Health Innovation Wessex

Evaluation of Point of Care Testing (POCT) in Mid and North Hampshire

LumiraDx and i-STAT Alinity

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May 2025

Part of the Health Innovation Network

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Evaluation team

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Disclaimer

The final report presents findings from an evaluation of point of care testing (POCT) in Mid and North Hampshire, focused on two devices LumiraDx and i-STAT Alinity, and conducted by Health Innovation Wessex (HIW). The findings of this evaluation are those of the authors and do not necessarily represent the views of Hampshire healthcare staff or the companies that developed the devices. This evaluation was completed before the announcement on 13 March 2025 that NHS England will be brought back into the Department of Health and Social Care (DHSC). The evaluation description of the innovation, its deployment, and the evaluation findings were accurate at the time of publication. The government decision may, in the future, alter how the report's findings and recommendations are received in this new context. We raise this issue for the reader to note.

Acknowledgements

We would like to thank Naomi Purdie, Alex Shambrook and Abigail Barkham for the opportunity to evaluate the two POCT devices. Also, we would like to thank the wide range of staff who contributed their time and energy to provide data and take part in interviews. These included consultant practitioners, advanced clinical practitioners, laboratory managers and paramedics. The authors would also like to thank several Health Innovation Wessex staff for their support designing and completing this evaluation – Philippa Darnton (Director of Insight), Rachel Bailey (Senior Programme Manager, Insight), and Charlotte Forder (Associate Director, Communications).

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Health Innovation Wessex

Evaluation of Point of Care Testing (POCT) in Mid and North Hampshire

LumiraDx and i-STAT Alinity

Executive summary

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Executive summary

Introduction

- The evaluation assessed the impact of two point of care testing (POCT) devices - LumiraDx (for C-Reactive Protein) and i-STAT Alinity (for kidney function urea & electrolytes) - used by Urgent Community Response (UCR) and Hospital @ Home virtual ward (H@H VW) teams in Mid and North Hampshire. The devices aimed to support faster diagnostic testing, improve clinical decision-making, and enable patients to receive care closer to home.

Evaluation purpose and methods

- Reason for the evaluation: To understand and enhance the use of these devices and potentially expand their use across Hampshire and Isle of Wight Integrated Care System (HIOW ICS).

- The evaluation took place between June 2024 and March 2025.

- The evaluation collected multiple perspectives on the use of the devices and synthesised quantitative and qualitative data to describe their impact for patient and staff users.

Executive summary

Key benefits

- **Enhanced clinical decision-making:** Both devices significantly improved the speed and quality of clinical decisions by providing real-time blood test results (e.g. 3-4 minutes compared to over 10 hours via lab testing), enabling faster treatment planning and timely interventions.

- **Enabling home-based care:** POCT enabled many patients to receive safe and effective treatment in the comfort of their homes, supporting autonomy, reducing travel burdens, and avoiding hospital admissions.

- **Patient experience:** Patients and families described POCT as reassuring, low-risk, and innovative. The immediacy of results enabled them to participate more actively in their care decisions.

- **Support for staff:** Clinicians valued POCT for its speed, diagnostic confidence, and the ability to make holistic assessments. It also reduced the need for repeat visits and staff travel - increasing efficiency in community care delivery.

- **Saved time:** An analysis of 81 instances of blood tests sent to the laboratory for CRP and U&E tests, taken during UCR H@H home visits, indicated the average time from blood taken to analysis provided by the laboratory was 10 hours 25 minutes. LumiraDx can provide a CRP test result within 4 minutes and i-STAT can provide a U&E test result within 3 minutes.

Executive summary

Challenges and room for growth

- **Technical and logistical barriers:** Practical constraints such as warm-up time, device sensitivity to environmental conditions, and the need for stable, flat surfaces occasionally impact usability during home visits. These logistical challenges can affect workflow efficiency and clinician experience.

- **Variation in use and confidence:** Differences in digital literacy, training, and familiarity with the devices have led to inconsistent usage across teams. A more structured, competency-based training offer would support wider, more confident adoption.

- **Interoperability with health records:** Continued lab testing alongside POCT is largely due to the lack of integration with systems like ICE, meaning POCT results aren't automatically visible to wider clinical teams. To ensure results are accessible and recorded, clinicians often request lab analysis alongside POCT - typically from a single blood draw. While work to enable interoperability is in progress, it has been delayed due to limited laboratory informatics capacity.

- **Clinical scope of POCT:** Dual testing is sometimes clinically necessary, as current POCT devices (e.g. LumiraDx, i-STAT Alinity) only cover specific markers like CRP and U&E. Tests such as full blood count or liver function still require lab analysis. In these cases, both POCT and lab tests are done from a single blood sample to support comprehensive decision-making.

- **Financial considerations:** Obtaining detailed financial data was not the focus of this evaluation, however, staff did highlight a need for better understanding of the cost of POCT and the practice of dual testing. The ICS may wish to consider investigating the cost-effectiveness of POCT.

Executive summary

Main conclusion

- The evaluation found that LumiraDx and i-STAT Alinity point of care testing devices positively impact patient care by enhancing clinical decision-making, supporting care at home, and reducing unnecessary hospital admissions. However, the full potential of these devices is not yet realised due to dual testing practices, and technical challenges. To maximise their value, greater standardisation, improved staff training, and system-wide strategies to integrate POCT, when clinically appropriate, into standard practice are needed, alongside addressing the financial and logistical barriers that limit their widespread adoption.

Key recommendations for commissioners

1. **Improve interoperability:** Prioritise integration of POCT results into electronic health record systems (e.g. ICE) to enhance information sharing across care settings and reduce dual testing.

2. **Standardise POCT use:** Develop and implement consistent clinical protocols across teams to guide appropriate, effective use of POCT, ensuring it becomes a reliable part of community-based care.

3. **Build workforce capability:** Provide structured, role-specific training that strengthens digital literacy and builds confidence in using POCT devices, with a focus on clinical interpretation and technical handling.

4. **Evaluate cost-effectiveness:** Undertake a comprehensive financial evaluation of POCT, considering both direct costs (devices, consumables) and wider system benefits (e.g. fewer hospital admissions, reduced travel, time savings).

5. **Collaborate with suppliers:** Resolve usability challenges, including warm-up times, handling constraints, and software issues, and explore design improvements.

Health Innovation Wessex

Evaluation of Point of Care Testing (POCT) in Mid and North Hampshire

LumiraDx and i-STAT Alinity

Full report

Part of the Health Innovation Network

Background

- **About Health Innovation Wessex**
  - Health innovation networks (formerly called Academic Health Science Networks or AHSNs) were established by NHS England in 2013 to transform the discovery, adoption and spread of innovation in health and care. We offer support and expertise across the health innovation pipeline, including the spread and adoption of technologies; enabling disruptive pathway redesign; building workforce capability; and evaluating implementation and impact to secure sustainable, transformative change.
  - Health Innovation Wessex (HIW) brings together the NHS, health and social care providers, universities, industry, community groups and voluntary organisations, and covers a regional population of almost three million. Working in partnership with our member organisations and industry, we support the NHS to generate economic benefits and improve health outcomes.

- **Origin of the evaluation**
  - Hampshire and Isle of Wight Healthcare NHS Foundation Trust (formally known as Southern Health NHS Foundation Trust) was awarded support from the HIW Insight team to conduct an independent real world evaluation (RWE) of their POCT programme, as part of the HIW Real World Evaluation Programme 2024.

- **Reason for the evaluation**
  - To understand the usage and impact of LumiraDx supplied by Roche, and i-STAT Alinity supplied by Abbott, in two Urgent Community Response (UCR) and Hospital and Home virtual ward (H@H VW) teams, with a view to enhancing and expanding their use across HIOW ICS, pending the results of the evaluation.

Background

- Diagnostic testing conducted at or near the site of patient care, called point of care testing (POCT), can provide results to a clinician without having to wait hours or days for sample transport and laboratory processing. Hundreds of companies are now involved in the development of a wide range of diagnostic devices, supporting care for many diseases and medical specialties in primary and secondary care.

- POCT responds both to focus on patients receiving care closer to home in the NHS Long Term Plan and is in line with the three reform shifts - moving care from hospitals to the community, embracing digital transformation, and shifting from treatment to prevention (Lord Darzi, 2024).

- In the North and Mid Hampshire region, two POCT innovations LumiraDx and i-STAT Alinity are supporting UCR and H@H VW services within Hampshire and Isle of Wight Healthcare NHS Foundation Trust and South Central Ambulance Service. LumiraDx is used to test for infection marker C-reactive protein (CRP) and i-STAT Alinity is used to test kidney function (urea and electrolyte levels). Both device types have been in use since November 2023, with ten of each device in regular use.

- The aims of POCT as described by the collaborating organisations are to:
    1. Enable the delivery of high quality and accessible diagnostics
    2. Improve treatment decisions and/or planning
    3. Increase the speed of clinical decision making
    4. Enhance patients' healthcare experience
    5. Provide patients with the opportunity to receive care closer to home
    6. Avoid unnecessary hospital-based activity.

- Fourteen staff are using both devices across the region. They are a range of professionals including consultant practitioners (nurse and allied health professionals), advanced clinical practitioners (ACP), trainee ACPs, ACPs with a prescribing qualification, and paramedics using the devices in the UCR and H@H VW services (including Falls and Frailty Car and Urgent Response Van).

