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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Commentary

Early COVID-19 Impact on Adolescent Health and Medicine Programs in the United States: LEAH Program Leadership Reflections

S. Jean Emans, M.D. [a], Carol A. Ford, M.D. [b,*], Charles E. Irwin Jr., M.D. [c], Laura P. Richardson, M.D., M.P.H. [d], Sara Sherer, Ph.D. [e], Renee E. Sieving, Ph.D., R.N. [f], and Tina Simpson, M.D., M.P.H. [g]

[a] *Boston Children's Hospital and Harvard Medical School, Boston, Massachusetts*
[b] *Children's Hospital of Philadelphia and University of Pennsylvania, Philadelphia, Pennsylvania*
[c] *University of California, San Francisco, San Francisco, California*
[d] *University of Washington, Seattle, Washington*
[e] *Children's Hospital of Los Angeles and the University of Southern California, Los Angeles, California*
[f] *University of Minnesota, Minneapolis, Minnesota*
[g] *University of Alabama at Birmingham, Birmingham, Alabama*

The United States Maternal Child Health Bureau (MCHB) funds seven Leadership in Adolescent Health (LEAH) programs across the country [1]. The mission of the network of LEAH programs is to train health professionals from medicine, nursing, nutrition, psychology, and social work to be leaders in clinical care, teaching, research, public health policy, and organization of health services for adolescents and young adults (AYA). On March 30, 2020, Project Directors of the LEAH programs convened an urgent conference call to discuss early experiences with managing adolescent health and medicine training programs within the context of the COVID-19 pandemic. LEAH Project Directors lead academic interdisciplinary adolescent health training programs in the following locations: Seattle, Washington; San Francisco, California; Los Angeles, California; Minneapolis, Minnesota; Birmingham, Alabama; Philadelphia, Pennsylvania; and Boston, Massachusetts. All project directors were experiencing extraordinarily rapid change that had disrupted standard operations within clinical services, teaching, and research domains. Many described changes were occurring on a daily and hourly basis. In the context of the COVID-19 pandemic, out-of-necessity patient and clinical care needs were prioritized. Programs were developing strategies to balance delivery of patient care with trainees' educational needs. Challenges and emerging approaches to meet the educational needs of multidisciplinary trainees were discussed. Clinical research projects were on hold, and strategies to support research training and projects were emerging.

Each LEAH Project Director reflected on their experiences over the preceding weeks, discussing strategies developed and implemented to address a wide range of rapidly evolving challenges within their clinical, teaching, research, and professional leadership environments. This report highlights common themes and insights that may be useful to colleagues in similar situations in the United States and across the world.

COVID19 Response: Timeline and Geographic Considerations

In the United States, COVID-19 infection was first recognized in the northwest coastal region near Seattle, Washington, in January 2020 [2]. The annual Society for Adolescent Health and Medicine (SAHM) meeting scheduled for March 11–14, 2020, on the southwest coast in San Diego, California, was canceled because of concerns about risks of COVID-19 infection, spread of infection across the country, and institutional restrictions on travel.

By March 30, 2020, LEAH programs in all seven locations had experienced rapid changes in their clinical, teaching, and research programs directly related to federal, state, community, university, and/or hospital attempts to control spread of COVID-19 infection and reduce risk of health care systems becoming overwhelmed with patients requiring hospitalization and intensive care. There was geographic variability in program experiences, with west coast programs reporting multiple weeks of COVID-19–related experience, and programs on the east coast

* Address correspondence to: Carol A. Ford, M.D., Division of Adolescent Medicine, Department of Pediatrics, University of Pennsylvania, Children's Hospital of Philadelphia, Buerger Building, 12th Floor, Philadelphia, PA 19104-4399.

E-mail address: fordc@email.chop.edu (C.A. Ford).

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reporting that rapid changes had begun only two weeks before our call. The discussion among LEAH Directors highlighted geographic variability in response to COVID-19 infection, with Seattle reporting early response, San Francisco, and Los Angeles reporting responses shortly thereafter, followed by rapidly evolving responses in Minneapolis, Birmingham, Philadelphia, and Boston. All programs reported changes related to cancelations of in-person courses, graduations and sports events, closure of nonessential businesses and daycares, and implementation of social distancing and stay-at-home policies. Programs that had experienced early impacts of COVID-19 were able to share their experiences and lessons learned with programs influenced later in the spread of the pandemic. Following are experiences and lessons learned related to clinical, educational, and research programs and leadership during this rapidly evolving situation.

