MADRID 2014 ESMO congress

How to manage a pregnant woman with cancer?

Including discussion of 266PD, 267PD and LBA49

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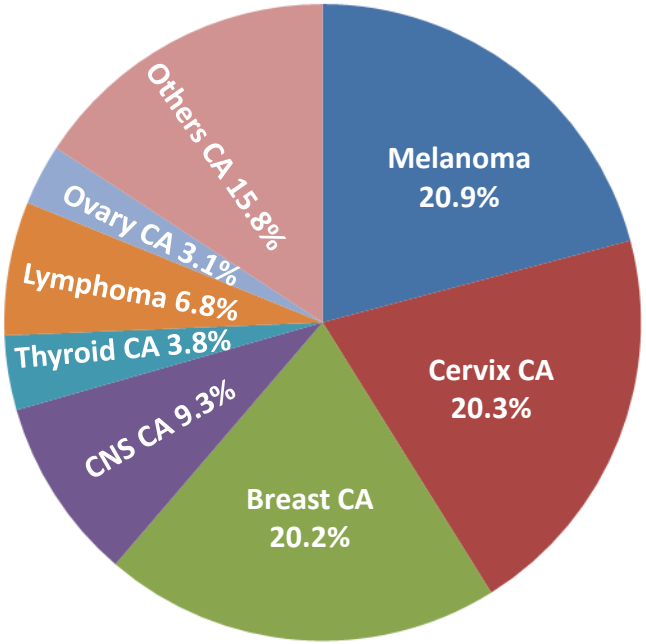
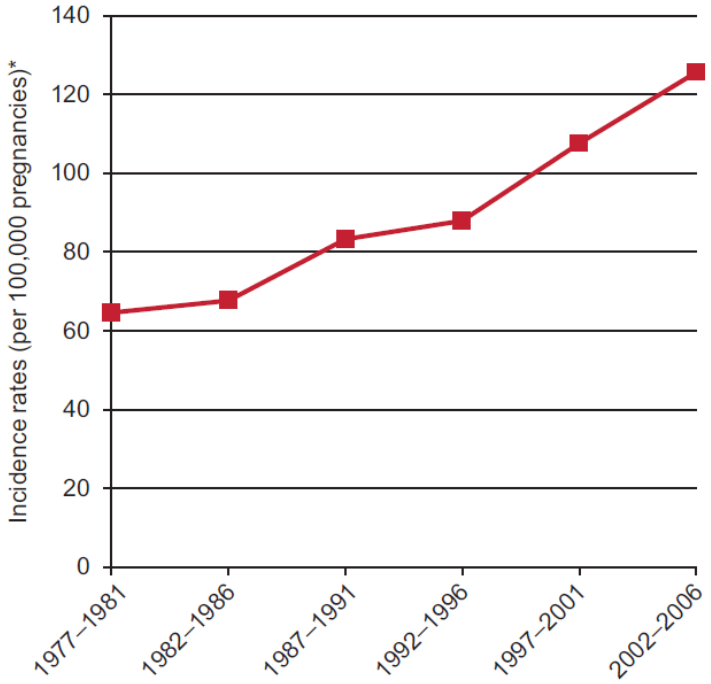
Disclosures

- **Advisory board:** Celgene, Nanostring
- **Honoraria:** GSK, Novartis, Celgene, Nanostring
- **Research support:** Amgen

Epidemiology

Data from the Danish Cancer Registry





Eibye S et al; Obstet Gynecol 2013

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Fighting for Two

WHEN PREGNANCY AND CANCER COLLIDE

Case Description

- Mrs. “C” is a 37-year-old pregnant lady, noticed a right breast lump during the 11th week of gestation. A breast U/S showed a speculated lesion UOQ 2cm in diameter with few surrounding microcaclification. Biopsy was performed

- Pathology revealed:
  - Invasive duct carcinoma, grade III
  - ER 90%, PgR 10%, HER2 3+ by IHC, FISH amplified, Ki67 40%

Case Description

- Other relevant history:
  - Married 3 years ago, no children
  - Positive family history of breast cancer, BRCA testing pending
  - Perfect general health, no associated medical conditions

Open Questions

1. Staging procedures during pregnancy – what to do and what not to do ?
2. Loco-regional management (surgery, role of SLN and RTH)
3. Safety of systemic therapy (chemo, HTH, targeted therapy) during pregnancy
4. What is the role of induced abortion? or Premature delivery?
5. Long-term outcome after in-utero exposure to chemo

Question 1: Staging, what to do and what not to do ?

	What to do ??	Not to do
Breast	- Ultrasound ✓ ✓ ✓ - MRI*	(Mammogram)
Chest	X-ray (pelvic shielding)	CT scan
Abdomen	Ultrasound	CT scan
Bone	MRI* (to areas of suspicion)	Bone scan
Brain	MRI*	
Whole body		PET scan

* Without gadolinium

Question 2: Role of surgery, RTH in pregnant cancer patients

- **Breast cancer**
  - Decision on type of surgery (BCS vs. Mastectomy) should follow standard practice – anytime during pregnancy
  - In patients diagnosed in 1st trimester, mastectomy could be preferred to avoid significant delay in RTH with BCS

Question 2: Role of surgery, RTH in pregnant cancer patients

- **RTH during pregnancy**

- Increase risk of fetal malformation, mental retardation with radiation exposure > 100 – 200 mGy

- This dose classically not reached if RTH to sites away from uterus (e.g. brain, head/neck) with adequate shielding

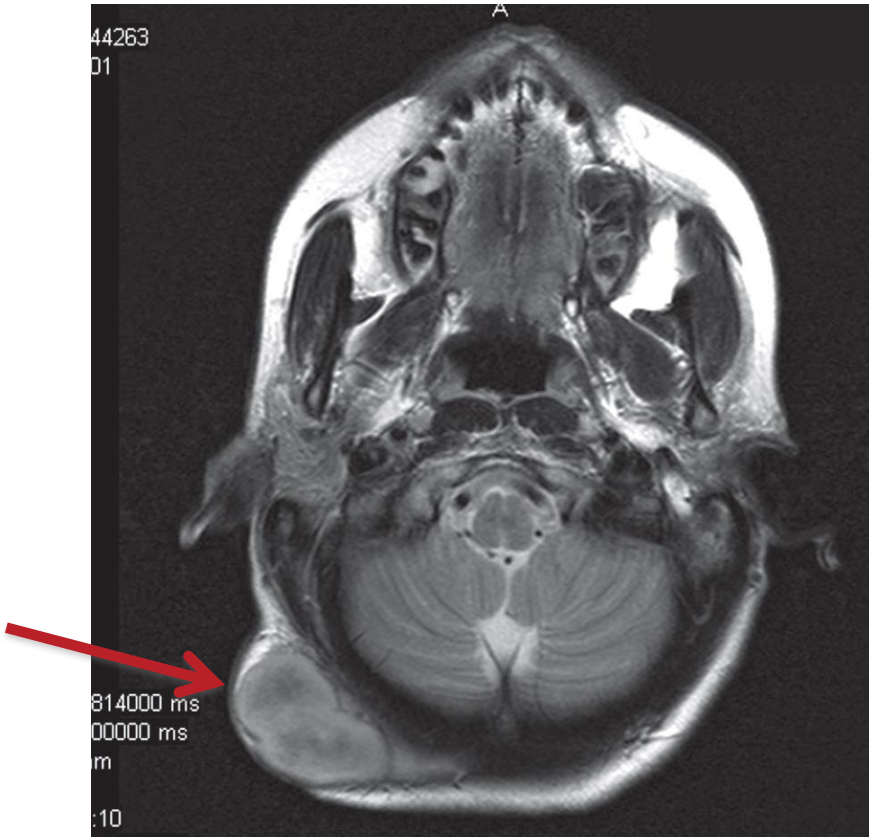
- Yet, uncertainty regarding risk of cancer / sterility exists even with low doses

