Poctify

Adnan Rafai

The Untold Realities of POCT in NHS Virtual Wards

POCT on Virtual Wards Today: Devices, Teams and Workflow

Point-of-care testing (POCT) has become a key enabler for NHS **Virtual Wards** and **Urgent Community Response (UCR)** teams, bringing hospital-level diagnostics into patients' homes. In current practice, community clinicians carry portable devices to perform critical tests on the spot. Existing services have identified a core set of priority tests for these settings, including **blood glucose** (and ketones), **C-reactive protein (CRP)**, **haemoglobin** (with haematocrit), **blood lactate**, **renal profile** (urea & electrolytes), and **venous blood gases (VBG)** [1]. Many virtual ward programs also deploy **D-dimer** assays (for ruling out blood clots), **INR** testing (for patients on warfarin), and rapid **influenza/COVID-19** tests [2]. Specialty pathways may add further diagnostics – for example, a heart failure virtual ward might use **NT-proBNP** testing to guide diuretic therapy [3].

To deliver these tests, teams use a range of **portable analyzers and devices**. Handheld blood analyzers like Abbott's **i-STAT** system are popular for their broad menu – cartridges are available for everything from electrolytes and lactate to cardiac markers like troponin I [4]. (Abbott's wireless i-STAT can even transmit results back to base, as we'll discuss later.) Multi-assay platforms such as the **LumiraDx** device are also emerging; for instance, Southern Health NHS Foundation Trust introduced the LumiraDx (a 1.1 kg battery-powered instrument) to perform CRP tests in frailty virtual ward patients' homes [5]. Typical **turnaround times** are only a few minutes per test, enabling near-immediate decision-making. All these devices are designed to be **carried in the field**. Clinicians usually pack them alongside other kit (medical bag, monitoring equipment), sometimes in a special temperature-controlled case to keep reagents stable [6]. The need for **lightweight, robust kit** is paramount – NHS England guidance stresses that devices for virtual ward use must be easy to carry and tolerate transport, since they'll be used in living rooms and care homes rather than lab benches [6].

Who uses POCT on virtual wards? Multidisciplinary teams are involved. UCR services often deploy **advanced paramedics, community nurses or healthcare assistants** as the frontline operators of POCT, backed by remote clinicians. In one frailty virtual ward/UCR service in East Yorkshire, Band 3 support workers, paramedics and advanced nurse practitioners visit patients at home and perform tests, while consulting with a **remote hub** of GPs and geriatricians for interpretation support [7] [8]. This hub-and-spoke model ensures that complex results (e.g. blood gas readings) get specialist review even though the test is done at the patient's house. Another example is Oxford's "acute hospital-at-home" service, where nurses and paramedics perform blood tests and other POCT (alongside portable ECGs and even digital stethoscopes), supported by hospital consultants; notably, Oxford's team blended in-person visits with virtual monitoring, and even trained some patients to **self-monitor** basic parameters in between visits [9]. The **aim** in all cases is to use on-the-spot diagnostics to decide whether a patient truly needs hospital admission or can be safely treated at home. NHS England's guidance notes that POCT is especially useful when an initial assessment leaves uncertainty – a rapid blood test can tip the balance on whether to convey an elderly patient to A&E or manage them in a virtual ward [10] [11].

POCT is already proving its value. In Cornwall, a pilot found that having CRP testing at the point of care significantly changed antibiotic prescribing decisions in about 60% of patients, improving antimicrobial

stewardship [12]. Frailty virtual ward trials have shown that immediate CRP results can avert next-day visits or escalations – in one service, 50% of patients avoided hospital escalation thanks to POCT-guided care [13] [14]. The **benefits** reported include faster and more confident clinical decisions, reduced unnecessary antibiotic use, and, critically, avoidance of hospital admissions [15] [16]. For example, paramedics in a pilot with Oxford University Hospitals used a portable i-STAT to run blood panels on frail 80- and 90-year-olds in their homes; results were transmitted directly into the hospital electronic record and discussed by phone with a hospital acute physician, enabling on-the-spot decisions about sending the patient to hospital or not [17]. Such integrations can substantially cut admissions – overall, studies have found introducing POCT can reduce conveyance to hospital for frail patients by 20–50% [15]. It's no surprise, then, that NHS policy (including the national urgent care recovery plan) is actively encouraging Integrated Care Boards to adopt POCT in virtual ward and community services [18].

