



School of Medicine
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Dialysis in the Pregnant Patient

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No financial interests or conflicts of interest to disclose.

No discussions of off-label medications.

Outline

- Epidemiologic Trends
- Impact
- Management of the pregnant dialysis patient

Patient Preferences

- Increasing desire for pregnancy among women with CKD
 - Increasing maternal age norms
 - Increasing kidney transplants improving fertility
 - Improved outcomes

Fertility Rates

Dialysis Patient

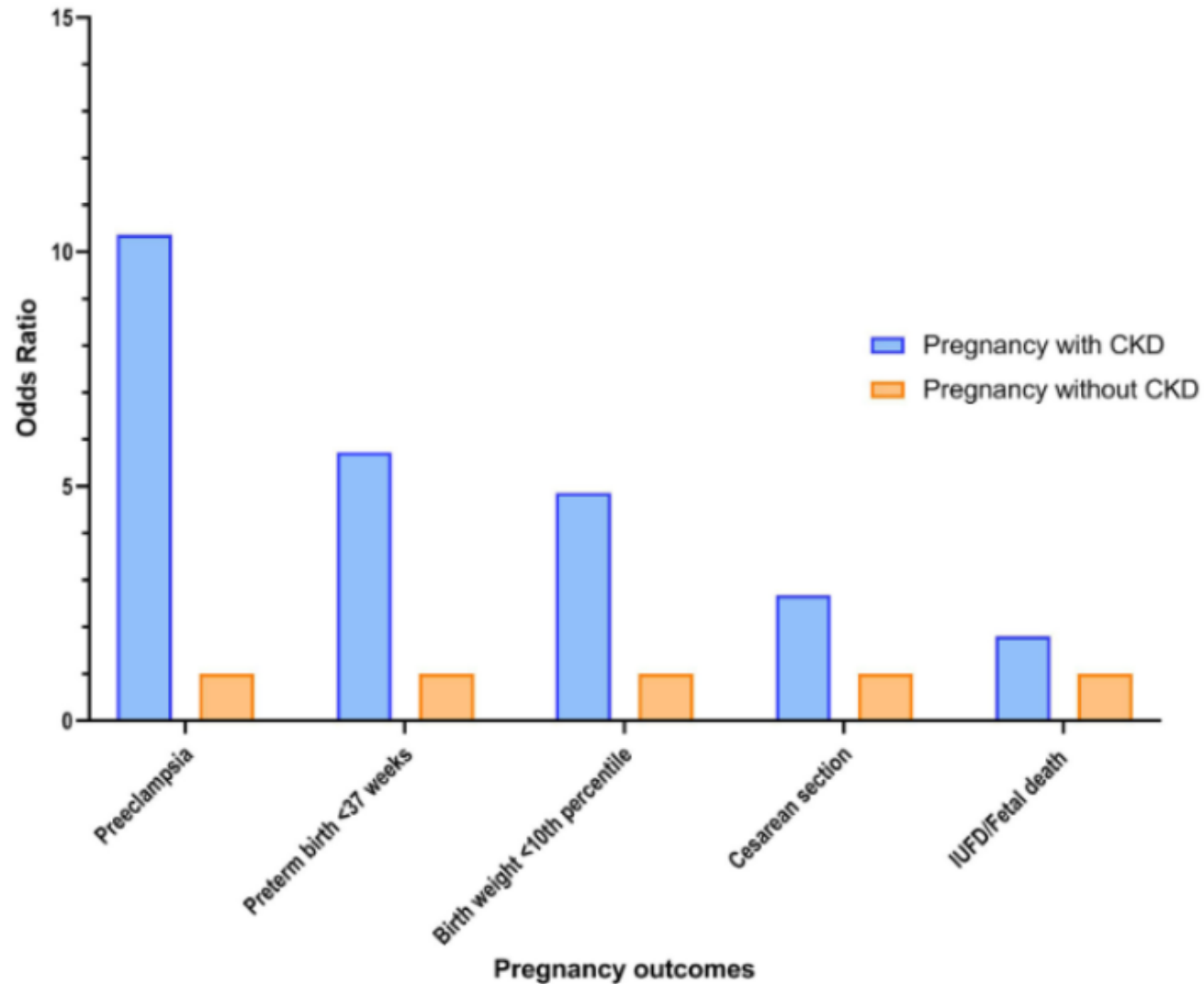
- 40.9/1000 pt-yrs
- Increasing

General Population

- 90/1000 pt-yrs
- Decreasing

Pregnancy Outcomes CKD vs non-CKD

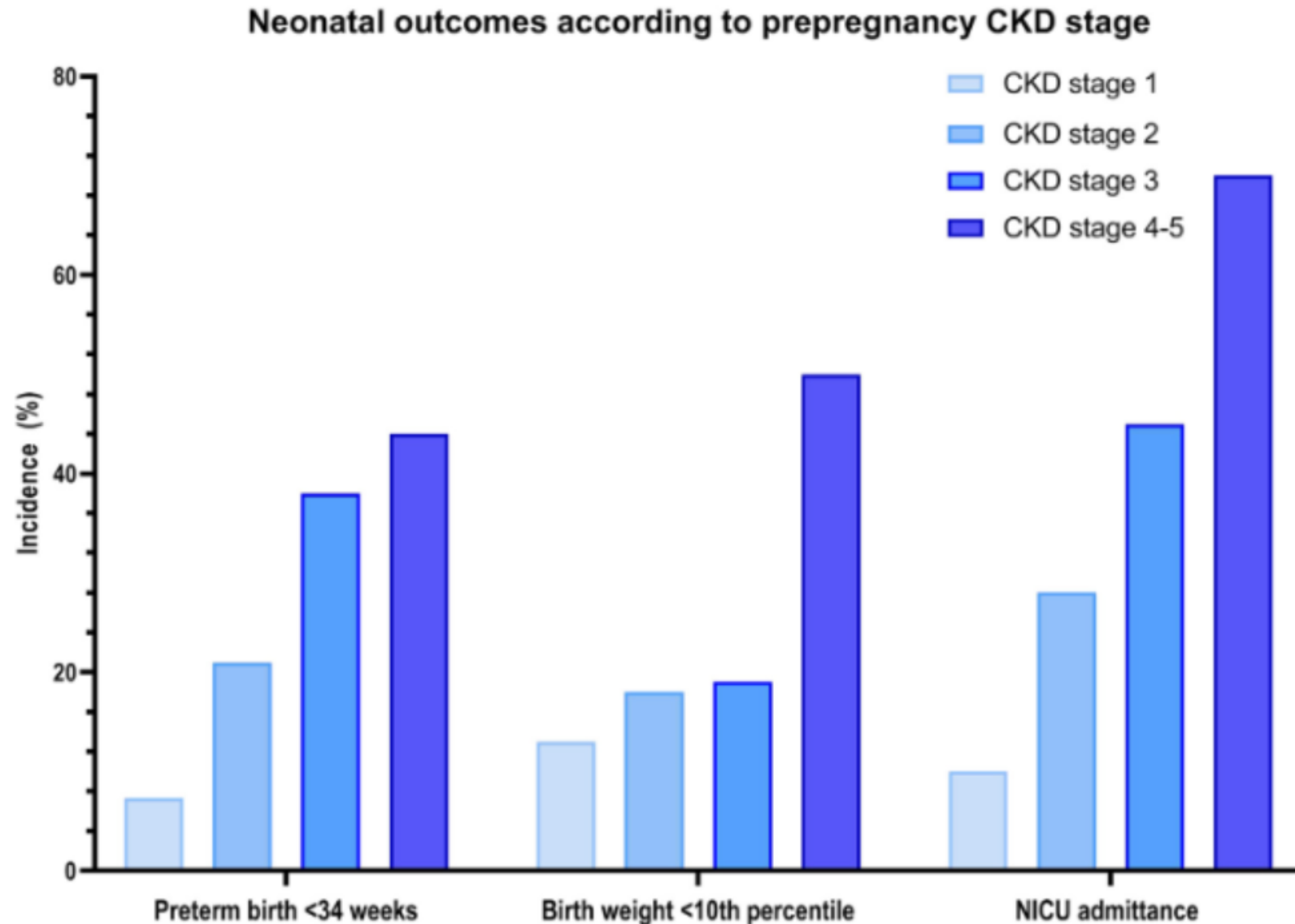
Maternal and fetal pregnancy outcomes in women with CKD compared to women without CKD



