

*In the name of  
God*



# Diagnostic modality for endometriosis

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# Diagnosis of endometriosis

- Typically there is a **lengthy delay** in the diagnosis of endometriosis, At least between 4 to 10 years
- Delayed diagnosis is mainly due to :
  - ✓ the non-specific nature of the associated symptoms and
  - ✓ the need to verify the disease surgically.
  - ✓ In addition, there may be little relationship between the severity of the symptoms and the extent of disease, further complicating successful diagnosis
- Many women report that the delay in diagnosis leads to increased personal suffering, prolonged ill health and a disease state that is more difficult to treat.

## Diagnosis of endometriosis is done by:

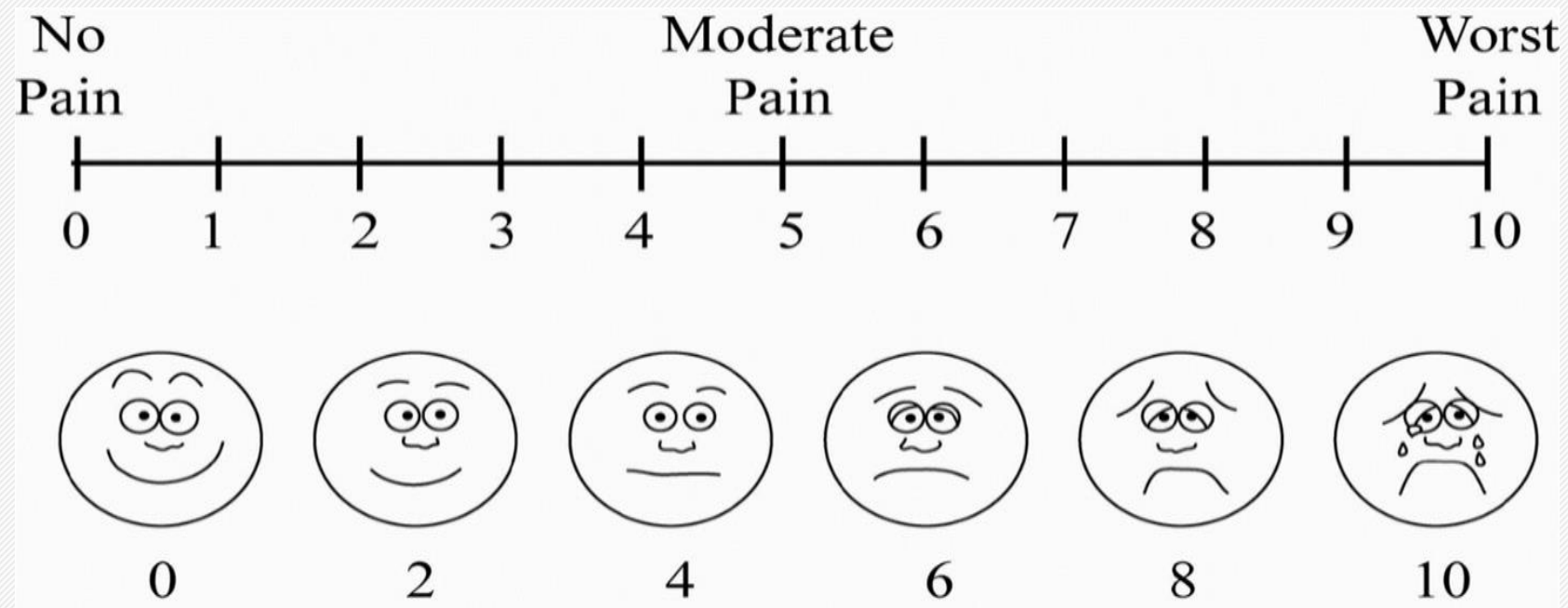
- History taking
- Physical examination
- Imaging
- Biomarkers
- Histo-pathological verification of endometrial glands and/or stroma
- Diagnostic Laparoscopy?

