Articles that Could Change the Way You Practice, with Some Lessons from Ohio!

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Disclosures

• The speakers have no disclosures and no off-label products will be discussed
Who has time to read articles?

Pride and Prejudice By Jane Austen

(Ultra-condensed by Anu Lahtinen)

Mr. Darcy: Nothing is good enough for me.
Ms. Elizabeth Bennet: I could never marry that proud man.
They change their minds.
The End
Despite everything....

• Researchers in Ohio continue to publish studies that could change the way we practice and improve outcomes for children and their families
• Thank you to those who sent in suggestions
  – This is just a sample!
Changes in Respiratory Illness During COVID-19

• Respiratory illnesses are the most common cause of pediatric ED visits & hospitalizations

• Many Non-pharmacologic interventions implemented early in pandemic to mitigate SARS-CoV2 transmission
  – Masks
  – School & business closures
  – Stay-at-home orders

• Let’s see what happened to acute care for pediatric respiratory illness
Methods

- Data from 44 children’s hospitals contributing to the Pediatric Health Information System

- Children 2 months – 18 years evaluated January 1 – September 30 over 4 years (2017-2020)
  - Over 9 million encounters over study period
    - Median age = 5 years IQR, 1-11
    - 48% female
Results

- Rapid & marked decline in all ED & inpatient encounters
  - 38% of expected volumes for respiratory illnesses
  - 60% of expected volumes for non-respiratory illnesses
Results

- Decreases for all age groups
- Ages 12-17 years
  - Decline less pronounced than other age groups
  - Rebound to higher than pre-COVID-19 levels largely attributable to COVID-related encounters
Implications

• Should we wear masks indoors every winter???

- I know that children are attracted to playing with small but powerful magnets. To be honest, I thought they were off the market, but I have just learned that they are sticking around. Is there any new information that I could use to help families pole-lice their home environment?
- 2012 – sales halted and there was a recall
- 2014 – limitations on the products
- 2018 – Recall order overturned, anyone ≥14 years can purchase them
- Method: Analysis of the National Poison Data System (NPDS), based on 55 poison control centers
Results

• Of the >5700 exposures, 39% were between 2018 and 2019
Conclusions

• Good case study of the effectiveness of policy to reduce exposure and the harm from reversing course
• Opportunity for advocacy
Collateral Damage: Impact of COVID-19 on Women Physicians

Jones Y et al. *J Hosp Med* 2020

- Pandemic may exacerbate existing inequities w/ long-term consequences
  - Increasing demands at home
    - e.g., female physicians more likely to have employed partners & report spending more time on house-hold activities than male counterparts
  - Exaggerating leadership gap
    - e.g., lack of female representation in institutional policy creation may lead to policies or procedures that negatively affect female physicians or fail to consider their needs
  - Compensation
    - e.g., women more prevalent as frontline workers so are at greater risk of needing to take unpaid leave to care for sick family or themselves
  - Physical & mental health
    - e.g., burnout higher among female physicians
Recommendations
Jones Y et al.  *J Hosp Med*  2020

- Monitor direct & indirect effects of COVID-19 on women physicians
- Identify & secure support for the needs of women physicians
- Provide a mechanism to account for lack of productivity during COVID-19
- Reward increased efforts in areas of clinical or administrative contribution resulting from the pandemic
- Support & advance diversity, equity, & inclusion efforts
- Advocate for fair compensation for providers caring for COVID-19 patients
From Early Childhood to Adolescence: Lessons About Traumatic Brain Injury from the Ohio Head Injury Outcomes Study

• Is there any new information that can help me plan the services that are needed to help with recovery for patients in my practice who had TBI?
• Method: Prospective, long-term (on average up to 82 months) after children 3-7 years had TBI (up to 16 with severe, 44 complicated mild to moderate, 11 mild), compared to those with orthopedic injuries
Results

• Family burden is high for those with moderate and severe TBI, even 18 months later, with complex patterns of parenting disagreements, denial, depressive symptoms, parental responsiveness
• School services and accommodations often did not meet the needs
• Emotional functioning and social competence persistently decreased
Conclusions

