



CENTRE OF GLOBAL EXCELLENCE Department of Gynaecology

RIGSHOSPITALET, COPENHAGEN UNIVERSITY HOSPITAL



Rigshospitalet

Foreword

On 28 September 2010, the Department of Gynaecology, the Juliane Marie Centre, University Hospital of Copenhagen, Rigshospitalet, received the Global Excellence Award in Health.

The Global Excellence Award in Health is an international mark of quality based on an independent international evaluation of the extent and quality of examination and treatment, patient services, education, development and research.

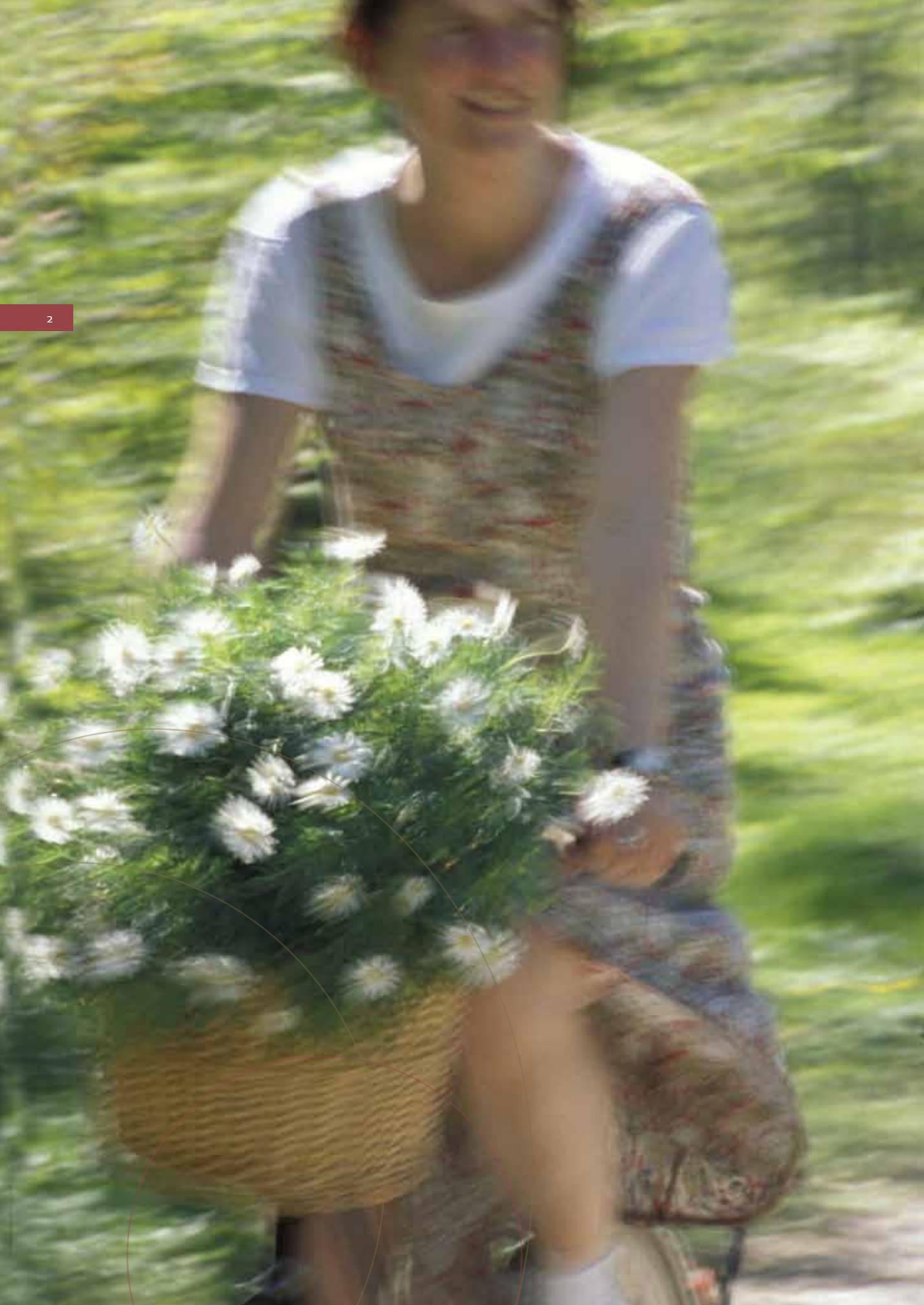
Better survival rates and the improvement of the quality of life for women with gynaecological cancer have always been the ambition for the department. We realize that this goal can only be obtained by a multidisciplinary and cross-sectional effort with focus on all aspects of the challenge: prevention, diagnostics, treatment, care, rehabilitation, organisation, communication etc. The award is therefore the result of a unique contribution from every single member of the staff: laboratory technicians, researchers, secretaries, nurses, social-health assistants, social workers, psychologists and doctors.

