The  's of the pediatric visit: A Cautionary Tale of Diagnostic Misses

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Disclosures

Non-Declaration Statement: I have no relevant relationships with ineligible companies to disclose within the past 24 months. (Note: Ineligible companies are defined as those whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.)

Lecture Objectives

- Discuss a standardized format for taking a pediatric well-visit history to minimize missed diagnoses
- Identify abnormal exam findings commonly missed in the pediatric patient
- Describe commonly overlooked communication, motor and social emotional development concerns in the pediatric patient
- Identify appropriate screening tools for detecting pediatric abnormalities
- Determine those findings that require specialty intervention or referral and those that can be monitored by the primary care provider

Diagnostic delays and misses in pediatrics

- ***No-fault***: outside the control of the provider such as an atypical disease presentation or patient-related factors such as providing misleading information
- ***System-related***: Inadequate care coordination and teamwork

- ***Cognitive***: Made by clinicians due a variety of factors including inadequate knowledge, poor critical thinking skills, a lack of competency, problems in data gathering, and failing to synthesize information

Diagnostic delays and misses in pediatrics

- Many misses are due to vague presenting symptoms; failure to gather information through history, PE or chart review; or an unconventional history

- Top missed diagnoses in pediatrics with medicolegal consequences include testicular torsion, appendicitis, meningitis and pneumonia
- Most commonly self-reported errors from clinician
- Viral illnesses being diagnosed as bacterial illnesses
- Misdiagnosis of medication side effects, psychiatric disorders

Cognitive biases are at the heart of many cognitive diagnostic errors

- Practitioners are trained and subsequently then pre-dispositioned to respond to situations in a predictable way
- Illness scripts and pattern recognition are our “quick thinking” mechanisms, but like anything quick they have their downfalls
- Cognitive biases can be due to distraction, fatigue, or in response to diagnostic uncertainty
- A wellness bias leads providers to feel prematurely reassured by the resiliency and short-lived nature of most pediatric illnesses → missing uncommon illnesses

Strategies to Prevent Diagnostic Delays/Misses?

Strategies to Prevent Diagnostic Errors/Misses?

Ask yourself a few key questions

- Are there pieces of the “story” that don’t fit?
- Am I feeling fatigued right now?
- Is there data I haven’t obtained or reviewed?
- Have I considered a red-flag or don’t miss diagnosis?
- Do I bring an illness or wellness bias to the visit?

Strategies to Prevent Diagnostic Errors/Misses?

Bias checkpoints

- Up to 70% of diagnostic errors are due to cognitive biases
- Implicit bias, if not recognized and deliberately addressed, may cause you to inadvertently miss a dx
- Debiasing strategies purposely slow down thinking and decision making—a mental timeout.
  - Deliberate and conscious consideration of alternative diagnoses (that don't come intuitively) can help overcome some bias
  - Decision support tools in the EMR
  - Time outs/Recalibrations
  - TWED
  - Group decision making

Strategies to Prevent Diagnostic Delays/Misses?

Create checklists, algorithms or mnemonics

- Limits to the human memory and cognition can decrease DDx
- Checklists may prompt new diagnostic considerations and investigation
- Mnemonics protect against memory failures and ensure a robust differential diagnosis is considered
- EHR can be helpful when using checklists or algorithms to follow

Create a standardized approach to your well-visits

- Determine whether basic needs are being met for adequate growth (look at the growth chart)
- Determine whether a child is progressing developmentally as he/she should (surveillance vs screening)
- Evaluate for age-appropriate or inappropriate physical exam findings

How do we assess growth?