Maternal outcomes

- Preeclampsia 20%
- Induction of labor 74%
 - Hypertension
 - Preeclampsia
 - Fetal growth restriction
- Cesarean section – 63%

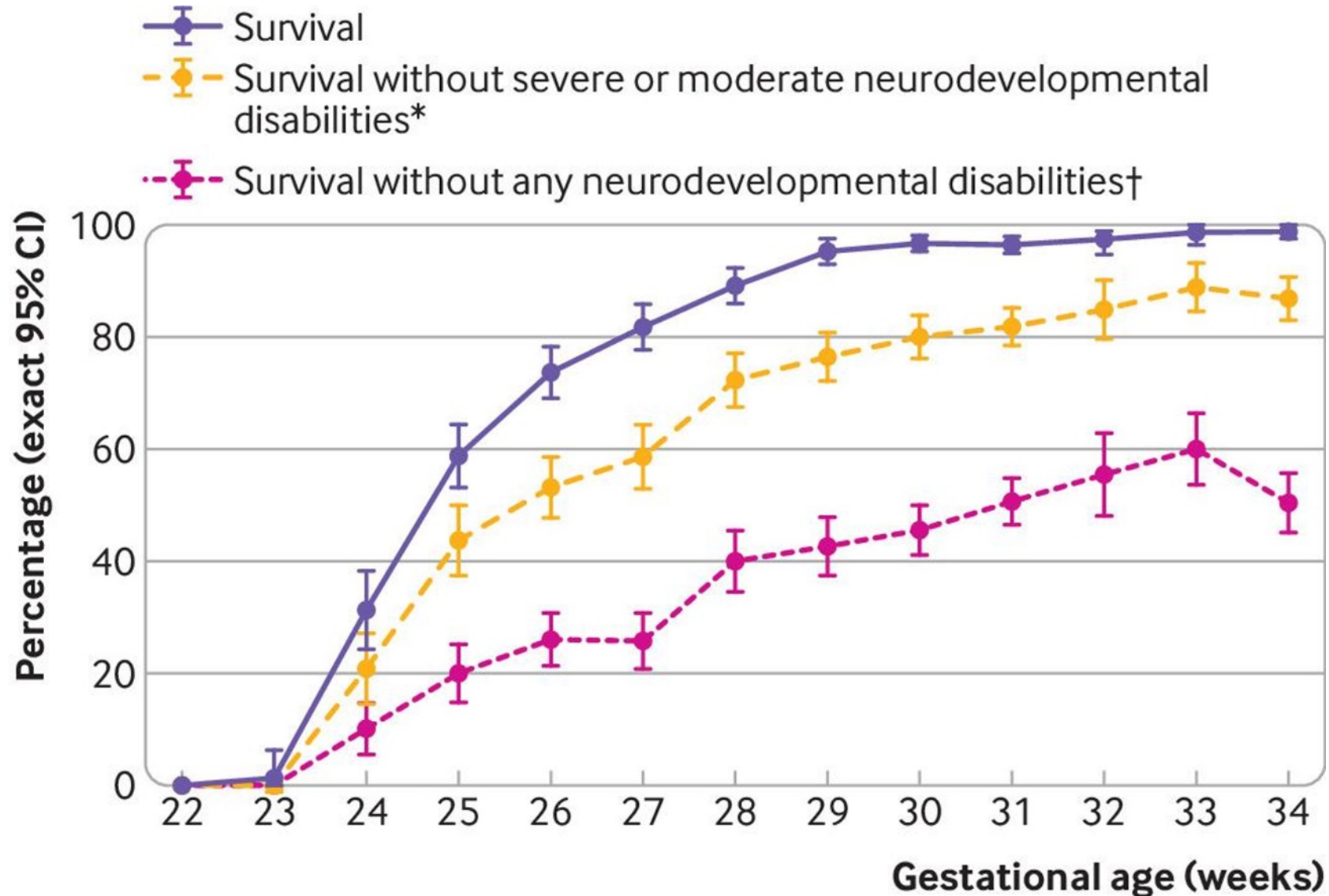
Infant outcomes in CKD vs non-CKD mothers