• When taking care of children with TBI, make sure to consider the entire family context and arrange psychological support for everyone early
• Partner with families and schools to improve long-term outcomes
Trends in Head CT After Traumatic Head Injury
Ukwuoma Ol et al. *Pediatr Emerg Care* 2021

- 750,000 pediatric ED visits for traumatic head injuries each year
- Computed tomography for assessment
  - Sensitive
  - Specific
  - Fast
  - Widely available
- PECARN head injury rule (published 2009) guides when to perform head CT following traumatic head injury with goal to minimize low value care
Methods

Ukwuoma Ol et al. *Pediatr Emerg Care* 2021

- Data from the Nationwide Emergency Department Sample, 2008-2013
  - Large publicly available all-payer ED database sponsored by the Agency for Healthcare Research & Quality
  - Data from ~900 hospitals from 30 states per year
  - Weighted sampling approach allows for national estimates
Results

Ukwuoma OI et al. *Pediatr Emerg Care* 2021

~1 in 4 children with ED evaluation for traumatic closed head injury received a head CT with no meaningful change in imaging over time

<table>
<thead>
<tr>
<th>Year of ED Visit</th>
<th>Visits With Closed Head Injuries, n</th>
<th>Visits With CT-H, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>604,093</td>
<td>148,021 (24.5%)</td>
</tr>
<tr>
<td>2009</td>
<td>750,356</td>
<td>185,411 (24.7%)</td>
</tr>
<tr>
<td>2010</td>
<td>730,119</td>
<td>196,999 (27.0%)</td>
</tr>
<tr>
<td>2011</td>
<td>807,855</td>
<td>216,667 (26.8%)</td>
</tr>
<tr>
<td>2012</td>
<td>863,601</td>
<td>223,741 (25.9%)</td>
</tr>
<tr>
<td>2013</td>
<td>796,047</td>
<td>210,821 (26.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>4,552,071</td>
<td>1,181,659 (25.96%)</td>
</tr>
</tbody>
</table>
Results

Ukwuoma OI et al. *Pediatr Emerg Care* 2021

- Trivial imaging decrease at metropolitan teaching hospitals
- Increased imaging at other hospitals
Implications
Ukwuoma OI et al. *Pediatr Emerg Care* 2021

- It takes 17 years, on average, for research to reach practice
- Only 14% of research reaches the patient
- Only 18% of practitioners report using evidence-based practices frequently

Need to prioritize & invest in evidence implementation
Prevention of Drowning

• I know that drowning is a leading cause of unintentional morbidity and mortality, with marked disparities. What new guidance from the AAP should I know about?
• New Technical Report
Key Points to Prevent Drowning

- Multiple levels of protection
  - Adult supervision
  - Lifeguards
  - Anti-entrapment and anti-entanglement measures
  - Pool fencing (pool covers are not a replacement!)
  - Pool alarms?
  - Door alarms
  - Bystander CPR
  - Swimming lessons, water survival training, and water competency
  - Life jackets
  - Boating safety
Polypharmacy

- Receiving multiple medications to manage health conditions
- Often defined as >5 medications

Safety implications for children

- Polypharmacy increases likelihood of medication errors
- Multiple caregivers may administer medications
  - Dual administration of the same medication by both parents is the most common reason for pediatric calls to Poison Control Centers
- Most polypharmacy research focuses on children with seizure disorders
Methods
Auger KA et al. *J Hosp Medicine* 2019

• Investigators asked one *simple* question “How many medications is this child on?”
  – 4 scenarios presented to physicians, nurses, & parents

