

Smoking during pregnancy: A contingency management intervention

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Smoking Cessation During Pregnancy

- **Surgeon General:**

Eliminating smoking during pregnancy could prevent

20% of all low birth weight births

8% of all preterm deliveries

5% of all perinatal deaths

- **Health care cost savings in the first year of life alone if the mother quits smoking during pregnancy is \$6 for every \$1 spent (Marks et al., 1990)**

Contingency Management Interventions for Substance Abuse

- **Seminal studies done at University of Vermont in the early 1990s by Higgins and colleagues demonstrating efficacy in the treatment of cocaine dependence**
- **> 65 controlled studies in peer-reviewed journals successfully extending this intervention to a wide variety of substance abusing populations and problems**

Abstinence Monitoring Schedule

- **Daily for initial 5 days (breath CO \leq 6 ppm)**
- **2x weekly for 7 weeks (urine cotinine \leq 80 ng/ml)**
- **1x weekly for 4 weeks**
- **Every other week until delivery**
- **1x weekly for initial 4 weeks postpartum**
- **2x monthly for next 8 weeks, after which vouchers ended**

Voucher Conditions

Contingent voucher condition:

- Vouchers earned contingent on biochemically-verified abstinence.
- Vouchers began at \$6.25, escalated at a rate of \$1.25 per consecutive negative specimen up to a maximum of \$45.00. Mean earnings were \$396 ± 410.

Non-contingent voucher condition:

- Vouchers were delivered independent of smoking status.
- Values were \$11.50 per visit in antepartum and \$20.00 postpartum. Mean earnings were \$311 ± 138.

Participant Characteristics

Characteristics	Contingent ^a (n = 30)	Non-contingent ^a (n = 23)	p value
Demographics:	±		
Age (years)	22.8 ± 4.9	22.5 ± 4.9	.83
% Caucasian	93	96	.72
Education (years)	11.7 ± 2.1	11.6 ± 1.9	.92
% Private insurance	10	13	.73
% Married	30	13	.14
% 1st pregnancy	57	48	.52
Weeks pregnant at intake	15.6 ± 7.5	11.8 ± 6.8	.06
Smoking History:			
Age started (years)	14.1 ± 2.6	13.7 ± 1.7	.47
% living with other smoker(s)	83	65	.13
Cigs/day prepregnancy	23.3 ± 11.9	22.7 ± 10.4	.83
Cigs/day in past 7 days	9.9 ± 8.8	10.8 ± 8.5	.70
Intake CO (ppm)	12.5 ± 9.5	10.3 ± 5.4	.30
Intake urinary cotinine (ng/ml)	1070 ± 712	1229 ± 606	.40
Smoking Attitudes:			
Amount want to quit ^b	3.9 ± 0.3	3.9 ± 0.4	.96
Confidence to quit ^b	3.1 ± 0.8	2.9 ± 0.7	.40
Intend to quit while pregnant ^c	4.5 ± 0.8	4.6 ± 0.6	.47