Classically contraindicated

Peccatori F et al; Ann Oncol 2013

Question 3: Role of surgery, RTH in pregnant cancer patients

- **RTH during pregnancy**



30y, first pregnancy, week 19 of pregnancy
Stage IA anaplastic large cell lymphoma (ALK +)

- A 6MeV electron beam (36 Gy/18ttt/25d)
- Four dosimeters were placed on the abdomen (estimated fetal dose 0.004 Gy).
- **Delivery**: CS at W35, she underwent a CS, boy
- **Fetal weight**: 2,650 g
- **Apgar score** at 10min: 10/10,
- **FU 2 years:** normal fetal development

Peccatori F et al; JCO 2009

Poster discussion: # LBA49

Long-term neuropsychological and cardiac follow-up of children who were antenatal exposed to radiotherapy

Frédéric Amant, Tineke Vandenbroucke, Magali Verheecke, Mina M. Gziri, Sileny N. Han, Frank Van den Heuvel, Lieven Lagae, Michèl A. Willemsen, Livia Kapusta, Petronella B. Ottevanger, Luc Mertens, Laurence Claes, & Kristel Van Calsteren

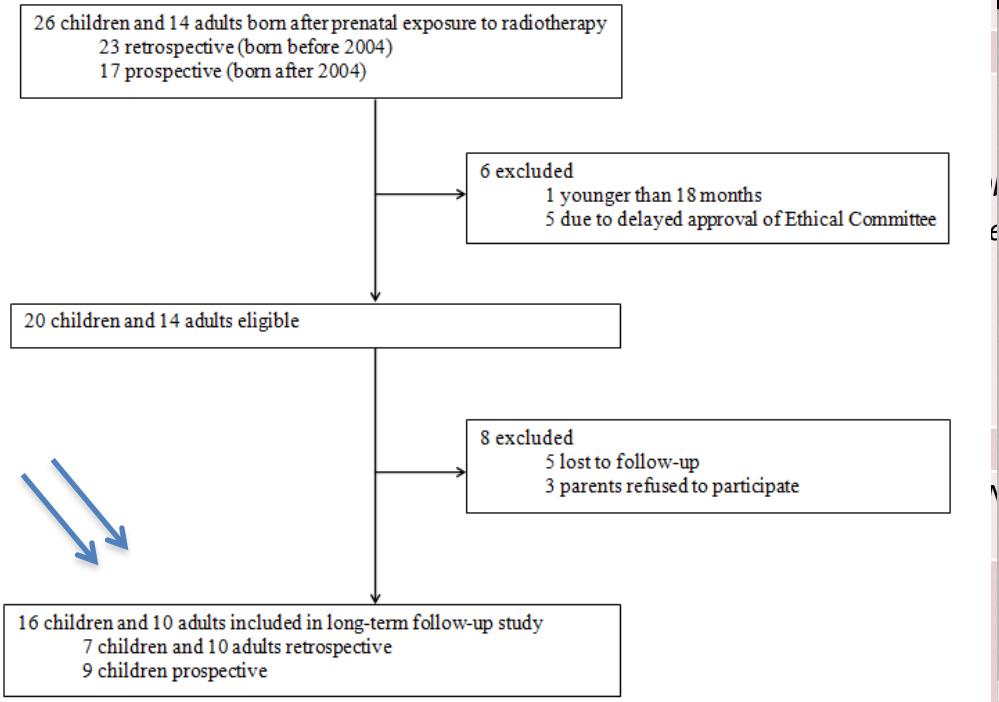
26-30 September 2014, Madrid, Spain

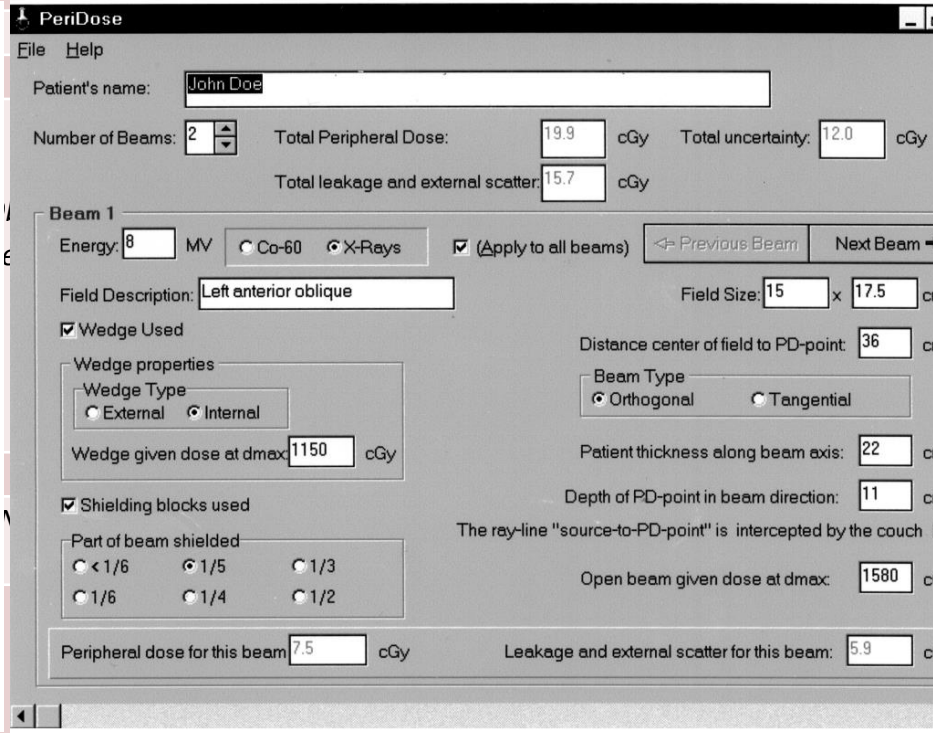
esmo.org

Patients enrolled from International registry

(www.cancerinpregnancy.org)

Test	18-36 months	6 years	9 years	Adult
General health	Questionnaire parents Clinical neurological exam by pediatrician	Questionnaire parents Clinical neurological exam by pediatrician	Questionnaire parents Clinical neurological exam by pediatrician	Questionnaire
		Faces	*Faces*	
Behavior		CBCL	CBCL	ASR
Heart Function	Only at 36 months: ECG Echo	ECG Echo	ECG Echo	ECG Echo





