

COMMUNITY DIAGNOSTIC SERVICES

# A viable plan for virtual reporting

Technological advances mean diagnostic services can move into community settings, say Lisa Hollins and colleagues

Technological developments are opening up new possibilities for the way communities can access diagnostic services. The current model for diagnosis typically relies on the interaction between a GP and a hospital based consultant, who exchange referrals and information.

This model is being challenged by the need to provide a more integrated service coupled with a move towards more localised patient care. This has led to the consideration and development of community based diagnostic services.

There has been little research exploring the financial and clinical impact of locating diagnostic services outside of hospitals. A study by a team from University College London Hospitals Foundation Trust took an evidence based approach to reviewing the potential benefits of community based diagnostic services.

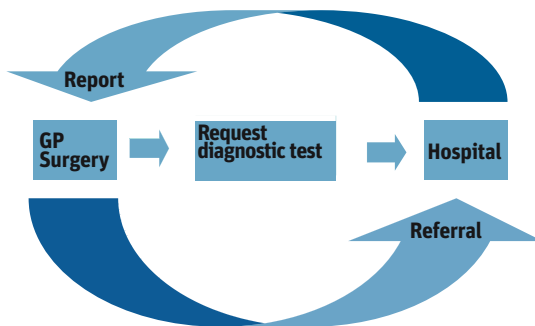
The study examined whether it would be financially and clinically viable to operate a new model of diagnosis and patient care, using a community based diagnostic testing centre.

The centre would use virtual reporting, linking information to the appropriate clinical setting for patient care, whether in a GP's surgery, a community outreach clinic or a hospital.

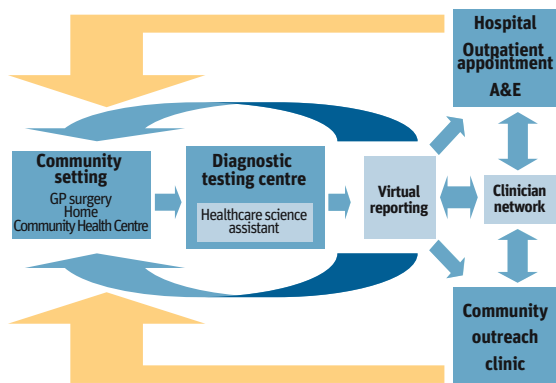
This system would be supported by a network of named consultants and

## MODELS FOR DIAGNOSTICS PROVISION

Current model: patient pathway for direct access diagnostic testing



Proposed model: patient pathway through the diagnostic testing centre



The patient would be referred by the GP to the diagnostic testing centre, where they would have their test performed by a member of staff appropriately trained for the specific test required – a radiographer or a healthcare science assistant. Reporting of tests would be carried out using virtual reporting links with an agreed provider. Once the test is reported, the patient may be referred by the GP to hospital for an outpatient appointment, referred to a community outreach clinic, or managed by the GP. The clinician network could be accessed at any point if the GP was uncertain or wished to consult with a specialist with regards to the most appropriate treatment plan.



There could be significant savings by carrying out tests in the community rather than in hospital

## ‘Community based diagnostic testing centres would link to the appropriate care setting’

community based clinicians, covering all the professional groups involved in a particular community's diagnostic and treatment pathways.

