Practice Standards and Health Related Quality of Life in Kidney Disease
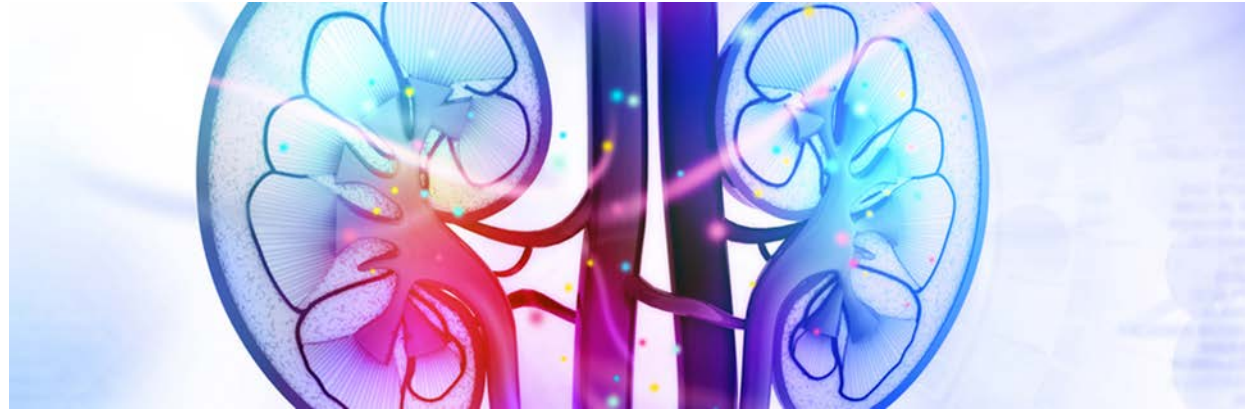
Schawana Thaxton, DNP, NP–C
2017 Tenth National Doctors of Nursing Practice Conference

Henry Ford Hospital

The Division of Nephrology and Hypertension

Background

1 of 10 adults have Chronic Kidney Disease.

Background

- Kidney disease: 9th leading cause of death in the US. (NIDDK)

- Affects 30 million U.S. adults over age 20 years have chronic kidney disease (CKD), and **most** of them are **unaware** of their condition. (CDC)

- Although the number of ESRD incident cases plateaued in 2010, the number of ESRD prevalent cases continues to rise by about 21,000 cases per year. (NIDDK)

Background

- CKD can develop into end-stage renal disease (ESRD) rapidly if no intervention is sought,

- The only treatments currently available for ESRD are dialysis or kidney transplant.

- Medicare spending for patients with CKD ages 65 and older exceeded $50 billion in 2013, and represented 20% of all Medicare expenditures in this age group. (NIDDK)

Literature: Standards of Care

- **Kidney Disease Outcomes Quality Initiative** (KDOQI, 2002):
  - produced the 1st set of guidelines on the evaluation, classification and stratification of CKD

- Now considered as an international guideline for CKD treatment by Kidney Disease: Global Outcomes Initiative (KDIGO) Group

- General understanding of **biometrics**

Literature: Quality of Life in CKD

- Understanding the domains of HRQOL is incomplete for patients with CKD

- Observational and cross-sectional studies demonstrated that CKD patients have lower perceived HRQOL compared to those w/o CKD.[1]

- The presence of co-morbid conditions including hypertension, anemia, frailty, and depression are also associated with low HRQOL scores.[2]

Perlman,2005; Han 2009; Soni,2010

Literature: Quality of Life in CKD

- Han and colleges suggested that ideal evaluation of mortality risk among those affected by CKD should include both the **traditional risk factors for mortality along with assessment of HRQOL.**[1]
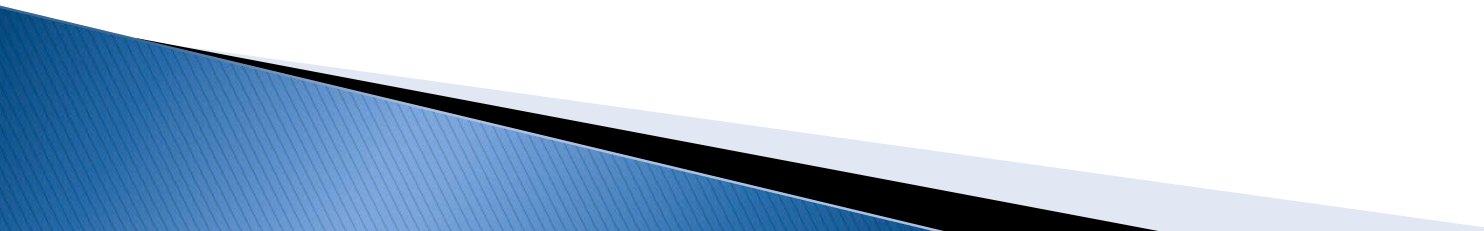
Perlman,2005; Han 2009; Soni,2010

