SUPPLEMENTAL MATERIAL (ON-LINE ONLY)

Supplemental Table 1. Association of Baseline Characteristics with Incident Urologic Symptoms, BACH Survey (2002-2010)

Variable	Incident LUTS, 10.0% (387/3423)			Incident UI, 8.5% (334/3724)			Incident Nocturia, 16.0% (601/2765)	
	No., % (95% CI)[a]	p-value[b]		No., % (95% CI)[a]	p-value[b]		No., % (95% CI)[a]	p-value[b]
Age								
<40 y	65, 6.3% (4.3, 9.1)	0.0008		50, 6.8% (4.0, 11.3)	<.0001		120, 10.9% (8.0, 14.7)	0.0006
40-49 y	103, 8.9% (6.7, 11.9)			76, 4.9% (3.6, 6.8)			172, 16.7% (13.1, 21.2)	
50-59 y	96, 9.8% (7.4, 12.9)			90, 10.6% (8.2, 13.6)			167, 22.2% (18.0, 27.0)	
60-69 y	81, 14.1% (10.4, 18.9)			82, 14.5% (10.6, 19.5)			103, 22.6% (16.4, 30.3)	
70+ y	43, 26.3% (17.0, 38.4)			37, 14.9% (9.1, 23.6)			39, 21.4% (13.7, 32.0)	
Sex								
Male	138, 7.1% (5.5, 9.2)	0.0010		103, 6.9% (4.6, 10.2)	0.0730		248, 14.6% (12.2, 17.5)	0.1279
Female	249, 12.6% (10.2, 15.4)			232, 10.1% (8.2, 12.4)			353, 17.4% (14.7, 20.4)	
Race/ethnicity								
Black	127, 11.3% (8.5, 14.9)	0.6127		98, 7.1% (5.3, 9.6)	0.2620		201, 20.8% (17.1, 24.9)	0.0023
Hispanic	149, 10.5% (7.6, 14.2)			108, 6.7% (4.5, 9.9)			221, 21.3% (15.7, 28.1)	
White	111, 9.3% (7.2, 11.9)			128, 9.6% (7.3, 12.5)			180, 13.3% (11.0, 15.9)	
SES								
low	203, 15.1% (11.4, 19.8)	0.0217		163, 9.5% (7.4, 12.1)	0.4060		309, 24.5% (20.4, 29.1)	0.0002
middle	138, 8.5% (6.5, 11.0)			124, 8.8% (6.2, 12.4)			232, 15.0% (12.2, 18.2)	
high	46, 8.0% (5.7, 11.2)			48, 7.2% (5.0, 10.1)			61, 11.9% (8.5, 16.4)	
Type 2 diabetes mellitus	57, 18.1% (12.9, 24.9)	0.0078		55, 15.7% (10.7, 22.5)	0.0134		82, 28.8% (19.9, 39.6)	0.0036
Heart disease	48, 12.8% (8.1, 19.7)	0.3375		47, 15.2% (9.8, 22.7)	0.0391		63, 27.9% (19.9, 37.5)	0.0060
Alcohol use								
0 drinks	192, 10.7% (8.2, 13.8)	0.6974		182, 11.2% (8.7, 14.4)	0.0455		280, 19.6% (16.1, 23.7)	0.1079
<1 drink/day	131, 10.2% (7.8, 13.4)			103, 7.7% (5.0, 11.6)			204, 15.3% (12.4, 18.8)	
1-3 drinks/day	47, 9.1% (6.1, 13.4)			37, 7.1% (4.4, 11.2)			87, 12.9% (9.5, 17.2)	
3+ drinks/day	17, 7.5% (3.8, 14.5)			13, 4.4% (1.9, 10.0)			31, 13.9% (8.3, 22.4)	
Physical activity								
Low	161, 15.1% (11.3, 19.8)	<.0001		156, 14.1% (9.8, 20.0)	0.0225		234, 23.5% (18.8, 28.9)	0.0012
Middle	176, 10.0% (7.8, 12.8)			133, 7.2% (5.4, 9.4)			271, 14.7% (12.2, 17.7)	
High	50, 4.9% (3.4, 7.0)			45, 5.5% (3.6, 8.4)			97, 12.0% (9.1, 15.7)	

