

Highly Specialised Service (HSS)
Colorectal and Peritoneal Oncology Centre (CPOC)
The Christie NHS Foundation Trust

June 2023



Colorectal and Peritoneal Oncology Centre



The Christie NHS Foundation Trust
Wilmslow Road
Withington
Manchester
M20 4BX

<https://www.christie.nhs.uk/patients-and-visitors/services/colorectal-and-peritoneal-oncology-centre>



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1. Introduction

The Christie Colorectal and Peritoneal Oncology Centre (CPOC) Peritoneal Tumour Service (PTS) has experienced an **8% increase in appendiceal tumour referrals**, which rose from 373 patients in 21/22 to 400 patients in 22/23. We have also seen a **13% increase in colorectal peritoneal metastases (CRPM) referrals**, rising from 223 patients in 21/22 to 252 patients in 22/23, making this the busiest year for referrals in our 21-year history. Our operative numbers have remained stable at 190 procedures in 22/23. Other CPOC activity not mentioned in this report includes: (i) Supporting other trusts in Greater Manchester with their primary colorectal cancer workload through a 'Cancer Hub' site offering an operating list a week; (ii) Anal cancer centre; (iii) Centre for advanced & recurrent pelvic tumours including exenteration and sacrectomy; (iv) Regional retroperitoneal sarcoma service; (v) Neuroendocrine tumours; and (vi) CRS/HIPEC for Ovarian Cancer-we have supported our gynaecologists in 23 cytoreductive surgery with hyperthermic intraperitoneal chemotherapy (CRS/HIPEC) procedures for ovarian cancer.

Our outcomes indicate we provide a high-quality service. We achieved a complete (CC0/1) cytoreduction in 75% of our patients with appendix tumours undergoing CRS and HIPEC in 22/23. In the 190 patients we operated on over the past year, we had a major complication rate of 6.31%, and no 90-day mortality. This was better than our overall major complication rate of 12.8%, and 90-day mortality of 0.53% in 1,884 cases since 2011. Our overall survival rates in patients we operate on with low grade appendiceal mucinous neoplasms (86%), malignant appendiceal tumours (64%) and colorectal peritoneal metastases (37%) at 72 months after surgery compare very favourably to internationally published data.

Unforeseen events on the past 12 months have led to the cancellation of 13 PTS operations at our trust. Although we have seen a recovery from the Covid-19 pandemic through vaccination, isolation prior to surgery and routine pre-operative testing have continued in the NHS and resulted in 8 PTS patients' operations being cancelled on the day before surgery. New challenges in the past 12 months such as industrial action by nurses, junior doctors, and allied health professionals and unavailability of critical care beds have led to a cancellation of a further 5 PTS operations at our trust.

We continue to be a hub for training hosting 2 ACPGBI/RCS advanced colorectal malignancy fellows, 5 European Society of Peritoneal Surface Oncology fellows, 1 NIHR Academic Clinical Lecturer, 1 European Society of Medical Oncology fellow, 1 Postgraduate Institute of Medicine Sri-Lankan fellow, and 1 International Fellow in Surgical Oncology from the National Board of Examiners in India.

Our peritoneal research portfolio has grown **with over £5m in active grants** from CRUK, MRC, NIHR and Greater Manchester Cancer. We have been supported by The Christie and Pseudomyxoma Survivor charities who have made a significant contribution to the experiences of our patients and their families.

Finally, **we keep patients at the centre of everything with do**, valuing their involvement and feedback across our peritoneal tumour service. This includes inviting them to share their experiences with us through a very successful and well-attended annual patient day, as well as having patient representatives on steering committees for our national and international research projects.



Professor Omer Aziz

Lead Clinician, The Christie CPOC PTS

June 2022

2. Workforce

Name	Job Title
Prof O Aziz	Consultant Surgeon/ Lead Clinician PTS service
Mr H Clouston	Consultant Surgeon/ Lead Clinician Colorectal service
Mr CR Selvasekar	Consultant Surgeon/ Associate Medical Director
Mr MS Wilson	Consultant Surgeon
Prof ST O'Dwyer	Consultant Surgeon
Prof AG Renehan	Professor of Cancer Studies and Surgery, Honorary Consultant
Mr J Wild	Consultant Surgeon/ Lead for Endoscopy
Ms R Fish	Consultant Surgeon
Mr P Sutton	Consultant Surgeon
Mr R Deshpande	Consultant Hepatobiliary Surgeon
Prof MP Saunders	Consultant Oncologist
Dr S Mullamitha	Consultant Oncologist
Dr M Braun	Consultant Oncologist
Dr J Barriuso	Consultant Oncologist
Dr R Kochhar	Lead Consultant Radiologist
Dr D Mullan	Consultant Radiologist
Dr V Kasipandian	Consultant in Intensive Care & Anaesthesia/Associate Medical Director
Dr Pawel Arkuszynski	Consultant in Intensive Care & Anaesthesia
Dr B Chakrabarty	Lead Consultant Histopathologist
Dr Rola Salama	Consultant Histopathologist
R Halstead	Lead Clinical Nurse Specialist
L Wardlow	Clinical Nurse Specialist
R Connolly	Clinical Nurse Specialist
A Coop	Clinical Nurse Specialist
F Akhtar	Clinical Nurse Specialist secretary
S Madden	HIPEC Service Manager
A Colclough	HIPEC Practitioner
P Kennedy	HIPEC Practitioner
R Wood	HIPEC Practitioner
M Starr	Deputy Divisional Manager
T Jones	Service Manager
T Hughes	Deputy Service Manager
Janet Gallagher	Contracts Manager - Finance
P Diez Echave/ L Platt	Data Manager
K Edwards	Administration & Access Support Manager
G Harrison	Medical Secretary
L Evans	Medical Secretary
A Shatwell	Medical Secretary
T Tilden	Medical Secretary
F Choudry	Medical Secretary
M McKenna	Medical Secretary
L Malcomson	Research Associate
M Ahmed	CPOC Research Manager until April 2023 (new manager appointed)
R Nagaraju	CPOC Lab Manager

Consultant Surgeons



In 22/23 CPOC maintained a consultant workforce of 8.5 WTE PTS consultant surgeons. In addition to their PTS commitments, our consultants are also core members of the anal cancer, advanced pelvic surgery, retroperitoneal sarcoma, neuroendocrine, and gynaecological MDTs.

Clinical Nurse Specialists (CNS)



This team of 4 has remained stable over the past 12 months. The team are supported by a dedicated secretarial/ admin support: Faizah Akhtar which is key in helping the CNS team to concentrate more on seeing, speaking to, and ultimately supporting our patients.

Anaesthesia and Critical Care

In 22/23 CPOC was supported by a workforce of 18 WTE Consultants in Anaesthesia, 8.5 WTE Specialty Doctors, North-Western Deanery senior Anaesthesia & Acute Medicine trainees and 1 WTE Critical Care Advanced Nurse Practitioner. We have successfully recruited an additional 3 WTE Consultant Anaesthetists who will be joining us in 23/24. In addition to supporting Anaesthesia services, 11 of the 18 WTE Consultants provide Level 3 care in our 8-bedded Oncological Critical Care Unit which additionally supports Stem Cell transplants, First in Human trials, Cell Therapy and innovative treatments for advanced metastatic cancers. The Anaesthesia service is further supported by an established pre-operative assessment clinic offering onsite Cardio-Pulmonary Exercise Testing, Pulmonary Function Tests and acute and chronic pain services.

Admin/Secretarial service

Our Data Manager Paul Diez Echave has left the organisation for a data position at the National Epidemiology Centre in Madrid, Spain. Lucy Platt was appointed and joined the team in January 2023 and is settling into her role.

There have been some new faces in our secretarial team; Ms T Tilden and Ms F Choudhary, we now have a full complement of medical secretaries in 22/23 however anticipate changes in personnel over the next year with career progression opportunities for administrative and clerical staff.

HIPEC Practitioners

Mrs Sarah Madden leads a team of 5 HIPEC practitioners including Andrew Colclough, Pamela Kennedy, Rachelle Wood and Sukoluhle Mlambo. Sukoluhle is the newest member of the team, starting in June 2022. All our HIPEC practitioners are UK Oncology Nursing Society SACT trained and have obtained the academic training to receive their competency passport. This is revalidated annually. Rachelle Wood has joined the Christie Clinical Skills team part-time and is now a SACT assessor for the trust.

Managerial staff

Dr Neil Bayman is our medical director. Ms Vicky Sharples was our Deputy Chief Operating Officer/ Divisional Director of CSSS, and Ms Mary Starr was our Deputy Divisional Manager for 2022/ 2023. Both left the trust in spring 2023 to pursue new challenges. Ms Jennifer Freer and Ms Caroline Culverwell have stepped into their respective roles in May 2023. Ms Faye Barnes (Directorate Operations Manager) left the organisation in August and was replaced by Ms Tracey Jones. Ms Sharon Roe also left the organisation in July 2022 and was replaced by Mr Thomas Hughes who is the new Deputy Service Manager responsible for CPOC.



In 2023, The University of Manchester, Cancer Research UK and The Christie NHSFT completed the Paterson research building on the Wilmslow Road site of the hospital. World-leading scientists, clinicians and operational staff have now started to move into the new £150m cancer research centre. The building is part of the Manchester Cancer Research Centre and will be one of the top cancer research centres in the world. The new research centre replaces a previous building that was severely damaged in a fire 6 years ago and is directly connected to The Christie Hospital. A designated surgical research hub has been established within this building, housing research active colorectal, urology, gynaecology, and plastic surgery consultants as well as PhD students, medical students, research managers, research fellows, and lecturers. The hub also houses an Academy of Surgical Oncology and the CPOC lab which is co-located with a CRUK Manchester Institute (see section

3. Patient & Public Engagement

3.1 Patient Day

Our annual patient support day took place on the 29th of September 2022. We held this as both a face-to-face and virtual event which worked fantastically with the support of our education team. 128 patients/relatives registered (83 face-to-face & 45 virtual). We had excellent feedback from the attendees watching on both platforms. As this was the first fully attended face-to-face event since the pandemic, we were able to have stalls at lunch time and patients were part of this, selling their own products (candles and knitted teddies), with the money donated to the Pseudomyxoma research fund, to which we are very grateful. We also took the opportunity to celebrate 20 years of the Peritoneal tumour service with our patients and there was a cake for all to share. The atmosphere on the day was wonderful and patients commented how it had given them a sense of togetherness and hope.

‘Firstly a massive thank you from Amanda & I for a very informative, inspirational and uplifting day at the Christies Hospital. You should be very proud of the event and the agenda was excellent, I personally feel so much more enlightened and encouraged to the future road ahead.’ D W. (Patient)

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The afternoon session was attended by the chairman and the Board of Governors and members of the CQC. In the recent CQC report (12/05/23) it was noted there was a positive culture of putting patients first within the trust and the patient day was marked out as evidence of that.

The next patient support day will take place the 28th of September 2023.



Our patients Charlotte and Karen cutting the celebration cake.

