# 15th International Congress of the Jordanian Society of Obstetricians and Gynecologists

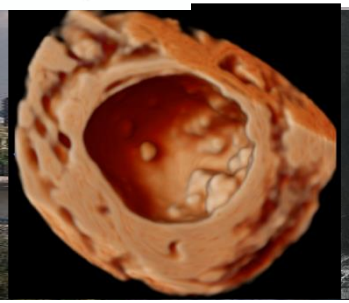
In collaboration with The Jordanian British Society for Obstetrics & Gynecology

## 14th - 16th September 2022
## Amman - Jordan

Guy's and St Thomas' NHS
NHS Foundation Trust

15th International Congress of the Jordanian Society of Obstetricians and Gynecologists
In collaboration with The Jordanian British Society for Obstetrics & Gynecology

Amman - Jordan



KING'S College LONDON

# Ovarian Masses: Characterization and management


***Asst Prof Ahmad Sayasneh MBChB ArBOG MD(Res) FRCOG***

***Consultant Gynaecologist and Gynaecological Oncology Surgeon***

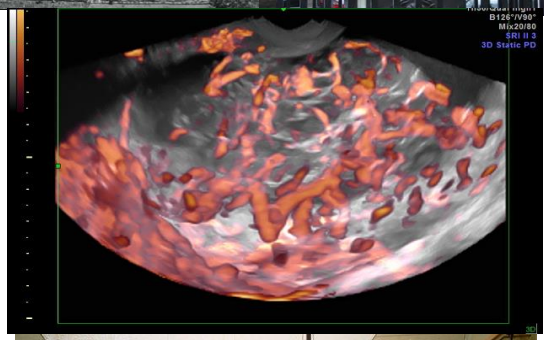
***Guy's and St Thomas' NHS Foundation Trust***

***Reader at King's College London***

***Honorary Senior Clinical Lecturer at Imperial College London***

***Lead for Undergraduate Education for Women's Health, KCL***

***Ovarian Masses Rapid Access Clinic Lead at GSTT***

SCIENTIA
SCIENTIA IMPERII DECUS ET TUTAMEN

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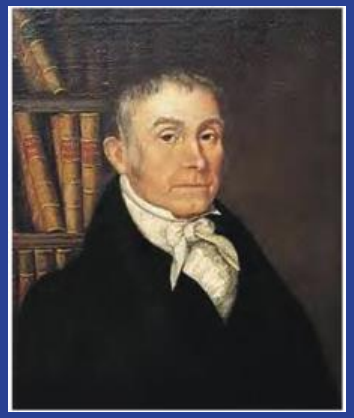
**No conflict of interest to declare**

# History



The first abdominal operation in the Western World was performed by the Kentucky physician, Ephraim McDowell (1771-1830) on a woman with a large ovarian tumour.

The first successful use of chemotherapy to eradicate a solid tumour (choriocarcinoma) Roy Hertz and Min Chiu Li at the NIH in the 1960s

# Diagnostics

# What can an ovarian mass be?

| | | |
|---|---|---|
| Normal ovary | Functional cyst | Benign tumour |
| Borderline tumour | Invasive tumour | Metastatic tumour |

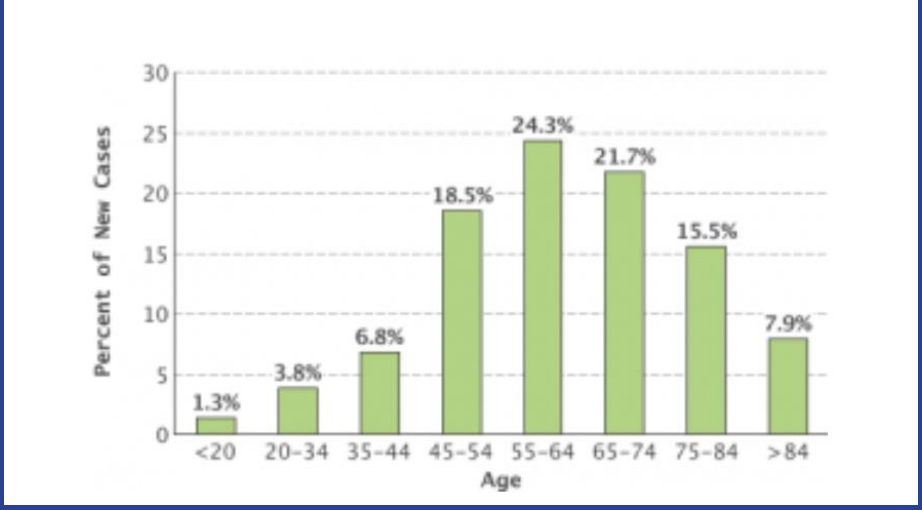
# Basic statistics

**Up to 10% of women will have some form of surgery during their lifetime for the presence of an ovarian mass.**

**A woman's lifetime risk of developing invasive ovarian cancer is 1 in 79.**

**A woman's lifetime risk of dying from invasive ovarian cancer is 1 in 109.**

**The median age at which women are diagnosed with ovarian cancer is 63**

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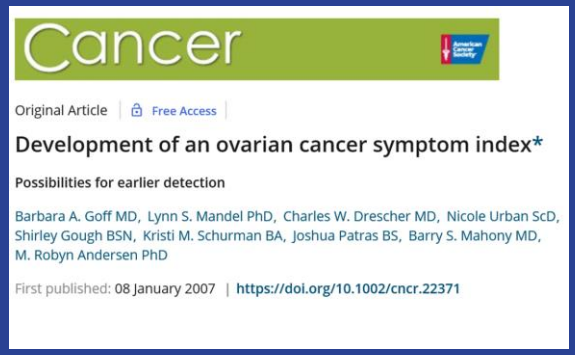
# BEAT Ovarian Cancer

- Bloating that is persistent and doesn't come and go
- Eating less and feeling full more quickly
- Abdominal and pelvic pain you feel most days
- Then talk to your GP about your symptoms



Cancer

Original Article | Free Access

Development of an ovarian cancer symptom index*

Possibilities for earlier detection

Barbara A. Goff MD, Lynn S. Mandel PhD, Charles W. Drescher MD, Nicole Urban ScD, Shirley Gough BSN, Kristi M. Schurman BA, Joshua Patras BS, Barry S. Mahony MD, M. Robyn Andersen PhD

First published: 08 January 2007 | https://doi.org/10.1002/cncr.22371

| Symptom | Have you experienced this symptom? Is so, please rate the severity: (0=no symptom, 1=minimal, 5=severe) | How many days per month did you experience this symptom? | | | | | | How long did this symptom persist? (Months) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | <1 | 1–2 | 3–6 | 7–12 | 13–19 | ≥20 | <1 | 1–2 | 3–4 | 5–6 | 7–9 | 10–12 | >12 |

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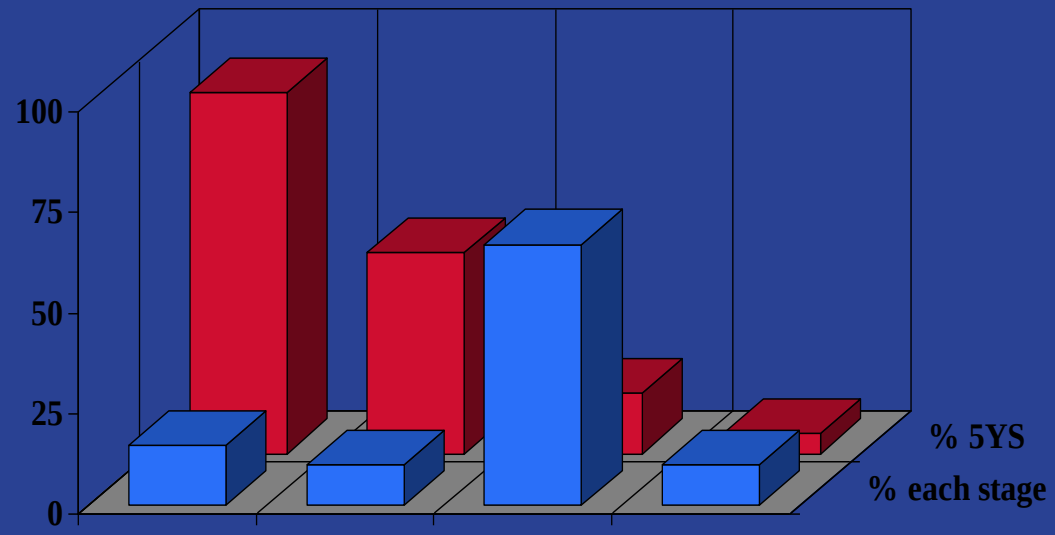
# Survival

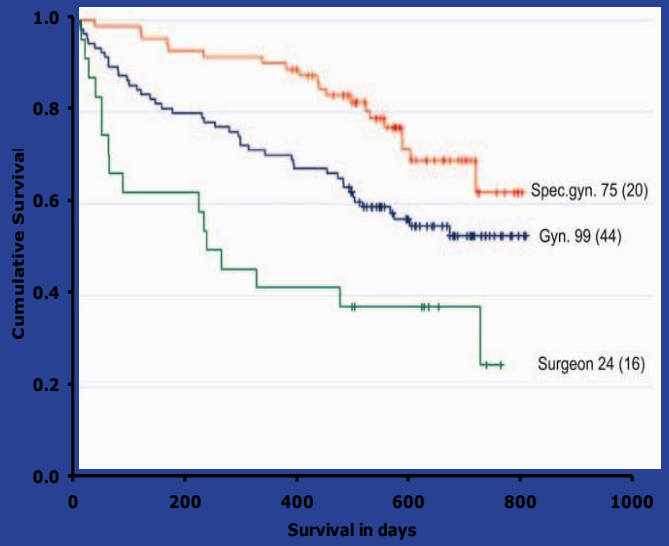



% I II III IV

STAGE

**% 5 YR SURVIVAL**

**% EACH STAGE**




Paulsen T et al. *Int J Gynecol Cancer.* 2006;16(Suppl 1):11-17.

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# Importance of preoperative characterization

**Keyrole in:**

- Timing
- Surgical access (laparoscopy - laparotomy)

  *Notice: cyst rupture ➔ spilling ➔ 'upstaging'*
- Referral to tertiary centre, gynaecological oncologist

**➔ Better survival**

# Characterisation model suggested by regulating bodies

NHS
National Institute for Health and Clinical Excellence

THE AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS
1951
WOMEN'S HEALTH CARE PHYSICIANS

IOTA SR & RMI

demographic, laboratory and imaging variables

International Ovarian Tumor Analysis

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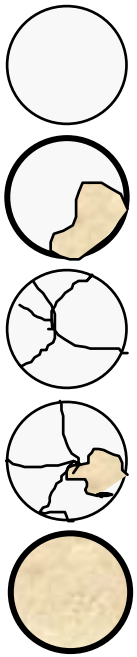
# Morphologic Classification (n=1066)



| Type of tumor | N | Malign. | % |
|---|---|---|---|
| 1.Unilocular cyst | 313 | 2 | **0.6** |
| 2.Unilocular solid | 132 | 44 | **33** |
| 3.Multilocular cyst | 196 | 20 | **10** |
| 4.Multilocular solid | 284 | 116 | **41** |
| 5.Solid tumo ur | 136 | 84 | **62** |

(IOTA)

*Ultrasound Obstet Gynecol* 2008; 31: 681–690
Published online in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/uog.5365

# Simple ultrasound-based rules for the diagnosis of ovarian cancer

D. TIMMERMAN*, A. C. TESTA†, T. BOURNE*, L. AMEYE‡, D. JURKOVIC§, C. VAN HOLSBEKE*, D. PALADINI¶, B. VAN CALSTER‡, I. VERGOTE*, S. VAN HUFFEL‡ and L. VALENTIN**

| *Rules for predicting a malignant tumor (M-rules)* | | | *Rules for predicting a benign tumor (B-rules)* | |
|---|---|---|---|---|
| M1 | Irregular solid tumor | ☐ | B1 | Unilocular | ☐ |
| M2 | Presence of ascites | ☐ | B2 | Presence of solid components where the largest solid component has a largest diameter < 7 mm | ☐ |
| M3 | At least four papillary structures | ☐ | | | |
| M4 | Irregular multilocular solid tumor with largest diameter ≥ 100 mm | ☐ | B3 | Presence of acoustic shadows | ☐ |
| | | | B4 | Smooth multilocular tumor with largest diameter < 100 mm | ☐ |
| M5 | Very strong blood flow (color score 4) | ☐ | B5 | No blood flow (color score 1) | ☐ |

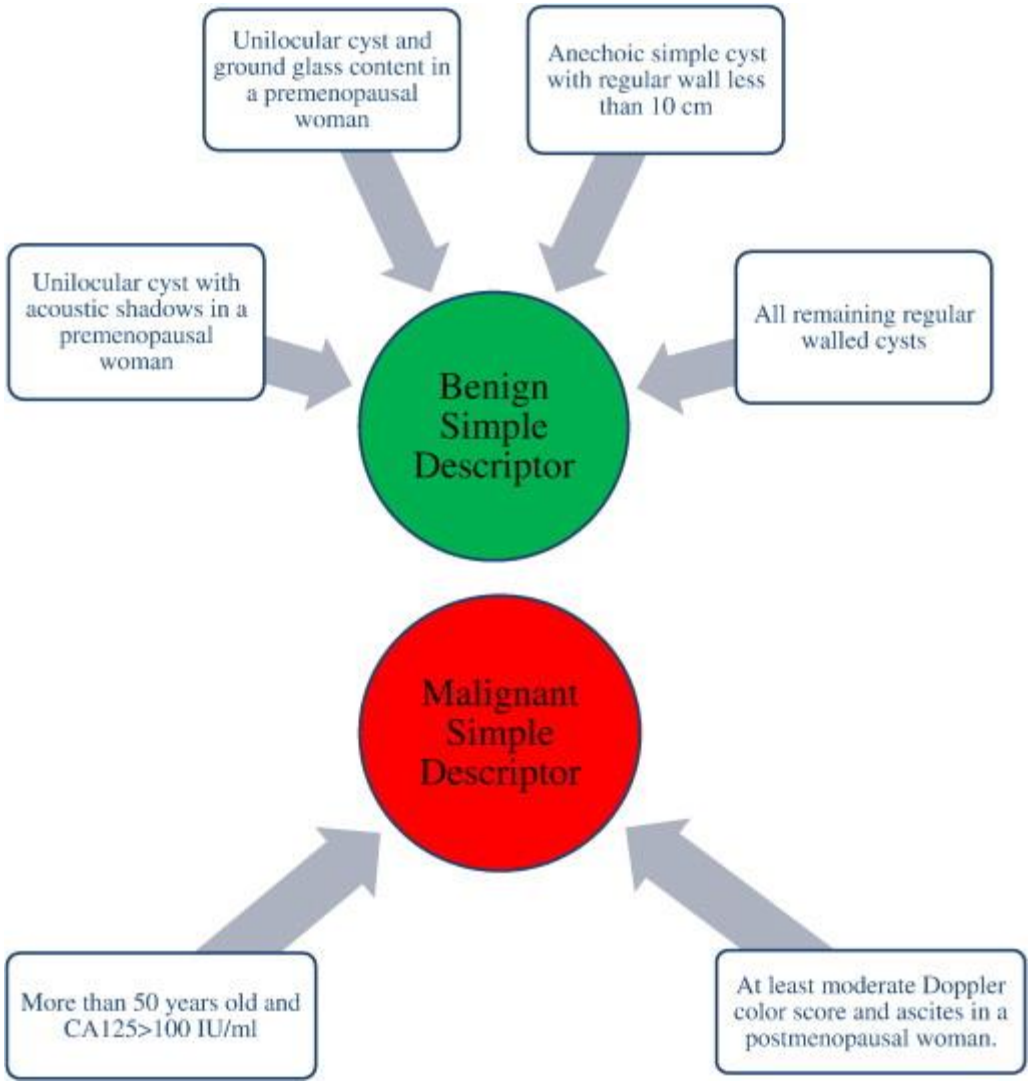
Gynecologic Oncology

Available online 8 April 2013

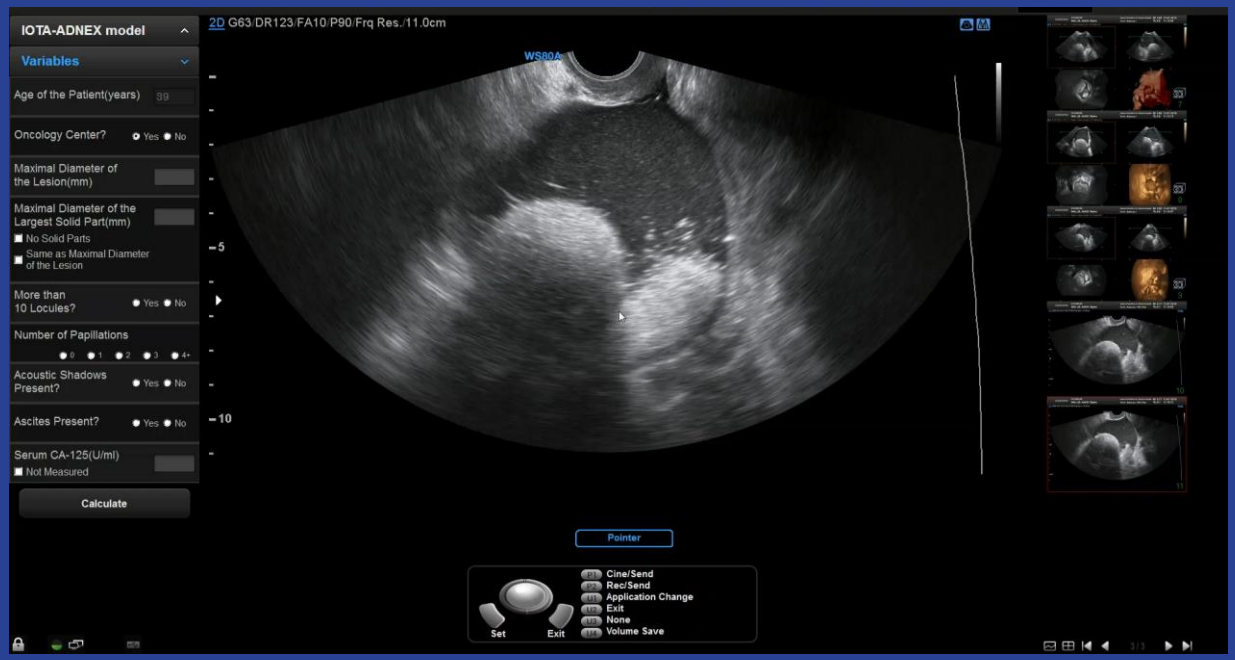
In Press, Corrected Proof — Note to users

# A multicenter prospective external validation of the diagnostic performance of IOTA simple descriptors and rules to characterize ovarian masses

Ahmad Sayasneh[a, b], Jeroen Kaijser[c], Jessica Preisler[b], Susanne Johnson[d], Catriona Stalder[b], Richard Husicka[b], Sharmistha Guha[b], Osama Naji[b], Yazan Abdallah[b], Fateh Raslan[e], Alexandra Drought[e], Alison A. Smith[f], Christina Fotopoulou[b], Sadaf Ghaem-Maghami[a, b], Ben Van Calster[g], Dirk Timmerman[c, g], Tom Bourne[a, b, g]




Sayasneh et al, 2013

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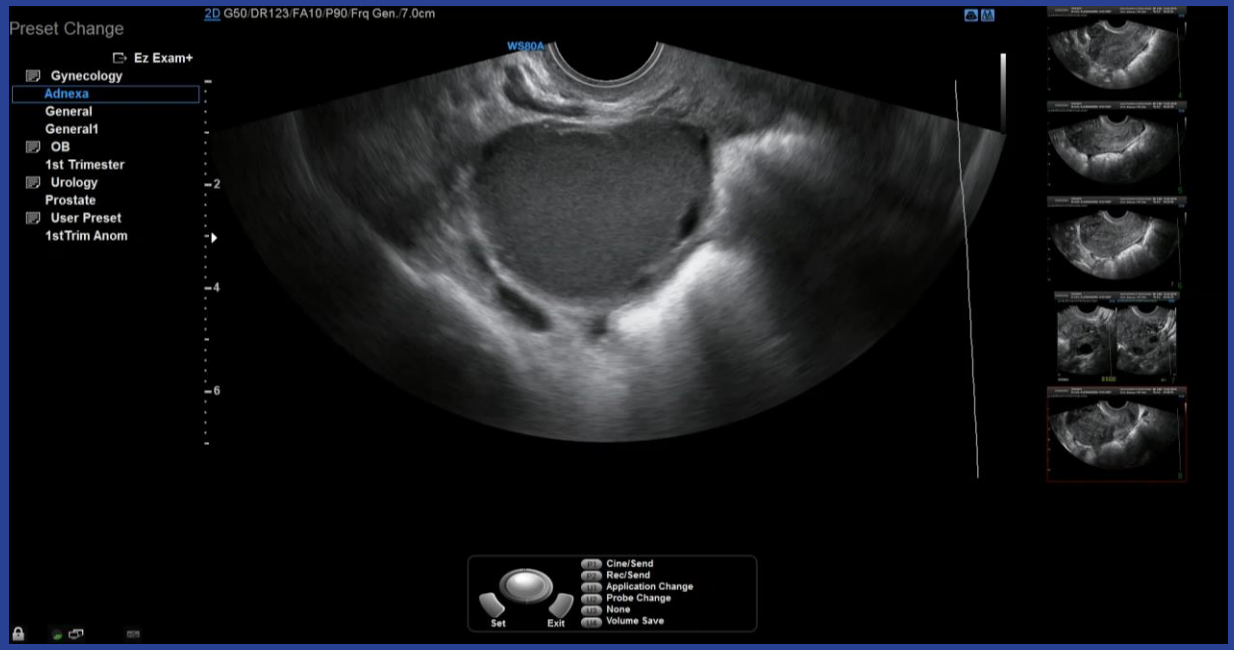
Preset Change
Ez Exam+
Gynecology
Adnexa
General
General1
OB
1st Trimester
Urology
Prostate
User Preset
1stTrim Anom
2D G50/DR123/FA10/P90/Frq Gen./7.0cm
WS90A
Set
Exit
Cine/Send
Rec/Send
Application Change
Probe Change
None
Volume Save

FULL PAPER

BJC

British Journal of Cancer (2013), 1–7 | doi: 10.1038/bjc.2013.224

Keywords: Biomarkers; CA125 antigen; decision support techniques; ovarian cancer; ovarian neoplasm; ultrasonography

# Multicentre external validation of IOTA prediction models and RMI by operators with varied training

A Sayasneh[*,1,2], L Wynants[3,4], J Preisler[2], J Kaijser[5], S Johnson[6], C Stalder[2], R Husicka[2], Y Abdallah[2], F Raslan[7], A Drought[7], A A Smith[8], S Ghaem-Maghami[1], E Epstein[9], B Van Calster[10], D Timmerman[3,10] and T Bourne[1,2,10]

*[1]Department of Cancer and Surgery, Imperial College London, Hammersmith Campus, Du Cane Road, London W12 0HS, UK; [2]Early Pregnancy and Acute Gynecology Unit, Queen Charlottes and Chelsea Hospital, Imperial College London, Du Cane Road, London W12 0HS, UK; [3]Department of Electrical Engineering-ESAT, SCD-SISTA, KU Leuven, B-3000 Leuven, Belgium; [4]iMinds Future Health Department, KU Leuven, B-3000 Leuven, Belgium; [5]Department of Obstetrics and Gynecology, University Hospitals KU Leuven, Herestraat 49, B-3000 Leuven, Belgium; [6]Southampton University Hospitals, Princess Anne Hospital, Coxford Road, Southampton SO16 6YD, UK; [7]West Middlesex University Hospital, Twickenham Road, Isleworth, Middlesex TW7 6AF, UK; [8]Department of Ultrasound, Queen Charlotte's and Chelsea Hospital, Du Cane Road, London W12 0HS, UK; [9]Department of Obstetrics and Gynecology, Karolinska University Hospital, S-171 76 Stockholm, Sweden and [10]Department of Development and Regeneration, KU Leuven, B-3000 Leuven, Belgium*

**Background:** Correct characterisation of ovarian tumours is critical to optimise patient care. The purpose of this study is to evaluate the diagnostic performance of the International Ovarian Tumour Analysis (IOTA) logistic regression model (LR2), ultrasound Simple Rules (SR), the Risk of Malignancy Index (RMI) and subjective assessment (SA) for preoperative characterisation of adnexal masses, when ultrasonography is performed by examiners with different background training and experience.

**Methods:** A 2-year prospective multicentre cross-sectional study. Thirty-five level II ultrasound examiners contributed in three UK hospitals. Transvaginal ultrasonography was performed using a standardised approach. The final outcome was the surgical findings and histological diagnosis. To characterise the adnexal masses, the six-variable prediction model (LR2) with a cutoff of 0.1, the RMI with cutoff of 200, ten SR (five rules for malignancy and five rules for benignity) and SA were applied. The area under the curves (AUCs) for performance of LR2 and RMI were calculated. Diagnostic performance measures for all models assessed were sensitivity, specificity, positive and negative likelihood ratios (LR+ and LR−), and the diagnostic odds ratio (DOR).

**Results:** Nine-hundred and sixty-two women with adnexal masses underwent transvaginal ultrasonography, whereas 255 had surgery. Prevalence of malignancy was 29% (49 primary invasive epithelial ovarian cancers, 18 borderline ovarian tumours, and 7 metastatic tumours). The AUCs for LR2 and RMI for all masses were 0.94 (95% confidence interval (CI): 0.89–0.97) and 0.90 (95% CI: 0.83–0.94), respectively. In premenopausal women, LR2 − RMI difference was 0.09 (95% CI: 0.03–0.15) compared with −0.02 (95% CI: −0.08 to 0.04) in postmenopausal women. For all masses, the DORs for LR2, RMI, SR+SA (using SA when SR inapplicable), SR+MA (assuming malignancy when SR inapplicable), and SA were 62 (95% CI: 27–142), 43 (95% CI: 19–97), 109 (95% CI: 44–274), 66 (95% CI: 27–158), and 70 (95% CI: 30–163), respectively.

**Conclusion:** Overall, the test performance of IOTA prediction models and rules as well as the RMI was maintained in examiners with varying levels of training and experience.

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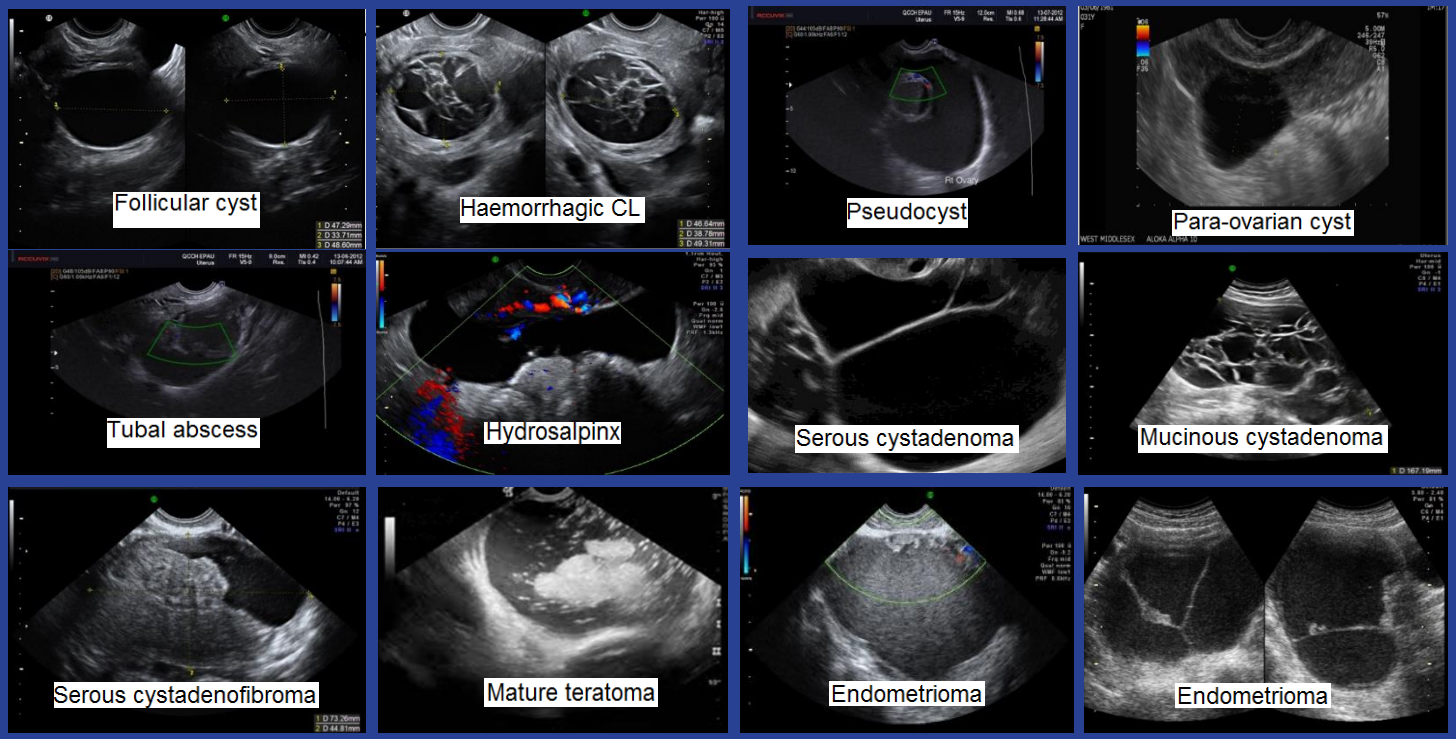
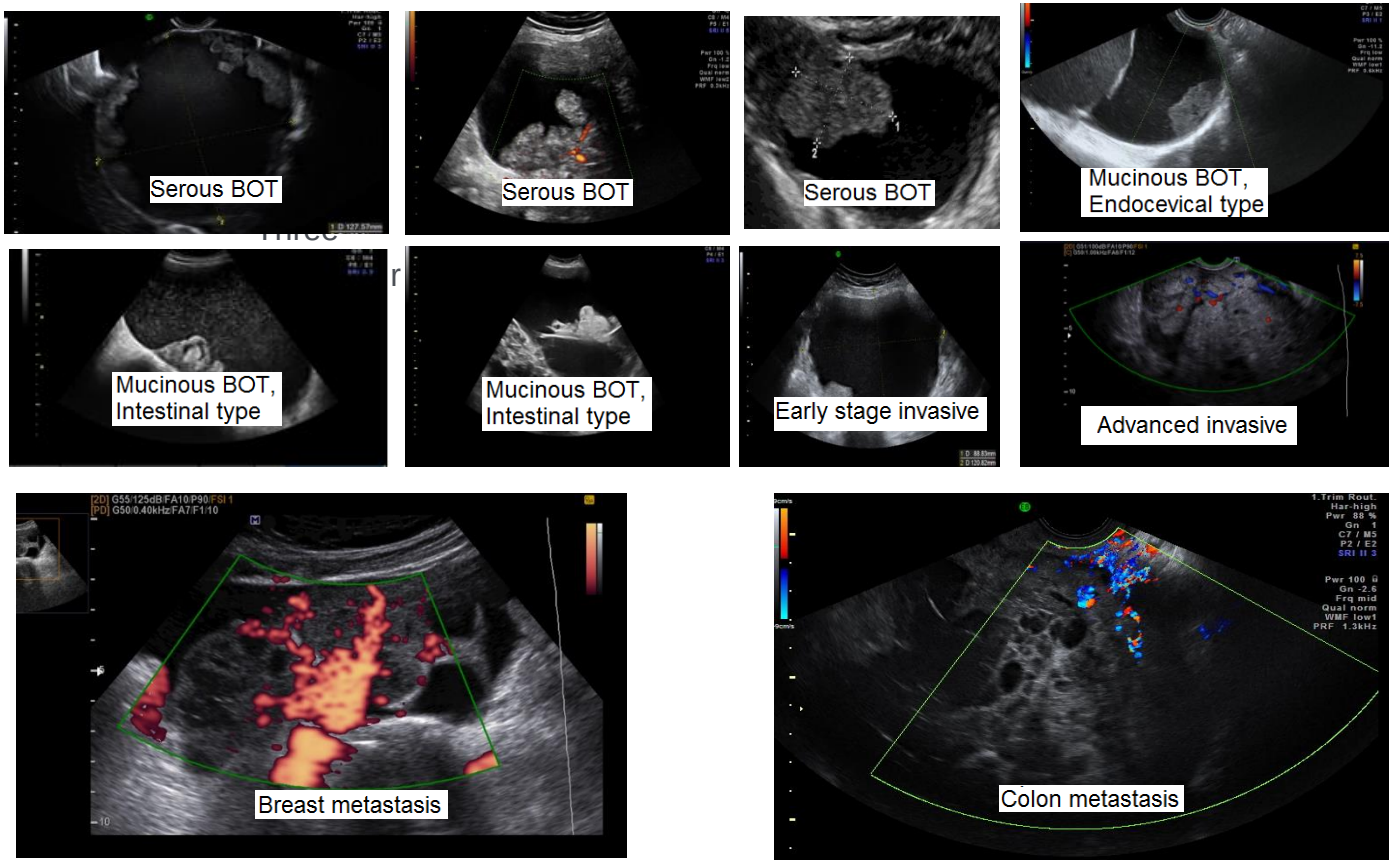
# Pattern Recognition of Ovarian Masses

