



LETTER TO THE EDITOR

Home haemoglobin monitoring: adapting to the times

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The National Health Service (NHS) England makes it clear in their 'Long-Term Plan' the importance of giving patients more control and responsibility over their care, developing new models of care and exploiting the information revolution and accelerating useful health innovation [1–3]. There is increasing acknowledgement of patients as 'experts by experience'; allowing them a role in the management of their conditions is likely to lead to better compliance and improve health outcomes. Meanwhile, the NHS has seen a steadily increasing workload over recent years with no corresponding increase in budget [2, 3]. Accordingly, healthcare professionals are challenged to develop high-quality, efficient, safe and cost-effective clinical pathways while acknowledging the move away from 'one-size-fits-all' medicine towards more individualized care. Renal clinicians have often been leaders in this respect, with widespread use of innovations such as 'Patientview' [4].

Point-of-care testing (POCT), administered in a community setting, or ideally by the patients themselves in their own homes, offers a wealth of opportunities to develop these individualized, empowering clinical pathways, exemplified by the Roche CoaguChekXS studies [5, 6]. The non-dialysis-dependent chronic kidney disease (NDD-CKD) patient who is at risk of or may already be suffering from a number of associated complications of CKD represents an ideal patient group for the development of such initiatives.

Renal anaemia, due to functional and absolute iron deficiency along with erythropoietin deficiency, affects patient functional capacity, quality of life and rate of renal decline [7, 8]. Erythropoietin-stimulating agents (ESAs), along with iron supplementation, effectively treat renal anaemia and its consequences but requires regular venous blood monitoring to avoid potential complications [8]. The burden of these phlebotomy visits, which are increasingly being performed in hospital settings due to changes in general practitioners' funding arrangements, adds to the demands on these patients in the management of their often multiple pre-existing comorbidities.

This is in addition to increased demands on transport and time away from work and family. This burden, and the need to develop alternative pathways, has been greatly emphasized by the current coronavirus disease 2019 (COVID-19) pandemic.

Our renal department is working with a corporate partner (Entia, London, UK) that has developed the world's first haemoglobin POCT solution suitable for use by patients in their own homes. The solution involves a device that is capable of monitoring haemoglobin from a fingertip drop of blood and a smartphone app along with blood pressure recordings from a separate, generic automatic blood pressure monitor. A project was planned to develop and evaluate this product; the project involved cost-effectiveness analysis, a focus group-based co-design study and a validation and feasibility home-based trial. The project progressed and was recruiting well until the onset of the COVID-19 pandemic, which mandated a halt to all non-COVID research activity in the trust. Due to the resultant scaling back of the majority of community phlebotomy services, many of our highly vulnerable renal anaemia patients were forced to attend phlebotomy appointments at the hospital site.

Within weeks of the onset of the pandemic, the project leads had reorganized the structure of the project to achieve maximum patient benefit and avoidance of harm. The co-design study was permanently halted and resources diverted to roll out the use of similar haemoglobin monitoring device, made by the corporate sponsor, which had already achieved a Conformité Européenne (CE) mark for use in iron-deficiency anaemia patients (Figure 1). Data gained from the aforementioned home trial and the manner in which the device operates suggest that the accuracy and utility of the Entia devices are not affected by the presence of CKD (Entia, Hull University Teaching Hospitals NHS Trust, unpublished data). Operating procedures, sign-offs and staff training were expediently achieved and the device is currently being rolled out, in small numbers and in a step-wise fashion, as a means of mitigating the need for venous blood tests in NDD-CKD patients on ESA. Provision has been

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FIGURE 1: Entia's 'Luma' home haemoglobin monitoring solution (<https://www.lumahealth.uk>). Image used with written permission from Entia, London, UK.

made for the incorporation of the resultant haemoglobin results, and any issues with the use of the device, into the renal electronic patient record. The effectiveness of this intervention will be assessed in ~6 months by means of a service evaluation. This evaluation will involve quantitative review along with qualitative measures mediated by staff and patient questionnaires and interviews.

We hope that the prompt redesign of this research project may serve to protect our high-risk renal patients from COVID-19 infection while empowering them and potentially reducing the burden on hospital staff. To our knowledge, this project will represent the first use of a home-based POCT solution in patients with renal anaemia.

CONFLICT OF INTEREST STATEMENT

The results presented in this article have not been published previously in whole or part elsewhere. The authors declare no conflicts of interest.

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