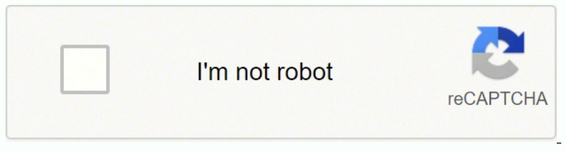

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This document was created to serve as a guide for all types of providers who evaluate and treat OAB patients, including those in general practice as well as those who specialize in various branches of medicine.Section 2: MethodologyThe primary source of evidence for the first version of this guideline was the systematic review and data extraction conducted as part of the AHRQ Evidence Report/Technology Assessment Number 187 titled Treatment of Overactive Bladder in Women (2009).1 That report, prepared by the Vanderbilt University Evidence-Based Practice Center (EPC), searched PubMed, MEDLINE, EMBASE and CINAHL for English-language studies published from January 1966 to October 2008 relevant to OAB and excluded non-relevant studies, studies with fewer than 50 participants and studies with fewer than 75% women. Kanagarajah P, Ayyathurai R, Caruso DJ et al: Role of botulinum toxin-A in refractory idiopathic overactive bladder patients without detrusor overactivity. 212. 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Rajkumar GN, Small DR, Mustafa AW et al: A prospective study to evaluate the safety, tolerability, efficacy and durability of response of intravesical injection of botulinum toxin type A into detrusor muscle in patients with refractory idiopathic detrusor overactivity. Int Urogynecol J 2013; 24: 5. Kosilov K, Kuzina I, Loparev S et al: Influence of the short-term intake of high doses of solifenacin and trospium on cognitive function and health-related quality of life in older women with urinary incontinence. Oerlemans DJAJ, Van Voskuilen AC, Marcelissen T et al: Is on-demand sacral neuromodulation in patients with OAB syndrome a feasible therapy regime? The quality of individual studies was assessed by the EPC using accepted criteria to determine the quality of internal and external validity. J Urol 1999; 162: 352. BJU 1990: 66; 479. Chapple CR, Rechberger T, Al-Shukri S et al: Randomized, double-blind placebo- and tolerodine-controlled trial of the once-dailyi antimuscarinic agent solifenacin in patients with symptomatic overactive bladder. LUTS: Lower Urinary Tract Symptoms. Int Urogynecol J Pelvic Floor Dysfunct 2004; 15: 243. Options generally reflect the Panel's judgment that a particular decision is best made by the clinician who knows the patient with full consideration of the patient's prior treatment history, current QOL, preferences and values.Table 1: AUA Nomenclature Linking Statement Type to Level of Certainty and Evidence StrengthStandard: Directive statement that an action should (benefits outweigh risks/burdens) or should not (risks/burdens outweigh benefits) be taken based on Grade A (high quality; high certainty) or B (moderate quality; moderate certainty) evidenceRecommendation: Directive statement that an action should (benefits outweigh risks/burdens) or should not (risks/burdens outweigh benefits) be taken based on Grade C (low quality; low certainty) evidenceOption: Non-directive statement that leaves the decision regarding an action up to the individual clinician and patient because the balance between benefits and risks/burdens appears equal or appears uncertain based on Grade A (high quality; high certainty), B (moderate quality; moderate certainty), or C (low quality; low certainty) evidenceClinical Principle: a statement about a component of clinical care that is widely agreed upon by urologists or other clinicians for which there may or may not be evidence in the medical literatureExpert Opinion: a statement, achieved by consensus of the Panel, that is based on members' clinical training, experience, knowledge, and judgment for which there is no evidenceLimitations of the Literature. J Urol 2006; 176: 177. Hullfish K, Fenner D, Sorser S et al: Postpartum depression, urge urinary incontinence, and overactive bladder syndrome: Is there an association? Am J Obstet Gynecol 1998; 179: 999. The International Urogynecological Association (IUGA) and International Continence Society (ICS) defines OAB as the presence of "urinary urgency, usually accompanied by frequency and nocturia, with or without urgency urinary incontinence (UUI), in the absence of UTI or other obvious pathology."4 Therefore, OAB symptoms consist of four components: urgency, frequency, nocturia and urgency incontinence. Eur Urol 2013; 63: 2.134. Expert OpinionFollow-Up:24. The clinician should offer follow up with the patient to assess compliance, efficacy, side effects and possible alternative treatments. Tincello DG, Kenyon S, Abrams KR et al: Botulinum toxin a versus placebo for refractory detrusor overactivity in women: a randomised blinded placebo-controlled trial of 240 women (the RELAX study). AUA conducted an additional literature search to capture articles published between October 2008 and December 2011. Eur Urol 2010; 57: 145. 60. Burgio KL, Locher JL, Goode PS et al: Behavioral vs drug treatment for urge urinary incontinence in older women: a randomized controlled trial. Urology 2004; 64: 12. Eur Urol 2007; 51: 1357. D'Souza AO, Smith MJ, Miller LA et al: Persistence, adherence, and switch rates among extended-release and immediate-release overactive bladder medications in a regional managed care plan. Song C, Park JT, Heo KO et al: Effects of bladder training and/or tolterodine in female patients with overactive bladder syndrome: a prospective, randomized study. Treatments are aimed at relieving symptoms and not necessarily at reversing pathophysiologic abnormalities. Wyman JF, Harkins SW and Fantl JA:Psychosocial impact of urinary incontinence in the community dwelling population. 