Expanded access to point-of-care tests (POC) is important for screening a variety of patient disorders, for example, it allows earlier detection of conditions that might benefit from prompter clinical intervention(s). From a public health perspective the test might also be useful to monitor the general health of a targeted demographic group such as school children.

Here in the UK, the BÜHLMANN Quantum Blue® lateral flow faecal calprotectin test has been useful in the management of common intestinal ailments such as inflammatory bowel disease (IBD) and has also been used in local GP-level settings. This POC assay measures concentrations of faecal calprotectin in the stool which is typically resultant from activated neutrophils that have been recruited into the gastrointestinal surface, indicative of a diseased state.

The technology behind this assay is portable, robust and simple to perform without recourse to complicated preparation or liquid handling steps. As such these factors also make the assay useful for re-purposing in disease surveillance in other parts of the world, especially where inappropriate field-based technology induces a health screening bottleneck.

In sub-Saharan Africa (SSA), for example, very little is known about the general levels of faecal calprotectin within the healthy populace, nor how raised levels may signal post-gastrointestinal disease. Notably in many parts of SSA, intestinal schistosomiasis maybe be very common, infecting over 200 million people, and leads to a variety of gastrointestinal disorders.

Understanding these dynamics is important to develop better morbidity management plans for children who are annually treated but are also often quickly re-infected, for they live in impoverished conditions with insufficient access to adequate healthcare.

To shed light on this we conducted a seminal study using the BÜHLMANN Quantum Blue® lateral flow faecal calprotectin test in a high endemic setting for intestinal schistosomiasis on the shoreline of Lake Albert, Uganda.

Along this shoreline very young children are also exposed to infection and may start to develop intestinal schistosomiasis before entry into primary school where they receive the first praziquantel treatment against this infection. The faecal calprotectin tests were used alongside standard parasitological surveillance methods used by the Ugandan national control programme where schistosome eggs were detected and viewed by microscopy together with faecal occult blood (FOB) test reagent strips.

Faecal calprotectin concentrations of 150–300 µg/g were strongly associated with Schistosoma mansoni infection and the presence of FOB. More importantly the levels of calprotectin were shown to decline after praziquantel treatment providing a tangible marker of immunological improvement.
Further use of the BÜHLMANN Quantum Blue® lateral flow faecal calprotectin test is envisaged as a population monitoring tool to measure the impact of praziquantel treatment campaigns in SSA that are currently aiming to reduce morbidity of this disease. In an ideal world, the test could also be used to intensify the management of treatments in those children who present with severe immunopathology.

Quantum Diagnostics

The BÜHLMANN Quantum Blue® system provides a rapid quantitative testing platform for lower throughput requirements.

If your faecal calprotectin test request number is too low to achieve a reasonable turn around time using an ELISA method, Quantum Blue provides a comprehensive, low cost, entry-level calprotectin testing solution.

Quantum Blue is ideal for applications in point of care, clinic or laboratory settings:

- The ease and speed of lateral flow technology
- Full quantitation by means of a small, dedicated telephone sized reading device
- Three faecal calprotectin kits available for screening or monitoring
  - Quantum Blue® fCAL
    - measurable range 30-300µg/g
  - Quantum Blue® fCAL High Range
    - measurable range 100-1800µg/g
  - Quantum Blue® fCAL Extended Range
    - measurable range 30-1000µg/g
- Ideal for low level testing
- No need to batch samples
- Results in just 12 minutes
- Improved turn-around times and more cost effective than a send away service

The benefits of the Quantum Blue system are also extended to an expanded assay range, providing a flexible solution for near patient testing requirements.

Serum Calprotectin (MRP8/14)
The MRP8/14 assays allow for precise and sensitive measurement of serum calprotectin. This marker of inflammation increases in concentration in inflammatory conditions such as rheumatoid arthritis and acute coronary syndromes, making it an ideal target for monitoring disease activity.

Calprotectin in Ascites
Measuring calprotectin in ascites samples is used as a rapid marker for elevated polymorphonuclear cell count. This can aid in the diagnosis of spontaneous bacterial peritonitis, an important cause of morbidity and mortality in cirrhotic patients with ascites.

CRP
The Quantum Blue C Reactive Protein (CRP) test allows for rapid detection of this important marker within 15 minutes. CRP is an acute phase protein, produced in the liver and released into the blood within a few hours of the start of infection or inflammation.

Measuring CRP alongside calprotectin testing has shown to increase the specificity of detecting inflammation in Crohn’s disease patients. Checking for high c-reactive protein is also used as an arthritis test.

Therapeutic Drug Monitoring
The BÜHLMANN Quantum Blue infliximab assay is the first rapid test to measure infliximab trough levels in human serum. Infliximab is a biologic drug which acts as an antagonist to TNF alpha, and works by effectively blocking the inflammatory process of a number of chronic inflammatory diseases like Ulcerative Colitis, Crohn’s Disease and Inflammatory Arthritis.

The quantitative determination of the infliximab trough levels can be used in immediate decision making for drug dosage and also to support therapy monitoring. Thus a POCT assay for infliximab on Quantum Blue enables responsive patient management.

Find out more about the full range of BÜHLMANN Quantum Blue® assays at www.alphalabs.co.uk/quantum-blue