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# Nutritional Considerations for Patients with Interstitial Cystitis/Bladder Pain Syndrome

**I**NTERSTITIAL CYSTITIS/BLADDER pain syndrome (IC/BPS) is an enigma of urology, thought to affect at least 4 million Americans, with estimates of up to 12 million.<sup>1,2</sup> IC/BPS is of interest to registered dietitian nutritionists (RDNs), as the associated urinary urgency, frequency, and pelvic pain can often be effectively managed by dietary adjustments.<sup>3</sup> Research addressing the relationship of certain foods to exacerbating symptoms prompted the American Urological Association (AUA) to include dietary modifications as first-line therapy for this condition.<sup>4,5</sup> In addition, other peer-reviewed articles advise health professionals to counsel patients with IC/BPS on nutrition interventions.<sup>6-8</sup>

The understanding of the mechanisms by which diet affects IC/BPS is limited; however, there are common bothersome foods and beverages (see Figure 1), as well as individual variations that elicit flares.<sup>9</sup> The diversity of symptom triggers complicates treatment strategies and emphasizes the need for RDNs to become knowledgeable about the connections between food sensitivities and increased

bladder pain to enlighten patients of this relationship and, if certain foods must be avoided, to ensure adequate dietary intake.

## OVERVIEW OF IC

Though usually considered to be a women's health problem, it is becoming more apparent that IC/BPS also affects men.<sup>2</sup> This syndrome is characterized by pelvic pain, pressure, or discomfort in the bladder and pelvic region, often associated with urinary frequency and urgency. A distinguishing feature of IC/BPS is that unlike urinary tract infections, the urine contains no infectious agent. Bladder pain can be severe; urinary symptoms typically result in frequent daytime bathroom visits and nocturia. Patients report varying degrees of symptoms, ranging from moderate to excruciating. For undetermined reasons, the symptoms typically wax and wane.

The cause of IC/BPS remains unknown. The diagnosis is made on the basis of typical symptoms and the exclusion of other diseases, such as urinary tract infections and bladder cancer. The pathogenesis of IC/BPS is most likely multifaceted, involving a defective bladder lining (leaky epithelium), upregulation of nerves, and inflammation.<sup>10</sup> Analysis of a large twin registry indicates that IC/BPS is more common among identical twins than fraternal twins, suggesting a possible genetic susceptibility.<sup>11</sup>

Researchers continue to investigate whether IC/BPS is a primary bladder ailment or whether it is part of a systematic disorder. Other chronic conditions often accompany IC/BPS, such as irritable bowel syndrome (IBS), fibromyalgia, and chronic fatigue syndrome.<sup>12,13</sup> Many patients with IC/BPS struggle with constipation.<sup>14</sup> Pelvic floor dysfunction, vulvodynia, and sexual dysfunction are frequent in this population.<sup>12,13,15</sup> Stress, depression, and the intensity of pain are commonly related to a poorer quality of life.<sup>13,15,16</sup>

Patients report that IC/BPS substantially impacts personal relationships, emotions, social life, and sleep/energy level.<sup>13,17</sup>

A systemic review of the literature found that "neural cross-talk" exists between the bladder and gastrointestinal tract (GI), and that the bowel influences bladder-associated pelvic pain.<sup>18</sup> Researchers hypothesize that when an IC/BPS patient consumes an item that bothers the GI tract, for example, aggravated gut nerves pass pain signals to the bladder, thereby inflaming IC/BPS symptoms. This may explain why therapies that target the GI tract, such as dietary modification and probiotics for IBS, may help control IC/BPS symptoms in some individuals with comorbidities.<sup>19,20</sup>

There have been more than 180 therapies used to treat IC/BPS, but none are totally effective for all individuals; responses to treatment vary.<sup>21</sup> This conundrum complicates the process of determining optimal management approaches. The AUA guidelines recommend that symptom severity, clinician judgment, and patient preference drive treatment choices.<sup>4,5</sup>

## EFFECT OF FOODS AND BEVERAGES ON IC/BPS

The effects of foods and beverages on IC/BPS symptoms have been acknowledged anecdotally for many years. However, it was not until recently that this relationship was systematically studied using a validated survey instrument. The benefits of dietary modifications to mitigate bladder symptoms are now stressed as is noted in the AUA treatment guidelines.<sup>4,5</sup>

