Point-of-Care CRP testing in acutely ill children: An interview study of pediatricians' perceptions and experiences

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Abstract

Background

Point-of-care (POC) C-reactive protein (CRP) testing has shown potential in improving diagnostic accuracy and reducing unnecessary antibiotic prescriptions. While previous studies have focused mainly on general practitioners, little research has explored how pediatricians perceive and implement this tool in ambulatory primary care settings. Pediatricians often manage younger and more severely ill children, making it essential to understand their experiences with POC CRP testing in order to tailor implementation strategies to the specific challenges and needs of pediatric practice in Belgium.

Aim

To aim of this study is to investigate pediatricians' perceptions, experiences, and attitudes toward POC CRP testing in the management of acutely ill children. This study takes into account the clinical, contextual, and organizational factors specific to ambulatory pediatric practice, including both solo and group practices.

Methods

In this qualitative study, semi-structured, in-depth interviews were conducted with pediatricians working in ambulatory care settings outside of hospitals in Belgium. The study is part of a nested qualitative process evaluation in the ARON trial. In the ARON trial primary care physicians, both pediatricians and general practitioners, used a diagnostic algorithm that included a POC CRP test to help determine the need for antibiotic prescriptions. Participants in our study were recruited through convenience sampling, including both ARON trial participants and additional pediatricians who utilize POC CRP testing. All participants worked in primary care settings; some also held part-time hospital roles. Data was analyzed using thematic analysis, guided by the Consolidated Framework for Implementation Research (CFIR) and the Medical Research Council (MRC) framework.

Results

Interviews were conducted with 15 pediatricians working in ambulatory primary care. The analysis identified 10 themes within 4 key domains: Intervention Characteristics & Development, Outer Setting & Acceptability, Inner Setting & Feasibility, and Characteristics of Individuals & Educational Impact. Pediatricians described POC CRP testing as particularly valuable in the context of young acutely ill children who are unable to articulate their symptoms, and in situations where physical examination alone provides limited diagnostic certainty. Compared to general practitioners, pediatricians more frequently see younger patients, including acutely ill infants, and frequently manage cases where rapid reassurance or escalation is needed. In this context, POC CRP testing was perceived as useful to support decision-making, especially in response to parental anxiety or pressure to prescribe antibiotics. Several pediatricians also highlighted its usefulness in complex social situations, such as among socioeconomically vulnerable families, or in cases where access to follow-up care is uncertain (e.g., refugees or families without transportation). In these cases, POC CRP testing was used to help guide referral decisions. Despite these perceived benefits, routine implementations were often hindered by barriers such as financial costs, workflow disruption, and variation in interpretation thresholds.

Conclusion

POC CRP testing is considered to be a valuable diagnostic aid by pediatricians, particularly in clinical situations where diagnostic uncertainty is high. Its usefulness is amplified in younger children who cannot verbalize symptoms, and in socially complex situations where timely referral or reassurance is critical. However, implementation in pediatric practice requires strategies that account for its unique clinical realities such as complex presentations, population-specific needs, and logistical constraints.

Tailored training, flexible interpretation guidelines, and sustainable financial frameworks are essential to support wider adoption in pediatric primary care practices.

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Introduction

Acute infections are the most common reason for children to seek ambulatory care, accounting for a significant proportion of consultations with pediatricians and general practitioners (GPs). Although these infections are often self-limiting and viral in nature, diagnostic uncertainty frequently complicates clinical decision-making which can result in inappropriate antibiotic prescriptions and unnecessary medication. This overprescribing contributes to potentially harmful outcomes and accelerates the global health threat of antimicrobial resistance (AMR) (1,2).

The World Health Organization (WHO) has identified AMR as one of the top 10 public health threats facing humanity, highlighting the urgent need for interventions to improve diagnostic accuracy and reduce unnecessary antibiotic use (2)

POC CRP testing has been shown to be clinically effective in reducing unnecessary antibiotic prescriptions in ambulatory care settings, including general practice and pediatrics, by helping to rule out serious infections and providing reassurance in lower-risk cases (3–6). Beyond improving antibiotic stewardship, qualitative research indicates that POC CRP testing enhances clinicians' diagnostic confidence by offering objective information to support decision-making and communication with patients; it serves as a rapid inflammatory marker to assess the likelihood of serious infections requiring immediate treatment, though it does not directly differentiate between bacterial and viral infections (7). The ARON trial (Antibiotic Prescribing Rate after Optimal Near-Patient Testing) demonstrated that incorporating POC CRP testing, along with prescription guidance and safety-netting advice, safely reduces antibiotic prescribing in acutely ill children. This approach supports clinical judgment, guides further assessment, aids in the timely exclusion of serious infections. Thereby it improved decision-making and reducing unnecessary antibiotic use without compromising patient safety (7).

The clinical context in which pediatricians work differs significantly from that of GPs, which may influence how they perceive and implement POC CRP testing. Pediatricians often care for children with more severe conditions, including those referred by a GP. Furthermore, many ambulatory pediatricians in Belgium work both in primary care settings outside the hospital and within the hospital, which can affect workflow integration, the interpretation of CRP results, and antibiotic prescribing behavior. Given these distinctions, it is important to investigate how pediatricians experience and apply POC CRP testing to ensure its effective integration into pediatric clinical practice.

This study is built upon the first phase of the ARON trial's process evaluation by extending the investigation with a specific focus on ambulatory pediatricians. The aim of this study is to explore their perceptions, experiences, and attitudes regarding the use of POC CRP testing in the management of acutely ill children. By capturing pediatricians' perspectives, the study assesses whether the benefits and implementation challenges observed during the ARON trial are applicable specific to pediatric care, or whether adaptations are required to optimize its use in this setting.

Gaining insight into the specific barriers and facilitators encountered by ambulatory pediatricians is essential for tailoring implementation strategies. These may include workflow adjustments, pediatric-specific interpretation guidelines, and solutions for financial or organizational challenges. Such strategies are key to integrating POC CRP testing effectively into routine pediatric practice. In this way

POC CRP will support accurate diagnosis, enhance antibiotic stewardship, and combat antimicrobial resistance.

Given the complexity of clinical decision-making in pediatric settings, qualitative research is particularly well suited to explore these issues. Unlike quantitative approaches, it captures the nuanced perspectives of clinicians and the contextual factors influencing their use of diagnostic tools. By focusing on pediatricians' experiences, this study deepens the findings of the ARON trial and contributes valuable insights for evidence-based improvements in the care of acutely ill children.

Methods

Study Design

This research is a qualitative study utilizing semi-structured, in-depth interviews with pediatricians, conducted either online via Microsoft Teams or in-person. This study follows the Standards for Reporting Qualitative Research (SRQR) and the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines to ensure rigor and transparency in reporting (8–10)

Context and Study Setting

This qualitative study is part of the nested process evaluation within the ARON trial. The ARON trial is a pragmatic, cluster-randomized, controlled superiority trial aimed at assessing the clinical and cost-effectiveness of a diagnostic algorithm designed to safely reduce antibiotic prescriptions for acutely ill children aged 6 months to 12 years in ambulatory care settings.

In the ARON trial, primary care physicians, including pediatricians and GPs, used a diagnostic algorithm to determine the need for antibiotics. The algorithm, as outlined in the trial protocol and in figure 1 (11), included a POC CRP test. In the intervention group, the decision tree was applied first. If any of the three features (gut feeling, dyspnea, temperature ≥ 40°C) were present, a POC CRP test was performed. If the CRP level was 5 mg/L or higher, referral or additional testing could be considered to rule out a serious infection. If all features were reassuring (all answers were 'no') and the physician still considered prescribing antibiotics, a POC CRP test was advised. Antibiotics not deemed appropriate if the CRP level was below 5 mg/L. The control group followed standard diagnostic and treatment protocols consistent with usual care practices (7).