Peritoneal Tumour Service Patient Day Thursday 29th September 2022 Auditorium, Education Centre, Dept 17, The Christie

09.50	Introduction	
10.00	Welcome	Professor Aziz (Consultant) Peritoneal Tumour Service Lead
10.15	Patient Story - Colorectal	Patient 1
10.45	Caring for your psychological well-being	Robin Muir (Clinical Psychologist Maggie's)
11.15	Coffee Break	
11.30	Research & future treatment opportunities	Professor Sarah O'Dwyer (Consultant)
12.00	Nutrition before and after treatment	Ashleigh Maske (Dietician)
12:30	Lunch	
14.00	Patient story – Living with PMP	Patient 2
14:30	Ovaries – how can we cope without them?	Dr Tara Kearney
15:00	Pseudomyxoma Survivor Charity	Susan Oliver
15:15	Patient Story - Appendix	Patient 3
15:45	Close	Malcolm Wilson (Consultant)

Examples of feedback results are shown below:

How would you rate the day overall?

Not Satisfactory	0	0%
Fair	1	2.3%
Very Good	4	9.3%
Excellent	38	88.4%

How informative was the day?

Fair	1	2.3%
Good	1	2.3%
Very Good	5	11.7%
Excellent	36	83.7%

How supportive did you find the day?

Fair	1	2.3%
Good	1	2.3%
Very Good	9	20.9%
Excellent	32	74.5%

Some of the comments from the patient's

“Having the opportunity to thank the team especially Professor O'Dwyer. The HRT talk was much needed”

The relaxed approach of the various speakers made it feel as if they were talking "only to me", even though I was listening virtually”

“The update from Prof O' Dwyer about the history and how far the team has come over the last 20 years, and the exciting research taking place. I also enjoyed meeting others with PMP, meeting the CNS nurses, speaking to the PMP survivors' team and chatting to my surgeons in an informal setting”

“Overall, it was inspirational and informative, and I was able to talk to my nurse (Lisa) about a new problem. Again, she was very helpful”

“It was better than ever - warm and uplifting as well as being instructive and supportive. You can't beat being with people who have shared experiences”

3.2 Twenty Years of the Peritoneal Tumour Service

2022 marked the official 20th anniversary of the peritoneal tumour service. We marked this with a number of events, culminating in the patient day.





3.3 ePROMS (electronic Patient Related Outcome Measure Service)

The Christie has developed an electronic quality of life questionnaire using a platform called ePROMS to improve patient outcomes. This enables patients to complete a questionnaire at home using an online application which is quick and easy to use. A link to this is sent out to them prior to their consultation. Answers are colour co-ordinated with a key providing patients with advice if they are having problems which they should seek help for. The results can be accessed by the Clinicians via individual patient records on our clinical (CWP). An example of a typical question frame is shown below:

Please select the ONE response that best describes your health TODAY.

ANXIETY / DEPRESSION

- ☐ I am not anxious or depressed
- ☐ I am slightly anxious or depressed
- ☐ I am moderately anxious or depressed
- ☐ I am severely anxious or depressed
- ☐ I am extremely anxious or depressed

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We have used the results from our ePROMS to improve patient care. An example of this is the question around menopause which was highlighted in the initial pilot study in 2021 and has been a recurring theme for women following the removal of their ovaries, since the ePROMS was rolled out in our CNS clinics in January 2022. Once we identified this, we invited a consultant specialising in the menopause to our patient support day to offer patients and clinicians an explanation for the symptoms as well as a treatment algorithm for options including types of HRT. This was an invaluable education not only for patients and their families, but also to the clinical members of the team. As a result, we now can support women much more than before and at an earlier stage with hormone replacement therapy, improving their outcomes. We intend to continue to use ePROMS to identify the problems our patients are having that may not be picked up in a clinical consultation. An abstract on the above is being prepared for presentation at the PSOGI meeting in October 2023.

3.4 Nurse-led teaching & spokes

Our CNS's continue to take part in the *Surgical Nursing Study Days* at The Christie which take place every 3 months. We specifically teach on the disease we treat, how each disease group is treated and how to manage post operative patients. We offer support to junior staff and encourage that they shadow us, so they understand the patient journey from the early stages. Student nurses and nurses new to the ward have been joining us for spokes and enjoying the additional education.

3.5 Supporting a patient on the BBC

On Good Friday, one of our young PMP patients was asked to tell her story in the media with the support of her CNS Rebecca Halstead. Stacy was operated on almost 5 years ago and in November 2022, following IVF with a sperm donor she had baby Harry. Stacy only had 2 embryos and Harry was her last chance. It was fantastic to support one of our patients in such a positive story giving hope to many other women who have lost their ovaries or ovarian function. Stacy, Harry and Rebecca gave interviews live on BBC breakfast, Radio 5 live, Radio Manchester, Northwest Tonight and Sky News live. Many patients and their families watched/heard the story and were delighted to hear awareness of PMP had been raised on such a significant platform.

The communications team at The Christie were subsequently informed that there was 272 pieces of print and online coverage and 18 pieces of TV and radio coverage. Since the broadcast, the unit have received many positive messages directly and via social media.



3.6 Greater Manchester (GM) Academy

Appendiceal malignancies are rare and many people completely unaware of them. Our patients often comment on the lack of education at their GP surgeries and local hospitals. We approached the Greater Manchester Academy, to see if they would fund online education modules which can be accessed by health care professionals all over the UK. The funding has just been approved for 3 modules and we are at the early stages of developing them. The modules will be interactive and CPD points awarded on completion. This new project will help educate health care professionals around the country and support them in managing patients locally, particularly when they are at an advanced stage and their management is complex.

3.7 Complaints

Any formal complaints or PALS (Patient Advice and Liaison service) enquiries are investigated by the relevant team members within the agreed Trust Response timeframes. Summary reports of any complaints received that month are included as a standard agenda item on the monthly PTS Business Meeting. All patient feedback is collected and discussed at our monthly PTS business meetings as a recurring agenda item.

The service received a complaint on the 17th November 2022 regarding a patient who was concerned that they had not been referred to supportive care services in a timely manner when her CNS was on annual leave, the patient also expressed concerns about other services such as complementary therapy, IPU and the surgical ward as the patient had to repeat her story to different departments. This was raised via the PALS service who notified Surgical Services and involved staff on ward 10, IPU and Complementary Therapy.

When the CNS team and Surgeon was notified of this issue the team met with the patient and provided an opportunity to discuss their concerns. The service apologised for the delay, informed the patient that a referral to supportive care services was completed prior to receiving the complaint, the patient was happy to have met and accepted the apology given. A letter of apology and summary of the discussion was sent following this meeting, other teams who were involved in the complaint also addressed and wrote to the patient to apologise. This was subsequently discussed in our Colorectal Business Meeting in December 2022

3.8 Compliments

Throughout the year, the team have received multiple messages, letters and cards from patients and their families praising the service. A number have also made significant contributions to our Charity in recognition of the care received. Some of the many positive comments received this year include:

"I cannot sing the praises of The Christie highly enough. What shines through most of all is the caring nature that flows throughout the hospital. You are made to feel very, very looked after by an extremely competent and talented team"

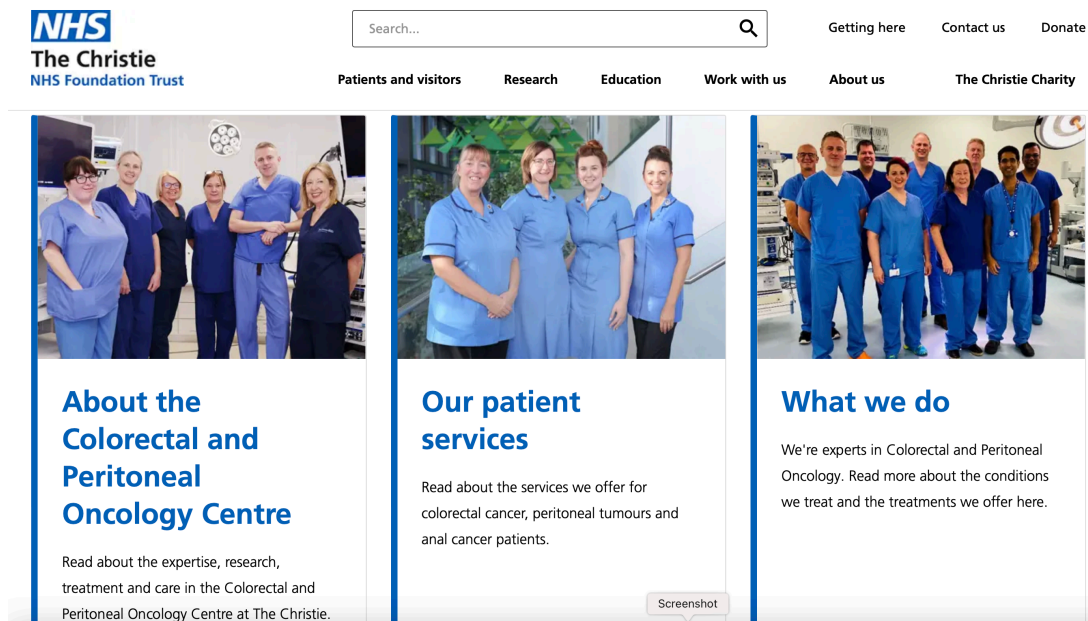
"I cannot emphasise how truly grateful I am to everyone involved in my treatment and care without whom I would not be here, now, at home recovering. I am grateful for the opportunity to be treated by such a fantastic team. I appreciate and promise that I will not waste this opportunity and do my best to make a good recovery."

"I am very grateful that you were able to successfully treat my Dad's PMP cancer with a lifesaving operation and treatment. Sadly, the cancer returned after 5 years. I will be forever in your debt for the 7.5 years we were able to spend with our precious father."

"I am so grateful for your skill, compassion, and amazing care. More than anything, thank you for the hope you have given me for the future."

3.9 Website & Social Media

The CPOC website (<https://www.christie.nhs.uk/CPOC>) continues to be used by patients, relatives, and medical professionals to access information about us, what we do, conditions we treat, the patient journey, and information for professionals. Our news section is updated every week with stories relating to the team, our patients, awards, and research.



We have a social media presence on Linked In, Facebook, and Twitter through The Christie NHS Foundation trust media department who manage these posts and responses.

Our website has recently been updated based on the results and the requirements of our patients. Individual patients have been asked for testimonials and we will be filming some patient experience videos once we are able to do so.

3.10 Accommodation

CPOC PTS patients travel from across the UK to have their treatment with us. Since 2019 Pseudomyxoma Survivor charity has supported our patients and their relatives with accommodation in Stay City apartments in Manchester City Centre. Our patients' stay takes priority over the general public and there is a floor dedicated to them including a communal lounge. All apartments are self catering and patients get a welcome card and a blanket courtesy of Pseudomyxoma Survivor. We have received very positive feedback from patients and their relatives regarding this service, which allows patients to be near their loved ones at an otherwise difficult time.



