



Future Directions in Pediatric Clinical Pathways: Challenges, Innovations, and Next Steps

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PATHWAYS4KIDS

Supporting Evidenced Based Practices



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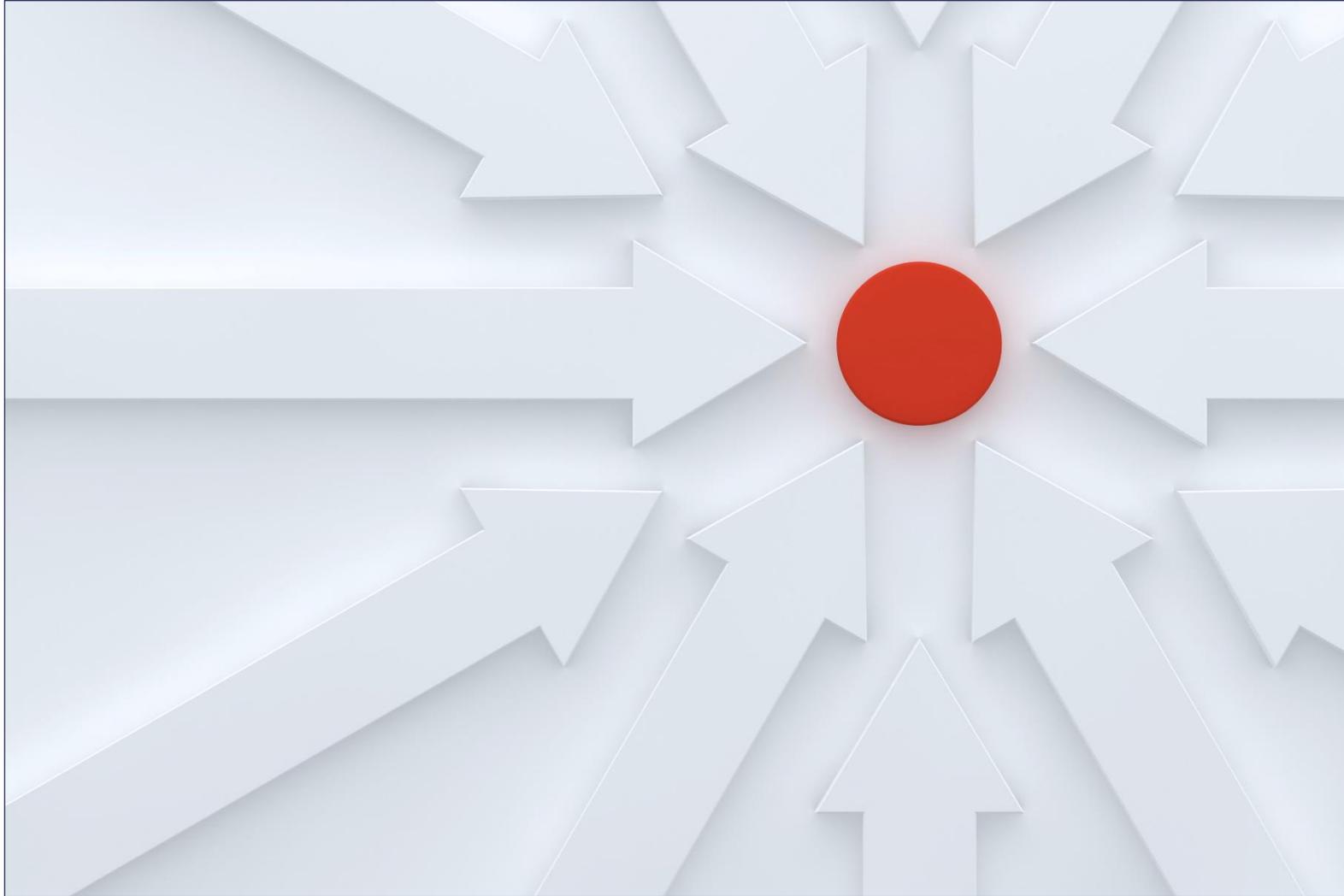
Learning Objectives

- Identify key challenges facing pediatric clinical pathways programs in today's rapidly changing environments.
- Describe emerging innovations in pathway development, implementation, and measurement that are shaping pediatric care.
- Discuss future directions for pediatric clinical pathways, including opportunities to strengthen collaboration, learning, and impact.