246. J Urol 2013;190: 6. Staskin DR, Dmochowski RR, Sand PK et al: Efficacy and safety of oxybutynin chloride topical gel for overactive bladder: A randomized, double-blind, placebo controlled, multicenter study. Patients also report negative impact on sexual function and marital satisfaction23 and OAB symptoms have been linked to depressive illness.24, 25 This negative impact also is evident among older adults (e.g., ≥ 65 years), resulting in significant impairments in QOL, including high rates of anxiety and depression, with the majority of patients reporting they have not sought treatment.26Successful treatment of OAB symptoms with behavioral approaches, medications, neuromodulation therapies, and onabotulinumtoxinA, balanced against adverse events, costs and ultimately patient compliance, all have been reported to improve patient QOL (see Discussion sections under each treatment type). Better Stratification of OAB. 124. The most effective approach for a particular patient is best determined by the individual clinician and patient. Crentsil V, Ricks MO, Xue QL et al. As defined by IUGA/ICS,4,27 "urgency is the complaint of a sudden compelling desire to pass urine which is difficult to defer." Investigators have tested urgency questionnaires to assess for validity and reliability;286-288 however, no single measure is used consistently across trials, making it difficult to compare findings. Clinical studies should use validated standardized measures to report subjective outcomes. 260. Neurourol Urodyn 2011;30:7. Continence Program in Women (CPW) Research Group. 86. Different investigative groups have reported findings of alterations in brain processing of bladder sensory signals in OAB subjects.294, 295Sensory (afferent) signaling from the bladder and urethra has been studied with various methodologies. Fujihara A, Ukimura O, Iwata T et al: Neuroselective measure of the current perception threshold of A-delta and C-fiber afferents in the lower urinary tract. Scand J Urol Nephrol 2011; 45: 46. Chancellor M, Freedman S, Mitcheson HD et al: Tolterodine, an effective and well tolerated treatment for urge incontinence and other overactive bladder symptoms. Brubaker L, Gousse A, Sand P et al: Treatment satisfaction and goal attainment with onabotulinumtoxinA in patients with incontinence due to idiopathic OAB. 38. BJU Int 2013; 111: 1. Curr Med Res Opin 2002; 18: 177. 173. Int J Gynaecol Obstet 2010; 110: 68. As the science relevant to OAB evolves and improves, the strategies presented here will require amendment to remain consistent with the highest standards of clinical care. Use of current perception thresholds electrophysiologic testing as a research tool has been described both in asymptomatic and OAB individuals.296-298 A recent review has also highlighted the potential interaction of the bladder urothelium, suburothelium and interstitial cells with the sensory afferent pathways.299 The urothelium has been proposed to be a "sensor-transducer" cellular compartment with urothelial cells able to release and respond to neurotransmitters, thus able to communicate with the afferent nerve endings that terminate within the urothelium.300 The bladder suburothelium and detrusor muscle compartments are purported to contain "pacemaker-like" cells, similar to interstitial cells of Cajal found in the gut, which can modulate bladder contractility, rhythmicity and/or overactivity.301 A more complete understanding of sensory mechanisms could lead to novel OAB therapies. 1. Kuo HC: Clinical effects of suburothelial injection of botulinum A toxin on patients with nonneurogenic detrusor overactivity refractory to anticholinergics. 162. Lee, J.;, Osann, K.; and Noblett, K.: Comparison of motor and sensory response of InterStim(R) for overactive bladder syndrome. JAGS 2011; 59: 2129. 217. Mohee A, Khan A, Harris N et al: Long-term outcome of the use of intravesical botulinum toxin for the treatment of overactive bladder (OAB). Neurourol Urodyn 2006; 25: 228. BJU Intl 2005; 95: 580. The finding of a biomarker for OAB would advance the pathophysiologic understanding of OAB. 2013; [Epub ahead of print]. Versi E, Appell R, Mobley D et al: Dry mouth with conventional and controlled-release oxybutynin in urinary incontinence. Urology 2003; 62: 237. Effectiveness of subsequent injection. Clinical Principle14. Clinicians should manage constipation and dry mouth before abandoning effective anti-muscarinic therapy. Eur Urol 2008; 54: 543. Moon, K.H.;, Han, J.Y.;, Kim, J.H.;Lee, H.N.;Lee, K.S.;Lee, J.G.;Oh, S.J.;Yoon, H.N.;Choo, M.S. et al: Prospective trial of sacral neuromodulation for refractory overactive bladder syndrome in Korean patients. Neurourol Urodyn 2012; 31: 8. Souto SC, Reis LO, Palma T et al: Prospective and randomized comparison of electrical stimulation of the posterior tibial nerve versus oxybutynin versus their combination for treatment of women with overactive bladder syndrome. LUTS: Lower Urinary Tract Symptoms 2011; 3: 43. Some studies report higher prevalence rates in women than men,7-10 while others found similar rates across genders.11-14 However, UUI is consistently more common in women than in men. J Obstet Gynaecol 2009; 29: 31. 105. Ravindra P, Jackson BL and Parkinson RJ: Botulinum toxin type A for the treatment of non-neurogenic overactive bladder: does using onabotulinumtoxinA (Botox®) or abobotulinumtoxinA (Dysport®) make a difference?. van Kerrebroeck PE, van Voskuilen AC, Heesakkers JP et al: Results of sacral neuromodulation therapy for urinary voiding dysfunction: outcomes of a prospective, worldwide clinical study. Therefore, it is common for OAB treatment trials to utilize total incontinence episodes as an outcome measure.Epidemiology. Faucheron, J.L.;, Chodez, M.; and Boillot, B:. Folstein MF, Robins LN and Helzer JE: The Mini-Mental State Examination. 