



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203




Human Journals

Review Article

June 2024 Vol.:30, Issue:6


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Ovarian Cancer: A Review



IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203



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Submitted: 25 May 2024
Accepted: 31 May 2024
Published: 30 June 2024

Keywords: ovarian cancer, Risk factor, treatments, surgery, chemotherapy

ABSTRACT

Ovarian cancer, a malignancy originating in the ovaries, presents significant health challenges due to its high mortality rate and often late-stage diagnosis. It is the eighth most common cancer among women globally and ranks as the third most prevalent cancer in Indian women, following cervical and breast cancer. The risk of developing ovarian cancer increases with age, peaking between 75 and 79 years. Contrary to its earlier characterization as a "silent killer," recent studies indicate that ovarian cancer does exhibit symptoms, albeit often vague, in its early stages. Women who have symptoms concerning for ovarian cancer should undergo a clinical examination, Transvaginal sonography and MR, measurement of biomarkers Common symptoms include abdominal or pelvic pain, frequent urination, difficulty eating, and changes in menstruation. Risk factors encompass age, prolonged menstruation, estrogen hormone replacement therapy, and family history. Addressing ovarian cancer effectively requires heightened awareness of its symptoms and risk factors, alongside advancements in diagnostic and therapeutic approaches. And also its treatment been done with surgeries and with or without intraperitoneal and intravenous chemotherapy .



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INTRODUCTION

Ovarian cancer that affects the ovaries, located in the female reproductive system. when abnormal cells grow and form a tumor on the ovary as result ovarian cancer. These cancerous cells can spread to other parts of the body, including the fallopian tubes, uterus, and abdominal cavity. Globally, ovarian cancer is the eighth most common cancer in women. [1,5]

Ovarian neoplasms affect a huge part of the female population and, they have the worst prognosis among all gynecological malignancies. The third leading site of cancer among women, trailing behind cervix and breast cancer that is ovarian cancer. as you get older the increase risk of developing ovarian cancer. The risk is greatest in those aged between 75 and 79. [4,6]

Symptoms of ovarian cancer

Ovarian cancer is also called as the “silent killer” because it was thought that there were no symptoms until the disease was widespread and at an advanced stage. But the recently studies show that is untrue.

The symptoms of ovarian cancer can be include. [2,5,8]

- Pain, swelling,
- a feeling of pressure in the pelvis
- Sudden or frequent urge to urinate
- Trouble eating
- Gastrointestinal problems
- Feeling tired
- Unexplained weight loss
- Changes in menstruation

Causes of Ovarian Cancer

There are following factors that can affected and increase the risk of developing ovarian cancer.

The risk factors, including [2,6,7]

- **Age** – ovarian cancer are risk between the ages 75 and 79

- **Ages when menstruation started and ended** –The higher their risk factor for this disease is longer the menstruates.
- **Family history**
- **Genetic mutation**- BRCA1 and BRCA2 mutation and Lynch syndrome.
- **Nulliparity and infertility**
- **Protective factor**- OCP's, tubal ligation

Types of Ovarian Cancer^[3,4]

There are several types of ovarian cancers. The ovaries are mainly made up of 3 kind of cells

- **Epithelial cells** – is a tumor start on the outside of the ovary.
- **Sex cord stromal cells** – start from the structural tissue cells that make and produce the female hormones estrogen and proestrogen
- **Germ cells** – start in the egg cells (ova)



Fig. 1 Types of ovarian cancer

STAGES AND GRADES OF OVARIAN CANCER

Stages of ovarian cancer^[5,14]

The tests and scans you will give some information about the size of your cancer and cancer's stage. The stage helps determine your prognosis and your treatment options.

Stage 1- The cancer is confined to ovaries.

Stage 2- The cancer has grown and spread outside the ovaries and other part of the pelvis.