Image from Pixabay by TawnyNina

The Ins & Outs of Growth Assessment (NEST)

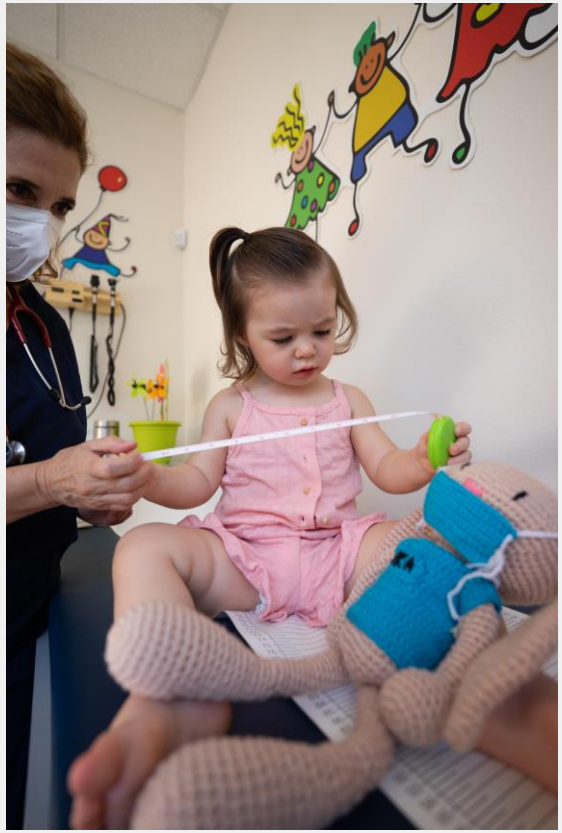
- **N**utrition
- **E**limination
- **S**leep
- **T**racking growth

Tracking: Using a growth chart

- Length/Height
- Weight
- Head circumference
- Age:BMI ratio

WHO growth charts for 0-23 mo.

CDC growth charts for ≥24 mo.