Fetal Outcomes

- Decreased rate of live birth – 73-86%
- If pregnancy occurs prior to start of dialysis – 91%
 - Importance of residual renal function
- Preterm delivery <37 weeks – 80%

Impact of preterm birth



Preconception

- Discuss risks
- Timing – Pregnancy prior to initiation of RRT improves live birth rate 63% vs 91%
- Impact on transplantation
 - Increased transfusions
 - Increased allosensitization

Medications

- No ACEi or ARB
 - ACEi Fetopathy:
 - Low fetal perfusion pressure relies on ATII to maintain GFR
 - Low fetal GFR results tubular dysgenesis and oligohydramnios
- No diuretics
 - Careful fluid management with UF

Noteworthy points

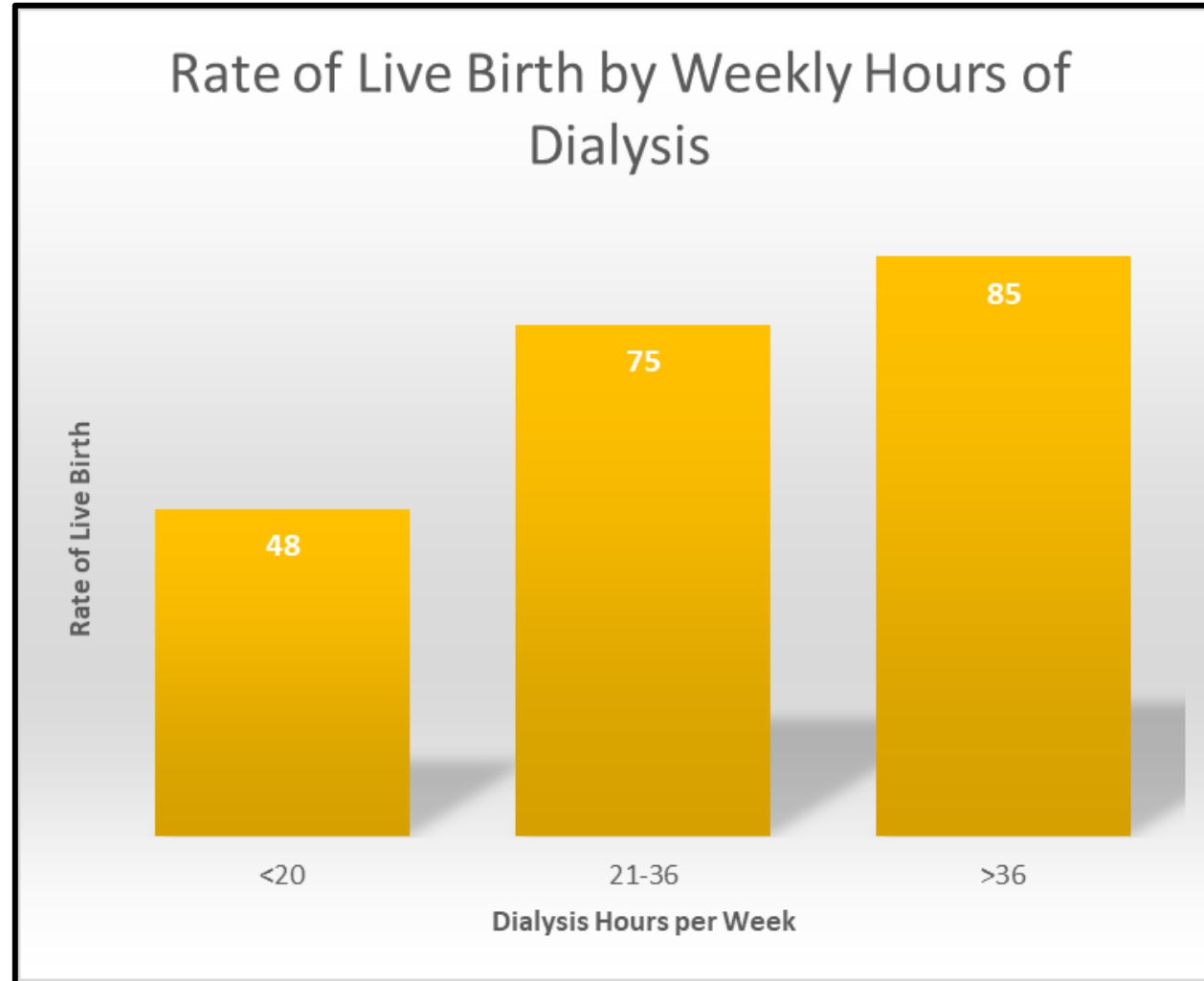
- β -hCG elevated in dialysis patients (renally cleared)
- Dietary changes-
 - Protein intake 1.5-1.8g/kg/day
 - Increased mineral needs – liberal dietary phosphorus
- Additional vitamin needs