Stage 3- The cancer has spread outside the pelvis into the abdominal cavity and lymph nodes

Stage 4- ovarian cancer has spread to other body organs such as the liver or lungs

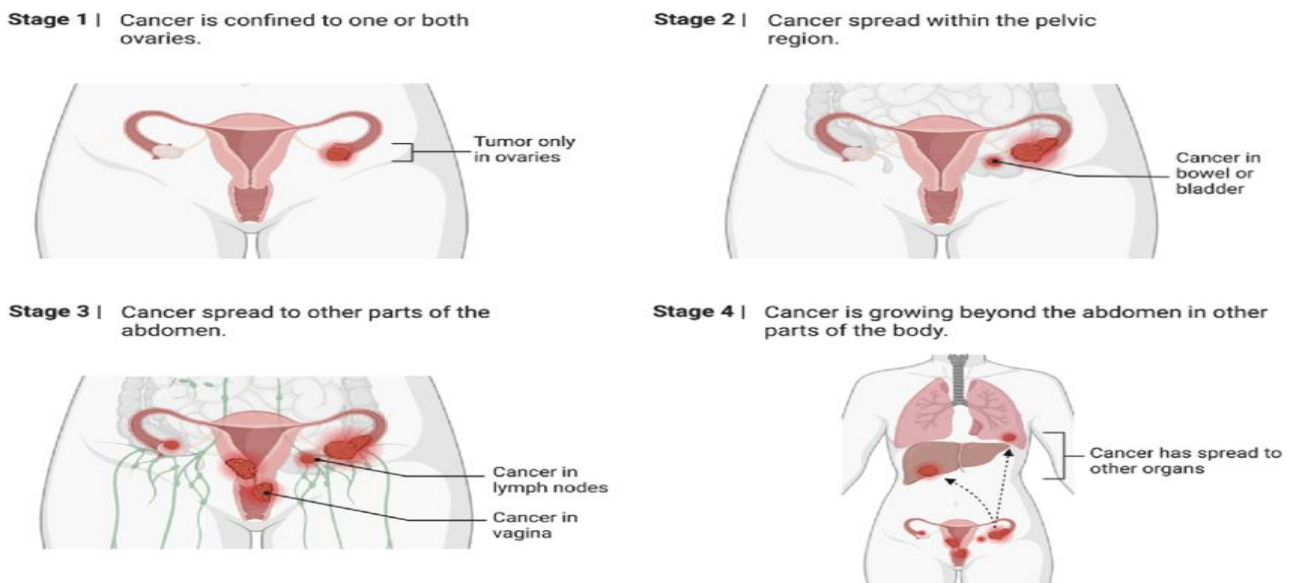


Fig:2 STAGES OF OVARIAN CANCER

Grades of ovarian cancer^[13,14]

The grade of a cancer cells is look like normal cells.

- **Grade 1** The cancer tissue that contains healthy-looking cells, which is known as “well-differentiated” tissue.(LOW GRADE)
- **Grade 2** The cancer tissue in which cells appear abnormal than healthy cells, also known as “moderately differentiated.”(MODERATE GRADE)
- **Grade 3** The cancer tissue with a lack of normal structure in which more abnormal than healthy cells appear, also “poorly differentiated” or “undifferentiated.”(HIGH GRADE)



Fig:3 Grades of ovarian cancer

TREATMENT FOR OVARIAN CANCER

The mostly combination treatments of ovarian cancer are surgery and chemotherapy. Almost all women with ovarian cancer will need surgery. The surgery will be depending on your stage and type of cancer.^[2]

1.Surgery for ovarian cancer^[2,4]

Mostly the surgery to remove their uterus, ovaries and fallopian tubes. During the operation, this is to check for signs of cancer for the surgeon examines the inside of your abdomen and abdominal organs. This is to check for signs of cancer. The surgeon also will remove as much of the cancer as possible your abdomen. This is called debulking.

The goal of surgery is to remove as many cancerous cells as possible.