Our study builds on previous qualitative process evaluation research, which explored the experiences of general practitioners and parents with antibiotic stewardship interventions, including POC CRP testing (6). However, our study specifically focuses on ambulatory pediatricians, offering new insights into the unique implementation challenges and experiences of pediatricians in managing acutely ill children with POC CRP testing.

Recruitment and Sampling

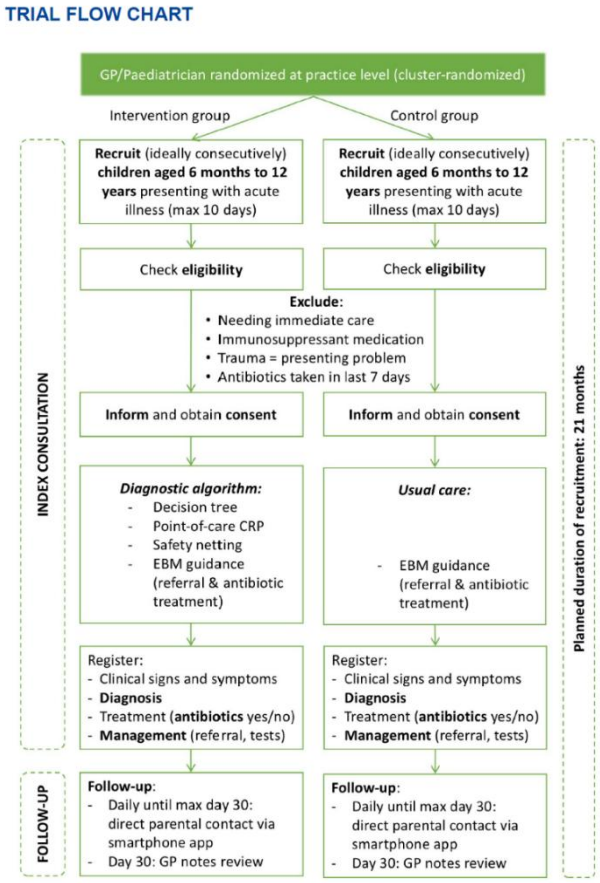
Our target participants were independent pediatricians working in ambulatory care practice outside the hospital, who routinely use a POC CRP device in primary care. Initial recruitment focused on pediatricians who had previously participated in the ARON trial (ARON +) and was supplemented by additional pediatricians recruited outside the trial (ARON -) to broaden the participant pool.

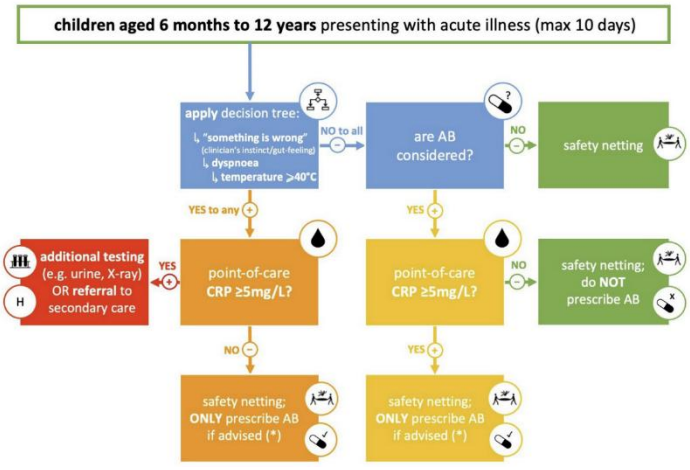
Due to a limited number of pediatricians in the ARON trial willing to participate in the nested qualitative substudy, we employed a convenience sampling approach to expand the recruitment pool to include additional pediatricians beyond the original trial participants. To reach pediatricians outside the ARON trial, we presented our flyer at Local Quality Circles (“LOK” groups) for pediatricians, which are peer review groups where pediatricians meet to discuss and improve medical practices, across Belgium. We distributed these flyers among pediatricians during these meetings. The flyer contained a link allowing pediatricians to express their interest and provide contact details. Additionally, during the interviews, we asked the pediatricians if they knew any colleagues who also owned a POC CRP device and might be willing to participate in the study. If they referred us to other pediatricians, we

sent those colleagues an email with the flyer and registration details, inviting them to participate if they were interested.

Pediatricians who participated in the ARON trial were required to follow the ARON protocol, including the use of the CRP test as outlined in the diagnostic algorithm (Figure 1), whereas pediatricians recruited outside the study context used CRP testing according to their own clinical judgment without a predefined protocol.

Figure 1: The diagnostic flowchart of the ARON trial. The top figure shows the flowchart of the ARON project. The bottom figure presents the detailed flowchart of the intervention group within the ARON trial(7).





Interview Procedure

The research team consisted of MM and IL, both third-year general GPs in training. Informed consent was obtained via an online LimeSurvey form (Appendix 1). During the interview, participants were provided with a link to the form, which the interviewer and participant reviewed together before it was digitally signed. The recruitment target was 14 to 18 pediatricians working in ambulatory practices with access to a POC CRP device.

Data collection and analysis were conducted simultaneously, allowing emerging themes to be explored in subsequent interviews, enhancing the depth of the study and ensuring comprehensive coverage of the research questions. There was no prior relationship between the researchers and the participating pediatricians, which allowed the participants to freely express their views and experiences regarding the use of POC CRP and its influence on antibiotic prescribing practices.

To maintain consistency and ensure in-depth exploration across all interviews, a structured topic guide was used (Appendix 2). The interviews focused on several key areas, including the technical use of the POC CRP device, practical experiences, and challenges encountered by pediatricians. They also explored how participants interpreted CRP test results and how these influenced their clinical decision-making. Additionally, the interviews addressed the organizational context in which the device was used, examining how it fit into existing workflows, as well as the perspectives of patients and parents regarding the device. Finally, the interviews explored clinicians' motivations, experiences, and attitudes toward the adoption and use of POC CRP in their practice.

Data Analysis

All interviews were audio- and video-recorded and transcribed verbatim. As stated in the study protocol, all recordings were stored on a password-protected computer. After the completion of the study (30/09/2025), all recordings will be permanently deleted and destroyed. We analyzed the transcripts using NVIVO 12 (QSR International Pty Ltd, Melbourne, Australia) to conduct a thematic content analysis. The analysis process consisted of several distinct phases.

In the first phase, MM and IL familiarized themselves with the data by listening to the recordings, transcribing the interviews, and thoroughly reviewing the transcripts. Since the interviews were conducted separately, each researcher transcribed her own interviews to ensure a deep understanding of the data.

In the second phase, a codebook was collaboratively developed based on emerging concepts identified in the data. The codes were iteratively refined through ongoing discussions and adjustments between the researchers, in close consultation with a third researcher (ED), to ensure accuracy and coherence. Each interview was coded independently, with regular meetings held to discuss discrepancies, ensure consistency, and reach consensus on emerging themes.

In the third phase, the codes were grouped into broader domains and themes to create a structured framework addressing the study’s research questions.

Finally, data collection and analysis were conducted simultaneously, so that insights from earlier interviews could inform and shape subsequent interviews. This iterative process contributed to a deeper and richer analysis of the data.

By following these steps, a rigorous and systematic approach to the analysis was ensured, leading to a comprehensive understanding of pediatricians' experiences with POC CRP testing.

Ethical Considerations

The study protocol, participant information, and consent procedures were approved by the Ethics Committee Research of University Hospitals Leuven (Approval Number: S62005). The study was submitted as an amendment to the initial ARON trial protocol.

