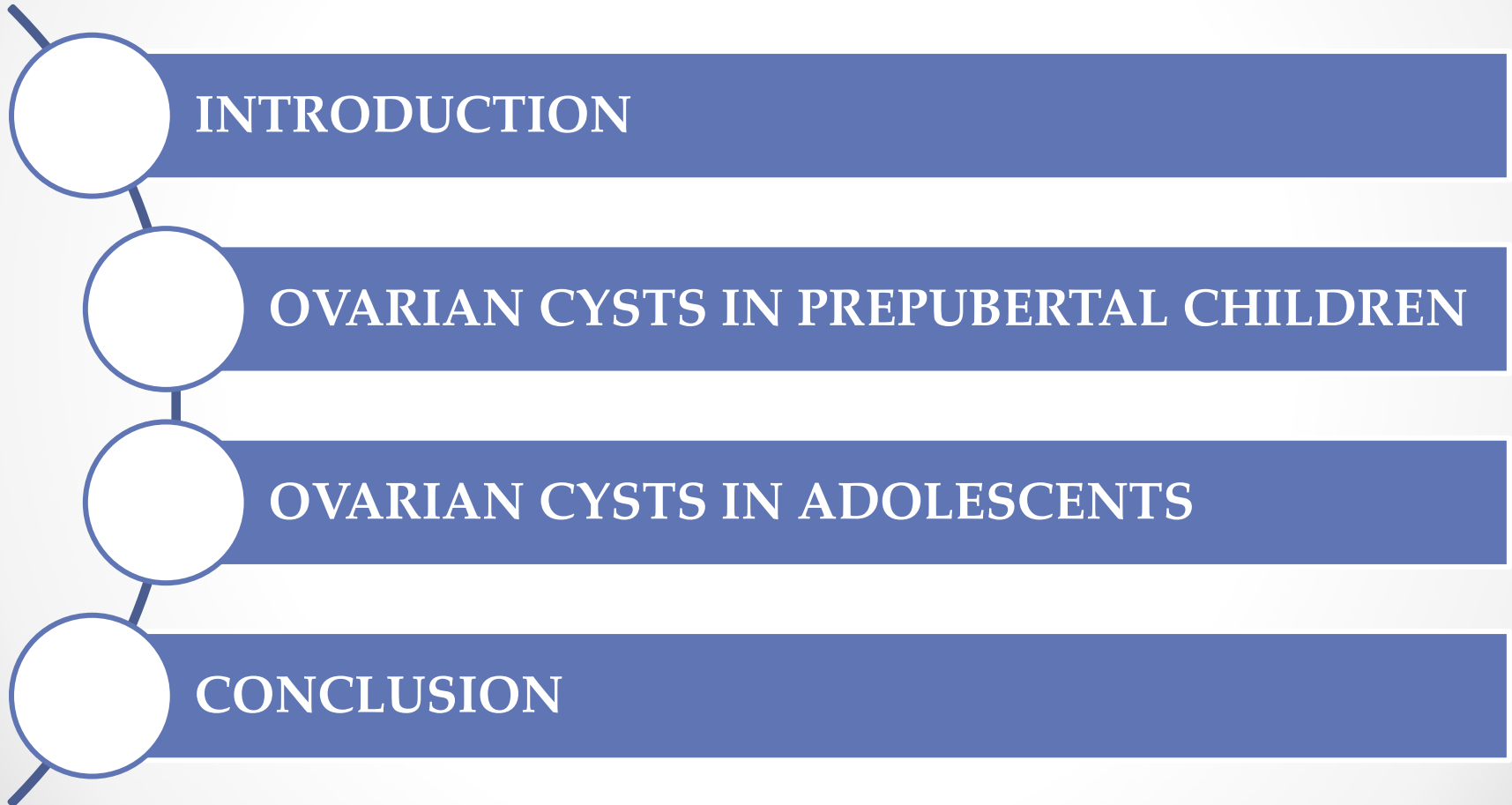


MANAGEMENT OVARIAN CYSTS IN CHILDREN

DR. NGUYEN MINH CHAU

CONTENT



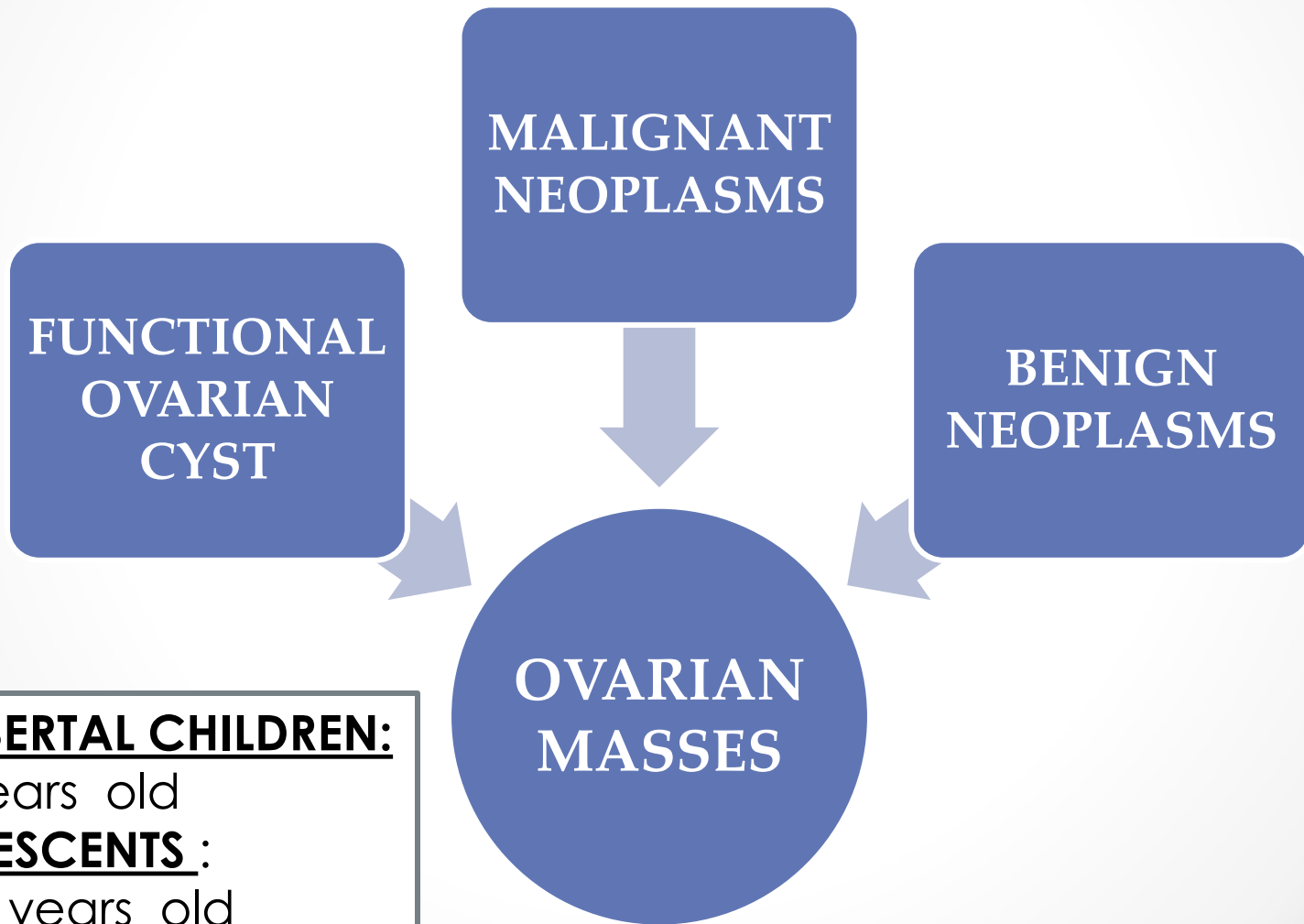
1. INTRODUCTION

BACKGROUND :

- Ovarian mass in children are very common; the vast majority of them are **benign and self-resolving**
- Less than 10% of these being malignant.
