



# Topic Brief: Pregnancy Test Frequency During Chemotherapy

**Date:** 2/21/2023

**Nomination Number:** 1024

**Purpose:** This document summarizes the information addressing a nomination submitted on October 27, 2022, through the Effective Health Care Website. This information was used to inform the Evidence-based Practice Center (EPC) Program decisions about whether to produce an evidence report on the topic, and if so, what type of evidence report would be most suitable.

**Issue:** It is agreed that a pregnancy test should be conducted at the start of chemotherapy for people of child-bearing age, but there is no standard of practice for the schedule of retesting for pregnancy after chemotherapy begins.

**Findings:** The EPC Program will not develop a new systematic review because we did not find any studies addressing the concerns of this nomination.

---

## Background

In the United States, the rate of new cancer cases is 442.4 per 100,000 people, with a death rate of 158.3 per 100,000.<sup>1</sup> In 2019, the national patient economic burden associated with cancer care was \$21.09 billion made up of patient out-of-pocket costs of \$16.22 billion and patient time costs (the value of time that patients spend traveling to and from health care, waiting for care, and receiving care) of \$4.87 billion.<sup>2</sup> In women, mortality rate is lower than in men (135.7 per 100,000 women and 189.5 per 100,000 men), and has decreased by 1.4% per year from 2001 to 2017.

The three most common types of cancer in women are breast, lung, and colorectal.<sup>1</sup> Breast cancer is the most common malignancy among women of childbearing age in the United States, with 11,160 women <40 years diagnosed annually.<sup>3</sup> In women of childbearing age, chemotherapy treatment for cancer can be complicated by the possibility of pregnancy during the treatment, making the detection of pregnancy during chemotherapy critical. During the embryonic stage of fetal development, chemotherapy can cause harm and lead to the termination of the pregnancy. When the cancer is diagnosed in the 2nd or 3rd trimester of gestation, or when it is possible to delay the initiation of chemotherapy beyond the 14th week, the risk of severe problems for the fetus are low and pregnancy termination is not required.<sup>4</sup> Pregnancy during cancer treatment is generally not advised and guidance exists on contraception options for women with cancer.<sup>5</sup>

While pre-chemotherapy pregnancy screening is recommended, it is not always conducted<sup>6</sup> and there are no guidelines on whether, and at what interval, to retest for pregnancy. The nominators would like a systematic review on the effectiveness and harms of different pregnancy testing intervals that would influence the development of guidelines.

## Scope

What is the effectiveness and harms of different schedules/frequencies of pregnancy tests after initiation of chemotherapy?

**Table 1.** Questions and PICOs (population, intervention, comparator, and outcome)

<b>Questions</b>	Schedules of pregnancy tests after initiation of chemotherapy
<b>Population</b>	Pre-menopausal adults $\geq 18$ who are being treated with chemotherapy
<b>Interventions</b>	schedules/frequencies of pregnancy testing after initiation of chemotherapy treatment
<b>Comparators</b>	other schedules/frequencies of pregnancy testing after initiation of chemotherapy; no pregnancy testing after initiation of chemotherapy
<b>Outcomes</b>	detection of a pregnancy; harms of chemotherapy to a developing fetus; any harms of pregnancy testing; harms of pregnancy to patient; anxiety; cost; harms of changes in treatment/cancer outcomes

## Assessment Methods

See Appendix A.

## Summary of Literature Findings

We did not find any evidence addressing the scope of the nomination. The targeted literature search yielded one study, which did not match the inclusion criteria.

**Table 2.** Literature identified for each Question

Question	Primary studies (1/2018-1/2023)
Schedules of pregnancy tests after initiation of chemotherapy	Total: 0

See Appendix B for detailed assessments of all EPC selection criteria.

## Summary of Selection Criteria Assessment

It is agreed that a pregnancy test should be conducted at the start of chemotherapy for people of child-bearing age, but there is no standard of practice for the schedule of testing after chemotherapy has been initiated. While a systematic review could contribute to the development of standards, we did not find any evidence addressing the issue.

Please see Appendix B for detailed assessments of individual EPC Program selection criteria.