3.11 Fundraising & Donations

Our patients and staff regularly fundraise for our service with donations received by The Christie Charity and placed into a dedicated CPOC PTS pseudomyxoma fund. In total £140,094 in donations were received by the CPOC PTS pseudomyxoma fund in 22-23. The PTS pseudomyxoma fund charitable committee is chaired by Mr Malcolm Wilson and meets every 6 months to review applications to fund research projects, equipment proposals, projects to improve patient experience, and pump prime new posts. Currently funded projects include:

- a) Patient assistance projects
 - a. Stay City accommodation for patients and relatives
 - b. Patient information leaflets
 - c. Support of annual patient day\
- b) Research projects
 - a. Targetable pathways in CRPM
 - b. Biomarker profiling in Colorectal peritoneal malignancies
 - c. Tumour microenvironment in appendiceal adenocarcinomas
 - d. Peritoneal cytokine production
 - e. 3-d modelling of pelvic tumours
- c) Education
 - a. Cadaver Course in peritoneal and pelvic oncology
 - b. Support for advanced rectal cancer day
 - c. Photography for the CPOC website
- d) Supporting workforce development
 - a. 0.6WTE Clinical Psychologist in Psycho-Oncology for 2 years
 - b. 1 year funding for CPOC Lab Manager (from Sept 2022)
 - c. OnCoRe+ Project Manager (0.85WTE) 2 years
 - d. 1 year fellowship in Pathology.

4. Education & Training

4.1 Fellowships

CPOC continues to be a place where specialists from across the UK and the world travel to train and gain invaluable experience in peritoneal tumour management and research.



- 4.1.1 RCS/ACPGBI Advanced Colorectal Malignancy Fellowship - Branded through the Royal College of Surgeons and the Association of Coloproctology of GB&I, we have had 4 fellows to date with excellent feedback from senior post-CCT UK trainees. In 22/23 our graduating fellows included Mr Nigel Day (appointed consultant colorectal surgeon at Epsom & St Helier's Hospitals) and Mr Christopher Kearsey (appointed locum consultant at Royal Preston Hospital). Our Current fellows are Mr Amarvir Bilku, Mr Amar Eltweri, and Mr Sajith Sasi.
- 4.1.2 European Society of Peritoneal Surgical Oncology (ESPSO) Fellowship: CPOC has been designated by the European Society of Surgical Oncology as a recognised training centre in peritoneal oncology since 2015. To date, we have mentored 9 Fellows registered through this program from the UK and abroad. Currently we have three Consultants approaching graduation from the programme for 2023-25.
- 4.1.3 Postgraduate Institute of Medicine (Sri-Lanka) Fellowship: We continue to receive an international fellow from Sri Lanka to travel to the UK for overseas training. These fellows have completed their training and are put forward to travel to the Christie for postgraduate specialisation in surgical oncology for a year. Our past fellow Mr Chamila Lakmal has moved on to a fellowship in in Cambridge and our current fellow is Mr Theekshana Pathirana.
- 4.1.4 National Board of Examiners (India) International Fellow in Surgical Oncology: We continue to appoint an international fellow through a competitive process of selection from The Ganga Ram Hospital in India. Our previous fellow was Mr Mayank Mathur and current fellow is Mr Asim Jindal.

4.1.5 National Institute of Healthcare Research (NIHR) Academic Clinical Lecturer: We have appointed an ST4 surgical trainee (Ms Meera Patel) developing a career as an independent academic surgeon and helped her apply for this NIHR ACL. Her clinical training is based at the Northwest of England Deanery and academic project on peritoneal metastases from colorectal cancer is based at the CPOC lab in the Manchester Cancer Research Centre. She is on track to apply for a clinician scientist grant application at the end of her specialist training.

4.1.6 European Society of Medical Oncology (ESMO) Fellowship: Dr Madeleine Strach is a medical oncologist specialising in the management of Appendix Adenocarcinomas who was successful in secure this competitive fellowship and spent 2 years with us as part of her PhD. Clinically she joined our CPOC oncology team and academically she set up a collaborative research programme studying the genomics of appendix adenocarcinomas between The CPOC Lab (University of Manchester), University of Sydney and Chris O'Brien Lifecare Cancer Hospital in Sydney Australia. She returned to Sydney to take up a post as a medical oncologist in April 2023.

4.2 RanD Academy

The Christie CPOC is a reference centre for units training in CRS/HIPEC. One of the routes through which we deliver this involves a memorandum of understanding between The Christie and RanD to join their academy of training centres. To date we have trained international teams from India, Brazil, Pakistan, Mexico, and Jordan). The latest a peritoneal tumour service we have helped set up is in the Middle East at The King Hussein Cancer Centre (KHCC), Jordan. This involved training the team in Manchester over 2 years and operating with them in Amman. The Christie CPOC remains a reference centre for training in laparoscopic CRS/HIPEC and have joined the Peritoneal Surface Oncology Group International's (PSOGI) laparoscopic CRS/HIPEC registry as one of the single largest contributors of this procedure in the world.

4.3 CRS/HIPEC for Ovarian Cancer

We are supporting our gynaecologists to undertake cytoreductive surgery with hyperthermic intraperitoneal chemotherapy (CRS/HIPEC) procedures for ovarian cancer. To date we have operated on 23 patients with advanced high grade ovarian cancer who had a partial response to neo-adjuvant chemotherapy and were amenable complete cytoreduction have been included in this program. In the neo-adjuvant setting, all patients received carboplatin and paclitaxel, and 6 patients received bevacizumab. Closed HIPEC delivery technique was used. Cisplatin was perfused at a dose of 100mg/m². The median number of cycles of chemotherapy prior to CRS + HIPEC was 3 (3-4). The mean pre-op PCI score was 6.5 (2-16), and the mean post-op PCI score was 0 (0-2). The average duration of inpatient stay was 11 days (7-20). Two patients had peri-operative complications. There was no 30-day or 60-day mortality and only 2 patients were re-admitted to hospital. There are no reports of long-term complications. No patients experienced systemic complications from peritoneal chemotherapy. All patients went on to receive adjuvant chemotherapy, while 21 patients received maintenance therapy with a PARP inhibitor, bevacizumab, or both. To date, seven patients have progressed since surgery and one patient has died from progressive disease. Mature data, including PFS is being collected. This places The Christie in a position to participate in the OVIPEC II randomised controlled trial. We are also currently evaluating the resources required for this service to be set up at The Christie should there be an NHS-commissioning framework for CRS/HIPEC in ovarian cancer in the future.

4.4 Education/Courses

In January 2023 we delivered a 'Hands-on Cyto-reductive Surgery and HIPEC Course' organised by Mr Selvasekar and Mr Wild attended by 18 delegates from 7 countries.



The program is shown below:



The Christie Hands-on Peritoneal Surgery Cadaveric Course

26th January 2023

The Manchester Surgical Skills and Simulation Centre

Time	Session	Location	Facilitators
08:45	Coffee and Registration	Seminar Room	
09:00	Introduction and Objective Setting	Seminar Room	Wild/Selvasekar
09:15	Applied anatomy relevant to peritoneal surgery	Seminar Room	Prof. Ingrid Gouldsbrough/RD
09:45	Cross-sectional imaging and pre-op planning	Seminar Room	Rohit Kochhar
10:15	Coffee	Seminar Room	
10:30-11:30	Video Session – <ul style="list-style-type: none"> • Patient positioning and set-up • Liver mobilisation & ablation • Diaphragmatic peritonectomy • Omentectomy (Greater and lesser) • Splenectomy • Pelvic peritonectomy • HIPEC setup 	Seminar Room	PS RD RD JW JW STOD OA
11:30-12:30	Cadaveric Session (Hands on training) <ul style="list-style-type: none"> • Omentectomy (Greater and lesser) 	Skills Lab	All Faculty
12:30	Lunch	Kro Bar	
13:15	Cadaveric Session (Hands on training) – <ul style="list-style-type: none"> • Liver mobilisation & ablation • RUQ diaphragmatic peritonectomy 	Skills Lab	All Faculty
14:30	Afternoon Tea		
14:45	Cadaver session (Hands on training) – <ul style="list-style-type: none"> • Splenectomy and LUQ peritonectomy • Anterolateral peritonectomy • Pelvic peritonectomy with hysterectomy + BSO (Demo) 	Skills lab	All Faculty STOD/B-WR
15:30	HIPEC set up (Demo)	Seminar Room	Sarah Madden
16:00-16:45	MDT with focused discussions	Seminar Room	Rebecca Halstead Rohit Kochhar All faculty
16:45	Round up and Questions/Discussions	Seminar Room	
17:00	Close	Seminar Room	

In March 2023 we delivered a Cheshire and Mersey Regional Training event on 'Rare Tumours for the Colorectal and General Surgeon' organised by Mr Sutton.

4.5 Academic meetings

We hold monthly hybrid academic meetings which have successfully included both clinical and basic science topics. Whilst not all of these are related to peritoneal tumours, we have at least 6 per year have this theme. Attendance at these meeting has ranged between 30-60 participants ranging from clinicians (oncologists, surgeons, and anaesthetists), nurses, allied medical professionals, and scientists. The meetings have included participants from peritoneal units in Basingstoke, Birmingham, Dundee, Dublin, Oslo, and Cordoba.

5. Research

We continue to expand our research portfolio. We have established The Christie Colorectal and Peritoneal Oncology Centre (CPOC) Academy and Lab, at the Manchester Cancer Research Centre and an Academy of Surgical Oncology in The Paterson Research Building. Our collective research team which comprises of 5 PhD students, an academic clinical lecturer (50% clinical/50% academic), an ESMO fellow, 2 postdoctoral research fellows, and a research manager. This team is funded through the grants listed in section 5.5. Our key research themes include:

- *Biomarker research*
- *Technology and Innovation*
- *Clinical outcomes and treatment effects*

5.1 Biomarker Research

5.1.1 Cancer Research UK Accelerator Award: Pseudomyxoma peritonei: building a European multicentric cohort to accelerate new therapeutic perspectives – We are one of three European groups (including Italy and Spain) that have been awarded this prestigious award to accelerate the collection of a comprehensive biobank of tissue from patients with pseudomyxoma peritonei (PMP) from Low-grade appendiceal mucinous neoplasms (LAMNs) over 5 years.



The £2.5m award aims to identify genomic biomarkers, build in vitro 3-D models and organoids, and ultimately establish a platform to identify therapeutic options for PMP patients. Our team includes faculty from across The University of Manchester including: CPOC Lab at The Manchester Cancer Research Centre, Wellcome Trust Centre for Cell Matrix, School of Pharmacology, and Manchester Centre for Genomic Medicine. The project has to date established a standardised biobank collection process, tumour sampling, DNA and RNA extraction across the 3 countries including a quality control

check. We have successfully standardised live tissue processing and cell culture leading to the development of LAMN and appendix adenocarcinoma in vitro models and organoids. Currently we are establishment of libraries of information that can be shared with researchers across the world to accelerate our understanding of LAMNs leading to PMP and optimising bioinformatics pipelines to look at this data. The project has 2 years remaining.

