La preservazione della fertilità: è oggi possibile ?

Fedro Peccatori, MD PhD
Fertility and Procreation Unit in Oncology
European Institute of Oncology,
European School of Oncology,
Milan, ITA

Carcinoma mammario: quando la donna è giovane
Negrar, 24 Giugno 2015

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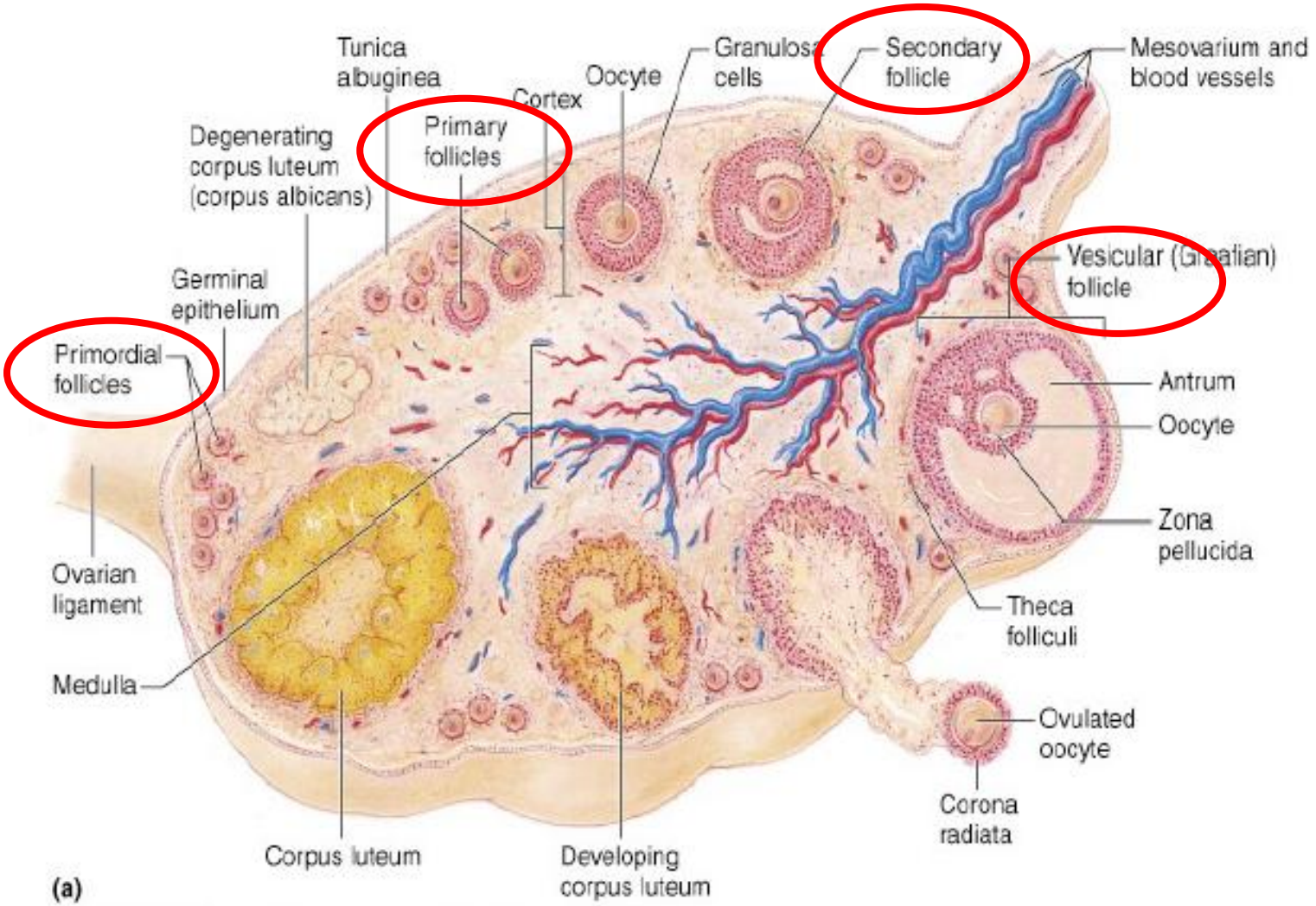
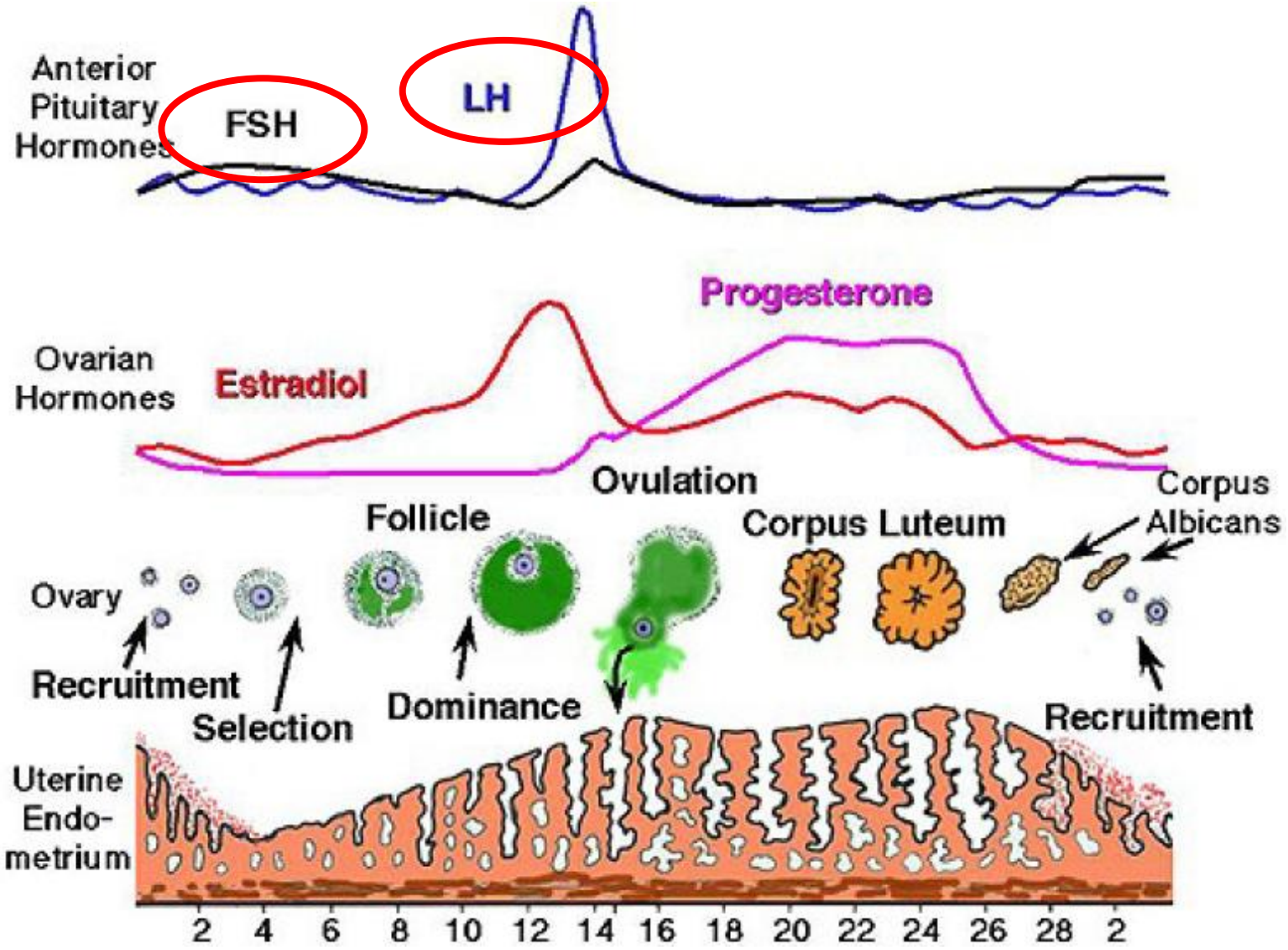
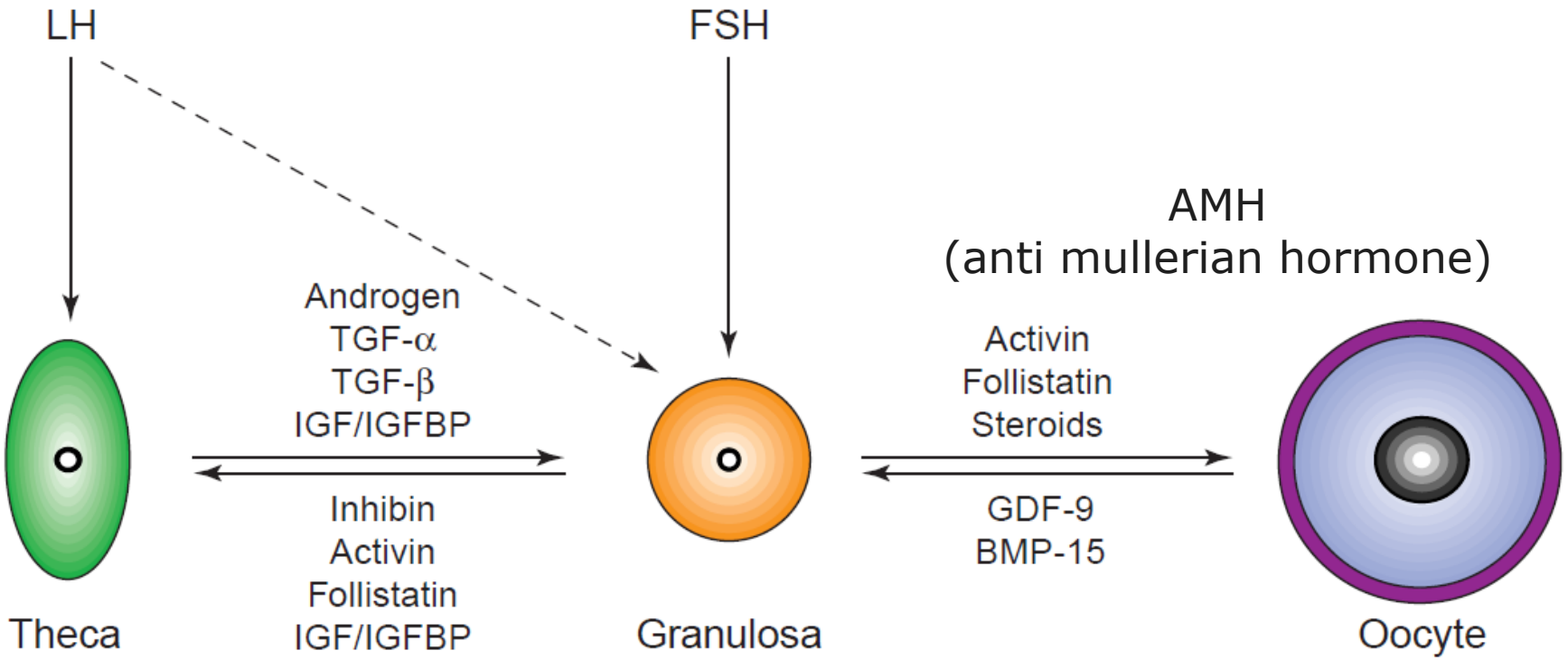
Foreword 1: the ovary



