

Beyond Task Delegation: Progressive Negotiated Embedding of a Physician Associate in Rural Primary Care—A Longitudinal Qualitative Case Study from India

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Research Article

Keywords: Physician Associate, primary care, rural health, workforce integration, role implementation, supervision, care coordination, India

Posted Date: October 14th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-11327437/v1>

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Additional Declarations: Competing interest reported. The authors declare the following competing interests. EVA is employed by Amrita Vishwa Vidyapeetham as a Physician Associate educator and was

involved in the development and coordination of the wider PA education and community-deployment initiative examined in this study, in addition to serving as the principal researcher. MVT supported institutional implementation and project administration, and SI provided doctoral supervision. The deployment salary was supported by an institutional research fund from Amrita Vishwa Vidyapeetham. The funder had no role in study design, data collection, analysis, interpretation, the decision to publish, or manuscript preparation. These employment, educational, implementation, funding and supervisory relationships could be perceived to influence interpretation of the findings. The authors declare no other financial or non-financial competing interests.

Abstract

Background

Physician Associates (PAs) in India have historically worked mainly in hospital specialties. National education reform now places greater emphasis on generalist and community-oriented preparation, but little is known about how an unfamiliar PA role becomes integrated into rural primary care. We examined how one newly introduced PA role was negotiated and embedded over time.

Methods

We conducted a longitudinal embedded single-case study in a rural primary-care service in Kerala, India. Purposive sampling included the deployed PA, three medical officers, four other healthcare/community stakeholders and six patients. Data comprised 14 individual interviews conducted in English, one Malayalam patient focus-group discussion, and 126 active-deployment reflective records. Reflexive thematic analysis was combined with longitudinal within-case and cross-source comparison.

Results

Participants described integration as progressive negotiated embedding rather than simple task delegation. Four linked themes characterised the process: (1) the unfamiliar role became locally legible as staff observed enacted capability; (2) wider but bounded entrustment developed alongside observed performance, while prescribing and final clinical decisions remained physician-linked; (3) the role broadened from task support into boundary-spanning coordination across physicians, nursing, pharmacy, referrals, outreach and organisational work; and (4) repeated contact was associated with growing trust and routine reliance, while formal institutionalisation lagged behind. Participants perceived smoother flow and redistributed workload, but these were not objectively measured. Role flexibility also created risks of overextension.

Conclusions

In this case, the PA role became locally understood through observed work and progressively incorporated through bounded physician-linked entrustment and coordination across service interfaces. For comparable settings, the findings suggest explicit physician-linked accountability, supervised opportunities for capability to become visible, clear role boundaries, recognition of coordination work, and early planning for continuity and governance. The findings do not establish doctor substitution, independent practice, clinical effectiveness or scalability.

Background

Primary health care depends on a sufficiently skilled and equitably distributed workforce. Yet shortages and maldistribution are most acute in rural and remote areas, where services must respond to high demand, chronic disease, prevention, continuity and referral needs with fewer personnel and organisational resources [1, 2]. India has expanded its rural health infrastructure, but national workforce data and longstanding research continue to show vacancies, uneven distribution and persistent difficulty staffing rural services [3, 4]. These conditions have intensified interest in team-based workforce models that extend service capacity without obscuring accountability or compromising clinical boundaries.

Physician Associates or Physician Assistants (PAs) are medically trained health professionals who work within physician-linked clinical teams, with scope and regulation varying across health systems. International primary-care research has largely examined the work undertaken by PAs, consultation outcomes, cost, patient acceptability and effects on physician workload. A systematic review found generally positive acceptability but heterogeneous and mostly weak-to-moderate evidence, while an English observational comparison reported similar re-consultation and care-process measures for selected same-day consultations, with longer PA consultations and lower consultation costs [5, 6]. More recent evidence shows that PAs can contribute across direct care, teaching, quality improvement and interprofessional work, including rural settings, while role ambiguity, funding and professional acceptance remain recurrent constraints [7].

Outcome and task-based evidence is necessary, but it can imply that a stable, self-explanatory role is simply inserted into an organisation. Qualitative studies instead show that integration is shaped by role clarity, relationships, supervision, organisational support, professional boundaries and local opportunity. In UK primary and secondary care, unfamiliarity with the PA profession, uncertainty about scope, and variable team preparation affected how the role was received and used [8–13]. These studies identify important facilitators, yet most provide cross-sectional or retrospective accounts. Less is known about the sequence through which capability becomes visible, responsibility is progressively entrusted, and an initially unfamiliar role becomes part of routine work.

The Indian context makes this implementation question especially salient. The first Indian PA programme was established in 1992 to support cardiovascular services; subsequent education and employment remained concentrated mainly in tertiary hospitals and specialty practice [14]. The National Commission for Allied and Healthcare Professions Act, 2021 established a statutory framework for education and professional regulation [15]. The national competency-based PA curriculum released in 2025 represents a further transition: it includes community orientation and engagement, primary-care exposure, non-communicable diseases, geriatrics, health-care management and supervised clinical preparation [16, 17]. Educational reform can produce relevant capability, but does not by itself determine how a rural service will interpret, authorise, supervise or sustain a new role.

Introducing a PA into rural primary care is therefore not only a question of which tasks can be delegated. It is an implementation problem involving occupational legibility, trust, supervision, workflow, professional boundaries, patient relationships and institutional continuity. A longitudinal embedded case

design can examine these processes as they unfold and can compare the PA's account with those of physicians, other staff, community workers and patients.

The timing of this study was particularly relevant because national PA education in India is moving toward greater primary-care and community orientation through the 2025 NCAHP competency-based curriculum [16, 17]. Curricular intent, however, does not establish how a newly trained PA role will be understood, supervised or used within an actual primary-care service. This study therefore did not assume that PA deployment into rural primary care was inherently appropriate; rather, it examined what occurred when a newly graduated PA was introduced under continuing physician supervision into a service with substantial outpatient and community-care demands.

This study explored how a newly introduced Physician Associate role was introduced, negotiated and embedded within a rural primary-care service, and how clinical responsibility, supervision, team relationships, coordination and sustainability evolved during deployment. We asked: how does a newly introduced PA role become embedded within rural primary care, and what processes shape its integration over time? The study was designed as an implementation account, not an evaluation of PA substitution, independent practice, clinical effectiveness or safety equivalence. The case was intentionally bounded to one planned six-month deployment in one service to permit intensive longitudinal examination of the integration process rather than cross-site comparison or statistical generalisation.

Methods

Study design and reporting

We conducted a longitudinal embedded single-case study [18], informed by a constructivist-interpretivist orientation in which participant accounts and role integration were treated as contextually situated and relationally produced. The case was the introduction and deployment of a PA role within one rural primary-care service, rather than an assessment of the individual PA's competence. A single-case design was appropriate because the deployment represented an early implementation case in a service without an established PA role, allowing intensive longitudinal examination of role formation within its organisational context. Embedded perspectives included the PA, medical officers, non-physician staff, a community health worker and patients. The longitudinal design enabled examination of changing role enactment, supervision and stakeholder relationships rather than relying on a single post-deployment judgement. The bounded single-case design sought analytic explanation of process within this setting rather than numerical representativeness. Reporting was informed by the Consolidated Criteria for Reporting Qualitative Research (COREQ) and the Standards for Reporting Qualitative Research [19, 20]; the completed COREQ checklist is provided as Additional file 1.