Pulling It All Together



Translating Evidence Into Practice Remains a Struggle

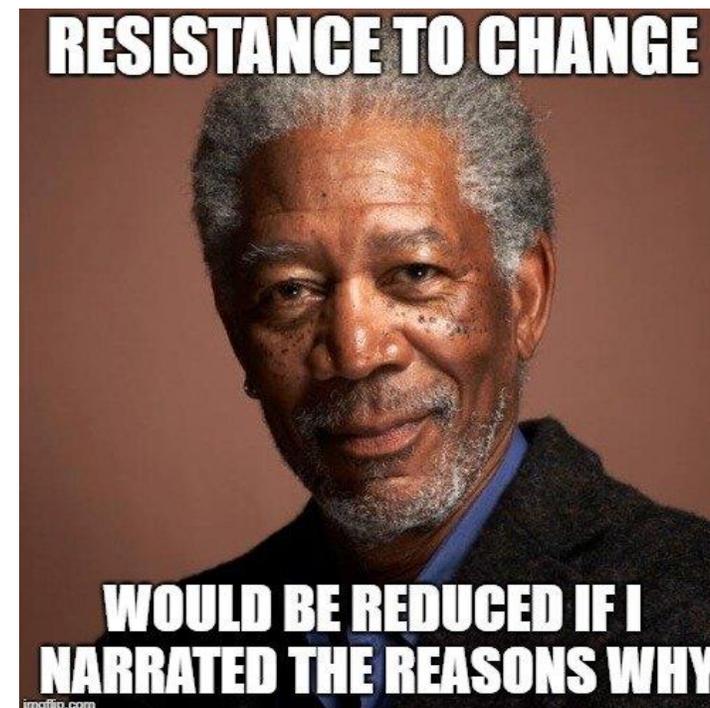
- Rapid growth of medical knowledge outpaces clinicians' ability to stay current, widening the evidence-to-practice gap
- Pathways are intended to close this gap, but only if they are **usable, trusted, and embedded in workflow**
- Several talks highlighted how outdated pathways, static PDFs, or poorly defined populations undermine credibility and adoption



Challenges: Themes That Have Emerged

Adoption Is Primarily a Human and Cultural Problem, Not a Technical One

- Resistance to change, preference for familiar workflows, and skepticism of externally driven pathways persist
- Adoption varies by role (physicians, residents, nurses), training level, and care setting
- Successful programs invested heavily in change management, leadership sponsorship, super-users, and repeated reinforcement



Pathways That Are Not Integrated Into the EHR Create Friction and Data Blind Spots

- Static PDFs and external links require clinicians to toggle systems, reducing use
 - This lack of integration makes it difficult to track adherence, define populations, and measure outcomes reliably
- Integration efforts face technical, financial, and workflow barriers—but institutions that invested saw measurable gains in visibility and engagement