Evaluation questions

1. In what clinical situations has point of care testing (POCT) been used between November 2023 and December 2024?
2. What are patients' views on their recent healthcare experience that involved the use of POCT?
3. Does the use of LumiraDx and i-STAT Alinity provide the option for patients to receive care closer to home?
4. How do staff view POCT in the context of LumiraDx and i-STAT Alinity, across North and Mid Hampshire?
5. How does the use of LumiraDx and i-STAT Alinity support better clinical decision-making?
6. Does the use of LumiraDx and i-STAT Alinity, increase the speed of diagnostic testing?
7. What perceived impacts does the use of LumiraDx and i-STAT Alinity have on urgent community response (UCR)?
8. What perceived impacts does the use of LumiraDx and i-STAT Alinity have on wider health services?
9. Is the use of LumiraDx and i-STAT Alinity for POCT sustainable?
10. What aspects of POCT generally or the two devices could be improved?

Evaluation methodology

The evaluation took place between June 2024 and March 2025.

The evaluation took a multi-perspective approach and used a mixed methods concurrent triangulation design to answer the evaluation questions.

Methods used:

1. An analysis of POCT team service-held utilisation data
2. Semi-structured interviews with 18 patients in receipt of care involving POCT
3. Semi-structured interviews with 14 POCT team staff (ACPs, trainee ACPs, paramedics).
4. Semi-structured interviews with two laboratory managers
5. Five half-day observations of the UCR team (Falls and Frailty Car and the Urgent Response Van).

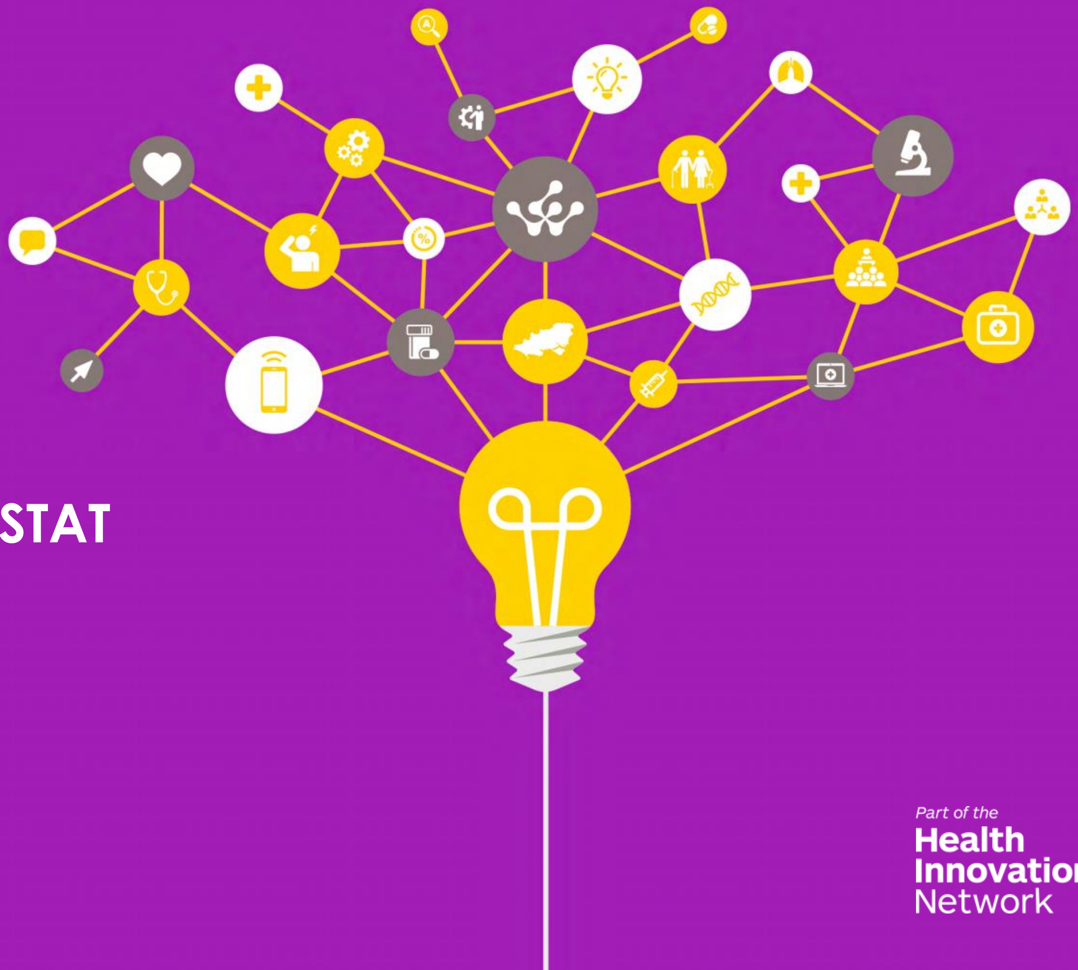
Findings from all data sources were synthesised to develop detailed conclusions about the value and impact of POCT activity.

Summary of results sections

The findings from all data sources were synthesised under the following headings:

1. Utilisation of LumiraDx & i-STAT Alinity
2. Acceptability of LumiraDx & i-STAT Alinity
3. Impact on patients
4. Impact on Urgent Community Response and Hospital @ Home virtual ward teams
5. Impact on laboratory blood testing
6. Sustainability of LumiraDx & i-STAT Alinity

Utilisation of LumiraDx & i-STAT Alinity



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Utilisation of LumiraDx and i-STAT Alinity

- LumiraDx and i-STAT have been in use with two UCR and H@H VW teams since November 2023, with ten of each device in regular use. Accurate data on POCT initiated C-reactive protein (CRP) and kidney function urea and electrolyte levels (U&E) tests was not available for this evaluation. However, it is estimated that approximately 119 CRP and 124 U&E tests are conducted each month by the UCR and H@H virtual ward teams.

- The figures below describe the total number of CRP and U&E blood tests received by the UCR and H@H-linked laboratory between 2023-25. Both figures show CRP and U&E tests generally increasing or remaining at previous levels to the year before. It would appear the introduction of LumiraDx and i-STAT have not reduced laboratory activity.

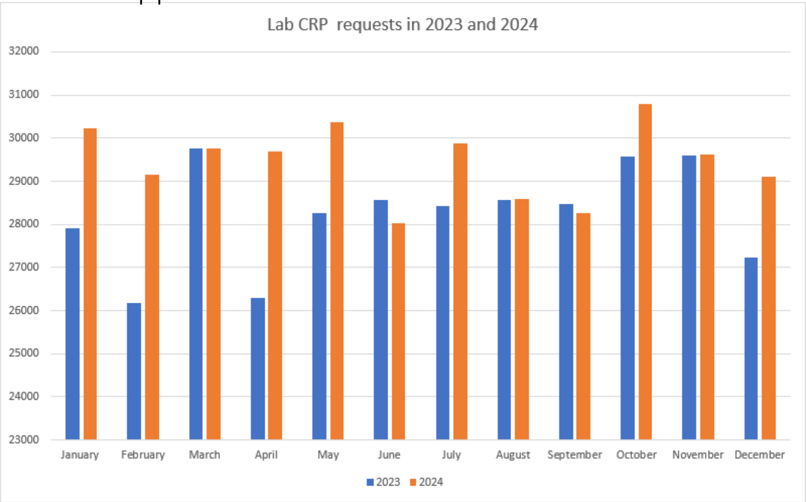


Figure 1: Total number of CRP test requests

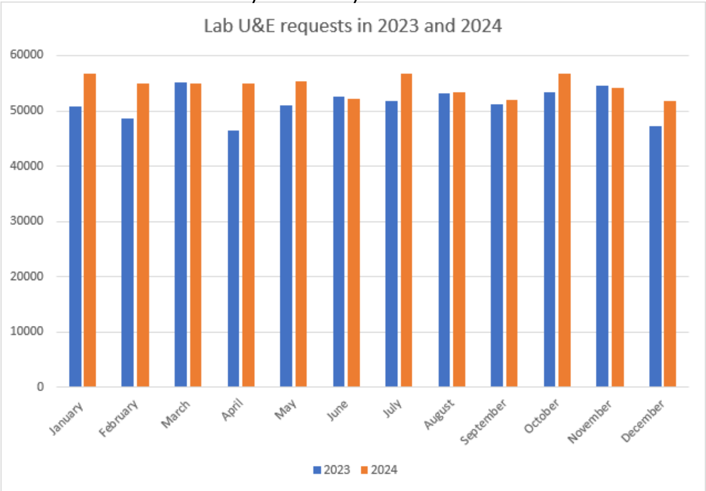


Figure 2: Total number of U&E test requests

Utilisation of LumiraDx and i-STAT Alinity

Theme 1 from the staff interviews (see Appendix 1) revealed UCR staff used the devices in different ways:

- This example describes several issues that lead to nuanced style of POCT use by individual clinicians: *"We're all using them differently…I do believe these are brilliant bits of kit...hugely valuable…but* ***I don't find them easy to use out on the road****. In patient homes I don't find them very conducive to the setting…I know I should use them more than I do…but we carry a huge amount of kit into a patient's home, I've got my obs kit, my bloods bag, medications, we are laden down with stuff.* ***I'm in the habit of just taking the essential stuff in and I leave [POCT devices] in the car*** *and nip back and forward to the car if needed. There have been occasions where I haven't been able to park straight outside the patient's home, so there's a bit of a walk...****sometimes I've done the processing and back at the car****. The thing is you have to wait for three minutes and then you've got a few seconds to drop in the blood and another three minutes while it processes, but also* ***the device needs to be on a flat surface*** *so it was on my briefcase on the back seat of the car…but then* ***it timed out and I had to re-enter all of the details and wait three minutes again*** *and it pinged saying the device needs to be on a flat surface and it timed out again. Also, there have been instances where we've had* ***the password expired or changed****. We've been out trying to use the Lumira that it won't accept the password and it's because* ***the machine needed to come back to base to upload the new password information****…so again that was another difficulty. Last winter there was an issue where I went to turn it on and* ***it was just too cold, so it just wouldn't turn on****. You've done your full assessment, you tend to get bloods at the end, you're making a decision…but the time it takes to get the machines up and running is additional time at the end of the assessment…there are logistical issues, I just thought I'd be honest." (ACP2)*

- *"When we see a patient, initially we take a point of care blood with the green bottle and we use that for our initial diagnostics on scene…but at the same time, because we're bleeding somebody,* ***we will get a full sample and that will enable us to collect a full blood count liver function and all of those other bits****. We're not just treating an infection, we need to make sure that they're not anaemic, that they haven't got something else going on with their liver. We do the initial acute infection part with the point of care so we can get treatment started...and then we process the other bloods, which help us to consolidate our thoughts." (ACP6)*

Case studies

- The UCR team, including the falls & frailty car, routinely use LumiraDx and i-STAT during home visits. The evaluation team observed five half-day sessions of UCR home visits between November 2024 and January 2025.