## References

1. Cancer Statistics. National Cancer Institute. doi: <https://www.cancer.gov/about-cancer/understanding/statistics>.
2. Annual Report to the Nation Part 2: Patient economic burden of cancer care more than \$21 billion in the United states in 2019. National Cancer Institute. doi: <https://www.cancer.gov/news-events/press-releases/2021/annual-report-nation-part-2-economic-burden>.
3. Breast Cancer Facts & Figures. American Cancer Society. doi: <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2017/cancer-facts-and-figures-2017.pdf>.

4. Esposito S, Tenconi R, Preti V, et al. Chemotherapy against cancer during pregnancy: A systematic review on neonatal outcomes. *Medicine (Baltimore)*. 2016 Sep;95(38):e4899. doi: <https://doi.org/10.1097/md.0000000000004899>. PMID: 27661036.
  5. Patel A, Schwarz EB. Cancer and contraception. Release date May 2012. SFP Guideline #20121. *Contraception*. 2012 Sep;86(3):191-8. doi: <https://doi.org/10.1016/j.contraception.2012.05.008>. PMID: 22682881.
  6. Hu L, Kichenadasse G, Martin H, et al. Pregnancy screening prior to chemotherapy administration. *Intern Med J*. 2016 Oct;46(10):1222-4. doi: <https://doi.org/10.1111/imj.13214>. PMID: 27734613.
- 

## **Author**

Emily Gean  
Robin Paynter  
Lisa Winterbottom

**Conflict of Interest:** None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

## **Acknowledgements**

Christine Chang  
Charli Armstrong

This report was developed by the Scientific Resource Center under contract to the Agency for Healthcare Research and Quality (AHRQ), Rockville, MD (Contract No. HHS-290-2017-00003C). The findings and conclusions in this document are those of the author(s) who are responsible for its contents; the findings and conclusions do not necessarily represent the views of AHRQ. No statement in this article should be construed as an official position of the Agency for Healthcare Research and Quality or of the U.S. Department of Health and Human Services.

Persons using assistive technology may not be able to fully access information in this report. For assistance contact [EPC@ahrq.hhs.gov](mailto:EPC@ahrq.hhs.gov).

## Appendix A: Methods

We assessed nomination for priority for a systematic review or other AHRQ Effective Health Care report with a hierarchical process using established selection criteria. Assessment of each criteria determined the need to evaluate the next one. See Appendix B for detailed description of the criteria.

### Appropriateness and Importance

We assessed the nomination for appropriateness and importance.

### Desirability of New Review/Absence of Duplication

The primary study yield was one. Consequently, we did not conduct the search for duplication.

### Impact of a New Evidence Review

The impact of a new evidence review was qualitatively assessed by analyzing the current standard of care, the existence of potential knowledge gaps, and practice variation. We considered whether it was possible for this review to influence the current state of practice through various dissemination pathways (practice recommendation, clinical guidelines, etc.).

### Feasibility of New Evidence Review

We conducted a limited literature search in PubMed and PsycInfo for the last five years January 5, 2018-January 5, 2023. We reviewed the one study from the yield for inclusion.

Search strategy

#### Ovid MEDLINE ALL 1946 to January 04, 2023

Date searched: January 5, 2023

1 Pregnancy Tests/ (3811)

2 (("Beta-hCG" or BhCG or hCG or "human chorionic gonadotropin" or pregnan\* or trimester) adj2 (screen\* or test\*)).ti,kf. (5264)

3 or/1-2 (7099)

4 exp \*Antineoplastic Agents/ or Chemotherapy.hw. or exp \*Neoplasms/dt (950631)

5 (antineoplastic or anti-neoplastic or chemotherap\* or chemo-therap\*).ti,ab,kf. (503435)

6 or/4-5 (1214580)

7 and/3,6 (79)

8 limit 7 to english language (67)

9 8 not ((exp Animals/ not Humans/) or (animal model\* or bitch\$2 or bovine or canine or capra or cat or cats or cattle or cow\$1 or dog\$1 or equine or ewe\$1 or feline or goat\$1 or hamster\$1 or horse\$1 or invertebrate\$1 or macaque\$1 or mare\$1 or mice or monkey\$1 or mouse or murine or nonhuman or non-human or ovine or pig or pigs or porcine or primate\$1 or rabbit\$1 or rat\$1 or rattus or rhesus or rodent\* or sheep or simian or sow\$1 or vertebrate\$1 or zebrafish or ectopic).ti.) (47)

