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# **PATHOLOGY**

IN PRACTICE



VITROS chemistry systems have a proven track record for performance, reliability and customer service. Here, two senior laboratory managers explain why their hospitals have invested in the new VITROS 5,1 FS Chemistry System from Ortho-Clinical Diagnostics.

## Clinical chemistry at another level

The new VITROS 5,1 FS Chemistry System from Ortho-Clinical Diagnostics (OCD) builds on the benefits of VITROS MicroSlide technology used so successfully on the VITROS 250 and VITROS 950 systems. It also represents an innovative response to the main findings of extensive research into the clinical and operational trends that laboratories now face.

Since the introduction of MicroSlide technology in the mid-1980s, laboratories have increasingly sought to run a greater range of chemistry tests on a single system – a goal that liquid chemistry systems could more easily achieve. Despite superior analytical performance, ease of use, and the facility to operate without water or drainage requirements, VITROS systems were perceived as lacking in menu range and refinements such as reflex testing – useful when an abnormal result automatically triggers another test to aid diagnosis and treatment.

In developing the VITROS 5,1 FS, OCD decided not only to address those issues that were persuading customers to consider alternative technologies but also to consider underlying trends that would influence instrumentation purchase in the foreseeable future.

Detailed surveys carried out by OCD across the market from 2000 onwards showed that laboratories faced four common pressures: a need to reduce errors; staff shortages and recruitment issues; demand from clinicians for enhanced laboratory services; and a need to control costs. Considered together, these factors shaped the design brief for the VITROS 5,1 FS.

The new system incorporates several innovative approaches but remains compatible with existing VITROS systems – and retains key VITROS principles such as elimination of the need for a water supply. The current VITROS Microslide menu accommo-



▲ A look inside Ortho-Clinical Diagnostic's VITROS 5,1 FS.

dates more than 90% of chemistry testing needs in most laboratories. The addition of MicroTip technology, which takes liquid chemistry to another level with its use of disposable tips and cuvettes, increases menu coverage dramatically. The MicroTip menu currently stands at 20 tests and is increasing. Combining these two technologies within one ergonomically designed instrument offers a powerful solution to some of the most pressing needs in today's clinical chemistry laboratories.

### Extended test repertoire

After a rigorous assessment process, Dr Ying Foo, head of the Department of Chemical Pathology and director of newborn screening at Great Ormond Street Hospital (GOSH) NHS Trust opted for the VITROS 5,1 FS system to meet some very specific needs. She told *Pathology in Practice*: "We are a world-class establishment working at the forefront of paediatric care and we wanted a system that met our very precise specification. The extended repertoire of tests was obviously a vital part of the decision. Many of these paediatric patients have rare metabolic disorders so we must be precisely geared to the clinician's investigations, whatever they may be.

"Almost every sample we receive is atypical, so we must have total accuracy and total confidence in these unusual results. You can forget about repeats; we must go with the first result. Our patients are very sick, often very tiny, babies with highly specialised needs. In paediatrics we are usually working with samples of 2 mL or less, compared with 5–10 mL from adult patients. Each tiny sample – often gathered drop by drop from the child's heel – must be sufficient for a battery of requests. There is only a small 'dead' volume with the VITROS 5,1 FS, which is vital for us because we must use every drop that we have.

"The VITROS 5,1 FS also offers an innovative way of assessing the state of the sample, which may be jaundiced, haemolysed or lipaemic. This has had a



▲ Overview of the VITROS 5,1 FS Chemistry System.