In 1993, Koziol and colleagues found that 50% of 374 patients with IC/BPS reported that coffee, tea, and acidic, alcoholic, and carbonated beverages exacerbated symptoms.<sup>22</sup> During this time, urologists and nurses also began informing patients with IC/BPS to avoid foods and beverages that might cause flares.<sup>23-25</sup>

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## PRACTICE APPLICATIONS

M ost B othersome		L east B othersome	
<b>Fruits</b>			
<ul style="list-style-type: none"> <li>• Cranberry juice</li> <li>• Grapefruit and grapefruit juice</li> <li>• Lemon</li> <li>• Orange and orange juice</li> <li>• Pineapple and pineapple juice</li> </ul>		<ul style="list-style-type: none"> <li>• Apricots</li> <li>• Bananas</li> <li>• Blueberries</li> <li>• Dates</li> <li>• Melon (honeydew and watermelon)</li> <li>• Prunes</li> <li>• Pears</li> <li>• Raisins</li> </ul>	
<b>Vegetables</b>			
<ul style="list-style-type: none"> <li>• Hot peppers</li> <li>• Pickles</li> <li>• Sauerkraut</li> <li>• Tomato and tomato products</li> </ul>		<ul style="list-style-type: none"> <li>• Avocados</li> <li>• Asparagus</li> <li>• Beets</li> <li>• Broccoli</li> <li>• Brussels sprouts</li> <li>• Cabbage</li> <li>• Cauliflower</li> <li>• Celery</li> <li>• Cucumber</li> <li>• Eggplant</li> <li>• Mushrooms</li> <li>• Peas</li> <li>• Potatoes (white, sweet potatoes, and yams)</li> <li>• Radishes</li> <li>• Spinach</li> <li>• Squash</li> <li>• Turnips</li> <li>• Zucchini</li> </ul>	
<b>Grains</b>			
<ul style="list-style-type: none"> <li>• Oats</li> <li>• Rice</li> </ul>			
<b>Protein Foods</b>			
<ul style="list-style-type: none"> <li>• Beef</li> <li>• Eggs</li> <li>• Fish (shrimp, tuna fish and salmon)</li> </ul>		<ul style="list-style-type: none"> <li>• Lamb</li> <li>• Nuts</li> <li>• Peanut butter</li> <li>• Pork</li> <li>• Poultry (chicken and turkey)</li> </ul>	
<b>Dairy</b>			
<ul style="list-style-type: none"> <li>• Milk (low-fat and whole)</li> <li>• Cheeses (mild)</li> </ul>			
<b>Condiments</b>			
<ul style="list-style-type: none"> <li>• Chili</li> <li>• Horseradish</li> <li>• Salad dressings</li> <li>• Vinegar</li> </ul>			
<b>Beverages</b>			
<ul style="list-style-type: none"> <li>• Coffee (caffeinated and decaffeinated)</li> <li>• Tea (caffeinated)</li> <li>• Carbonated drinks (cola, non-cola, diet, and caffeine-free)</li> <li>• Beer</li> <li>• Wine (red and white)</li> <li>• Champagne</li> </ul>		<ul style="list-style-type: none"> <li>• Grain beverages/Coffee substitutes (Cafix<sup>a</sup>, Pero<sup>b</sup>, Roma<sup>c</sup>)</li> <li>• Water</li> </ul>	
<b>Other Foods</b>			
<ul style="list-style-type: none"> <li>• Chocolate</li> <li>• Indian food</li> <li>• Mexican food</li> <li>• Spicy foods</li> <li>• Thai food</li> <li>• Pizza</li> </ul>		<ul style="list-style-type: none"> <li>• Pretzels</li> <li>• Popcorn</li> </ul>	
<b>Additives/Artificial Sweeteners</b>			
<ul style="list-style-type: none"> <li>• Monosodium glutamate (MSG)</li> <li>• Artificial sweeteners (Equal<sup>d</sup> (sweetener), NutraSweet<sup>e</sup>, saccharin, and Sweet'N Low<sup>f</sup>)</li> </ul>			

<sup>a</sup>World Finer Foods.<sup>b</sup>Unifrank Lebensmittelwerke GmbH.<sup>c</sup>Atlantic Natural Foods.<sup>d</sup>Mersiant Company.<sup>e</sup>NutraSweet Property Holdings, Inc.<sup>f</sup>Cumberland Packing Corp.**Figure 1.** Experience with specific foods and beverages reported by patients with interstitial cystitis/bladder pain syndrome.