10 limit 9 to yr="2019 -Current" (4)

11 (meta-analysis or systematic review).pt. or (meta-anal\* or metaanal\* or ((evidence or review or scoping or systematic or umbrella) adj3 (review or synthesis))).ti. (793262)

12 and/10-11 (1)

13 limit 9 to yr="2017 -Current" (9)

14 (controlled clinical trial or randomized controlled trial).pt. or (control or controls or controlled or placebo\$1 or random\* or trial\*).ti,ab,kf. (5684266)

15 and/13-14 (1)

16 Case-Control Studies/ or Cohort Studies/ or Comparative Study/ or Controlled Before-After Studies/ or Cross-Sectional Studies/ or Epidemiologic Studies/ or exp Evaluation Studies as Topic/ or Follow-Up Studies/ or Historically Controlled Study/ or Interrupted Time Series Analysis/ or Longitudinal Studies/ or Prospective Studies/ or Retrospective Studies/ or ("case-control" or cohort\$1 or "before-after" or ((comparative or epidemiologic or evaluation) adj3 study) or cross-sectional or follow-up or (historic\* adj4 control\*) or "interrupted time" or longitudinal\$2 or prospective\$2 or retrospective\$2).ti,ab,kf. (687065 1)

17 and/13,15 (1)

18 (guideline or practice guideline).pt. or guideline.ti,ab,kf. (108324)

19 and/13,18 (0)

20 limit 8 to yr="2017 -Current" (14)

Because only one study was identified in the Medline search, a ClinicalTrials.gov search was not conducted.

## Appendix B. Selection Criteria Assessment

Selection Criteria	Assessment
<b>1. Appropriateness</b>	
1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the United States?	Yes.
1b. Is the nomination a request for an evidence report?	Yes.
1c. Is the focus on effectiveness or comparative effectiveness?	Yes.
1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic?	Yes.
<b>2. Importance</b>	
2a. Represents a significant disease burden; large proportion of the population	Yes. In the United States, the rate of new cancer cases is 442.4 per 100,000 people, with a death rate of 158.3 per 100,000. <sup>1</sup> Breast cancer is the most common malignancy among women of childbearing age in the U.S., with 11,160 women <40 years diagnosed annually. <sup>3</sup>
2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large proportion of the United States population or for a vulnerable population	Yes. Breast cancer is the most common malignancy among women of childbearing age in the United States, with 11,160 women <40 years diagnosed annually. <sup>3</sup> In 2019, the national patient economic burden associated with cancer care was \$21.09 billion made up of patient out-of-pocket costs of \$16.22 billion and patient time costs (the value of time that patients spend traveling to and from health care, waiting for care, and receiving care) of \$4.87 billion. <sup>2</sup>
2c. Incorporates issues around both clinical benefits and potential clinical harms	Yes.
2d. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers	Yes. In 2019, the national patient economic burden associated with cancer care was \$21.09 billion made up of patient out-of-pocket costs of \$16.22 billion and patient time costs (the value of time that patients spend traveling to and from health care, waiting for care, and receiving care) of \$4.87 billion. <sup>2</sup>
<b>3. Desirability of a New Evidence Review/Absence of Duplication</b>	
3. A recent high-quality systematic review or other evidence review is not available on this topic	Yes. The search yield for primary studies was one. Due to the extremely low yield, the search was terminated and duplication was not conducted.
<b>4. Impact of a New Evidence Review</b>	
4a. Is the standard of care unclear (guidelines not available or guidelines inconsistent, indicating an information gap that may be addressed by a new evidence review)?	Yes. There are no guidelines on the schedule of pregnancy tests for women after treatment for cancer has begun.
4b. Is there practice variation (guideline inconsistent with current practice, indicating a potential implementation gap and not best addressed by a new evidence review)?	Yes. There is practice variation in the schedule of pregnancy tests.
<b>5. Primary Research</b>	

<p>5. Effectively utilizes existing research and knowledge by considering:</p> <ul style="list-style-type: none"><li>- Adequacy (type and volume) of research for conducting a systematic review</li><li>- Newly available evidence (particularly for updates or new technologies)</li></ul>	<p><i>Size/scope of review:</i> We did not find any studies addressing the scope.</p>
--	---