160. Neurourol Urodyn 2013; 32: 1. Brubaker L: Urgency: the symptom of overactive bladder. JAMA 1998; 280: 1995. European Urol 2006; 50: 317. Menopause 2011; 18: 962. How can we better objectively measure bladder symptoms? Malone-Lee JG, Walsh JB, Maugourd MF et al: Tolterodine: A safe and effecti ve treatment for older patients with overactive bladder. 194. In addition, particularly in females, stress urinary incontinence (SUI) symptoms may exist concomitantly with OAB-symptoms (dry or wet). 56. Kuo HC, Liu HT and Chancellor MB: Can urinary nerve growth factor be a biomarker for overactive bladder? London: National Institute for Health and Care Excellence (UK); 2013.140. When sufficient evidence existed, the body of evidence for a particular treatment was assigned a strength rating of A (high), B (moderate), or C (low). Rogers R, Bachmann G, Jumadilova Z et al: Efficacy of tolterodine on overactive bladder symptoms and sexual and emotional quality of life in sexually active women. 264. (AUA). Cheung W, Bluth MJ, Johns C et al: Peripheral blood mononuclear cell gene array profiles in patients with overactive bladder. 270. Within the field of OAB, research sometimes is dichotomized between OAB/lower urinary tract symptoms or LUTS (e.g., OAB-dry) versus OAB/urgency incontinence (OAB-wet). Gilbert, SM and Hensle TW: Metabolic consequences and long-term complications of enterocystoplasty in children. Mattiasson A, Blaakaer J, Hoye K et al: Simplified bladder training augments the effectiveness of tolterodine in patients with an overactive bladder. Urology 2003; 62: 20. 103. J Urol 2013; 189: 4.132. Zinner N, Noe L, Rasouliyan L et al: Impact of solifenacin on resource utilization, work productivity and health utility in overactive bladder patients switching from tolterodine ER. 40. Siegel SW, Catanzaro F, Dijkema HE et al: Long-term results of a multicenter study on sacral nerve stimulation for treatment of urinary urge incontinence, urgency-frequency, and retention. 41. J Urol 2007; 178: 189. Eur Urol 2007; 52: 407. 219. 109. Int Urogynecol J 1995; 6: 63. World J Uro 2003; 20: 327. Rovner E, Kennelly M, Schulte-Baukloh H et al: Urodynamic results and clinical outcomes with intradetrusor injections of onabotulinumtoxinA in a randomized, placebo-controlled dose-finding study in idiopathic overactive bladder. Therefore, the phenotype of bladder symptoms should be carefully considered and declared in all research to clarify the particular patient group being studied. Figure 4: OAB Patient GroupsEpidemiology. Burgio KL, Goode PS, Locher JL et al: Behavioral training with and without biofeedback in the treatment of ure incontinence in older women: A randomized controlled trial. Herschorn S, Swift S, Guan Z et al: Comparison of fesoterodine and tolterodine extended release for the treatment of overactive bladder: A head-to-head placebo-controlled trial. BJU Intl 2003; 91: 54. 57. All guideline amendments require approval of the PGC and BOD. Section 3: BackgroundDefinition. Urol Nurs 2009; 29: 177. 2010. 144. Vandoninck V, van Balken MR, Agro EF et al: Percutaneous tibial nerve stimulation in the treatment of overactive bladder: Urodynamic data. Spinelli M, Bertapelle P, Cappellano F et al: Chronic sacral neuromodulation in patients with lower urinary tract symptoms: results from a national register. Fitzgerald MP, Link CL, Litman HJ et al: Beyond the lower urinary tract: the association of urologic and sexual symptoms with common illnesses. Van Kerrebroeck P, Kreder K, Jonas U et al: Tolterodine once-daily: superior efficacy and tolerability in the treatment of the overactive bladder. AUA's amendment process provides for the amendment of existing evidence-based guideline statements and/or the creation of new evidence-based guideline statements in response to the publication of a sufficient volume of new evidence. Neurourol and Urodynamics 2003; 22: 17. 187. Shumaker SA, Wyman JF, Uebersax JS et al: Health-related quality of life measures for women with urinary incontinence: the Incontinence Impact Questionnaire and the Urogenital Distress Inventory. J Am Geriatr Soc 2011; 59: 2209. OAB is a clinical diagnosis characterized by the presence of bothersome urinary symptoms. Siegel, S.;, Noblett, K.;, Mangel, J.;Griebling, T.L.;Sutherland, S.E.;Bird, E.T.;Comiter, C.;Culkin, D.;Bennett, J.;Zylstra, S.;Berg, K.C.;Kan, F.;Irwin, C.P. et al: Results of a prospective, randomized, multicenter study evaluating sacral neuromodulation with InterStim therapy compared to standard medical therapy at 6-months in subjects with mild symptoms of overactive bladder. Van Der Pal F, van Balken MR, Heesakkers JP et al: Correlation between quality of life and voiding variables in patients treated with percutaneous tibial nerve stimulation. 25. Sand PK, Goldberg RP, Dmochowski RR et al: The impact of the overactive bladder syndrome on sexual function: a preliminary report from the Multicenter Assessment of Transdermal Therapy in Overactive Bladder with Oxybutynin trial. Mayo Clin Proc 2003: 78; 687 76. Kuo HC: Bladder base/trigone injection is safe and as effective as bladder body injection of onabotulinumtoxinA for idiopathic detrusor overactivity refractory to antimuscarinics. et al: Efficacy of sacral neuromodulation on urological diseases: a multicentric research project. However, this type of compartmentalization highlights our lack of understanding of OAB. Urol Int 2011; 87: 4. N Engl J Med 2003; 349: 2274. This overlap in bladder symptoms is captured in the Venn diagram below with their potential to be concomitantly present. 237. Anderson RU, Mobley D, Blank B et al: Once daily controlled versus immediate release oxybutynin chloride for urge urinary incontinence. Handb Exp Pharmacol 2011; 171. Burgio KL, Goode PS, Johnson TM 2nd et al: Behavioral versus drug treatment for overactive bladder in men: the male overactive bladder treatment in veterans (MOTIVE) trial. 