

## The future for pathology

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The year 2000 has been used as a marker or watershed in describing events over an enormous range of human activity. The relentless pace of advance in medicine means that there is always something to remark upon which is new and which presents a new hope for many afflicted by some of the commonest diseases of man. It is noteworthy that rapid translation of recent discoveries in basic sciences into contributions to everyday life is seen more rapidly and effectively in medicine than in most other disciplines. Pathology is at the forefront of this type of integration.

The techniques of molecular biology now allow more precision in diagnosis and in some instances allow us to be more precise about prognosis, but it is important to realise that this is not simply a matter of disease labelling. In the well-recognised normal mucosa-adenoma-carcinoma sequence which results in most large bowel neoplasia, a better understanding of the genetics of the step-wise pathogenesis of these conditions can affect health policy; the manner of investigation of gut associated bleeding may be altered by knowledge of the time sequence of events. If an individual presents in this way at 55 years, say, and no genetic change is found in the large bowel mucosa on biopsy by exploiting our new techniques, then it becomes clear that there is no time to develop cancer before death from another cause will intervene. This will avoid the need for unpleasant investigations if the symptoms recur and current trials ad-

dress the benefits for the individual and will quantify the apparently large savings for the health system.

The use of fluorescence in situ hybridisation (FISH) allows the better definition of genetic change in abortions or in malformed foetuses, with enormous potential benefit in terms of the prognosis given to parents with regard to future pregnancies. This may offer reassurance but may also provide the explanation of what has happened, an explanation so often sought by patients in this difficult area. FISH is also a rapid and valuable diagnostic method in the precise diagnosis of some groups of tumours which are notoriously difficult to differentiate.

Classical methods are also demonstrating a new value as clinical techniques change. The advent of invasive and aggressive cardiology, for example, where the lesions of atherosclerosis are subjected to direct intervention means that the techniques of surgical pathology can be applied to resected lesions. This gives new insights into the pathogenesis of the dangerous phases of arterial disease and better understanding of the pathogenesis of acute complications of this essentially chronic and often intractable problem.

As our basic understanding of a number of processes increases we are better able to provide a precise diagnosis in infectious disease, by hybridisation or immunochemical recognition of organisms and to give important information about the suitability of cases

for treatments (interferon and/or Ribavirin for Hepatitis C for example).

Changes in the pattern of work with direct pathological involvement in "one-stop" clinics where radiologist and pathologist work closely together (in breast disease, say) are making worrying and traumatic processes for patients less disturbing, as delays and recurrent hospital or clinic visits are reduced. A process of management of basal cell carcinoma which used to need a visit to a dermatologist, an appointment for a biopsy, an assessment visit for report evaluation and a further visit for the first radiotherapy treatment can now be gone through in one session. A skin scrape permits cytological diagnosis, a direct report is made and discussed and a first visit to radiotherapy follows. Increasingly pathologists are involved in fine needle aspiration work in diseases of the lymphoid tissues and in thyroid disease, where the ability to obtain tissues close to the site where modern techniques are applied greatly simplifies the management of the individual patient.

Other changes require a radical rethink in the way we have worked. Classification systems in liposarcoma may include seven to ten "varieties" depending on the system used; genetics tell us there are only two. Some cherished expertise may turn out to have no clinical significance - always a difficult thing to accept but one which has occurred in other branches of medicine as new techniques advance.

A note of caution. It is evident from long experience that the maintenance of quality controls in laboratories is a central problem in pathology. The newer techniques, including those of molecular biology, are demanding. It is necessary to give close attention the proper use of reagents, there is a constant need for their evaluation in terms of performance, there is a particular problem faced by small laboratories who do not do enough work for proper internal comparisons to be made or to justify belonging to co-operative evaluation schemes and an imperative requirement for external evaluations of performance to be made regularly. This makes these techniques unsuitable for small laboratories and is leading to concentration of work into larger groups. However, telepathology, which has also evolved rapidly in recent years, may help a great deal in allowing small practices to stay in touch with the developments that promise so much.

Specialisation increases as therapy advances; accurate diagnosis is essential if medicines of high potency are to be used. This again favours large groupings where there can be system based (renal, gastrointestinal, dermatological, hepatic, breast, pulmonary and so on) or age-based (neonatal, paediatric) specialists working in close collaboration. Add to this the need for scientific input from specialist graduates and the modern Pathology department becomes a formidable weapon in the struggle to improve our health.