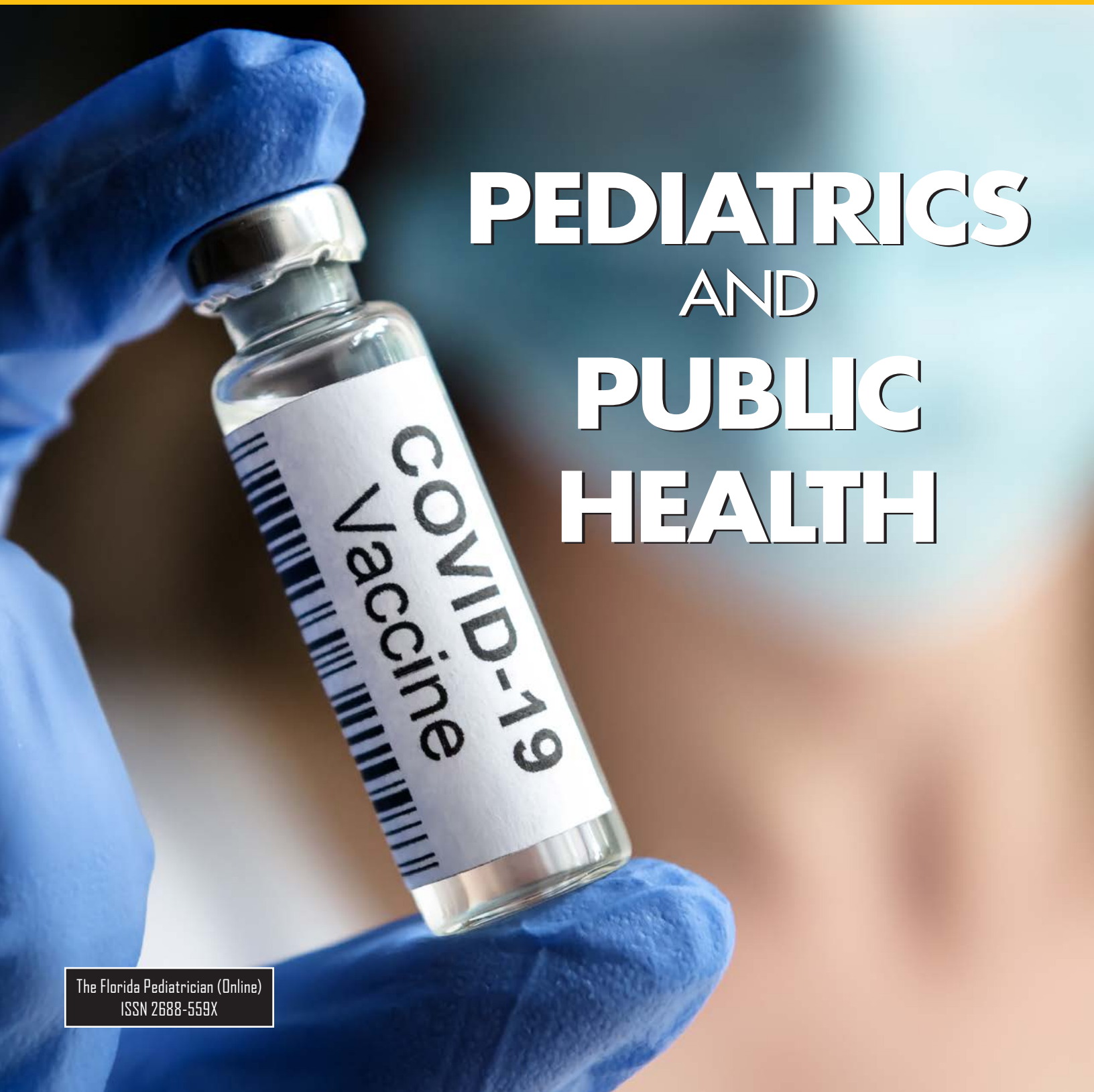
The Florida Pediatrician

FCAAP
Florida Chapter
OF THE AMERICAN ACADEMY OF PEDIATRICS
INCORPORATED IN FLORIDA

THE PEER-REVIEWED JOURNAL OF THE FLORIDA CHAPTER OF THE AAP WINTER 2024



PEDIATRICS AND PUBLIC HEALTH

The Florida Pediatrician (Online)
ISSN 2688-559X

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VOLUME 44, ISSUE 1

Florida Chapter of the American Academy of Pediatrics
INCORPORATED IN FLORIDA

The Florida Pediatrician is the peer-reviewed journal of the Florida Chapter of the American Academy of Pediatrics, published by the FCAAP Editorial Board for FCAAP members.

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There Are No Shelters

We are in the middle of the legislative season, and your Florida Chapter leaders are working hard to protect the interests of children in Florida. We are advocating for all children and protecting their right to be who they are and what they want to be. The Florida Chapter wants politicians out of the patient-physician relationship and let pediatricians decide based on sound science what is best for children. This is an uphill battle in the current environment, and we have to be on a war footing to protect our children.

Advocacy is not just about persuasion; it has to be a passion. There are often no immediate rewards and usually no recognition. Thousands of people advocate for children without any regard for recognition. Pediatricians are the epitome of such advocacy. Yes, we have child advocates like Mona Hanna-Atisha who, when they saw injustice in Flint, take it upon themselves to advocate for children and families. No one asked Mona, but it was in her nature to advocate for children. We have many child advocates In Florida, like Louis St. Petry and Jeff Goldhagen, to name a couple. They are fearless and untiring in their advocacy for children. I wish I had half of their courage and tenacity. And then there is Dr. Gerold L. Schiebler who is a force of nature. He would work with anyone who would help him advance the cause of children. But then there are many other pediatricians who work for this cause even when it is downright controversial. No advocacy for safety and improvement of children's lives can ever be controversial, at least not in my mind.

One pediatrician I only learned about recently is Dr. Barbara Zind of Grand Junction, Colorado. What a phenomenal individual. I just don't have enough space to write about her, but you can find out more about her on this pbs link (https://www.rmpbs.org/blogs/news/barbara-zind-colorado-doctor-gaza-israel/). I never knew about her until I heard her interview on CNN. If you want to see a courageous woman watch this CNN clip (https://www.cnn.com/videos/world/2023/10/10/barbara-zind-israel-hamas-gaza-ebof-vpx.cnn). In the middle of a bombing, Wolf Blitzer asked her to go to a shelter and she said nonchalantly, "there are no shelters." That summed it up.

This mild-mannered woman physician has more courage than many people. It is inspiring to see the dedication of pediatricians like Dr. Barbara Zind and others who passionately advocate for children's rights.

No matter what you believe in, please continue to raise your voice for children all over the world. We need to set aside political views to prioritize humanity in advocating for children.

Dr. Martin Luther King, Jr aptly emphasized the interconnectedness of our actions and their impact on a global scale when he said, "Injustice anywhere is a threat to justice everywhere. We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly, affects all indirectly."

Mobeen H. Rathore, MD, CPE, FAAP, FPIDS, FSHEA, FIDSA, FACPE
Editor, The Florida Pediatrician

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REVIEW ARTICLE

The Intersection of Public Health and Direct Patient Care: What Pediatricians Should Know

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Even as the United States and the world continue to count the devastating costs of the SARS-CoV-2 (COVID-19) outbreak in terms of human lives and financial resources, the pandemic has shed light on the need for a robust public health system to prevent the spread of infectious and communicable diseases.[1] After years of an overall divestment in the U.S. public health infrastructure and a trend towards reactionary funding to emergent crises,[2] experts have suggested that increased awareness of funding and workforce needs due to the pandemic may reinvigorate the current public health enterprise.[3] Nevertheless, interest in public health has already started to wane as individuals perceive the immediate crisis to be over.[4] Even among those who might benefit the most from greater knowledge of public health programs and services (i.e., physicians), priorities have begun to shift to concerns exacerbated by the pandemic (e.g., behavioral health, well-child visits, vaccinations, health equity).[5] Therefore, it is incumbent upon the profession to fully articulate how public health safeguards population health.

This article aims to provide a high-level overview of public health, including areas of focus, key functions, and strategic services. This topic may interest the general public, but we have written it for physicians as our primary audience, specifically pediatricians in Florida. The following three questions serve as our major headings for the article:

- What is Public Health?
- With which Public Health programs and services should pediatricians be most familiar?
- How can pediatricians and health departments work together to support public health?

WHAT IS PUBLIC HEALTH?

Fundamentally, public health involves society's collective efforts to (1) prevent disease, (2) prolong life, and (3) promote health. Researchers have used the *upstream/downstream* metaphor to describe how public health actions, policies, and interventions focus

on macro-level (upstream) factors to address individual health (downstream) concerns.[6,7] For example, an upstream public health initiative might include adding parks, walkways, and green spaces to residential areas to increase physical activity among residents. This is just one illustration of how public health strives to address the social determinants of health or nonmedical factors influencing health outcomes.[8] To further exemplify how public health protects and improves health, we describe the three core functions and ten essential public health services that comprise a framework for carrying out the public health mission.[9]

THREE CORE FUNCTIONS AND 10 ESSENTIAL PUBLIC HEALTH SERVICES

As demonstrated in Figure 1, the three core functions of public health, assessment, policy development, and assurance, comprise ten essential public health services (EPHS). While the core functions are divided into essential services, the circular design of the framework suggests that there is no singular starting point for activation. Moreover, services across core functions may readily build upon one another. For additional information regarding the composition of the EPHS framework, including the three core functions and ten essential services and associated activities, see Table 1.

