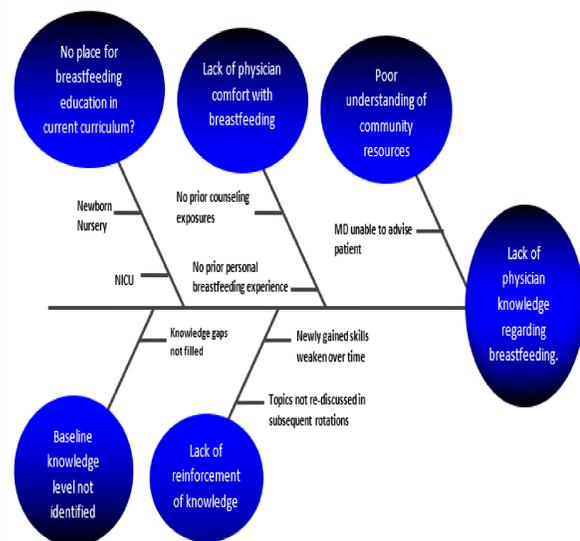


Abigail Adair-Dimmick, MD, PGY-3  
 Melinda Chance, MD, PGY-1  
 Alex Brenner & Miranda Ave, FSU COM

## Background

The numerous benefits of breastfeeding for both mother & child are well-documented in literature. Medical personnel, including physicians, have an impact on a mother's decision to both initiate and continue breastfeeding. Prior research has demonstrated that both resident physicians and graduate medical education programs report the need for more in-depth training regarding breastfeeding. The residency period provides a unique opportunity to provide breastfeeding education to physicians. Resident pediatric physicians are likely to be providing care for a high volume of breastfeeding families during training; specifically during rotations such as newborn nursery, NICU, and continuity clinic. Currently at the Advent Health for Children Pediatric Residency Program, breastfeeding is addressed in the syllabi of these rotations; however, there is no formal breastfeeding-centered curriculum in place to educate the pediatric residents.

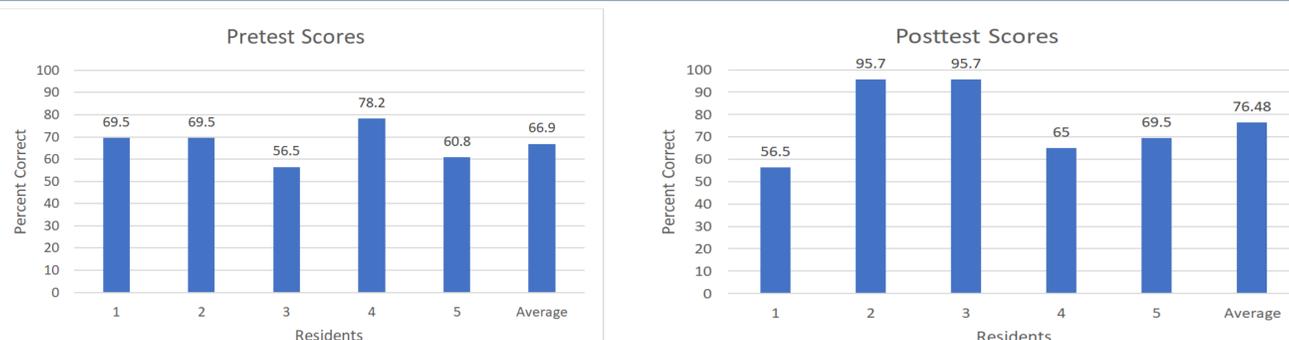
## Root Cause Analysis



## Methods

- Pediatric Resident Physicians (PGY1-PGY3) completed a portion of the American Academy of Pediatrics Breastfeeding Curriculum Pre-test in order to obtain a measure of baseline knowledge and identify knowledge gaps.
- Pediatric Resident Physicians (PGY-1) participated in an educational session focused on basic knowledge of breastfeeding and common clinical scenarios the pediatrician may encounter when counseling breastfeeding families.
- Pediatric Resident Physicians (PGY-1) completed a portion of the American Academy of Pediatrics Breastfeeding Curriculum Post-test.
- Results from the pre-test and post-test were compared to determine if the resident physicians scores increased at least an average of 20%.
- Subjective questions were provided to the Residents to illicit feedback on their experience while completing the breastfeeding curriculum, along with the impact it had on their breastfeeding knowledge and confidence in applying this knowledge during patient care.

## Results



### Post-Curriculum Completion Participant Responses:

1. Did the curriculum better prepare you for patient engagement and breastfeeding advocacy? Why or why not?  
*"I felt more comfortable talking with parents about breastfeeding".*  
*"I feel better prepared to counsel mothers on breastfeeding, however I felt that the curriculum was too long."*  
*"No, the curriculum was too long and not well integrated into the rotation so to be honest I skimmed through it".*
2. Did your comfort level in discussing breastfeeding change over the course of the nursery rotation?  
*"A little. Learned more as I went along".*  
*"A little bit just due to what I learn while on the Newborn rotation. I think it would have been more beneficial to spend a day or two with lactation rather than this online curriculum in addition to our rotation duties".*
3. What did you learn from the curriculum that you will apply to patient care and/or breastfeeding education?  
*"Different modes of latching". "I liked the testing aspect of the curriculum because it tested and reinforced my knowledge". "Adequate amount and frequency". "How to deal with common problems, such as sore nipples".*
4. Was this curriculum beneficial to your understanding of breastfeeding or how to troubleshoot common issues?  
*"No because I could not complete most of the reading portions as it was too long. I think that the curriculum needs to take all types of learners into account. Some of us cannot learn by simply reading".*  
*"Not really. I didn't have many patients asking me questions about breastfeeding. We usually had too many patients to round on to spend extra time with breast feeding education/support and would leave it up to the lactation consultant".*
5. What would you change to the curriculum to make it more applicable to either the newborn nursery or patient education?  
*"Integrate it into the rotation better, make it shorter, or have residents spend time with lactation instead".*  
*"I think that the curriculum should be shorter and consist of more video material rather than modules".*  
*"It would have to be summarized, it's too long in my opinion".*

## Conclusions

1. Completion of the breastfeeding curriculum by first year Pediatric Residents resulted in an increase in knowledge of breastfeeding principals as evidenced by an average increase of 9.58% in pretest vs posttest scores; however, this falls short of the goal of an average score increase of 20%.
2. While subjective data show that residents credited the curriculum with providing them some additional skills and comfort with counseling breastfeeding families, most of the feedback indicate that the residents found the curriculum to be time consuming, not well integrated into their newborn rotation, and not applicable to them as many breastfeeding questions were deferred to the lactation specialists.
3. Addition of a breastfeeding curriculum to the PGY-1 Newborn Rotation was not well-received by the participants; thus, initiating this curriculum as a requirement of residents may not produce the desired learning gains if adjustments are not made to the present curriculum.

## Next Steps

1. Consider altering the current curriculum in ways to facilitate greater compliance:
  - Remove some modules in order to condense the curriculum.
  - Divide the curriculum to be completed across various rotations during PGY-1 year.
2. NICU-specific breastfeeding curriculum for PGY-2 class.
  - Initial research and curriculum planning has been started.

## Heading

### Contact Information

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### References

- Naylor A, Wester R. Lactation Management Self-Study Module. *Wellstart International*. 2014
- AAP Breastfeeding Curriculum
- <https://services.aap.org/en/learning/breastfeeding-curriculum/>
- Meek, JY. Educational Objectives and Skills for the Physician with Respect to Breastfeeding, Revised 2018.
- Breastfeeding Medicine Vol. 14.1. Nov. 2019.

## Mayer-Rokitansky-Kuster-Hauser syndrome in a previously healthy teenager presenting with primary amenorrhea

Barbara Ximenes Braz, MD – PGY-2 Pediatric Resident at AdventHealth. Alfredo Pacheco, MD, MA at AdventHealth. Heather Elizondo-Vega, MD – Attending Physician at AdventHealth

### Introduction

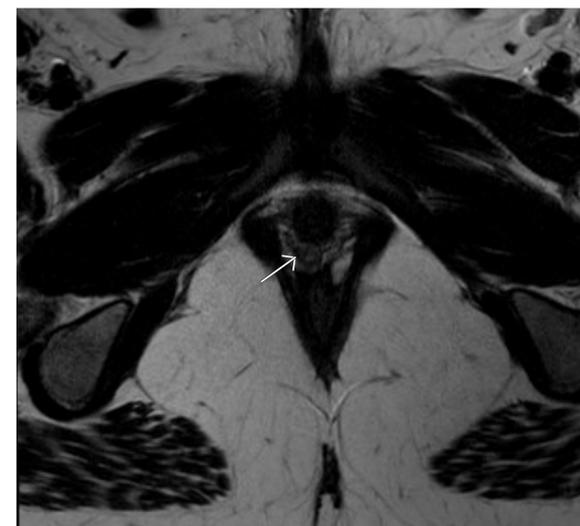
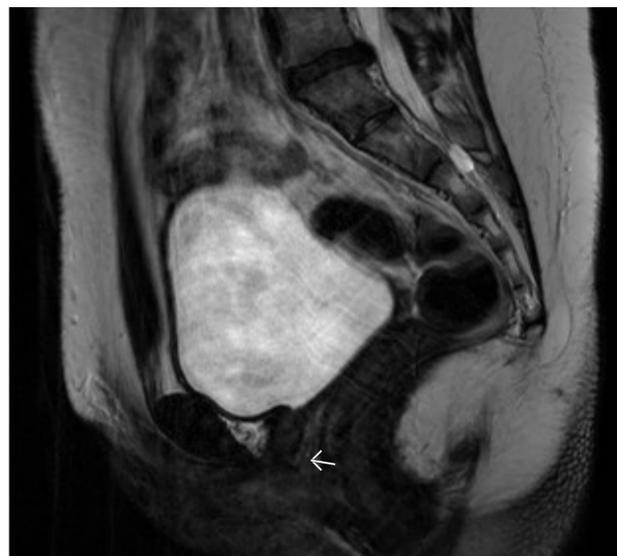
- The Mayer-Rokitansky-Kuster-Hauser (Mullerian Aplasia) syndrome is an important differential diagnosis for females presenting with primary amenorrhea and normal secondary sexual characteristics.
- Endocrinologic laboratory workup is normal and diagnosis is confirmed with imaging.
- Treatment consists of vaginal dilation, surgical reconstruction, psychological support, and education regarding fertility and assisted reproductive technology.

### Case Description

- We present the case of a previously healthy female teenager presenting with primary amenorrhea. Patient was noted to have adequate development of secondary sexual characteristics, with Sexual Maturity Rating 5 for breasts and pubic hair. An external genital exam revealed a normal vaginal opening. She was otherwise asymptomatic. Maternal menarche was at 13-years-old.
- Laboratory evaluation revealed normal TSH, T4, FSH, LH, testosterone and prolactin.
- Pelvic Ultrasound revealed absent uterus, normal right ovary with 2.1 cm simple cyst, and normal kidneys. The left ovary was unable to be visualized on the ultrasound.
- Pelvic MRI confirmed the absence of her uterus, confirmed the presence of bilateral ovaries, and demonstrated partial agenesis of the upper vagina. She was then referred to a gynecologist for further evaluation, treatment, and counseling.

