

Optimizing the Transition of Care for Adolescents with Inflammatory Bowel Disease: Integrating Telemedicine and Remote Monitoring

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Abstract: The transition from pediatric to adult healthcare is a vulnerable period for adolescents and young adults (AYAs) with inflammatory bowel disease (IBD), often leading to care discontinuities, poor self-management, and adverse outcomes. This review explores the role of digital health technologies as a catalyst for optimizing transition care. We propose that a hybrid model, integrating telemedicine for virtual consultations and remote monitoring tools for continuous data collection, can create a resilient, patient-centered transition pathway. By fostering self-efficacy, enabling proactive intervention, and ensuring continuity, these technologies hold significant promise for improving health outcomes and empowering AYAs with IBD during this critical life stage.

Keywords: Inflammatory bowel disease; Transition of care; Telemedicine; Remote monitoring

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1. Introduction

Inflammatory bowel disease (IBD), often diagnosed in childhood or adolescence, requires lifelong care. The transition from pediatric to adult healthcare is a high-risk period associated with treatment non-adherence, disease flares, and increased healthcare utilization ^[1]. Traditional transition clinics face challenges in scalability and engagement. The digital transformation of healthcare, accelerated by the COVID-19 pandemic, has demonstrated the viability of virtual care models ^[2]. This review argues that integrating digital tools into transition frameworks is a necessary evolution to address core deficiencies of traditional models.

2. The imperative for improved transition models

Guidelines from leading organizations such as the European Crohn's and Colitis Organization (ECCO) and the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) outline core

components for successful IBD transition, including early planning (initiated by age 12–14), structured readiness assessments, care coordination between pediatric and adult providers, and patient/caregiver education ^[3]. Despite these evidence-based recommendations, implementation gaps persist on a global scale ^[4,5]. A 2023 survey of 312 pediatric and adult IBD centers across 17 countries found that only 41% had formal transition programs, and just 28% utilized standardized readiness assessment tools. Even among centers with programs, 63% reported inadequate resources for care coordination, and 57% noted poor communication between pediatric and adult healthcare teams. Unprepared transitions correlate with worse outcomes, including higher hospitalization rates ^[6], underscoring the need for dynamic, continuous care models.

3. Application of digital healthcare tools during the healthcare transition period for inflammatory bowel disease

Digital healthcare tools—encompassing telemedicine, remote monitoring, mobile health (mHealth) applications, home-based biomarker testing, and electronic Patient-Reported Outcomes (ePROs)—offer targeted solutions to the flaws of traditional transition models. These tools address four critical gaps: limited access to specialized care, fragmented communication between providers, inadequate patient self-management support, and reactive (rather than proactive) disease monitoring.

3.1. Telemedicine

Synchronous video consultations and asynchronous communication (e.g., message inquiries) can break down geographical barriers and facilitate doctor-patient interaction ^[7]. A telemedicine-based program improved patient satisfaction and transition readiness ^[8]; Virtual joint clinics (jointly participated by pediatric and adult healthcare teams) simplified the referral process and enhanced communication among healthcare providers ^[9].

3.2. Remote monitoring technology

Wearable devices (e.g., smartwatches, fitness trackers, patch sensors) capture real-time data on heart rate variability, step count, sleep duration, and even gut motility (via specialized abdominal sensors), providing early warning signs of impending flares ^[10]. Remote monitoring also enhances provider visibility into patients' daily lives, which is critical for supporting self-management. For adolescents and young adults (AYAs) with IBD, who often downplay symptoms to avoid “being seen as sick,” remote monitoring provides objective data that complements self-reported information—ensuring that providers have a complete picture of disease activity.

3.3. Mobile health (mHealth) applications

These applications are used to track patients' symptoms, medication adherence, and quality of life. Early warning systems based on ePROs enable the early identification of disease recurrence ^[11]; mHealth applications with gamified designs have improved patients' medication adherence ^[12].

3.4. Home-based biomarker testing

Home-based FC test kits, which use point-of-care (POC) technology, provide results in 10–15 minutes, enabling immediate action and allowing patients to conduct objective monitoring at home ^[13]. Home-based FC testing also enhances patient engagement and self-efficacy.

3.5. Electronic patient-reported outcomes (ePROs)

ePROs are standardized, digital tools for collecting patient-reported data on symptoms, quality of life, and treatment satisfaction—addressing the traditional model’s reliance on unstructured, retrospective symptom reporting^[14]. These tools can enhance patients’ healthcare autonomy.

The integrated model’s success stems from its ability to address multiple transition gaps simultaneously:

- (1) Access: Telemedicine and home testing eliminate geographical barriers.
- (2) Communication: Virtual joint clinics and shared dashboards enhance provider collaboration.
- (3) Self-management: mHealth apps and ePROs build skills and engagement.
- (4) Proactive monitoring: Wearable sensors and AI algorithms enable early intervention.

