

Fairfield Imaging Ltd – Britain's leading provider of digital pathology solutions

- Digital imaging is markedly improving cancer diagnosis and prognosis.
- Fairfield Imaging is a major provider of advanced digital imaging technologies.

Founded in 1989 as a research company, Fairfield was incorporated in 1995 as a developer of scientific software and computer-enhanced microscopy.

The company is based at Tunbridge Wells in Kent, south east England and employs 18 staff in its R&D, sales and service support operations in the UK.

In 1999, the company was acquired by Medical Solutions plc, a British company with operating divisions in Digital Diagnosis – Pharmaceuticals – Medical Products Distribution. Medical Solutions is a fast-growing provider of cancer related digital diagnostics.

In August 1999, Fairfield Imaging released the **Fairfield DNA Cytometry System**, a suite of image-based DNA Ploidy and Nucleotyping products that can accurately identify whether genomically-unstable cell lines are present in early-stage tumours.

The system offers

- early prognosis
- accuracy
- sensitivity
- speed
- automation
- ease of use
- cost-effectiveness
- suitability for use in routine hospital environments

Fairfield ICM-DNA Ploidy is particularly valuable in the prognosis of ovarian and prostate cancers, where it has been shown to give a clear and reliable indication to the oncologist as to the treatment required.

Part of the reason for the success of ICM-DNA Ploidy is that the process entails separate measurement on each individual nucleus, each cell nucleus being automatically classified into 'tumour cell', 'fibroblast', 'lymphocyte' groups and so on.

In another application, Fairfield DNA-Ploidy has been found to be reliable in guiding difficult early diagnosis in pre-malignant leukoplakia and in gynaecological tumours.

A trial on Stage 1 Ovarian Cancer patients which compared results using the Fairfield ICM-DNA Ploidy system, and FCM-DNA Ploidy on material from 280 patients produces conclusive results for the Fairfield System.

Currently, a clinical trial involving material from 1,200 men already diagnosed with prostate cancer is underway in Sheffield, England, with results expected later in the year.

During 2000, Fairfield established reference sites for its automatic DNA Cytometry systems in specialist centres:

- Fox Chase Cancer Centre in Philadelphia;
- Department of Genomic Medicine, University of Sheffield;
- Division of Digital Pathology, Norwegian Radium Hospital, Oslo, Norway;
- Osaka Medical Centre, Japan.

Fairfield Imaging's **PathSight** telepathology system merges high quality digital image transfer with video-conferencing to provide a demonstrably time- and cost-effective means of remote case-conferencing on biopsy specimen images and data.

Using this technology, a pathologist can immediately refer a case to a specialist in the field. Crystal-sharp images of slides may be sent to remote locations for diagnosis or second opinion.

The Fairfield Imaging PathSight System features

- full remote control
- videophone link
- diagnostic quality 24 bit images (at a resolution that is more than four times higher than any other system available)
- high resolution digital camera
- a mailbox function providing advanced store and forward features.

PathSight examines a biopsy specimen via remote controlled microscope and relays images of these, live, to online parties who are in continuous contact via the system's live video link.

Typically, the parties would share on-screen a low-resolution overview image of the specimen along with clinically relevant patient details and up to 18 diagnostically significant images referenced to their locations within the overall specimen.

Images can be discussed in live sessions, saved and databased with session and patient record for future reference.

PathSight supports all pathological microscopic and gross anatomy images along with mammograms, X-Rays and dermatological images.

The key benefits of using the Fairfield Imaging PathSight system against conventional pathology are:

- Mass recording of high quality image data
- Choice of and access to different images
- Automated screening
- Greater reproducibility
- Remote control diagnosis
- Improved user time management

PathSight has been subject to rigorous and ongoing trials and peer review.

The interest in and uptake of PathSight is fast-growing in the UK pathology sector. The system is enjoying increasingly wide acceptance amongst Trusts and Hospitals in the NHS and private sectors.

Today's decreasing number of pathologists are required to travel to case meetings on a weekly basis, further limiting the number of cases they can review and diagnose.

This journey time is conservatively estimated at consuming 50 days per pathologist per annum, putting an additional stress on a profession which is already grossly overworked and at a cost to the NHS of around £2.16 million each year.

In UK PathSight is currently installed at hospitals in London, Edinburgh, Glasgow, Nottingham, Sheffield and Chesterfield.

In addition to UK installations, a network of 13 PathSight telepathology systems is now established for routine clinical use in most of the Regional District Hospitals in Southern Norway and similar installations are underway in Japan and Southern Sweden.

Cervical cancer is the second most common female cancer. Whilst screening has reduced the incidence of invasive cervical cancer it has also identified smears as being abnormal for large numbers of women who have no disease or very transient minor changes.

Fairfield Imaging provides two systems to better enable the microscope examination of the cervix (colposcopy): the **DataRep Colposcopy System** and its latest **VideoRep Telecolposcopy System**. Both offer clear and fast image delivery and reporting features.

The DataRep still image system is for hospital use by a consultant gynaecologist (or similarly trained specialist).

In addition to fulfilling all of the BSCCP Minimum Dataset (MDS) requirements, DataRep benefits from being easy to use and to integrate with existing systems.

Early installations of DataRep have been made in UK and in Eire.

VideoRep brings colposcopy tests nearer to the patient with a system that enables screening tests to be carried out by a practice nurse at a GP's surgery.

Using a portable videocolposcope, a nurse can capture 60 second video images and transmit these with any accompanying data via ISDN lines to a hospital colposcopologist for review, diagnosis and reporting back to the Primary Care site. A letter is automatically generated to the woman informing her of the findings and any proposed action.

This new system brings significant and added levels of convenience to all concerned, speeding up the process of analysis and reporting and reducing both costs to NHS Primary Care Groups and the waiting time faced by women anxious for their test results.

Fairfield has completed a successful NHS-funded pilot study and a randomised prospective multi-centre trial of the VideoRep is underway in the Birmingham area. Early data from this trial will be available in 2002.

Both Fairfield Imaging Colposcopy systems offer special editing and reporting features such as:

- database customisation
- split screen image comparison
- image editing and annotation
- easy automatic letter generation
- visit report printing
- bespoke reporting
- email capability

Both solutions provide improved quality of image over competing systems on the marketplace.

Medical Solutions' group turnover for the ended December 31 2000 was £9.8m against £1.3m for 1999 with a gross profit achieved of £4.3m. Its three

divisions have developed new business footholds in the US and Continental Europe to complement the group's UK operations.

Fairfield Imaging anticipates growing uptake of DataRep in the UK and in continental European countries when the MDS requirements translate into their markets. With its time and cost savings capabilities, VideoRep is likely to draw even greater demand as the practice of telemedicine becomes increasingly mainstream.

With Medical Solutions' support, Fairfield Imaging Ltd anticipates being the leading provider of advanced digital imaging systems for the UK healthcare sector by 2004.