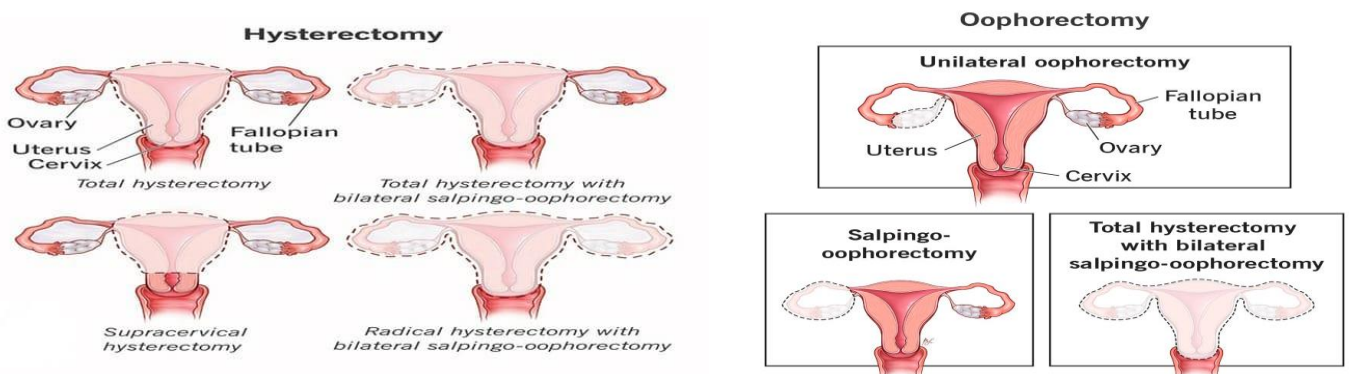


Fig:4 Surgical options include – Hysterectomy and oophorectomy

2. Chemotherapy for ovarian cancer^[2,5]

Chemotherapy uses anti-cancer drugs to treat cancer. The drugs circulate throughout the body in the blood vessel. To minimum side effects and less damage to healthy cells. Chemotherapy is recommended may be before or after the surgery, or both.

Doctors most commonly use the chemotherapy drug carboplatin and paclitaxel to treat ovarian cancer.

The treatment is depending for several factors, including the stage and the grade.

OVARIAN CANCER TREATMENT BY STAGES

When the diagnosed with ovarian cancer, the treatment is will be depend in the type and stage of the cancer, among the other factors. some patients will require immediate surgery, and others may receive chemotherapy, in an attempt to destroy and remove the cancer cells. Many patients will undergo come combination of surgery and chemotherapy. ^[2,4,8]show in table 1.

TABLE 1: OVARIAN CANCER TREATMENT

Ovarian cancer treatment (early stage, IA and IB)	
Surgery (in almost all cases)	TAH-BSO: Total abdominal hysterectomy (removal of the uterus) – bilateral salpingo-oophorectomy (removal of ovaries and fallopian tubes)
Ovarian cancer treatment (late stage, II-IV)	
Chemotherapy	Partial removal of the tumor, followed by platinum – e.g. cisplatin treatment, paclitaxel, carboplatin, docetaxel, and cyclophosphamide.
Chemotherapy (in recurrent cases)	Ifosfamide, etoposide, liposomal doxorubicin, gemcitabine, topotecan, oxaliplatin, 5-FU, or altretamine.

1] STAGE 1 OVARIAN CANCER TREATMENT^[2,8,14]

Stage 1 the cancer is very small and confined to one ovary or the other and there is some fluid in abdomen and part from this the cancer has not spread further in abdomen.

In Stage I, cancer is in one or both ovaries and also be on the outer surface of the ovaries. It is divided into 3 sub type – A, B, and C:

- **Stage 1A:** That the cancer is in one ovary.
- **Stage 1B:** That the cancer is in both ovaries.
- **Stage 1C:** This means that the cancer with malignant ascites, rupture surface tumor.