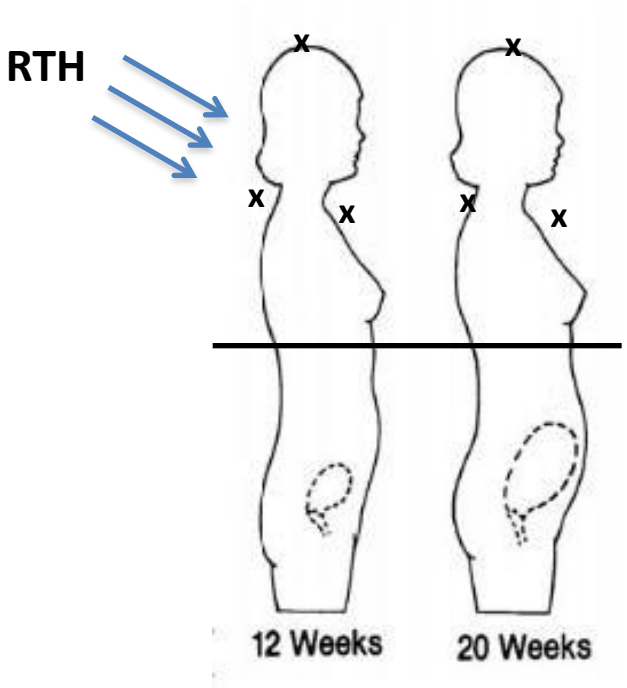
Poster discussion: # LBA49 Results

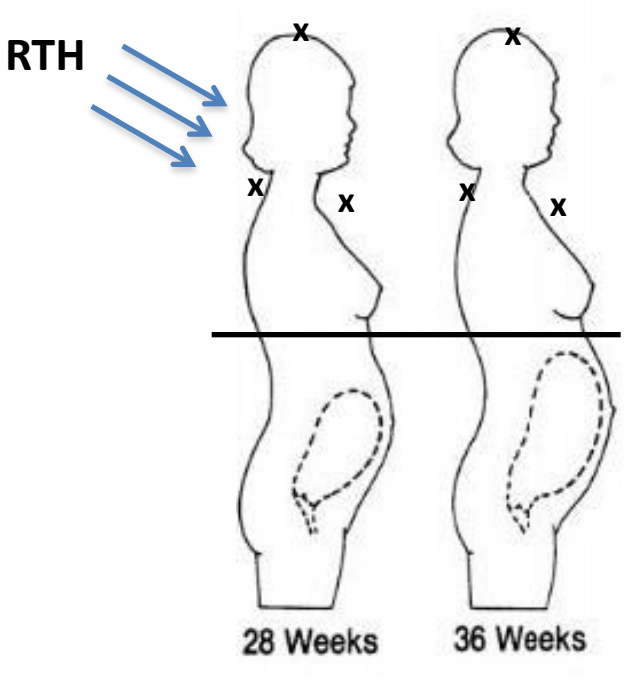
- 16 children (median age: 6.0 years, range 1.5-9.6) and 10 adults (median age: 33, range 22-49)
- Median maternal irradiation: 48 Gy (range 12-70)
- Median estimated fetal irradiation: 91 mGy (range 0-1690)
- Sites of RTH
  - Brain / H&N = 11
  - Breast / chest wall = 9
  - Mantle field / mediastinum = 4

	Study children (9) Med (range)	Controls(18) Med (range)	P-value	Study adults (7) Med (range)	Controls(7) Med (range)	P-value
Age	3.3 (1.5 - 9)	2.9 (1.4 - 9)	0.94	33 (25 - 49)	33 (25 to 47)	0.88
BSA	0.62 (0.45 - 1.03)	0.63 (0.42 - 1.15)	0.70	72 (54 - 89)	69 (46 to 76)	0.51
Heart rate	116 (72 - 142)	100 (68 - 132)	0.21	129 (117 - 137)	128 (115 to 140)	0.79
Systolic blood pressure	106 (76 - 132)	95 (75 - 115)	0.09	83 (71 to 88)	79 (62 to 90)	0.09
Diastolic blood pressure	60 (50 - 76)	55 (40 - 85)	0.45	-0.70 (-2.00 - 0.40)	-0.60 (-2.70 - 1.00)	0.94
Shortening Fraction (%)	37 (26 - 43)	38 (32 - 47)	0.19	61 (58 to 67)	62 (58 to 66)	0.93
Ejection Fraction (%)	68 (54 - 75)	70 (62 - 80)	0.08	62.02 (42.97 - 73.40)	79.50 (52.33 - 112.87)	0.11
Mean LV longitudinal strain (%)	19 (11 - 21)	21 (17 - 23)	0.04	17 (12 to 23)	20 (17 to 22)	0.13

A **negative** correlation was found between **verbal intelligence** and mean **gestational age at RTH**

Verbal intelligence was especially **low** for 2 children after **3rd trimester** exposure.





++++ risk

Poster discussion: # LBA49

First attempt to evaluate patients exposed to RTH in-utero

Robust protocol. Results show apparent safety of “early” RTH with no detrimental long term cardiac or developmental sequelae

Limitations

- Small numbers
- Selection bias ?? Probably limited

Implications on practice

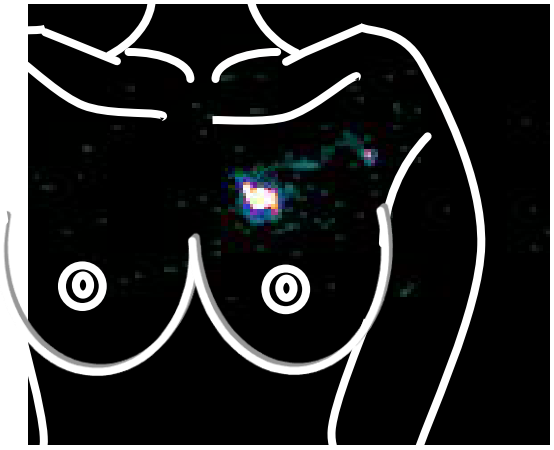
Significant improvement over anecdotal data regarding possibility of RTH in very selected cases

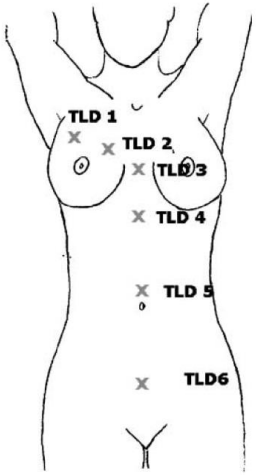
Nevertheless, RTH use during pregnancy should remain limited

Question 2: Role of surgery, RTH in pregnant cancer patients

- **Sentinel lymph node during pregnancy**

Dosimetery study in non-pregnant patients (N=26)





12 MBq ⇒ fetal exposure < 0.1 mGy

Pilot study in pregnant patients (N=12)

Median age (range)	38 (33 – 42)
Clinical stage	T1N0 (7); T2N0 (5)
Gestational age	17w (5-33w)
SLN outcome	10 –ve; 2 +ve
At 32 months of FU •Patient •Babies	 No axillary recurrence Normal development

Gentilini O et al; Ann Oncol 2004; Gentilini O et al; Eur J Nucl Med Mol Imag 2010

266 Poster Discussion (Han S et al)

SENTINEL LYMPH NODE BIOPSY FOR BREAST CANCER TREATMENT DURING PREGNANCY - ON BEHALF OF THE INTERNATIONAL NETWORK OF CANCER, INFERTILITY AND PREGNANCY (INCIP) AND THE GERMAN BREAST GROUP (GBG)

Poster discussion: # 266PD

Pooled analysis of 2 "prospective" databases (INCIP + GBG)

Objective: Maternal efficacy and outcome of SLNB in BC during pregnancy

Number	97
Age	35 (28 – 45)
Technique -99m TC albumin nanocolloid only -Blue dye only -Combined -Unknown	 71 (73.2%) 1 (1%) 9 (9.3%) 16 (16.5%)
Successful mapping	96 (99%)
Mean number of SLN	2.2 (0 – 7)
Positive SLN	22 (23%) – including 6 micromets, 2 isolated cells
Loco regional events at median FU: 35m	8 (2 in axilla including one who refused adjuvant ttt)

Poster discussion: # 266PD

Largest analysis to date on SLNB in breast cancer during pregnancy

Results confirm reliability of SLNB during pregnancy evident by comparable rates of successful mapping and SLN detection and low recurrence rates at ~ 3 years of FU

Limitation

- No data on fetal safety (??reported later)
- Some patients were included in previous study (Gentilini et al; 2010)

Implications on practice

ESMO 2013, NCCN 2014: SLNB could be considered **but not methylene blue due**

Based on this data, acknowledging relative rarity of the disease precluding conduction of randomized comparisons**, if confirmed fetal safety, SLNB with colloid should not be denied to pregnant BC patients with clinically negative LNs**

