

Diabetes Prevention in Women with GDM

**What can we do
during and after pregnancy?**

Assiamira Ferrara, MD, PhD

**Division of Research
Kaiser Permanente Northern California**

Gestational diabetes (GDM): definition and diabetes risk

- **GDM is defined as carbohydrate intolerance leading to hyperglycemia with onset or first recognition during pregnancy**
- **Affects 4-10% of pregnancies in the United States**
- **One third have diabetes or impaired glucose metabolism (IFG/IGT) at postpartum screening**
- **15-50% will develop diabetes in the decades following the affected pregnancy**

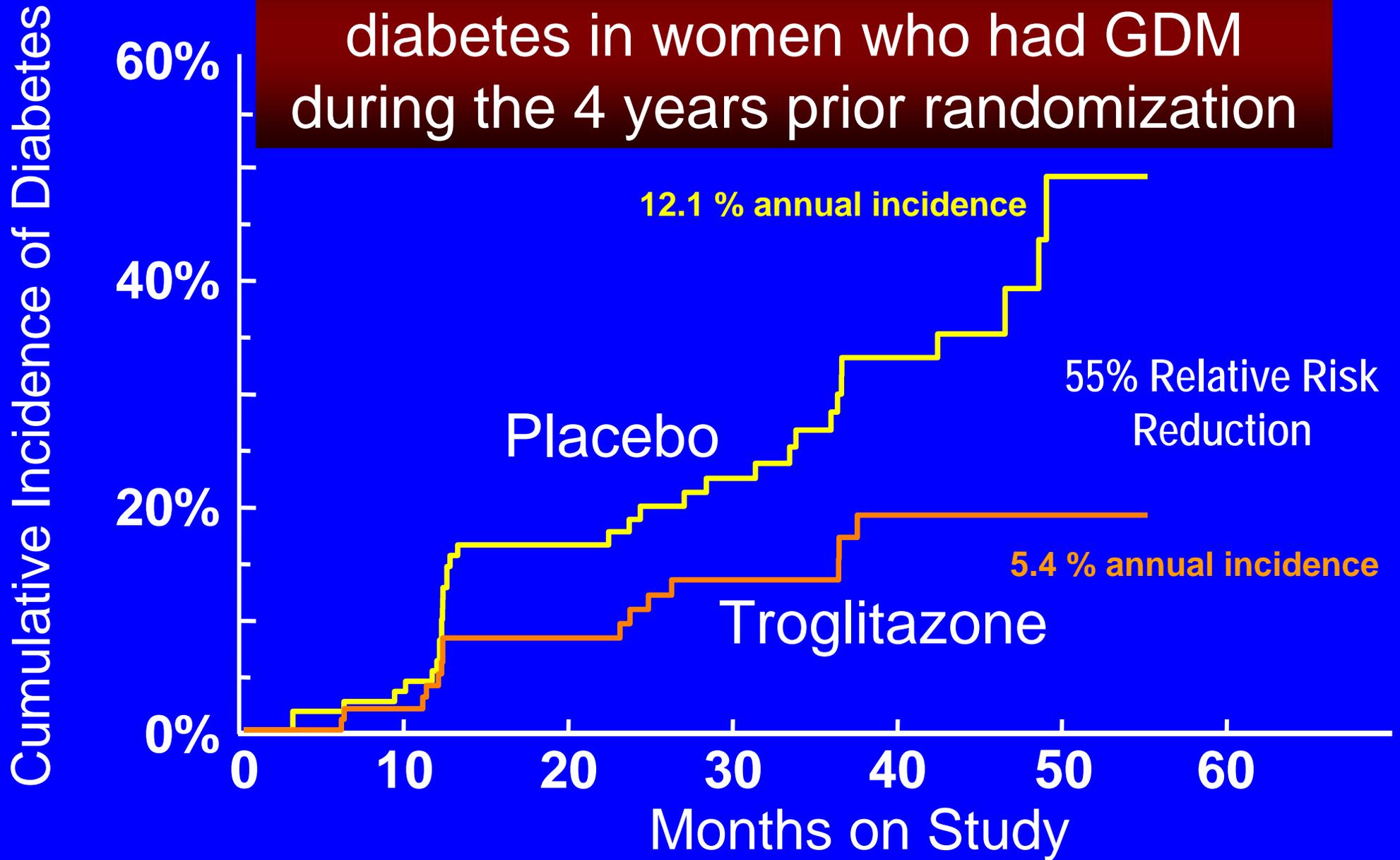
Follow Up Recommendations for women with history of GDM