# History taking

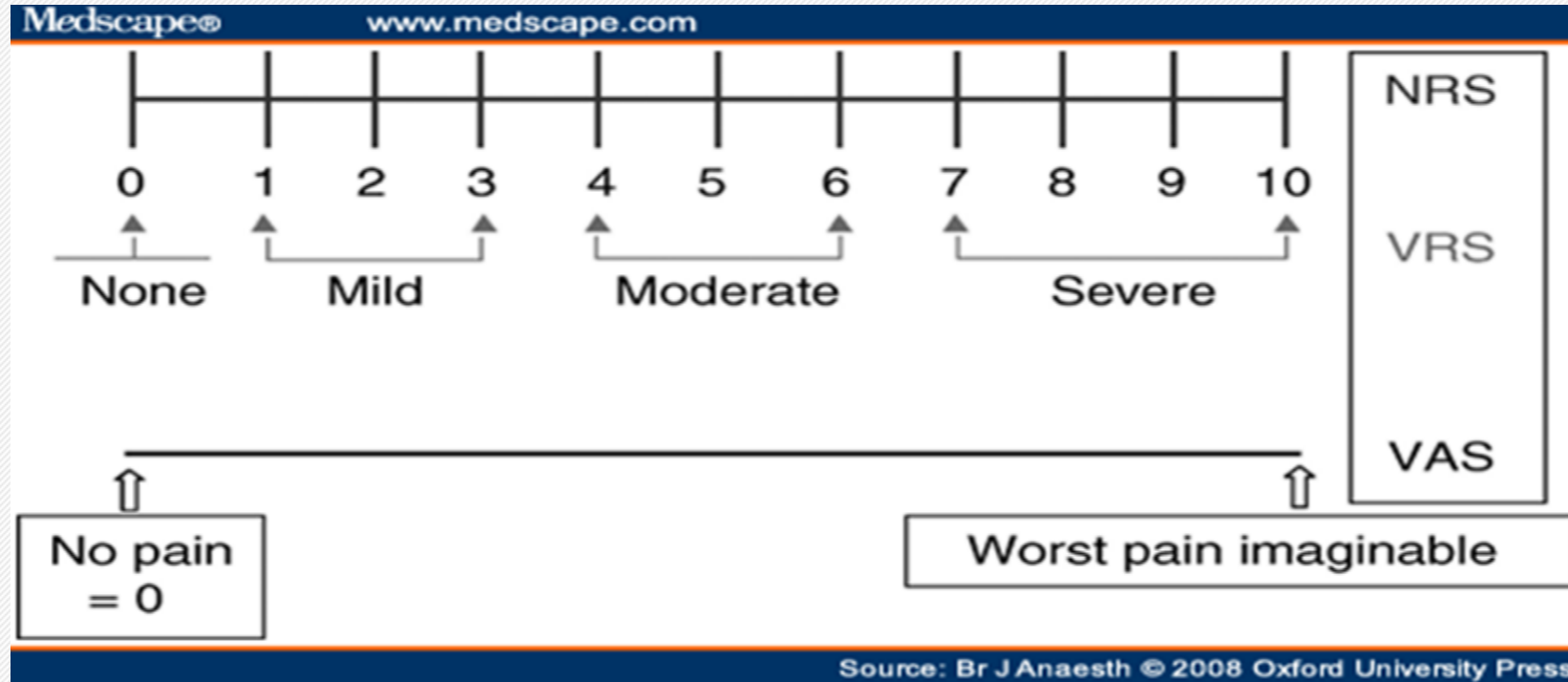
- Age, Parity, Menstrual cycles,
- Pain : **VAS score** or **Numeric Rating Scale**
- Others autoimmune or endocrine diseases
- Previous pelvic surgery
- Hormonal or non-hormonal medication usage
- Family history

# Pain score

- Visual Analog Scale for Pain (**VAS Pain**)



- Numeric Rating Scale for Pain (**NRS Pain**)



# Chronic pelvic pain:

- Period-related pain (**dysmenorrhoea**) affecting daily activities and quality of life ( isolated cyclic pain is less common in adolescence)
- Acyclic pain
- Deep pain during or after sexual intercourse(**dyspareunia**)
- Period-related or cyclical gastrointestinal symptoms, in particular, painful bowel movements(**dyschesia**)
- Period-related or cyclical urinary symptoms, in particular, blood in the urine or pain passing urine(**dysuria** )

**Infertility** in association with 1 or more of the above



# History taking

- Age, Parity, Menstrual cycles,
- Pain : **VAS score** or **Numeric Rating Scale**
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- Previous pelvic surgery
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- Family history

# Physical examination:

Physical examination is essential to determine the diagnosis and appropriate care, as well as to **rule out other disorders**, including **acute conditions** that may require immediate attention.