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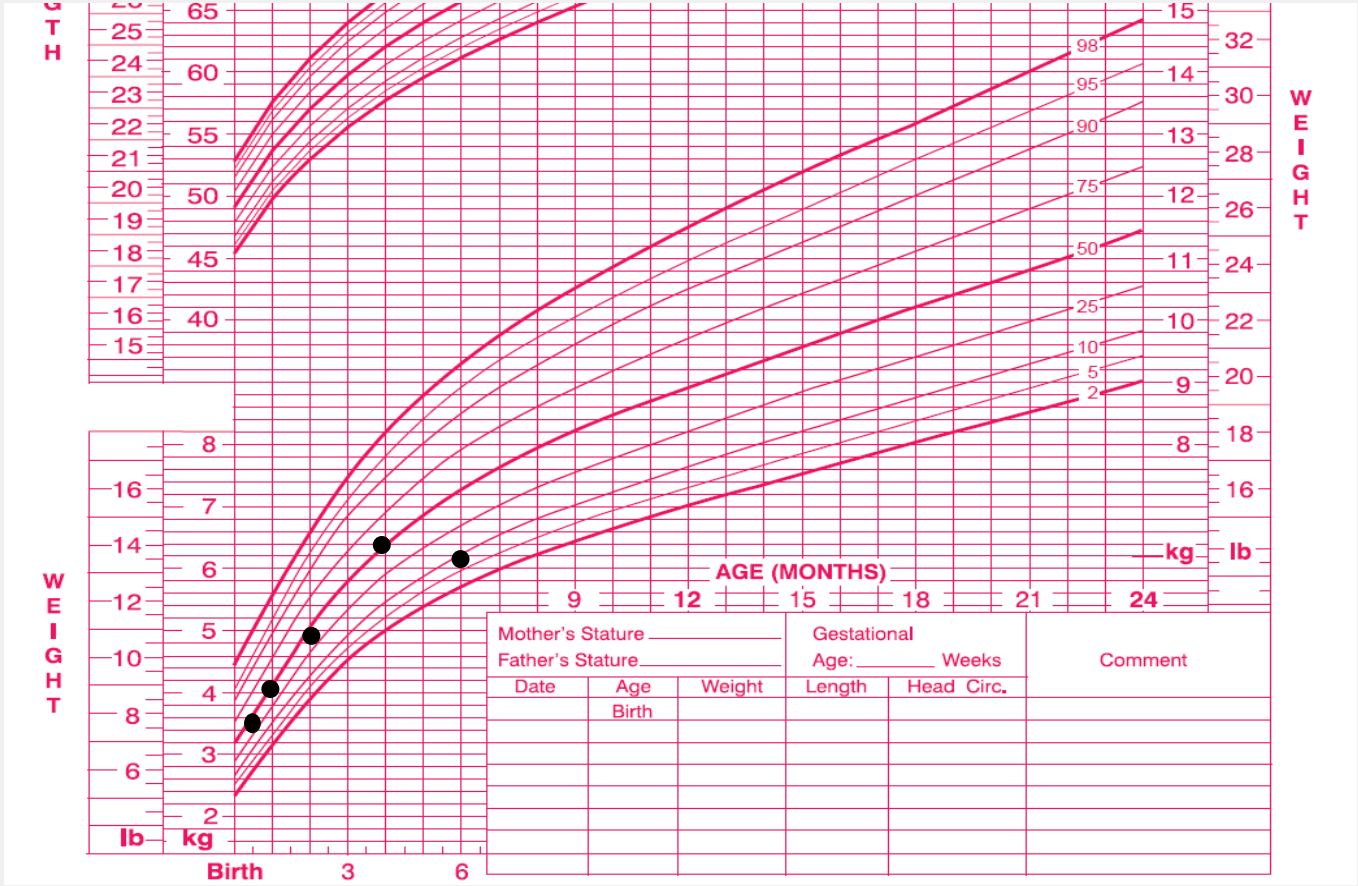
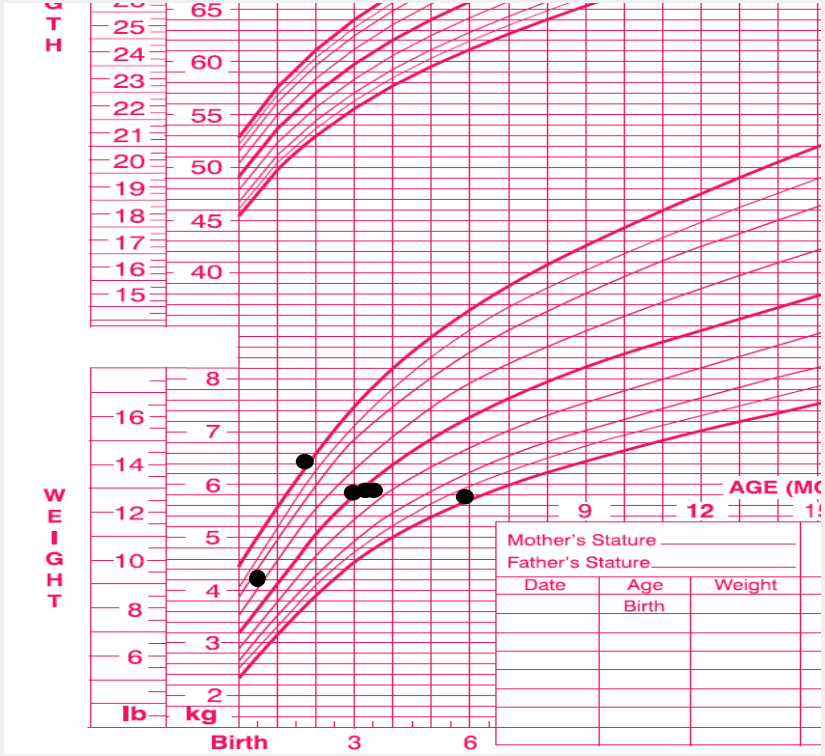
Tracking: Using a Growth Chart



How to know normal vs. abnormal?

- Enough points on the graph?
- Any human error?
  - » Data points accurate?
  - » Data plotted accurately?
- Following a curve?
  - » May see discontinuous growth over a short period of time
  - » Looking for a general trend following a percentile line



Tracking
What not to miss in pediatric patients

- Childhood overweight and obesity
  - » Childhood overweight >85th percentile
    - Primary care management with lifestyle modifications and recheck q 3 months
  - » Childhood obesity >95th percentile
    - Primary care management but referral to nutrition or cardiology appropriate
- Failure to thrive (dropping more than 2 percentile lines in weight or a pattern of weight points below the 3rd percentile)
  - » Nutrition referral with initial lab work-up for common endocrine
- Any abnormal physical, laboratory or developmental findings with growth trajectory changes → immediate further investigation
  - » Referral to endocrinology, neurology, nutrition or genetics could be appropriate