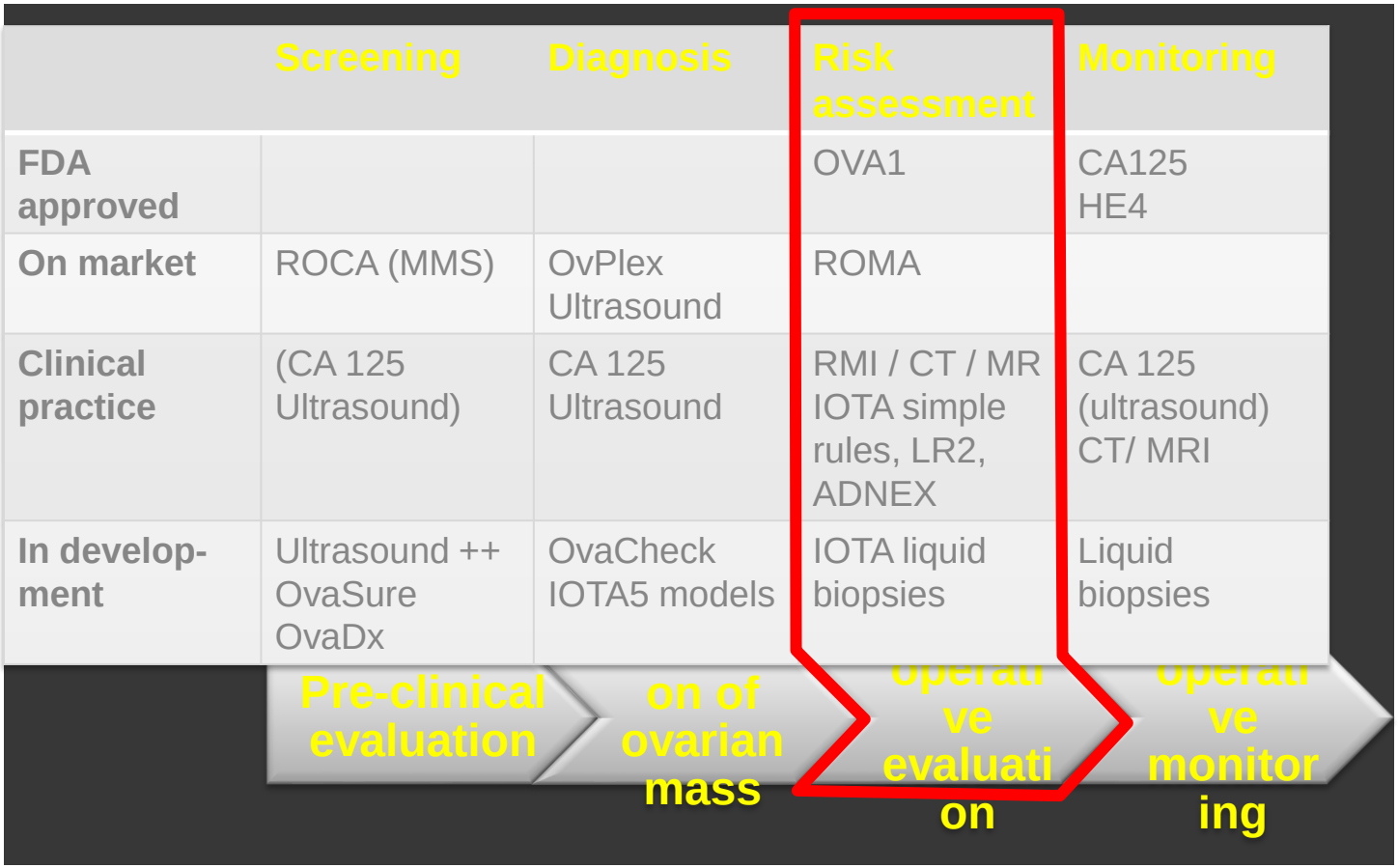


# Pattern Recognition of Ovarian Masses



# Scope of IOTA for ovarian cancer

| | Screening | Diagnosis | Risk assessment | Monitoring |
|---|---|---|---|---|
| **FDA approved** | | | OVA1 | CA125<br>HE4 |
| **On market** | ROCA (MMS) | OvPlex<br>Ultrasound | ROMA | |
| **Clinical practice** | (CA 125<br>Ultrasound) | CA 125<br>Ultrasound | RMI / CT / MR<br>IOTA simple rules, LR2, ADNEX | CA 125<br>(ultrasound)<br>CT/ MRI |
| **In develop-ment** | Ultrasound ++<br>OvaSure<br>OvaDx | OvaCheck<br>IOTA5 models | IOTA liquid biopsies | Liquid biopsies |



## Subjective assessment of blood flow

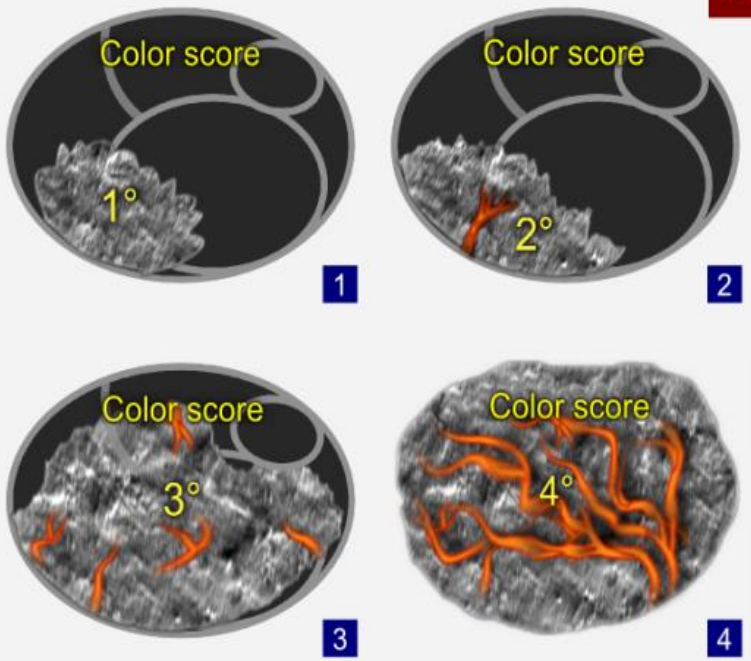


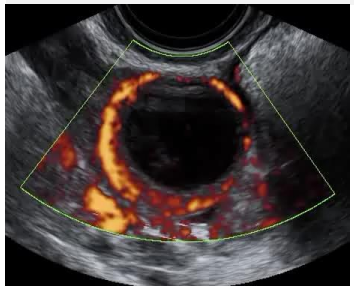
1 **Color score of 1** is given when no blood flow within the septa, cyst walls, or solid tumor areas.

2 **Color score of 2** is given when only minimal flow can be detected.

3 **Color score of 3** is given when moderate flow is present.

4 **Color score of 4** is given when the adnexal mass appears highly vascular with marked blood flow.

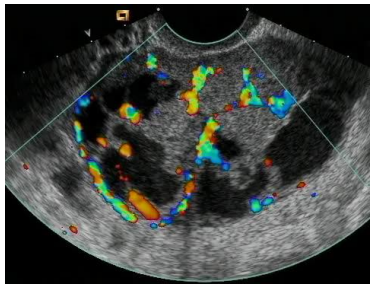


‘Ring of fire’ corpus luteum

**<<- Overlap ->>**

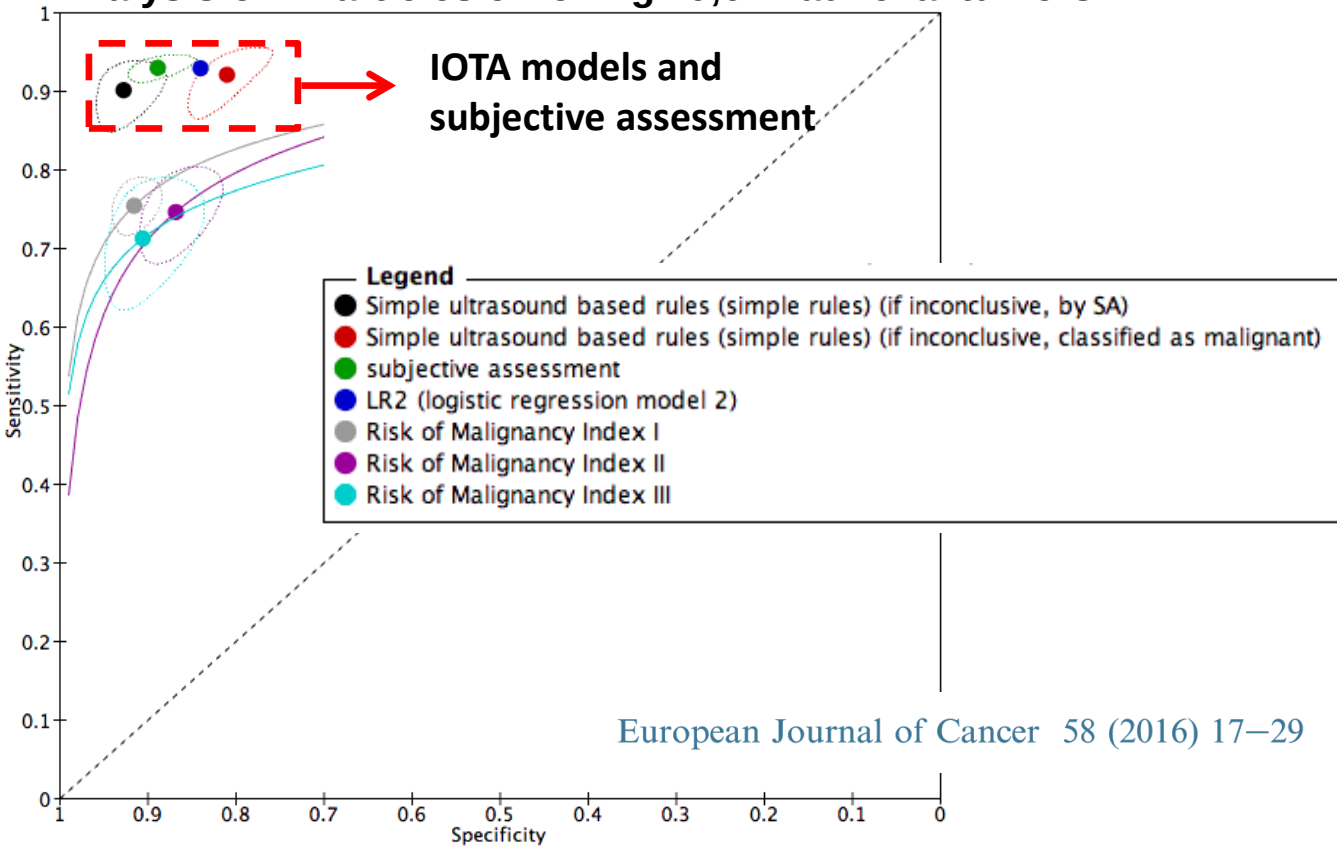
Endometrioid ovarian cancer



# IOTA Centers

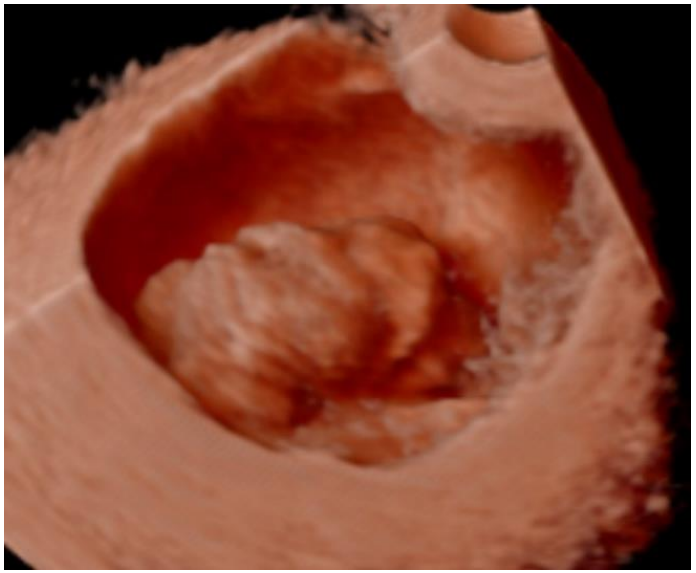
# Systematic review and meta-analysis

**Analysis of 47 articles enrolling 19,674 adnexal tumors**




European Journal of Cancer 58 (2016) 17–29

# IOTA apps:  Apple store “IOTA Models”



MENU

BJC British Journal of Cancer

Clinical Study | OPEN | Published: 02 August 2016

# Evaluating the risk of ovarian cancer before surgery using the ADNEX model: a multicentre external validation study

A Sayasneh ✉, L Ferrara, B De Cock, S Saso, M Al-Memar, S Johnson, J Kaijser, J Carvalho, R Husicka, A Smith, C Stalder, M C Blanco, G Ettore, B Van Calster, D Timmerman & T Bourne

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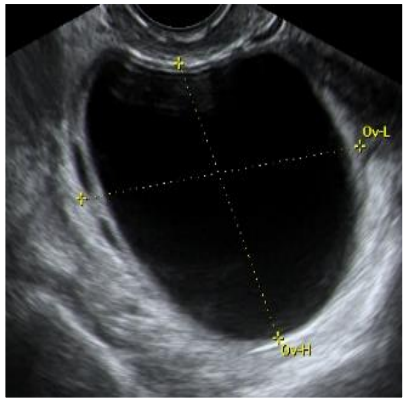
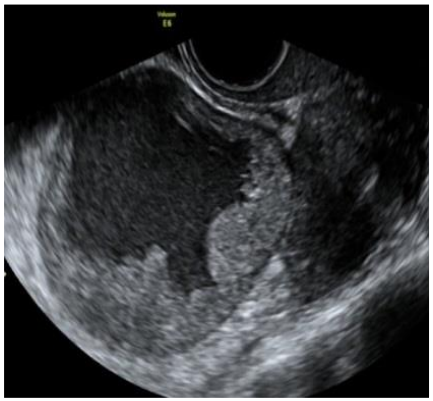



Benign Tumour

Borderline Tumour



FIGO Stage I Ovarian cancer

IOTA

**ADNEX**
**Assessment of Different NEoplasias in the adneXa**

The ADNEX-model computes the risk that a detected adnexal mass for which surgery is indicated is benign, borderline, stage I invasive, stage II-IV invasive, or metastatic cancer to the adnexa.

Start Analysis

FIGO Stage II-IV Ovarian cancer

Metastasis to the ovary

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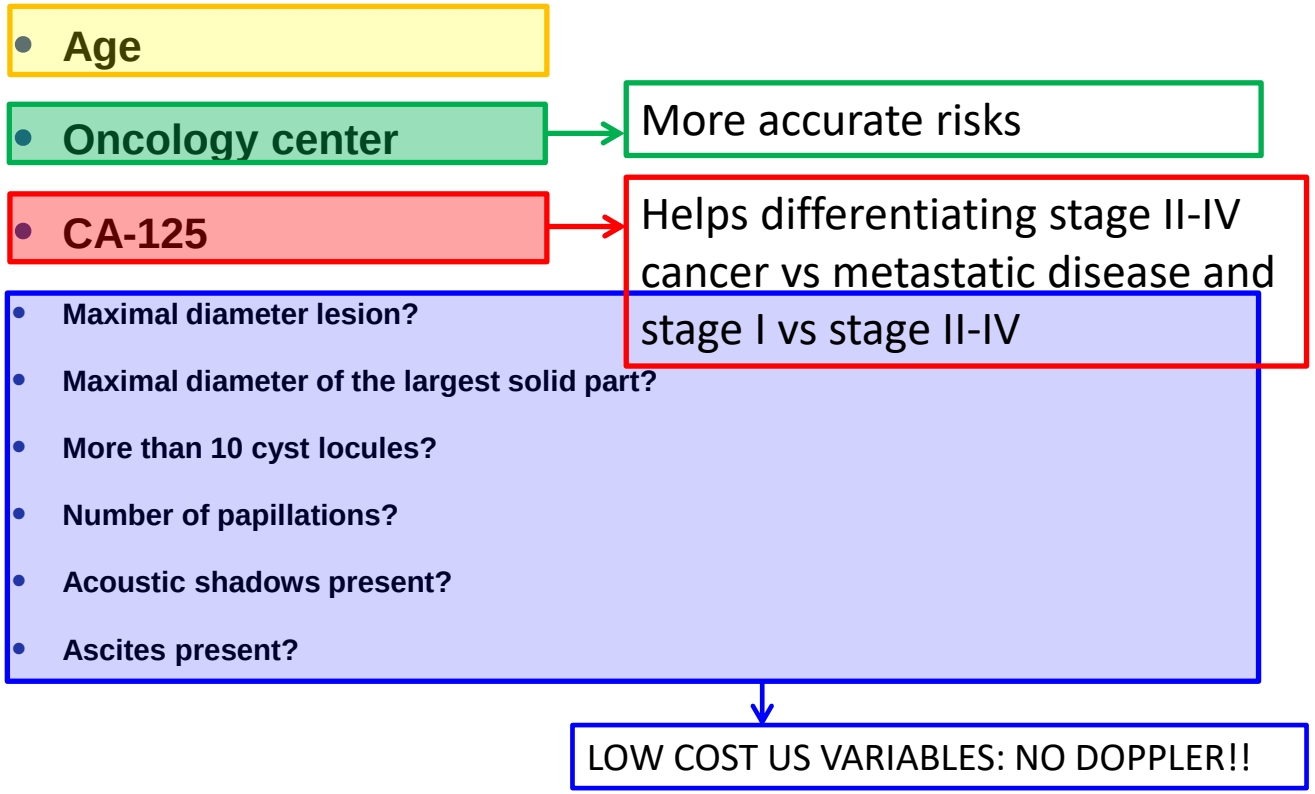
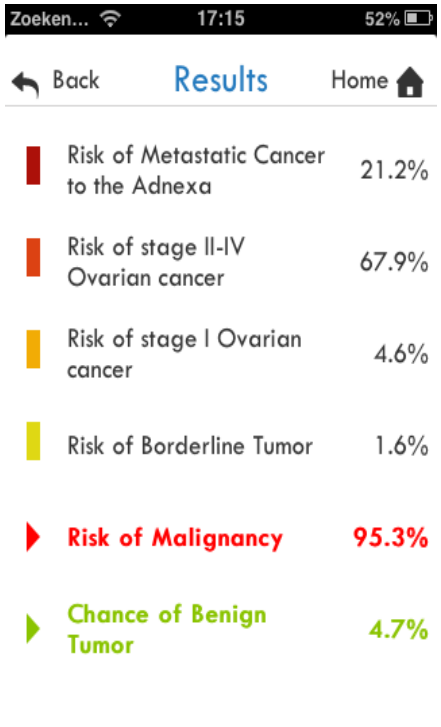
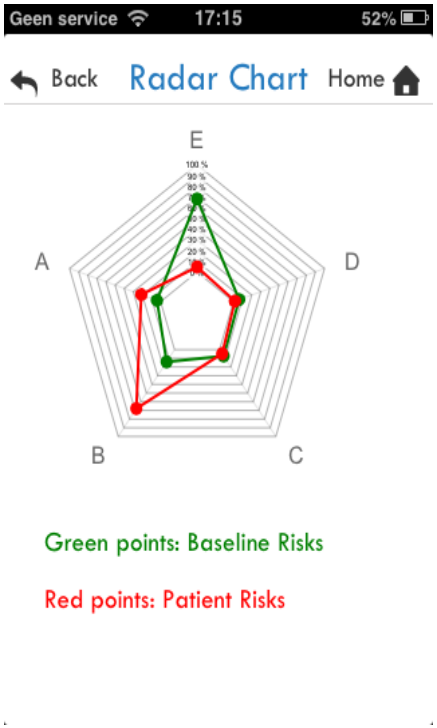
# IOTA-ADNEX (Assessment of Different NEoplasias in the adneXa)

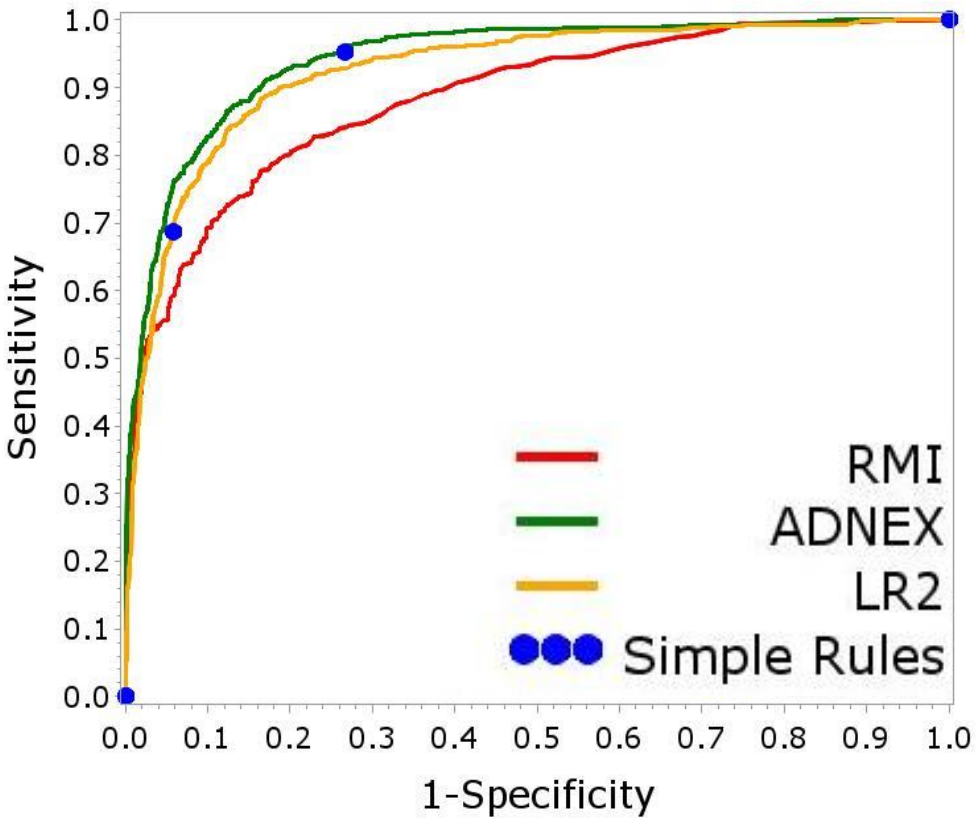


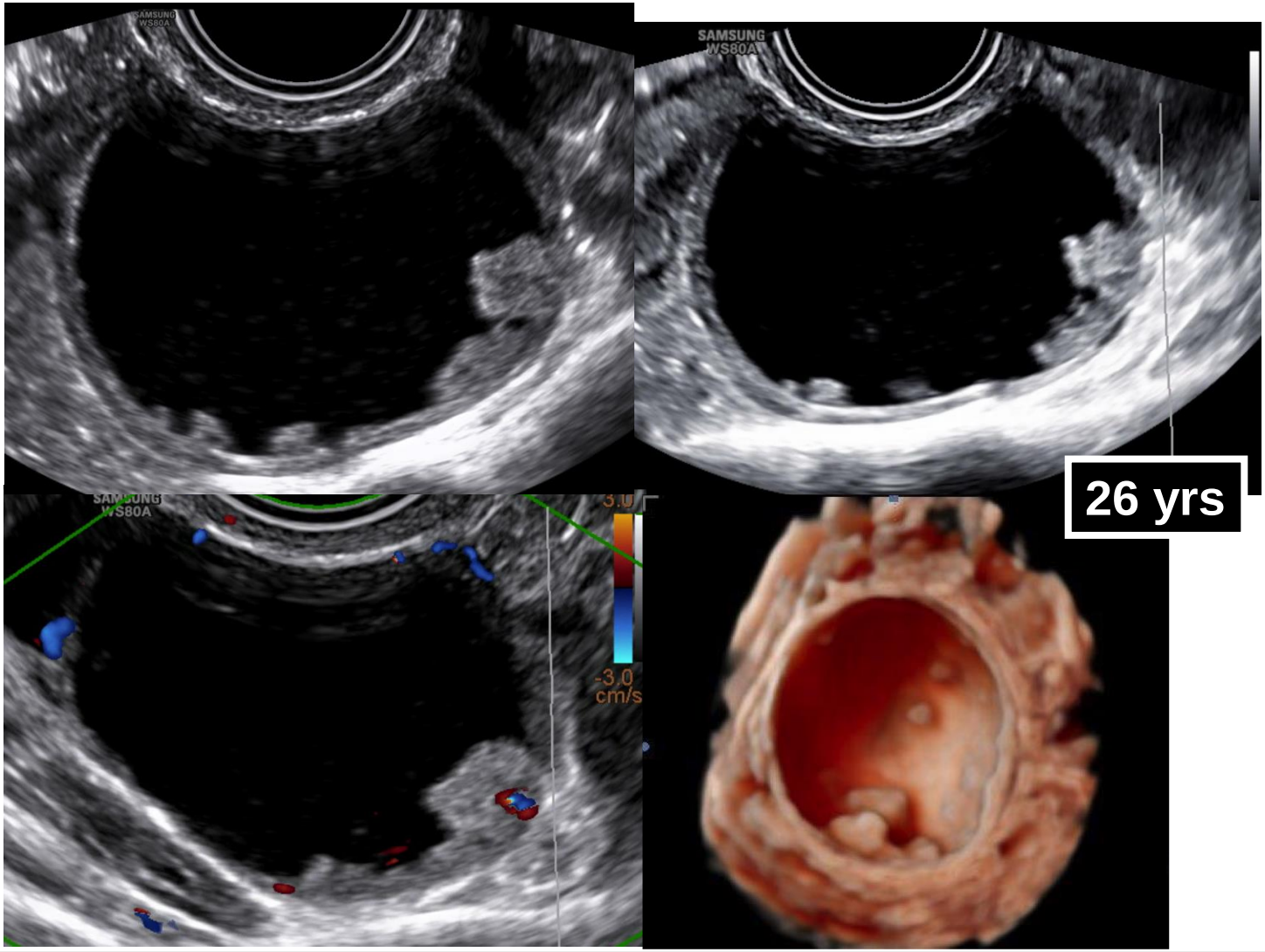
# Results (calculator on IOTA website or App)





# Test performance of the ADNEX model compared to RMI and LR2 using IOTA 3 data (n=2403)



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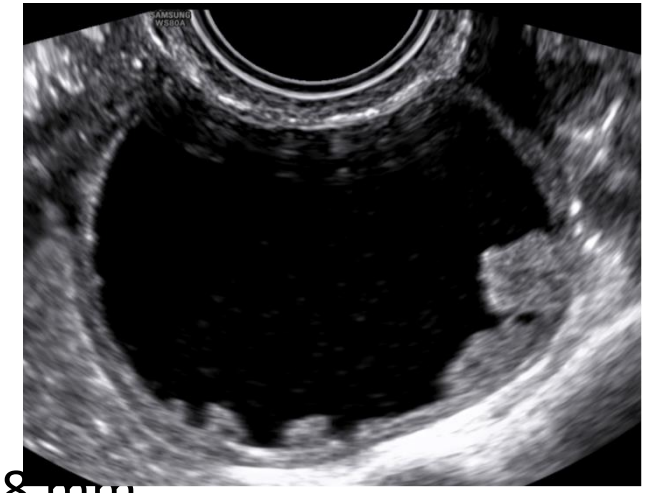


- 26 years
- Unilocular-solid lesion
- Lesion diameters 45x41x38 mm
- 4 papillary projections
- Largest papillary projection 8x7x11 mm
- Acoustic shadowing is not present
- Color score 3
- No free fluid
- CA-125 22 kU/l

# Application of the IOTA Simple Rules

- Lesion diameters 45x41x38 mm
- 4 papillary projections
- Largest papillary projection 8x7x11 mm
- Acoustic shadowing is not present
- Color score 3
- No free fluid

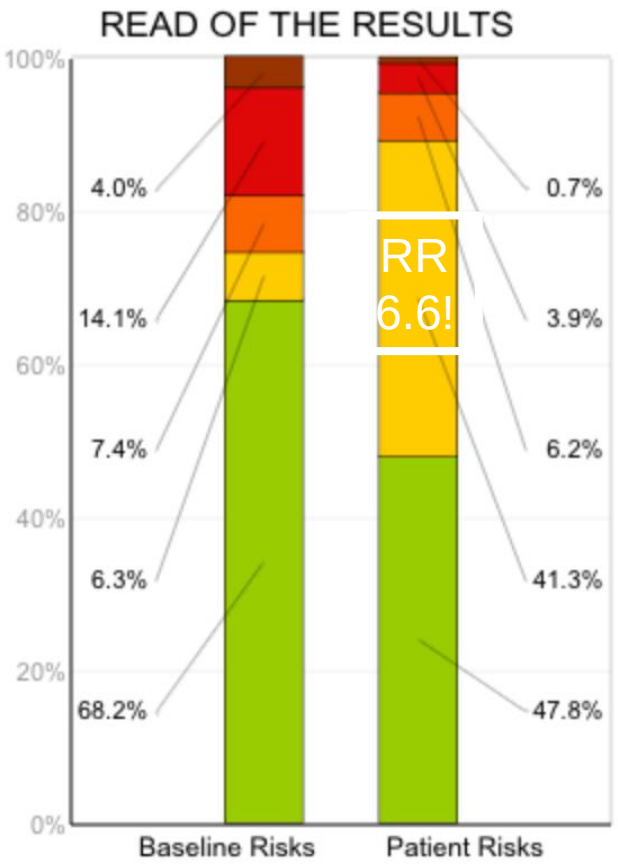
| *Rules for predicting a malignant tumor (M-rules)* | | *Rules for predicting a benign tumor (B-rules)* | |
|---|---|---|---|
| M1 Irregular solid tumor | ☐ | B1 Unilocular | ☐ |
| M2 Presence of ascites | ☐ | B2 Presence of solid components where the largest solid component has a largest diameter < 7 mm | ☐ |
| M3 At least four papillary structures | ■ | B3 Presence of acoustic shadows | ☐ |
| M4 Irregular multilocular solid tumor with largest diameter ≥ 100 mm | ☐ | B4 Smooth multilocular tumor with largest diameter < 100 mm | ☐ |
| M5 Very strong blood flow (color score 4) | ☐ | B5 No blood flow (color score 1) | ☐ |

**MALIGNANT**

# ADNEX model

| | |
|---|---|
| Risk of Metastatic Cancer to the Adnexa | 0.7% |
| Risk of stage II-IV Ovarian cancer | 3.9% |
| Risk of stage I Ovarian cancer | 6.2% |
| Risk of Borderline Tumor | 41.3% |
| **Risk of Malignancy** | **52.2%** |
| **Chance of Benign Tumor** | **47.8%** |

Without CA-125




Guy's Cancer

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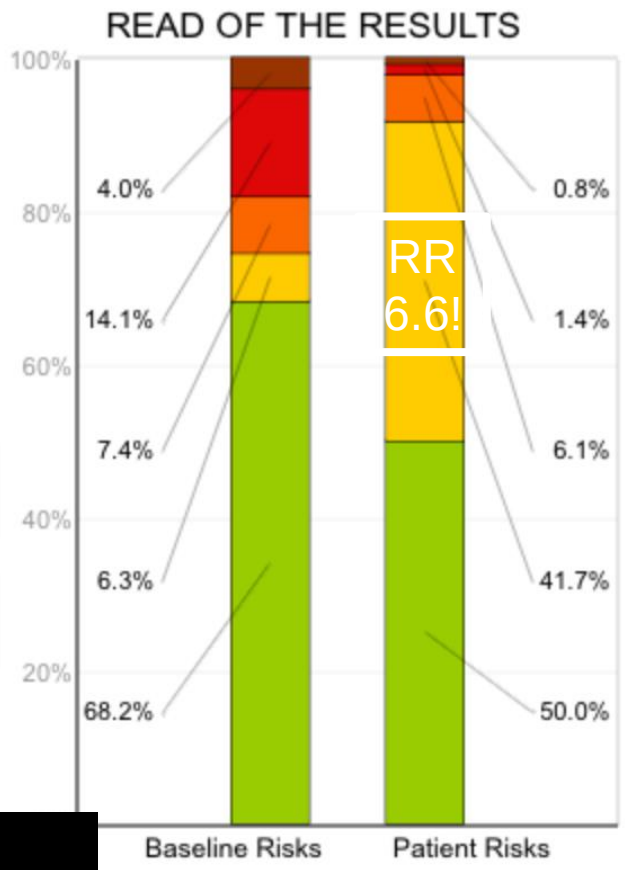
NHS Foundation Trust

# ADNEX model

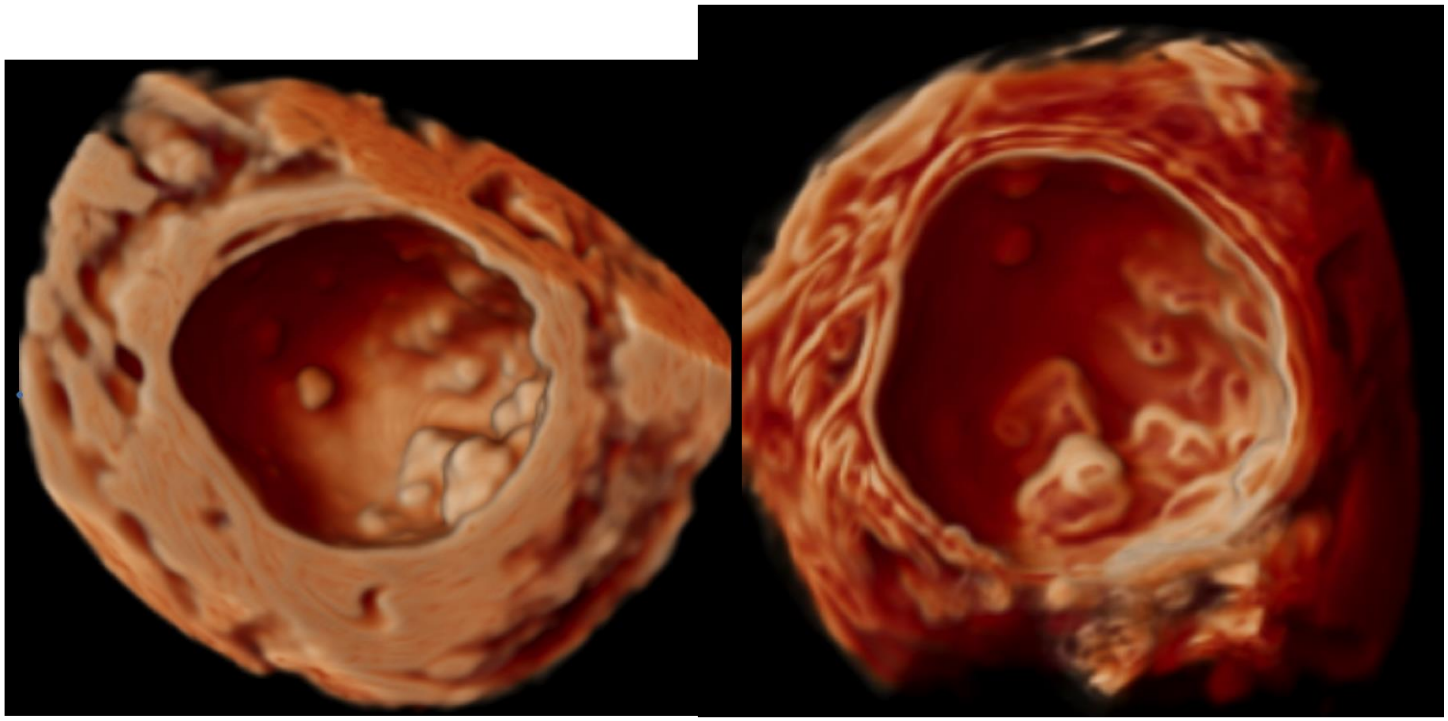
| | |
|---|---|
| Risk of Metastatic Cancer to the Adnexa | 0.8% |
| Risk of stage II-IV Ovarian cancer | 1.4% |
| Risk of stage I Ovarian cancer | 6.1% |
| Risk of Borderline Tumor | 41.7% |
| **Risk of Malignancy** | **49.9%** |
| **Chance of Benign Tumor** | **50.1%** |