### Discussion

- The Mayer-Rokitansky-Kuster-Hauser (Mullerian Aplasia) syndrome is characterized by congenital aplasia of the uterus and the upper part of the vagina.
- These patients show otherwise typical growth and pubertal development, with normal development of secondary sexual characteristics.
- It affects 1 out of 4500 women and patients have a normal 46 XX karyotype. Majority of cases are sporadic.
- The syndrome is subdivided in two types. Type I, which presents with the above described abnormalities in an isolated form, and Type II, which is associated with renal, vertebral, auditory and cardiac defects.
- Treatment consists of either vaginal dilation or vaginoplasty to allow for sexual intercourse, along with counseling for education and psychological support due to the distress generated by this diagnosis.



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### References

1. Morcel, K., Camborieux, L., Programme de Recherches sur les Aplasies Müllériennes (PRAM). et al. Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome. Orphanet J Rare Dis 2, 13 (2007). <<https://doi.org/10.1186/1750-1172-2-13>>
2. ACOG Committee Opinion No. 728: Müllerian Agenesis: Diagnosis, Management, And Treatment, Obstetrics & Gynecology: January 2018 - Volume 131 - Issue 1 - p e35-e42 doi: 10.1097/AOG.0000000000002458

## Introduction

- Intravenous Fluids are a mainstay in pediatric inpatient practice for managing the fluid status of the acutely ill or pre/post-operative child. Previously, the standard of practice for MIVF selection was 0.45% normal saline (NS).
- There were increasing reports of hyponatremia in children, and there was an overall trend for the use of isotonic fluids.
- In 2018, the American Academy of Pediatrics (AAP) released a clinical practice guideline that MIVF be isotonic (3).
- The primary aim of the SOFI project is to increase the total proportion of hospital days where patients aged 28 days to 18 years old, were on isotonic MIVF exclusively, for a total goal percentage of  $\geq 80\%$  of hospital days on exclusive isotonic fluid use all with a secondary aim to monitor lab draws per day.

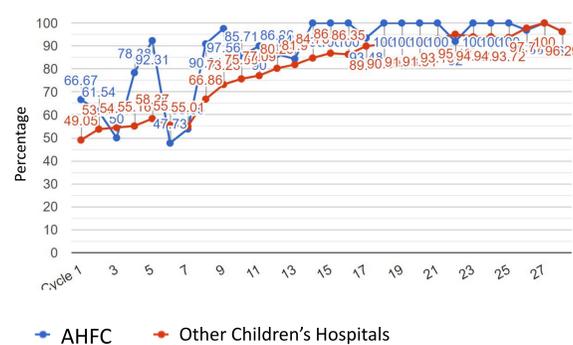
## Materials/Methods

- Using the retrospective chart review in Cerner and the SOFI Chart Review Tool and Quality Improvement Data Aggregator, (QIDA) we monitored the usage of intravenous fluids at Advent Health for Children.
- Inclusion criteria was age of 28 days to 18-years-old, and on MIVF on day 2 of admission
- Exclusion criteria included: any active ICU stay, active adrenal, cardiac, hepatic, neurosurgical, hematology/oncologic, biochemical, genetic, metabolic, or chronic renal illness, diabetes insipidus, DKA, severe burns, psychiatric holds, or voluminous watery diarrhea for greater than 7 days.
- Data was collected 6 months prior to the clinical guideline was released (May 2018) to December 2020.
- Factors documented included: tonicity of fluids ordered, the length of time the fluids were running per day, the amount of white blood cell (WBC) count draws obtained per day, sodium draws obtained per day, and if weight was measured per day.

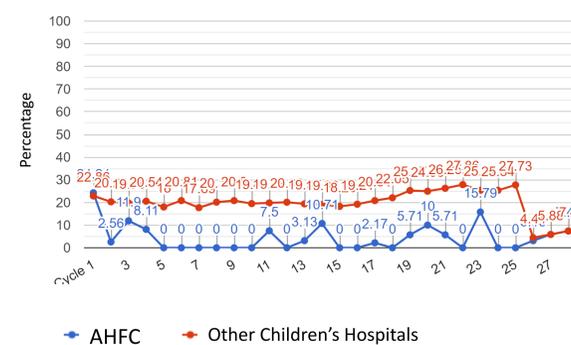
## Results

- Baseline Data was collected every 30 days from May 2018–May 2019, and it was found that AdventHealth for Children was at 66.7% hospital days on exclusive isotonic fluid use compared to nationwide average of 49%, with a quality gap of 13.3% (Goal of 80%) for isotonic fluid use.
- Post-intervention data collection began in November 2019, and it was found that AdventHealth for Children significantly improved in the use of exclusive isotonic fluids for pediatric patients, with an average of 90% or higher for the following months.
- However, the hospital did have a higher numbers of daily lab draws (WBC, Na) compared to other institutions in the study.
- Another pitfall was that we had significantly lower number of daily weights recorded compared to other institutions, however this has continued to improve with each cycle.

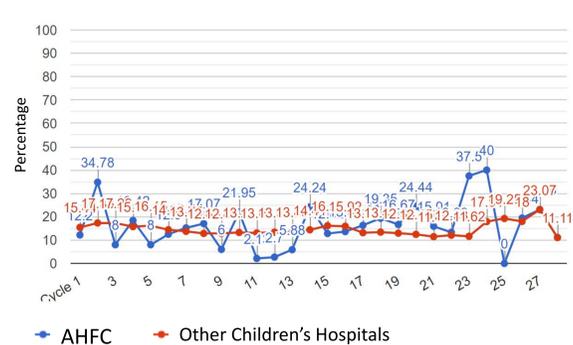
Hospital Days with Exclusive Isotonic IVF Use



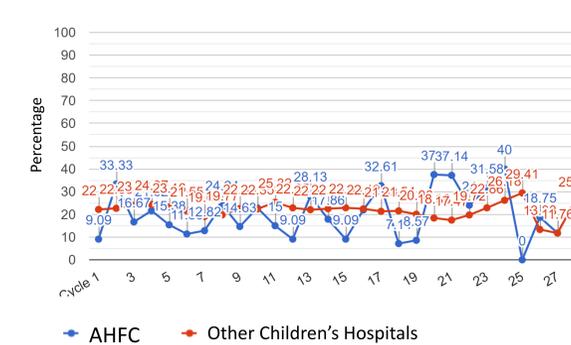
Hospital Days with Daily Weights Measured While on IVF



Hospital Days with Serum WBC Levels Checked



Hospital Days with Serum Na Levels Checked



## Discussion/Conclusion

- AdventHealth for Children has adopted the AAP recommendation for isotonic MIVF usage and consistently met the study goal after starting December 2018, one month after the clinical practice guideline was published.
- Recognized areas for improvement on AdventHealth for Children include optimizing daily weight measurements, as well as decreasing the amount of daily lab draws.
- In concert with nursing, the hospitalist team and the residency program, new solutions and efforts are being developed and trialed to improve adherence to these study points to improve patient safety and experience while at AdventHealth for Children.

## Acknowledgments

Sincere Thanks to

- AHFC Pediatric Hospitalist Medicine Team for Collection of Baseline Data
- Meg Heaton and Jennifer Congilo, who assisted in assembling monthly reports

## References

- Arief AI, Ayus JC, Fraser CL. Hyponatraemia and death or permanent brain damage in healthy children. *BMJ*. 1992;304(6836):1218-1222
- Hatherill M. Rubbing salt in the wound. *Arch Dis Child*. 2004;89(5):414-418
- Clinical Practice Guideline: Maintenance Intravenous Fluids in Children Pediatrics 2018;142; November 26, 2018;

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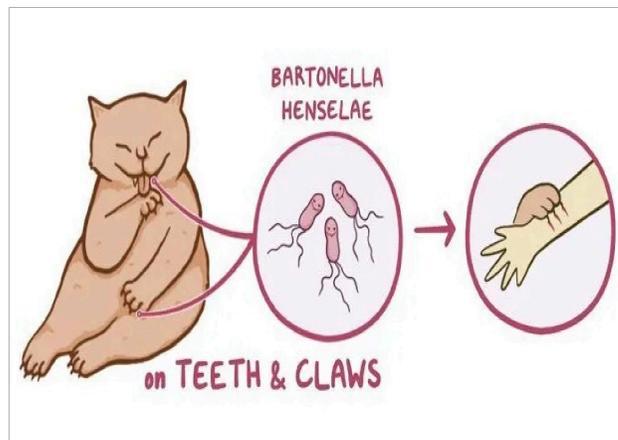
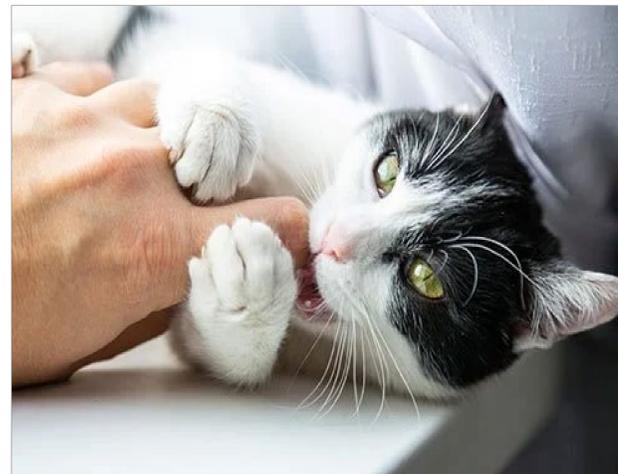
Shani Cunningham, DO FAAP, APD Pediatrics  
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# Cat scratch disease presenting as Parinaud's oculoglandular syndrome in a pediatric patient

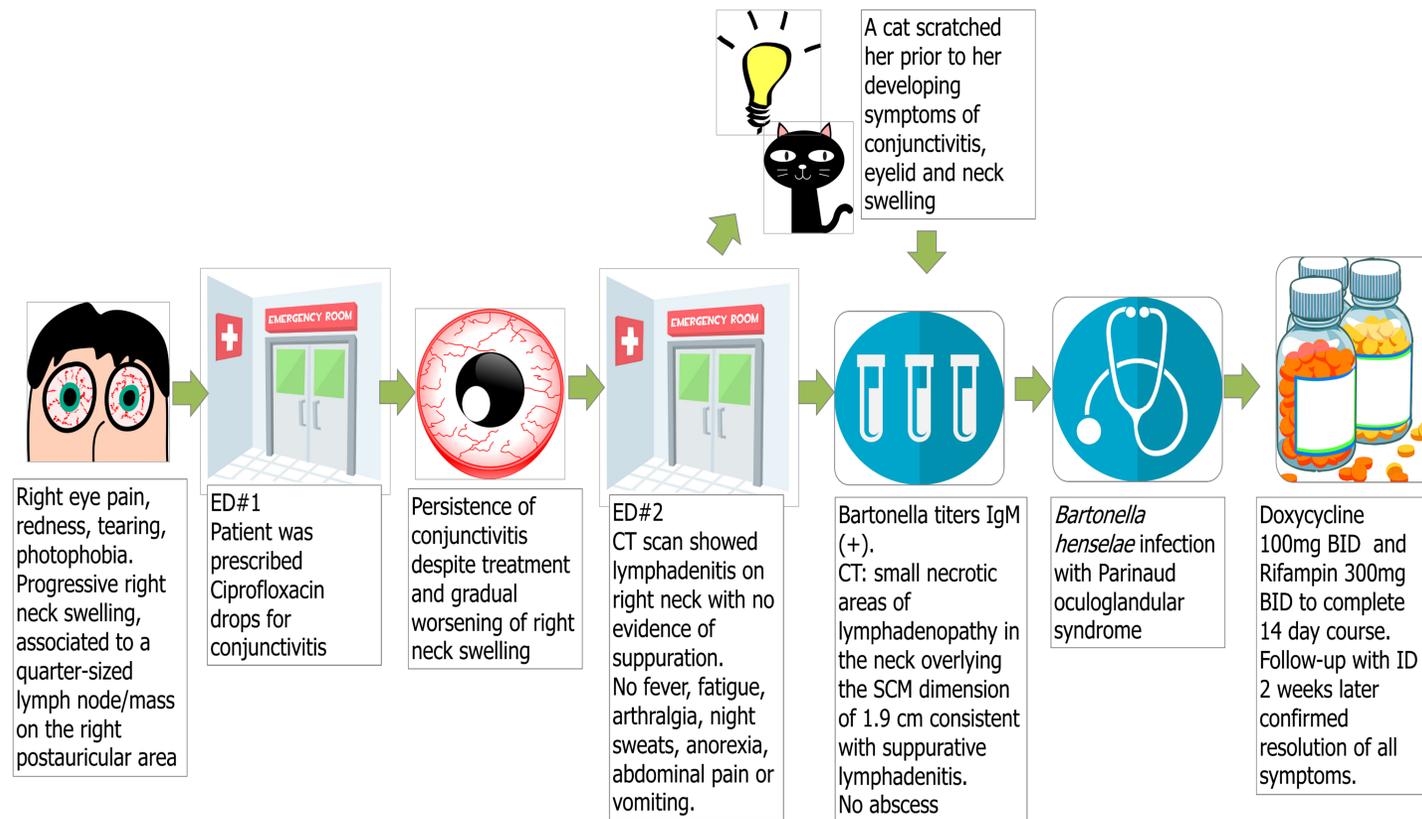
Melissa Zegarra Bustamante, MD<sup>1</sup>, Monica Lee, MD<sup>1</sup>  
<sup>1</sup>Adventhealth for Children, Department of Pediatrics, Orlando, Florida