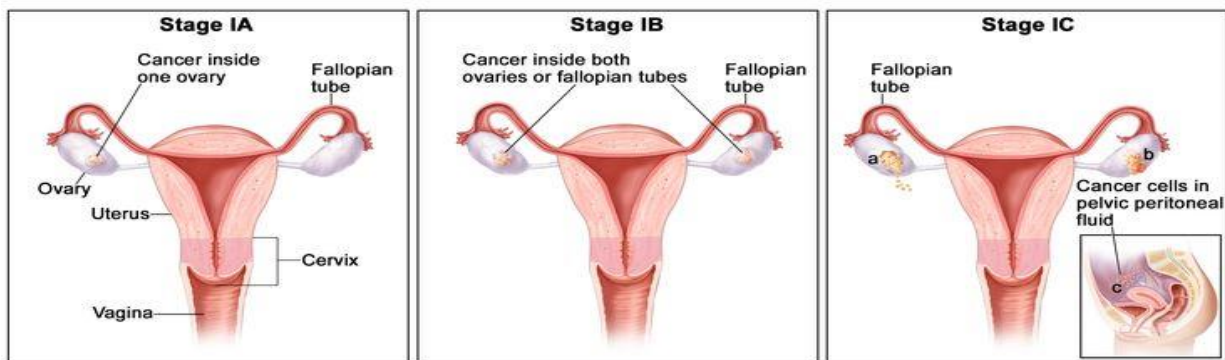


Fig:5 Stage 1 ovarian cancer

TREATING STAGE 1 OVARIAN CANCER^[2,4]

The doctors consider some factors when deciding which type of treatment you need. The factors include;

- Which stage of ovarian cancer is 1A, 1B or 1C
- which type of cells the cancer started in
- which grade of your cancer
- your age and if you want any more children
- also the health conditions.

1.SURGERY

first treatment the for stage 1 ovarian cancer is surgery , we remove the uterus .both ovaries lymph nodes and the omentum.

During the operation, for signs of the cancer is surgeon examines the inside of the abdomen and abdominal organs . After surgery, ,for depending on the severity of the tumor if the person not require further treatment, ^[2]

If the someone has stage 1B or 1C ovarian cancer, they have chemotherapy and additional surgery in the future.

2.CHEMOTHERAPY

In chemotherapy this is also no needed if you are diagnosed at an early stage and have low grade cancer but chemotherapy Is needed if you are diagnosed in the late stage and have high grade cancer.^[2]

2] STAGE 2 OVARIAN CANCER TREATMENT^[2,4,14]

If the cancer has spread to the uterus or nearby organs other than the ovary then it is called stage 2 cancer.

In Stage II, cancer has spread to the fallopian tubes or other organs in the pelvis. It is divided into two substages – A and B:

- **Stage 2A** – The cancer has spread to the fallopian tubes and the ovaries.
- **Stage 2B-** The cancer has spread to other pelvic tissues . They include the bladder, colon, rectum.

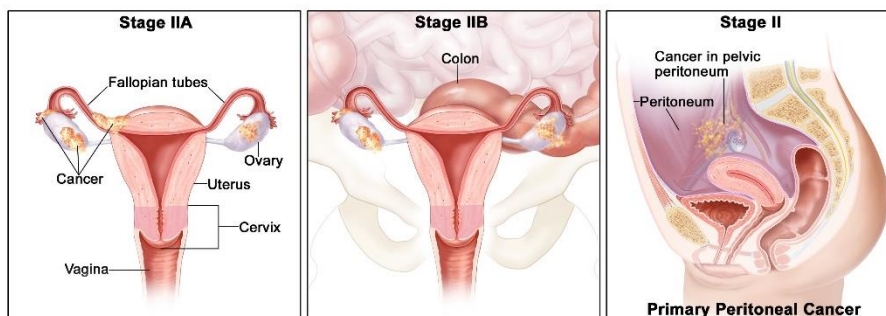


Fig:6 Stage 2 ovarian cancer

TREATING STAGE 2 OVARIAN CANCER

The class of stage 2 cancer is an advanced ovarian cancer. This means the cancer has spread away from the ovary. The main treatments of combination for surgery and chemotherapy.