Foreword 2: the hypothalamus-ovarian axis



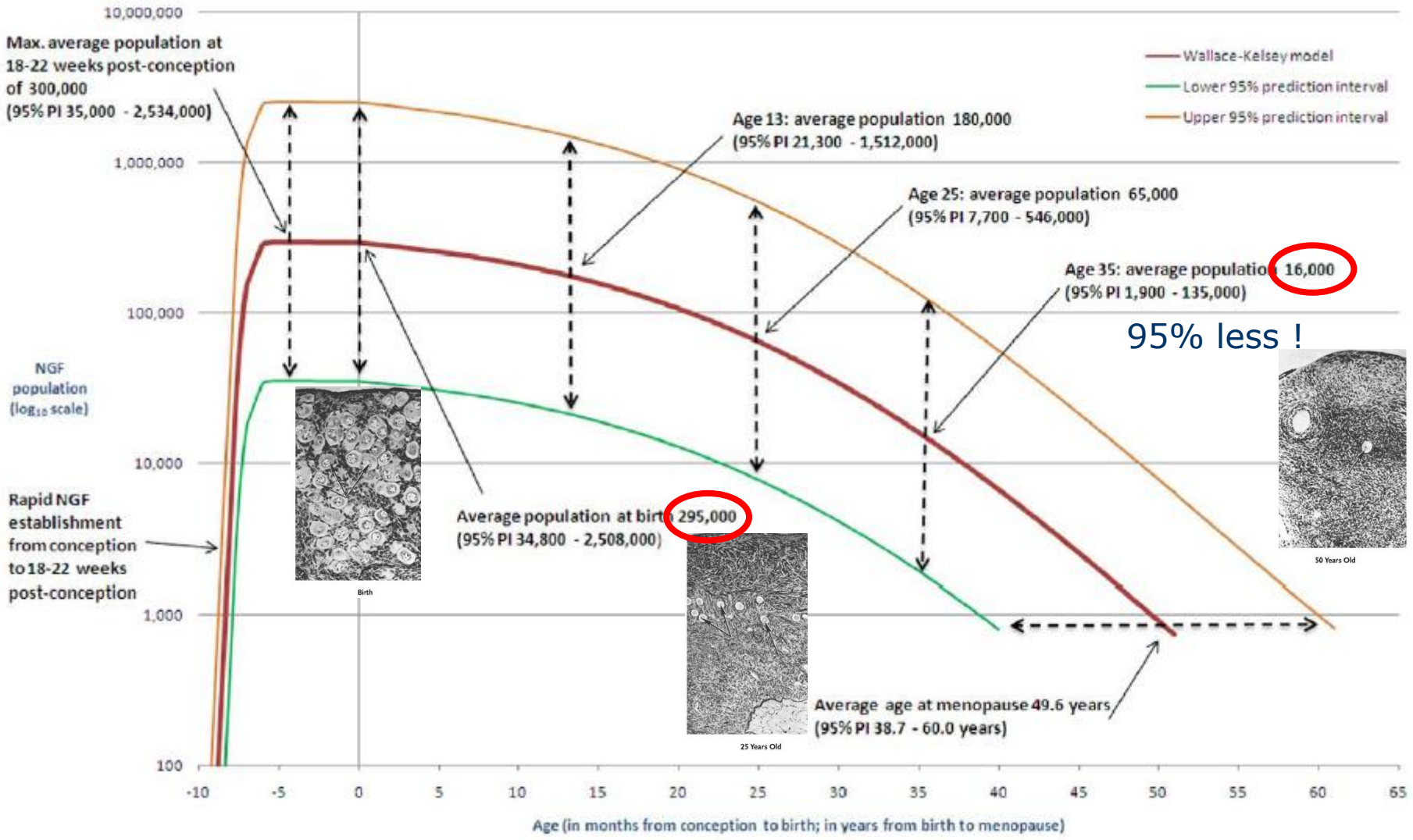
Foreword 3: the paracrine factors



Potential local regulatory functions of inhibins, activins and follistatin in the ovary

Philip G. Knight and Claire Glister

Foreword 4: times goes by



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Human Ovarian Reserve from Conception to the Menopause

W. Hamish B. Wallace[1]*, Thomas W. Kelsey[2]

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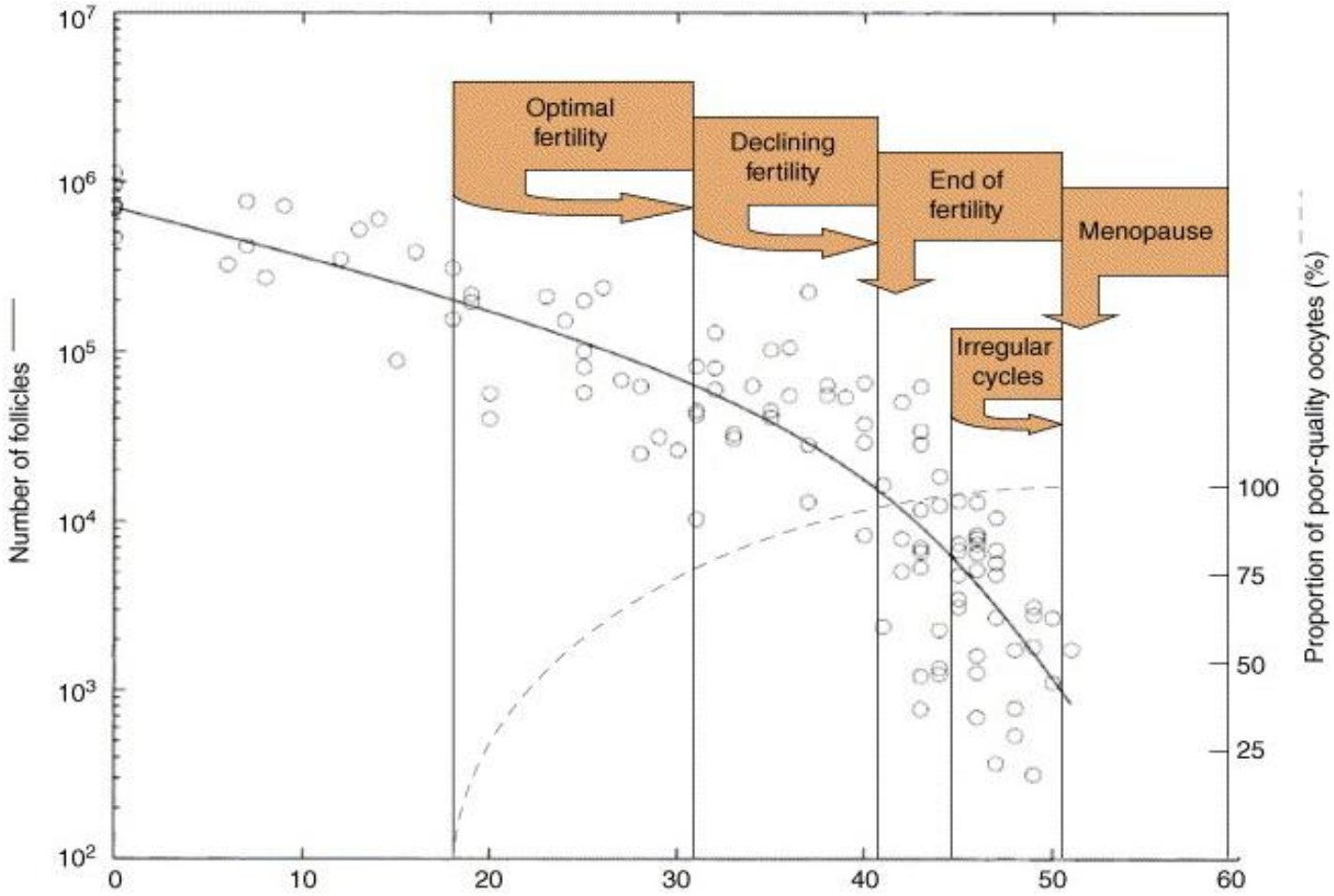
Foreword 5: fertility is not forever



Decrease in quantity and increase in poor-quality oocytes with age

Broekmans FJ et al. Trends in Endocrinol & Metab, 2007

The clinical case

Anna, 36 y/o nullipara
No family history, no comorbidities

20/02/2015 Quadrantectomy and axillary dissection
pT1c N1 (3/15 +ln) G3 ductal infiltrating carcinoma
ER 75% PgR 60% HER2 1+ Ki67 45% LVI +
Lum B-like according to St Gallen

ECx4 ->wPTX x12 -> LHRHa+Exemestane x 5y

but…

The clinical case

The clinical case: 2 burning questions

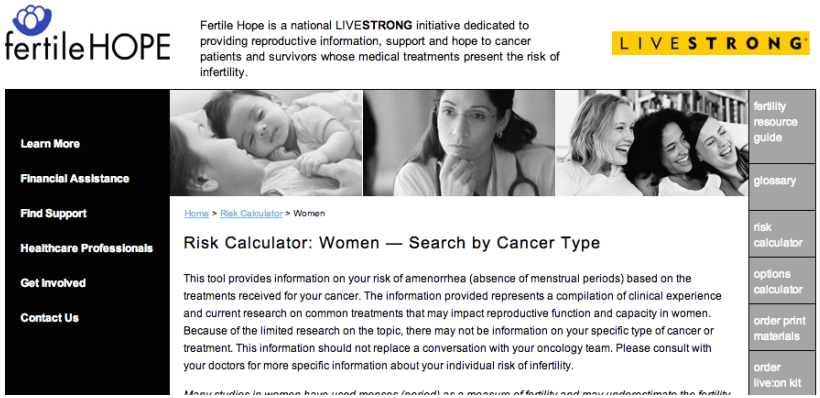
What is the risk of chemotherapy-induced infertility ?

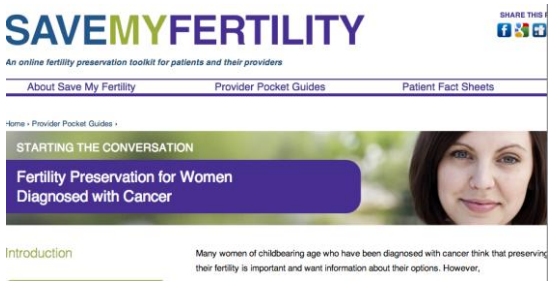
Is there anything we can do to reduced it?

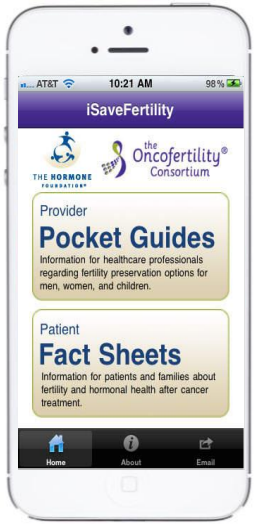
Assessing the risk of infertility

CRITICAL FACTORS:

- ✓ Age at diagnosis (oocyte quantity and quality)
- ✓ Drugs administered (schedule and dosage)
- ✓ Age at pregnancy (treatment duration)







the Oncofertility® Consortium
AT NORTHWESTERN UNIVERSITY

http://oncofertility.northwestern.edu/about-us

http://www.savemyfertility.org/pocket-guides

http://www.fertilehope.org/tool-bar/risk-calculator-women-type.cfm

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Assessing the risk of infertility

36 y/o
ECx4 ->wPTX x12 -> LHRHa+Exemestane x 5y

Intermediate Risk
Approximately 30-70% of women develop amenorrhea post-treatment.

- CMF x 6 cycles in women ages 30-39 (cyclophosphamide, methotrexate, 5-fluorouracil)
- CEF x 6 cycles in women ages 30-39 (cyclophosphamide, epirubicin, 5-FU)
- CAF x 6 cycles in women ages 30-39 (cyclophosphamide, doxorubicin, 5-FU)
- AC x 4 cycles in women ages 40 and older (doxorubicin, cyclophosphamide)

http://www.fertilehope.org/tool-bar/risk-calculator-women-type.cfm

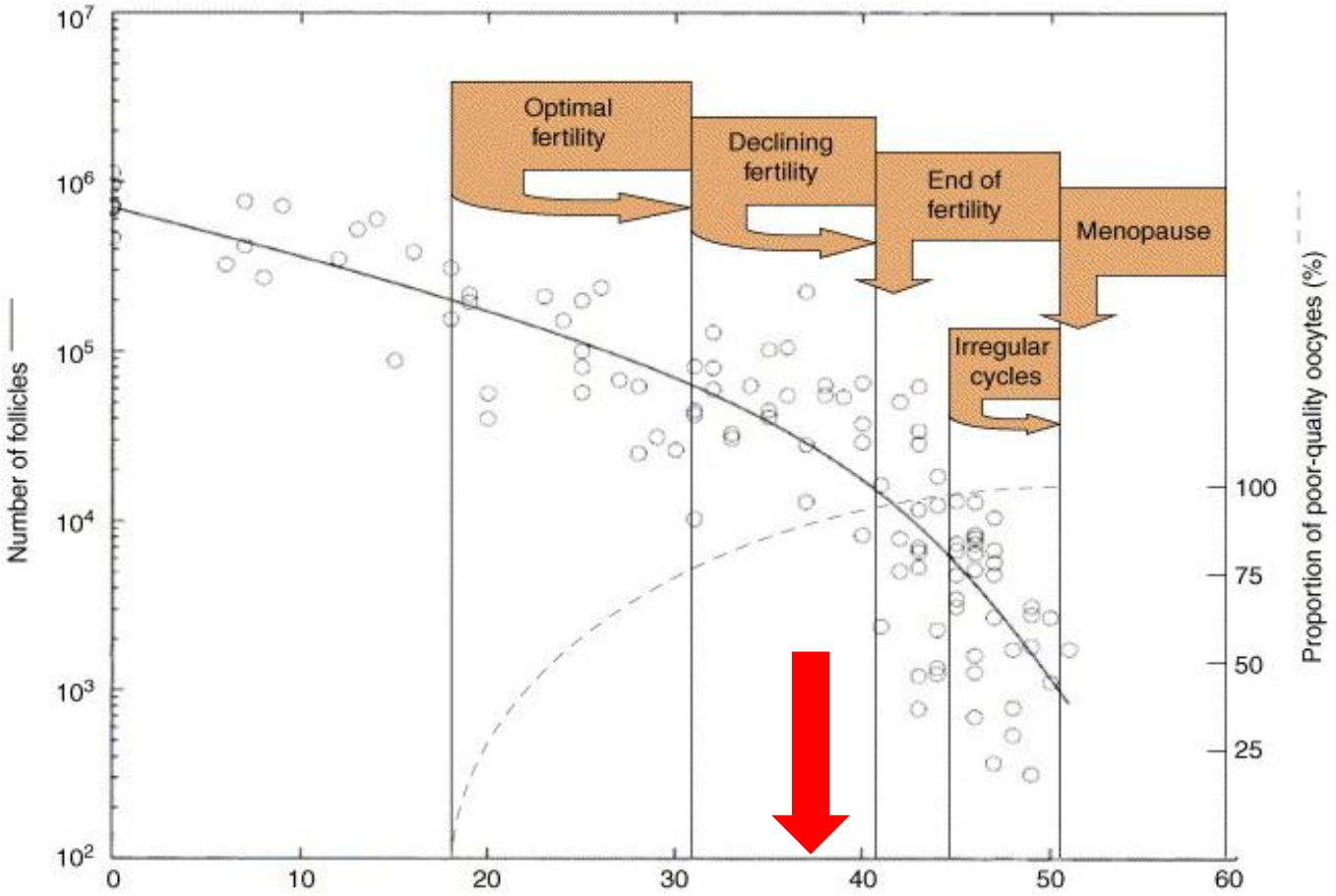
Assessing the risk of infertility

Treatment	Age <30	Age 30-40	Age>40
AC x 4	--	13	57-63
CMF x 6	19	31-38	76-96
CAF/CEF x 6	23-47		80-89
TAC x 6	51		
AC x 4 -> T x 4	38 (15% age <40)		