- 5.1.2 Genomic (DNA) and transcriptomic (RNA) biomarkers for colorectal cancer peritoneal metastases - We have established this translational research program in the CPOC lab through a combination of charitable funds and expertise developed through the CRUK accelerator project. We have developed a 'peritoneal signature', identified through the PanCancer 360 Gene Expression Panel, which has been applied and tested on transcriptomic data from large worldwide consortia, identifying deregulated pathways that suggest synchronous peritoneal metastasis may be a relatively early event to develop in this patient group (see publications). We have appointed an oncology PhD who is currently looking at signatures (DNA and RNA) signatures for metachronous CRPM.
- 5.1.3 Genomic drivers and mechanisms of colorectal peritoneal metastasis formation identified through Whole Genome Sequencing (WGS) - We are collecting tissue samples from CRPMs and from the matched primary tumours, to perform WGS in order to identify the full range of genomic aberrations that have occurred in the cancer cells, including large structural rearrangements, copy number aberrations, small insertions/deletions and single nucleotide variants (SNVs). By comparing the mutations found in the primary and metastatic lesions, we will identify the likely genetic drivers of CRPM. We also aim to elucidate the process of metastasis, for example discovering whether CRPMs grow from a single cell (monoclonal seeding) or are derived from multiple cells with different genotypes (polyclonal seeding).
- 5.1.4 Genomics of appendix adenocarcinomas – A 2-year joint research programme completed in 2023 studying the genomics of appendix adenocarcinomas between The Christie NHSFT, University of Manchester, University of Sydney and Chris O'Brien Lifehouse Cancer Hospital in Sydney Australia (Kate Mahon). We have been co-supervising of an oncologist who undertook a joint PhD spending 1 year in Sydney and 2 years in Manchester funded through a European Society of Medical Oncology (ESMO) fellowship which we helped her secure. Madeleine has just returned to Australia in May 2023 and is writing up her thesis.
- 5.1.5 The Role of bacteria in peritoneal metastases – This is a joint project with The Institute of Cancer Sciences Glasgow for an NIHR academic clinical lecturer who is building large colorectal tissue microarrays for identification of clinically relevant prognostic and predictive biomarkers. The project aims to identify the role of bacteria in peritoneal metastases from colorectal cancers through genomic characterisation of these tissues for bacterial DNA. To the best of our knowledge, it is the first project of its kind for peritoneal tumours in the world.

5.2 Technology and Innovation

- 5.2.1 Mass Spectrometry to characterise lipid profiles of CRPM: Mass spectrometry is a very powerful tool, used to rapidly and reliably characterise tissue. We have established a partnership between Waters Corporation (A leading mass spectrometer manufacturer), The University of Manchester, and The Christie CPOC to characterise colorectal peritoneal metastases using this powerful tool. Funded by

the Medical Research Council, funded a PhD student whose thesis involved characterising the lipid profiles of these tumours. This is a platform for future research in this area which has implications not only for the understanding of the peritoneal environment as a metastatic site, but also for the development of rapid tools that tell the surgeon in real-time whether a tissue is 'tumour' or 'normal'. The project aims to have a mass spectrometer installed in an operating theatre for real-time tissue characterisation. As part of this project, we have been awarded funds from 'Nanosttring' from this company to analyse metabolic, genetic, and immune cell changes in human colorectal cancer and colorectal metastatic tissue by combining Nanosttring digital spatial profiling and Mass Spectrometry Imaging (MSI).

- 5.2.2 Prehabilitation with wearables before CRS/HIPEC: A randomised controlled pilot study. Having undertaken a systematic review of prehabilitation programs in abdominal cancer surgery, we have designed and completed the first randomised controlled trial of prehabilitation delivered solely with wearable devices versus standard of care in patients undergoing CRS/HIPEC. Funded through a donation from the charity 'Pseudomyxoma Survivor', we were able to achieve 67% recruitment. The prehabilitation group engaged in more daily minutes of moderate and vigorous physical activity compared to controls. They also had significantly greater improvements in the distance they could walk in 6 minutes compared to controls (+ 85.6 m vs + 13.23 m, $p = 0.014$). We have now designed a larger randomised control trial in this group to quantify the impact of this improvement on post-operative recovery. We have secured a grant from Manchester Academic Health Science Centre and Pseudomyxoma Survivor charity to build a prehabilitation Mobile phone App combined with wearables.
- 5.2.3 Developing and migrating to a closed HIPEC technique: HIPEC can be administered via the open coliseum technique (O-HIPEC) or using a closed technique (C-HIPEC). Data comparing the safety and outcomes of these different approaches was limited so we compared morbidity and mortality rates of O- HIPEC and C-HIPEC following CRS for peritoneal metastases from colorectal cancer and appendiceal tumours. Our study published in the European Journal of Surgical Oncology demonstrated closed administration of HIPEC is safe with no difference in post-operative morbidity or mortality compared to open HIPEC administration. Differences in longer term oncological outcomes including overall survival and disease-free survival between open and closed HIPEC techniques are yet to be determined.

5.3 Clinical outcomes and treatment effects

- 5.2.4 Evidence Review of Peritoneal Tumours (EVERPET) was a 3-year NIHR-funded project between University College London and The Christie CPOC that started in 2019 and completed in December 2022. This project has reviewed the randomised controlled trial evidence for efficacy and cost-effectiveness of cytoreductive surgery and hyperthermic intraperitoneal chemotherapy for peritoneal metastases from ovarian, colorectal, and gastric cancer for the UK NHS. The report has been submitted to NIHR and is being reviewed.
- 5.2.5 Outcomes research for patients with peritoneal metastasis: We continue to publish and share our outcomes with the international community. Projects include indications and outcomes for repeat CRS/HIPEC in peritoneal surface malignancy, Referral pathways and outcome of patients undergoing CRS/HIPEC, and Radiological patterns of recurrence after CRS/HIPEC for CRPM.

5.2.6 Early identification of LAMNs at risk of PMP: We have one of the world's largest patient groups with early LAMNs referred through our established network over the past decade. Our research in this area includes: The Long-term outcomes for pTis and pT3 non-perforated LAMNs on an active surveillance pathway and outcomes from Laparoscopic CRS/HIPEC for perforated LAMNs. We are a major contributor to the PSOGI international collaborative laparoscopic CRS/HIPEC registry which has published its results.

5.4 Conferences and Meetings

- 19th World Congress of Basic and Clinical Pharmacology (2023). Oral: 'Quantitative proteomics of pharmacokinetics (PK) and pharmacodynamics (PD) targets in liver, small intestine, colon, appendiceal and peritoneal cancer'.
- 16th European International Society for the Study of Xenobiotics (ISSX) and Drug Metabolism Discussion Group (DMDG) Meeting (2023). Poster: 'A liquid biopsy approach for the characterization of pharmacokinetics and pharmacodynamics protein targets in exosomes from Pseudomyxoma peritonei'
- ACPGBI Annual Conference (2023). Oral: A quality improvement project to pilot and evaluate a one-stop multi-speciality clinic for patients undergoing surgery for advanced pelvic malignancy in Greater Manchester at The Christie NHS Foundation Trust
- ACPGBI Annual Conference (2023). Oral: Matrisomal proteomic profiling of appendiceal mucinous neoplasms and pseudomyxoma peritonei
- ACPGBI Annual Conference (2023). Oral: Impact of peritoneal metastasis histological grade on prognosis of pseudomyxoma peritonei arising from appendiceal mucinous neoplasms
- ACPGBI Annual Conference (2023). Oral: Sustained complete response to neoadjuvant (chemo)radiotherapy in patients with rectal cancer: before and after 2016 in the OnCoRe Research Database
- ACPGBI Annual Conference (2023). Poster: Outcomes for patients with appendix adenocarcinoma and the role of systemic chemotherapy
- ACPGBI Annual Conference (2023). Poster: Clinical outcomes of appendix goblet cell adenocarcinoma
- ACPGBI Annual Conference (2023). Poster: Quantitative proteomics analysis to understand the role of the human appendix: Does its proteome hold the key?
- ACPGBI Annual Conference (2023). Poster: Does non-perforated LAMN of appendix progress to pseudomyxoma peritonei? - 15 years of experience with regular follow-up at a peritoneal tumour centre
- ACPGBI Annual Conference (2023). Poster: Cytoreductive surgery and HIPEC in Colorectal Cancer Peritoneal Metastases (CRPM): Real-world outcomes of all-comer, complete cytoreduction and systemic anti-cancer treatment (SACT) naïve patients

- ACPGBI Annual Conference (2023). Poster: Economic evidence for a watch-and-wait strategy in patients with rectal cancer: a systematic review and critical appraisal
- ACPGBI Annual Conference (2023). Poster: Development of updated ACPGBI Guidelines for the Diagnosis and Management of Anal Cancer and its Precursor Intra-epithelial Lesions, using the AGREE II framework
- ASCO GI (2023). Poster: Cytoreductive surgery and HIPEC in colorectal cancer peritoneal metastases (CRPM): Real-world outcomes in systemic anticancer treatment-naïve patients.
- ESMO Sarcoma & Rare Cancers Congress (2023). Oral: Outcomes for patients within appendix adenocarcinoma and the role of systemic chemotherapy
- ESMO Sarcoma & Rare Cancers Congress (2023). Poster: Molecular mutations in appendix cancers
- ASCO GI (2023). Poster: Clinical outcomes of appendix goblet cell adenocarcinoma and role of systemic chemotherapy.
- ACPGBI (2022). Poster: Ensuring safe and timely cancer surgery during the COVID-19 pandemic: Closed technique for administration of heated intraperitoneal chemotherapy (HIPEC) following cytoreductive surgery is a safe alternative to the traditional open coliseum technique.
- ESMO (2022). Poster: Single-cell transcriptomic analysis of appendiceal cancer peritoneal disease
- ACPGBI (2022). Poster: (Rosette) Appendiceal adenocarcinoma treated at a national peritoneal tumour centre.
- ACPGBI (2022) Poster: Proteomics profile and quantitation of pharmacokinetics (PK) and pharmacodynamics (PD) targets in liver, small intestine, colon, and peritoneal cancer
- ACPGBI (2022). Poster: Patterns and Timing of recurrence following CRS and HIPEC in Colorectal Cancer Peritoneal Metastasis
- ACPGBI (2022) Poster: Investigating the role of the extracellular matrix in the peritoneal dissemination of pseudomyxoma peritonei
- BGCS (2022) Poster: A pilot study of interval cytoreductive surgery(CRS) and hyperthermic intraperitoneal chemotherapy(HIPEC) for advanced epithelial ovarian cancer(AEOC)
- RCoA The Royal College of Anaesthetists – Anaesthetic Updates Conference (2022): Anaesthesia for Cytoreductive Surgery and HIPEC

5.5 Grants

- Characterisation of the peritoneal tumour microbiome in patients with appendix cancer metastasis. Funder: Manchester-Melbourne-Toronto-Synergy Centre for Cancer Research. (2023-2024) Omer Aziz, Meera Patel. Award Value: **£10,000**