When Devices Gather Dust: Underutilised Community POCT

For all the success stories, there are also **untold cases where POCT deployments haven't lived up to expectations**. Not every device introduced to a virtual ward ends up widely used; some have even been quietly abandoned after purchase. Frontline reports (often shared informally or within trusts) indicate various reasons why a POCT device might **gather dust** in a community clinic closet:

- **Poor Fit with Workflow:** If a testing device doesn't slot smoothly into the clinical workflow, busy staff will default to familiar habits. For example, a frailty team might receive a fancy bench-top analyser for home use, but if using it requires too many steps or if it slows down a visit, clinicians may skip it. NHS laboratory leaders stress the importance of understanding the **patient pathway, environment, and operator needs** before choosing a device – the device must suit the setting and staff skills, not the other way around [19]. An ill-suited device (say, one requiring venous blood draws and complex prep in a setting where staff are used to simple finger-pricks) is likely to be under-used. Early engagement with end-users is critical; as one biomedical scientist put it, *"consider who will operate the device and how it will be used – robustness and portability are significant factors"* [20]. These insights reflect lessons learned from instances where lack of such foresight led to kit that was technically good but impractical for a home visit scenario.

- **Size, Power and Portability Issues:** Design matters immensely for adoption. Several community teams found out the hard way that a device which is *technically* portable can still be too much of a burden. If an analyser is heavy, bulky, or has short battery life, it becomes one more encumbrance for staff already lugging bags of equipment up patient staircases. One commonly cited example is the early deployment of standard blood analyzers in "Hospital at Home" pilots – some were essentially re-purposed lab devices that needed mains power and a stable surface, hardly ideal for use in a patient's kitchen. **Temperature sensitivity** is another challenge: many cartridge-based tests must be kept within a narrow temperature range. NHS England notes that teams sometimes have to carry POCT reagents in special cool bags to keep them viable [6]. In practice, some community nurses found managing cool packs and timers for reagents was impractical on top of their clinical duties, so the testing was simply omitted. Without proper logistic support (like lightweight cool boxes or next-gen cartridges that tolerate room heat), a device may not get used as intended.

- **Complexity and Training Burden:** Unlike a central lab, a virtual ward has no full-time lab technician on site. If a device requires extensive user training or frequent calibration and maintenance, there's a risk that staff will avoid it, especially as turnover brings in new staff who haven't been trained. Community teams often work 7-day rosters, so ensuring every nurse or

paramedic is **competent and confident** in using a new machine is non-trivial. There have been cases where a POCT device was piloted but then left idle when the "champion" staff member trained on it moved on, because others didn't feel comfortable running it. NHS guidance recommends that pathology departments help provide comprehensive training to all frontline users [21], and that operating procedures be put in place (including what to do with unexpected results) [22]. Where this hasn't happened, **staff confidence** in the device can remain low. One trust's internal evaluation (as shared via an NIHR collaboration platform) found that clinicians were initially hesitant to trust a new POCT device's results until they had repeat validations – during that time, many still sent patients to hospital for blood tests "just in case," undermining the purpose of the device. This highlights how crucial early familiarization and trust-building is; otherwise the device might be viewed as more hassle than help.

- **Insufficient Pathway Integration:** Perhaps the most subtle reason for underuse is a lack of clear integration into the **care pathway**. If it's not explicitly defined **when and why** the community team should use a test, it may be overlooked. For example, if a virtual ward buys troponin testing devices but doesn't have a protocol for managing chest pain at home, clinicians won't automatically start doing troponin tests – they'll still call an ambulance to take suspected heart attacks to hospital, because that pathway is ingrained. Real-world reports suggest that some POCT devices were procured in enthusiasm ("this device can do 20 different tests!") but without a focused use-case in the pathway. Over time, without obvious triggers to use it, the kit sat on the shelf. A strategic **pathway design** – e.g. incorporating a CRP test into the standard workflow for assessing any patient with infection symptoms on a virtual ward – is needed to ensure the technology is actually utilized. Otherwise, even the best gadget can be forgotten in the heat of daily practice. In short, **technology must align with clinical workflow**; when it doesn't, adoption suffers [23] [24].

It's worth noting that such underutilisation cases often go unpublicized – no one issues a press release about a device that *wasn't* used. But they provide valuable lessons. Successful programs (like those in Oxford, Hull, and Frimley) learned from early missteps and now emphasize rigorous planning: matching the device to the use-case, piloting in small batches, and gathering staff feedback to refine processes. By acknowledging these "false starts," the NHS can avoid repeating them as virtual wards scale up nationwide.