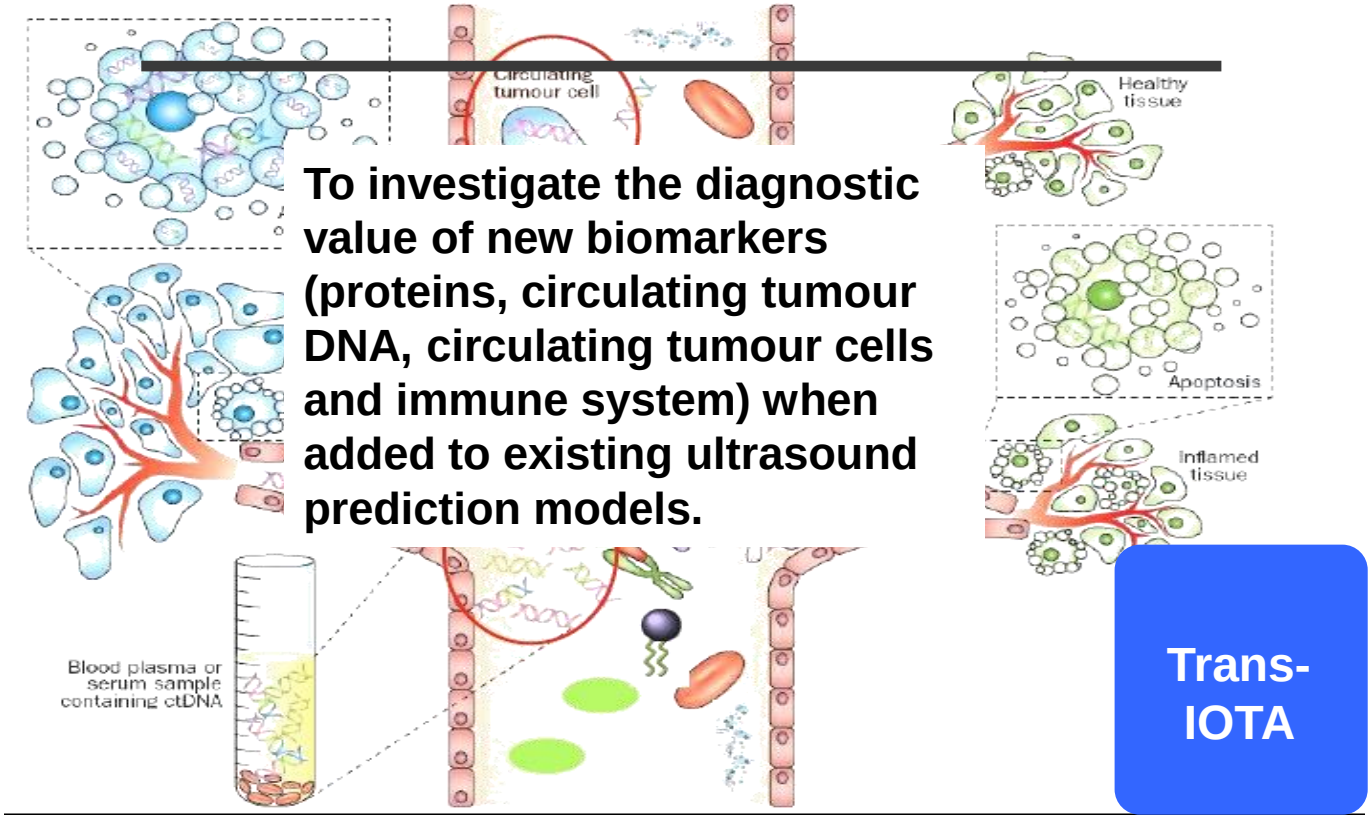

With CA-125 (22 kU/l)

# BORDERLINE SEROUS CYSTADENOMA

**C 2**



# The IOTA study phase 7 (Trans-IOTA)



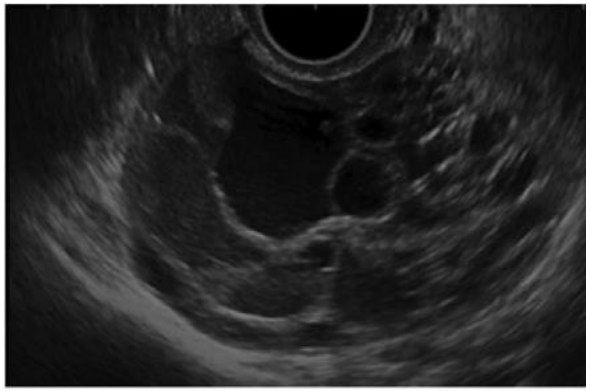

**To investigate the diagnostic value of new biomarkers (proteins, circulating tumour DNA, circulating tumour cells and immune system) when added to existing ultrasound prediction models.**

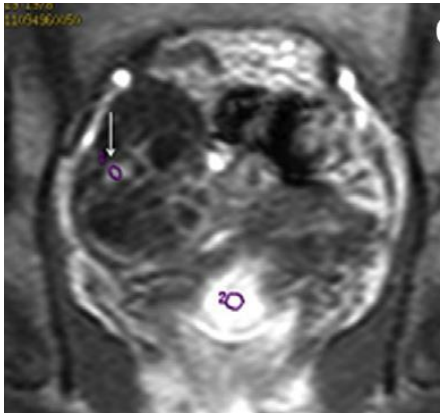
**Trans-IOTA**

# IOTA-MRI

To investigate the ability of MRI perfusion- and diffusion-weighted imaging to correctly discriminate between benign and malignant adnexal masses that cannot be classified using the IOTA Simple Rules

EURAD
MCQ-test





OXFORD ACADEMIC

human reproduction update

eshre SCIENCE MOVING PEOPLE MOV NG SC ENCE

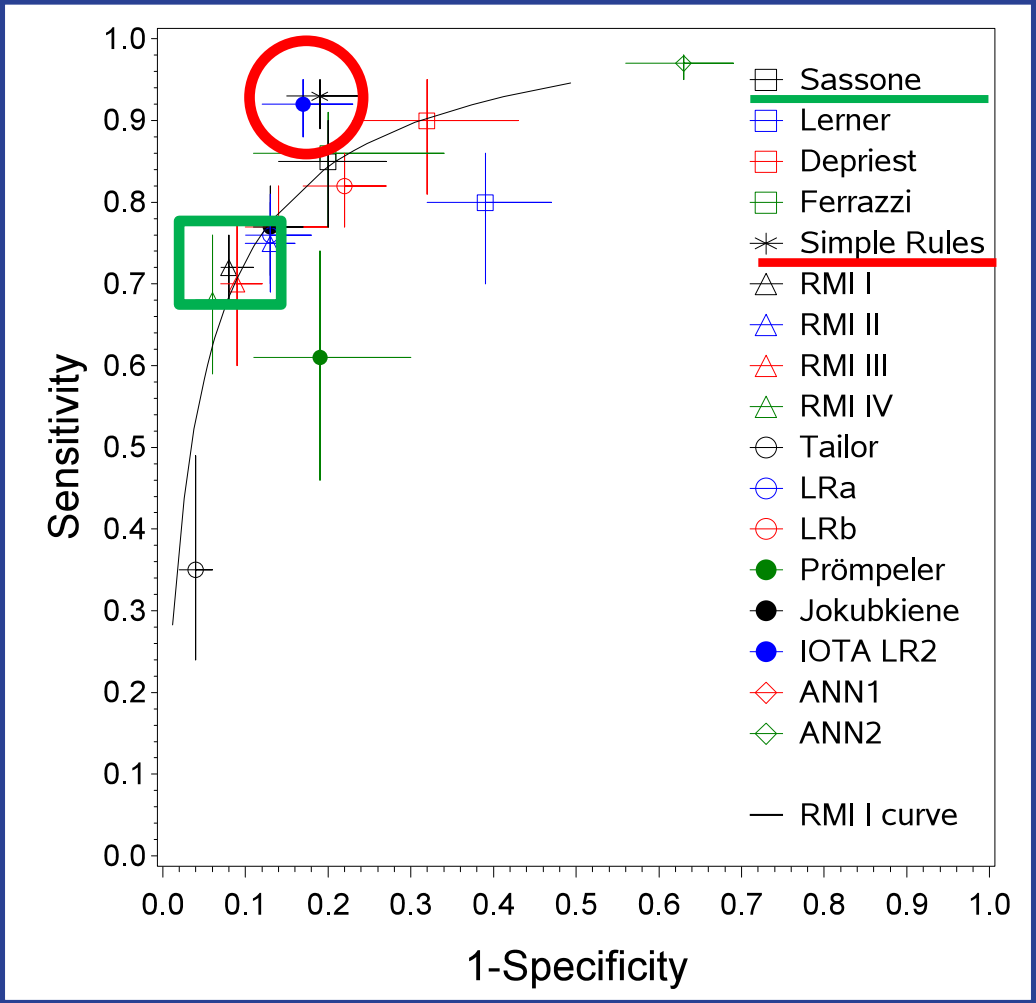
Volume 20, Issue 3

# Presurgical diagnosis of adnexal tumours using mathematical models and scoring systems: a systematic review and meta-analysis FREE

Jeroen Kaijser, Ahmad Sayasneh, Kirsten Van Hoorde, Sadaf Ghaem-Maghami, Tom Bourne, Dirk Timmerman ✉, Ben Van Calster

Guy's Cancer

Guy's and St Thomas' NHS Foundation Trust




Kaijser et al. Hum Reprod Update 2014;20 (3):449-

International Journal of Gynecological Cancer. 24(7):1173–1180, SEP 2014
DOI: 10.1097/IGC.0000000000000181 , PMID: 24987915
Issn Print: 1048-891X
Publication Date: 2014/09/01

Print

# Prognostic Value of Serum HE4 Levels and Risk of Ovarian Malignancy Algorithm Scores at the Time of Ovarian Cancer Diagnosis

Jeroen Kaijser; Vanya Van Belle; Toon Van Gorp; Ahmad Sayasneh; Ignace Vergote; Tom Bourne; Ben Van Calster; Dirk Timmerman

**CONCLUSION:**
Pretreatment HE4 levels and ROMA scores are not independent prognostic factors for DSS and PFS after multivariable adjustment in patients with ovarian cancer.

ULTRASOUND
in Obstetrics & Gynecology

isuog

Original Paper

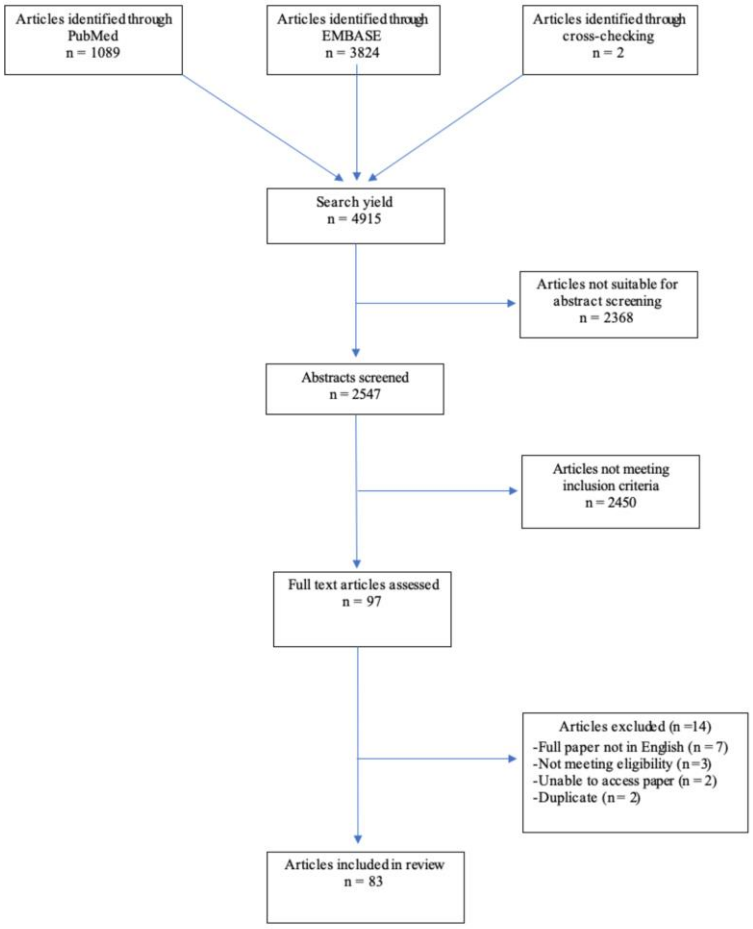
# Are serum HE4 or ROMA scores useful to experienced examiners for improving characterization of adnexal masses after transvaginal ultrasonography?

J. Kaijser, T. Van Gorp, M.-E. Smet, C. Van Holsbeke, A. Sayasneh, E. Epstein, T. Bourne, I. Vergote, B. Van Calster, D. Timmerman

Cureus
Journal of Medical Science

# Is Ultrasound a Reliable and Reproducible Method for Assessing Adnexal Masses in Pregnancy? A Systematic Review

Jonathan E. Gaughran ✉, Osama Naji, Mohammed Q. Al Sabbagh, Ahmad Sayasneh




October 2021

In conclusion, currently, there is a lack of high-quality prospective studies to guide the management of adnexal masses in pregnancy. Ultrasound appears to have an adequate accuracy in differentiating benign from malignant masses; however, more research is required to assess the role of ultrasound models, rules, and subjective assessment in pregnancy compared to non-pregnant women.

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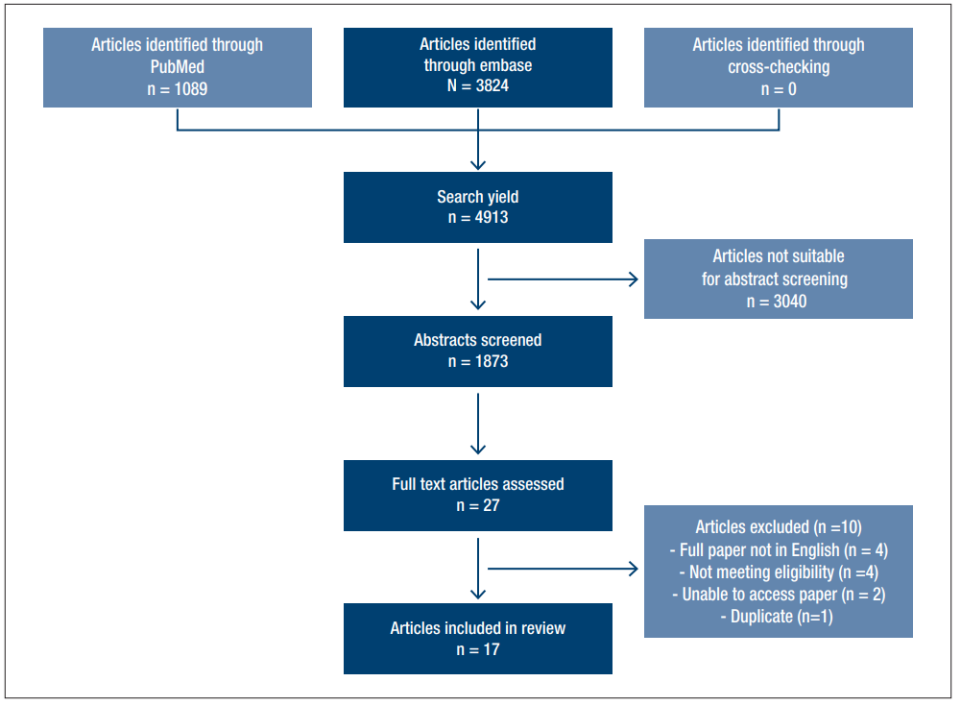
ESG

European Gynecology & Obstetrics

# Can ultrasound reliably assess ovarian endometriomas in pregnancy? A systematic review

Jonathan Gaughran [1*], Osama Naji [1], Anas Murad [2], Ahmad Sayasneh [3,4]

[1] Department of Women's Health, Guy's & St Thomas' NHS Foundation Trust; [2] Faculty of Medicine, University of Jordan, Amman, Jordan; [3] Department of Surgical Oncology, Guy's and St Thomas' NHS Foundation Trust, Guy's Hospital, Great Maze Pond, SE1 9RT; [4] School of Life Course Sciences, Faculty of Life Sciences and Medicine, St Thomas' Campus, Westminster Bridge Road, London, SE1 7EH




Jan 2022

There is currently a lack of high-quality prospective studies to guide the clinician on how to diagnose and manage ovarian endometriomas in pregnancy. The accuracy of ultrasound in deciphering benign endometriomas from malignant masses appears to be less in pregnant than in non-pregnant women. Further work is required to assess the role of ultrasound models for assessing endometriomas in pregnancy.

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SAGE journals

PubMed.gov

An Evaluation of the Effectiveness of Image-based Texture Features Extracted from Static B-mode Ultrasound Images in Distinguishing between Benign and Malignant Ovarian Masses

Dhurgham Al-karawi, Hisham Al-Assam, Hongbo Du, Ahmad Sayasneh, Chiara Landolfo, Dirk Timmerman, Tom Bourne, and Sabah Jassim

The Walking Egg

FACTS, VIEWS & VISION

Issues in Obstetrics, Gynaecology and Reproductive Health

inObGyn

February, 2021

Automated characterisation of ultrasound images of ovarian tumours: the diagnostic accuracy of a support vector machine and image processing with a local binary pattern operator

S. Khazendar,[1] A. Sayasneh,[2] H. Al-Assam,[1] H. Du,[1] J. Kaijser,[3] L. Ferrara,[4] D. Timmerman,[3] S. Jassim,[1] and T. Bourne[2,3,4]

SPIE. DIGITAL LIBRARY

**An automated technique for potential differentiation of ovarian mature teratomas from other benign tumours using neural networks classification of 2D ultrasound static images: a pilot study**

*Dhurgham Al-karawi, A. Sayasneh, Hisham Al-Assam, Sabah Jassim, N. Page, D. Timmerman, T. Bourne, Hongbo Du*

July, 2015

Medical Analytica

May, 2017

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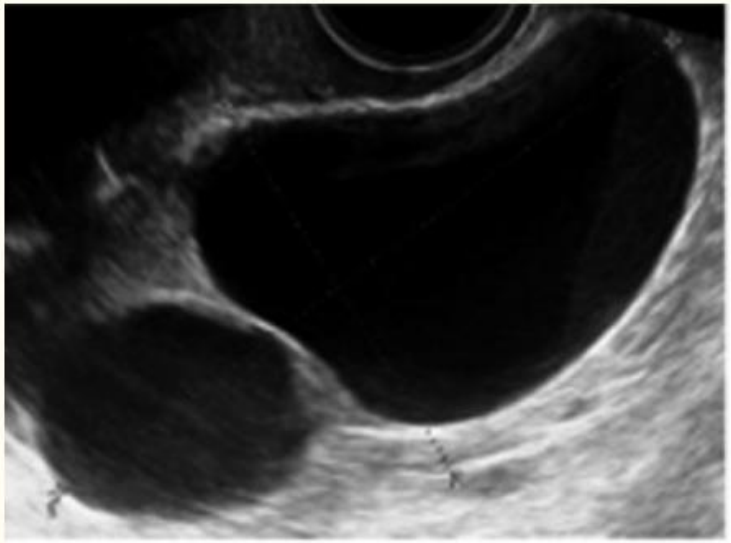
Guy's and St Thomas' NHS

NHS Foundation Trust



Original Image

LBP (8, 2) on Original Image

THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2011

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2018

# Recognitions & Awards

- **Queen's Award** for Enterprise:
  - **International trade**, 2011.
  - **Innovation**, 2012 and 2018
  - **Winner** Out standing achievement Award, Bio Pesticide summit, UK, 2019

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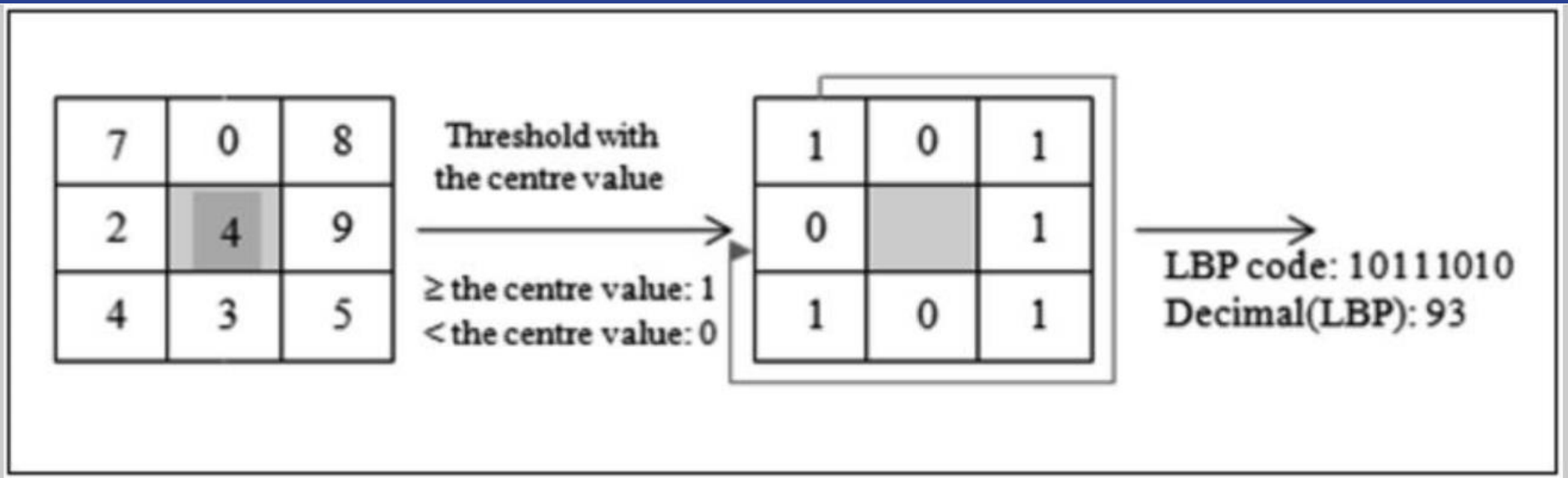
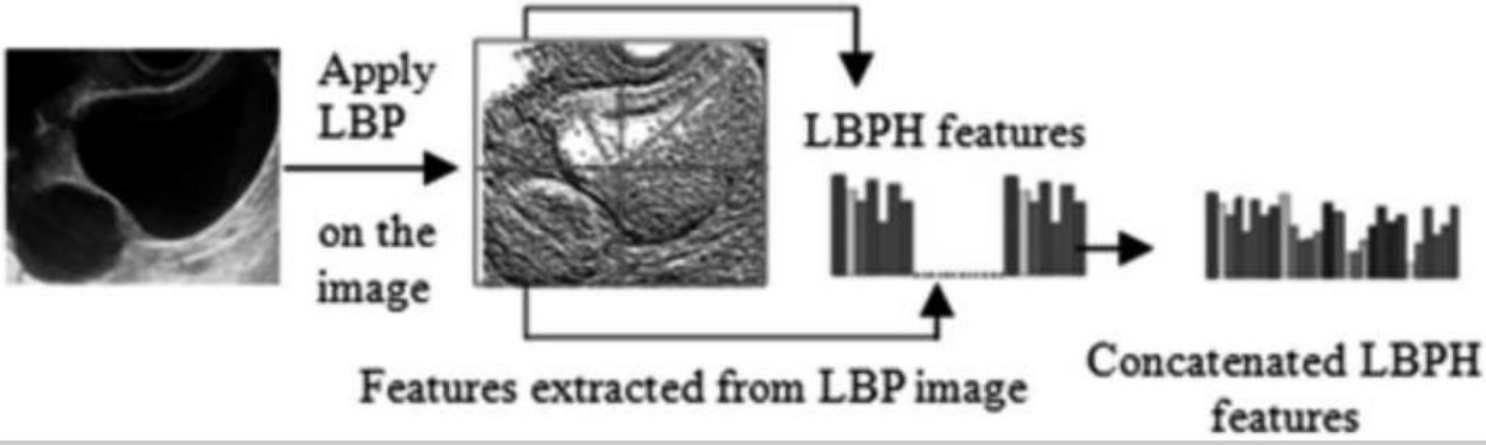
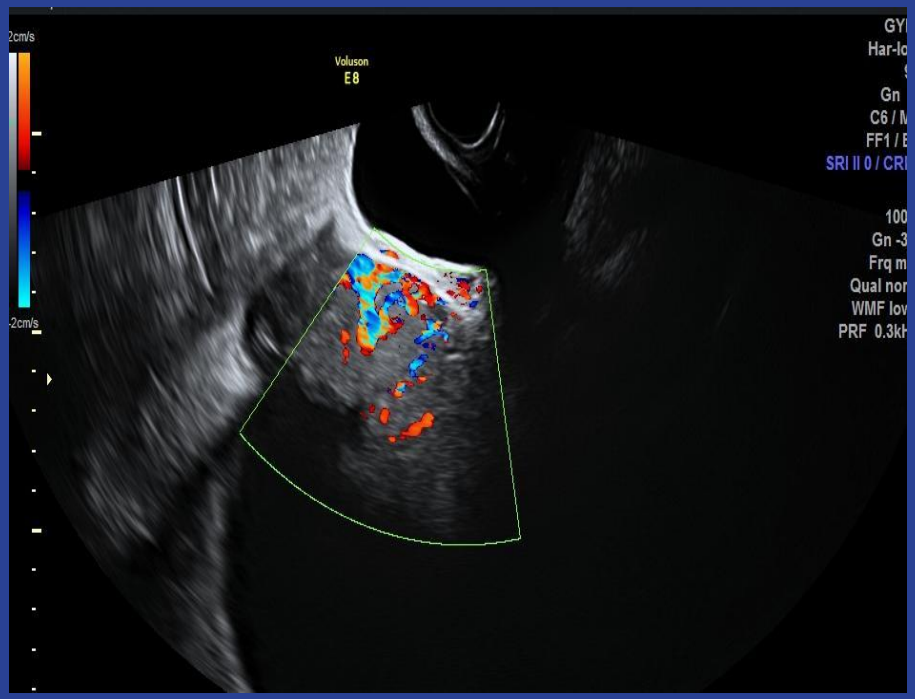
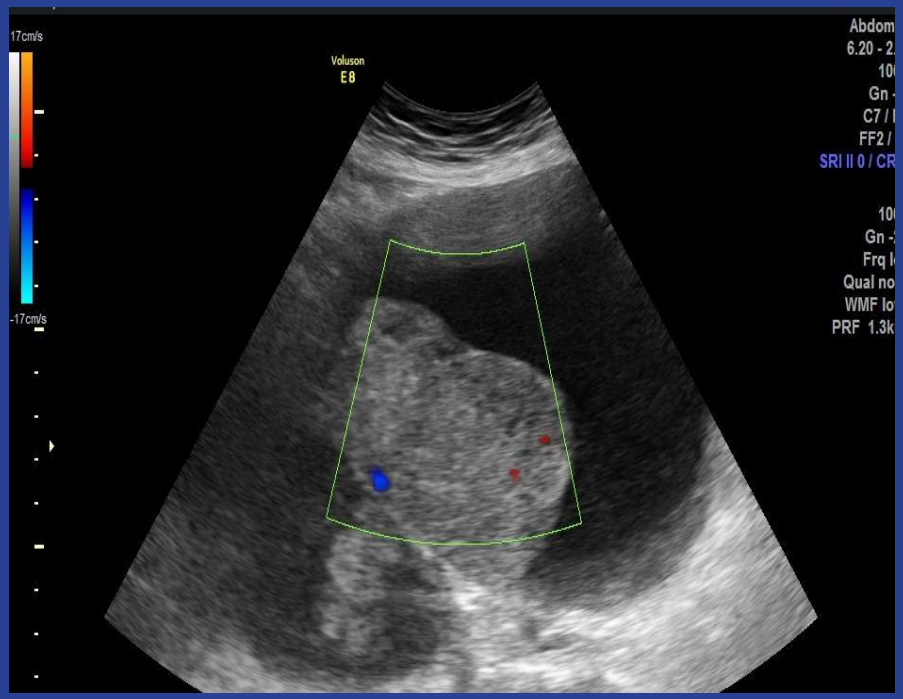
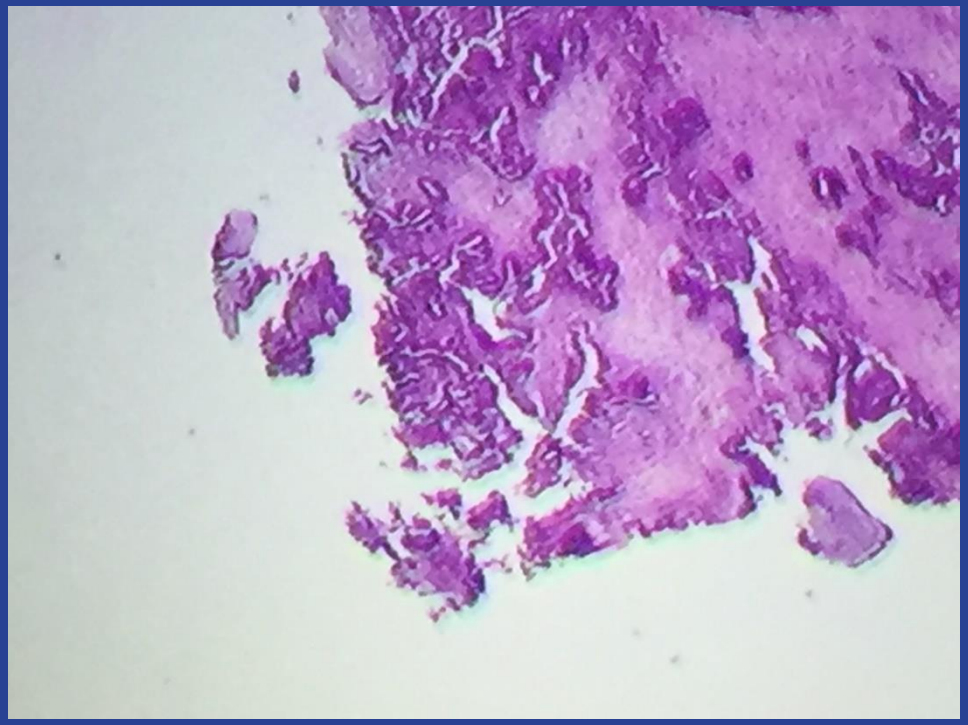

7 0 8
2 4 9
4 3 5
Threshold with the centre value
≥ the centre value: 1
< the centre value: 0
1 0 1
0 1
1 0 1
LBP code: 10111010
Decimal(LBP): 93

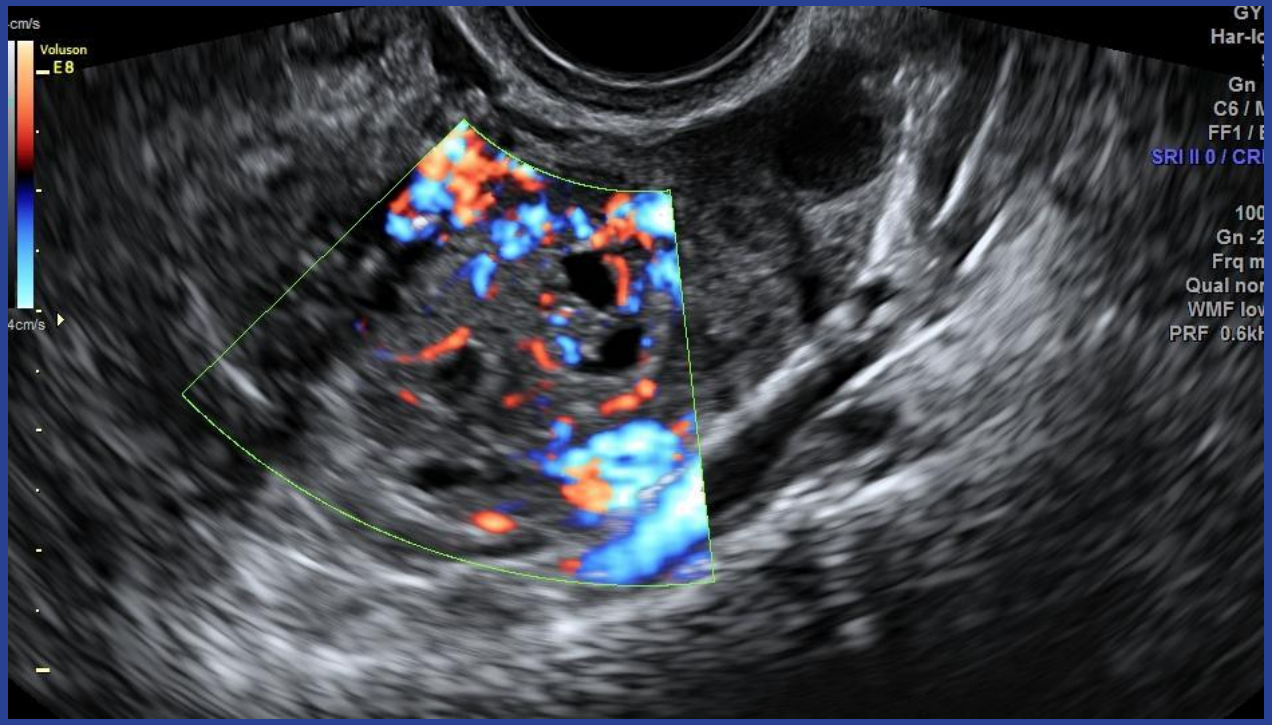

Apply LBP
on the image
LBPH features
Features extracted from LBP image
Concatenated LBPH features