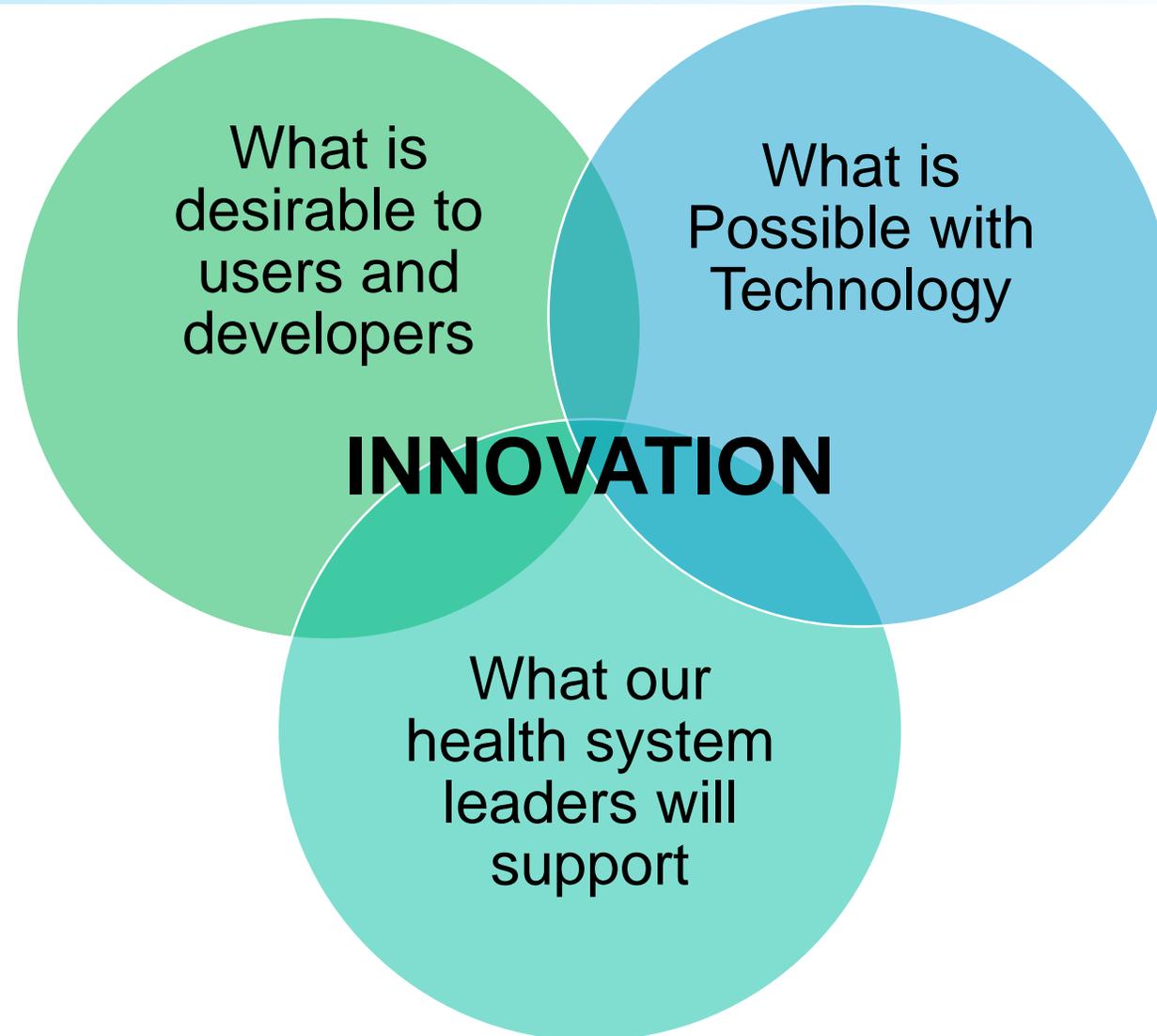
- Measurement Is Hard—Especially Defining the “Right” Population and Metrics
 - Inconsistent cohort definitions lead to misleading or non-actionable results
 - Over-measurement delays projects and overwhelms teams
 - Equity analyses (e.g., lipid screening disparities) revealed unintended consequences and system-level barriers
 - Sustained trust requires stable denominators and transparent data governance



Sustaining and Scaling Pathways Requires Infrastructure

- Growth is messy
 - introduces challenges around prioritization, ownership, review cycles, and resource allocation
- Programs struggle without dedicated roles for pathway coordination, analytics, and QI support
- Training new champions (faculty, residents, nurses) is essential to avoid burnout and bottlenecks
- Several institutions responded by formalizing academies, centralized dashboards, or standardized review frameworks