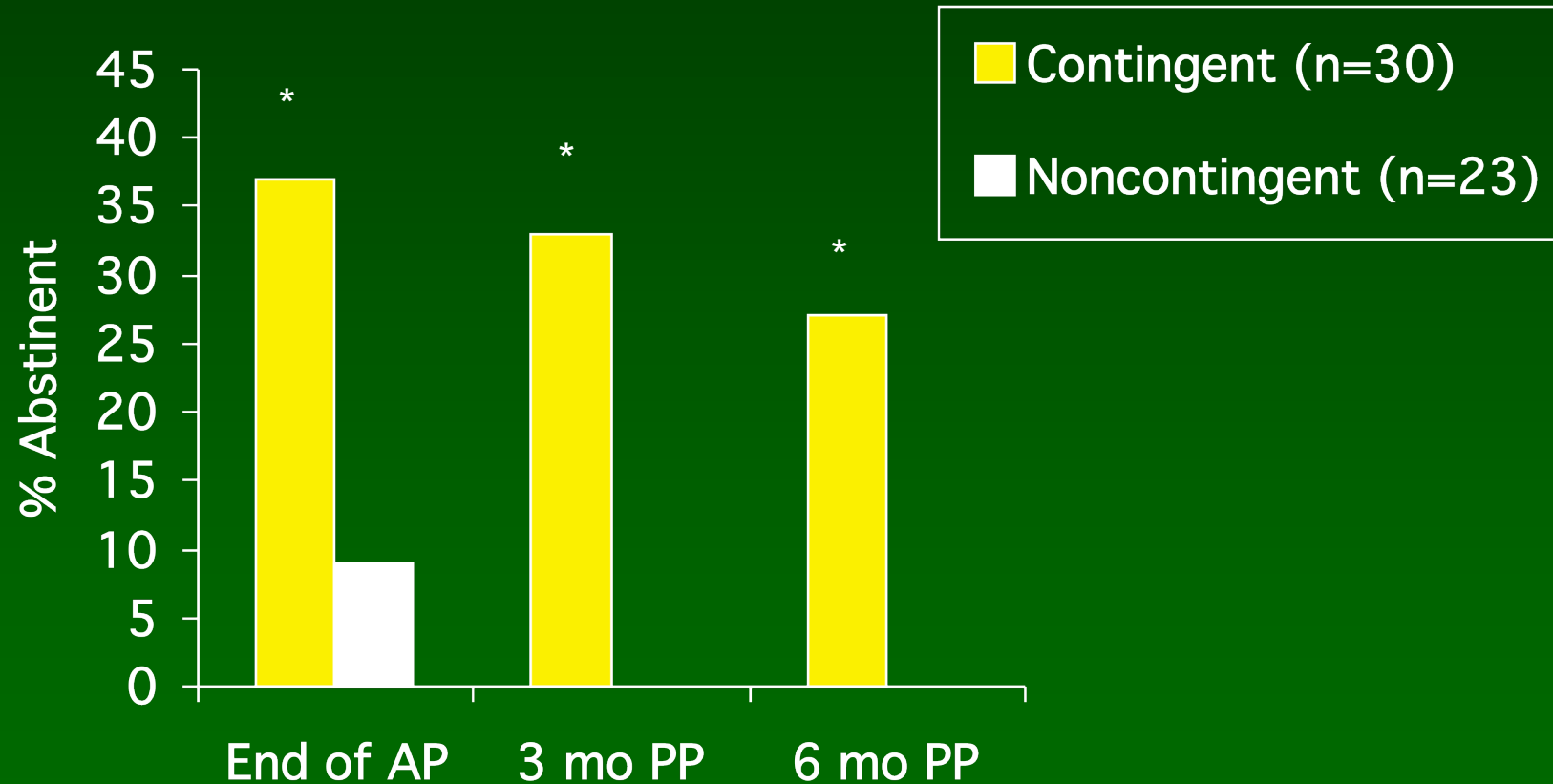
Note: Values represent mean ± SD, unless otherwise specified.

^aTreatment groups are described in the text