## Introduction

Cat scratch disease (CSD) is caused by *Bartonella Henselae*, a Gram-negative intracellular bacteria. The transmission occurs between cats and humans directly by a cat scratch or a cat bite. Typical CSD in pediatric population usually presents as a self-limited, symptoms resolve in 2-4 weeks, however evidence suggest that Azithromycin helps to decrease the lymph node size. The hallmark feature of CSD is a regional, unilateral, and isolated lymphadenopathy in the site of direct inoculation, associated to systemic symptoms such as a fever and malaise. Atypical CSD occurs in approximately 5% - 14%, with Parinaud oculoglandular syndrome as a major complication.



## History



## Discussion

- Features that confirmed the diagnosis of CSD in this case were the presence of lymphadenopathy in the right side of the neck overlying the sternocleidomastoid muscle in concurrence with right eye findings, a history of recent exposure to cat and positive *Bartonella Henselae* IgM antibodies.
- Symptoms of Parinaud's oculoglandular syndrome include foreign body sensation in the eye, usually misdiagnosed as a sty.
- Manifestations consist of a necrotic granuloma with subsequent ulceration of the conjunctival epithelium.
- A definitive diagnosis of CSD is challenging, physicians should rely on the clinical presentation and serological testing to confirm clinical symptoms.

## Physical Exam

- Vital signs were normal.
- Supple neck with multiple enlarged lymph nodes on right side.
- No overlying erythema
- Severe right preauricular tenderness with approximately 4x3 cm of swelling.
- Right conjunctiva injected and erythematous.
- Granulomatous conjunctivitis in lower right eyelid.
- Clear discharge present/no purulent discharge.
- Minimal pain on palpation of lateral aspect of right eye.
- Pupils were equal, round, and reactive to light.
- No proptosis, intact extraocular movements.
- No supraclavicular or axillary adenopathy.
- Splenomegaly present.



## Conclusion

Patients who present with unilateral eye involvement consistent with oculoglandular symptoms (granulomatous nonsuppurative conjunctivitis), associated to ipsilateral preauricular lymphadenopathy and a history of exposure to cats, should have a high suspicion for *Bartonella henselae* infection causing Parinaud oculoglandular syndrome.

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## Discussion

- Patients present with unilateral eye redness, increased tear production, and regional lymphadenopathy affecting either the preauricular or cervical lymph nodes.
- Important to rule out other differential diagnosis such as orbital cellulitis, periorbital cellulitis, uveitis, foreign body, and bacterial conjunctivitis.



# Better Antibiotic Selection In Children (BASIC) for Urinary Tract Infection Management at AdventHealth For Children— A Quality Improvement Project

Marlene Fernandez D.O., M.S., PGY-2;  
Chantal Soobhanath M.D., PGY-1;  
Shani Cunningham D.O., FAAP

## Introduction

Fifty percent of children receive an antibiotic prescription in an ambulatory setting, as do 1 in 3 children admitted to the hospital. Half of these antibiotic prescriptions are either inappropriately chosen or unnecessarily prescribed. Excess prescription of antibiotics contributes to the world wide issue of bacterial antibiotic resistance which contributes to lifelong health consequences, adverse medication side effects, and healthcare costs that could otherwise be avoided.

## Background

UTIs are one of the most common bacterial infections in childhood, accounting for 5-14% of pediatric emergency department visits. It is the second most common bacterial infection in children after acute otitis media and represents ~1.8% of all pediatric hospitalizations.

National studies have examined ambulatory antibiotic prescriptions for urinary tract infections and determined that TMP-SMX and third generation cephalosporins are prescribed in 70% of pediatric UTI visits.

The rate of use of ceftriaxone in the ambulatory setting was found to be double that used in the inpatient setting due to convenience of one time intramuscular dosing.

However, antibiotic resistance patterns suggest that there is room to use narrower options based on sensitivity.

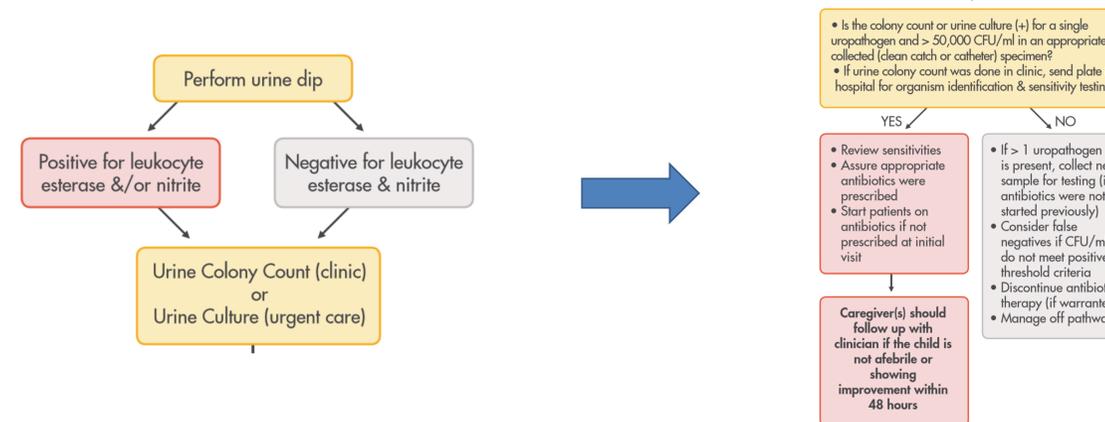
## Goals

The goal of this quality improvement project is to assess the impact of implementing evidence-based clinical practice guidelines for antibiotic use in children with UTI in hopes to reduce antibiotic resistance. Our objective is to increase the proportion of children who receive appropriate empirical antibiotic therapy, definitive therapy, and antibiotic therapy duration for UTI by at least 50% in our hospital without increasing the proportion of children experiencing ED revisits or re-hospitalizations, transfers to a higher level of medical care, or increased lengths of hospital stay. We plan to achieve this by educating our residents and hospitalist staff and provide them with easy access to the recommended algorithm.

## Methods

Using retrospective chart review in our electronic medical record and the QIDA tool provided by the AAP, we gathered data on prior antibiotic selection for treating UTI at AdventHealth for Children Med-Surg Unit from July 2019 to December 2020. Inclusion criteria was defined as children  $\geq 2$  months of age – 12 years of age with presumed or definite UTI. Exclusion criteria included: toxic appearing, prior history of UTI (defined as  $> 2$  febrile UTIs), chronic kidney disease defined by estimated glomerular filtration rate (GFR) of  $< 80$  mL/min, genitourinary abnormalities, including previous GU surgery (other than circumcision) neurogenic bladder conditions, known obstructive uropathy, known high-grade vesicoureteral reflux (Grades III-V), septic shock, immunocompromised host, pregnancy, recent history of sexual abuse, children  $< 2$  months of age or  $> 12$  years of age, patients requiring admission to the ICU or PICU and premature infants.

We subsequently educated residents in detail on the new treatment algorithms proposed based on similar antibiogram data with presentations as well as providing print-out forms for the inpatient team for easy accessibility. We then began implementing these treatment algorithms with first line antibiotic choices for the treatment of UTI as Cephalexin and Bactrim versus Ceftriaxone which was formally utilized.

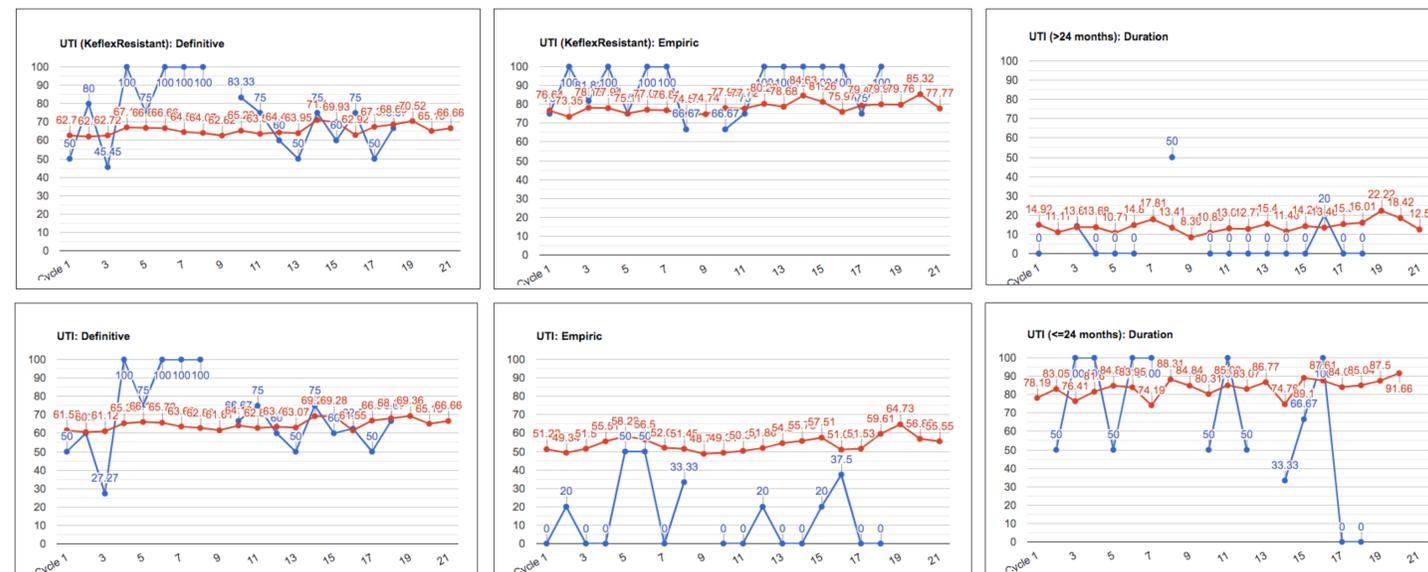


## Results

Baseline data was collected every 30 days from July 2019 – December 2020. The blue lines represent our hospital while the red line represents national data

The data revealed a total of 85 children with UTI meeting the inclusion criteria.