Setting and case

The study was conducted in a charitable rural primary-care hospital in a rural district of Kerala, India, within a service initiative supported by the authors' institution. The service provided high-volume outpatient care, basic laboratory and pharmacy services, nursing and procedure-room care, referral coordination, and mobile outreach and home visits to geographically dispersed rural and socioeconomically underserved communities. Medical care directly relevant to the deployment involved a senior medical officer and junior medical officer in facility-based care and a community/outreach medical officer assigned to the mobile outreach programme; all three were interviewed. Visiting specialists in psychiatry, urology, dentistry, gastroenterology, surgery and other specialties attended periodically on a voluntary basis and were not part of the hospital's regular staffing. Staff accounts placed usual outpatient attendance at approximately 150 patients per day, with seasonal variation and higher peaks. The site had not previously employed a PA, and the role was unfamiliar to most staff and patients. The case was purposively selected as an early implementation case: the first planned deployment of a newly graduated PA into a service without an established PA role, permitting intensive longitudinal examination of how an unfamiliar role was interpreted, supervised and incorporated over a bounded six-month period.

The deployed PA (PA01) was a recent bachelor's-level PA graduate whose prior clinical training had been predominantly in tertiary and specialty settings, although her programme included structured primary- and community-care exposure. The six-month deployment and associated data collection were covered by ECASM approval, and the deployment itself was formally approved by the Chief Medical Officer of the study site. She entered without an established local PA job description or mature PA-specific workflow. Physician-linked clinical accountability was maintained, consistent with the physician-supervised national curriculum framing of the PA profession [16]: PA01 could undertake delegated assessment, procedures, counselling, coordination and follow-up, but prescribing and final clinical decisions remained with medical officers. The deployment did not transfer medical accountability away from supervising physicians. Patients were informed that PA01 was a Physician Associate working with and supporting the senior medical officer; participant accounts nevertheless indicated that understanding of the role developed further through repeated encounters. The active deployment was examined from January to July 2026. For analysis, contemporaneous records were organised into an early phase (27 January-28 February), a developing phase (2 March-30 April) and an established phase (1 May-18 July). These were analytic descriptions of changing work, not prespecified intervention stages (Table 2).

Participants and recruitment

Purposive sampling selected people with direct experience of different interfaces of the deployment. Eligible professional participants were invited because of their direct involvement in the case; all those approached agreed to participate and none declined. PA01 completed four longitudinal interviews. Three medical officers each completed two interviews: a senior medical officer (SMO01), a junior medical officer (JM001) and a community/outreach medical officer (CMO01). Four non-medical stakeholders completed one interview each: a nurse (NUR01), laboratory professional (LAB01), pharmacist (PHA01)

and community health worker (CHW01). This produced 14 individual interviews, each attended only by EVA and the participant. For the patient focus group, the local team screened and invited nine adults who had received care from PA01; six attended and completed the discussion, while three were unable to attend on the scheduled day for personal reasons. There were no withdrawals. The focus group comprised four women and two men aged 19–55 years, all of whom had previously received care from PA01; the duration and frequency of previous contact varied among participants. Participant codes replaced names in the analytical dataset and are summarised in Table 1. Detailed demographic characteristics of uniquely identifiable staff roles are not reported to reduce deductive-identification risk. Sampling was structured around the bounded case and relevant stakeholder interfaces rather than a saturation-based stopping criterion.

Data collection

The principal researcher, Ebin V Abraham (EVA), a male PA educator and doctoral researcher, conducted all individual interviews and moderated the patient focus-group discussion (FGD). His qualifications include an MSc in Physician Assistant studies, an MBA in Healthcare Management, and a Postgraduate Diploma in Public Health and Hospital Administration from the Public Health Foundation of India; he is a PhD scholar. His qualitative-research preparation included formal qualitative-research training at NIMHANS Bengaluru, doctoral research-methodology training, institutional qualitative-research workshops, prior supervision of two undergraduate qualitative studies involving interviewing and thematic analysis, mentoring from experienced qualitative researchers, and self-directed study of reflexive thematic analysis. Semi-structured interview and FGD guides were developed specifically for this study from the study objectives, case-study protocol and relevant methodological literature, including guidance on the development of qualitative semi-structured interview guides [21], and were reviewed and refined with the doctoral supervisory team and qualitative-research experts before use. The preliminary PA guide was refined for clarity, wording and sequencing before formal T1. Medical-officer and other staff guides were reviewed and refined before use and did not undergo separate pilot testing. Guides were tailored to participant role and used flexibly; for longitudinal participants, later guides retained common domains while incorporating issues arising from earlier interviews and contemporaneous developments within the case, consistent with qualitative longitudinal approaches that allow repeated data collection to remain attentive to time, change and emerging developments [22, 23]. The final guides are provided in Additional file 2.

PA01 completed four face-to-face semi-structured interviews in English in a private room at the study site: T1 in February 2026 (75 minutes), T2 in March (44 minutes), T3 in May (78 minutes) and T4 in August (90 minutes). T1-T3 occurred during the deployment; T4 was conducted approximately two weeks after completion of the six-month placement as an end-of-deployment retrospective interview. T1 captured the early deployment period and included retrospective reflection on the first days and weeks; subsequent interviews examined early change and adaptation, role development and the overall deployment trajectory. All interviews were digitally audio-recorded with consent.

Three medical officers involved in the deployment each completed two face-to-face semi-structured interviews in English in private rooms at the study site. Initial interviews were conducted in February 2026 and lasted 40–48 minutes; follow-up interviews were conducted in July and lasted 42–50 minutes. T1 explored initial understanding and expectations of the PA role, early role enactment, delegation, supervision, professional boundaries and emerging implementation challenges. T2 guides were informed by the T1 interviews and contemporaneous case developments, including Deployment Activity Reflective Records (DARRs) and researcher reflexive notes, and examined changes in responsibilities, supervision, role boundaries, interprofessional integration and sustainability. EVA reviewed contemporaneous DARR material before later interviews; it was used to identify areas for open follow-up rather than to seek confirmation of PA01's account.

Four additional healthcare workers each completed one face-to-face semi-structured interview in English toward the latter part of deployment. CHW01 was interviewed in late June 2026 (38 minutes); NUR01 and LAB01 (40 and 38 minutes) and PHA01 (35 minutes) were interviewed in early July. NUR01, LAB01 and PHA01 were interviewed in private rooms at the study site. CHW01 was interviewed in an open community setting with only the participant and EVA present; no other person attended the interview, although the open setting is recognised as a contextual privacy limitation. The role-tailored guides explored understanding of the PA role, interprofessional relationships, professional boundaries, patient or community response, changes in service functioning, challenges and future considerations. All interviews were digitally audio-recorded with consent. Because these participants were interviewed once toward the end of deployment, their accounts of change over time were retrospective rather than prospectively longitudinal.

The patient FGD was conducted in June 2026 in Malayalam in a private room at the study site and lasted 70 minutes. Nine eligible adults with prior experience of PA care were purposively invited through the local healthcare team following eligibility screening; six participated (four women and two men; age range 19–55 years), while three were unable to attend on the scheduled day for personal reasons. EVA moderated the discussion, while an observer recorded contemporaneous field notes on group interaction, non-verbal responses and contextual features. EVA additionally prepared immediate post-discussion reflexive notes. The semi-structured guide explored participants' understanding of the PA role, experiences of care, communication and relationships, changes over repeated encounters, perceived contribution to care, concerns or negative experiences and views regarding future PA involvement. Participants were explicitly invited to describe positive, negative, mixed or differing experiences. The discussion was audio-recorded with consent.