- Ovarian malignant tumors account for only 1% of all childhood cancers.

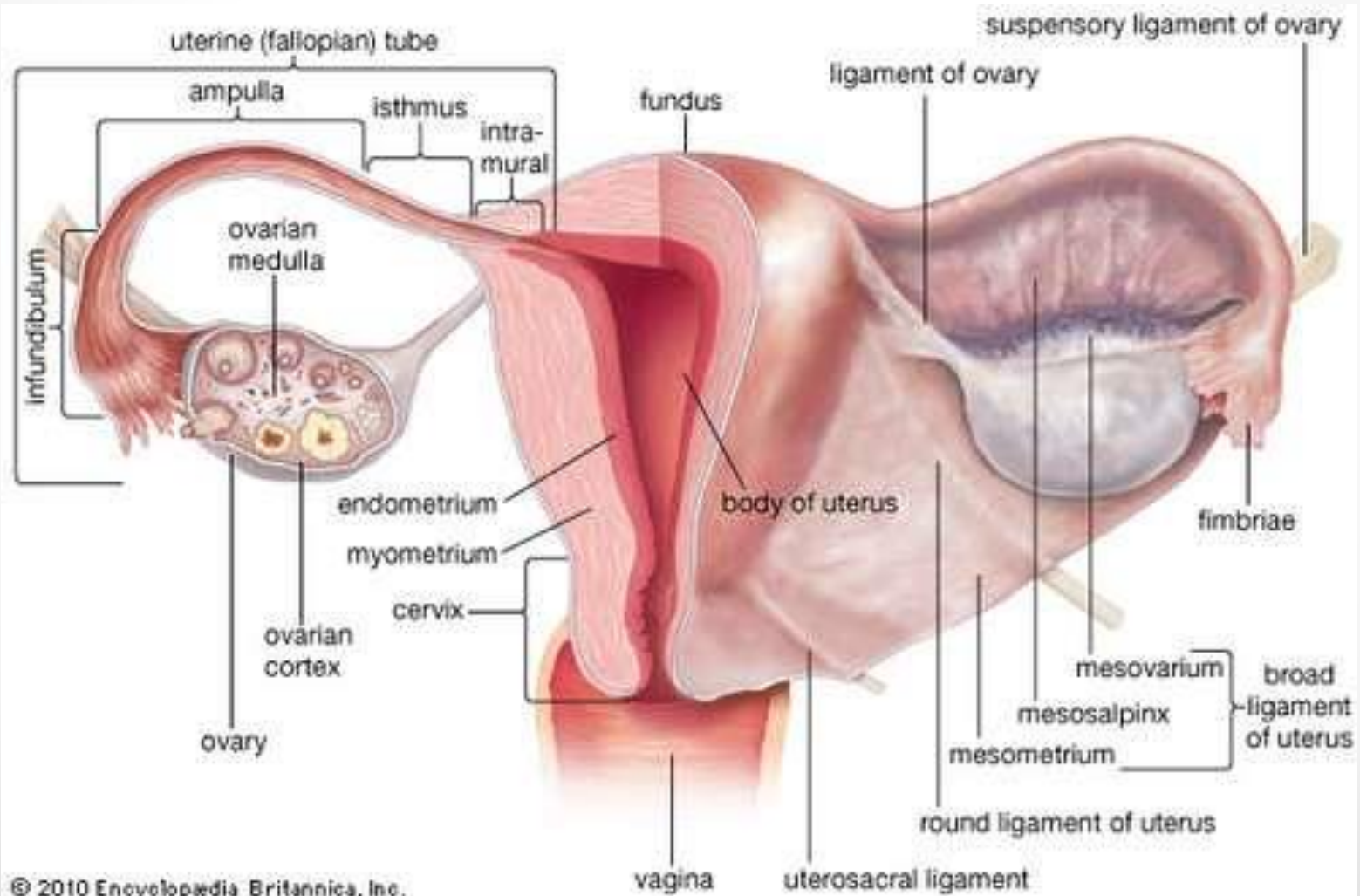
M Herson, et al. (2009). "The histology and management of ovarian cysts found in children and adolescents presenting to a children's hospital from 1991 to 2007: a call for more paediatric gynaecologists". *An International Journal of Obstetrics and Gynaecology*. 117), 181-184.

