with specific issues to more appropriate clinics (eg, hypertrophic cardiomyopathy and amyloidosis). Respondents also mentioned communicating wait times to referring providers (and allowing them to flag urgent cases), discharging stable patients back to their referring provider to manage volumes or discharging patients sooner.

As also shown in table 3, there was no to slight agreement between actual and ideal ratings for the following clinic referral criteria: the referred patient was an inpatient at the institution where the clinic resides (ie, this is common practice, but clinics did not perceive it should be). There was only fair agreement between actual and ideal ratings for the following clinic referral criteria:

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Table 3 HF clinic and clinic-referring provider ratings of clinic referral criteria

Criteria*	Is clinic inclusion criterion	HF clinics perceive should be inclusion or exclusion criteria	Clinic agreement for actual versus ideal (interpretation†; rank‡)	Clinic-referring provider perception of criteria importance§ (n=73)
Diagnosis of HF with preserved ejection fraction	26 (74.3%)	21 (61.8%)	0.60 (moderate; 12)	3.86±1.12
Diagnosis of HF with reduced ejection fraction*	29 (85.3%)	22 (64.7%)	0.48 (moderate; 16)	4.02±0.98
One emergency department visit due to HF in the last 3 months*	22 (66.7%)	19 (59.4%)	0.73 (substantial; 6)	4.27±1.10
Two or more emergency department visits for HF*	22 (66.7%)	21 (63.6%)	0.66 (substantial; 10)	4.36±1.14
Recent hospitalisation due to HF*	25 (78.1%)	23 (74.2%)	0.91 (almost perfect; 1)	4.20±1.10
Two or more hospitalizations due to HF*	22 (66.7%)	22 (66.7%)	0.79 (substantial; 4)	4.45±1.11
Medications need titration, changes are required for optimisation or there may be interactions with other medications patients are taking and some need consulting advice (ie, sub-optimal drug therapy) *	23 (67.6%)	23 (76.7%)	0.43 (moderate; 18)	4.00±1.09
Progressive intolerance or down-titration of medications needed*	17 (51.5%)	19 (59.4%)	0.69 (substantial; 8)	3.86±1.12
Patient visiting general cardiologist, internist or primary care provider with complaints of persistent shortness of breath, even at rest*	15 (45.5%)	14 (43.8%)	0.62 (substantial; 11)	3.61±1.00
Stage D HF (ie, advanced, end-stage HF) *	19 (57.6%)	18 (54.5%)	0.62 (substantial; 11)	4.39±1.09
Intravenous inotropes*	11 (33.3%)	13 (40.6%)	0.47 (moderate; 17)	4.36±1.14
NYHA class IIIB/IV symptoms*	26 (78.8%)	23 (71.9%)	0.83 (almost perfect; 2)	4.37±1.07
Persistently-elevated natriuretic peptides*	15 (45.5%)	16 (50.0%)	0.50 (moderate; 14)	3.82±1.08
HF is secondary to congenital heart disease or pulmonary hypertension	16 (50.0%)	17 (54.8%)	0.36 (fair; 19)	4.17±1.13
New diagnosis of HF*	24 (75.0%)	24 (77.4%)	0.91 (almost perfect; 1)	3.54±1.16
Patient with HF requires rhythm device (ICD and CRT)	16 (50.0%)	15 (46.9%)	0.81 (almost perfect; 3)	4.11±1.19
Recurrent defibrillator shocks*	8 (25.0%)	10 (32.3%)	0.69 (substantial; 8)	4.09±1.37
Cardiac transplantation consideration	17 (54.8%)	19 (61.3%)	0.72 (substantial; 7)	4.64±1.05
Patient is at risk of hospital admission*	22 (68.8%)	21 (70.0%)	0.77 (substantial; 5)	3.98±1.14
Patient has barriers to behaviour change; needs education and coaching to support self-management*	20 (62.5%)	14 (45.2%)	0.56 (moderate; 13)	4.04±0.99
Comorbidities causing complexity in treatment approach	17 (53.1%)	10 (32.3%)	0.49 (moderate; 15)	4.07±1.03
Amyloidosis	22 (68.8%)	14 (46.7%)	0.48 (moderate; 16)	4.21±1.06
Genetic cardiomyopathies	17 (53.1%)	12 (38.7%)	0.36 (fair; 19)	4.29±1.06
End-organ dysfunction or worsening renal or liver function related to HF*	16 (50.0%)	18 (58.1%)	0.68 (substantial; 9)	4.31±1.03
Oedema despite escalating diuretics*	22 (68.8%)	17 (54.8%)	0.47 (moderate; 17)	4.16±1.09
Low blood pressure and high heart rate*	14 (43.8%)	10 (32.3%)	0.66 (substantial; 10)	4.11±1.04
Referred patient was an inpatient at the institution where your clinic resides	18 (69.2%)	12 (38.7%)	0.14 (low; 20)	–