In comparison to other hospitals nationwide, there was large variability in the empiric therapy, definitive therapy and treatment duration.



## Conclusion

AdventHealth For Children is in the process of implementing the new change packages for UTI.

As we completed the baseline data collection phase, we found that there was a large trend toward use of third line antibiotics in the treatment of UTI, thus lending to the problem of antibiotic resistance.

As we move forward in the upcoming months, we hope to see a change in antibiotic selection with first line therapy, namely Keflex and Bactrim, being largely selected.

This is especially important in our pediatric population to prevent lifelong colonization with antibiotic resistant organisms.

Post implementation analysis will be conducted in the future.

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## Acknowledgments

We would like to give a special thank you to all of those involved including the Pediatric Hospital Medicine Team, Fatma Levent MD (Pediatric Infectious Disease), Jen Coniglio and Meg Heaton (data collection), as well as the AAP VIP network.

## References

McCulloch, Robert. Orientation Webinar. American Academy of Pediatrics, 7<sup>th</sup> October 2020. Webinar.

Balighian E, Burke M. Urinary Tract Infections in Children. *Pediatr Rev.* 2018 Jan;39(1):3-12. doi: 10.1542/pir.2017-0007. PMID: 29292282.

Copp HL, Shapiro DJ, Hersh AL. National ambulatory antibiotic prescribing patterns for pediatric urinary tract infection, 1998-2007. *Pediatrics.* 2011;127(6):1027-1033. doi:10.1542/peds.2010-3465

# Identifying Communication Barriers in the Hospital: The Incorporation of iPASS into Family Centered Rounds

Philip Jay Frayre, MD; Advent Health for Children, Pediatric Resident, PGY2; Marlene Fernandez DO MS; Advent Health for Children, Pediatric Resident, PGY2; Carlos Carmona, DO; Advent Health for Children, Pediatric Resident, PGY3; Stacy McConkey, MD, FAAP; Advent Health for Children, Pediatric Residency Program Director

## Introduction:

- Family Centered Rounds (FCR) is a structured communication program that intends to increase the efficacy of communication between health care team members and patients and their families.
- The gap in health literacy creates the largest obstacle between

## effective communication

Number of Rounds Observations and End of Rotation Surveys by Month of Implementation

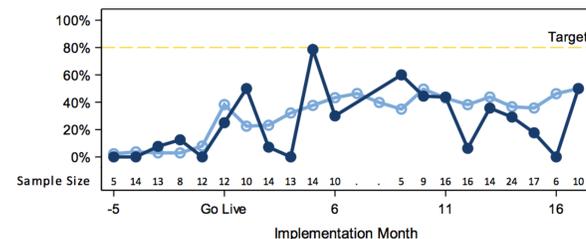
Implementation Month	Dates for your site	# Rounds Observations		# Resident End of Rotation Surveys	
		Your Site	All Sites	Your Site	All Sites
-5	16APR2019-15MAY2019	6	63	.	.
-4	16MAY2019-15JUN2019	15	251	.	.
-3	16JUN2019-15JUL2019	13	327	1	107
-2	16JUL2019-15AUG2019	8	276	2	92
-1	16AUG2019-15SEP2019	12	321	5	107
Go Live	16SEP2019-15OCT2019	12	369	4	87
2	16OCT2019-15NOV2019	10	178	2	61
3	16NOV2019-15DEC2019	14	183	3	39
4	16DEC2019-15JAN2020	13	145	7	47
5	16JAN2020-15FEB2020	14	234	5	56
6	16FEB2020-15MAR2020	10	221	3	55
7	16MAR2020-15APR2020	0	207	0	52
8	16APR2020-15MAY2020	0	125	0	29
9	16MAY2020-15JUN2020	5	141	1	29
10	16JUN2020-15JUL2020	9	133	1	42
11	16JUL2020-15AUG2020	18	151	2	32
12	16AUG2020-15SEP2020	16	194	0	41
13	16SEP2020-15OCT2020	15	165	4	50
14	16OCT2020-15NOV2020	24	150	5	54
15	16NOV2020-15DEC2020	17	136	2	51
16	16DEC2020-15JAN2021	6	111	1	39
17	16JAN2021-15FEB2021	10	76	5	33

- With its implementation, FCR seeks to improve communication between

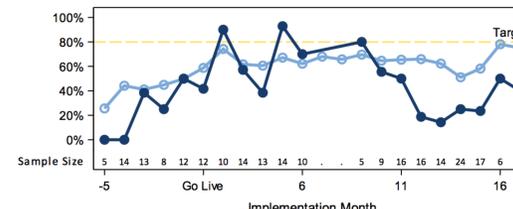
## Methods

- A member of the FCR committee rounded with the inpatient team and recorded varying metrics on a Rounds Observation Form. These included each component of the iPASS model (Illness severity, Patient Summary, Action List, Situation Awareness and Contingency Planning and Synthesis by Receiver)
- Observation Form for at least 3 individual patients per week

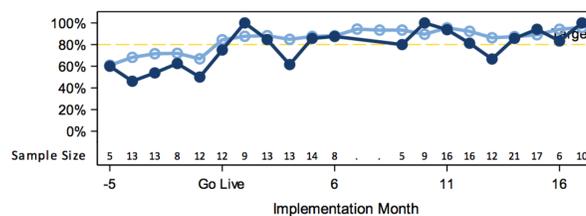
i-PASS: All Components Observed



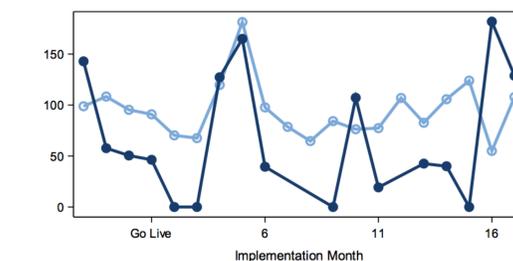
Health Literacy/Quality of Communication  
Providers utilized plain language terms ("To a great extent")



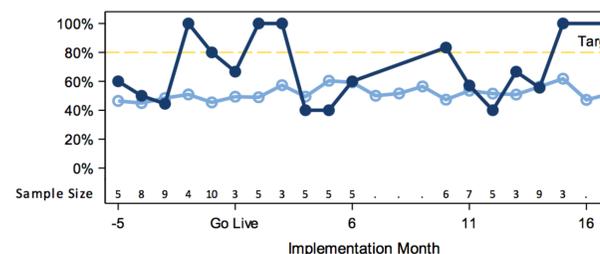
Family Engagement on Rounds (score of 4 or 5 out of 5)



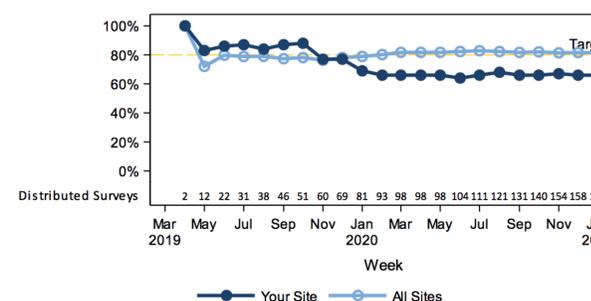
Resident-reported harm rate (#/1000 resident days)



How well did you understand what was being said on rounds? (Extremely)



Patient Family Survey: Cumulative Response Rate by Calendar Month



— Your Site — All Sites

## Results:

- There has been no significant change in survey participation with the introduction of QR codes and multi-language surveys
- There has been a steady increase in

## inclusion of all

\*This points of the iPASS model highlights the efficacy of the IPASS model for Family Centered Rounds. Initially for consistent and structured communication of \*Family engagement remained high through 2020 and 2021. However, overall health literacy scores for providers and March 2020 providers has

# Sialidosis II in a Newborn Leading to Associated Cardiorespiratory Failure and Death

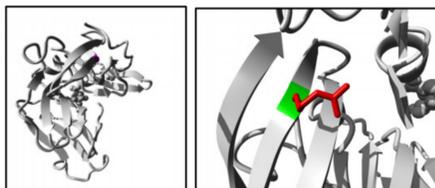
Feras Hares, MD, MS, Kelvin Lee, MD, Majed Dasouki, MD  
AdventHealth for Children

## Background

- Genetic defects and or predispositions are a common sight for any modern general pediatric practice or especially in the sub-specialty setting. We at AdventHealth are especially used to these syndromes given our Coordinated Care for Kids (CCK) for complex care clinic.
- However, there are the few occasions in which a syndrome requires the education and or re-education of the entire healthcare team due to the complexity or pure rarity of the disease process, and the tortuous treatment path they will lead on.

## Genetics

- Sialidosis results from a missense mutation in the NEU1 gene on 6p21.3 and is inherited in an autosomal recessive manner
- NEU1 Codes for alpha-neuraminidase
- Lysosomal neuraminidase the removal of terminal sialic acid molecules (N-acetylneuraminic acid or NANA) from glycolipids, glycoproteins and oligosaccharides
- Like many other lysosomal storage disorders, this enzymatic deficiency leads to inappropriate cellular build up of the associated target molecules, ultimately leading to apoptosis.
- The most common missense mutation seems to be c.679G > A; p.Gly227Arg, with the bulky arginine subgroup leading to misfolding, seen in the figure below



## Case Discussion

- The infant was born at 33 weeks gestation with concern for non-autoimmune fetal hydrops. She initially required CPAP for respiratory support, and an initial KUB was concerning for a lucency and irregularity in the proximal right femoral metaphysis which could be linked to an intrauterine infection, however all infection workup was negative.
- Head ultrasound showed a possible thalamic mineralizing vasculopathy. Given this, and associated mild facial dysmorphism (short upper lip, bilateral epicanthal and sub canthal folds), a karyotype was reported as 46xx, and urine and plasma organic acids were ordered and resulted normal, along with two Florida infant screens.
- On week 3 of life, corrected gestational age (CGA) of 37 weeks, decreased perfusion to the bilateral lower extremities, as well as a new onset gallop developed. An echo showed an ejection fraction (EF) of 50-55% and was placed on milrinone and carnitine supplementation for cardiac support.
- Whole genome sequencing resulted for a compound heterozygous NEU-1 mutation consistent with Sialidosis type II.
- The infant was discharged from the NICU at DOL 53, CGA 41 weeks, however continued to have repeat admissions to both the medical/surgical floor and PICU for cardiac failure associated complications. After placement of a surgical central line, they were unable to be weaned off mechanical ventilation and was terminally extubated at 4 months of life in mother's arms.

## Sialidosis

- Sialidosis, also known as mucopolidosis I, fits under the overarching category of lysosomal storage diseases, and is majorly divided into two distinct types.
- Both types are exceedingly rare, with estimated prevalence of either type to be 1 out of 500,000 to 5,000,000 births globally.
- Type I is associated with later diagnosis, usually at the second decade of life due to diffuse myoclonus and possible seizure associated development, but overall have a better prognosis.
- Type II is subdivided based on onset, in utero with associated hydropic features or infantile.
- Children with type II rarely live longer than 2 years of age.
- Common presenting symptoms include hepatosplenomegaly, a collection of abnormal bone development known as dysostosis multiplex, and like many lysosomal diseases, a cherry red macula. Congenital forms, like presented here, are also commonly seen with ascites and a hydrops-like picture.

