

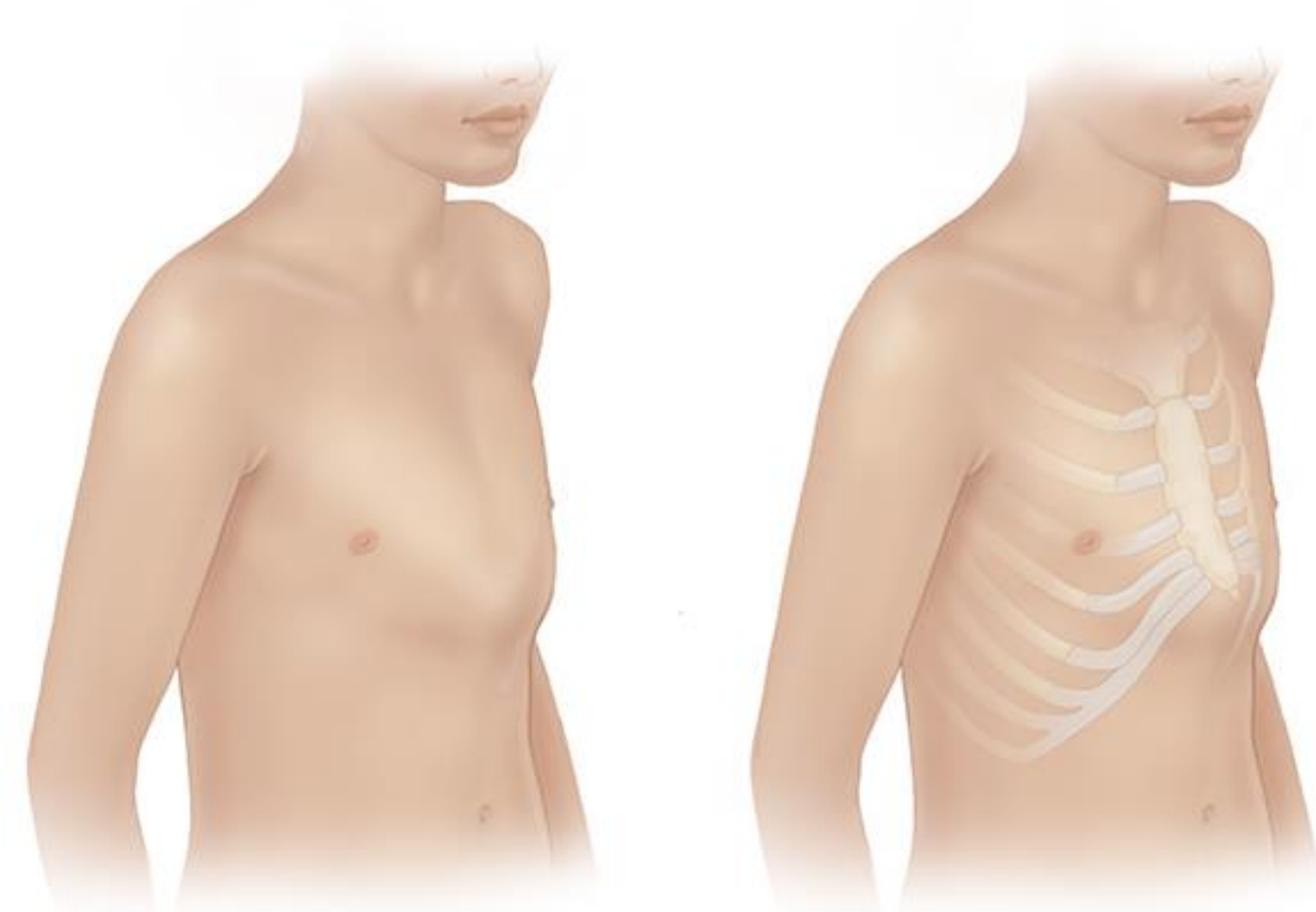


Treatment of Pectus Carinatum via Telemedicine

Kristin Brausch
XAVIER UNIVERSITY

Purpose

The purpose of this study was to develop an alternative to in person clinic visits that can be used especially during times of unexpected events or disasters that would prevent patients from being seen in the office. A telemedicine program would decrease interruptions and delay in care by offering patients an option to continue care virtually



Background

- Pectus carinatum is a chest wall condition in which the cartilages that attach the ribs to the sternum grow abnormally resulting in a protrusion of the chest wall (Jung et al., 2012).
- It is the second most common chest wall deformity with an overall prevalence of 0.675% and a male to female ratio of 4:1 (Desmarais & Keller, 2013).
- Pectus carinatum causes significant psychological effects on patients, especially as they reach their adolescent years and become more aware of their chest wall abnormality (Colozza & Buetter, 2013).
- Because the chest wall remains flexible through the adolescent years, non-operative treatment with a compression brace has proven to be a successful treatment option for the correction of pectus carinatum (Jung et al., 2012).
- Successful bracing is dependent on patient compliance with wearing the brace and following the treatment plan (Kang et al., 2014).
- Close follow up is essential to maintaining patient compliance and attaining a successful bracing outcome (Colozza & Buetter, 2013).
- The COVID-19 pandemic resulted in the cancellation of non-essential clinics at Cincinnati Children's Hospital Medical Center. This greatly affected the 290 patients being treated with a brace for pectus carinatum.