- **Postpartum screening.**
 - All women should receive a blood glucose test at 6 weeks postpartum
- **Postpartum management.**
 - All women should be educated about lifestyle change.
 - Women with IGT/IFG should receive intensive MNT and individualized exercise program

ACOG Committee Opinion No. 435 Obstet Gynecol 2009

ADA Gestational diabetes mellitus Diabetes Care 2004

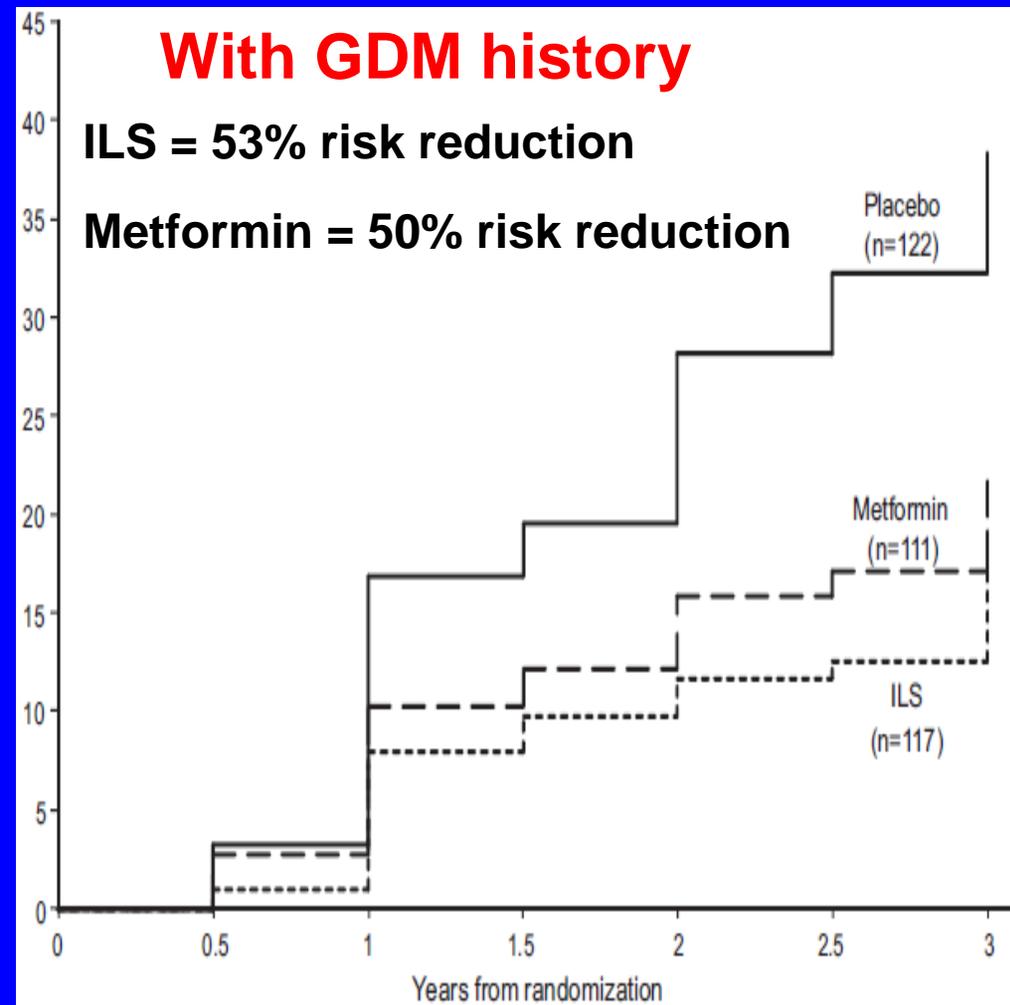
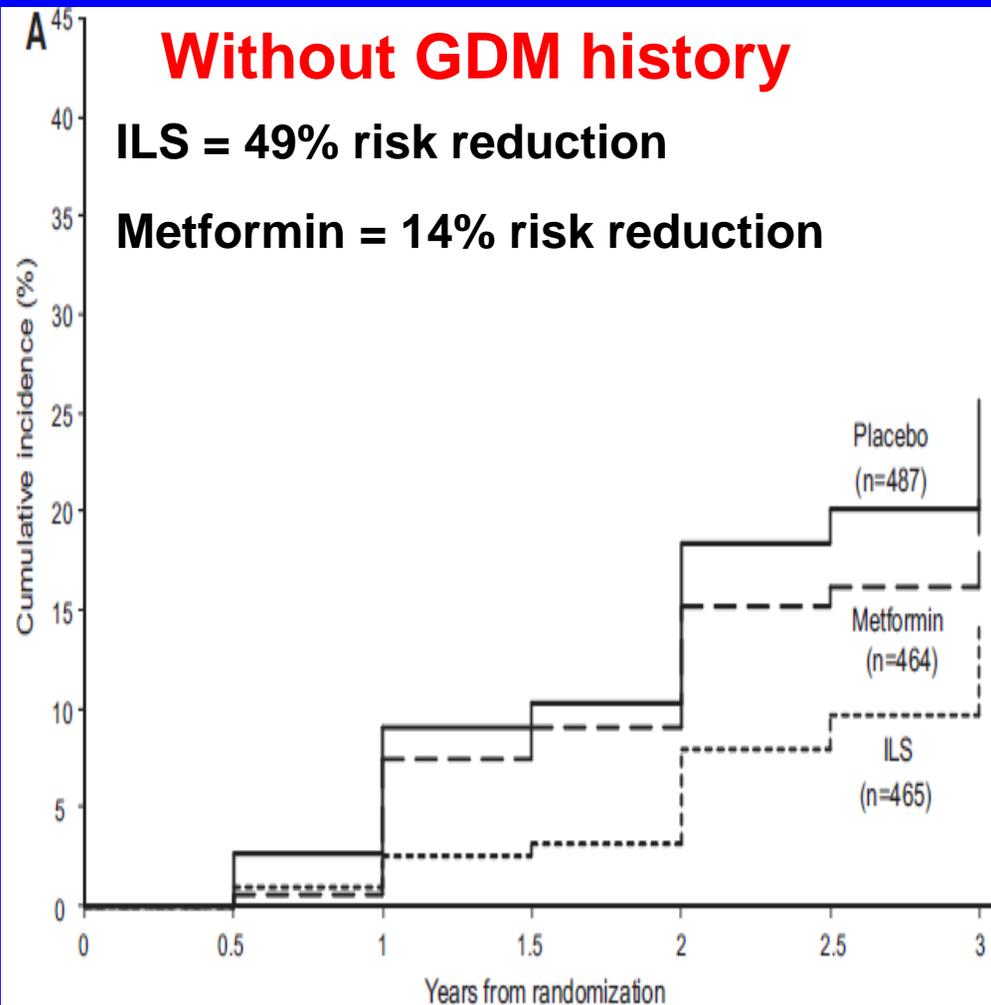
TRIPOD: Cumulative incidence rates of diabetes in women who had GDM during the 4 years prior randomization