Clinical Programs

All programs reported changes in their AYA health clinical programs. These changes were aligned with larger health care system strategies to reduce risk of COVID-19 exposure and transmission among all patients and clinical staff and to prepare for a surge of hospitalized patients with COVID-19 infections. LEAH Project Directors discussed challenges to providing both physical and mental/behavioral health care to AYA patients in multiple clinical sites, and challenges to providing multidisciplinary team care. Discussions about challenges, and strategies to overcome challenges, are summarized by clinical settings as below.

- Hospitalized AYA patients
- In-person outpatient AYA visits
- Telephone and video outpatient AYA visits
- Support for community safety net programs
- Youth in juvenile justice facilities
- Youth in mental health/behavioral health facilities

Hospitalized AYA patients

Programs described strategies to limit hospital admissions to those AYA patients with acute needs and to limit exposure to potential COVID-19 infection among patients, staff, faculty, and trainees during hospitalization. Elective admissions, surgeries, and procedures had been canceled across institutions. Several programs developed strategies to reduce inpatient adolescent admissions, including refining eating disorder admission criteria. Several programs discussed that they had implemented protocols that allowed for more rapid refeeding. These changes, combined with a reduction of patients presenting to the hospital, resulted in significant reductions in the inpatient census at these institutions. To preserve personal protective equipment (PPE) and promote social distancing, inpatient consultations in some institutions were being conducted by telehealth or phone. In some programs, hospitalized patients on COVID precautions were given specially programmed tablets to communicate directly with nurses and medical staff, thereby preserving PPE. Across institutions, reduced numbers of team members participated in in-person patient care, with a focus on limiting in-person visits to those that involved performing a physical examination. Similarly, the number of people involved in in-person patient care conferences was limited, and social distancing was addressed with chair spacing. Several programs had developed strategies for direct admission for eating disorder patients to reduce risk for emergency room exposure. Some hospitals had adopted strategies to increase regional adult bed capacity, including closing community pediatric wards and directing all pediatric admissions to the children's hospital, or admitting young adult patients to the children's hospital.

In-person outpatient AYA visits

Most programs described strategies to limit in-person outpatient visits to those patients with essential medical needs, aligned with guidelines from their larger institutions. LEAH programs were developing and implementing plans to meet medical and mental/behavioral health needs of AYA patients who did not require in-person visits using alternative strategies. A substantial portion of the discussion focused on how programs conceptualized what constituted essential in-person outpatient visits. Although there were many similarities, differences across programs in the types of patients served resulted in unique challenges. Approaches are presented by clinical population below.

Eating disorder patients. Eating disorder patients have medical and mental/behavioral health needs and are best cared for by a multidisciplinary team. In the context of the COVID-19 crisis, multiple challenges and strategies to address these challenges were discussed. Many programs were using weight and heart rate criteria to define urgency and need for in-person medical assessments. Several programs had established daily morning "vital sign clinics" where patients would come in for heart rate, blood pressure, and weight assessment that was either followed by, or preceded by, a telehealth visit. Some programs were enlisting parents to monitor vital signs, including teaching parents to take pulses, using "fit bit" pulse features, and assessing weights on home scales. A few programs had developed triage mechanisms by experienced clinicians and mechanisms to offer in-person visits to a select group of new patients based on medical or mental/behavioral health criteria for urgency. In some programs, new eating disorder visits for patients with less urgent needs were being comanaged with primary care providers until safe in-person visits could be arranged, and programs were in the process of developing strategies to initiate care using telehealth. Programs were considering or developing strategies to offer eating disorder patients synchronous or asynchronous telehealth visits with medical, behavioral health, and nutrition team members.

Gender patients. The main area of discussion for gender patients focused on methods for continuing medical care and mental/behavioral health support through telehealth methods. Discussions about medical care included developing self-injection teaching methods via telehealth platforms, and methods to coordinate obtaining laboratory testing results before telehealth appointments. Strategies to provide written prescriptions in systems without access to online mechanisms for prescribing controlled substances were also discussed. Most programs were delaying new visits for gender patients as nonurgent with the exception of young adolescents who had a limited time window for starting pubertal blocking medications due to puberty. Some programs were offering in-person visits for known gender

patients who needed hormone injections within the context of substantial gender dysphoria, when no other strategies to receive medication were available.

