A PILOT STUDY:

IS THE SECOND MORNING SAMPLE OF TOTAL TESTOSTERONE LEVEL REALLY NECESSARY

FOR DIAGNOSIS?

Jason Schmidthuber PA-C,

Robert S Tan MD MBA

The Low T Center *experience*

- INTRODUCTION:

- Because of the observation of fluctuation of serum testosterone (T) levels, professional associations have suggested a second morning sample to verify diagnosis in their guidelines.

- Endocrine Society Guidelines on Androgen Deficiency:
  - "We suggest the measurement of morning total testosterone level by a reliable assay as the initial diagnostic test. We recommend confirmation of the diagnosis by repeating the measurement of morning total testosterone…

- Insurance companies started policies to only allow treatment after two morning samples.

HYPOTHESIS

- We hypothesize that if the first sample is below a certain threshold, there is no need to repeat T levels.

- Low T Centers are distributed across the United States, following similar strict protocols, have clinically evaluated 100,000+ men for Androgen Deficiency Syndrome in the past 8 years.

METHODS

- In this pilot study, we selected centers in CO and TX.
- All patients were male and age ranges between 25-69 years (mean= 45 years). IRB approval was sought and data was mined from the EMR (Advanced MD) with patient information de-identified.
- Randomization was based on selection of last name by a fixed alphabetical order in the different centers. Patients who were symptomatic of hypogonadism were selected.
- Data was entered into Excel, and the statistical analysis performed using Graphpad QuickCalcs.

RESULTS

- 249 patients who had symptoms of fatigue and loss of libido were analyzed with two morning samples separated between 1-4 weeks.
- initial sample had to be below 300 to trigger return for 2nd am sample.
- Second sample Two separate cut-off points were set <300ng/dl [A] and <350 ng/dl [B]. For [A] 5 (2%) and [B] 16 (6.4%) did not meet criteria after the second sampling.
- Comparative statistics were applied for differences between observed & expected in both groups and difference was statistically significant (p= 0.0001).

A: Patients with first sample <300ng/dl

	Observed	Expected
Group 1	5	1
Group 2	244	248

Group 1= Second sample > 350 ng/dl
Group 2= Second sample < 300 ng/dl

B: Patients with first sample <300 ng/dl

	Observed	Expected
Group 1	16	1
Group 2	233	248

Group 1= Second sample > 300 ng/dl
Group 2= Second sample < 300 ng/dl

Red font show outliers
Chi square applied, p= 0.001

OBSERVATIONS OF FIRST AND SECOND SAMPLES

RESULTS

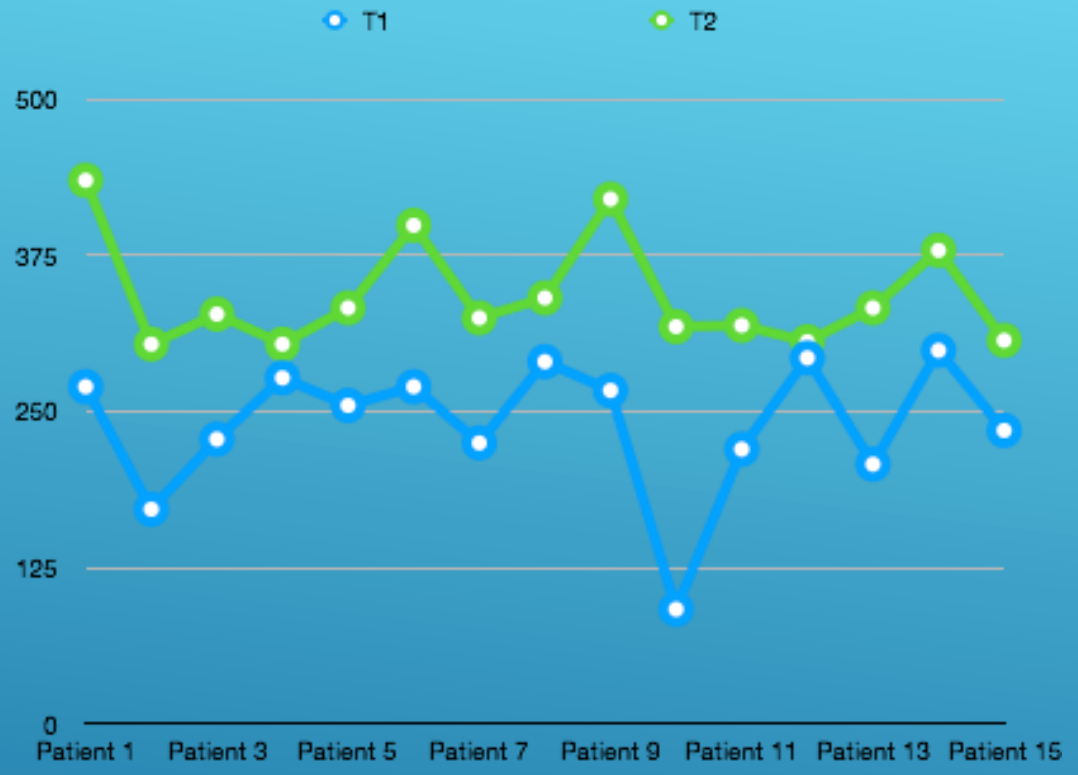
- Of those that had repeat samples higher than initial, only 5 (2%) did not meet criteria of CfT < 6 pg/dl (p=0.0001).

- It was also observed that for patients that had initial low levels of either < 170 ng/dl, the repeat never fluctuated above 300 ng/dl. There was more variance of initial and second T level with age.

2ND TEST OUTLIERS

Second Test “Normal”

T1	T2
270	435
172	304
228	328
277	304
255	333
270	399
225	325
290	341
267	420
92	318
220	319
293	306
208	333
299	379
235	307



CONCLUSION

- Under current standard protocols, second morning samples are necessary to qualify patients for treatment despite positive symptoms. Our pilot study reveals that there is a very low yield for the second sample and causes inconvenience to the patient and leads to unnecessary phlebotomies and costs.

- We observe that if the initial T level is <170 ng/dl or if the patient is <28 years old, the first sample is reliably predictive of need of treatment based on current recommendations. This suggest that second samples are unnecessary in severely hypogonadal and younger patients. A larger study is needed to confirm our preliminary findings.