whether you can have surgery the several factors are deciding They consider as specialist doctors. And whether you should have chemotherapy before or after the surgery. They include;^[1,2]

- where the cancer is spread
- whether the specialist surgeon (gynaecological oncologist) thinks they can remove all the cancer
- also general health.

we remove the uterus both ovaries lymph nodes, nearby organs where the cancer has spread by surgery. After surgery the stage 2 cancer usually needed for chemotherapy.

You might have;

- after surgery treatment of chemotherapy – this is called debulking surgery
- before and after surgery chemotherapy – doctors sometimes call this interval debulking surgery (IDS)

Chemotherapy after surgery

You have debulking surgery as your first treatment if; If you are well enough specialist surgeon thinks they can remove all the cancer.

The surgeon main aim to removes as much of the cancer as possible. After you recover from surgery, you have chemotherapy. This is adjuvant chemotherapy.^[2,4]

Chemotherapy before and after surgery

your surgeon looks at your scans and decides it isn't possible to remove all your cancer, if you aren't well enough for surgery straight away

This is neoadjuvant chemotherapy or primary chemotherapy. The aims of the chemotherapy is to shrink the cancer and make it easier to remove.

3] STAGE 3 OVARIAN CANCER TREATMENT

ovarian cancer in the stage 3 has spread outside the pelvis into the abdominal cavity or to lymph nodes. Treatment is surgery and chemotherapy.

The stage of a cancer tells the doctor how far it has grown and if it has spread. The examination tests and scans you have to diagnose your cancer will give the some information about the stage.^[2,8,]

In Stage III, cancer has spread to the lymph nodes; to other places in the abdomen such as the lining, or peritoneum; or to the outer surface of the spleen or liver. It is divided into three substages – A, B, and C:

- **Stage 3A1** – Cancer cell has spread outside the pelvis,
- **Stage 3A2** – Cancer cell has spread to the tissue lining the abdomen. The cancer is so small they only seen by microscope.
- **Stage 3B** – the cancer cell growths that are 2cm or smaller in size on the lining of abdomen (peritoneum).
- **Stage 3C**- the cancer cell growths is larger than 2cm on the lining of abdomen.

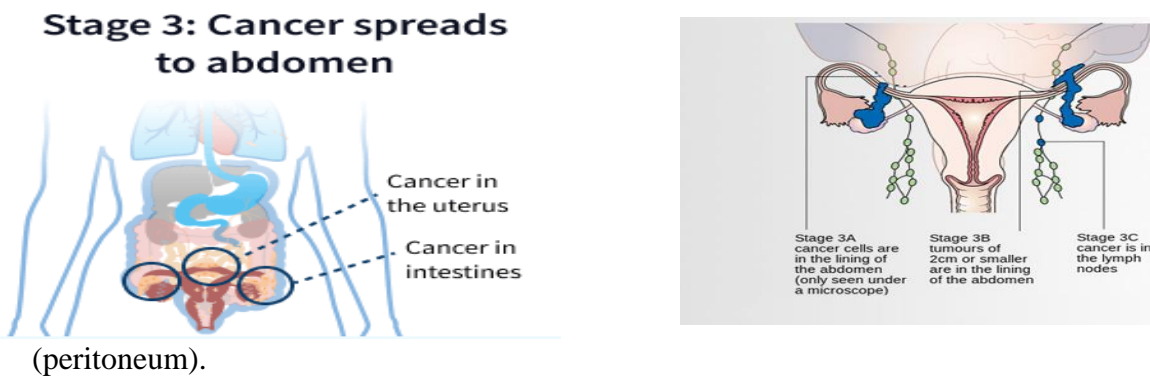


Fig:7 Stage 3 ovarian cancer

TREATING STAGE 3 OVARIAN CANCER

The class stage 3 ovarian cancer as advanced ovarian cancer. The cancer has spread away from the ovary.