EHR Embedded Pathways

- Software and technology improves care

Mobile Apps

- Human Factors in Clinical Pathways work

Data Collection and Analysis

- Making it easier to gauge impact

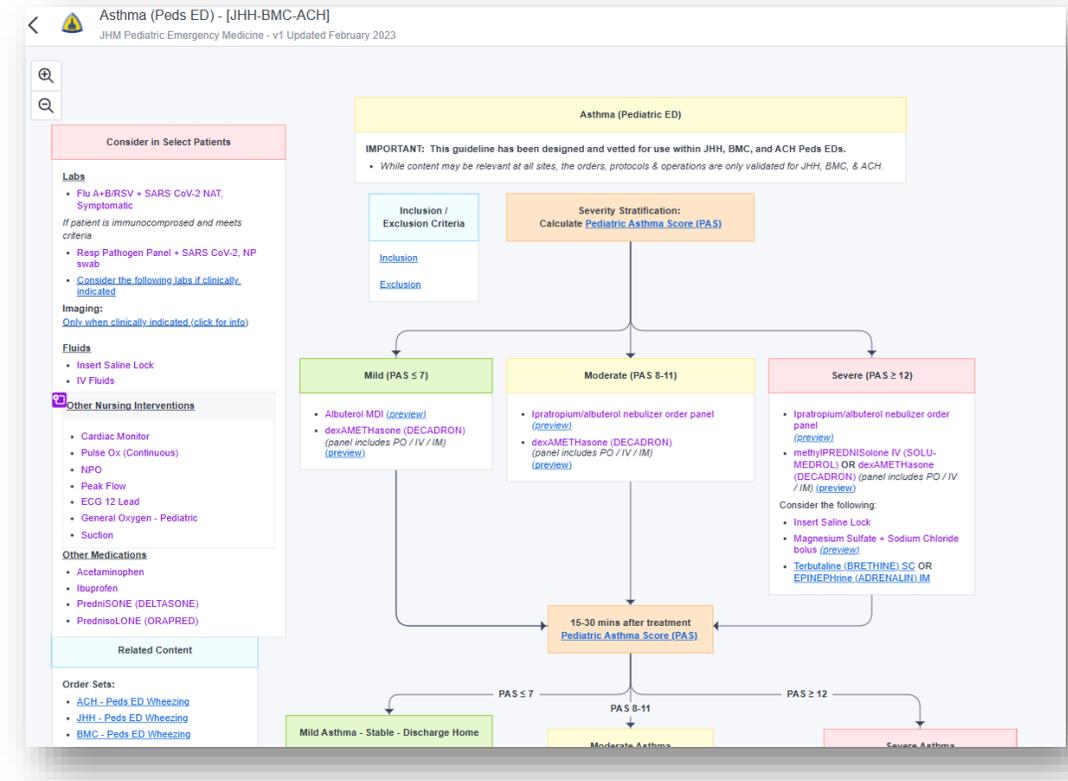




Innovations: EHR Embedded Pathways

- Health Information Technology systems are known to improve outcomes, quality of care and resource utilization (Neame) yet many pathways are still static workflows in PDF format
- Some teams shift from PDF only to EHR digitally embedded work through order sets or third party products
- New products and technology are rapidly changing, new features
- Benefits: Solves adoption and measurement issues
- Downside: Not as robust as PDFs

Johns Hopkins All Children's Hospital





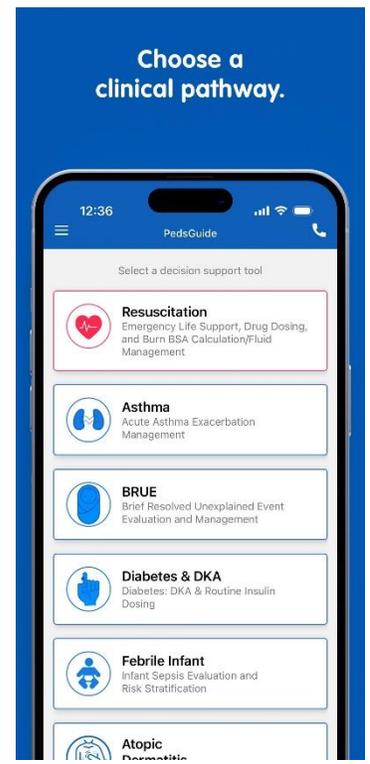
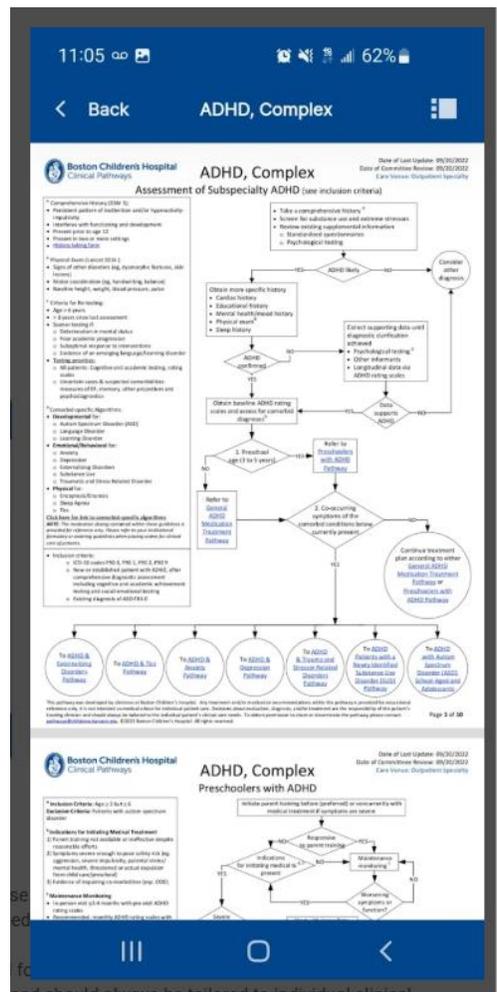
Innovations: Clinical Pathway Mobile Apps



- Teams are bringing Clinical Pathways to the bedside
- Human Factors is key when implementing work
- Benefits: allow the tool to be at the bedside
- Downside: expensive, time consuming

Boston Children's Hospital

Children's Mercy Kansas City



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Data Collection

- Data is important to help get buy in from teams
 - “Transparent sharing of health data with developers, users, and key stakeholders builds trust and engagement, which in turn enables continuous learning and measurably improves care quality and outcomes.” (National Academy of Medicine)
- The work of finding discrete data elements for analysis is labor intensive
- AI supported Chart Abstraction Tools turn charts into structured data for much faster analysis- from weeks to minutes