This award is a great encouragement for us to continue our work, because we believe that the treatment and care of patients will benefit from development and front line research. The award will be used to strengthen and expand our international collaboration in order to be able to offer our patients treatment at the highest international level.

Bent Ottesen



Professor in Obstetrics and Gynaecology
Director of the Juliane Marie Centre



Goals & ambitions

The ambition of the department is to improve the survival rate for women with gynaecological cancer. We expect to achieve this goal by fine-tuned collaboration between highly specialized experts, fast diagnosing, extensive surgery, intensive post-operative care, oncological treatment and rehabilitation. Research, development and education are an integrated part of this ambition. We believe that cross-professional, cross-sectional collaboration is a determining factor for improved patient journeys from the first symptom to full recovery.

The Department of Gynaecology, Rigshospitalet covers all disciplines in gynaecological oncology at an international level. The department is involved in all aspects of education of health professionals from beginner to expert levels. It has a world famous virtual training laboratory for laparoscopy. Scientifically the department covers basic, translational and clinical research, epidemiology, preventive research (HPV vaccination) and quality control programmes.

The combined disciplines ensure the highest quality of patient treatment, as evidenced by the best cancer survival rates in Denmark.

The department focuses on research and education, especially developing surgical skills. This initiative, combined with other initiatives, has resulted in an 8-10 % increase in survival rate for women with ovarian cancer.

For women with cervical cancer the clinic has developed a less traumatic surgical method, called trachelectomy, which means that young women retain their fertility. The department is the only place in Denmark where this form of surgery has been fully developed and is being used. This makes us one of the leaders in diagnosing and treating these diseases. The new surgical method has great benefits for the patients, with fewer complications and better survival rates.



Characteristics and numbers

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Danish Gynaecological Multidisciplinary Cancer Group (DGCG)

Most consultants and younger doctors in the department are involved in the National Danish Gynaecological Multidisciplinary Cancer Group (DGCG). The head of the department (Lene Lundvall) is head of the DGCG, and departmental doctors are represented in the working groups for the different gynaecological cancers. The DGCG is responsible for the national guidelines. The department hosts the active DGCG homepage: www.dgc.eu.com. The department has had a large impact on Danish gynecologic cancer treatment through the DGCG work.

Some of the main activities, research projects and units at the Department of Gynaecology

The establishment of an infrastructure to support treatment, research and education has been highly prioritized at the department. The infrastructure, highlights of research projects and units can be summarized as:

- Clinical research unit with specialized research nurses
- A multidisciplinary Gynaecological Cancer Database (DGCD) for research and quality assessment
- A biobank with blood products as well as paraffin-embedded and fresh frozen tissues
- A multidisciplinary team (MDT) of the most experienced and highly qualified gynaecological and gastro-intestinal oncology surgeons as well as experts in pathology, medical oncology and radiotherapy
- Access to the most modern and largest imaging unit in Europe (PET/CT, ultrasound and MR)
- Established collaboration with several national and international laboratories
- Several fulltime PhD students, professors and postdoc. researchers. Expert use of the most modern and experimental surgical methods and use of laparoscopic and robotic surgery
- Focus on research in medical education with surgical training programmes including virtual reality simulation
- Established collaboration with several national and international leading research groups
- DGCG Clinical Trial Unit (ENGOT-EN2-DGCG study for endometrial cancer)
- One of the world's largest population-based prospective cohorts of HPV tested and genotyped women (> 50,000), with additional information on background and lifestyle factors
- The development of HPV vaccines (Head: Professor, Susanne Krüger Kjaer)
- A superior gynaecological epidemiological cancer unit (Head: Prof. Øjvind Lidegaard) with access to the world's most complete registers (CPR, LPR, Cause of Death register, Danish Statistics and DGCD).



Patients and operations

- 10,000 emergency patients a year
- 6,000 outpatients
- 2,400 surgical procedures a year
- 6,000 total admissions
(all gynaecological diseases)
- 120 special staging procedures
- 30 laparoscopic exairesis on advanced stages of cervical cancer

Employees according to professional position

- Professors 4
- Senior hospital physicians 10
- Staff specialists 2
- Junior doctors 11
- Nurses 27
- Staff in collaboration laboratories and clinics at Rigshospitalet: Medical laboratory technologists, radiographers, midwives, physiotherapists, social- and health service assistants, social workers, psychologists and gastro-intestinal surgeons.