## Therapies

- Unfortunately, there are currently no therapies for Sialidosis, for either type and are managed symptomatically.
- Stem Cell transplantation has not been found to be effective in this disease
- Enzymatic study of alpha-neuraminidase is exceedingly difficult due to its self-aggregation properties and highly immunogenic nature.
- These same limitations prevent enzymatic replacement.

## References

- International Society for Mucopolysaccharidosis & Related Diseases, Dr. Sandra d'Azzo  
Sialidosis Review, 2018
- National Organization for Rare Disorders (NORD)
- Orphanet
- Online Mendelian Inheritance in Man (OMIM)
- Ahmed N. Mohammad, Katelyn A. Bruno, S. Hines, Paldeep S. Atwal, Type 1 sialidosis presenting with ataxia, seizures and myoclonus with no visual involvement, Molecular Genetics and Metabolism Reports <https://doi.org/10.1016/j.ymgmr.2017.12.005>.
- Veronica Arora, Nitika Setia, et al Sialidosis type II: Expansion of phenotypic spectrum and identification of a common mutation in seven patients, Molecular Genetics and Metabolism Reports <https://doi.org/10.1016/j.ymgmr.2019.100561>
- Platt, F.M., d'Azzo, A., Davidson, B.L. et al. Lysosomal storage diseases. Nat Rev Dis Primers 4, 27 (2018). <https://doi.org/10.1038/s41572-018-0025-4>

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# Better Antibiotic Selection in Children (BASiC) in regards to Community Acquired Pneumonia at AdventHealth for Children

Feras Hares MD PGY2, Lyndsay Kotarba MD PGY1, Shani Cunningham, DO, FAAP

## Introduction

- Community acquired pneumonia (CAP), even with the introduction of routine vaccinations, continues to be a significant cause of hospital admissions and associated morbidity and mortality in the pediatric population.
- Given this, it is not uncommon for patients with a pneumonia diagnosis to receive antibiotics. Approximately 50% of pediatric patients in an ambulatory setting and 33% of those hospitalized receive antibiotics (1). However, of those, fifty percent are either inappropriate (i.e. wrong medication for the chosen pathogen) or unnecessary, such as in the case of a viral infection instead of bacterial. These prescriptions lead to multiple costs, both direct and indirect to our healthcare system and patients.
- The primary aim of the BASiC project is to: increase the proportion of children who receive appropriate, narrow spectrum, empiric treatment by 85%; increase the proportion discharged on the narrowest spectrum antibiotic by 90%; and increase the proportion of proper antibiotic treatment length by at least 85%.

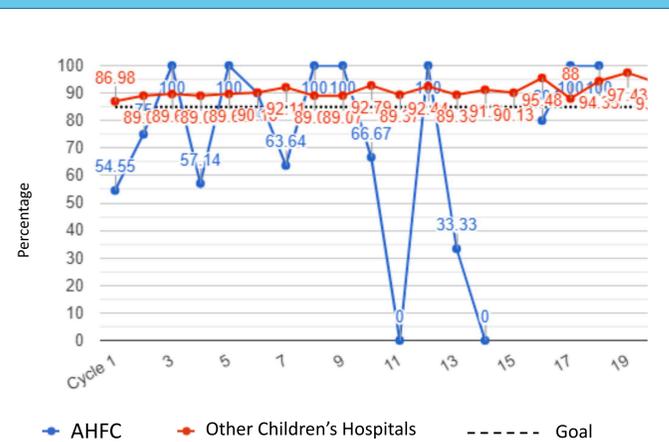
## Materials/Methods

- Using the retrospective chart review in Cerner the BASiC Chart Review Tool and Quality Improvement Data Aggregator (QIDA), we monitored all children aged 2 months to 18 years old with a discharge diagnosis of pneumonia.
- Inclusion criteria also included patients that were admitted to the pediatric hospitalist service and received antibiotics within 24 hours of admission.
- Exclusion criteria included: any immunocompromised patient, ill-appearing patient, those with cystic fibrosis, or those who did not receive antibiotics within 24 hours.
- Baseline hospital data was collected for any admissions from July 2019 to December 2020.
- Starting in January 2021, a new CAP treatment pathway was initiated for all AdventHealth for Children (AHFC) patients.

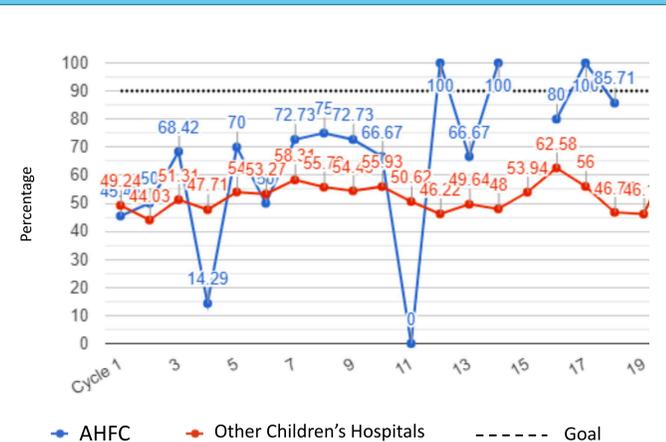
## Results

- Baseline hospital data was collected for any hospital admissions every 30 days from July 2019 to December 2020, and starting in January 2021, a new CAP treatment pathway was initiated for all AHFC patients.
- In comparison to other children's hospitals, AHFC has been inconsistent in all measures, however in recent months, it has been improving.
- Positively, re-admission rates were below or at other hospital admission rates.

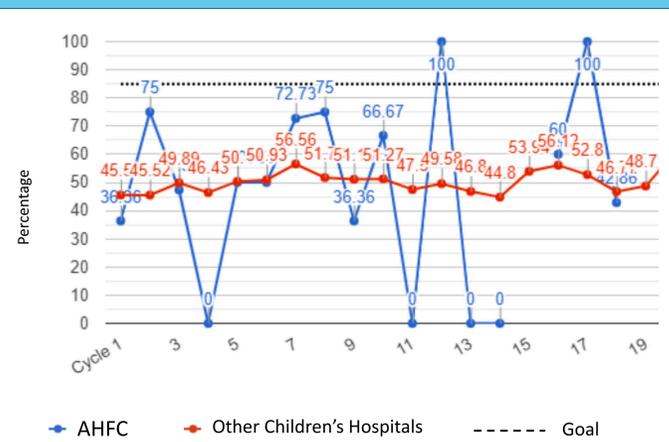
Community Acquired Pneumonia, Appropriate Use of Empiric Treatment



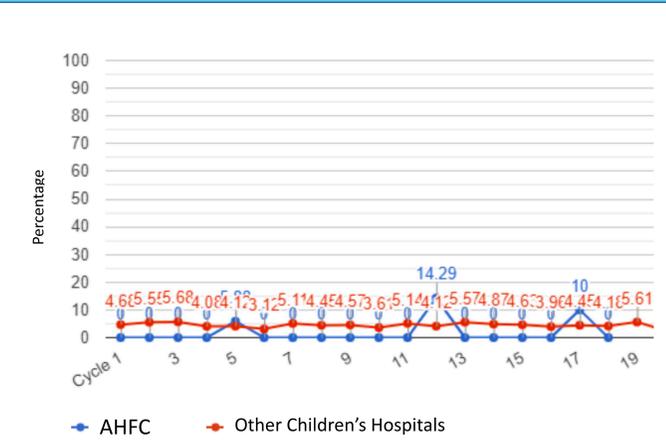
Community Acquired Pneumonia, Appropriate Use of Definitive Treatment



Community Acquired Pneumonia, Appropriate Treatment Length



Readmission Rates



## Discussion/Conclusion

- Currently, AHFC is in the process of implementing the change packet for CAP, including increased involvement from nursing leadership, hospitalist attendings, and the residency program.
- Post-intervention data is pending collection and analysis.
- With an overwhelming consistent increase in antibiotic resistance, and newer pathogens on the horizon, proper selection of antibiotics is of high priority to the entire medical field.
- This is especially important in pediatrics, as we can inadvertently colonize our patients with life-long resistance to antibiotics from childhood.

## Acknowledgments

- AHFC Pediatric Hospitalist Medicine Team for Collection of Baseline Data
- Meg Heaton and Jennifer Congilo, who assisted in assembling monthly reports
- Dr. Fatma Levent for her help in reviewing the hospital antibiograms and selecting the new treatment pathways

## References

- British Thoracic Society guidelines for the management of community acquired pneumonia in children: update 2011. Harris M, Clark J, Coote N, Fletcher P, Harnden A, McKean M, Thomson A, British Thoracic Society Standards of Care Committee
- Global, regional, and national estimates of pneumonia morbidity and mortality in children younger than 5 years between 2000 and 2015: a systematic analysis. McAllister DA, Liu L, Shi T, Chu Y, Reed C, Burrows J, Adeloje D, Rudan I, Black RE, Campbell H, Nair H Lancet Glob Health. 2019;7(1):e47. Epub 2018 Nov 26.
- Child and Adolescent Health From 1990 to 2015: Findings From the Global Burden of Diseases, Injuries, and Risk Factors 2015 Study. JAMA Pediatr. 2017 Jun 1;171(6):573-592. doi: 10.1001/jamapediatrics.2017.0250

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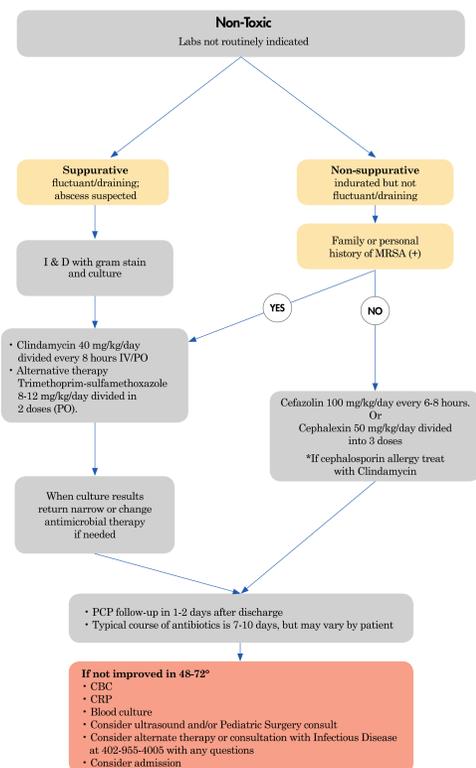
## Background

- Hospitalizations of children for skin and soft tissue infections have steadily been increasing.
- Over 50% of children seen in the ambulatory setting and 1 in 3 hospitalized children receive antibiotic prescriptions [1]. Half of these antibiotic prescriptions are either inappropriately chosen or unnecessarily prescribed. Excessive antibiotic prescribing contributes to bacterial antibiotic resistance, and subjects' children to avoidable and potentially life-long health consequences.

