by the urodynamic catheter. Free flows are much more valuable and it is reasonable to obtain noninvasive uroflow/residual studies in all patients with significant emptying complaints. However, a large percentage of patients with emptying symptoms have them only because of the perceived need to urinate when the bladder is nearly empty. Without an adequate stretch the detrusor cannot respond with an appropriate contraction. Such patients note that the first morning void has a good flow but all subsequent voids are weak. The bladder diary will confirm the underlying pathophysiology as well as or better than a pressure-flow study.

I believe that bladder neck obstruction is common enough in the male population with IC symptoms that uroflow/residual studies might be used routinely to screen for potential obstruction. Pressure flow studies would then be used selectively for those men (and women) with relevant clinical symptoms and/or significantly abnormal screening studies. It has been argued that obstruction is also common in female patients with IC[4] but the cause is unclear and postulated to be primarily due to pelvic floor dysfunction/dysfunctional voiding. I concur with this conclusion and argue that the combination of history, physical examination and noninvasive flow studies is more than adequate to make the diagnosis and direct the patient to pelvic floor physical therapy.

Quality investigation of UDS in patients with PBS/IC symptoms would be welcome. A wide cross-section of patients should be studied with detailed UDS and then treated by the investigators blinded to the UDS results to define clinically relevant urodynamic phenotypes. However, the best evidence at this time suggests that invasive UDS is indicated only for select patients based on clinical criteria and noninvasive screening studies. UDS (complete reassessment) should also be considered for refractory patients. Irwin et al (2005) reevaluated patients referred to them with a diagnosis of IC and found alternative diagnoses in many.[5] However, UDS provided a new diagnosis in only 11 of 54 (20.4%) patients, including DO in 8 (not all responded to treatment and so this may not be relevant) and bladder outlet obstruction in 5 (although "4 had clear histories of bladder outlet obstruction").

The onus is on the clinician to rule out "confusable disorders" but this should not produce a shotgun approach to testing all patients, but rather a thoughtful, personalized investigation appropriate to each individual.

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REFERENCES

1. Hanno PM, Landis JR, Matthews-Cook Y et al: The diagnosis of interstitial cystitis revisited: lessons learned from the National Institutes of Health Interstitial Cystitis Database study. J Urol 1999; **161:** 553.
2. van de Merwe JP, Nordling J, Bouchelouche P et al: Diagnostic criteria, classification, and nomenclature for painful bladder syndrome/interstitial cystitis: an ESSIC proposal. Eur Urol 2008; **53:** 60.
3. Hanno P, Lin A, Nordling J et al: Bladder pain syndrome. In: Incontinence, 4th ed. Edited by P Abrams, L Cardozo, S Khoury et al. London: Health Publications Ltd 2009.
4. Cameron AP and Gajewski JB: Bladder outlet obstruction in painful bladder syndrome/interstitial cystitis. Neurourol Urodyn 2009; **28:** 944.
5. Irwin P and Samsudin A: Reinvestigation of patients with a diagnosis of interstitial cystitis: common things are sometimes common. J Urol 2005; **174:** 584.

PRO

NOWHERE is evidence-based medicine less "evidence-based" than in the diagnosis and treatment of interstitial cystitis. Notwithstanding the enormous output of basic science and clinical research, there have been few real advances. In the clinical arena the diagnosis of IC remains empirical based on symptoms and a wide array of exclusion criteria. In fact, there are no confirmatory diagnostic tests, no biochemical or genetic markers and no pathognomonic findings at biopsy.

Diagnostic criteria for IC have been proposed by several organizations. The International Continence Society defined ". . . Interstitial cystitis . . . (as) . . . a specific diagnosis that requires confirmation by typical cystoscopic and histological features and suggested, instead, another term, painful bladder syndrome . . ." to describe "suprapubic pain related to bladder filling, accompanied by other symptoms such as increased daytime and night-time frequency, in the absence of proven urinary infection or other obvious pathology."[1] In 2007 the NIDDK adopted the International Continence Society terminology but broadened the diagnostic criteria to include pelvic pain, pressure and discomfort typically with a persistent urge to void or urinary frequency.[2]