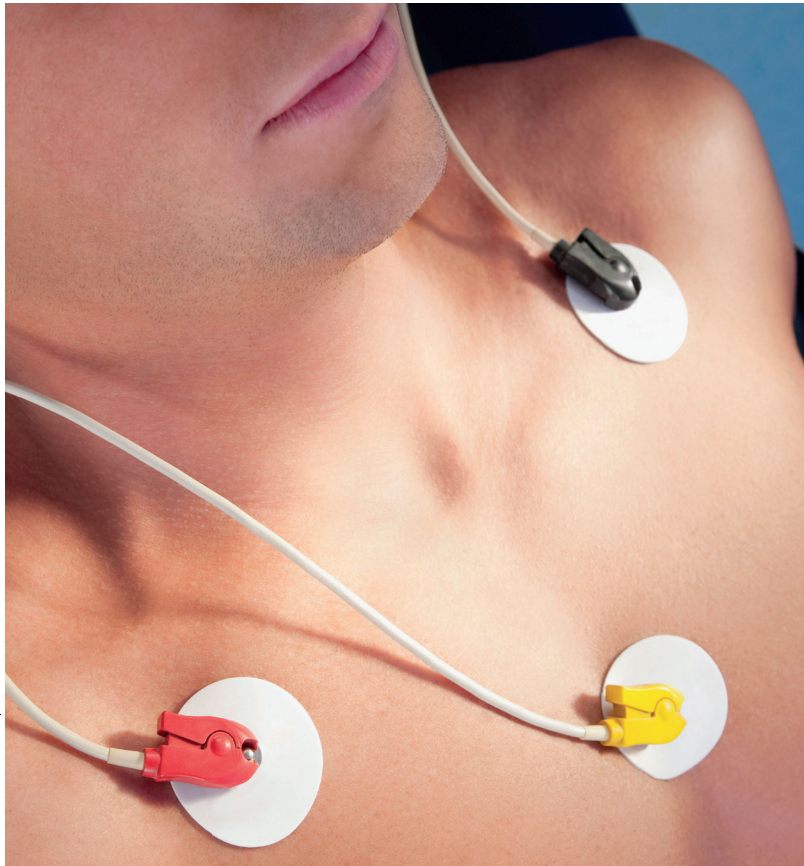
The proposed model for centres would allow for simple imaging modalities, such as X-ray and ultrasound, as well as non-imaging modalities like ambulatory ECG monitoring, including reporting capabilities for both. Centres would be staffed on rotas by the chosen tertiary provider to ensure adequate support and professional development.

The research looked at the feasibility of establishing four diagnostic “menus” for



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## 'The overall financial performance appears viable and preferable'

TABLE 1: POTENTIAL IMPROVEMENTS

	Clinical quality gain	Efficiency/ access gain	Improved patient experience
Diagnostic testing offered in the community		Yes	Yes
Diagnostic testing co-located in one facility		Yes	Yes
Tests carried out by appropriately trained personnel	Yes		
Workforce provided on rotational basis from partner provider	Yes	Yes	
Improved turnaround of results through virtual reporting	Yes	Yes	Yes
Virtual access to raw data from all diagnostic tests		Yes	
Support for GPs to manage entire pathways in primary care	Yes	Yes	Yes
Improved community management of long term conditions	Yes	Yes	Yes
Reduced variation in healthcare outcomes	Yes	Yes	Yes

community based diagnostics: imaging, cardiology, respiratory and pathology, covering a mix of ultrasound, spirometry, ambulatory ECG and blood pressure, resting ECG and plain film X-ray.

The team looked at both the capital cost and IT infrastructure required to set up a centre in a chosen facility, whether bespoke or existing, coupled with a review of the recurrent costs that the service would incur, such as workforce, consumables, equipment maintenance and reporting.

The research had three stages:

- the creation of an operational model for a new community diagnostic pathway;
- the derivation of the associated financial model;
- the review of the key assumptions about volume and the sensitivity of the operational model to variations, which involved the production of a "high" and "low" volume model.

The activity data used to underpin the assumptions on volume was based on a mix of historic evidence and estimated future GP requests. The financial model compared an estimation of current costs, based on Department of Health references, with the proposed bottom-up costs of the centres, which were calculated in collaboration with senior clinicians.

The findings indicated that the proposed diagnostic testing centre model could produce improvements in clinical quality, efficiency, access to diagnostic services and an improved patient experience (see table 1, above).

### Cost savings

Based on the assumptions in table 2 (overleaf) and assuming a region with activity driven by 50 GPs, the normal costs for current diagnostic models, when accounting for the modalities in the table, are approximately

£2m per year. By comparison, the norm for the proposed model would cost around £500k per year less.

This disparity increases proportionally with the volume of GPs covered, so that diagnostic costs for a regional community covering 150 GPs would end up exceeding £6m per year with current practice, but just £4m per year with the proposed centre model.

Even allowing for variations in costs and volume of activity,

the current diagnostic model only gets near to the cost-efficiencies of the proposed model in those areas that are in the bottom 5 per cent for costs; and only then on the assumption that the community based diagnostics are in the top 5 per cent for costs (see graph, overleaf). The overall financial performance of community based diagnostics appears to be not only viable, but financially preferable compared with the existing model.

The overall conclusion of the

research was that the proposed new model not only adds clinical value through improved access and support to patients and GPs, but also its operational costs were significantly more cost-effective for most tests, particularly physiological measurement modalities where minimal up-front investment is required.