## Aim

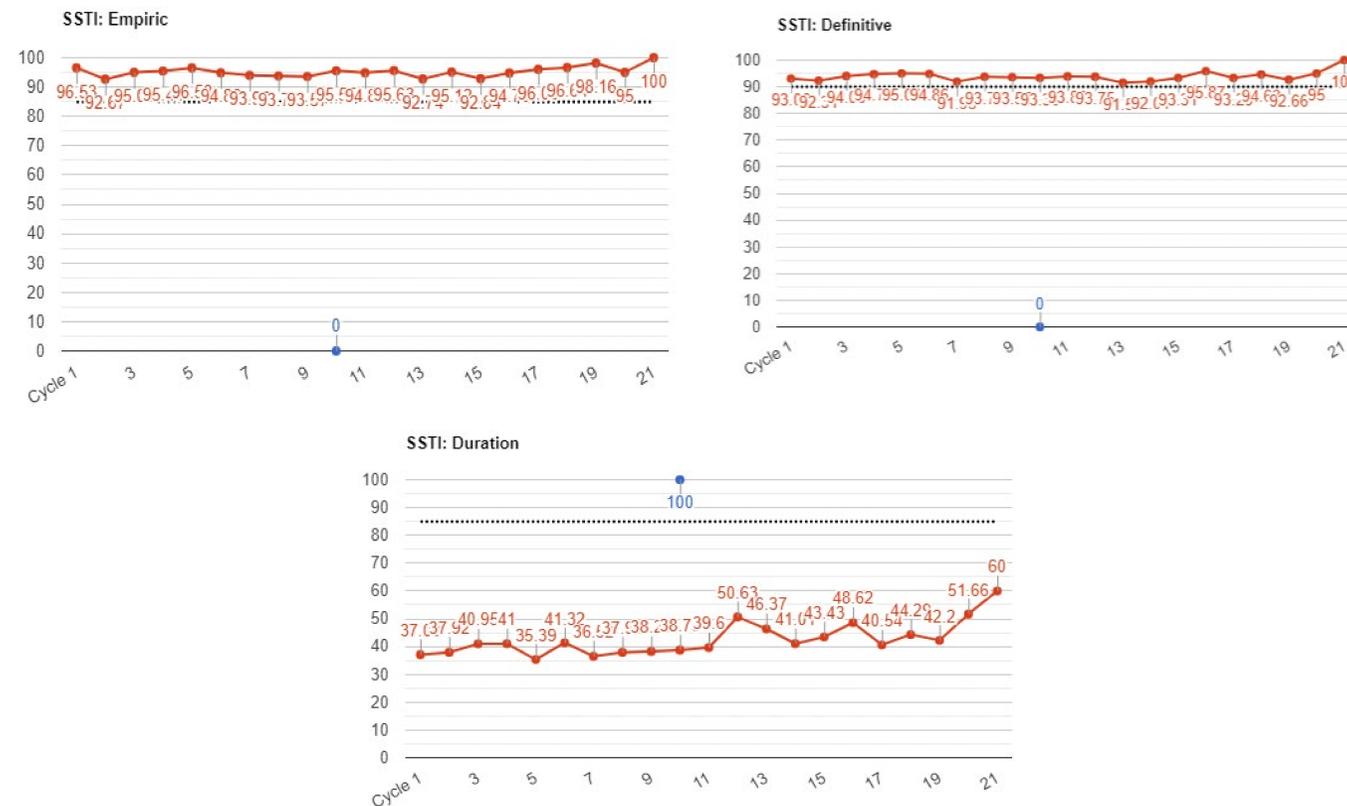
- Increase the proportion of children who receive appropriate empiric antibiotic therapy by 85%, definitive therapy by 90% and antibiotic therapy duration by at least 85%.
- Balancing measures include monitoring for readmission rates within 14 days of discharge, transfers to the ICU and overall length of stay.

## Omaha Pathway for Skin and Soft Tissue Infection



## Method

- Using the retrospective chart review in Cerner and the BASiC Chart Review Tool and Quality Improvement Data Aggregator (QIDA), we monitored the use of empiric and definitive antibiotic therapy at AdventHealth for Children.
- Baseline data collection occurred from July 2019 to December 2020.
- Omaha Children Pathway for Skin and Soft Tissue Infection in a *non-toxic patient* was implemented to guide antibiotic selection and decision-making starting January 2021. Changes introduced include distinction between suppurative and non-suppurative infections and treatment recommendations accordingly.
- Inclusion Criteria:** Patients aged 3 months to 18 years with non-toxic skin and soft tissue infections.
- Exclusion Criteria:** Immunocompromised host, suspected foreign body, infections near a recent surgical site, facial infections including orbital, periorbital or dental areas, bite wounds, symptoms overlying a joint and adenitis.
- Data will be collected and compared to baseline cycle using a retrospective chart review in Cerner from January to December 2021.



## Results

- AdventHealth for Children is in the process of analyzing the baseline data and implementing the Omaha Children Pathway for Skin and Soft Tissue Infection.
- National data suggests that Children being treated for SSTI have been receiving appropriate Empiric and Definitive Therapy by more than 85% and 90% during data collection phase. However, duration of antibiotic therapy has been appropriate <85% of the time.

## Conclusion

- Baseline Data from our center is currently on data collection phase.
- National Data suggests that prior to implementation of BASiC, SSTIs have been treated with appropriate antibiotics both empirically and definitively. However, duration of antibiotic therapy leaves room for improvement.
- AdventHealth for Children is in the process of implementing the new change packages for SSTI using the Children's Omaha Pathway for Skin and Soft Tissue Infection with the hope of improving antibiotic selection as well as appropriate duration of therapy.

## References

- Tribble AC, et al. Sharing Antimicrobial Reports for Pediatric Stewardship (SHARPS) Collaborative. Appropriateness of Antibiotic Prescribing in United States Children's Hospitals: A National Point Prevalence Survey. Clin Infect Dis. 2020 Nov 5; 71(8): e226-e234.
- Schuler CL, Courter JD, Conneely SE, et al. Decreasing duration of antibiotic prescribing for uncomplicated skin and soft tissue infections. Pediatrics. 2016; 137 (2): e20151233
- Children's Omaha Cellulitis and Abscess Pathway, Revised November 17, 2017.

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## Acknowledgement

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# Fever of unknown source, A Case of Disseminated Bartonella Infection in a Pediatric Patient

Monica Lee, MD (PGY2)  
Melissa Zegarra Bustamante (PGY3)

## Introduction

- Cat-scratch disease (CSD) is a common infection in children. *B henselae*, the causative organism of CSD, is a fastidious, slow-growing, gram-negative bacillus
- The most common clinical feature of CSD is regional lymphadenopathy but reports of other clinical manifestations associated with this infection are increasing.
- Less common manifestations of *B henselae* infection likely reflect disseminated disease and include culture-negative endocarditis, encephalopathy, osteolytic lesions, granulomata in the liver and spleen, glomerulonephritis, pneumonia, thrombocytopenic purpura, and erythema nodosum.

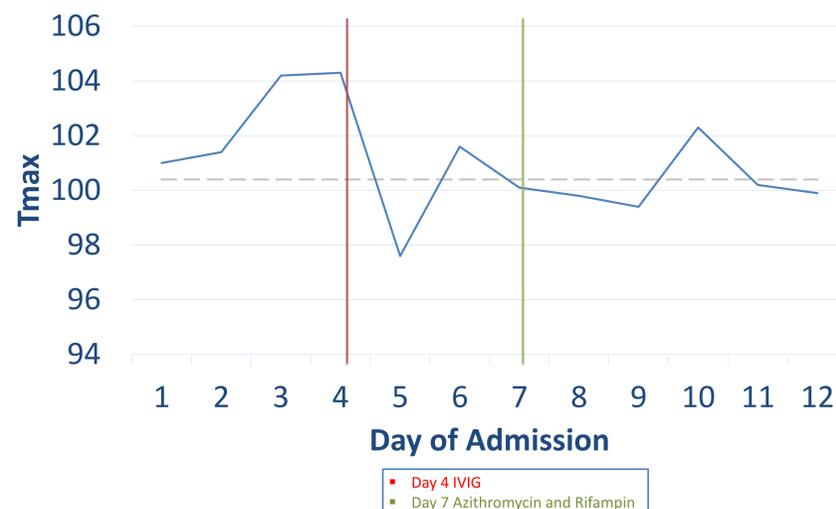
## Case Description

- A Male Toddler presented with a history of high grade fever (Tmax 105.5) which prompted first ED visit. Mother initially instructed to provide symptomatic management. On day 4 of daily fevers, mother brought the patient to the ED again. This time symptoms were associated with decreased oral intake and vomiting. Work up including Respiratory PCR, Rapid strep a, U/A and chest x-ray were unremarkable. He was sent home as PO improved after observation. He continued with daily fever ranging from 101.1 F - 105.6F, with partial relief with Tylenol and Motrin. This prompted a 3rd ED visit on day 8 of fevers. Mother reports marked decreased appetite, abdominal distension, fatigue and malaise. Denies night sweats, chills, peripheral edema, conjunctivitis, rash, diarrhea, constipation, altered mental status or seizures. Patient PMHx significant for recurrent ear infections s/p myringotomy tube placement and eczema. Mother admits to freshwater exposure 1 day prior to symptom onset.
- Vital signs remarkable for fever, tachypnea and tachycardia. Neck supple, non-tender, with multiple small 0.5 cm bilateral cervical lymph nodes. Abdomen was soft, non-tender, mild splenomegaly, mild distention, no guarding, no tenderness. Bowel sounds were present. Bilateral Inguinal lymphadenopathy noted. Otherwise, alert, oriented, hemodynamically appropriate, and well perfused.
- Patient was admitted for fever of unknown source with an 8-day history of daily high-grade fevers. He had 3 previous ED visits that did not show any source of fevers. Initial laboratories remarkable for leukocytosis with neutrophilic predominance, elevated inflammatory markers and mild acute kidney injury and dehydration. Patient also had increased sleepiness and decreased appetite which prompted work up and treatment for meningitis. CT of brain was unremarkable. CSF studies positive for HHV6 which was likely false positive and possibly a reactivation of a prior infection, cultures remained negative. Patient continued to have daily fevers despite meningitic dosing of Ceftriaxone. Cultures remained negative despite fevers. Given presentation of lymphadenopathy as well as abdominal distension Abdominal ultrasound was ordered and revealed splenomegaly with hypoechoogenicities and possible liver echogenicities. Despite treatment with Rocephin, patient continued on daily fevers with Cultures remaining negative. There was also concern for atypical Kawasaki as an echocardiogram showed a mildly dilated left anterior descending artery and was subsequently treated with 1 dose of IVIG on day 4 of admission. Due to suspicion for Cat scratch disease, Rifampin and Azithromycin was added to treatment regimen on day 7 of admission. The following day, titers resulted positive for Bartonella antibodies elevated at 1:256 (IgG) and 1:64 (IgM) confirming cat scratch disease as diagnosis. Fever curve improved within 72hours. He was also noted to improve clinically and was more interactive and acting like himself per mother. He was treated with a total of 9 days of Rocephin and completed a 14 day course of Rifampin and Azithromycin

## Discussion

- We present a case of Cat Scratch Disease associated with hepatosplenic involvement and coronary artery dilation.
- Our patient presented with prolonged high grade fever associated with alterations in mental status, cervical lymphadenopathy, hepatosplenic involvement as well as mild dilation of left anterior descending coronary artery.
- Patient is suspected to have Disseminated *B henselae* infection. In patients diagnosed with disseminated *B henselae* infection consultation with a pediatric infectious diseases expert is recommended.
- Cat Scratch Disease is generally self-limiting and does not require treatment in an immunocompetent patient. However, Infection of Bartonella should be considered in the differential diagnosis for any patient with prolonged fevers. Especially patient who remain culture negative.
- In patient's showing signs of disseminated infection, it is imperative to have Pediatric infectious diseases expert involved to help guide management.
- For our case, patient required triple antibiotic therapy of Rocephin, azithromycin and rifampin.

