Hypothesis / Aims of study
Nocturia represents a significant source of bother to patients and can be detrimental to quality of life and sleep [2]. There are two possible reasons why patients have nocturia – they are awakened by an urge to void (primary nocturia voids or PNV) or they awaken for some other reason and then void before going back to sleep (secondary nocturia voids or SNV). Primary nocturia can be subdivided into urgency voids and non-urgency voids. The aim of this study is to determine the relative contribution of each type of night-time voids in a large cohort of patients.

Study Design, Materials and Methods
This is an IRB approved retrospective study of consecutive patients who completed a 24 hour paper bladder diary (24H BD). Clinical diagnoses were included as documented in the patient record. Day and night-time voids were distinguished by the bedtime and awake as recorded on the diary. Each nocturnal void was designated as primary or secondary nocturia based on the following scheme: Involuntary Urge Perception Score (UPS). Primary nocturia was sub-divided into urgency voids (severe urge or desirable urge: UPS = 3 or 4) and non-urgency voids (mild urge or moderate urge: UPS = 1 or 2). Secondary nocturia was defined as void without urgency (no urge: UPS = 0).

Results
572 patients completed 1288 diaries included in the analysis, including 369 men and 203 women. Overall, 1586 bladder diaries were reviewed. 572 diaries were excluded because of inaccurate UPS scores or incompleteness. 338 patients completed 1 diary, 113 patients completed 2 diaries, 54 patients completed 3 diaries and 77 patients completed 3 or more diaries. 2,793 night time voids were analyzed. 214 voids (7.7%) were designated as secondary nocturia. 1629 voids (58.3%) were designated as non-urgency voids (49.5%) were designated as urgency voids. The age of patients ranged from 6 - 100 years. The average patient age was 62, with a standard deviation of 18.2. 169 patients had a clinical diagnosis documented. Clinical diagnoses include Urinary Stricture, Unaware Incontinence, OAB, BPH, and Stress Incontinence. The most common diagnosis was overactive bladder (OAB) with 549 patients, followed by BPH with 184 patients. Analysis of urge perception scores and diagnoses yielded a characteristic of nocturia voids in each diagnostic class. Patient with a diagnosis of stress incontinence most frequently had non-urgency voids at-bladder related voids. On analysis of diagnoses and UPS scores, patients with OAB also had majority non-urgency voids with a slightly increased proportion of secondary nocturia or non-bladder related voids (15.6%). Patients with OAB had majority urgency voids. Patients with those with urge symptoms had highest were found to have majority non-urgency voids. Patients with nocturia and urethral stricture listed as a diagnosis were found to have nearly equivalent percentages of urgency and non-urgency voids.

Introduction
Nocturia is defined as "the complaint that the individual has to wake at night one or more times to void" [1]. There are two possible reasons why patients have nocturia – they are awakened by an urge to void (primary nocturia voids or PNV) or they awaken for some other reason and then void before going back to sleep (secondary nocturia voids or SNV). Primary nocturia voids can be subdivided into urgency voids and non-urgency voids. Voiding has many potential contributing factors or causes. Causes of nocturia can be separated into categories including nocturnal polyuria, polyuria and storage issues or reduced bladder capacity. A useful tool in the clinical evaluation of nocturia is the 24 hour bladder diary (24H BD). In a bladder diary, patients record the time and volume of both daytime and night-time voids for a period of 24 hours to 3 days. Combining this with analysis of urge perception creates a helpful method of analyzing quality of life and sleep [2]. There are two possible reasons why patients have nocturia – they are awakened by an urge to void (primary nocturia voids or PNV) or they awaken for some other reason and then void before going back to sleep (secondary nocturia voids or SNV). Primary nocturia voids can be subdivided into urgency voids and non-urgency voids. Voiding has many potential contributing factors or causes. Causes of nocturia can be separated into categories including nocturnal polyuria, polyuria and storage issues or reduced bladder capacity. A useful tool in the clinical evaluation of nocturia is the 24 hour bladder diary (24H BD). In a bladder diary, patients record the time and volume of both daytime and night-time voids for a period of 24 hours to 3 days. Combining this with analysis of urge perception creates a helpful method of analyzing quality of life and sleep [2]. There are two possible reasons why patients have nocturia – they are awakened by an urge to void (primary nocturia voids or PNV) or they awaken for some other reason and then void before going back to sleep (secondary nocturia voids or SNV). Primary nocturia voids can be subdivided into urgency voids and non-urgency voids. Voiding has many potential contributing factors or causes. Causes of nocturia can be separated into categories including nocturnal polyuria, polyuria and storage issues or reduced bladder capacity. A useful tool in the clinical evaluation of nocturia is the 24 hour bladder diary (24H BD). In a bladder diary, patients record the time and volume of both daytime and night-time voids for a period of 24 hours to 3 days. Combining this with analysis of urge perception creates a helpful method of analyzing quality of life and sleep

Materials and Methods
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Discussion
Overall, it appears that 7.7% percent of the time, patients may be voiding at night due to secondary nocturia. Because patients designated that these were not accompanied by any urge, we post that at the time of these voids, the patients knew why they were voiding - a reason other than urge is what is responsible for these non-urgency voids during the night-time are, in fact, related to the bladder. We found that the prevalence of primary nocturia with urgency voids to be 34% overall. However, the great majority of nighttime voids (58.3%) were reported non-bladder related urgency voids. In addition to primary nocturia voids, secondary or non-bladder related voids, there is a third category – patients who wake and who are unsure as to why they awake. We can conclude that patients awake to urinate for the urgency voids, we cannot definitively attribute waking up at night to the bladder-related causes for these non-urgency voids.

Conclusions
Although the vast majority of patients in this series with nocturia were awakened by the desire to void, a subset were not. Further, voiding at rest did not appear to be related to the bladder in all some patients. It is important to make these distinctions about why people void at night because the diagnostic evaluation and treatment options may be completely different depending upon these factors.

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References