Primary oncological diseases

- Ovarian cancer (primary) : 95
- Ovarian cancer (recurrences): 35
- Borderline ovarian tumor: 22
- Cervical cancer: 80
- Endometrical cancer: 75
- Vulva and vaginal cancer: 20

Research

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Staff and academic composition

The research within gynaecological oncology at the department is multidisciplinary. Four gynaecological professors: Bent Ottesen, Claus Høgdall, Øjvind Lidegaard and Susanne Krüger Kjaer are responsible for the different gynaecological research areas. An assistant professor has special-

ized in educational research (Ass. Professor Jette Led Sørensen). Furthermore, Professors Liselotte Højgaard (PET/CT) and Svend Aage Engelholm (The Radiotherapy clinic) are connected to the group. Numerous assistant professors, PhD students and expert gynaecological oncologists are also involved in the research.



| Academic staff in numbers | |
|----------------------------------|--|
| Professors | 4 |
| Associate professors | 2 |
| Postdocs | 2 |
| PhD students | 16 |
| Medium higher education | 3 |
| Formalised cooperation | <p>University College London Hospitals</p> <p>The Gynaecological Department Lund University Hospital, Sweden</p> <p>Department of Gynaecologi and Obstet, Odense University Hospital</p> <p>Vermillion inc. California, USA</p> <p>and several others.</p> |



Danish Gynaecologic Cancer Database (DGCD)

– a national multidisciplinary research and quality database

The DGCD is multidisciplinary and covers all gynaecologic cancer types. There are separate forms for history, preoperative examinations, operations, pathology, oncology and follow-up. The department uses the database as an electronic patient file. From September 2010 a special nursing data form will be included. An On-line Portal for Analysis is connected enabling day-to-day structured quality reports and possibilities to build up research and quality reports related to a specific department or clinic. Professor Claus Høgdall has initiated and programmed the DGCD and is head of the database. The database has 97 % national coverage and is one of the most successful national clinical databases regarding related research projects. Printed annual reports, with clinic-related indicator reports, can be requested from the secretariat at the department or downloaded from the DGCG homepage: www.dgc.eu.com. The secretariat of the national Danish Gynaecological Database (DGCD) is located in the department of Gynaecology.

The department is evaluated with 10 clinical indicators in the DGCD. Results are published in annual reports and newly updated indicator levels can currently be assessed in our Online Portal for Analyses.

Indicators and results

1. Cervical cancer operations, lymph-node excision: Satisfactory level (remarks because of the many trachelectomies, which are special for the department)
2. Bleeding (ml) at radical hysterectomy: Satisfactory level
3. Complications at radical hysterectomy: Satisfactory level
4. Ovarian cancer: Macroradical abdominal operation. Satisfactory level
5. Ovarian cancer: Residual tumour < 1 cm. Satisfactory level
6. Ovarian cancer: Waiting time for chemotherapy: Satisfactory level
7. Ovarian Cancer: Postoperative complications: Satisfactory level
8. Peroperative bleeding at operation for ovarian cancer st. IIIC: Satisfactory level
9. Peroperative bleeding at operation for corpus cancer st. I: Satisfactory level
10. Corpuscancer: Postoperative complications: Satisfactory level.

We are presently working on new indicators:
 Accuracy of cervical cancer staging: Satisfactory level
 Ovarian cancer survival: Significantly at national top and international class

Clinical research

We have developed and reported fast-track programmes for ovarian cancer. The question of neoadjuvant chemotherapy versus radical extensive surgery and fast-track programmes will be addressed in the coming years by a PhD student recruited onto the staff.

Postoperative care for the patients who have received extensive surgery is another focus area for clinical research. A nursing database has been established in connection with the Danish Gynaecological Database. By combining these we expect to move the treatment and care of these very ill patients to a leading international position.



Gynaecologic epidemiological cancer research

We have an ambitious ongoing epidemiological research programme aiming to combine our wish to better understand the causes of malignant female diseases and the special Danish epidemiological research opportunities in general, and within the field of pharmaco epidemiological research in particular.

The epidemiological focus has been the influence of external sex steroids on the risk of developing different types of ovarian cancer. Our analyses have demonstrated a highly differential influence of hormone therapy on different types of ovarian cancer, and even protection against some types of ovarian cancer. Similarly, the influence of oral contraceptives on the risk of venous thromboembolism has been assessed. Both studies are the largest conducted globally so far in the respective areas.

In the next three years we expect to have made nationwide epidemiological studies on the influence of hormonal contraception and hormone therapy on risk of endometrial, cervical, tubal, and breast cancer.