EVA personally prepared the individual interview transcripts from the English-language recordings, and the transcripts were returned to the respective participants for review and correction before analysis. This transcript review allowed correction or clarification of the recorded account and was not treated as validation of subsequent thematic interpretation. Quoted extracts were lightly cleaned for publication where necessary by removing fillers, false starts or repetition without altering substantive meaning. The focus-group recording was transcribed verbatim in Malayalam by EVA, a native Malayalam speaker, and

translated into English using a meaning-oriented approach that prioritised contextual and conceptual equivalence rather than literal word-for-word translation. The English translation was independently reviewed against the original Malayalam audio by a Malayalam-English bilingual reviewer with expertise in translation and linguistic evaluation. Differences in wording, meaning or culturally specific expressions were discussed and resolved before finalisation of the English transcript. Interactional and relevant non-verbal cues were retained. The FGD transcript was not returned to participants for member checking; the group discussion was treated as a situated and co-constructed account, with credibility supported through audio verification, contemporaneous observer notes, immediate moderator reflexive notes, bilingual review, cross-source comparison and attention to divergent accounts.

Deployment Activity Reflective Records

Throughout deployment, PA01 maintained Deployment Activity Reflective Records (DARRs) combining structured activity fields with open-text reflection. Structured fields recorded work setting, number of patients initially assessed, cases discussed with a senior physician, involvement in history taking and examination, broad clinical presentations, community/outreach activity, administrative and coordination responsibilities, and the principal level of supervision experienced. Open-text fields documented new clinical, community or health-system exposures; new responsibilities; challenges and their management; interactions with patients and colleagues; learning; and professional reflection. DARR completion was not a placement requirement and was not used for academic or workplace assessment; the records were maintained as contemporaneous reflective research material. The complete cleaned dataset contained 132 records across 129 unique calendar dates between January and July 2026. Six records related to orientation; the remaining 126 active-deployment DARRs were used in the longitudinal phase analysis: 24 early, 44 developing and 58 established. DARRs contained no patient names or other direct patient identifiers and were analysed as PA01's de-identified contemporaneous professional reflective records; no patient-level clinical record was extracted for research. DARRs were treated as situated self-records and primarily as a temporal and contextual record for the case, not as an independent observational dataset or as objective measures of workload, productivity, safety, clinical outcomes or formal regulatory scope. Patient reactions recorded in DARRs were interpreted as PA01's contemporaneous observations and compared with direct stakeholder and patient data. Terminology used in the DARRs reflected PA01's contemporaneous descriptions of work and was not treated as a formal statement of professional scope or authority; medication-related and clinical-decision accounts were interpreted in conjunction with physician and stakeholder data.

Data analysis

We used reflexive thematic analysis [24, 25] in combination with longitudinal qualitative comparison [22, 23, 26]. EVA led the analysis, beginning with repeated familiarisation with the interview, focus-group and narrative DARR material. Coding remained open to semantic and interpretive meanings relevant to role understanding, enacted work, responsibility, supervision, professional boundaries, relationships,

coordination, context and sustainability. Coding was managed in ATLAS.ti Version 26 (Scientific Software Development GmbH), which was used to organise transcripts, quotations, codes, comments, memos and analytical relationships rather than to perform interpretation. An evolving coding record and analytic memos supported organisation of the material without functioning as a fixed coding framework or a test of coder agreement. Independent duplicate coding and inter-rater reliability testing were not undertaken.

Analysis proceeded in three linked directions. First, longitudinal within-case matrices compared PA01's interviews from T1 to T4 and DARRs across early, developing and established phases, supported by trajectory and change memos. Second, cross-source matrices examined convergence, divergence and contradiction across PA, physician, nursing, laboratory, pharmacy, community-worker and patient accounts. Agreement between sources was not treated as validation of a single objective account; differences were retained where they contributed to understanding the case. Third, analytic memos moved from descriptive patterns towards candidate processes and themes. A case-study claim-evidence-strength matrix was used as an evidentiary audit to distinguish directly supported case findings from researcher interpretation and participants' proposals about possible future roles. Quotations selected for reporting were returned to their source context and checked against the ATLAS.ti export.

Theme development was iterative and recursive. Candidate themes were reviewed in relation to coded extracts, the wider dataset, longitudinal trajectory memos and contrasting or disconfirming material. Particular attention was given to evidence that complicated an uncomplicated success narrative: physician authority remained; CHW01 had not observed PA-specific patient seeking; laboratory workload remained largely unchanged; different clinicians used the role differently; direct supervision returned for unfamiliar work; and growing flexibility created competing demands. Themes were developed as patterns of shared meaning organised around central explanatory concepts rather than as summaries of interview topics, code frequency or the number of participants expressing a view. The four-theme framework was refined through recursive comparison and writing. The overarching construct, progressive negotiated embedding, was developed through this analytic process as a way of connecting the themes, not as an a priori implementation framework. The temporal phases were used to examine change within and across themes and were not treated as a deterministic stage model. Structured DARR fields were used descriptively to contextualise timing and supervision patterns; no inferential statistical testing, causal inference, clinical-effectiveness assessment or safety comparison was undertaken.

Researcher reflexivity and analytical quality

EVA's professional involvement in PA education, programme development and organisation of the wider community-deployment initiative provided contextual familiarity with the profession and the educational pathway of PA01, while also creating the possibility that prior expectations could influence questioning and interpretation. EVA had a pre-existing educator-programme relationship with PA01, having served as programme coordinator with some involvement in her academic supervision; he had not taught her directly. He was not her clinical supervisor during the deployment; clinical supervision was provided by

medical officers at the study site, and selection for the placement was made by the PhD supervisor. The deployment salary was supported by an institutional research fund from Amrita Vishwa Vidyapeetham. PA01 was aware before consent that the deployment formed part of EVA's doctoral research. Participation in the research was voluntary; the consent process stated that withdrawal would carry no consequences, and DARR completion was neither required for the placement nor used for academic or workplace assessment. These safeguards were particularly relevant given the pre-existing educator-programme and institutional relationships. EVA had no prior professional relationship with SMO01, JMO01, CMO01, NUR01, LAB01, PHA01 or CHW01 before the deployment. Throughout data generation and analysis, EVA maintained interviewer/reflexive notes and analytic and decision-trail memos, actively sought disconfirming evidence, separated enacted findings from future proposals, and compared accounts across participant groups and time points. Supervisory and qualitative-methodology discussions were used to challenge assumptions and strengthen interpretive reasoning rather than to establish coding consensus. Analytical quality was supported through longitudinal engagement, cross-source and temporal comparison, contextualised participant quotations checked against their source context, explicit evidence boundaries and preservation of negative and contrasting cases. These procedures strengthened interpretive accountability but did not remove the influence of researcher position.