The EPHS framework was developed in 1994 and updated in 2020 to better reflect current and future practice. Furthermore, discussions focused on how the EPHS could be used to create communities where people can achieve their best possible health.[10] According to the authors, the updated EPHS framework was long overdue since the realities of the world over the previous 25 years had outpaced the original framework. The most compelling change to the EPHS is its central focus on equity, as depicted in the inner circle of the model and reflected in language changes throughout each of the ten services. According to Sellers et al., "Centering equity means that all public health work must reach towards two aims simultaneously: improving overall health *and* advancing equity."[11]

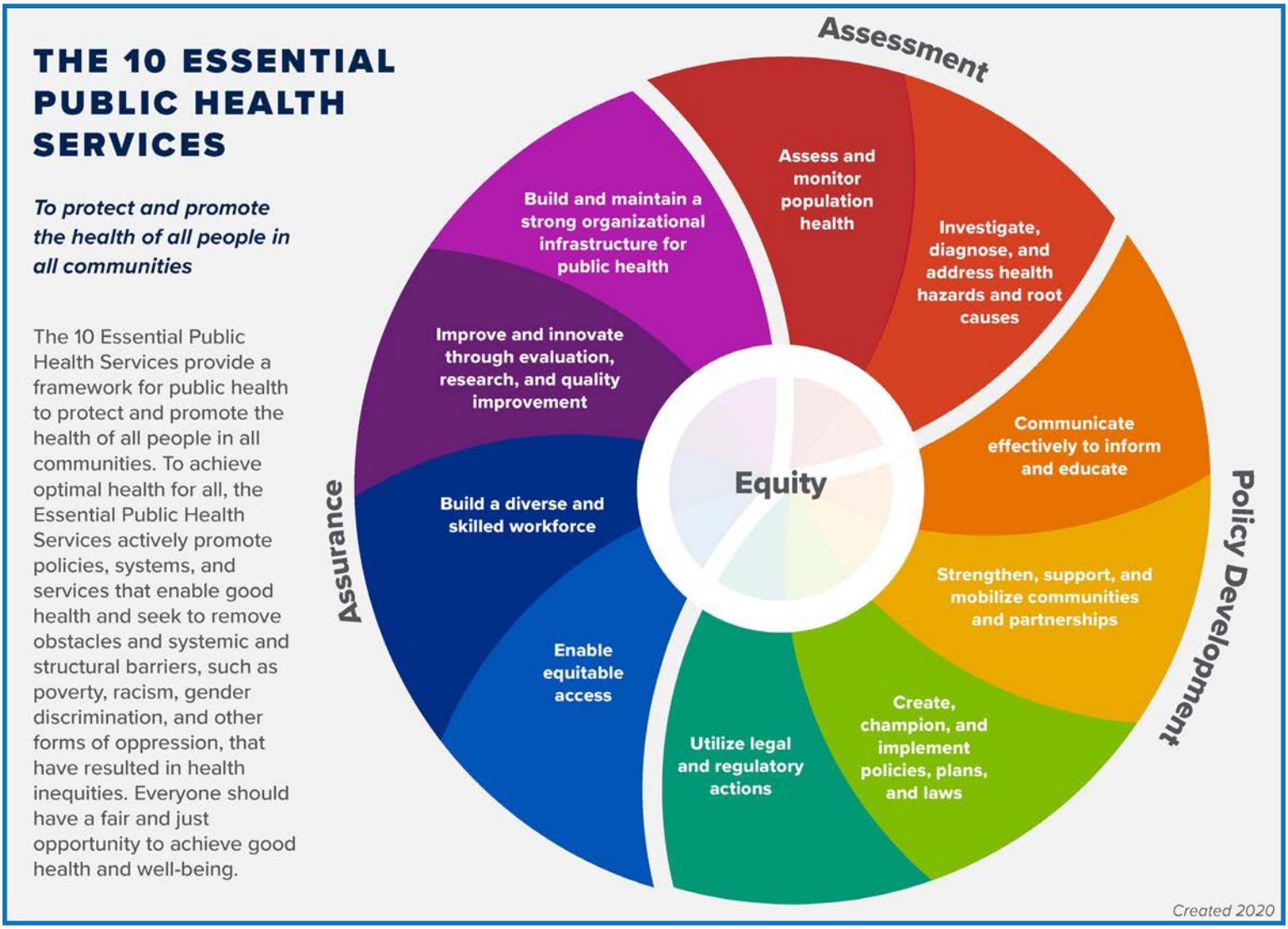

Figure 1: Essential Public Health Services Framework
Source: https://www.cdc.gov/publichealthgateway/publichealthservices/essentialhealthservices.html

CORE FUNCTION	ESSENTIAL SERVICES	ACTIVITIES
Assessment	Assess and monitor population health status, factors that influence health, and community needs and assets	• Maintaining an ongoing understanding of health in the jurisdiction by collecting, monitoring, and analyzing data on health and factors that influence health to identify threats, patterns, and emerging issues, with a particular emphasis on disproportionately affected populations • Using data and information to determine the root causes of health disparities and inequities • Working with the community to understand health status, needs, assets, key influences, and narrative • Using innovative technologies, data collection methods, and data sets • Utilizing various methods and technology to interpret and communicate to diverse audiences • Analyzing and using disaggregated data (e.g., by race) to track issues and inform equitable action • Engaging community members as experts and key partners
	Investigate, diagnose, and address health problems and hazards affecting the populations	• Anticipating, preventing, and mitigating emerging health threats through epidemiologic identification • Monitoring real-time health status and identifying patterns to develop strategies to address chronic diseases and injuries • Using real-time data to identify and respond to acute outbreaks, emergencies, and other health hazards • Using public health laboratory capabilities and modern technology to conduct rapid screening and high-volume testing • Analyzing and utilizing inputs from multiple sectors and sources to consider social, economic, and environmental root causes of health status • Identifying, analyzing, and distributing information from new, big, and real-time data sources
Policy Development	Communicate effectively to inform and educate people about health, factors that influence it, and how to improve it	• Developing and disseminating accessible health information and resources, including through collaboration with multi-sector partners • Communicating with accuracy and necessary speed • Using appropriate communications channels (e.g., social media, peer-to-peer networks, mass media, and other channels) to effectively reach the intended populations • Developing and deploying culturally and linguistically appropriate and relevant communications and educational resources, which includes working with stakeholders and influencers in the community to create effective and culturally resonant materials • Employing the principles of risk communication, health literacy, and health education to inform the public when appropriate • Actively engaging in two-way communication to build trust with populations served and ensure the accuracy and effectiveness of prevention and health promotion strategies • Ensuring public health communications and education efforts are asset-based when appropriate and do not reinforce narratives that are damaging to disproportionately affected populations
	Strengthen, support, and mobilize communities and partnerships to improve health	• Convening and facilitating multi-sector partnerships and coalitions that include sectors that influence health (e.g., planning, transportation, housing, education, etc.) • Fostering and building genuine, strengths-based relationships with a diverse group of partners that reflect the community and the population • Authentically engaging with community members and organizations to develop public health solutions • Learning from and supporting existing community partnerships and contributing public health expertise
	Create, champion, and implement policies, plans, and laws that impact health	• Developing and championing policies, plans, and laws that guide the practice of public health • Examining and improving existing policies, plans, and laws to correct historical injustices • Ensuring that policies, plans, and laws provide a fair and just opportunity for all to achieve optimal health • Providing input into policies, plans, and laws to ensure that health impact is considered • Continuously monitoring and developing policies, plans, and laws that improve public health and preparedness and strengthen community resilience • Collaborating with all partners, including multi-sector partners, to develop and support policies, plans, and laws • Working across partners and with the community to systematically and continuously develop and implement health improvement strategies and plans and evaluate and improve those plans
	Utilize legal and regulatory actions designed to improve and protect the public's health	• Ensuring that applicable laws are equitably applied to protect the public's health • Conducting enforcement activities that may include, but are not limited to sanitary codes, especially in the food industry; full protection of drinking water supplies; and timely follow-up on hazards, preventable injuries, and exposure-related diseases identified in occupational and community settings • Licensing and monitoring the quality of healthcare services (e.g., laboratory, nursing homes, and home healthcare) • Reviewing new drug, biologic, and medical device applications • Licensing and credentialing the healthcare workforce • Including health considerations in laws from other sectors (e.g., zoning)
Assurance	Assure an effective system that enables equitable access to the individual services and care needed to be healthy	• Connecting the population to needed health and social services that support the whole person, including preventive services • Ensuring access to high-quality and cost-effective healthcare and social services, including behavioral and mental health services, that are culturally and linguistically appropriate • Engaging health delivery systems to assess and address gaps and barriers in accessing needed health services, including behavioral and mental health • Addressing and removing barriers to care • Building relationships with payers and healthcare providers, including the sharing of data across partners to foster health and well-being • Contributing to the development of a competent healthcare workforce
	Build and support a diverse and skilled public health workforce	• Providing education and training that encompasses a spectrum of public health competencies, including technical, strategic, and leadership skills • Ensuring that the public health workforce is the appropriate size to meet the public's needs • Building a culturally competent public health workforce and leadership that reflects the community and practices cultural humility • Incorporating public health principles in non-public health curricula • Cultivating and building active partnerships with academia and other professional training programs and schools to assure community-relevant learning experiences for all learners • Promoting a culture of lifelong learning in public health • Building a pipeline of future public health practitioners • Fostering leadership skills at all levels
	Improve and innovate public health functions through ongoing evaluation, research, and continuous quality improvement	• Building and fostering a culture of quality in public health organizations and activities • Linking public health research with public health practice • Using research, evidence, practice-based insights, and other forms of information to inform decision-making • Contributing to the evidence base of effective public health practice • Evaluating services, policies, plans, and laws continuously to ensure they are contributing to health and not creating undue harm • Establishing and using engagement and decision-making structures to work with the community in all stages of research • Valuing and using qualitative, quantitative, and lived experience as data and information to inform decision-making
	Build and maintain a solid organizational infrastructure for public health	• Developing an understanding of the broader organizational infrastructures and roles that support the entire public health system in a jurisdiction (e.g., government agencies, elected officials, and non-governmental organizations) • Ensuring that appropriate, needed resources are allocated equitably for the public's health • Exhibiting effective and ethical leadership, decision-making, and governance • Managing financial and human resources effectively • Employing communications and strategic planning capacities and skills • Having robust information technology services that are current and meet privacy and security standards • Being accountable, transparent, and inclusive with all partners and the community in all aspects of practice

Table 1: Functional Depiction of the Essential Public Health Services Framework

DELIVERY OF PUBLIC HEALTH IN THE UNITED STATES

The governmental public health system in the United States comprises public health agencies from the federal government (e.g., the Centers for Disease Control and Prevention), 50 states plus the District of Columbia, local governments, and federally recognized tribal and territorial agencies.[12] Due to this complex network of people and organizations, the public health infrastructure in the United States is highly diverse. As described by Mays et al., "Some [state and local public health] agencies operate as freestanding, independent departments, whereas others are embedded within larger 'super agency' structures that have responsibilities for an array of health and social service programs."[13]

The governmental authority for public health derives from the 10th amendment to the U.S. Constitution, which states that any powers not "delegated to the United States by the Constitution nor prohibited by it to the States, are reserved to the States respectively, or to the people."[14] This is the basis of federalism. Public health powers are then described as a subset of the police powers established under the 10th Amendment, further elaborated at the state and local levels. Thus, the major locus of public health authority in the United States is at the state level; whatever authorities are then delegated to local government is a matter of each state's constitution and statutes. In Florida, authority is granted through state statute.