244. 118. Expert OpinionAdditional Treatments:23. Indwelling catheters (including transurethral, suprapubic, etc.) are not recommended as a management strategy for OAB because of the adverse risk/benefit balance except as a last resort in selected patients. Fowler CJ, Auerbach S, Ginsberg D et al: OnabotulinumtoxinA improves health-related quality of life in patients with urinary incontinence due to idiopathic overactive bladder: a 36-week, double-blind, placebo-controlled, randomized, dose-ranging trial. Neurourol Urodyn 2010; 29: 4. J Urol 2010; 183: 1438. Burgio KL, Goode PS, Richter HE et al: Combined behavioral and individualized drug therapy versus individualized drug therapy alone for ure urinary incontinence in women. Stewart WF, Van Rooyen JB, Cundiff GW et al: Prevalence and burden of overactive bladder in the United States. Yoong W, Shah P, Dadswell R et al: Sustained effectiveness of percutaneous tibial nerve stimulation for overactive bladder syndrome: 2-year follow-up of positive responders. 175. 287. Irwin P, Somov P and Ekwueme K: Patient reported outcomes of abobotulinumtoxinA injection treatment for idiopathic detrusor overactivity: A pragmatic approach to management in secondary care. 102. Klausner AP and Steers WD: Corticotropin releasing factor: a mediator of emotional influences on bladder function. Int Urol Nephrol 2013; 46: 1.139. Br J Nurs 2002; 11: 560. However, objective measures of the "cornerstone" OAB-symptom of urgency285 remains poorly assessed. Incidence, prevention and management. Arrabal-Polo MA, Palao-Yago F, Campon-Pacheco I et al: Clinical efficacy in the treatment of overactive bladder refractory to anticholinergics by posterior tibial nerve stimulation. J Urol 2002; 168; 580. Int J Urol 2011; 18: 483. Standard (Evidence Strength Grade B)19. Clinicians may offer peripheral tibial nerve stimulation (PTNS) as third-line treatment in a carefully selected patient population. Drutz HP, Appell RA, Gleason D et al: Clinical efficacy and safety of tolterodine compared to oxybutynin and placebo in patients with overactive bladder. 115. 250. 77. Urology 2005; 66: 82. A phase III, randomized, double-blind, parallel-group, placebo-controlled, multicentre study to assess the efficacy and safety of the beta(3) adrenoceptor agonist, mirabegron, in patients with symptoms of overactive bladder. Female Pelvic Med Reconstr Surg 2013; 19: 6. 65. Urology 2000; 56: 766. JAMA 2002; 288: 2293. Staskin DR: Patient-Reported Outcome Assessment. Dmochowski RR, Sand PK, Zinner NR et al: Trospium 60 mg once daily (QD) for overactive bladder syndrome: results from a placebo-controlled interventional study. BJU Intl 2008; 102: 62. 91. 200. 52. Randomized double-blind, active-controlled phase 3 study to assess 12-month safety and efficacy of mirabegron, a beta(3)-adrenoceptor agonist, in overactive bladder. BJU Intl 2002; 90: 375. Burgio, KL, Engel, BT, and Locher, JL: Normative patterns of diurnal urination across six age decades. 274. Int Urogynecol J Pelvic Floor Dysfunct 1999; 10: 283. J Urol 2013;189: 6. Chapple C, Khullar V, Gabriel Z et al: The effects of antimuscarinic treatments in overactive bladder: a systematic review and meta-analysis. 26. Obstet Gynecol 2000; 95: 718. Moller LA, Lose G and Jorgensen T: The prevalence and bothersomeness of lower urinary tract symptoms in women 40-60 years of age. BJUI 2007; 100: 840. Urology 2008; 71: 449. 278. 157. Vaarala MH, Tammela TL, Perttila I et al: Sacral neuromodulation in urological indications: the Finnish experience. Further, the use of vaginal estrogen should be studied as a monotherapy for OAB as well as in combination with other therapies, including behavioral and pharmaceutical. The effect of treatment of OAB on the elderly, the very frail and those with pre-existing cognitive deficiencies needs further research. Hsu C and Sandford BA: The Delphi Technique: Making Sense of Consensus. 201. BJU Int 2004; 93: 303. PetersKM, MacDiarmid SA, Wooldridge LS et al: Randomized trial of percutaneous tibial nerve stimulation versus extended-release tolterodine: Results from the overactive bladder innovative therapy trial. The Panel fully recognizes that OAB constitutes a significant burden for patients. BJU Intl 2003; 92: 741. Evidence-based guideline amendments require the agreement of a methodologist and panel members that new evidence is sufficient to change or add evidence-based statements. Drug Safety 1998; 19: 45. Funding of the panel was provided by the AUA and the Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU), although panel members received no remuneration for their work. Results from a randomized placebo-controlled study. Clinical Medicine Insights: Therapeutics 2010; 2: 889. 47. Recommendation (Evidence Strength Grade C)11. If a patient experiences inadequate symptom control and/or unacceptable adverse drug events with one anti-muscarinic medication, then a dose modification or a different anti-muscarinic medication or a β3-adrenoceptor agonist may be tried. The review yielded an evidence base of 151 treatment articles after application of inclusion/exclusion criteria. Int Neurourol J 2018; 22:41. Biemans JM and van Balken MR: Efficacy and effectiveness of percutaneous tibial nerve stimulation in the treatment of pelvic organ disorders: a systematic review. 123. Curr Med Res Opin 2007; 23: 2347. 195. 