1. INTRODUCTION



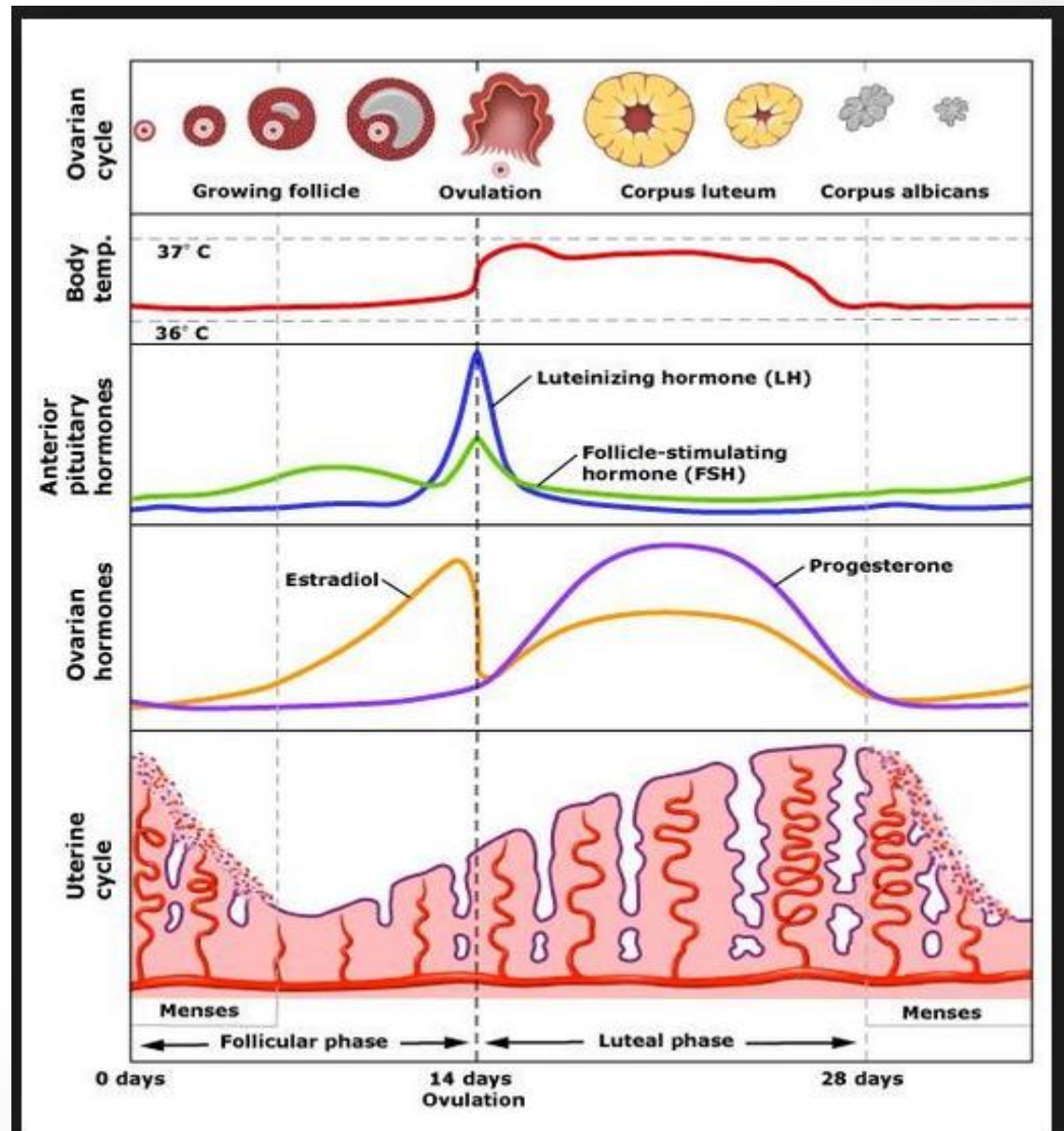
1. INTRODUCTION

- **ANATOMY**



1. INTRODUCTION

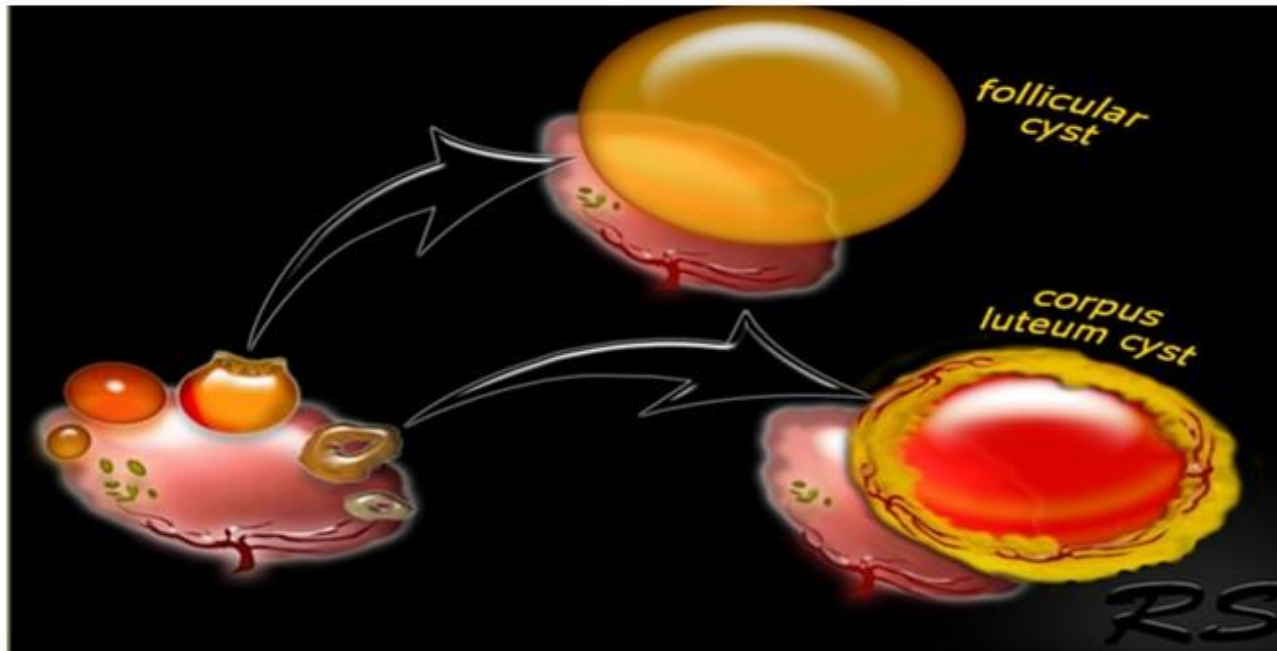
PHYSIOLOGY



1. INTRODUCTION

Corpus luteum cyst
(functional cyst):
result from the normal
formation of a corpus
luteum after ovulation

Graafian follicles (follicular cyst)
functional cysts
A follicular cyst occurs when the
follicle of the ovary doesn't rupture
or release its egg. Instead, it grows
until it becomes a cyst.



2. PREPUBERTAL CHILDREN



2. PREPUBERTAL CHILDREN

Table 2. Characteristics of ovarian cysts by age groups

| | Laterality | | Size | | | Appearance | |
|-------------|------------|------|--------|--------|--------|------------|---------|
| | Right | Left | < 3 cm | 3-5 cm | > 5 cm | Simple | Complex |
| Age group | | | | | | | |