Variable	Incident LUTS, 10.0% (387/3423)			Incident UI, 8.5% (334/3724)			Incident Nocturia, 16.0% (601/2765)	
	No., % (95% CI)[a]	p-value[b]		No., % (95% CI)[a]	p-value[b]		No., % (95% CI)[a]	p-value[b]
Smoking status Non-smoker Former Current	 153, 7.7% (5.8, 10.2) 126, 12.5% (9.1, 17.0) 109, 12.1% (8.8, 16.3)	0.0409		 145, 7.9% (5.5, 11.3) 110, 10.3% (7.7, 13.7) 80, 7.7% (5.6, 10.5)	0.3684		 265, 13.1% (10.7, 16.0) 155, 17.2% (13.6, 21.4) 181, 20.7% (16.5, 25.6)	0.0059
Anti-depressant use	79, 11.8% (8.0, 17.1)	0.4067		76, 16.0% (9.2, 26.3)	0.0638		112, 24.5% (18.2, 32.0)	0.0091
Secondary sedation meds	153, 16.6% (12.6, 21.7)	0.0016		146, 16.0% (11.0, 22.8)	0.0044		196, 25.5% (20.6, 31.0)	0.0002
Primary stimulation meds	8, 6.8% (2.7, 16.2)	0.3365		3, 1.3% (0.2, 7.4)	0.0005		18, 22.5% (13.1, 36.0)	0.2712
Secondary stimulation meds	107, 9.3% (6.8, 12.6)	0.5661		96, 11.6% (7.4, 17.7)	0.1322		155, 16.7% (13.2, 20.9)	0.7000

Abbreviations: BACH, Boston Area Community Health; BMI, body mass index; CI, Confidence interval; LUTS, lower urinary tract symptoms; SES, Socioeconomic status; UI, urinary incontinence

[a] Unweighted counts and weighted percentages and 95% CIs presented.

[b] p-value testing the null hypothesis of no association between incidence of the urologic symptom with the variable of interest.

[c] Frequencies may not add up to the total due to multiple imputation and rounding.

Supplemental Table 2. Association of Baseline Characteristics with Incident Sleep Outcomes, BACH Survey (2002-2010)

Variable	Incident poor sleep quality, 24.2% (673/2449)		Incident sleep restriction, 13.3% (210/1279)[a]		Incident sleep medications, 11.6% (405/3569)	
	No., % (95% CI)[b]	p-value[c]	No., % (95% CI)[b]	p-value[c]	No., % (95% CI)[b]	p-value[c]
Age						
<40 y	167, 20.9% (16.7, 25.8)	0.1328	52, 11.9% (7.8, 17.9)	0.4650	127, 13.2% (10.2, 16.9)	0.0870
40-49 y	200, 27.8% (22.4, 33.9)		56, 10.8% (7.4, 15.4)		115, 10.2% (7.6, 13.5)	
50-59 y	152, 22.2% (18.0, 27.1)		52, 14.4% (9.6, 21.0)		74, 8.0% (5.9, 10.9)	
60-69 y	104, 24.3% (17.8, 32.2)		33, 17.0% (9.3, 29.0)		66, 12.5% (8.7, 17.5)	
70+ y	50, 32.9% (23.4, 44.0)		17, 19.9% (10.3, 35.1)		23, 13.3% (7.6, 22.2)	
Sex						
Male	262, 22.5% (18.6, 26.8)	0.2309	NA	NA	128, 10.0% (7.6, 13.0)	0.0884
Female	412, 25.8% (22.1, 30.0)				277, 13.1% (11.0, 15.5)	
Race						
Black	216, 28.9% (23.6, 34.8)	0.1397	81, 20.9% (16.3, 26.3)	0.0074	104, 9.4% (7.2, 12.4)	0.2332
Hispanic	253, 25.6% (21.7, 29.8)		66, 13.8% (9.5, 19.7)		144, 11.6% (9.1, 14.6)	
White	204, 22.1% (18.3, 26.4)		63, 10.8% (7.5, 15.3)		157, 12.6% (10.3, 15.3)	
SES						
low	315, 32.2% (26.7, 38.2)	0.0078	91, 16.5% (12.3, 21.7)	0.0003	187, 14.4% (11.4, 18.1)	0.2091
middle	269, 23.3% (19.4, 27.7)		95, 16.5% (11.9, 22.3)		154, 10.3% (7.9, 13.2)	
high	89, 20.1% (15.3, 26.0)		24, 6.5% (4.0, 10.5)		63, 11.3% (8.3, 15.3)	
Type 2 diabetes mellitus	82, 39.2% (28.2, 51.4)	0.0228	23, 20.9% (9.4, 40.2)	0.3148	39, 8.4% (5.0, 13.8)	0.1726
Heart disease	67, 39.0% (28.7, 50.2)	0.0118	19, 14.0% (8.0, 23.2)	0.8521	48, 15.1% (9.9, 22.4)	0.2653
Alcohol use						
0 drinks	327, 30.4% (25.6, 35.7)	0.0025	81, 18.3% (12.2, 26.4)	0.3040	170, 11.9% (9.3, 15.1)	0.4841
<1 drink/day	224, 18.8% (15.4, 22.7)		69, 11.3% (7.9, 15.9)		158, 11.7% (9.2, 14.8)	
1-3 drinks/day	88, 26.7% (20.3, 34.1)		39, 11.1% (7.1, 16.8)		58, 11.9% (8.5, 16.4)	
3+ drinks/day	34, 24.7% (14.2, 39.4)		21, 15.1% (8.3, 25.9)		18, 7.4% (3.6, 14.8)	
Physical activity						
Low	220, 29.0% (23.8, 34.7)	0.1138	74, 19.8% (13.4, 28.2)	0.0827	156, 15.5% (12.1, 19.5)	0.0432
Middle	328, 22.0% (18.4, 26.0)		93, 10.6% (7.8, 14.1)		184, 10.3% (8.1, 13.0)	
High	126, 24.7% (19.1, 31.2)		43, 11.9% (7.6, 18.1)		65, 10.0% (7.5, 13.3)	
Smoking status						
Non-smoker	332, 23.9% (19.8, 28.6)	0.0298	75, 11.3% (7.8, 16.0)	0.0838	191, 10.0% (7.9, 12.6)	0.1833
Former	155, 19.9% (15.8, 24.7)		56, 11.6% (7.5, 17.6)		103, 14.8% (11.1, 19.3)	
Current	187, 30.8% (24.6, 37.8)		79, 18.8% (13.5, 25.6)		111, 11.1% (8.4, 14.6)	
Anti-depressant use	99, 29.4% (21.5, 38.8)	0.1919	24, 11.2% (6.5, 18.8)	0.5097	88, 17.1% (11.3, 25.0)	0.0863

