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Indhold

1. Clinical trials I
#1-8

#1: A 12-month PRO-based symptom management intervention is beneficial in patients with chronic hematological malignancies – a randomized trial.

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Abstract
Introduction
Hematology has seen substantial advancements in treatment in recent decades, coinciding with the growing older population. This demographic shift is escalating healthcare demands, requiring new care strategies to allocate time and resources effectively. Patients with chronic hematological malignancies suffer from various symptoms, and the use of patient-reported outcomes (PRO) is an approach to improve symptom communication and management. The aim of this study was to investigate the effect of a systematic approach to symptom identification and management using PROs in outpatient care of patients with chronic hematological malignancies.

Methods
This is a two-arm, single-center randomized controlled trial including patients diagnosed with chronic myeloid leukemia (CML), myeloproliferative neoplasia (MPN), clonal cytopenia of unknown significance (CCUS) and myelodysplastic syndrome (MDS). Participants were allocated to an intervention (n=46) or control group (n=48). The 12-month intervention comprised; 1) PROs delivered by the participants, 2) nurse-led PRO assessment guided by an algorithm, and 3) tailored nurse-led symptom management. The control arm received usual care. The primary outcome was change in quality of life global (QoL). Secondary outcomes were physical and emotional symptoms, symptom burden and symptom interference. (Clinicaltrial.gov: NCT04757545).

Results
A statistically significant difference in QoL global over time favored the intervention (diff . 10.26; p = 0.04). Additionally, a significant change over time was observed in overall symptom burden (diff . -0.72; p = 0.029), fatigue (diff . -13.56; p = 0.003), anxiety (diff . -2.47; p = 0.001) and emotional functioning (diff . 9.99; p< 0.0001).

Conclusions
The 12-month PRO-based symptom management intervention showed effectiveness, with significant improvements over time in QoL, symptom burden, fatigue, anxiety, and emotional functioning.

#2: DBCG Skagen trial 1: Phase III randomised trial of hypo- vs standard fractionated loco-regional radiotherapy in node-positive breast cancer patients

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Abstract
Purpose
Moderately hypofractionated breast cancer (BC) radiation therapy (RT) based on 40Gy/15fr has been increasingly used, however, not for loco-regional therapy. The non-inferiority DBCG Skagen trial 1 hypothesised that 40 Gy/15 fr (2.67 Gy/fr) did not cause more 3-yr arm lymphedema than 50 Gy/25 fr (2.0 Gy/fr).

Methods
Patients with for node-positive BC were randomised 50Gy/25fr vs. 40Gy/15fr. Primary endpoint was 3-yr arm lymphedema. Accrual stopped, when 1012 patients had 3-yr estimates of lymphedema.

Results
Between 2015-2021, 2,963 patients were recruited with 2,908 in the intention-to-treat analysis. The 50Gy group comprised 1444 patients(50%) and the 40Gy group 1464 patients(50%). Median age was 57 years (range 23-86). Mastectomy was used in 1383 patients (48%), 1525 patients (52%) had lumpectomy. 953 (33%) patients had sentinel node biopsy (SNB) only (50Gy:32%; 40Gy:33%), and 1946 (67%) had axillary lymph node dissection (ALND) (50Gy:66%; 40Gy:66%). At median follow-up 4.1 years (IQR 2.9-5.0), the 3-year rates of lymphedema were 8.5% in the whole group; 9.0%(50Gy) vs 8.3%(40Gy), p=0.41. When estimated cumulatively, the 3-year cumulative incidence of lymphedema was 14.9%(95%CI 12.9;17.1)

(50Gy) and 15.3%(13.4;17.5) (40Gy), p=0.77. The rates of lymphedema were 3.2% (SNB) vs 11.4% (ALND), AD 8.8%(6.6%;10.9%), p<0.01). By fractionation: 5-year(SNB) 8.4%(50Gy) vs 13.9%(40Gy), p=0.10 and for (ALND) 28.2%(50Gy) vs 26.2%(40Gy), p=0.40. The 5-year risk of loco-regional recurrence was 2.8%(95%CI 2.0;3.8)(50Gy) vs 2.4%(1.6;3.2)(40Gy), p=0.46. The risk of distant recurrence was 11.1%(9.4;12.8)(50Gy) vs 12.0%(10.3;13.8)(40Gy), p=0.46. The risk of death from all causes was 7.8%(6.4;9.4)(50Gy) vs 9.9%(8.4;11.6)(40Gy), p=0.06. The risk of BC death was 5.1%(4.0;6.4)(50Gy) vs 7.2%(5.9;8.7)(40Gy), p=0.02.

Conclusion
Hypofractionated RT did not cause more arm lymphedema, nor influence pattern of recurrence or death, except the 5-yr risk of BC death was higher.