Design Limitations and New Frontiers in Home-based POCT

Existing POCT devices, while powerful, do have design limitations that can hinder home-based use. Many were originally designed for **hospital near-patient testing** (think emergency departments or GP clinics), not for a nurse's satchel on a home visit. Let's examine a few key design challenges:

- **Portability vs. Capability:** There is often a trade-off between the range of tests a device can do and its size/weight. Truly pocket-sized devices (like a glucose meter or a hemoglobin handheld) typically perform one specific test very well. Broader multi-test devices (that can measure multiple analytes) tend to be larger or more complex. For example, the Abbott i-STAT is a one-handed device that *can* run a broad panel of tests via cartridges, but carrying enough cartridges to cover all scenarios (lactate, troponin, chemistries, etc.) means carrying a cooler box and managing their shelf-life [6]. On the other hand, bench-top devices like the Radiometer AQT90 or some small chemistry analyzers can run many tests from one blood sample, but these units weigh several kilograms and need a power source – not exactly ideal for lugging into someone's living room. The ideal solution (lightweight and multifunctional) has been elusive with current tech. Virtual ward teams often compromise by carrying 2–3 small devices (e.g. a glucose/ketone

meter, a handheld blood gas/electrolyte analyzer, and maybe a separate CRP reader). This **modular approach** works but adds complexity – multiple devices means multiple interfaces and QC checks.

- **Power and Battery Life:** A truly mobile service needs battery-powered devices. Many handheld POCT devices do run on batteries, but battery life can be a limitation, especially in cold weather (which saps battery performance) or when doing multiple tests in succession. Some analyzers were designed assuming indoor use and frequent recharging. Community teams have described situations where a device's battery died mid-visit, forcing them to reschedule the test or revert to Plan B (e.g. taking a blood sample to send to the lab). Ensuring devices are charged and having backup batteries or car chargers is now part of the routine, but it adds one more thing for staff to remember. Newer devices are improving in this regard – for instance, the LumiraDx platform is fully portable and can operate for extended periods in the field – but users still report that **battery anxiety** is real when you're far from base. This is an area where incremental engineering (longer-life batteries, faster charging) would make a practical difference.

- **User Interface and Training:** In a hospital lab, trained technicians operate analyzers; in the community, the same task might fall to a nursing assistant who performs such tests only occasionally. Thus, the device UI must be extremely user-friendly and error-proof. Some older POCT systems have clunky interfaces or require manual steps that are not intuitive. Each additional step (mixing a reagent, diluting a sample, entering a lot number) is an opportunity for error or delay when a non-laboratory professional is doing it under time pressure. There have been reports of devices going unused because staff found them **too fiddly** or were afraid of doing something wrong. Modern devices are moving toward automation (e.g. cartridges that contain all necessary reagents and onboard calibration). Still, any POCT deployed in virtual wards should ideally be **"CLIA-waived"** in spirit – i.e. simple enough to use with minimal training. Reducing the training burden is vital, because high staff turnover in community services can otherwise lead to continual retraining cycles just to keep everyone competent. Some trusts have tackled this by **standardising devices** across services – for example, Oxfordshire chose to use the same Abbott i-STAT/Alinity devices in all their ambulatory and virtual services, so staff and labs have a consistent platform [25]. This standardisation means once you learn one device, you can work in various teams, and the laboratory support (for QC, connectivity) is simplified. However, that also means living within the limitations of that chosen device's test menu until new tests can be added [26] [27].

Addressing these design limitations is an active area of innovation. The future of POCT for home use is **exciting**, thanks to biomedical engineering advances:

- **Microfluidics and Lab-on-a-Chip:** These technologies miniaturise laboratory processes onto tiny chips. Researchers and medtech companies are creating credit-card sized cartridges that can perform multiple assays on a single small blood sample [28]. By integrating microfluidic channels, reagents, and sensors, a lab-on-chip device could, for example, measure a dozen blood chemistry values from a finger prick – essentially a "lab in your hand." The promise of microfluidics is to reduce the size and complexity of devices (no need for large reagent bottles or heavy mechanical parts) while maintaining accuracy. Many current POCT devices already use microfluidic principles (the i-STAT's cartridges, for instance, have micro-scale silicon sensors [4]), but next-generation devices aim to expand this. We are seeing prototypes that combine, say, a full blood count, electrolytes, and biomarkers on one chip. For virtual wards, this could be transformative: instead of multiple devices, a nurse might carry one analyzer with multi-test cartridges that don't require refrigeration. Some lab-on-chip platforms are also being designed with connectivity in mind, meaning results could auto-transmit via 4G or WiFi to the clinical

system. While still in development, these devices are **edging closer to market** – several UK trials (often funded by NIHR and similar) are evaluating multi-analyte portable devices for community diagnostics. In the next few years, we can expect more **compact, battery-operated analyzers** that address the current size and power constraints.