- An observation sheet was used to document key information during five patient visits. The observations made note of:
    - Reason for the patient home visit
    - POCT devices used
    - Activities and interactions amongst staff, patients, relatives/carers
    - Decision-making processes
    - Outcomes of the visit
    - Post-visit actions.

- Five case studies describe how the devices were/were not used in UCR home visits. These have been thematically named to describe the essence of POCT use in those examples:
    1. 'Saved by the tip of the finger' (LumiraDx used)
    2. 'Instant home monitoring at your fingertips' (LumiraDx used)
    3. 'Consent and consumables' (POCT not used)
    4. 'I'm ok, thank you for checking in' (POCT not used)
    5. 'The persuasive power of POCT' (LumiraDx and i-STAT used)

- The five case studies are described in the following slides.

Observational case study 1 – *'Saved by the tip of the finger'*

The context

Reason for patient visit – Patient was struggling to recover at home from an episode of pneumonia (recently admitted and discharged from a hospital). The patient lives with her husband who was struggling to care for her and was worried she may be deteriorating.

The husband called NHS 111 and UCR was subsequently asked to visit the patient for comprehensive assessment and decision on onward care.

The outcome

Prioritising the use of LumiraDx over i-STAT Alinity helped staff to make holistic decisions with the limited amount of blood sample from the patient. Vital signs and infection marker indicated low-risk of health deterioration at the time of assessment. The decision made with the patient was to stay at home and be monitored by H@H virtual ward team.

The patient was happy with this outcome instead of being sent to A&E and experience a long wait for medical assessment.

The experience

POCT used – LumiraDx

The patient appeared nauseous and dehydrated (could not keep fluids down). Staff struggled to collect enough blood sample from the patient for both POCT devices and lab test.

LumiraDx (for infection marker) was prioritised over i-STAT Alinity (for urea and electrolyte levels).

The value of POCT to decision-making

- LumiraDx's ability to collect a small amount of blood from the patient's fingertip was a useful feature when staff had difficulty collecting blood sample from venepuncture.
- The test result from LumiraDx affirmed the staff's decision by providing an additional piece of evidence to ascertain the patient's clinical presentation.
- Consumables for POCT were used as necessary.

Observational case study 2 – ‘*Instant home monitoring at your fingertips*’

The context

Reason for patient visit – A patient who lives alone had slipped out of the bath and was left lying on the floor overnight. A neighbour noticed the following morning that the curtains were still closed and came to check the patient.

The ambulance crew was called in and the patient was subsequently transferred to the care of H@H VW team to monitor the raised infection marker.

The outcome

Visits from the UCR and H@H VW team gave the patient reassurance and helped rebuild her confidence. The instantaneous test results from LumiraDx allowed the patient and the staff to note her improvement without waiting for a laboratory result.

The patient was happy to be monitored at home and avoided a hospital admission. The patient received daily care in the comfort of her home and was able to commence early therapy input from the UCR and H@H VW team.

The experience

POCT used – LumiraDx

The ability to test the patient’s inflammatory marker from a fingertip blood sample was quick and less invasive compared to drawing blood by venepuncture.

The instant test result from LumiraDx replaced the need to send a blood sample for laboratory testing.

The value of POCT to decision-making

- The instantaneous test result on LumiraDx allowed the daily monitoring visit to be a quick process.
- LumiraDx replaced the need for a laboratory test and prevented the patient from having to wait for an update from UCR staff on the laboratory test result.
- Consumables for POCT were used as necessary.

Observational case study 3 – ‘*Consent and consumables*’

The context

Reason for patient visit – A patient living in assisted living accommodation was recently admitted and discharged from hospital for a fall due to an epileptic episode. The patient is well known among the UCR staff, has a learning disability and controlled epilepsy. Since discharge, the patient was less mobile, less communicative and generally unwell. The patient was found on the floor by their bedside during breakfast which prompted a visit by the UCR team.

The experience

POCT used – None

The UCR team struggled to establish a clear picture of the patient’s health status due to limited information provided by the patient and residential staff.

The patient initially agreed to provide a blood sample for POCT and laboratory tests (LumiraDx was turned on and prepared) but the patient subsequently refused because they became fearful of needles and assumed that a blood test meant being readmitted to hospital.

The outcome

The UCR team reviewed the hospital discharge letter and completed their assessment. The patient was deemed to be experiencing residual flu symptoms for which an antiviral medication was prescribed as part of the discharge plan.

The residential staff agreed to take two-hourly observations instead of readmitting the patient to hospital. The residential staff were advised to contact UCR or H@H virtual ward team directly if there were any concerns about the patient’s health.

The value of POCT to decision-making

- Patient declined to provide a blood sample for POCT; the use of POCT was therefore not justified.
- LumiraDx was set up and prepared in anticipation, but subsequently aborted due to no blood sample being collected.
- Consumable for LumiraDx (test strip) was discarded without being used.
- The POCT device had no impact on the clinical decision-making by the staff in this visit.

Observational case study 4 – *'I'm ok, thank you for checking in'*

The context

Reason for patient visit – the UCR team visited a patient who had fallen and hurt the right side of their body earlier in the day. The patient used their personal alarm pendant, and the daughter called GP on patient's behalf. The patient's daughter and the domestic carer were present at the time of visit.

Upon arrival, the patient had already managed to get up and sit on the sofa comfortably, though shaken by the fall.

The outcome

After a thorough assessment by the UCR team, there were no concerns, and the patient was deemed safe to remain at home. There were no concerns from the patient, the daughter or the carer.

There was no need for further input by the UCR team. As a safety-net plan, the daughter was advised to contact the UCR or the hospital frailty team if further support was needed.

The experience

POCT used – None

Upon arrival, the patient was mobile and communicating as per their usual self (confirmed by the daughter and the carer). The patient was already known to the hospital frailty team.

A thorough assessment by the UCR staff concluded that there was no need to check signs of infection or kidney function via POCT.

The value of POCT to decision-making

- Decision not to use POCT was justified from the thorough assessment by the UCR team.
- The POCT device had no impact on the clinical decision making by the staff in this visit.
- The cost of POCT consumables was appropriately avoided.

Observational case study 5 – '*The persuasive power of POCT*'

The context

Reason for patient visit – NHS 111 requested a follow-up visit by the UCR team (patient complained of feeling generally unwell, including vomiting and diarrhoea). A district nurse was present at home for a separate visit to see the patient's son. The district nurse coincidentally found the patient on the floor of the bedroom but was not aware when the fall may have happened as neither patient or son could report accurately.

The outcome

A comprehensive assessment including the use of LumiraDX and i-STAT helped staff to build a holistic picture of the patient's condition. The decision was made to escalate the care and admit the patient to the hospital urgently for treatment of suspected low cortisol level.

Patient was initially reluctant to leave home. The POCT results persuaded the patient that hospital admission was necessary to prevent further deterioration in her health.

The experience

POCT used – LumiraDX and i-STAT

After one failed attempt of venepuncture, the attending staff decided to insert a peripheral cannula to have the option to administer IV fluid. This meant that sufficient blood sample was collected via cannula for both POCT devices and the lab test, as well as administering IV fluid during the visit. The blood result from POCT indicated that several markers were out of normal range (e.g. infection marker, sodium level and eGFR*).

The value of POCT to decision-making

- The results from POCT added confidence and assurance to both the patient and staff on decisions around the patient's care.
- The attending ambulance crews appreciated the POCT results in the handover as they substantiated the reason for ambulance callout and the subsequent hospital admission.
- Consumables for POCT were used as necessary.

*eGFR: estimated Glomerular Filtration Rate. A blood test to measure the kidney's ability to filter waste from blood.