^b Assessed by a four-point scale: 1 = none, 4 = a lot

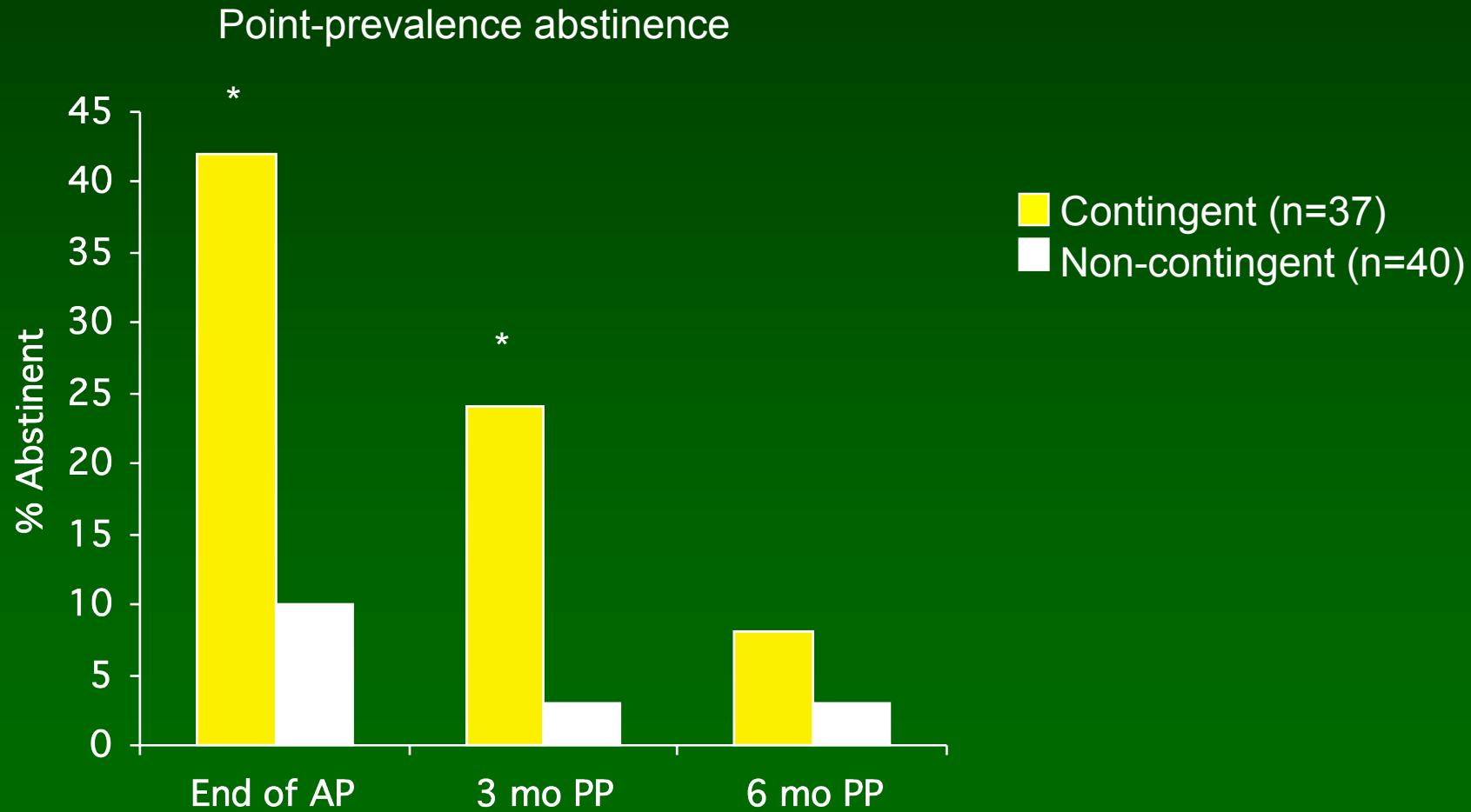
^c Assessed by a five-point scale: 1 = definitely not, 5 = definitely