- **Wearable and Continuous Biosensors:** Another emerging frontier is wearable POCT – sensors that patients can wear, which continuously or repeatedly measure certain parameters. The best-known example today is continuous glucose monitors for diabetic patients, but researchers are rapidly expanding the repertoire. For instance, wearable patches or wristbands with embedded **microfluidic sensors** can sample sweat or interstitial fluid to track things like electrolytes, lactate or cortisol in real time [29]. Imagine a frailty virtual ward patient wearing a small device that constantly monitors their hydration or inflammatory markers and alerts the team if something goes awry. While this might sound futuristic, early versions exist: there are patches that measure lactate (useful for tracking sepsis or fitness) and experimental devices that aim to measure CRP or other cytokines through the skin. The **advantage** for virtual wards is obvious – less need for a clinician to perform a test if the patient's wearable is feeding data to the system continuously. Of course, challenges around data accuracy, device cost, and patient acceptance mean these wearables are not yet mainstream for diagnostics. But the NHS is already trialling wearables for vital signs (like oxygen saturation monitors and ECG patches in virtual wards); integrating biochemical sensors is the next step. Over time, such biosensors could tackle some limitations of current POCT devices by removing the on-site manual testing step altogether.

In summary, today's POCT devices have some rough edges when applied in home care – they could be smaller, easier, and more integrated. The good news is that **innovation is alive and well** in this space. From microfluidic lab-on-chip devices that pack more tests into a portable unit, to wearable biosensors offering new ways to monitor patients, the next generation of POCT tech is likely to mitigate many current limitations. Virtual ward teams and NHS procurement leads should keep an eye on these trends, as they promise tools that are better tailored to community use than ever before.

Governance and Connectivity: The Unseen Challenges

Deploying POCT in a hospital at least keeps everything "in house" – the devices talk to the hospital lab system, results pop into the electronic patient record, and lab staff oversee quality control. In the community, achieving that same level of integration and governance is a **major challenge**. Some of the *less visible* barriers to scaling POCT on virtual wards are in service delivery, IT, and governance:

- **Result Documentation and Sharing:** A test result is only useful if it's seen by the right people at the right time. In a patient's home, far from the hospital network, how does a POCT result get recorded and shared? The **ideal** is a connected device that transmits results instantly into the patient's electronic record (and to any clinician who needs to act on it). In practice, however, many teams have had to resort to clunkier solutions. For example, some devices store results internally or on a portable printer, and when clinicians return to base, they **dock** the device or manually upload the data. Oxford's team managed to set up real-time connectivity in two of their rapid response vehicles, linking the i-STAT devices via middleware to the hospital system [30]. But as they acknowledge, this was not easily scalable across the whole service [31] [30]. Instead, a common interim solution is that community staff record results in their **community EPR** or on paper and later have them entered into the main hospital system – a workaround at best. The cross-organisational nature of virtual wards (often involving hospital trusts, community trusts, GPs, etc.) means multiple IT systems are in play [31]. There isn't always seamless interoperability. One virtual ward clinician might have to log results in two systems (e.g. the hospital's and the

GP's) to ensure everyone's informed – clearly not ideal. Efforts are underway to improve integration – NHS England has guidance specifically on "Access to diagnostics on virtual wards" pushing for better IT connectivity solutions [32]. Until those mature, many services are using **"middleware"** or stop-gap methods: e.g. emailing results to the GP, or using summary care record updates. However, these add administrative burden and risk delays or errors (transcription mistakes, missed communications). **Patient safety** can be impacted if a critical result isn't seen promptly by the covering doctor because it lives in a standalone device or paper note. Thus, creating a connected data flow is as important as the test itself – an area needing concerted investment.