Ethical considerations

This study formed part of an approved multi-phase doctoral research protocol. Ethical approval for the doctoral study, including the six-month deployment and associated data collection, was obtained from the Ethics Committee - Amrita School of Medicine (ECASM) (approval reference: ECASM-AIMS-2025-443; approval date: 23 September 2025). The deployment itself was formally approved by the Chief Medical Officer of the study site. Written informed consent, including permission for audio recording and publication of de-identified participant quotations, was obtained before data collection. Participation was voluntary, and the study information stated that participants could withdraw without consequences. Research data were de-identified. All methods were carried out in accordance with relevant guidelines and regulations, including the Declaration of Helsinki. Identifiers were replaced with study codes, and digital files were stored in password-protected systems with access restricted to the research team. Site details are intentionally limited to reduce deductive identification.

Results

Case overview: from introduction to progressive negotiated embedding

The deployment began as the introduction of an unfamiliar profession into an already busy service. PA01 initially sat beside a senior doctor, took histories and documented dictated prescriptions. Within days, physicians began asking her to examine selected patients and report findings. By the developing phase,

individual first-contact assessment, basic investigations, minor procedures, counselling, referral work and outreach were recurring responsibilities. By the established phase, these activities continued alongside coordination of nursing, pharmacy, reception, specialist camps, materials, projects and learner orientation.

The trajectory was neither a simple transfer of tasks nor a linear move toward independence. Familiar clinical work was increasingly undertaken with indirect or remote supervision, while unfamiliar or higher-risk work brought doctors closer again. Prescribing and final clinical decisions remained physician-linked. At the same time, team members and patients increasingly approached PA01 directly, and the role began to connect activities that had previously required repeated hand-offs between departments and clinicians.

We interpret this process as progressive negotiated embedding: an unfamiliar role became locally legible as enacted capability became visible; participants linked increasing visibility with wider but bounded entrustment; recurring responsibility became routine; cross-functional coordination made the role useful across service interfaces; and repeated interaction was associated with relational trust and operational reliance. Four connected themes describe this process (Table 3).

Theme 1. Making an unfamiliar role legible through enacted capability

Entering through familiar professional categories

The title 'Physician Associate' did not initially communicate a clear place in the service. NUR01 and PHA01 had not previously heard of the profession and initially interpreted PA01 through familiar categories. PHA01 first assumed that someone arriving from the tertiary hospital was a doctor, while also describing PA01's early work beside the senior physician as resembling the trainee doctors who commonly attended the service. PA01 anticipated this uncertainty and, at T3, recalled that staff had not known what a PA was or what she would contribute. Initial ambiguity therefore concerned both occupational identity and workflow placement: should she remain beside doctors, work with nurses, or move across both?

No. I had not heard about the Physician Associate profession before... Initially, we thought she was a doctor. After becoming acquainted with her, we understood her profession. She explained to us what a PA was.

— NUR01

When she first came here, I asked her, 'Are you a doctor?' ... I then asked the senior doctor and gradually understood what a PA was.

— LAB01

Formal explanation helped, but did not by itself define the role. PHA01 described repeatedly asking about PA01's role because she was visible in the outpatient department, nursing area and outreach. Her cross-functional presence initially made the role harder to classify through familiar categories.

Capability becoming visible through shared work

Local understanding developed as staff observed what PA01 could do in real situations. At entry, her existing history-taking, examination and procedural capability was not automatically utilisable; it required opportunity and physician permission. PA01's early account shows how quickly observation translated into small tests of capability.

On the first day, I was only sitting with the doctor and helping him with history-taking, writing the medications and whatever else he wanted me to do. From the fourth or fifth day onwards, he started assigning patients to me for assessment, history-taking and physical examination. He would tell me, 'Go and see the patient, come back and tell me what it is.'

— PA01, T1

SMO01's follow-up account described a similar process from the organisational side. Physicians had initially imagined a documentation-focused assistant but subsequently observed a wider combination of clinical, nursing-related, medication and administrative skills. Participants linked growing recognition of capability with broader use of the role.

Over time, we began to understand the specific range of skills that a PA possesses... As we understood those skills, we began using the PA in those areas as well.

— SMO01, T2

The transition was therefore not from incompetence to competence, but from capability that was organisationally invisible to capability that was recognised and locally authorised. Shared work also altered interpersonal positioning. PHA01 described the initial professional distance reducing until PA01 was considered 'one among us'; NUR01 and LAB01 similarly described greater comfort and interaction over time. Local legitimacy was enacted before it was formally specified.

Legibility remained partial and situated

Understanding did not become completely uniform. Different physicians used PA01 to different extents, and patients could accept her care without articulating the distinction between PA and doctor. The role became legible primarily as a dependable way of working within this service, rather than through a shared abstract definition of the profession. This distinction between acceptance and precise scope understanding remained important throughout the case.

Theme 2. Entrustment without independence: expanding responsibility within continuing medical boundaries

Observed performance was accompanied by progressive delegation

Responsibility expanded as physicians observed PA01's approach to patients and the work she completed. A major early turning point occurred when two doctors were absent and she was allocated a separate room to perform initial history, vital signs, examination and selected basic investigations before patients saw the remaining doctor. What began as an exceptional arrangement became more regular. Early-deployment DARR entries documented doctors assigning patient assessment, minor procedures and follow-up; later entries documented separate space for initial assessment and responsibility during periods when doctors were physically elsewhere but remained contactable.

I was able to perform history-taking, physical examination and basic procedures... I was also able to ask patients to undergo basic investigations and then take them to the doctor. That was a major shift in my work. It was the first major responsibility I received.

— PA01, T1

By T2, PA01 described first-contact assessment as routine rather than a novel privilege. She also undertook wound examination, dressings, suture removal, health education and referral follow-up. By the later phases, PA01 sometimes undertook initial patient assessment while a physician was not physically present in the consultation area; treatment decisions, prescribing and escalation remained physician-linked. The temporal movement was from possible task, to tested task, to explicitly delegated task, and then to a recurring component of the role.

The main change is that I am now able to see patients individually. They assign patients to me for the initial assessment. I assess them, arrange any basic investigations that are needed and then send them to the consultant.

— PA01, T2

Supervision became selective and task-dependent

The changing location of the doctor did not mean that supervision disappeared. Familiar work increasingly occurred through case discussion, later review or telephone contact. CMO01 described home visits in which PA01 assessed the patient and used audio or video communication so that the doctor could decide treatment and issue a prescription. The established DARR also showed closer direct supervision returning when PA01 encountered unfamiliar procedures or specialty work. Supervision therefore changed from broadly close oversight toward selective proximity calibrated to task, experience and uncertainty.

From what I understand, even when she examines patients, she consults the doctor who is with her. She also consults the doctor before medicines are given. I observed that during today's camp as well.

— CHW01

When the PA is present, she examines patients alongside me. After completing the initial assessment, she gives me the relevant information. I then review it and write the prescription.

— CMO01, T2

Clinical authority remained visible

PA01 repeatedly identified prescribing as the clearest boundary. She could gather and interpret information, propose decisions and arrange basic investigations within local permission, but consulted a doctor before medication was administered, changed or newly prescribed. Pharmacy staff approached PA01 for clarification, while medication substitutions requiring a medical decision were taken by her to the doctor. JMO01 made the distinction explicit.

The doctor's role is ultimately to make the final decision. The PA may take the history, examine the patient and provide relevant findings, but the final clinical decision remains with the doctor.