Open Questions

1. Staging procedures during pregnancy – what to do and what not to do ?
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3. Safety of systemic therapy (chemo, HTH, targeted therapy) during pregnancy
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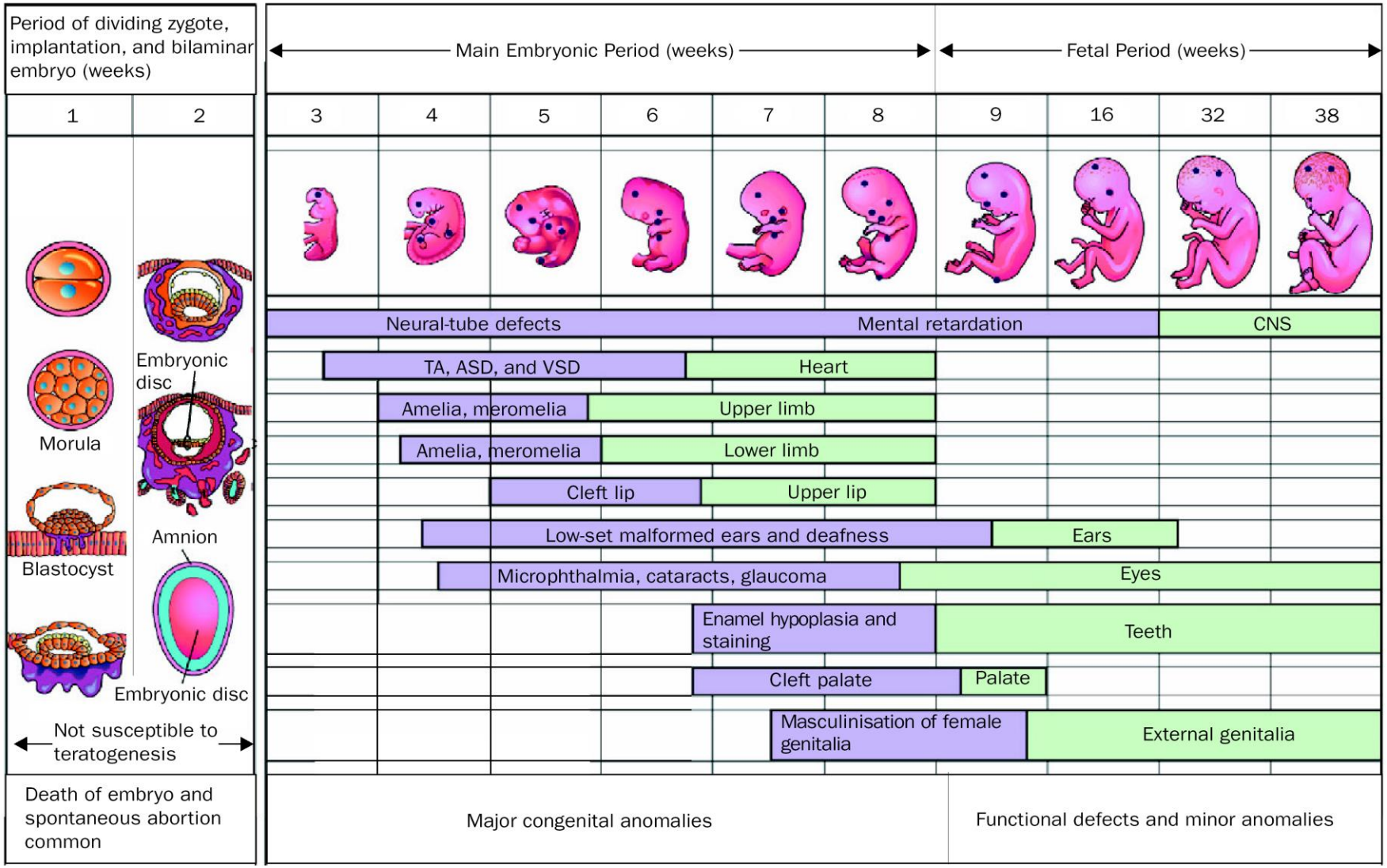
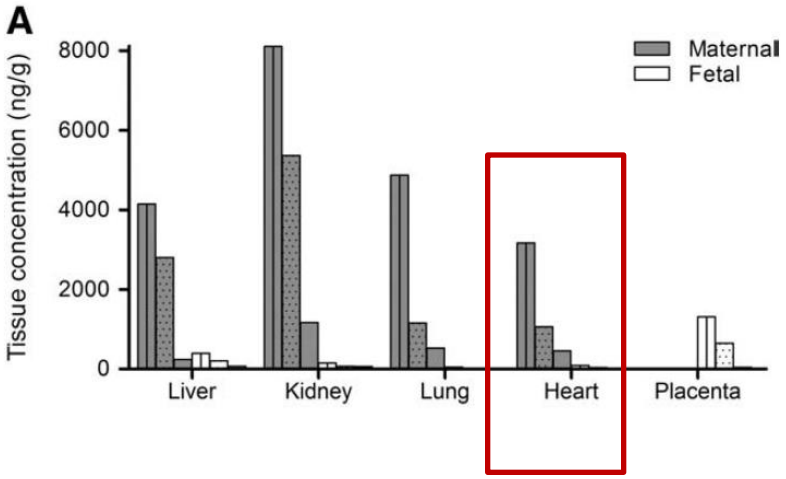
Question 3: Safety of systemic therapy (CTH, HTH, targeted TH)



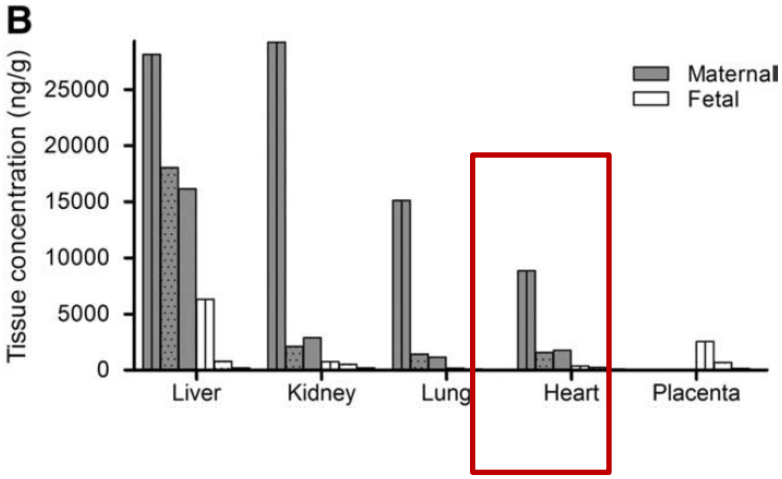
Cardonick E et al; Lancet Oncol 2004

	Number	Drug detected in fetus (n)	% drug detected in fetus
Doxorubicin	15	6	7.5 ± 3.2
Epirubicin	11	8	4.0 ± 1.6
Paclitaxel	11	7	1.4 ± 0.8
Docetaxel	9	0	0
Cyclophosphamide	4	3	25.1 ± 6.3
Carboplatin	7	7	57.5 ± 14.2

DOXORUBICIN



EPIRUBICIN



van Calsteren et al; Int J Gynecol Oncol 2010, van Calsteren et al; Gynecol Oncol 2011

Question 3: Safety of systemic therapy (CTH, HTH, targeted TH)

	Ring, 2005	Hahn, 2006	Peccatori, 2009	Loibl, 2012
Study type	Retrospective	Prospective	Prospctive	Prospective
	Multicentric	Monocentric	Monocentric	Registry
N.	28	57	20	197
Regimen	A(E)C=16 CMF=12	FAC (100%)	Weekly E (100%)	A-based=178 A(E)C (n=55) Taxane=14 CMF=15
Median gestational W at chemo	W20 (15 – 33)	W23 (11 – 34)	W19 (16 – 30)	W24 (NR)
Median gestational W at delivery	W37 (30 – 40)	W37 (29 – 42)	W35 (28 – 40)	W37 (32 – 42)
Congenital malformations	0	3/57 (5%)	1/20 (5%)	8/179 (4.5%)

Ring A et al; JCO 2005, Hahn et al; Cancer 2006; Peccatori F et al; BCRT 2009, Loibl S et al; Lancet Oncol 2012

Anthracyclines during pregnancy

NOT ALL THE SAME !!