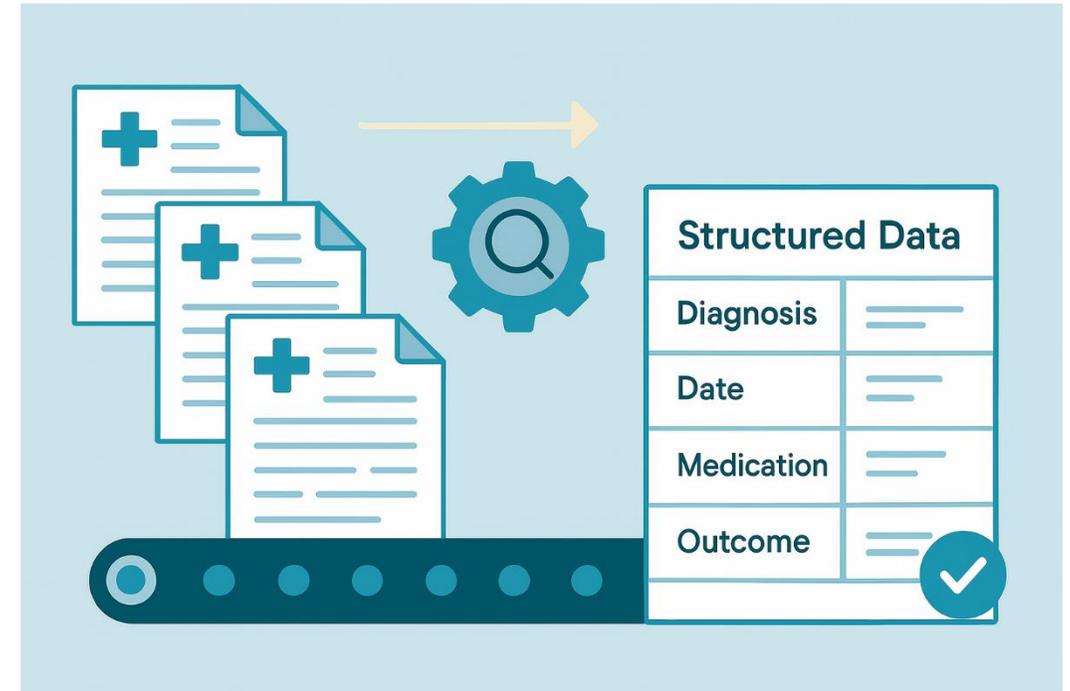


Image credit: Brim Analytics





Innovations: Data Collection Examples

Tool	Primary Focus	How AI Is Used	Key Use Cases
Brim Analytics	Research & registry chart abstraction	Uses LLMs to define variables in plain English and automate abstraction	Research studies, cancer registries, quality initiatives; integrates with REDCap
Astrata (Chart Review)	HEDIS abstraction	NLP guides abstractors directly to relevant evidence in the chart	HEDIS measures, efficiency gains, improved Star ratings
Autonomize AI (Medical Chart Review Copilot)	Clinical chart review	Transforms multi-source, multi-format data into structured, searchable summaries	Chart review, patient summaries, clinical and quality analysis
Carta Healthcare	Registries, research, and trials	AI tools (Atlas, Harbor) automate data collection and analysis	Registry abstraction, research analytics, clinical trial matching
Hathr.AI	Large-scale chart review	HIPAA-compliant generative AI finds and summarizes relevant chart data	Retrospective research, quality improvement analysis
OphthoACR	Specialty-specific EHR review (ophthalmology)	Automated extraction of structured variables from complex notes	Ophthalmology registries, specialty-specific analytics
Reveleer	Health plan abstraction	AI maps chart findings to care gaps and risk adjustment codes	Regulatory compliance, risk adjustment, quality reporting