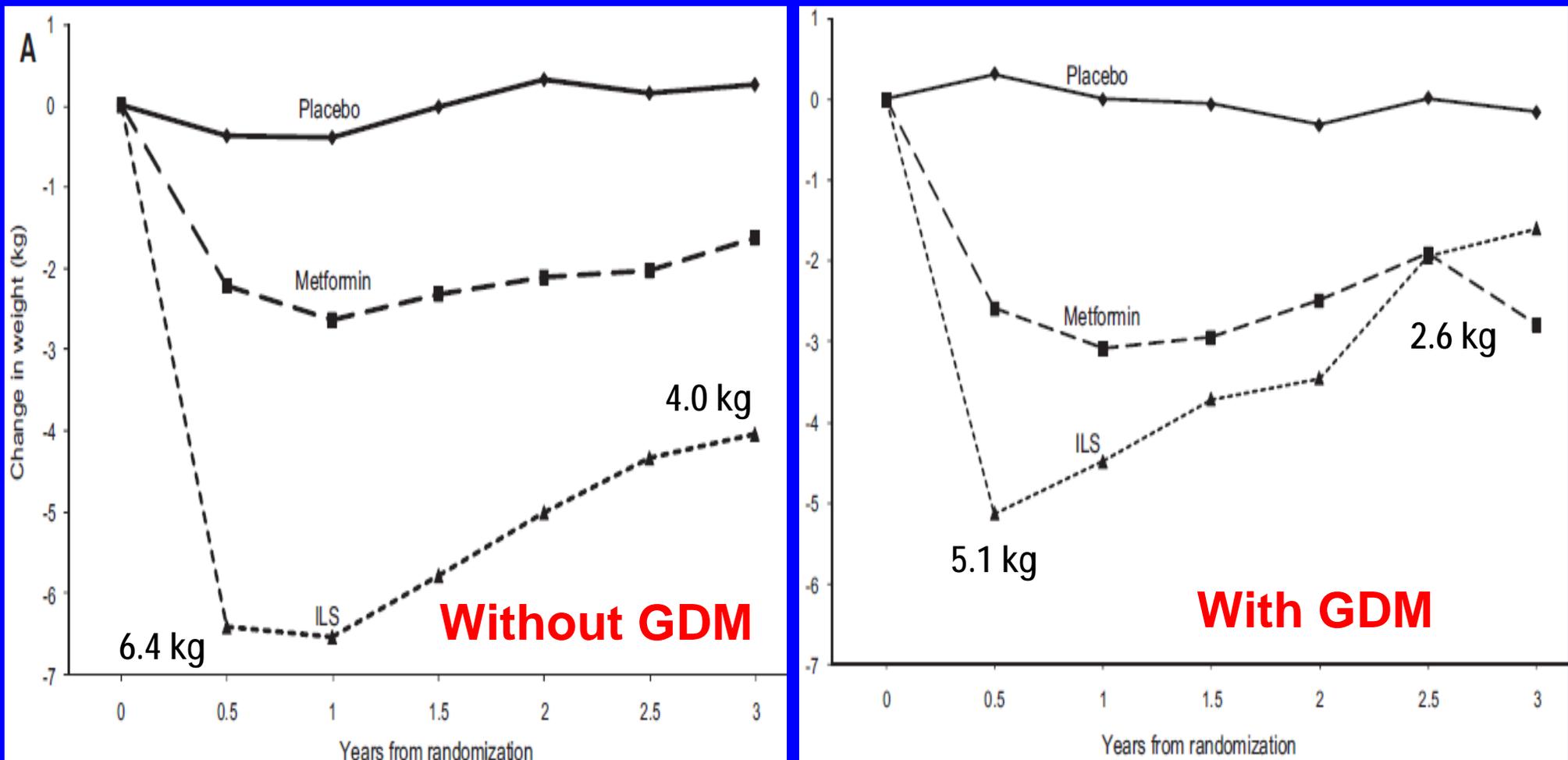
TRIPOD results

- **Protection from diabetes required an initial increase in insulin sensitivity and consequent reduction in insulin output**
- **Troglitazone preserved pancreatic beta-cell function by reducing hyperglycemia**

Cumulative Diabetes Incidence: DPP Trial



Changes in weight during the DPP by randomized treatment assignment



DPP: Changes in physical activity (PA)

- **Both women with and without a history of GDM in the ILS:**
 - increased PA by 1.5 hours per week by year 1
- **Among women with a history of GDM**
 - This increase was not sustained
 - 30 minutes of increased PA per week by year 3

What have we learned from the TRIPOD and DPP studies?