**VITROS 5,1 FS Chemistry System provides:**

- **Sampling Centre**
  - load up to 160 samples at one time
  - STAT lane for urgent samples
  - repeat, reflex and dilution testing
  - sample and reagent monitoring
- **MicroSlide Centre**
  - innovative 3-ring incubator
  - MicroSlide accuracy and precision
  - integrated reagent supplies for over 45 assays
- **VITROS VersaTip Processing Centre**
  - bulk tip loading
  - reagentless sample integrity testing
  - eliminates subjective interpretation of sample quality
- **MicroTip Chemistry Centre**
  - stores up to 36 MicroTip assays
  - holds diluents, MicroTips and cuvettes
- **Command Centre**
  - easy-to-use software
  - simple navigation
  - comprehensive on-board help and instruction
  - e-connectivity for remote delivery of software, documentation and troubleshooting

profound effect on the way we work. Previously, I often received calls at home about particular results, and the technical staff would try to describe the appearance of the sample: 'it's a bit pink', 'a bit yellow', 'sort of cloudy'. This was highly subjective. Now we have proper indices and do not require any additional sample or time-consuming manual input to the computer.

"Our previous system utilised only dry chemistry but the MicroTip feature means that we now have the best of both worlds.

"Assays can be moved across from other analysers to the VITROS 5,1 FS and be dealt with in a single pass through the machine. This has improved turnaround time and enabled us to perform more tests on each tiny sample."

### Best of both worlds

Up to 160 samples can be loaded at once on the VITROS 5,1 FS, with a dedicated short turnaround time (STAT) lane for urgent samples. When a tray is detected in this lane, the samples are run preferentially before the system returns to routine work. This has proved particularly useful at GOSH, where samples for ammonia are unstable and analysis must be

completed within 20–30 minutes of sample collection.

Dr Ying Foo's team must also carry out numerous lactate tests every day; in an adult environment these would probably be markedly reduced, although this may be changing, particularly in intensive care units.

As a former chair of the UK National External Quality Assessment Scheme (NEQAS) Specialist Advisory Group for Clinical Chemistry, Dr Ying Foo set particularly rigorous criteria for the system's accuracy and stability. She says: "Through the national quality assessment scheme we are able to compare the accuracy of different instruments in laboratories across the country, and we know that we are in the top 10% of laboratories. In addition, the VITROS 5,1 FS is exceptionally stable. We will only need to calibrate it once every six months, which will save staff time and down time for the system."

The laboratory at GOSH has a team of 63 staff carrying out around 1.5 million highly diverse tests each year. Laboratory manager Anne Sheldrake reports that confidence in using the VITROS 5,1 FS has built quickly among the team. She says: "All the work carried out here is tertiary referrals, so

## VITROS 5,1 FS Chemistry System makes it simple to get the job done

### ■ Reduces opportunity for errors – both human and system – through innovative design

### ■ Improves staff utilisation

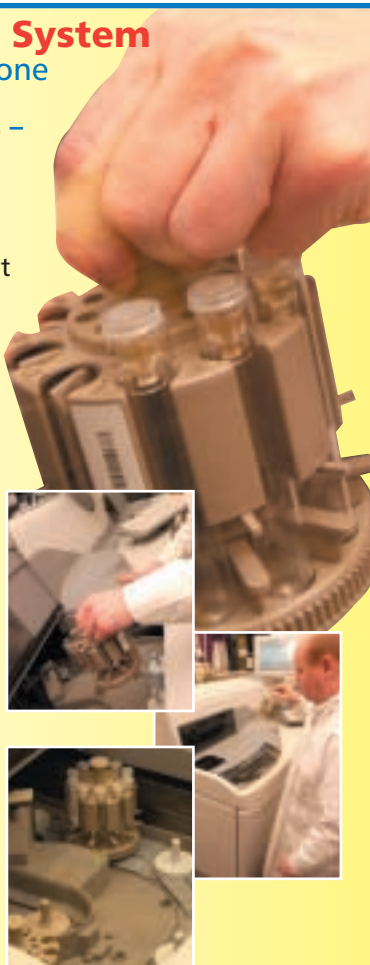
- increased system capacity without increasing staff
- simple to train, easy-to-use
- frees up staff for value-added tasks
- produces high percentage of reportable results without staff intervention

### ■ Improves service levels

- capable of wide range of testing – paediatric to elderly
- robust system means minimal additional tests for quality control, calibration and repeats
- minimal maintenance
- simultaneous multiple assays on a single sample
- fast result turnaround time
- up to 80 assays available on-board

### ■ Facilitates budget control

- predictable financials
- elimination of hidden costs
- no water requirement



there is very little that is routine or mundane. However, there was little apprehension because everyone was familiar with the technology. Even the reference ranges remained the same, so it has been a seamless transition."