- 1- Ask for any pain and its location,
- 2- **Abdominal inspection** for scar, distended veins, striae,
- 3- **Abdominal palpation** for assess of intra-abdominal organ enlargement or masses,
- 4- **Inspection of vagina and cervix** with Speculum (any bluish nodule).
- 5- **Superficial palpation** (look for tenderness, mass or nodule, rigidity),
- 6- **Deep palpation**

## Physical examination cont....

**7-Bimanual digital pelvic examination** (size, shape, consistency, position, mobility of uterus, both lateral fornixes and posterior fornix)

8- A **recto-vaginal examination** may be necessary and appropriate to palpate the uterosacral ligaments and rectovaginal septum, which may reveal tender nodules suggestive of deeply infiltrating endometriosis.

9- Bimanual palpation for both **kidneys**.

10- **Rectal examination** in virgin women or/and adolescents.

\* **Examination during menses** may improve the chances of detecting deeply infiltrating nodules and the assessment of pain.

## Physical examination cont....

- Clinicians may consider the diagnosis of endometriosis in women suspected of the disease even if the clinical examination is normal. ( level III)
- Clinical examination is of less value in evaluating patients with DIE and thus there is a need for additional diagnostic studies.

# Diagnostic Laparoscopy:

**Diagnostic laparoscopy** has been Replaced with a “**See and Treat**” Approach. Surgery for endometriosis may be an appropriate intervention, but it should ideally done when its **therapeutic benefit outweighs the risks.**

Surgery maybe indicated in:

- ✓ Patients who Decline, do not respond to, do not tolerate, or have contraindications to medical therapy.
- ✓ Patients who request surgical confirmation(suspicious to malignancy), or perceived failure of therapy, Sociocultural and Religious Considerations.

# Imaging modalities:

- Laparoscopy and histopathologic confirmation used to be considered the standard route of diagnosis for endometriosis (specially DIEs), but it is an invasive method.
- Imaging tests are available, feasible and more affordable and early diagnosis of DIE is an important predictor of outcome and quality of life as well as fertility.
- Imaging tests can predict the location of endometriotic lesions. Thus surgeons may achieve the information they need to plan and improve their surgical approach

Useful Imaging modalities in diagnosis of endometriosis, consist of:

- **Ultrasonography:**

Trans-vaginal ultrasound /Trans-rectal ultrasound.

KUB ultrasound , 3D Ultrasound , Elastosonography

rectal water contrast transvaginal ultrasound , sonovaginography

- **MRI**

While both investigation modalities are operator dependent, there is potential for more inter-observer variation in ultrasound than MRI, which may be reported by a second radiologist, providing some quality control

## Transvaginal/Transrectal ultrasound :

- TVS is the modality of choice in diagnosis of endometriosis.  
with bowel preparation
- rectal sonography with bowel preparation for virgin patients