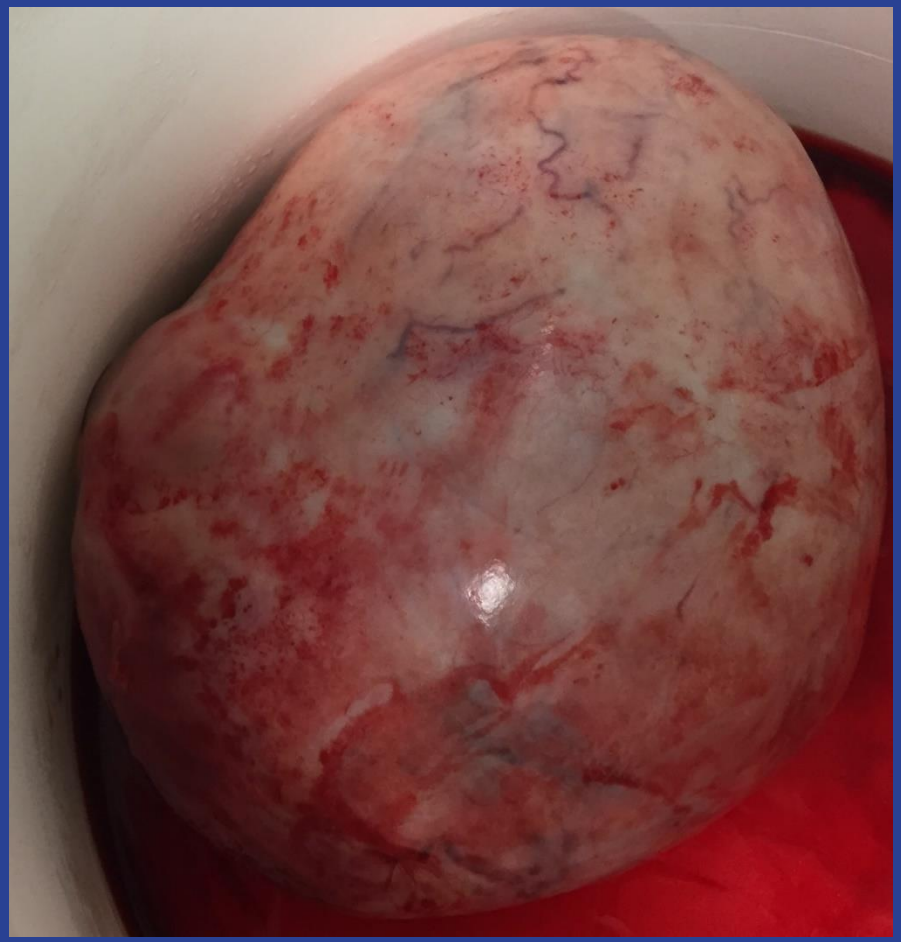

Voluson
E8

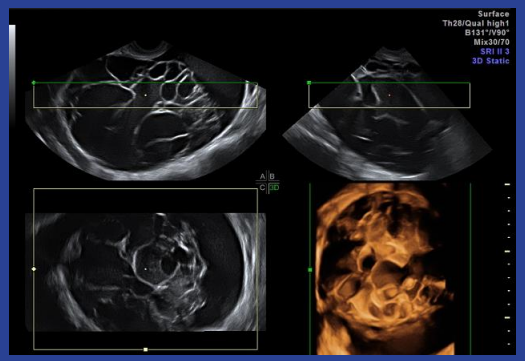

17cm/s
-17cm/s
Voluson
E8
Abdom
6.20 - 2
Gn
C7 /
FF2 /
SRI II 0 / CR
Gn
Frq
Qual no
WMF lo
PRF 1.3k

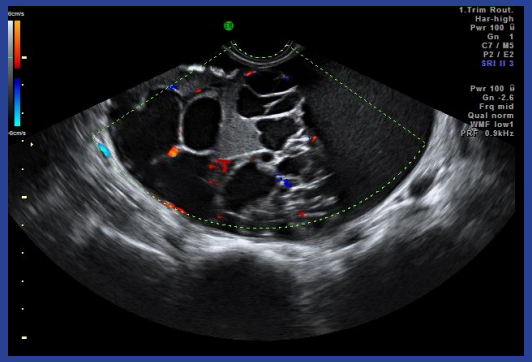
# Endometrioid adenoca

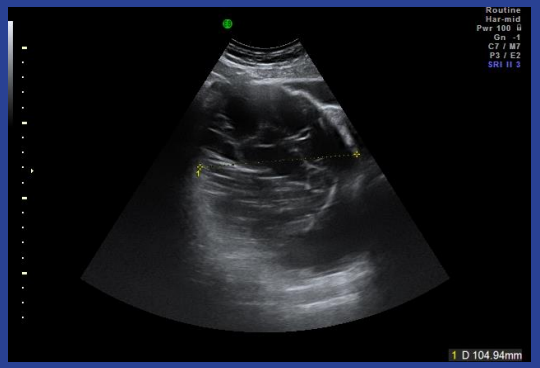


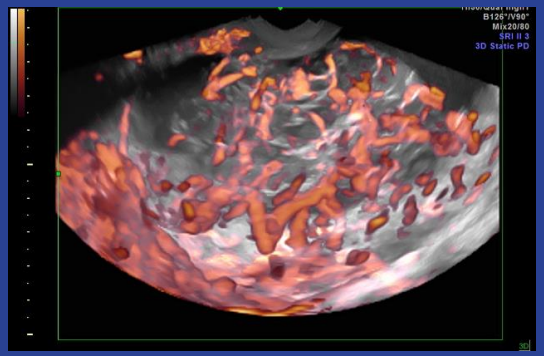

cm/s
Voluson
E8
4cm/s



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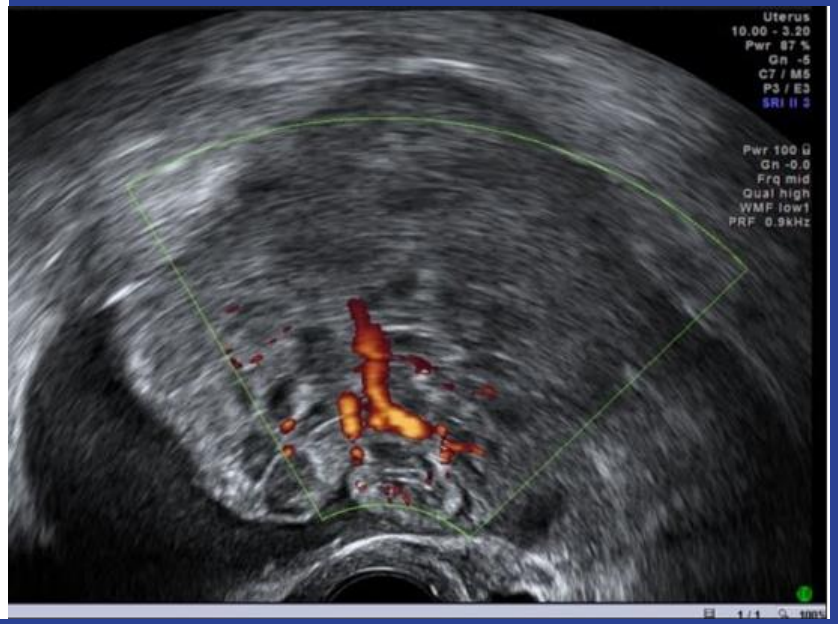
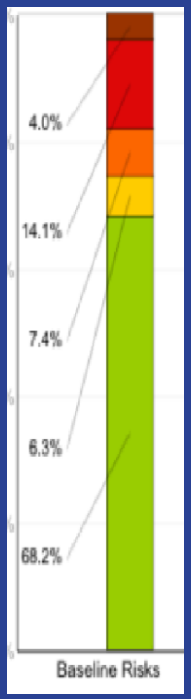
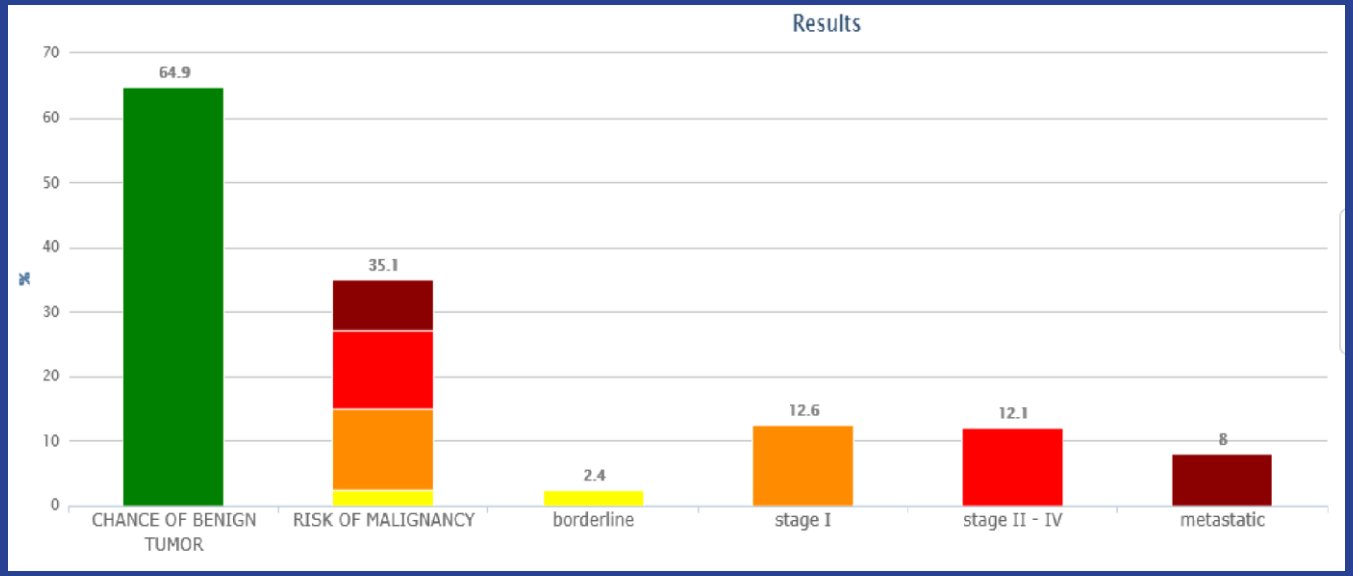
Uterus
10.00 - 3.20
Pwr 100
Gn -5
C7 / M5
P3 / E3
SRI II 3

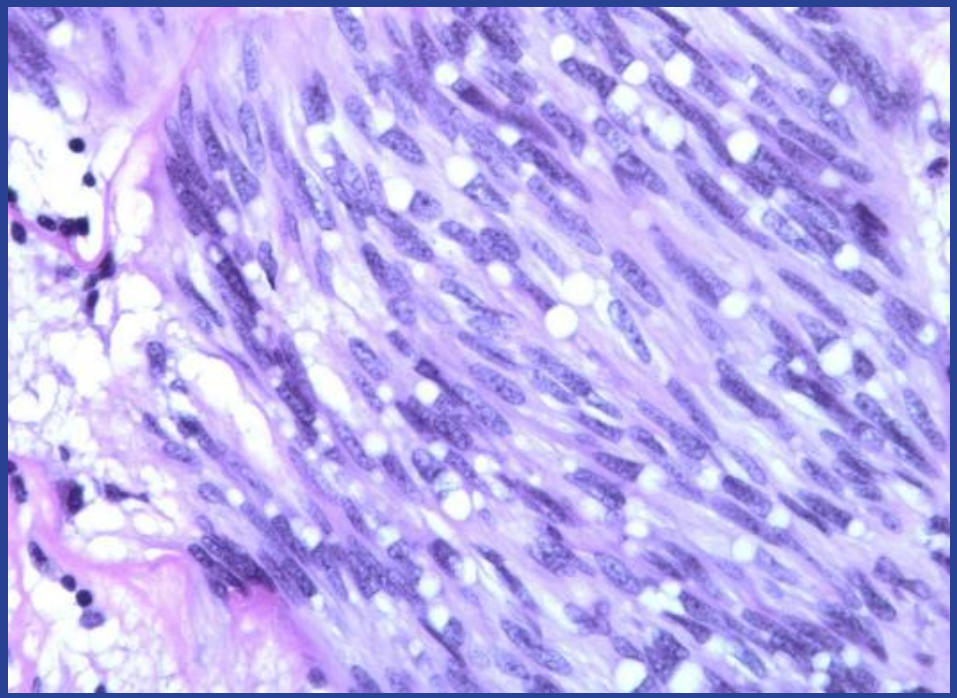

Uterus
10.00 - 3.20
Pwr 87 %
Gn -5
C7 / M5
P3 / E3
SRI II 3
Pwr 100
Gn -0.0
Frq mid
Qual high
WMF low1
PRF 0.9kHz

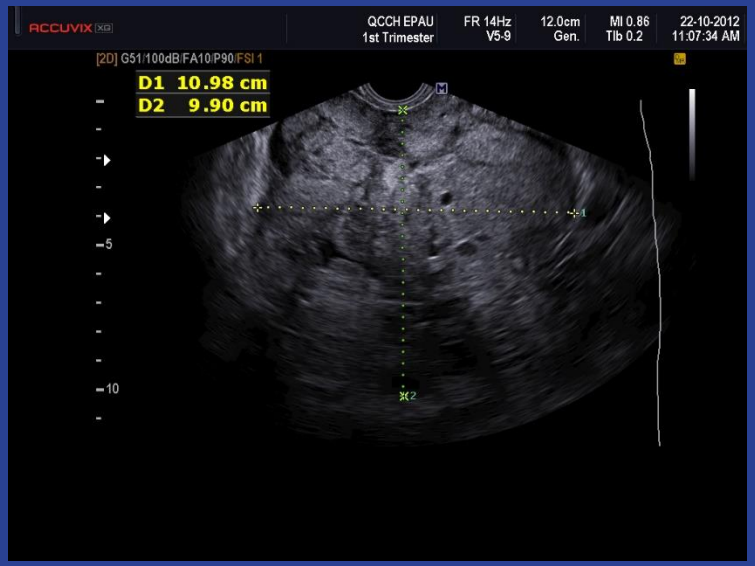
1. Age of the patient at examination (years) 43
2. Oncology center (referral center for gyn-oncol)? no
3. Maximal diameter of the lesion (mm) 60
4. Maximal diameter of the largest solid part (mm) 60
5. More than 10 locules? no
6. Number of papillations (papillary projections) none
7. Acoustic shadows present? no
8. Ascites (fluid outside pelvis) present? no
9. Serum CA-125 (U/ml) 32

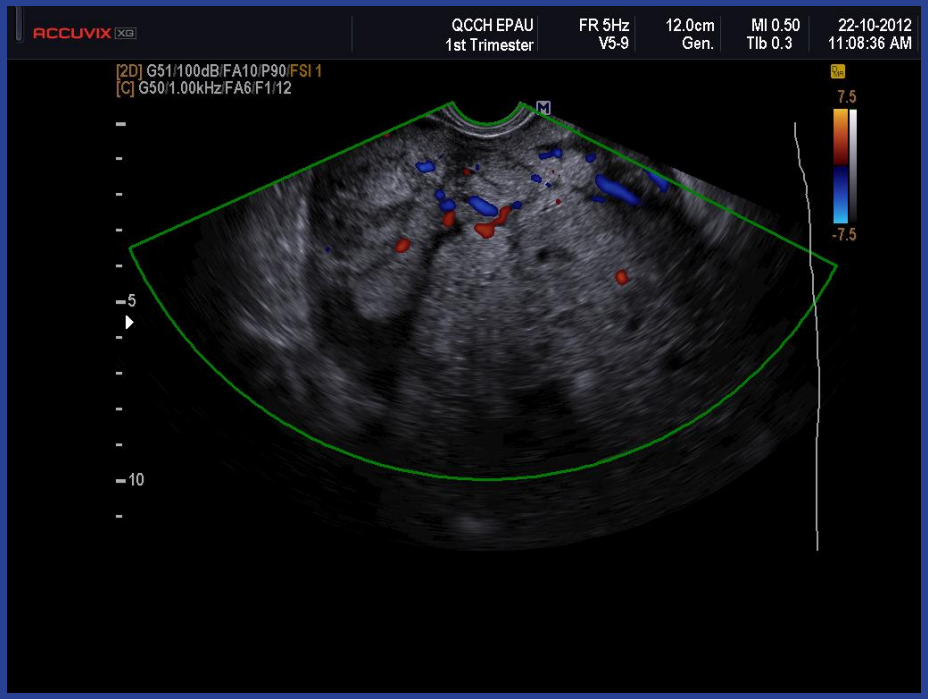

4.0%
14.1%
7.4%
6.3%
68.2%
Baseline Risks


Results
%
70
60
50
40
30
20
10
0
64.9
35.1
2.4
12.6
12.1
8
CHANCE OF BENIGN TUMOR
RISK OF MALIGNANCY
borderline
stage I
stage II - IV
metastatic

# GIST



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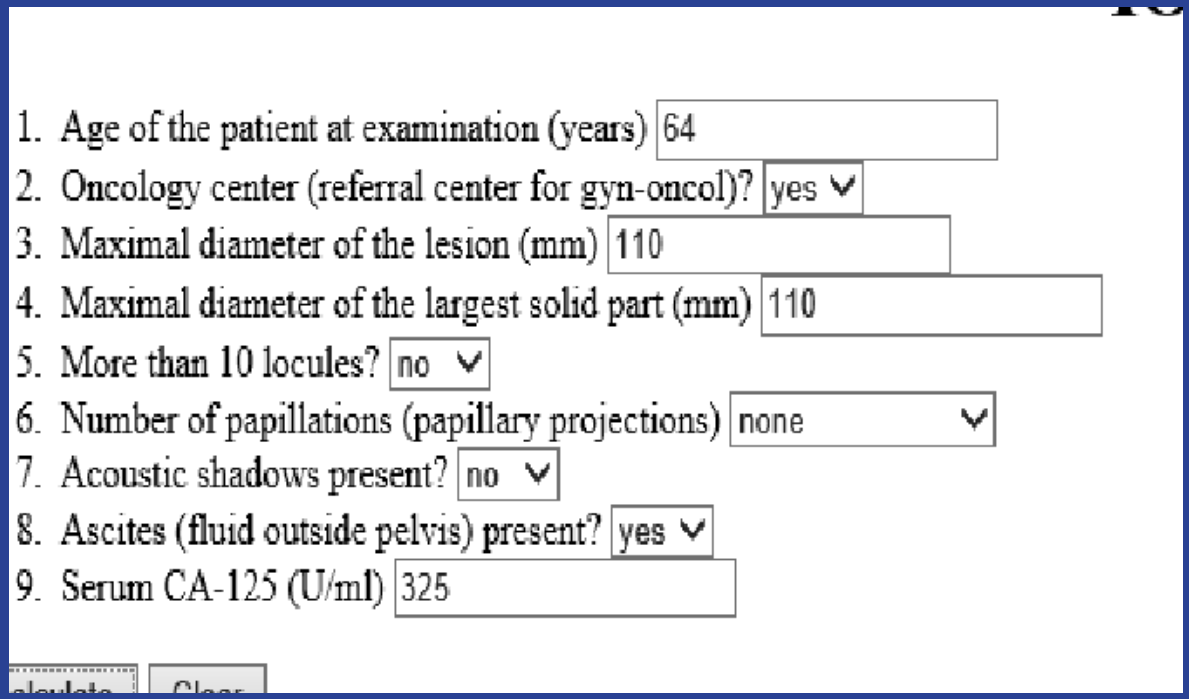
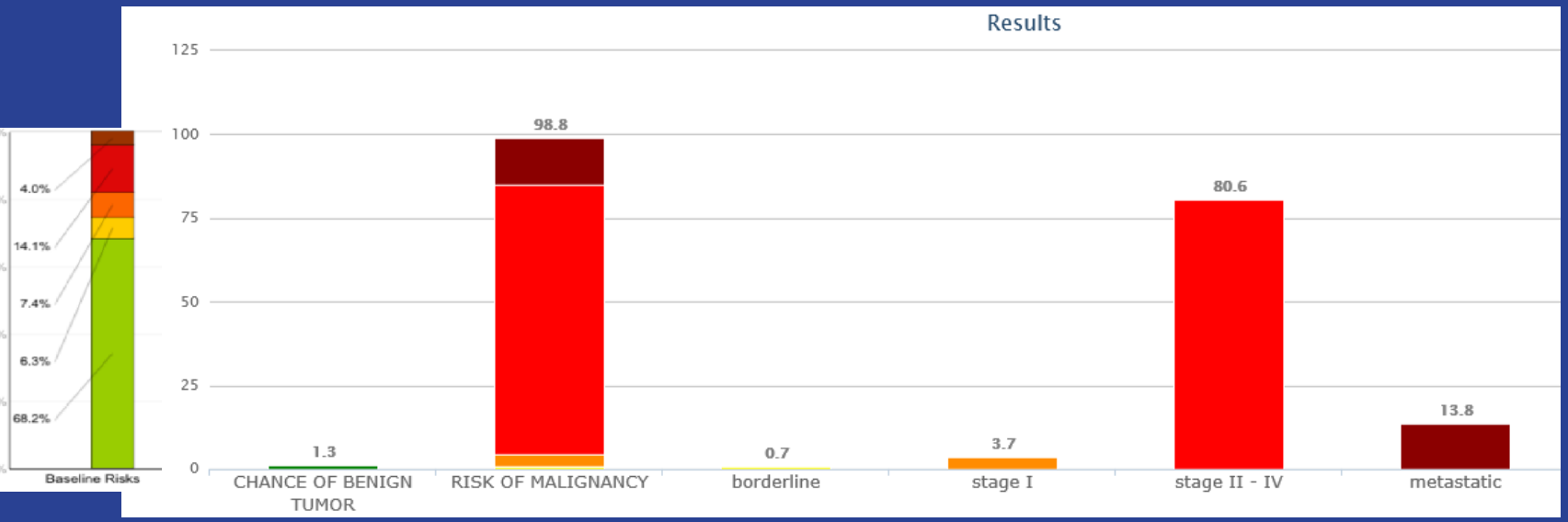

1. Age of the patient at examination (years) 64
2. Oncology center (referral center for gyn-oncol)? yes
3. Maximal diameter of the lesion (mm) 110
4. Maximal diameter of the largest solid part (mm) 110
5. More than 10 locules? no
6. Number of papillations (papillary projections) none
7. Acoustic shadows present? no
8. Ascites (fluid outside pelvis) present? yes
9. Serum CA-125 (U/ml) 325

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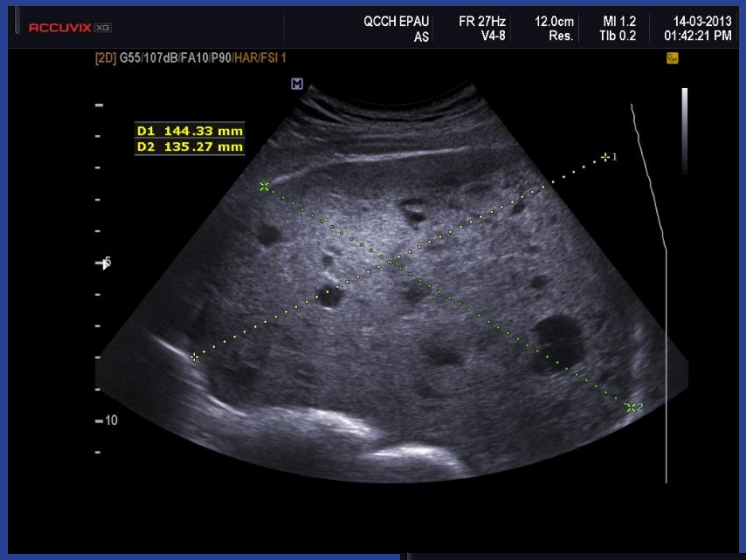
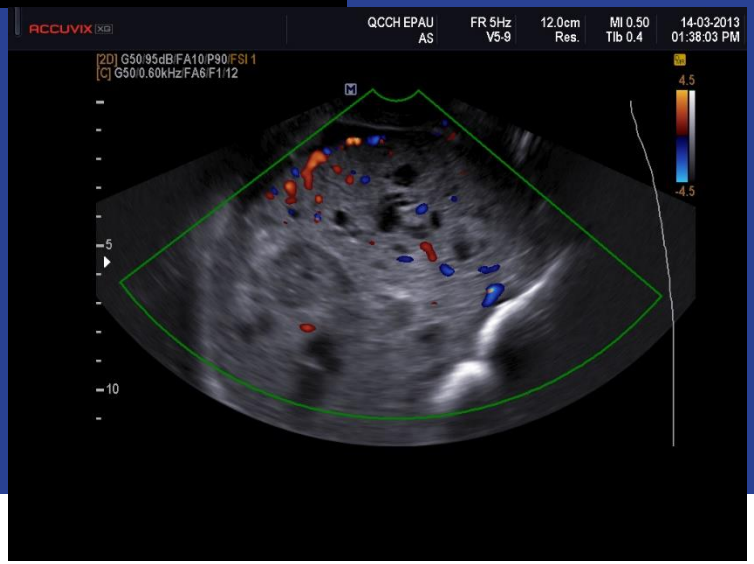
# HGSC



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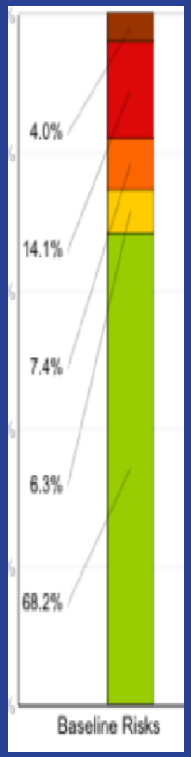
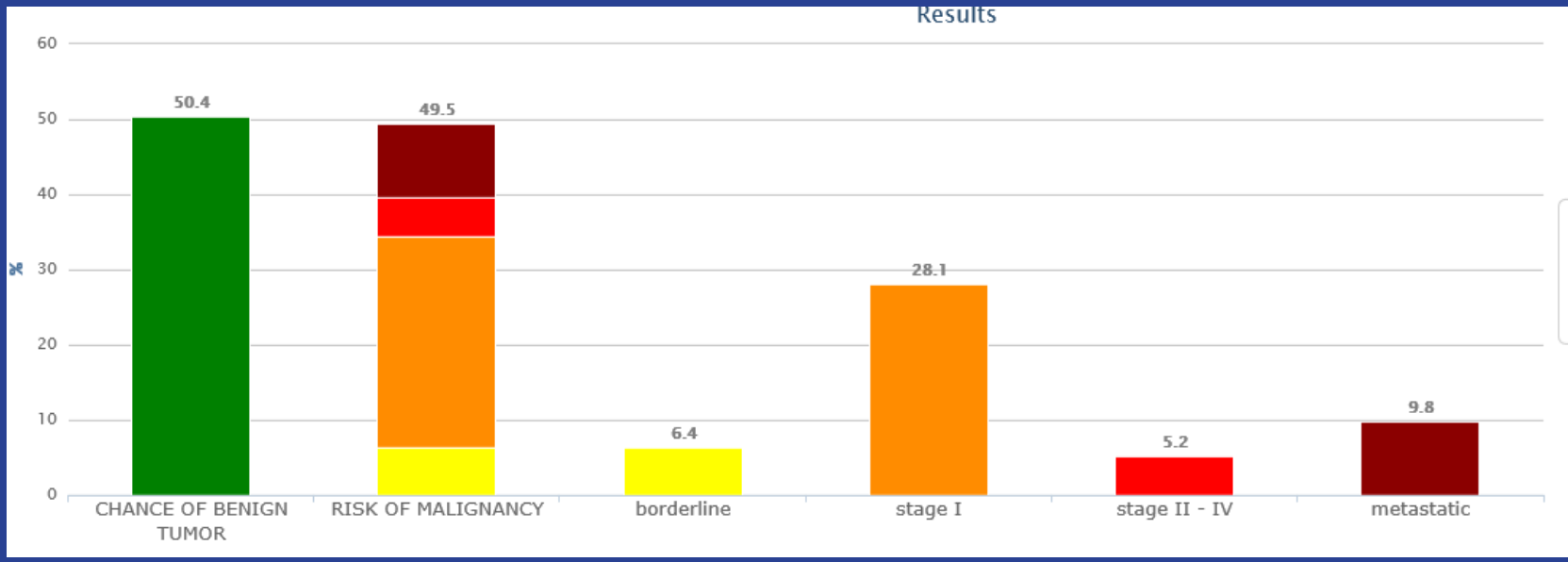
NHS Foundation Trust

1. Age of the patient at examination (years) 20
2. Oncology center (referral center for gyn-oncol)? yes
3. Maximal diameter of the lesion (mm) 144
4. Maximal diameter of the largest solid part (mm) 144
5. More than 10 locules? no
6. Number of papillations (papillary projections) none
7. Acoustic shadows present? no
8. Ascites (fluid outside pelvis) present? no
9. Serum CA-125 (U/ml) 22

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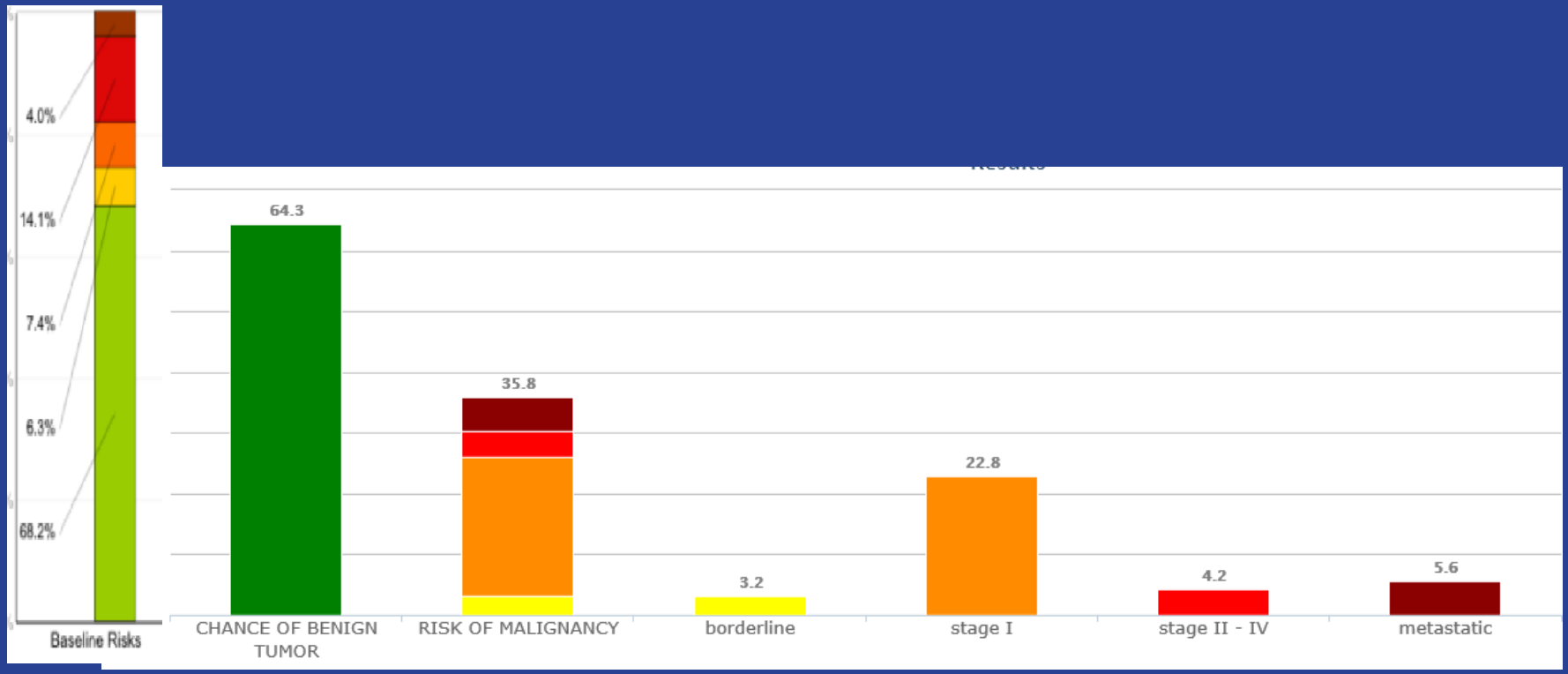
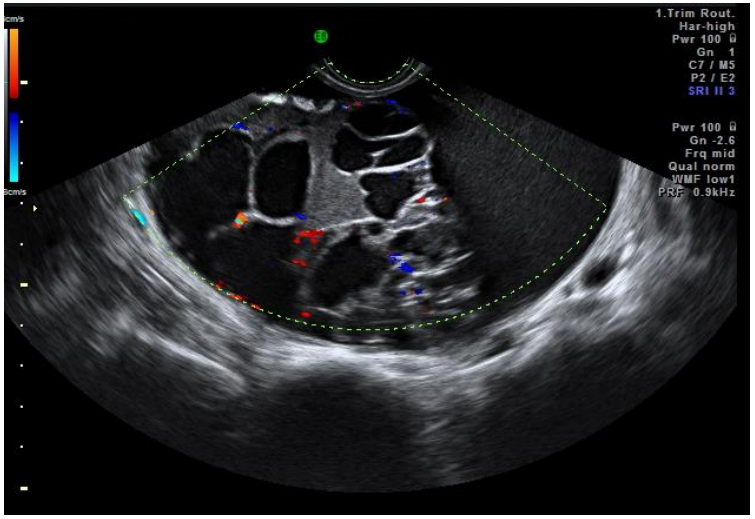
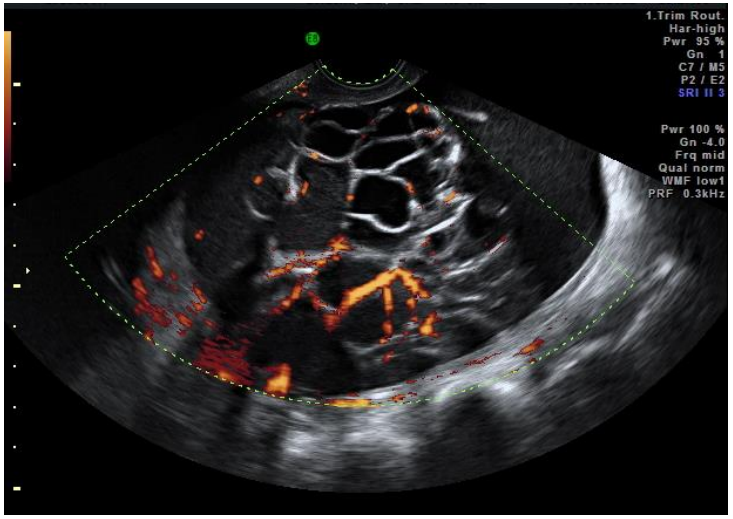
NHS Foundation Trust