A decade later (2004–2006), the Events Preceding Interstitial Cystitis case-control study<sup>26</sup> found that 85% of newly diagnosed patients experienced increased thresholds of bladder pain

after intake of certain foods and beverages. Analysis included a comparison with the Interstitial Cystitis Data Base cohort—diet exacerbated IC/BPS pain in 77% of this group.<sup>26</sup> Furthermore, 91%

of 560 patients indicated a relationship between dietary intake and symptoms in a self-report questionnaire developed by the Interstitial Cystitis Association; 63% reported using dietary

modification concurrently with other treatments.<sup>27</sup>

In 2007, Shorter and colleagues,<sup>9</sup> using a validated questionnaire, surveyed 104 female patients with IC/BPS; over 90% reported that certain foodstuffs were problematic. Women were asked whether and how 175 items affected their symptoms. The worst offenders were coffee, tea, soda, alcohol, citrus fruits and juices, artificial sweeteners, hot peppers, and tomatoes. However, there were variations in responses among individuals. Not all the same foods affected respondents in a similar manner. Patients with the worst bladder symptoms as determined by the O'Leary Sant Symptoms Index and Problems Index and the Pelvic Pain, Urgency/ Frequency Patient Symptom Scale had the greatest food sensitivities.<sup>9</sup>

A 2009 Internet-based survey reaffirmed these findings.<sup>28</sup> Employing a  $\chi^2$  goodness-of-fit test, self-report data were analyzed for 1,982 respondents who confirmed a diagnosis of IC/BPS. Dietary changes were used by 83% of this group to control symptoms.<sup>28</sup>

In a web-based, cross-sectional study conducted in 2009-2010, researchers from the University of South Florida found further evidence connecting diet with IC/BPS flares.<sup>29</sup> Nearly all (96%) of the 598 respondents indicated that certain foods and beverages made symptoms worse. The primary trigger items were similar to those found by Shorter and colleagues<sup>9</sup> and included citrus fruits, tomatoes, coffee, tea, carbonated and alcoholic beverages, and spicy foods.<sup>29</sup>

Analysis of data from 3-day food and voiding diaries suggests that trigger foods may exacerbate symptoms within 2 to 4 hours of consumption<sup>30</sup>; anecdotal information indicates, however, that patients with IC/BPS may experience flares within minutes after intake. Of note, patients have complained that bladder symptoms may last anywhere from days to weeks after the consumption of offending items.

## NUTRITION CARE PROCESS FOR IC/BPS

RDNs can play a pivotal role in IC/BPS patients' quality of life. They can booster self-care by offering a practical approach to maintaining dietary needs as they eliminate certain foods and beverages to mitigate symptoms.

**Figure 2** provides a suggested treatment algorithm for medical nutrition therapy. The Nutrition Care Process mirrors that of working with patients who experience food allergies and intolerances. The nutritional needs of this patient group can be complicated because of the variability of allergens and comorbidities. Clinical experience suggests that a full hour is necessary for the first patient appointment to assess food/beverage consumption patterns and to determine modifications essential for adequate nutrient intake. When possible, diverse disciplines engaging in an interdisciplinary approach is beneficial.<sup>4,5,10,23</sup>

## Nutrition Assessment

Published data on how dietary restrictions for IC/BPS affect a patient's nutritional status are lacking. An in-depth, individualized assessment is required for appropriate counseling. Anecdotal information indicates that providers are often concerned that in an effort to control bladder flares, patients with IC/BPS may exclude many more foods than is necessary. As a result of the consistent evidence relating diet to bladder symptoms, Shorter and colleagues developed a validated questionnaire to determine the incidence of food sensitivities in patients with IC/BPS and document the effect of common bladder flare triggers among this population.<sup>31</sup> The Shorter-Moldwin Food Sensitivity Questionnaire can be used by RDNs to screen for food sensitivities and address patients' lack of knowledge related to items that trigger bladder flares.