The structure of local health departments varies, but they all share the common goal of promoting and protecting community health. Nevertheless, differences in structure have important implications for delivering essential public health services. Moreover, public health authority's roles, responsibilities, and scope rely on state policy and the government's relationship between state and local health departments.[15] Florida has a centralized structure in which all local health departments are units of state government.[16]

STATE HEALTH DEPARTMENTS

State health departments provide population-based health services related to primary prevention, screening, and treatment of diseases and conditions. Typical duties of a state health department include (1) disease surveillance, epidemiology, and data collection; (2) state laboratory services; (3) preparedness and response to public health emergencies; (4) population-based primary prevention; (5) health care services; (6) regulation of health care providers and other licensed professions; (7) environmental health; and (8) technical assistance and training.[17] The state of Florida fits within this national framework.

LOCAL HEALTH DEPARTMENTS

In 2019, the National Association of County and City Health Officials (NACCHO) concluded that most local health departments (70%) are locally governed. The remaining 30% were either units of the state health agency or had a shared governance structure.[18] Functions of local health departments vary but may include oversight (i.e., responsibility for public health performance), policy development, legal authority, continuous quality improvement, resource stewardship, and partner engagement. Local health departments range in size from one employee (e.g., agencies in Massachusetts that have a local health department in all 351 towns and cities) to over 4,000 employees (e.g., Los Angeles County Health Department).

STRUCTURE OF COUNTY HEALTH SYSTEM IN FLORIDA

As noted above, Florida's public health system is an example of a centralized state health department structure, where the state maintains direct authority over all 67 county health departments. At the state level, the Florida Department of Health (FDOH) is an executive branch agency led by the State Surgeon General, who also serves as the State Health Officer (SHO)/Secretary of Health and is directly appointed by Florida's Governor and confirmed by Florida's Senate.[19] In addition to the state health office in Tallahassee and Florida's 67 County Health Departments (CHDs), the FDOH includes 12 Medical Quality Assurance (MQA) regional offices, nine Disability Determinations regional offices, and three public health laboratories.[19] Four Deputy Secretaries for Health manage the various programs and services of the FDOH, including the Deputy Secretary for Children's Medical Services (who controls all CMS Offices); the Deputy Secretary for Health (over vital statistics, emergency preparedness, community health promotion, and disease control and health protection); the Deputy Secretary for Operations (over finance and accounting, regulation and licensure, executive boards, and disability determinations); and the Deputy Secretary for County Health Systems (over the 67 CHD offices).

The directors of those CHDs are appointed by and report to the Deputy Secretary for County Health Systems after the concurrence of the board of county commissioners of the respective county.[20] The various CHD facilities and offices are provided through partnerships with local county governments and owned by the counties even if constructed with state funds. In addition to the main CHD office in each county, 188 affiliated sites throughout the state provide an array of public health services, ranging from a single service (e.g., an office for providing the special supplemental nutrition program for Women, Infants, and Children [WIC]), to large sites that provide multiple programs and services. Funding for CHDs comes from a mix of local, state, and direct federal sources and fees for services rendered. Historically, statewide, the percentage of funding from these sources has been approximately 10% local, 50% state and federal, and 20% Medicaid and Medicare, with the remaining 20% from various other sources, including fees.

Services and programs provided by CHDs differ across the state, depending on local resources and other local services availability, the size of the county, and specific needs. A complete listing of programs and services can be found at https://www.floridahealth.gov/programs-and-services/index.html. Florida State Statutes[21] describe three general groups of services that are most commonly provided:

1. "Environmental health services," including food hygiene, safe drinking water supply, sewage, and solid waste disposal, swimming pools, group care facilities, migrant labor camps, toxic material control, radiological health, occupational health, and entomology.
2. "Communicable disease control services," including epidemiology, sexually transmissible disease detection and control, immunization, tuberculosis control, and maintenance of vital statistics.
3. "Primary care services," including first contact acute care services; chronic disease detection and treatment; maternal and child health services; family planning; nutrition; school health; supplemental food assistance for women, infants, and children; home health; and dental services.

From a more programmatic perspective, these statutes translate into a set of core public health services and programs common for almost all CHDs (see Table 2).

County health departments also provide access to birth and death certificates, community health programs such as SNAP-ed (nutrition education for families), and the Florida Breast and Cervical Cancer Early Detection Program. County health departments oversee the

Maternal and Child Health Programs	Healthy Start is a free home visiting program that provides education and care coordination to pregnant women and families of children under the age of three years
Clinical Services	Adult health: preventive, acute, and chronic care
	Child health: well-child exams and screening (Early Periodic Screening, Diagnostic, and Testing (EPSDT)
	Dental health: preventive and restorative
	Family planning: an array of reproductive services for pregnancy prevention
	Diabetes prevention: screening and counseling
	Nutrition counseling
Communicable Diseases Services	Childhood and adult vaccines
	Foreign travel immunizations
	HIV/AIDS testing and linkage to care
	Sexually transmitted infections (STI) prevention, diagnosis, and treatment
	Tuberculosis screening and linkage to care
	Refugee health clinical assessments and immunizations
WIC Nutrition Program	Food, nutrition counseling, and access to health services provided to low-income women, infants, and children

Table 2: Core Public Health Services and Programs

School Health **Services Program, providing school health nurses in public schools across the state.** Services range from basic to comprehensive to full, based on funding availability.[22] (For a complete description of these different levels of school health services, see https://www.floridahealth.gov/programs-and-services/childrens-health/school-health/school-health-program.html).

Basic school health services include health appraisals; nursing assessments; child-specific training; preventive dental screenings and services; vision, hearing, scoliosis, and growth and development screenings; health counseling; referral and follow-up of suspected or confirmed health problems; first aid and emergency health services; assistance with medication administration; and health care procedures for students with chronic or acute health conditions.[22] Separate from CHDs but under the auspices of the FDOH, the Children's Medical Services System provides an array of programs that serve children with special health care needs (CSHCN) through 22 area offices. These services use statewide networks of specially qualified doctors, nurses, and other healthcare professionals that provide care to children with special needs. This program is closely coordinated with the state Medicaid program and is among the largest networks for CSHCN in the nation.

While CHDs are under the direct authority of FDOH, they must also be responsive to their county government through their County Commission. County health department budgets must be approved by both the County Commission and the State Health Office, and Florida law requires County Commission concurrence with the appointment of the county health officer or county administrator. Historically, CHDs in Florida have not been governed by county Boards of Health, with a few exceptions.

ACCREDITATION OF STATE AND LOCAL HEALTH DEPARTMENTS IN FLORIDA

State and local health departments are accredited by the Public Health Accreditation Board (PHAB), a nonprofit organization dedicated to advancing the continuous quality improvement (CQI) of tribal, state, local, and territorial public health departments.[23] In 2016, FDOH received first-in-the-nation national accreditation as an integrated department of health through PHAB.[24] This distinction signified that FDOH, including the state office and all 67 county health departments, had been "rigorously examined and meets or exceeds national standards for public health performance and continuous quality improvement."[24] In a recent press release by the Florida News, FDOH announced its reaccreditation as an integrated system by PHAB for the next five years.[24] State Surgeon General Ladapo stated, "Working to continually improve the quality and performance of our services allows the department to keep communities ahead of emerging health threats and ongoing health challenges."[25]

WITH WHICH PUBLIC HEALTH PROGRAMS AND SERVICES SHOULD PEDIATRICIANS BE MOST FAMILIAR?

The following public health services and programs are the most relevant for pediatricians who practice in Florida, especially those in private practice settings.

1. Immunizations

Providing childhood vaccines remains one of the most frequent reasons for visits to the pediatrician, and in Florida, there are two main options FDOH provides to support vaccinating children. First, a pediatrician may enroll in the federally-funded Vaccines for Children (VFC) program managed by FDOH, which provides vaccines to Medicaid-eligible children and VFC Program-eligible children who are not otherwise eligible for Medicaid. The VFC Program enrolls both Medicaid and non-Medicaid providers, who then provide immunizations to VFC Program-eligible children.[26] Vaccines are shipped directly to the pediatrician's office at no cost. Pediatricians may bill Medicaid for office visits and vaccine administration fees; VFC-eligible families not covered by Medicaid or Medicaid HMOs may be charged a vaccine administration fee. If a patient has no insurance and receives an immunization through Florida Shots, they can be billed for the administration fee. However, only one bill can be sent, and bills cannot be sent to collections. By rule, providers may not refuse administering a vaccine to a VFC-eligible child due to an accompanying adult's inability to pay an administration fee.[27] A second option available to the pediatrician is to refer VFC-eligible children directly to the nearest CHD, where they may receive the necessary vaccinations.

2. WIC and nutrition counseling

The special supplemental food program known as WIC is a nutrition-centered program for women who are pregnant or breastfeeding or who have recently been pregnant, and infants and children under age five years.[28] The WIC program provides not only financial support for the purchase of healthy foods but nutrition education, counseling, and breastfeeding support. Eligibility guidelines for WIC include all children enrolled in Medicaid and non-enrolled families who meet specific income criteria. Children may be determined to be "at risk" by being either underweight or overweight and receive nutrition counseling services from nutritionists at the CHD. This is one of the few options available for low-income families to receive counseling for children who are overweight. Breastfeeding support services vary by county, depending on the availability of a Certified Lactation Counselor; CHDs may also have a breastfeeding peer counseling program.