The Ups & Downs of Development Assessment (FLY)

- Family
- Learning
- Your tools

Family Situation

- Family structure
  - Who makes up the family
  - Child care
  - Responsibility division
  - Siblings
- Adjustment to age/stage
  - Child's temperament
  - Parental experiences → variation in discipline styles
  - Stresses
  - Outside support systems
- Money
  - Food/housing insecurity
  - Educational attainment → earning potential
- Safety
  - Violence
  - Environmental factors
  - Smoke, EtOH, drug exposures (primary or secondary)

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Learning: 4 Acquired Skills

- Physical development
- Communication
- Social-Emotional
- Cognitive/Problem-Solving





Images from Pixabay

Learning: Physical Development

- Vision
- Hearing
- Gross motor
- Fine motor

Image from www.babynerd.com

Learning: Communication

- Body Language
- Verbal Communication

Image from Mercer Cognitive Psychology (http://mercercognitivepsychology.pbworks.com/w/page/32429395

Learning: Social-Emotional

- Signs of connection
- Signs of self-regulation

Learning: Cognitive/Problem Solving

- Engagement
- Intelligence
- Ability to understand

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Audience Question
When are you screening for developmental delays?

A. At every well-child check
B. At every visit (well or sick)
C. Only at the 9-month and 18-month visits
D. At the 9-month, 18-month, 24-month and 30-month visits
E. My practice doesn’t use a standardized screening tool

Learning
What not to miss in pediatric patients

Developmental delays

- Developmental delays are common (12-15% of US children)
- Age-appropriate developmental checklists are used to record milestones as part of surveillance
- Parental concern and surveillance alone are often inadequate for identifying children with developmental delays (miss about 2/3 of kids)
- Most common disability is intellectual disability, followed by CP and ASD
- Could be an isolated delay but more commonly children have global delay
- Delay in one developmental domain often correlates with delay in other domains.
- Bilingual exposures should not be an excuse to overlook a delay

Your screening tools
Bias controls and Checklists

- Incorporating screening tools into your practice can serve as a type of checklist to decrease diagnostic misses associated with developmental and psychosocial diagnoses
- Screening tools used as a standard practice can help to mitigate implicit and explicit biases
  - » Factors that have been associated with lower screening rates include minority race/ethnicity, poverty (income and insurance type) and the state of practice

Your screening tools

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Diagnoses commonly delayed or missed if a screening tool is not used…

- Maternal depression
- Developmental delay
- Child/Adolescent mood disorders
- Suicidality

Audience Question
Which of the following screening tools do you use routinely in your practice?

A. Edinburgh Postnatal Depression Scale (EPDS)
B. Ages & Stages Questionnaire (ASQ)
C. Pediatric Evaluation of Developmental Status (PEDS)
D. Modified Checklist for Autism in Toddlers (M-CHAT)
E. Survey of Well-Being of Young Children (SWYC)
F. Car, Relax, Alone, Forget, Friends, Trouble (CRAFFT)
G. Patient Health Questionnaire (PHQ-9)
H. Ask Suicide Screening Questions (ASQ)
I. Other

Screening tools you might include in your practice

Maternal depression—EPDS or PHQ-9

- Screening at 1, 2, 4 and 6 month WCC
- Children of depressed mothers are more likely to exhibit:
  - Socio-emotional problems including poor self-control
  - Delays or impairment in cognitive, linguistic, and social development
  - Show aggression
  - Have poor peer relationships
  - Difficulty in school
- Developmental outcomes extended into childhood/adolescence
- Screening for PPD reduces the overall prevalence of depression at 3-month follow-up and increase the likelihood of remission or treatment response in postpartum women

Screening tools you might include in your practice

Developmental delay

- ASQ, PEDS, SWYC, M-CHAT
- Developmental screening recommended at 9, 18 and 30 month WCC
- Autism screening at 18 and 24 month WCC
- Only 30% of the nearly 9 million children under the age of 3 received a parent-completed screening for development
- Without routine screening, less than 1/3 of children with developmental issues were identified before kindergarten.
- Children who underwent routine screening were more likely to have delays detected and receive earlier referrals to early intervention and evaluation