Significance

- Patients perceptions of their health can be viewed as a key quality indicator

- Should be evaluated when rendering healthcare services rendered to those with CKD.

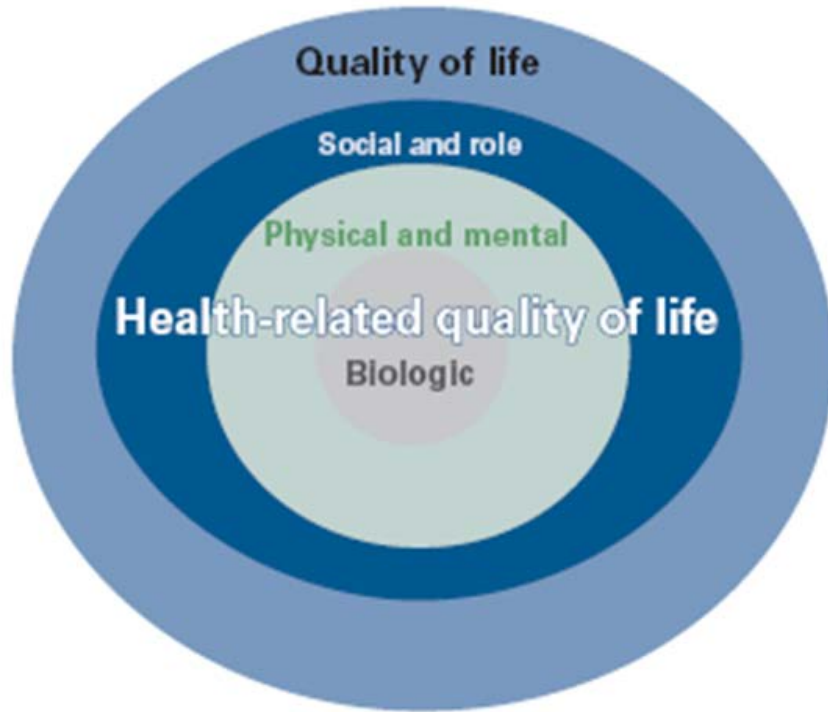- To date, little evaluation of the relationship between the CKD standards of care and their impact on HRQOL.

Significance

- Few studies have evaluated the relationship between perceived HRQOL with the standardized clinical indicators of care.
- Of those studies, the patient populations primarily included ESRD patients receiving dialysis
  - The final, most expensive stage of this disease.
- To date, **no studies** have considered this issue in the larger CKD population with lower stages of kidney impairment