| 5-9 years | 4 | 2 | 6 | 0 | 0 | 6 | 0 |
| 10-14 years | 28 | 19 | 29 | 11 | 7 | 33 | 14 |
| 15-17 years | 42 | 28 | 36 | 23 | 11 | 46 | 24 |
| 18 years | 5 | 4 | 6 | 2 | 1 | 6 | 3 |

The frequency of ovarian cysts was found to be 1.8% (6/337) in children aged 5 – 9 years and 18.8% (126/672) in those aged 10 – 18 years.

All the cysts detected in children aged 5 – 9 years were small < 3cm and simple.

Emeksiz, H.C., et al. (2017). "Age-Specific Frequencies and Characteristics of Ovarian Cysts in Children and Adolescents". *Journal of clinical research in pediatric endocrinology*. 9(1), 58-62.

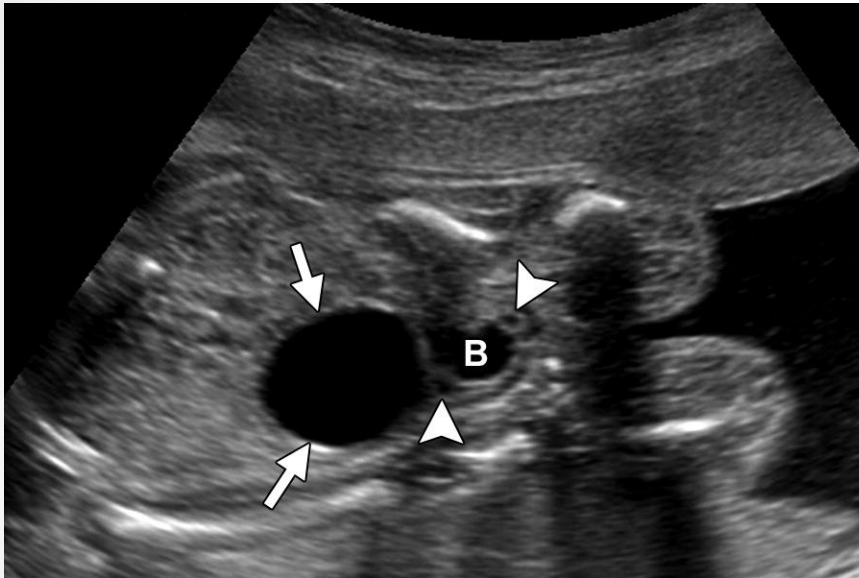
2. PREPUBERTAL CHILDREN

- **Signs and symptoms:**
 - asymptomatic abdominal mass
 - abdominal pain
 - nonspecific other symptoms
 - precocious puberty \pm (if hormonally active)