51. The review revealed insufficient publications to address OAB diagnosis from an evidence basis; the diagnosis portions of the associated algorithm, therefore, are provided as Clinical Principles or as Expert Opinion with consensus achieved using a modified Delphi technique if differences of opinion emerged.2 A Clinical Principle is a statement about a component of clinical care that is widely agreed upon by urologists or other expert clinicians for which there may or may not be evidence in the medical literature. Option (Evidence Strength Grade B)13. Clinicians should not use anti-muscarinics in patients with narrow-angle glaucoma unless approved by the treating ophthalmologist and should use anti-muscarinics with extreme caution in patients with impaired gastric emptying or a history of urinary retention. 292. Onyeka BA, Shetty A, Ilangovan K et al: Submucosal injections of botulinum toxin A in women with refractory idiopathic detrusor overactivity. Neuromodulation 2013; 16: 1. J Manag Care Pharm 2008; 14: 291. Young W, Ridout AE, Damodaram M et al.: Neuromodulative treatment with percutaneous tibial nerve stimulation for intractable detrusor instability: outcomes following a shortened 6-week protocol. 10. 207. Chung SD, Liu HT, Lin H et al: Elevation of serum c-reactive protein in patients with OAB and IC/BPS implies chronic inflammation in the urinary blladder. 4. 107. Urology 2013; 82: 2.133. 284. Yih, J.M.;, Killinger, K.A.;, Boura, J.A.;Peters, K.M. et al.: Changes in sexual functioning in women after neuromodulation for voiding dysfunction. Furthermore, the Guideline Panel's meta-analytic efforts were hampered by lack of consistent reporting of variance information (e.g., standard deviations, standard errors of the mean) for baseline and post-treatment measurements. Further research is needed focused on therapy utilizing different combinations of anti-muscarinics and β3-adrenoceptor agonists as well as other drug classes looking at both efficacy and adverse effects. Liberman JN, Hunt TL, Stewart WF et al: Health-related quality of life among adults with symptoms of overactive bladder: results from a U.S. community-based survey. 82. Int Urogynecol J 2012; 23: 8. 43. Veeratterapillay R, Harding C, Teo L et al: Discontinuation rates and inter-injection interval for repeated intravesical botulinum toxin type A injections for detrusor overactivity. Eur Urol 2013; 63: 2.131. Abrams P, Cardozo L, Fall M et al: The standardization of terminology of lower urinary tract function: report from the Standardisation Sub-Committee of the International Continence Society. Clinical Principle4. OAB is not a disease; it is a symptom complex that generally is not a life-threatening condition. Kenton K, Simmons J, FitzGerald MP et al: Urethral and bladder current perception thresholds: normative data in women. Expert Opinion16. Clinicians should use caution in prescribing anti-muscarinics or β3-adrenoceptor agonists in the frail OAB patient. The AUA nomenclature system explicitly links statement type to body of evidence strength and the Panel's judgment regarding the balance between benefits and risks/burdens.3 Standards are directive statements that an action should (benefits outweigh risks/burdens) or should not (risks/burdens outweigh benefits) be undertaken based on Grade A (high level of certainty) or Grade B (moderate level of certainty) evidence. Urology 2004; 63: 61. Obstet Gynecol 2005; 106: 585. 257. Fourth International Consultation on Incontinence, report of Committee 5, part 5B. 104. Ozdedeli S, Karapolat H and Akkoc Y: Comparison of intravaginal electrical stimulation and trospium hydrochloride in women with overactive bladder syndrome: a randomized controlled study. J Urol 2003; 169: 207. Van Kerrebroeck P, Abrams P, Chaikin D et al: The standardisation of teminology in nocturia: Report from the standardization sub-committee of the International Continence Society. 17. Int Urogynecol J 2012; 11:1. With regard to treatment, a total of 151 articles from the original search as well as 72 from the 2014 review, and 37 from the 2019 review processes met the inclusion criteria. Urinary incontinence in particular may have severe psychological and social consequences, resulting in restricted activities and unwillingness to be exposed to environments where access to a bathroom may be difficult. Wein AJ: Diagnosis and treatment of the overactive bladder. Combination therapeutic approaches should be assembled methodically, with the addition of new therapies occurring only when the relative efficacy of the preceding therapy is known. Leong RK, Marcelissen TA, Nieman FH et al: Satisfaction and patient experience with sacral neuromodulation: results of a single center sample survey. Urol 2009; 182: 1055. 85. 215. Eur Urol 2012; 62:3. Popat R, Apostolidis A, Kalsi V et al: A comparison between the response of patients with idiopathic detrusor overactivity and neurogenic detrusor overactivity to the first intradetrusor injection of botulinum-A toxin. Neurourol Urodynam 2007; 26: 196. MacDiarmid SA, Peters KM, Shobeiri SA et al: Long-term durability of percutaneous tibial nerve stimulation for the treatment of overactive bladder. Neurourol Urodyn 2013; 32: 3. 263. Cameron, A.P.;, Anger, J.T.;, Madison, R.;Saigal, C.S.;Clemens, J.Q.; et al: Urologic Diseases in America, P. Cui Y, Wang L, Liu L et al: Botulinum toxin-A injections for idiopathic overactive bladder: a systematic review and meta-analysis. J Urol 2007; 178: 978. Urology 2001; 57: 1044. In addition, because the Panel wished to consider data for male as well as female patients, studies excluded by the AHRQ report because there were fewer than 75% women participants were extracted and added to the database. 