Cardiology in the Young

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Successful implementation of telehealth visits in the paediatric heart failure and heart transplant population

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Abstract

The Advanced Cardiac Therapies Improving Outcomes Network (ACTION) and Pediatric Heart Transplant Society (PHTS) convened a working group at the beginning of 2020 during the COVID-19 pandemic, with the aim of using telehealth as an alternative medium to provide quality care to a high-acuity paediatric population receiving advanced cardiac therapies. An algorithm was developed to determine appropriateness, educational handouts were developed for both patients and providers, and post-visit surveys were collected. Telehealth was found to be a viable modality for health care delivery in the paediatric heart failure and transplant population and has promising application in the continuity of follow-up, medication titration, and patient education/counselling domains.

Telemedicine is defined as specific application of technology to conduct clinical medicine at a distance and establishment of a connection between physicians and patients in a multitude of settings.[1] While the onset of the COVID-19 pandemic transformed care delivery for all patients, the utility of telehealth in paediatric advanced cardiac therapy patients (including heart failure, ventricular assist device and heart transplant recipients), a population with significant vulnerability who often require heightened vigilance, was unknown.

Composed of multiple centres across North America, the Advanced Cardiac Therapies Improving Outcomes Network (ACTION) is a collaborative network designed to improve the outcomes of children with heart failure.[2] Together with the Pediatric Heart Transplant Society (PHTS), an organisation dedicated to improving outcomes for the paediatric heart transplant population, a working group was convened during the early period of the COVID-19 pandemic to study telehealth use in this population and assess provider and patient experience with this technology.

Methods

An algorithm (Fig 1) was developed to help determine patients in whom use of the telehealth medium was appropriate. Educational handouts were developed and provided to both patients/families and providers to optimise the comfort with telehealth technology during visits (supplementary files). To assess patient/family and provider satisfaction, anonymous surveys