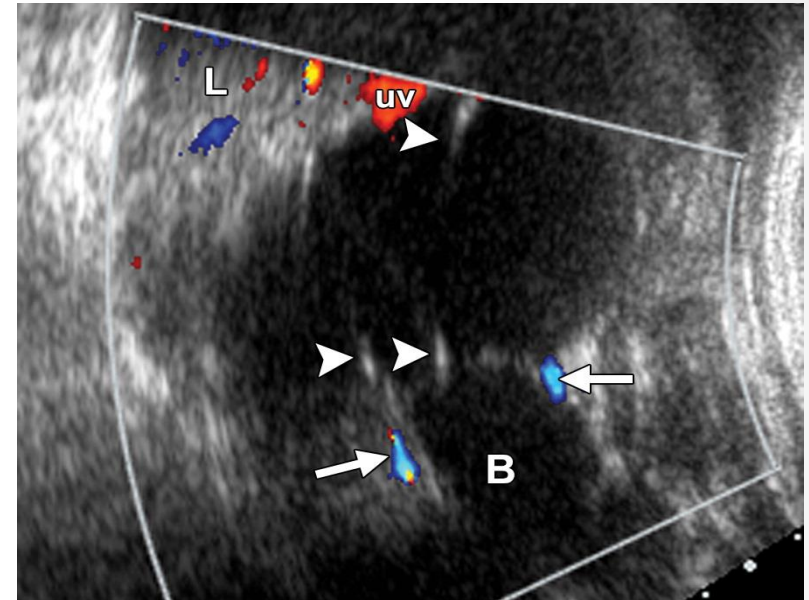
EVALUATION

- Ultrasonography is the primary assessment tool.
- Evaluate for precocious puberty if the child has signs of early sexual development or the cyst larger than 1 cm or bilateral.
- The management of an ovarian cyst in the prepubertal age group depend upon the appearance of the cyst on ultrasound imaging and presentation.

Simple vs complex cyst



- ❖ Thin wall
- ❖ Homogeneous
- ❖ None or one septation



- ❖ Thickened wall/ solid tissue
- ❖ Heterogeneous
- ❖ Multiple septations
- ❖ calcification

MANAGEMENT

Asymptomatic+ Simple cyst

“Persistent” ~ 6 mons

Murray, S. and S. London (1995). "Management of ovarian cysts in neonates, children, and adolescents". *Adolescent and Pediatric Gynecology*. 8(2), 64-70.

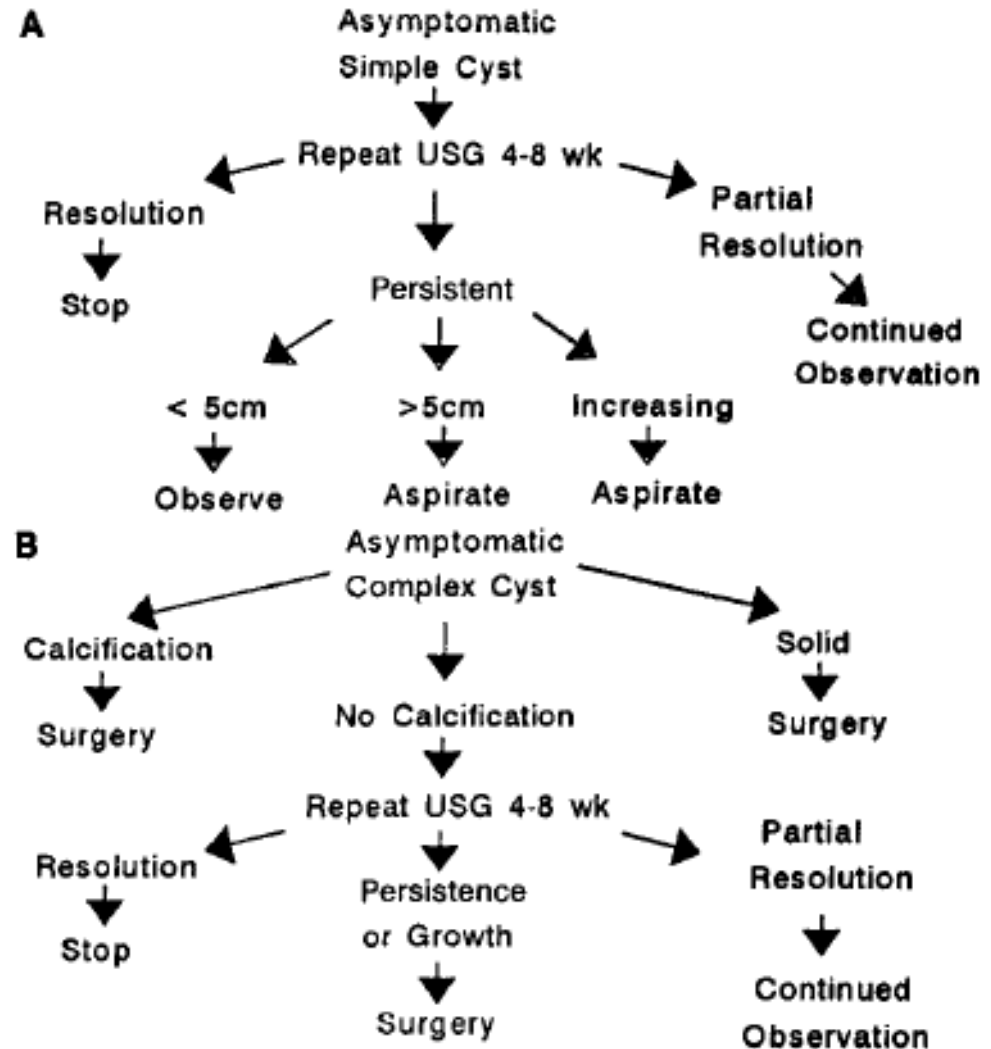


Fig. 3. Management of asymptomatic simple (A) or complex (B) cyst in childhood. USG, ultrasonography.

MANAGEMENT

- Ovarian cysts in this age group, should be observed only if :
 1. The cyst is clearly of ovarian origin
 2. The cyst is not complex
 3. AFP and β HCG are normal
 4. The patient is asymptomatic.

L Brandt, M. and M. A Helmraath (2005). "Ovarian cysts in infants and children".