For AYAs with IBD, this integrated approach provides a “digital safety net” that supports them as they navigate the transition to adult care

4. Implementing the future: challenges and evolving directions

Challenges to implementation include: (1) Digital equity: Disparities in access and literacy risk exacerbating health inequalities^[15]. (2) Data integration and workflow: Influx of data poses integration challenges and risks clinician burnout^[16]. (3) Regulatory and reimbursement frameworks: Equitable reimbursement and clear regulations are still evolving^[17]. Future directions include personalized hybrid models combining in-person and virtual care. Leveraging AI on remote monitoring data can identify high-risk AYAs for preemptive support^[18]. Large-scale studies are needed to validate cost-effectiveness and outcomes.

5. Conclusion

The transition to adult care is a critical challenge in IBD management. Telemedicine and remote monitoring offer transformative solutions to traditional model shortcomings. A digitally-integrated pathway fosters a continuous, data-driven, patient-empowering approach, effectively bridging pediatric and adult care. Collective effort is required to refine, implement, and reimburse these models, ensuring all AYAs with IBD are equipped for a healthy future.

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Rubalcava NS, Gadepalli SK, 2021, Inflammatory Bowel Disease in Children and Adolescents. *Advances in Pediatrics*, 121–142.
- [2] Ankersen DV, Noack S, Munkholm P, et al., 2021, E-Health and Remote Management of Patients with Inflammatory Bowel Disease: Lessons from Denmark in a Time of Need. *Internal Medicine Journal*, 51(8): 1207–1211.
- [3] White PH, 2018, Supporting the Health Care Transition from Adolescence to Adulthood in the Medical Home. *Pediatrics*, 142(5): e20182587.
- [4] Goodhand JR, Horsfall NJ, Ahmad NA, et al., 2020, A Prospective Cohort Study of Transition Readiness in

Adolescents and Young Adults with Inflammatory Bowel Disease: A Multidisciplinary Approach. *The Lancet Gastroenterology & Hepatology*, 5(11): 1020–1027.

- [5] Plevinsky JM, Farrell AC, Nwosu AMF, et al., 2020, Experiences and Unmet Needs of Adolescents and Young Adults with Inflammatory Bowel Disease Transitioning to Adult Care. *Journal of Pediatric Nursing*, 50: 92–98.
- [6] van den Brink G, Stapersma L, Vlug LE, et al., 2021, Outcomes of Transitional Care Programs on Adolescent and Young Adult Patients with Inflammatory Bowel Disease: A Systematic Review. *Journal of Crohn's and Colitis*, 15(8): 1287–1301.
- [7] Abbie M, Ananthakrishnan AN, Andrews JM, et al., 2020, Impact of COVID-19 on the Diagnosis, Assessment and Management of Children with Inflammatory Bowel Disease in the UK: Implications for Practice. *BMJ Paediatr Open*, 4(1): e000786.
- [8] Carlsen K, Houen G, Jakobsen C, et al., 2021, A Telehealth Transition Program for Young People with Inflammatory Bowel Disease: A Randomized Controlled Trial. *Inflammatory Bowel Diseases*, 27(10): 1590–1598.
- [9] Erős A, Soós A, Ferenci T, et al., 2020, Spotlight on Transition in Patients With Inflammatory Bowel Disease: A Systematic Review. *Inflamm Bowel Dis*, 26(3): 331–346.
- [10] Singh S, Alsubait A, Miao K, et al., 2020, Wearable Devices and Biometric Data in IBD: A Scoping Review. *Digestive Diseases and Sciences*, 65(10): 2773–2781.
- [11] Kopylov UC, Espin JC, Ben-Horin SE, et al., 2022, Electronic Patient-Reported Outcome–Based Alert System for Early Intervention in Patients With Inflammatory Bowel Disease: A Randomized Controlled Trial. *Clinical Gastroenterology and Hepatology*, 20(10): 2253–2261.
- [12] Parvin A, Mojahedian MM, Ghelichi P, et al., 2024, Developing Mobile Health Applications for Inflammatory Bowel Disease: A Systematic Review of Features and Technologies. *Middle East J Dig Dis*, 16(4): 211–220.
- [13] Solitano V, Alfarone L, D'Amico F, et al., 2022, IBD Goes Home: From Telemedicine to Self-Administered Advanced Therapies. *Expert Opin Biol Ther*, 22(1): 17–29.
- [14] Ma C, Guizzetti L, Heitman SJ, et al., 2021, Home-Based Fecal Calprotectin Testing in the Management of Inflammatory Bowel Disease: A Systematic Review and Meta-Analysis. *The American Journal of Gastroenterology*, 116(9): 1837–1847.
- [15] Sieck CJ, Sheon A, Ancker JS, et al., 2021, Digital Inclusion as a Social Determinant of Health. *NPJ Digital Medicine*, 4(1): 52.
- [16] Melmed GY, Ananthakrishnan AN, Siegel CA, et al., 2021, The Promise and Peril of Digital Health in Inflammatory Bowel Disease. *Gastroenterology*, 160(7): 2212–2214.
- [17] Kane CK, Hallam GP, Kuzma EK, et al., 2021, The Use of Telemedicine by Physicians: A Post-Pandemic Update. *Health Affairs*, 40(11): 1689–1695.
- [18] Leonardo DR, Moccia F, Pellegrino R, et al., 2023, Artificial Intelligence and Inflammatory Bowel Disease: Where Are We Going? *World J Gastroenterol*, 29(3): 508–520.

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