(Goodwin et al., JCO 1999; Burstein, H. J. et al. NEJM 2000; Nabholtz et al., ASCO 2002; Parulekar et al., JCO 2005; Fornier et al., Cancer 2005; Petrek et al, JCO 2006)

Assessing the risk of infertility

Treatment duration (age at pregnancy)
ECx4 ->wPTX x12 -> LHRHa+Exemestane x 5y



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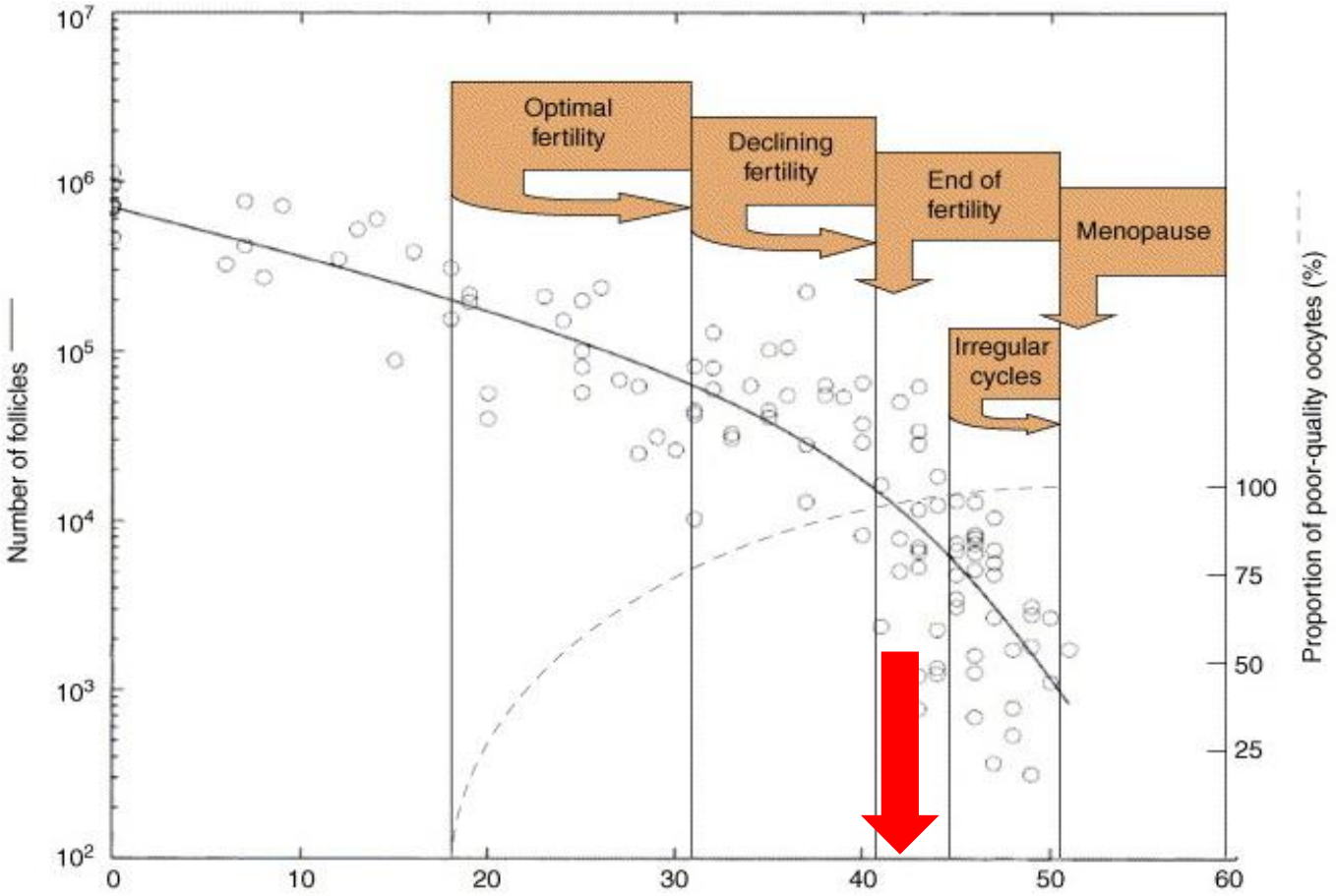
Assessing the risk of infertility

Treatment duration (age at pregnancy)
ECx4 ->wPTX x12 -> LHRHa+Exemestane x 5y



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Is there anything we can do ?

THINK PROACTIVELY !

- ✓ Inform the patient about the risk of infertility
- ✓ Refer her to the reproductive endocrinologist asap
- ✓ Consider egg/embryo freezing before chemotherapy
- ✓ If you're a believer, offer LHRHa during chemotherapy
- ✓ Discuss temporary interruption of endocrine treatment before Y5

Inform the patient about the risk of infertility

Young women desiring future fertility should be counselled on available fertility preserving options before starting anticancer treatments. Counselling should be implemented soon after diagnosis, to allow prompt referral to fertility specialists [IV, B]. Age is the most important determinant of chemotherapy or radiotherapy-induced ovarian dysfunction

clinical practice guidelines

Annals of Oncology 24 (Supplement 6): vi160–vi170, 2013
doi:10.1093/annonc/mdt199
Published online 27 June 2013

Cancer, pregnancy and fertility: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up†

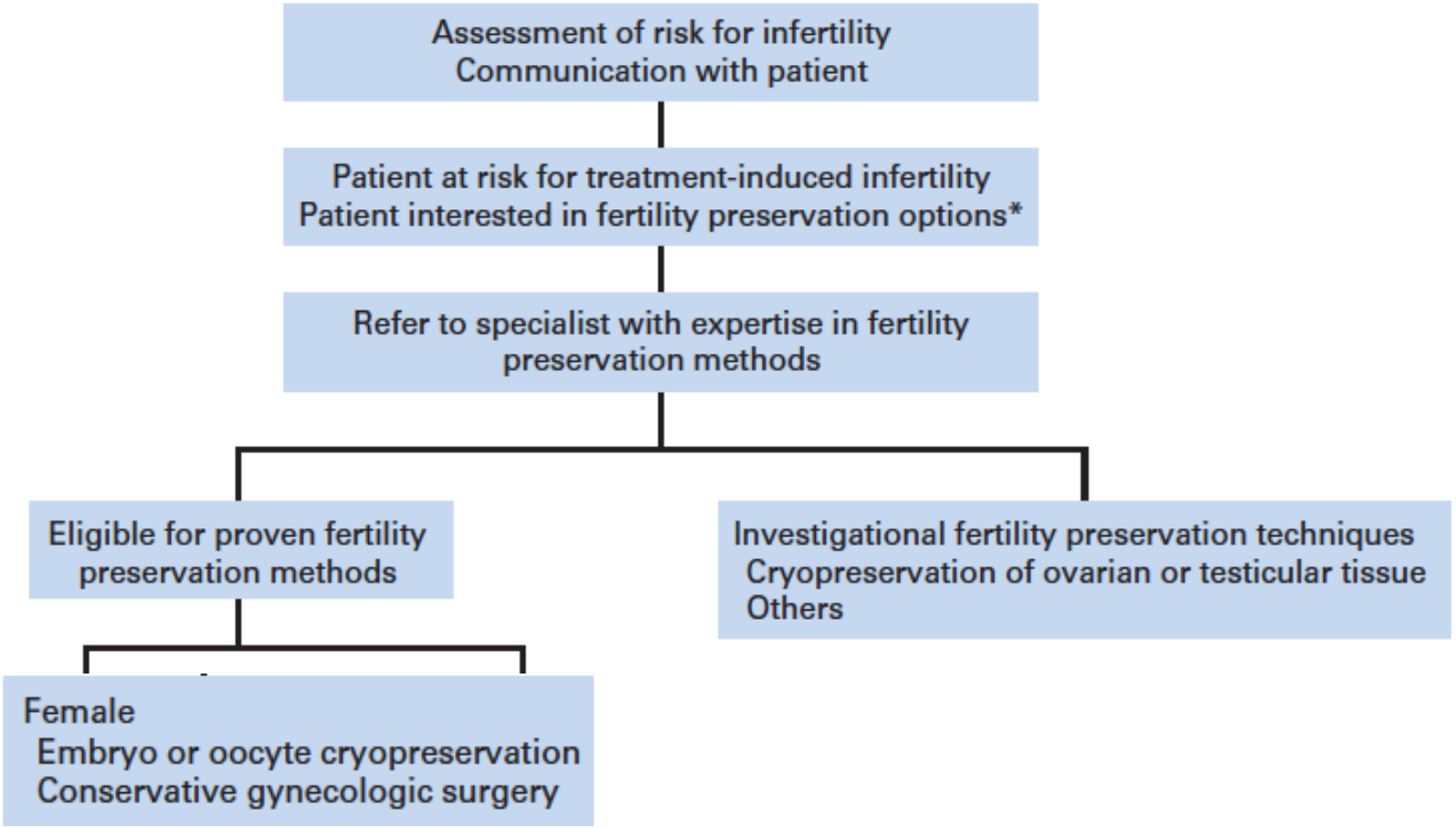
F. A. Peccatori[1], H. A. Azim Jr[2], R. Orecchia[3], H. J. Hoekstra[4], N. Pavlidis[5], V. Kesic[6] & G. Pentheroudakis[5], on behalf of the ESMO Guidelines Working Group*

[1]*Fertility and Procreation Unit, Division of Gynaecologic Oncology, European Institute of Oncology, Milan, Italy;* [2]*Department of Medicine, BrEAST Data Centre, Institut Jules Bordet, Université Libre de Bruxelles, Brussels, Belgium;* [3]*Department of Radiotherapy, European Institute of Oncology, Milan, Italy;* [4]*Department of Surgical Oncology, University Medical Centre Groningen, Groningen, The Netherlands;* [5]*Department of Medical Oncology, University of Ioannina, Ioannina, Greece;* [6]*Department of Obstetrics and Gynaecology, Faculty of Medicine, University of Belgrade, Belgrade, Serbia;*

These Clinical Practice Guidelines are endorsed by the Japanese Society of Medical Oncology (JSMO)

2013

Inform the patient about the risk of infertility



Fertility Preservation for Patients With Cancer: American Society of Clinical Oncology Clinical Practice Guideline Update

Alison W. Loren, Pamela B. Mangu, Lindsay Nohr Beck, Lawrence Brennan, Anthony J. Magdalinski, Ann H. Partridge, Gwendolyn Quinn, W. Hamish Wallace, and Kutluk Oktay

2013

Early referral

VOLUME 28 · NUMBER 31 · NOVEMBER 1 2010

JOURNAL OF CLINICAL ONCOLOGY

ORIGINAL REPORT

Value of Early Referral to Fertility Preservation in Young Women With Breast Cancer

Sanghoon Lee, Sinan Ozkavukcu, Elke Heytens, Fred Moy, and Kutluk Oktay

From the Institute for Fertility Preservation, New York Medical College/ Westchester Medical Center; Graduate School of Basic Medical Sciences, New York Medical College, Valhalla, NY.

Submitted June 9, 2010; accepted August 10, 2010; published online ahead of print at www.jco.org on September 27, 2010.

Supported by Grant No. HD 053112 (K.O.) from the National Institutes of Health.

Presented in part at the 46th Annual Meeting of the American Society of Clinical Oncology, June 4-8, 2010, Chicago, IL.

Authors' disclosures of potential conflicts of interest and author contributions are found at the end of this article.

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A B S T R A C T

Purpose
To determine whether early referral to reproductive specialists improves fertility preservation (FP) outcomes and reduces delay in adjuvant treatment in young women with breast cancer.

Patients and Methods
A secondary analysis of a prospective database of patients with breast cancer undergoing ovarian stimulation (OS) for FP by oocyte or embryo cryopreservation was performed.