MANAGEMENT

INDICATION OF SURGICAL INTERVENTION

Significant symptoms

Concern for malignancy

Multilocated mass with papillary projection

Solid components

Increased blood flow

Increased AFP and β HCG

Torsion

Failure of the cyst to resolve on serial ultrasound

3. ADOLESCENTS



3. ADOLESCENCE

- With the onset of adolescence, ovarian cyst frequency started to increase with age and ranged 3.8 – 31.3% throughout adolescence.
- Age of peak ovarian cyst frequency was 15 years with a rate of 31.3%.
- The signs and symptoms of ovarian cysts in this age group are as same as those aged 5 – 9 years. Ovarian cyst in adolescents are most likely to be associated with irregular menstrual cycles.

Emeksiz, H.C., et al. (2017). "Age-Specific Frequencies and Characteristics of Ovarian Cysts in Children and Adolescents". *Journal of clinical research in pediatric endocrinology*. 9(1), 58-62.

PRESENTATION

- Clinical symptoms have not shown to be reliable in the prediction of ovarian malignancy.
- Age at presentation may pose a significant risk factor for malignancy
- The odd ratio of malignancy in 1 to 8-year group 3-fold greater than 15 to 19-year-old group, in total 442 children with ovarian cyst.

Oltmann, S.C., et al. (2010). "Can we preoperatively risk stratify ovarian masses for malignancy?". *J Pediatr Surg.* 45(1), 130-4.

EVALUATION

- Differential diagnosis is complex

| Differential diagnosis | |
|------------------------------------|--|
| Uterine masses | Cornual ectopic gestation Adenomyoma Pregnancy |
| Gastrointestinal conditions | Appendiceal abscess |
| Tubal conditions | Ectopic pregnancy Paratubal cyst Hydrosalpinx |
| Ovarian tumors | Benign cystic teratomas Serous or mucinous cystadenomas |
| Obstructive genital lesions | Imperforate hymen Noncommunicating uterine horn |

EVALUATION

- Detailed menstrual and sexual history
- Physical examination
- Imaging : Sonography ± Doppler flow

± Tumor marker : AFP, LDH, CA 125, hCG, CEA, Inhibin A or Inhibin B

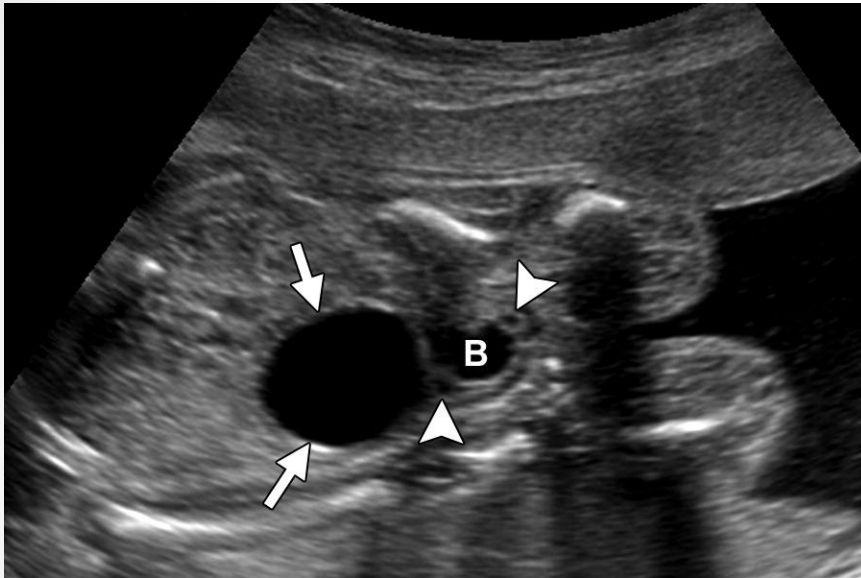
EVALUATION

TABLE Tumor markers in ovarian masses

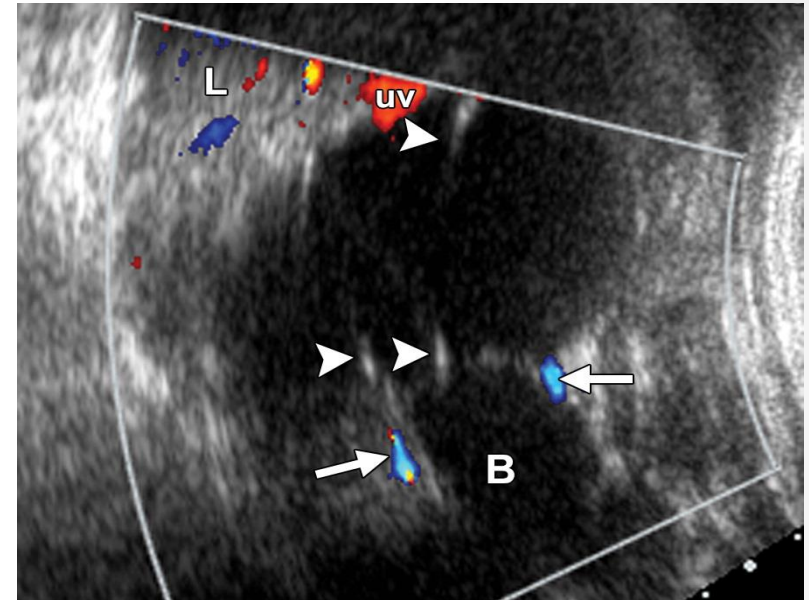
| Tumor marker | Ovarian neoplasm |
|------------------------|---|
| CA-125 | Epithelial ovarian cancer |
| CEA | Mucinous ovarian cancer |
| HCG | Embryonal carcinoma Choriocarcinoma |
| Inhibin A or inhibin B | Granulosa cell tumor |
| Lactate dehydrogenase | Dysgerminoma |
| α -Fetoprotein | Endodermal sinus tumor Embryonal carcinoma |

Abbreviations: CEA, carcinoembryonic antigen; HCG, human chorionic gonadotropin.