### **Rectal preparation order for sonography:(One day before imaging)**

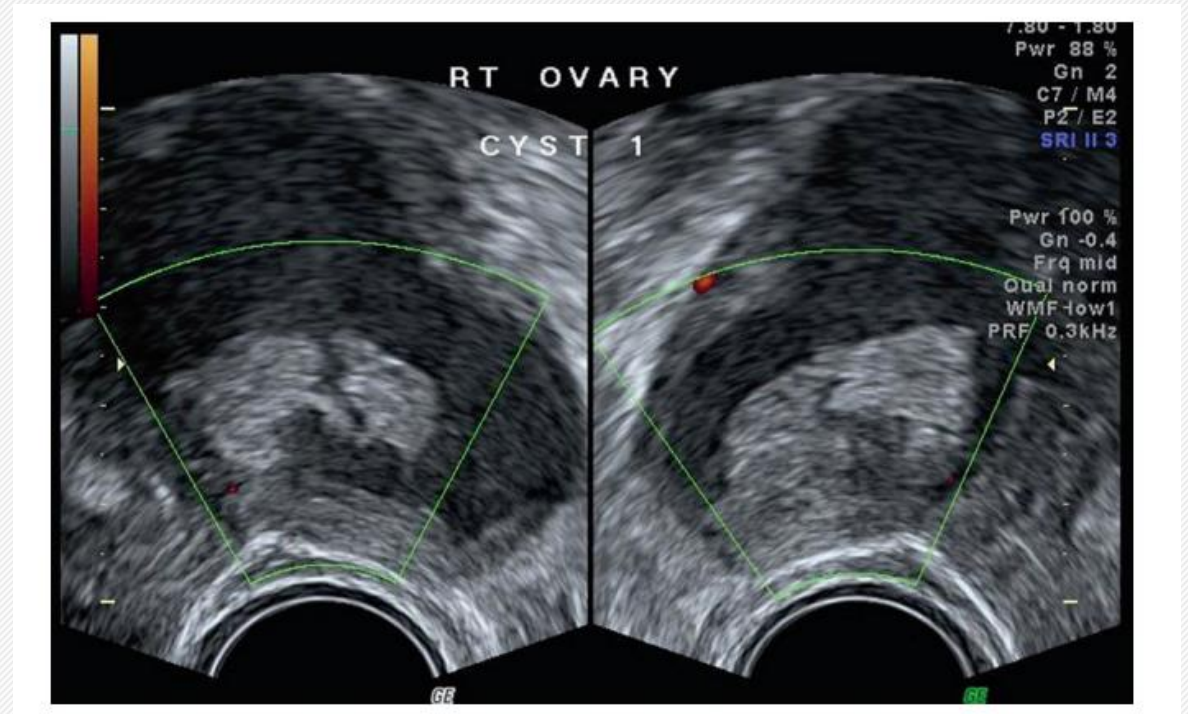
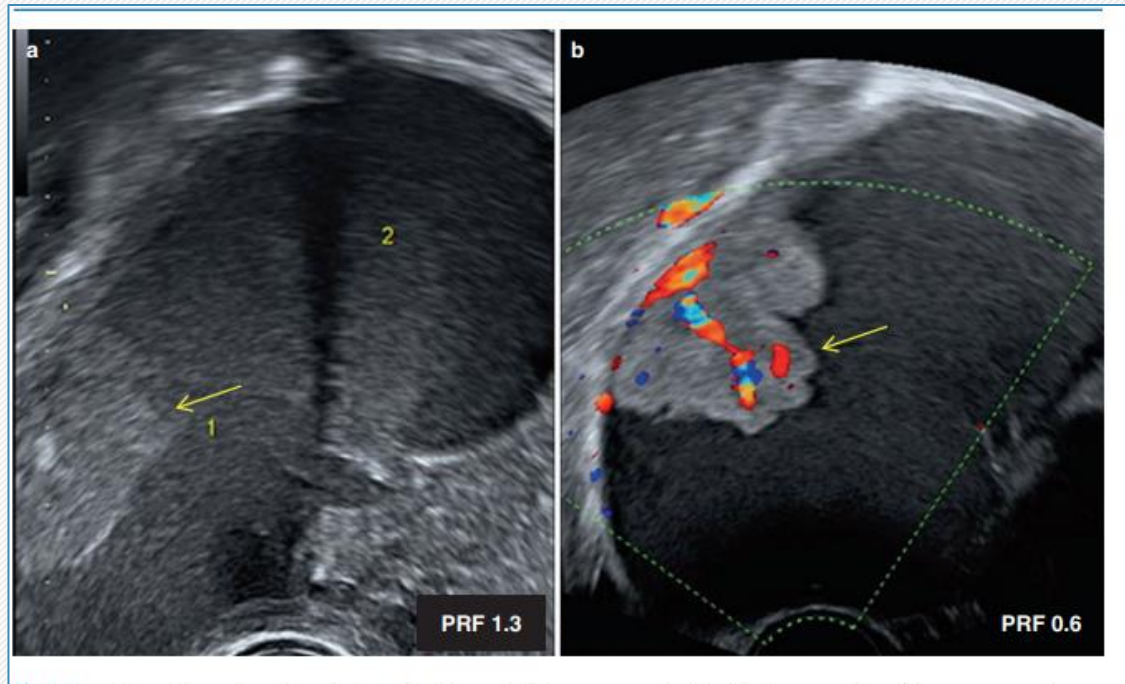
- laxative suppository plus Liquid diet.
- Patients should avoid any oral intake in the last 2 hours prior to sonography, because GI peristalsis may push the bowel content to the rectosigmoid and disturb the visual field.