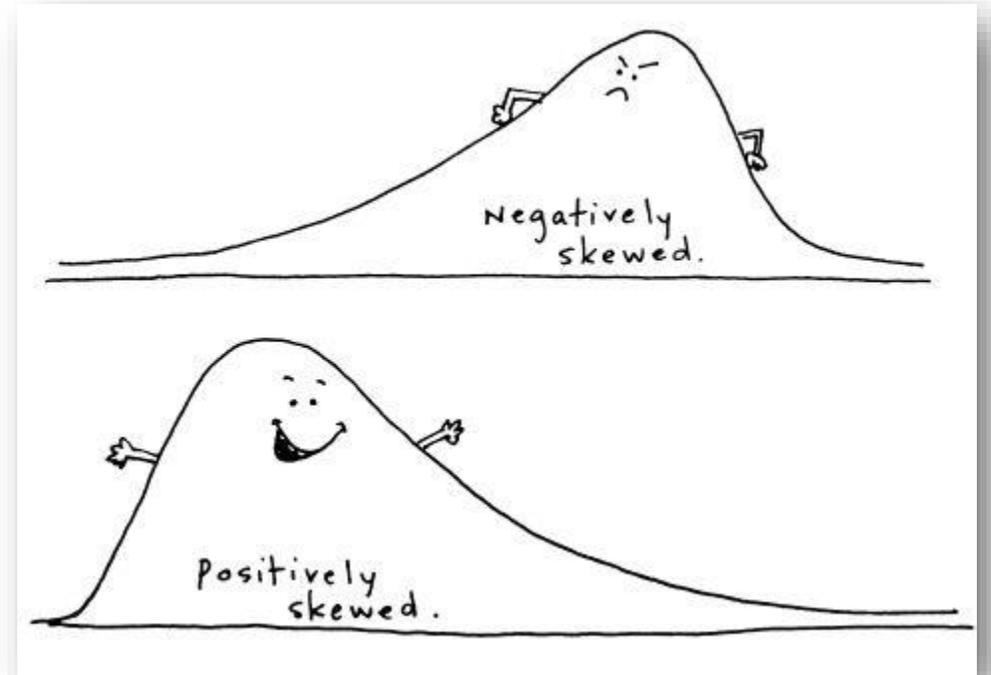


What about AI?

Great for gut checks on data, easy entry to

- Descriptive statistics
- Statistical analysis
- Basic chart creation

Confirmation is always recommended due to hallucinations and inaccuracies but it's a good start





Prompt:

“I have a dataset evaluating an asthma clinical pathway implemented on April 1, 2025 to reduce unnecessary chest X-rays.

Please do the following:

- Calculate basic descriptive statistics (mean and median) for the percentage of unnecessary chest X-rays in the pre-implementation vs post-implementation phases.
- Use an appropriate statistical test to determine whether the change is statistically significant (e.g., two-proportion z-test or chi-square test)
- Create a publication- or conference-ready line graph with individual points, a dotted line at showing date of implementation, and clearly showing the percentage of unnecessary chest X-rays over time pre vs post implementation”





Descriptive statistics

Outcome: % of unnecessary chest X-rays
Pre-implementation (Jan–Mar 2025)

- Mean: 49.16%
- Median: 49.55%

Post-implementation (Apr–Jun 2025)

- Mean: 24.00%
- Median: 23.75%

Absolute reduction: ~25 percentage points

That is a ~50% relative reduction, which is clinically and operationally meaningful.

Statistical significance

Because this is a binary outcome at the patient level (unnecessary CXR vs not) aggregated over time, a two-proportion z-test is appropriate and standard for pathway evaluations.

