Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Maintaining routine cystic fibrosis sputum surveillance during the pandemic

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Background: Prior to the COVID-19 pandemic, sputum cultures were obtained quarterly for routine surveillance. During the pandemic, with the shelter-in-place order, we took an innovative approach to continue monitoring for adverse CF airway pathogens and intervene early for optimal patient outcomes. The CF center aimed to improve the process of outpatient surveillance of cystic fibrosis (CF) airway pathogens during the COVID-19 pandemic through a drive-through throat culture or sputum collection and courier services.
Methods: In March 2020, the need for sputum culture surveillance was identified. In conjunction with institutional guidance, due to the COVID-19 pandemic, a drive-through throat culture and sputum collection clinic was implemented. In addition, sputum drop-off was coordinated, and institutional courier services were utilized. Patients were identified through changes in pulmonary symptoms or during their quarterly remote visits. The care team would offer a throat culture or sputum collection in the safety of the patient's car by one of the CF center staff. Patient and family education was provided by the certified child life specialist (CCLS) and center coordinator regarding this new process and personal protective equipment (PPE) worn by the staff. Information was also collected, including the make and model of the car, location of the child's car seat if applicable, and any special considerations by the patient or family. Those who produced sputum were offered a drop-off time during the clinic. Collection kits and instructions were mailed to patients' homes. The samples were picked up from the vehicles by staff donning enhanced PPE, maintaining the safety of staff and patients. Additionally, the institution's courier service was utilized to pick up specimens up to 2 hours away. The specimens were brought back to our facility to be tested according to CFF guidelines for pathogen identification in the CF airway.
Results: Between June 2020 and February 2021, a total of 43 cultures were collected by the 3 methods described. Five of those cultures, or 8%, required attention. Two were newly identified *Pseudomonas aeruginosa*, 2 were screening for *Mycobacterium abscessus* with a positive smear, and the others were related to cough or symptom presentation and changes in flora. Of the 3 methods of collection, 27 specimens were obtained via throat culture, 9 were sputum drop-off, and 7 were obtained via courier service.

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Consistent approach to lung function decline in a pediatric cystic fibrosis center

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Background: Our CF center initiated a quality improvement project in November 2019 with the goal of standardizing the care that providers give to a more minimal decline in lung function (those with 5% of greater decline in lung function). Previous data suggests that high-performing CF centers are more consistent in the treatment of pulmonary exacerbations. At out center, nursing staff has noted that providers have a wide variation in their approach to decline in lung function and this made it very difficult for them to counsel patients. Our specific aim was to determine if we could employ an algorithm for uniform response to declines in lung function.
Methods: We modified an algorithm proposed by Schechter et al. [1] for a standard response to declines in lung function. Baseline FEV1 was defined as the best percent predicted FEV1 (ppFEV1) over the previous 12 months (prior to November 2019) for each individual patient and could be adjusted in 2020 if the patient continued to improve upon lung function throughout the year. ppFEV1 obtained at the clinic visit was compared to this baseline and patients stratified in groups of >5% to < 10% and >10% if there was a decline. Response from the provider including time to next follow-up, changes in medications, and changes in airway clearance (AWC) were also tracked. Three PDSA cycles were performed from November 2019 to March 2020 (cycle 1), May 2020 to September 2020 (cycle 2) and from October 2020 to March 2021 (cycle 3). Due to the coronavirus pandemic, this project was on hold from March 2020 to May 2020 as pulmonary function testing was not being performed. The 3rd cycle was started after an additional provider joined our CF staff.
Results: We had 132 patients over the age of 6 able to consistently perform PFTs. In cycle 1, there were 25 patients with ppFEV1 drop of 5–10% and 29 with a drop >10%. In cycle 2, no patients had a drop of 5–10% and 10 had a drop >10%. In cycle 3, there were 18 patients with a drop of 5–10% and 15 patients had a drop >10%. Overall adherence to the algorithm was better when patients had >10% drop compared to a 5–10% drop (70% versus 51%). We then assessed adherence to individual parts of the algorithm. Adherence to changes in recommended care, including increased AWC and/or use of antibiotics, was 88% (22/25 patients) for those with a drop of 5–10% in cycle 1 and 83% (15/18 patients) in cycle 3. For those with >10% drop, adherence to change in care was 83% (24/29 patients) in cycle 1, 80% (8/10 patients) in cycle 2 and 73% (11/15 patients) in cycle 3. For those with drop of 5–10%, adherence to recommended time for follow-up (4–6 weeks) was 64% (16/25 patients) in cycle 1 and 39% (7/18 patients) in cycle 3. For those with >10% drop, adherence to recommended time for follow-up was 76% (22/29 patients) in cycle 1, 90% (9/10 patients) in cycle 2 and 80% (12/15 patients) in cycle 3.
Conclusion: Our findings demonstrate that an algorithm to provide a consistent clinical response to declines in FEV1, even when < 10%, can be effective. Consistent use for >1 year requires constant re-education, as there was significant reduction in adherence over the course of the year. When trying to alter responses in clinical decision-making, multiple methods directed at change in care should be employed to address stylistic differences.