# Sonography....

- TVS for the diagnosis of rectal endometriosis is highly operator dependent. The **sensitivity, specificity, PPV** and **NPV** of TVS was found to be 83.3%, 46.1%, 85.7% and 41.6%, respectively.
- Typical appearance of ovarian **endometrioma** in premenopausal women can be described as **ground glass echogenicity** with one to four **compartments** and **absence of papillar structures with detectable blood flow**.
- **transvaginal ultrasound and 3D sonography** for diagnose **rectosigmoidal** lesions  
But clinicians should be aware that the usefulness of 3D ultrasound to diagnose rectovaginal endometriosis is not well established

# Papillar structures with detectable blood flow.



## **KUB ultrasound:**

It should be done in all the patients with endometriosis and DIE,  
(specially in the presence of US ligament DIE)

KUB ultrasound is for evaluation of periureteric DIE that caused the ureteral stricture and hydronephrosis.

# MRI

- Diagnostic accuracy of MRI is higher than TVS and TRS in diagnosis of DIE, especially in rectovaginal and ureter locations and small bowel involvement.  
but TVS has the same sensitivity and specificity in the diagnosis of DIE  
(if reported by expert radiologist/gynecologist)

**Thus because of the cost, MRI is not the first choice.**

- Combination of MRI and TVS may increase even further the positive post-test probabilities to near 100%.
- **The usefulness of MRI in diagnosis of peritoneal endometriosis is not well established.**

# Biomarkers

- ❖ A good test could shorten the time lapse between the onset of the symptoms and the beginning of the treatment, and allow monitoring of disease progression and recurrence
- ❖ Various types of biomarker had been examined in endometriotic patients, for example: angiogenesis/growth factors, apoptosis markers, cell adhesion molecules, hormonal markers inflammatory markers, microRNAs, tumor markers, anti-endometrial antibodies, interleukin-6 (IL-6), cancer antigen-19.9 (CA-19.9) and CA-125.
- ❖ These serum biomarkers that were demonstrated above **hadn't any value** in endometriosis diagnosis

# Biomarkers...

The intriguing question is not “why have we failed,” but  
“**why should we have succeeded**” in this endeavor.

Like breast cancer, coronary heart disease, or osteoporosis and many other prevalent and disabling conditions, endometriosis is a focal disease with some systemic features and biochemical signs that are too nonspecific to be accurately used as diagnostic biomarkers.

Endometriotic lesions are often small, have scarce cellular content, and usually do not release inflammatory mediators or growth factors in amounts that outweigh alternative sources of the same molecules



# Biomarkers...

- The most studied of these proteins is **CA-125**,
- It is a glycoprotein produced by endometrial and mesothelial cells in response to inflammation
- CA-125 is not specific for endometriosis, and has low sensitivity for disease detection at any stage.
  
- As the CA-125 level in endometriosis patients is consistently elevated, its assessment is not recommended routinely. The same applies to the serum level of human epididymal protein (HE4).

## Conditions associated with an elevated serum CA 125 concentration

### Nongynecologic conditions

Ascites

Appendicular abscess

Cirrhosis and other liver disease

Colitis

Cystic fibrosis

Diverticulitis

Heart failure

Myocardial infarction

Myocardopathy

Pancreatitis

Pericardial disease

Pleural effusion

Pneumonia

Pulmonary embolism

Recent surgery

Renal insufficiency

Sarcoidosis

Systemic lupus erythematosus

Tuberculosis peritonitis

Urinary tract infection



# Conditions associated with an elevated serum CA 125 concentration

<b>Benign gynecologic conditions</b>
Adenomyosis
Benign ovarian neoplasms
Endometriosis
Functional ovarian cysts
Meig syndrome
Menstruation
Ovarian hyperstimulation
Pelvic inflammatory disease
Pregnancy
Uterine leiomyomas

# Conditions associated with an elevated serum CA 125 concentration

## Gynecologic malignancies

Endometrial cancer

Epithelial ovarian, fallopian tube, and primary peritoneal cancers

## Nongynecologic cancers

Breast

Colon

Gallbladder

Hematologic malignancies

Liver

Lung

Pancreas

# Biomarkers...

What should be checked in any specific case?

- **Typical endometrioma** : AMH (and Ca125 ? )
- **Atypical endometrioma** : HE4 (ROMA) , CEA.
- **Infertile women** need more investigations like:  
FSH , TSH, prolactin, HSG, Semen Analysis.