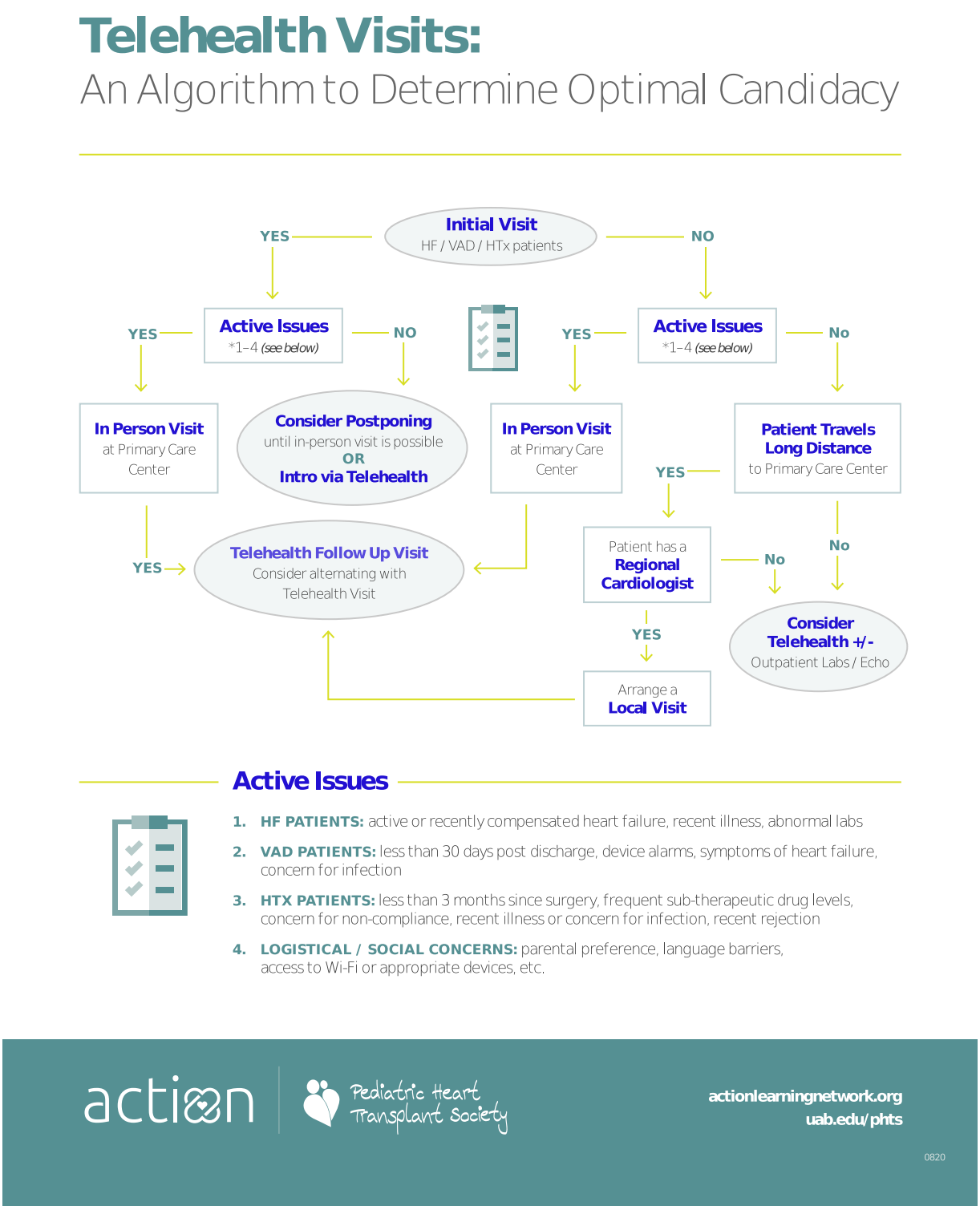

Figure 1. Algorithm developed by the workgroup to determine optimal candidacy for telehealth visits.

were created using REDCap and distributed to each centre (one each for patients/families and providers) (supplementary files). Questions addressing indication and usefulness of the telehealth visits were also collected via a separate REDCap survey. Number of sites using the algorithm and the education material, percent of visits completed via telehealth, and the survey responses were analysed with descriptive statistics.

Results

From January 1 to December 31, 2020, a total of 11,882 visits were completed across 18 participating sites, with 1,744 (14.7%) of these visits performed via telehealth. In January and February, prior to the onset of the COVID-19 pandemic in North America, there were few (n = 22) reported telehealth visits. Of each month's total

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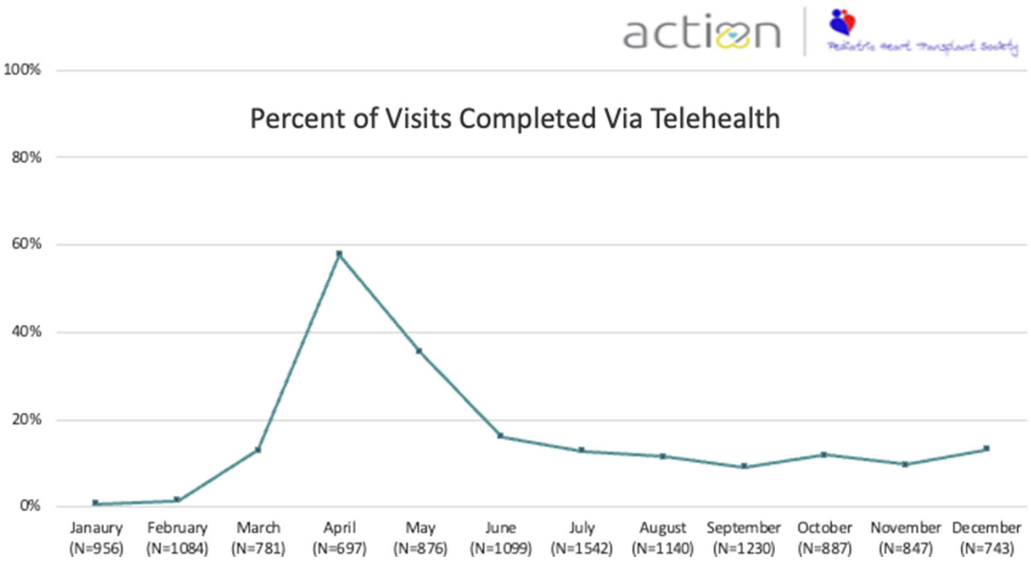

Figure 2. Percent of visits amongst collaborating ACTION/PHTS sites completed via telehealth, January–December 2020.

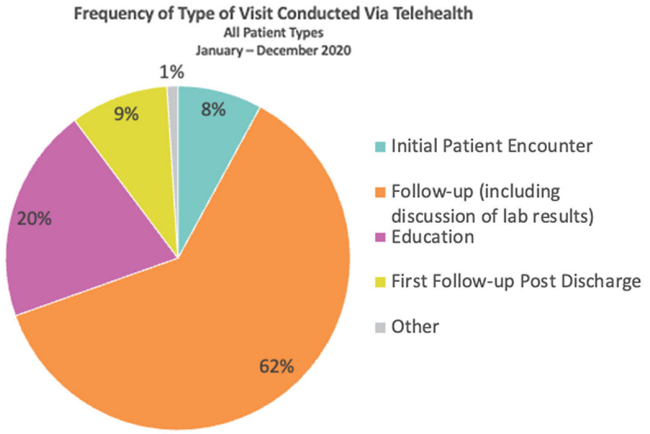

Figure 3. Type of visit conducted via telehealth across collaborating ACTION/PHTS sites, January–December 2020.

visits, proportion performed via telehealth peaked in April 2020 at 58% and then slowly decreased to an average of 12% of visits per month reported from June 2020 through December 2020 (Fig 2). Of the total 1744 telehealth visits, 695 (39.9% of total) were in heart failure patients (non-ventricular assist device), 497 (28.5% of total) were in post-heart transplant patients, and 41 (2.4% of total) were in patients with a ventricular assist device. The remaining 511 (29.3%) telehealth visits had missing visit type.