Test performed

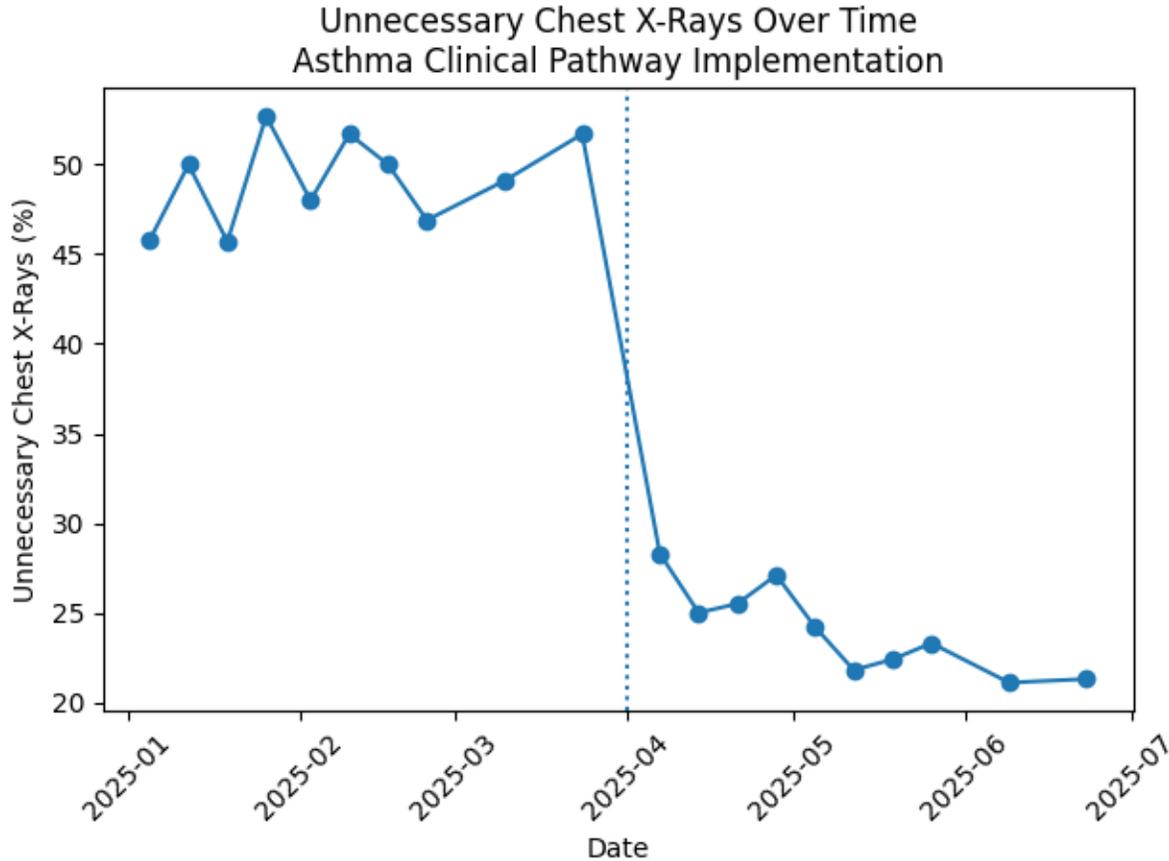
- Two-proportion z-test
- Pre: total unnecessary CXRs ÷ total asthma cases (all pre weeks combined)
- Post: total unnecessary CXRs ÷ total asthma cases (all post weeks combined)

Results

- Z-statistic: 8.76
- p-value: < 0.000000000000000001 ($\approx 1.9 \times 10^{-18}$)

Interpretation

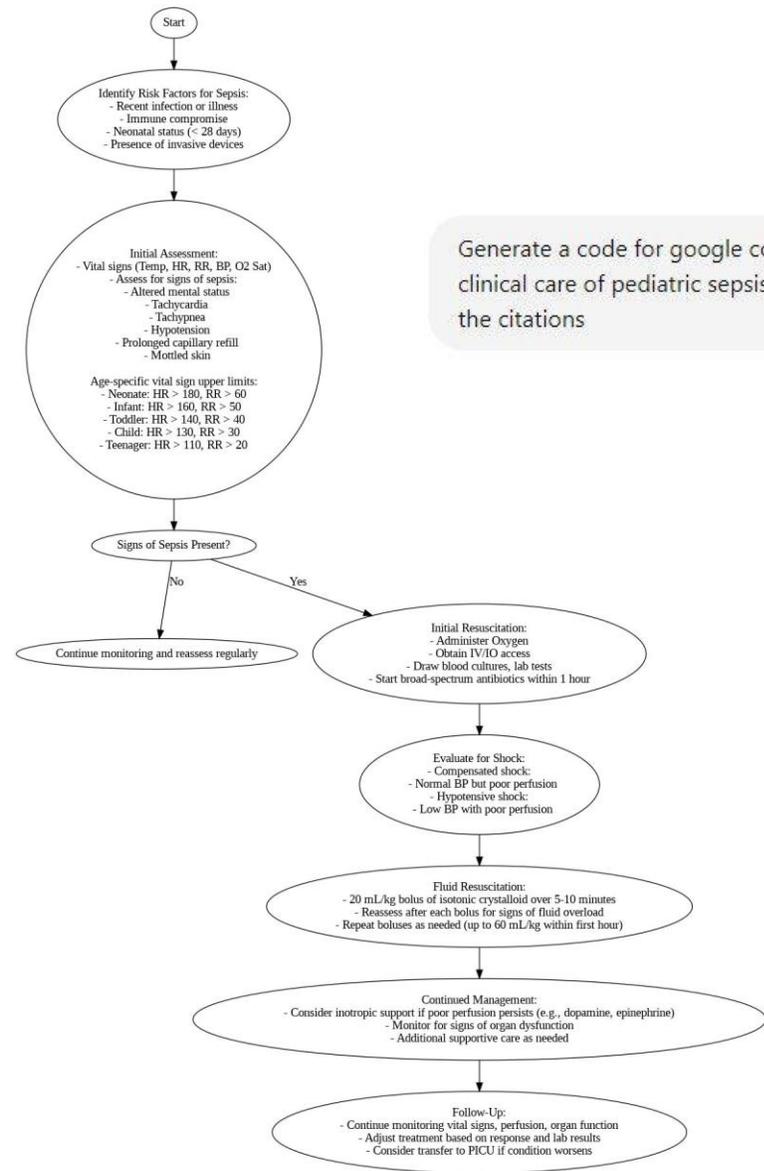
The reduction in unnecessary chest X-ray utilization following pathway implementation was statistically significant ($p < 0.001$).





