

Which of the following is MOST CORRECT regarding Nocturia in the elderly?

- a. The majority of cases are due to urological issues
- b. It disrupts QOL but has no effects on morbidity or mortality
- c. Its Prevalence increases to 80-90% in 80+ year olds
- d. Chronic kidney disease is associated with decreased urine output

Which of the following is MOST CORRECT regarding syndrome of Nocturnal Polyuria?

- a. Oral loop diuretics taken 6-10 hours before recumbency reduce nocturnal urinary frequency
- b. Nocturnal ADH secretion is decreased in all cases
- c. Oral desmopressin is both ineffective and potentially dangerous
- d. CPAP may help Sleep apnea but has no effect on nocturnal polyuria

All of the following are causes of nocturnal polyuria EXCEPT:

- a. Congestive heart failure
- b. Venous insufficiency
- c. Autonomic dysfunction
- d. Acute use of NSAID's

Nocturia

Jeannette M. Potts, MD
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San Jose, California

Prevalence

- 69% men 76% women over age 40
- The most common LUTS
- The most bothersome
- Increases with age

Nocturia is...

- Normal part of aging
- Urological Problem
- Just a component of LUTS
- Symptom of BOO due to BPH
- Symptom of OAB
- Therefore**
- Treatments are urological

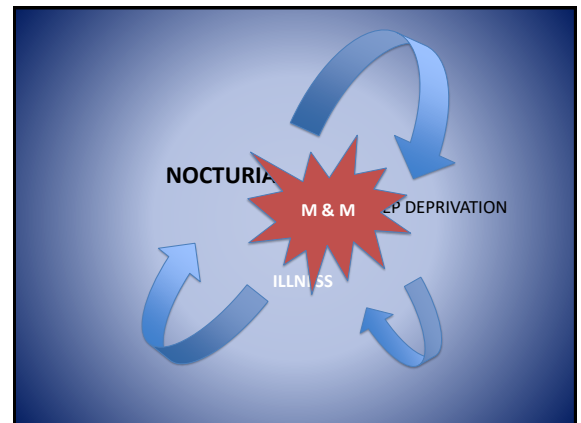
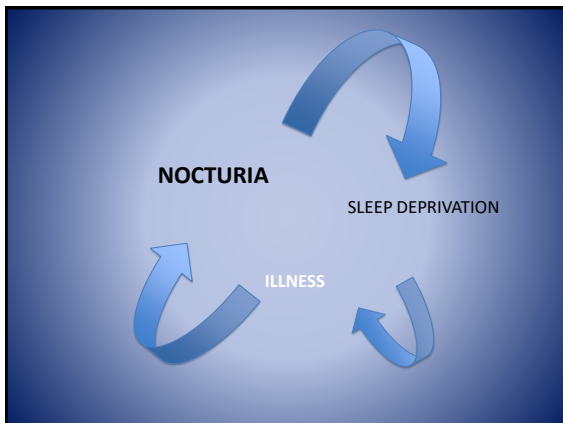


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Nocturia- Disrupts Sleep


- Chronic Fatigue
- Depression
- Endocrinological Disturbances
- Trauma
- Hypertension
- Mortality