On average, 60% of sites reported using the provider educational materials prior to telehealth visits (range 44%–80% per month). A total of 11 of the 18 sites (61%) reported ever using the algorithm. Fifty per cent of families reported receiving the educational materials prior to the visit and 94% reported feeling prepared for the visit. Among those receiving the educational materials who completed relevant surveys (n = 8), all reported them to be helpful.

A majority (62%) of telehealth visits were follow-up visits with established patients, while 20% were reported to have been specifically focused on patient or family education. Telehealth was rarely used for initial outpatient consultations (8%) or for the initial assessment following hospital discharge (9%), where in-person visits were preferred (Fig 3). Of all telehealth visits, only 3.5% (n = 47) resulted in an in-person follow-up visit within 30 days of their telehealth visit due to clinical uncertainty and need for additional face-to-face examination or testing.

The majority (90%) of providers who completed the post-visit survey (n = 31 from six institutions) were satisfied with their ability to assess the patients via telehealth. There was a similar rate of satisfaction (n = 30, 97%) in their ability to provide education via telehealth.

Discussion

Patients with heart failure requiring advanced cardiac therapies necessitate continual assessment of symptoms, health status, and medication adjustments.[3] Telemedicine became a crucial form of care provision to patients during the pandemic. This study shows that telehealth can be used in a vulnerable group of paediatric advanced cardiac therapypatients with high success. Given the low rate of return for in-person visits and high patient and provider satisfaction, we conclude that the proposed algorithm was successful for patient selection. This mirrors an adult study by Umapathi et al. where only 6% patients required in-person visit for further evaluation following telehealth.[4]

In our study, the utilisation of telehealth in paediatric advanced cardiac therapy patients peaked during the height of the pandemic and was utilised primarily for follow-up and education. Given these successful follow-up paediatric advanced cardiac therapy visits, a future use of telehealth could target medication titration in these patients.[5,6] Prior adult work has demonstrated the feasibility of uptitration of medications via nurses and pharmacists working in collaboration with heart failure providers. Such collaborative work using telehealth and remote data collection of weights, blood pressure, and laboratory monitoring may be an ideal evolution of telehealth to improve the care of this paediatric population. Children often require frequent adjustment of medications given their growth and weight gain. The involved sites in the study are now planning to utilise telehealth to aid medication titration in paediatric advanced cardiac therapy patient population.

In our study, telehealth visits were utilised 20% of the time for patient and parental education. Telemedicine may be an ideal resource for continued education and parental counselling, especially with potential continued pandemic restrictions

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necessitating fewer family members in clinic, as well as the ability to democratise education to family members who may not be able to travel or take time off from work.

Prior to the pandemic, telehealth capacity was limited, and utilisation was poor. Beyond the pandemic, the demand for telehealth will likely continue to increase perhaps outpacing pre-pandemic levels. The benefits of telehealth include patient convenience, infection control, and improved patient satisfaction, among others. Our study shows that telehealth is a feasible option to closely monitor medically complex children and a vehicle to deliver the much-needed education to the families. It helps discover potential issues sooner that may, in turn, prevent excessive unplanned readmissions. Finally, telehealth may improve access to otherwise geographically distant heart failure/transplant providers, thereby minimising opportunity costs incurred while making physical appointments. Our study was limited with the small number of participating centres, and thus, the results cannot be generalised to all children, especially those with limited resources. In addition, the results of the physician survey may not be generalisable due to the limited number of responses. The pandemic has brought to the forefront concerns of health equity, and our study was not designed to evaluate disparity in care, which will have to be followed closely. In addition, telehealth visits were less commonly used for post-discharge and initial consults for which in-person visits still seem to be the preferred method for patient assessment and interaction. It may be useful to study prospectively the impact of telehealth utilisation in our patient population.

In summary, telehealth is a viable mechanism for health care delivery in the paediatric advanced cardiac therapy population. Telemedicine serves as a useful tool for triaging patient care appropriately and will have great utility in the future for continuity of follow-up, education, and counselling as well as medication titration of established paediatric advanced cardiac therapy patients.

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