The main treatments are surgery and chemotherapy. Treatment can cure some advanced cancers.

If the patient is medically fit the will be first option for surgery on the basis of some clinical examination, CT scan and tumor marker. [4,14]

we remove the uterus, both ovaries, lymph nodes and omentum and any areas where cancer has spread by surgery.

If the sometimes there is a lot of fluid in the abdomen, or the patient has several medical problems and their patient is not fit for surgery or the tumor marker is a very high and there are lot of disease in the abdomen and it is impossible to remove. so, in this case first a few cycle of chemotherapy are given and a CT scan is done to see how the tumor is responding.

If the response to chemotherapy is good based on the CT scan, tumor markers and clinical examination surgery is performed and chemotherapy is completed after surgery.

or some stage 3 cancers, you might have a type of targeted drug treatment called bevacizumab with chemotherapy.^[2]

4] STAGE 4 OVARIAN CANCER TREATMENT

Stage 4 ovarian cancer has spread to other body organs such as the liver or lungs. Is there is a water in the chest deposit inside the liver deposit inside the lungs or not in the chest all this condition are in stage 4 ovarian cancer.^[2,5]

. There are two substages, A and B

- **Stage 4A** – The cancer cells present in the fluid around the lungs. This is known as malignant pleural effusion.
- **Stage 4B** – Cancer is spread into the inside of the liver or spleen, to distant lymph nodes, or to other organs outside the abdomen.

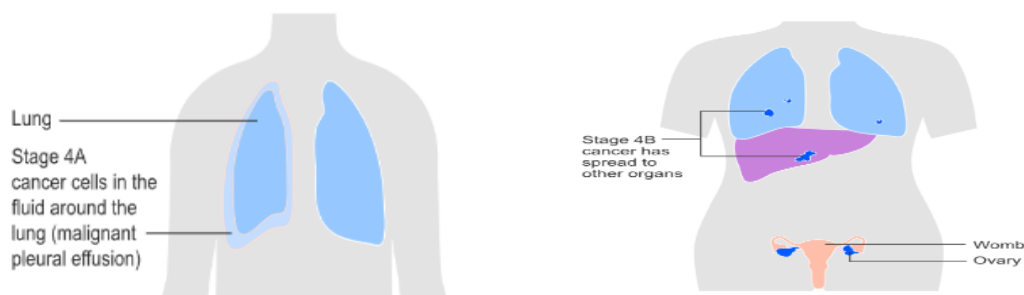


Fig:8 Stage 4 ovarian cancer

TREATING STAGE 4 OVARIAN CANCER

Stage 4 ovarian cancer is also known as advanced (metastatic) cancer. This means the cancer has spread away from the ovary to other body organs, such as the liver or lungs. The main treatments are surgery and chemotherapy. ^[14]

The several factors when deciding whether you can have surgery. These factors include:

- where the cancer is spread to
- also general health

You might have;

- the treatment of chemotherapy is before and after surgery – they call this interval debulking surgery (IDS)
- chemotherapy by after the surgery (debulking surgery)
- chemotherapy without surgery

Chemotherapy is a first option to give in stage 4 and its responsive observed.

If many patients where the disease is outside the abdomen but is limited and the camo response Is good it can be operated on. ^[2]

If the response to chemotherapy is a not good and this disease the progressed or the disease has spread to many places then their possibility of not getting the operation done.

Chemotherapy before surgery

The first treatment is chemotherapy. This is neoadjuvant chemotherapy and also called as primary chemotherapy. The main aims chemotherapy is to shrink the cancer and make it easier to remove.

Chemotherapy after surgery

The debulking surgery is as your first treatment if you are well enough. The surgeon main aim to removes as much of the cancer as possible. After you recover from surgery, you have chemotherapy. This is adjuvant chemotherapy.