- What is the role of bacteria in peritoneal metastasis from colorectal cancer? Funder: Pump Priming Grant, Royal College of Surgeons England. Meera Patel, Omer Aziz (2023-2025) Award Value: **£9,950**
- Investigation of the peritoneal tumour microbiome in colorectal cancer metastasis Funder: Clinical Lecturer Starter Grant, University of Manchester. Meera Patel, Andrew McBain, Omer Aziz (2023-2025). Award Value: **£10,000**
- Biomarker profiling of metachronous colorectal peritoneal metastases and their primary tumours; Funder: Peritoneal Charitable Fund (Christie CPOC). Omer Aziz & Jorge Barriuso; Student: Nadina Tinsley; (2021-2023). Award Value: **£24,967**
- Pseudomyxoma peritonei: building a European multicentric cohort to accelerate new therapeutic perspectives. CRUK Accelerator Award (2020-2025) S O'Dwyer, J Barriuso & O Aziz. Award value **£3.5m**
- Genomics of appendix adenocarcinoma. European Society for Medical Oncology (2021-2024), J Barriuso & O Aziz. Award value **40,000 Euros**
- EORTC QLQ new module development- neoadjuvant treatment in rectal cancer. European Organisation for Research and Treatment of Cancer (2021-2024), A Gilbert & R Fish. Award value **122,751 Euros**
- Pseudomyxoma Survivor charity (2022-2023), Development of a 'prehabilitation' App to improve patient post-operative outcomes. O Aziz, J Saxton & J Allen, Award value **£22,000**
- ValCoRe: Value of Benefit from a new cancer treatment: clinical complete response in rectal cancer Marie-Skłodowska Curie ITN Early Stage Researcher (2020-2023). A Renehan. Award value **£211,202**
- Knowledge Asset Grant (2022), The feasibility of creating combined genetic, clinical and quality of life datasets in patients with locally recurrent rectal cancer. P Sutton, O Aziz, S O'Dwyer. Award value **£24,000**
- Manchester Academic Health Science Centre (MAHSC) (2021-2022), Development of a 'prehabilitation' App to improve patient post-operative outcomes. O Aziz, J Saxton & J Allen. Award value **£24,000**
- Colorectal and Peritoneal Oncology Academy. Christie Charity (2020-2025), S O'Dwyer & O Aziz. Award value **£375,000**
- Cytoreductive surgery with hyperthermic intraoperative peritoneal chemotherapy versus standard of care in people with peritoneal metastases from colorectal, ovarian or gastric origin: Systematic review and individual participant data meta-analyses of effectiveness and cost-effectiveness NIHR (2019-2022) S O'Dwyer & O Aziz, Award value **£305,636**
- Surgical Oncology Academic Business Case. The Christie Charity; Co-PI's: Sarah O'Dwyer & Omer Aziz; (2020-2025). Total Value: **£375,000**
- Quantifying and implementing preferences for the treatment of high-risk rectal cancer (PrefCoRe): NIHR RfPB (2019-2022), A Renehan. Award value **£248,879**
- Mass Spectrometry Imaging for Colorectal Cancer Subtype Classification. MRC National Productivity Investment Fund (2017-2022), O Aziz. Award value **£75,000**

- The feasibility of creating combined genetic, clinical and quality of life datasets in patients with locally recurrent rectal cancer; Funder: UK Government Knowledge Asset Grant Fund; PI: Paul Sutton; Co-PIs: Omer Aziz; Sarah T O'Dwyer; Jorge Barriuso; Bipasha Chakrabarty (2022-2023). Award Value: **£24,973**
- The Characterisation of appendiceal adenocarcinomas using single cell transcriptomic analysis; Funder: Peritoneal Charitable Fund (Christie CPOC); Co-PI's: Omer Aziz & Jorge Barriuso; Student: Madeleine Strach; (2021-2023). Award Value: **£20,390**
- The Investigation of therapeutically targetable pathways in patients with colorectal peritoneal metastasis; Funder: Peritoneal Charitable Fund (Christie CPOC); Co-PI's: Omer Aziz & Jorge Barriuso; Student: Meera Patel (2021-2023). Award Value: **£24,372**

5.6 Publications

- Hassan S, Dritsas S, O'Dwyer ST, Aziz O, Sutton P, Wang X, Fish R; other members of the Colorectal and Peritoneal Oncology Group. Open versus Closed technique for administration of heated intraperitoneal chemotherapy (HIPEC): Morbidity and Mortality outcomes from a high-volume centre. *Eur J Surg Oncol*. 2023 Apr 29;S0748-7983(23)00483-3. PMID: 37179147.
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6. Unit Data

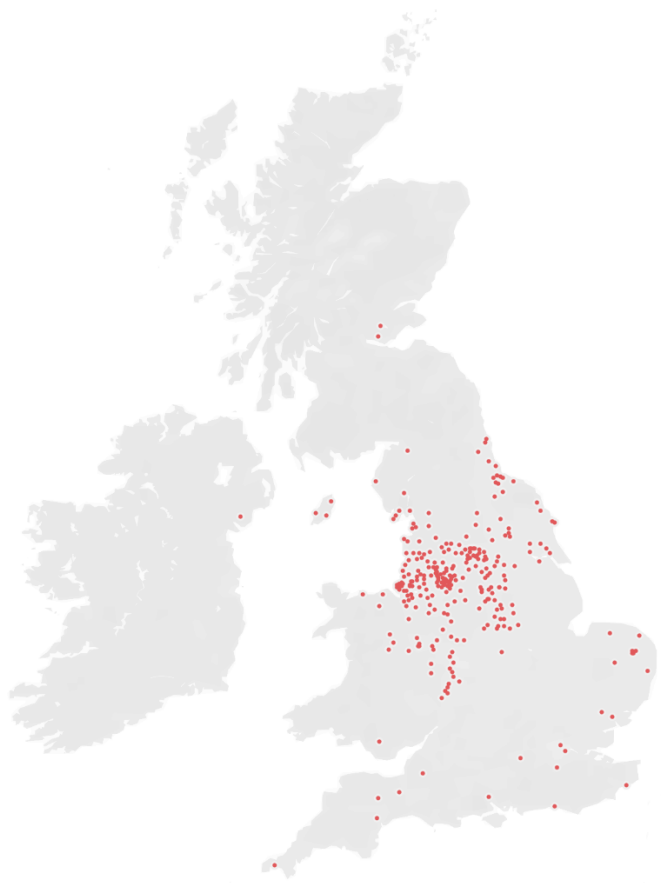
6.1 Referrals

Highly Specialist Commissioning (Appendix) Referrals

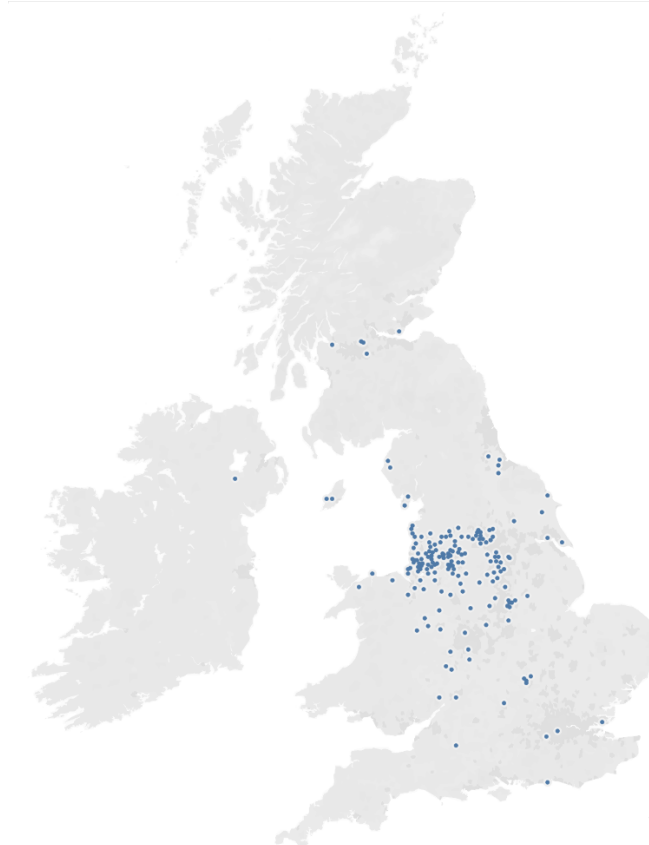
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
Q30 - NORTH EAST	3	10	6	3	5	6	11	36	23	8	15	12	15
Q31 - NORTH WEST	45	50	54	61	105	109	108	112	133	130	107	162	184
Q32 - YORKSHIRE & THE HUMBER	18	24	23	35	39	35	49	6	31	68	56	100	90
Q33 - EAST MIDLANDS	6	4	8	9	13	13	17	16	22	5	15	20	32
Q34 - WEST MIDLANDS	9	10	7	16	12	27	29	49	44	37	38	40	40
Q35 - EAST OF ENGLAND	0	2	2	0	1	5	7	4	11	5	10	5	11
Q36 - LONDON	0	1	0	0	0	1	3	1	3	4	4	7	3
Q37 - SOUTH EAST COAST	1	1	0	0	0	0	4	5	4	4	0	3	4
Q38 - SOUTH CENTRAL	0	1	2	0	0	0	0	2	0	2	0	0	0
Q39 - SOUTH WEST	1	1	0	0	0	7	7	4	3	4	2	7	5
ENGLAND - NOT KNOWN	0	0	0	0	0	0	0	0	0	0	0	0	0
W01 - WALES	8	12	3	8	5	5	10	8	2	4	6	9	7
NORTHERN IRELAND	2	2	1	1	2	2	5	5	2	0	1	2	2
SCOTLAND	6	4	4	12	4	5	9	8	5	5	4	4	2
OTHER GB	0	0	0	3	0	1	1	1	4	1	1	2	3
OTHER	0	0	0	0	0	0	0	2	0	1	0	0	2
TOTAL	99	122	110	148	186	216	260	259	287	278	259	373	400

CRPM Referrals

	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
Q30 - NORTH EAST	1	1	2	1	1	7	4	31	11	6	12	12	6
Q31 - NORTH WEST	15	10	31	28	57	82	83	98	107	110	114	109	137
Q32 - YORKSHIRE & THE HUMBER	3	2	3	6	22	16	21	6	13	31	30	51	45
Q33 - EAST MIDLANDS	4	1	2	3	6	6	10	14	11	3	12	15	21
Q34 - WEST MIDLANDS	3	0	2	5	4	14	25	32	36	22	13	15	18
Q35 - EAST OF ENGLAND	0	0	1	2	7	6	10	5	8	4	4	4	1
Q36 - LONDON	0	0	0	2	1	1	3	0	0	3	0	1	1
Q37 - SOUTH EAST COAST	0	0	2	0	0	0	1	7	7	2	0	0	7
Q38 - SOUTH CENTRAL	0	0	0	0	0	1	1	1	2	0	1	0	0
Q39 - SOUTH WEST	1	0	0	0	1	2	2	7	6	0	3	6	3
ENGLAND - NOT KNOWN	0	0	0	0	0	0	0	0	0	0	0	0	0
W01 - WALES	0	1	1	0	1	2	1	2	4	3	1	1	4
NORTHERN IRELAND	0	0	0	0	0	1	0	2	0	1	0	1	1
SCOTLAND	0	1	1	1	0	3	3	9	5	5	2	4	5
OTHER GB	0	0	0	2	2	2	0	1	2	5	6	4	3
OTHER	0	0	0	0	0	0	0	0	0	1	0	0	0
TOTAL	27	16	45	50	102	143	164	215	212	196	198	223	252