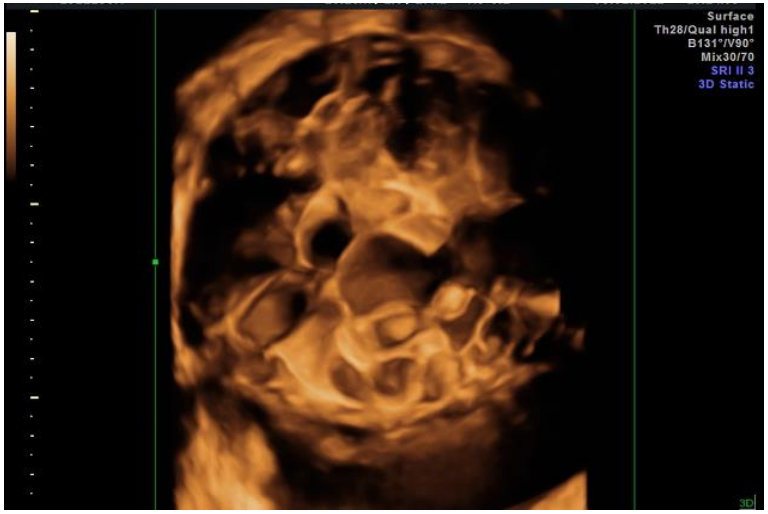
# If same patient was seen in a non-oncology hospital

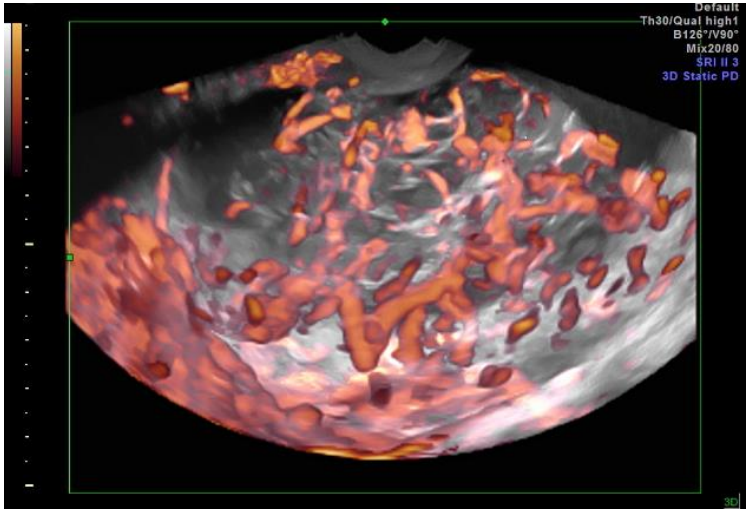


# Stage I GCT (Yalk sac GCT)


1.Trim Rout.
Har-high
Pwr 100
Gn 1
C7 / M5
P2 / E2
SRI II 3
Pwr 100
Gn -2.6
Frq mid
Qual norm
WMF low1
PRF 0.9kHz


1.Trim Rout.
Har-high
Pwr 95 %
Gn 1
C7 / M5
P2 / E2
SRI II 3
Pwr 100 %
Gn -4.0
Frq mid
Qual norm
WMF low1
PRF 0.3kHz

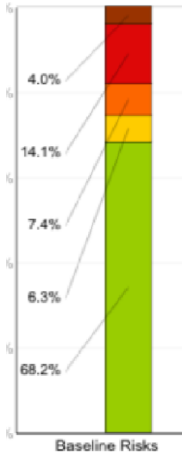

Surface
Th28/Qual high1
B131°/V90°
Mix30/70
SRI II 3
3D Static

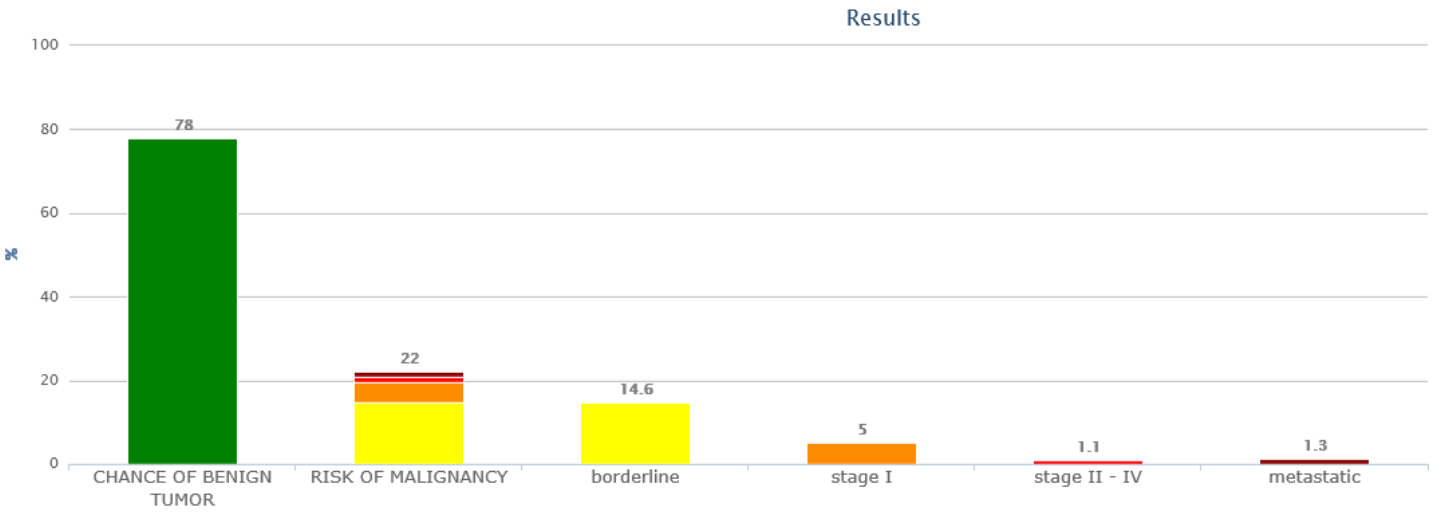

Default
Th30/Qual high1
B126°/V90°
Mix20/80
SRI II 3
3D Static PD

1. Age of the patient at examination (years) 34
2. Oncology center (referral center for gyn-oncol)? yes
3. Maximal diameter of the lesion (mm) 200
4. Maximal diameter of the largest solid part (mm) 0
5. More than 10 locules? yes
6. Number of papillations (papillary projections) none
7. Acoustic shadows present? no
8. Ascites (fluid outside pelvis) present? no
9. Serum CA-125 (U/ml)

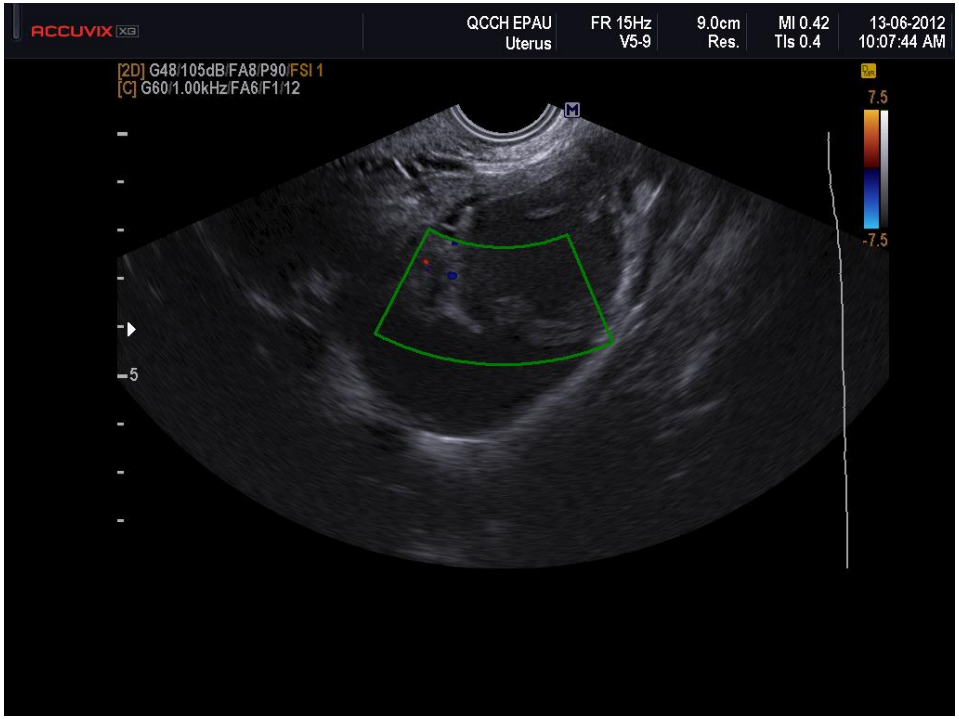
calculate Clear

*Additional information is given when moving the mouse pointer over the variable names.*



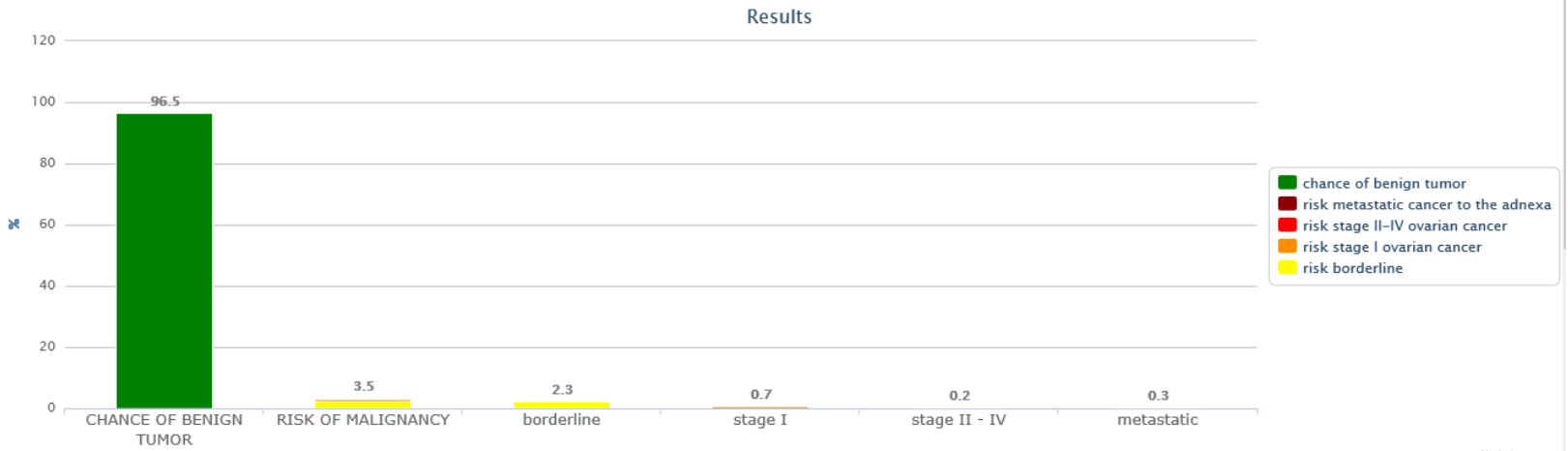
- **Luteinised mucinous cystadenoma**


ACCUVIX XG
QCCH EPAU
Uterus
FR 15Hz
V5-9
9.0cm
Res.
MI 0.42
TIs 0.4
13-06-2012
10:07:44 AM
[2D] G48/105dB/FA8/P90/FSI 1
[C] G60/1.00kHz/FA6/F1/12
7.5
-7.5
5

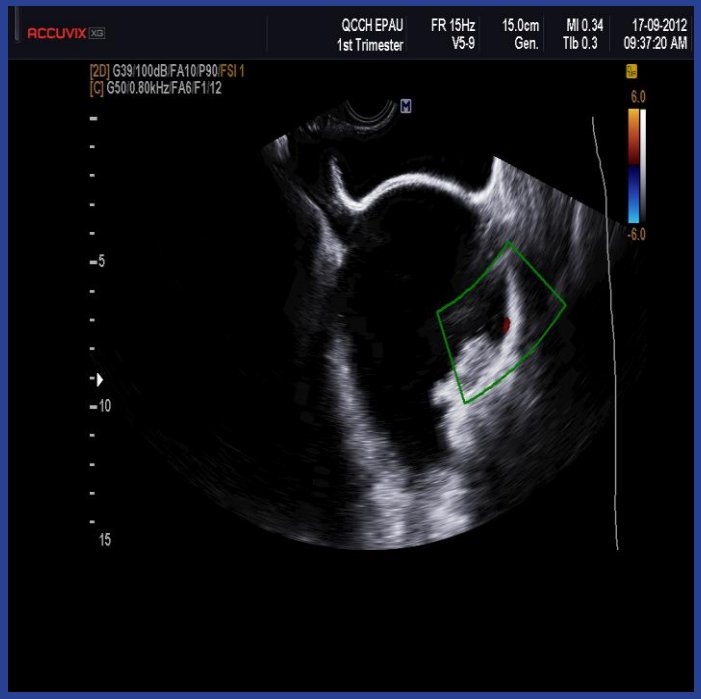
1. Age of the patient at examination (years) 45
2. Oncology center (referral center for gyn-oncol)? yes
3. Maximal diameter of the lesion (mm) 63
4. Maximal diameter of the largest solid part (mm) 0
5. More than 10 locules? no
6. Number of papillations (papillary projections) none
7. Acoustic shadows present? no
8. Ascites (fluid outside pelvis) present? no
9. Serum CA-125 (U/ml) 19

calculate Clear

*Additional information is given when moving the mouse pointer over the variable names.*



- **Tubal abscess**


ACCUVIX XG
QCCH EPAU
1st Trimester
FR 15Hz
V5-9
15.0cm
Gen.
MI 0.34
TIb 0.3
17-09-2012
09:37:20 AM
[2D] G39/100dB/FA10/P90/FSI 1
[C] G50/0.80kHz/FA6/F1/12
6.0
-6.0
5
10
15

ACCUVIX XG
QCCH EPAU
1st Trimester
FR 11Hz
V5-9
18.0cm
Gen.
MI 0.96
TIb 0.2
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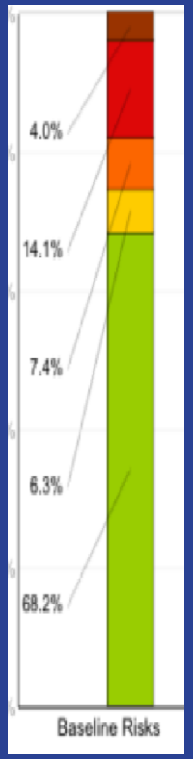
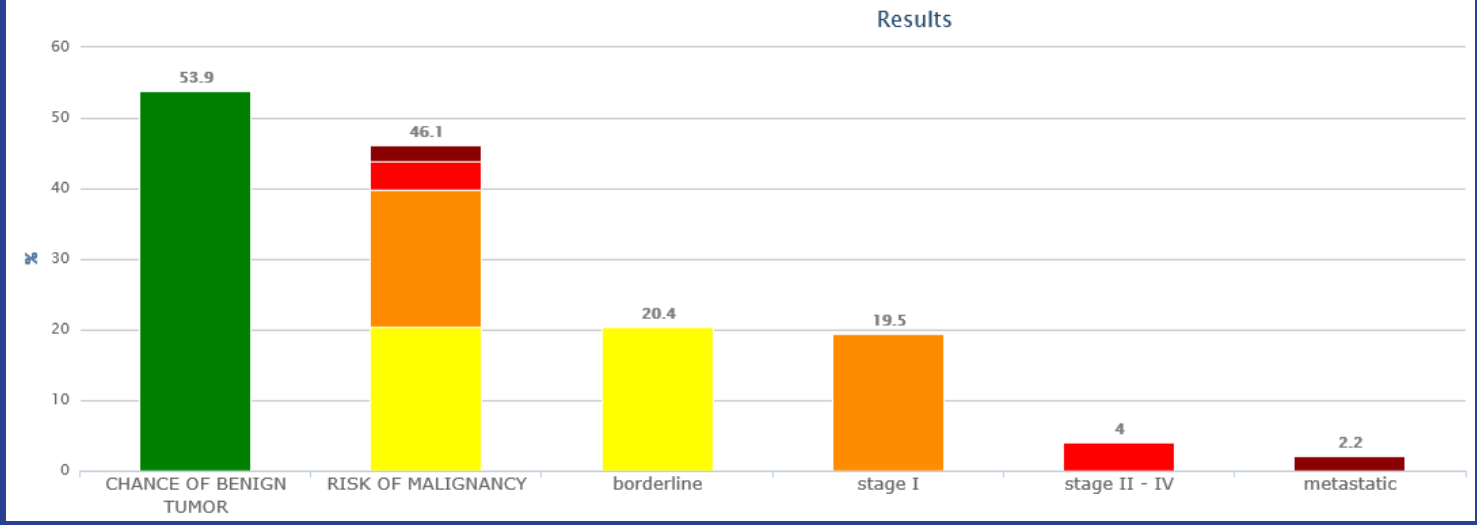
5
10
15




1. Age of the patient at examination (years) 36
2. Oncology center (referral center for gyn-oncol)? yes
3. Maximal diameter of the lesion (mm) 166
4. Maximal diameter of the largest solid part (mm) 50
5. More than 10 locules? no
6. Number of papillations (papillary projections) one
7. Acoustic shadows present? no
8. Ascites (fluid outside pelvis) present? no
9. Serum CA-125 (U/ml) 32

calculate Clear

*Additional information is given when moving the mouse pointer over the variable names.*

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# Stage I immature teratoma

Clarius C3 Scanner

Vscan

ULTRASOUND
in Obstetrics & Gynecology

Original Paper

# Do pocket-sized ultrasound machines have the potential to be used as a tool to triage patients in obstetrics and gynecology?

A Sayasneh[1,*], J Preisler[1], A Smith[1], S Saso[1], O Naji[1], Y Abdallah[1], C Stalder[1], A Daemen[2], D Timmerman[2], T Bourne[1,2]

DOI: 10.1002/uog.11184

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Issue

Ultrasound in Obstetrics & Gynecology

Accepted Article (Accepted, unedited articles published online for future issues)

Additional Information (Show All)

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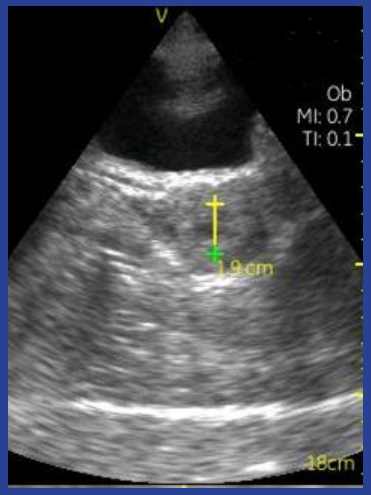
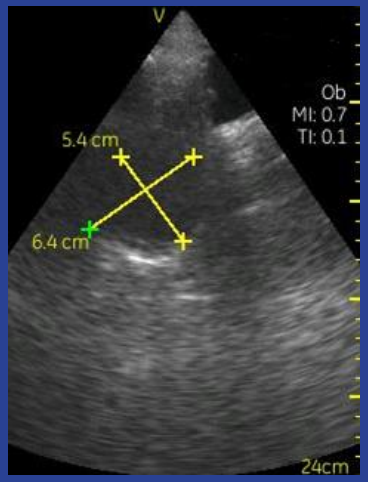
NHS Foundation Trust

# Ovarian masses on PUM

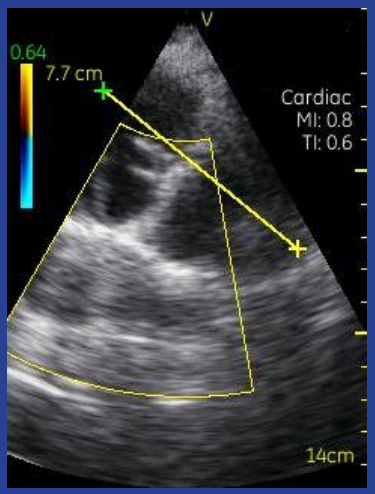
*Normal ovary*

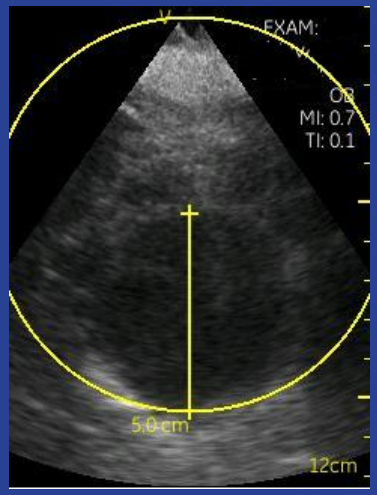


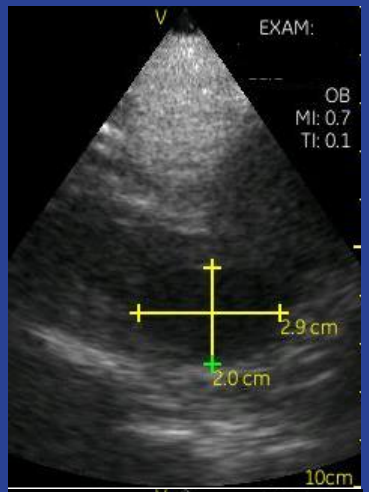

*Simple cyst*

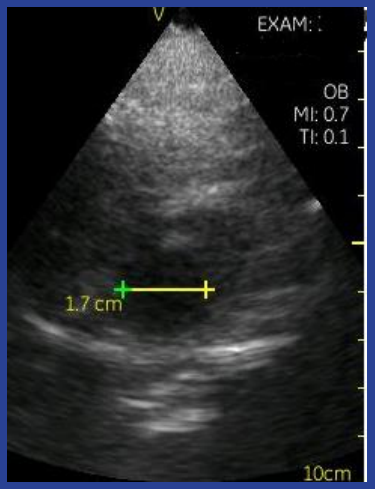


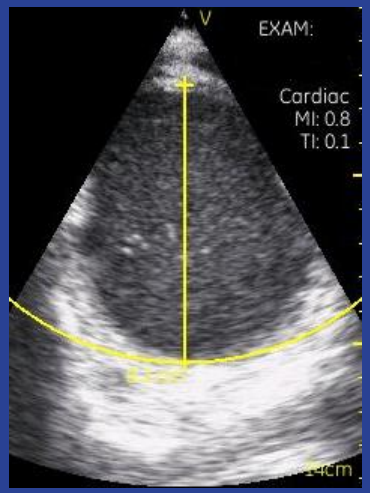

*Multilocular cyst*

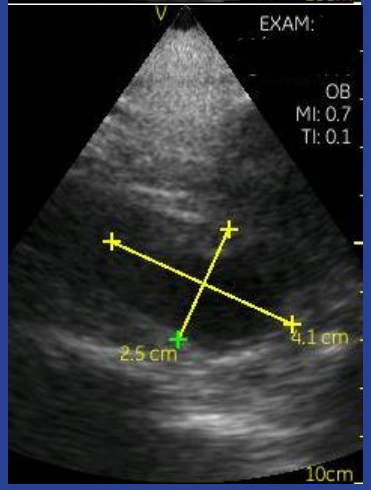
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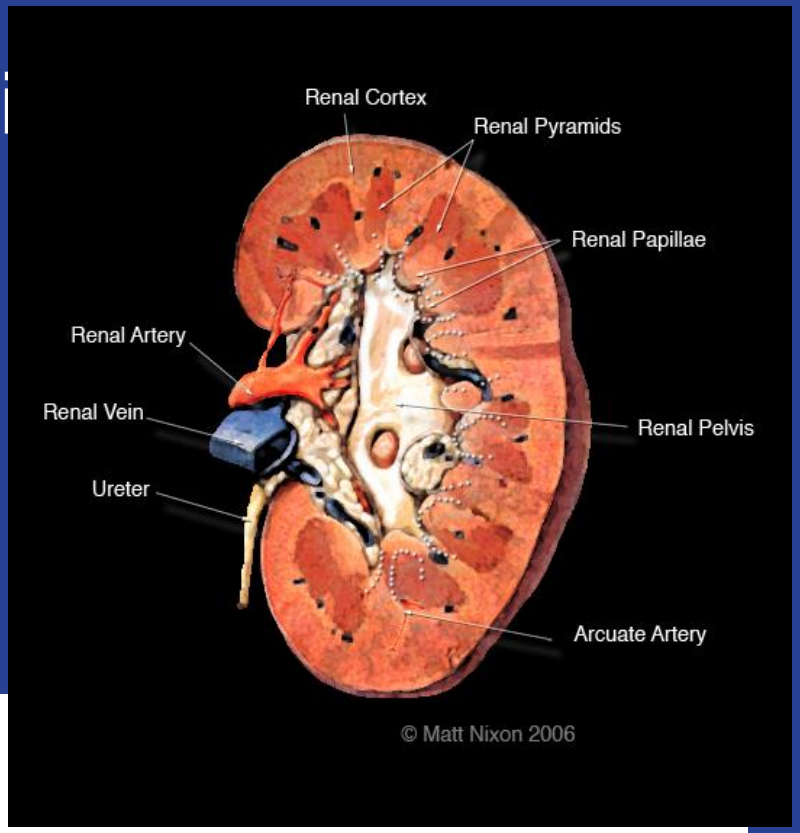
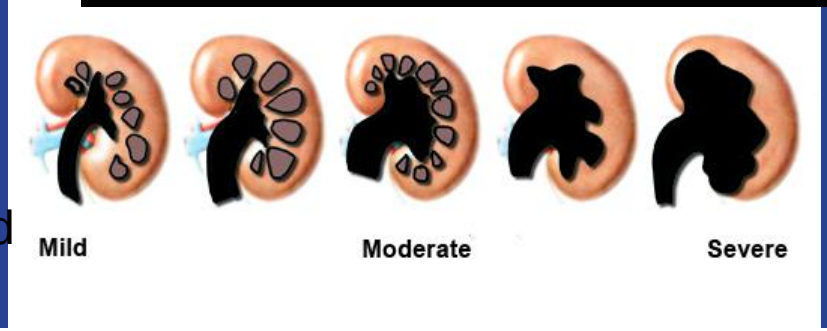
EXAM: 1379
03/Apr/2015
8:19:23 PM
Cardiac
MI: 0.8
TI: 0.1
18cm
GE Healthcare

# Grades of hydronephrosi




- **grade 0**
  - no dilatation, calyceal walls are apposed to each other
- **grade 1** (mild)
  - dilatation of the renal pelvis without dilatation of the calyces (can also occur in the extrarenal pelvis)
  - no parenchymal atrophy
- **grade 2** (mild)
  - dilatation of the renal pelvis (mild) and calyces (pelvicalyceal pattern is retained)
  - no parenchymal atrophy
- **grade 3** (moderate)
  - moderate dilatation of the renal pelvis and calyces
  - blunting of fornicies and flattening of papillae
  - mild cortical thinning may be seen

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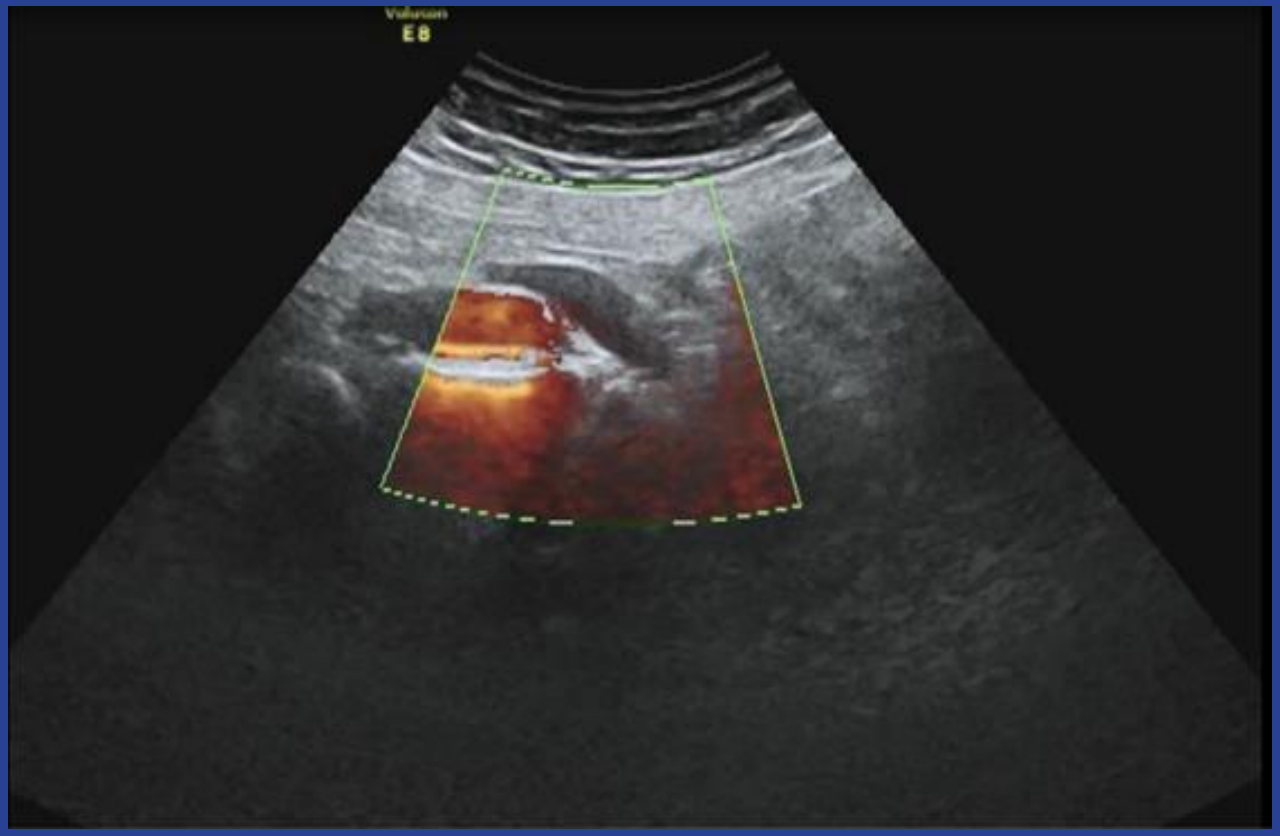
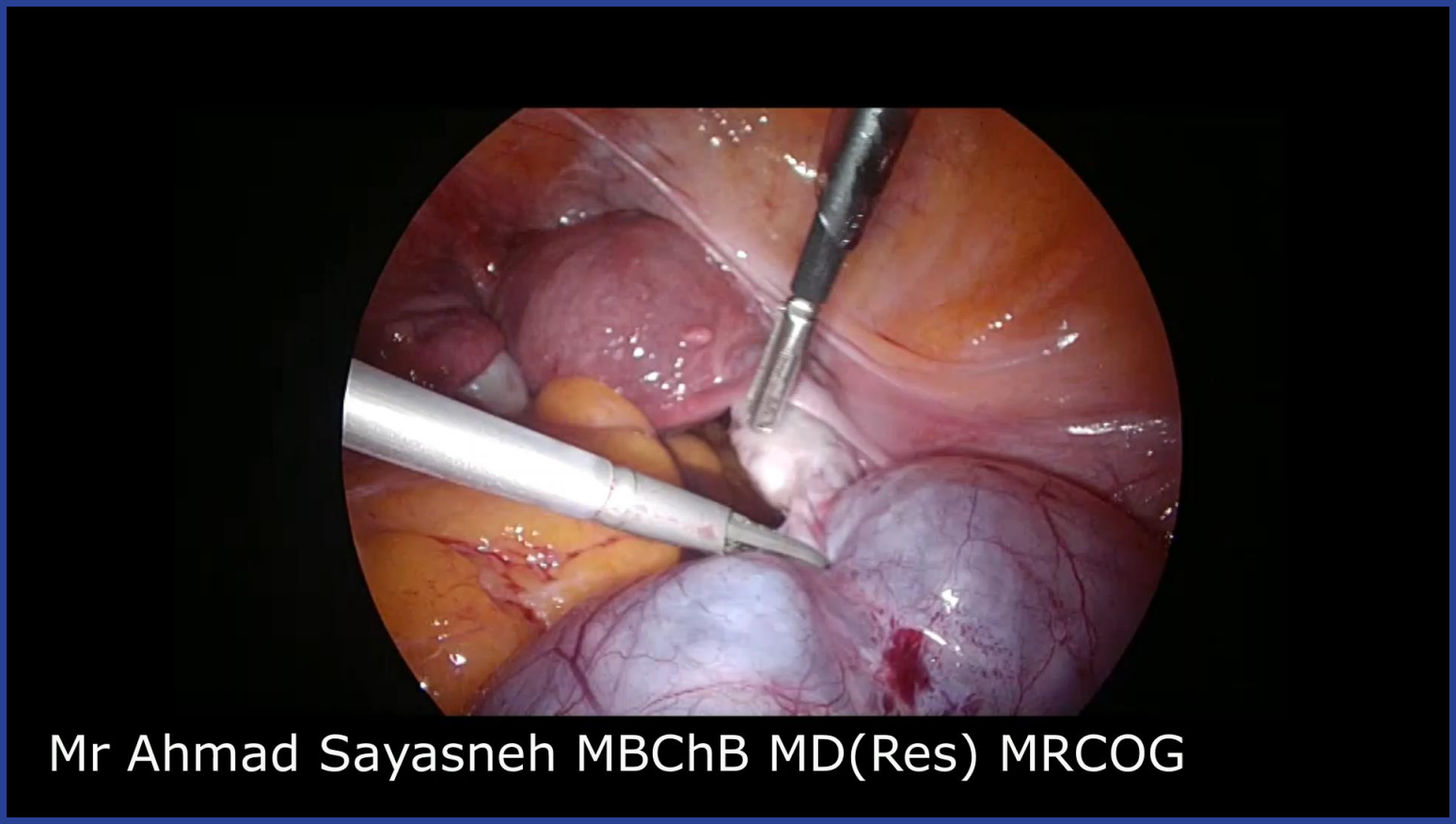
Voluson
E8