Screening tools you might include in your practice

Child/Adolescent mood disorders

- PHQ-2/PHQ-9 or GAD-7
- Screening annually starting at 12 y/o
- Self-reported screening—less than 50% of primary care providers routinely do an adolescent depression screening
- Far less (1.9%) are coded for in billing
- National average of adolescents with MDD is 8-10% of patients
- Children and adolescents with MDD typically have:
  - » Impairments in school/work performance, interactions
  - » Negatively affects developmental trajectories

Screening tools you might include in your practice

Suicidality—PHQ-9 or ASQ

- Second leading cause of mortality in the adolescent population
- Screener specifically for suicidality detect 15% of patients with suicidal risk
- Adding it to a depression screener can increase detection by 8%, with 55% of those additionally identified scoring below the cutoff for depression on the PHQ-9

The Physical Exam

- Systematic head-to-toe exam with special emphasis on age-specific exam components
- Changes as the child grows
- May include objective observations of development

The Physical Exam: What not to miss in pediatrics

- Early childhood caries
  - Dental caries prevalence is higher in Mexican American children (33%) and non-Hispanic Black children (28%) than in non-Hispanic White children (18%)
  - Caries initially appears as opaque white spots on the surface of the tooth enamel
  - Progression leads to cavitation → abscess, cellulitis
  - White enamel lesions could indicate caries, fluorosis and genetic and developmental disorders

Audience Question
A 6-month-old child is seen for persistent dacryostenosis, at what age should you refer to ophthalmology?

A. Today's visit
B. 9 months (if it continues to persist)
C. 1 year of age (if it continues to persist)
D. No referral is necessary, as this is a benign condition

Audience Question
At what age should you refer a child with a lazy eye to ophthalmology?

A. 2 months
B. 4 months
C. 14 months
D. 36 months
E. No referral is necessary, as this is a benign condition

The Physical Exam: What not to miss in pediatrics

The eye exam

- Absent or Asymmetric Red Reflex—Retinoblastoma, but also an indicator of cataracts and refractive error (asymmetric red reflex)
- Asymmetric ocular alignment—asymmetric corneal light reflex or movement of covered eye in cover-uncover; intermittent strabismus after 4 mo. of age may be presenting sign of cranial nerve defect, amblyopia, cataracts, chorioretinitis or retinoblastoma
- Persistent dacryostenosis—may resolve by 6 mo., but if persisting, consider glaucoma, uveitis, corneal abrasion or increased risk for anisometropia
- Decreased visual acuity—fixation reflex and optotype testing; <3 y/o fixation is a marker of visual function; asymmetric fix-and-follow test, unable to follow in a vertical fashion after 3 mo. and past midline by 6 mo..

The Physical Exam: What not to miss in pediatrics

The cardiac exam

- Pediatric hypertension
  - » Typically asymptomatic
  - » Must use height-based tables for diagnosis
  - » >90th percentile requires interventions
    - Lifestyle modifications, BP of upper and lower extremities, ambulatory BP monitoring and referral are the range of options depending on the classification of BP

The Physical Exam: What not to miss in pediatrics

The cardiac exam

- Coarctation of aorta
  - Diagnosis is delayed in older children
  - Subtle PE findings with asymptomatic patients
  - Often presents as elevated BP or hypertension
    - AAP recommends standardized BP measurements after the age of 3
  - Femoral pulses as compared to brachial pulse (brachial-femoral delay)

The Physical Exam: What not to miss in pediatrics

The abdominal exam

- Appendicitis
  - » Missed in up to 15% of pediatric patients
  - » Abdominal pain, constipation, N/V, fever or diarrhea
  - » Commonly misdiagnosed as constipation suggesting cognitive bias called premature closure
  - » High risk for diagnostic uncertainty
  - » F/U abdominal pain with 7 days

Photo courtesy of Amy Akerman, PA-C

The Physical Exam: What not to miss in pediatrics

The GU exam

- Testicular torsion
  - Adolescent males between 12-18 y/o
  - Can present atypically
    - 31% of patients present with abdominal pain alone
  - Should do a testicular exam even if not presenting of testicular pain
  - Emergent referral


THANK
YOU

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