— JMO01, T2

The main thing I cannot do independently is prescribe medication... prescribing, changing medications and calculating certain medication doses still require the doctor's involvement.

— PA01, T2

Entrustment was also situated and reversible. PA01 retained concern about error, different clinicians varied in how they involved her, and periodic visiting specialists did not automatically incorporate the role into their workflow. These cases prevent interpretation of the trajectory as a ladder toward unrestricted autonomy. Responsibility expanded at task level while final medical accountability, verification and escalation remained physician-linked.

Theme 3. From task support to boundary-spanning coordination within primary care

Connecting physicians and frontline staff

A prominent enacted contribution extended beyond the sum of delegated clinical tasks. PA01 increasingly connected work across physicians, nursing, pharmacy, patients, referrals and organisational processes. Nursing provides a clear example. Before deployment, nurses sometimes left their work to find a senior doctor, waited for assessment and returned for instructions. With PA01 present, initial assessment, action within her capability and physician escalation could occur through one accessible intermediary.

Before she came, if a patient required wound dressing or an examination, we sometimes had to wait for the senior doctor. Now, when the PA is present, she comes and assesses the patient. If it is something she can manage, she does it herself. Otherwise, she informs the senior doctor after completing the initial assessment. She then comes back and tells us what to do... In that way, we save a lot of time.

— NUR01

This account shows a change in the pathway of coordination, not simply an extra person completing dressings. PA01 could translate a nursing concern into an initial clinical assessment, identify whether escalation was necessary, and return medical guidance to the nursing team. In NUR01's account, her accessibility reduced repeated movement and waiting at the nurse–physician interface.

PHA01 described a similar process at the pharmacy interface. Questions about an unavailable medicine or possible substitute could be taken to PA01; when physician authority was required, PA01 carried the question to the doctor and returned the decision while pharmacy work continued.

If we need the doctor's decision, we also contact her. She will speak to the doctor and inform us after discussing it with him. It is really beneficial for us because we do not have to wait until the doctor is free. We can continue our work.

— PHA01

The PA therefore occupied a practical bridging position: sufficiently clinically informed to understand the question, sufficiently accessible to frontline staff, and explicitly linked to physicians for decisions outside her authority. Boundary-spanning did not dilute clinical boundaries; it made those boundaries operational by creating a route through which information and decisions could move.

Connecting clinical and organisational processes

Coordination broadened as deployment progressed. PA01 maintained referral records, accompanied vulnerable patients for external investigations, assembled lists for specialist and dental camps, contacted patients, checked medicines and materials, and linked outside diagnostic and specialist services to the facility. Developing-phase DARRs documented simultaneous coordination of outpatient, nursing and referral activities. Established records added medicine and materials management, reception and patient-flow coordination, cardiovascular and telemedicine projects, specialist-camp preparation and learner scheduling.

These activities were not a separate administrative job detached from care. They arose when organisational work was necessary to move a patient, result, medicine, referral or service event through the care pathway. PA01's late transition from supervised newcomer to orienting interns and teaching local workflows further showed that situated knowledge had accumulated: she became a resource for how the service operated, while physician authority over medical decisions remained unchanged.

Bridging facility and community care

The coordinating role extended beyond the facility. PA01 progressed from joining outreach visits to conducting individual assessment, counselling and home-based evaluation of people unable to reach camp sites. CHW01 perceived that her presence allowed the team to reach additional locations and bedridden patients, while CM001 described parallel assessment as useful during high-volume outreach. Later DARRs documented diet advice, catheter and pressure-sore prevention, and a patient specifically requesting a PA home visit.

After she joined, we were able to cover more locations and conduct more home visits. There are bedridden patients and other people who cannot travel to the camp site. She showed particular interest in visiting those patients.

— CHW01

Perceived flow benefits and the limit of flexibility

Nursing, pharmacy, outreach and patient accounts converged on a perceived redistribution of work. Focus-group participants described preliminary work being completed before the doctor consultation and believed this shortened waiting. One returning patient went first to PA01 because she already knew the history and arranged investigations before doctor review.

Because the Physician Associate already knew my medical history, I went to her first... Everything was completed before I met the doctor. So, by the time I entered the consultation room, most of the preliminary work had already been finished.

— FGD01-P5

These are stakeholder perceptions, not measured changes in waiting time, productivity or outcomes. The effect was also not uniform across departments: LAB01 said the laboratory workload 'remains as usual', despite perceiving better coordination. The analysis therefore supports an interpretation of redistributed work and reduced coordination friction, not a claim of objectively improved efficiency.

Flexibility also generated strain. In early deployment, moving between functions partly reflected uncertainty about where the PA belonged. Later, it became deliberate utilisation during staffing gaps and competing demands. DARR records from late March showed that allocation to one workflow could prevent PA01 from contributing elsewhere; by July she was being asked to coordinate nursing and reception according to patient rush while continuing clinical work. The problem had shifted from 'what can the PA do?' to 'how can one broadly useful PA be positioned without overextension?' Cross-functional flexibility was both an integration resource and a role-design challenge.

Theme 4. Relational and operational embedding outpaced institutionalisation

Repeated encounters were associated with relational trust

Patient acceptance developed through repeated contact rather than immediate understanding of the professional title. Focus-group participants described PA01 first as a new or unknown person and later as someone who remembered their history, followed up after treatment and was easier to approach. One participant located the change not in PA01 but in the patients themselves.

“At first, she was a new person. We didn't know her well, so naturally we weren't comfortable speaking openly. Now she feels like one of our own family members... As we continued visiting, we met her repeatedly. With every visit we spoke a little more. Gradually we became comfortable discussing our problems with her.”

— FGD01-P5

“Even our children feel comfortable talking with her. When she examines us, she does everything gently. That makes both children and adults feel comfortable.”

— FGD01-P2

When the group was explicitly invited to identify anything they disliked, found difficult or would have changed about PA care, participants did not identify a specific negative PA-care experience. This predominantly positive account is interpreted alongside the small prior-user sample and local recruitment pathway.

Repeated encounter enabled recognition, disclosure and continuity. A parent who first encountered PA01 during care of an injured child described subsequent follow-up calls and then preferring to meet her first on later visits. Another participant said PA01 regularly checked recovery and was usually the first person to begin treatment. The DARR trajectory also documented patients enquiring about PA01 in March and later asking her to remain or requesting home visits. Direct patient accounts therefore corroborated, while also placing limits around, PA01's own observations.

PA trust complemented rather than displaced doctor trust

Acceptance did not require patients to understand every professional boundary, and it did not erase long-standing relationships with doctors. CHW01 observed that patients did not avoid PA01 and attended her for check-ups, but some continued to ask for the familiar senior doctor. When specifically asked whether community members had returned requesting the PA, CHW01 answered, 'No. No one has specifically asked for the PA.' This contrasts with PA01 and focus-group accounts of direct seeking. The difference is analytically useful: PA-specific trust developed among some repeatedly exposed patients, while doctor-centred expectations persisted and may have varied across community sites.

Operational reliance became visible

Embedding also appeared in how work was organised around PA01's availability. Staff increasingly approached her without first going to a doctor; senior staff continued to assign medicine and hospital coordination near the end of deployment; and NUR01 described a likely return to the prior workflow if the PA were absent.

The work would return to how it was before the PA joined.