The study of continuity of care among gynaecologic cancer patients was commenced in 2005. The study has aimed to identify areas of high importance for how patients experience continuity of care. The study has used a range of methodologies including qualitative interviews with patients, questionnaires and clinical data extracted from the DGCD. The study is collaborating with four out of the five specialised departments for gy-

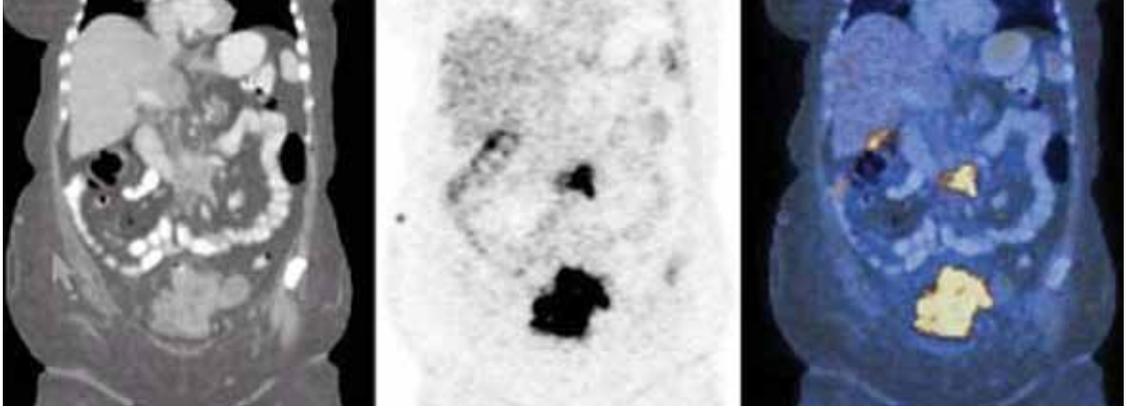


naecologic cancer surgery in Denmark as well as Department for Health Services Research at Copenhagen University. A PhD thesis will be finalised in October 2010. So far the study has provided insights into the areas that are deemed important by gynaecologic patients for continuity of care. A major area has been the experiences of delays in the diagnostic process – both before and after contact with secondary healthcare services.

Study results will lay the ground to future research and interventions aimed at optimizing cancer patient pathways across the primary and secondary sector, including providing data on the information needed by patients and healthcare workers to do so. Likewise, the study will provide baseline data for a future central diagnostic unit to be evaluated against.

Ovarian cancer research

Our ovarian cancer research is based on a study from 1994 called MALOVA (Danish Malignant Ovarian Cancer Study). MALOVA is both nationally and internationally one of the most successful epidemiologic and translational ovarian cancer studies. The study was initiated based on a grant from the NCI, USA and later MALOVA was extended with UK collaborators (Professor Ian Jacobs, London) and the MERMAID collaboration. A few years ago MALOVA became part of the international Ovarian Cancer Association Consortium (OCAC). As a result of this collaboration, numerous studies and PhD thesis have been accomplished and several are in progress or under preparation.



The other cornerstone of ovarian cancer research in the department is the Pelvic Mass study started in 2004. This covers a comprehensive clinical research and quality database (DGCD) and a biobank. The Pelvic Mass concept is currently becoming nationwide. The study is a member of OCAC and has international collaborators from the USA (Professor Erik Fung, UK (Professor Ian Jacobs) and the companies Vermillion (USA) and Abbott Diagnostics (Germany). The translational research has been successful with a paradigm shift of using PET/CT in ovarian cancer treatment. Successful proteomic studies have been finished and have resulted in one patent and acceptance for presentation at the prestigious ASCO meeting in the USA in June 2010.

Endometrial cancer research

Endometrial cancer has previously been the “forgotten gynaecological cancer disease”. With our present research and data from the DGCD, we intend to change this situation.

There is an urgent need for a better pre-operative staging for endometrial cancer. At present too many patients are over or under-treated. We have therefore started a project to evaluate PET/CT, MRI and 3D Ultrasound as methods for staging uterine cancer before surgery and we have included a biobank for translational research.

Ultimately we hope that the results can lower operative morbidity and improve survival. The study has been initiated at the Gynaecological Department, Rigshospitalet. Odense University Hospital has been participating since April 2010.

We are working on including other departments and clinics. International collaborators include Professor Helga Salvesen, Bergen. We are in contact with the international Endometrial Cancer Consortium and expect to become a member of this distinguished consortium this year.

In the near future, the department/the DGCG will be heading randomized phase 3 trials that will collaborate internationally in order to answer the main questions: Does proper lymphadenectomy improve survival directly or by choosing the right patients for adjuvant treatment? The following trials will be included: the AGO-ECLAT trial (Germany), the LYTEC trial (Mayo Clinic, USA), the NSGO trial and the Danish ENGOT-EN2-DGCG trial. These are separate trials, but will run under the umbrella of the European Network of Gynaecologic Oncology trials (ENGOT) and with the collaboration of the Mayo Clinic, USA and the Tata Memorial Cancer Centre, Mumbai. The ENGOT-EN2-DGCG trial is planned to start by autumn 2010, and will include 678 patients during a period of four years. This requires establishment of an efficient data centre, with electronic data capture facilities. The centre has been planned as a sub centre in the DGCD secretariat.