3. Children's Medical Services (CMS)

Children with special medical needs, including those with complicated, chronic, multi-system conditions may be referred to CMS to determine eligibility for clinical and supportive services. There are both general and clinical eligibility requirements. Typically, children with special health care needs younger than 21 years of age who have chronic physical, developmental, behavioral, or emotional conditions and who also require health care and related services of a type or amount beyond that which children generally require will qualify for CMS. Over the past decade, the CMS system has transitioned from regional offices providing care and wrap-around services to a statewide managed care organization as the service provider. Since 2021, Sunshine Health has been a managed care organization. Over 90,000 children are currently enrolled. Presently, Sunshine Health is jointly overseen by FDOH (CMS) and the Agency for Health Care Administration, which is responsible for the state Medicaid program. The general eligibility groups for CMS include the following:

- Medicaid eligible (Title XIX)
- Florida KidCare SCHIP (Title XXI)
- Children with Special Health Care Needs with family incomes over 200% FPL with spend-down to Medicaid levels
- High-risk pregnant females eligible for Medicaid

Clinical eligibility focuses more on medical conditions and includes medical, behavioral, or developmental conditions that have lasted or are expected to last at least 12 months. For example, these congenital, genetic, chronic, or catastrophic conditions are representative of those covered by CMS:

- ADD/ADHD
- Brain and Spinal Cord Injuries
- Cancer
- Cystic Fibrosis
- Diabetes
- Hemophilia
- Sickle Cell Anemia
- Spina Bifida

The benefits of CMS program services span the full range of care, including prevention and early intervention services, primary and specialty care, and long-term care for medically complex, fragile children. Families may receive other services that are medically necessary, such as respite care, genetic testing, genetic and nutritional counseling, and parent support.[29]

CMS also has other roles and services. It is the agency responsible for Florida's infant metabolic screening program for early recognition of genetic disorders. The infant hearing screening program was among the first to be established in the nation. Additionally, CMS oversees the Poison Control Center network. Child Protection Teams operate statewide in close collaboration with the Department of Children and Families to detect children suffering from abuse and neglect. Early Steps, Florida's early intervention program, is another important program under the CMS umbrella.

4. Other services for infants, children, and adolescents

In addition to the three program areas detailed above, the following list includes other FDOH services of which pediatricians should be aware:

- Lead poisoning/testing: https://www.floridahealth.gov/environmental-health/lead-poisoning/parent-info.html
- Safe Kids Florida, which includes the provision of car seats: https://www.floridahealth.gov/programs-and-services/safe-kids-florida/index.html
- Family planning, including services for teens: https://www.floridahealth.gov/programs-and-services/womens-health/family-planning/index.html
- Sexually transmitted infections screening, diagnosis, and treatment: https://www.floridahealth.gov/diseases-and-conditions/sexually-transmitted-diseases/index.html

HOW CAN PEDIATRICIANS AND HEALTH DEPARTMENTS WORK TOGETHER TO SUPPORT PUBLIC HEALTH?

State and local health department representatives play an essential role in educating lawmakers about the needs of their communities; however, as governmental health employees, public health officials cannot advocate or lobby elected officials on behalf of public health programs and policies. Notwithstanding these limitations, advocacy for public health programs, policies, and positions is critical to maintaining the mission of public health to "fulfill society's interest in assuring conditions in which people can be healthy."[30] Therefore, governmental public health frequently relies on other entities to advocate for local and state policies that protect and improve the health of all people and their communities.[31] One critical partner for local and state public health departments is the American Academy of Pediatrics (AAP).

AMERICAN ACADEMY OF PEDIATRICS

Historically, the American Academy of Pediatrics (AAP) has been one of the most important organizations for ensuring the public's health. This member organization of 67,000 pediatricians is committed to "the optimal physical, mental, and social health and well-being for all infants, children, adolescents, and young adults."[32] Since its founding in 1930, the AAP has served as a unified voice for collective action through policy, advocacy, and education. In addition to the national organization, AAP has 59 chapters in the United States and seven in Canada. The Florida Chapter of the AAP (FCAAP) comprises 2,500 members, and its advocacy efforts help shape the laws and policies that govern the delivery of children's healthcare services in Florida.[33]

ADVOCACY PROGRAMS AND POLICIES

As an example of Florida-specific advocacy on the part of pediatricians, the following section describes policy statements and advocacy efforts by AAP and others to protect individuals from tobacco, including the hazards of secondhand smoke and an innovative program designed to empower youth to work towards a tobacco-free future. Additionally, we identify two emergent public health crises that will require an *all-hands-on-deck* approach to protect the public's health: vaccine hesitancy and gun safety.

TOBACCO

The Florida Clean Air Act (FCIAA) was enacted in 1985 by the Florida Legislature to protect people from the health hazards of secondhand smoke. In 2003, the legislature passed a voter-approved amendment to prohibit smoking in workplaces that previously allowed smoking. In 2019, electronic vapor products were included in the FCIAA and, therefore, prohibited in indoor workplaces.[34] AAP has continuously advocated for greater restrictions on the use of tobacco products in all indoor and outdoor public places.

According to an AAP Issue Brief, "Not only are children more likely to suffer health consequences from exposure to secondhand smoke, but adolescents are the age group most susceptible to becoming addicted to tobacco products."[35] Therefore, AAP recommends that pediatricians should counsel parents about the importance of maintaining tobacco-free environments for children, including homes, cars, schools, childcare programs, playgrounds, and other venues. Furthermore, at the individual level, the AAP encourages pediatricians to seek appointment to the state tobacco advisory committee to advise the Surgeon General on the direction and scope of the Comprehensive Statewide Tobacco Education and Use Prevention Program as outlined in the state constitution. In Florida, the Tobacco Advisory Council meets quarterly to recommend policies to encourage a coordinated response to tobacco use in the state.[36] Additionally, FCAAP convenes issue-oriented task forces to effect real change around the most pressing pediatric health challenges facing Florida's children, including an e-cigarette task force to promote health policies and best practices on vaping and support curbing the vaping epidemic in the pediatric population.[37]

Students Working Against Tobacco (SWAT)

In 1997, the State of Florida settled a lawsuit against tobacco companies; the late Governor Lawton Chiles directed settlement monies to fund a state program to prevent youth smoking.[38] In 1998, Florida established Students Working Against Tobacco (SWAT), a youth-led program to "develop a coordinated, unified assault against the manipulation of Big Tobacco… (through) tobacco prevention activities."[39] Under the guidance of FDOH, SWAT has become an important part of the political process in Florida, educating key decision-makers about the necessity of tobacco prevention. SWAT chapters exist in all 67 counties in Florida and are divided into one of five regions. Pediatricians can connect with the Regional Tobacco Prevention Coordinator in their region by visiting:

- http://www.gen-swat.com/gen-swat1/contact.html

VACCINE HESITANCY

AAP remains a steadfast champion of preventive care, including immunizations, as a major component of pediatric health care and disease prevention. Therefore, advocacy efforts by AAP focus on educating the public and key decision-makers about the importance of routine child immunization and actively countering misinformation about vaccine safety and efficacy.[40] However, as stated by Olson and colleagues, "Parental vaccine hesitancy is becoming an increasingly important public health concern in the United States."[41] According to the WHO's Strategic Advisory Group of Experts on Immunization (SAGE), vaccine hesitancy refers to "[d]elay in the acceptance or refusal of vaccines despite the availability of vaccination services. Vaccine hesitancy is complex and context specific, varying across time, place, and vaccines. It is influenced by factors like complacency, convenience, and confidence."[42]

Despite overwhelming evidence of the effectiveness and safety of vaccinations, parental vaccine hesitancy is prevalent in the United States.[43] These concerns have only been exacerbated by the COVID-19 pandemic. Results of a recent survey by the Kaiser Family Foundation (KFF) suggest that many parents are adopting a *wait-and-see approach before vaccinating their child, and approximately 30% said they would* "definitely not" get their child under five years of age vaccinated for COVID-19. Parents' primary apprehensions were related to unknown long-term effects and serious side effects of the vaccine, including concerns that the vaccine may affect their child's future fertility despite the absence of evidence of such an effect.[44]

As reported by Messerly and Mahr, one of the biggest fears among public health experts, pediatricians, immunization advocates, and state officials is that "an increasing number of families are projecting their attitudes toward the COVID-19 vaccine onto shots for measles, chickenpox, meningitis and other diseases."[45] Additionally, concerns have been raised regarding state legislatures either removing or limiting school vaccination requirements, which may lead to greater vaccine hesitancy among parents of school-age children. Based on the results of a nationally representative survey, Hammershaimb and colleagues stated that efforts to ensure COVID-19 vaccine uptake should include messaging to increase overall confidence in the COVID-19 vaccine among U.S. adults.[46] Belief in the benefits of COVID-19 vaccination and acceptance of routine childhood vaccines were the strongest predictors of parents' intention to vaccinate their children.

Eller and colleagues suggested that providers can be key in encouraging parents to follow the recommended vaccine schedule.[47] The researchers noted that while most parents trusted their child's doctor for vaccine information, mothers who had less trust in their health providers more frequently reported using more informal and potentially less reliable sources of vaccine information (e.g., internet, family and friends, media other than internet). Therefore, it is imperative that pediatricians maintain trusting relationships with patients to ensure compliance with the recommended vaccine schedule and to minimize conflicting reports and suggestions from less dependable data sources.

In a recent press release, FCAAP President Lisa Gwynn stated, "FCAAP and the American Academy of Pediatrics (AAP) are dedicated to protecting Florida's children and will continue to urge Gov. DeSantis to allow parents who choose to do so the option to vaccinate their young children against COVID-19."[48] Moreover, FCAAP affirmed that COVID-19 vaccines for children are "safe, effective, and the best available tool to prevent serious illness."[48] Unfortunately, that press release resulted in the removal of Dr. Gwynn from the board of directors of the Florida Healthy Kids Corporation, as her statements were viewed as "very political" by Florida's chief financial officer.[49] This action demonstrated that advocacy, even when supported by science, can still carry political risk but is required for advancing crucial public health policies and programs.

