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Adolescent use of combined hormonal contraception and peak bone mineral density accrual: A meta-analysis of international prospective controlled studies

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What do we already know?

- ‘The Pill’ is widely used throughout the world to prevent pregnancy.
- It is increasingly used by teenage women.¹⁻³
- We know little about ‘The Pill’ and teen bones.
- Adolescence is an important time for bone growth; achieving high peak bone during growth will prevent broken bones and osteoporosis at older ages.^{4,5}
- ‘The Pill’ contains high doses of estrogen, required for effective contraception.
- High dose estrogen suppresses the bone formation necessary for the growth of bones in adolescent and young-adult women.^{2,3}
- Most of the research on “The Pill” (scientifically referenced as combined hormonal contraceptives, CHC) use and bone health is in premenopausal women, in whom it does not seem to show either benefit or harm.

1. Skouby *Eur J Contracept Reprod Health Care*; 2004;9(2):57-68

2. Prior *J Women’s Reproductive Health*; 2016;3:73-93

3. Brajic *J Musculoskelet Neuronal Interact*; 2017;18:227-36

4. Polatti *Contraception*; 1995;51(4):221-24

5. Weaver *Osteoporos Int*. 2016;27(4):1281-1386





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What do we *need* to know?

- Understanding the effect of “*The Pill*” (CHC) on teen women's bone change allows young women to:
 - make informed decisions, and
 - share accurate information with their parents and their physicians.
- So we asked this research question:

Is there any difference in the growth of the bone between teenage women using and not using CHC?



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How did we do the study?

- We did a **Meta-Analysis**. A meta-analysis is a standardized way of combining research results from many studies; it provides some of our strongest scientific evidence.
- We systematically searched the internet for research studies on bone change, over one or two years, among teenaged (12-19 years) women, by whether they used CHC, or not.
- We reviewed the articles and found a total of nine articles that met these parameters so as to be included in this meta-analysis.
- Five¹⁻⁵ of nine articles had information on bone change over two years.

1. Berenson *Obstet Gynecol* 2004; 103:899-9062004
2. Cromer *Fertil Steril* 2008; 90:2060-67
3. Scholes *J Clin Endocrinol Metab* 2011; 96:E1380-87
4. Gai *Contraception* 2012; 86:332-36
5. Brajic *J Musculoskelet Neuronal Interact* 2018; 18: 227-36





What did we learn?

- In 885 teen-women—ages 12-19 years from China, the USA, and Canada—we found that there was 0.02 g/cm² more spine/back bone loss, *or less bone gain*, over two years among the adolescent women taking CHC (n = 558) than in the teen women (n = 327) who were not taking CHC.
- Although this difference in spinal bone change was small, it is very strong scientific evidence (P = 0.0006).
- Results were also quite variable between studies (I² = 85%). This variability is likely because of racial and country differences. However, the specific tests we did, that were required by meta-analysis procedures, showed that these results were reliable.





What do these results mean for women's health?

- **“The Pill” (CHC) prevents normal bone growth in teen women.**
- High peak bone mass is key to lifelong bone health—lower levels are related to later life osteoporosis and broken bones.
- CHC use is now commonly started during adolescence; women ages 16-24 in CaMos¹ started CHC at an average age of 17.3 years.
- Over 50% of the CaMos Youth Cohort women first used CHC for *treatment* of [acne](#), [cramps](#), and [irregular cycles](#); all of these are *normal* in the first two years after menarche (starting of menstruation).
- There are good, [non-hormonal contraceptive methods](#), that teens who need birth control can use.
- Family doctors, parents and ***all young women*** need to know that **use of CHC in the teen years is not good for life-long bone health.**

1. Brajic *J Musculoskelet Neuronal Interact* 2018; 18: 227-36.