Reference

1. Schechter MS, Schmidt HJ, Williams R, Norton R, Taylor D, Molzhon A. Impact of a program ensuring consistent response to acute drops in lung function in children with cystic fibrosis. *J Cyst Fibros*. 2018;17:769–78.

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CF Global Care: Continuation of the collaboration between 2 CF centers; University of Michigan, USA, and Marmara University, Istanbul, Turkey, in the COVID-19 pandemic

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Background: CF care in Turkey has not been adequate with disproportionate morbidity and mortality, as indicated by the fact that the majority of people with CF are ≤18 years of age. A sustainable training program for CF centers can lead to improving quality of care and clinical outcomes. A pilot project was established between the University of Michigan and Marmara University CF centers to achieve these goals. The collaboration started in 2018; however due to COVID-19 restrictions on travel, interaction was switched to virtual methods.
Methods: A number of barriers exist, including: lack of multidisciplinary approach to CF care, inadequate training of health care professionals (nurses, dietitians, physiotherapists) on CF, lack of infection control policies, lack of quality improvement (QI) assessments of care, limited funding for staff support, lack of clinical research, and lack of standardization of CF care among centers in Turkey. Through funding and support from Middle East CF Association (MECFA) and CFF, the collaboration started between the University of Michigan and Marmara University CF centers in 2018 to: implement a state-of-the art multidisciplinary CF center at Marmara University, train the multidisciplinary team at Marmara University center, improve clinical outcomes of PwCF seen at the center, focus on QI initiatives to evaluate their work and progress, lead

implementation of a network of CF centers in Turkey, expand clinical research, and improve median life expectancy and quality of life.
Results: The collaboration started in November 2018 with a site visit from the University of Michigan CF center director to assess the Mamara University center's needs and deficiencies. Deficiencies included the following: 1) Lack of infection prevention and control (IP&C) measures in the inpatient and outpatient settings. Once that was pointed out, immediate measures were implemented. 2) Inadequate outpatient clinic space and limited staff support. Discussion began with Marmara University leadership and the Family Advisory Board to gain support for the center. Next, the University of Michigan team visited Istanbul in March 2019 for training with the Marmara University team, to follow up on progress from the site visit and to start discussion of QI projects to improve the nutritional status (measured by BMI%) and lung function (measured by FEV1%). Other areas of QI work included: assessment of depression and anxiety and evaluation of parents' knowledge of equipment cleaning. One of the Marmara University fellows rotated with the University of Michigan center from June to August 2019. The Marmara University team visited the University of Michigan CF center in November 2019 for further training. For the second year, University of Michigan and Marmara University teams were supposed to continue in-person communications. Due to COVID-19 restrictions, virtual meetings started to follow up on QI projects and continue the interactions between the 2 teams. In 2021–2022, in-person interactions will resume to continue with the QI work and training. In addition, the University of Michigan and Marmara University teams plan to meet with Turkey's Ministry of Health to help provide all needed medications and to help create a National CF Network in Turkey.
Conclusion: The goals of the Marmara University–University of Michigan project are to provide multidisciplinary team training, implement evidence-based, state-of-the art health care delivery that operates under strict QI principles, and expand clinical research training. The project continued despite pandemic restrictions, and virtual meetings have allowed continuation of the project. Several QI projects were done during the pandemic, despite limited in-person clinic visits. This model can be applied to other centers/countries with a combination of in-person and virtual communications to help improve CF care globally.
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Drop-in QI: Model for improvement education in the CF learning network