**Fig 1. Fever Curve**



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## References

1. English, R. Pediatrics in Review April 2006, 27 (4) 123-128; DOI: <https://doi.org/10.1542/pir.27-4-123>
2. American Academy of Pediatrics. Bartonella henselae (Cat-Scratch Disease). In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. *Red Book: 2018 Report of the Committee on Infectious Diseases*. 31st ed. Elk Grove Village, IL: American Academy of Pediatrics; 2018: 244-247

# Promoting Literacy as Primary Care Pediatricians via the Reach Out and Read Program Model

Adriana Delgado-Alvarez, DO (Pediatric PGY-3), Emma Mancini, MD (Pediatric PGY-2), and Chelsea Hawthorne, DO (Pediatric PGY-1)

## Background

- Research has shown that only 12% of adults have proficient health literacy
- Despite the known benefits of reading aloud, surveys show 50% of parents read to their young children daily and less than 10% read to their children from infancy
- American Academy of Pediatrics (AAP) Policy Statement supports promotion of early literacy such as in reading regularly with young children as it stimulates optimal patterns of brain development and strengthens parent-child relationships which, in turn, builds language, literacy and social-emotional skills
- As primary care pediatricians, our goal is to teach and remind parents that reading aloud to their children builds motivation, curiosity, vocabulary, memory, and coping with stress and anxiety
- Through Reach Out and Read (ROAR), we promote pediatric literacy by gifting age-appropriate books to review developmental milestones at each wellness visit from 6-60 months of age

## Objective

**Primary Objective:** The primary objective is to increase resident use of Reach Out and Read books during each well child visit to 80% by March 2022.

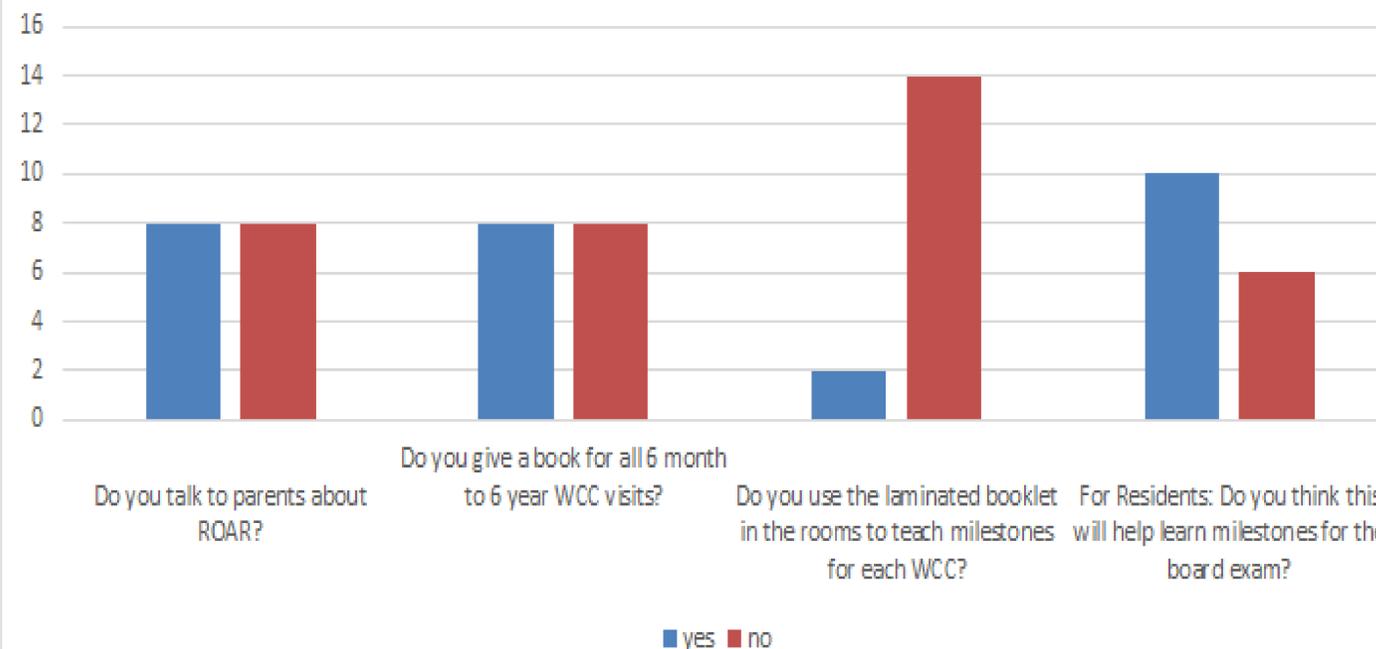
**Secondary objective:** As a result, we hope to simultaneously teach parents how to incorporate reading in their child's everyday life. We propose that over time, parents will understand the model of the Reach Out and Read program to learn about and enhance their children's developmental skills while using a book.

## Material and Methods

- At the Center for Pediatric and Adolescent Medicine clinic, surveys were distributed to all Pediatric Residents asking if they talk to parents about Reach Out and Read, if they give books at each well child visit from 6-60 months, are they using the laminated booklets in each room to teach milestones and do they think it helps to learn milestones for board preparation
- Based on responses from the residents, the most significant barrier was remembering to bring the books into the room
- To address this barrier, we:
  - Educated residents on ROAR and how to properly use it based on the patient age
  - Placed laminated reminder cards to bring a book into the room on each clinic workroom monitor
  - Included a section on Reach Out and Read book teaching to the well child note templates that physicians use

## Results

Resident Response Pre-Changes



## Conclusions

- Currently, only 50% of Pediatric Residents are using the Reach Out and Read books appropriately for each well child visit between 6- 60 months of age

## Future Directions

- We plan to reissue the same resident survey after the instilled changes to monitor for further barriers in the use of ROAR books by the providers during well child visits
- We plan to provide continued education to residents and clinical staff quarterly about the ROAR program with power points, lectures, and interactive conferences
- In the future, we plan to survey the parents of well child visits quarterly on the use of ROAR books by both providers during the visit and by parents at home to identify areas of improvement within the initiative
- We plan to provide handouts to parents on developmental milestones and ROAR to increase education and awareness

## References

Health Literacy: Implications for Child Health  
 Andrea K. Morrison, Alexander Glick, H. Shonna Yin  
 Pediatrics in Review Jun 2019, 40 (6) 263-277;  
 DOI: 10.1542/pir.2018-0027

Literacy Promotion: An Essential Component of Primary Care Pediatric Practice  
 Pediatrics Aug 2014, 134 (2) 404-409; DOI:  
 10.1542/peds.2014-1384

<https://www.reachoutandread.org>

### Background

The inpatient rotations during the first year of residency tend to be the most difficult due to several factors. *Clinical duties* can restrict the time available for teaching and learning<sup>1,2</sup>; therefore, it is imperative to optimize educational tools to residents' learning needs. The current methodology of relaying practical work habits and workflow to junior residents depends on individual mentorship by the senior resident or attending during a shift. This educational approach can be highly *variable*. Standardization of peer mentoring instruction is necessary to ensure all learners are exposed to the same core curriculum for achieving success on the inpatient rotation.

### Objective

Increase intern readiness to the inpatient pediatric rotation by at least an average of 25% of the participants of a voluntary peer-mentoring program offered to the Pediatric Residency Class 2023 during July 2020- July 2021.

### Method

A pilot structured voluntary peer mentoring program with an in-person and digital component was designed and implemented for first-year pediatric residents. Evaluations were sent to the program's participants at specific curriculum intervals to tailor the learning interventions appropriately. The pilot program was designed to meet specific criteria: *accessibility, individualized-paced, intern readiness, and practicality*.

### Online Module



#### Course Curriculum

Start next lecture >

#### General Interface

- Horizontal Menu (3:54)
- Side Menu (3:59)

#### Patient Care

- Patient Lists (3:52)
- Medication Reconciliation (3:54)

### Next Steps

- Expansion of program's participants to include different learn levels (ie. medical students, physician assistant students)
- Broadening of topics covered during interventions
- Development of worksheets associated with each module

### SMART Objective

**Specific:** First-year pediatric residents of the Pediatric Class 2023 at AdventHealth for Children rotating on the inpatient rotation

**Measurable:** Aiding learning of practical expectations

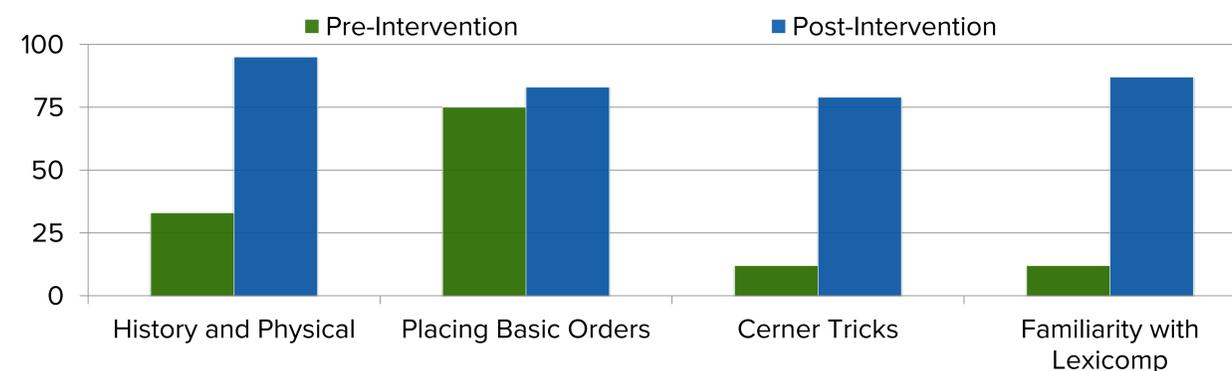
**Attainable:** Greater than 25% average of the program's participants in all aspects

**Relevant:** Improving the People System

**Timebound:** Spring 2021

### Results

Resident confidence level were assessed. Survey results showed increase in resident confidence level in three out of four areas addressed by the learning modules by more than 25%.



### General Info

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#### References

1. Schuller MC, DaRosa DA, Crandall, ML. Using Just-in-Time Teaching and Peer. Instruction in a Residency Program's Core Curriculum: Enhancing Satisfaction, Engagement, and Retention. *Academic Medicine*. 2015; 90:3.
2. Chokshi, BD, Schumacher, HK, et al. A "Resident-as-Teacher" Curriculum: Using Flipped Classroom Approach: Can a Model Designed for Efficiency Also Be Effective? *Academic Medicine*. 2017; 92:4.

# Feasibility of a Telemedicine Lifestyle-based Rehabilitation Program (HEAL) for Gynecologic Cancer Patients

Nnamdi I. Gwacham, Nathalie D. McKenzie, Julie W. Pepe, Sarfraz Ahmad, James E. Kendrick, Robert W. Holloway  
*Gynecologic Oncology Program, AdventHealth Cancer Institute, Orlando, FL 32804*

## Abstract

**Background:** General health related factors such as obesity, unhealthy diets disproportionate with sugary and highly processed foods, inactivity, and smoking have repeatedly been shown to negatively impact survival and quality of life in cancer survivors. With the recent COVID-19 pandemic access to care, and care delivery has undergone a transformation with increased use of telemedicine and virtual care visits. The Healthy Eating Active Lifestyle (HEAL) – GYN “rehabilitation” program was developed to provide intensive group lifestyle training on exercise, nutrition, sleep, social integration, and stress management via a telemedicine platform.

**Methods:** A multidisciplinary rehabilitation team led by a gynecologic oncologist addressed diet, physical activity, strategies for sleep and stress management, smoking cessation, and alcohol intake. The intervention included training to address unmet psychologic, emotional, physical, sexual, social, and spiritual needs common to cancer survivors. American College of Lifestyle Medicine (ACLM) inventories were administered, utilizing Likert scales (1-5) in a pre- and post- fashion to assess improvements in physical activity levels, dietary habits, sleep hygiene, and quality of life.