Cervical cancer research

The department is a pioneer in using PET/CT in the diagnostic workout of cervical cancer. The groundbreaking research was initiated in 2004. This pioneering work represents a real paradigm shift by changing our standard diagnostic evalua-



tion and treatment. Today patients receive more individualized treatments consisting of either more cancer-focused surgery or laparoscopic lymph node resection of PET/CT positive nodes and more precise tumour-focused radiotherapy. The change has resulted in less morbidity and hopefully increased survival. A survival study is ongoing with expected publication in 2011 (Head: Professor Svend Aage Engelholm).

Newer surgical methods such as vaginal trachelectomy, have been developed in order to preserve fertility. Trachelectomy is a composite procedure of laparoscopic lymph node resection and vaginal operation and demands the highest surgical skills. Trachelectomy has been performed in the department since 2003. This is the only department in Denmark performing this operation. Constant research and follow-up of this patient group is ongoing, in order to register morbidity, relapses and pregnancy rates. From May 2010 a new project has been initiated using robotic surgery in cervical cancer patients. Extensive data registrations are performed in the DGCD for each procedure and these are used for quality control and research.

In an ongoing postdoc study we compare miRNA profiling in HPV-positive cervical cancer with HPV-negative cancers using miRNA microarrays on fresh frozen tumour samples from patients with cervical cancer. By exploring similarities in these two HPV-induced cancers derived from different body regions, patterns may be revealed, thus expanding our understanding in virus-related cancers.

HPV infection is a necessary factor in the development of cervical cancer and its precursor lesions. Through our research, initiated more than 15 years ago, we have contributed significantly to the current knowledge about the natural history of HPV and cervical cancer. The research has led to the development and availability of a new primary preventive tool against cervical cancer – namely vaccination against infection HPV.

Our research is based on a close collaboration between clinicians, basic scientists and epidemiologists, and can be characterized both as translational research and molecular epidemiology. The research is based on a strong collaboration with national (e.g. Dept. of Pathology, Hvidovre Hospital) as well as international research organizations (e.g. the National Cancer Institute (NCI), USA; University College London, UK; University of Tübingen, Germany, and the International Agency on Research on Cancer (IARC), France).

We have established large population-based prospective cohorts of women (> 50,000) where we have collected biological material such as blood samples and/or cervical swabs and in addition information on background and lifestyle factors from personal interviews or questionnaires. All the samples have been tested for HPV and genotyped. We have participated in clinical HPV vaccination trials since 2001. Currently we are heading the Danish part of a comprehensive Nordic post-licensure monitoring initiative of the HPV vaccine. In the department, the HPV research programme is headed by Professor Susanne Krüger Kjaer.



Education and training

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The department is involved in all aspects of education of all medical professionals and is responsible for undergraduate, specialist and expert gynaecological education. Head of education (Ass. Prof. Jette Led Sørensen) has a masters degree in medical education, and has supervised PhD projects involving research within surgical training. This is the first gynaecological department in Denmark that has completed academic research within medical education.

Virtual reality simulation and surgical training laboratory

One of the main focus areas for education in the department is the training of surgical skills in laparoscopic and open surgery. Practical and theoretical courses are undertaken which include theory of surgical techniques, live surgical demonstration and individual training. To train laparoscopic skills we use the virtual simulator “Lapsim” as a first step. This instrument has been investigated, evaluated and validated in our department. The next step is laparoscopic procedures on pigs. The surgical procedures are also trained on cadaver. One of our innovative consultants has created a special box for laparoscopic training called the ‘Laparotrainer’. This is in an easily accessible light box with real instruments. The Laparotrainer has

the advantage of being relatively inexpensive and mobile for use anywhere.

The department is open for foreign doctors at all levels of education. We regularly have one to three visiting doctors/fellows from Europe, who participate in advanced surgical procedures and receive the most up-to-date teaching in gynaecologic oncology.

Accredited European subspecialty training centre (ESGO/EBGOG)

The department is the second Scandinavian centre to be accredited as an ESGO/EBGOG subspecialty training centre. To identify the centres that can provide this subspecialty training in the Scandinavian countries, we developed an online questionnaire in cooperation with the Nordic Society of Gynaecological Oncology (NSGO) to





all Scandinavian gynaecological centres that treat cancer patients. The results of this will constitute the basis for a publication and will be available on the NSGO website. Hopefully the results can be used to improve gynaecological oncological education/training and facilitate the exchange of fellows between Nordic countries. The department also has specialist training in OBGYN, and has trainees on all levels. The specialist training curriculum is in accordance with aims approved by the National Board of Health and the programmes are regularly approved.

In recent years our department has received awards for best educational institution for doctors in specialist training (2010) and for medical student teaching (2008).