266. Continence Program for Women Research Group. Litman HJ and McKinlay JB: The future magnitude of urological symptoms in the USA: projections using the Boston Area Community Health survey. et al: Reproductive factors associated with nocturia and urinary urgency inin women: A population-based study in Finland. J Urol 2007; 178: 2488. Boyle P, Robertson C, Mazzetta C et al: The prevalence of male urinary incontinence in four centres: the UREPIK Study. Brubaker L, Richter HE, Visco A et al: Refractory idiopathic urge urinary incontinence and botulinum A injection. J Urol 2010; 184: 598 67. World J Uro 1997; 15: 144. Kessler TM, Danuser H, Schumacher M et al: Botulinum A toxin injections into the detrusor: An effective treatment in idiopathic and neurogenic detrusor overactivity? Griffiths D, Tadic SD, Schaefer W et al: Cerebral control of the bladder in normal and urge-incontinent women. Once finalized, the guideline was submitted for approval to the PGC. There is a continually expanding literature on OAB; the Panel notes that this document constitutes a clinical strategy and is not intended to be interpreted rigidly. Int Urogynecol J 2013; 24: 9.136. Chapple, C.R.;Kaplan, S.A.;Mitcheson, D.;Klecka, J.;Cummings, J.;Drogendijk, T.;Dorrepaal, C.;Martin, N. These publications were used to create the majority of the treatment portion of the guideline. BJU Intl 2009; 103: 931. Therefore, many studies of OAB treatments have relied upon other measures (e.g., number of voids, number of incontinence episodes) to measure treatment response.Urinary frequency can be reliably measured with a voiding diary. Homma Y and Koyama N: Minimal clinically important change in urinary incontinence detected by a quality of life assessment tool in overactive bladder syndrome with urge incontinence. Gratzke C, van Maanen R, Chapple C et al: Long-term safety and efficacy of mirabegron and solifenacin in combination compared with monotherapy in patients with overactive bladder: a randomised, multicentre phase 3 study (SYNERGY II). At the clinician's discretion, a urine culture and/or post-void residual assessment may be performed and information from bladder diaries and/or symptom questionnaires may be obtained. 148. Preclinical studies (e.g., animal models), pediatric studies, commentary and editorials were eliminated. 15. 29. Campbell-Walsh Urology 2011; 10. BJU Int 2014: 28.135. OAB studies have used varying combinations of these symptoms to identify patients for study inclusion and to define treatment response. Kay G, Crook T, Rekeda L et al: Differential effects of the antimuscarinic agents darifenacin and oxybutynin ER on memory in older subjects. The review panels determined that each update review warranted targeted updates to the document, thereby creating the 2014 and 2019 amendments.Data from studies published after the literature search cut-off will be incorporated into the next version of this guideline. For example, despite the relatively large number of RCTs with placebo control groups and randomized designs with active controls that assessed pharmacologic OAB treatments, the overwhelming majority of trials followed patients for only 12 weeks. Int Urogynecol J 2012; 23: 6. 126. Int J Clin Pract 2009: 63; 560. Chapple CR, Khullar V, Gabriel Z et al: The effects of antimuscarinic treatments in overactive bladder: an update of a systematic review and meta-analysis. Finazzi-Agro E, Petta F, Sciobica F et al: Percutaneous tibial nerve stimulation effects on detrusor overactivity incontinence are not due to a placebo effect: a randomized, double-blind, placebo controlled trial. Clin Drug Investig 2000; 19: 83. Davila GW, Daugherty CA and Sanders SW: A short-term, multicenter, randomized double-blind dose titration study of the efficacy and anticholinergic side effects of transdermal compared to immediate release oral oxybutynin treatment of patients with urge urinary incontinence. 159. Neurourol Urodyn 2011; 30: 1242. J Urol 1999; 161: 1551. The criteria and rating scheme are described in detail in the published report. 169. Urology 2006; 67: 731. With regard to adverse events, most pharmacologic studies reported rates of dry mouth and constipation, but few reported on other clinically-relevant issues such as cardiac or cognitive adverse events. 198. 174. Millard R, Tuttle J, Moore K et al: Clinical efficacy and safety of tolterodine compared to placebo in detrusor overactivity. Therapies that do not demonstrate efficacy after an adequate trial should be ceased. British Journal of Medical and Surgical Urology. Clinical Principle17. Patients who are refractory to behavioral and pharmacologic therapy should be evaluated by an appropriate specialist if they desire additional therapy. Female Pelvic Med Reconstr Surg 2011; 17: 50. Komesu YM, Ketai LH, Mayer AR et al: Functional MRI of the brain in women with overactive bladder: brain activation during urinary urgency. Br J Obstet Gynaecol 1997; 104: 988. 204. J Urol 2013;189:5. Neurourol Urodyn 2013; [Epub ahead of print] 218. Cochrane Database of Systematic Reviews2009; 4: CD001405. Tikkinen, KA, Auvinen A, Tiitinen A. 127. Okamura K, Takei M, Nojiri Y et al: Twelve months follow-up of injection of onabotulinumtoxina into vesical submucosa for refractory non-neurogenic overactive bladder. American Urological Association Education and Research, Inc. Granese R, Adile G, Gugliotta G et al: Botox® for idiopathic overactive bladder: efficacy, duration and safety. Eur J Obstet Gynecol Reprod Biol 2001; 98: 97. World J Uro 2003; 20: 392. 259. Arch Gynecol Obstet 2012; 286: 6. Recommendation (Evidence Strength Grade C)20. Clinicians may offer sacral neuromodulation (SNS) as third-line treatment in a carefully selected patient population characterized by severe refractory OAB symptoms or patients who are not candidates for second-line therapy and are willing to undergo a surgical procedure. 