— NUR01

This was operational reliance rather than complete organisational dependence. Outreach existed before the deployment and continued when PA01 was absent, and the laboratory reported no major workload change. The role had nevertheless become part of how several interfaces functioned, particularly during high patient demand or reduced physician staffing.

Usefulness did not secure institutionalisation

Local usefulness developed faster than formal structures for continuity. Because the deployment was time-limited, the service had limited opportunity to redesign work around a role whose continuity was not assured. SMO01 believed a longer-term programme would permit fuller and more structured utilisation, but conditioned sustainability on resources. PA01's widening remit also exposed unresolved authority for organisational coordination, and CHW01 linked continuous community contribution to practical infrastructure and service organisation.

If this were a long-term programme, I think we could use the PA much more effectively. Over time, we could define specific roles and identify particular areas where the PA could make the greatest contribution.

— SMO01, T2

By the end of the case, the PA was relationally accepted and operationally useful, but the role remained contingent on individual capability, physician permission, local flexibility, resources and continuity. Functional embedding had occurred; institutionalisation had not yet been demonstrated.

Integrative result

Across six months, integration was co-produced by PA capability, service pressure, physician observation and permission, team adaptation and repeated patient interaction. The organisation learned where PA capability could be used while PA01 learned the service and accumulated situated responsibility. The resulting role was broader than the physician-side assistance imagined at entry, yet remained medically bounded and organisationally contingent. Figure 1 presents this explanatory process.

Discussion

Principal findings

In this longitudinal embedded case study, integration of a newly introduced PA into rural primary care involved progressive negotiated embedding rather than simply the assignment of clinical tasks. Participants described the unfamiliar role becoming legible as capability was enacted in shared work; wider but bounded entrustment developing alongside observed performance; the enacted contribution broadening into boundary-spanning coordination; and repeated interaction being associated with relational trust and operational reliance. These processes advanced faster than the formal arrangements required for institutional continuity.

Integration as a negotiated implementation process

Previous PA integration studies emphasise the importance of role information, clarity, supervision, team relationships, champions and organisational support [8–11]. Our findings are consistent with these conditions but add temporal and process detail. Role clarity did not precede deployment as a finished organisational product. The service first interpreted PA01 through familiar categories, then learned the role through observing contribution, and subsequently adjusted responsibilities and workflows. In this case, local role definition was partly an outcome of implementation.

The concept of progressive negotiated embedding captures this reciprocal movement. 'Progressive' denotes accumulating but non-linear changes across time; 'negotiated' denotes that permission, boundaries and use were produced through relationships and service conditions; and 'embedding' denotes incorporation into ordinary work and relationships. The construct avoids a simple introduction–acceptance–success sequence. Entrustment could contract for unfamiliar work, patient acceptance coexisted with doctor preference, and useful flexibility could produce overextension.

Progressive negotiated embedding has conceptual overlap with Normalization Process Theory (NPT), which focuses on the work through which practices become workable, routinely enacted and sustained in everyday settings [27]. NPT was not used as a coding or analytic framework in this study; the construct was developed through the case analysis. Its contribution here is therefore a case-derived account of how role legibility, physician entrustment, coordination and relational trust interacted over time when an unfamiliar PA role was introduced.

Enacted capability as a route to occupational legibility

A central implementation problem was that the occupational title carried little local meaning. Explanation was necessary but insufficient; participants described credibility developing through situated performance. This extends prior findings that existing staff and patients need clear information about new roles [8, 9]. In settings where the profession is unfamiliar and formal job architecture is immature, the findings suggest that organisations could consider a protected entry period in which

capability can be observed across relevant activities. In comparable settings, explicit expected tasks, supervision, escalation routes and review points could provide safeguards during such an entry period.

Bounded entrustment rather than independence

Responsibility expanded through observed performance, a pattern consistent with literature describing trust as dependent on the individual, relationship, task and context [28]. Although entrustment theory originates largely in clinical education, it helps explain how physicians judged the proximity of supervision needed for a newly introduced role. Our data also demand an important qualification: task-level entrustment did not transfer final medical authority. Prescribing and final clinical decisions remained physician-linked, escalation pathways remained available, and closer supervision returned when work was unfamiliar.

This distinction is important when interpreting the trajectory observed in this case. Describing the trajectory as 'growing independence' would collapse several empirically separate changes: the PA performed more of an assessment, the doctor was sometimes physically distant, case discussion became more selective, and the PA developed confidence. None alone demonstrates independent medical practice. 'Entrustment without independence' more accurately describes increasing responsibility within an accountable collaborative structure.

Boundary-spanning coordination as a primary-care contribution

A key contribution of the case is the identification of boundary-spanning coordination as one interpretive process through which participants described the PA contributing to the service. Boundary spanners facilitate information flow and transactions between groups that otherwise have limited access or trust [29]. PA01's position combined clinical understanding, accessibility to several staff groups, connection to physician authority, and continuity across facility and community settings. This allowed nursing or pharmacy questions to move toward a decision while other work continued.

This interpretation complements international descriptions of PA continuity and interprofessional contribution [7, 10], while avoiding an unmeasured productivity claim. Participants perceived shorter waits, smoother outreach and redistributed workload, but the study did not collect time-motion, patient-flow, economic, safety or clinical outcome data. Boundary-spanning is therefore a plausible interpretive process for understanding experienced contribution and should be examined in future mixed-method implementation studies.

Relational trust and professional understanding are not equivalent

Patients became comfortable with PA01 through recognition, follow-up, remembered history and repeated conversations. Communication-focused research similarly suggests that satisfaction with PA encounters is shaped by interpersonal processes and expectations [30]. Our negative cases add nuance: some community members still sought long-standing doctors, and not all observers saw direct PA-seeking. Patient acceptance should therefore not be treated as evidence that the PA–doctor distinction

was fully understood or that trust in the PA displaced trust in physicians. Implementation should support both relationship continuity and transparent role introduction.

Connecting education reform to workplace implementation

The national competency-based PA curriculum now explicitly includes primary care and community medicine within the profession's educational and practice framework [16, 17]. This represents an important shift in emphasis for a profession that has historically been concentrated in hospital-based specialty practice [14]. This case suggests the value of considering curricular capability and service integration together. Graduates need relevant knowledge and skills, but organisations also need physician supervisors, authorised task boundaries, escalation pathways, role orientation for the wider team, and career and continuity arrangements. Without these, services may either underuse capability because it remains invisible or overextend an adaptable individual because capability becomes useful everywhere.

India's wider primary-care reform already includes team-based mid-level roles, notably Community Health Officers within comprehensive primary care under Ayushman Bharat [31]. Experience integrating community health assistants in Zambia similarly shows that introducing a new cadre does not itself secure local integration; supervision, governance, information flow and material support shape implementation [32]. These comparisons are not claims of role equivalence, but they situate this PA case within a broader health-systems lesson that workforce innovations depend on the organisational systems into which they are introduced.

Implications for rural primary-care implementation

Taken as hypotheses for future implementation rather than prescriptive recommendations, the findings suggest a provisional phased approach that may be considered when introducing PAs into comparable settings. Before deployment, services could clarify physician-linked accountability, prescribing and medication boundaries consistent with applicable regulation and institutional policy, escalation routes and an initial set of functions, while orienting staff and patients to the role. During entry, supervised opportunities could make capability visible across selected clinical and coordination activities. Delegation could then be reviewed according to observed performance, complexity and risk, allowing selectively indirect supervision where appropriate. As recurring work develops, recognition of coordination and community linkage, monitoring of competing demands, and avoidance of making one adaptable PA the default solution for every service gap may help guide local role design. Continuity, protocols, employment arrangements and governance could be addressed early, before local reliance becomes dependent on one person.