There are structured educational programmes for nurse students and nurses at different educational levels. Clinical supervisors are in charge of intro-

duction and practical parts of the the student's education. A special competency development programme has been established for all nurses in the department. The nurses are divided into four levels of competence, according to their experience, education, specialist knowledge and functions. A nurse with a masters degree, is responsible for organizing courses, training and education for the nurses according to the programme. As a special competency focus area the nurses in the department have completed two courses in communication and one in feedback with a follow-up in the department either individually or together with a colleague, bedside.

A special education for nurses as nursing specialist in cancer care, is a possibility for the nurses in the department. The education lasts for one year and combines theory with practice. Seven nurses in the department have completed this education.



Expected activities and future goals

Our goal is to maintain the current international position and obtain a position as an attractive Nordic and European centre for the treatment and training in gynaecological oncology. This will be achieved by:

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Expansion of education and training

The research in education by virtual reality simulation, robotic and laparoscopic surgery is currently being strengthened by a three-year employment of a PhD. student in this area. A special programme for developing the robotic surgery was launched in April 2010. The programme includes an increasing number of gynaecological oncologic surgeons and increasing complexity, starting with simple hysterectomies and ending with more advanced cancer operations. The set-up requires a team of surgeons and nurses specially trained in robotic surgery. As a centre of global excellence, we will share this knowledge with surgeons and nurses from other centres. After three years we expect to have more teams mastering the robotic and laparoscopic surgery; a patient-orientated more non-traumatic technique, compared to the general standard procedure. With our high number of patients, tight quality control and research possibilities, we expect to become one of the leading centres in robotic and laparoscopic surgery.

Expansion of research and clinical trials units

Our research and clinical trials units are the cornerstones in developing the department and developing new treatments in favour of the patients. We will strengthen and expand these units during the forthcoming years. After three years we expect to be able to present an increased scientific activity, expanded research unit and clinical trial unit including a paradigm shift.

International activities

Over the next three years, the department will expand its international activities and external promotion of results and international cooperation. We have planned international symposiums about translational research in ovarian and endometrial cancer. The symposiums will be directed towards continuous collaboration in research and workgroups with the aim of paradigm shifts in diagnostics and treatments.

10 selected

publications within the last five years

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This list has been selected with the purpose of showing a part of the wide range of research at the department and the impact and main results of the publications (presented below). See the full publication list at our homepage at www.gynaekologi.rh.dk.

■ PET/CT and primary ovarian cancer diagnostics

Risum S, Hogdall C, Loft A, Berthelsen AK, Hogdall E, Nedergaard L, Lundvall L, Engelholm SA. The diagnostic value of PET/CT for primary ovarian cancer. A prospective study.

Gynecol Oncol. Apr;105(1):145-9. Epub 2007 Jan 16

■ PET/CT and primary ovarian cancer prediction

Risum S, Høgdall E, Engelholm SA, Fung E, Lomas L, Yip C, Petri AL, Nedergaard L, Lundvall L, Høgdall C. A proteomics panel for predicting optimal primary cytoreduction in stage III/IV ovarian cancer. Gynecol Oncol. 2009 Dec;19(9):1535-8.

► Main results of the PET/CT ovarian cancer studies:

These studies present the best diagnostic results published on differential diagnostics between ovarian cancer and benign tumours. The studies have had major impact on our present standard preoperative evaluation and surgical planning. We can now select patients more precisely for either radical surgery or neoadjuvant chemotherapy. The new standard PET/CT procedures

in the department have already proven an effect on survival. The department has the best Danish survival rate at international premium class level. Since the publication of our convincing data, the PET/CT has been introduced in the preoperative diagnostic evaluation in most Danish and some international tertiary centres

■ Fast-track ovarian cancer surgery

Marx C, Rasmussen T, Jakobsen DH, Ottosen C, Lundvall L, Ottesen B, Callesen T, Kehlet H. The effect of accelerated rehabilitation on recovery after surgery for ovarian malignancy. Acta Obstet Gynecol Scand. 2006;85(4):488-92.

► Main results of the fast-track study

Before the introduction of fast-track the hospital stay was 8-12 days. Following the new set up the stay was reduced to 2-4 days. The fast-track regimen also reduced morbidity i.e. major pulmonary and cardiovascular events, consequently the fast-track was introduced in our general guideline.

The accelerated fast-track procedure has also been accepted in the other national tertiary centres. Sin-

ce the above publication, national working groups have been formed in order to develop new guidelines regarding postoperative fluid therapy and nursing care. The project nurses in our department are heads of these national working groups. A national nurse-care database connected to the Danish Gynaecological Cancer Database (DGCD) will be launched September 2010. The database secretariat is situated in our department with one of our project nurses as chairman.

■ SELDI Proteomic profiling in urine, primary ovarian cancer

Petri AL, Simonsen AH, Yip TT, Hogdall E, Fung ET, Lundvall L, Hogdall C. Three new potential ovarian cancer biomarkers detected in human urine with equalizer bead technology. Acta Obstet Gynecol Scand. 2009;88(1):18-26.

