
Pediatric Misdiagnosis in Emergency Departments

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Introduction

Over the last few years, pediatric emergency department visits have shown a growing pattern of pediatric misdiagnosis. Literature suggests that 15-77% of pediatricians admit to making at least one diagnostic error per month, and approximately 45% report committing at least one error resulting in one patient harm annually (Porter et al., 2021). In a pediatric emergency department, a national study examining 184,490 visits found that 70% of the attending children had serious conditions for which a misdiagnosis could be measured. These findings reflect the diagnostic errors that can be identified in cases with outcomes that were trackable, indicating that the actual misdiagnosis rate is higher. Of this percentage, the 3% should be considered a low estimate of the true extent of misdiagnosis in pediatric emergency rooms. That in total is 5,534 pediatric patients who were misdiagnosed (Michelson & Grubenhoff, 2025). A pediatric misdiagnosis refers to the failure to diagnose a child correctly, which might lead to incorrect or delayed treatment of the child's medical condition. Dr. Beigi's interview was important in the discussion of misdiagnosis (Blissy, 2024). Generally, the concept of "mismatch" highlights the delayed treatment and failure to accurately diagnose (Misdiagnosis Association and Research Institution, 2024).

The impact of diagnostic errors can range from mild to severe, with one important fact that diagnostic errors frequently result in harm to pediatric populations, in which 48.7% of pediatrics experienced moderate harm, and 10% had major harm (Mahjan et al. 2023). In this article, the primary causes, the clinical consequences, and methods to overcome diagnostic errors in pediatric emergency departments will be discussed.

Primary Causes

One primary cause of diagnostic errors is the pediatric-parent-provider interactions, basically, misinterpreted histories or incomplete physical examinations, representing 59.1% of the diagnostic errors (Mahjan et al. 2023). For instance, a study conducted by Mahjan et al. (Mahjan et al. 2023) found that pediatric emergency department physicians reported diverse diagnostic errors, often occurring in children presenting with common, undifferentiated symptoms. The authors reported that many of these errors were linked to communication and assessment issues during patient or caregiver interactions (Mahjan et al. 2023).

Nonspecific Symptoms and Common Diagnoses

Usually, diagnostic error cases involve children presenting with nonspecific symptoms such as abdominal pain (21.1%), fever (17.2%), or vomiting (16.5%) (Mahjan et al. 2023). Consequently, these patients were frequently discharged with common diagnoses like acute gastroenteritis (16.7%), viral syndrome (10.2%), or constipation (7.0%) (Mahjan et al. 2023), which bear a diagnostic error percentage.

Provider-Related Factors

Another cause is the early clinical judgment that the provider relies on before any other possible diagnosis. And this cause is usually linked to factors affecting the provider, including fatigue, distractions in high-volume emergency departments, and cognitive overload as reported by Alsabri et al. (2023).

Clinical Consequences

Diagnostic errors in pediatric emergency departments can result in serious clinical consequences for patients. When a diagnosis is delayed or missed, children may not receive appropriate treatment in time, allowing disease progression. Many of these diagnostic errors go unrecognized, leading to delayed treatment, progression of disease, and in some cases, permanent disability or death, as reported by Marshall et al. (2022). From 6.9% to 14.5% of pediatric patients were subjected to inappropriate medications based on their misdiagnosed conditions (Porter et al. 2021).

Moreover, according to Samuels-Kalow et al. (2019), medication errors in pediatric emergency settings can lead to incorrect dosing, adverse drug reactions, and delayed treatment of the disease. This can result in a risk of higher complications, additional emergency visits, and prolonged duration of the disease in pediatric patients Samuels-Kalow et al. (2019). Overall, these outcomes highlight the significant impact that diagnostic errors have and their clinical consequences for both provider and patient.

Strategies to Overcome Diagnostic Errors

Missed opportunities for improving diagnosis (MOID)s are considered a strategy to overcome diagnostic errors because they help healthcare providers and hospitals identify where the diagnostic process failed and use that information to further prevent similar errors (Mahajan et al., 2025). In a study conducted by Mahajan et al. (2025), aimed to investigate MOIDs in pediatric emergency departments, three electronic triggers and their association with MOIDs were evaluated Mahajan et al. (2025). These triggers were as follows: trigger (1), which was return visits within 10 days resulting in admission, trigger (2) was care escalation in 24 hours, and trigger (3) was death after 24 hours of the visit. Each of these triggers was specific to every child. Although trigger (3) was the rarest, it led to 112 death cases Mahajan et al. (2025). Moreover, the authors also suggested several prevention strategies to reduce medication errors, which includes using weight-based medication to ensure appropriate medication administration and reporting these medication errors Mahajan et al. (2025).

AI-Based Systems

According to the American Academy of Pediatrics, AI-based systems have a different approach to overcoming diagnostic errors. The AI-based system can address system-related issues to reduce errors. Specifically, AI clinical decision support tools can gather large volumes of patient data and are able to detect subtle clinical patterns (Marshall et al., 2022). Additionally, the review highlighted that 50% of diagnostic errors are preventable and that diagnostic errors affect 5-15% of pediatric patients, suggesting that these AI-driven systems will help mitigate these high numbers. Finally, these findings suggest that implementing AI systems in pediatric emergency departments has the potential to overcome these diagnostic errors (Marshall et al., 2022).

Conclusion

In conclusion, diagnostic errors in pediatric emergency departments range from mild to severe and frequently result in preventable harm in children. This article examined the primary causes, clinical consequences, and prevention strategies to overcome diagnostic errors. The evidence highlights the need to enhance the quality and consistency of reporting systems to identify diagnostic errors, understand their root causes, and implement prevention strategies. Moving forward, future research should focus on validating the reported key errors and have a better weight/measurement enforcement that is a standard practice in clinical settings, while also highlighting the importance of (MOID)s to overcome diagnostic errors.

Questions and Answers

What is a diagnostic error in pediatrics?

A diagnostic error in pediatrics is the failure to diagnose a child accurately. This leads to misdiagnosis and treatment errors.

What is one primary cause of diagnostic errors in pediatric emergency departments?

Misinterpretation of patient history during provider-caregiver interactions is a primary cause of diagnostic errors, which contributed 59.1% of cases (Mahjan et al. 2023).

What are the consequences associated with diagnostic errors?

The most common consequences include delayed treatment, incorrect treatment, long-term impairment, and disease progression that can lead to disability or death.

What are missed opportunities for improving diagnosis (MOID)s?

MOIDs are strategies used to mitigate diagnostic errors and to identify preventable points of error.

What role does artificial intelligence (AI) have in reducing diagnostic error?

AI systems can collect patient data from large datasets and analyze clinical disease patterns.

Resources

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