Results
Of the 154 patients, 93 met the inclusion criteria (mean age, 35.2 ± 4.4 years). Thirty-five of the 93 patients were referred before breast surgery (PreS), and 58 patients were referred after surgery (PostS). The time periods from initial diagnosis (ID) to initiation of OS (42.6 ± 27.7 days for PreS *v* 71.9 ± 30.7 days for PostS; $P < .001$) and from ID to initiation of chemotherapy (83.9 ± 24.3 days for PreS *v* 107.8 ± 42.9 days for PostS; $P = .045$) were significantly shorter for the PreS group versus the PostS group. Nine (25.7%) of 35 patients in the PreS group versus one (1.7%) of 58 patients in the PostS group were able to undergo two FP cycles ($P < .001$), resulting in an increased yield of oocytes in the PreS group (18.2% [93 of 511 oocytes] *v* 0.6% [five of 800 oocytes], respectively; $P < .001$) and embryos (17.2% [40 of 233 embryos] *v* 0.6% [two of 357 embryos], respectively; $P < .001$). Patients who had an oocyte retrieval within 5 weeks of the surgery were able to complete a second cycle within 9 weeks of the surgery.

Conclusion
FP referral before breast surgery enables earlier initiation of cryopreservation cycles and chemotherapy and, when appropriate, multiple FP cycles. Women who can undergo multiple cycles may be at advantage for FP because of a larger number of oocytes or embryos cryopreserved. This is the first study demonstrating the benefit of early FP referral in patients with cancer.

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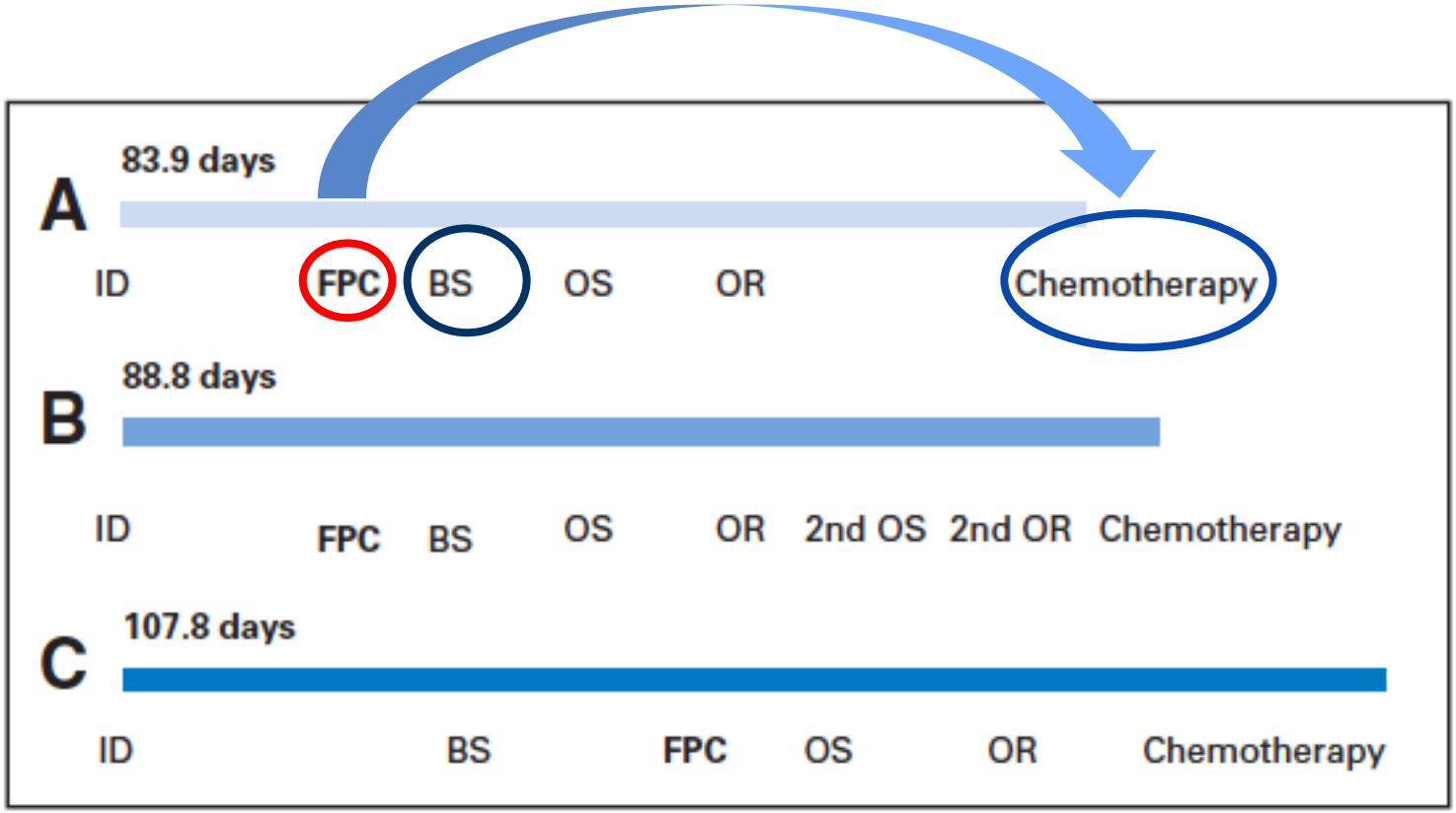
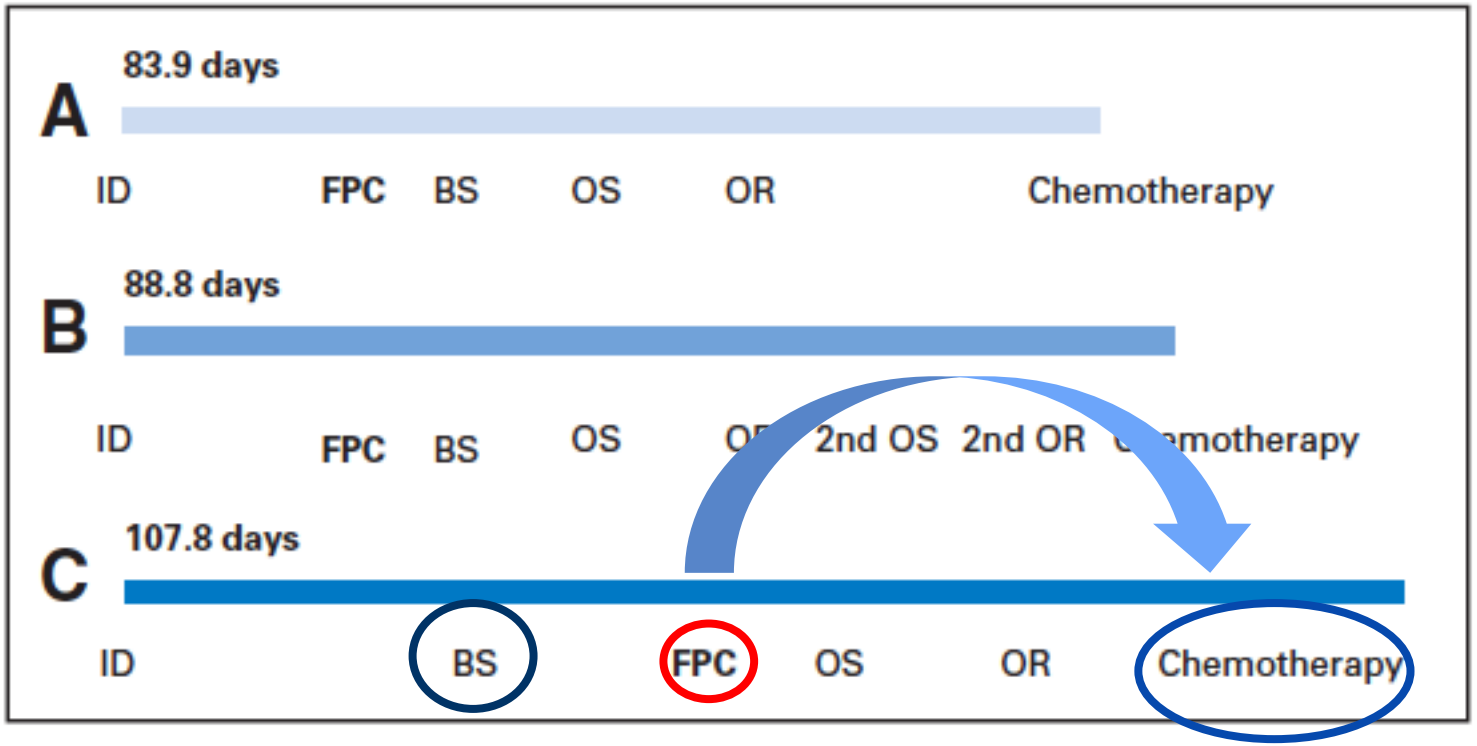
Early referral



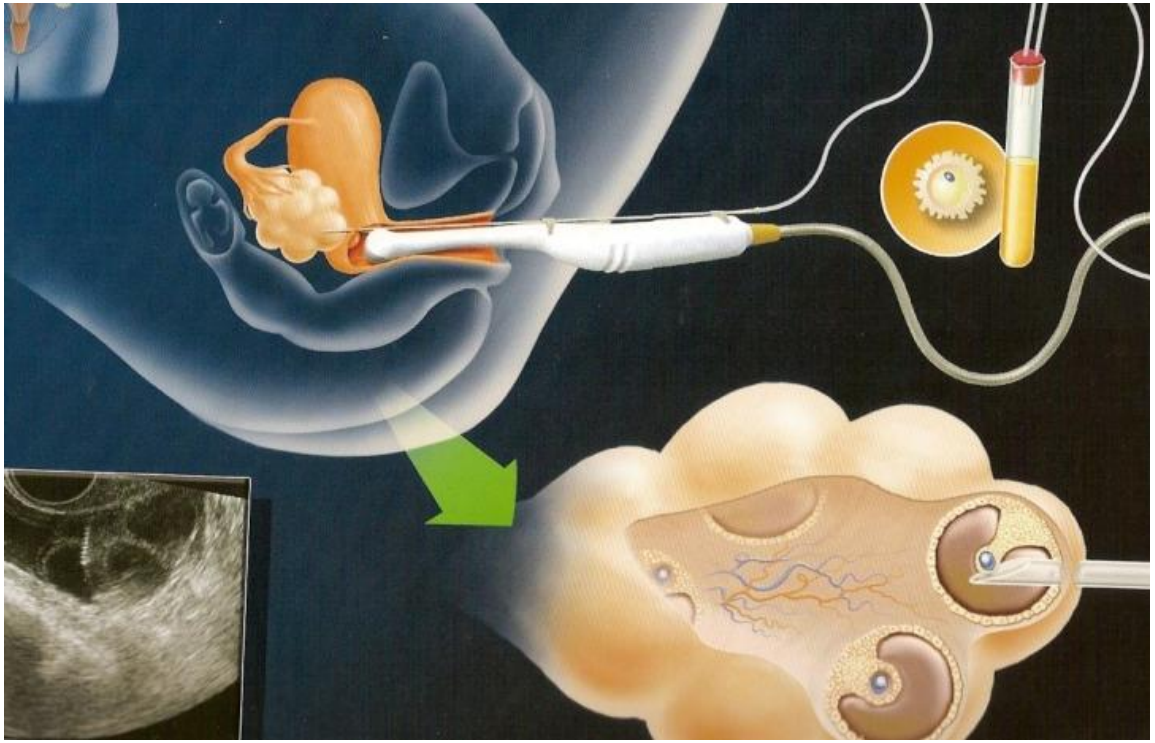
ID: initial diagnosis, FPC: fertility preservation counseling
BS: breast surgery, OS/OR: ovarian stimulation/oocyte retrieval

Early referral



ID: initial diagnosis, FPC: fertility preservation counseling
BS: breast surgery, OS/OR: ovarian stimulation/oocyte retrieval

Consider egg/embryo freezing before chemo



Gonadotrophin administration
Oocytes pick up

Oocytes freezing

IVF/ICSI and embryo freezing

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Oocyte cryopreservation

John K. Jain, M.D., and Richard J. Paulson, M.D.

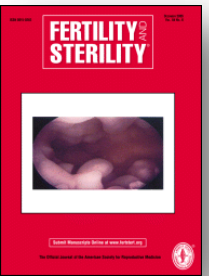
Department of Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility, University of Southern California Keck School of Medicine, Los Angeles, California

Success rates of selected recently reported series using slow-freeze and vitrification methods.

Author (y; reference no.)	Method	Survival rate, n (%)	Fertilization rate, n (%)	No. of oocytes per pregnancy
Fabbri (2001 [35])	Slow-freeze	796/1,502 (53)	632/796 (79)	94
Chen (2005 [36])	Slow-freeze	119/159 (75)	80/119 (67)	23
Boldt (2006 [46])	Slow-freeze (sodium depleted)	218/361 (60)	134/218 (61)	26
Yoon (2003 [56])	Vitrification	325/474[a] (68.6)	142/198 (71.7)	79
Kuwayama (2005 [58])	Vitrification	58/64 (91)	52/58 (90)	5

[a] Cryopreserved and thawed cumulus–oocyte complexes.

90% vitality and fertilization after thawing
8-12 frozen oocytes - 30% probability of a baby



Jain et al Fertil Steril 2009

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Oocyte/embryo freezing: pros and cons

Good reproductive outcome

Limited invasiveness

Delay in chemotherapy start (?)

Relatively high estrogen levels (3-7 days)

Breast cancer and fertility preservation: what can be done (in ER+ tumours) ?