► Main results of the SELDI Proteomic profiling in urine

The study may be regarded as basic translational research. The publication is one of the first publications showing, that proteomic profiles specific for ovarian cancer can be detected in urine. The use of urine has a great potential, especially in rural areas with large

distances between health centres. A reliable diagnostic test in urine will be very valuable in the primary diagnostic evaluation and future screening trials. The research of proteom profiles in urine is one of our future Pelvic Mass activities for the next three years.

■ MALDI Basic proteomic research in primary ovarian cancer (proteom variability and stability)

Mikkel West-Nørager, M.Sc.; Christian D. Kelstrup; Christian Schou; Estrid V. Høgdall; Claus K. Høgdall; Niels H. H. Heegaard. Unraveling in vitro variables of major importance for the outcome of mass-spectrometry-based serum proteomics. *J Chromatogr B Analyt Technol Biomed Life Sci.* 2007 Feb 15;847(1):30-7

▶ Main results of MALDI Basic proteomic research in primary ovarian cancer

The first proteom article by Petricoin in 2002 was very sensational with almost 100% diagnostic accuracy. Unfortunately the results were not reproducible. Many hypothetic reasons for this were published shortly after, with no real proof. The present study shows clearly that many of the proteomic profiles are very sensitive to the handling and storage of blood samples. Based on this study, strict guidelines of handling and storage of biological materials in biobanks have been established. The guidelines are introduced by the National Cancer Biobank and are followed in our

Pelvic Mass and endometrie cancer (ENDOMET) studies. In our international collaborations, where Pelvic Mass blood samples have been used, the Pelvic Mass samples have been classified as those of the highest quality.

■ PET/CT and primary cervical cancer diagnostics

Loft A, Berthelsen AK, Roed H, Ottosen C, Lundvall L, Knudsen J, Nedergaard L, Højgaard L, Engelholm SA. The diagnostic value of PET/CT scanning in patients with cervical cancer: a prospective study. *Gynecol Oncol.* 2007 Jul;106(1):29-34. Epub 2007 May 7.

▶ Main results of PET/CT and primary cervical cancer diagnostics

Also, these studies have had major impact on our present standard diagnostic evaluation and treatment planning. The pioneering work changed our standard diagnostic evaluation and treatment, so patients today receive more individualized treatments consisting of either more cancer-focused surgery or laparoscopic lymph node resection of PET/CT positive nodes and more precise tumour-focused radiotherapy. The change has resulted in less morbidity and hopefully increased survival. A survival study is ongoing with expected publication in 2011.

■ Cervical cancer prevention, HPV vaccination

Muñoz N, Kjaer SK, Sigurdsson K, Iversen O-E, Hernandez-Avila M, Wheeler CM, Gonzalo Perez G, Brown DR, Koutsky LA, Tay EH, Garcia PJ, Ault KA, Garland SM, Leodolter S, Olsson S-E, Tang GWK, Ferris DG, Paavonen J, Steben M, Bosch FX, Dillner J, Huh WK, Jaura EA, Kurman RJ, Majewski S, Myers ER, Villa LL, Taddeo FJ, Roberts C, Tadesse A, Bryan JT, Lupinacci LC, Giacoletti KED, Sings HL, James M, Hesley TM, Barr E and Haupt RM. Impact of a quadrivalent HPV 6/11/16/18 vaccine on all HPV associated genital disease (women 16-26). *JNCI* 2009 *J Natl Cancer Inst.* 2010 Mar 3;102(5):325-39. Epub 2010 Feb 5.

▶ Main results of Cervical cancer prevention, HPV vaccination

Our selected papers in cervical cancer prevention represent some of the basic research for the HPV vaccination against cervical cancer started in Denmark in January 2009. Currently we are heading the Danish part of a comprehensive Nordic post-licensure monitoring initiative of the HPV vaccine. The studies have the highest rank in citations and impact factors. The articles describe research results that will result in the prevention of dysplasia, genital warts and cervical cancer for thousands of women worldwide in the future.

■ Clinical research

Meyhoff CS, Wetterslev J, Jorgensen LN, Henneberg SW, Høgdall C, Lundvall L, Svendsen PE, Mollerup H, Lunn TH, Simonsen I, Martinsen KR, Pulawska T, Bundgaard L, Bugge L, Hansen EG, Riber C, Gocht-Jensen P, Walker LR, Bendtsen A, Johansson G, Skovgaard N, Heltø K, Poukinski A, Korshin A, Walli A, Bulut M, Carlsson PS, Rodt SA, Lundbeck LB, Rask H, Buch N, Perdawid SK, Reza J, Jensen KV, Carlsen CG, Jensen FS, Rasmussen LS; PROXI Trial Group. Effect of high perioperative oxygen fraction on surgical site infection and pulmonary complications after abdominal surgery: the PROXI randomised clinical trial. *JAMA*. 2009 Oct 14;302(14):1543-50.