E8

# Management

# Dermoid ovarian cysts


Mr Ahmad Sayasneh MBChB MD(Res) MRCOG

# Chemotherapy or upfront surgery for newly diagnosed advanced ovarian cancer

## Results from the MRC CHORUS trial

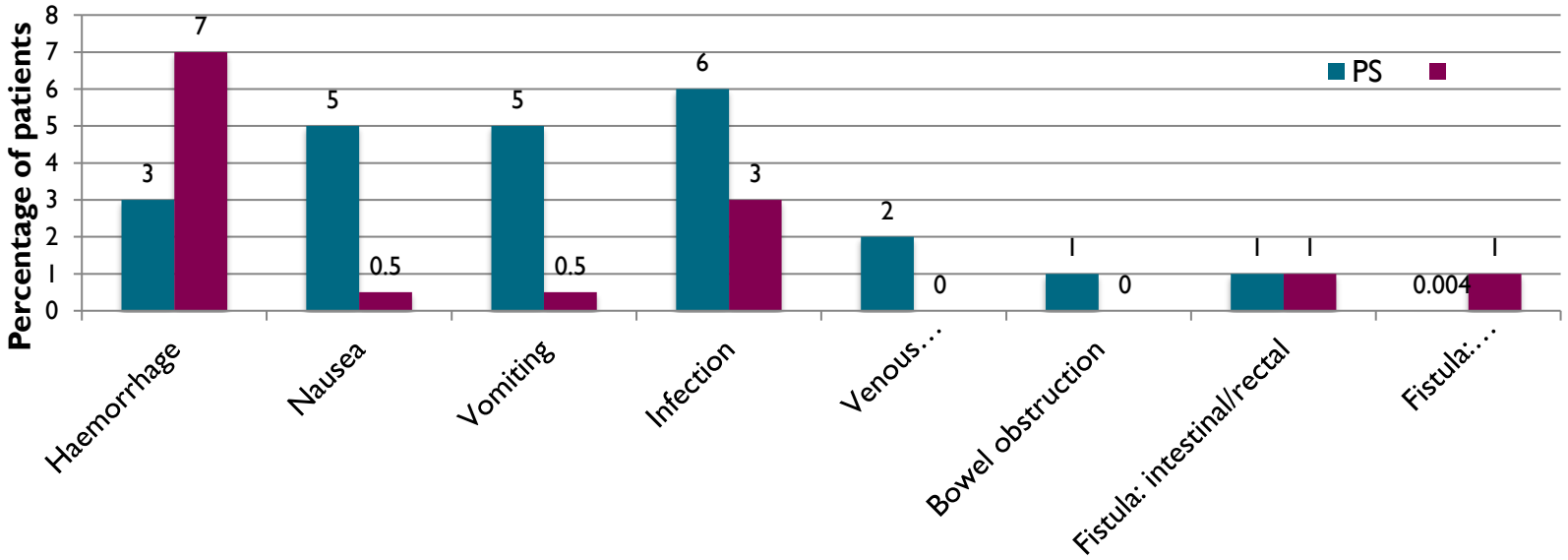
S Kehoe, JM Hook, M Nankivell, GC Jayson, HC Kitchener, T Lopes, D Luesley, TJ Perren, S Bannoo, M Mascarenhas, S Dobbs, S Essapen, J Twigg, J Herod, WG McCluggage, M Parmar, AM Swart on behalf of the CHORUS trial collaborators and NCRI Gynaecological Cancer Studies Group

# Radical Ovarian Surgery

## Post-op Complications

- Any grade 3/4 complication **PS = 24%** vs. **NACT = 14%**
- Discharge within 14 days post-op **PS = 74%** vs. **NACT = 92%**

**Complications affecting >5% & other important post-op complications**




Kehoe et.al. Lancet 2015

# Radical Ovarian Surgery

## Deaths within 28 days of surgery

| | PS | NACT |
|---|---|---|
| **Surgery** | 14 (5.6%) | 1 (0.5%) |

- Review of deaths within 28 days of surgery
  - PS
    - Disease progression = 4
    - Pulmonary embolism = 2; infection = 3; problems with fluid balance or renal failure = 2; hemorrhage = 1; intra-operative problems = 1
  - NACT
    - Pulmonary embolism = 1

Kehoe et.al. Lancet 2015

# Radical Ovarian Surgery

***Q: But what about oncologic safety and survival?***

# Radical Ovarian Surgery

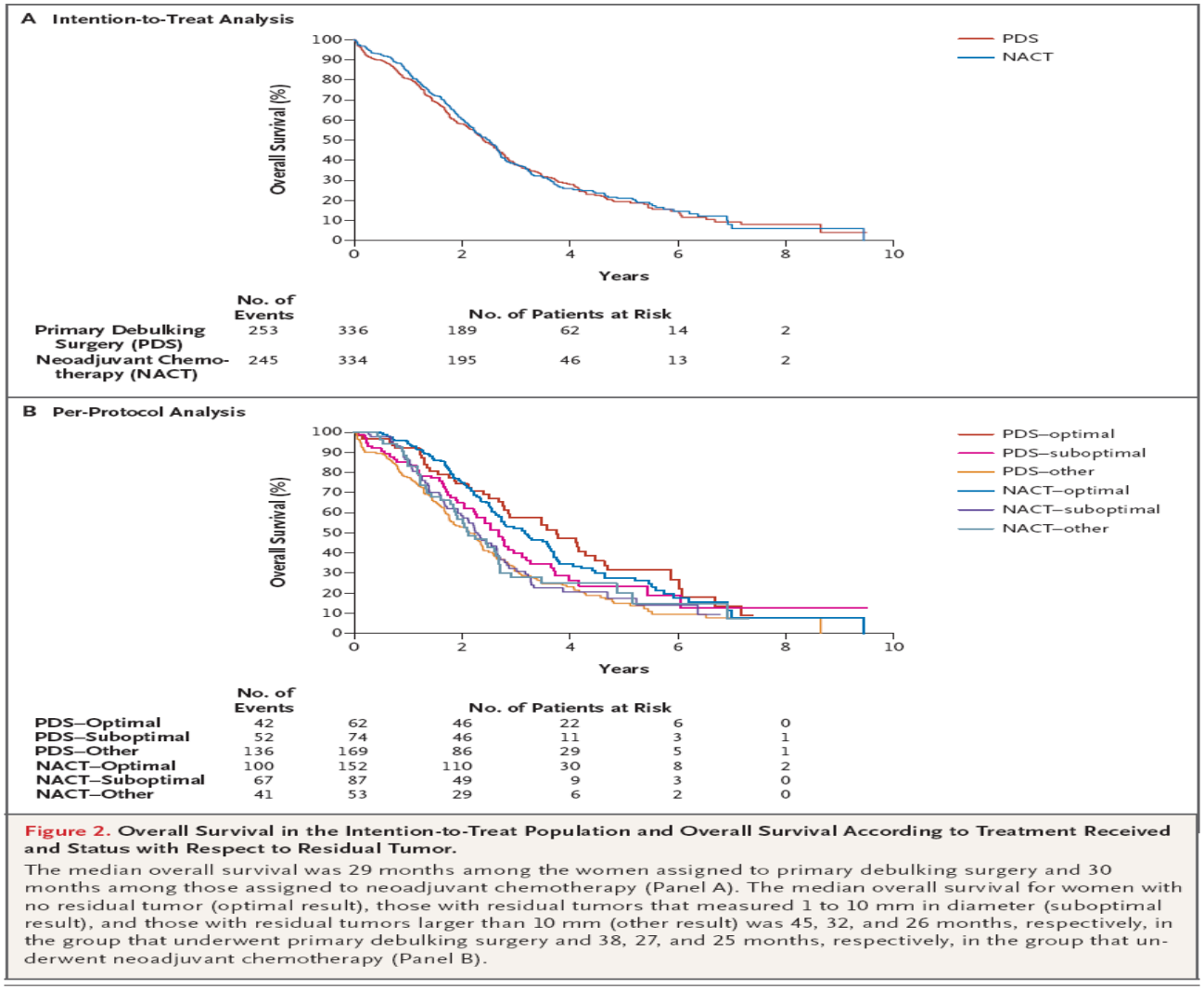



**Figure 2.** Overall Survival in the Intention-to-Treat Population and Overall Survival According to Treatment Received and Status with Respect to Residual Tumor.

The median overall survival was 29 months among the women assigned to primary debulking surgery and 30 months among those assigned to neoadjuvant chemotherapy (Panel A). The median overall survival for women with no residual tumor (optimal result), those with residual tumors that measured 1 to 10 mm in diameter (suboptimal result), and those with residual tumors larger than 10 mm (other result) was 45, 32, and 26 months, respectively, in the group that underwent primary debulking surgery and 38, 27, and 25 months, respectively, in the group that underwent neoadjuvant chemotherapy (Panel B).

**Despite significantly higher (32%) complete tumor resection rates at delayed primary debulking,**

**No equivalent improvement of survival**

*Vergote et.al. NEJM 2010*

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# Radical Ovarian Surgery

## A paradigm shift?

**TuR0 ≠ TuR0 post-CTX**

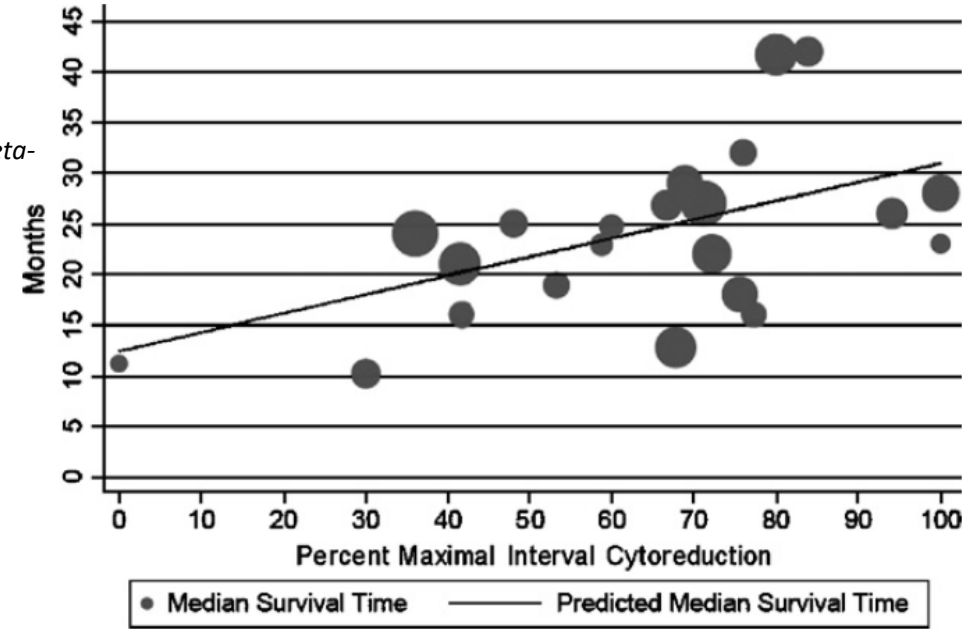
# Radical Ovarian Surgery

**Outcome becomes inferior with longer duration of pre-OP chemotherapy**
**(= longer time with significant tumor volume -> higher risk for resistance)**

**Meta-Analysis publications 1989-2005: 22 cohorts / 835 pts with FIGO III-IV ovarian cancer**

- **all pts had pre-OP platinum-based chemotherapy followed by interval-OP**
- **Prognostic factors: year, % FIGO IV, % optimal debulking, chemotherapy +/- taxan *and* number of pre-OP chemotherapy courses > 3 –> neg. impact!**

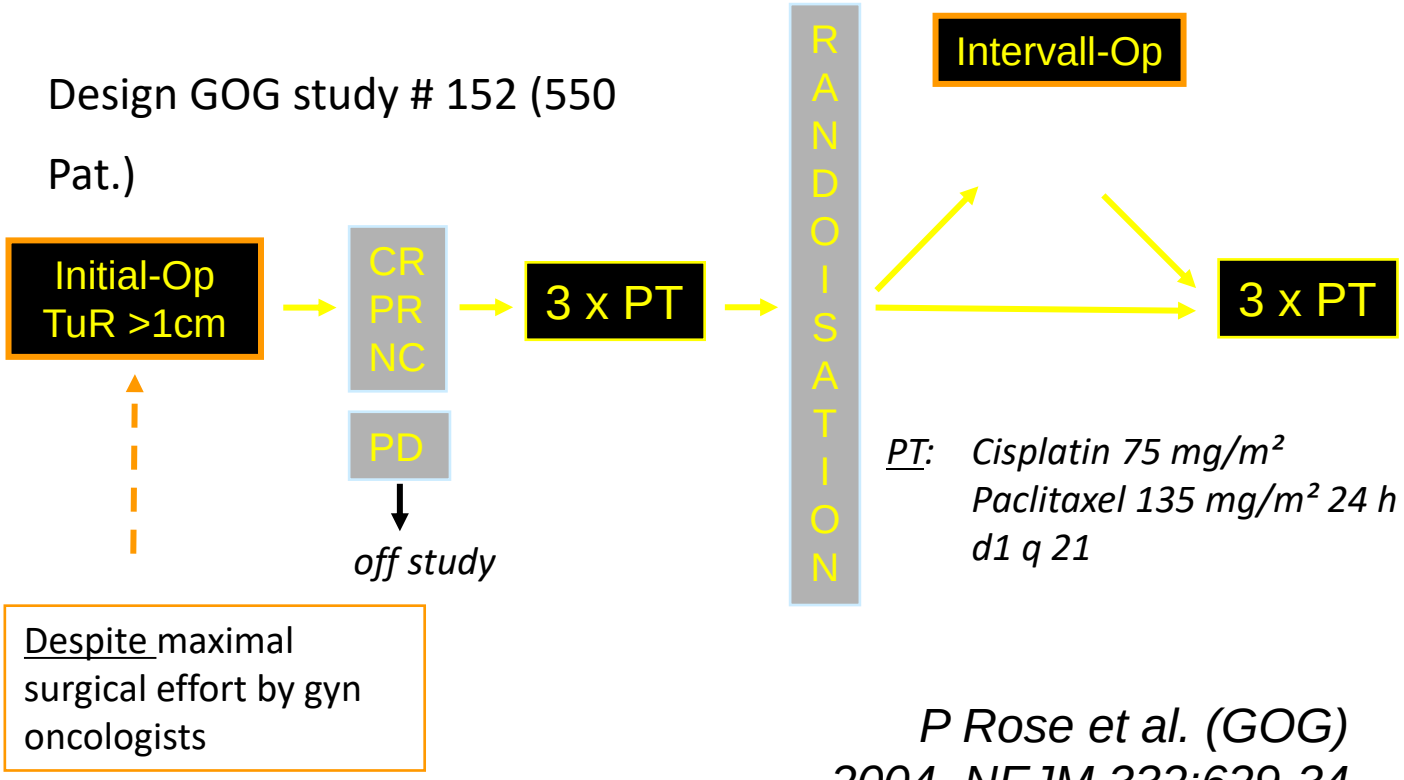
*Bristow RE, Chi DS (2006A meta-analysis. Gynecol Oncol 103: 1070-1076*




***-4.1 mos. median OS per pre-OP chemo-course > 3 courses***

# Radical Ovarian Surgery

***No value*** **of interval debulking surgery after suboptimal primary debulking** ***despite maximal surgical effort***




*P Rose et al. (GOG) 2004, NEJM 332:629-34*

# Quality of Surgery: Evolution over time

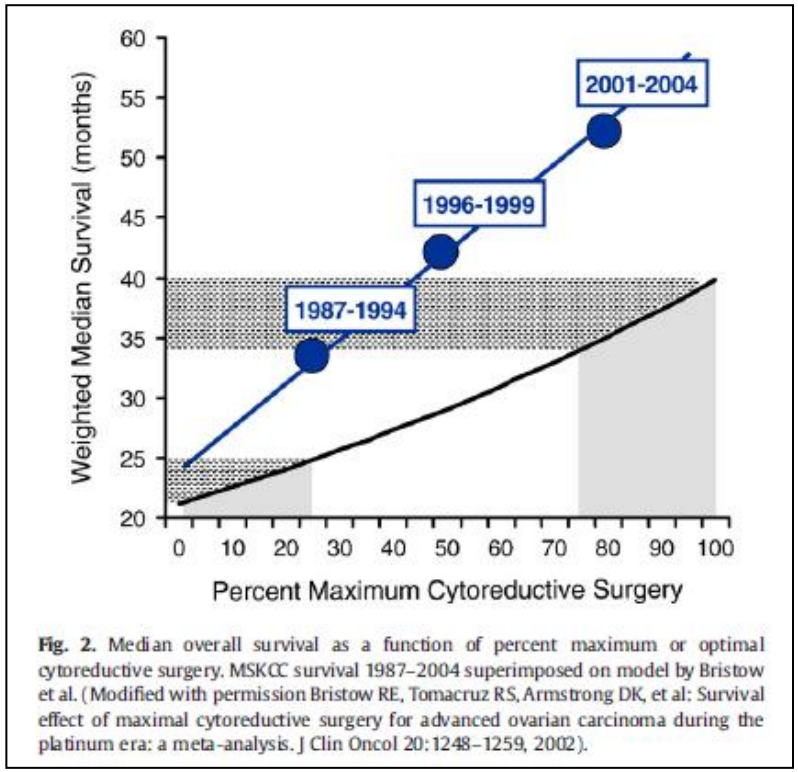
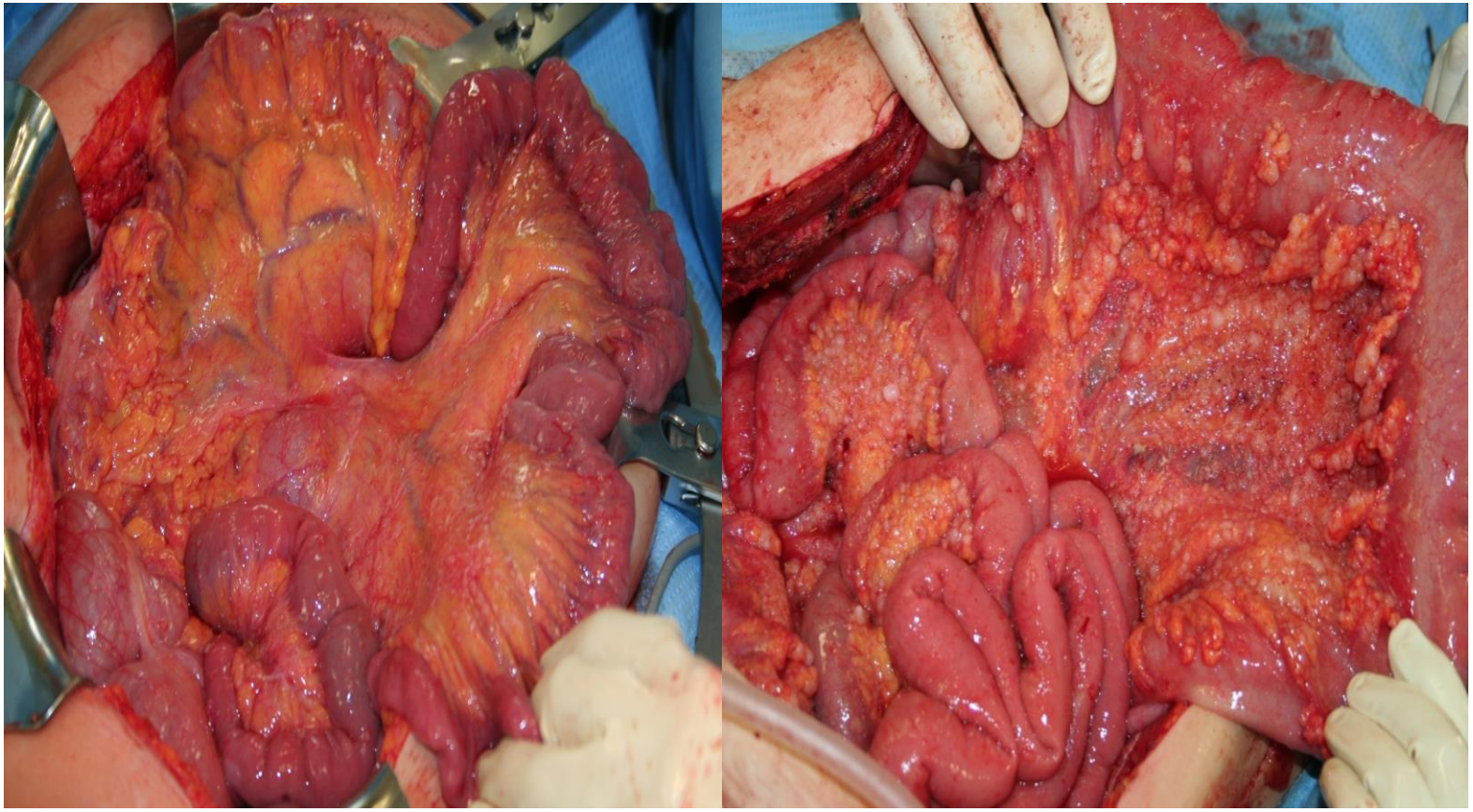



**Fig. 2.** Median overall survival as a function of percent maximum or optimal cytoreductive surgery. MSKCC survival 1987–2004 superimposed on model by Bristow et al. (Modified with permission Bristow RE, Tomacruz RS, Armstrong DK, et al: Survival effect of maximal cytoreductive surgery for advanced ovarian carcinoma during the platinum era: a meta-analysis. J Clin Oncol 20:1248–1259, 2002).

Chi DS et al, Gynecol Oncol 2009 - MSKCC

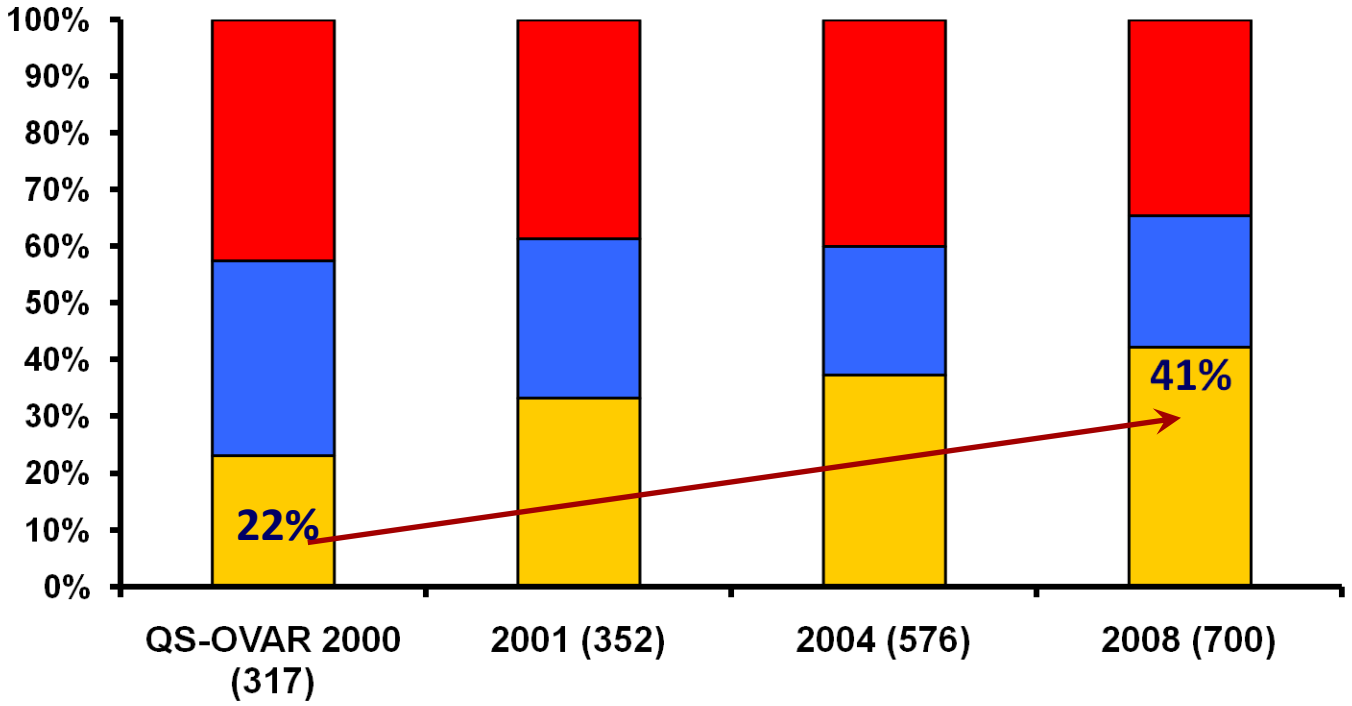
# Radical Ovarian Surgery



# Radical Ovarian Surgery

## Quality of Surgery: Evolution over time

### Residual tumor in Germany (2000 – 2008)




p = 0.029

No residual tumor

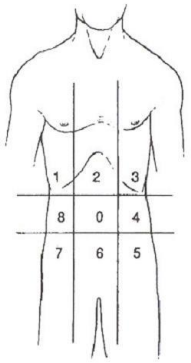
1-10 mm

> 1 cm

*duBois A, 2010*

| Procedure | Points |
|---|---|
| Laparoscopic approach | 1 |
| Total hysterectomy +/- Bilateral Salpingo-oophorectomy | 1 |
| Bilateral Salpingo-oophorectomy | 1 |
| Radical hysterectomy +/- Bilateral Salpingo-oophorectomy | 4 |
| Radical trachelectomy | 3 |
| Simple trachelectomy | 1 |
| Cervical stumpectomy | 2 |
| Ureterolysis (mobilisation of ureter from tumour / adhesions) | 1 |
| Re-implantation of ureter | 2 |
| Omental Biopsy / Staging Infracolic Omentectomy | 1 |
| Supracolic + Infracolic Omentectomy | 2 |
| Adhesiolysis (any code for adhesiolysis) | 1 |
| Pelvic Lymphadenectomy | 2 |
| Para aortic Lymphadenectomy | 2 |
| Peritoneum resection / stripping | 1 |
| Large bowel resection with primary anastomosis | 3 |
| Large bowel resection with stoma | 2 |
| Small bowel resection with anastomosis | 2 |
| Small bowel resection with end small bowel stoma | 1 |
| Appendicectomy | 1 |
| Diaphragm stripping / resection | 2 |
| Splenectomy | 2 |
| Liver resection (s) | 2 |
| Wide local excision of vulva | 1 |
| Simple vulvectomy | 1 |
| Radical vulvectomy | 2 |
| Sentinel node biopsy | 1 |
| Inguinofemoral Lymphadenectomy | 2 |
| Posterior Exenteration | 5 |
| Anterior exenteration +/- urinary conduit | 7 |
| Total exenteration | 7 |
| **Surgical Complexity Score** | |
| **Complexity Score Group** | **Points** |
| **1** | **<3** |
| **2** | **3-4** |
| **3** | **5-6** |
| **4** | **7-8** |
| **5** | **>8** |

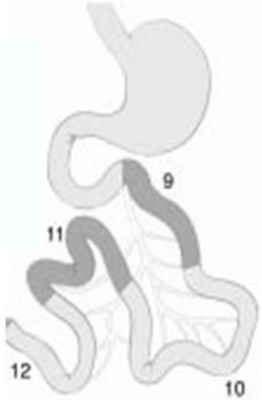
# Sugarbaker peritoneal cancer index



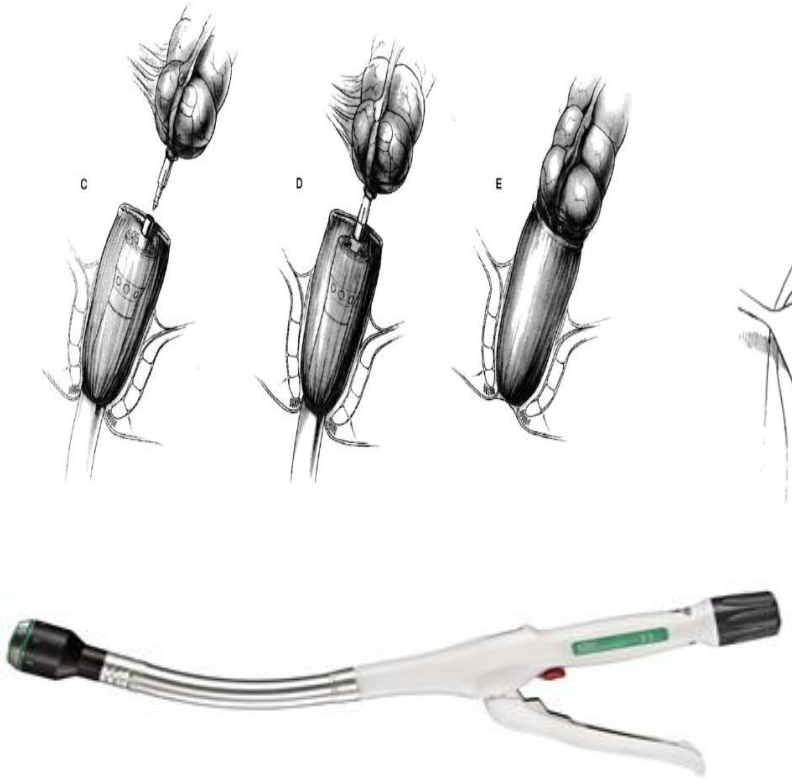

| Regions | Lesion Size |
|---|---|
| 0 Central | 0 |
| 1 Right Upper | 2 |
| 2 Epigastrium | 3 |
| 3 Left Upper | 0 |
| 4 Left Flank | 1 |
| 5 Left Lower | 1 |
| 6 Pelvis | 0 |
| 7 Right Lower | 0 |
| 8 Right Flank | 2 |
| 9 Upper Jejunum | 0 |
| 10 Lower Jejunum | 3 |
| 11 Upper Ileum | 1 |
| 12 Lower Ileum | 3 |
| **PCI** | **16** |

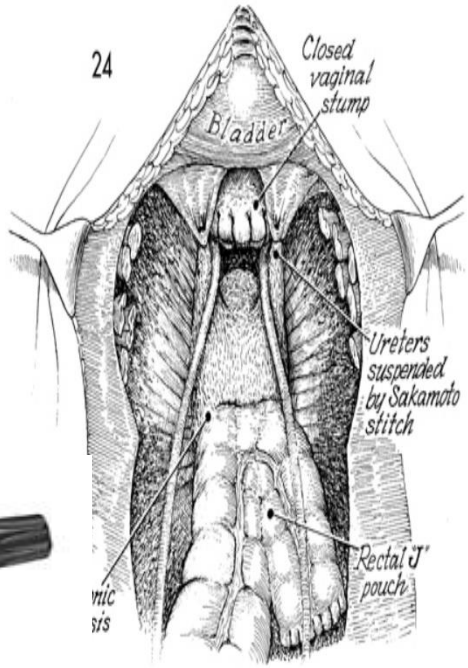
**Lesion Size Score**

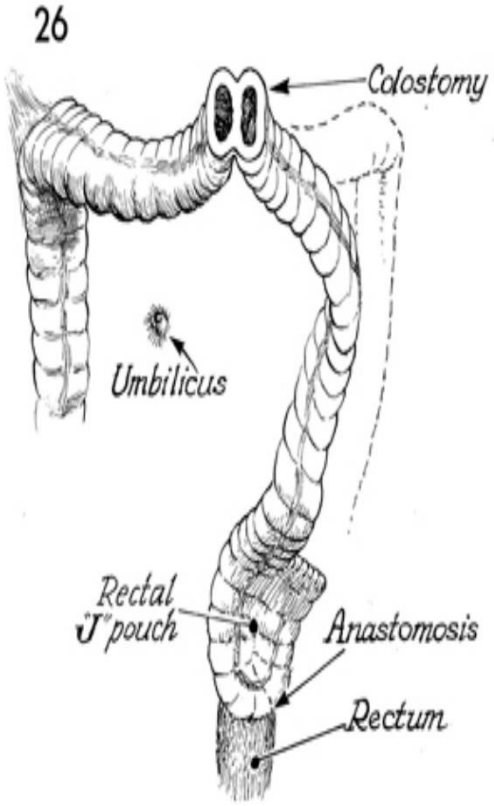
LS 0 No tumor seen
LS 1 Tumor up to 0.5
LS 2 Tumor up to 5.0
LS 3 Tumor > 5.0 cm



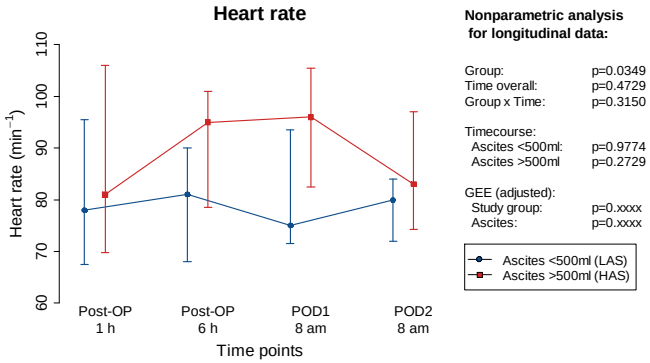
# Radical Ovarian Surgery

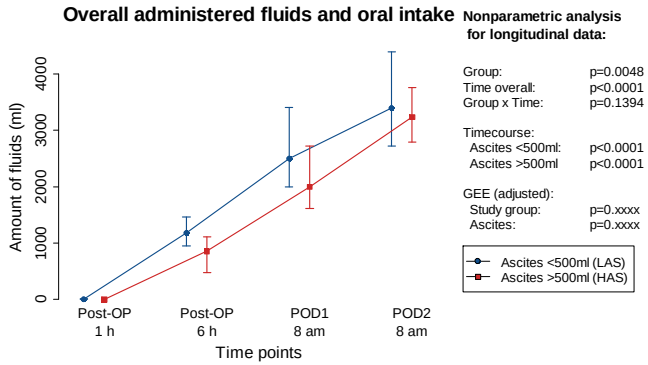


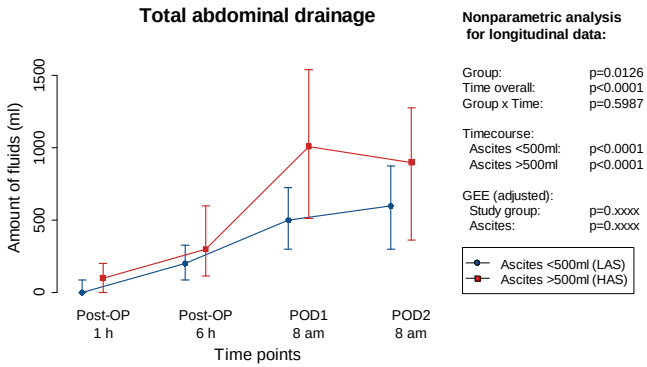



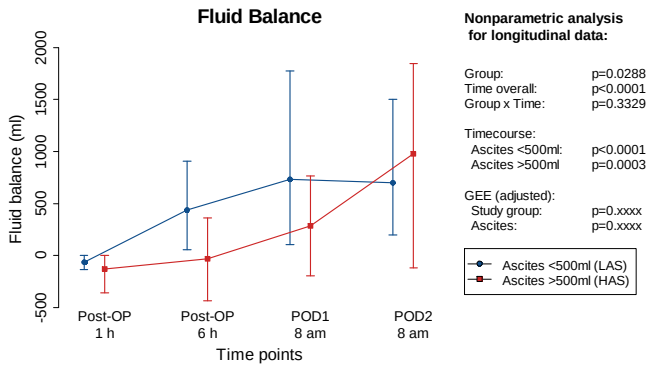



# Postoperative course of heart rate and fluid balance parameter depending on the presence of ascites




Fotopoulou/Feldheiser in press, 2015

Guy's Cancer

Guy's and St Thomas' NHS
NHS Foundation Trust

# Healthcare ressources

ITU support

Blood bank ressources

Ward bed availability

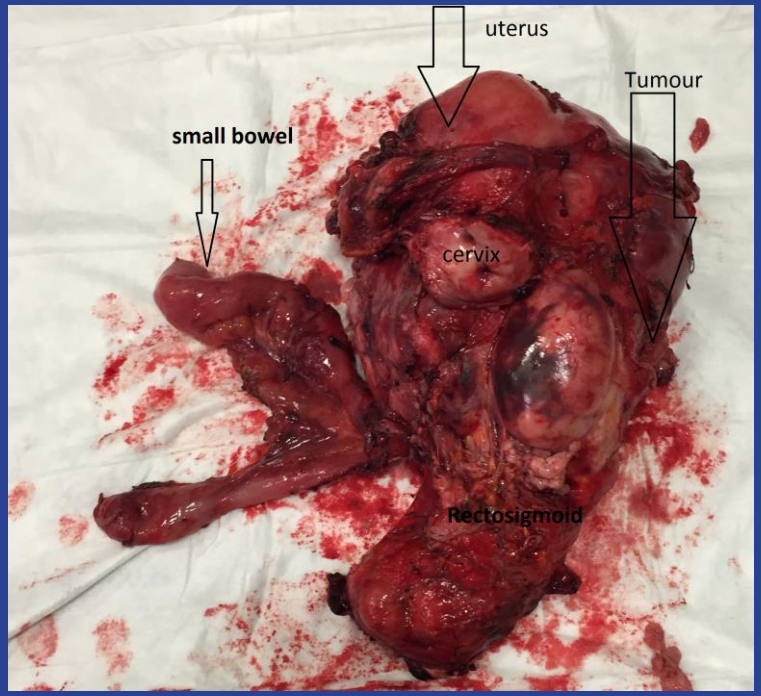
Theatre time

Health insurance regulations

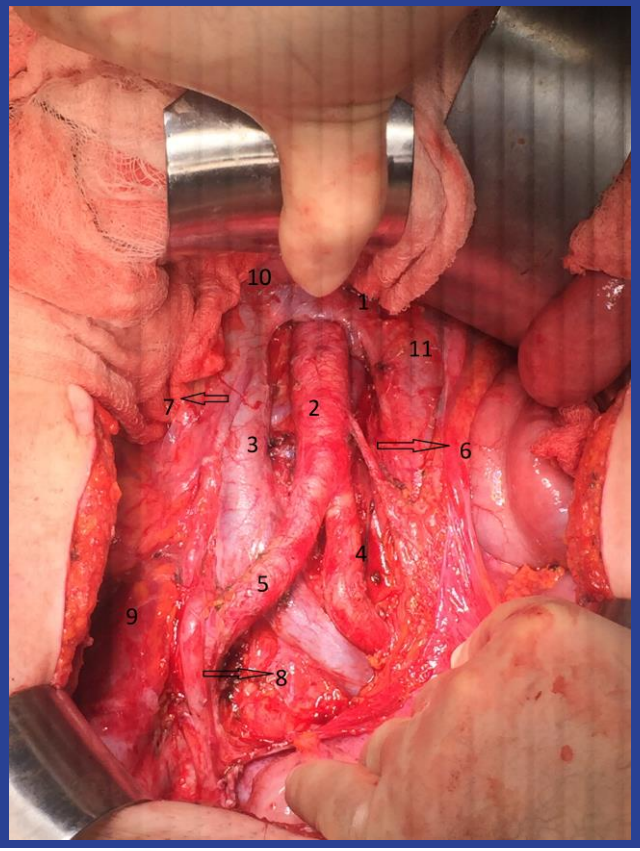
Psychooncological/clinical nurse specialist support