Note: n and valid percentage shown to take into account any missing data, unless otherwise indicated.
'–' iIndicates not assessed in referrer survey.
*Criteria in clinical practice guidelines.[3 6 32–34]
†Cohen's Kappa; interpretation: values 0–0.20 none to slight concordance; 0.21–0.40 fair; 0.41–0.60 moderate; 0.61–0.80 substantial concordance, and 0.81–1.00 almost perfect agreement.[35]
‡ i,e.1 is the highest level of agreement; ties are given the same rank.
§Responses range from 1 'this should definitely not be considered' to 5 'this should definitely be considered" as an HF clinic inclusion or exclusion criterion. Mean and SD shown.
CRT, cardiac resynchronisation therapy; HF, heart failure; ICD, implantable cardioverter-defibrillator; IV, Intravenous; NYHA, New York Heart Association.

patient's HF secondary to congenital heart disease or pulmonary hypertension and patients with genetic cardiomyopathies (more often than not, the latter should not be a criterion). There was moderate agreement between actual and ideal ratings for the following clinic referral criteria: HFpEF, patients need self-management support, persistently elevated natriuretic peptides, comorbidities, HFrEF, amyloidosis, oedema despite escalating diuretics, intravenous inotropes and medication consult needed (ie, titration, changes and drug interactions); for all but the

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latter, they were more often actual criteria than perceived ideal. There was substantial agreement between actual and ideal ratings for the following clinic referral criteria: ≥2 HF-related hospitalisations, patients at risk of hospital admission, one emergency department visit due to HF in the last 3 months, cardiac transplantation consideration, recurrent defibrillator shocks, progressive intolerance or down-titration of medications needed, end-organ dysfunction or worsening renal or liver function related to HF, low blood pressure and high heart rate, stage D HF and patient complaints of persistent shortness of breath at rest. Finally, there was almost perfect agreement between actual and ideal ratings for the following clinic referral criteria: recent hospitalisation due to HF, new diagnosis of HF, NYHA class IIIB/IV symptoms and patient with HF requiring a rhythm device. For the most highly endorsed ideal clinic criteria, agreement with actual criteria was almost perfect or substantial, except in the case of sub-optimal drug therapy, where it was moderate. This suggests clinics perceive they should more often be supporting the implementation of guideline-directed medical therapy than they are.

Clinic-referring provider ratings for each referral criterion are also shown in table 3. Providers most commonly perceive that the following criteria should be applied: cardiac transplantation consideration, ≥2 HF-related hospitalisations, stage D HF, NYHA class IIIB/IV symptoms, intravenous inotropes and end-organ dysfunction or worsening renal or liver function related to HF. While all criteria were rated quite highly, the least strongly endorsed were the new diagnosis of HF, patient complaints of persistent shortness of breath at rest, persistently elevated natriuretic peptides, progressive intolerance of medications and HFpEF.