Variable	Incident poor sleep quality, 24.2% (673/2449)		Incident sleep restriction, 13.3% (210/1279)[a]		Incident sleep medications, 11.6% (405/3569)	
	No., % (95% CI)[b]	p-value[c]	No., % (95% CI)[b]	p-value[c]	No., % (95% CI)[b]	p-value[c]
Secondary sedation meds	194, 27.6% (23.0, 32.9)	0.1406	57, 14.9% (10.3, 21.1)	0.4961	142, 14.0% (10.8, 17.8)	0.1506
Primary stimulation meds	16, 33.2% (17.8, 53.2)	0.3340	9, 42.4% (20.2, 68.2)	0.0844	17, 19.9% (11.3, 32.6)	0.1790
Secondary stimulation meds	156, 23.9% (18.7, 30.1)	0.9226	45, 13.3% (8.2, 20.7)	0.9974	112, 17.3% (13.1, 22.4)	0.0053

Abbreviations: BACH, Boston Area Community Health; BMI, body mass index; CI, Confidence interval; SES, Socioeconomic status

[a] Sleep restriction was assessed in men only.

[b] Unweighted counts and weighted percentages and 95% CIs presented.

[c] p-value testing the null hypothesis of no association between incidence of the urologic symptom with the variable of interest.

[d] Frequencies may not add up to the total due to multiple imputation and rounding.

Boston Area Community Health (BACH) Survey
Detailed Sedation/Stimulation Medication Coding Scheme

Sedation/Stimulation Coalition Build Methodology

- A systematic literature evaluation was performed for each medication looking for keywords in the descriptions, indications and adverse events section of each reference.

- If the keyword appeared in the indication section this would be considered primary sedation/stimulation.

- If the keyword appeared in the common side effects or adverse event section, and the description of the adverse event was consistent with the outcomes we are looking, for this drug would the considered to cause secondary sedation/stimulation.

    - Inclusion of adverse events with low prevalence were considered on a case by case basis

    - If a drug showed mixed adverse effects of stimulation and sedation the more common effect was chosen for inclusion based on manufacturer drug monographs and patient specific information leaflets.