Specifically, the study discovered that the biggest cost-efficiencies could be found in community based spirometry, ambulatory blood pressure monitoring and resting ECG. The savings were less pronounced for ambulatory ECG and plain film X-ray. Having said this, there is some evidence to suggest that operating a plain film X-ray service may become more cost-efficient with greater volume.

For ultrasound specifically, it would be more expensive to operate in a community based structure.

Based on a region covering 150 GPs, the savings per tested modality associated with establishing a community based diagnostic testing centre, compared with the existing model, were calculated as shown in the box below:

Testing modality	Percentage saving (based on activity from 150 GPs)
Plain film X-Ray	10
Ultrasound	-7
Spirometry	62
Ambulatory monitoring (ECG)	16
Ambulatory monitoring (BP)	58
Resting ECG	56

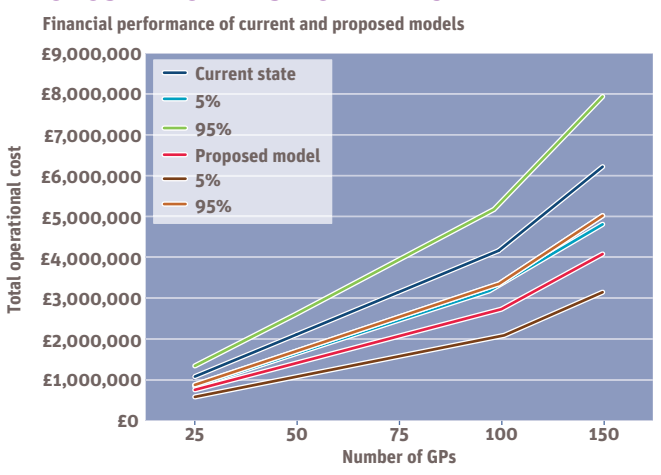
**Practical challenges**

As with any study of this type, there are some limitations to consider. For example, the lack of centralised data on diagnostic testing as well as variations in GP request rates limits accuracy and the DH reference

**TABLE 2: INVESTMENT AND POTENTIAL CAPACITY ASSUMPTIONS**

Modality	Equipment	Enabling works	Estimated IT costs	Total cost	Capacity (per year)	Assumptions
Plain film X-ray	£150,000	£100,000	£20,000	£270,000	9,000-12,000	253 working days per year, operating 8 hours per day, imaging 4-6 patients per hour
Ultrasound	£150,000	£10,000	£20,000	£180,000	4,050	253 working days per year, operating 8 hours per day with 2 patients per hour
Spirometry	£5,000		£1,000	£6,000	9,000	253 working days per year, operating 8 hours per day with 4 patients per hour
Ambulatory monitoring (ECG)	£1,500 (1 monitor)		£1,000	£2,500	260	5 tests per week, 52 weeks per year
Ambulatory monitoring (BP)	£1,500 (1 monitor)		£1,000	£2,500		5 tests per week, 52 weeks per year
Resting ECG	£5,000		£1,000	£6,000		253 working days per year, operating 8 hours per day with 4 patients per hour

**PROPOSED MODEL IS MORE EFFICIENT**



costs do not fully reflect actual spend.

Also, the indirect costs of transacting diagnostic requests, such as the administrative costs for handling them, are currently unclear and so reference costs are used as an approximate alternative.

There are also a number of practical challenges to overcome in order to establish community based diagnostic testing centres, such as planning of staff rotation and the cultural

change needed to support what would represent a significant change to the way diagnostic services are both planned and accessed.

Other keys to success include establishing a centralised activity reporting system, establishing virtual reporting capabilities, and formalising the links between the various clinical partners.

However, despite these challenges, the testing modalities undertaken in the

**62%**  
Savings in the cost of spirometry associated with a diagnostic testing centre

research suggest that, if enacted effectively and embraced culturally, community based diagnostic services could deliver significant savings and real improvements in the care provided to patients.

● *Lisa Hollins is acting project director of the quality, efficiency and productivity programme and Donna Elliott-Rotgans is project manager of service transformation at University College London Hospitals Foundation Trust. Mark Eaton is managing director of Amnis. Thanks to Professor Stefan Scholtes; Dennis Gillings; professor of health management at Judge Business School and Markus Harder, PhD student at Judge Business School and Cambridge University.*