Clinicians are recommended not to use biomarkers in endometrial tissue, menstrual or uterine fluids and/or immunological biomarkers, including CA-125, in plasma, urine or serum, to diagnose endometriosis.



## Classification of endometriosis

This article reviews the four standard classification systems, namely, the

- revised American Society for Reproductive Medicine (rASRM) classification,
- ENZIAN classification,
- endometriosis fertility index (EFI), and
- American Association of Gynecological Laparoscopists (AAGL) classification.

### rASRM classification

#### Advantages:

- it has been **accepted globally** and has been widely used in recent years.
- it is **easy to use** and **helpful** for physicians to explain the degree of endometriosis in simple terms to patients.

## Disadvantages of rASRM classification.....

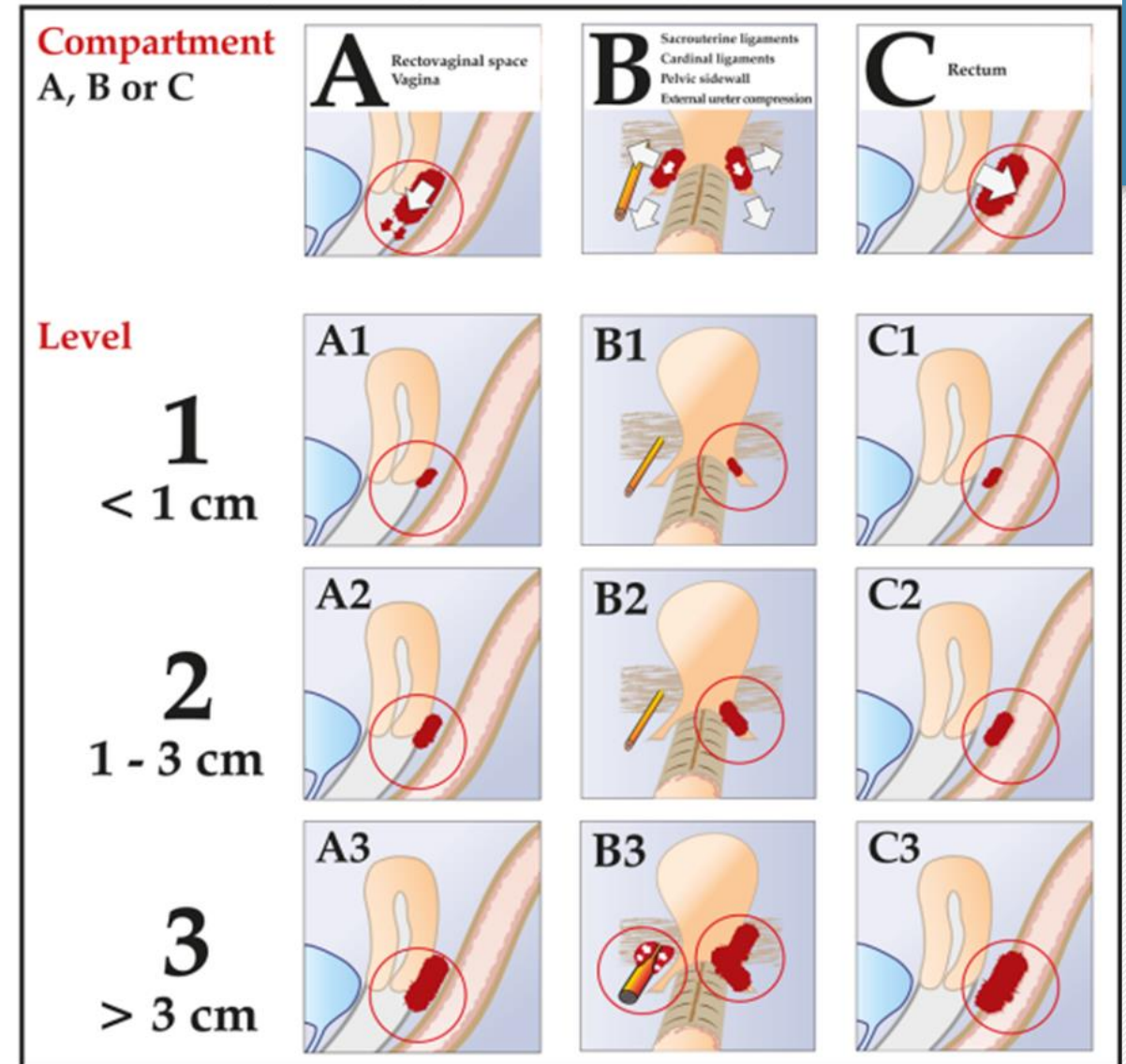
- there is a **difference** between **histologically** diagnosed endometriosis and a **visually** diagnosed stage
- comparison of interobserver and intraobserver scores resulted in a change in stage in 52% and 38% of the patients
- severities of pain and infertility are not correlated with rASRM stage
- rASRM classification does not consider the presence of deeply infiltrating endometriosis (DIE) in different sites such as the uterosacral ligaments, bladder, vagina, and bowel.