- Interventions may be most beneficial before IGT or IFG develop because hyperglycemia is a chronic stimulus for insulin secretion leading to diabetes**
- Unique approaches are needed to translate the lifestyle modifications effective in older individuals to younger women**

Why wait years to initiate prevention efforts?

Opportunity to prevent recurrent GDM and diabetes at younger age

Lifestyle intervention

During pregnancy

- Help women gain weight within recommended ranges

Post-partum

- Help women loose pregnancy weight and additional weight if overweight prior to pregnancy

A Translational Diabetes Prevention Program for women with GDM



**Feasibility study
funded by the
Kaiser Garfield foundation
and the NIDDK**

Manuscript under review

DEBI feasibility study

- **AIM**
 - to evaluate the feasibility of a randomized lifestyle intervention that started soon after the GDM diagnosis and continued postpartum
- **Goal**
 - returning to pre-pregnancy weight if normal BMI
 - or**
 - reaching 5% reduction from pre-pregnancy weight if overweight (BMI \geq 25.0 kg/m²)

DEBI: Intervention during pregnancy

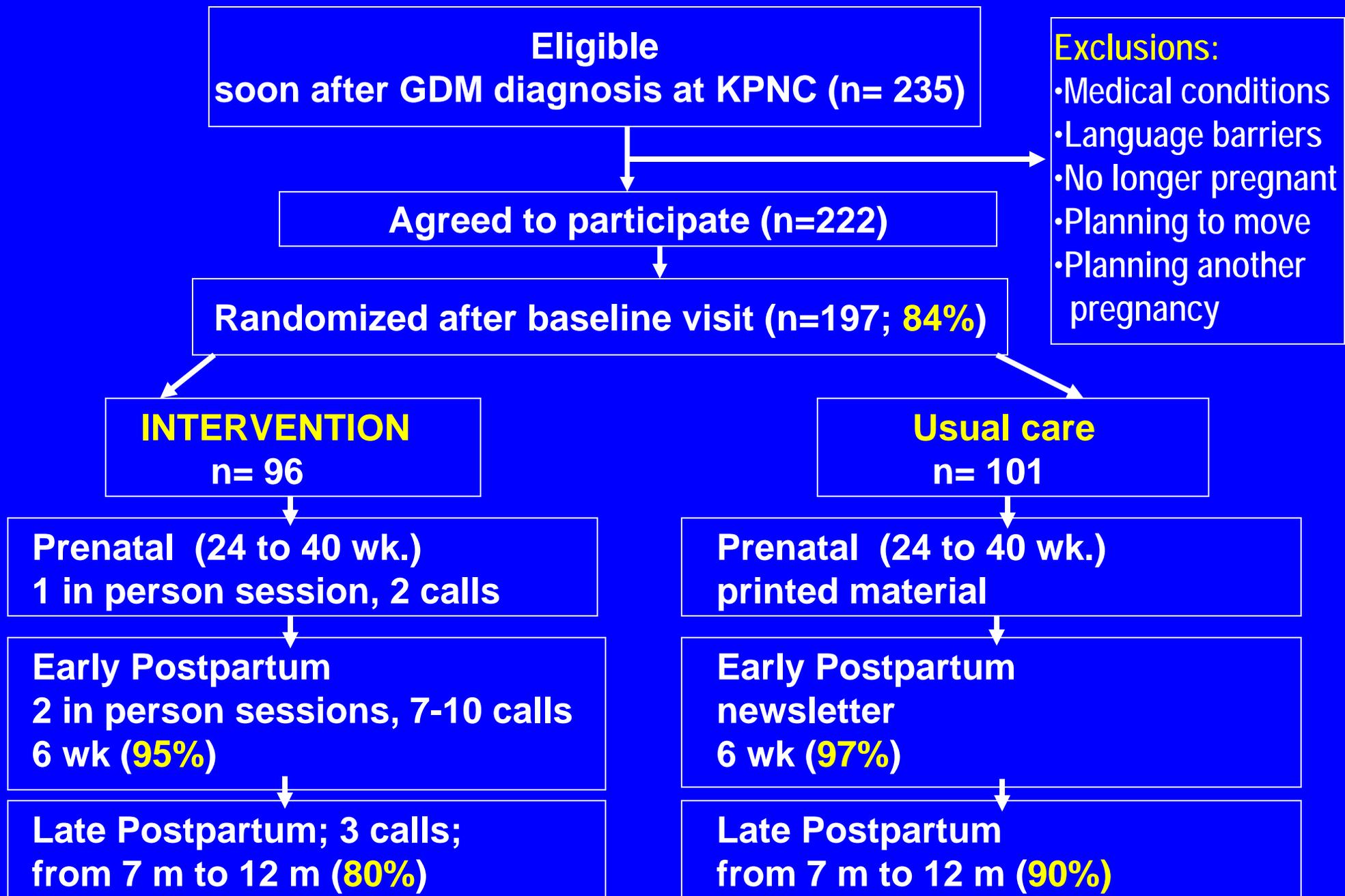
- **Started soon after GDM diagnosis**
- **Women were advised to**
 - **comply with the IOM guidelines for gestational weight gain**
 - **follow ADA diet (reduce carb, low glycemic index)**
 - **Exercise (walk 150 min per week)**
- **Delivered by a dietician with training in PA:**
 - **1 in person visit**
 - **2 telephone calls**