Unintentional changes in weight are common in this population. Discussions with urologists reveal that patients with IC/BPS are often afraid to eat because of the fear of flares. Some patients restrict food and beverage intake so dramatically that they experience weight loss and varying degrees of malnutrition. In contrast, patients often take multiple medications, some of which lead to weight gain. For example, antidepressants, shown to promote abdominal girth,<sup>32</sup> may be prescribed to alleviate IC/BPS pain and/or comorbid mental health issues.<sup>4,5</sup> In addition, severe pelvic pain may lead to significant decreased levels of activity, thus causing weight gain in some patients. A food/symptom/voiding diary

is helpful to track the impact of foods and beverages and other factors that might influence bladder flares, such as physical activity and medications.

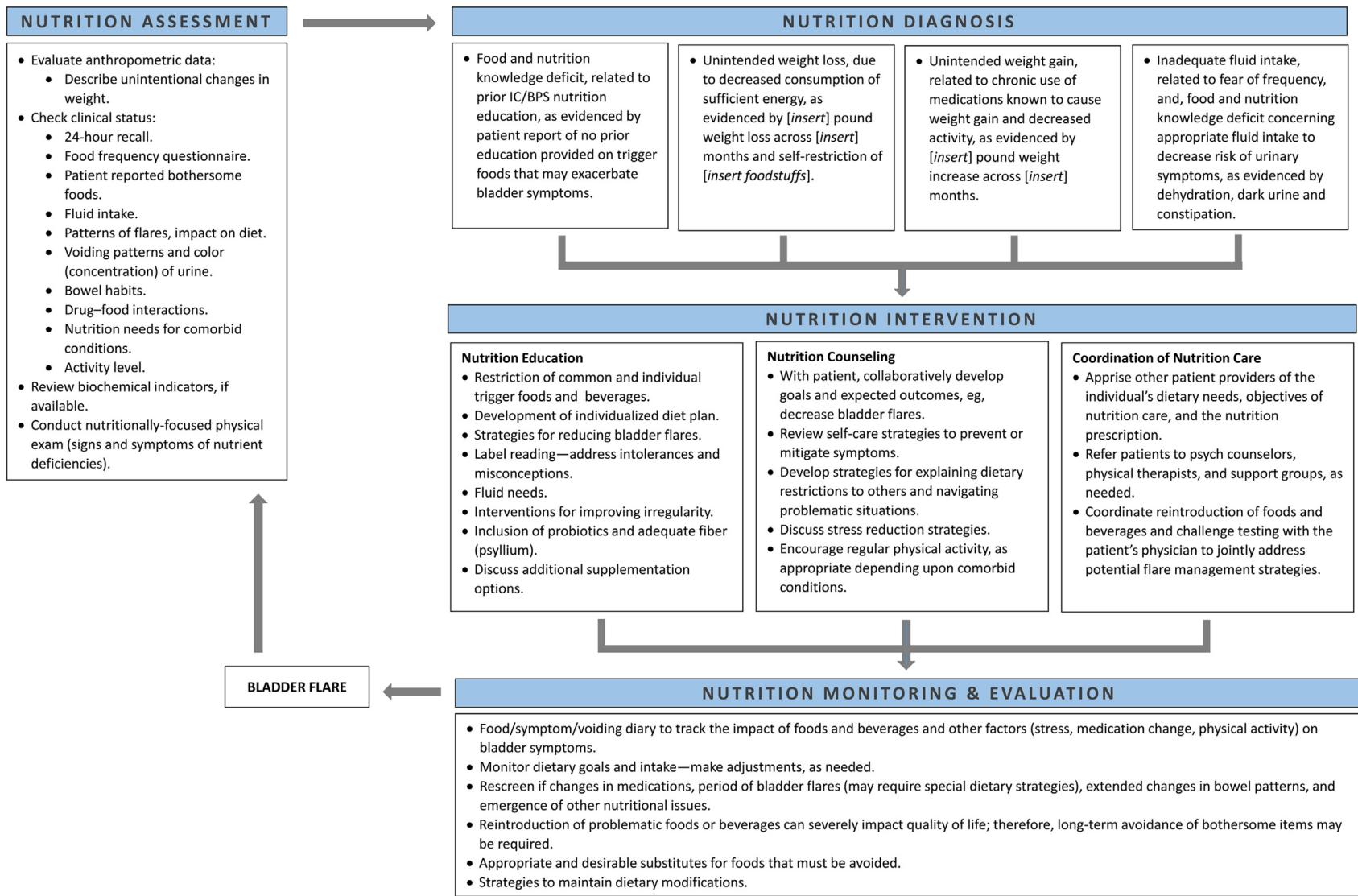
Fluid intake needs to be assessed. Restriction or additional hydration may be required to alter the concentration and/or volume of urine.<sup>3-5</sup> Clinical experience suggests that patients must be reminded to consume adequate fluids to maintain hydration, but not to over-consume them to the point of exacerbating urinary frequency.