However, concerns about the safety of markedly elevated estrogen levels associated with conventional ovarian stimulation using follicle-stimulating hormone (FSH) have limited enthusiasm for this strategy. Does a relatively brief exposure to high estrogen levels affect risk of recurrence in young women with newly diagnosed early breast cancer?

Fertility After Breast Cancer: Questions Abound

Ann H. Partridge and Eric P. Winer, *Dana-Farber Cancer Institute and Brigham and Women's Hospital and Harvard Medical School, Boston, MA*

Controlled ovarian stimulation: Letrozole

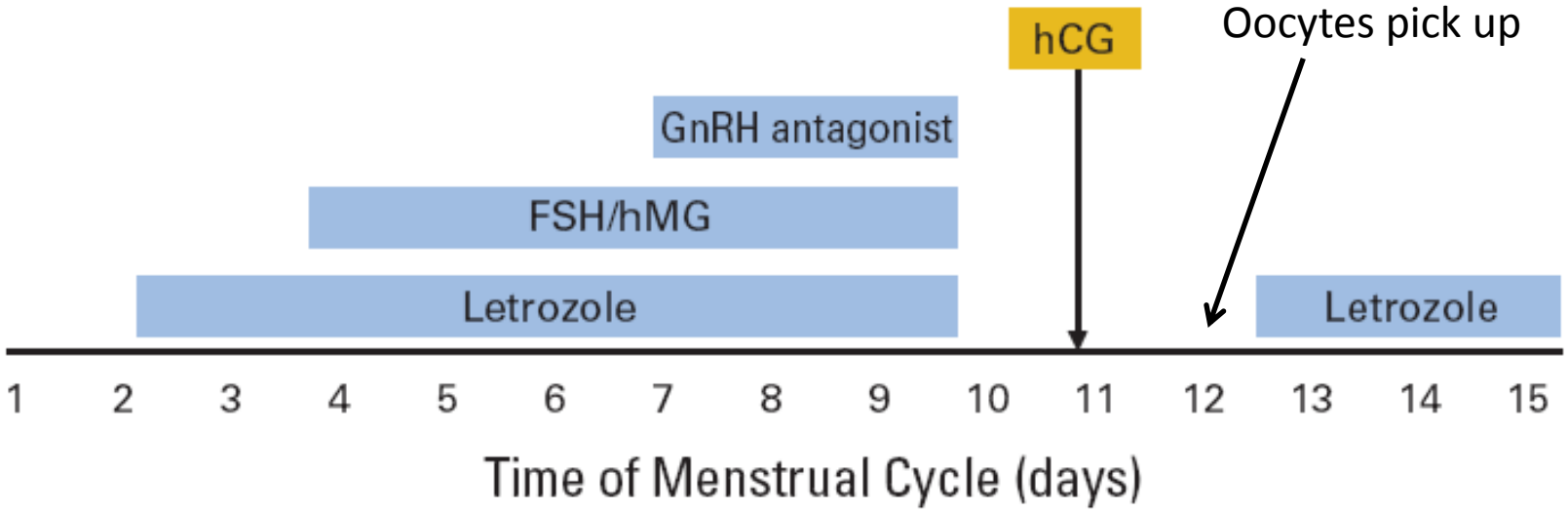


Fig 1. Protocol for ovarian stimulation with letrozole and gonadotropins in patients diagnosed with breast carcinoma. In this regimen, letrozole is initiated on the second day of menstrual cycle and gonadotropins are started 2 days later. A gonadotropin-releasing hormone (GnRH) antagonist is administered when estradiol levels reach ≥ 250 pg/mL or the lead follicle size reaches 14 mm. Human chorionic gonadotropin (hCG) is administered when the leading follicle reaches 19 to 20 mm in diameter. Letrozole treatment is restarted after oocyte retrieval until the estradiol levels are lower than 50 pg/mL. FSH, follicle-stimulating hormone;

Safety of Fertility Preservation by Ovarian Stimulation With Letrozole and Gonadotropins in Patients With Breast Cancer: A Prospective Controlled Study

Amr A. Azim, Maria Costantini-Ferrando, and Kutluk Oktay

Controlled ovarian stimulation: Letrozole

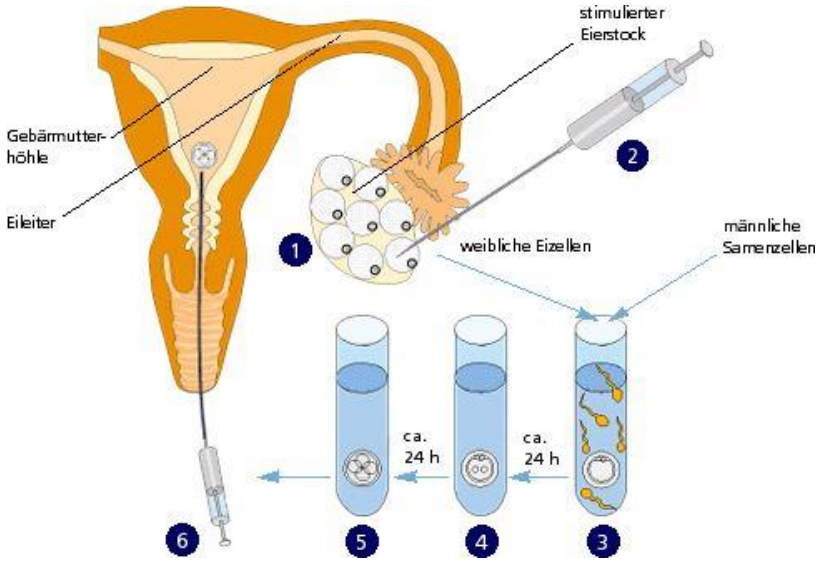
79 patients

Mean age: 36.1 ± 3.8

N-: 62%

ER+: 81%

HER-2+: 26%



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Controlled ovarian stimulation: Letrozole

Peak estradiol levels 58.4-1.166 pg/ml
(mean 405.94 ± 256.64 pg/ml)

Average number of oocytes retrieved 10.3 ± 7.75

Average number of frozen embryos 5.97± 4.97

Median time from surgery to systemic Rx 45 d

10 embryo implanted, 5 deliveries.

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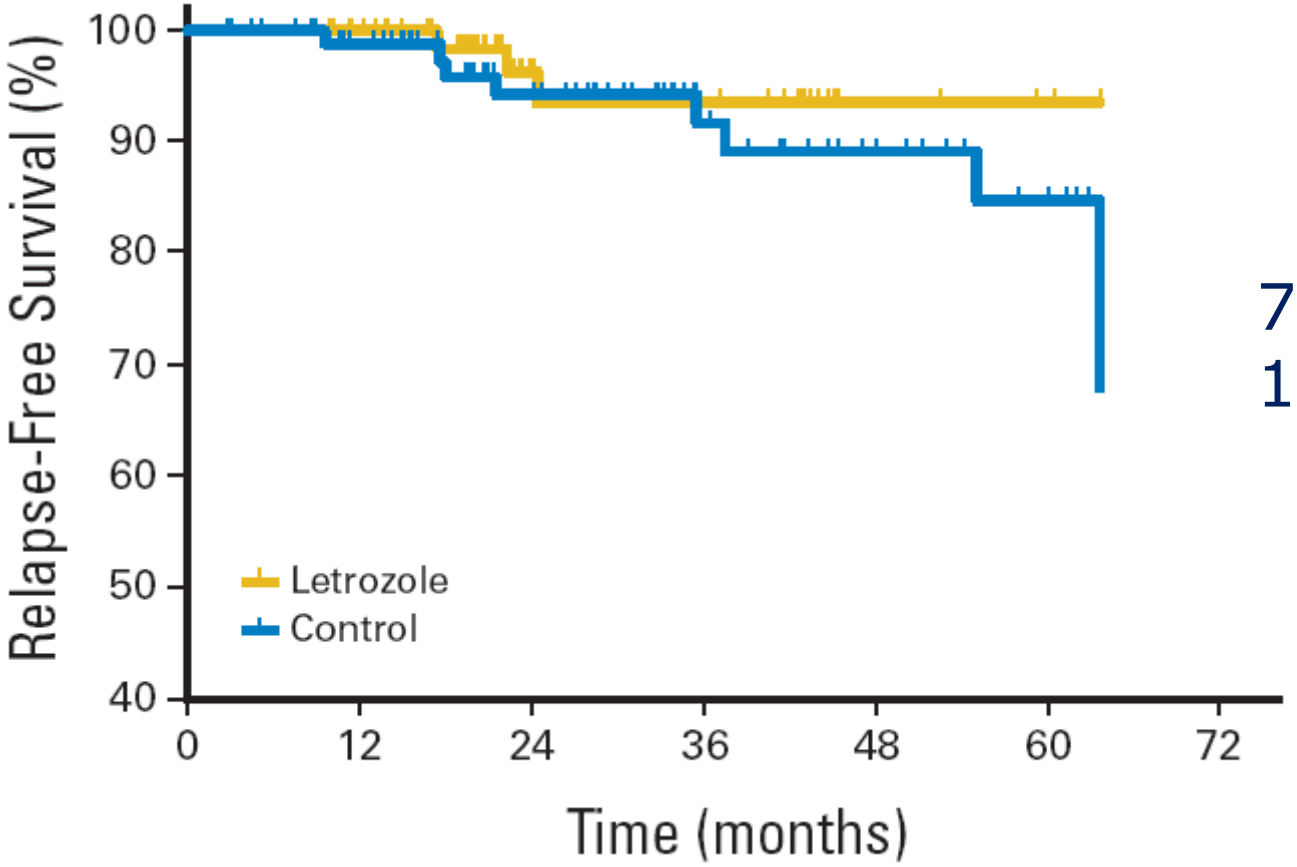

79 letrozole
136 controls

No. of patients at risk						
Letrozole	79	74	37	18	7	5
Control	136	81	56	38	26	19

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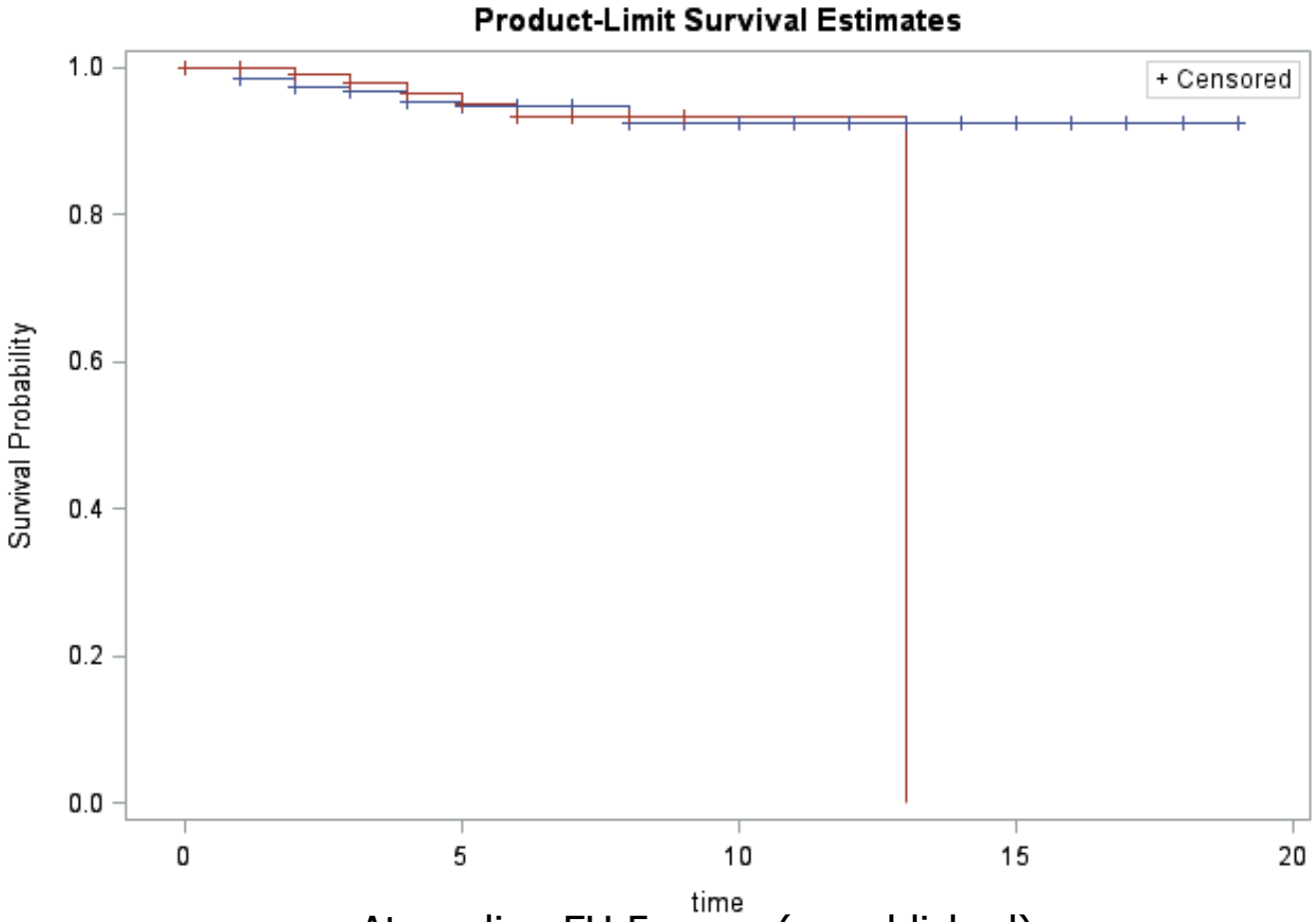

At median FU 5 years (unpublished)

Safety of Fertility Preservation by Ovarian Stimulation With Letrozole and Gonadotropins in Patients With Breast Cancer: A Prospective Controlled Study

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Controlled ovarian stimulation: Tamoxifen

Tamoxifen co-administration during controlled ovarian hyperstimulation for in vitro fertilization in breast cancer patients increases the safety of fertility-preservation treatment strategies

Dror Meirow, M.D.,[a] Hila Raanani, M.D.,[a] Ettie Maman, M.D.,[a] Shani Paluch-Shimon, M.B., B.S., M.Sc.,[b] Moran Shapira, B.Sc.,[a] Yoram Cohen, M.D.,[a] Irena Kuchuk, M.D.,[b] Ariel Hourvitz, M.D.,[a] Jacob Levron, M.D.,[a] Michal Mozer-Mendel, M.D.,[b] Masha Brengauz, Ph.D.,[a] Hana Biderman, B.Sc.,[a] Daphna Manela, R.N.B.A.,[a] Rephael Catane, M.D.,[b] Jehoshua Dor, M.D.,[a] Raoul Orvieto, M.D.,[a] and Bella Kaufman, M.D.[b]

Fertil Steril. 2014 Aug;102(2):488-495.