The main aims Adjuvant chemotherapy to shrink the cancer that has been left behind.^[2,8]

CONCLUSION:^[2,5]

In the major researches in the past it's concluded that the ovarian cancer is one of the most deadly malignancy in woman It's the main reason behind the death it has the shocking death ratio of 15/1000000 And it's also find out that it's frequency of eoc is maximum compared to all type of ovarian cancer. Even after long years and researches in preventive medicine the medicine industry has not been able to find proper treatment and prevention methods for preventing ovarian cancer and these is causing a large harm to human society but in some cases it's found and studied that dual pathogenesis of ovarian cancer can lead to find different plans and strategies for dealing ovarian cancer. And some research states that continued molecular characterization of eoc will allow the discovery of some specific tumor markers. And by comparing Last few tests and research it's found out that bilateral salpingo oophorectomy is the only way to reduce ovarian cancer, For reducing the risk of ovarian cancer the one should visit the gynecologist and do necessary preventive actions should be taken. Physician can also recommend genetic testing and can further go with BRCA testing if family has and past breast cancer history or any other types of cancer.

REFERENCES:

1. **Cancer: Principles and Practice of Oncology (11th edition)**
VT DeVita , TS Lawrence, SA Rosenberg
Lippincott, Williams and Wilkins, 2018
2. **Cancer and its Management (7th edition)**
J Tobias and D Hochhauser
Wiley-Blackwell, 2015
3. **Ross and Wilson Anatomy and Physiology in Health and Illness (13th edition)**
A Waugh and A Grant
Elsevier, 2018
4. **Newly diagnosed and relapsed epithelial ovarian carcinoma: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up**
JA Ledermann and others
Annals of Oncology, Volume 24, Supplement 6

5. **Ovarian cancer**

Prof Gordon C Jayson and others

The Lancet (Seminar), 2014. Volume 384, Issue 995

6. **Risk and prognosis of ovarian cancer in women with endometriosis: a meta-analysis**

H Kim and others

British Journal of Cancer. 2014 April 2;110(7):1878-90

7. **Ovarian cancer familial relative risks by tumour subtypes and by known ovarian cancer genetic susceptibility variants.**

S Jervis and others

Journal of Medical Genetics. 2014 February;51(2):108-13

8. **The Textbook of Uncommon Cancers (5th edition)**

Raghavan and others

Wiley Blackwell, 2017

9. **Cancer of the ovary, fallopian tube, and peritoneum**

J Berek and others

International Journal of Gynaecology and Obstetrics 2018. Volume 143 (supplement 20) pages 59 – 78

10. **Principles and practice of oncology (10th edition)**

De Vita VT, Lawrence TS and Rosenberg SA

Lippincott, Williams and Wilkins, 2015

11. **British gynaecological cancer Society (BGCS) Epithelial Ovarian / Fallopian Tube / Primary Peritoneal Cancer Guidelines: Recommendations for Practice**

C Fotopoulou and others

European Journal of Obstetrics and Gynecology and Reproductive Biology, April 2017. Vol. 213, p123–139

12. **Newly Diagnosed and Relapsed Epithelial Ovarian Carcinoma: ESMO Clinical Practice Guidelines**

JA Ledermann and others

Annals of Oncology, 2013. Volume 24, Supplement 6.

13. **Oswald, A. J. & Gourley, C. Low-grade epithelial ovarian cancer: a number of distinct clinical entities? *Curr. Opin. Oncol.* 27, 412–419 (2015).**

14. **Benedet JL, Bender H, Jones H 3rd, et al. (2000) FIGO Staging classifications and clinical practice guidelines of gynaecological cancers. *Int J Gynaecol Obstet* 70(2): 209–62**

15. **High grade serous ovarian carcinomas originate in the fallopian tube**

S Intidhar Labidi-Galy and others

Nature Communications, 2017. Volume 8, Issue 1093