Patients with IC/BPS frequently experience irregular bowel habits; limited fluid, decreased activity, and side effects of certain medications such as nonsteroidal anti-inflammatory drugs, tricyclic antidepressants, and narcotic pain opioids may be contributing factors.<sup>33</sup> Furthermore, comorbid pelvic floor dysfunction<sup>34</sup> and/or IBS may be associated with constipation.

## Nutrition Diagnosis

Guidelines support the use of elimination diets to determine food intolerances needing documentation in the Nutrition Care Process diagnosis step.<sup>35,36</sup> For IC/BPS patients consuming a wide range of items including potential triggers, an elimination diet is a useful tool to determine appropriate individual modifications. Most individuals with IC/BPS (51% to 62%), however, are aware of the relationship between certain foods and/or beverages and their effects on bladder symptoms.<sup>9</sup> Yet, not all patients modify their diets because of a belief that required dietary modifications are daunting and overly restrictive. After a thorough assessment, a nutrition diagnosis can be determined. The diagnosis is derived from the synthesis of nutrition assessment data in a PES (problem, etiology, signs/symptoms) format that lists the problem, its cause, and defining characteristics that consists of objective (signs) and/or subjective (symptoms) to support the diagnosis. Typical nutrition diagnoses for patients with IC/BPS follow.

If an IC/BPS patient is excluding more foods from his or her diet than necessary, a common nutrition diagnosis might be food- and nutrition-related knowledge deficit related to lack of prior IC/BPS nutrition education, as evidenced by patient report of no prior education provided on trigger foods that may exacerbate bladder symptoms. As



**Figure 2.** Medical nutrition therapy algorithm for interstitial cystitis/bladder pain syndrome (IC/BPS).

noted in the assessment section above, unintentional changes in weight are also common among IC/BPS patients. A nutrition diagnosis can be unintended weight loss related to decreased ability to consume sufficient energy, as evidenced by a 10-lb weight loss across a 2-month period and self-restriction of acidic beverages and tomato-based foods. Another nutrition diagnosis relative to weight change can be unintended weight gain related to chronic use of medications known to cause weight gain and decreased activity, as evidenced by a patient report of a 25-lb weight gain across a 12-month period. It might be common to see an IC/BPS patient with inadequate fluid intake, related to fear of urinary frequency, and food- and nutrition-related knowledge deficit concerning appropriate fluid intake to decrease risk of urinary symptoms, as evidenced by dehydration, dark urine, and constipation.

### Nutrition Intervention

Once a nutrition diagnosis is identified, it becomes the basis for setting up appropriate nutrition intervention(s). In this step it is necessary to identify goals and expected outcomes to be achieved as a result of the intervention. A common goal for the majority of patients with IC/BPS may be to decrease bladder flare-ups. Although reactions to trigger foods may be severe, many patients find this goal challenging because they do not want to eliminate foods and beverages they enjoy.

For the patient with knowledge deficit, education and counseling focus on trigger foods. The initial approach includes restriction of the documented common trigger foods and beverages coupled with any specific items identified by the patient. The development of an individualized diet plan compensating for foods that must be eliminated is usually required. Given that the introduction of questionable foods can evoke symptoms (eg, pain, urinary frequency and urgency), long-term elimination of bothersome items may be the most effective approach for patients with IC/BPS. Additional education on label reading is essential for common trigger foodstuffs and individual sensitivities. Use this opportunity to address misconceptions. For example, clinical experience has found

that some patients mistakenly believe that citric acid, a common additive used in small amounts, must be avoided. Reviewing labels of non-trigger foods containing citric acid can help correct this misunderstanding.