Results

We recruited 15 pediatricians, ensuring a diverse representation in terms of years of experience and practice settings. 14 interviews were conducted online via Microsoft Teams, while 1 interview was conducted in-person. The interviews took place between April 2024 and September 2024. IL conducted 10 interviews, and MM conducted 5 interviews. Of the 15 pediatricians, 5 had participated in the ARON trial.

Participant characteristics

The characteristics of the participating pediatricians are summarized in Table 1 below. This table provides an overview of the type of practice (such as solo private practice or multidisciplinary/group practice), years of experience in pediatrics, percentage of employment within the hospital, years of experience using a POC CRP device, and the practice location. The practice locations are categorized as urban (located within 10 km of a hospital) or rural (more than 10 km from a hospital). The table also indicates whether the pediatricians had previously participated in the ARON trial.

Table 1: Participant characteristics

Category	Subcategory	Number of Pediatricians
Type of Practice	Solo	10
	Group/Multidisciplinary	5
Years of Experience	0-10 years	1
	11-20 years	7
	21-30 years	3
	31+ years	4
Employment Percentage in Hospital	0%	6
	1-25%	1
	25-50%	6
	>50%	2
Years of Experience with POC CRP	< 1 year	6
	1-5 years	5
	6+ years	4
Location of practice	Urban	8
	Rural	7
Participated in the ARON trial	Yes No	5 10

Domains & themes

We identified 10 themes within 4 domains based on a combination of the Consolidated Framework for Implementation Research (CFIR) and the Medical Research Council (MRC) framework for developing and evaluating complex interventions. This combined approach allowed us to explore both the practical barriers and facilitators (CFIR) and the feasibility and acceptability (MRC) aspects of integrating POC CRP testing into pediatric ambulatory care. By combining these frameworks, we aimed to capture the complexity of adopting POC CRP testing and to provide a comprehensive understanding of the contextual factors influencing its implementation. The relationships between these domains and themes are illustrated in Figure 2.

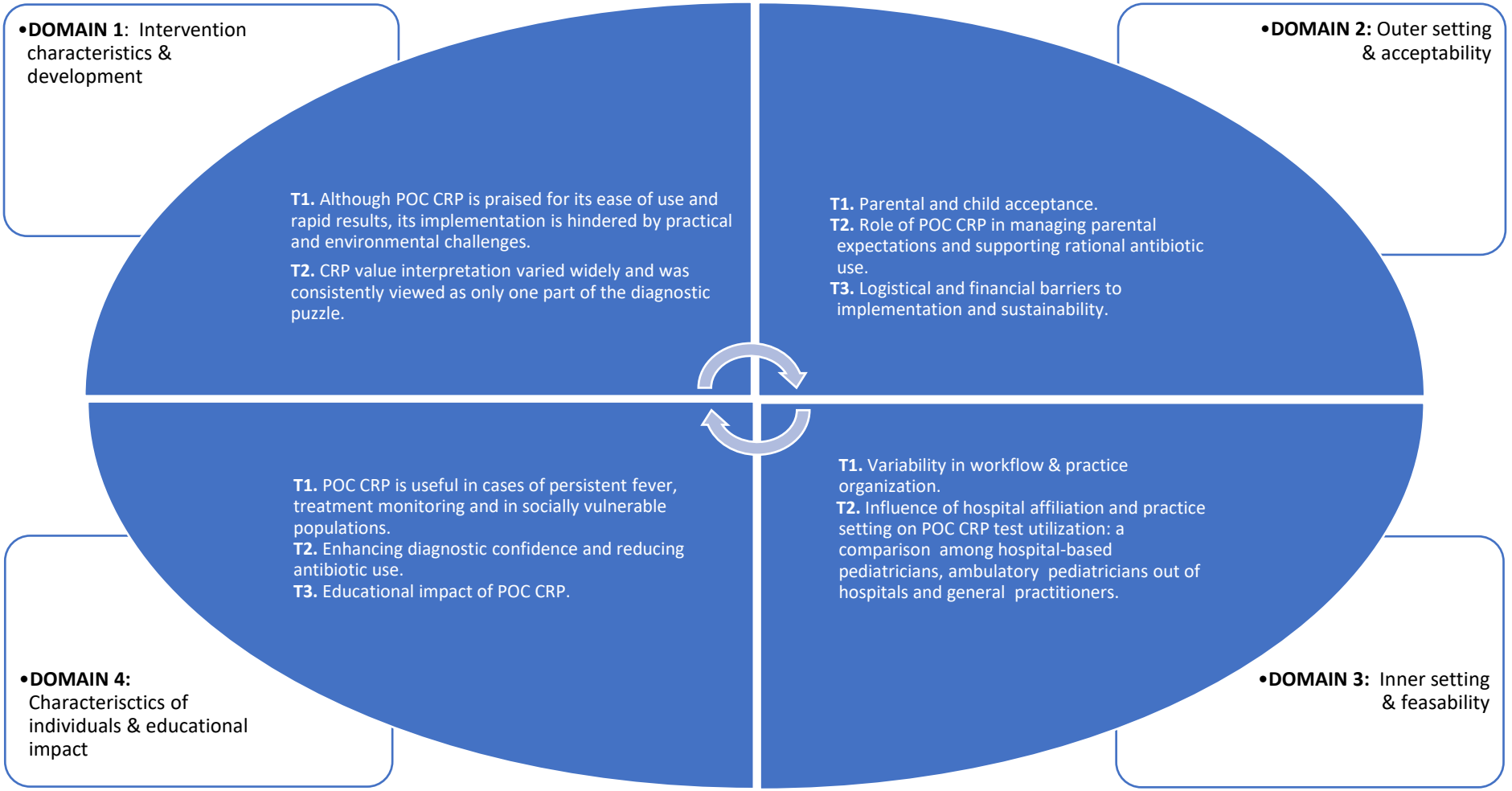


Figure 2: The hybrid framework that combines the CFIR and the MRC framework. We identified 4 main domains that captured the key factors influencing the use and implementation of POC CRP testing in pediatric ambulatory care. For each domain, we defined several themes (T).

DOMAIN 1: Intervention characteristics and development

Theme 1: Although POC CRP is praised for its ease of use and rapid results, its implementation is hindered by practical and environmental challenges

Pediatricians generally praised the POC CRP device for its intuitive design and ease of use, which allowed for seamless integration into their daily workflows. Many found it particularly valuable in ambulatory care settings, where its rapid results minimized delays and reduced the need for traditional blood draws.

"The device almost explains itself; I had no problems learning to use it. Within a few tests, I became comfortable with the process, and it is now part of my routine. It's very straightforward for anyone to pick up" (P13, 15 years of experience, ARON -)

"It's very convenient in ambulatory care because you're not waiting long for results. Parents are reassured quickly, and you can avoid sending the child for a full blood test at the hospital. This saves time and reduces anxiety for everyone involved" (P7, 31 years of experience, ARON -)

Despite its usability, the POC CRP device was not without challenges. Pediatricians frequently encountered errors, often due to improper cartridge handling or insufficient sample volume. These errors were described as frustrating, especially during busy periods, but most agreed that experience reduced their frequency.

"You need to take the cartridges out of the fridge early and let them warm up. If they're too cold, they won't work, and it's frustrating when you're trying to keep things moving smoothly during consultations" (P10, 24 years of experience, ARON -)

"Errors occur if the sample isn't filled enough, which can be tricky when working with a child who is distressed or uncooperative. Over time, I've learned to avoid this, but it's definitely something you need to get used to" (P7, 31 years of experience, ARON -)

"I had some issues initially with calibration, but after some trial and error, I figured out how to prevent most of the common errors. Now I know exactly what to check before starting" (P14, 11 years of experience, ARON +)

The environmental impact of the POC CRP device was a common concern among pediatricians, particularly the disposable cartridges, which generated significant waste. Some questioned whether the design could be improved to reduce this burden.