- **IT Infrastructure and Connectivity:** Community settings pose IT hurdles we don't face in hospitals. Not all patient homes have reliable broadband or mobile signal. UCR teams sometimes work in rural areas with patchy 4G coverage; a device that relies on live connectivity might struggle. Some devices can store results for later upload, but if immediate clinical decisions depend on remote specialists seeing the data, then **real-time connectivity** becomes crucial. Teams have tried solutions like equipping clinicians with 4G hotspots or using tablet-based apps to sync data when signal permits. Still, it's a hurdle – one trust noted that getting devices onto their secure network remotely was a headache, leading them to allow offline use with manual data entry as the fallback [31] [33]. Moreover, the **cybersecurity** aspect cannot be ignored: sending patient data from a home over public networks to hospital systems has to be done securely, adding another layer of IT coordination. Until a robust national solution exists (perhaps a dedicated NHS community diagnostics cloud), virtual ward POCT services often lean on their pathology IT teams to jury-rig connectivity. Some use encrypted USB uploads back at base, others have built custom interfaces between community EPRs and lab systems. All of this requires funding and expertise that not every area has readily available, creating variability in how well integrated POCT data is across different virtual wards.

- **Governance and Quality Assurance: Quality and safety governance** of POCT is a non-negotiable aspect, yet harder to oversee when testing is decentralized. In hospitals, a pathology department typically manages quality control (QC) for POCT devices, running regular checks and external quality assessment (EQA) schemes to ensure results are accurate. On virtual wards, devices are scattered in the field with busy clinicians. Ensuring each device gets its control checks (e.g. running a known sample to verify the machine) on schedule can be challenging. NHS guidance makes it clear that community POCT must meet the same quality standards – devices should be enrolled in EQA programs and have scientific oversight by the local pathology network [34] [35]. Many successful programs have formal arrangements where the hospital lab *adopts* the community devices: lab staff provide training, supply control materials, and monitor the QC data remotely. For instance, Oxford's POCT team acts as the distributor and quality overseer for all devices used in their county's virtual services [25]. This kind of model is emerging as best practice. However, not every region has this nailed down. In some areas, community teams reported uncertainty about who was responsible for quality checks – the community provider or the acute trust's lab. Overcoming these ambiguities is critical. Clear governance frameworks need to be in place: from **device maintenance** (Who fixes or replaces a faulty device in the field? How quickly?) to **incident handling** (What happens if a test result is later found erroneous? Is there a recall process?). There are also **clinical governance** questions specific to using test results remotely: for example, if a frailty nurse gets a dangerously high potassium result on a home test, do they have a direct line to a consultant immediately? Protocols for escalation and confirming unexpected results (perhaps by sending a lab sample) are part of safe practice [22] [34]. Additionally, ensuring **patient safety** means training staff not just in operating devices, but in interpreting results in context – e.g. knowing the limitations of a POCT troponin or D-dimer and when a lab confirmatory test is still needed. Governance also extends to **regulation**: all

POCT devices must be approved (UKCA marked or CE marked under UK regulations) for use [36], and services must comply with medical devices regulations for near-patient testing. Virtual ward teams are navigating these complexities often for the first time, and it's an evolving learning process.

- **Cross-organisational Working:** By their nature, virtual wards often blur traditional boundaries – acute trusts, community trusts, primary care, and even ambulance services might all collaborate in one virtual ward pathway. While this is great for patient-centered care, it introduces governance complexities. For example, **who "owns" the result** of a POCT done on a virtual ward patient? If a community nurse employed by a community trust performs a test on a patient under a hospital consultant's virtual ward, which organisation's policies apply for things like incident reporting or documentation? Integrated Care Systems (ICS) are working to develop shared protocols, but variations exist. Some places have the acute trust's pathology department manage everything (devices, training, QC) even if the staff using the device are from another organisation – essentially acting as a centralized governance body. This requires strong partnership and sometimes formal agreements (Memorandums of Understanding) to share data and resources. Without such alignment, there's a risk of gaps – e.g. devices not maintained because each side thought the other was handling it. The **cross-org nature** also impacts IT (as noted) – multiple record systems mean a result might need duplication. As one report highlighted, having to navigate "multiple IT networks and patient records" has led some services to adopt **indirect routes** to enter results, which is less safe and efficient [31]. Tackling these issues is part of the growing pains of virtual wards, and it underscores that technology is only half the story – governance and systems integration are equally important to get right.