- Keywords: drowsiness, fatigue, somnolence, sedation, sleepiness, insomnia, restlessness, narcolepsy, dizziness, mental alertness

- Each drug was categorized based on the outcomes seen in drug labeling or literature.
    - For primary sedative effect or indicated use for sedation purpose (Primary Sedation)
    - For sedative effect as an adverse reaction (Secondary Sedation)
    - For primary stimulative effect or indicated use for stimulant purpose (Primary Stimulation)
    - For stimulative effect as an adverse reaction (Secondary Stimulation)
    - For mild sedation or dizziness/ cautions regarding mental alertness or performing tasks such as driving, as side effect or adverse effect (Secondary Sedation II)
- A drug is considered having none of the above effects if these key words are unreported or insufficient data in the drug adverse effects section.
- References included:
    - Drugs@FDA and DailyMed (for product labeling)
    - Clinical Pharmacology
    - Micromedex
    - Martindales

- Natural Standard
- Natural Medicines Comprehensive Database

Coalition Build

- **Primary Sedation** Coalition: Contains medications found in the sedative hypnotic class that are indicated for sleep. Includes all benzodiazepines and the related hypnotics: zolpidem, zaleplon and eszopiclone. Includes antihistamines used for sleep: diphenhydramine and doxylamine. Also includes the natural product melatonin. Includes the NOS- benzodiazepine and NOS- sleep medication/sedative/hypnotic unknown. Does not include the barbiturates used for seizures: phenobarbital , mephobarbital , or butalbital which is used in combination with analgesics for the treatment of migraine (see Secondary Sedation I Coalition)

- **Secondary Sedation** Coalition: Contains medications that cause sedation, drowsiness as a side effect. Includes most CNS active medications including drugs from the following classes: first generation antihistamines, muscle relaxants, alpha adrenergic blockers, beta blockers (except for timolol which is primarily used topically in the eye), urinary smooth muscle relaxants (oxybutynin, tolterodine, tropsium),central alpha agonists, narcotic analgesics, anticonvulsants, antimigraine, tricyclic antidepressants, antipsychotics, serotonin modulators, spironolactone, and dopamine agonists (levodopa, pramipexole, ropinirole). Herbs and natural products that are considered to have sedative properties including: chamomile, valerian, hops, kava, lavender, passion flower

and St Johns Wort. Also includes the “NOS”-allergy/hayfever and nos- anxiety drug unknown codes. Excludes topicals (skin, eye, ear, nose), includes orally inhaled. [Note: some dietary supplements containing chamomile that are not indicated for relaxation or sleep are excluded]

- **Secondary Sedation II** Coalition: Contains medications that cause mild sedation, dizziness or drowsiness as a side effect. Includes medications from the following classes: second generation antihistamines, anticholinergics, some SSRI antidepressants (paroxetine, citalopram,duloxetine and venlafaxine), less sedating dopamine agonists (bromocriptine, cabergoline),SNRI antidepressants, NSAIDs, some antibacterials (quinolones, minocycline) and antivirals, calcium channel blockers, ACE inhibitors, antiarrythmics, angiotensin receptor blockers and dextromethorphan. Includes “NOS” codes for colds/fever (generic and by brand), pain, sinus, migraine, anti-depressant, anti-hypertensive, heart and nos-antihistamine. Excludes topicals (skin, eye, ear, nose). Note some agents may have mixed sedation/stimulation effects but carry a warning regarding mental alertness or dizziness (e.g.,SSRIs, efavirenz, atomoxetine)

- **Primary Stimulation** Coalition: Includes medications known to have stimulating effects. Includes stimulant medications used to treat ADHD, narcolepsy (modafinil) and obesity (amphetamines, phentermine), ephinephrine, and caffeine. Excludes products containing caffeine to enhance pain relief or in a dietary supplement.

- **Secondary Stimulation** Coalition: Includes medications known to have stimulation, agitation and insomnia as a side effect. Includes beta-agonists used to treat asthma, decongestants, cholinergic agents, corticosteroids (excludes hydrocortisone which is used topically), bupropion, sibutramine, some SSRI antidepressants (fluoxetine, sertraline, and escitalopram), theophylline, nicotine and varenicline. Medications, herbs and natural products that contain caffeine or other stimulants including citrus aurantium, cola, ephedra, green tea, guarana, sida cordifolia and yerba mate. Also includes other herbs and natural products that are considered to have stimulating effects including deanol (DMAE), ginseng, huperazine, and vinpocetine. Includes “NOS” codes for colds/fever (generic and by brand) that may contain a decongestant. Excludes topicals (skin, eye, ear, nose), includes orally inhaled. [Note: some dietary supplements containing green tea as an antioxidant are excluded, those containing ginkgo and ginseng are generally included]. Drug codes for some steroids are linked to topical products (skin and nasal) and to oral inhaled products, and could not be excluded (e.g., triamcinolone, beclomethasone , budesonide and fluticasone).