Referrals 2022-2023 CRPM



6.2 Demographics

Highly Specialist Commissioning (Appendix) Demographics

	Age												
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
Median - Male:	55	57	62	58	64	65	62	59	60	60	61	61	62
Median - Female:	61	62	59	61	62	62.5	62	60	60	60	61	61	62
Range:	23-92	29-85	28-86	20-86	21-91	19-89	19-87	23-84	13-89	22-87	16-90	20-87	20-87
N =	99	122	110	148	186	216	260	259	287	278	259	373	400

	Gender												
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
Male	42	55	37	51	58	88	108	117	107	130	105	163	158
Female	57	67	73	97	128	128	152	142	180	148	154	210	242
Total	99	122	110	148	186	216	260	259	287	278	259	373	400

CRPM Demographics

	Age												
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
Median - Male:	61	59	65	61	63	63	62	61	64	65	62	63	64
Median - Female:	54	57	62	58	55	60	60	61	59	62	60	64	64
Range:	35-81	34-73	33-78	28-81	22-84	20-83	22-86	28-81	29-81	33-86	21-86	31-85	21-86
N =	27	16	45	50	102	143	164	215	212	213	198	223	252

	Gender												
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
Male	11	4	20	24	54	69	80	109	94	91	96	101	107
Female	16	12	25	26	48	74	84	106	118	105	102	122	145
Total	27	16	45	50	102	143	164	215	212	196	198	223	252

6.3 Assessment and Treatment

(Please note colorectal peritoneal metastases (CRPM) cases have been included for comparison)

Figure 1: Highly Specialist Commissioning (Appendix Tumours) – Referrals and Operations

This graph includes all patients including private patients

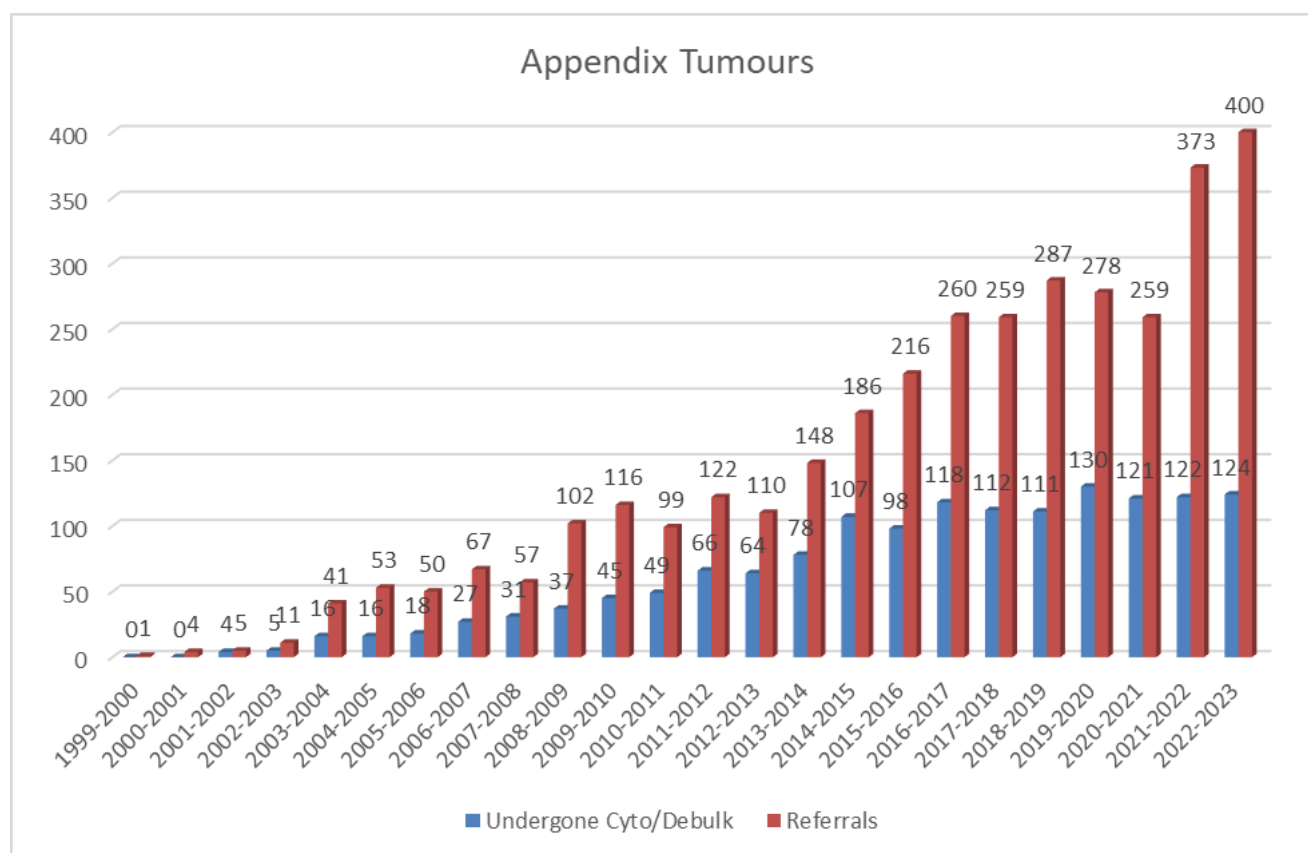
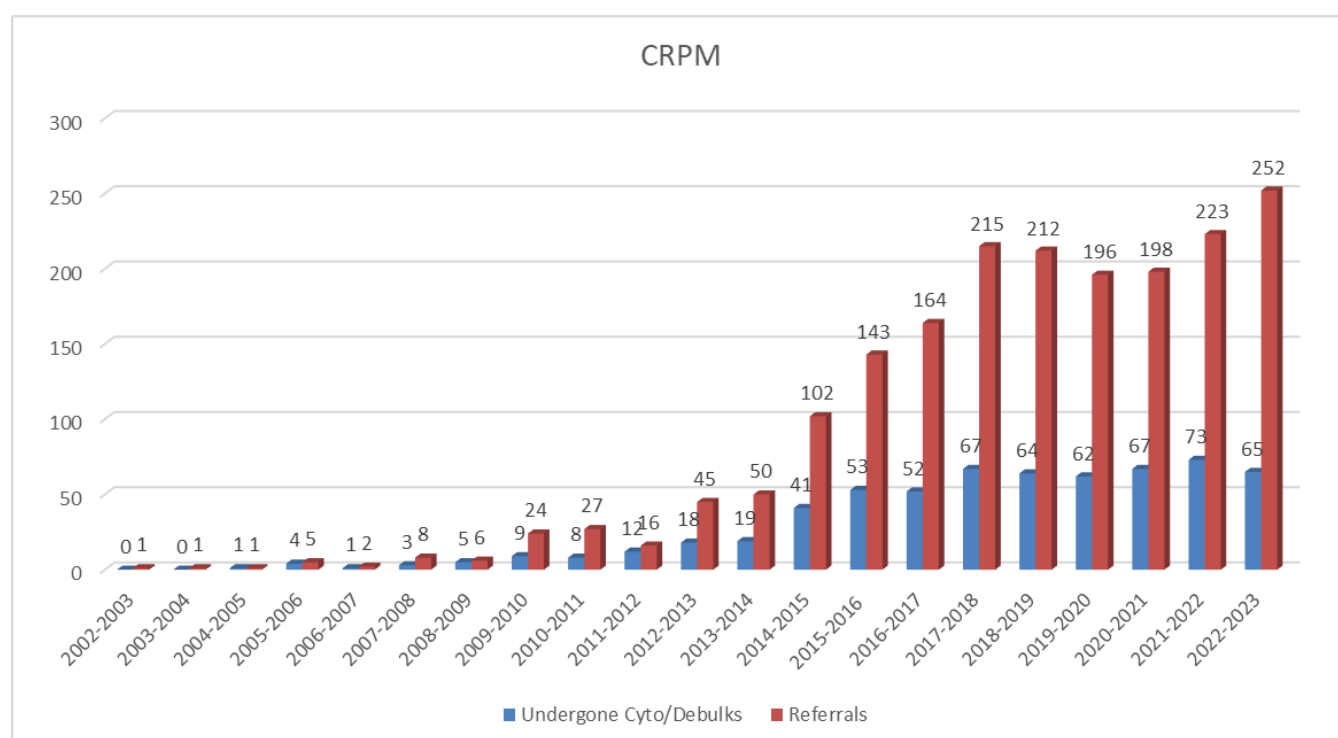


Figure 2: CRPM - Referrals and Operations

This graph includes all patients including private patients



6.4 Specialist Commissioning (Appendix) Assessment/Follow up Activity

	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
First Assessment IP	4	0	0	0	2	3	5	0	0	0	0	1	0
First Assessment OP	75	80	78	82	127	141	135	149	180	154	135	168	177
Re Assessment IP	45	40	14	26	53	47	21	4	8	12	4	4	0
Re Assessment OP	63	51	65	56	69	59	23	45	54	63	80	51	53
Follow Ups	189	239	236	291	332	414	427	518	479	442	132	275	288
Telephone Follow Ups	0	65	91	102	178	263	297	377	462	549	1142	1345	1324
Chemo Appointments	226	199	212	189	296	313	286	225	302	403	447	446	489
Total	602	674	696	746	1057	1240	1194	1318	1485	1623	1940	2290	2331

6.5 Quality

Operation times

		08-09	09-10	10-11	11-12	12-13	13-14	14-15	
Cytoreduction	Median Op Time	8.5	8.67	7.83	9.03	8.43	8.47	8.72	
	Range Op Time	4.17-10.83	6.45-12.55	5.77-13.00	6.42-14.00	5.30-13.72	4.83-14.05	6.53-11.92	
Major Debulk	Median Op Time	4.22	3.91	3.89	3.86	3.82	3.45	4.7	
	Range Op Time	3.27-6.33	2.00 - 7.00	2.28-5.00	1.8-9.83	1.57-5.98	1.48-8.17	2.15-8.08	
		15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
Cytoreduction	Median Op Time	8.55	8.52	8.48	7.95	7.95	7.8	8.08	7.73
	Range Op Time	4.52-12.48	2.98-12.58	4.08-12.75	4.02-11.98	4.13-12.37	3.65-13.33	3.73-12.08	5.02-12.25
Major Debulk	Median Op Time	4.38	4.05	4.48	3.8	3.45	3.73	4.38	4.19
	Range Op Time	3.02-7.7	2.53-8.52	2.5-6.5	2.6-6.7	2.03-6.53	2.32-6.98	2.15-8.33	2.23-8.72