- Nocturia x2, 40-80 year olds ↑ Hip fracture

Temml et al. Neurourol Urodyn, 2009

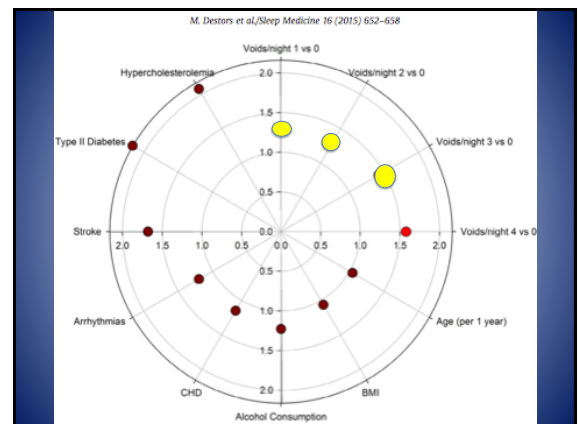
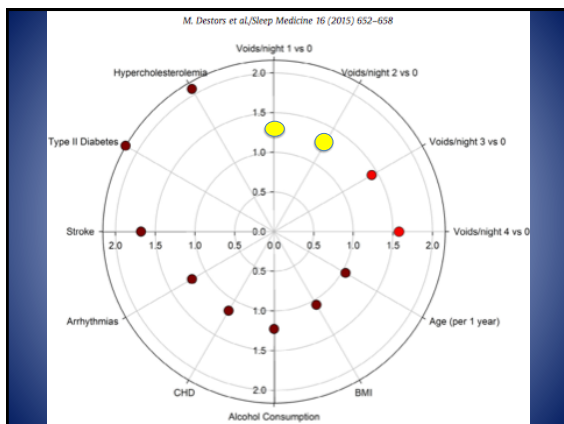
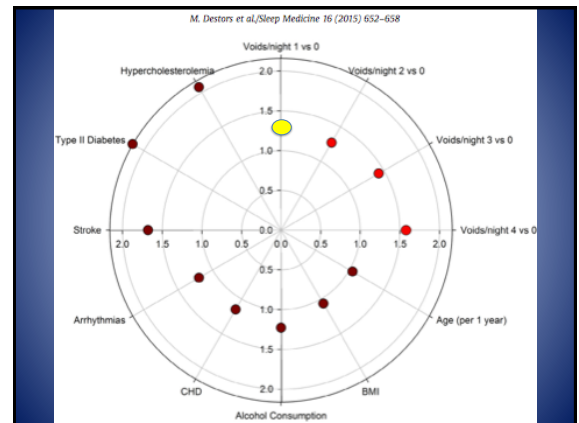
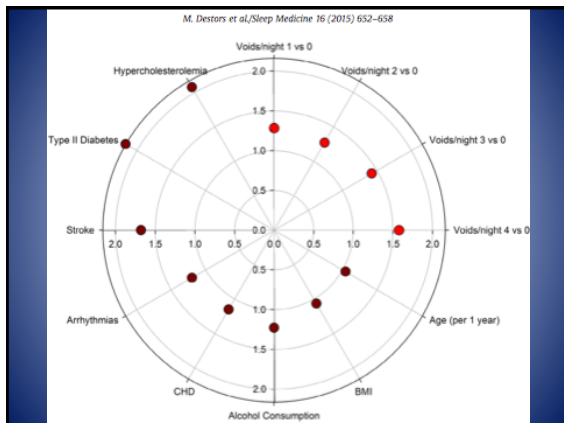
- Nocturia = increases Mortality 22%
- Nocturia x3 = increases Mortality 46%

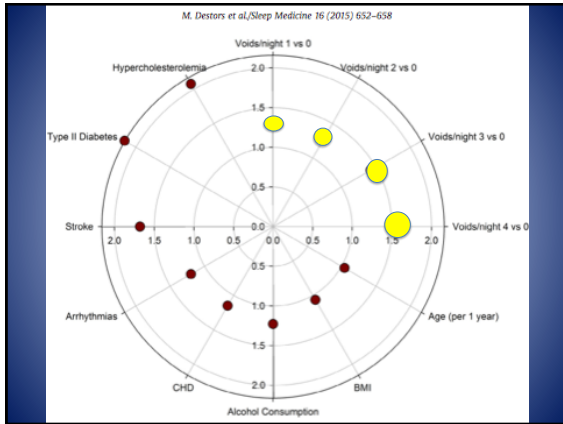
Fan et al. Intl J Cardio, 2015

Sleep disturbance=  Blood Pressure

- Normal: 10% dip in BP overnight
- Decrease quantity of sleep
- Decrease quality of sleep
- Prevents nocturnal dipping of BP

