

**Title:** Diagnostic Delay in Paediatric Inflammatory Bowel Disease: A Systematic Review

**Authors:**

Ayman Ajbar<sup>1</sup>, Simbarashe Matoi<sup>1</sup>, Eleanor Cross<sup>2</sup>, Charles A Hay<sup>2</sup>, Benjamin Saunders<sup>2</sup>, Adam D Farmer<sup>2, 3</sup> & James A Prior<sup>2,4</sup>

Ayman Ajbar - [17221277@rcsi.com](mailto:17221277@rcsi.com)

Simbarashe Matoi - [17239419@rcsi.com](mailto:17239419@rcsi.com)

Eleanor Cross, MBChB, MPhil - [e.l.cross@keele.ac.uk](mailto:e.l.cross@keele.ac.uk),

Charles A Hay, Medical Research Assistant, MA - [c.hay@keele.ac.uk](mailto:c.hay@keele.ac.uk)

Benjamin Saunders, Lecturer in Applied Health Research, PhD - [b.saunders@keele.ac.uk](mailto:b.saunders@keele.ac.uk)

Adam Farmer, Consultant Gastroenterologist, PhD FRCP - [a.farmer@qmul.ac.uk](mailto:a.farmer@qmul.ac.uk)

James A. Prior, Honorary Senior Lecturer in Epidemiology, PhD - [j.a.prior@keele.ac.uk](mailto:j.a.prior@keele.ac.uk)

**Affiliations:**

<sup>1</sup>Royal College of Surgeons in Ireland – Medical University of Bahrain, Bahrain

<sup>2</sup>School of Medicine, Keele University, UK, ST5 5BG

<sup>3</sup>Department of Gastroenterology, University Hospital of North Midlands (UHNM) NHS Trust

<sup>4</sup>Midlands Partnership NHS Foundation Trust, Trust Headquarters, St. George's Hospital, Stafford

## **Background**

Diagnostic delay in inflammatory bowel disease (IBD) is common, but the true extent of this delay remains unclear due to varied results across studies. We performed a systematic review to gain a clearer understanding of IBD diagnostic delay in pediatric patients. Our objectives were 1) to assess the extent of diagnostic delay and 2) to assess the association of specific characteristics with the length of the delay.

## **Methods**

We identified studies in several medical bibliographical databases (EMBASE, Medline, and CINAHL) from their inception to October 2018. Studies that involved pediatric cohorts (<18 years old) diagnosed with IBD, Crohn's Disease (CD) or Ulcerative Colitis (UC) and which reported an average time between the onset of symptoms and a final diagnosis (diagnostic delay) were included. Study selection, data extraction and quality assessment were conducted by two reviewers. The extent of the diagnostic delay and associated sample characteristics were then examined using narrative synthesis.

## **Results**

Of the 7571 studies initially identified, 28 were included in the review. The overall median diagnostic delay range was 3.1-10.4 months for IBD, 4.1-15.0 months for CD and 2.0-15.0 months for UC. However, for the majority of CD studies, delay ranged from 4.1-6.8 months and 2.0-5.0 for UC. Several sample characteristics were found to be significantly associated with a longer delay; however, these were examined too infrequently to draw firm conclusions about their role.

## **Conclusion**

Children continue to wait several months for a definitive diagnosis of IBD, with CD patients facing a longer wait than UC patients. The effect of particular characteristics on delay should be explored further.

**Table 1: Median Diagnostic Delay in Inflammatory Bowel Disease, Crohn's Disease and Ulcerative Colitis**

	<b>Author, reference</b>	<b>Year</b>	<b>Country</b>	<b>Sample size (n)</b>	<b>Diagnostic Delay (Months)</b>	<b>IQR/Range (Months)</b>
IBD	Greuter, et al.	2017	Switzerland	329	3.1	2-7.1
	Timmer, et al.	2011	Germany and Austria	2436	4	2-9
	Ricciuto, et al.	2017	Canada	111	4.5	2.1-8.8
	Sawchenko, et al.	2003	UK	739	5.04	<1-108
	Spray, et al.	2001	UK	112	10.38	0.5-24.1
CD	Greuter, et al.	2017	Switzerland	173	4.10	2-8.1
	Barton, et al.	1990	UK	68	4.8	
	Timmer, et al.	2011	Germany and Austria	1456	5	2-10
	Gerasimidis, et al.	2013	UK	113	5	9.5
	Sawchenko, et al.	2003	UK	431	6	3.6-12
	Ricciuto, et al.	2017	Canada	65	6.8	2.9-12.5
	Spray, et al.	2001	UK	64	10.85	0.92-84.28
	Bland, et al.	1999	UK	105	10.54	
Avinash, et al.	2009	India	23	15	1-60	
UC	Barton, et al.	1990	UK	37	2	0-5.1
	Gower-Rousseau, et al.	2009	France	151	2	1-6
	Ricciuto, et al.	2017	Canada	46	2.4	1.3-5.3
	Bland, et al.	1999	UK	105	2.92	
	Timmer, et al.	2011	Germany and Austria	817	3	1-6
	Greuter, et al.	2017	Switzerland	156	3	1-6.1

---

Spray, et al.	2001	UK	41	4.62	0.46-36.12
Gerasimidis, et al.	2013	UK	57	5	10
Avinash, et al.	2009	India	11	15	6-48

---