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To address this, the International Consultation on Incontinence has developed a series of standardized modular questionnaires for pelvic conditions, including OAB.18 The Panel encourages the development of such standardized PRO tools which can be used in OAB research and clinical practice. Impact on Psychosocial Functioning and Quality of Life (QOL). Dmochowski RR, Davila GW, Zinner NR et al: Efficacy and safety of transdermal oxybutynin in patients with urge and mixed urinary incontinence. 170. 34. Fitzgerald MP and Brubaker L: Variability of 24-hour voiding diary variables among asymptomatic women. AUA conducted additional literature searches to capture treatments not covered in detail by the AHRQ report (e.g., intravesical onabotulinumtoxinA) and relevant articles published between October 2008 and December 2011. Schmidt RA, Jonas U, Oleson KA et al: Sacral nerve stimulation for treatment of refractory urinary urge incontinence. Kuo, HC: Comparison of effectiveness of detrusor, suburothelial and bladder base injections of botulinum toxin A for idiopathic detrusor overactivity. Expert Opinion5. Clinicians should provide education to patients regarding normal lower urinary tract function, what is known about OAB, the benefits versus risks/burdens of the available treatment alternatives and the fact that acceptable symptom control may require trials of multiple therapeutic options before it is achieved. Neurourol Urodyn 2014; [Epub ahead of print]. See text and algorithm for definitions and detailed diagnostic, management and treatment frameworks.Guideline StatementsDiagnosis1. The clinician should engage in a diagnostic process to document symptoms and signs that characterize OAB and exclude other disorders that could be the cause of the patient's symptoms; the minimum requirements for this process are a careful history, physical exam, and urinalysis. Am J Obstet Gynecol 2008: 199: 153 e1. Chapple C, Van Kerrebroeck P, Tubaro A et al: Clinical efficacy, safety, and tolerability of once-daily fesoterodine in subjects with overactive bladder. The Ditropan XL Study Group. 53. Cardarelli, S.;, D'Elia, C.;, Cerruto, M.A.;Curti, P.;Ostardo, E.;Signorello, D.;Pastorello, M.;Caleffi, G.;Molon, A.;Artibani, W. Clinical Principle2. In some patients, additional procedures and measures may be necessary to validate an OAB diagnosis, exclude other disorders and fully inform the treatment plan. Standard (Evidence Strength Grade B)9. If an immediate release (IR) and an extended release (ER) formulation are available, then ER formulations should preferentially be prescribed over IR formulations because of lower rates of dry mouth. 45. Traditionally, up to seven micturition episodes during waking hours has been considered normal,5 but this number is highly variable based upon hours of sleep, fluid intake, comorbid medical conditions and other factors.Nocturia is the complaint of interruption of sleep one or more times because of the need to void.4 In one study, three or more episodes of nocturia constitutes moderate or major bother.6 Like daytime frequency, nocturia is a multifactorial symptom which is often due to factors unrelated to OAB (e.g., excessive nighttime urine production, sleep apnea).Urgency urinary incontinence is defined as the involuntary leakage of urine, associated with a sudden compelling desire to void. The AUA conducted a thorough peer review process of the original document. Smits, M.A.;, Oerlemans, D.;, Marcelissen, T.A.;Van Kerrebroeck, P.E.;De Wachter, S.G. et al: Sacral neuromodulation in patients with idiopathic overactive bladder after initial botulinum toxin therapy. 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Lackner TE, Wyman JF, McCarthy TC et al: Randomized, placebo-controlled trial of the cognitive effect, safety, and tolerability of oral extended-release oxybutynin in cognitively impaired nursing home residents with urge urinary incontinence. 33. A phase III, randomized, double-blind, placebo-controlled study of the beta -adrenoceptor agonist, mirabegron 50 mg once-daily, in Japanese patients with overactive bladder. BJU Intl 2010; 105: 1276. 299. Haab F, Stewart L and Dwyer P: Darifenacin, an M3 selective receptor antagonist, is an effecdtive and well-tolerated once-daily treatment for overactive bladder. 81. Curr Med Res Opin 2008: 24; 1583. 235. Zhao J, Bai J, Zhou Y et al: Percutaneous tibial nerve stimulation twice a week in female patients with refractory urinary frequency: A preliminary study. Arab J Urol 2013; 11: 4. Int Urogynecol J Pelvic Floor Dysfunct 2008; 19: 1055. Br J Urol 1998; 81: 801. 293. 199. Neurourol and Urodynamics 2003; 22: 227. Journal of Clin Urol 2013; 6: 1. J Obstet Gynaecol Can 2013; 35: 1. While not specifically targeting epidemiology of OAB, there are large community-based studies that assess prevalence of lower urinary tract symptoms and urinary incontinence.280, 281 By longitudinally studying these community cohorts, these investigators have developed a new hypothesis that lower urinary tract symptoms are likely related to other systemic diseases/conditions.282, 283 Continuation of these types of studies could lead to potential preventive interventions for OAB symptoms and/or utilization of treatments that target the associated systemic conditions rather than the bladder. Most studies of OAB, including this guideline, exclude individuals with symptoms related to neurologic conditions. 