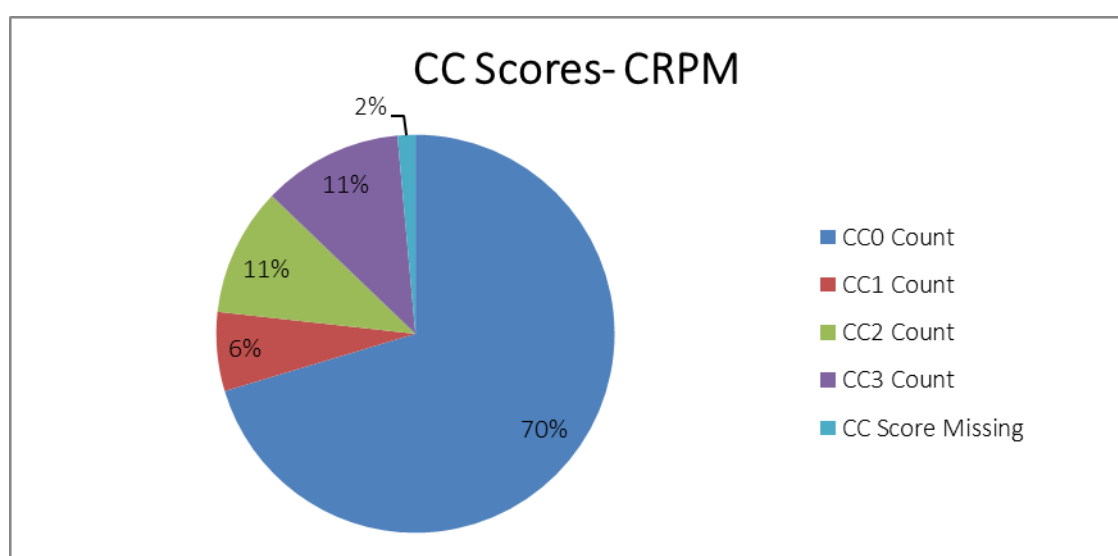
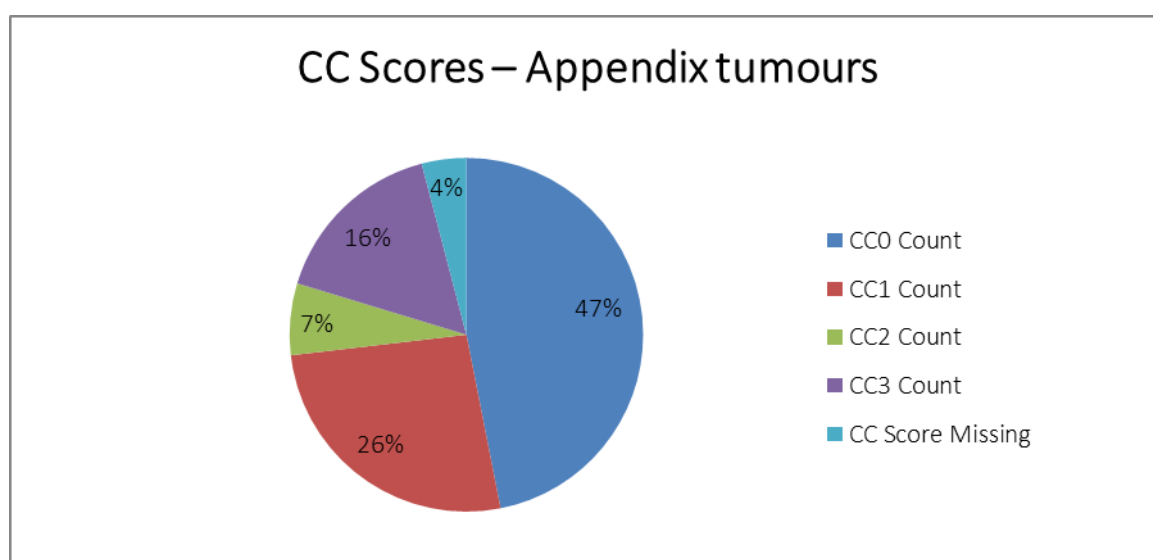
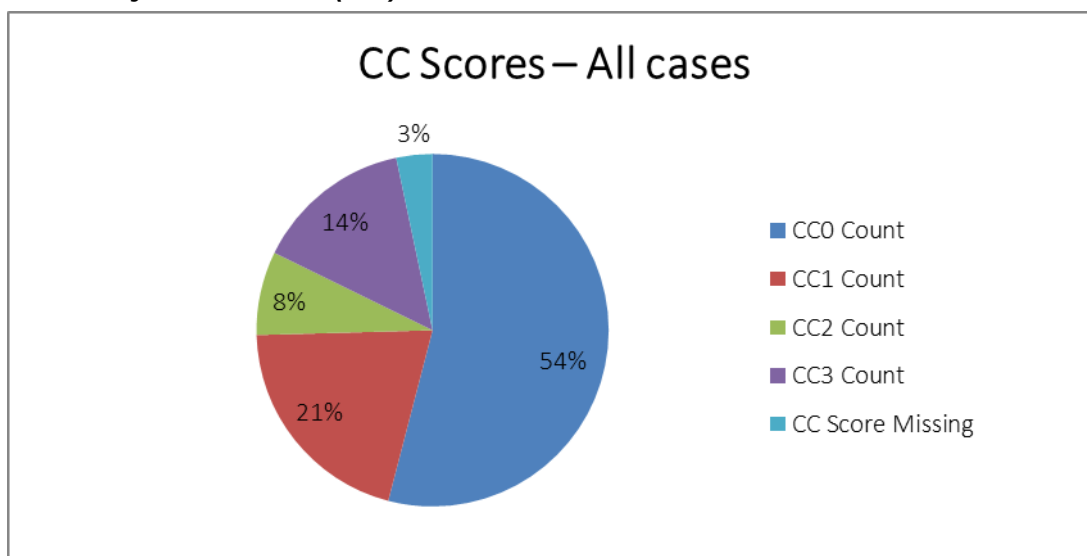
Length of Stay

	2010-11		2011-12		2012-13		2013-14		2014-15		2015-16			
	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay		
Median	2	11	2	12	2	10	2	10	2	11	2	12		
Range	0-7	05-28	0-8	05-25	0-12	06-41	0-12	05-77	0-9	06-54	0-22	05-51		
	2016-17		2017-18		2018-19		2019-20		2020-21		2021-22		2022-23	
	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay	Level 2 CCU Stay	Total Stay
Median	1	10	1	13	1	12	2	12	1	9.5	1	9	1	9
Range	0-8	4-66	0-4	4-58	0-13	3-36	0-18	5-96	0-7	3-61	0-8	3-53	0-12	2-39

Minimal Access Laparoscopic Cytoreduction & HIPEC – overview

	Cases	Median Hospital Stay	Median CCU Stay	Median PCI Score	PCI Range	Median Op Time
2011-2012	5	8	1	0	0	9.03
2012-2013	7	6	1	0	0-2	8.53
2013-2014	7	5	1	0	0	8.32
2014-2015	13	6	0	1	0-4	7.22
2015-2016	6	5.5	0	1	0-2	9.28
2016-2017	15	7.5	0	1	0-2	9.02
2017-2018	16	6.5	0	3	0-8	7.29
2018-2019	6	9.5	1	2	0-19	8.41
2019-2020	3	7	0	4	0-4	8.73
2020-2021	3	6	1	0	0-1	8.44
2021-2022	1	7	0	0	0-0	8.23
Total	82	6.5	0	1	0-19	8.44

6.6 Completion of Cytoreduction (CC) Scores



6.7 Complications

Complications Appendix/PMP (2022-2023)

	n	%
No Complications	64	51.61%
Minor Complications (NCI grade 1 - 2)	51	41.13%
Major Complications (NCI grade 3 - 4)	9	7.26%
Peri-Operative (30 Day) Mortality	0	0.00%
Peri-Operative (0-90 Day) Mortality	0	0.00%

Complications CRPM (2022-2023)

	n	%
No Complications	34	45.33%
Minor Complications (NCI grade 1 - 2)	38	50.67%
Major Complications (NCI grade 3 - 4)	3	4.00%
Peri-Operative (30 Day) Mortality	0	0.00%
Peri-Operative (0-90 Day) Mortality	0	0.00%

Minimal Access Laparoscopic Cytoreduction & HIPEC Complications (n=82)

	n	%
No Complications	63	76.83
Minor Complications (NCI grade 1 - 2)	14	17.07
Major Complications (NCI grade 3 - 4)	5	6.10
Peri Operative (30 Day) Death	0	0.00
Peri Operative (90 Day) Death	0	0.00

Complication rates overview for Cytoreduction & HIPEC/Debulk procedures

		Minor Complications*		Major Complications**		Peri-Operative (30 Day) Mortality		Peri-Operative (90 Day) Mortality	
	Cases	n	%	n	%	n	%	n	%
2011-2012	81	9	11.11%	18	22.22%	0	0.00%	0	0.00%
2012-2013	89	20	22.47%	12	13.48%	0	0.00%	0	0.00%
2013-2014	101	23	22.77%	17	16.83%	1	0.99%	1	0.99%
2014-2015	151	43	28.48%	16	10.60%	1	0.66%	1	0.66%
2015-2016	159	40	25.32%	31	19.62%	0	0.00%	2	1.26%
2016-2017	184	36	19.57%	27	14.67%	0	0.00%	2	1.09%
2017-2018	179	58	32.40%	13	7.26%	1	0.56%	1	0.56%
2018-2019	175	45	25.71%	28	16.00%	0	0.00%	1	0.57%
2019-2020	192	45	23.44%	23	11.98%	0	0.00%	1	0.52%
2020-2021	188	55	29.25%	26	13.82%	1	0.53%	1	0.53%
2021-2022	195	65	33.30%	18	9.20%	2	1.00%	0	0.00%
2022-2023	190	79	41.58%	12	6.31%	0	0.00%	0	0.00%
Total	1,884	518	27.49%	241	12.79%	6	0.32%	10	0.53%

*Defined as Grade 1 or 2 NCI Common Terminology Criteria for Adverse Events (v4.0)

**Defined as Grade 3 or 4 NCI Common Terminology Criteria for Adverse Events (v4.0)

Grade 1 Mild; asymptomatic or mild symptoms; clinical or diagnostic observations only; intervention not indicated.

Grade 2 Moderate; minimal, local or non-invasive intervention indicated; limiting age-appropriate instrumental activities of daily living.

Grade 3: Severe or medically significant but not immediately life-threatening; hospitalization or prolongation of hospitalisation indicated; disabling; limiting self-care activities of daily living.