Finally, as shown in table 3, referring providers gave high importance ratings to many common actual HFC referral criteria (eg, HFrEF, NYHA class IIIB/IV symptoms and recent hospitalisation due to HF). Yet, there were some cases where referrers gave high importance ratings to criteria that were not as commonly applied in clinic practice (eg, low blood pressure and high heart rate, recurrent defibrillator shocks and intravenous inotropes). There was also some agreement between clinics and referring providers on what criteria *should* be applied. Referring providers gave high importance ratings to many referral criteria, which clinics also often perceived should be applied (eg, recent hospitalisation due to HF, NYHA class IIIB/IV symptoms and medication consultation needed). However, they also gave high importance ratings to criteria that were not as commonly perceived as important to clinics: intravenous inotropes, patients with HF requiring rhythm devices, genetic cardiomyopathies, low blood pressure and high heart rate, as well as comorbidities.

DISCUSSION

HFCs are proven to reduce mortality and morbidity where they are accessed. There is a lack of clarity and some incongruence in the Clinical Practice Guideline direction on which patients should receive care in HFCs, variation in HFC entry criteria, resulting in understandable confusion on the part of referring providers. This study aimed to examine perceptions of optimal entry criteria—inclusion and exclusion—for HFCs. The most common HFC inclusion criteria were newly diagnosed HFrEF, NYHA class IIIB/IV, recent HF-related hospitalisation and need for medication optimisation or consultation; these are consistent with guideline recommendations.[11 18] There was congruence in clinic and referring provider perceptions of these HFC entry criteria, but referrers also gave greater importance to the additional guideline-recommended criteria[11] of low blood pressure along with high heart rate, recurrent defibrillator shocks and intravenous inotropes than HFCs.

To our knowledge, this is the first quantitative study on actual and ideal HFC entry criteria as well as exclusion considerations, although there has been a review of guideline recommendations for entry criteria,[13] with more recent guidance by the Heart Failure Society of America (HFSA),[24] primary studies on the clinical characteristics of patients who access them[12] and some related qualitative research.[25] In line with recent recommendations from the HFSA,[26] among others,[24] it appeared respondents perceived there are two types of HFCs needed: standard and advanced or specialised (eg, device candidature assessment, home inotropic therapy and heart transplant) care. If such a model were applied, the findings here could likely be used to inform differential referral criteria for these clinic types. Indeed, HFSA's practical guide suggests all HFCs be resourced to manage stages B and C patients[11] with HFrEF or HFpEF, as well as related cardiac comorbidities. The more advanced clinics could manage stage D patients, including patients those undergoing or receiving mechanical circulatory support and/or transplantation.

With regard to inclusion criteria, there seems to be agreement among clinics and referring providers (as well as with evidence-based guideline recommendations)[18 24] on the criteria shown in figure 2. Indeed, these are part of the I-NEED-HELP referral decision-making acronym from the American Guidelines,[7 11 18] or the more recent HFSA Practical Guide (see Table 4).[24] Given natriuretic peptide measurement is now more widely available,[15] it is likely this should be an entry criterion as well; this likely did not figure prominently in the results given some data were collected some time ago before the COVID-19 pandemic.

HFC exclusion criteria were also appraised here, but clinician judgement of individual cases must continue to be applied. These included non-cardiac or non-clinical concerns such as having a healthcare provider to whom the patient could eventually be discharged from the HFC, consideration of non-cardiac comorbidities, as well as some social determinants of health. In the current era, the patient's technological ability and access are also important considerations. Interestingly,

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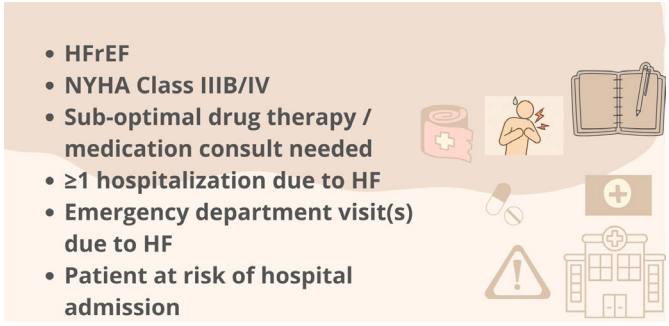

Figure 2 Most highly and commonly agreed heart function clinic entry criteria. HF, heart failure; HFrEF, heart failure with reduced ejection fraction; NYHA, New York Heart Association.

some clinics reported a guideline-recommended entry criteria as an exclusion criterion, including for example, intravenous inotropes. Overall, research is needed to explore whether these are the best HFC entry criteria based on evidence of patient benefit through primary studies and meta-regression analyses, for example, while also considering cost-effectiveness, feasibility and implementability.