"The cartridges generate too much waste—this could definitely be optimized. I often wonder if there's a way to make them smaller or reusable to reduce the environmental burden. As it stands, it feels excessive" (P10, 24 years of experience, ARON –)

"In an era where sustainability is key, having so much plastic waste from each cartridge feels counterproductive. We need to find a way to balance diagnostic advances with environmental responsibility" (P8, 8 years of experience, ARON -)

Theme 2: CRP value interpretation varied widely and was consistently viewed as only one part of the diagnostic puzzle.

Pediatricians described a wide variability in how they interpret CRP values. While low CRP values were generally seen as reassuring, what qualified as "low" differed considerably among them. ARON trial participants typically followed the trial's lower threshold guidelines (5mg/L). Though they acknowledged these were not always useful in complex cases. In contrast, non-ARON pediatricians adopted a more flexible, context-driven approach, placing greater emphasis on clinical judgment and using higher thresholds as practical guidance.

As one ARON participant explained: *"For me, low is under 20. In the ARON trial, under 5 was considered low, but I use 20 as a practical guide. These values are typically reassuring and don't push me toward antibiotics unless there's something else in the clinical presentation." (P6, 15 years of experience, ARON +)*

Others emphasized that when CRP values fall in a "gray zone", they rely more on clinical signs, parental input, and sometimes additional tests:

"Those values in between, like 50 or 60, are the most difficult. It really depends on how the child looks. You need to combine it with clinical signs and maybe do extra investigations." (P10, 24 years of experience, ARON -)

The variability in CRP interpretation underscores its role as a supportive, but never standalone, tool in clinical decision-making. Both ARON and non-ARON participants agreed that POC CRP, whether used alone or alongside WBC count, must always be interpreted within the broader clinical context and cannot replace clinical examination or judgment.

"A CRP of 100 makes me think of bacterial infection, but it's not always that simple. I've seen children with viral infections and high CRP too. So, you always have to look at the child, not just the number." (P4, 24 years of experience, ARON +)

"A CRP between 40 and 70 is what I call 'neither fish nor fowl.' It doesn't give you a definitive answer, and you really need to rely on the clinical picture." (P15, 27 years of experience, ARON -)

<u>DOMAIN 2: Outer setting and acceptability of POC CRP testing</u>

Pediatricians highlighted how parental and child experiences, as well as societal and structural factors—such as financial constraints and logistical barriers—influence the use and acceptability of POC CRP testing.

Theme 1: Parental and child acceptance of POC CRP Testing

Overall, POC CRP testing was well-accepted by parents and children. Parents appreciated the rapid, minimally invasive finger prick, especially when it helped avoid hospital referrals or venous blood draws. Pediatricians noted that a clear explanation of the procedure improved acceptance among both parents and children.

"Parents are usually quite enthusiastic because it's quick, avoids a full blood draw, and often spares them a trip to the hospital." (P1, 11 years of experience, ARON -)

"Even the little ones are often curious, and they tolerate it well when you explain it properly." (P11, 16 years of experience, ARON +)

Theme 2: Role of POC CRP in managing parental expectations and supporting rational antibiotic use

POC CRP testing was often used to manage parental pressure for antibiotics. Pediatricians noted that sharing objective CRP results helped explain and justify the decision to withhold unnecessary antibiotics, particularly when parents were anxious or insistent. The test also offered tangible reassurance, helping parents understand and accept why antibiotics were not needed in certain cases

"Some parents keep pushing for antibiotics, saying they've already been to the doctor twice. Showing them a low CRP often reassures them that antibiotics aren't necessary." (P2, 44 years of experience, ARON -)

"I notice that parents are increasingly requesting the POC CRP test themselves. It reassures them." (P6, 15 years of experience, ARON +)

Additionally, POC CRP testing was perceived as part of a broader strategy to address antibiotic resistance, encouraging stricter prescribing practices based on objective markers rather than parental pressure.

"Antibiotic resistance is a major problem. POC CRP testing is an essential tool to curb unnecessary antibiotic use and preserve the options we have." (P15, 27 years of experience, ARON -)

Theme 3: Logistical and financial barriers to implementation and sustainability

Despite the clinical value of POC CRP testing, pediatricians described significant financial and logistical barriers to its sustainable use, particularly in solo and small practices. Unlike hospital settings where laboratory costs are covered, ambulatory pediatricians out of hospitals often bore the financial responsibility for purchasing cartridges and maintaining the device.

Some clinicians reported that cost considerations influenced how frequently they used POC CRP, as not all parents were willing to pay out of pocket for the test:

"The cartridges are expensive, and many patients are unwilling to pay for them, which makes implementation challenging." (P12, 36 years of experience, ARON -)

In solo practices, clinicians had to independently source and purchase cartridges, often at a higher cost than in larger group practices with bulk purchasing options. Some pediatricians sought workarounds, such as obtaining supplies through hospital laboratories when possible:

"I buy the cassettes through the lab because it's cheaper than buying directly from Abbott." (P1, 11 years of experience, ARON -)

For pediatricians working both in hospitals and in ambulatory practice out hospitals, the difference in financial burden was notable. Some described informal arrangements that allowed them to take cartridges from hospital labs for use in their ambulatory practice, underscoring the financial challenges they faced:

"The lab allows me to take the tests to my ambulant practice. At the lab, they pay for them, but in my ambulatory practice, I have to pay for them myself." (P12, 36 years of experience, ARON -)

Pediatricians emphasized that government reimbursement would be crucial for ensuring broader adoption and sustainable implementation of POC CRP testing:

“With reimbursement, more doctors would use POC CRP—it would make a big difference in its accessibility.” (P13, 15 years of experience, ARON -)

Collaboration with labs plays a role in the logistical feasibility of POC CRP use. Hospital-linked pediatricians benefited from centralized lab support (e.g., maintenance, calibration), while ambulatory practitioners out of hopitals had to manage this themselves, including buying cartridges

"In the hospital, the lab provides all the materials, including calibration and supply management." (P15, 27 years of experience, ARON -)

"The clinical biology team oversees the calibration and regular checking of the device for reliability." (P9, 46 years of experience, ARON -)

DOMAIN 3: Inner setting and feasibility

This theme explores the organizational and contextual factors influencing the integration and sustainable use of POC CRP testing in ambulatory pediatric care. Variability in workflow and practice organization, as well as differences between hospital-based pediatricians, ambulatory pediatricians working outside hospitals, and general practitioners, emerged as critical elements shaping feasibility.

Theme 1: Variability in workflow and practice organization

The organization of POC CRP workflows varied significantly across practices. Pediatricians working in larger group practices or those affiliated with hospitals often had more support, such as secretaries or nurses, assisting in the testing process. In contrast, solo practitioners handled every step themselves, from purchasing cartridges to running the test and interpreting results, which placed a heavier workload on them.

"In the ambulatory practice, devices are on the first floor. A medical secretary performs lung function tests and also takes the CRP finger pricks. We do the puncture, and they operate the device and provide the results." (P8, 8 years of experience, ARON -)

"No, I do it myself. I buy the cassettes from Abbott and use them whenever I find it necessary." (P11, 16 years of experience, ARON +)

Pediatricians highlighted that while POC CRP is practical, integrating it efficiently requires careful planning. Solo practitioners in particular noted that lack of assistance makes it challenging to incorporate the test during busy consultations.

