Editorial

Predicting the future of urodynamics

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The clinical assessment of lower urinary tract dysfunction has been supported by objective measures obtained during urodynamics (UDS) for more than 30 years. Over this time, equipment has evolved with several technological advances, understanding has progressed with achievement of many milestones in UDS research, and access to care has improved with UDS equipment present in many health care centers throughout the developed world.

UDS testing began with the introduction of noninvasive uroflometry, followed by pressure flow studies, and more recently the additional use of fluoroscopy. Electromyography electrodes, air charged bladder and rectal catheters, and automated puller systems have added to the information gained at the time of study. Unfortunately, this has all come at a huge cost to the health care industry. Aside from equipment start up and maintenance fees, billing to Medicare is at a minimum is greater than $500 per study (1).

While the acquisition of more data from UDS cannot be contested, the translation to superior clinical outcomes can be. Recent data suggest UDS do not lead to superior outcomes in the setting of uncomplicated and demonstrable stress urinary incontinence (2). It is important that this data not be extrapolated to other urologic conditions or to more complicated or non-demonstrable stress incontinence. Several patient scenarios where UDS can offer diagnostic value can be supported; however, clinical trials data is limited. In order to justify the cost of this intervention, appropriately designed clinical trials documenting improvement in patient treatment outcome, including avoiding harm, should be employed. In the absence of this supporting data we can expect precertification and billing denials from insurance companies to increase and ultimately UDS utilization to drop significantly in upcoming years. Important sub-considerations include the circumstances under which simultaneous fluoroscopy (videourodynamics-VUDS) is necessary, as this adds considerably to cost, and whether the addition of electromyography has improved the diagnostic or prognostic worth of UDS or VUDS.

Patient comfort and dignity is certainly a major concern with a test that involves exposing and manipulating the urethral and anal orifices and requiring an "audience" (observer) for a typically private function. Sustained discomfort following the test has been reported, and sequelae of urinary tract infections are well documented (3). As imaging modalities improve and the sophistication of computer software to allow real time input and transmission of data evolve, at home ambulatory noninvasive methods of assessing bladder function will likely follow--much like the Holter monitor to study cardiac function. This technology will allow assessment of the patients bladder function in their usual day to day setting without the artifact of catheters and wires or the impact of observers to a usually solo activity. Cost will need to be contained with development and utilization of this emerging technology or widespread acceptance will be unlikely. In an aging population with a high anticipated prevalence of incontinence, accessible, affordable and comfortable testing will be in demand. Therefore, defined guidelines on the proper use of UDS perhaps through algorithms of care will likely be in use. For example, behavioral modifications and non-invasive conservative methods of treatment may be required prior to utilization of UDS. Undoubtedly, allocation of health care resources to an aging population will add new challenges to the treatment of urological conditions.

UDS of the future will need to balance cost effective health care with the temptation of utilizing state of the art and emerging technology. Most important will be proving that UDS have the ability to improve patient treatment as measured by patient satisfaction scores and patient reported outcome measures. Regardless of the evolution of

equipment and technology, the primary aims of UDS should remain the same: (I) to reproduce the patient's complaint during the study, and (II) to provide a pathophysiologic mechanism to explain the patient's complaint (4).

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Footnote

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