HIGHLY LIPOPHILIC

"higher placental transfer"

DAUNORUBICIN

	Number	Gestational age of 1st exposure	Gestational age at delivery	Fetal adverse events
Cytarabine + daunorubicin	9	W (15–29)	W (28–41)	IUFD (2) Premature, RDS (3) Fetal distress, Pancytopenia (1) IUGR (1) NAD (2)
Cytarabine + daunorubicin + thioguanine	11	W (15-W29)	W (30–40)	NAD: 5 Down syndrome: 1 IUFD: 1 Materno-fetal death: 1 Premature: 1 Congenital eye defects: 1 Polydactyly: 1 (+FH)
Cytarabine + daunorubicin + 6MP	5	W (16–27)	W (32–26)	NAD: 4 Pancytopenia: 1
Cytarabine + daunorubicin + idarubicin	2	W (20–26)	W (32–38)	NAD: 1 Still born fetus: 1
Cytarabine + daunorubicin + others	5	W (18–34)	W (32–39)	NAD: 3 IUGR + pancytopenia: 1 Premature: 1

IDARUBICIN

Cytarabine + idarubicin (+/– others)	5	W (22–34)	W (32–37)	Acrocyanosis short digits and limbs, mild macrognathia, shallow sacral dimple VSD: 1 Fetal distress: 1 Cardiomyopathy: 1 IUGR, oligohydramnios: 1

Azim HA Jr et al; Cancer Treat Rev 2010

TAXANES IN CANCER DURING PREGNANCY

Number	55
- Breast cancer	39
- Other	16
- Paclitaxel	33
- Docetaxel	19
- Both	3
Neonatal outcome	
- Mean Gestational age at delivery	W 36
- Foetal weight	2400 g
- Early preterm delivery	1 (2%)
- Foetal complications	Anaemia (n=1), neutropenia (n=1)
- Foetal malformations	Pyloric stenosis (n=1)

Mir O et al; Ann Oncol 2010, Cardonick E et al; Ann Oncol 2012

PLATINUM IN CERVICAL CANCER DURING PREGNANCY

Number - Cisplatin - Carboplatin	48 47 1
Regimen	- Single agent (61.7%) - Combination with bleomycin, or taxanes (38.3%)
Neonatal outcome - Mean Gestational age at delivery - Foetal weight - Foetal complications - Foetal malformations	 W 33 2200 g ++ creatinin (n=1), intraventricular hge (n=1), hypoglycemia (n=1), hypotension (n=1) None

Zagouri F et al; Obstet Gynecol 2013

An increase in the risk of pregnancy complications “on average” in patients treated with chemo during pregnancy even if started after the 1st trimester

	Obstetric complications		Fetal wt <10th percentile	
	Chemo	No chemo	Chemo	No chemo
Cardonick, 2010	22/104 (22%)	NR	8/104 (7.5%)	0/12 (0%)
Loibl, 2012	31/179 (17%)	15/149 (9%)	15/175 (9%)	5/139 (4%)

Cardonick J et al; Cancer J 2010, Loibl S et al; Lancet Oncol 2012

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CORRESPONDENCE

Treatment of Cancer During Pregnancy: The Need for Tailored Strategies

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WEEKLY APPLICATION OF CHEMOTHERAPY

Allow close monitoring of pregnancy

Low peak plasma concentration resulting in

- Lower toxicity (more safe)
- Possible lower placental transfer & foetal exposure

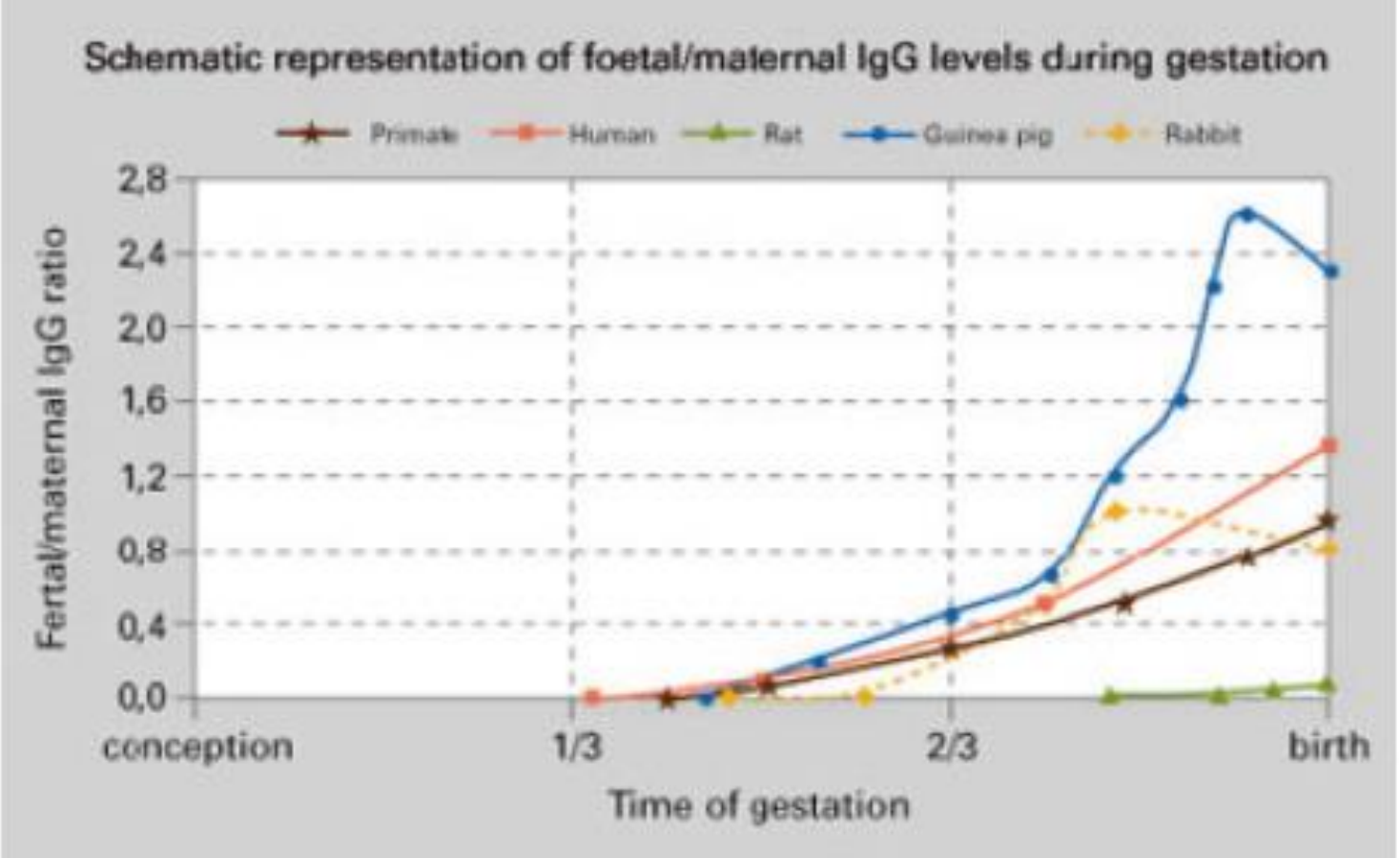
Easy interruption in case of toxicity

Tamoxifen **should not** be given during pregnancy

Tewari et al. [12]	1	Until 20 wks	One live birth with congenital anomaly: ambiguous genitalia with clitoris hypertrophia
Cullins et al. [13]	1	Until 26 wks	One live birth with congenital anomaly: Goldenhar's syndrome. Note: marijuana-cocaine inhalation during first 6 wks of pregnancy and bone scan
Berger and Clericuzio [14]	1	First trimester	One live birth with congenital anomaly: Pierre-Robin sequence with severe micrognathia and cleft palate
Öksüzoglu et al. [15]	1	First trimester	One live birth without congenital anomaly
Koizumi and Aono [16]	2	First trimester	Two live births without congenital anomaly
Isaacs et al. [17]	1	After first trimester	One live birth without congenital anomaly
Clark [18]	85	Unknown	No fetal abnormalities
Astra Zeneca Safety Database	37	First trimester	Two live births with congenital anomalies: one girl delivered at 29 wks with XXX chromosomes and also a phallic-like clitoris and huge labia, and one idiopathic chylothorax. Two elective terminations with fetal defects; six spontaneous abortions; six live births without congenital anomalies; four elective terminations (no fetal defects or unknown); 17 unknown
Astra Zeneca Safety Database	15	After first trimester	Two live births with congenital anomaly: one congenital hand malformation, and one vaginal adenoma at 2.5 years. One elective termination with fetal defects; eight live births without congenital anomaly; one elective termination (no fetal defects or unknown); three unknown
Astra Zeneca Safety Database	10	During all pregnancy	One live birth with congenital anomaly: one Goldenhar's syndrome (Cullins'report). Eight live births without congenital anomalies; one elective termination (no fetal defects or unknown)
Astra Zeneca Safety Database	74	Unknown	Six live births with congenital anomaly: one cleft palate, one ear malformation, one trisomy 21, one with small degree of labial fusion, one with craniofacial defects, one slight clitoral hypertrophy. One stillbirth with fetal defects; three elective terminations with fetal defects; one stillbirth without fetal defects; five spontaneous abortions; one ectopic pregnancy; 11 live births without congenital anomaly; 10 elective terminations