<table>
<thead>
<tr>
<th>How many medications is this child on?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A</strong></td>
</tr>
<tr>
<td>Amoxicillin twice a day by mouth</td>
</tr>
<tr>
<td>Fluticasone twice a day by inhaler</td>
</tr>
<tr>
<td><strong>Panel C</strong></td>
</tr>
<tr>
<td>Topiramate 3 mL by mouth each morning</td>
</tr>
<tr>
<td>Topiramate 5 mL by mouth each evening</td>
</tr>
<tr>
<td>Diazepam by rectum as needed for seizure</td>
</tr>
<tr>
<td><strong>Panel B</strong></td>
</tr>
<tr>
<td>Clindamycin three times a day by mouth</td>
</tr>
<tr>
<td>Ibuprofen every 4 hours as needed by mouth</td>
</tr>
<tr>
<td>Acetaminophen every 4 hours as needed by mouth</td>
</tr>
<tr>
<td><strong>Panel D</strong></td>
</tr>
<tr>
<td>Oxycodone SR 20 mg twice a day</td>
</tr>
<tr>
<td>Oxycodone 5 mg every 4 hours as needed by mouth</td>
</tr>
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Results
Auger KA et al. *J Hosp Medicine* 2019

**How many medications is this child on?**

**Panel A**
Amoxicillin twice a day by mouth
Fluticasone twice a day by inhaler

**Panel C**
Topiramate 3 mL by mouth each morning
Topiramate 5 mL by mouth each evening
Diazepam by rectum as needed for seizure

**Panel B**
Clindamycin three times a day by mouth
Ibuprofen every 4 hours as needed by mouth
Acetaminophen every 4 hours as needed by mouth

**Panel D**
Oxycodone SR 20 mg twice a day
Oxycodone 5 mg every 4 hours as needed by mouth

"2" (oxycodone but BID + prn)

"1" (topiramate only)
"2" (topiramate, diazepam)
"3" (2 topiramate doses, diazepam)

"1" Physicians
"3" Nurses, parents

"2" All stakeholders
Implications
Auger KA et al. J Hosp Medicine 2019

• Physicians do not know
  – how a parent or caregiver will prioritize medications to give to their child
  – whether families will count medications as a group or as separate entities

• Providers, patients, & families share a list of medications at discharge BUT
  – the list may contain items not considered as “medications” by physicians
  – the medication list provided at discharge is what the family must navigate once home
Trauma-Informed Care in Child Health Systems


• What can I do to address toxic stress, build resilience, mitigate trauma, and ultimately improve health outcomes?

• New policy statement
Considerations for Institutions to Provide Trauma-Informed Care

• Provide a safe physical and emotional environment
• Be committed as an institution to trauma-informed care across the health care system
• Partner with patients and families
• Recruit and train a compassionate workforce
Medicaid’s EPSDT Benefit: An Opportunity to Improve Pediatric Screening for Social Determinants of Health

- I know that many of my patients have adverse social determinants of health, like food insecurity, unstable housing, and transportation problems. However, I don’t routinely screen. It might help if Medicaid made it a requirement, but that might also be an adverse determinant for my practice’s economic health. What do studies and experts think?

- Method: Systematic review and key informant interviews
Results

• States Medicaid agencies vary in how EPSDT is designed and implemented
• *Bright Futures* shapes EPSDT in practice, and could influence what is done
• Screening will identify additional need, and so significant resources will need to be made available for practices
• Risk that some practices could stop taking Medicaid-enrolled patients, especially if there is not sufficient support
Conclusions

• Clear evidence that addressing social determinants of health can improve long-term patient and family outcomes
• Need scalable models and support. Federal-state partnership programs, like Medicaid/EPSDT can help lead the way
Now, what you really came here for!

The “I know Ohio Better Than You” Stanley Cup
What city had the first traffic light in the USA?

A. Akron  
B. Cincinnati  
C. Cleveland  
D. Dayton  

Bonus: What year?  
1914
Where was the cash register invented?

A. Cincinnati  
B. Columbus  
C. Dayton  
D. Toledo

Bonus: What year?  
1879
How many US Presidents were born in Ohio?

7!
Bonus: Which of the following presidents was not born in Ohio?

A. Josiah Bartlet
B. James A. Garfield
C. Ulysses S. Grant
D. Warren G. Harding
E. Benjamin Harrison
F. Rutherford B. Hayes
G. William McKinley
H. William H. Taft

Double Bonus: Which one served two full terms?
What proportion of the United States population lives within 500 miles of Columbus?