Abstinence Rates (S-R + biochemical verification)



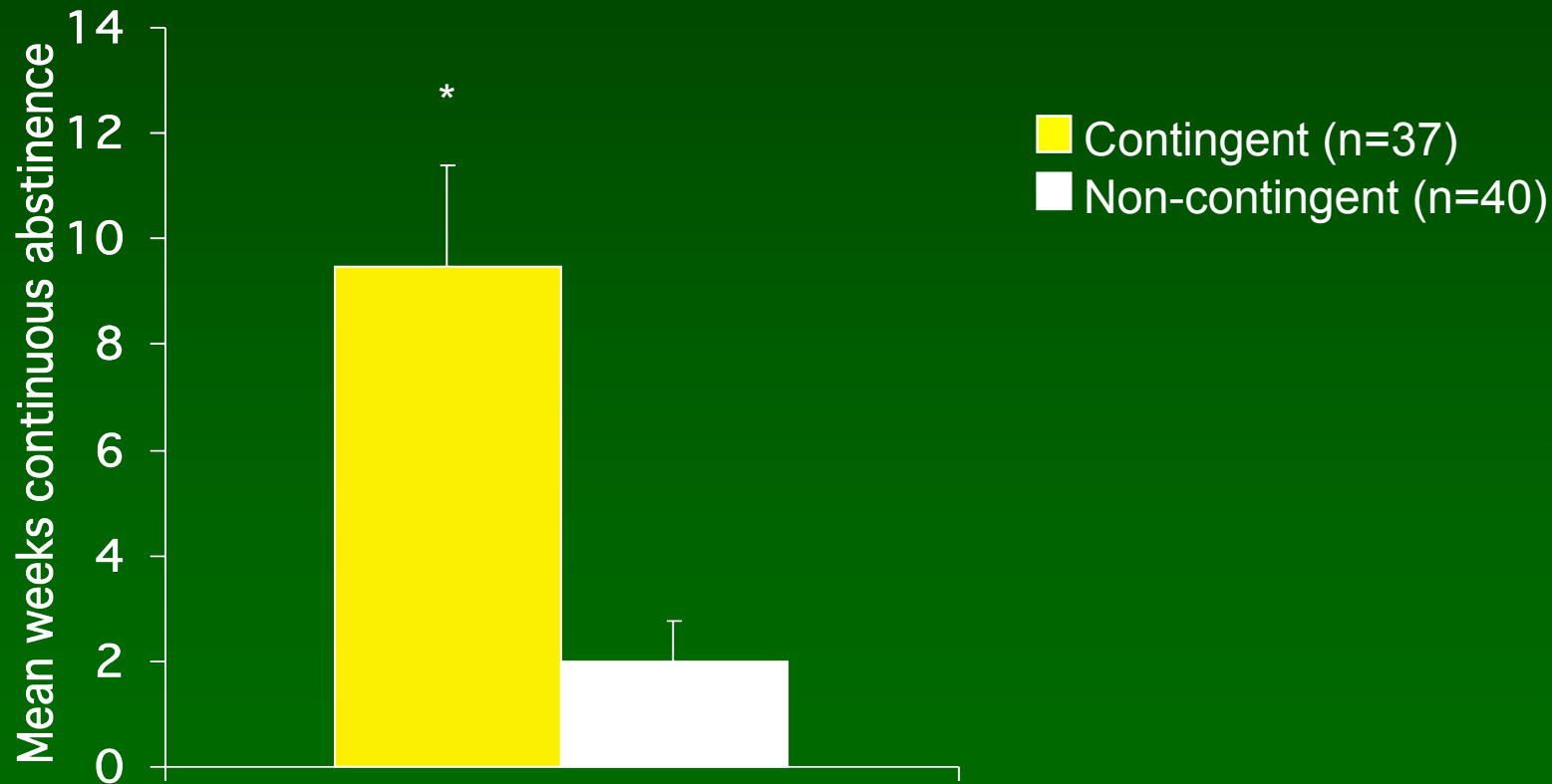
(Higgins et al., 2004).