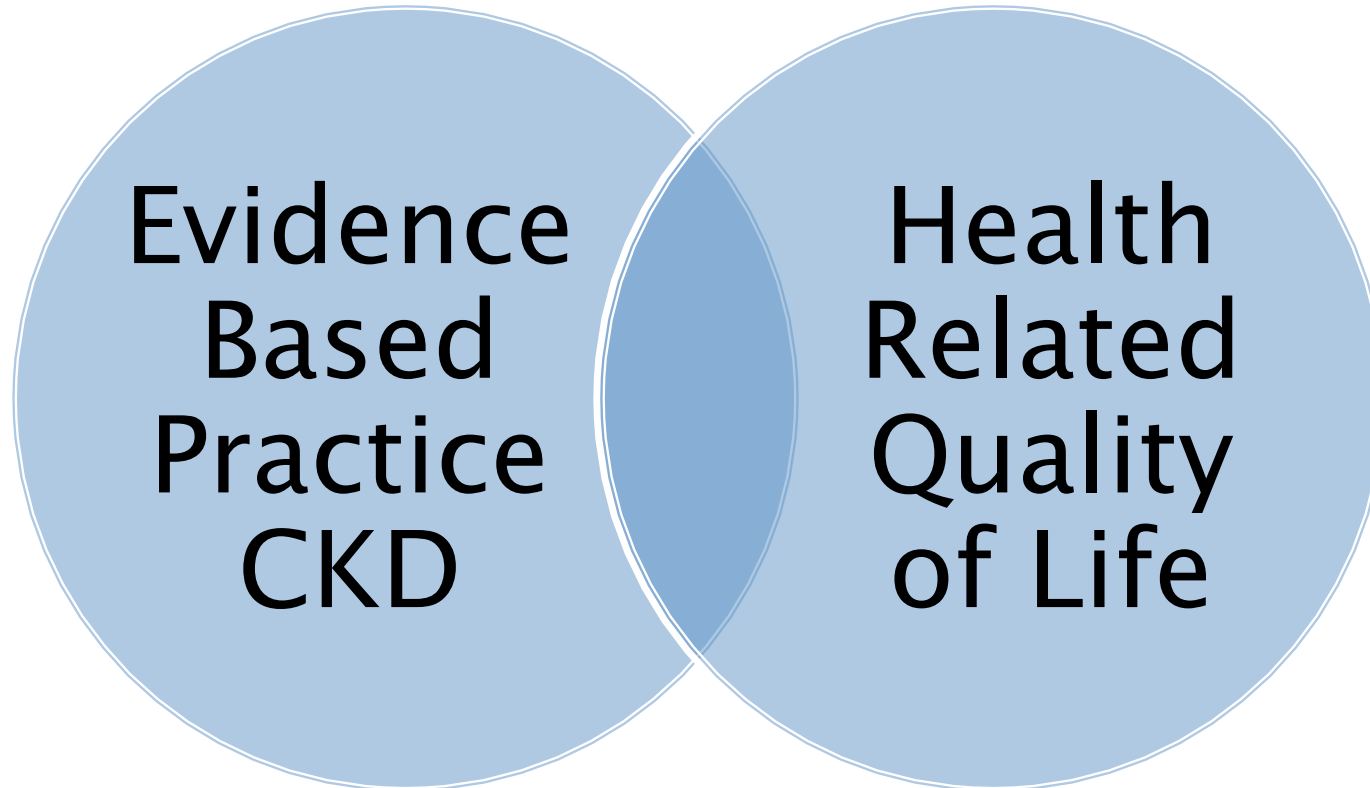# Purpose

- To evaluate the perceived health related quality of life in patients with CKD stages 1-5, who are not on dialysis and receiving evidenced-based care in an urban nurse practitioner-managed CKD clinic.
- To examine the relationship between the KDOQI practice standards and the HRQOL of CKD patients.

Theoretical Support

Ware JE Jr, Dewey J. Health status and outcome assessment tools. Int Electronic J Health Education. 2000;3:138–148.

D.L. Sackett (1996)
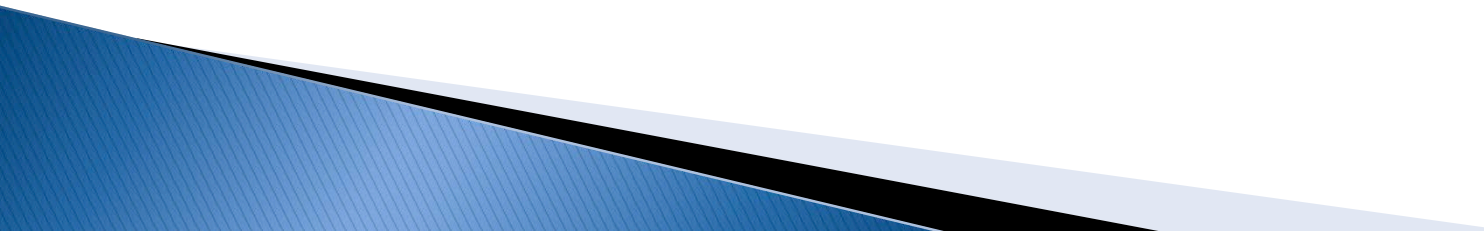
Theoretical Support

Study Design/ Method

- Cross-sectional correlational study

Sample Criteria (n= 100)

1. Age 40–85 years
2. Diagnosis of CKD stages 1–5
3. Currently not on dialysis
4. Able to speak and read English
5. Receiving treatment for CKD in an independent nurse managed clinic for at least 6 *consecutive* months

Procedure

▶ Patients were identified at time of visit
▶ PI screened for cognitive status prior to obtaining informed consent
  ◦ Consent included permission to extract medical history, sociodemographic data, most recent blood pressure, and clinical lab data
▶ If eligible, completed a semi-structured interview/survey with a trained volunteer

Survey Instruments: Kidney Disease Quality of Life-36 (KDQOL)

▸ Self-report questionnaire that measures the quality of life in the perceived health status of participants with kidney disease the 4 weeks prior to taking the questionnaire.