Simple vs complex cyst



- ❖ Thin wall
- ❖ Homogeneous
- ❖ None or one septation



- ❖ Thickened wall/Solid tissue
- ❖ Heterogeneous
- ❖ Multiple septation
- ❖ Calcification

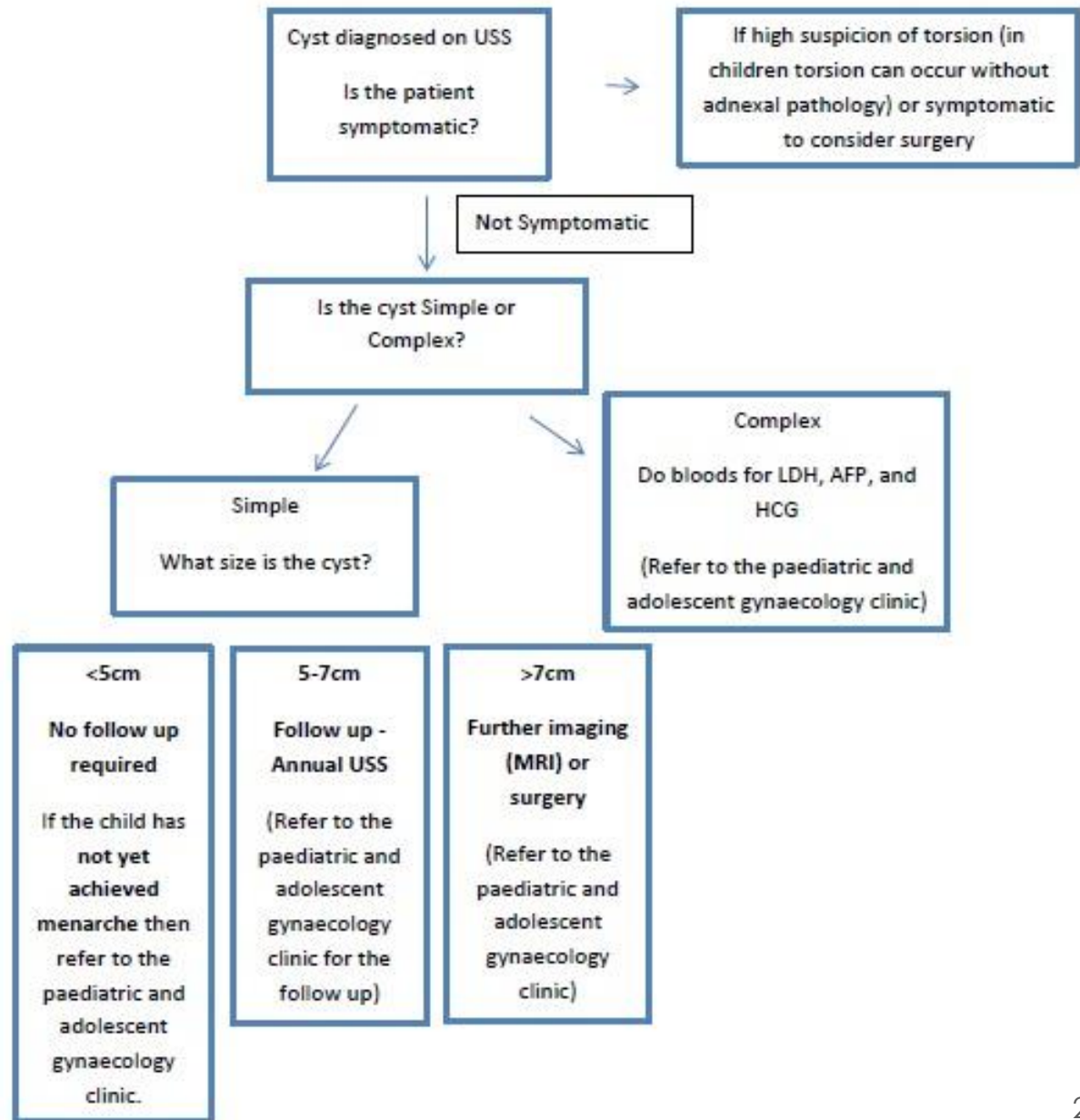
FUNCTIONAL OVARIAN CYST

- Two types of functional ovarian cyst :
 1. **Follicular cysts**
 2. **Corpus luteum cysts**
- Simple cysts **greater than 3 cm** should be managed conservatively with **monthly ultrasounds** to confirm regression.[1]
- Large ovarian cysts, defined as **greater than 5 cm**, require **weekly ultrasounds** [2]

1.Pfeifer, S.M. and G.G. Gosman (1999)."Evaluation of adnexal masses in adolescents". *Pediatr Clin North Am.* 46(3), 573-92.

2.Warner, B.W., J.C. Kuhn, and L.L. Barr (1992)."Conservative management of large ovarian cysts in children: the value of serial pelvic Ultrasonography". *Surgery.* 112(4), 749-55.

Flow chart for cysts diagnosed on an Ultrasound scan.



With the child/
young woman
has **achieved
menarche**

Guideline for the
management of ovarian
cysts in children and
adolescents
The British Society for
Paediatric and Adolescent
Gynaecology

Murray, S. and S. London (1995). "Management of ovarian cysts in neonates, children, and adolescents". *Adolescent and Pediatric Gynecology*. 8(2), 64-70.

