UIJ UroToday International Journal®

www.urotodayinternationaljournal.com
Volume 3 - December 2010

Remote Access for Teaching and Reporting Urodynamics: Use of Smartphones

Salvador Vilar Correia Lima,[1,2] Fabio de Oliveira Vilar,[1,2] Eugenio Soares Lustosa,[1] Carlos Antonio de Souza,[1] Evandilson Guenes C de Barros,[1] Sharlles Gois Cavalcanti[1]

[1]Department of Urology/Surgery, Federal University of Pernambuco, Recife, Brazil; [2]Centro Urológico de Pernambuco, Recife, Brazil

Submitted August 24, 2010 - Accepted for Publication October 7, 2010

ABSTRACT

INTRODUCTION: The field of telemedicine has expanded over the past few decades. Remote operation of various devices enables physicians to provide off-site assistance in different areas of medicine. The purpose of the present report was test the use of hand-held smartphones for remote-access urodynamic telementoring.

METHODS: Telementoring was performed using the Teleurodynamics software program (www.urodyn.net). The program was downloaded and installed at the testing site. Simultaneous use of voice over internet protocol (VoIP) software through smartphones allowed: (1) visualization of the tests for individuals at all settings, and (2) dialogues between the person performing the test, observers, and patients. Mentors participated during the test or helped interpret stored data. Password-protected access provided patient privacy. Urodynamic tests were performed between January, 2008 and August, 2010. The tests were conducted by residents at one center and by a technician at a second center. A recording of the procedure is available from the author on request.

RESULTS: The authors remotely monitored over 1000 urodynamic studies, using 50 different examiners in various locations. They were able to analyze the urodynamic tests and reports in the same way as when the examiner was in situ, because all participants were using the same software programs. Occasional loss of the signal was eliminated by using an optional portable 3G connection.

CONCLUSIONS: Telementoring urodynamic examinations by using computers and smartphones facilitates teaching and consultation. The technology adds very little cost to equipment and operating procedures. Hand-held smartphones can make the procedure available to a large number of users.

INTRODUCTION

Modern Internet technologies applied to different areas of science have opened a wide range of opportunities to access and operate various devices in any setting. The field of telemedicine has been expanding. We recently reported our initial experience using common Internet software and webcams for: (1) remote examination of patients needing urology services, and (2) shared interpretation of test results between sites [1]. This technology is particularly useful to mentor junior physicians or to examine or treat patients in remote locations where there are technicians but no physician.

International Mobile Telecommunications-2000, better known as 3rd generation (3G) connection, allows the use of smartphones for remote access to places where conventional

KEYWORDS: Urodynamics; Telementoring; Cystometry

CORRESPONDENCE: Salvador Vilar Correia Lima, MD, Department of Urology/Surgery, Federal University of Pernambuco, Av. Parnamirim, 95, Recife, Pernambuco, 52060, Brazil (urology@salvador.net).

CITATION: *UroToday Int J*. 2010 Dec;3(6). doi:10.3834/uij.1944-5784.2010.12.02

Abbreviations and Acronyms

3G = third generation

VoIP = voice over internet protocol

UroToday International Journal®

mini-report

Remote Access for Teaching and Reporting Urodynamics: Use of Smartphones

access to the Internet is not available. The purpose of the present study was to expand the methodology that we previously reported for telementoring in urodynamics to the use of smartphones.

METHODS

Telementoring was performed using a software program called Teleurodynamics (www.urodyn.net). The program was downloaded and installed at the testing site. The website contained a description of the methodology and procedures. The information was available in 3 languages (Portuguese, English, and Spanish). The reader registered in the system could connect with it and obtain a subscription.

Simultaneous use of voice over internet protocol (VoIP) software such as Truphone (Software Cellular Network Ltd; London, UK) allowed: (1) visualization of the tests for individuals at all settings, and (2) dialogues between the person performing the test, observers, and patients. Patient privacy was preserved through password protection of the data. The local operator could give an unlimited number of persons simultaneous or independent access to the tests. A recording of the procedure is available from the author on request.

Urodynamic tests were performed between January, 2008 and August, 2010. The tests were performed by residents at one center and by a technician at a second center. After the tests were conducted, they were stored on the website. Most equipment offers the possibility of an extended graph, which was particularly useful for complex cases. The computer connected to the urodynamic equipment could be explored, and tests could be monitored in real time and reported by the remote participant. The examiners could also connect with faculty physicians following storage of the data to collaborate on test interpretation.

RESULTS

The authors completed over 1000 remote accesses to the centers during the study period. The procedure was completed by 50 different examiners in various locations. It was possible to analyze the urodynamic tests and reports in the same way as when the examiner was in situ, because all participants were using the same software. In a very few instances, temporary loss of connection led to interruption of the study. The utilization of an optional portable 3G connection has prevented this inconvenience.

DISCUSSION

The use of the Internet and various technology devices has created unlimited possibilities for remote medicine. Application of these tools to urodynamics and other tests is now available to a large number of people in nearly any setting. Rapid consultations between residents and staff in training can be made at any time using the benefits of 3G connection and VoIP. Connections may involve an unlimited number of people in different settings. Mentors can be accessed from any location to guide technicians or junior faculty. Additionally, a databank of standard reporting tests can be created to facilitate reporting procedures. This databank is especially useful when using smartphones, where typing large reports may be difficult or too time-consuming.

Another area that would benefit from this methodology is ambulatory urodynamics (both clinical and experimental). Mills et al [2] reported their experience using radiotelemetered cystometry in experimental animals. These studies could be expanded by using live remote monitoring of bladder activity.

The present methodology can also allow highly experienced professionals with specific expertise to give remote advice, particularly for complex cases. Having the tests stored at a website and not at a specific computer reduces the risk of missing data and facilitates test visualization and reporting when the equipment is not in use or connected. The tests can also be saved and printed locally or sent via a smartphone.

The portal presented here uses known systems such as Virtual Network Computing (RealVNC Ltd; Cambridgeshire, UK) and Java software platform (Sun Microsystems, Oracle Corp; Redwood Shores, CA, USA). People more familiar with these types of programs can create alternative models, thereby further expanding their use.

ACKNOWLEDGEMENTS

The authors thank the staff at NUTES- Núcleo de Telessaúde, Hospital das Clínicas, Federal University of Pernambuco for technical support during the implementation and maintenance of this program.

Conflict of Interest: none declared.

REFERENCES

1. Lima SV, Vilar FO, Carvalho LHF, Bezerra JAD, Souza CA. Telementoring in urodynamics: initial experience. *UroToday Int J.* 2008 Aug;1(2). doi:10.3834/uij.1939-4810.2008.07.04.

2. Mills IW, Noble JG, Brading, A.F. Radiotelemetered cystometry in pigs: validation and comparison of natural filling versus diuresis cystometry. *J Urol*. 2000;164(5):1745-1750.