GUN VIOLENCE

According to the Pew Research Center, more than 45,000 people died from gun-related injuries in the United States in 2020, the most recent year for which complete data are available. This number represents a 14% increase from 2019 and a 43% increase from 2010, and it includes suicides (54%), murder (43%), and other (3%), such as unintentional, involved law enforcement, or undetermined circumstances.[50] Moreover, in 2020, gun violence overtook motor vehicle accidents to become the number one cause of death for U.S. children and adolescents.[51]

In a recent report issued by The Trace, the authors noted a dramatic rise in youth suicide, with the sharpest increases among people of color. Between 2011 and 2020, "The firearm suicide rate more than doubled among Black, Latino, and Asian teenagers, while it increased by 88 percent for Native Americans and 35 percent for white teens."[52] Findings from a qualitative study of factors associated with childhood suicide (children aged 5 to 11) revealed that firearms were the second most prevalent method of suicide, behind hanging or suffocation, and among all cases with detailed information, all of the children/adolescents who completed suicide with guns used guns that had been stored in an unsafe manner.[53]

The Florida Medical Association was an early supporter of counseling patients on the safe storage of guns in the home. Similarly, the AAP has been a longtime advocate for meaningful policy change to keep children safe from guns. In a recent AAP press release, Dr. Lee, incoming chair of the AAP Council on Injury, Violence, and Poison Prevention, stated:

> We as a country need to take a public health approach that mixes safe storage of guns at home to keep them out of the hands of children and teenagers and common-sense legislative approaches that reduce the incidence and impact of community violence.[54]

Based on the advocacy efforts of the AAP and other physician, nurse, and hospital groups, President Biden signed the Bipartisan Safer Communities Act into law at the end of June 2022. This legislation includes measures to limit access to guns among young adults, individuals who have committed acts of domestic violence, and individuals who are considered a danger to themselves or society.[55] According to the AAP president, this bill also includes "funding to expand mental health services for children and adolescents in communities and schools, and funds and reauthorizes the AAP-championed Pediatric Mental Health Care Access program," which supports pediatricians with telehealth consultation by child mental health provider teams.[56]

The AAP recommends that pediatricians address firearm safety as part of routine care for families with children of all ages. The AAP offers pediatricians training and resources that help them have productive conversations about how best to store firearms to protect children and young people. One resource available to pediatricians is the AAP Gun Safety Campaign Toolkit, available here:

- https://www.aap.org/en/news-room/campaigns-and-toolkits/gun-safety/

Florida pediatricians can assume a leadership role on the topics of gun violence and gun safety through FCAAP's gun violence task force, whose mission is to educate pediatricians and the community on the risks and dangers of gun violence and provide resources regarding gun safety education and training, mental health resources, and reasonable legislative measures to curb the safety risks to children and families.[37]

CONCLUSION

Public health and pediatricians are natural allies–both focus on infant, child, and adolescent health and well-being, strongly emphasizing primary prevention (i.e., vaccinations). For the practicing pediatrician, knowledge of the resources and services available through FDOH's county health departments and other offices–especially CMS–can amplify and extend the care provided in the private practice office. If readers of this article react by saying (of FDOH), "I didn't know they offered that," then the article will have achieved its

purpose. Pediatricians can have a direct voice in health department activities–as any citizen can–by attending County Commission meetings when the health department budget is being presented or when there is a new appointment of an administrator or health officer. However, pediatricians are especially well-positioned, through the FCAAP, to advocate for evidence-based interventions and community-based programs that protect the public's health, as the examples on tobacco, vaccine hesitancy, and gun violence prevention demonstrate.

Understanding the structure of the local health department, how public health programs and services can best meet the needs of children and families, and how pediatricians can partner with their county health department empowers pediatricians to make full use of available resources. Moreover, fully participating in organizations like FCAAP to advocate for needed public health policies, programs, and funding strengthens the overall health system and ensures access to services to the most vulnerable populations in Florida.

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STUDENT CASE REPORT

Another Face of Late-Onset Group B Strep Sepsis

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ABSTRACT

Group B Streptococcus (GBS) infection in neonates is one of the most common causes of neonatal sepsis in the United States.[1] While many infants present within the first six days of life with sepsis, late-onset GBS sepsis can also occur. This case explores an 11-day-old male with very subtle behavior changes who did not have key history factors such as GBS colonization in his mother. Additionally, the presented case illustrates the importance of paying attention to parents' concerns, evaluating a newborn for sepsis, and initiating empiric antibiotic therapy.

PRIMARY OBJECTIVE

To explain a case of a subtle presentation of late-onset GBS sepsis, explore the importance of paying attention to parents' concerns, and initiating empiric antibiotic therapy for infants.

BACKGROUND

Group B Streptococcus (GBS) infection in neonates is one of the most common causes of neonatal sepsis in the United States.[1] It affects around 0.5 per 1000 live births. The incidence of early-onset GBS has declined since the 1990s.[2, 3] Early-onset sepsis presents from birth to day 6 of life; late-onset GBS sepsis occurs in babies from 7 days up until several months old. [4] These infants can still face a GBS infection even if mothers screen negative for GBS during pregnancy. Although early-onset GBS infection is usually acquired perinatally during the passage through the birth canal, it can be spread through skin-to-skin contact or exposure in the hospital.[4] Late-onset cases of GBS can have a variety of presentations[5]. Neonates can present with bacteremia[6] while 25-30% of cases present with meningitis.[7] Infants usually present with fever and a recent history of upper respiratory infection.[6]

There is currently no effective approach for the prevention of late-onset disease. Still, a current research direction is to develop a GBS vaccine to prevent all GBS neonatal sepsis.[8] GBS sepsis can have many serious sequelae, such as cerebral palsy, intellectual disability, seizures, hearing loss, and visual impairment.[9] With such serious consequences as these, a high index of suspicion and early recognition of sepsis symptoms, often non-specific and subtle, is critical. Empiric antibiotic treatment in neonates is imperative to prevent the sequelae of GBS sepsis.

CASE

An 11-day-old male born at 39 weeks plus five days gestation via spontaneous vaginal delivery was seen in the emergency department with a one-day history of crying, fussiness, eating less, and non-bilious non-bloody emesis on three occasions. He was afebrile at home and did not receive any medications or home treatments.

There was no maternal history of GBS colonization, all routine antenatal serologies were non-reactive, and the mother was rubella-immune. The pregnancy, labor, and delivery were uncomplicated. Examination of the infant showed a rectal temperature of 37.9° C, blood pressure of 76/47 mm of Hg, pulse rate of 187/minute, respiratory rate of 32/min, and SpO2 on pulse oximetry of 99% on room air. He was consolable and had mild jaundice. The rest of the physical examination was unremarkable. He underwent a sepsis evaluation, including blood and urine cultures. A lumbar puncture was performed for cerebrospinal fluid (CSF) evaluation and cultures.

Laboratory testing revealed a CBC with a WBC count of 35.10/dL with 73% neutrophils, 17% lymphocytes, 3% monocytes, and 7% bands. He had an ESR of 26 mm/hr, a CRP of 8.5 mg/dL, and a procalcitonin of 25.83 ng/mL. His blood glucose was 61 mg/dL. His CSF showed 7 WBCs with 81% lymphocytes, 19% monocytes, and 2 RBCs, with a glucose of 57 mg/dL and protein of 51 mg/dL. No organisms were seen on the CSF Gram stain. Herpes simplex virus and enterovirus polymerase chain reactions were negative. A respiratory rapid viral panel was negative. An abdominal radiograph was unremarkable.

The patient was started empirically on IV ampicillin and gentamicin and admitted to the hospital. His blood culture was initially reported to show Gram-negative cocci in chains and pairs, later corrected to Gram-positive cocci in chains and pairs. It was subsequently identified as group B streptococcus at 72 hours of blood culture incubation. His urine and CSF cultures were sterile. Gentamicin was discontinued. He showed clinical improvement and was discharged after ten days of intravenous antibiotic treatment.

DISCUSSION

GBS sepsis is a potentially severe disease in neonates, and one must have a high level of clinical suspicion even if presenting after the first week of life. In this case, the presentation was missing several classical risk factors, such as a GBS-positive mother and a history of fever. It is essential to reiterate to parents of young children who are usually very attentive to small changes in behavior from their children, and these small changes, such as fussiness, not eating well, not sleeping, or sleeping too much, may be the only presentation of neonatal sepsis.

It is a well-accepted and time-tested practice to evaluate neonates if sepsis is a consideration and use empiric antibiotics while awaiting the results of cultures. Most neonates evaluated for sepsis are not confirmed to have a bacterial infection. However, the use of empiric antibiotics remains the holy grail of management of "rule out sepsis" in neonates. This is standard teaching for trainees to initiate antibiotic management in neonates who are being evaluated for neonatal sepsis before significant morbidity occurs. There is evidence that earlier antibiotic treatment results in lower morbidity and mortality.[10]

This case illustrates the importance of paying attention to parents' concerns, evaluating a newborn for sepsis, and initiating empiric antibiotic therapy.

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STUDENT CASE REPORT

A Rare Case of Persistent Chylothorax

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ABSTRACT

Chylothorax is a condition referring to the presence of chyle in one or both pleural cavities. Chylothorax is an especially rare condition in the pediatric population. It most often occurs secondary to infection, iatrogenic or non-iatrogenic trauma, malignancy, or congenital malformations. Prompt diagnosis and effective treatment of chylothorax in a pediatric patient is essential as this condition is associated with significant morbidity and mortality. This case describes a persistent chylothorax in a 12-year-old boy who initially presented to a community hospital emergency room complaining of chest pain. Radiologic examinations included chest X-rays, ultrasounds, and computed tomography scans. After failed conservative management, the patient was eventually transferred to a tertiary academic institution for more specialized care. Additional testing was performed, including lymphoscintigraphy and genetic panels. Results of lymphoscintigraphy were normal, while genetic testing showed four variants of undetermined significance. We discuss the ongoing medical management and maintenance of a pediatric patient who remains stable with persistent chylothorax.

CASE REPORT

We present a case of chylothorax in a previously healthy 12-year-old boy who initially presented to his primary care provider (PCP) with chest pain. The patient reported intermittent chest pain for approximately one month. He was diagnosed with pectus excavatum and referred to pediatric cardiology for further evaluation. An echocardiogram performed by the cardiologist revealed an incidental right pleural effusion, which prompted the patient's immediate referral to the community hospital emergency department.