Other Potential AI Implications?

- Generate Algorithms
 - Upload a publication and give it basic directions
- AI generated pathway simulations
 - Check logic
 - Run a practice patient through the algorithms
- Create documents
 - Create GPT Prompt teams to create PDFs by asking questions



Generate a code for google collab with a detailed algorithm for the clinical care of pediatric sepsis based on the best evidence and include the citations





FUTURE DIRECTIONS





Future Directions: Where are we going?

Increased
Collaboration

- Shared learning
- Shared resources

Setting
Standards

- Establishing Best practices
- Sharing Standard measures
- Benchmarking key measures while allowing for local customization





Is Collaboration Evidence Based?

- Collaborative networks accelerate the spread of evidence-based practices
- Shared learning reduces unwarranted variation in care
- Communities of practice support sustained adoption and improvement
- Learning health systems enable continuous feedback and refinement





Collaboration Examples



- BPD Collaborative
 - National collaborative efforts in bronchopulmonary dysplasia have demonstrated measurable improvement through shared data and implementation strategies.
- Vermont Oxford Network
 - NICUs working together, sharing data and evidence-based improvement strategies through a learning network sharing best practices and driving measurable improvements





We've already started this work

- Virtual webinars
- Conferences like this one
- Poster Sessions
- One on one connections
 - Our team met with another about how we developed and implemented our Sepsis work
 - MOC credit help
- Slack and now Forums

FORUMS

Welcome to Pathways4Kids.org > Forums

Forum	Topics	Posts	Last Post
<p>Announcements</p> <p>Welcome to the Pathways4Kids Community Forum.</p> <p>This space is for members to ask questions, share resources, discuss clinical pathway development, implementation, measurement, and research, and learn from one another across institutions. Please post in the appropriate topic area and keep discussions collaborative and respectful.</p>	0	0	No Topics
<p>2026 Conference</p> <p>Use this forum to ask questions, share insights, and continue conversations related to the 2026 Pathways4Kids Conference, including sessions, posters, and logistics.</p>	2	2	1 day, 10 hours ago 
<p>Community Q&A & Shared Learning</p> <p>Ask questions, share resources, and learn from peers across institutions working on pediatric clinical pathways.</p>	0	0	No Topics
<p>Implementation & Measurement</p> <p>Share questions and lessons learned about rollout, metrics, dashboards, PDSA cycles, and sustaining change in real-world settings.</p>	0	0	No Topics
<p>Clinical Pathway Development</p> <p>Use this space to share resources, discuss pathway design, evidence selection, scope decisions, and alignment with national guidelines.</p>	1	1	1 day, 10 hours ago 





This has been happening on a small scale

People are already networking and helping each other sharing documents:

- Operational definitions
- Data request template
- Rubric for prioritization
- Org charts
- Pathway application processes
- Approval processes





Having a collection of these resources in one place might be the best use case for this group

What would be most meaningful? What would you want to see?

Resource Library

Access recordings, slides, and educational resources shared across the Pathways4Kids community. This library includes quarterly meetings, conference content, and other member-only materials as they become available.

[Browse the Resource Library](#)





As a group we could work on:

- Best practices
 - What development and implementation has worked for other teams
- Sharing standard measures
 - Which measures mean the most for specific diseases
- Benchmarking key measures
 - How are we doing compared to others?
- Transparent pathways published online
 - Benefits the whole healthcare community





Future: What Can We Take Home?

- Individually:
 - Take one thing learned from this conference and try it out
 - Encourage public transparency of your pathways to support your local network of patients
 - Try and get basic data from at least one pathway and then publish
- As a Group:
 - Engage support and mentor other pathway teams
 - Pathways4Kids Forum
 - Work together to Publish
 - Share pathways work at conferences (Posters, CME presentations)





GROUP DISCUSSION





Where do you see the greatest opportunity for us to amplify impact with pediatric clinical pathways?





What resources would you love to see shared from other clinical pathways programs?





How can this group contribute to improving the work of clinical pathways?





Looking ahead 3–5 years, what capabilities will be most critical for pediatric clinical pathways programs to succeed?





Thank You

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