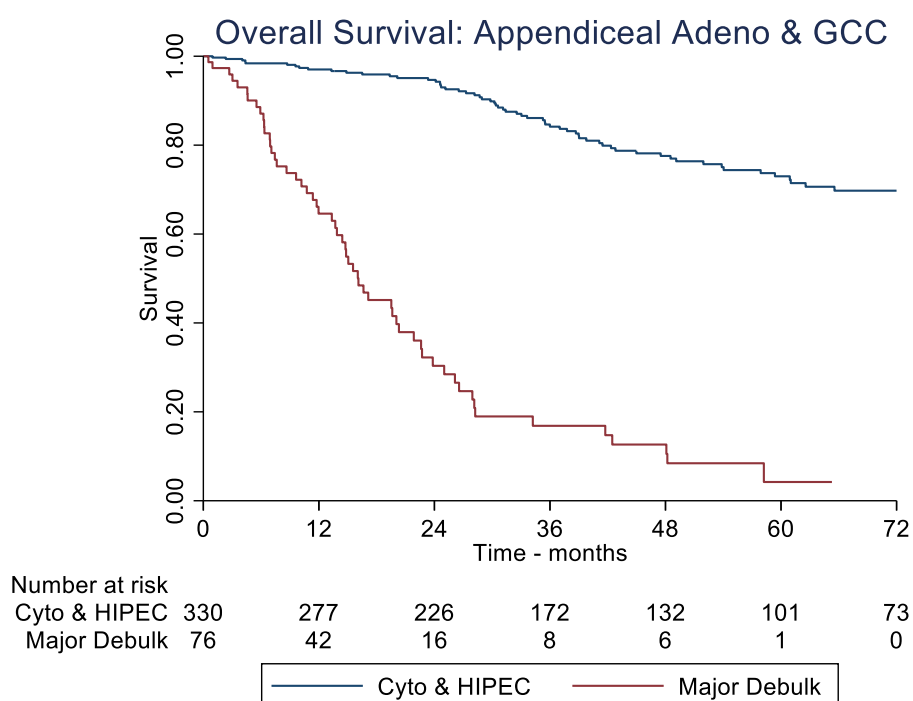
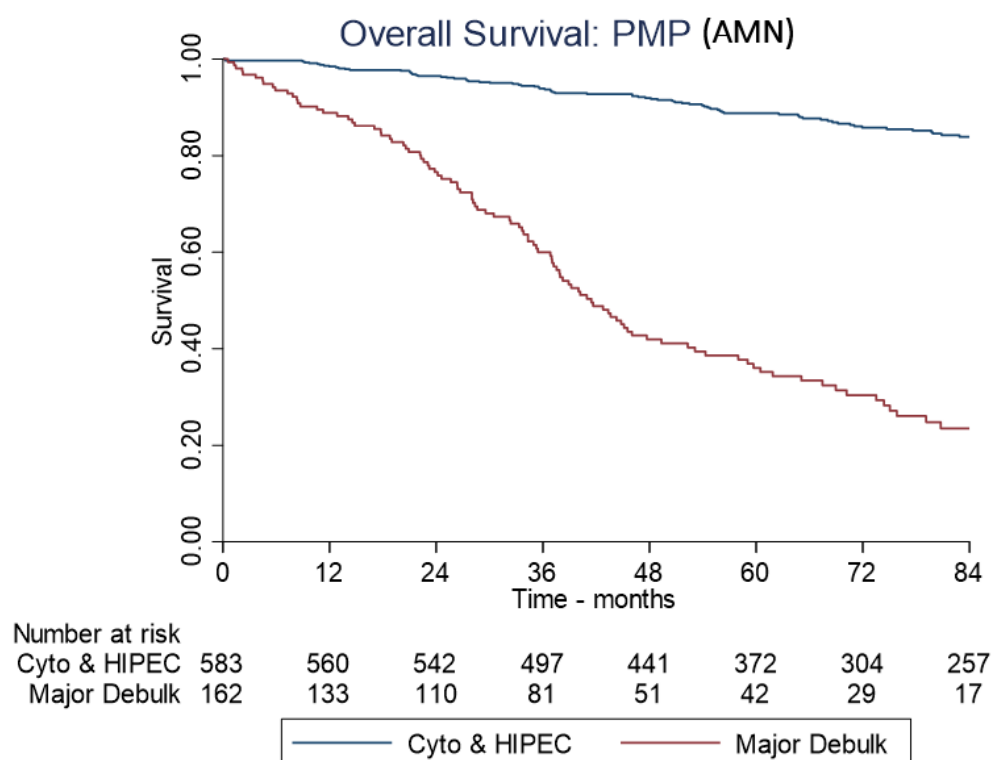
Grade 4: Life-threatening consequences; urgent intervention indicated.

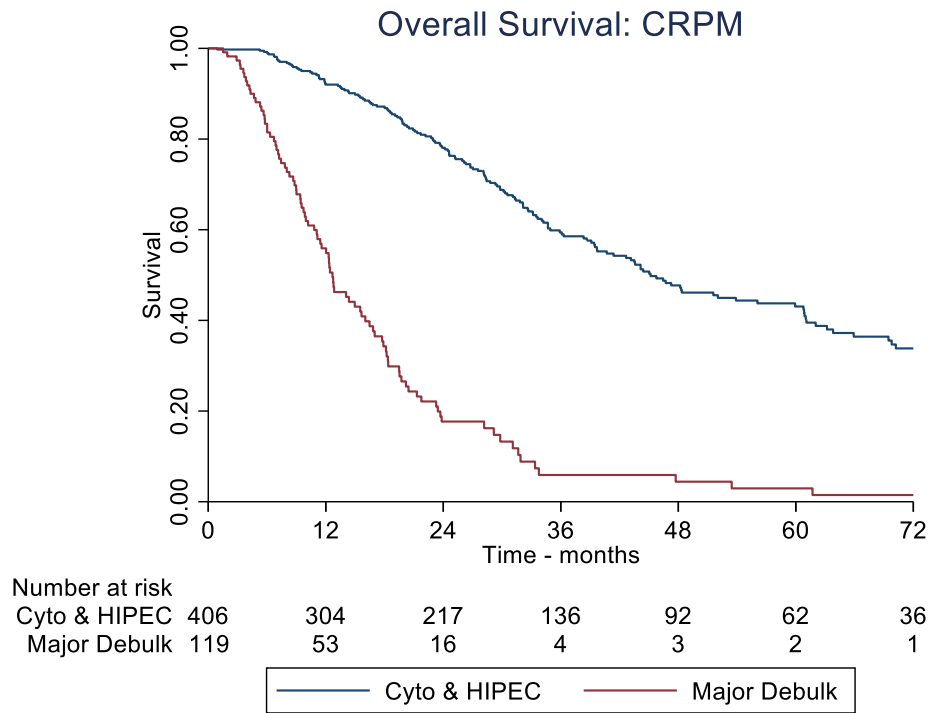
Grade 5: Death related to AE.

6.8 Survival

Only patient's first operation has been included in this analysis, re-dos and second stage operations have been excluded.

Operations with a CC Score of 0 and 1 have been considered as Cytoreduction & HIPECs, with the others as Major Debulks.





Appendix 1: Activity

All Procedure Activity by year

	Major Debulk	Cytoreduction	Total
2001-2002	0	4	4
2002-2003	4	2	6
2003-2004	10	8	18
2004-2005	5	13	18
2005-2006	5	20	25
2006-2007	12	17	29
2007-2008	6	30	36
2008-2009	3	47	50
2009-2010	15	42	57
2010-2011	4	55	59
2011-2012	10	71	81
2012-2013	13	74	87
2013-2014	21	81	102
2014-2015	17	134	151
2015-2016	19	140	159
2016-2017	34	150	184
2017-2018	16	163	179
2018-2019	20	155	175
2019-2020	23	169	192
2020-2021	19	169	188
2021-2022	46	149	195
2022-2023	38	152	190
Total	340	1845	2185

Appendix Procedure Activity by year

	Undergone Cyto/ Debulk	Referrals
1999-2000	0	1
2000-2001	0	4
2001-2002	4	5
2002-2003	5	11
2003-2004	16	41
2004-2005	16	53
2005-2006	18	50
2006-2007	27	67
2007-2008	31	57
2008-2009	37	102
2009-2010	45	116
2010-2011	49	99
2011-2012	66	122
2012-2013	64	110
2013-2014	78	148
2014-2015	107	186
2015-2016	98	216
2016-2017	118	260
2017-2018	112	259
2018-2019	111	287
2019-2020	130	278
2020-2021	121	259
2021-2022	122	373
2022-2023	124	400
Total	1499	3504

CRPM Procedure Activity by year

	Undergone Cyto/ Debulks	Referrals
2002-2003	0	1
2003-2004	0	1
2004-2005	1	1
2005-2006	4	5
2006-2007	1	2
2007-2008	3	8
2008-2009	5	6
2009-2010	9	24
2010-2011	8	27
2011-2012	12	16
2012-2013	18	45
2013-2014	19	50
2014-2015	41	102
2015-2016	53	143
2016-2017	52	164
2017-2018	67	215
2018-2019	64	212
2019-2020	62	196
2020-2021	67	198
2021-2022	73	223
2022-2023	65	252
Total	624	1891

Appendix 2: PCI And CC Scores By Disease Group

PMP (AMN)	n	%
Cytos/ Debulks procedures	986	
Cytoreduction & HIPEC	785	79.61%
Debulking Procedure	201	20.39%
Total Procedures	986	
PCI Median	12	
PCI Range	0-39	
OC0 Count	345	34.99%
OC1 Count	340	34.48%
OC2 Count	74	7.51%
OC3 Count	183	18.56%
OC Score Missing	44	4.46%
	986	100.00%

Appendix Adenocarcinoma (incl MCP - High Grade)	n	%
Cytos/ Debulks procedures	307	
Cytoreduction & HIPEC	253	82.41%
Debulking Procedure	54	17.59%
Total Procedures	307	100.00%
PCI Median	6	
PCI Range	0-39	
OC0 Count	188	61.24%
OC1 Count	43	14.01%
OC2 Count	16	5.21%
OC3 Count	45	14.66%
OC Score Missing	15	4.89%

Goblet Cell Carcinoma	n	%
Cytos/Debulks procedures	206	
Cytoreduction & HIPEC	191	92.72%
Debulking Procedure	15	7.28%
Total Procedures	206	
PCI Median	3	
PCI Range	0-36	
OC0 Count	169	82.04%
OC1 Count	9	4.37%
OC2 Count	7	3.40%
OC3 Count	18	8.74%
OC Score Missing	3	1.46%

CRPM	n	%
Cytos/Debulks procedures	624	
Cytoreduction & HIPEC	559	89.58%
Debulking Procedure	65	10.42%
Total Procedures	624	
PCI Median	6	
PCI Range	0-39	
OC0 Count	441	70.67%
OC1 Count	41	6.57%
OC2 Count	65	10.42%
OC3 Count	68	10.90%
OC Score Missing	9	1.44%