289. Davis, T.;, Makovey, I.;, Guralnick, M.L.;O'Connor R, C. J Urol 1991; 145: 728. The Practice Guidelines Committee (PGC) of the AUA selected the Panel Chair and Vice Chair who in turn appointed the additional panel members with specific expertise in this area. Lowenstein L, FitzGerald MP, Kenton K et al: Evaluation of urgency in women, with a validated Urgency, Severity and Impact Questionnaire (USIQ). Frenkl TL, Zhu H, Reiss T et al: A multicenter, double-blind, randomized, placebo controlled trial of a neurokinin-1 receptor antagonist for overactive bladder. Int J Clin Pract 2006; 60: 119. Practical Assessment, Research & Evaluation 2007; 12. Management may include bowel management, fluid management, dose modification or alternative anti-muscarinics. BJU Intl 2010; 106: 1673. Future research will need to address the entire spectrum of research endeavors including epidemiology, QOL measurements, treatment modalities and basic bladder physiology including sensory and motor signaling. JAMA 1991; 265: 609. J Am Geriatr Soc 2002; 50: 799. These methodologic differences across studies make it a challenge to interpret the OAB literature related to epidemiology and treatment.Urgency is defined by IUGA/ICS as the "complaint of a sudden, compelling desire to pass urine which is difficult to defer."4 Urgency is considered the hallmark symptom of OAB, but it has proven difficult to precisely define or to characterize for research or clinical purposes. Tikkinen KA, Johnson TM, Tammela TL et al: Nocturia frequency, bother and quality of life: how often is too often? Nitti VW, Dmochowski R, Sand PK et al: Efficacy, safety and tolerability of fesoterodine for overactive bladder syndrome. Neurourol and Urodynamics 2005; 24: 231. 269. 156. 277. Urologia 2012; 79: 2. BJU International 2004; 93: 1257. Investigated biomarkers which have been published include nerve growth factor,289 corticotrophin releasing factor,290 prostaglandins291 and inflammatory factors such as C - reactive protein.292 Another approach to find potential relevant biomarkers is to utilize high throughput DNA array profiles, using subtractive techniques to identify uniquely expressed genes in OAB (as compared to controls).293 However, this approach is non-targeted and may result in selection of many spurious, non-OAB specific candidate biomarkers.Functional MRI (fMRI) has provided an imaging tool to ascertain the roles of the CNS (brain/cerebrum) in mediating bladder symptoms and whether there are visible abnormalities in subjects with OAB-symptoms. Can J Urol 2004; 11: 2278. Makovey I, Davis T, Guralnick ML et al: Botulinum toxin outcomes for idiopathic overactive bladder stratified by indication: lack of anticholinergic efficacy versus intolerability. 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Angioli, R.;, Montera, R.;, Plotti, F.; et al:Aloisi, A.;Montone, E.;Zullo, M.A. Success rates, quality of life, and feasibility of sacral nerve stimulation in elderly patients: 1-year follow-up. Tseng LH, Wang AC, Chang YL et al: Randomized comparison of tolterodine with vaginal estrogen cream versus tolterodine alone for the treatment of postmenopausal women with overactive bladder syndrome. Eur Urol 2012; 61: 4. J Urol 2004; 172: 1919. The purpose of this guideline is to provide a clinical framework for the diagnosis and treatment of non-neurogenic overactive bladder (OAB).MethodsThe primary source of evidence for the original version of this guideline was the systematic review and data extraction conducted as part of the Agency for Healthcare Research and Quality (AHRQ) Evidence Report/Technology Assessment Number 187 titled Treatment of Overactive Bladder in Women (2009).1 That report searched PubMed, MEDLINE, EMBASE, and CINAHL for English-language studies published from January 1966 to October 2008 relevant to OAB. 176. Govier FE, Litwiller S, Nitti V et al: Percutaneous afferent neuromodulation for the refractory overactive bladder: results of a multicenter study. Kim JC, Park EY, Seo SI et al: Nerve growth factor and prostaglandins in the urine of female patients with overactive bladder. Abrams P, Kelleher CJ, Kerr LA et al: Overactive bladder significantly affects quality of life. J Urol 2010; 184: 2416. Int Urogynecol J Pelvic Floor Dysfunct 2008; 19: 1551. Kafri R, Langer R, Dvir Z et al: Rehabilitation vs drug therapy for urge urinary incontinence: short-term outcome Int. 233. J Urol 2008; 180: 217. Aboseif S, Tamaddon K, Chalfin S et al: Sacral neuromodulation as an effective treatment for refractory pelvic floor dysfunction. Recommendations are directive statements that an action should (benefits outweigh risks/burdens) or should not (risks/burdens outweigh benefits) be undertaken based on Grade C (low level of certainty) evidence. 7. 226. Sancaktar M, Ceyhan ST, Akyol I et al: The outcome of adding peripheral neuromodulation (Stoller afferent neuro-stimulation) to anti-muscarinic therapy in women with severe overactive bladder. Kaya S, Akbayrak T and Beksac S: Comparison of different treatment protocols in the treatment of idiopathic detrusor overactivity: a randomized controlled trial. 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Lai, H.H.; and Grewal, S.: Bacterial colonization rate of interstim and infection outcome with staged testing. These articles were added to the database, and AUA's qualitative and quantitative analyses were updated as appropriate. Urology 2005; 66; 94. 50. Recommendation (Evidence Strength Grade C)Second-Line Treatments: Pharmacologic Management8. Clinicians should offer oral anti-muscarinics or oral β3-adrenoceptor agonists as second-line therapy. Standard (Evidence Strength Grade B)10. Transdermal (TDS) oxybutynin (patch or gel) may be offered. However, in patients with mixed urinary incontinence (both stress and urgency incontinence), it can be difficult to distinguish between incontinence subtypes. Krauwinkel WJJ, Kerbusch VMM, Meijer J et al: Evaluation of the pharmacokinetic interaction between the β3-adrenoceptor agonist mirabegron and the muscarinic receptor antagonist solifenacin in healthy subjects.

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