"It’s not just about using the device—it’s about finding the time in a packed schedule to incorporate it seamlessly. I wish we had better support for this, particularly in smaller practices like mine." (P6, 15 years of experience, ARON +)

"In my practice, I handle everything myself—from preparing the cartridges to running the test. It’s manageable, but it would be much easier if I had someone to assist during busy hours." (P11, 16 years of experience, ARON +)

Participants had mixed views on whether standardized protocols were needed to integrate POC CRP testing into their workflow. While protocols were seen as helpful for guiding less experienced clinicians, they emphasized that these should complement, not replace, clinical reasoning. Rigid

adherence to protocols could undermine the individualized care necessary for pediatric patients. The pediatricians who participated in the ARON trial were required to follow its protocol. However, we observed that they occasionally deviated from it. Instead of strictly adhering to the predefined cutoff value of 5 mg/L, they often set a slightly higher threshold and relied more on clinical judgment.

"Protocols are useful, but clinical reasoning and context must always remain central." (P7, 31 years of experience, ARON -)

Theme 2: Influence of hospital affiliation and practice setting on POC CRP test utilization: a comparison among hospital-based pediatricians, ambulatory pediatricians out of hospitals, and general practitioners

Pediatricians described how POC CRP testing is used differently depending on the setting. In hospitals, acutely ill children who are likely to be admitted often undergo a full venous blood test. This allows for the simultaneous placement of an IV line and broader biochemical testing using the same venous blood sample. POC CRP in hospitals is used for urgent triage and to monitor CRP levels over time. In ambulatory care, POC CRP is valued for its speed and accessibility, especially when rapid access to hospital care or lab results is not guaranteed, such as late in the day or before weekends.

“In the hospital, if I think the child is very ill, I prefer to do a full venous blood test. But in ambulatory practice, I often use the POC CRP first—to check if referral is really needed. I use it more quickly in practice than in the hospital.” (P10, 24 years of experience, ARON -)

“In the hospital, everything is managed by the lab: maintenance, calibration, materials… In private practice, you have to take care of all of that yourself. That really changes how often and how easily you use it.” (P15, 27 years of experience, ARON -)

“Sometimes you don’t know where the fever is coming from, and it’s Friday afternoon… Then I do a CRP test. It helps reassure the parents and gives me a little extra to base my safety-netting advice on.” (P1, 11 years of experience, ARON -)

DOMAIN 4: The characteristics of individuals and educational impact

This theme examines the key scenarios in which POC CRP testing is used, its influence on clinicians’ confidence and antibiotic prescribing practices, and its educational role, particularly for less experienced practitioners. It highlights how the test supports evidence-based care while emphasizing the importance of integrating results with clinical judgment.

Theme 1: POC CRP is useful in cases of persistent fever, treatment monitoring and in socially vulnerable populations

Pediatricians identified several clinical scenarios where POC CRP testing proved particularly useful. One of the primary indications was persistent fever without a clear focus. In these cases, POC CRP testing provided additional insight into the severity of the illness. Pediatricians often performed POC CRP tests on the third or fourth day of fever to determine whether further investigation or antibiotics were necessary.

"For children with persistent fever beyond three or four days, CRP is an extra tool to decide on antibiotics." (P7, 31 years of experience, ARON -)

Another important indication was monitoring treatment responses. By tracking CRP levels over time, clinicians could assess the effectiveness of treatment and identify potential complications.

"I use POC CRP to evaluate if an antibiotic therapy is working or if there's a need to escalate treatment." (P8, 8 years of experience, ARON -)

Pediatricians also emphasized a critical indication for POC CRP testing in vulnerable populations where socioeconomic factors, such as extreme poverty and poor access to transportation, significantly impacted clinical decision-making. One pediatrician practicing in an area of high childhood poverty and a large refugee population explained clearly how POC CRP helped quickly determine urgency and guide hospital referral decisions:

"We are located in one of the poorest areas of Flanders. Many patients don't have a car, and public transportation is poor. We also have many refugees—often, during consultations, I don't even speak Dutch. Communication frequently relies on Google Translate. Every euro counts for these families." (P12, 36 years of experience, ARON -)

Due to these challenges, POC CRP testing became particularly important in rapidly assessing the severity of acute presentations, such as deciding whether immediate hospitalization was needed:

"Many people here don't have a car, so I need to quickly assess how urgent the situation is. For instance, if you have a two-month-old baby with a fever of 39 degrees, should they be immediately hospitalized or not? CRP provides an immediate indication of severity. These patients can't just easily get to the hospital—they have no transport. POC CRP helps me make that critical decision quickly. However, you must never follow CRP blindly; clinical examination remains paramount." (P12, 36 years of experience, ARON -)

Theme 2: Enhancing diagnostic confidence and reducing antibiotic use

POC CRP testing significantly boosted pediatricians' confidence in their diagnostic decisions, especially in ambiguous cases. The objective results offered reassurance both for clinicians and parents, strengthening trust in treatment plans. CRP results often confirmed the absence of bacterial infections, allowing clinicians to safely avoid unnecessary antibiotics.

Pediatricians emphasized that while POC CRP was a valuable tool, it must always be interpreted in conjunction with clinical judgment. A low CRP value alone did not exclude all potential issues, and decisions were made based on the overall clinical picture. Many highlighted the test's role in addressing antibiotic resistance by reducing overprescription and promoting more targeted treatment.

Pediatricians also mentioned that CRP is sometimes complemented with POC white blood cell (WBC) counts to get a fuller picture, especially when CRP and clinical assessment do not align. However, they noted that WBC counts can also be ambiguous and are not always conclusive:

"Combining CRP with WBC counts gives a fuller picture, especially when the clinical findings and CRP don't align." (P15, 27 years of experience, ARON-)

"Sometimes the WBC count can help, but not always. I've had cases where both CRP and WBC were low, but the child was still very ill. So you need to keep looking at the whole picture." (P7, 31 years of experience, ARON -)

Pediatricians also mentioned that during busy periods, such as Fridays before the weekend, POC CRP testing helps with quick decision-making and provides reassurance to families, reducing the need for referrals.

"I use it most during consultations where parents are anxious about their child's condition. It gives quick results and provides reassurance, especially when there's uncertainty. It's very fast, particularly useful when parents need answers quickly before the weekend." (P9, 46 years of experience, ARON -)

"The speed of results reassures parents and helps finalize treatment plans during the same consultation." (P15, 27 years of experience, ARON -)

Theme 3: Educational impact of POC CRP

POC CRP testing also served as a valuable educational tool, particularly for less experienced clinicians. It provided diagnostic support and helped build confidence in decision-making, enabling younger practitioners to avoid unnecessary antibiotic prescriptions. Over time, as clinicians gained experience, reliance on POC CRP testing tended to decrease, reflecting greater confidence in clinical evaluations without additional testing .

"For doctors with less experience, CRP can be a helpful tool to avoid prescribing antibiotics unnecessarily." (P11, 16 years of experience, ARON+)

Pediatricians noted that their approach differs from that of general practitioners, who typically see fewer children. Some pediatricians felt that GPs, especially in out-of-hours settings, might be more likely to prescribe antibiotics due to time constraints and less familiarity with pediatric patients. Implementing and educating about POC CRP could reduce unnecessary antibiotic prescriptions and referrals.

"I really don't want to criticize general practitioners, but when children go to the out-of-hours GP service, almost 9 out of 10 walks out with antibiotics." (P11, 16 years of experience, ARON +)

"It's just different. GPs don't see as many children, especially not sick babies. In our case, CRP helps us spot which kids really need to be referred." (P12, 36 years of experience, ARON -)

POC CRP testing also serves as an effective tool for parent education. Several pediatricians noted that clearly explaining a low CRP result to parents helped reduce unnecessary re-consultations. When parents understood that a low CRP level indicated a low likelihood of serious infection, they felt more reassured and were more comfortable waiting before seeking additional medical advice.