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Background: The CF Learning Network (CFLN) is a network of people with CF (PwCF), family partners, and clinicians working in collaboration to test innovations, accelerate improvement, and achieve key clinical and patient-reported outcomes. There are 36 CF programs in the CFLN, joining in 3 waves over 4 years since the Network began in 2016. Each program designates local leader roles: quality improvement leader (QIL), patient/family partners (PFP), and physician leader. The CFLN uses the model for improvement (MFI) as its quality improvement (QI) methodology. Network members' knowledge and use of the MFI is essential to achieve network goals and outcomes and necessitates specialized training. Though CFLN members have access to MFI instruction in program orientation, community conferences, and online tools and resources, challenges arise as membership evolves and participants join, leave, and move in and out of engagement. To increase access to MFI methods education, the CFLN designed and tested a learning series called Drop-In QI. The aim was to test a new process for MFI fundamentals training.
Methods: Drop-In QI was designed for all participants of the CFLN, regardless of wave or role. Content was adapted from the Cincinnati Children's Anderson Center Improvement Science Problem Solving Model and QI Units standardized training content for learning network teams. Series 1 sessions were held for 6 consecutive weeks, beginning in January 2021, and had a flexible attendance framework. Sessions were 30 minutes in length. Zoom was the virtual platform. Enduring materials were shared with the CFLN and are housed on the CFLN Commons platform. MFI was used to design and structure the series and sessions. A key driver diagram organized the theory of improvement and plan-do-study-act (PDSA) cycles were used to plan, test, and adapt individual sessions. Participation and satisfaction data were collected and a mixed-methods evaluation was conducted after the series.
Results: Most participants indicated that individual sessions met their expectations (89–100%) and were a good use of time (89–100%). Attendees preferred 30-minute sessions, though felt more time for some topics may be beneficial. Median attendance per session was 33 (26–46), and 60 individual participants joined 1 or more sessions. Network attendance by CFLN team leadership role was as follows: QIL (40%), PFP (23%), and physician leaders (11%). Other participant roles reflected the multidisciplinary nature of CF teams. Participants represented 24 of 36 programs (66%). Despite longer network participation, most programs (66%) and attendees (75%) were from waves 1 and 2.
Conclusion: Satisfaction and evaluation results indicate Drop-In QI was well-designed and received. There is an interest in MFI fundamentals training across program roles. Higher participation among members in waves 1 and 2 suggests a need for ongoing MFI education opportunities. A second series is planned. MFI knowledge and skills application is thought to be a driver of QI capacity, and we intend to test this connection.
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Antibiotic prescribing practice in pediatric cystic fibrosis patients at University of Rochester Medical Center: A quality improvement initiative

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Background: Pulmonary exacerbations in children with cystic fibrosis (CF) are frequently treated in the outpatient setting with oral antibiotics. However, there is no generalized consensus on the definition of an outpatient pulmonary exacerbation [1, 2]. Because the definition is not standardized, treatment strategies vary. Thus, we sought to retrospectively evaluate our clinical practice over a 1-year period related to oral antibiotic treatment for pulmonary exacerbations in the outpatient setting. The ultimate goal is to standardize our internal practice in diagnosing and managing a pulmonary exacerbation.
Methods: A retrospective chart review of 80 patients ages 0–18 years followed in our Pediatric CF Center from July 1, 2018, to June 30, 2019, were reviewed. Patients with an encounter indicating at least 1 pulmonary symptom above baseline were included. Encounter types included phone call, MyChart message, or outpatient clinic visit. Analyzed variables included: best FEV1 within previous 6 months and at next encounter, symptoms present and duration, last positive respiratory culture/organism present, previous antibiotics within 6 weeks, home therapies, recommendation made by CF Care Center, if antibiotic prescribed name/dose/length of treatment, timing of follow-up, inpatient admission within 6 weeks, organism present on follow-up respiratory culture, and if organism was sensitive to antibiotic prescribed.
Results: Inclusion criteria was met by 44 (55%) patients with at least 1 pulmonary symptom above baseline. The median number of encounters per patient was 2.5 (IQR: 1,4) with a total of 152 total encounters. The majority of encounters occurred in person (53.9%); however, a significant proportion of visits occurred via phone (40.1%). Independent of encounter type, significant variation in symptom documentation occurred. In 95.4% of encounters, cough was documented. Inversely, the presence or absence of hemoptysis was documented in 31.6% of encounters. Antibiotics were prescribed 50.7% of the time, regardless of visit type (Figure 1). The