▸ 5 subscales

KDQOL-36

- SF-12 measure of physical (PCS) and mental (MCS) functioning
- Burden of Kidney Disease subscale
- Symptoms and Problems subscale
- Effects of Kidney Disease on Daily Life subscale.

Other Instruments

- **Generalized Anxiety Disorder (GAD) 7:** identifies anxiety levels over the past 2 weeks

- **Patient Health Questionnaire-9 (PHQ-9):** evaluates depressive symptoms over the past 2 weeks among the participants

- **Duke-UNC Functional Social Support Questionnaire:** determines perceived levels of social support the participants.

Clinical Data Extraction

- Sociodemographic data (gender, age, ethnicity, marital status, insurance coverage)

- Medical history (the primary cause of CKD [DM or HTN], co-morbid conditions

- Most recent clinical values of: BP, estimated glomerular filtration rate (GFR), serum creatinine, hemoglobin, calcium, parathyroid hormone (PTH), vitamin D, and phosphorus

CKD: Critical Clinical Values

Standards of care	Goals
Hemoglobin	> 9.5 g/dL
Calcium	8.2 -10.2 mg/dL
Parathyroid hormone (PTH)	<130 pg/mL
Phosphorus	2.5 - 4.5mg/dL
Vitamin D	>30 ng/mL
Blood pressure	Goal < 140/90 mmHg

Results

Demographics	Sample (N=100)
Age (years)	69.3±10
BMI	30.11
Gender	**%**
Female	61
Male	39
Ethnicity	**%**
African American	84
Caucasian	14
Hispanic	2
Relationship Status	**%**
Married	52
Single	25
Widowed	11
Divorced	12

Results

Cause of Kidney Disease	%
Hypertensive CKD (403.10)	64
Diabetic Kidney Disease (250.4)	36
Stage of Chronic Kidney Disease	**%**
Stage ≤ 3	42
Stage 4	44
Stage 5 (non-dialysis)	14

Results

Clinical Indicator	Mean Value	Indicator Goal	% of Sample Achieving Goal
Serum Measures			
Hemoglobin (g/dL)	11.3 + 1.9	> 9.5 g/dL	77%
Calcium (mg/dL)	9.2 + 1.0	8.2- 10.2 mg/dL	91%
Parathyroid (pg/mL)	148 + 143.5	<130 pg/mL	71%
Phosphorus (mg/dL)	4.2 + 0.8	2.5-4.5mg/dL	72%
25- Hydroxyvitamin D3 (ng/mL)	29.1 + 16.8	>20 ng/mL	37%
Serum creatinine (mg/dL)	2.77+ 1.7	NA	
Glomerular filtration rate:ml/min/1.73m2)	29.7 + 15.7	NA	
Clinical Measures			
Systolic BP (mmHg)	135.4 + 17.5	Goal < 140mmHg	61%*
Diastolic BP (mmHg)	72 + 10.7	Goal< 90mmHg	61%
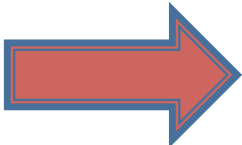
Results: Covariates

Instrument	(mean $\pm$ SD)
Generalized Anxiety Disorder 7	3.2 $\pm$ 4.6
Patient Health Questionnaire-9	5.0 $\pm$ 4.8
Duke-UNC Functional Social Support Questionnaire	36.0 $\pm$ 6.1
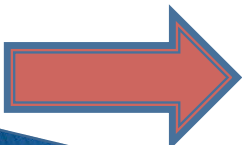
Results: HRQOL

KDQOL-36	(mean $\pm$ SD)
Symptom	80.6 $\pm$ 15.6
Effects	83.1 $\pm$ 18.1
Burden	75.4 $\pm$ 27.4
Physical	39.7 $\pm$ 10.3
Mental	52.9 $\pm$ 9.7