The goal of diagnostic evaluation is to 1) determine the source of pain, ie is it coming from the bladder or someplace else, and 2) exclude other con-

ditions in the differential diagnosis. The final diagnosis of IC/PBS is essentially one of exclusion. So how best to determine the source of pain and exclude other conditions? Some recommend cystoscopy with hydrodistention to look for the "pathognomonic findings" (which of course are not pathognomonic), the potassium sensitivity test or instillation of local anesthetics into the bladder to determine whether the pain is indeed from the bladder. However in our judgment, none of these procedures adds enough to diagnostic specificity to warrant the cost and patient discomfort.[3]

We believe that once treatment proves refractory to therapy, cystoscopy and videourodynamics should be performed. Refractory—there's the rub. How long should you treat presumed IC/PBS before you consider it refractory (weeks, months, a year)? It has been estimated that some IC/PBS treatments require 3 to 6 months or more for a successful outcome. That is much too long to wait before initiating a proper evaluation. Remember, the symptom complex of IC/PBS includes urinary frequency, urgency, voiding symptoms and pelvic pain. The differential diagnosis includes detrusor overactivity and urethral obstruction as well as urethral diverticulum in women and even bladder cancer. The former 2 conditions can only be diagnosed with certainty by UDS, and urethral diverticulum may be detected on the video portion. In fact, the presenting symptom was pelvic pain in more than half the women with urethral diverticulum in multiple series.[4] In addition, the original NIDDK exclusion criteria included 1) cystometric bladder capacity greater than 350 ml, 2) absence of intense urgency during cytometry at a bladder volume of 150 ml or less and 3) detrusor overactivity, all of which are urodynamic diagnoses.

A bladder diary should be started before the UDS, and include the time and amount of each micturition, and why the patient voided. For this assessment we prefer the urgency perception score (UPS).[5] Some patients void frequently but with a low UPS (0 to 2), which means they are voiding frequently not because of urgency or pain, but for some other reason which could include 1) a conscious attempt to avoid the discomfort they experience if they wait too long to void, 2) an acquired voiding dysfunction based on prior symptoms that are no longer present or 3) a misconception that the pain syndrome is due to a bladder abnormality that requires frequent voiding, ie they void frequently because they think it is healthy to do so. In other patients the diary shows a clear relationship between the intensity of the pain or urge to void and the voided volume. Finally, some patients void frequently in small amounts and always have a high UPS (3 to 4). Thus, the bladder diary creates the substrate upon which the urodynamic evaluation is based.

For patients who void small amounts frequently and have a high UPS the bladder is filled slowly while for other it is filled at a medium rate. During bladder filling the patient is asked to try to distinguish normal sensations from pain and discomfort, and whether bladder filling reproduces the pain. In doubtful cases the patient can be "tricked" by disconnecting the tubing from the catheter and letting the pump continue to run as the bladder is being emptied. This can be started and stopped until it is determined whether bladder filling reproduces the pain. If involuntary detrusor contractions are present, the patient is asked whether the pain was reproduced. Finally, the bladder capacity is compared to the bladder diary. During voiding the detrusor pressure uroflow characteristics define the presence or absence of urethral obstruction.

Urodynamics provides information about IC/PBS, including 1) the relationship among bladder filling, bladder volume and the intensity of urge or pain; 2) the presence or absence of detrusor overactivity or low bladder compliance and its relationship to the symptoms; and 3) urethral obstruction, which cannot be obtained by any other means.[3] Although UDS can do all of this, is it clinically relevant? Does it affect treatment choices and outcomes? We believe so. Certainly, remediable conditions such as urethral diverticulum and urethral obstruction are relevant and symptomatic DO requires different treatment than that prescribed for IC/PBS. However, you might say that those conditions are not IC/PBS. That is exactly the point. Without urodynamics you would not know that!

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REFERENCES

1. Abrams P, Cardozo L, Fall M et al: The standardisation of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. Neurourol Urodyn 2002; **21:** 167.
2. National Institute of Diabetes and Digestive and Kidney Diseases: Consensus Meeting on IC/PBS, February 10, 2007. Washington, D.C.: US Government Printing Office 2007; NIH Publication No. 07-5512.
3. Sastry DN, Hunter KM and Whitmore KE: Urodynamic testing and interstitial cystitis/painful bladder syndrome. Int Urogynecol J Pelvic Floor Dysfunct 2010; **21:** 157.
4. Romanzi LJ, Groutz A and Blaivas JG: Urethral diverticulum in women: diverse presentations resulting in diagnostic delay and mismanagement. J Urol 2000; **164:** 428.
5. Blaivas JG, Panagopoulos G, Weiss JP et al: The urgency perception score: validation and test-retest. J Urol 2007; **177:** 199.