Abstinence Rates (S-R + biochemical verification)

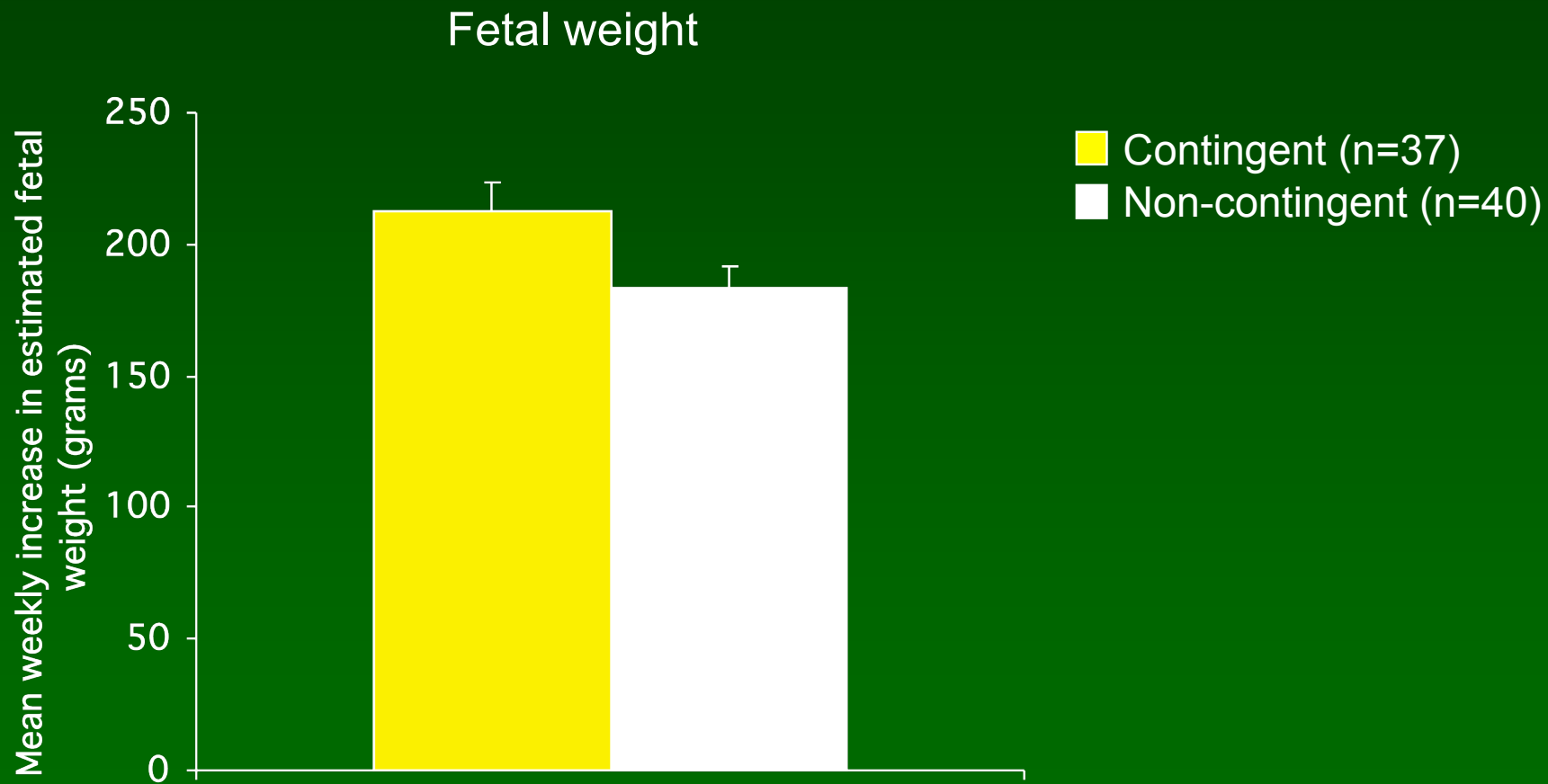


Abstinence Rates (S-R + biochemical verification)

Mean weeks of continuous
abstinence antepartum

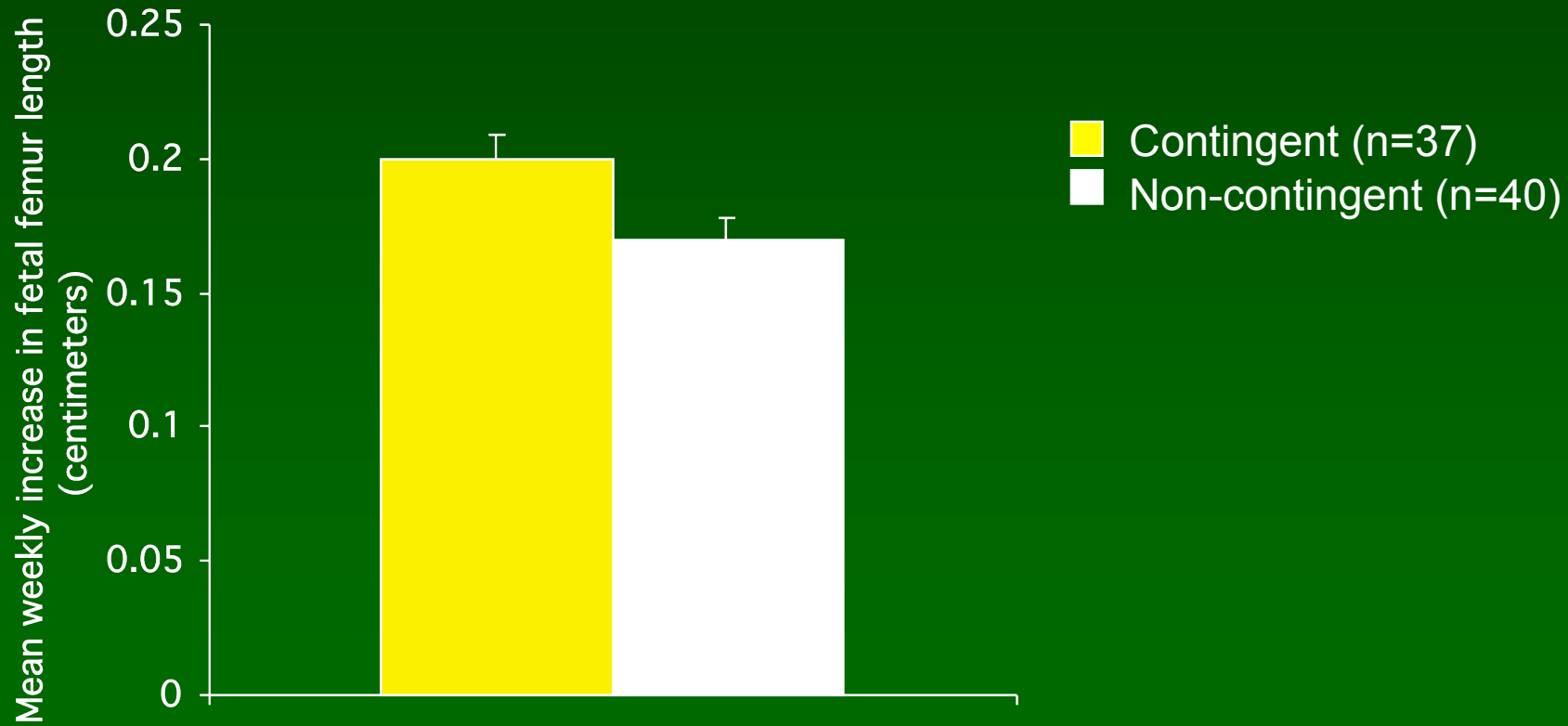


Fetal Growth



Fetal Growth

Fetal femur length



Conclusions

- **Contingency management is an effective intervention for increasing abstinence from cigarette smoking during pregnancy and improving fetal growth**