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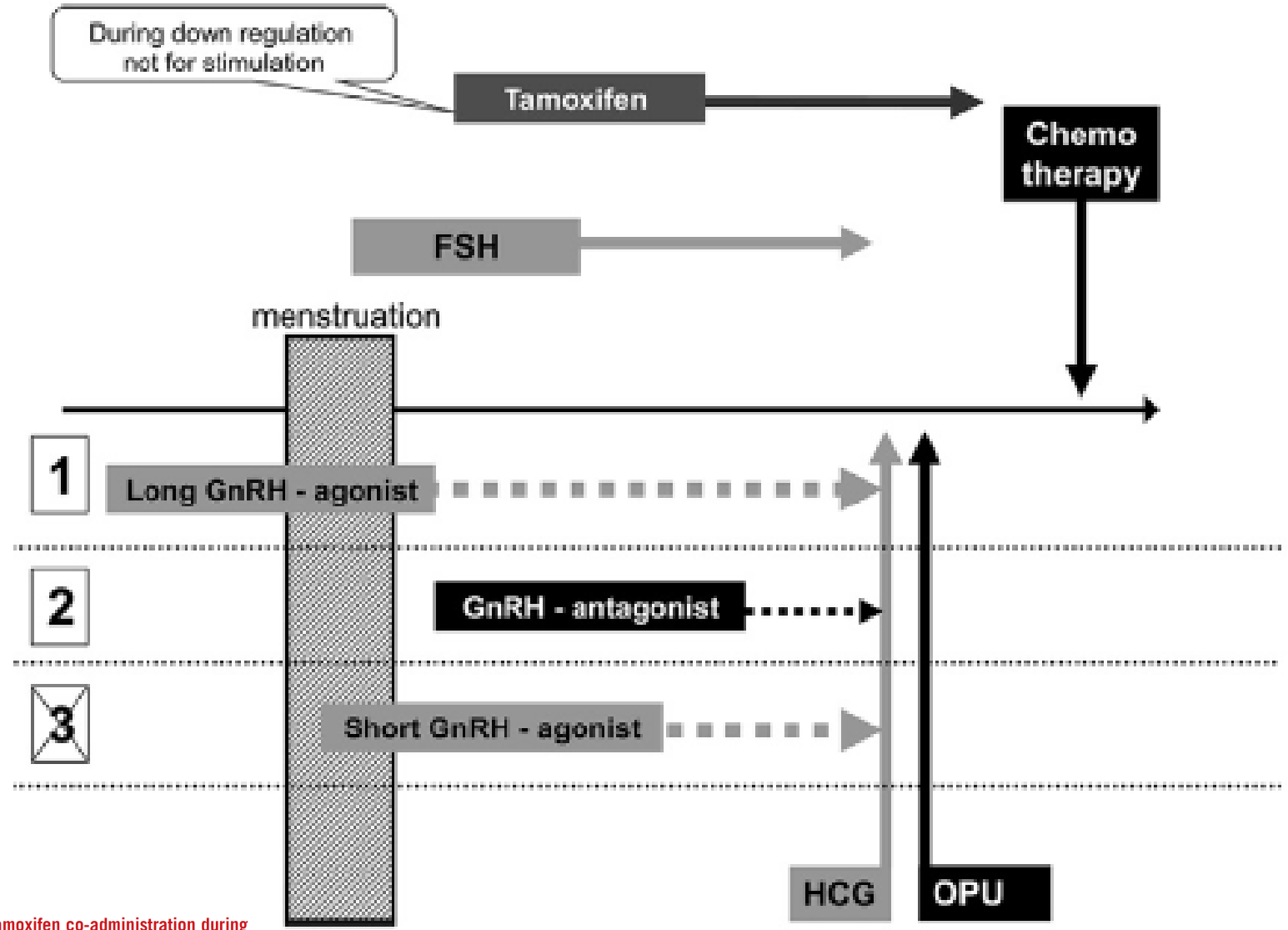
Controlled ovarian stimulation: Tamoxifen



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Controlled ovarian stimulation: Tamoxifen

- 70 patients, 76 cycles
- 48 cycles with TAM, 28 cycles without TAM
- Median age 33.6 y (range: 24-43), 58%=ER+
- No difference in outcome for the 4 groups, with 4.3% late mortality
- Fertility preservation with controlled ovarian stimulation and TAM is safe (and effective !)

Tamoxifen co-administration during controlled ovarian hyperstimulation for in vitro fertilization in breast cancer patients increases the safety of fertility-preservation treatment strategies

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If you're a believer, offer LHRHa during chemo

Contents lists available at ScienceDirect

Cancer Treatment Reviews

journal homepage: www.elsevierhealth.com/journals/ctrv

Gonadotropin-releasing hormone analogues for the prevention of chemotherapy-induced premature ovarian failure in cancer women: Systematic review and meta-analysis of randomized trials

Lucia Del Mastro [a,*], Marcello Ceppi [b,1], Francesca Poggio [c,2], Claudia Bighin [c,3], Fedro Peccatori [d,4], Isabelle Demeestere [e,5], Alessia Levaggi [a,2], Sara Giraudi [a,6], Matteo Lambertini [c,2], Alessia D'Alonzo [a,2], Giuseppe Canavese [f,7], Paolo Pronzato [c,8], Paolo Bruzzi [b,9]

[a] UO Development of Innovative Therapies, Medical Oncology Department, IRCCS AOU San Martino-IST, National Institute for Cancer Research, Genova, Italy
[b] UO Clinical Epidemiology, IRCCS AOU San Martino-IST, National Institute for Cancer Research, Genova, Italy
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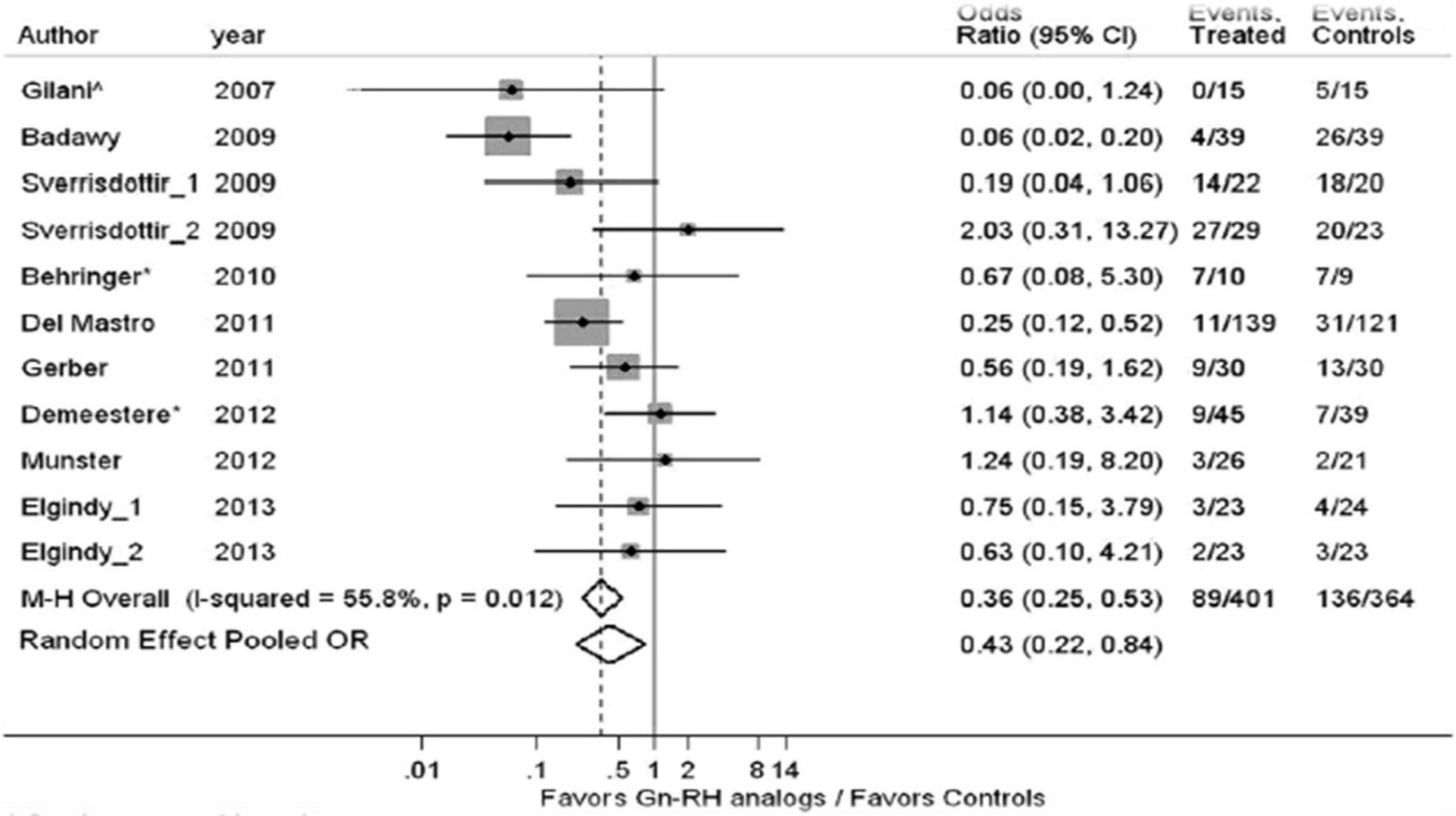
[d] Fertility and Reproduction Unit, Department of Medicine, European Institute of Oncology, Milano, Italy
[e] Research Laboratory on Human Reproduction, Université Libre de Bruxelles, Brussels, Belgium
[f] Breast Surgery Unit, IRCCS AOU San Martino-IST, National Institute for Cancer Research, Genova, Italy



Gonadotropin-releasing hormone analogues for the prevention of chemotherapy-induced premature ovarian failure in cancer women: Systematic review and meta-analysis of randomized trials