"With a low CRP, I feel more confident in waiting, which prevents unnecessary antibiotics, but I always use it alongside clinical assessment." (P9, 46 years of experience, ARON -)

"Antibiotic resistance is a major problem, and CRP helps us prescribe more responsibly." (P15, 27 years of experience, ARON-)

Discussion

Summary of findings

This study demonstrates that pediatricians view POC CRP testing as a practical and intuitive tool for use in ambulatory care. Parents and children generally responded positively, appreciating the test's minimally invasive nature and the rapid availability of results. Pediatricians primarily used the test to evaluate persistent fever without an obvious focus, typically around day 3 or 4, and to monitor treatment response.

The context of ambulatory pediatrics differs notably from general practice. Pediatricians often care for younger children, who present with less specific symptoms and for whom ruling out serious infections is more urgent. Compared to general practitioners, pediatricians typically have more focused experience with children, including severely ill infants and toddlers. Many ambulatory pediatricians in Belgium also work part-time in hospitals. This dual role significantly influences their approach to POC CRP testing. This combined expertise shapes how they interpret CRP results and make clinical decisions, particularly regarding referral and follow-up.

Previous studies mainly focused on the use of POC CRP by general practitioners (6,13–15). In our study, we observed subtle differences between the use of POC CRP in ambulatory care and in hospital settings. In hospitals, acutely ill children who are likely to be admitted often undergo a full venous blood test. This allows for simultaneous placement of an IV line and broader biochemical testing. CRP testing is integrated into this broader venous blood analysis. POC CRP is also used in hospitals for urgent triage and to monitor CRP levels over time.. In contrast, in ambulatory care, POC CRP is used more selectively, to support rapid decision-making, rule out severe illness, and assess the need for further referral.

Pediatricians also reported that they frequently care for socioeconomically vulnerable families, particularly in certain regions. These families often face barriers such as limited access to transportation or language difficulties. In such cases, POC CRP testing played a key role in helping clinicians decide whether immediate referral was needed, especially when families would have difficulty accessing emergency care or returning for reassessment. These combined factors underscore the importance of tailoring POC CRP implementation strategies specifically to pediatricians, whose clinical context, patient population, and diagnostic thresholds differ meaningfully from those of general practitioners.

There is no universally accepted CRP threshold in pediatric care. Cut-off values varied across participants, shaped by clinical judgment and situational factors. ARON trial participants tended to adopt stricter thresholds due to the study's safety-focused protocol, while others applied more flexible criteria, relying heavily on their clinical expertise. While standardized protocols were seen as beneficial—particularly for less experienced clinicians—pediatricians emphasized that they should support, not override, individualized clinical reasoning.

Some pediatricians complemented CRP results with white blood cell differentiation, especially in diagnostically ambiguous cases. However, there was a strong consensus that numerical values should never replace comprehensive clinical assessment. POC CRP was consistently viewed as a supportive tool rather than a diagnostic determinant.

Implementation challenges were noted, particularly in private practices, where logistical and financial issues related to storage, calibration, and cartridge supply were common. In contrast, hospitals benefited from centralized laboratory support. Due to the lack of a structured reimbursement system, some pediatricians informally used hospital-provided cartridges in their private practices, underscoring the urgent need for sustainable funding mechanisms in ambulatory settings.

Overall, POC CRP testing was widely valued for its role in improving diagnostic accuracy, enhancing clinical confidence, and reducing unnecessary antibiotic prescriptions. Clear communication of test results to parents was considered essential in building trust and supporting shared decision-making.

Comparison to literature

Previous studies show POC CRP testing, combined with clinical assessment and safety-netting advice, can reduce unnecessary antibiotic use in children (5). For example, a randomized trial found that POC CRP testing helped decrease antibiotic prescriptions for children with non-serious lower respiratory tract infections in primary care (16).

However, several authors emphasize that while CRP testing can support rational antibiotic prescribing, it should not be used in isolation due to its limited positive predictive value (5). Consistent with these observations, pediatricians in our study highlighted the importance of combining CRP with clinical judgment rather than relying on numeric values alone.

Regarding the interpretation of CRP values, both pediatricians and GPs show variability. Our study found that pediatricians, particularly those participating in ARON, tend to apply stricter CRP thresholds, primarily due to protocol constraints. This variability is also noted among GPs. A recent qualitative study by D'hulster et al. confirmed similar variability in CRP interpretation among GPs, influenced by both protocol-driven safety considerations and individual clinical experience (6).

Additionally, qualitative research by Cals et al. highlighted that some GPs felt hesitant to use POC CRP testing in children due to uncertainty about how to interpret results, which aligns with pediatricians' concerns in our study (13). Like our pediatricians, GPs emphasized that CRP cannot replace clinical judgment and should be used as an adjunct, particularly in conversations with parents when deciding on antibiotics.

Parental expectations and communication are also key factors described in the literature. A qualitative study in the UK found that GPs used CRP to manage parental pressure for antibiotics, using it as an objective measure to support clinical decisions (13). Pediatricians in our study similarly reported that POC CRP testing helped explain and justify decisions to withhold antibiotics, reducing parental anxiety and demand for prescriptions.

Moreover, financial and logistical barriers to POC CRP testing are well documented. Our study highlights how solo and small pediatric practices face difficulties sustaining POC CRP use due to cartridge costs and the absence of reimbursement. These challenges are echoed in a recent qualitative

study by Beckers et al., which compared experiences in the Netherlands and England (12). In the Netherlands, government reimbursement facilitated POC CRP use, while in England, lack of structural funding limited its application in daily practice. Similarly, Hardy et al. found that costs and workflow barriers limited CRP's feasibility in U.S. primary care settings, adding a broader international perspective to the financial challenges identified in our Belgian context (14).

Overall qualitative evidence across different healthcare systems confirms that while CRP testing is valued for its contribution to antibiotic stewardship, its successful implementation requires addressing context-specific barriers. Our study adds to this evidence base by focusing on ambulatory pediatricians, a group less represented in POC CRP implementation research. The findings underscore the need for tailored strategies, including clinician training, workflow adaptations, and most importantly, financial and structural support to make POC CRP testing sustainable in ambulatory pediatric care.

Strengths and limitations

The interviewers, IL and MM, conducted the interviews as neutral facilitators to obtain open and honest feedback on the experience with the POC CRP device. The interview questions were carefully phrased in a non-leading manner, allowing participants to express their opinions about the device freely and honestly.

While our study provides valuable insights, it is important to acknowledge several limitations. The relatively small sample size and the focus on Belgian pediatric practices may limit the generalizability of our findings to other healthcare systems or settings. Recruiting pediatricians proved challenging, resulting in a limited number of participants, some of whom were enrolled outside the ARON trial via personal networks or laboratory contacts. As previously mentioned, the two interviewers in this study were general practitioners in training. Their clinical experience and professional background may have influenced how the data were interpreted.

Implications for practice, policy, and future research

Our study highlights several key actions necessary to improve the integration and sustainable use of POC CRP testing in ambulatory pediatric care. Based on the experiences and insights of pediatricians, we recommend the following strategies:

1. Context-specific training and flexible pediatric guidelines

There is a strong need for tailored training programs to equip pediatricians with the skills to interpret and apply POC CRP testing effectively. These programs should prioritize the integration of CRP results with clinical assessment, strengthen communication strategies with parents, and, when relevant, include complementary tests such as WBC counts.

Although protocols can assist less experienced clinicians, pediatricians stressed that guidelines must be flexible and adapted to pediatric care. Rather than enforcing rigid thresholds, guidelines should allow space for clinical reasoning. Pediatric-specific frameworks, distinct from those designed for adults or general practice, are essential to reflect the complexity of pediatric cases.

2. Financial and logistical support to ensure sustainable use

Financial barriers are a significant obstacle, particularly for solo and rural practices. Government reimbursement and subsidization are essential to ensure equitable access and encourage broader adoption of POC CRP testing.

