DEFINING BLADDER HEALTH IN WOMEN AND GIRLS: IMPLICATIONS FOR RESEARCH, CLINICAL PRACTICE, AND PUBLIC HEALTH

Hypothesis / aims of study
This original work was designed to demonstrate a novel approach to the study of prevention for lower urinary tract symptoms (LUTS) in women and girls. While prevalence and risk factors for LUTS have been extensively studied, there has been little work in the area of LUTS prevention or “bladder health” promotion. This, in part, is due to the lack of a commonly accepted definition of optimal “bladder health.” The general misconception that a response of “no” to LUTS questions implies “bladder health” has hindered our ability to appropriately identify modifiable risk factors. Epidemiologic studies classically use this methodology to define referent groups when calculating risk factors for LUTS. But, this does not ensure that those in the referent group are without other unassessed LUTS. Yet, strategies to mitigate risk factors have been suggested based on these false assumptions, particularly during pregnancy or in older women; and there has been little to no focus on primordial or primary prevention in girls, adolescents or younger women. Thus, to accurately identify and promote “bladder health,” a systematic approach to defining “bladder health” across the life course is needed. This abstract describes the process by which a working definition of “bladder health” was developed to establish a foundation for developing instruments, and assessing outcomes of LUTS prevention and bladder health promotion in scientific research, clinical practice, and public health initiatives.

Study design, materials and methods
A transdisciplinary research consortium comprised of U.S. experts in adolescent medicine, pediatrics, geriatrics, female pelvic medicine & reconstructive surgery, preventive medicine, community health science, psychology, nursing, medical sociology, behavioral science, epidemiology, and biostatistics was assembled to identify “bladder health” as a state to preserve and protect. We explored lessons from other health promotion research (e.g. cardiovascular health) and determined that there was insufficient evidence in “bladder health” to apply similar models. Thus, we proceeded in defining it using an iterative process starting with expert opinion (consortium members) to develop a framework for focus group exploration and population-based testing. Consistent with the World Health Organization (WHO) definition of “health,” we propose that the absence of particular LUTS is insufficient to define “bladder health,” and emphasize the ability of the bladder to adapt to short term physical, social, and psychological challenges [2,3]. Further, in addition to the commonly defined phases of bladder function: 1) bladder storage and 2) bladder emptying, we identified 3) protection of the individual from infection, neoplasia, and other biologic threats as a third function.[3] This third bioregulatory function was added to reflect the increasing knowledge surrounding relationships between urothelial function, urinary markers, proteins and biomes associated with LUTS. After defining overall “bladder health”, we used currently accepted LUTS definitions to capture various dysfunctions of the bladder and developed “healthy” counterparts to a variety of bladder functions. This iterative process began with a subgroup of investigators and then was validated by the larger consortium, and continues to be refined. Definitions were created recognizing that definitions of “bladder health” may vary across the life course; with development of continence in children reliant on bladder maturation and appropriate neurodevelopmental function, while storage capacity and emptying efficiency may change with advanced age.

Results
The working definition of “bladder health” developed by the consortium is: “A complete state of physical, mental, and social well-being related to bladder function, and not merely the absence of LUTS. Healthy bladder function permits daily activities, adapt to short term physical or environmental stressors, and allows optimal well-being (e.g. travel, exercise, social, occupational or other activities).” A comprehensive table was developed to categorize dysfunction and health for each of the three bladder phases (Storage, Emptying and Bioregulatory). The table below is an excerpt of the working version of our tool to identify gaps in knowledge and areas for future “bladder health” research. Additional domains under each phase are described as “functions” Subjective and objective measures to assess health in each of these domains are proposed.
The bioregulatory category – the most novel element of the table – is organized in terms of three main bioregulatory functions: host defense/biosis barrier, chemical/physical barrier, and cancer barrier. We recognize that the bladder functions in a bi-directional manner to communicate with the environment, prevent systemic and/or local infection, transmit appropriate physiologic signals, and regulate cellular function. Possible biomarkers for LUTS prevention research were also compiled as targets of study as we move forward in our novel approach to understanding the healthy bladder.

Interpretation of results
This is the first report of a definition of “bladder health” that has been systematically developed for purposes of studying LUTS prevention and bladder health promotion. Future efforts of this consortium include refining definitions, and developing and validating measures of bladder health for use in scientific research, clinical practice, and public health initiatives. We plan to describe the healthy bladder experience using community engagement and focus group methods, and intend to collect normative objective data for the three bladder functions. With this foundational work, we hope to lay the groundwork for development of survey instruments and other assessment tools to explore risk and protective factors for bladder health.

Concluding message
This work provides a bladder health framework for research, clinical practice, and public health promotion.

References

Disclosures
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