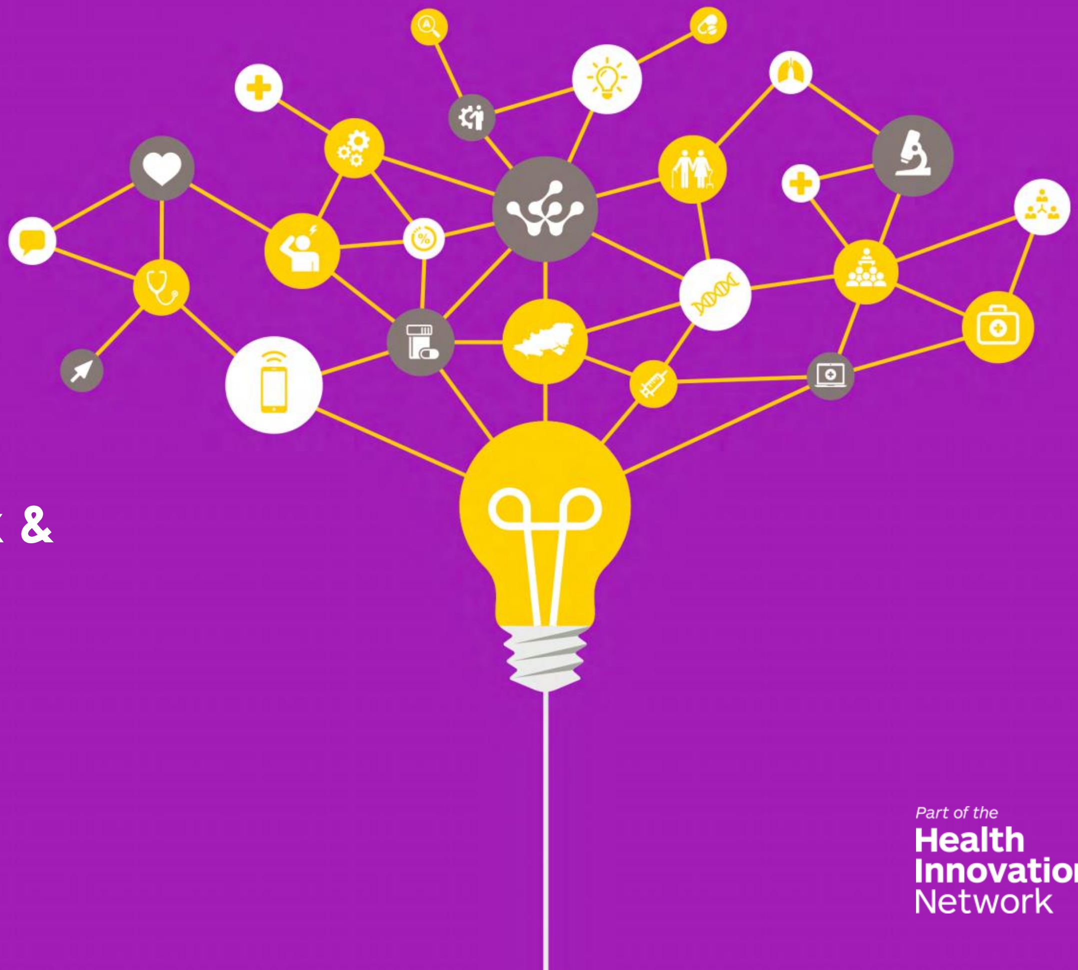
Summary of observation findings

- Overall, the case studies demonstrate some of the ways in which POCT by UCR and H@H VW team have been integrated into patient visits.

- The timing and the use of POCT varied in each visit, reflecting the unique nature of each patient's case. Considerations for the staff included decisions around whether to use POCT, setting up the POCT (including blood sample collection process), processing the blood analysis and the short waiting time for the test result. For example, one member of UCR staff would be speaking to the patient to ascertain presenting symptoms whilst their colleague (all visits were attended in pairs) would set up the POCT and other clinical equipment (e.g. blood pressure monitor, pulse oximeter, preparing for blood sample collection). The blood sample would be collected and analysed while proceeding with other assessment tasks to optimise the time spent with the patient.

- The attending staff used both POCT devices to collect supplementary evidence as part of a comprehensive assessment and to confirm their clinical decision. The POCT results were as essential as any other clinical information (such as taking the patient's vital signs, medication check, physical examination, etc.) gathered during the visit to holistically assess and plan the most appropriate care.

- As seen in the case studies, the use of POCT is not always appropriate or possible. The use of POCT is guided by the clinical indication to use POCT, patient consent to blood samples being taken for testing, and successful and sufficient collection of blood for testing.



Acceptability of LumiraDx & i-STAT Alinity

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Acceptability of LumiraDx and i-STAT Alinity

Theme 1 from the staff interviews (see Appendix 1) revealed the acceptability of LumiraDx and i-STAT as POCT devices. Acceptability was discussed in several ways and nuanced.

- Many clinicians were **sceptical about the devices initially**: *“I was sceptical about point of care testing initially, but over time, I saw its value in real-time decision-making.” (ACP11)*
- But then later appreciated its value for **rapid decision-making**: *“It really speeds up decision-making… we could save 24 hours easily in waiting for blood results to come back [from laboratory] and then arranging a potential admission.” (ACP4)*
- And valued the device’s ability to **provide reassurance** on decision-making during visits: *“I had a patient who, if I hadn't had the Lumira, I would have thought that they were okay. But because their inflammatory markers were high, we went straight into treating.” (ACP6)*
- And valued the device’s ability to **support care at home**: *“It definitely helps people receive care closer to home. It makes such a difference to my assessments and treatment decisions." (ACP9)*
- And valued the impact on the UCR team to **reduce follow-up visits:** *“Less staff are needed for follow-up care when point of care tests provide immediate results and allow treatment decisions on the spot.” (ACP9)*

Acceptability of LumiraDx and i-STAT Alinity

- Although many clinicians had clear positive views on the acceptability of LumiraDx and i-STAT in some situations, there were some indications that the devices were not fully accepted or embedded as POCT tools.

- It was clear that dual testing (via POCT and laboratory) took place in many instances. This was largely due to the lack of integration with systems like ICE, meaning POCT results aren't automatically visible to wider clinical teams, and some issues of trust about the results provided by both devices.

"Despite the benefits, POCT is not replacing traditional testing entirely due to trust issues and the need for further verification." (ACP2)

"It's difficult to say if POCT alone is keeping patients at home. There is still a lot of caution and staff tend to duplicate with sending blood to the lab as well." (Laboratory manager 1)

"I think there is some negativity because I don't think you necessarily explore all the potential causes for inflammation. I think it can be quite easy to go 'it's an infection' rather than thinking what else might be causing inflammation. I think that's a learning curve for the whole team and a topic for supervision." (ACP7)

Acceptability of LumiraDx and i-STAT Alinity

Theme 2 from the staff interviews (see Appendix 1) about training and competencies is relevant to the acceptability of the devices to UCR staff. The journey toward the level of acceptability reported was affected by perceptions of training provided and the need to develop trust in the devices.

- **Mixed views on level of training provided**

"I had train-the-trainer training, and the companies were proactive in helping us with issues like error codes." (ACP9)

"The training was done on quite an ad hoc basis…there was certainly no official training." (ACP2)

"I had training from Lumira and then had to cascade train others…some staff struggle with confidence to use [LumiraDx]." (ACP4)

- **Building trust in devices required**

"For paramedics, using POCT is a professional development opportunity - we weren't used to interpreting blood results before." (PM1)

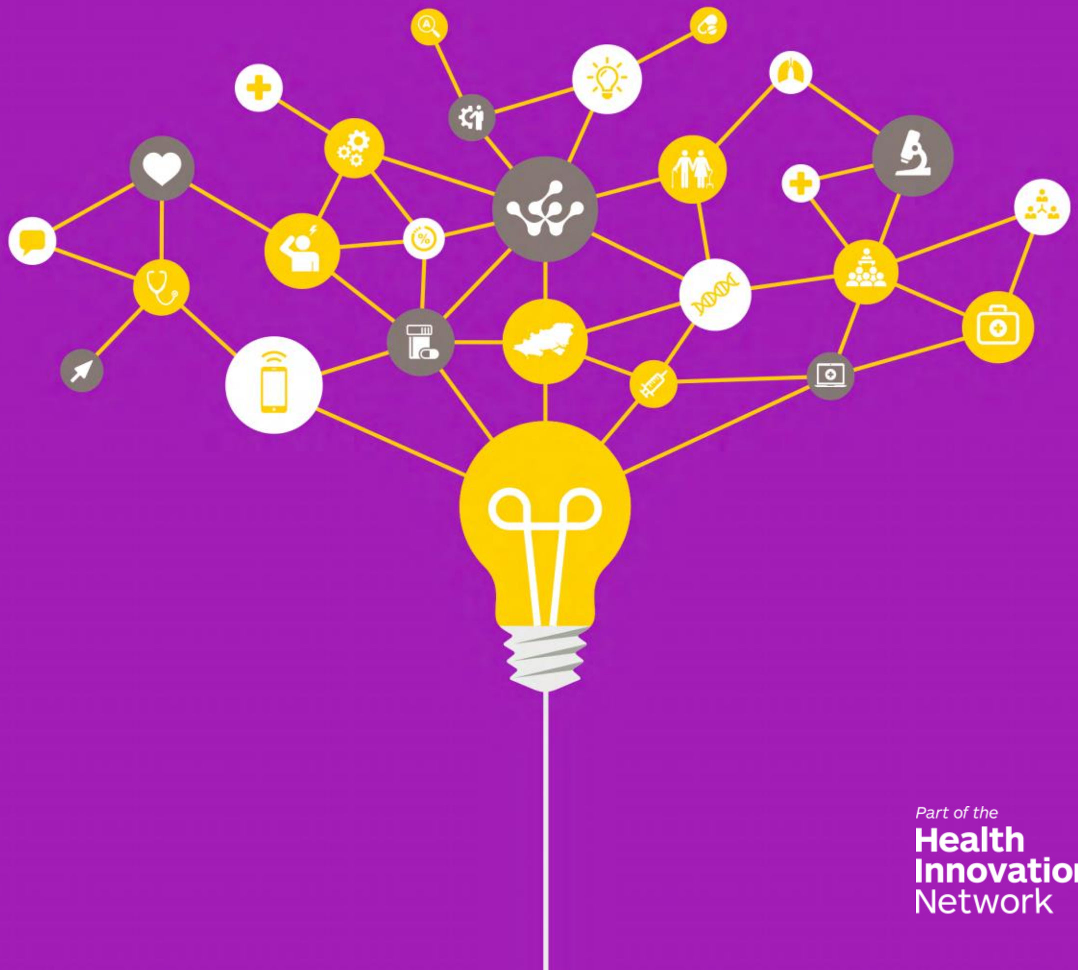
"It's trust in that equipment, isn't it initially? Learning what the ranges are and when you should be concerned." (ACP5)