A. <1%
B. 25%
C. 50%
D. 100%
What is special about Sundays and the fourth of July in Ohio?

A. Time to be with your family  
B. You can’t be arrested  
C. Fireworks  
D. The best time to close your open notes in the EHR

Ohio Revised Code  
Section 2331.12 Days on which arrests may not be made.  
Effective: October 1, 1953  
Legislation: House Bill 1 - 100th General Assembly

No person shall be arrested during a sitting of the senate or house of representatives, within the hall where such session is being held, or in any court of justice, during the sitting of such court, or on Sunday, or on the fourth day of July.
Risk Factors & Outcomes After BRUE
Tieder JS et al. Pediatrics 2021

• Brief, Resolved, Unexplained Events (BRUE)
  – Changes in color, breathing, muscle tone, or consciousness in 1st year of life
  – Often explained by normal infant behaviors BUT occasionally reflect serious underlying condition
  – Alarming for caregivers
  – Challenging for clinicians

• AAP management recommendations published in 2016
Methods
Tieder JS et al. *Pediatrics* 2021

- Data from 11 children’s hospitals
  - Age <1 year & discharged 2015-2018

- 4,971 records of infants discharged with a condition known to be associated with BRUE reviewed

- 2,036 of these evaluated for BRUE
Results
Tieder JS et al. *Pediatrics* 2021

- 87% of infants had higher-risk factors by AAP guideline criteria
  - *Most* of these infants did not have any serious condition
  - Presence of 1 higher-risk factor had 4% positive predictive value in identifying a serious underlying condition

- 4% (82 infants) had serious explanatory diagnosis (e.g., seizure or infantile spasm, 23; airway abnormality, 13; abusive head trauma, 7)
**Implications**

Tieder JS et al. *Pediatrics* 2021

- Identifying infants presenting with BRUE who are at high-risk of having a serious underlying condition remains challenging despite availability of guidelines.

- Opportunity to improve identification of infants with BRUE who are at high-risk of poor outcomes.
A Combined Reach Out and Read and Imagination Library Program on Kindergarten Readiness

- I have listened to you talk before about Reach Out and Read, but I don’t really have the time. I know that some of my patients’ families are signing up for the Ohio Governor’s Imagination Library. But, my time is all booked. Is it shelf-ish of me to question the value of this additional work or should I open a new chapter in my practice?
Methods

• Retrospective study, 2016-2018, comparing Kindergarten readiness between those participating in Reach Out and Read and the Dolly Parton’s Imagination Library to those who did not participate
Results

- “On track” Kindergarten Readiness Assessment literacy subtests increased over time

- No statistical difference between those who participated in Reach out and Read and the Imagination Library and a comparison sample
Conclusions

• Do not be dissuaded by the lack of statistical difference
  – Challenge in matching to the Kindergarten Readiness Assessment (25%)
  – Difficulty in matching
  – Outcome measure might not be granular enough
  – Exposure to books increased over time because of how the Imagination Library rolled out, so differences in exposure

• Low-risk, high-yield intervention
  – There is much prior research supporting Reach Out and Read
  – The barrier to participating in the Imagination Library is low
The Top Street Signs We Saw While Searching for Articles
TERRIBLE SUMMER FOR HUMPTY DUMPTY
BUT HE HAD A GREAT FALL
Opportunities for Practice

1. Wearing masks can decrease the decrease respiratory illnesses overall
2. Magnets still pose a risk to our patients
3. Advocate for fair compensation for all healthcare works during the pandemic and beyond
4. The family burden associated with TBI is high
Opportunities for Practice

5. Use the PECARN head injury rule when considering a head CT
6. Work to prevent drowning
7. Learn strategies to improve communication with families about medications
8. Work to ensure that your clinical setting can provide trauma-informed care
Opportunities for Practice

9. Addressing social determinants of health has significant benefit for our patients and their families
10. Determining which infants with BRUE have risk for a serious underlying medical problem is challenging
11. Use Reach Out and Read in your practices and refer to the Imagination Library