These implications do not establish that PAs can replace doctors, prescribe independently, manage undifferentiated risk without medical support, improve clinical outcomes, or be scaled unchanged across settings. Transfer requires attention to local regulation, physician availability, referral capacity, medicine supply, team composition, patient expectations and the PA's preparation.

Strengths and limitations

The study's main strength is its ability to reconstruct process. Four PA interviews, repeated physician interviews and 126 active-deployment DARRs enabled temporal comparison, while nursing, laboratory, pharmacy, community-worker and patient perspectives reduced reliance on the deployed PA's retrospective account. The audit trail included an evolving codebook, trajectory matrices, cross-stakeholder synthesis, claim–evidence review and negative-case analysis. Quotations used in the paper were checked against the final ATLAS.ti export.

Several limitations require caution. This was one PA in one organisational setting; analytical transferability depends on similarity of context, not statistical generalisability. The role may reflect PA01's individual communication, initiative and learning as well as the profession. The case was a planned first deployment in a service linked to the authors' institution, the PA was selected for placement by the PhD supervisor, and the deployment salary was institutionally funded rather than borne by the rural service. Perceived usefulness and operational reliance therefore cannot establish whether the service would have adopted or sustained the role if local financing had been required. Facility administrators and organisational decision-makers were not interviewed, so interpretations concerning long-term employment, financing, governance and sustainability remain provisional. The principal researcher's involvement in PA education and deployment may have influenced questioning and interpretation despite reflexive safeguards. PA01's first formal interview occurred approximately four weeks after deployment began, so the earliest experiences were recalled rather than captured in an interview at the point of entry. Nursing, laboratory, pharmacy and community-worker participants were each interviewed once late in deployment; their descriptions of change were therefore retrospective rather than prospectively longitudinal. All individual interviews were conducted in English, which may have constrained nuance for participants who might have expressed some experiences differently in Malayalam; the patient FGD was conducted in Malayalam. The Malayalam FGD material was translated by the principal researcher and independently reviewed against the original audio by a bilingual reviewer; interpretive decisions nevertheless remained researcher-mediated. The patient group was recruited through the local team, comprised patients with prior experience of receiving care from PA01, and produced predominantly positive accounts; local gatekeeping may have favoured patients who were more engaged with or satisfied by the service, and patients with limited exposure, dissatisfied experiences or weaker engagement may therefore be underrepresented. Staff could have offered socially desirable accounts, and the time-limited deployment itself shaped behaviour. Because this was a small bounded case with distinctive professional roles, complete deductive anonymity cannot be guaranteed even though names, the district and other direct identifiers are withheld. Because movement through the service and waiting were included as optional probes in the FGD guide, waiting-time perceptions may also have been partly elicited by the discussion guide rather than arising entirely spontaneously.

Conclusions

A newly introduced PA role became embedded in this rural primary-care setting through progressive negotiation rather than task allocation alone. Participants described the role becoming locally legible as capability became visible, wider but bounded entrustment developing alongside observed performance, and boundary-spanning coordination extending contribution across professional, organisational and community interfaces. Repeated contact was associated with patient trust and operational reliance, although these developments remained vulnerable without continuity and formal governance. For services considering PA integration in comparable settings, the findings suggest linking educational preparation with structured entry, adaptive physician-linked supervision, explicit role boundaries, recognition of coordination work and early planning for continuity and governance.

Abbreviations

ECASM

Ethics Committee – Amrita School of Medicine

EVA

Ebin V Abraham

COREQ

Consolidated Criteria for Reporting Qualitative Research

DARR

Deployment Activity Reflective Record

FGD

focus-group discussion

NCAHP

National Commission for Allied and Healthcare Professions

PA

Physician Associate/Assistant

T1–T4

interview time points 1–4.

Declarations

Ethics approval and consent to participate

This study formed part of an approved multi-phase doctoral research protocol. Ethical approval for the doctoral study, including the six-month deployment and associated data collection, was obtained from the Ethics Committee – Amrita School of Medicine (ECASM) (approval reference: ECASM-AIMS-2025-443; approval date: 23 September 2025). Written informed consent, including permission for audio recording and publication of de-identified participant quotations, was obtained before data collection. Participation was voluntary, and participants were informed that they could withdraw without consequences. Research data were de-identified, and all methods were carried out in accordance with relevant guidelines and regulations, including the Declaration of Helsinki.

Consent for publication

Participants provided written informed consent for publication of de-identified research data and participant quotations. No directly identifying personal information is reported. Because the study concerns a small bounded case with distinctive professional roles, complete deductive anonymity cannot be guaranteed.

Competing Interests

The authors declare the following competing interests. EVA is employed by Amrita Vishwa Vidyapeetham as a Physician Associate educator and was involved in the development and coordination of the wider PA education and community-deployment initiative examined in this study, in addition to serving as the principal researcher. MVT supported institutional implementation and project administration, and SI provided doctoral supervision. The deployment salary was supported by an institutional research fund from Amrita Vishwa Vidyapeetham. The funder had no role in study design, data collection, analysis, interpretation, the decision to publish, or manuscript preparation. These employment, educational, implementation, funding and supervisory relationships could be perceived to influence interpretation of the findings. The authors declare no other financial or non-financial competing interests.

Author Contribution

EVA conceived the study, contributed to the methodology, conducted the interviews and focus-group data collection, curated the data, led the formal analysis, administered the research project and drafted the original manuscript. PVG contributed to conceptualisation and methodology and critically reviewed and edited the manuscript. JM contributed to conceptualisation, methodology and critical interpretive review of the findings and critically reviewed and edited the manuscript. LSG contributed to qualitative methodology, development and refinement of the interview guides, supervision, critical review of the analysis, and review and editing of the manuscript. MGW contributed to qualitative methodology and interpretive review of the analysis and critically reviewed and edited the manuscript. MVT contributed institutional implementation support, resources and project administration. SI contributed to conceptualisation and methodology, supervised the doctoral research, contributed to critical interpretation of the findings and critically reviewed and edited the manuscript. All authors read and approved the final manuscript.

Acknowledgement

The authors thank the deployed Physician Associate, medical officers, healthcare staff, community health worker and patients who contributed their time and experiences to this study. The authors also

thank Aleena Laiju for assisting with observation and field-note recording during the patient focus-group discussion, and Dr Uma Sangameswaran for independent Malayalam–English review and linguistic evaluation of the translated focus-group material.

Data Availability

The qualitative datasets generated and analysed during this study are not publicly available because the interview transcripts, focus-group data and reflective records contain detailed contextual information that could permit deductive identification of individual participants and the study setting. Limited de-identified supporting material may be made available by the corresponding author on reasonable request, subject to the scope of participants' consent, ethical requirements and institutional permission.