In summary, while POCT brings clear clinical benefits to virtual wards, making it *truly seamless* requires overcoming these behind-the-scenes challenges. Connectivity, IT integration, and rigorous governance are the less glamorous but absolutely crucial pieces of the puzzle. They ensure that a glucose reading in a patient's home is as reliable and instantly available to the care team as one done in hospital – and that's ultimately what patients need for safe care.

Future Directions: Making Community Diagnostics Work Better

As virtual wards mature and the NHS pushes more care closer to home, it's clear that point-of-care testing will play an even greater role. To unlock its full potential, however, we need strategic improvements in how POCT is procured, deployed, and integrated into community pathways. Based on the lessons learned so far, here are some insights and suggestions for the road ahead:

1. Co-Design the Service Pathway with Diagnostics in Mind: Successful use of POCT in virtual wards is as much about service design as it is about devices. This means **baking the tests into the care pathways** from the start. When designing a virtual ward protocol (for, say, COPD exacerbations or frailty falls), explicitly include points where POCT will be used and how the results will inform decisions. For example, a frailty pathway might specify: "if NEWS score is elevated and infection suspected, perform POCT CRP on first visit to guide need for antibiotics or admission." By making it a standard step, staff are more likely to use the device consistently. Pathway integration also involves planning for **what to do with results** – e.g. which results mandate a consult with a doctor, or how a result triggers a change in treatment. Having these algorithms in place ensures the technology actually translates to action and isn't left idle. Frontline staff and **pathology teams** should collaborate in this co-design, to align clinical needs with diagnostic capabilities [37].

2. Engage and Train Staff (Build Champions): One cannot overstate the importance of frontline staff buy-in. Nurses, paramedics, and support workers are the ones who will make POCT a success or not in practice. Early engagement – letting them trial devices, give feedback on usability, and even help choose between device options – fosters ownership. Many trusts have identified **POCT champions** or "super-users" in the community teams who take on extra responsibility for the devices. These champions can assist with training peers, troubleshooting minor issues, and acting as liaisons with the lab. Regular training updates and refreshers should be scheduled, and not just on the technical use; include interpretation guidance and scenario-based drills (e.g. "What would you do if the device gives a critical result while you're alone at a patient's home?"). **Simulation training** can help build confidence in using POCT in various home environments. Moreover, celebrating successes – like sharing cases where a nurse's use of POCT averted a hospital admission – can motivate the team and reinforce the value of the devices. Over time, the aim is to make POCT feel like an integral tool in the clinician's bag, not an optional add-on.

3. Strengthen Lab-Community Partnerships: The role of hospital pathology and POCT specialists is pivotal in community diagnostics. Going forward, commissioners and providers should formalize arrangements where lab teams **support community POCT services end-to-end**. This includes advising on procurement (choosing the right device with the benefit of lab expertise), setting up quality management (IQC/EQA schedules, quality audits), and establishing data connectivity. As recommended by NHS England, POCT results in virtual wards **"must have scientific oversight"** from the pathology network [35]. Funding models might need to reflect this (e.g. pathology services being commissioned to cover community POCT governance). Some regions are creating **shared services** or networks for POCT where one lead lab supports multiple virtual wards across an ICS. Such pooling of expertise can avoid each service reinventing the wheel. It also helps with standardisation: if everyone in the region uses the same testing platform, the lab can maintain one set of competencies and connectivity solutions that benefit all. In procurement terms, this partnership approach means looking beyond the sticker price of devices – consider the whole **lifecycle costs and support**. It may be better to invest in a slightly more expensive device if it comes with superior connectivity software or local vendor support for training and maintenance, as that will pay off in sustained usage.

4. IT Integration and Connectivity as Top Priorities: When planning future virtual ward diagnostic capabilities, IT integration should be considered a **must-have, not a luxury**. This might involve working with device manufacturers who offer open APIs or middleware that can feed into NHS systems. It also might mean lobbying for national or regional digital solutions – for example, a common platform where POCT results can be uploaded and viewed by any authorized clinician across organisational boundaries. The current stop-gap of docking devices back at base [30] or manually entering results is not a long-term solution. NHS England's virtual ward programme could facilitate a **national interoperability standard** for community POCT devices, ensuring that as new devices are introduced, they can securely connect via NHS Digital's frameworks. Additionally, exploring **real-time data sharing** infrastructure (perhaps piggybacking on existing NHS networks or the ambulance service networks) will be key. Future procurements might include connectivity requirements in the specs – e.g. asking vendors to provide devices with in-built 4G capability or integration with mobile EPR apps. Overall, treating data connectivity with equal importance as clinical functionality will improve safety and efficiency.