Correlation Matrix: Practice Standards & Perceived HRQOL in Persons with CKD

	PCS	MCS	Symptoms	Burden	Effects
Hemoglobin	**0.22[a]**	**0.37[b]**	0.14	**0.26[b]**	**0.30[b]**
Creatinine	-0.10	-0.11	-0.09	**-0.27[b]**	**-0.22[a]**
GFR	0.16	0.15	0.13	**0.27[b]**	**0.24[a]**
Calcium	-0.1	0.002	-0.00	0.04	0.04
PTH	-0.15	-0.10	-0.06	-0.09	-0.06
Phosphorus	-0.09	-0.14	-0.08	-0.07	-0.07
Vitamin D	**-0.22[a]**	-0.09	-0.12	0.06	-0.14
SBP	0.16	-0.12	0.05	-0.04	0.00
DBP	**0.26[b]**	0.00	-0.00	0.08	0.10
Comorbidities	**-0.30[b]**	**-0.28[b]**	**-0.28[b]**	-0.14	**-.24[a]**
Total goals met	0.13	0.11	0.09	0.14	**0.20[a]**

Spearman correlations. [a]$p < 0.05$. [b]$p < 0.01$

Interpretation of Findings

"We were just as surprised by the test results as you. We're still scratching our heads over it."

Hemoglobin

Study	Method/ number of participants	Stages of CKD	QOL tool	Results
Perlman (2005)	Cross-sectional/ 634 participants	All stages	SF-36	Increased HGB levels statistically significant higher QOL scores
Cruz (2011)	Cross-sectional/ 191 participants	All stages	SF-36	Increased HGB levels correlation with higher QOL scores
Finkelstein (2009)	Prospective observational cohort study/ 1200 participants	Stages 3-5 CKD	KDQOL	Increased HGB levels statistically significant higher QOL scores

Vitamin D

- Vitamin D has a negative relation with PCS
- This finding may be the related to the high BMI (mean of 30) of the participants
- In several studies it has been reported a significant negative relationship between obesity and low vitamin D concentration[1,2]
- Multiple studies have demonstrated that obesity is a factor related to diminished QOL [3,4]

BMI QOL VIT D

Vimaleswaran,2013; Brock ,2010; Han,2009; Duval,2006

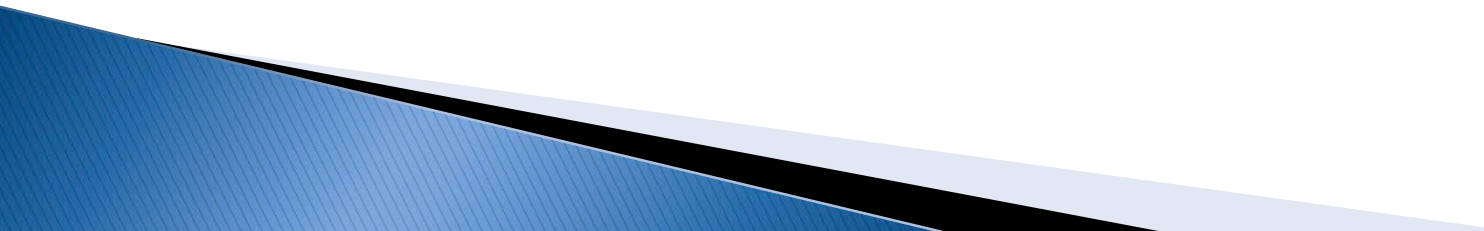# Markers related to Bone in CKD

- Calcium, Phosphorus, PTH & Vitamin D are monitored routinely
- Prevent and slow the progression of renal osteodystrophy (ROD) in patients with CKD
  - multi-system disease entity involving abnormalities of mineral metabolism, and extraskeletal calcification.
  - The monitoring and interventions to correct alterations in Ca, P, PTH, and vitamin D is required to minimize ROD
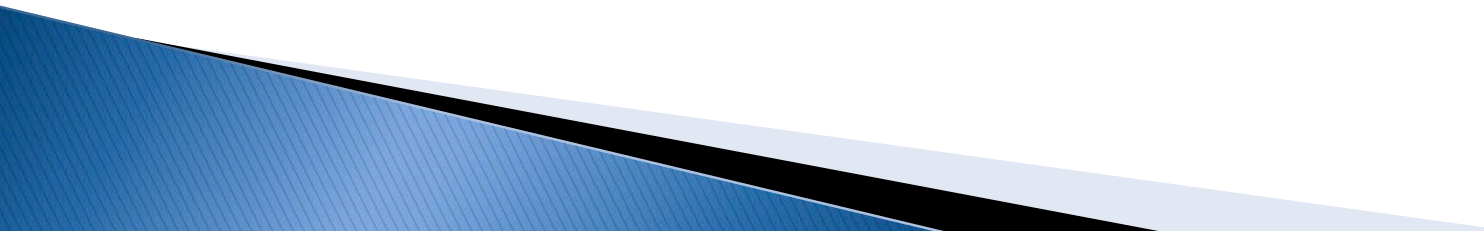- CKD-related bone loss is associated with increased risk for CVD, morbidity and mortality