- **ENZIAN classification**

- in order to supplement DIE in retroperitoneal structures, the ENZIAN classification was developed
- is determined by the extent of endometriosis during surgery

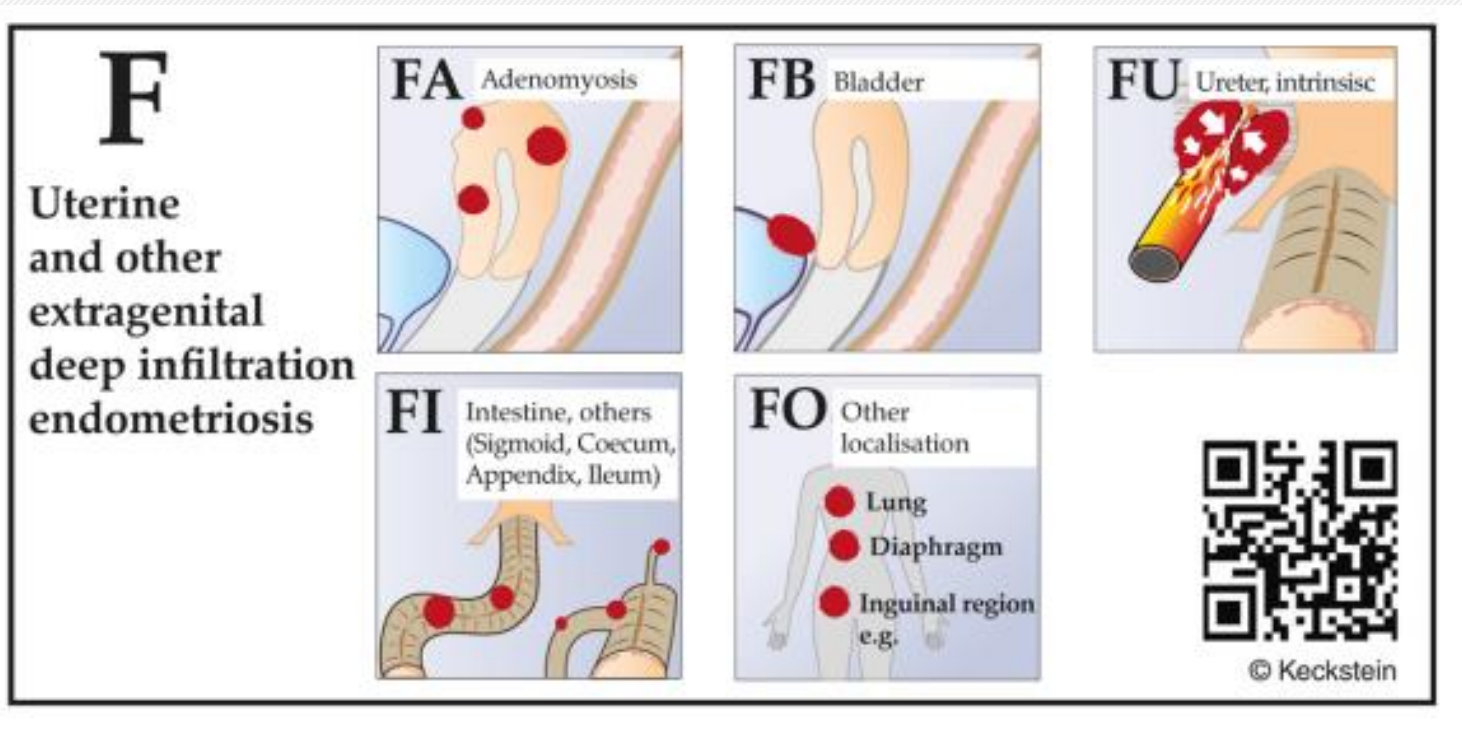
## ENZIAN 2012

Classification of Deep Infiltrating Endometriosis (according to the Endometriosis Research Foundation, SEF)