**Results:** 26 patients have enrolled thus far, and we report outcomes on the first 22 participants. The mean age was 58.8 years; 22 were Caucasian, and 7 patients were on maintenance therapy during their enrollment. There was a significant decrease in the average number of general symptoms reported by a comprehensive medical symptom questionnaire (MSQ) (36.39 vs 24.77,  $p < 0.05$ ). Trends towards improvement were demonstrated in eating patterns (4.59 vs 3.74  $p = 0.06$ ), perceived stress (11.32 vs 10.73,  $p = 0.28$ ), levels of anxiety and depression (10.76 vs 7.68,  $p = 0.07$ ) and weight management (17.55 vs 16.79,  $p = 0.23$ ). Patients also reported feeling an increased sense of purpose and connection as a result of their enrollment in the program (35.57 vs 37.26,  $p = 0.07$ ). 100% of participants would “highly recommend the program” and none complained of stress or altered mood associated with online instruction.

**Conclusions:** The telemedicine peri-habilitation program is feasible and well tolerated. The program may improve quality of life and may prevent further decline for cancer survivors.

## Background and Objectives

- The recent COVID-19 pandemic affected and continues to impact healthcare delivery systems across the globe
- Gynecologic cancer survivors have an unmet psychologic, emotional, physical, sexual, social, and spiritual need
- We aimed to evaluate the feasibility of implementing a telemedicine-based comprehensive peri-habilitative program to address unmet needs of gynecologic cancer survivors
- We also sought to determine the tolerability of the intervention as well as its impact on overall health and short-term quality of life

## Methods

- A longitudinal prospective design with pre- and post-program inventory was implemented
- HEAL-GYN consisted of 8 weekly group sessions offering experiential instruction with personalized goal setting
- A multidisciplinary team including chef, nutritionist, registered dietitian, physical therapist, exercise physiologist, and body image counselor
- ACLM inventories were self-administered, and each dimension evaluated using Likert scales

MEDICAL SYMPTOM QUESTIONNAIRE (MSQ)			
This questionnaire identifies symptoms that help to identify the underlying causes of illness, and helps you track your progress over time. Rate each of the following symptoms based upon your health profile for the PAST 30 DAYS. If you are taking after the first time, record your symptoms for the LAST 48 HOURS ONLY.			
Point Scale		3 = Frequently have it, effect is not severe	
0 = Never or almost never have the symptom		4 = Frequently have it, effect is severe	
1 = Occasionally have it, effect is not severe		2 = Occasionally have it, effect is severe	
<b>DIGESTIVE</b>	0 1 2 3 4	<b>EMOTIONS</b>	0 1 2 3 4
Constipation	0 1 2 3 4	Mood swings	0 1 2 3 4
Diarrhea	0 1 2 3 4	Anxiety, fear, nervousness	0 1 2 3 4
Bleated feeling	0 1 2 3 4	Anger, irritability, aggressiveness	0 1 2 3 4
Bloating, passing gas	0 1 2 3 4	Depression	0 1 2 3 4
Heartburn	0 1 2 3 4	<b>ENERGY/ACTIVITY</b>	0 1 2 3 4
Indigestion/heartburn	0 1 2 3 4	Fatigue, sluggishness	0 1 2 3 4
Nausea or vomiting	0 1 2 3 4	Agility, behavior	0 1 2 3 4
<b>ENTRALS</b>	0 1 2 3 4	Restlessness	0 1 2 3 4
Earaches, ear infections	0 1 2 3 4	<b>EYES</b>	0 1 2 3 4
Drainage from ear	0 1 2 3 4	Water or itchy eyes	0 1 2 3 4
Ringing in ears, hearing loss	0 1 2 3 4	Swollen, redness or sticky eyelids	0 1 2 3 4
<b>HEAD</b>	0 1 2 3 4	Bags or dark circles under eyes	0 1 2 3 4
Headaches	0 1 2 3 4	Blurred or tunnel vision (does not include near or far sightedness)	0 1 2 3 4
Fatigue or lightheadedness	0 1 2 3 4	<b>NOSE</b>	0 1 2 3 4
Itching or sneezing	0 1 2 3 4	Stuffy nose	0 1 2 3 4
Insomnia	0 1 2 3 4	Sinus problems	0 1 2 3 4
<b>HEART</b>	0 1 2 3 4	Smelling attacks	0 1 2 3 4
Irregular or skipped heartbeat	0 1 2 3 4	Excessive mucus formation	0 1 2 3 4
Chest pain	0 1 2 3 4	Hay fever	0 1 2 3 4
Rapid or pounding heartbeat	0 1 2 3 4	<b>SKIN</b>	0 1 2 3 4
<b>JOINTS/MUSCLES</b>	0 1 2 3 4	Aches	0 1 2 3 4
Pain or aches in joints	0 1 2 3 4	Hives, rashes, dry skin	0 1 2 3 4
Arthritis	0 1 2 3 4	Hair loss	0 1 2 3 4
Stiffness or limitations of movement	0 1 2 3 4	Flushing or hot flashes	0 1 2 3 4
Pain or aches in muscles	0 1 2 3 4	Excessive sweating	0 1 2 3 4
Feeling of weakness or tiredness	0 1 2 3 4	<b>WEIGHT</b>	0 1 2 3 4
<b>LUNGS</b>	0 1 2 3 4	Weight gain/loss	0 1 2 3 4
Chest congestion	0 1 2 3 4	Coughing certain foods	0 1 2 3 4
Asthma, bronchitis	0 1 2 3 4	Excessive weight	0 1 2 3 4
Shortness of breath	0 1 2 3 4	Water retention	0 1 2 3 4
Difficulty breathing	0 1 2 3 4	Underweight	0 1 2 3 4
<b>MIND</b>	0 1 2 3 4	Compulsive eating	0 1 2 3 4
Poor memory	0 1 2 3 4	<b>OTHER</b>	0 1 2 3 4
Confusion, poor comprehension	0 1 2 3 4	Frequent illness	0 1 2 3 4
Poor concentration	0 1 2 3 4	Frequent or urgent urination	0 1 2 3 4
Poor physical coordination	0 1 2 3 4	Genital itch or discharge	0 1 2 3 4
Difficulty making decisions	0 1 2 3 4	<b>Total points</b>	0 1 2 3 4
Slurring or stumbling	0 1 2 3 4		
Learning disabilities	0 1 2 3 4		
Slurred speech	0 1 2 3 4		
<b>Total points</b>		<b>GRAND TOTAL</b>	



## Lifestyle Assessment Long Form

**GETTING STARTED**

Very poor health | Very good health

0 1 2 3 4 5 6 7 8 9 10

a. Please circle your current overall LEVEL OF HEALTH.

b. Please rank the top 3 areas you would like to improve with 1 being the most important and 3 the least important.

Exercise \_\_\_\_\_ Weight Management \_\_\_\_\_ Nutrition \_\_\_\_\_

Substance Use \_\_\_\_\_ Purpose & Connection \_\_\_\_\_ Mental Health \_\_\_\_\_

c. How IMPORTANT is it for you to make the change you ranked as the #1 most motivated topic area to address? 0 1 2 3 4 5 6 7 8 9 10

d. How CONFIDENT are you regarding your ability to make the change you ranked as the #1 most motivated topic area to address? 0 1 2 3 4 5 6 7 8 9 10

e. How IMPORTANT is it for you to make the change you ranked as the #2 most motivated topic area to address? 0 1 2 3 4 5 6 7 8 9 10

f. How CONFIDENT are you regarding your ability to make the change you ranked as the #2 most motivated topic area to address? 0 1 2 3 4 5 6 7 8 9 10

g. How IMPORTANT is it for you to make the change you ranked as the #3 most motivated topic area to address? 0 1 2 3 4 5 6 7 8 9 10

h. How CONFIDENT are you regarding your ability to make the change you ranked as the #3 most motivated topic area to address? 0 1 2 3 4 5 6 7 8 9 10

i. What would you like to gain from this lifestyle visit? Check all that apply.

More medical/scientific knowledge  Practical health tips  Other: \_\_\_\_\_

Accountability  Personalized plan



## Conclusions

- A telemedicine-based peri-habilitation program is feasible and well tolerated
- Such a program may improve quality of life and may prevent further decline for patients in surveillance or maintenance therapy
- These preliminary findings support continued investigation of a telemedicine-based health lifestyle peri-habilitative program

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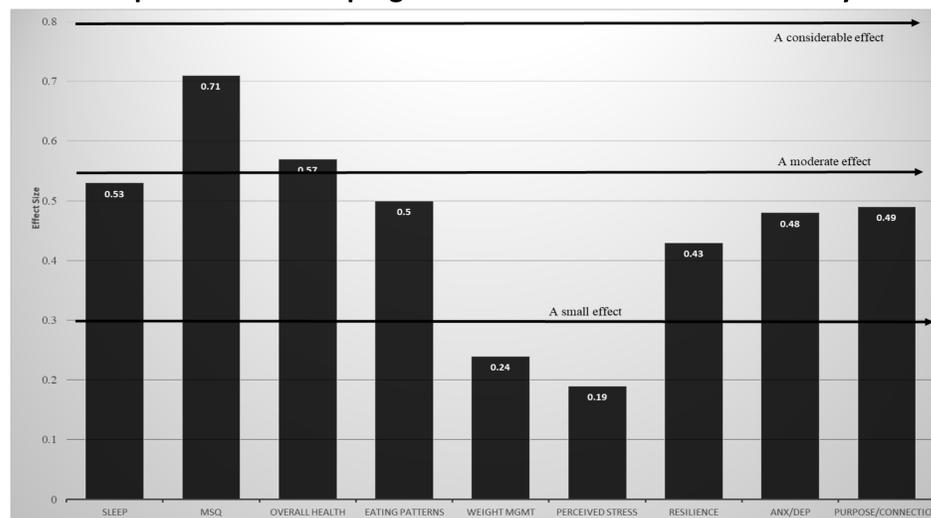
There were no external funds utilized or required for this project.

## References

- Poort H, de Rooij BH, Uno H, Weng S, Ezendam NPM, van de Poll-Franse L, Wright AA. Patterns and predictors of cancer-related fatigue in ovarian and endometrial cancers: 1-year longitudinal study. *Cancer*. 2020; 126: 3526-3533
- van Middendorp H, Kox M, Pickkers P, Evers AW. The role of outcome expectancies for a training program consisting of meditation, breathing exercises, and cold exposure on the response to endotoxin administration: a proof-of-principle study. *Clin Rheumatol*. 2016; 35: 1081-1085
- Fleming S, Jones T, Janda M, Vagenas D, Ward L, Reul-Hirche H, Sandler C, Obermair A, Hayes S. Physical activity trajectories following gynecological cancer: results from a prospective, longitudinal cohort study. *Int J Gynecol Cancer*. 2020; 30: 1784-1790.
- Forsythe LP, Kent EE, Weaver KE, Buchanan N, Hawkins NA, Rodriguez JL, Ryerson AB, Rowland JH. Receipt of psychosocial care among cancer survivors in the United States. *J Clin Oncol*. 2013; 31: 1961-1969

## Results

### Impact of the HEAL program on various dimensions of lifestyle



- Effect sizes within the program were mild to moderate as most dimensions scored near 0.50
- Greatest effect size was noted in the medical symptom questionnaire
- Weight management and perceived stress saw the least impact from the program