DEBI: Postpartum Intervention

- From 6 weeks to 7 months postpartum
- Women were advised to:
 - Reach the post-partum weight goals
 - Reduce dietary fat to <25% of calories
 - 150 min of moderate physical activity per week
 - Breastfeeding for 6 months
- Delivered by a dietician with training in PA:
 - 1 in person visit
 - 7-10 telephone calls
 - 1 additional in-person visit before entering the maintenance phase (8-12 months postpartum with 3 calls)

DEBI: Usual care arm

- **During pregnancy**
 - printed educational materials including publicly available information on GDM
- **During postpartum**
 - newsletters focused on issues related to infant safety and health topics



DEBI: Baseline Characteristics

	Intervention (n = 96)	Control (n = 101)
Age (years)		
Mean (SD)	33.3 (4.8)	33.0 (5.0)
Pregravid BMI (kg/m²)		
Mean (SD)	28.0 (6.2)	27.9 (6.6)
19-24	40.6%	43.6%
25-29	24.0%	21.8%
30+	35.4%	34.6%

DEBI Study: Baseline Characteristics

	Intervention (n= 96)	Control (n= 101)
Race-ethnicity (%)		
White	19.8	18.8
African American	5.2	4.0
Asian	49.0	54.4
Hispanic	18.8	18.8
Other	7.2	4.0
Primi-parous (%)	39.6	41.6

DEBI: Conclusions

- **Results suggest that a lifestyle intervention for women with GDM that starts during pregnancy and continues postpartum:**
 - **is feasible**
 - **may prevent gestational weight retention**
 - **may help overweight/obese women lose weight**
 - **decreases dietary fat intake**
 - **may help women to breastfeed their infants for a longer period**
 - **strategies to increase PA in postpartum women are still needed**

Questions remaining on diabetes prevention in GDM

- Are alternative intervention delivery methods more effective in helping young mothers to increase physical activity?
- Do different diabetes prevention strategies have different effect on the control of obesity, diabetes, hypertension, dyslipidemia and depression?
- Do effectiveness of interventions vary by women glucose tolerance status at postpartum (normal vs. IFG/IGT)?
- Do such interventions have the opportunity to reduce the risk of obesity and diabetes in the offspring?
- Are early prevention efforts cost-effective

AHRQ: HS019367; NIDDK: 2R18DK067344