

QR Codes – an Essential Tool for Orthodontist's Smartphone

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Abstract

QR codes, which stand for Quick Response code, are the new generation of barcodes, which have widespread use in the retail industry. They have also been used in medical and dental field for much more efficient practice management. In orthodontics, QR codes have use in record keeping of the patient, inventory management, practice management, practice marketing and providing much better understanding to the patient regarding the use of their appliance. Though with a few drawbacks, The QR codes have a wide potential to be used in orthodontics so that the practice can be managed much more efficiently.

Keywords

Dentistry; Orthodontics; QR Code

A QR code, which stands for Quick Response code, is one of the most rapidly disseminating innovations the technology has to offer. QR codes are two-dimensional barcodes [1]. As the name suggests these codes can be scanned at a much faster rate as compared to the barcodes. QR codes were first introduced by Denso Wave, a subsidiary of Toyota to swiftly scan the vehicle parts during the manufacturing process [2]. In the recent times, QR codes have gained wide acceptance and can be seen on most of the articles ranging from grocery and daily use products to medicines, online payment wallets and patient tags. The QR codes are basically symbols, which can be scanned using lasers, or camera based systems and information like product serials and specifications can be encoded into these symbols.

Figure 1: QR Codes are 2-D Matrix Barcodes



QR codes are said to be the next generation of barcodes. Barcodes were first introduced in 1970s. These are set of parallel lines and numbers which can store up to 20 characters and are very commonly seen on all the retail products. Information such as commodity prices, date of manufacturing etc. can be easily encoded in such barcodes. Introduction of barcodes revolutionized the retail industry as information could be scanned in seconds using specially designed laser units and there was no need to feed the quantity and pricing information manually. The QR codes were introduced to store much more information. They can

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store around 4500 alphanumeric characters, are scanned much more quickly and allow for much higher margins of error. Quick response codes have the ability to handle different types of data such as numeric and alphabetic characters. QR codes have the advantage of smaller printout size, high speed scanning and can be recognized correctly even if 50% areas of barcode are damaged [1].

QR codes can be read by freely available software using any Smartphone, tablet or laptop with a camera, or by a QR code scanner. Due to the constant rise in people using smartphones, QR codes have also gained significance as now most of the people can scan them with a single click.

QR codes have been found to have widespread application in medical and dental world. In hospitals QR codes are mainly used for patient identification. QR codes are printed on the patient wristbands or patient files so as to have easy patient identification and get knowledge about the history and other significant findings. QR code-based technology has higher data storage capacity, lower implementation cost, technical simplicity and has the wide availability of free programs for reading and decoding by camera-equipped smartphones. These features make this technology attractive for patient identification purposes, especially for institutions in developing countries with limited sources [3].

QR codes with so many advantages have found their way into the Orthodontist’s offices also. They have been used for many purposes like patient management, record keeping, appliance identification, inventory management, practice marketing, patient education, student work assessment and forensic identification. QR codes are very useful in busy Orthodontic practices. Every time a new patient comes, the OPD Card of the patient can be labeled with a QR code. All the information about the patient can be encoded into this code so that whenever the patient comes only a single scan can reveal all the information and significant findings about the patient. This has an important role in patient management as appointments of the patients can be very easily recorded. By a single scan the Orthodontist can know what all mechanics and materials have been used on the patient in the past and also if the patient is timely reporting for the appointments.

QR codes are an excellent tool for record keeping. Orthodontics unlike all other branches has much more significance of patient records, as they need to be stored for a very long duration of time and need to be assessed every now and then to know about the treatment progress. The records of the patient can be labeled with QR codes

with provides with easy identification of the records. Also by creating a database information can be stored in the QR code on patients OPD card indicating the location of the records of the patient. This helps in saving a lot of valuable clinical time.

Figure 2: Patient Study Model with QR Code



QR codes also have a role to play in identification of patient appliances and providing instructions to the patient regarding their appliances. The QR code can be printed on a paper, after being laminated it can be incorporated into the orthodontic appliance. The Orthodontists can scan the QR code to identify which patient’s appliance it is. Also instructions regarding the appliance can also be encoded into QR code, which can be scanned by the patient at their convenience. This helps to decrease the necessity of verbally reinforcing the instructions to the patient. QR codes also form an excellent tool for patient education. Patients can be shown hundreds of educational videos or images just by scanning the code. The code can be shared with the patients and their parent, thus by helping the increasing awareness among them. Being technology friendly this helps to evoke an enthusiasm in today’s smartphone generation.

Figure 3: QR Code on a Hyrax Key Can Guide the Patient about Activation Schedule and Also Link to a Video Showing How to Activate the Hyrax can be Encoded



QR codes can be used for dental education and student work assessment. Interactive fixed and removable

appliance video libraries can be designed for students where they can scan the code and learn about the appliance or any dental technique. This provide with a better and practical approach toward education. Most of the dental journals are labeled with QR codes and scanning the code opens the online version of the article. The regular appliance fabrication done by the students during their orthodontic training can be labeled and scanned. This helps to know the amount of work each student has done.

QR codes can be used as an important tool for inventory management. Inventory management is a difficult part of Orthodontic practice due to the involvement of such a huge inventory. Majority of the Orthodontic articles have been labeled using barcodes or QR codes, which can be used to know about the inventory in the Orthodontic office. With the help of practice management software, this can be used to alert the Orthodontist and the support staff regarding the depleting supplies. QR codes have also been popularly used for practice marketing in orthodontics. Orthodontists can provide the patient with visiting card with QR codes to guide them for proper location of the Orthodontist’s office. Such a gesture though small, helps to attract more patients and provides an insight into the state of the art and technological friendly atmosphere of the orthodontic office.

Figure 4a: Using QR Codes for Getting Location

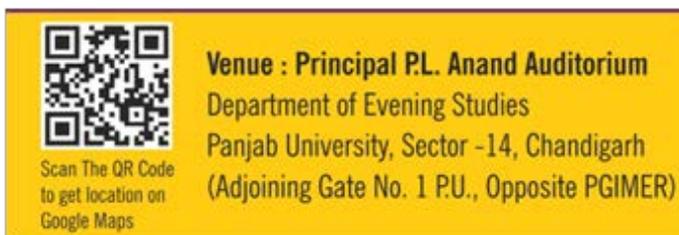


Figure 4b. Patient’s denture labelled with QR code can be scanned to know the details of the patient4



QR codes with such extensive potentials have a

few limitations to their use also. The most significant of them being the necessity to punch the information. For encoding the informtion it needs to be first feeded into a QR code generator, which requires time and personel. Also the infomartion regarding the mechanics used in a patient and apppointment schedule needs to be constantly updated, so that the QR code provides with the latest information. Thus data entry requirements are more when using QR codes. Another disadvantge with the use of QR codes is that they can scanned by anyone, putting patient’s privacy at a risk.

Nonetheless, QR codes have very widespread appliactions and should be a routine part of any Orthodontist’s office. They can have further innovative applications making the practice much more eefcentit and technology friendly. As the law of the nature, one must evolve to keep surviving in this world with cut throat competition for survival. Hence embracing new technologies such as QR codes provides with an edge to the Orthodontist’s office.

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