Additionally, system-level logistical support is needed, including easier access to cartridges, device maintenance, and calibration services. Pediatricians suggested exploring collaborative models, such as centralized purchasing or sharing devices among practices, to reduce costs and enhance feasibility, particularly in low-resource settings.

3. Strengthened collaboration with laboratories and device manufacturers

Improved collaboration with laboratories is needed to facilitate consistent access to consumables and ensure proper device maintenance, especially for practices without direct lab support. Some pediatricians currently rely on informal agreements with hospitals to obtain cartridges for private use, underscoring the need for a formalized and transparent system to support ambulatory care.

Furthermore, device manufacturers should address practical challenges, such as calibration errors, usability issues, and environmental concerns. Development of more sustainable cartridge designs, including options for reduced waste or reusable components, would help align POC CRP testing with environmental goals.

4. Enhanced parental communication and education tools

Pediatricians emphasized that POC CRP testing plays a crucial role in managing parental expectations and reducing pressure for antibiotics, especially when used to explain clinical decisions. However, clear communication tools and strategies are needed to help pediatricians effectively convey the purpose, interpretation, and limitations of POC CRP testing. Strengthening this communication could improve parental understanding, reduce anxiety, and foster trust in antibiotic stewardship decisions.

5. Integration into broader antibiotic stewardship and public health efforts

POC CRP testing should be recognized as a strategic component of national and local antibiotic stewardship programs, given its potential to reduce inappropriate antibiotic prescribing. Policymakers and healthcare leaders should include POC CRP testing in broader interventions aimed at tackling AMR in children. Embedding POC CRP testing into clinical decision-making frameworks and public health strategies will enhance its impact on improving prescribing practices and addressing AMR challenges.

Conclusion

This qualitative study provides in-depth insights into the experiences of ambulatory pediatricians with POC CRP testing. While pediatricians value the test as a helpful adjunct to clinical judgment, especially in situations of diagnostic uncertainty, several barriers limit its consistent use in daily practice.

Key challenges include high financial costs, lack of pediatric-specific guidelines, and logistical difficulties, particularly in solo and small practices. Additionally, pediatricians expressed concerns about device usability, calibration errors, and environmental waste associated with cartridges. These

findings highlight the need for practical, financial, and educational strategies to support the sustainable integration of POC CRP testing in ambulatory pediatric care.

To facilitate broader and more effective use of POC CRP testing, system-level interventions are necessary. These include:

- **Reimbursement mechanisms and financial incentives**
- **Training and flexible guidelines** tailored to pediatric contexts, allowing for the integration of POC CRP testing with clinical reasoning.
- **Improved collaboration with laboratories and manufacturers** to ensure maintenance, supply, and device optimization.
- **Development of communication tools** to help pediatricians explain CRP testing to parents and align expectations about antibiotics.
- **Incorporation of POC CRP into broader antibiotic stewardship frameworks**, supporting its role in reducing inappropriate antibiotic use in children.

Future research should explore how these measures impact clinical outcomes, healthcare costs, and antibiotic resistance trends. Additionally, studies evaluating the cost-effectiveness of POC CRP-guided care in pediatric ambulatory settings are needed to inform policy decisions and ensure equitable access.

By addressing these challenges and focusing on real-world implementation, POC CRP testing has the potential to improve diagnostic accuracy, optimize antibiotic use, and enhance the quality of care for acutely ill children in ambulatory care settings.

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Appendices

Appendix 1: Informed consent

Geïnformeerde toestemming (via eICF, Qualtrics) voor deelname aan het onderzoek

Impact van het gebruik van point-of-care CRP bij acuut zieke kinderen: kwalitatieve studie over de ervaringen, percepties, attitudes en verwachtingen van kinderartsen.

Start of Block: Informed Consent

Q1
Doel? Antibioticavoorschrijfgedrag van kinderartsen bij acuut zieke kinderen tussen 6 maanden en 12 jaar en de rol van POC CRP testing op dit gedrag bestuderen en beschrijven.

Type studie Kwalitatief, semi-gestructureerde interviews

Hoe? Live interviews of interviews via Microsoft Teams

Thema's Ervaring met het gebruik van de POC CRP-test in een ambulante setting, de impact ervan op de therapeutische aanpak en de vooruitzichten voor de toekomst.

Procedure	Tijdsduur
Geïnformeerde toestemming	+/- 5 minuten
Interview (Microsoft Teams of live)	+/- 45-60 minuten

Q2 **Er zijn geen kosten** verbonden aan deze studie.

U krijgt geen financiële vergoeding voor deelname aan deze studie.

Q3 **Deelname aan dit onderzoek is vrijwillig**. Als u besluit niet deel te nemen, heeft dit geen negatieve gevolgen. U mag op elk moment stoppen met deelnemen en u mag besluiten om geen vragen meer te beantwoorden.

Q4 **De onderzoeker zal de persoonsgegevens uiterst vertrouwelijk bewaren.**

De video- en audio-opnames worden op een met paswoord beveiligde manier bewaard op een computer en worden verwijderd zodra het interview werd uitgeschreven. Enkel de persoon die de interviews uitschrijft (Isabelle Lauwers) zal toegang hebben tot deze bestanden. Bij het uitschrijven van het interview wordt geen persoonlijke informatie genoteerd welke identificatie van de deelnemer mogelijk maakt (naam en voornaam, adres, geboortedatum). De naam van de deelnemer wordt vervangen door een studie specifieke code.

De uitgeschreven interviews en de NVIVO bestanden worden bewaard in een beveiligde databank van de KULeuven, in een gesloten kast of op een met paswoord beveiligde computer.

Alle onderzoeksgegevens worden na het afronden van de studie verwijderd (30/09/2025).

Uw gegevens zullen worden verwerkt overeenkomstig de Europese Algemene Verordening inzake Gegevensbescherming (AVG/GDPR) en de Belgische Wetgeving (Belgische wet 30/07/2018) betreffende de bescherming van natuurlijke personen met betrekking tot de verwerking van persoonsgegevens. Stopzetting van deelname aan de studie houdt dus in dat de eerder verzamelde gegevens nog verder rechtsgeldig kunnen worden betrokken in de studie en niet moeten worden verwijderd door KU Leuven.

Microsoft bewaart geen informatie over de audio- of video-opnames via Microsoft Teams.

Indien u vragen hebt over hoe wij uw gegevens gebruiken of uw recht op inzage, correctie, eventuele stopzetting van de verdere verwerking wil uitoefenen, dan kan u hiervoor steeds terecht bij uw onderzoeker op volgend contactadres: isabelle.lauwers@student.kuleuven.be (+32 471 49 26 98) of jan.verbakel@kuleuven.be. Indien u naderhand nog bijzondere aandachtspunten heeft of klacht wenst neer te leggen, kan u terecht bij het privacy team van de KU Leuven op privacy@kuleuven.be.

Q5 Financiering

Deze studie wordt gefinancierd door het Federaal Kenniscentrum voor de Gezondheidszorg (KCE).

Q6 **U heeft het recht om een klacht in te dienen** over hoe uw gegevens worden behandeld, bij de Belgische toezichthoudende instantie die verantwoordelijk is voor het handhaven van de wetgeving inzake gegevensbescherming:

Gegevensbeschermingsautoriteit (GBA)
Drukpersstraat 35, 1000 Brussel
Tel. +32 2 274 48 00
e-mail: contact(at)apd-gba.be
Website: www.gegevensbeschermingsautoriteit.be

Q7 **De resultaten van dit onderzoek kunnen gebruikt worden voor wetenschappelijke doeleinden en mogen gepubliceerd worden.** Mijn naam wordt daarbij niet gepubliceerd, anonimiteit en de vertrouwelijkheid van de gegevens is in elk stadium van het onderzoek gewaarborgd.

