Impact of new technologies in ophthalmology

New technologies in medicine generally have many origins, some predicted and planned, others serendipitous. The application of the new genetics is an example of the former while the discovery of antibiotics and the intraocular lens might better fit into the latter category. The application of new technology to medicine is set to produce a revolution in health care, in both diagnostics and its management. According to Hendee of the National Institutes of Health, USA, "biomedical informatics, imaging, and engineering are major forces driving the knowledge revolutions that are shaping the agendas for biomedical research and clinical medicine in the 21st century." This is a bold statement but there is considerable evidence to support it. Remarkable advances are being made in technologies which will indeed shape the way disease control is managed. Examples include high throughput genetic screening in the post-genomic era using microchip arrays, biosensor techniques which will allow mass screening for antibodies, highly sensitive devices to improve management of patients in intensive care, electronic methods which will guide surgical techniques under computer control, and improved polymerase chain reaction techniques to assist in the diagnosis of infectious disease. Developments in proteomics, genomics, and imaging will not only impact on medical care but will provide us with a much greater understanding of normal physiology and, in turn, pathology, and the NIH has called for a greatly increased investment in the development of the three core "tools" identified above. Indeed, a new institute to study systems biology has been established with part of its remit to maximise the advancement and application of the new technologies.7

Ophthalmology as a specialty covers the widest of spectra and thus lends itself to the development and application of new technologies. This applies both to the basic sciences of ophthalmology and vision, and to investigative methodology and treatments in clinical ophthalmology. The American Medical Association in its continuation of the global theme issues has proposed new technologies as the theme for 1999 and many journals worldwide are participating in this effort. Thus, the current issue of the BJ O contains a series of articles on a range of new technologies and approaches to ophthalmological problems. All three of Hendee's "tools" are addressed including information technology, imaging, and bioengineering. Thus, informatics forms a significant part of the agenda for improving the practical and possible with the new technologies together the practical and possible with the new technologies. These might involve the use of good patient data bases (see paper by Aylward and Palmer, p 1264) with remote monitoring systems such as telemedicine (see paper by Murdoch, p 1254). Bringing together the practical and possible with the new technologies will be the challenge of tomorrow for disease control at the population level, particularly in the developing nations, but also at the level of individual patient care.

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