Postoperative rehabilitation/recovalescence homes

# Enbloc colorectal resection with TAH BSO and small bowel resection (ovarian HGSC, mdm surgery)



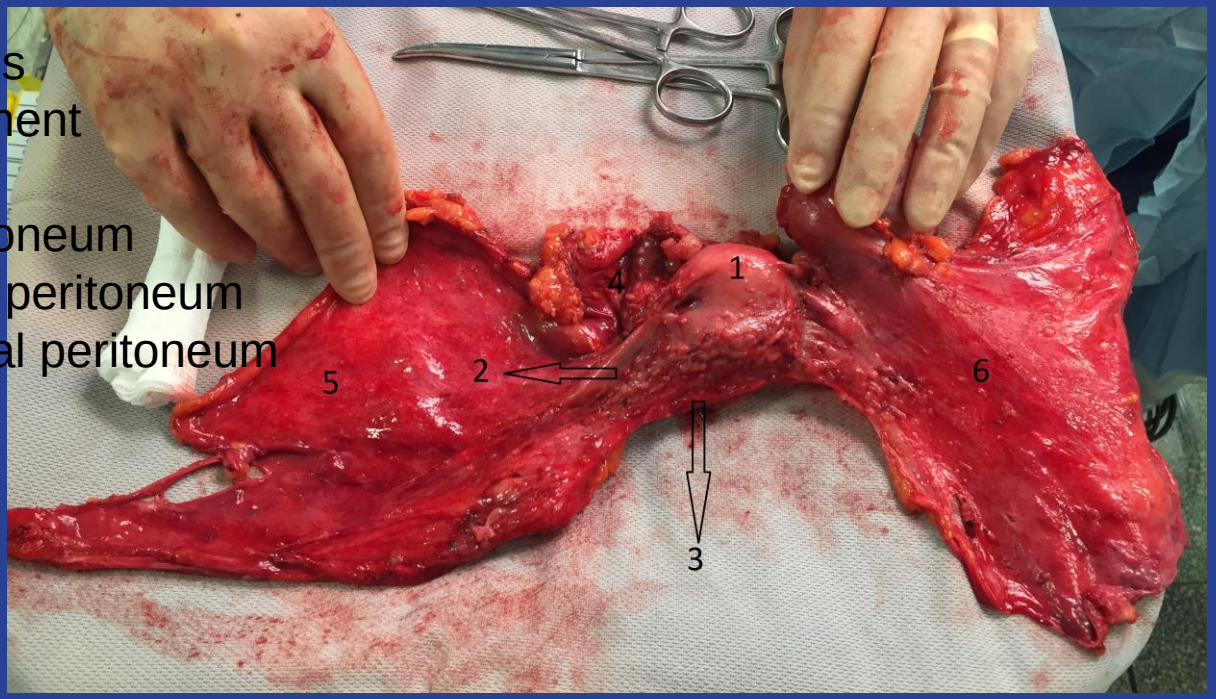
# Para-aortic lymphadenectomy



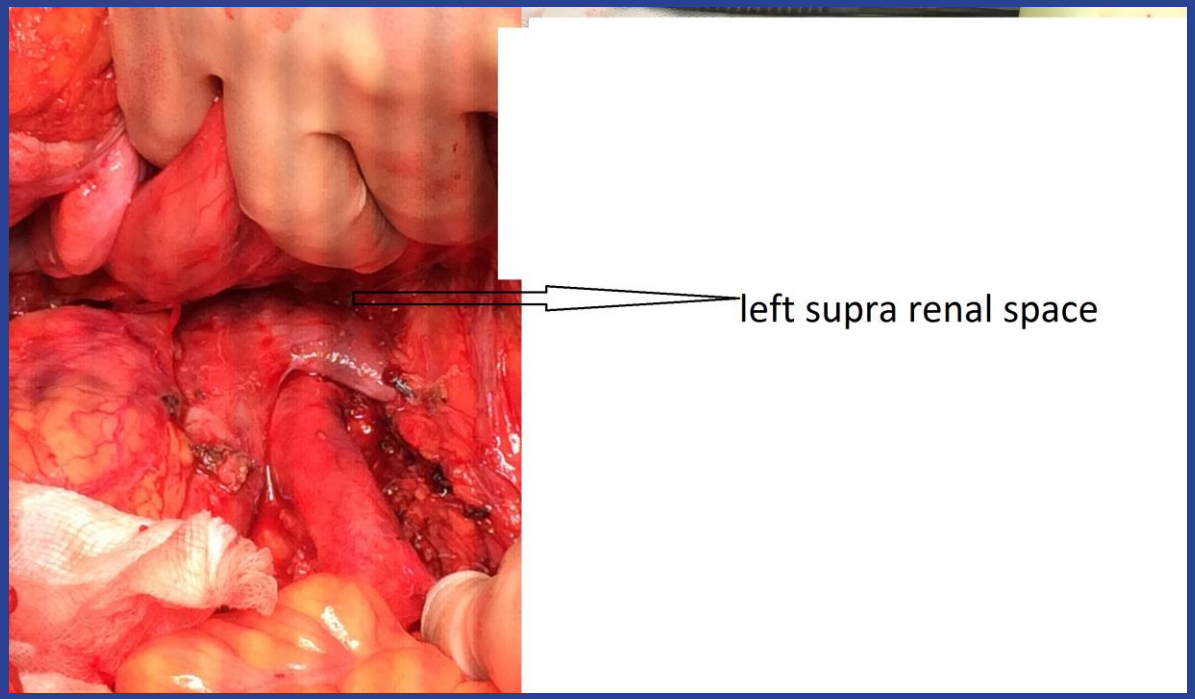

1- left renal vein
2- aorta
3- vena cava
4- left common iliac artery
5- right common iliac artery
6- IMA
7- right ovarian vein
8- right ureter
9- psoas muscle
10- duodenum
11- IMV

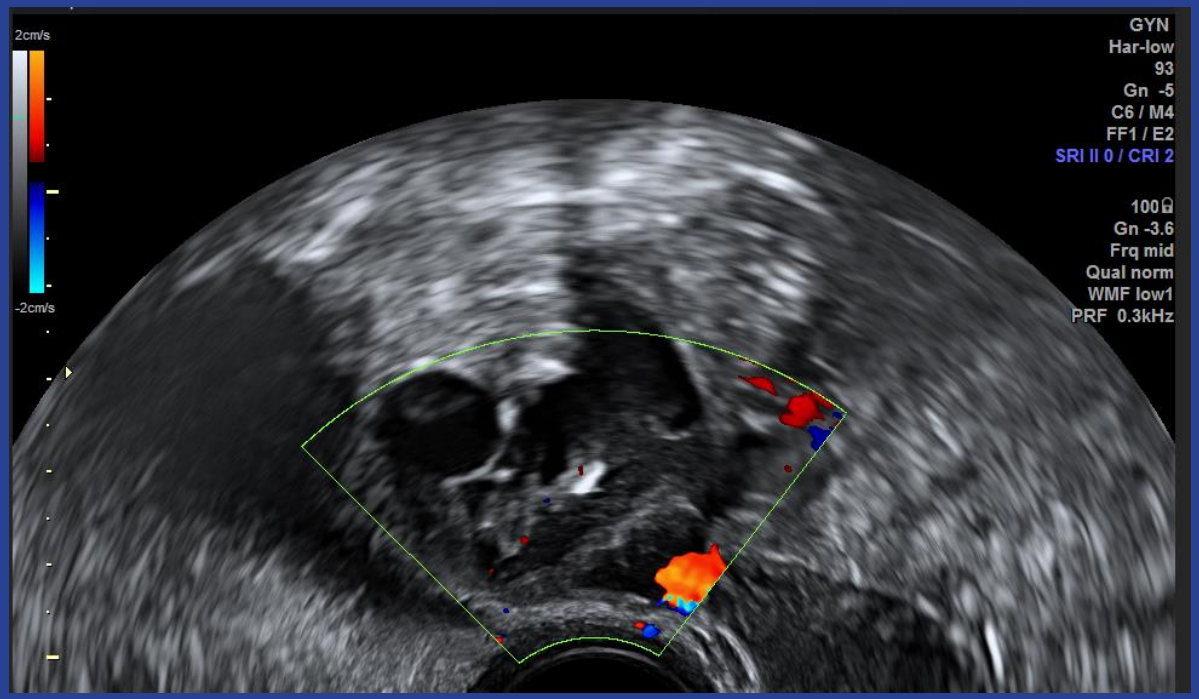
# Enbloc extraperitoneal excision of uterus, cervix, tubes, ovaries, and rectal-bladder- pararectal peritoneum. Delayed primary debulking of ovarian cancer

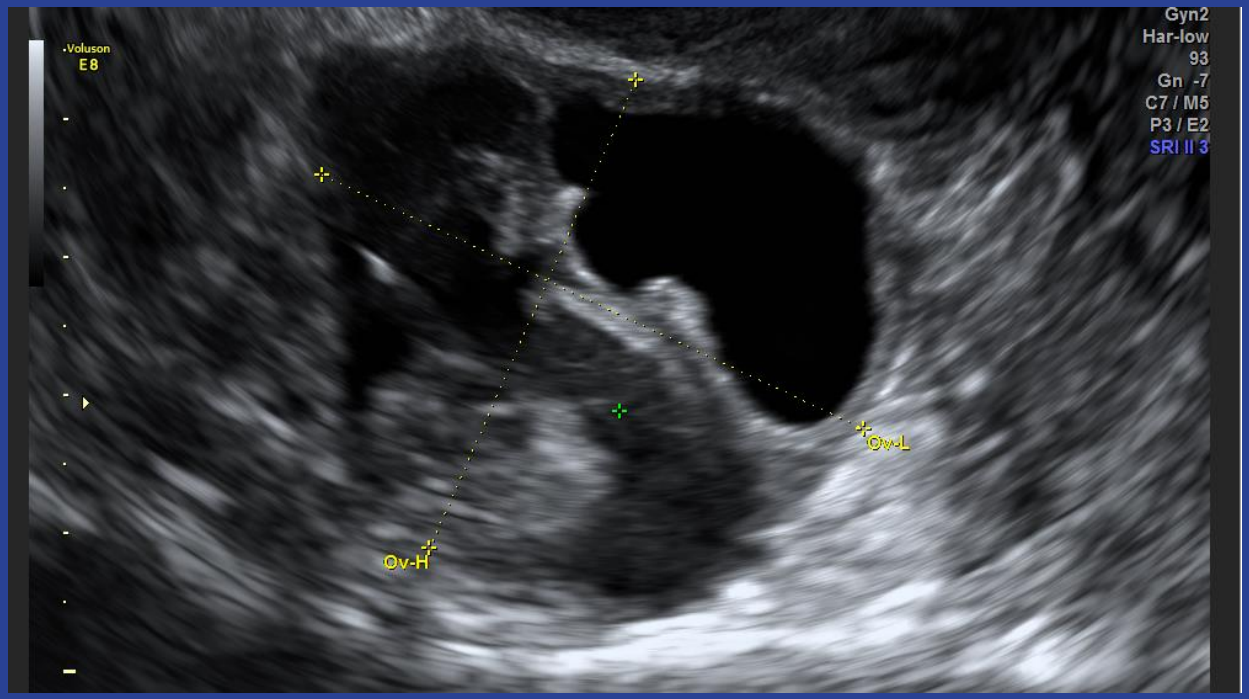
1- uterine fundus
2- rt round ligament
3- rectal serosa
4- bladder peritoneum
5- rt para rectal peritoneum
6- left para rectal peritoneum

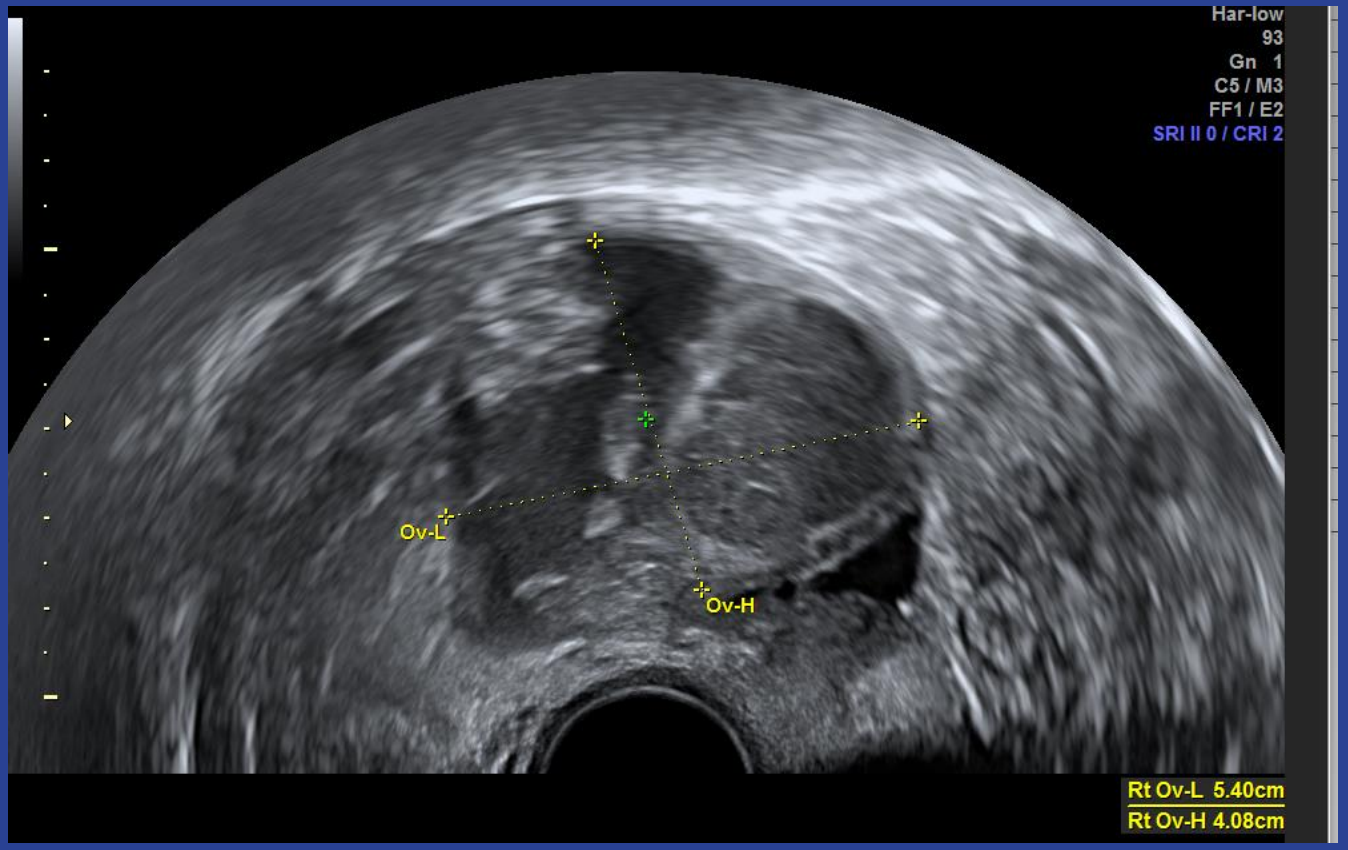


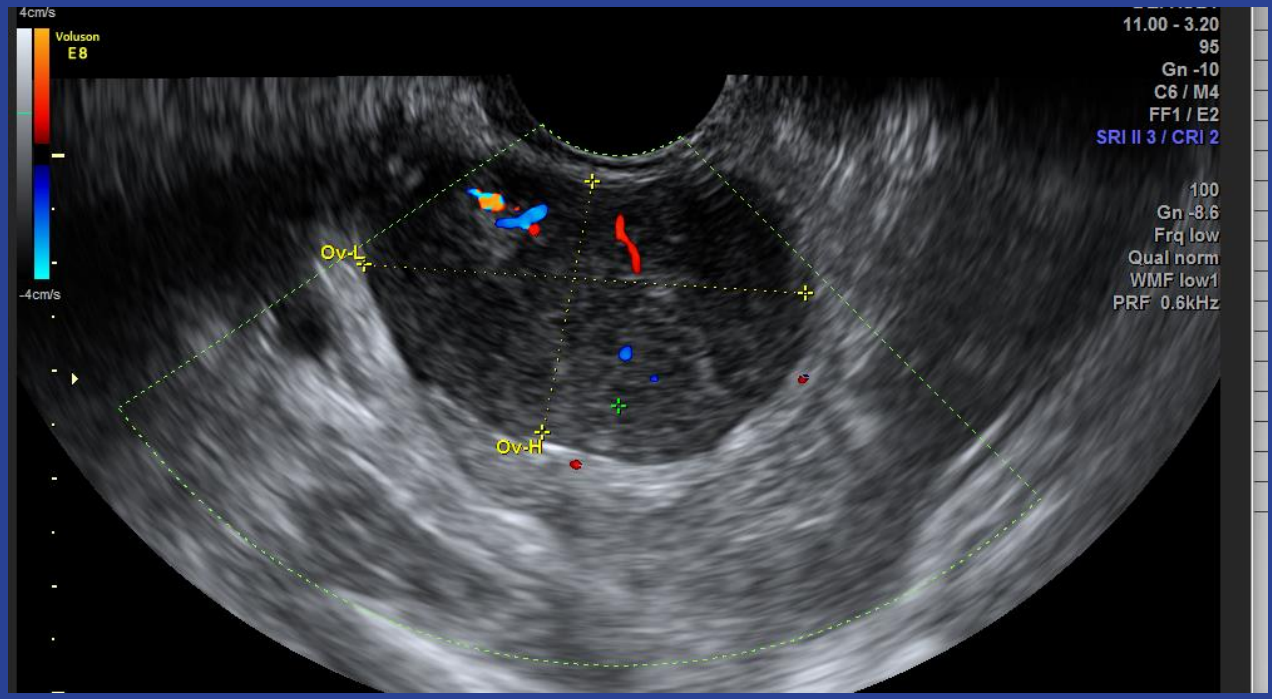
# Left supra renal lymphadenectomy(mdm surgery)

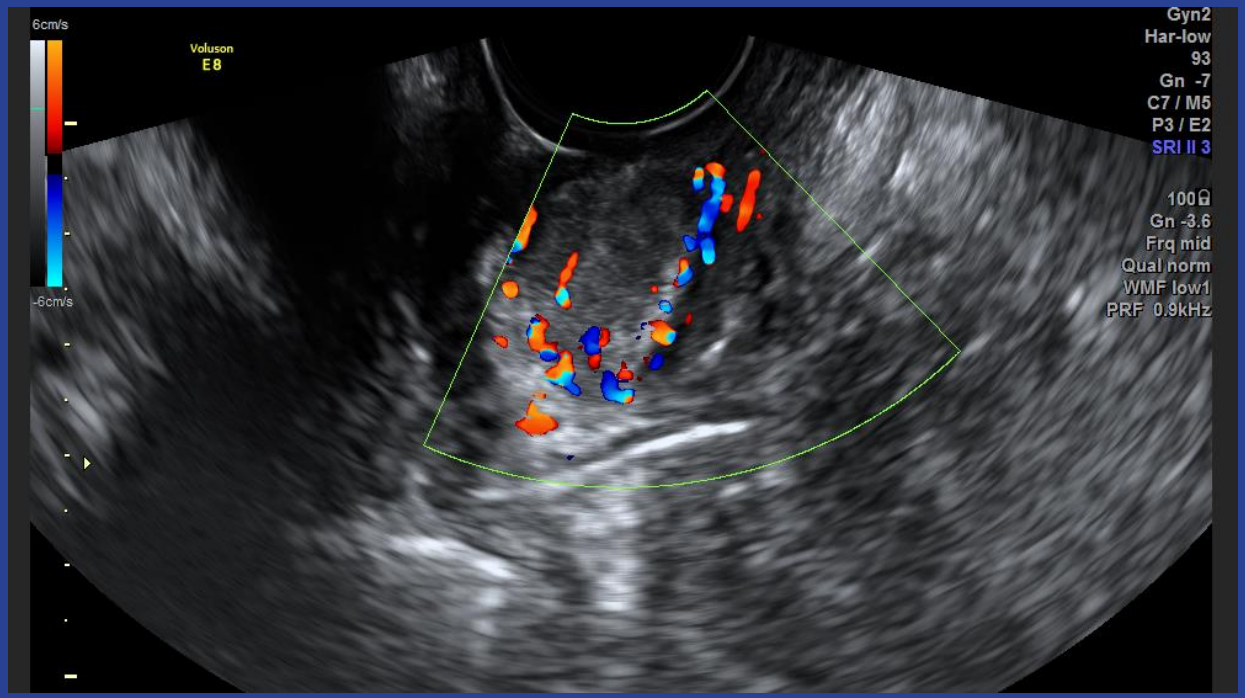


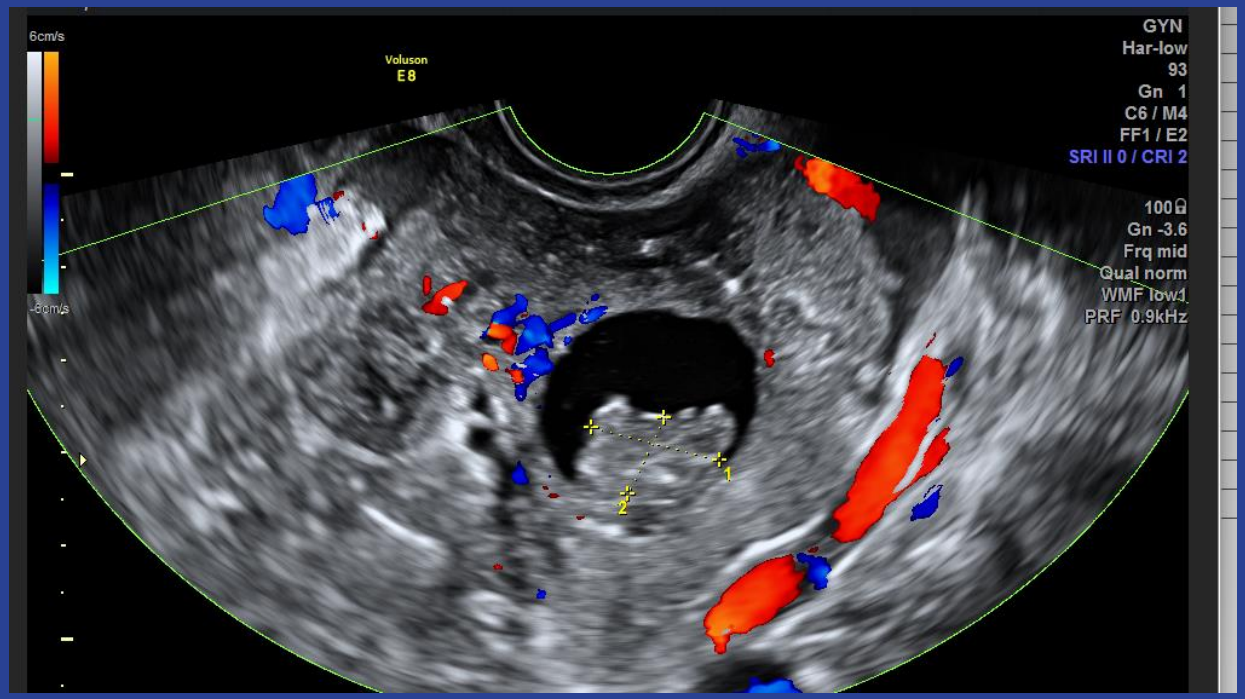

2cm/s
-2cm/s
GYN
Har-low
93
Gn -5
C6 / M4
FF1 / E2
SRI II 0 / CRI 2
100
Gn -3.6
Frq mid
Qual norm
WMF low1
PRF 0.3kHz

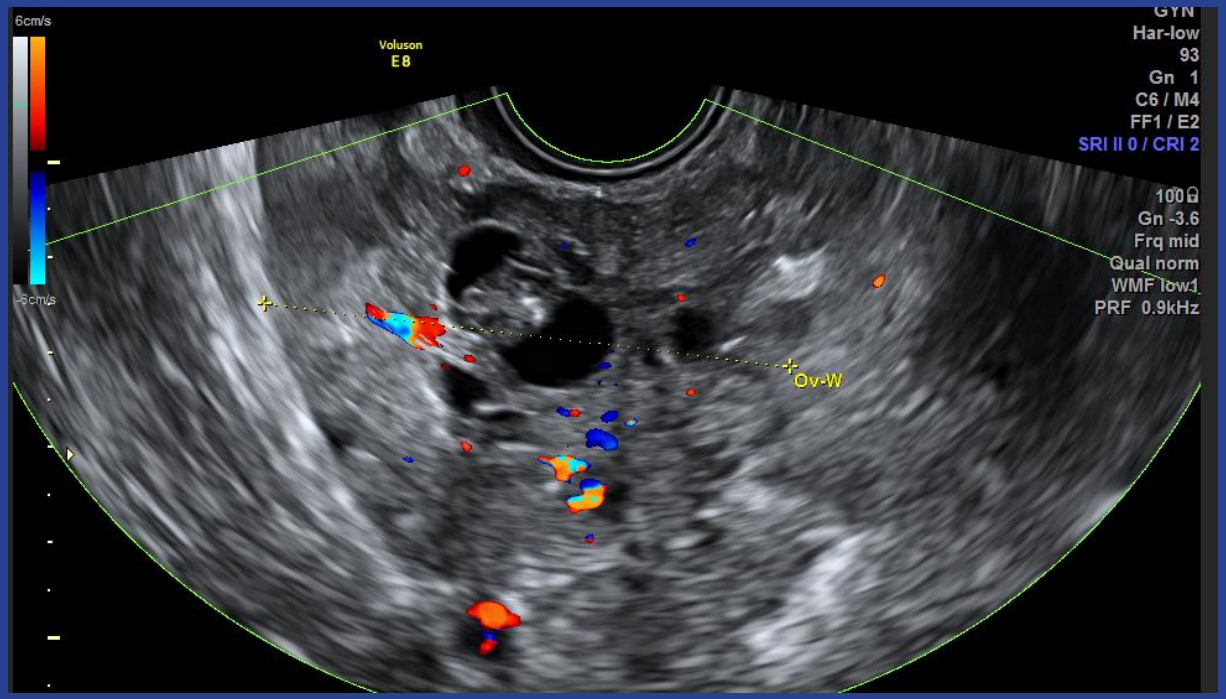

Voluson
E8
Gyn2
Har-low
93
Gn -7
C7 / M5
P3 / E2
SRI II 3
Ov-L
Ov-H

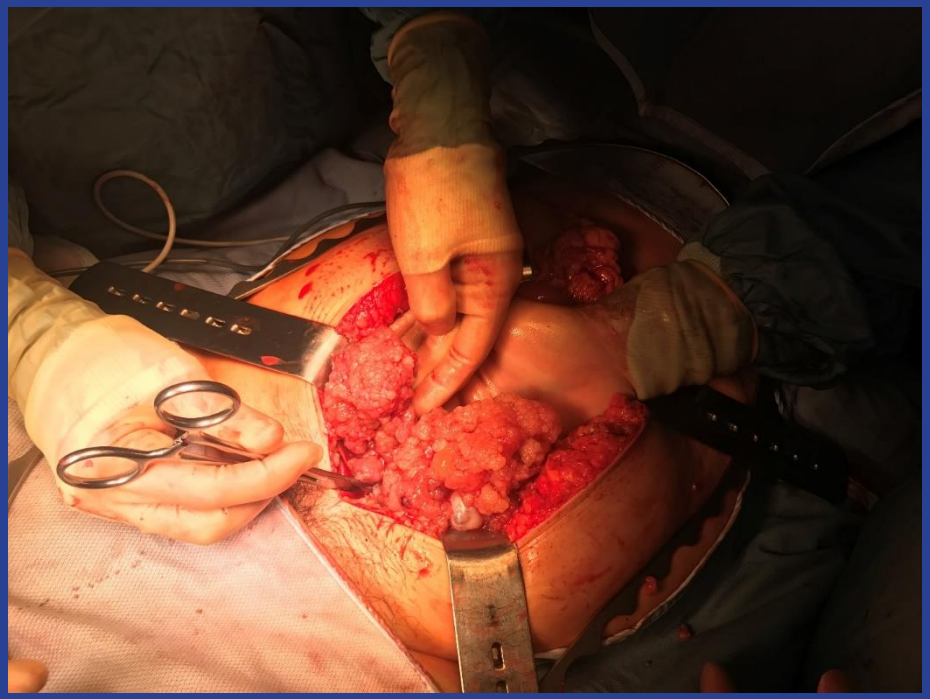

Har-low
93
Gn 1
C5 / M3
FF1 / E2
SRI II 0 / CRI 2
Ov-L
Ov-H
Rt Ov-L 5.40cm
Rt Ov-H 4.08cm

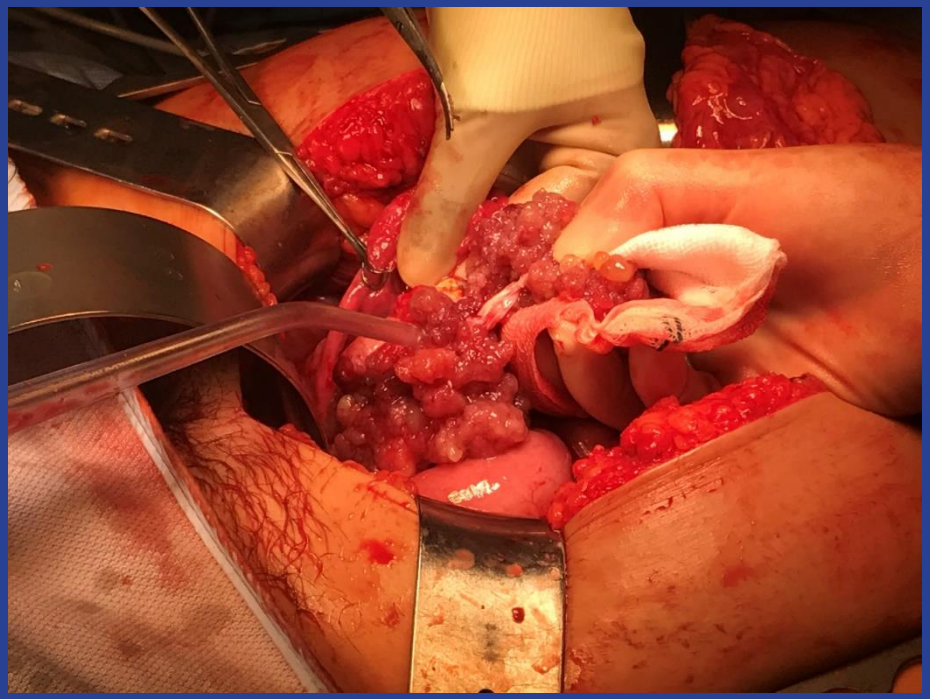

4cm/s
Voluson
E8
-4cm/s
11.00 - 3.20
95
Gn -10
C6 / M4
FF1 / E2
SRI II 3 / CRI 2
100
Gn -8.6
Frq low
Qual norm
WMF low1
PRF 0.6kHz
Ov-L
Ov-H