Modality Choice

- Nocturnal HD > Conventional HD > Peritoneal Dialysis

Adjusting the dialysis prescription

- Time



Adjusting the dialysis prescription

- Time
 - More dialysis:
 - Higher rate of live birth¹
 - Higher gestational age²
 - Higher birth weight²

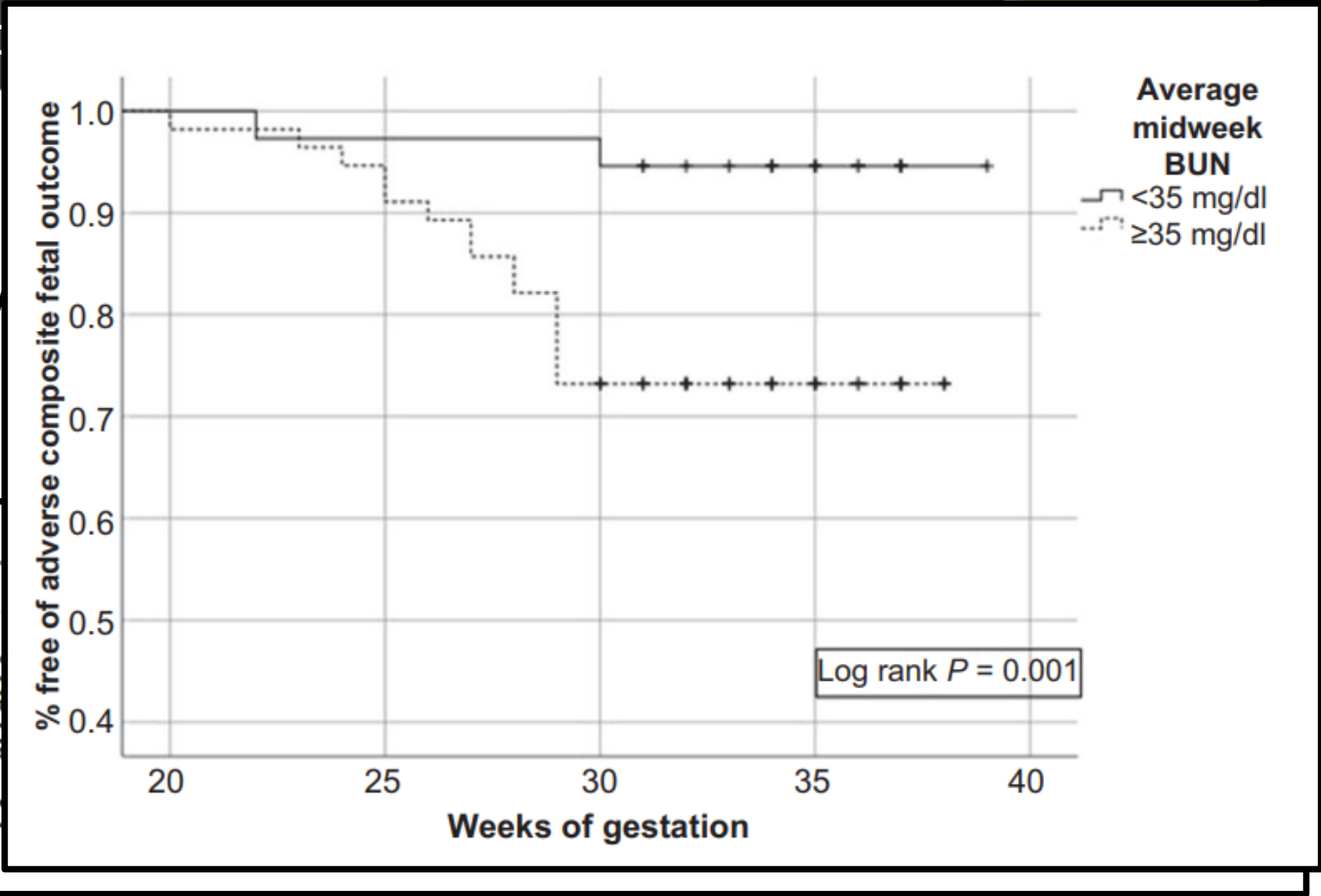
Adjusting the dialysis prescription

- Time
 - > 36 hrs/week
- Adequacy target

Adjusting the c

- Time
 - > 36 hrs/w
- Adequacy

Average
Average
*Fisher



Average
week
BUN
mg/dl
mg/dl

Adjusting the dialysis prescription

- Time
 - >36 hrs/week
- Adequacy target
 - BUN <35

Adjusting the dialysis prescription

- Time
 - >36 hrs/week
- Adequacy target
 - BUN <35
- Volume Shifts⁴:
 - Increased fetal HR variability
 - Uterine contractions

Adjusting the dialysis prescription

- Time
 - >36 hrs/week
- Adequacy target
 - BUN <35
- Volume stability
- Heparin

Hypertension

- Increased risk of preeclampsia, preterm delivery, fetal growth restriction¹
- No data on outcomes related to target BP in dialysis patients²
 - Non-dialysis hypertensive patients: no difference in maternal, fetal, or neonatal outcomes based on diastolic BP

Managing HTN

Safe

- Methyldopa
- Labetalol
- Nifedipine
- Hydralazine
- Careful volume control

Unsafe

- ACE inhibitors
- Angiotensin receptor blockers

Metabolic bone disease

- Liberal dietary phosphorus and calcium
- Hyperphosphatemia less common
- Phosphorus binders may reduce absorption of fat-soluble vitamins and folate
 - Sevelamer may be unsafe
- VDRA safe in pregnancy
- No safety data for cinacalcet

Anemia

- ESA safe – do not cross placenta

Summary

- Women on dialysis increasingly desire pregnancy
- Counsel on high rates of mother and infant morbidity
- BUN < 35 mg/dL
- 36 hrs/week
- Nocturnal hemodialysis best outcomes



RESPECT

RESPONSIBILITY



DISCOVERY

EXCELLENCE