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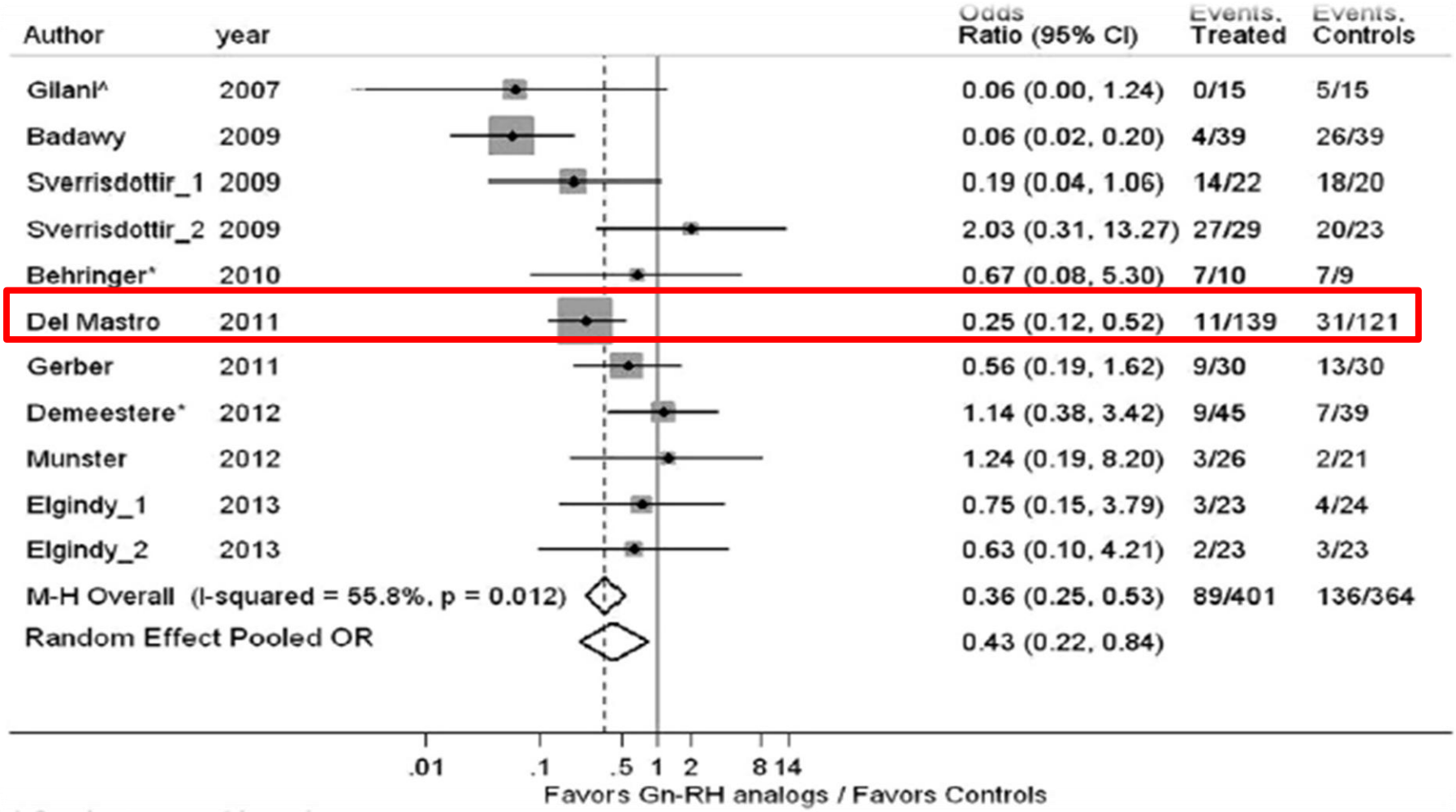

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If you're a believer, offer LHRHa during chemo

Effect of the Gonadotropin-Releasing Hormone Analogue Triptorelin on the Occurrence of Chemotherapy-Induced Early Menopause in Premenopausal Women With Breast Cancer

A Randomized Trial

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Emanuela Magnolfi, MD
Tiziana Scotto, MD
Carlo Vecchio, MD
Marco Venturini, MD

Context Premenopausal patients with breast cancer are at high risk of premature ovarian failure induced by systemic treatments, but no standard strategies for preventing this adverse effect are yet available.

Objective To determine the effect of the temporary ovarian suppression obtained by administering the gonadotropin-releasing hormone analogue triptorelin during chemotherapy on the incidence of early menopause in young patients with breast cancer undergoing adjuvant or neoadjuvant chemotherapy.

Design, Setting, and Patient The PROMISE-GIM6 (Prevention of Menopause Induced by Chemotherapy: A Study in Early Breast Cancer Patients–Gruppo Italiano Mammella 6) study, a parallel, randomized, open-label, phase 3 superiority trial, was conducted at 16 sites in Italy and enrolled 281 patients between October 2003 and January 2008. The patients were premenopausal women with stage I through III breast cancer who were candidates for adjuvant or neoadjuvant chemotherapy. Assuming a 60% rate of early menopause in the group treated with chemotherapy alone, it was estimated that 280 patients had to be enrolled to detect a 20% absolute reduction in early menopause in the group treated with chemotherapy plus triptorelin. The intention-to-treat analysis was performed by including all randomized patients and using imputed values for missing data.

Interventions Before beginning chemotherapy, patients were randomly allocated to receive chemotherapy alone or combined with triptorelin. Triptorelin was administered intramuscularly at a dose of 3.75 mg at least 1 week before the start of chemotherapy and then every 4 weeks for the duration of chemotherapy.

Main Outcome Measure Incidence of early menopause (defined as no resump-

Del Mastro L, Boni L, Michelotti A et al JAMA 2011

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Ovarian function outcome

281 pts

	CT alone N=133	CT + Triptorelin N=148	Absolute difference (95% CI)	P value
No resumption of menses and post-menopausal or unknown levels of FSH and E2, 1 year after the end of CT (primary end-point)	25.9%	8.9%	-17% (from -26 to -7.9)	<.001

Courtesy of L Del Mastro

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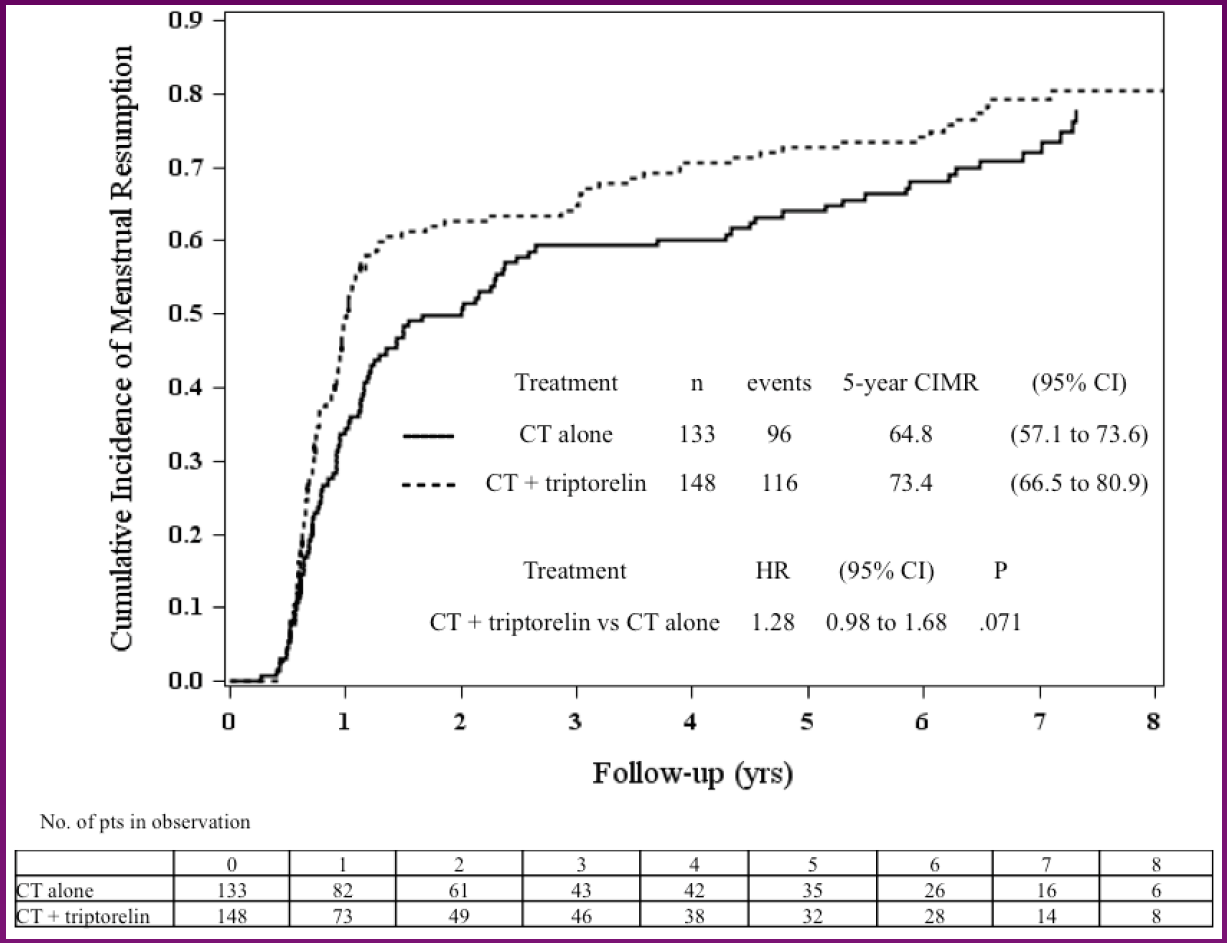
Current Analysis: Long-term Ovarian Function



No. of pts in observation

	0	1	2	3	4	5	6	7	8
CT alone	133	82	61	43	42	35	26	16	6
CT + triptorelin	148	73	49	46	38	32	28	14	8

The use of LHRH analog increased the probability for menstrual resumption at longer follow-up, although non-statistically significantly

(HR=1.28; 95% CI 0.98-1.68, p=.071)

Current Analysis: Pregnancies

Median follow up: 7.3 years (6.3 - 8.2 years)

	Chemotherapy alone arm (n=133)	Chemotherapy + triptorelin arm (n=148)
No. pregnancies	3	8
Incidence rate per 100 person-years (range)	0.4 (0.1 – 1.1)	0.9 (0.4 – 1.8)
No. abortions (type)	-	1 (induced abortion) 2 (miscarriages)
No. live births	3	5

The use of LHRH analog increased the probability for becoming pregnant, although non-statistically significantly

(HR=2.56; 95% CI, 0.68 to 9.60, p=.142)

If you're a believer, offer LHRHa during chemo

ORIGINAL ARTICLE

Goserelin for Ovarian Protection during Breast-Cancer Adjuvant Chemotherapy

Halle C.F. Moore, M.D., Joseph M. Unger, Ph.D., Kelly-Anne Phillips, M.D., Frances Boyle, M.B., B.S., Ph.D., Erika Hitre, M.D., David Porter, M.D., Prudence A. Francis, M.D., Lori J. Goldstein, M.D., Henry L. Gomez, M.D., Carlos S. Vallejos, M.D., Ann H. Partridge, M.D., M.P.H., Shaker R. Dakhil, M.D., Agustin A. Garcia, M.D., Julie Gralow, M.D., Janine M. Lombard, M.D., John F. Forbes, M.B., B.S., Silvana Martino, D.O., William E. Barlow, Ph.D., Carol J. Fabian, M.D., Lori Minasian, M.D., Frank L. Meyskens, Jr., M.D., Richard D. Gelber, Ph.D., Gabriel N. Hortobagyi, M.D., and Kathy S. Albain, M.D., for the POEMS/S0230 Investigators

ABSTRACT

BACKGROUND

Ovarian failure is a common toxic effect of chemotherapy. Studies of the use of gonadotropin-releasing hormone (GnRH) agonists to protect ovarian function have shown mixed results and lack data on pregnancy outcomes.

METHODS

We randomly assigned 257 premenopausal women with operable hormone-receptor–negative breast cancer to receive standard chemotherapy with the GnRH agonist goserelin (goserelin group) or standard chemotherapy without goserelin (chemotherapy-alone group). The primary study end point was the rate of ovarian failure at 2 years, with ovarian failure defined as the absence of menses in the preceding 6 months and levels of follicle-stimulating hormone (FSH) in the postmenopausal

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Moore H, Unger J, Phillips KA et al NEJM 2015