For a patient with a diagnosis of inadequate fluid intake, the intervention would include instructing the patient on adequate fluid intake to perhaps dilute noxious urinary substances<sup>26</sup> and improve regularity. Inclusion of probiotics<sup>37</sup> and psyllium<sup>38</sup> for those with comorbid IBS may be helpful. Also, incorporate nutrition interventions on constipation and/or IBS offered in the Academy of Nutrition and Dietetics' Nutrition Care Manual as appropriate.<sup>38</sup>

Discuss supplementation options with the IC/BPS patient. Nutraceuticals, including calcium glycerophosphate, aloe vera concentrate, glucosamine, and chondroitin, have been found to mitigate IC/BPS symptoms in some cases.<sup>4,5,12,28,30,39</sup> Sometimes, bladder flares are reduced by consuming baking soda and calcium glycerophosphate prior to eating a trigger food.<sup>12,28,29</sup>

For patients who have unintended weight loss from severely restricted food choices, the RDN needs to evaluate nutrient sufficiency with regard to macro- and micro-deficiencies, and move ahead to the second step of an elimination diet—challenge testing to increase the variety of foods and beverages consumed.

Apprise other patient providers of the individual's dietary needs, objectives of nutrition care, and the nutrition prescription. Collaborate with the patient's physician regarding the reintroduction of foodstuffs to jointly address flare management strategies. Also, discuss with the physician medications that might be suspect for unintended weight gain and/or constipation. Patients can be referred to physical therapists knowledgeable about IC/BPS, counselors, and support groups, as needed,<sup>3-5</sup> as well as the Interstitial Cystitis Association ([www.ichelp.org](http://www.ichelp.org)).

### Nutrition Monitoring and Evaluation

The purpose of monitoring and evaluation is to determine whether the patient is meeting the nutrition intervention goals/desired outcomes: nutrition adequacy and avoidance of bladder flare

triggers. IC/BPS is a chronic condition that may require ongoing nutrition monitoring and re-evaluation. Nutrition care indicators that can be used include the food/symptom/voiding diary, fluid intake, bowel habits and weight data. Dietary compliance can be challenging, especially for patients requiring restrictive diet plans. Changes in medications may affect bladder symptoms and, therefore, require follow up with the patient regarding food and nutrition choices. Revisions of dietary considerations may also be necessary due to changes in bowel patterns. Special dietary strategies may be required for periods of intense flares, and rescreening is needed during phases of extensive flaring.

### Practice and Research Opportunities Ripe for RDNs

For years, evidence-based dietary guidelines for IC/BPS were lacking.<sup>40</sup> Now, the inclusion of dietary management in treatment guidelines recommended by the AUA and the interdisciplinary approach offer numerous opportunities for RDNs. RDNs are essential to act as patient counselors, as well as nutrition experts for teams of urologists, gynecologists, physical therapists, psychologists, and other providers. Practice in this field, however, is not without challenges. Many questions about food triggers remain unanswered, and the Internet is cluttered with misinformation on IC/BPS and diet.

The need for double-blind, placebo-controlled research to evaluate the role of foods and beverages on pain and urinary symptoms is warranted. However, conducting clinical studies confirming that dietary components do make a difference is complicated in this population due to the numerous uncontrollable variables. The Shorter-Moldwin Food Sensitivity Questionnaire can be used to develop databases of patient food sensitivities and provide a data resource for future studies related to dietary intake. Other topics to explore include the nutritional status of patients with IC/BPS, the role of genetics in food intolerances, and the effectiveness of supplements and functional foods in managing symptoms.

Despite the need for additional controlled research, RDNs can make a difference in the lives of patients with IC/BPS by providing them with the tools

## PRACTICE APPLICATIONS

to maintain an adequate diet while avoiding diet-related bladder flares. In addition, RDNs can communicate to those with IC/BPS the importance of evidence-based nutrition interventions.

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