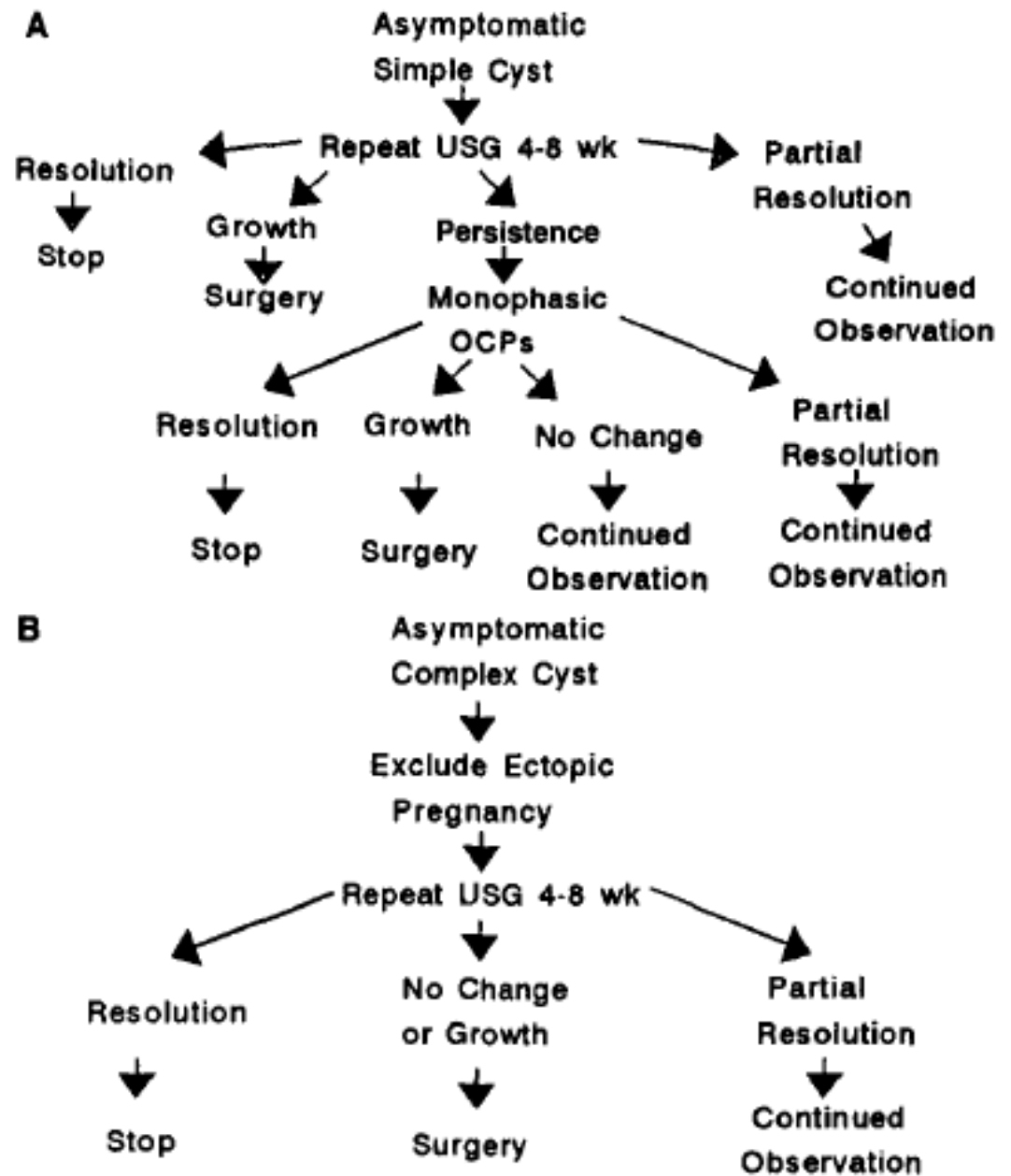


Fig. 4. Management of asymptomatic simple (A) or complex (B) cyst in adolescence. USG, ultrasonography; OCP, oral contraceptive pill.

MEDICAL INTERVENTION



**Cochrane
Library**

Cochrane Database of Systematic Reviews

Oral contraceptives for functional ovarian cysts (Review)

Grimes DA, Jones LB, Lopez LM, Schulz KF

Although widely used for treating functional ovarian cysts, **combined oral contraceptives appear to be of no benefit.**

Watchful waiting for two or three cycles is appropriate.
Should cysts persist, surgical management is often indicated.

SURGICAL INTERVENTION

Management decisions should be based on physical exam, ultrasound findings, and laboratory studies.

Warner, *et al.* demonstrated a need for surgical intervention :

- for large simple cysts (greater than 5 cm) if **severe symptoms** did not resolve in 12 - 24 hours;
- **associated signs and symptoms** such as mass effect were involved; if the cyst failed to decrease in size in 1 - 2 weeks, or if the diagnosis was questionable

Warner, B.W., J.C. Kuhn, and L.L. Barr (1992). "Conservative management of large ovarian cysts in children: the value of serial pelvic ultrasonography". *Surgery*. 112(4), 749-55.

OVARIAN NEOPLASMS

Ovarian neoplasm

Ultrasound findings consistent with malignancy include:

- a solid lesion \pm calcification
- increased vascular flow
- septations of 3 mm or greater, and presence of ascites.
- Size of tumor have not been shown to be a predictor of malignancy, although persistent or enlarging cysts are concerning for a malignant process

4. CONCLUSION

- The frequency of ovarian cyst was found to be 1.8% in prepubertal children and 18.8% in those aged 10 – 18 years.
- Management of ovarian cysts in children and adolescents should include participation of a gynaecologist, a surgeon, and a oncologist with a specialist in pediatric and adolescent, to try and reduce the over treatment of benign ovarian cysts which may resolve spontaneously.
- All complex cysts should be evaluated as risk of malignancy.



Thank you for your
attention!!! 😊😊