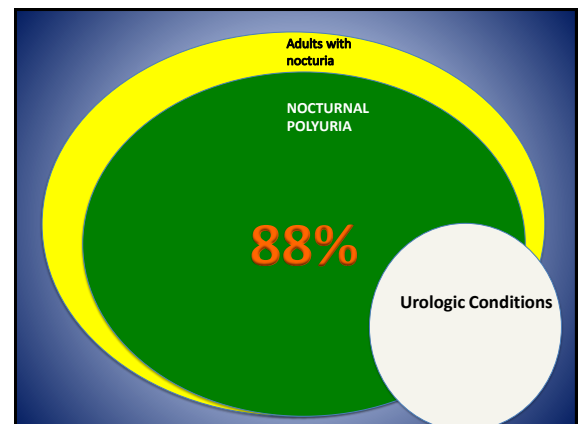
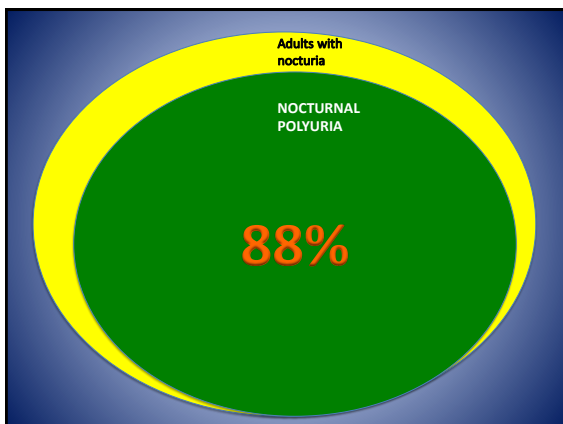
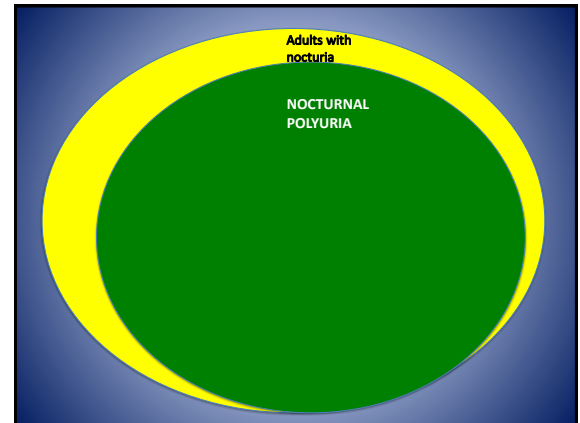
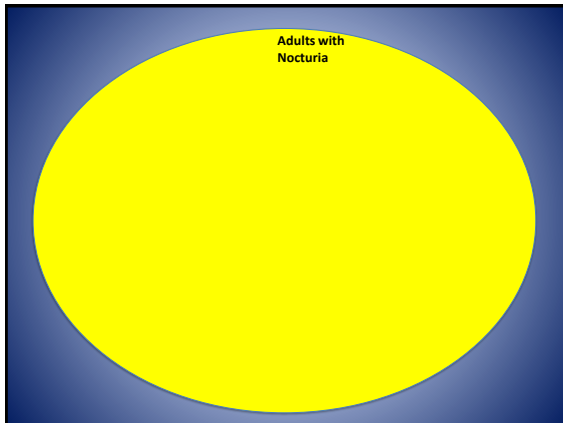
Nocturnal Hypertension is predictive of CV morbidity/mortality





NOCTURIA

CAUSE or MARKER



NOCTURIA = LUTS

MM 64

- Trials with various alpha blockers over 2 years
- Worsening LUTS and Nocturia
- HTN

MM 64

- Trials with various alpha blockers over 2 years
- Worsening LUTS and Nocturia
- HTN
- No pedal edema
- Neg U/A

Friday 17:40. 280ml

- 19:10. 230ml
- 20:50 230ml
- 23:00 250ml avg

• 13:15 200ml

- 14:20 200ml
- 16:15 250ml
- 19:00 250ml
- 20:50 220ml

Saturday AM 1:00 250ml avg

- 3:20 250ml avg
- 3:50 250ml avg
- 6:00 350ml
- 7:10 300ml
- Got up 8:00 250ml

Sunday AM 1:20 350ml

- 3:40 330ml
- 5:05 300ml
- 6:40 300ml
- Got up 7:30 250ml
- 11:15 250ml
- 14:55 250ml

- Go to bed

- 23:00 250ml avg

Saturday AM 1:00 250ml avg

- 3:20 250ml avg

- 3:50 250ml avg

- 6:00 350ml

- 7:10 300ml

- Got up 8:00 250ml

10:00 150ml Friday 17:40. 280ml

- 19:10. 230ml

- 20:50 230ml

- 13:15 200ml

- 14:20 200ml

- 16:15 250ml

- 19:00 250ml

- 20:50 220ml

- Go to bed

Sunday AM 1:20 350ml

- 3:40 320ml

- 5:05 300ml

- 6:40 300ml

- Got up 7:30 250ml

**Nocturnal/ 24 hour Total :
1,650 divided by 2,920 = .565**

NPi <.33 for >65 year olds
NPi <.20 for <65

The patient with OAB

GH 70

- Nocturia
- Diabetic
- Parkinson
- Depression
- Married

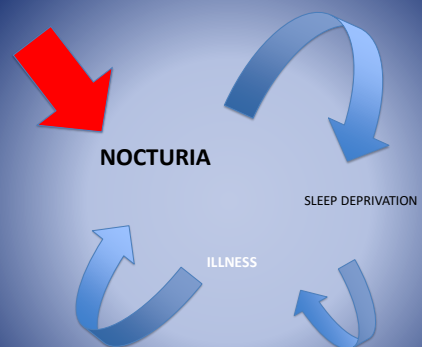
GH 70

- Nocturia- Insomnia, light sleeper vs urinary urge
- Diabetic- glycemic control, ?cystopathy
- Parkinson- Diurnal variation ADH secretion with neurogenic bladder
- Depression- primary or secondary, meds?
- Married- partner's health?