Contraception. There was variability across programs in the degree to which contraceptive care was considered a reason for an essential in-person visit. There was also variability in strategies to meet the needs of patients who were scheduled for long-acting reversible contraceptives (LARCs). Some programs focused on encouraging hormonal methods that could be prescribed via telehealth such as oral contraceptives. Some were prescribing Depo-Provera and considering a clinic visit for an injection as an essential visit, while also exploring strategies for patients to receive Depo-Provera without clinic visits (e.g., pharmacy visits; teaching self-injection). However, most programs continued to provide LARCs, particularly implants, in cases where other forms of birth control were not feasible for the patient, the device had expired, and the patient was thought to be at risk for pregnancy or heavy bleeding without LARC.

Substance use treatment/resources. At programs that provided substance use services, telehealth was initially limited to established patients who were already engaged in treatment. However, the day after the Directors call, new DEA regulations were released allowing credentialed providers to see new substance use treatment patients via telehealth. Programs were considering or developing strategies to offer telehealth visits from members of medical and mental/behavioral health multidisciplinary teams. Several programs were working in children's hospitals that were anticipating possible admission of adult patients. Faculty members in some of these institutions were developing resources to aid pediatricians in recognizing risks of substance use disorders among adult patients.

HIV patients. To minimize the number of in-person visits, one program defined essential in-person visits as encounters to establish or re-establish care for patients who were not virally suppressed. Nonessential visits were completed by telehealth or deferred to a later date.

Mental/behavioral health visits. Many programs expressed concern about needs for supporting adolescents with mental/behavioral health concerns. Given the high needs of the populations served, there was a focus on acute response resources and suicide prevention as well as strategies to ensure ongoing counseling visits. One program reported that in their community, mental health providers had adopted telehealth methods before the pandemic. Within the context of COVID-19, these providers were able to ramp up quickly to convert almost all types of mental/behavioral health visits to telehealth, including psychological assessments and therapeutic groups. Requirements by governors that telehealth become a covered benefit for physical and mental health visits resulted in rapid change. In some cases, youth were able to continue established therapy with an LEAH clinician and other providers in the community. In other situations in which college students were sent home, patient/provider relationships were disrupted.

Primary care visits. Programs offering primary care created separate clinics for urgent care; those with fever and/or other symptoms of possible viral infection received care in one clinical space and those without such symptoms received urgent care as needed in an alternative clinical venue. Telehealth visits were conducted to triage patients to urgent care versus emergent care. Ongoing routine primary care follow-up was being offered through virtual visits, particularly for youth with chronic conditions. Although the highest risk for COVID-19 mortality is in adults aged 65 years and older, youth with higher risk of serious disease are embedded within primary care patient populations including those with chronic lung disease; moderate to severe asthma; serious cardiac conditions; diabetes; severe obesity defined as BMI $\geq$ 40; immunocompromised, which includes patients who smoke; chronic kidney disease requiring dialysis; and liver disease [3].

Telephone and video outpatient AYA visits

Most programs were rapidly increasing their capacity to provide telephone or video visits to patients who did not require an in-person visit. Telephone visits were typically linked to a structured visit format and entered into the patient chart as a formal visit, with a billing code, which (if insurance allows) can be reimbursed as a billable clinical service. Video visits, within the broad domains of telehealth, focused on synchronous live videoconferencing involving a two-way interaction between a patient and a clinician using audiovisual telecommunications technology [4]. Video visits were also typically conducted in structured format, entered into the patient chart as a formal visit, with a billing code, which (if insurance allows) can be reimbursed.

All programs were discussing the implementation of one or both of the aforementioned strategies for clinicians who provide medical care and among clinicians who provide mental/behavioral health care. In general, the ease and strategies for pivoting from in-person visits to formal telephone or video visits was dependent on specific health care system issues. For example, some electronic health record systems were more conducive to integrated video visits than other systems. Some programs had made significant investment in telemedicine/health before the COVID-19 pandemic while others did not yet have access to video conferencing or other telehealth means beyond telephone visits. Programs were learning about the importance of assuring that telehealth platforms were HIPAA compliant and therefore met security and regulatory standards. Professional licensing and credentialing across state lines, for physicians as well as other health professionals, was a consideration for those who care for patients who are located in surrounding states. Rapidly evolving scenarios were described, with states on both coasts waiving or altering previous credentialing requirements.