Literature Review

- Surgical correction of pectus carinatum was the original treatment of choice to correct this chest wall condition (Frey et al., 2008).
- Because of the invasiveness of surgical treatment, only the most severe cases of pectus carinatum were considered for treatment (Martinez-Ferro et al., 2008).
- Because of the flexibility of the chest wall through the adolescent years, external compression bracing has shown to be an effective means for correction of pectus carinatum (Colozza & Buetter, 2013).
- It has been demonstrated that the most important factor affecting successful bracing treatment is patient compliance with wearing the compression brace (Jung et al., 2012).
- Factors that affect patient compliance with bracing include discomfort, embarrassment, and slow progress (Kang et al., 2014).
- Regular monitoring and assessment have proven to be essential in promoting patient compliance and successful treatment (Emil et al., 2017).
- Telemedicine allows patients to receive the support and reinforcement of the treatment plan even when there are barriers to being seen in the office (Portnoy et al., 2020).
- Telemedicine provides a means to provide treatment from a distance in a way that benefits both patients and providers (Leite et al., 2020).

Nursing Theoretical Framework

- Dorthea Orem's Self-Care Deficit Theory -three interrelated components including self-care, self-care deficit and the nursing system (McEwen & Wills, 2019).
 - Self-care: the ability of a patient to independently complete activities that will meet their needs and maintain their health and wellbeing (McEwen & Wills, 2019).
 - Self-care deficit: the need for nursing assistance when an individual is unable to provide their own care (McEwen & Wills, 2019).
 - The third component of Orem's theory is the nursing system, and focuses on how the nurse will help the patient meet their needs (McEwen & Wills, 2019).
- By creating a telemedicine program, a supportive-educative nursing system is put in place so that the patient is able to receive the needed guidance and support to adjust their brace at home and continue with their treatment plan.

Method/Project Description

- Develop resources to guide and assist patients with brace adjustments via telemedicine
 - Create an educational handout for patients about the telemedicine approach to brace management and adjustments
 - Write a script for a demonstration video to provide a visual reference that walks through the steps of the telemedicine appointment
 - Assemble a tool kit that would provide the patients with the appropriate tools to perform brace adjustments from home
- Pilot the telemedicine program with 15-20 patients.
 - Obtain feedback from patients and providers regarding their experience through anonymous survey

Welcome to Telepectus!

What you will need:

- Webcam
- Phillips head #2 screw driver
- Scissors
- Spare parts:
 - extra compression plate,
 - extra pads/screws

Tips for making adjustments:

- Be sure to have adequate space for proper positioning within the webcam: We must be able to see neck to belly
- Have at least one adult to assist with adjustments
- Be sure the screw driver fits appropriately-otherwise screws will become stripped

Steps for adjustments:

- Check lateral room
 - Patient should be able to take a deep breath in without restrictions.
 - Patient should be able to place at least one finger at each side
- Check how loosely the brace fits
 - Have patient move the brace up and down
- Check the patient's chest
 - Check the front and sides of the patient's bare chest
 - Check the flexibility of the chest when pressed on
- Make adjustments according to the provider's instructions
- Verify the correct fit and pressure of the brace
 - Check how tight the FMF Brace is by instructing patient to move it up and down

Reminders:

- Allow provider to check the entire brace to anticipate future adjustments and the possibility of needing spare parts.
- White to red finger test
 - Press down on reddened area and then let go- skin should turn white and immediately go back to red- this checks for adequate skin perfusion
- Breathing exercises
 - Hold breath for 10 seconds after maximum inspiration.
 - 4 sets of 10 each day to improve chest wall flexibility.
 - Balloon exercises
 - 4 sets of 10 each day to help re-shape rib flare.

Telepectus Tool Kit



Measureable Outcomes/Evaluation

- Patient/parent satisfaction
- anonymous survey was provided to the patient/parent following their telemedicine visit.
 - 13 pilot patients participated in a telemedicine visit, only 8 returned the survey.
 - Six patients rated their experience as 5/5 and two patients rated their experience as 4/5.
 - Subjective feedback included patients being highly satisfied with the convenience of performing the brace adjustments from their home, and confidence in the providers instructing them on appropriate brace adjustments.
 - Provider satisfaction
 - Of the six returned surveys, one rated the overall experience as 5/5 and five rated the overall experience as a 4/5.
 - Subjective feedback for improvement included comments regarding connection difficulties, difficulty getting an accurate assessment of the patient's chest, and length of time required for each visit.

Implications/Relevance for APRNs

- Implementation of a telemedicine program would have a significant impact on how physicians and nurse practitioners provide care to their patients, especially in uncertain times such as the COVID-19 pandemic.
- Telemedicine opens up significant possibilities for providers to see patients near and far, and greatly increases their ability to broaden their practice.
- telemedicine would decrease the risk of healthcare providers being exposed to potentially contagious diseases.

Conclusion

- There are many unexpected events that directly impact the ability to provide care to patients, and when these events arise, it is important to have an alternative plan in place so that patient care can continue with minimal disruptions. Implementation of a telemedicine program for patients with pectus carinatum who are being treated with a compression brace would allow patients to continue treatment including brace adjustments and routine follow up with the provider so that they receive the support and encouragement they need to successfully correct their pectus carinatum.