

## Introduction

Providing patients with quality, accessible information is necessary when attempting to obtain informed consent prior to surgery. Obtaining Informed consent is a legal requirement and the healthcare provider must ensure that the patient is fully aware of the risks and benefits before any surgery can take place. There are various methods of delivering this information including patient information leaflets, diagrams, videos and numerous multimedia formats. The difficulties that healthcare providers face include a wide ranging service user base with varying levels of literacy, physical and mental disabilities and spoken languages. This creates a need for the information to be presented using an array of different media in order to meet the individuals requirements.

Another problem is patients obtaining information from external sources. Numerous studies show patients are self diagnosing using resources such as the internet. This can be problematic as the information can be irrelevant, inaccurate or misleading.<sup>1</sup>

## Aims

The aim of this study was to produce a comprehensive patient information resource (PIR) in a single device that would ensure the patient has all the necessary information to make an informed decision about their treatment. To increase accessibility of the information and reduce the patient's need to seek further information from unapproved external resources.

## Methods

iBooks Author, a program for creating digital books released by Apple was chosen to create the information resource. iBooks Author allows the creator to include an array of multimedia including:

- Interactive diagrams
- 3D interactive models
- Videos
- Text
- Diagrams
- Audio descriptions

The digital books can then be viewed through the iBooks app which can be opened on an iPad and any mac computer with the latest operating system (Mavericks as of Jan 2014). The robust construction of the Apple iPad with high quality screen and processor ensures the user receives a rich reliable experience. The ability to use gestures to scroll through the book also ensures the patient is easily able to navigate through the information.

When compared to app development, iBooks Author makes the digital publishing process very simple. iBooks Author does not require any computer programming skills, has a simple user friendly interface and is free of charge.

Three Neurosurgical patient information digital books were produced including ACDF (anterior cervical discectomy and fusion), lumbar discectomy and lumbar laminectomy. Various multimedia elements were developed for inclusion and designed to explain the complex medical information in the simplest way possible. These included:

- A video presentation from the consultant surgeon
- Illustrations of the anatomical structures
- An illustration of the condition
- A 3D animation of the surgery
- A 3D interactive model of the anatomical structures
- A patient experience video

The software used to create the animations, Blender, was also free (open source). Although some training is required the user can quickly produce broadcast quality medical animations. 32 volunteer patients were presented with an iPad whilst they were waiting for their assessment. They were given 10 - 15 minutes to read through the digital book and then after the assessment each patient was asked to complete a brief

questionnaire. The pre-operative nurse was also asked to complete a questionnaire for each patient they assessed.

## Results

Results showed that the digital books were well received by all patients and also showed that the majority of patients did not feel the need to seek further information from external sources. It was also found that almost half of the participants had access to an iPad from home.

The Neurosurgical information resources can be downloaded here:

<https://itunes.apple.com/us/book/anterior-cervical-discectomy/id797014628?mt=11>

The latest version of Apples Operating System and the iBooks Author app are required before downloading.

## Conclusions

- iBooks Author can be used to create effective multimedia patient information resources.
- Development costs are low when compared to app development.
- Numerous multimedia elements can be included in a single device.
- iPads are increasingly being used by the British public and offer an opportunity for the NHS to provide interactive, engaging patient information in a robust and reliable format.
- Although around half of the participants had access to an iPad at home it would be advantageous to determine if it is possible to create non Apple digital books in order to maximise accessibility.
- Once established it may be possible to roll out the project throughout the Trust by providing other Medical Illustration departments with the iBooks Author file and explanatory multimedia elements. The illustrator or designer would then be able to adapt the content and adjust the design to suit their own Trust branding.

## Limitations

The iBooks app can only be viewed on Apple devices which limits the books accessibility from home. To ensure all patients receive the information in the hospital setting iPads with the digital book software are made available to them during their pre-operative assessment.

A pdf version of the resource can also be made available including embedded Flash movies and 3D interactive models that can be manipulated directly in the pdf. However the pdf lacks the quality, interactiveness and tactile nature of the resource. Also due to the array of different devices that will be used to access the pdf, considerably less reliable.

## Reference

1. Wolterskluwerhealth (2012) Wolters Kluwer Health Q1 Poll: Self-Diagnosis [Online], Available: <http://www.bioheat.ac.cn/paper/07/animation%20of%20cryosurgical%20process%20of%20biological%20tissues%20during%20tumor%20treatment.PDF> [dec 2011]