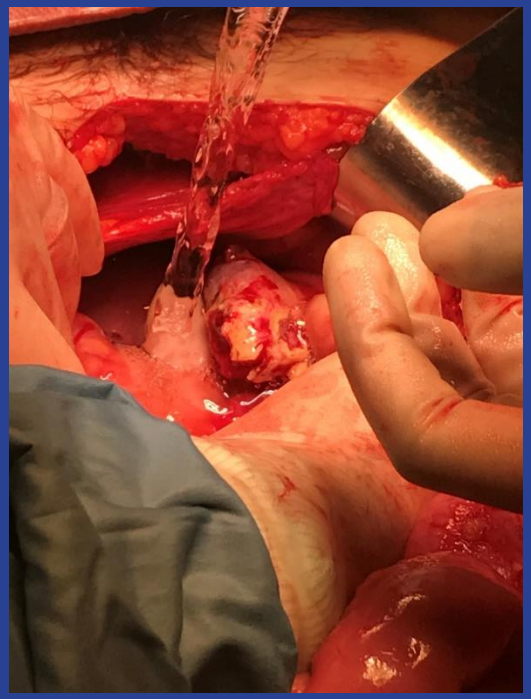

6cm/s
-6cm/s
Voluson
E8
Gyn2
Har-low
93
Gn -7
C7 / M5
P3 / E2
SRI II 3
100
Gn -3.6
Frq mid
Qual norm
WMF low1
PRF 0.9kHz

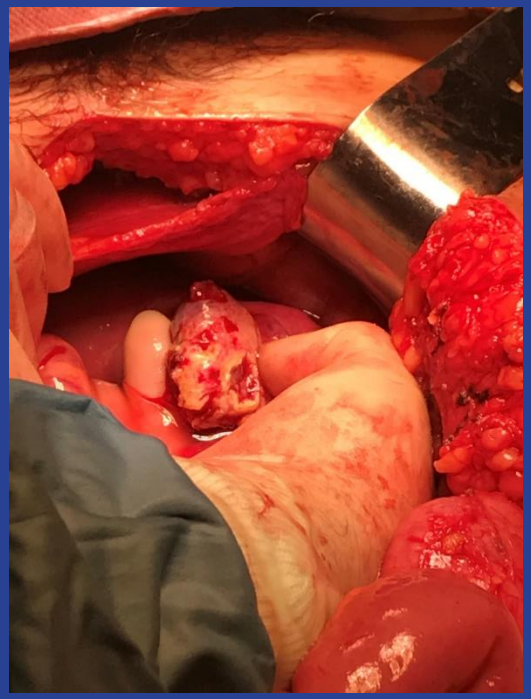

6cm/s
-6cm/s
Voluson
E8
GYN
Har-low
93
Gn 1
C6 / M4
FF1 / E2
SRI II 0 / CRI 2
100
Gn -3.6
Frq mid
Qual norm
WMF low1
PRF 0.9kHz
1
2


6cm/s
-6cm/s
Voluson
E8
GYN
Har-low
93
Gn 1
C6 / M4
FF1 / E2
SRI II 0 / CRI 2
100
Gn -3.6
Frq mid
Qual norm
WMF low1
PRF 0.9kHz
Ov-W

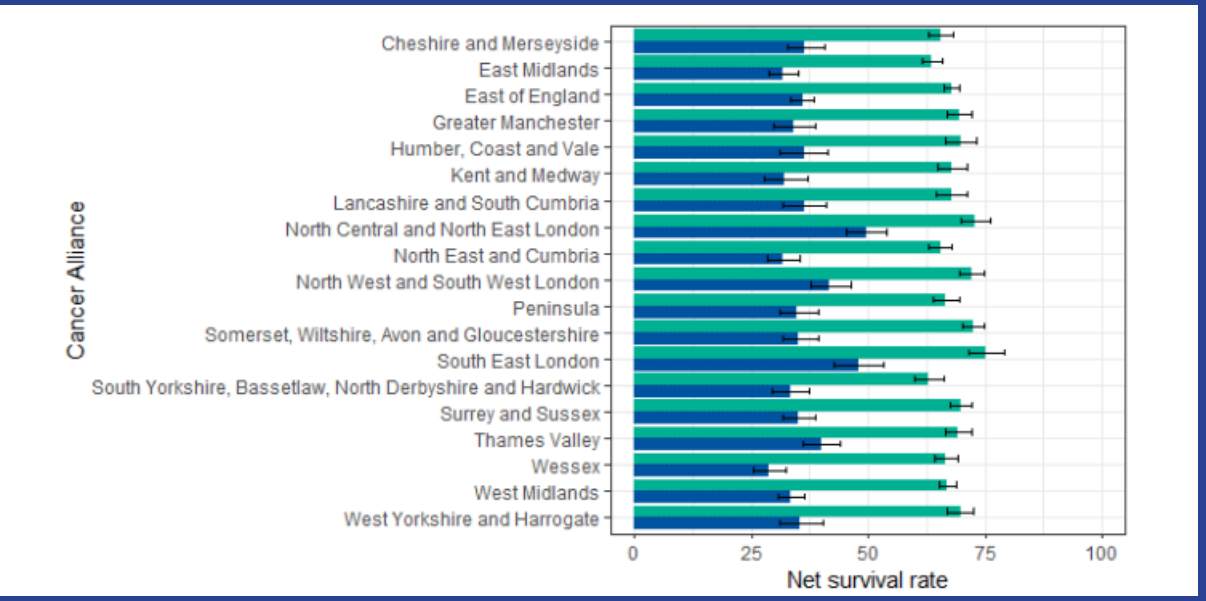








# Basic statistics



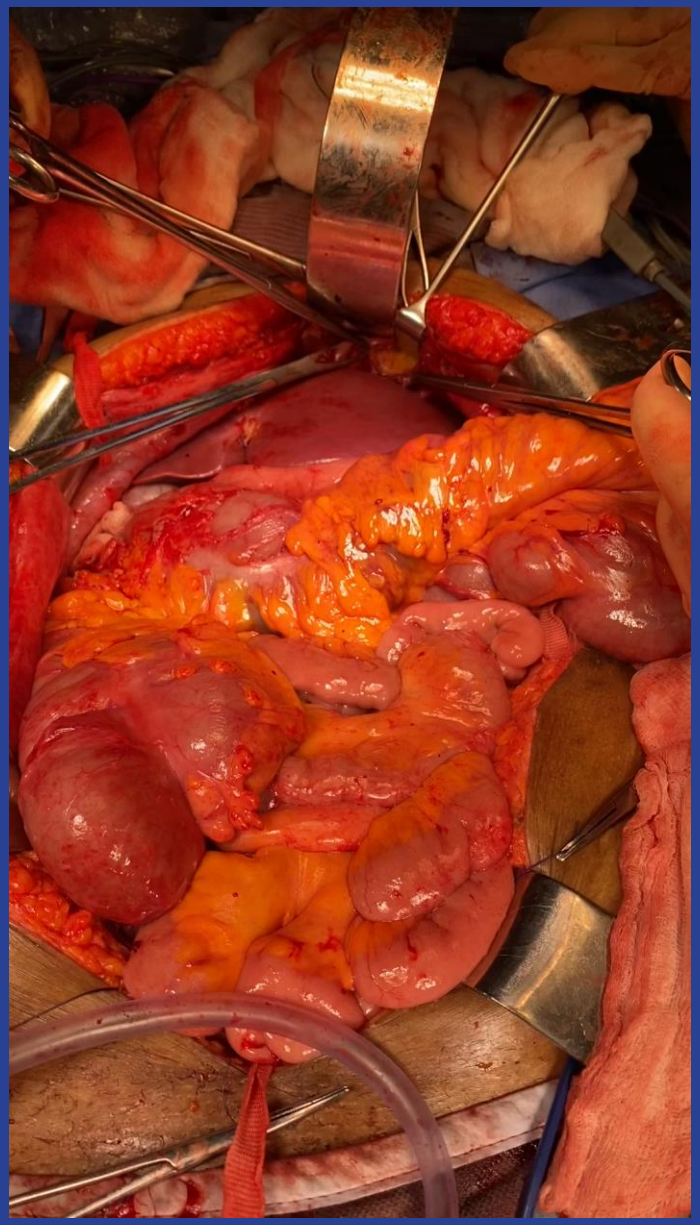

ncras
National Cancer Registration and Analysis Service

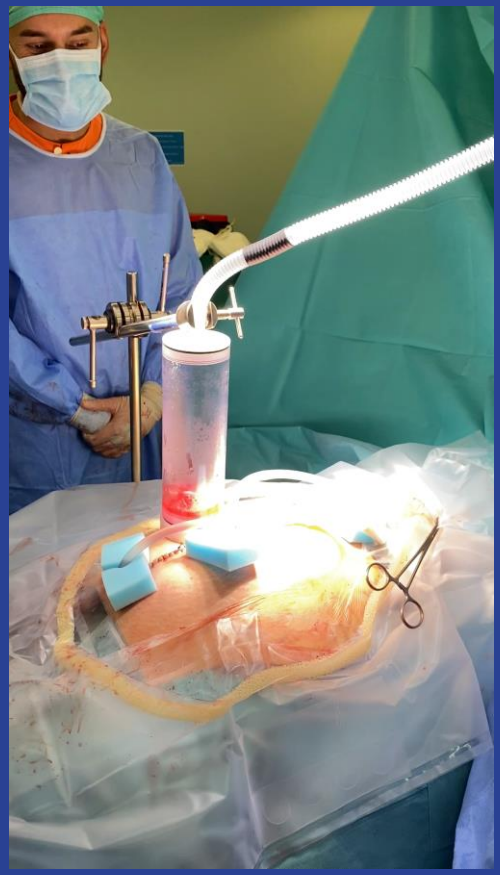
Net survival rates of patients with ovary, fallopian tube and primary peritoneal carcinomas excluding borderlines at one and 5 years by Cancer Alliance, 2013 to 2017 diagnoses (Source: CAS AV2017)

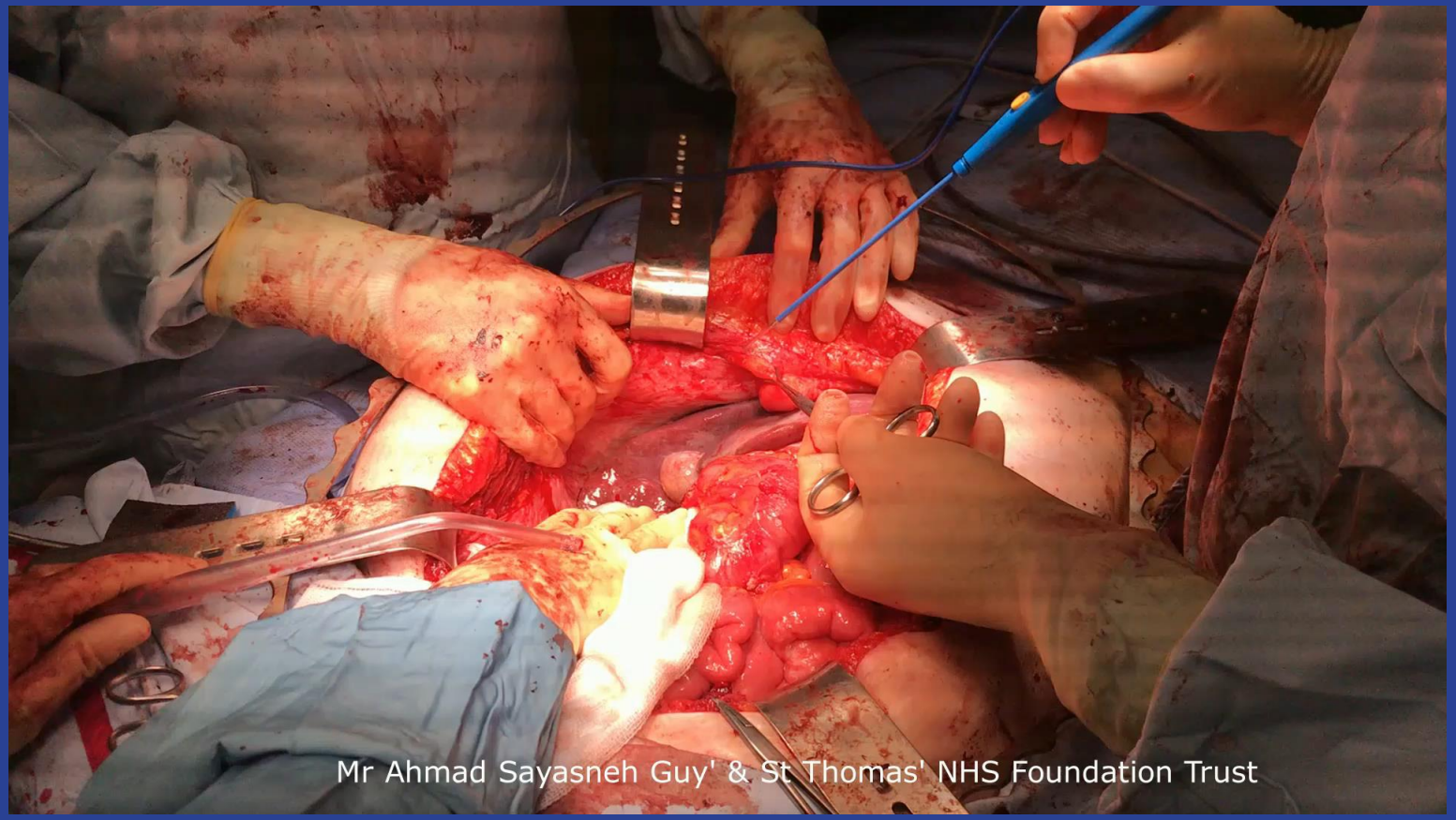
Guy's Cancer

Guy's and St Thomas' NHS
NHS Foundation Trust

# Small bowel obstruction with ovarian cancer

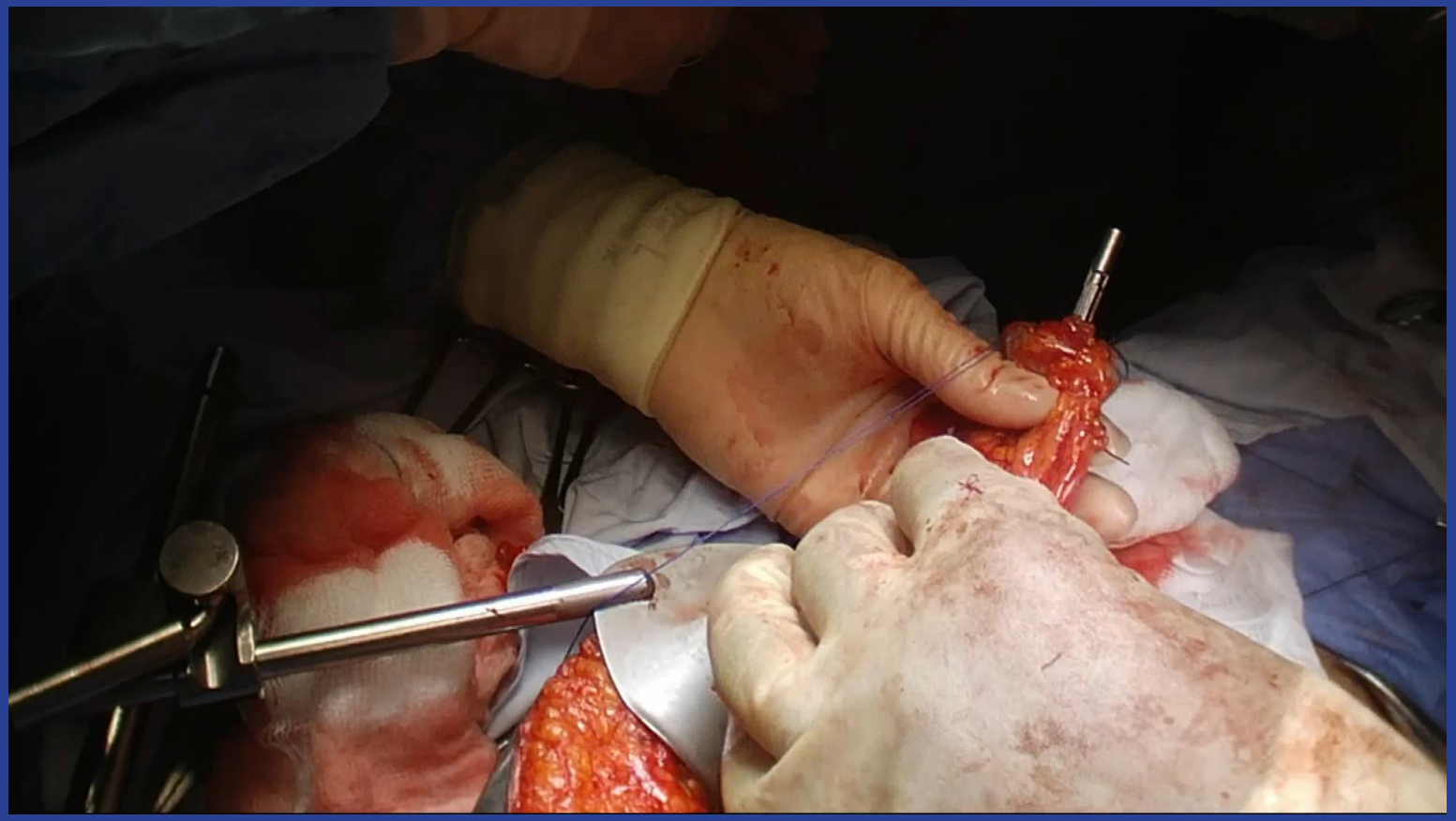





Mr Ahmad Sayasneh Guy' & St Thomas' NHS Foundation Trust

## Bladder peritonectomy, Asst Prof Ahmad Sayasneh, GSTT, KCL

**Rectosigmoid Resection/Ovarian Cancer/ Asst Ahmad Sayasneh, GSTT, KCL**



Journal of *Personalized Medicine*

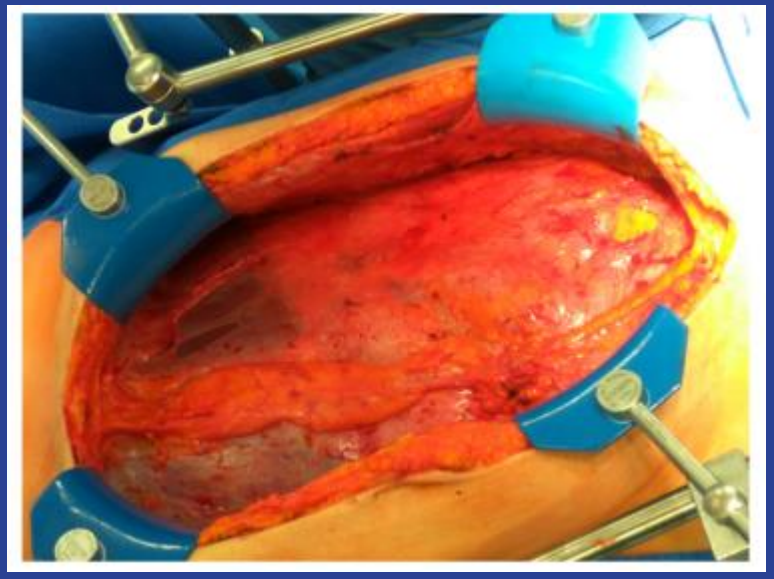
MDPI

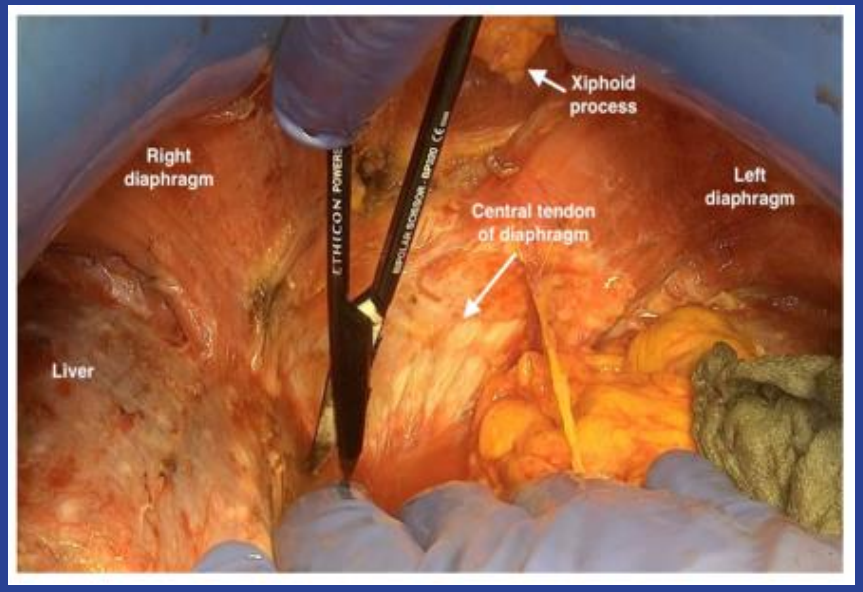
*Article*

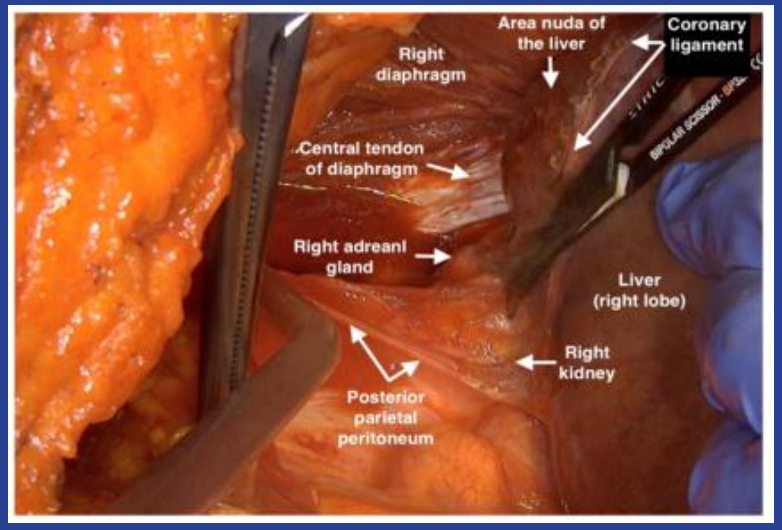
# A Promising Approach for Primary Cytoreductive Surgery for Advanced Ovarian Cancer: Survival Outcomes and Step-by-Step Description of Total Retroperitoneal en-Bloc Resection of Multivisceral-Peritoneal Packet (TROMP)

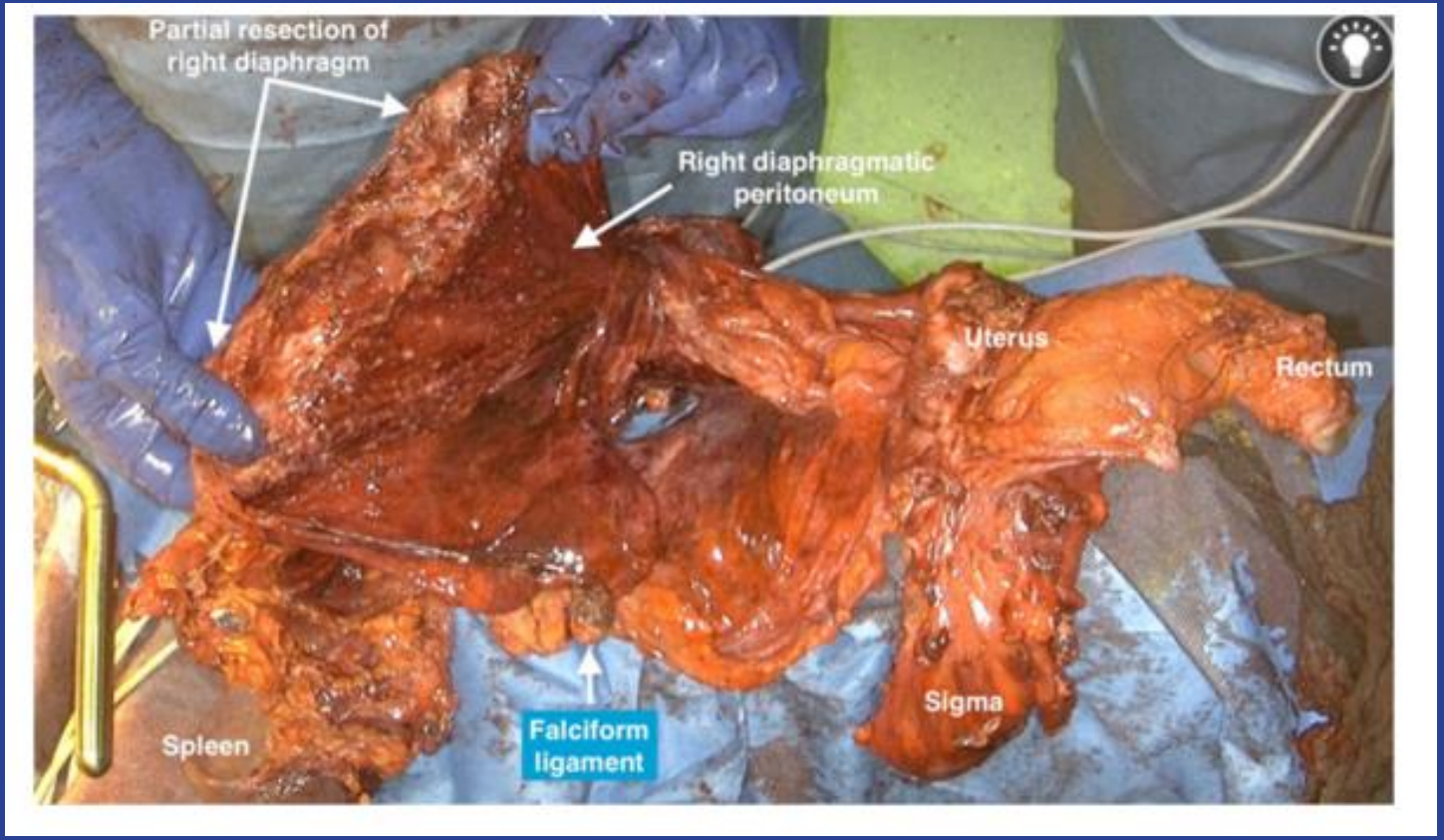
**Mustafa Zelal Muallem [1,*], Luisa Kluge [1], Ahmad Sayasneh [2], Jalid Sehouli [1], Dario Zocholl [1], Jumana Muallem [1] and Andrea Miranda [1]**

J. Pers. Med. 2022, 12, 899. https://doi.org/10.3390/jpm12060899

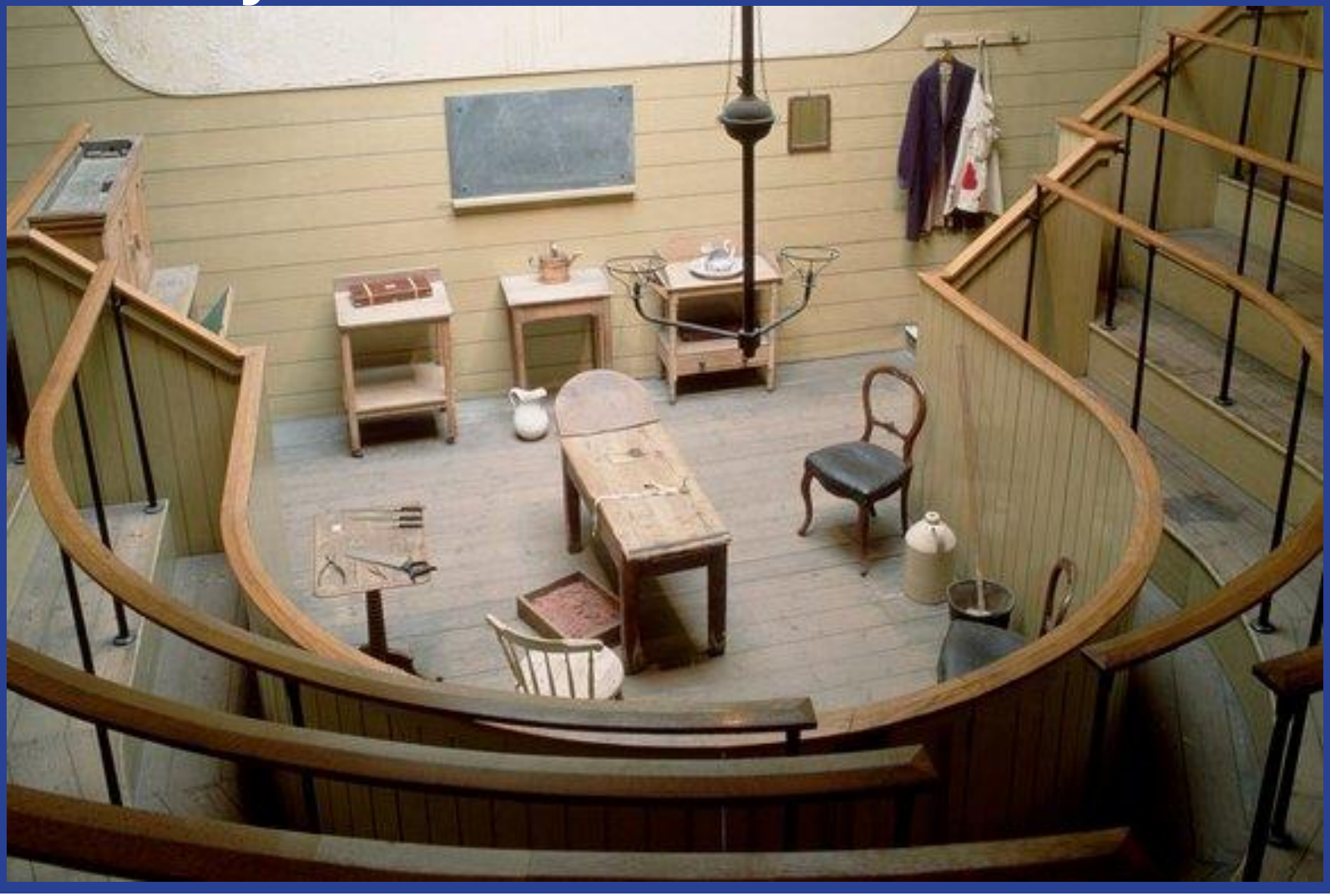



Xiphoid process
Right diaphragm
Left diaphragm
Central tendon of diaphragm
Liver


Area nuda of the liver
Coronary ligament
Right diaphragm
Central tendon of diaphragm
Right adreanl gland
Liver (right lobe)
Right kidney
Posterior parietal peritoneum


Partial resection of right diaphragm
Right diaphragmatic peritoneum
Uterus
Rectum
Sigma
Falciform ligament
Spleen

# Thank you



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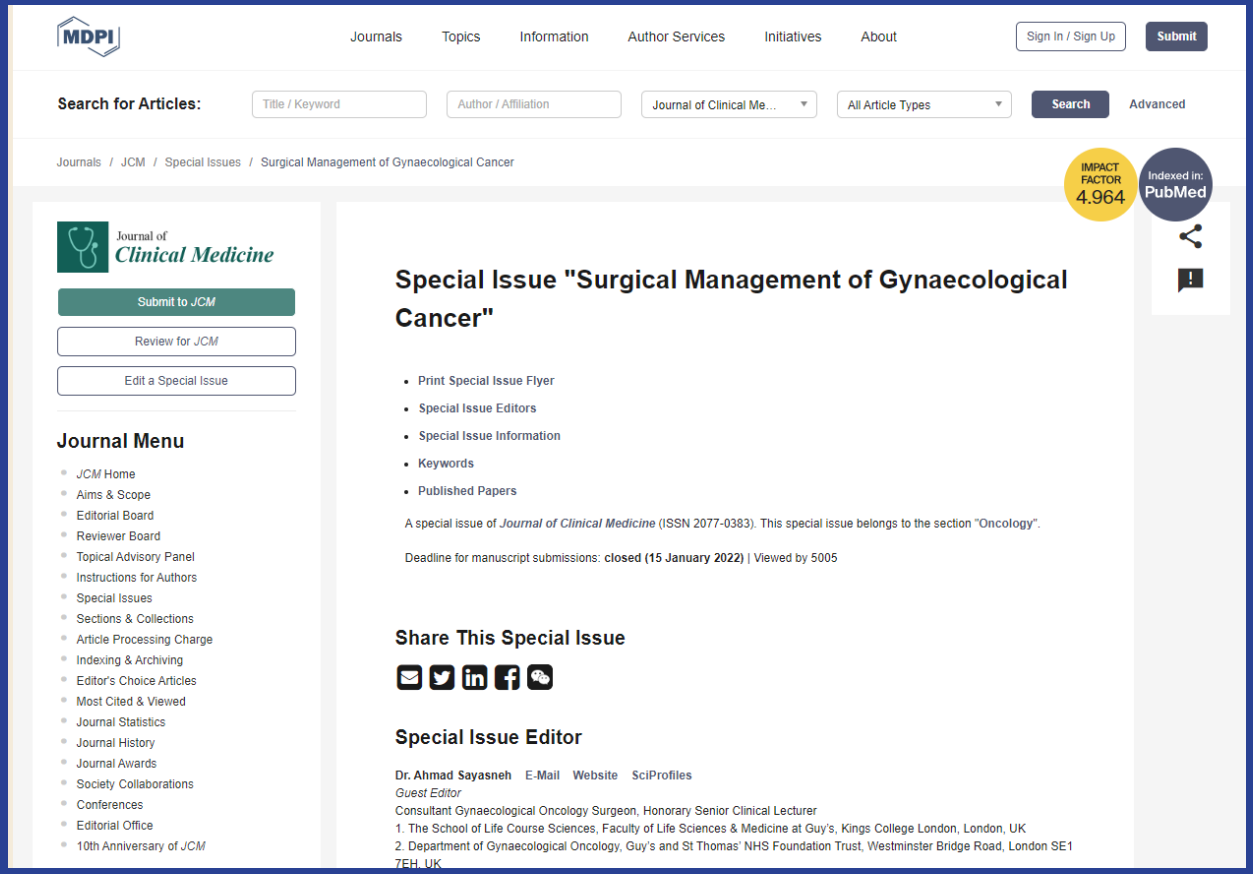


**Ahmad.Sayasneh@gstt.nhs.uk**

Guy's Cancer

Guy's and St Thomas' NHS
NHS Foundation Trust

# ISUOG WORLD CONGRESS 2022

London and virtual | 16 - 18 September

## Scientific program

Sunday, 18 September 2022

| | |
|---|---|
| 14:40 - 15:40 | **[OC] Imaging in oncology**<br>Hall 1 (Mancy/Avize, Champagne Suite)<br>**Chairperson:** Antonia Testa, Ahmad Sayasneh |

# THANK YOU

Mr Ahmad Sayasneh

Department of Gynaecological Oncology
Guy's & St Thomas' NHS Foundation Hospital
King's College London; University of London