► Main results of the clinical research study – PROXI

The results of the study have met overwhelming interest in the scientific and clinical world. The article has until now been downloaded more than 6,000 times from the JAMA homepage and has received the predicate "Highly accessed" on Trials homepage. The study has generated new knowledge about postoperative infections and registration of infections. The study is basis for more published, ongoing and planned studies.

■ Educational research

Larsen CR, Soerensen JL, Grantcharov TP, Dalsgaard T, Schouenborg L, Ottosen C, Schroeder TV, Ottesen BS. Effect of virtual reality training on laparoscopic surgery: randomised controlled trial.

BMJ. 2009 May 14;338:b1802. doi: 10.1136/bmj.b1802. Erratum in: *BMJ*. 2009;338. doi: 10.1136/bmj.b2074.

► Main results of Educational research

The research behind this article is an important contribution on how to train and assess surgical trainees. It was a randomised study, where the surgery was performed on patients in the operative theatre. The intervention group, i.e. the simulator-trained group, reached a mean total score as intermediate experienced gynaecologists, while the controls performed as true novices. The mean total operating time was reduced highly significantly by 50% in the simulator-trained group. The results from this study have impact on the curriculum for postgraduate training of trainee doctors in gynaecology-obstetrics and other surgical specialities. More information (in Danish) www.skopisimulator.rh.dk

■ Epidemiologic research

Morch LS, Lokkegaard E, Andreasen AH, et al.: Hormone Therapy and Ovarian Cancer. *JAMA* 2009; 302: 298-305.

► Main results of the clinical epidemiologic study

Our pharmacoepidemiological study on the influence of hormone therapy (HT) on the risk of different types of ovarian cancer demonstrates the scientific potential in combining different national databases, in this case the national registry of medicine (NRM, established in 1994) and the national registry of patients (NRP, established 1976). Including all Danish citizens prescribed medicine or admitted to hospital for any disease, we were able to quantify the influence of different hormone therapies on the risk of different types of ovarian cancer. Contrasting some other studies, we demonstrated an elevated risk with estrogen-only therapy as well as with estrogen-progestin therapy, and that different types of HT only influence the risk of serious and endometrioid ovarian cancers.

Having these data available makes it very cost-effective to analyse the influence of specific types of medicine on a long list of clinical endpoints, including ovarian cancer.

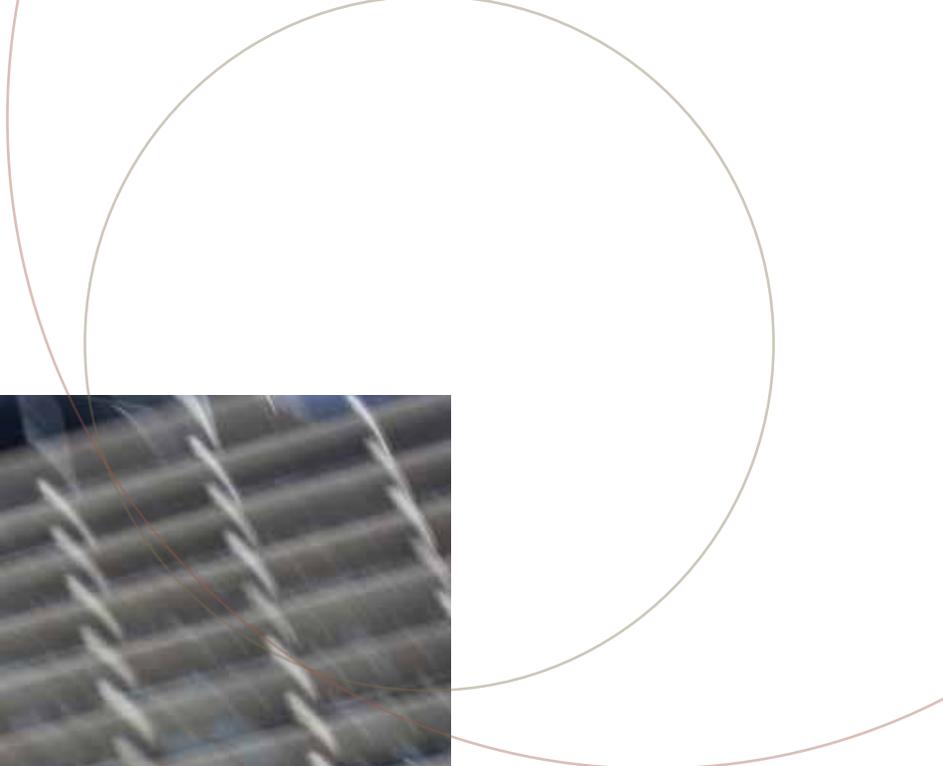
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REGION

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