Mon 12:00. 150 mL	• 10:00 125 ml
• 14:20. 150 ml	• 12:00 180 ml
• 17:10 100ml	• 2:30 150 ml
• 22:00 125ml avg	• 17:20 125 ml
	• 19:50 100 ml
Tuesday 00:10 180 ml avg	Wednesday 00:00 250 ml
• 2:30 150 ml avg	• 2:40 170 ml
• 3:40 200 ml avg (leakage)	• 4:25 180 ml
• 5:00 150 ml	• 6:40 100 ml
• 6:30 100 ml	• Got up 9:00 180 ml
• Got up 7:00 120 ml	• 10:30 200 ml
	• 12:55 150 ml

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• 5:00 150 ml	• 4:25 180 ml
• 6:30 100 ml	• 6:40 100 ml
• Got up 9:00 180 ml	
• 9:00 100ml	

Nocturnal Volume/24 hour Total= Npi
900 DIVIDED BY 1780 = .501



Causes of Nocturia

Urological

- Bladder Outlet Obstruction
- Detrusor Dysfunction and Urinary Retention
- Detrusor Overactivity
- Urinary Tract Infection
- Neurogenic Bladder with reduced capacity
- Bladder Calculi
- Bladder Neoplasm

Causes of Nocturia

Non-Urological

- Chronic heart failure
- Venous Insufficiency
- Diabetes mellitus
- Diabetes insipidus
- Hypoalbuminemia
- Sleep apnea
- Multiple sclerosis
- Neurological Disease- Alzheimer's or Parkinson's
- Renal disease

NOCTURNAL POLYURIA

- Chronic heart failure
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- Diabetes mellitus
- Diabetes insipidus
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Interstitial edema formation

- Congestive Heart failure,
- Venous or lymphatic insufficiency
- Elimination of third space during repose

Interstitial edema formation

- CHF, Venous or lymphatic insufficiency
- Elimination of third space during repose

Tx: Evening fluid restriction, support stockings,
leg elevation, Afternoon naps,
Afternoon diuretics?

Sleep Apnea

- Growing prevalence
- AASM estimates 26% of US adult population
- 80 percent are undiagnosed



- Nocturia is independently associated with sleep-disordered breathing and its severity
- Intermittent hypoxia, sympathetic hyperactivity and variation in intrathoracic pressure lead to increased secretion of natriuretic hormones

Parthasarathy et al. PLoS ONE, 2012

Apnea & Atrial Natriuretic Peptide

Hypoxia/Hypercapnea



Apnea & Blood Pressure

- Hypoxia causes increase in sympathetic outflow from kidney
- Increase renin, increases angiotensin II and aldosterone
- Prevents nocturnal “dipping” of BP

Sleep Apnea: Treat the cause

- CPAP
- Diet and exercise
- Moderation of caffeine and alcohol
- Sleep hygiene

Vasopressin/Anti-Diuretic Hormone

- AVP/ADH insufficiency at night
- Medications
- Alcohol
- Caffeine
- Disruption of Circadian Rhythms
- Electrolyte imbalances
- Renal receptor “resistance” (autoimmune, meds)

Asplund and Aburg 1991

Treating ADH deficiency

Efficacy and safety of desmopressin for treatment of nocturia: a systematic review and meta-analysis of double-blinded trials.

Zong et al, Int'l Urol Nephro 2012

Vasopressin Deficiency

- >90% responders remained on tx 12 months
- Men tolerate higher doses
- Women have best responses
- Decreases Urine Volume, Increases Sleep
- Serious AE's had nothing to do with the med
- Hyponatremia 3-12%, rarely symptomatic

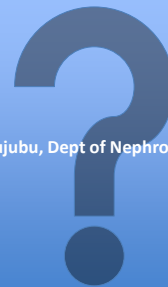
Mattiasson 2002, Lose 2003, Van Kerrebroeck 2007, Weiss 2012

Prescribing ADH

- Start low (25 mcg)
- Monitor Sodium
- Monitor AE's
- Determine if patient is a responder and d/c asap



Dean Kujubu, Dept of Nephrology, UCLA



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Nocturia- History

- Poor sleep vs urinary urgency
- Sleep hygiene, alcohol and caffeine
- PMH: CHF, DM, Neurological d/o
- Meds
- Thirst
- Has anyone commented about your snoring?
- Edema- are your ankles thinner in the morning



Nocturia-Exam

- BMI/waist circumference
- BP
- Cardiovascular
- Feet and legs
- Urine- r/o uti or suspicious sediment
- Specific gravity, glycosuria, protein
- FLUID DIARY

Conclusion

ASSUME IT'S POLYURIA

Conclusion

ASSUME IT'S POLYURIA
FLUID DIARY

Conclusion

JUST ASSUME IT'S POLYURIA
FLUID DIARY.
MAKE DX- MAKE AN IMPACT