Q8 Voor vragen over deze studie weet ik dat ik terecht kan bij: **Dr Isabelle Lauwers,**isabelle.lauwers@student.kuleuven.be of+32471492698**,Dr Mary Meijdam** mary.jaunsenmeijdam@student.kuleuven.be of +32 470 72 07 92 of bij **Prof Dr Jan Verbakel, jan.verbakel@kuleuven.be**

Voor vragen met betrekking tot de rechten als deelnemer aan een studie, kunt u contact opnemen met de **Ethische Commissie Onderzoek UZ/KU Leuven (email: ec@uzleuven.b e)**, Tel **+32-16-348600.**

Q9: **Ik bevestig dat ik**

- bovenstaande informatie gelezen en begrepen heb
- antwoord heb gekregen op al mijn vragen betreffende deze studie
- toestemming geef om deel te nemen aan de studie
- mag gecontacteerd worden voor bijkomende vragen met betrekking tot deze studie
- toestemming geef om de gegevens van het interview te gebruiken voor wetenschappelijke doeleinden
- op de hoogte ben dat ik mijn deelname aan deze studie steeds kan stopzetten

○ JA

○ NEE

Q10 Datum

_____

Q11 Gelieve uw naam in het onderstaande vak in te typen om aan te geven dat u aan deze studie wilt deelnemen.

_____

End of Block: Informed Consent

Appendix 2: The topic guide of the study protocol or our study (S62005)

INTRODUCTION

- Thank the pediatrician(s) for participating in this interview.
- Introduce yourself.
- Explain that this interview is part of the ARON trial and that the goals of the interview are described in the participant information sheet.
- Explain that it is not mandatory to answer a question if one is not comfortable doing so.
- Ask if it is ok to audio (and video) record the conversation. The recording will be transcribed, but data will be pseudonymized. Communicate that names and place names will never be noted so that someone reading the transcript will never be able to figure out who is sitting in front of you.
- Inform the participants that if he/she wants the recording to stop, he/she may indicate this at any time.
- Ask if the participant has any questions.
- The informed consent form will be reviewed and completed together with the investigator.

TOPICS TO BE EXPLORED

- Factors that influence the behavior to prescribe antibiotic treatment (e.g. awareness of antimicrobial resistance issues).
    - Ask the participant to describe the key factors that influence their decision-making process when prescribing antibiotics to patients.
    - Request concrete examples of situations where patient expectations played a role in their decisions related to antibiotic prescriptions.
    - Delve into the specific clinical considerations they take into account when determining whether antibiotics should be prescribed.
- Participants' views and experiences, perceptions, attitudes and expectations using the POC CRP testing (e.g., perceived barriers and facilitators to using the diagnostic algorithm).
    - The personal experience with point-of-care CRP testing.
    - Exploring any specific challenges or obstacles they may have faced while using POC CRP testing. Encourage them to provide detailed examples.
    - Discuss their perceptions of the effectiveness of point-of-care CRP testing in their diagnostic process.
- The influence of the point-of-care CRP on the therapeutic management.
    - Request specific instances where point-of-care CRP testing had a noticeable impact on their therapeutic decisions for patients.
    - Inquire about any significant changes or shifts they observed in their approach to patient treatment following the introduction of point-of-care CRP testing.
    - Explore any challenges or limitations they encountered during the implementation of point-of-care CRP testing in therapeutic management.
- Future goals to reduce the unnecessary prescription of antibiotics.
    - Ask the participant to discuss what they perceive as the most significant challenges in achieving this goal.
    - Encourage them to share innovative strategies or interventions they envision as effective in minimizing unnecessary antibiotic use.
    - Inquire about specific guidelines, policies, or educational initiatives they believe should be prioritized to address this issue effectively.
    - Discuss any potential advancements or enhancements in diagnostic tools that they believe could contribute to the reduction of antibiotic overprescription.

EXAMPLE QUESTIONS

Profile of the participant: These questions should provide a clearer picture of the participant's characteristics and experience relevant to the interview

- Can you please provide some insights into your professional background? Specifically, could you tell us about your gender, age, and the type of clinical practice you're involved in?
- How many years of experience do you have in your current clinical role, and could you describe the location of your practice?
- What is the percentage of your employment dedicated to hospital work?
- In terms of Point-of-Care CRP (POC CRP) testing, how many years of experience do you have in using this technology?

Point-of-care CRP testing

- Introduction POC CRP testing: Can you tell us when you first started using point-of-care CRP testing in your medical practice?
- Reasons and device Usage: What prompted you to incorporate point-of-care CRP testing into your practice? Could you share which specific point-of-care CRP device you utilize? In your experience, what aspects of this device do you find practical, and are there any drawbacks or impractical aspects?
- Integration and collaboration: How have you organized the utilization of point-of-care CRP testing in your medical practice? Can you elaborate on your collaboration with the laboratory in this regard?
- Cost: Could you discuss the cost implications of point-of-care CRP testing for both your practice and the patients? Do you believe it represents a it is a good/efficient way to spend the money?
- Ambulatory vs. hospital Usage: Do you also implement point-of-care CRP testing in hospital settings? Are there notable differences in its application between ambulatory practice and hospitals?
- Clinical workflow and learning curve: How did you manage waiting for test results during patient consultations? Was there a steep learning curve involved in operating the device and interpreting results accurately? Can you provide an estimate of the time it takes for a CRP test?
- Patient acceptance: Did you encounter any resistance from parents when it came to having their child's finger pricked for the CRP test?
- Clinical utility: What has been your overall experience with using CRP tests in ambulatory practice? Have you found them helpful, and if so, why? Are there specific patient cases or situations where you found them particularly useful? Have there been instances where test results did not align with your clinical assessment, and how did you address such discrepancies?
- Advantages and impact: From your perspective, what are the key advantages of using CRP tests in your practice? How did POC CRP tests had any discernible impact on your therapeutic decision-making? Have they influenced your antibiotic prescribing rate, and if so, how?
- Confidence and communication: Have these tests enhanced your confidence in making diagnoses or treatment plans? How have you integrated CRP test results into your communication with patients and parents? What has been the response from parents, and in what ways has this affected your patient relationships?
- Potential disadvantages: In your opinion, what are the potential disadvantages or limitations of point-of-care CRP testing in primary care?
- Patient perception: How do you believe your patients and their parents perceive this diagnostic test? Has it influenced their understanding of the treatment plan?
- Future use and requirements: Looking ahead, how do you foresee the future use of point-of-care CRP devices in your practice? What factors or support mechanisms would encourage you to use the test? Are there any facilitators, such as financial compensation, reimbursement for the test, or inclusion in guidelines? Are there any barriers that need to be addressed?
- Guidelines and protocols: In which setting do you typically recommend using point-of-care CRP tests? Do you follow a specific protocol, or is it based on clinical judgment? Do you believe a standardized protocol is necessary?

Antibiotic prescribing in children

- What are your thoughts on antimicrobial resistance? Do you sometimes/frequently worry about the frequent use of antibiotics?
- What factors influence your prescribing behavior in sick children? In what way is your prescribing behavior different with a child? In what way do parents have an influence (or not) on your prescribing behavior? When do you use the guidelines or how do you use the guidelines? If not, why not?
- Has the utilization of point-of-care CRP testing (POC CRP) affected your prescribing behavior?

CONCLUDING QUESTIONS

- If there is anything else you would like to add, please go ahead.
- As we wrap up our conversation, can you reflect on how the incorporation of Point-of-Care CRP testing has impacted your antibiotic prescribing practices and your perspective on antimicrobial resistance? Additionally, could you share any insights on how this technology may influence future approaches to antibiotic management and patient care?

ENDING OF THE INTERVIEW

Thank you very much for your time.