Upon arrival, a thorough history was obtained. The patient's mother reported that his symptoms may be related to a fall from his bicycle approximately 3-4 months prior, in which the patient flew over the handlebars and landed on his chest. The intermittent chest pain had no exacerbating or alleviating factors. He denied any additional symptoms, including shortness of breath, difficulty breathing, palpitations, recent or current fever, chest pain with exertion, syncope, night sweats, weight loss, or cough. Physical exam was unremarkable besides a pectus excavatum deformity. Pulmonary auscultation was significant for an expiratory wheeze in the

posterior right upper lung. Vital signs were normal for age. Laboratory studies were within normal limits except for mild anemia (hemoglobin 12.8 g/dL, hematocrit 38.7%) and an elevated alkaline phosphatase level (561 U/L). An electrocardiogram (ECG) on initial evaluation revealed a right bundle branch block.

Several imaging modalities were utilized, including chest X-ray (CXR), ultrasound (US) pleural effusion survey, and computed tomography (CT) of the thorax, abdomen, and pelvis. CXR revealed a patchy atelectasis or infiltrate in the right middle lobe **(Figure 1)**. CT revealed an airspace opacity in the right perihilar region and pleural effusion on the right. **(Figure 2).** US confirmed these findings, indicating a right pleural effusion with a volume of approximately 900 mL. The patient was admitted to the pediatric hospitalist service for continued management. Thoracentesis was performed with chest tube placement, producing 550 mL of milky fluid. Initial conservative management included a low-fat diet, and the chest tube was set to suction.

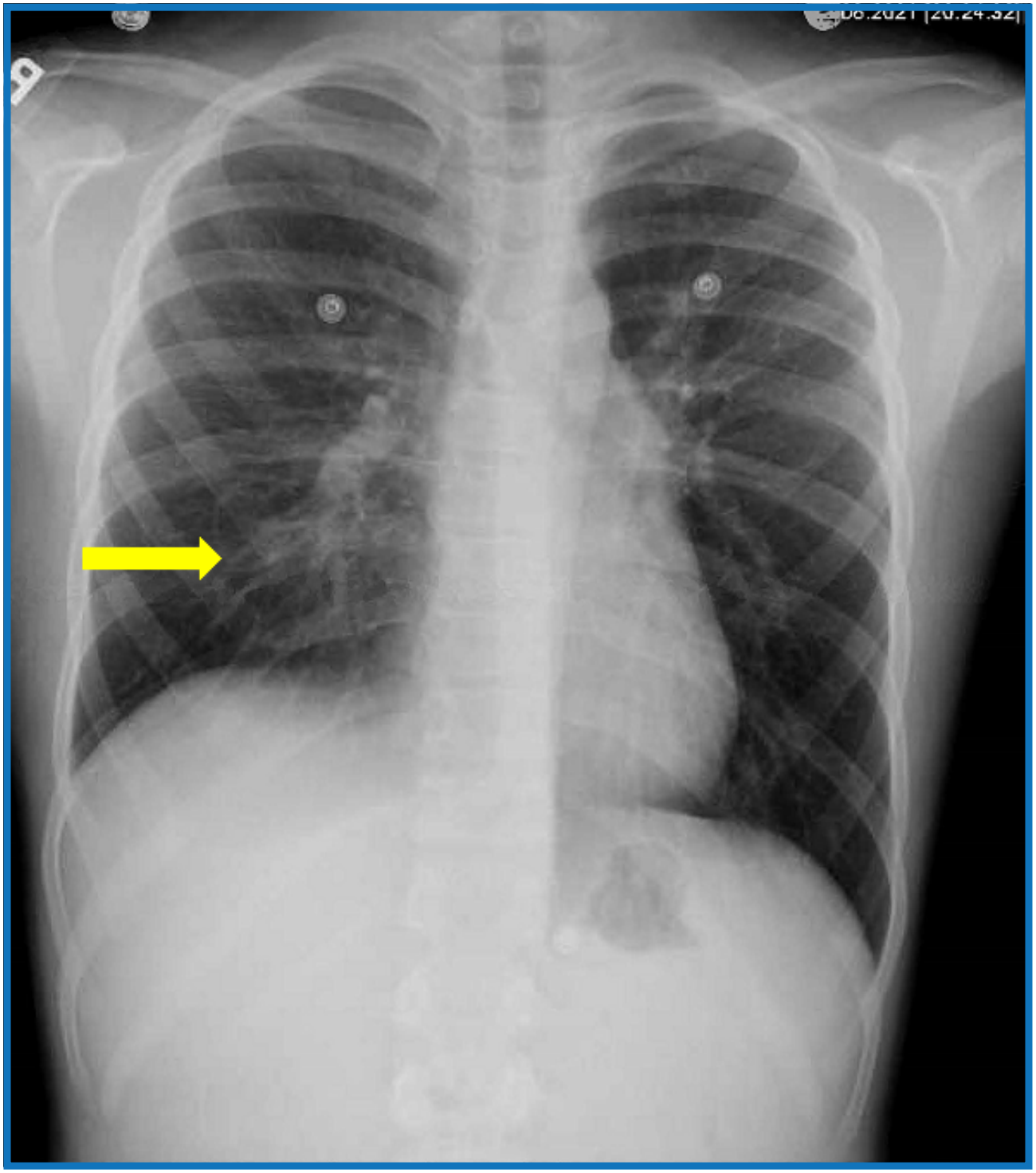

Figure 1: Chest X-ray showing a questionable pectus excavatum deformity, and patchy atelectasis or infiltrate of the right middle lobe.

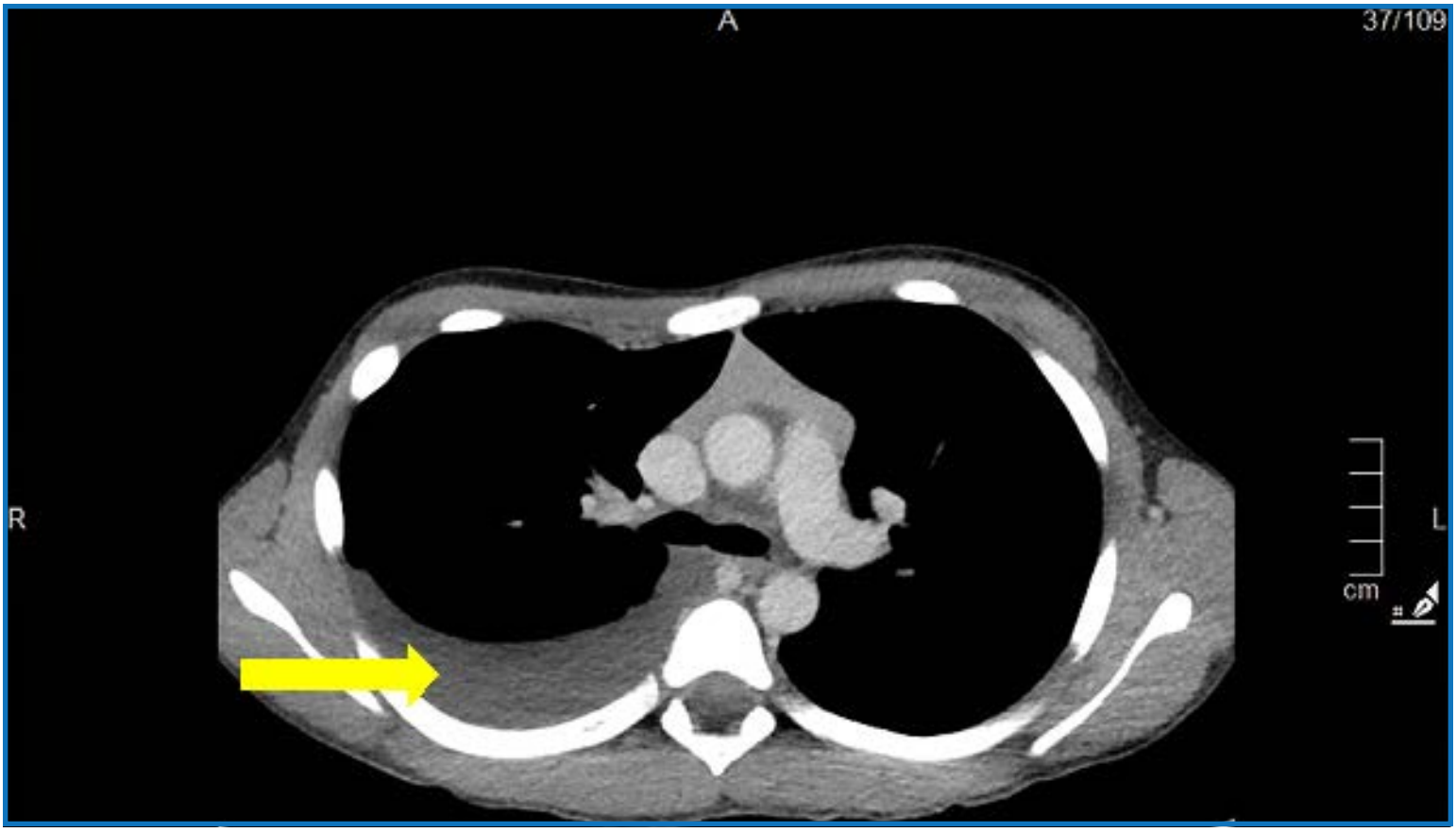

Figure 2: CT imaging significant for right-sided pleural effusion.

Several pleural fluid analyses confirmed the presence of a chylothorax. Results showed amylase 12 U/L, glucose 155 mg/dL, lactate dehydrogenase (LDH) 144 U/L, and triglycerides 1887 mg/dL. The pleural fluid triglyceride concentration above 110 mg/dL was sufficient to confirm the fluid as chylous.[4] Additionally, chyle is a lymphocyte-dominant fluid with cell counts of 80% lymphocytes or higher.[4] The pleural fluid cytology in this case was significant for a lymphocyte count of 99%, further confirming a chylothorax. Flow cytometry of pleural fluid showed no immunophenotypic abnormalities, and cultures for any infectious etiology were negative. Additional hematologic analysis showed normal immunoglobulin levels, LDH, uric acid, C-reactive protein (CRP), and erythrocyte sedimentation rate (ESR). Flow cytometry of peripheral blood indicated no presence of a non-Hodgkin's lymphoma or acute leukemia. QuantiFERON and heterophile antibody testing proved negative for tuberculosis and infectious mononucleosis, respectively. These analyses presumably ruled out infectious and malignant causes of chylothorax.