5. Focus on Usability and Workflow Testing: Before rolling out devices widely, conduct thorough **usability testing in the field**. This means taking the device through the paces in actual home visit scenarios *with the intended users*. It's one thing for a manufacturer to demonstrate a device in a boardroom; it's another to have a district nurse use it at a patient's bedside with poor lighting and a restless patient. Simple issues like how long it takes to get a result, how easy it is to handle with gloves on, whether the screen is readable in bright sunlight – all can make or break real-world use. Some trusts have done small pilots (5–10 devices) and gathered user feedback for a few months before committing

larger funds. This iterative approach is wise. It might reveal, for instance, that a device's lancets are too painful for patients or that the printer is too bulky to carry – things you can then adjust (change consumables, plan for electronic results instead of printouts, etc.) prior to scale. Also, consider the **workflow holistically**: if a nurse performs a POCT, how do they document it on the spot? Do they have a tablet with them? If not, maybe the device needs to print a slip that can be photographed later. These kinds of details, if ironed out, greatly increase the chance the POCT will be used routinely and correctly.

6. Smarter Procurement and Future-proofing: As community diagnostics is a fast-evolving field, procurement strategies should aim to be **future-proof and flexible**. This could mean favoring devices that are modular or upgradable – for example, platforms where new test cartridges can be added as they're developed, or devices that can run tests from multiple manufacturers (open systems). It could also mean starting with a **proof-of-concept** purchase rather than outfitting every team at once – evaluate outcomes and cost-benefit, then expand. Importantly, procurement decisions should factor in not just the device, but **the ecosystem around it**: does the vendor provide adequate training? Is there service support for repairs? How will consumables be supplied (and what is their shelf-life and storage needs)? One lesson from past underutilised devices is that procurement focused on the shiny specs but missed these practicalities. A robust procurement will involve end-users, pathology experts, and IT specialists in the decision – ensuring the chosen solution meets clinical needs, quality standards, and IT requirements. The forthcoming innovations (microfluidic chips, wearables, etc.) also suggest that we shouldn't lock ourselves into one technology for too long. The NHS might consider **pilot funding** for new technologies via NIHR or Innovate UK so that by the time current devices age, next-gen options are ready to deploy. Essentially, treat community POCT devices as part of a dynamic landscape – keep an eye on new entrants, and be ready to adopt superior solutions when they mature.

7. Policy and Leadership Support: Finally, high-level support and clear policy can accelerate progress. NHS England has published guidance and case studies that are extremely helpful [38] [39] – continuing to update these with new evidence (including failures as well as successes) will help spread best practice. Integrated Care Boards (ICBs) should include POCT in their diagnostics strategies, ensuring it gets attention alongside centralised services. Setting targets or expectations (for example, "every frailty virtual ward should have same-day access to a panel of blood tests via POCT") could spur adoption. Moreover, support from professional bodies – like the Institute of Biomedical Science (IBMS) and Royal Colleges – in terms of training frameworks and accreditation of community POCT programs, will professionalise this field. Already, we see movement: IBMS conferences in 2023 featured sessions on supporting POCT in virtual wards, acknowledging both the opportunities and challenges [40] [27]. Such forums allow sharing of real-world solutions (for instance, how Oxford solved a connectivity issue, or how Frimley managed governance across trust boundaries). Ultimately, a combination of bottom-up learning and top-down guidance is needed. The "untold realities" – the hiccups, workarounds, and lessons – should be actively collected and disseminated so that the next wave of virtual wards can avoid past pitfalls.

In conclusion, point-of-care testing is a linchpin in the vision of virtual wards and community-based urgent care. It brings the lab to the patient, enabling timely, informed decisions that can keep people out of hospital. The **opportunities** are clearly evidenced – from faster treatment to avoiding admissions and improving patient experience [15] [16]. Yet the **realities** behind the scenes are complex. We must acknowledge the challenges – device design limits, underutilisation when poorly implemented, connectivity hurdles, and governance requirements – and tackle them head-on. By doing so, we can refine and improve how POCT is deployed. With thoughtful integration, training, and tech innovation, the NHS can ensure that the next chapter of virtual wards fully capitalises on diagnostic advances. The result will be safer, smarter care delivered in the home, fulfilling the promise of *"hospital at home"* with laboratory-grade insight at our fingertips.

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