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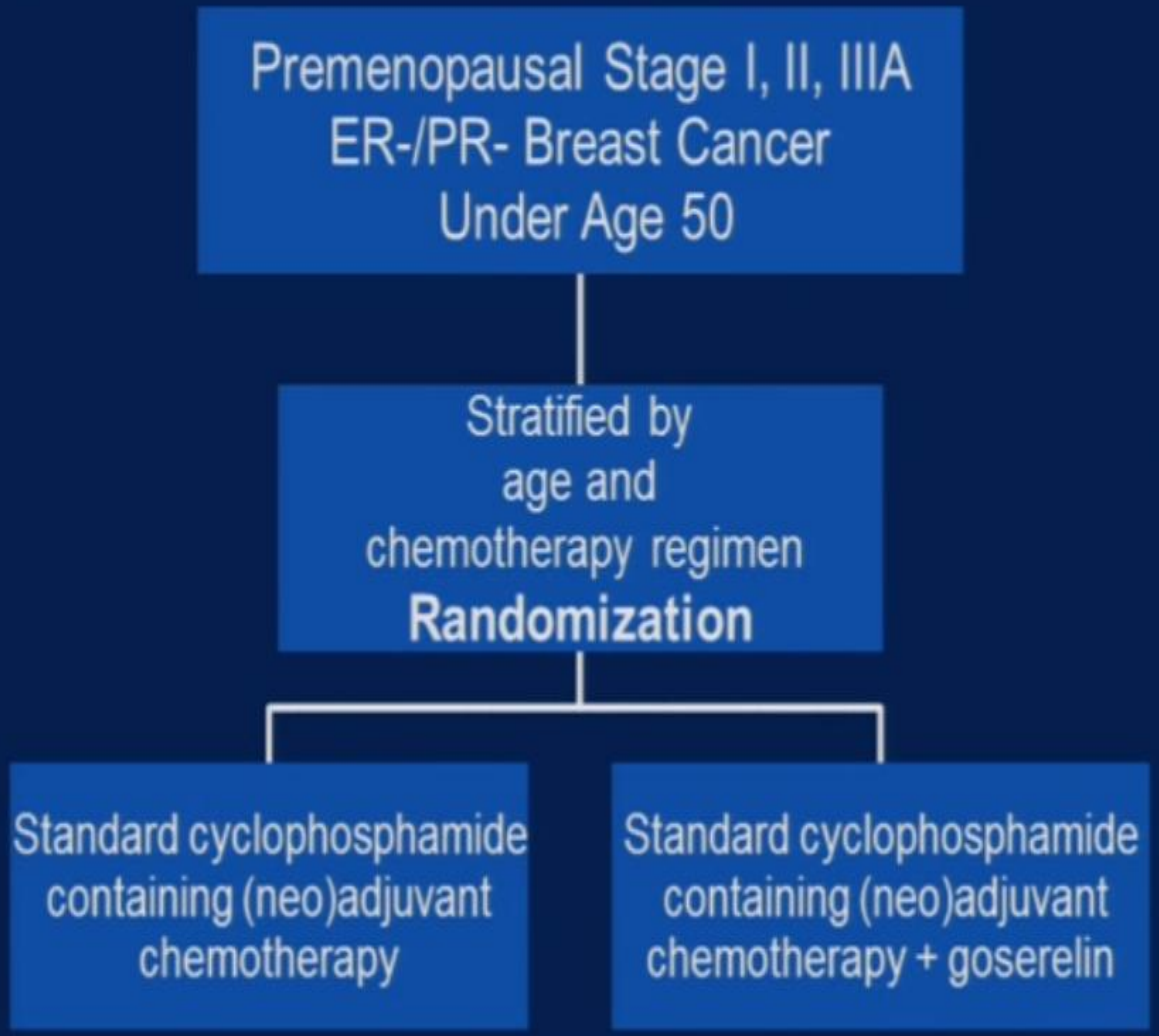
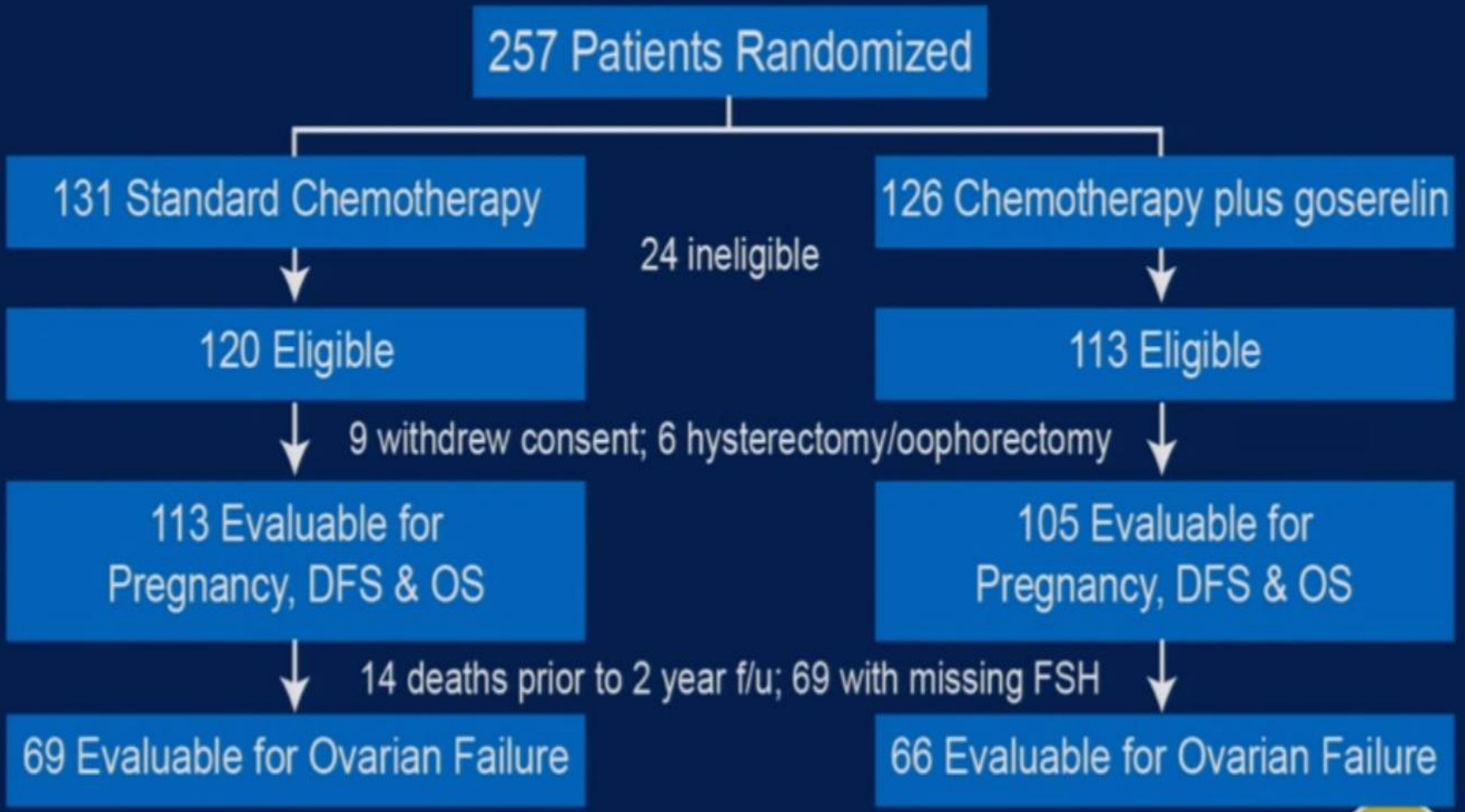
POEMS/S0230 Schema



POEMS Consort Diagram



POEMS Ovarian Failure

	Standard Chemotherapy	Chemotherapy + Goserelin
Ovarian failure at 2 years	15/69 = 22%	5/66 = 8%

Logistic Regression Results:

Analysis	Odds Ratio	95% CI	p-value	
			One-sided	Two-sided
Univariate	0.30	0.10 – 0.87	p=.01	p=.03
Stratified*	**0.30**	**0.09 – 0.97**	**p=.02**	**p=.04**
Multivariate*	0.36	0.11 – 1.14	p=.04	p=.08

*Accounting for age and regimen through stratification ("Stratified") or covariate ("Multivariate") adjustment, respectively

POEMS Pregnancy

	Standard Chemotherapy n=113	Chemotherapy + Goserelin n=105	Adjusted OR	Adjusted P-value
Attempted pregnancy	18 (16%)	25 (24%)		p=.12
Achieved pregnancy	12 (11%) 66%	22 (21%) 88%	2.45	p=.03
Patients with ≥ 1 delivery	8 (7%)	16 (15%)	2.51	p=.05
Delivery or ongoing pregnancy	10 (9%) 55%	19 (18%) 76%	2.45	p=.04

Total number of babies	12	18
Ongoing pregnancies	3	5
Total adverse events		
Miscarriages	5	4
Elective termination	3	2
Delivery complication	2	2

If you're a believer… Offer LHRHa during chemo

- Consistent 15% amenorrhea reduction after LHRHa+CT vs CT
- Possible increased pregnancy rates
- Both in ER+ and ER- breast cancer patients

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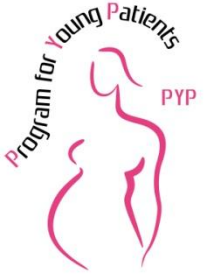
Discuss temporary interruption of ET



A single-arm, phase II trial evaluating the pregnancy outcomes and safety of interrupting endocrine therapy for young women with endocrine responsive breast cancer who desire pregnancy.

Pregnancy **O**utcome and **S**afety of **I**nterrupting **T**herapy for women with endocrine respons**IVE** breast cancer (**POSITIVE**).

Study chair: Olivia Pagani (IBCSG/IOSI)

BIG Breast International Group

NABCG The North American Breast Cancer Group

IBCSG

TRIAL SCHEMA

- ✓ ER+ early breast cancer
- ✓ <43 years at enrolment
- ✓ Completing 18-30 months of ET
- ✓ (SERMs alone, LH-RH analogue + SERM or AIs)

Pregnancy desire

1. Treatment interruption
2. 3 months' wash out
3. 2 years' break to allow: conception, delivery ± breast feeding or pregnancy failure

→ Resume ET to 5-10 years according to individual risk, institutional policy and patient's preference

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ENDPOINTS

Primary:

- Breast cancer free interval (BCFI) defined as the time from enrollment in the phase II trial to BC relapse. BC relapse will be the primary measure of safety being evaluated

Secondary:

- Pregnancy outcome (i.e. full term pregnancy, abortion, miscarriage, ectopic, stillbirth rates, caesarean section)
- Offspring outcome (i.e. preterm birth, low birth weight, births defects rates)

CORRELATIVE RESEARCH

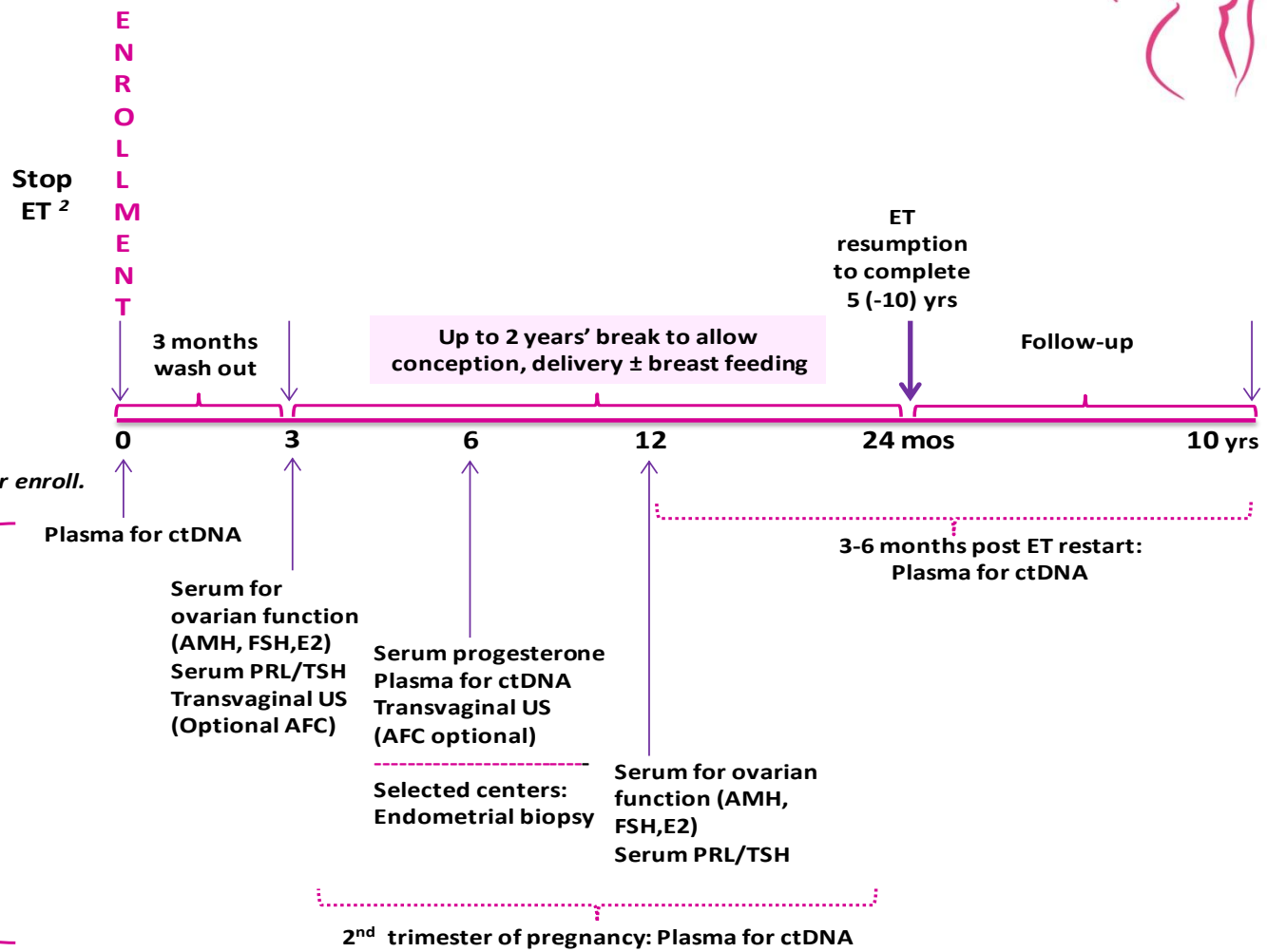
Screening/eligibility:

Patients with ER+ early breast cancer

≤42 years at enrollment

Completing 18-30 months of ET (SERMs alone, GnRH analogue + SERM or AIs) [1]

Pregnancy desire



[1] ± CT

[2] No more than 1 month prior enroll.

IBCSG

Conclusions

- ✓ Chemotherapy may impair ovarian function. Age, drug type and dosage are the critical factors
- ✓ Early oncofertility counseling and prompt referral to the reproductive endocrinologist are essential for effective fertility preservation
- ✓ Egg or embryo freezing before chemotherapy +LHRHa administration can be used to improve results
- ✓ Dedicated research protocols for young women with cancer are warranted

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Learning to care

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Grazie !

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Carcinoma mammario: quando la donna è giovane
Negrar, 24 Giugno 2015

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