"At first, I felt anxious about using the Lumira, but over time, I've learned how to integrate it effectively with my clinical assessments." (ACP6)

Acceptability of LumiraDx and i-STAT Alinity

- In summary, both devices are being used regularly and valued by clinicians; however, it could be argued that the full benefit of POCT is yet to be realised due to persisting reliance, in some cases, on laboratory testing in addition to POCT. The 'pilot status' of these POCT devices appears to affect how they are perceived.
- Staff reported high levels of acceptability for specific activities, namely rapid decision-making, providing reassurance on decision-making during visits, the ability to support care at home, and the ability to reduce UCR follow-up visits.
- However, there were some indications that the devices were not fully accepted or embedded as POCT tools by all staff, with some variation in when POCT devices were used (e.g. at the start or end of a visit). Possible factors may be limitations in the training provided, lack of clarity about the aim of POCT use in UCR and H@H VW team, and lack of standardisation of use across UCR and H@H VW team.
- The areas highlighted above (e.g. clinical decision-making) are discussed further as their own themes later in the report.

Impact on patients



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Impact of POCT on patients

Theme 4 from the staff interviews (see Appendix 1) describes the impact of LumiraDx and i-STAT on patients.

- Patients were reported as **positive about POCT**, many staff reported patients had a positive view of POCT: *"I haven't really heard anything negative from the patients about it…they're like, oh, wow, that's amazing. I often say to people we're going to take your bloods and one of the samples we're taking we can run two tests here, one to check the inflammatory marker and then one to check the renal function. Lots of people are quite interested in it and inquisitive, so it's good." (ACP1)*

- POCT facilitated **informed decisions** to support patient care: *"The fact that we're doing the blood test at the house, so we're not waiting for the blood results from the hospital…we're able to have conversations with the patient about the blood tests and involve them in their care and decision-making. I think it gives them a bit of autonomy in terms of being able to decide their care with us." (ACP1)*

- POCT supported **appropriate escalation** of care: *"We've had patients reluctant to go to hospital, but by showing them CRP results, we helped convince them of the need for escalation." (ACP6)*

- POCT supported patients to **receive care at home**: *"It definitely helps people receive care closer to home. It makes such a difference to my assessments and treatment decisions." (ACP9)*
  "The biggest win is on medication delivery, starting treatment there and then saves travel time and additional staff workload." (ACP11)

Impact of POCT on patients

Theme 3 from the staff interviews (see Appendix 1) describes the impact of LumiraDx and i-STAT on patients through **improved clinical decision-making.** This was reported in several ways:

- **Enhancing diagnostic confidence:** *"It gives me some additional evidence and confidence to allow me to make autonomous decisions...I defer less to GPs because the evidence allows me to make decisions." (ACP2)*

- **Reassurance in uncertain cases:** *"I had a patient who, if I hadn't used Lumira, I would have thought they were okay but because their inflammatory markers were high, we went straight into treating." (ACP6)*

"Families might call an ambulance if they're worried and showing the CRP number helps reassure them." (ACP4)

- **Influence on admission decisions:** *"We were able to convince a nursing home to accept a patient by showing the POCT results." (PM1)*

"If you've got that objective data there that can quite often sway patients to agree to admission. When you show them that, it changes their mind." (ACP5)

"Sometimes we're not quite sure and they would end up in A&E. POCT helps avoid unnecessary admissions." (PM1)

- **Balancing clinical judgment with test results:** *"Even if I'm thinking infection but the CRP isn't raised, then I'm still going to want to do something about what I'm finding." (ACP7)*

Impact of POCT on patients

Theme (3b) from the staff interviews (see Appendix 1) describes the impact of LumiraDx and i-STAT on patients through improved **rapid** clinical decision-making.

- Many UCR staff reported both devices increased the speed of clinical decision-making.

“It really speeds up decision-making… we could save 24 hours easily in waiting for blood results to come back and then arranging a potential admission.” (ACP4)

“It speeds up decision-making, especially when you get unexpected results like a high CRP that completely changes your treatment plan.” (ACP9)

“Instead of waiting for another clinician to review the bloods, we can discuss it there and then.” (PM1)

- The above was supported by an analysis of 81 instances of blood tests sent to the laboratory for CRP and U&E tests, taken during UCR home visits, which indicated the average time from blood taken to analysis provided by the laboratory was 10 hours 25 minutes. LumiraDx can provide a CRP test result within 4 minutes and i-STAT can provide a U&E test result within 3 minutes.

Impact of POCT on patients

Theme 5 from the staff interviews (see Appendix 1) describes the impact of LumiraDx and i-STAT on treatment decisions.

- **Early initiation of treatment:** *"We tend to initiate antibiotic treatments sooner because of the point of care, in my opinion." (ACP10)*

"The elderly can be very confusing, they don't always have classic infection symptoms…you think they're fine and then you do their CRP and you're absolutely shocked that it's really high and that totally changes my treatment plan…if we didn't have point of care, I would have gone away from that person thinking I can't see anything wrong with them, they seem fine, they're not confused." (ACP9)

- **Avoidance of unnecessary treatment:** *"The point of care CRP actually was less than five, which meant that the acute confusion is not bacterial...it prevented initiation of antibiotic treatment." (ACP10)*

- **Monitoring treatment:** *"We've used Lumira to repeat CRP after 24 hours, which helped confirm if treatment was effective." (ACP6)*

- **Informed prescribing:** *"If I do the CRP from the Lumira and the renal function from the i-STAT, I can then prescribe really safely. A lot of medications depend on renal function." (ACP9)*

Impact of POCT on patients: Direct patient feedback

- Staff perceptions of the impact of POCT on patients were complemented by interviews with patients themselves.
- Patients and relatives, who had recently been visited by a clinician from a UCR team and had experienced the use of POCT in their home, were invited to participate in a phone interview. Patients were contacted retrospectively by the clinical team to receive their consent to be contacted by the evaluation team.
- If preferred, patients were also invited to leave written feedback for the evaluation team.
- Patient feedback was also collected during observational patient visits, if patients were happy to share their views and thoughts on POCT.
- Feedback from a total of 18 patients, relatives and service users was collected. This included:
    - 14 phone interviews with patients and/or relative, live-in carer and carer manager
    - One written feedback from a patient
    - Three notes of conversations with patients during the observation visits.
- See Appendix 2 for the tables of themes.

Patient feedback: Theme 1

Theme 1: Perception of POCT as a low-risk procedure and high value outcome

- The POCT results are perceived by patients and relatives as an **objective measure** that can be **trusted** alongside the clinician's view or opinion.

- Patients perceive the use of POCT as **low risk procedure** to make the blood result available quickly (instead of waiting for the pathology laboratory results). Notes from the observational visits indicated that the blood sample collection for the POCT "doesn't bother" the patient as blood sample is going to be collected regardless of whether the plan is to stay at home or being admitted to the hospital.

- The option of collecting blood sample via fingertip is less invasive than venepuncture:

  "They took a [blood] sample like a pinprick, almost like a diabetes check, and then stuck it into their machine, and it was quite amazing." (Patient's carer)

Patient feedback: Theme 2

Theme 2 – POCT reassures patients on the decision made by the clinicians

- The availability of POCT results at the time of visit reassures patients in two ways.

- First is the benefit of **being able to see the blood results** as part of the clinical information. This partial visibility into the clinical decision-making empowered a relative to voice their view of the patient care.

  "…Because the CRP was not low enough for me (patient's relative) to be confident, so I asked if they (UCR team) could come back one more day just to do another check on [the patient]. It was brilliant, and so we've worked in tandem. We worked together, we tried to make sure that [the patient] was kept at home, which is what she wanted… and to support me through that." (Patient's relative)

- The second is the **timing of the test result** which assured patients that the results are considered swiftly during the visit instead of waiting for a pathology laboratory test result to confirm optimal care.

  "…if we submit to those blood tests [to the pathology lab], we could have probably got the results back in a day or two. And who knows where we would have been then, but we were able to… put [the patient] back on a specific antibiotic because he was being treated for a [urinary tract infection] and we needed to be treated for a chest infection. So we had to change the antibiotics." (Patient's carer)

Patient feedback: Theme 3

Theme 3 – Patients' perception of indifference to POCT provided that appropriate care is given

- Contrary to the first two themes, the third theme articulated a perception of indifference to the use of POCT provided that the clinicians make appropriate decisions about their care.

  "I don't really get into that, I just leave them to it" (Patient's relative)

- To some patients, POCT was perceived as **another clinical tool to gather information**, no different from other equipment such as blood pressure monitors or pulse oximetry.

  "They [UCR team] were happy and they have been using it so they know its capability and I trusted what they were telling me" (Patient)

- This theme may be underpinned by the trusted relationship patients and relatives hold with clinicians (e.g. "I do as I'm told").

  "If the [UCR team] trust it (POCT) and it probably is tested regularly… I'm happy with that, no concerns" (Patient's relative)

Patient feedback: Theme 4

Theme 4 – Perceived reduction of burden to individuals by minimising hospital admissions

- The final theme articulates patients' perceptions of POCT associated with home-based care and reducing the sense of burden to individuals by reducing hospital admissions.