Braems G et al; Oncologist 2011

Increase transfer of MoAB starting 2nd trimester



Pentsuk N et al; Birth Defects Research 2009

No congenital malformation after accidental exposure to trastuzumab during first trimester – Analysis from HERA phase III trial

	Pregnancy on trastuzumab	Pregnancy No trastuzumab
Number of pts (pregnancies)	16 (16)	9 (9)
Miscarriage	4 (25%)	0
Induced abortion	7 (44%)	3 (33%)
Completed pregnancies	5 (31%)	6 (67%)
N. Live births	5 (100%)	6 (100%)
N. Congenital anomalies	0	1
Mean Gestational week at delivery	40	39
Mean Apgar score at 10 min	10	9
Mean fetal weight in gm	3,485	3,197
Mean fetal length in cm	50	49

Azim HA Jr et al; Breast Ca Res Treat 2012

High risk of anhydramnios and fetal morbidity/mortality secondary to trastuzumab administration during pregnancy

	Setting	Regimen	Time	Mother	Pregnancy	Baby
Watson 2005	A	T	Pre, 1st, 2nd	NS	Anhydramnios	NAD
Fanale 2005	M	T+ vinorelbine	3rd	NS	NS	NAD
Bader 2007	M	T + paclitaxel	2nd	NS	Anhydramnios, IUGR	Transient Resp F,RF
Shrim 2007	M	T	Pre, 1st, 2nd	-- EF	NS	Transient RF
Sekar 2007	M	T + docetaxel	2nd, 3rd	NS	Anhydramnios	NAD
Witzel 2008	M	T	Pre, 1st, 2nd, 3rd	NS	Anhydramnios, vag blee	Resp F, died
Pant 2008	M	T	Pre, 1st, 2nd, 3rd	NS	Anhydramnios	NAD
Weber 2008	M	T	Pre, 1st, 2nd	NS	Anhydramnios	Resp F, died
Warraich 2009	A	T + tam + LHRH	Pre, 1st, 2nd , 3rd	NS	Anhydramnios	Res. F, fetal death after 40 minutes
Beale 2009	A	T + tam	Pre, 1st, 2nd	NS	Anhydramnios, PROM	Twins: 1) RF, Resp F, Death 2) Transient Resp. F
Goodyer 2009	M	T	2nd	None	None	Premature
Gottschalk 2011	M	T + Carbo + Doc	2nd	None	Anhydramnios	Fetal growth restriction

Azim HA Jr et al; Exp Rev Immunol 2010

Rituximab during pregnancy: Transient depletion of fetal B-cells

Study (year)	Number of patients	Age at pregnancy (years)	Diagnosis	Exposure to rituximab	Concomitant therapies	Obstetrical complications	Delivery	Neonatal outcome
Klink *et al.* (2008)	1	36	ITP	30–34 weeks	None	None	At term	Healthy, B lymphocytes were not detectable at birth
Decker *et al.* (2006)	1	31	LNH	II trimester	CHOP	Preterm delivery	33 weeks	Healthy, transient B-cell depletion at birth
Friedrichs *et al.* (2006)	1	35	Burkitt's lymphoma	II trimester	CHOP	None	At term	Healthy, transient complete B-cel depletion at birth
Scully *et al.* (2006)	1	Unknown	TTP	III trimester	None	None	At term	Healthy
Ojeda-Uribe *et al.* (2006)	1	41	Autoimmune hemolytic anemia	I trimester	Corticosteroids	None	At term	Healthy, normal lymphocyte count at birth
Chakravarty *et al.* (2011)	153	19–45	Autoimmune diseases and lymphoma	I–II trimester	Combination chemotherapy corticosteroids	22 premature delivery 1 fetal loss for umbilical cord knot	90 live births, 30 miscarriages, 22 abortions	11 B-cell depletions, 4 neonatal infections without complications, 2 malformation (1 cardiac, 1 clubfoot)
Perez *et al.* (2012)	1	22	PMLBCL	II trimester	CHOP	Elective preterm labour	34 weeks	Healthy

esmo.org

Sarno MA et al; Immunotherapy 2013

Open Questions

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3. Safety of systemic therapy (chemo, HTH, targeted therapy) during pregnancy
4. What is the role of induced abortion? or Premature delivery?
5. Long-term outcome after in-utero exposure to chemo

Question 4: What is the role of induction of abortion?

The experience of pregnancy and early motherhood in women diagnosed with gestational breast cancer

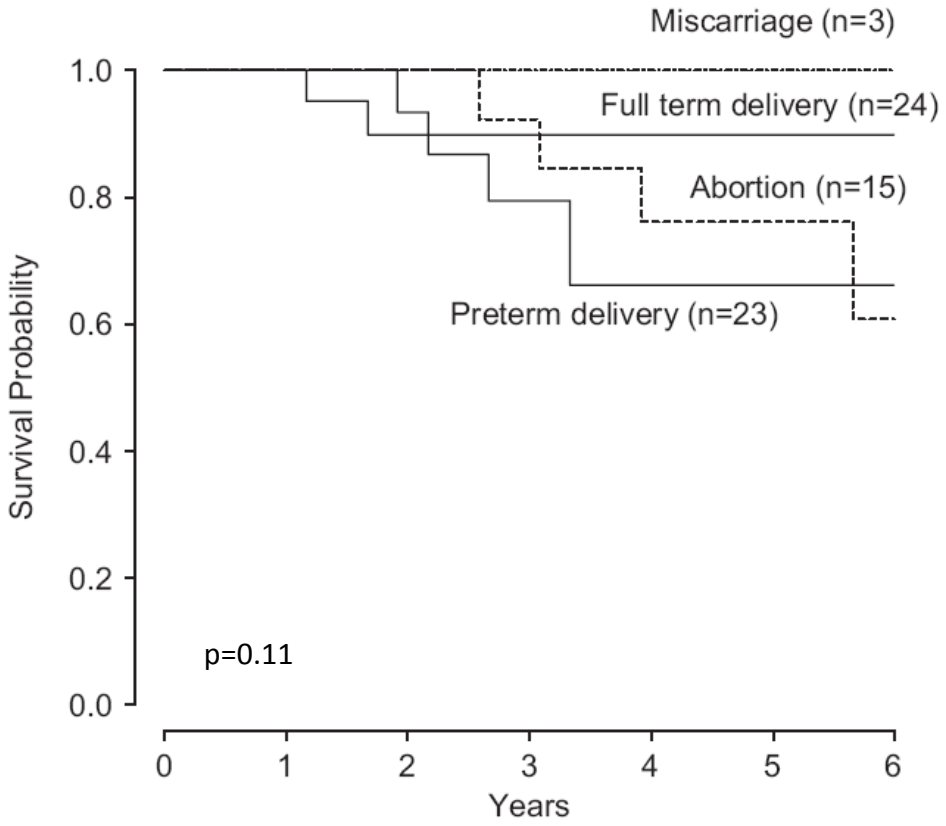
A. Ives[1]*, T. Musiello[2] and C. Saunders[2]

A Woman who interrupted her pregnancy

"It does make me feel, you know, quite bad some days. It does not go"