Overall programs reported that AYA patients and families were appreciative of telehealth services, but common challenges emerged. These challenges included concerns for how to set up confidential care and provide time alone with youth in the context of a telehealth or telephone visit, and developing strategies for incorporating trainees and delivering multidisciplinary care in the context of telehealth. There is variability in patient/family access to the Internet and sophistication with technology, so that even within health care systems able to pivot to video visits, some visits need to be by telephone. Need for interpreter services presents unique challenges. In many systems, access to telehealth was not consistent across disciplines, and in particular, resources were more limited for nutrition and nursing; this results in further challenges for implementing team-based care.

Support for community safety net programs

At the time of our conference call, most K-12 schools in our communities had closed, including school-based health clinics. Lack of access to school-based clinics was noted to have disproportionate impact on communities with high rates of poverty and marginalized groups. Some programs were providing substantial medical support for homeless and marginalized youth. For these youth, implementation of federal, state, or community stay-at-home orders frequently meant that they needed to stay in institutionalized or out-of-home settings. Creative strategies capitalizing on existing relationships with health care systems, public health departments, community-based organizations, and key stakeholders invested in the health and well-being of these youth were described. One example included collaboration with a local health department to ensure onsite COVID-19 testing was available, which dramatically improved the ability to manage and triage young people appropriately in these high-risk settings.

Youth in juvenile justice facilities

Faculty from some programs provided care in juvenile detention facilities and were working to reduce COVID-19 infection risk among incarcerated populations. One area of challenge was that many of these settings had limited access to testing and PPE. Medical faculty were working with local health departments and institutions to improve access to testing, but equipment was difficult to procure given high demands throughout the system. In addition, given the low rates of infection in children, systems often considered justice-involved youth to be at low risk for infection, resulting in slow adoption of infection control strategies such as limiting visitation and reducing interinstitution transfers.

Youth in mental health/behavioral health facilities

Faculty providing medical care in inpatient behavioral and psychiatric facilities reported significant concerns for infection, with some requiring screening for COVID-19 before patients were allowed admission. Shortly after our call, one program experienced a COVID-19 outbreak among patients hospitalized in an inpatient behavioral facility despite requirements that patients be test-negative on admission.

Education Programs

The LEAH programs provide multidisciplinary training involving medicine, nursing, nutrition, psychology, and social work. At the time of the meeting, all of the programs had moved their fellowship seminars and case conference sessions to online learning, reflecting policies instituted by the universities and hospital systems that house the LEAH programs. Fellows were encouraged to present complex cases in virtual conferences, including assessment and management strategies for telephone and video visits. Some were working on virtual methods for presentation of fellow leadership projects. Some were transitioning in-person continuing education programs for AYA professionals into entirely online formats, using a combination of synchronous and asynchronous strategies. Directors noted it was helpful to tap into expertise that existed within their institutions regarding online learning platforms and approaches. Examples of techniques noted to be successful in engaging virtual learners included the use of white boards, nonhierarchical photo galleries of participants, simultaneous PubMed searches, identifying health disparities in mortality from COVID-19, and incorporating publicly available clinical pathway algorithms from other LEAH web sites (e.g., CHOP clinical pathways on COVID-19 and eating disorders at https://www.chop.edu/pathways).

Several programs were engaging trainees in leadership teams focused on developing care processes, policies, and protocols to address the challenges of COVID-19. There were concerns across programs with continuing to provide clinical learning opportunities in interdisciplinary settings. There was inconsistency across professional schools with some disciplines removing all learners from clinical rotations and others encouraging continued engagement in clinical activities through telehealth as possible. Senior LEAH fellows were engaged to develop new online learning opportunities for learners with reduced access to clinical care. In light of the limited access to direct care, most of the disciplines were developing modified requirements for clinical training and, for some, adding telehealth skills to competencies.