- The value of POCT results seem to be viewed as a form of **confirmatory evidence** to start the treatment earlier and closer to home, in comparison to waiting for the laboratory test results. By starting treatment closer to home, there is a **perception of reducing the burden** of hospital admission.

  "…you know [the patient] would have been taken into hospital, which we were so grateful he didn't. And that's the major thing, you know, we don't want to be wasting NHS times anywhere." (Patient's relative)

  "The sooner we can start treatment, the better really, especially with when it's infection based because we know the longer someone's left untreated increases that risk of them needing to go into hospital" (Care manager of an assisted home)

Patient feedback: Summary of themes

- Patients and relatives feedback generally appreciated the use of POCT in their care.

- The feedback highlighted the value of POCT as:
  - Objective evidence that can be trusted alongside clinicians' holistic decision-making
  - Perception of POCT as a low-risk procedure
  - Perceived assurance that clinicians are making decisions based on evidence and in a timely manner
  - Perception of POCT results as confirmatory evidence to support early commencement of treatment and potentially reducing hospital admission.

- A distinct perception of indifference towards POCT was also identified from the feedback. The sense of indifference stemmed from trusting the clinicians to gather necessary clinical information to make appropriate decisions on patient care. There was a sense that some patients perceived POCT as any other clinical tool that clinicians use, such as blood pressure monitors or pulse oximetry, to build clinical evidence.

Impact on Urgent Community Response and Hospital @ Home virtual ward teams

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Impact on UCR and H@H VW teams

Theme 6 from the staff interviews (see Appendix 1) revealed several impacts of LumiraDx and iSTAT on team activity.

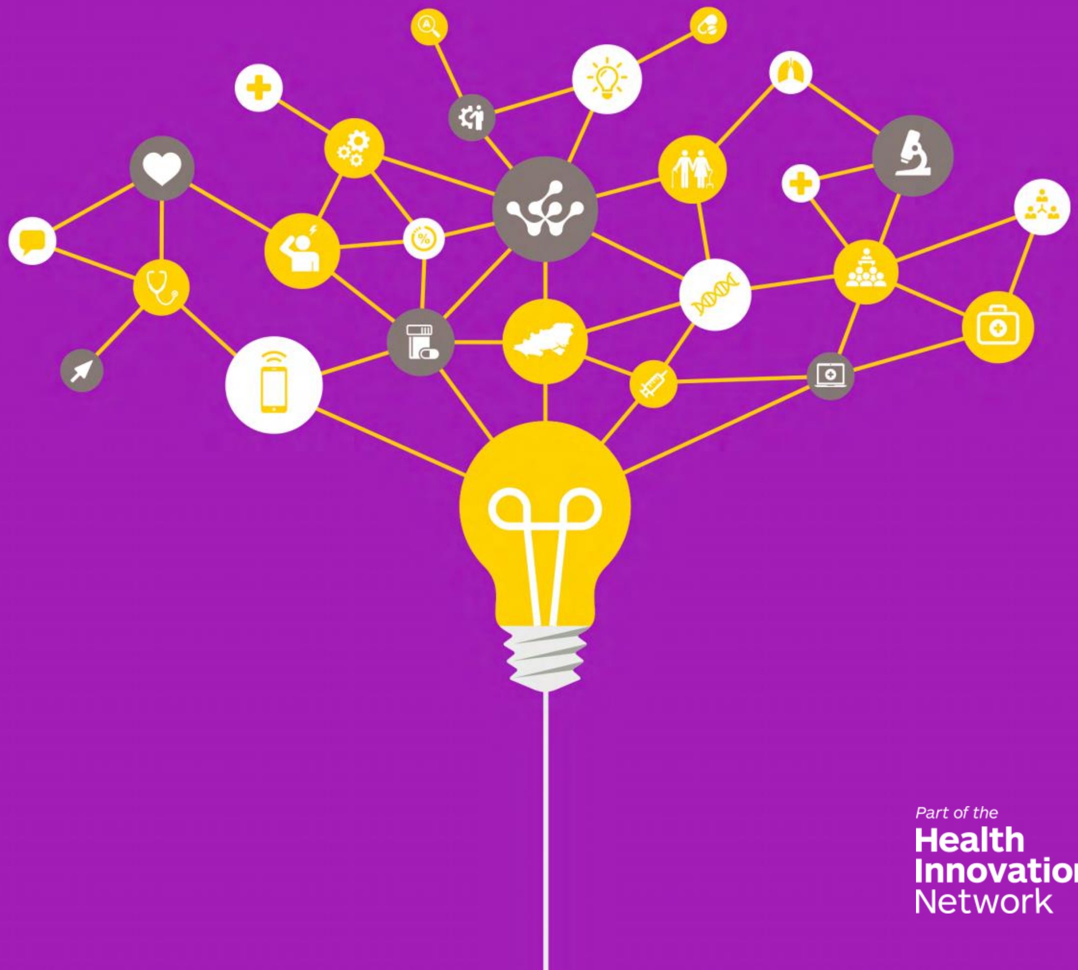
Reducing follow-up appointments: *"Less staff are needed for follow-up care when point-of-care tests provide immediate results and allow treatment decisions on the spot." (ACP9)*
"Time saving is a big part…it cuts out more visits. If we can make a decision with the point of care at the house, then it means somebody else doesn't have to go back later." (ACP1)

Reducing staff travel time and travel costs: *"The biggest win is on medication delivery, starting treatment there and then saves travel time and additional staff workload." (ACP11)*

"With LumiraDx, you're talking about 15 minutes from sample to having a result...so it's really quick in knowing what the answer is, but that generally prompts some extra work. But our old way of working or if you have to wait for the lab, you've got a little bit of a delay in that so yeah definitely quicker overall, but just more time consuming for the person on a visit." (ACP11)

Positive effect on trainee ACPs: *"I think it's had a huge positive impact. I think it's become routine to be using them, so us trainees are using them and it's been really helpful as a trainee for learning…in terms of being able to make joint decisions and being able to action and not delay care. One of the biggest things is if CRP is elevated on the Lumira we can action it there and then and can source antibiotics and commence that and have a better outcome for the patient and keep them at home." (ACP1)*

Impact on laboratory blood testing



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Impact on laboratory blood testing

Theme 7 from the staff interviews (see Appendix 1) revealed limited impact of LumiraDx and i-STAT on laboratory activity. The reasons for this are:

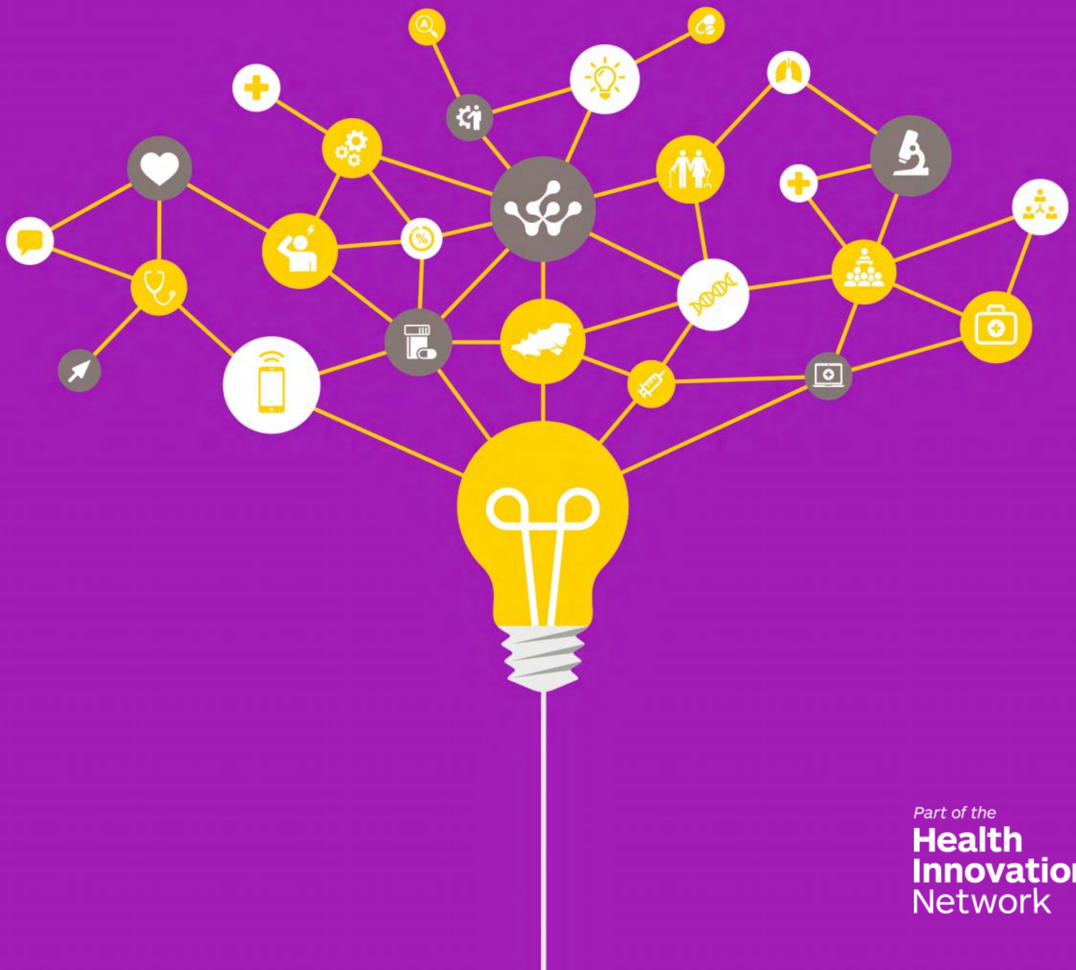
- Figures 1 and 2 in the slides above showed limited POCT testing in comparison to the tens of thousands of CRP and U&E tests completed by linked laboratories each year. For POCT to have the additional benefit of avoiding duplication of blood tests (POCT and laboratory requests), a move toward trusting POCT results would be required by clinicians.