Ives A et al; Psycho-Oncol 2012

No therapeutic benefit of induced abortion



Azim HA Jr et al; Acta Oncol 2012

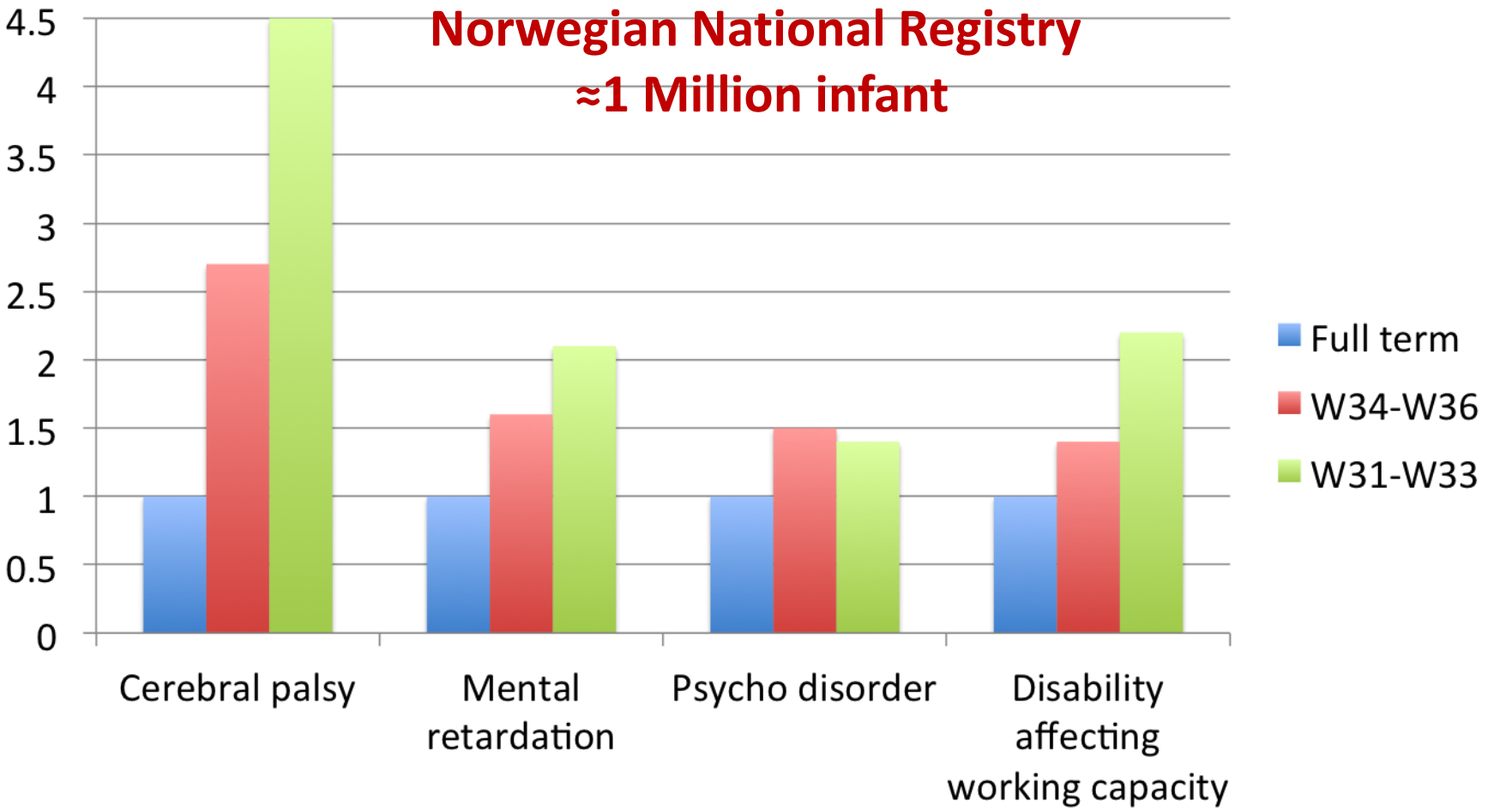
When to consider pregnancy termination ?

"Is when you can not balance maternal benefits and fetal risks"

- Urgent chemotherapy is required during the first trimester (e.g acute leukemias)

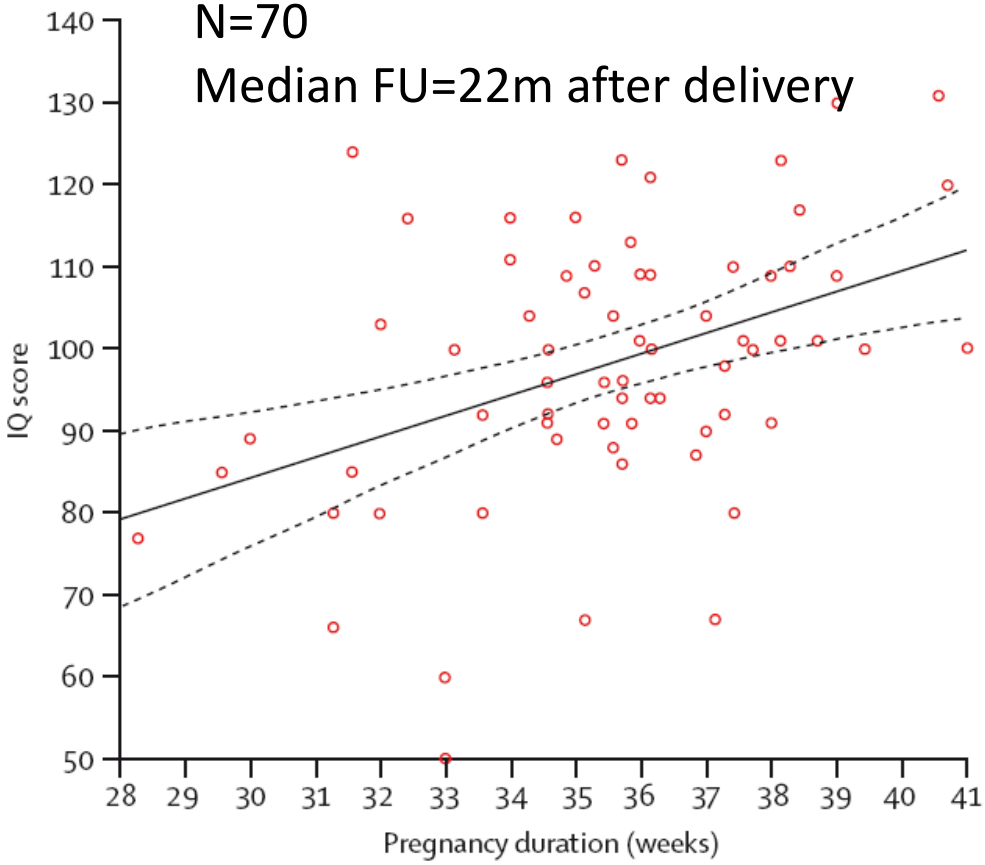
- Patient is seriously concerned on delaying standard therapy that can not be delivered during pregnancy (e.g. Ca cervix)

Question 4: What is the role of preterm delivery?



Moster D et al; NEJM 2008

Long-term cognitive function correlates with time of delivery



Each additional month of pregnancy is associated with 11.6 points increase in the IQ scale !!