Conservative management was continued for the subsequent 1-week period that the patient remained admitted in the community setting. A total of 720 mL of chylous fluid drained from the chest tube over the next five days. Due to the failure of chest tube output to cease, the patient was transferred to a tertiary academic pediatric center for subspecialty care.

Upon arrival, a peripherally inserted central catheter (PICC) line was placed to deliver total parenteral nutrition (TPN) with intralipids and continuous intravenous Octreotide. The patient was only allowed oral medium chain triglyceride (MCT) oil and clear liquids. Despite these interventions, the chylothorax persisted. Lymphoscintigraphy was performed, which showed no evidence of extravasation. Repeat CT imaging confirmed the presence of a persistent, low-output right pleural effusion. The treatment plan consisted of IV octreotide, TPN and lipids, and chest tube output monitoring, which was continued for 14 days after transfer.

Despite the persistence of the chylothorax, daily chest tube output gradually subsided over the 14 days. This gradual improvement prompted the discontinuation of TPN and IV octreotide. During this time, a consultation was performed by the clinical geneticist. Physical exam features, including myopia, high-arched palate, positive Marfan (Walker–Murdoch) wrist sign, pectus excavatum, and a borderline large aorta seen on cardiac echo, prompted ordering a DNA genetics panel, which would investigate for possible Marfan syndrome, Noonan Syndrome, and other connective tissue disorders.

The patient was discharged 19 days after transfer. Upon follow-up with pulmonology one month later, the patient was readmitted to the hospital after imaging revealed a persistent right-sided pleural effusion. The patient was asymptomatic and cleared for discharge. Follow-up after one month showed a stable chylothorax.

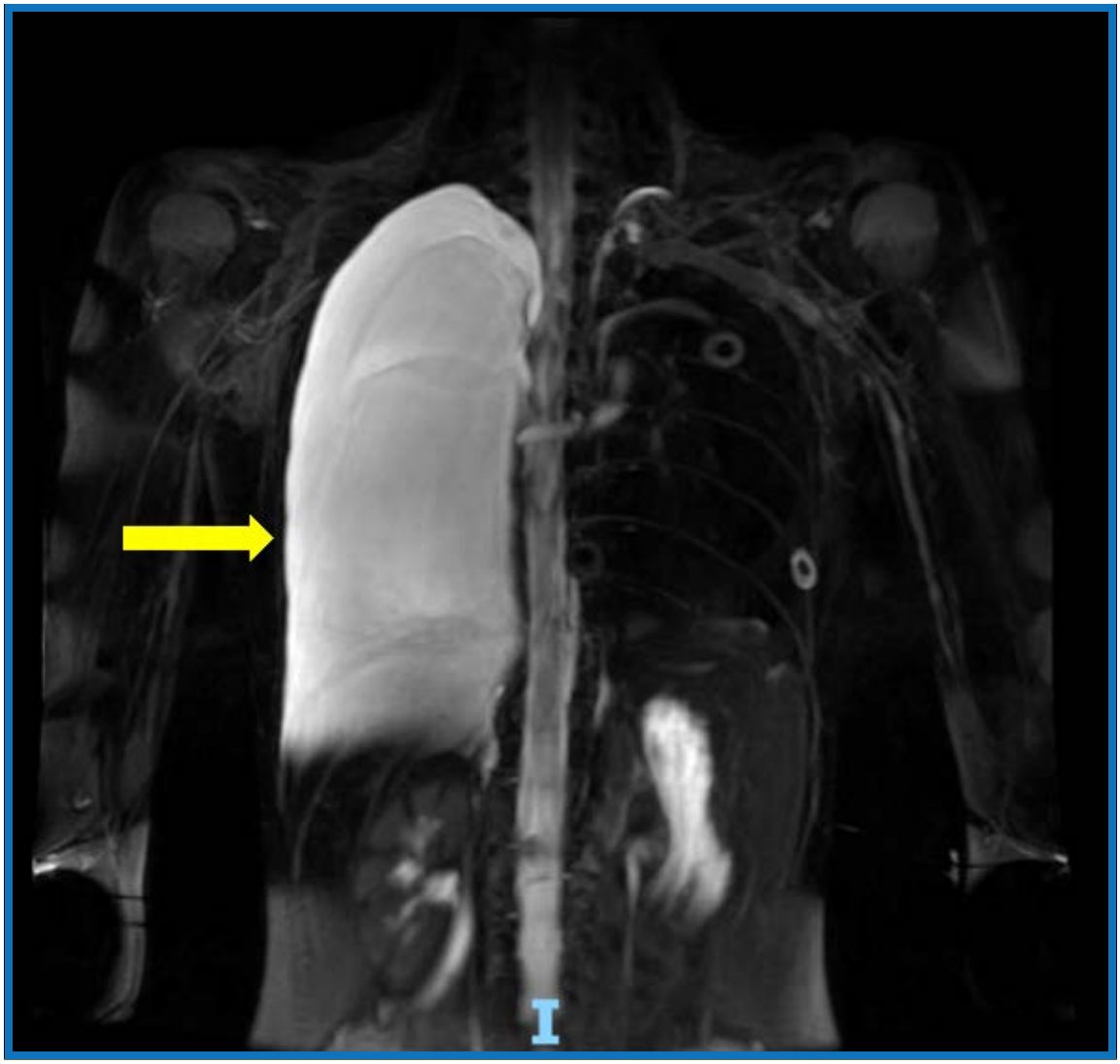

Figure 3: MR lymphangiogram demonstrating a large right pleural effusion

Genetic testing revealed four variants of undetermined significance in the following genes: ABL1, ADAMTS17, B4GALT7, and C1S. The variant in one copy of the ABL1 gene may cause symptoms as it follows an autosomal dominant pattern. This gene is associated with various skeletal malformations and congenital heart defects. The single variants of undetermined significance in the subsequent genes are all inherited in a recessive manner and, as such, are unlikely to contribute to the patient's features. Further genetic counseling was recommended, as well as surgical correction of the patient's pectus deformity and a possible thoracic duct embolization if complete resolution of chylothorax cannot be achieved in the future.

In the months following, the patient underwent MR and intranodal lymphangiograms, which showed no evidence of lymphatic leakage. The studies demonstrated good flow from the thoracic duct into the left subclavian vein without any evidence of obstruction. He continues to require bimonthly thoracentesis. It was determined by the interventional radiology specialists that he likely does have a leak in his lymphatic system but that it is too small to be visualized. While the presentation was initially concerning for an underlying complicated vascular anomaly, none was found. Ultimately, the lymphatic leak was attributed to trauma from his bicycle accident as the most likely etiology.

DISCUSSION

Chylothorax refers to the accumulation of chylous fluid in the pleural spaces. This condition is exceptionally rare in children and adolescents and has the potential to cause significant morbidity and mortality. Chylothorax can lead to significant respiratory distress, fluid imbalances, malnutrition, and secondary immunodeficiency if not appropriately diagnosed and treated.[2,5] Although chylothorax is a rare and challenging condition to identify, its diagnosis is crucial as untreated cases are almost always fatal.[6]

The diagnosis of chylothorax is facilitated initially through imaging modalities, including X-ray, ultrasound, and CT scan, which are used to identify fluid collections and assess the size and location of pleural effusion. Once identified, chyle obtained via thoracentesis is typically characterized by a white, odorless, milky pleural fluid. The specific composition of the fluid is characterized by a high

triglyceride content, elevated protein, and albumin level, along with a high cell count (>1,000 cells/mcL) predominately composed of >80% lymphocytes.[7]

There is a diverse array of etiologies to consider in diagnosing a pediatric chylothorax. Congenital etiologies include lymphatic malformations and genetic syndromes such as Noonan Syndrome, Turner Syndrome, and Gorham-Stout Syndrome. Traumatic chylothoraces often result from injury during operations for congenital heart malformations, lymph node excisions, and therapeutic procedures such as subclavian vein catheterization. Other traumatic causes include blunt or penetrating injuries and even actions like coughing and vomiting that may induce a chylothorax. Additionally, malignant etiologies must be considered, including conditions such as neurogenic tumors and lymphomas. Finally, granulomatous infections such as tuberculosis must be thought of as well.[2,8]

Specifically, in this case, with the exclusion of malignant and infectious etiologies through laboratory testing, we were left to consider a traumatic fall from a bicycle 3-4 months before the patient's onset of chest pain. Of note, literature shows that a traumatic chylothorax usually presents after a latent period of 2 to 10 days between the trauma and the onset of pleural effusion.[2,9] With normal lymphoscintigraphy, lymphatic malformation was also largely ruled out.

As in this case, initial management of chylothorax in a pediatric patient should begin conservatively to relieve respiratory symptoms, prevent recurrence, and treat or avoid malnutrition and immunodeficiency.[6] Treatment should begin with chest tube placement and initiation of a low-fat diet with MCT oil supplementation to reduce lymphatic production.[7,10] TPN with IV intralipids should be started if the chyle output does not subside. Additionally, a trial of octreotide or somatostatin can be started as these medications have been shown to reduce lymphatic fluid production via vasoconstriction of the splanchnic circulation.[2] If chylothorax persists after 2-4 weeks of conservative management, surgical management with thoracic duct ligation, pleurodesis, or pleuroperitoneal shunt placement should be considered.[2,5] Of note, a lymphatic leak will sometimes close after a lymphangiogram with ethiodol by causing an embolic effect at the leak site.

CONCLUSION

Chylothorax is a rare and life-threatening condition in the pediatric population. With a wide array of etiologies, clinicians must thoroughly explore many potential congenital, traumatic, malignant, and infectious causes. Identification and treatment of this condition must be prompt and effective, as chylothorax is associated with high morbidity and mortality. This case highlights a standard procedure for managing persistent chylothorax in a child.

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STUDENT ORIGINAL RESEARCH

The Impact of Infant Feeding Method on Post-Urologic Surgery Recovery Outcomes

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ABSTRACT

Objectives/Background

Breastmilk is rich in immunoglobulins, carbohydrates, fats, vitamins, and other nutrients, which have numerous health benefits for infants. Many studies have been done on the copious health benefits of breastfeeding for infants; however, there is scant literature comparing surgical outcomes in infants who were breastfed versus infants fed solely with infant formula. This study aimed to show that breastfed infants have less postoperative pain overall and spend less time in the post-anesthesia care unit (PACU) than formula and clear liquid-fed infants.

