It has become increasingly apparent that the quality of communication between physician and patient has risen in importance and effective communication can result in improved patient health outcomes [Stewart 1995; Greenfield et al. 1985]. Collaboration between the School of Media Arts and Imaging, University of Dundee and Ninewells Medical School and Hospital, Dundee has identified that 3D visualisation methods and techniques can allow patients a greater understanding of disease process and associated health implications. In the area of Diabetes, there is a lack of alternatives to basic, written leaflets and the demand for more engaging forms of information communication that address issues of readability, accessibility and consideration of patient needs, [Boulos 2005; Coulter 1998; Estey et al. 1991] is high.

This work is the result of a pilot project undertaken during MSc study to explore the potential use of 3D graphics in diabetes disease understanding. Amongst diabetes sufferers in the UK, a trend of reduced attendance at essential annual eye screening appointments has developed. A major factor that has contributed to this development is the patient’s lack of understanding with regards to how diabetes affects the eye. The resulting 5-minute film uses a combination of live action, still image and digital 3D representations to explain the main aspects of Diabetic Retinopathy. A traditional animation approach was taken, with storyboard panels offering the flexibility needed to convey visual ideas fully and succinctly to non-visual thinkers (i.e.: clinicians), whilst still offering the flexibility for change and improvement (Figure 1).

The approach to the visual style of the 3D elements developed through a desire to achieve recognisable and accurate anatomical references without clouding the essential information with overwhelming anatomical structures (Figure 2). This resulted in allowing the viewers to easily relate to, and recognise, the anatomy in question without being distracted by unnecessary detail.

This pilot work has shown that creating a 3-Dimensional representation of the information contributes to furthering understanding of spatial aspects not always obviously apparent in 2-Dimensional renderings [McArthur et al. 1997]. This aims to allow the viewer an increased ability to interpret images provided to them on diagnosis. Providing information in this manner endeavours to support the shift to patient-centred care in Diabetes in the UK, encouraging informed decision-making by patients. It has the potential to play an important role in supporting both primary and secondary care representatives in addressing the needs of the individual patient.

Information, visual and interface design are all converging as technology becomes more integrated into everyday life. Patients are increasingly being referred to as ‘consumers’ of health, and as such, expect the high standards associated with the service industry. 3D visualisation and animation have the potential to fill the need for high quality, concise and accurate information resources with patient’s needs at the core. Future lines of investigation include exploration of the ways in which patients interact with the information available to them. The flexibility of 3D graphics provides an opportunity to explore the possibilities of immersive environments, allowing research into the effects the viewing environment may have on patients’ reactions and emotions in addition to the level of understanding gained from the information.

References