Amant F et al; Lancet Oncol 2012

Open Questions

1. Staging procedures during pregnancy – what to do and what not to do ?
2. Loco-regional management (surgery, role of SLN and RTH)
3. Safety of systemic therapy (chemo, HTH, targeted therapy) during pregnancy
4. What is the role of induced abortion? or Premature delivery?
5. Long-term outcome after in-utero exposure to chemo

Long term cardiac effect after in-utero exposure to anthracyclines

"Controls matched according to actual age"

	N*	Study children (n=50)	Controls (n=50)	Effect (95% CI)	p value
Shortening fraction (%)	98	35 (30 to 43)	39 (28 to 51)	−4·0 (−5·9 to −2·1)	<0·0001†
Ejection fraction (%)	98	66 (60 to 75)	71 (57 to 83)	−6·0 (−8·3 to −3·7)	<0·0001†
Left ventricle mass index (g/m^2)	94	48·3 (37·4 to 65·5)	55·4 (40·0 to 82·6)	−2·53 (−7·89 to 2·82)	0·35
Left ventricle mass index (left ventricle mass per height$^{2·7}$)	93	35·9 (19·8 to 54·5)	35·3 (20·6 to 28·8)	−0·94 (−3·79 to 1·91)	0·51
Left ventricle Tei index	94	0·33 (0·27 to 0·45)	0·32 (0·15 to 0·53)	0·014 (−0·025 to 0·052)	0·47
Left ventricle end diastolic diameter (*Z* score)	96	0·02 (−2·28 to 3·19)	0·25 (−2·22 to 3·00)	−0·13 (−0·64 to 0·38)	0·61
Left ventricle posterior wall thickness (*Z* score)	95	0·16 (−2·32 to 1·81)	−0·20 (−1·90 to 1·98)	0·35 (−0·25 to 0·94)	0·25
Interventricular septum thickness (*Z* score)	95	−1·09 (−2·50 to 0·45)	−0·64 (−2·10 to 1·65)	−0·47 (−0·89 to −0·05)	0·029
Right ventricle end diastolic diameter (*Z* score)	93	0·76 (−1·48 to 1·83)	0·30 (−1·91 to 2·21)	0·29 (−0·19 to 0·76)	0·24

Amant F et al; Lancet Oncol 2012

Poster discussion: # 267PD

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KU LEUVEN

A case-control interim analysis of mental development and cardiac functioning of 38 children prenatally exposed to chemotherapy

Frédéric Amant, Tineke Vandenbroucke, Magali Verheecke, Petronella B. Ottevanger, Monica Fumagalli, Luc Mertens, Sileny N. Han, Kristel Van Calsteren, & Laurence Claes

26-30 September 2014, Madrid, Spain

esmo.org

Poster discussion: # 267PD

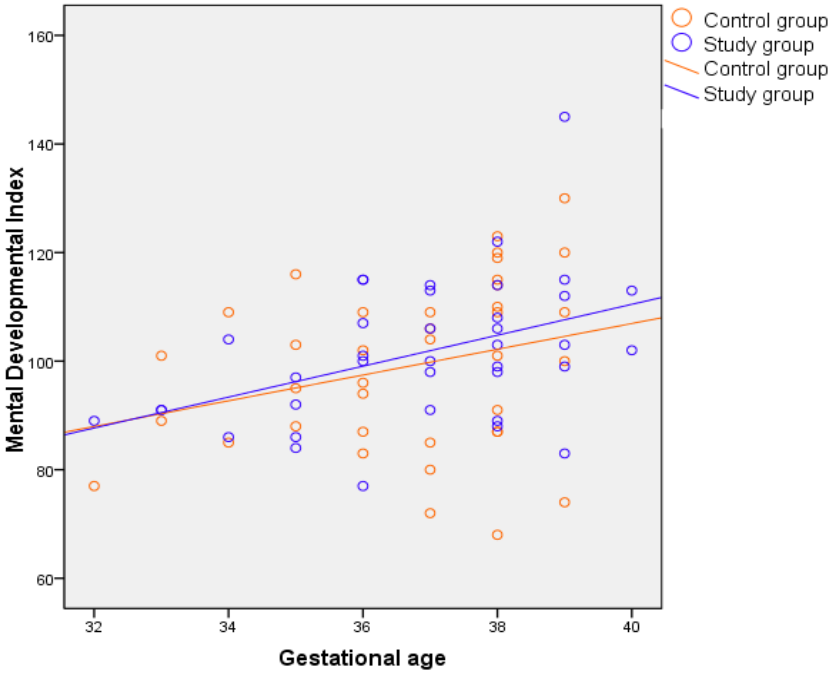
- 38 children (median age: 20.5 months, range 18-42) and 38 controls (median age: 22 months, range 18-42) were included *"matched for gestational age at delivery"*
- Echocardiography in 24 study children (anthracyclines administered during pregnancy in 87%) and 24 controls
- Most frequently breast (61%) and hematological cancers (22%)
- Chemotherapy consisted on average of 4 cycles during pregnancy (range 1-7) and of 3 different chemo types (range 1-5). Polychemotherapy was administered in 91% of cases.

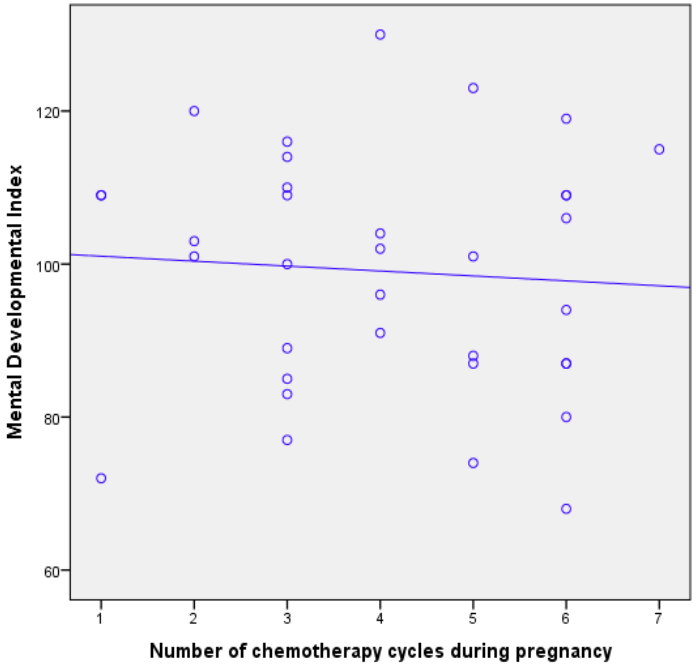
	Study children (24) Med (range)	Control children (24) Med (range)	P-value
Age	2.3 (1.5 to 3.5)	2.2 (1.2 to 3.6)	0.80
BSA	0.58 (0.45 to 0.72)	0.54 (0.42 to 0.84)	0.88
Heart rate	111 (78 to 147)	110 (84 to 138)	0.80
Systolic BP (mm Hg)	105 (90 to 131)	96 (75 to 110)	**0.005**
Diastolic BP (mm Hg)	65 (50 to 94)	57 (40 to 75)	**0.014**
Shortening Fraction (%)	36 (32 to 42)	39 (32 to 51)	**0.004**
Ejection Fraction (%)	67 (59 to 78)	71 (61 to 83)	**0.007**
LV mass index (g/m²)	29.65 (15.75 to 45.27)	38.46 (18.61 to 62.83)	0.01

Amant F et al; proceeding ESMO 2014

Poster discussion: # 267PD

Long-term cognitive function correlates with time of delivery **but not** number of cycles of chemo





Poster discussion: # 267PD

- In-utero chemo induces subtle changes in cardiac evaluation

(?? Clinical relevance)

- Reassuring data on lack of long term mental development

Limitation

- Some patients were included in previous study (2012)

Implications on practice

Avoid preterm delivery

Long-term safety of in-utero exposure to anthracyclines

Take Home messages

- Multidisciplinary +++++++
- SLNB (with colloid) could be performed
- RTH: Should be postponed particularly if late in pregnancy . Could be considered on a case by case basis if early pregnancy and areas away from pelvis (neck, shoulder, brain)
- Chemo: contraindicated in first trimester, can be given starting W14 until W34 .. Avoid delivery in nadir period

Take Home messages

- Tam – Trastuzumab: avoid during pregnancy
- Rituximab: could be considered starting second trimester
- Abortion: does not improve outcome. Consider if aggressive disease early in pregnancy (e.g. acute leukemia) or advanced pelvic tumors needing surgery/RTH
- Premature delivery: should be avoided unless major maternal complications requiring early induction

MADRID 2014 ESMO congress

clinical practice guidelines

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

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