- POCT results guide clinical interventions, but full reliance on them is limited due to the requirement for additional laboratory tests. *"There is lots of dual blood testing going on...we haven't noticed a drop in the number of lab tests requested…we are still ordering the same amount of reagents." (LM1)*

"We do have a policy of sending our POCT blood tests to the lab...this is about not having test results viewable on ICE...if it were possible to see those then you could see the trends and make a clinical decision. I would say in those instances you don't need to send the blood results to the lab...also, for acute initial crisis intervention, there will definitely be circumstances where you do not need to send the bloods off to the lab at the point you do POCT." (ACP10)

- Limited staff awareness of financial implications of POCT may be increasing the cost of blood testing to the UCR and H@H virtual ward linked laboratory services: *"The lab blood samples don't come out of our budget, so there's less incentive to reduce lab tests despite using point of care devices." (ACP11)*

Sustainability of LumiraDx & i-STAT Alinity



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Sustainability

Theme 7 and 8 from the staff interviews (see Appendix 1) revealed an unmet need to understand the financial impact of POCT and to address a range of practical challenges when using LumiraDx and i-STAT:

- **Understanding of the cost implications of using POCT:** Several participants stated that the full costs of using POCT, and consequent impact on laboratory usage, has yet to be understood: *"I don't think there is financial oversight…when you think these machines cost a lot of money, the equipment costs a lot of money, the blood tests themselves cost a lot of money…and plus we're sending the bloods away so effectively doing the tests twice. From that point of view, I can see that [LumiraDx and i-STAT] probably do cost more money to the team and the health service." (ACP7)*

"The lab blood samples don't come out of our budget, so there's less incentive to reduce lab tests despite using point-of-care devices." (ACP11)

- **Test discrepancies:** Clinicians use POCT results as a crucial part of the decision-making process but acknowledge potential discrepancies with lab results. Clinicians noted difficulties with machine sensitivity, temperature variations, and cumbersome handling. *"I was responsible for collecting data for quality control… I was using it with every patient to build up confidence in the results." (ACP4) "We advised them that there might be up to a 20% difference between the lab results and Lumira." (LM2)*

Sustainability

Usability challenges with LumiraDx:

- Requires 10 minutes to turn on and warm up before being able to add patient details
- Need to find a stable, flat and hard surface to level the device (difficult to find in a patient's bedroom / lounge with items and ornaments on available surfaces)
- Patient's NHS barcode often does not register – requires manual input using on-screen keyboard when scanning doesn't work
- Onscreen keyboard is small and non-QWERTY key layout – requires additional focus to prevent mistyping details
- There are multiple waiting periods and actions to execute within a specified time. Failure to act within the specified time will cancel the test procedure and will need to be restarted from the point of inputting patient details:
    - A test strip heat-up period (waiting time up to 5min)
    - Sample application period (action to apply blood sample within 3min window)
    - Test strip door closure (action to close the test strip within 10 seconds)
    - Test process period (approximately 4min).

Sustainability

Usability challenges with i-STAT Alinity:

- Fingertip blood sample collection is not part of the device and when trialled was unreliable because squeezing the blood through capillaries in the fingertip affect the cellular integrity of the blood components and impact on the test result.
- Printed expiry dates on consumables to use in order and avoid wastage
- Remove the need for refrigeration of cartridges to improve ease of use and avoid wastage

Sustainability

- **Interoperability:** *"The hospital systems don't link up, so they can't see our notes, so we take pictures of the results and put them in our clinical notes, but they can't access that…it's still verbal word of mouth." (ACP1)*

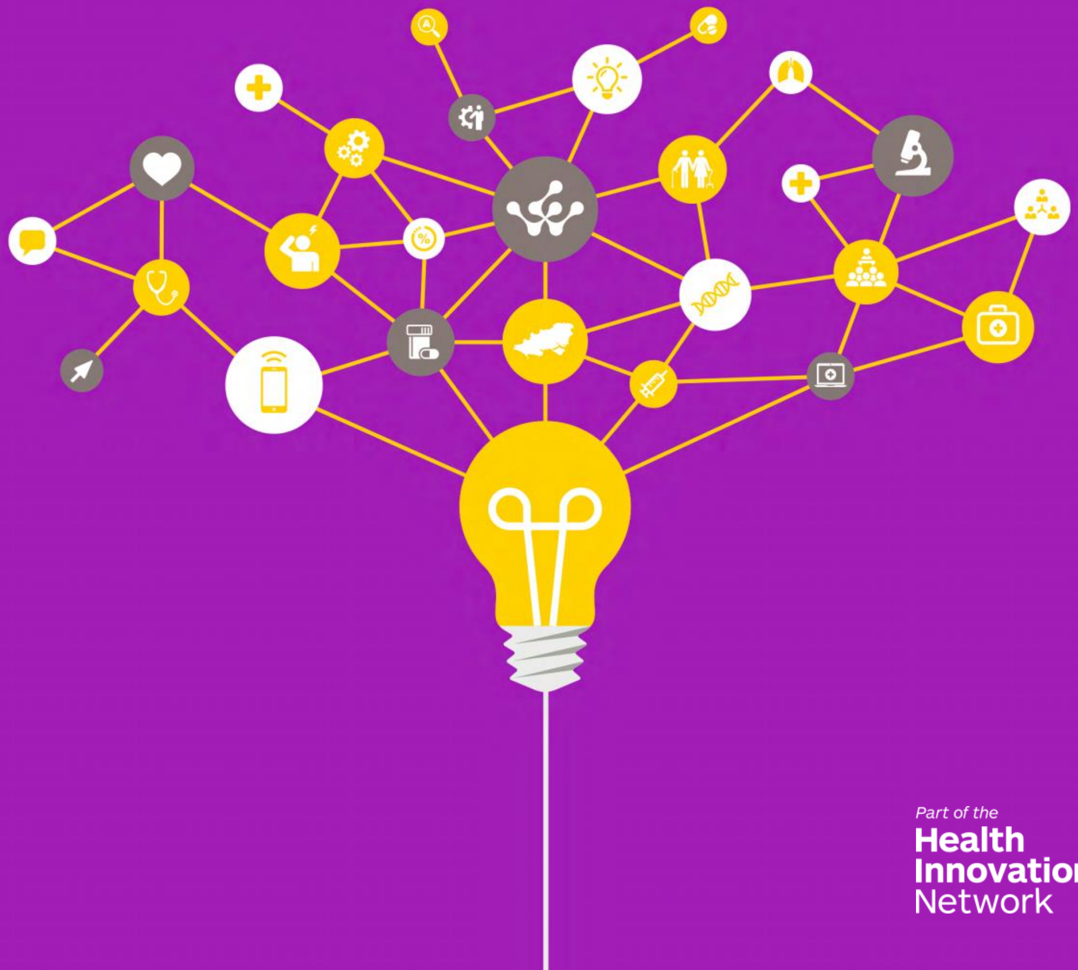
"The Lumira and the i-STAT don't automatically update onto the ICE system, but we can log onto our ICE account and look at previous bloods…for a comparison and things, but it won't input those results that we're doing on the point of care in the house onto the ICE system." (ACP1)

- **Geography:** *"If I'm running late and have kids to pick up, I might not take the device out because I can't bring it back." (ACP7)*

"There was reluctance to go and collect machines because you lived nearer the patient. We're getting better, but geography has been a pushback." (ACP9)

"It does mean sometimes like logistics wise, say if I'm not working the next day, then I know I have to bring it back to the office…but a visit may be nearer to home than coming back to the office, but I have to do that because otherwise the equipment is going home." (ACP1)

Conclusions



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Conclusions

Scope of LumiraDx & i-STAT Alinity usage

- LumiraDx and i-STAT have been in use with UCR and H@H virtual ward teams since November 2023, with ten of each device in regular use. Accurate data on POCT initiated CRP and U&E tests was not available for this evaluation. However, it is estimated that approximately 119 CRP and 124 U&E tests are conducted each month by the UCR teams.

- Compared to the tens of thousands of CRP and U&E tests completed by linked laboratories each year, for POCT to have the additional benefit of avoiding duplication of blood tests (POCT and laboratory requests), several implementation issues must be resolved – these include interoperability of POCT test results in data systems for clinical decision-making, improvements in device reliability, and an increase in staff general attitudes toward POCT compared to using laboratory testing.

- There is clearly expressed and observed value of both LumiraDx and i-STAT to support UCR and H@H virtual ward POCT activities and patient care at home. These are the driving forces for the introduction of POCT. However, other potential benefits to the health care system are unable to be realised at present due to the need for dual testing, meaning limited value to laboratory services and likely increased financial costs to the system.

Conclusions

Impact on patients

- Patients and relatives find POCT a valuable piece of information for decision-making about patient care.
- The use of POCT reassures and empowers patients and relatives by enabling them to partly observe the decision-making process of the attending clinicians.
- The objectivity and speed of POCT results give patients and relatives a perception of reducing demand on NHS resource by commencing treatment earlier and closer to home, ultimately reducing hospital admissions.
- An opposing view from the feedback indicated that patients and relatives are less concerned about use or non-use of POCT provided that the clinicians make appropriate decisions about their care.

