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 basic science in many fields including physics, engineering, informatics, computer technology, genetics, molecular and cell biology, and many more disciplines. In many cases the potential spinoffs for medicine generally and ophthalmology in particular could not have been predicted and are a strong argument for promoting both directed and "blue skies" research.

Not all problems in ophthalmology are immediately amenable to the new technologies. Some worldwide blinding disease such as trachoma (see paper by Mabey and Bailey, p 1261) will need combinations of new laboratory technologies, for instance for investigative purposes, with imaginative approaches to disease control. These might involve the use of good patient data bases (see paper by Ayward and Palmar, 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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