

Fertility Risks for Women

Assessing how certain treatments could affect future fertility is an important part of cancer care. This chart represents a compilation of clinical experience and published data about the effect of common cancer treatments on menstruation in post-pubertal women (unless otherwise noted). Visit [LIVESTRONG.org/Fertility](https://www.livestrong.org/Fertility) for more resources.

	CANCER TREATMENT PROTOCOL	PATIENT AND DOSE FACTORS	COMMON USAGE	FERTILITY PLANNING CONSIDERATIONS
HIGH RISK	Any alkylating agent (e.g., busulfan, carmustine, cyclophosphamide, ifosfamide, lomustine, melphalan, procarbazine) + total body irradiation		Conditioning for HSCT for leukemias, lymphomas, myelomas, Ewing's sarcoma, neuroblastoma, choriocarcinoma	>70% of women develop amenorrhea post-treatment. Any treatments containing high doses of alkylating agents and/or radiation to the abdomen, pelvis or hypothalamic axis present the highest level of risk for gonadal impact and immediate amenorrhea. Patients should be counseled about fertility preservation prior to treatment.
	Any alkylating agent + pelvic radiation		Sarcomas, ovarian	
	Total cyclophosphamide	5 g/m ² in women age > 40 7.5 g/m ² in women and girls age <20	Multiple cancers: breast cancer, NHL, conditioning for HSCT	
INTERMEDIATE RISK	Protocols containing procarbazine: MOPP BEACOPP	> 3 cycles > 6 cycles	Hodgkin lymphoma	
	Protocols containing temozolomide or BCNU + cranial radiation		Brain tumor	
	Whole abdominal or pelvic radiation doses	> 6 Gy in adult women > 10 Gy in post-pubertal girls > 15 Gy in pre-pubertal girls	Wilm's tumor, neuroblastoma, sarcomas, Hodgkin lymphoma, ovarian	
	Total body irradiation (TBI) doses		HSCT	
LOWER RISK	Cranial radiation	>40 Gy	Brain tumor	~30-70% of women develop amenorrhea post-treatment. Lower levels of alkylating agents and/or radiation to the abdomen, pelvis or hypothalamic axis reduce risk of immediate amenorrhea but do not eliminate risk of gonadal damage. Patients should be counseled about fertility preservation prior to treatment. For Bevacizumab, risk of amenorrhea is intermediate, yet the outcome of fertility is unknown.
	Total cyclophosphamide	5 g/m ² in women age 30- 40	Multiple cancers, breast	
	AC for breast cancer	x4 + paclitaxel or Docetaxel in women age < 40	Breast	
	Monoclonal antibodies, e.g., Bevacizumab (Avastin)		Colon, non-small cell lung, head and neck, breast	
	FOLFOX4		Colon	
	Protocols containing cisplatin		Cervical	
	Abdominal/pelvic radiation	10-15 Gy in prepubertal girls 5-10 Gy in post-pubertal girls	Wilm's tumor, neuroblastoma, spinal tumors, brain tumor, relapsed ALL or NHL	
VERY LOW/ NO RISK	Protocols containing nonalkylating agents or lower levels of alkylating agents (e.g., ABVD, CHOP, COP; multi-agent therapies for leukemia)		Hodgkin lymphoma, NHL, leukemia	<30% of women develop amenorrhea post-treatment. These treatments are unlikely to cause immediate amenorrhea at standard dosage; however, patients should be counseled that they may be at risk for early menopause. Patients may want to consider fertility preservation before or after treatment.
	Protocols for breast cancer containing cyclophosphamide (e.g., CMF, CEF, or CAF)	Women < 30	Breast	
	Anthracycline + cytarabine		AML	
UNKNOWN	Multi-agent therapies using vincristine		Leukemia, lymphoma, breast and lung cancer	Negligible to no effects on menses. Patients should be counseled regarding the lack of conclusive data about the reproductive effects of these drugs; fertility preservation options should be discussed.
	Radioactive iodine		Thyroid	
UNKNOWN	Monoclonal antibodies, e.g., cetuximab (Erbix), trastuzumab (Herceptin)		Colon, non-small cell lung, head and neck, breast	Negligible to no effects on menses. Patients should be counseled regarding the lack of conclusive data about the reproductive effects of these drugs; fertility preservation options should be discussed.
	Tyrosine kinase inhibitors, e.g., erlotinib (Tarceva), imatinib (Gleevec)		Non-small cell lung, pancreatic, CML, GIST	

The LIVESTRONG Foundation does not directly or indirectly engage in the practice of medicine. The information presented here does not constitute medical advice, diagnosis or treatment, should not be considered complete and should never be used in place of consultation between patient and health care provider.

© LIVESTRONG, a registered trademark of the LIVESTRONG Foundation. The LIVESTRONG Foundation is a 501(c)(3) under federal tax guidelines.