# Role of 18F-FDG PET/CT in Ovarian Malignant Tumors

**Thesis**

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# ABSTRACT

Ovarian cancer is the leading cause of ceath from gynecologic malignancies. Despite good response to therapy, a large number of these patients experience relapse. PET/CT is an imaging technology with evolving potential. Its advantage lies in its ability to detect metabolic changes in cancer cells even before the manifestation of the anatomic changes such as (CT). This study aims to evaluate role of PET/CT in early detection of recurrence in the settings of suspected biochemical recurrence with negative or equivocal conventional imaging and in assessment of response to therapy.

**Keywords: PET/CT - CA-125 - Ovarian recurrence**

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# Table of contents

## LIST OF FIGURES

# LIST OF TABLES

# List of abbreviations

**PET:** Positron emission tomography.

**FDG:** Fluoro-2-deoxy-d-glucose.

**CT:** Computed tomography.

**OC:** Ovarian cancer.

**HRT**: Hormone replacement therapy.

**OEC:** Ovarian epithelial carcinoma.

**HBOC:** Hereditary breast-ovarian cancer syndrome

**HNPCC:** Hereditary non-polyposis colorectal cancer

**FIGO:** Féderation Internationale de Gynécologie et d'Obstétrique

**LGSCs:** Low grade serous carcinomas.

**HGSCs:** High grade serous carcinomas.

**BOTs:** Borderline ovarian tumors.

**CCCs:** Clear cell carcinomas.

**PFI:** Platinum-free interval

**NNCN:** National Cancer comprehensive network

**BEP:** Bleomycin, etoposide and cisplatin

**MMMT:** Malignant Mixed Mùllerian Tumors

**MOGCTs**: Malignant Ovarian Germ Cell Tumors.

**SCSTs :** Sex Cord Stromal Tumors

**HCG**: Human chorionic gonadotropin.

**AFP:** Alfa Fetoprotien.

**TVUS**: Trans-vaginal ultrasound.

**US:** ultrasound.

**MRI**: Magnetic resonance imaging.

**RMI**: Risk of malignancy index.

**NPV**: Negative predictive value.

**PPV**: Positive predictive value.

**FN**: False negative.

**FP**: False positive.

**DWI**: Diffusion weighted imaging.

**ADC**: Apparent diffusion coefficient.

**IGCB**: Image-guided core biopsy.

**MDCT**: Multi-detector computed tomography.

**Ce-CT: C**ontrast enhanced computed tomography.

**ld-CT:** Low Dose computed tomography.

**P-W:** Peritoneal wash

**SLL:** Second-look laparotomy

**T.M:** Tumor marker

**CEA:** Carcino-embryonic antigen

**CA-125:** Cancer antigen 125

**CA 19-9:** Cancer antigen 19-9

**CA 153**: cancer antigen 153.

**MIP:** maximum intensity projection.

**TAH:** Total abdominal hysterectomy.

**BSO:** Bilateral salpingo-oopherectomy.

**SUV:** Standard uptake value.

**WHO:** World Health Organization

**PERCIST:** PET Response Criteria in Solid Tumors

**RECIST:** The Response Evaluation Criteria in Solid Tumors

**EORTC**: The European Organization for Research and Treatment of Cancer.

**FN**: False negative

**FP**: False positive

**TN:** True negative

**TP**: True positive

# *Introduction*

Worldwide, ovarian cancer accounts for 4% of all female cancers with over 190,000 new cases diagnosed each year. Ovarian cancer has been termed a 'silent' killer with the majority of patients, up to 70% presenting with advanced disease due to the vague, nonspecific nature of the presenting symptoms **[1].** The most important determinant of survival for ovarian cancer patients is the disease stage at diagnosis **[2]**. However there are no valid methods for screening and early diagnosis of ovarian cancer, and the available follow-up protocols are not efficient for an early detection of tumor relapse **[3].**

In the late 1990s, positron emission tomography (PET) with 2-[18F] fluoro-2-deoxy-d-glucose (FDG), which exploits the increased utilization of glucose by malignant cells and their high uptake of glucose, opened a new field in clinical oncologic imaging. Originally, PET lacks anatomic information, and precise localization of any suspicious lesions. Integrated PET/CT has made it possible to acquire both metabolic and anatomic imaging data using a single device in a single diagnostic session and provides precise anatomic localization of suspicious areas of increased FDG uptake **[4].** In the clinical setting, FDG-PET/CT has achieved a significant improvement in diagnostic accuracy and exerted a considerable impact on patient management including diagnosis, staging, optimization of treatment, restaging, therapy monitoring, and prognostic prediction of various malignant tumors **[5, 6]**.We herein review the current and future role of FDG-PET/CT in the management of ovarian cancer, discussing its usefulness and limitations in the imaging of these patients.