The implications stemming from this work are numerous. First, as promoted in the 2021 Practical Guide of the HFSA,[24] HFCs need to more explicitly and transparently publicise their entry criteria with all potential referring providers in their catchment area. Given how many HFCs perceive that their entry criteria should be changed, active and ideal clinic-specific inclusion and exclusion criteria should be explicitly publicised. The HFSA Practical Guidance also suggests HFCs set up 'automated electronic medical record-based referral alerts' using the agreed criteria.[24] Consistent application of the entry criteria could help overcome some of the inequities observed in HFC access.[12]

Second, it seemed that some clinicians were highly capable of managing patients with HF without an HFC even as their complexity increased, while others were not comfortable and needed to refer most patients with HF. The degree to which further training needs play a role here versus supporting standard and advanced clinics to address both scenarios warrants further consideration.

Third, better system-wide coordination is needed, given that one-third of HFCs reported having to change their entry criteria—sometimes on the basis of new research (eg, accepting HFpEF), but commonly due to the inability to handle the volume of referrals received in a timely manner. Ontario's 'spoke-hub-node' model is a demonstrated example of how this might be achieved.[27] Within the system, a dashboard showing all HFC clinic types with their entry criteria along with average wait times could be useful. Moreover, this could facilitate more efficient triage of cardiac patients to the most applicable clinics, including other subspecialty clinics (eg, cardiomyopathies, amyloidosis or even cardiac rehabilitation).[10]

Limitations

Caution is necessary in interpreting these results. Chiefly, generalisability to other countries is unknown due to differences in healthcare system organisation, particularly as they relate to HF patient care, as well as clinic organisation and reimbursement. Further research in other jurisdictions is needed, particularly those with private healthcare funding where there may be a profit motive to see patients yet not all patients have coverage. There was also wide variation in response rate by province and only one response in three provinces (eg, Saskatchewan), so generalisability in these provinces may be limited.

Moreover, there was a poor response to the referring physician survey online,[28] which also raises the possibility of selection bias. To optimise the survey response rate, elements of Dillman's tailored design method[29] were applied, including multiple contacts, personalised mailings and a short questionnaire. Physicians as a group are more homogeneous than the general population with regard to knowledge, training, attitudes and behaviour, such that non-response bias may not be as crucial in physician surveys as with the general population.[30 31]

CONCLUSION

HFC referral criteria were investigated, with inclusion criteria primarily being HFrEF, having NYHA class IIIB/IV symptoms, HF-related hospitalisation, need for medication consultation and risk of decompensation. While there was wide concordance in actual and perceived 'ideal' HFC entry criteria based on evidence, need or guideline recommendations, some clinics reported not being able to apply their 'ideal' entry criteria or having to change criteria for reasons other than evidence of patient benefit. Differentially, yet also consistent with HF guideline recommendations, referring providers perceived that stage D HF, intravenous inotropes and end-organ dysfunction should trigger HFC referral. Exclusion criteria were also forwarded. While more research is needed, publicising evidence-based criteria and applying them systematically at referral sources could support improved HF patient care journeys and outcomes.

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Contributors SLG conceptualised the work, supported funding acquisition, secured research ethics approval, as well as supervised the first author in formal analysis and interpretation of data and in drafting the manuscript. TM was responsible for data acquisition, data analysis and drafting of the manuscript. As members of the Expert Panel, SAV and MM made substantial contributions to the conception of the work, acquisition of data (SAV) and interpretation of results (MM), as well as reviewing the work critically for important intellectual content. HE served on the first author's doctoral supervisory committee, providing feedback on the approach, as well as critically reviewing the manuscript for important intellectual content. All authors gave approval of the final version and agreed to be accountable for all aspects of the work. SLG is responsible for the overall content as the guarantor.

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Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

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