



## Telementoring in Urodynamics: Initial Experience

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### ABSTRACT

#### BACKGROUND

The development of computer-based equipment for diagnostic and therapeutic purposes has evolved considerably in the past few decades. The ability to remotely operate various devices has led physicians to provide off-site assistance in different areas of medicine.

#### OBJECTIVE

The aim of this paper is to share the authors' initial experience with remote-access urodynamic telementoring. The main focus is in the possibility of using this method for teaching purposes.

#### METHODS

A combination of software installed in both the equipment and the remote computer allowed mentors to participate in the test both peri- and post-procedurally. The use of a webcam allowed visualization and dialog with the patient, and more than one observer could monitor technicians performing the test. Password-protected access warranted patient privacy.

#### INTRODUCTION

Although cystometry was first performed in the nineteenth century, its clinical value was only recently recognized with the development of the clinical science of urodynamics [1,2]. Some authors believe that modern cystometry began in the 1950s, and the period from then to the present is the appropriate subject of a review on modern methodologies [3]. With the development of computer-based equipment, this diagnostic method has evolved considerably in the past few decades. Additionally, modern Internet technologies have been applied to different areas of science, opening a wide range of opportunities to access and operate devices remotely. Remote

#### RESULTS

The authors remotely monitored over one hundred urodynamic studies performed in two centers during the past 6 months. The results were satisfactory concerning remote visualization and reporting of tests. The use of this technology adds very little cost in terms of both equipment and operating procedures.

#### CONCLUSIONS

Telementoring in urodynamics may open new possibilities for the teaching and spreading of this important urologic diagnostic tool.

#### KEYWORDS

Telementoring, Urodynamics, Diagnostic, Urinary incontinence

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interpretation of electrocardiograms and performance of noninvasive procedures in cardiology have been in practice for a few decades in different centers throughout the world [4]. Telementoring has been mostly applied for remote-controlling surgical procedures in various fields, but the need for sophisticated new technology together with some ethical questions may put some limitations on the use of this tool [5].

We developed a system involving the Internet that allows telepresence and interpretation of urodynamic testing, offering new possibilities in this area of urologic diagnosis.

## METHODS

Telementoring was performed by using common Internet software downloaded and installed in the computers at both the testing site and the remote location. A webcam and the software Skype™ allowed two-way communication of both sound and image in order that the remote examiner was able to interact with the patient and the technician. Different ways of password-protected access were offered in order to preserve patient privacy. More than one observer could gain access to the test either simultaneous or independently and with the ability of observing and reporting on it. The actual tests were performed by residents in one center and by a trained technician in the other.

## RESULTS

From January 2008 to June 2008, over 200 remote access urodynamic tests were performed. Different examiners were involved at the two centers both during and after the tests. There was no difficulty in accessing and reporting the results of the tests.

## DISCUSSION

The fantastic evolution in web communication has changed the way people and institutions interact. Quick and efficient ways of communication have provided opportunities of interacting regardless of distance. We had worked on this idea over a decade ago, but the technology available at that time proved very slow and unstable. The low-quality connection to the remote computer led us to temporally abandon the idea [6]. The fast development of computer hardware and software, as well as the quick and efficient evolution of the Internet, has afforded unlimited possibilities to remote communication and operation of remote devices in all fields. It is expected that the routine use of these tools can make urodynamics available to a higher number of patients. Doctors in other specialties can now utilize the benefits of this test with assistance of an expert urologist located anywhere. For teaching purposes, this technology may represent an advantage for providing training courses and discussions with mentors in different locations.

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