Summary

- This sample of primarily African Americans, with stable mood and high levels of social support managed in a NP led clinic demonstrated relatively high levels of perceived QOL, except for PCS
  - Higher levels of social support have been linked to survival in several studies of patients with and without renal disease.[1]
  - In African American community, those who have a strong social support network have better health outcomes, including a decreased rate of mental illness, a reduced rate of suicide, and better management of chronic disease.[2,3]
- Hemoglobin is the most important clinical measure associated with perceived quality of life

Cohen,2007; Ronnebaum,2013; Shelby ,2008

Limitation

- The cross-sectional design that prohibits causality and generalizability
- Is limited to a predominantly African American urban population.
- The moderate sized sample with few participants in stage 5 CKD may have impacted the ability to detect significant differences between stage groups
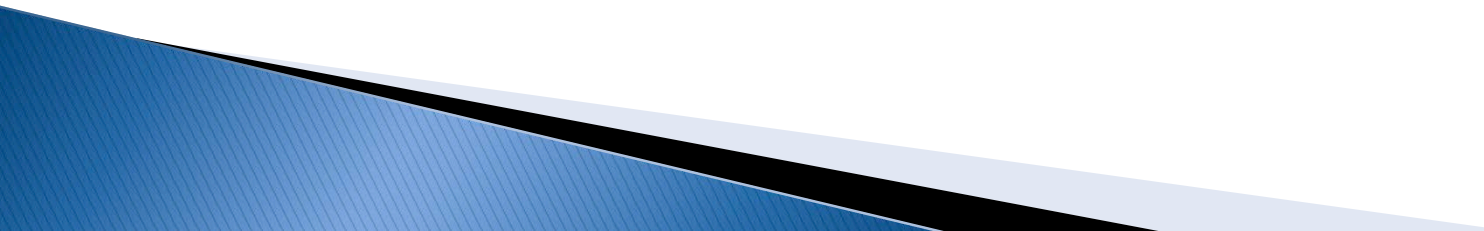- Selection/Respondent bias (patients from current practice setting)

Strengths

- The use of psychometrically sound instruments for measurement of the key variables
- The high representation of African Americans in the study, a key group at risk for CKD.
- The nature of the clinic setting, run by nurse practitioners with a holistic perspective of the patient may have influenced the patient's response to the study questions

Future studies

- Examine the influence of meeting multiple clinical indicators
- The routine use of HRQOL assessment in patients with CKD not on dialysis in a longitudinal study.

Implications for Advanced Nursing Practice

- This study shows that NP can independently managed patients with CKD, while achieving the rigorous CPGs, effectively.

- This model may be explored on a larger scale for clinical outcome and economic benefits.

Clinical Indicator	Mean Value	Indicator Goal	% of Sample Achieving Goal
Serum Measures			
Hemoglobin(g/dL)	11.3 + 1.9	> 9.5 g/dL	77%
Calcium (mg/dL)	9.2 + 1.0	8.2- 10.2 mg/dL	91%
Parathyroid (pg/mL)	148 + 143.5	<130 pg/mL	71%
Phosphorus (mg/dL)	4.2 + 0.8	2.5-4.5mg/dL	72%
25- (OH)Dd3 (ng/mL)	29.1 + 16.8	>20 ng/mL	37%
Serum creatinine (mg/dL)	2.77 + 1.7	NA	
Glomerular filtration rate (ml/min/1.73 m2)	29.7 + 15.7	NA	
Clinical Measures			
SBP (mmHg)	135.4 + 17.5	Goal < 140 mmHg	61%*
DBP (mmHg)	72 + 10.7	Goal< 90 mmHg	61%

Thank You

Schawana Thaxton, DNP,NP
Nephrology & Hypertension
(313) 916-2707 office
sthaxto9@HFHS.org

Questions