Methods

A retrospective chart review was conducted on 168 male infants aged 0-12 months who underwent circumcision at Nemours Children's Hospital in Orlando, Florida, from January 2014 to December 2020. The infants were sorted based on their feeding methods: breast, formula, or clear liquid fed. Postoperative face, legs, activity, cry, consolability pain score, the type/amount of pain medication administered, and postoperative time of discharge were compared among the three cohorts.

Results

Patients fed infant formula spent an average of 15.42 minutes less in the PACU when compared with infants fed clear liquids ($p = 0.023$). There were no significant differences in PACU time between breastfed versus infant formula-fed patients or breastfed versus clear liquid-fed patients.

Conclusions

The results indicate little difference in recovery outcomes among infants who were breastfed, formula-fed, or given clear liquids in the PACU. There was a faster discharge and lower recovery time on formula-fed infants versus clear liquid-fed infants, probably because they were more satisfied.

INTRODUCTION

Breastmilk is known to have numerous health benefits for infants and is often considered the best source of their nutrition. These benefits include brain, immunological, and gastrointestinal development by providing essential nutrients for infant growth.

Breastmilk has significant immune-boosting effects on infants due to its high levels of immunoglobulins.[1,2] Breastmilk also contains many beneficial microbes and oligosaccharides that reduce infection and regulate microflora in the gastrointestinal tract.[2] This allows for the proper synthesis of folate and vitamins K, B6, and B12, all essential for infants.[1] Such immunologic benefits have led to breastmilk being referred to as the first "immunization" infants receive. Breastfed infants also have significantly lower rates of diarrhea, upper respiratory tract infections, obesity, and immune-mediated diseases such as asthma, eczema, food allergies, and even type 1 diabetes.[1,3]

In addition to immune and developmental benefits, breastmilk has also been demonstrated to have analgesic effects for infants. Multiple studies have shown that for infants who underwent venipuncture and heel prick blood collection, those who were given breastmilk on pacifiers during the procedure had reduced pain scores compared with infants who were offered water on pacifiers, swaddled, or who were just held by their mothers.[4,5] Pain score quantification included parameters of crying, grimacing, and heart rate differences.

Infant formula is an alternative feeding method that was developed to closely mimic the properties of breastmilk. Soy or cow's milk is often used for the formula base with supplemental ingredients such as casein protein, vitamins, minerals, iron, and fat blends.[6] Although infant formula tries to emulate the nutritional composition of human breastmilk, there is a question of whether it can mimic the analgesic effects of breastmilk.

Although many studies have been done on the numerous health benefits of breastfeeding for infants, there is scant literature comparing surgical outcomes in infants who were breastfed versus infants fed solely with infant formula. The primary goal of our study was to explore the difference in post-urologic surgery recovery outcomes among male infants who were breastfed, formula-fed, or given clear liquids (i.e., apple juice, oral electrolyte solution) in the post-anesthesia care unit (PACU) in terms of their postoperative Face, Legs, Activity, Cry, Consolability (FLACC) pain score, the type/amount of pain medication administered, and their postoperative time of discharge.

We hypothesize that infants who were given breastmilk will have less postoperative pain overall and will spend less time in the PACU compared with infants who were given infant formula and clear liquids.

METHODS

We performed a single-site retrospective chart review consisting of male infants classified as American Society of Anesthesiologists 1 or 2, aged 0-12 months, who underwent a circumcision under general anesthesia and regional anesthesia. All patients received presurgical caudal analgesia (1 ml/kg of 0.2% ropivacaine, maximum of 20 ml) after mask induction of general anesthesia and intravenous line placement. Data were collected from the electronic medical record (Epic Systems Corporation, Verona, WI) on patients who underwent these procedures from January 2014 to December 2020 at the Nemours Children's Hospital in Orlando, Florida. Only one surgeon performed all cases. We received approval from our institutional review board. Data from 167 patient charts were used in the final analysis. Information collected from patient charts included surgical service, date of birth, surgery date, primary procedure name, postoperative medication administered, time in the operating room, time out of the operating room, total PACU time, postoperative FLACC pain score, and patient feeding method. Infants who did not receive caudal analgesia were excluded. -

The patient data were divided into three groups based on the postoperative feeding method, as noted in the chart. These three groups included breastfed, infant formula-fed, and clear liquid-fed (water, oral electrolyte solution, or apple juice). For breastfed infants, mothers directly nursed the patients in the postoperative unit. Variables analyzed included postoperative FLACC pain score, type of pain medication received, and postoperative time of discharge (total time spent in PACU). The FLACC pain scores were then averaged for each patient and recorded as one score. The FLACC scores for each feeding group were analyzed using descriptive statistics and the analysis of variance test. The type of pain medication administered was organized into three data groups: morphine/fentanyl (opioids), acetaminophen/ibuprofen, or none. The type and amount of medication administered to infants in each feeding group were analyzed using descriptive statistics and analysis of variance test. The time of discharge was recorded as a sum of time spent in phases 1 and 2 of the PACU. Mean differences in time spent in the PACU between groups were analyzed using the Tukey Honestly Significant Difference test. All data were analyzed using SPSS version 27.0 (IBM Inc., Armonk, NY) with the significance value set at $p < 0.05$.

RESULTS

There was no statistically significant difference among the demographics (Table 1). Breastfed infants received the lowest amount of morphine and/or fentanyl among the three groups, with 9.5% of breastfed infants receiving morphine and/or fentanyl compared with 20.3% of formula-fed infants and 12.5% of clear liquid-fed infants. Breastfed infants also received the lowest amount of ibuprofen and/or acetaminophen among the three groups, with 9.5% of breastfed patients receiving ibuprofen and/or acetaminophen compared with 15.6% of formula-fed infants and 20.0% of clear liquid-fed infants. In addition, a higher percentage of patients in the breastfed

Medication Group	Feeding Group, N (Percentage of Total)		
	Clear Liquids N = 40	Breastmilk N = 63	Infant Formula N= 64
Morphine, fentanyl	5 (12.5)	6 (9.5)	13 (20.3)
Ibuprofen, acetaminophne	8 (20.0)	6 (9.5)	10 (15.6)
None	27 (67.5)	51 (81.0)	41 (64.1)

Table 1: Type and Amount of Medication Taken Per Feeding Group
Note: Analysis of variance difference between groups (p = 0.851).

Feeding Group	Mean FLACC Pain Score	N
Clear liquids	0.7000	40
Breastmilk	0.7872	63
Infant formula	1.3003	64

Table 2: Mean FLACC Pain Scores Per Feeding Group
Note: Analysis of variance difference between groups (p = 0.138); FLACC, Face, Legs, Activity, Cry, Consolability.

Milk		Mean Difference (I-J) in Time Spent in PACU	P
Clear liquids	Breastmilk Infant formula	7.542 15.416*	0.402 0.023*
Breastmilk	Clear liquids Infant formula	-7.542 7.874	0.402 0.279
Infant formula	Clear liquids Breastmilk	-15.416* -7.874	0.023* 0.279

Table 3: Mean Difference in Time Spent in Post-anesthesia Care Unit (PACU) Between Feeding Groups
****The mean difference is significant at α = 0.05 (p = 0.023).***

feeding group received no medication at all (81.0%) compared with formula-fed infants (64.1%) and clear liquid-fed infants (67.5%). These differences, however, were not statistically significant.

The average FLACC pain scores were 0.79 for breastfed infants, 0.70 for the clear liquid-fed group, and 1.30 for the infant formula-fed group. There was no significant difference in the average FLACC pain scores between the groups (p = 0.138 between groups), as summarized in Table 2.

There was a statistically significant decrease in total time spent in the PACU for formula-fed infants compared with the clear liquid group. These results are summarized in Table 3. Patients fed infant formula spent an average of 15.42 minutes less in the PACU when compared with infants fed clear liquids (p = 0.023). There were no statistically significant differences in PACU time between breastfed versus formula-fed infants or breastfed and clear liquid-fed infants. The difference between the total time spent in PACU between breastfed and formula-fed infants was 7.87 minutes (p = 0.279), and the difference between breastfed and clear liquid-fed infants was 7.54 minutes (p = 0.402). These differences were not statistically significant.

DISCUSSION

Our study showed a statistically significant difference in total time spent in the PACU between the infant formula-fed and clear liquid-fed groups. Infants fed formula spent an average of 15.42 minutes less in the PACU compared with the clear liquid group. However, there were no significant differences in the total time breastfed infants spent in the PACU compared with formula-fed and clear-liquid-fed infants. These findings may be attributed to these babies feeling fuller and more satisfied, as formula is denser than clear liquid or breast milk.

A fascinating result was a nonsignificant decrease in the amount of pain medications needed, both opioids and nonopioids, in breastfed babies. This trend may turn out to be significant in a future large randomized study.

When a child needs to undergo surgery, it can be one of the most stressful times in a parent's life, especially in the newborn/infant phase. Parents' lack of control over the situation often results in attempting to do anything that may be remotely helpful for the child. Breastmilk and breastfeeding have been touted in our society as being the best method of infant nutrition because of their many known immunological benefits. However, many unsubstantiated benefits are also anecdotally attributed to breastmilk, such as improved recovery and lessened pain after surgery. Mothers of infants undergoing surgery may feel anxious and guilty if they do not (or cannot) offer breastfeeding to their infants post-surgery.

There are some important limitations to our study. The first is the small sample size. In addition, this study looked at differently fed infants during a very small snapshot of the recovery period–their time in the PACU only–even though post-surgical recovery is a much longer process. Our study also looked at the pain scores, medication requirements, and PACU times after multiple surgical procedures, and it is not statistically powered enough to look at each type of surgical procedure individually. It could very well be that the infant feeding method may affect the recovery after some types of surgical procedures and not others. The retrospective nature of our study is an additional limitation.

CONCLUSION

This study shows no significant difference between breastmilk-fed and formula or clear liquid-fed infants in pain score, pain medication requirements, or PACU time. In the future, and as a follow-up study, it would be insightful to analyze infant health outcomes based on long-term feeding methods rather than just short-term ones in the PACU. It would also be worthwhile to have a larger sample size in a prospective, randomized control trial that could be analyzed by surgical procedure type.

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