Conclusions from the case studies

The context

- Reasons for patient visit by UCR and H@H virtual ward teams are wide ranging. The attending team needs to be equipped to accommodate a variety of patient and clinical needs.
- The availability of POCT provides staff with an additional tool to help build more evidence for their clinical assessment and decision-making for holistic patient care.

The outcome

- In cases where POCT were used, staff and patients both benefited from the instantaneous blood test results to assess the patient's condition.
- The non-use of POCT in three cases did not cause detriment to clinical decision-making. The care plan in these cases included a safety-net plan of a follow-up visit or the option to contact the team directly if the patient's condition seemed to deteriorate.

The experience

- The reason for and the use of POCT are unique to each patient visit.
- The indication for POCT use is multifaceted based on the clinical presentation of the patient, patient consent and successful blood sample collection.
- Patients appreciate the minimally invasive procedure of fingertip blood sample collection and rapid turnaround of the test results.

The value of POCT to decision-making

- The speedy test results from POCT gave both patients and staff the increased sense of assurance and confidence that the patient's care is appropriately planned and escalated.
- The objective clinical evidence of POCT is valued by other clinicians who are involved in onward care.
- There are cost considerations when consumables are discarded without being used or when blood samples are sent to the pathology laboratory for the same test.

Conclusions

Impact on receiving care closer to home

- Patients appreciated the rapid results and minimally invasive nature of the tests.
- POCT supported home-based care, reducing unnecessary hospital admissions.

Staff acceptability of LumiraDx and i-STAT Alinity

- Staff acceptability is growing, but further training and clearer protocols are needed to maximise its benefits.

Impact on clinical decision making

- POCT devices (LumiraDx and i-STAT Alinity) enhanced real-time clinical decision-making, allowing timely treatment and better patient experiences.

Impact on speed of diagnostic testing

- POCT devices like LumiraDx and i-STAT Alinity improve the speed of clinical decision-making.
- An analysis of 81 instances of blood tests sent to the laboratory for CRP and U&E tests, taken during UCR home visits, indicated the average time from blood taken to analysis provided by the laboratory was 10 hours 25 minutes. LumiraDx can provide a CRP test result within 4 minutes and i-STAT can provide a U&E test result within 3 minutes.

Conclusions

Impact on UCR and H@H virtual ward teams

- POCT streamlined workflows, reducing follow-up visits and travel time for UCR and H@H virtual ward staff.
- It improved diagnostic confidence, aiding in prompt treatment decisions.
- However, dual testing (POCT and lab tests) remained a common practice due to lack of integration with systems like ICE, limiting efficiency gains.

Wider considerations

- Despite its clinical benefits, POCT has not significantly reduced laboratory workloads due to continued reliance on traditional testing.
- Obtaining detailed financial data was not the focus of this evaluation, however, staff did highlight a need for better understanding of the cost of POCT and the practice of dual testing. The ICS may wish to consider investigating the cost-effectiveness of POCT.

Conclusions

Sustainability and improvements

- While POCT is seen as valuable, logistical and technical limitations hinder its full integration.
- Continued laboratory testing alongside POCT is largely due to the lack of integration with systems like ICE, meaning POCT results aren't automatically visible to wider clinical teams. To ensure results are accessible and recorded, clinicians often request lab analysis alongside POCT - typically from a single blood draw. While work to enable interoperability is in progress, it has been delayed due to limited laboratory informatics capacity.
- Usability issues, such as long warm-up times and the need for flat surfaces, affected practical use in home settings.
- Some staff lacked confidence in POCT results and dual testing led to additional laboratory testing.
- Variability in training and familiarity with devices impacted consistency of use.
- Technical limitations, issues with accuracy, and clinician confidence remain challenges. Despite these implementation issues, POCT is viewed as a valuable tool in community healthcare settings.

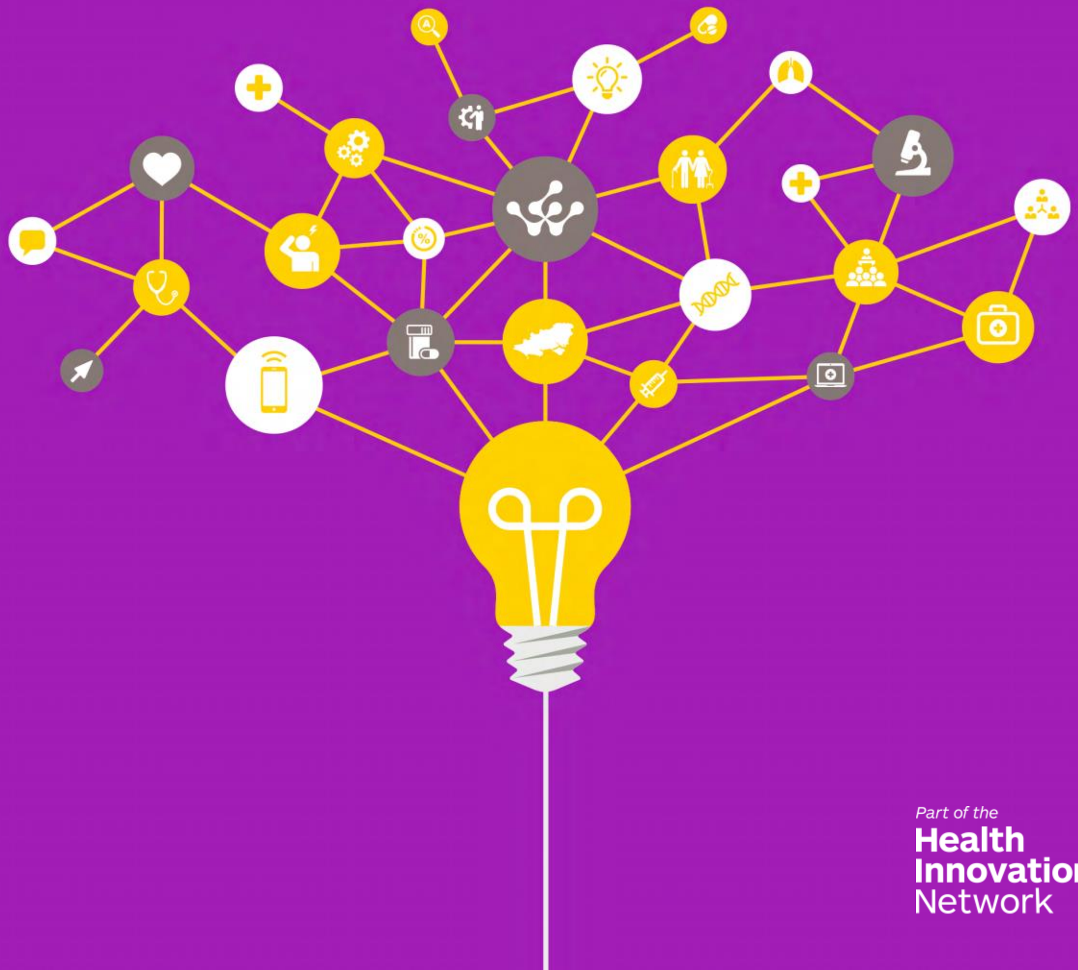
Main conclusion

Main conclusion

- The evaluation found that LumiraDx and i-STAT Alinity point of care testing devices positively impact patient care by enhancing clinical decision-making, supporting care at home, and reducing unnecessary hospital admissions. However, the full potential of these devices is not yet realised due to dual testing practices, and technical challenges.

- To maximise their value, greater standardisation, improved staff training, and system-wide strategies to integrate POCT into routine practice are needed, alongside addressing the financial and logistical barriers that limit their widespread adoption.

Appendices



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Appendix 1: Table of themes from staff interviews

	Themes	Sub-themes
1	Acceptability	-
2	Training and competency development	(a)Mixed views on level of training provided
		(b)Building trust in devices
3	Clinical decision-making	(a)Enhancing diagnostic confidence
		(b)Rapid decision-making
		(c)Reassurance in uncertain cases
		(d)Influence on admission decisions
		(e)Balancing clinical judgment with test results
4	Impact on patient care	(a)Facilitating informed decisions
		(b)Patient perception of POCT / acceptability
		(c)Supporting appropriate escalation
		(d)Care at home
5	Impact on treatment decisions	(a)Early initiation of treatment
		(b)Avoidance of unnecessary treatment
		(c)Monitoring treatment
		(d)Informed prescribing
6	Impact on UCR	(a)Reducing follow-up appointments
		(b)Reducing staff travel time and travel costs
		(c)Positive effect on trainee ACPs
7	Impact on the laboratory	(a)Dual testing (same blood tests requested via POCT and lab) (b)Limited financial oversight of POCT
8	Sustainability	(a)Device reliability issues
		(b)Usability issues
		(c)Interoperability
		(d)Geography

Appendix 2: Table of themes from patient feedback

	Themes	Sub-themes
1	**Perception of POCT as a low-risk procedure and high value outcome**	An objective measure that can be trusted alongside the clinician's view or opinion
		A low-risk procedure for a quick access to blood test results
		Option of fingertip blood sample collection a less invasive procedure
2	**POCT reassures patients on the decision made by the clinicians**	A partial visibility of clinical information empowers patients
		Assurance of the test result being considered swiftly
3	**Patients' indifference to POCT provided that appropriate care is given**	Relying on clinicians to appropriately make decision around patient care
		Perception of POCT as another clinical tool to gather information
		Perception of trusting relationship with clinicians held by patients and relatives
4	**Perceived savings for NHS by reducing hospital admissions**	A confirmatory evidence to start treatment earlier and closer to home
		A perception of reducing the burden of hospital admission

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