Although some adaptations of previous teaching methods are possible, the COVID-19 crisis has resulted in cancelation of nationally recognized LEAH-sponsored postgraduate courses as well as training of Title V health professionals such as state health department–funded school-based nurses. National and international conferences across disciplines have been canceled. Canceling these courses and conferences results in lost educational opportunities for all trainees and faculty.

Research Programs

Most LEAH programs include substantial research portfolios, and some include clinical research projects that require staff to have direct interactions with human subjects. Research projects across locations have been impacted by restrictions on in-person contact. Recruitment dependent on access to clinical sites has been halted. In some locations, in-person recruitment has been transitioned to alternative recruitment strategies when feasible. In-person data collection has been changed to alternative strategies when feasible. Clinical trials in some instances have been put on hold. Timelines for project completion have been altered. The annual national Pediatric Academic Society Meeting scheduled in May 2020 has been canceled. This cancelation, along with the recent SAHM Meeting cancelation, has severely limited opportunities for trainees and faculty to present their research and scholarly activity at national meetings in 2020. Directors and program faculty encouraged their trainees to submit accepted research presentations to online forums being hosted by SAHM and other professional organizations that have canceled in-person scientific meetings. Some programs noted that local institutional forums for trainees to present their research were being shifted from in-person formats to innovative virtual formats. Fortunately, with some lead time and creative work, the Academy for Eating Disorders has transformed their in-person meeting in Australia in June to a virtual International Conference on Eating Disorders with the help of LEAH faculty and other members.

Leadership

The COVID-19 pandemic has provided unprecedented opportunities to demonstrate leadership across multiple domains.

We are all experiencing a disruptive and stressful time that involves many unknown factors and extraordinarily rapid change. LEAH Project Directors discussed the importance, and challenge, of demonstrating calm consistent responsible leadership. Everyone has found that communication with faculty, trainees, and staff require daily or weekly emails, virtual meetings, and "town meetings with leadership" to provide sufficient information that is inclusive and honest, recognizes the significant stress everyone is feeling, solicits creative solutions from all stakeholders, and is accompanied by explanations of the next steps being taken to meet challenges. Fulfilling this professional responsibility, as well as fulfilling a wide range of personal responsibilities involving family and friends, requires self-compassion and self-care. Indeed, LEAH faculty and fellows have discovered the benefits of the 30 minutes "crash" course in resiliency and adaptive leadership, part of the "MCH Competency-Based Resources for Difficult Times," (https://www.mchnavigator.org/transformation/mini-module-resilience.php) disseminated by the MCH Navigator March 27, 2020. Modeling high-quality leadership, supporting leaders in our own groups, supporting colleagues in leadership roles, and encouraging our trainees to closely observe and learn from different effective leadership strategies are all important opportunities that should not be missed.

Lessons Learned and Opportunities

During times of disruption and rapid change, there are multiple opportunities for creativity and learning. During this brief conversation among seven LEAH program leaders, the value of sharing experiences and expertise became clear. We were able to identify similar challenges, learn about challenges that could be anticipated in the near future, and share a variety of strategies being developed or implemented to overcome these challenges. One conversation immediately informed problem solving at multiple institutions. Follow-up communication has continued to support sharing of resources and technical assistance across programs. During times of crisis, working and sharing together can produce effective action.

Our conversation focused on the immediate medical needs of the AYA populations we serve, while also thinking through strategies to support mental/behavioral health needs. We provide care to many AYA populations with comorbid physical and mental/behavioral health issues, as well as those who are physically healthy but have substantial mental/behavioral health needs. Furthermore, the impact of the COVID-19 pandemic and the disruption it is causing in young people's lives will likely have ongoing impact for all [5]. We need to be actively engaged in identifying opportunities to support the mental health and well-being of all young people through these challenging times.

Dramatic shifts in strategies for providing clinical care, embracing telehealth, and creatively engaging multidisciplinary learners may evolve into long-term opportunities to improve adolescent and young adult health, and multidisciplinary training programs [6]. During this time of rapid change and creativity, it will be important to identify and evaluate strategies that will help address immediate challenges—and potentially improve our traditional pre-COVID practices and programs. Early in our experience with COVID-19, we have the opportunity to learn lessons that will inform opportunities for improvement in our multidisciplinary training programs, and ultimately AYA health, in the future.

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