

# Personal centrifuges: streamlining sample processing

In many GP surgeries, especially those in rural areas, blood sample collection has become an intricate and time-consuming process.

Lauren Young explains how the provision of a fast personal centrifuge produces immediate benefits for the practice, its patients and the local hospital laboratory.

The Clinical and Laboratory Standards Institute recommends that serum samples be separated within two hours of collection for most analytes.<sup>1</sup> Unprocessed blood samples can be affected greatly by the temperature of storage, along with the length of time from phlebotomy to specimen centrifugation. Most GP practices do not have centrifuges available in-house and therefore must depend on a courier services that offers temperature-controlled transportation to move fresh samples to the nearest hospital or laboratory for processing.

Beth Evans, a practice nurse at Mendip Country Practice, explained: “Our blood samples are collected at 11.00 am, which does not allow us much time, especially with the increase in blood monitoring that we perform today in general practice. It was becoming a nightmare rushing to try to get all the samples collected before 11.00 am, and the courier could not wait any longer as he had to get to the next collection point.”

The article entitled ‘Stability of common biochemical analytes in serum gel tubes subjected to various storage temperatures and times pre-centrifugation’<sup>1</sup> highlights the fact that

the analytes potassium, glucose, phosphate, magnesium, LDH, calcium, creatinine, urea, iron and ferritin have variable stability when centrifugation is delayed. The current system used by many GP practices can see samples being left for a number of hours precentrifugation and can also result in samples being subjected to varying temperatures during transit. Tests performed on an unstable sample can create an unreliable result, and consequentially the test may have to be repeated on a new blood sample.

Jill Mears, SPS operations manager for Taunton and Somerset Hospital, explained: “It is not unusual to have numerous potassium results requiring telephone notification to the GP as they have been collected the same day and are often just above the borderline for clinical notification. These bloods are often within the normal range on repeat samples. As the laboratory GP workload is processed into the early evening, this can also result in additional calls to the GP out-of-hours service notifying them of clinically significant potassium results.”

A compact personal centrifuge used in a



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GP practice can help to combat the timing issues related to dependence on the hospital courier's schedule. The sample collection procedure can be streamlined considerably by reducing the strain of time deadlines and the need for the repeat testing of new blood samples.

“We purchased a StatSpin Express 3 centrifuge in March 2008,” added Beth. “The centrifuge has allowed us greater flexibility to take these samples at any time of the day and has also allowed patient flexibility. Patients who start work long before the surgery opens can access us later in the afternoon instead. In addition, patients seeing a doctor as an

emergency can have bloods taken at the time, instead of having to return the following morning.”

### Improved productivity

Practices that have a centrifuge in-house can offer a more comprehensive service to their patients, as samples can be taken at any time convenient to the patient, centrifuged and then banked until the courier collection time. This takes the time pressure off the surgery staff and reduces the need to repeat testing due to erroneously elevated assays.

General practitioners spend around £1.5 billion on laboratory testing each year,<sup>2</sup> and a proportion of this money will be spent on retesting failed assays due to the storage environment after extraction.

### Patient satisfaction

Having to book separate appointments so that blood tests can be taken can be difficult and frustrating for patients, especially those who have work commitments or have to travel a considerable distance to get to the practice. Often, a patient who requires a repeat blood test due to elevated potassium levels must give the new sample at their local hospital to prevent centrifugation delays and ensure an accurate result. In some rural areas, patients may have to travel for a prolonged period of time to reach the nearest hospital. This can be especially difficult for the elderly or for patients who depend on others for transportation.

### Beyond the practice

The benefits of having a lightweight and compact centrifuge extend beyond the GP practice, as the unit can be transported easily for use in clinics or by doctors who are on call. The StatSpin Express 2 weighs just 2.3 kg and so it is easily portable away from the practice, making it ideally suited to point-of-care testing. Satellite laboratories that focus on chronic disease management, for example, can use a personal centrifuge in conjunction with a portable haematology analyser to perform glucose and full blood counts on site. Taking a personal centrifuge to out-of-practice clinics when there is a need to take bloods means there is no need to rush back to the surgery in time for the hospital transport.

“The controls of a StatSpin Express unit are very simple to operate, in many cases being just a matter of selecting the spin duration and pressing Go”



“The benefits of using a StatSpin Express centrifuge stretch forward to help streamline the process, from patient to biomedical scientist.”

### Leaner laboratory processes

The advantages of having a personal centrifuge in the GP practice can also have an impact on the testing laboratory that collects the samples. Studies have shown that primary care usually accounts for 50% of laboratory activity,<sup>2</sup> and the receipt of precentrifuged specimens can result in faster turnaround times and leaner laboratory processes.

Laboratories with large batch centrifuges often have to address the issue of utilisation – either there is a delay while a batch accumulates, or a delay while the previous batch completes its cycle. If a significant number of specimens come into the laboratory at once then a proportion of the tubes will have to be stored until they can be processed, which is in addition to the time from venesection to specimen delivery at the laboratory. The laboratory batching and testing process can be made much more efficient if the samples arrive from the GP practice already centrifuged and ready for testing.

General practitioners can improve the productivity of their testing procedures by having a compact personal centrifuge in the practice. The bottleneck often experienced with sample testing can be targeted and the pressure on surgery staff can be reduced. The benefits of using the StatSpin Express 2 stretch forward to help streamline the process, from the patient through to the biomedical scientist. The small footprint means that the unit can fit easily on a desk or workstation and the controls are very simple to operate – in many cases it’s a matter

“Studies show that test results obtained after microcentrifugation are comparable with results using conventional centrifugation”

of selecting the spin duration and pressing ‘Go’. Clearly, a personal centrifuge’s compact size and low weight are suited perfectly to the point-of-care environment. □

### References

- 1 Tanner M, Kent N, Smith B, Fletcher S, Lewer M. Stability of common biochemical analytes in serum gel tubes subjected to various storage temperatures and times pre-centrifugation. *Ann Clin Biochem* 2008; **45**: 375–9.
- 2 Bird C. Laboratory tests: guidance for general practitioners. *The Biomedical Scientist* 2008; **52**: 42–3.

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