Inevitably though, even with a new system recently installed, Dr Ying Foo and her colleagues are looking towards the future.

She says: "We expect that our decision to acquire two VITROS 5,1 FS systems will enable us to handle an anticipated increase in the number of assays of 10–30% per annum over the next five to seven years. In terms of future repertoire, we consider it vital to work with a supplier able to anticipate our needs. New markers are being identified all the time, making it possible for us to diagnose new conditions or to monitor new treatments. Ortho-Clinical Diagnostics has the sort of track record and future plans to give us confidence in this area."

### Year-on-year increase

Working with a proactive supplier was also an important consideration for Steve Davis, principal biochemist in the Department of Clinical Biochemistry at the 530-bed Royal Glamorgan Hospital

just outside Cardiff. The hospital serves a population of some 200,000 in the Rhondda Cynon Taff area and, like many others, is experiencing a significant increase in assay requests from general practitioners.

Steve Davis and his laboratory team of 21 have been using the first of their two VITROS 5,1 FS systems on manufacturer's release evaluation. He says: "There has been a dramatic increase in demand recently for high-density lipoprotein (HDL) cholesterol testing, so the availability of an HDL assay on the VITROS 5,1 FS – using MicroTip technology – was an important factor for us. We also understand that there is a slide assay for HDL cholesterol in development, which confirms that OCD is responsive to the demands made by us.

"The majority of the increased workload is coming from GPs as a result of the General Medical Services (GMS) contract, National Institute for Clinical Excellence (NICE) guidelines, and national service frameworks for conditions such as diabetes.

"These factors resulted in a year-on-year increase of 25% in our workload from GPs in the six months from April 2004. Annual increases in tests

originating from the hospital tend to run at 9–10%."

Inevitably, this increased workload is set against a background of budgetary pressures, both in terms of staffing and overall costs. The laboratory at the Royal Glamorgan Hospital (formerly the East Glamorgan General Hospital) has been using dry slides since 1996.

Steve Davis says: "It may have seemed expensive then, but the overall cost is now very much in line with alternative methodologies.


"However, we are also seeing other benefits. In particular, we were very pleased that training on the VITROS 5,1 FS does not take up a huge amount of time. Much of its operation is virtually intuitive, particularly for staff familiar with our other VITROS systems, and we've found the helpline to be very useful when we need support.

"We already have the experience of performing around 1.5 million assays each year using MicroSlide technology on our existing VITROS 250, VITROS 950 and VITROS 950AT systems. We are well aware of the cost-benefits delivered by high levels of stability, precision and long calibration periods."

### Expectations exceeded

Willie Burns, OCD vice-president for Europe, Middle East, Africa and the Asia Pacific region reveals that the performance of the VITROS 5, 1FS exceeded all expectations in prelaunch laboratory trials. He is confident that the VITROS 5, 1 FS will raise industry standards for ease of use, integrity of results and operational efficiency.

Willie says: "We know that laboratory time is at a premium in today's demanding clinical environment and we set out to develop a next-generation VITROS system that would accommodate our customers' current and future needs.

"High performance, together with the additional features of remotely managed online troubleshooting and low maintenance requirements, means that the VITROS 5,1 FS is cost effective and user friendly. Above all, it produces results consistently and fast." 

*If you are interested in learning more about how automated systems such as the VITROS 5,1 FS Chemistry System could help you get the job done by improving staff utilisation, improving service levels and facilitating budget control then contact Ortho-Clinical Diagnostics, tel +44 (0) 1494 658600, email [ccare@ocdgb.jnj.com](mailto:ccare@ocdgb.jnj.com).*