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Tables

Table 1. Participants and data sources

Code/source	Perspective	Contribution to dataset
PA01	Deployed Physician Associate	4 interviews (T1–T4) + 126 active-deployment DARRs
SM001	Senior medical officer	2 longitudinal interviews
JM001	Junior medical officer	2 longitudinal interviews
CM001	Community/outreach medical officer	2 longitudinal interviews
NUR01	Nurse	1 interview
LAB01	Laboratory professional	1 interview
PHA01	Pharmacist	1 interview
CHW01	Community health worker	1 interview
FGD01	Patients with prior PA care	1 focus group: n=6; 4 women/2 men; age 19–55; 70 min

Total: 14 individual interviews, one six-participant focus group and 126 active-deployment DARRs used in the longitudinal phase analysis. The complete cleaned DARR dataset comprised 132 records, including six orientation records. DARR, Deployment Activity Reflective Record.

Table 2. Longitudinal deployment trajectory

Phase and DARR period	Dominant transition	Indicative enacted work	Main tension
Early 27 Jan–28 Feb 24 records	Capability testing, role discovery and initial delegation	Physician-proximate entry; assessment; procedures; early outreach and coordination	Where does the PA fit, and what can be entrusted?
Developing 2 Mar–30 Apr 44 records	Widening delegation and routinisation	Separate first-contact assessment; procedures and follow-up; referrals; increased indirect supervision	Where should the PA be positioned across competing demands?
Established 1 May–18 Jul 58 records	Cross-functional and relational embedding	Routine clinical work; hospital coordination; projects; learner orientation; home-based care	How can a broad role be governed, resourced and sustained?

Phases were developed analytically from longitudinal change; they were not prespecified intervention stages. Record counts indicate the number of DARR entries available within each analytic phase and are not measures of patient volume, workload or productivity.

Table 3. Themes, interpretive processes and evidence boundaries

Theme	Process described in the case	Evidence boundary
1. Making an unfamiliar role legible through enacted capability	Role explanation combined with observed contribution was linked to local understanding and legitimacy	Acceptance did not always mean precise knowledge of PA scope
2. Entrustment without independence: expanding responsibility within continuing medical boundaries	Observed performance was associated with selective delegation and task-dependent supervision	Prescribing and final clinical decisions remained physician-linked; escalation was available and supervision became closer for unfamiliar work
3. From task support to boundary-spanning coordination within primary care	Accessibility, clinical understanding and physician linkage supported movement of information and work across interfaces	Flow and workload effects were stakeholder perceptions, not objective outcomes
4. Relational and operational embedding outpaced institutionalisation	Repeated encounters and routine reliance were associated with trust and embedded use	Time-limited deployment, resources, financing and role design limited claims of sustainability

The overarching concept of progressive negotiated embedding connects, but does not replace, the four themes.

Figures

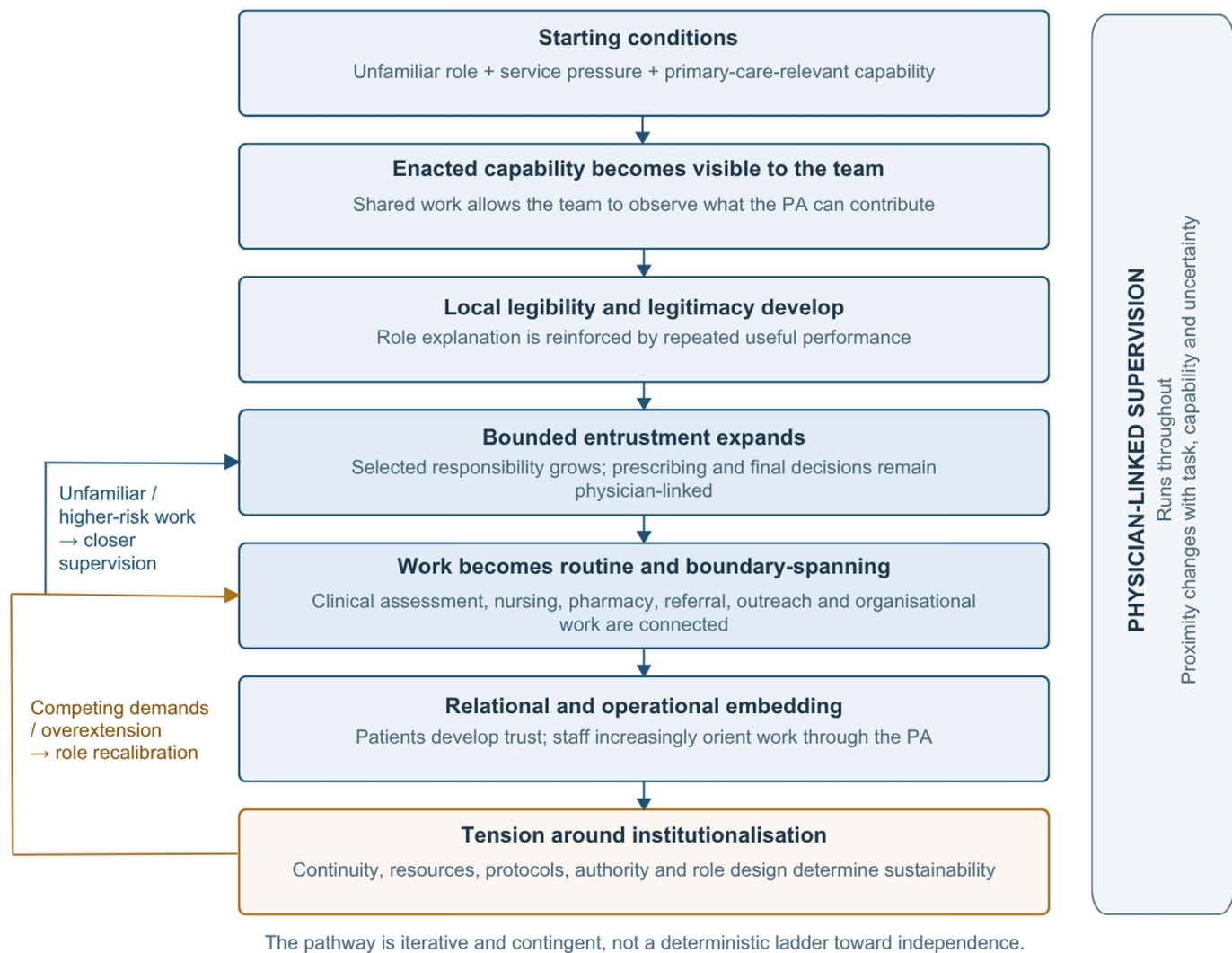


Figure 1

Progressive negotiated embedding of a Physician Associate into rural primary care.

Figure legend. The figure illustrates the proposed process through which a Physician Associate became integrated into a rural primary-care service. Demonstrated capability became visible to the team; participants linked this visibility with increasing local legibility, bounded entrustment and increasingly routine boundary-spanning work. Repeated interaction was associated with relational and operational embedding, while institutionalisation remained contingent on continuity, resources, protocols, authority and role design. Physician-linked supervision operated throughout. Feedback loops indicate that unfamiliar or higher-risk work prompted closer supervision and that competing demands or overextension could trigger role recalibration. The boxes represent recurrent analytic processes rather

than discrete stages, and the arrows indicate interpretive temporal relationships rather than causal effects. The pathway is therefore iterative and contingent rather than a deterministic progression toward independence.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [AdditionalFile2InterviewandFGDGuidesFINAL.docx](#)
- [AdditionalFile1COREQChecklistFINALV3.docx](#)