# ENZIAN classification....



## ENZIAN classification....

- **advantages** of the ENZIAN classification is that
  - detailed descriptions of the retroperitoneal structures.
  - the ENZIAN classification can be determined by imaging modalities and used for surgical planning.  
the accuracy of the ENZIAN scores detected by preoperative MRI was 95% with a low false-negative rate of 4%
  - associated and correlated with the presence and severity of different symptoms



## Endometriosis fertility index

- The purpose of the development of the EFI system is to predict the pregnancy rate in patients with surgically documented endometriosis who have not attempted to become pregnant with IVF
- The EFI system has a clear advantage on predicting pregnancy outcome
- the IVF outcomes were higher in patients with an EFI score of 6 or higher than in those with a score of 5 or less.

# ENDOMETRIOSIS FERTILITY INDEX (EFI) SURGERY FORM

## LEAST FUNCTION (LF) SCORE AT CONCLUSION OF SURGERY

Score	Description	Left	Right	
4 =	Normal	<input type="text"/>	<input type="text"/>	
3 =	Mild Dysfunction	<input type="text"/>	<input type="text"/>	
2 =	Moderate Dysfunction	<input type="text"/>	<input type="text"/>	
1 =	Severe Dysfunction	<input type="text"/>	<input type="text"/>	
0 =	Absent or Nonfunctional	<input type="text"/>	<input type="text"/>	
<p>To calculate the LF score, add together the lowest score for the left side and the lowest score for the right side. If an ovary is absent on one side, the LF score is obtained by doubling the lowest score on the side with the ovary.</p>		<p><b>Lowest Score</b></p> <input type="text"/>	<p><b>Lowest Score</b></p> <input type="text"/>	<p><b>LF Score</b></p> <input type="text"/>

## ENDOMETRIOSIS FERTILITY INDEX (EFI)

Historical Factors			Surgical Factors		
Factor	Description	Points	Factor	Description	Points
<u>Age</u>	If age is ≤ 35 years	2	<u>LF Score</u>	If LF Score = 7 to 8 (high score)	3
	If age is 36 to 39 years	1		If LF Score = 4 to 6 (moderate score)	2
	If age is ≥ 40 years	0		If LF Score = 1 to 3 (low score)	0
<u>Years Infertile</u>	If years infertile is ≤ 3	2	<u>AFS Endometriosis Score</u>	If AFS Endometriosis Lesion Score is < 16	1
	If years infertile is > 3	0		If AFS Endometriosis Lesion Score is ≥ 16	0
<u>Prior Pregnancy</u>	If there is a history of a prior pregnancy	1	<u>AFS Total Score</u>	If AFS total score is < 71	1
	If there is no history of prior pregnancy	0		If AFS total score is ≥ 71	0
<b>Total Historical Factors</b>		<input type="text"/>	<b>Total Surgical Factors</b>		<input type="text"/>
<p>EFI = TOTAL HISTORICAL FACTORS + TOTAL SURGICAL FACTORS:</p>			<input type="text"/>	<p>+</p> <input type="text"/>	<p>=</p> <input type="text"/>
			Historical	Surgical	EFI Score

# AAGL

American Association of Gynecological Laparoscopists  
classification

- This system contained all the **basic information** thought to be important in quantifying the extent of disease in a patient.
- **surgical difficulties** were categorized into four levels
- For validation of the score system, **visual analogue scale scores** and **infertility history** were collected from the patients before surgery

scores ranging from 0 to 10 points

# summery

- Early diagnosis can reduce morbidity and increase confidence in women
- Physical examination is important (Examination during menses )
- TVS or TRS with Rectal preparation is recommended
- These serum biomarkers that were demonstrated above **hadn't any value** in endometriosis diagnosis

The image features a white background with decorative watercolor elements. In the top-left corner, there is a large, detailed pink rose with green leaves. The bottom-left corner contains several small, scattered pink watercolor splatters. The bottom-right corner features another pink rose with green leaves and a small branch with buds. A black pen nib is visible at the bottom center, pointing towards the right. The text "Thank you" is written in a black, elegant cursive script in the center of the page.

*Thank you*