#3: Optimizing psychological treatment for pain after breast cancer: Results from a factorial design study

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Abstract
Background
The lack of effective management of cancer-related pain poses a significant clinical challenge. This study used the Multiphase Optimization Strategy (MOST) to identify the most effective third-wave cognitive behavioral therapy components for treating breast cancer (BC) related pain.

Methods
Using a 2x3 factorial design, 192 BC survivors with BC-related pain were randomized to 16 experimental conditions combining three components: (1) Mindful Attention, (2) Decentering, (3) Values and Committed Action. Assessments were conducted at baseline (T1), post-intervention (T2), and at 12-week follow-up (T3). Outcomes included two primary outcomes (pain intensity and pain interference from T1 to T2), process measures, and secondary outcomes. Effects were evaluated with mixed linear models and p-values were adjusted according to number of components (p>0.017). BC survivors were recruited at Aarhus University Hospital, and sessions were conducted online.

Results
Intent-to-treat analyses demonstrated effects on pain intensity (d=0.40;p=0.010) and pain interference (d=0.39;p=0.012) in all participants receiving the Decentering component compared with those who did not, and on pain intensity (d=0.48;p=0.002) in all participants receiving the Mindful Attention component compared with those who did not. The effects did not remain statistically significant at T3 (d=0.09-0.24;p=0.026-0.423). Concerning secondary outcomes, effects were observed for nonprescription pain medication at T3 for the Mindful Attention component (d=0.38;p=0.010) and for pain catastrophizing at T2 for the Values and Committed Action component (d=0.38; p=0.016).

Conclusion
The results demonstrated that both two sessions of Decentering and Mindful Attention reduced BC-related pain. The results hold promise for a brief, optimized psychological treatment for BC-related pain.

#4: Beyond the First Cut: A Comparison of Breast Induration in Breast Cancer Patients With and Without Repeat Surgery Based on DBCG Data

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Abstract
Purpose/objective
Breast-conserving surgery followed by whole breast irradiation (WBI) is standard for most breast cancer patients. For node-negative cases, optimising treatment while minimising late effects is essential. Repeat surgery (RS), often needed due to incomplete margins, may increase late effects. This study evaluated late effects in patients undergoing RS.

Material/methods
Patients receiving WBI were included from the two randomised phase III trials, DBCG HYPO (2009-2014) and PBI (2009-2016) and categorised based on RS yes/no performed within 60 days. This study reports the cumulative incidence of grade 2–3 induration at 3 and 5 years, calculated using the Aalen-Johansen estimator with competing risk analysis. The cumulative incidence of induration was assessed starting from year two to disregard initial surgical healing.

Results
Of 1,919 patients, 303 underwent RS and 1,616 did not (NoRS). The median age was 63.6 years (RS: 62.7, NoRS: 63.8). DCIS was more frequent in the RS group (19.1% vs. 8.4%). A tumor bed boost was given to 220 patients (173 received 10 Gy/5 fx, 47 received 16 Gy/8 fx).Induration rates were higher in the RS group. At 3 years, rates were 15.6% (RS) vs. 11.7% (NoRS), and at 5 years, 20.0% vs. 14.9% (HR 0.75, 95% CI 0.56-1.00). With boost, 3-year rates were 22.0% (RS) vs. 18.9% (NoRS), and 5-year rates 30.7% vs. 25.7%. Without boost, 3-year rates were 14.7% (RS) vs. 10.8% (NoRS), and 5-year rates 18.1% vs. 13.5%.

Conclusion
RS was associated with increased grade 2–3 breast induration at 3 and 5 years, particularly in patients receiving a tumor bed boost. Compared to a boost, RS appeared to induce less induration. Adjustments for age, smoking, and irradiated breast volume will be performed in the final analysis.

#5: Breaking Barriers in Breast Cancer Trials: Non-Accrual Insights from the phase III randomized clinical DBCG NATURAL and PROTON trials

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Abstract
Introduction
5000 Danish patients (pts) are diagnosed with breast cancer (BC) annually. Danish Breast Cancer Group (DBCG) provides guidelines for standard adjuvant radiotherapy (RT) and develops new RT strategies through trials. Trial participation may vary due to socio-economic, geographic, and time-related barriers. This study, supported by the Danish Clinical Quality Improvement Program, Danish Comprehensive Cancer Center, and the Danish Cancer Society, examines reasons for non-inclusion in the DBCG NATURAL and PROTON trials.

Materials and methods
From September 2021 to December 2023, a screening log recorded non-trial participation reasons across all Danish RT departments. Each pt was reviewed to determine reasons for not being included in trial.

Results
Non-inclusion rates for the NATURAL Trial varied in four recruiting departments, thus 54%-79% eligible pts were not included. The key reasons for omitting trial were patient preference (71%), eligibility not mentioned in MDT meetings (12%), ineligibility (4.4%), physician does not discuss trial with the patient (8%). For the PROTON Trial, the rates of not accruing eligible pts at 6 departments were 40%-79%. Primary factors: patient preference (49%), geographic barriers (25%), language barriers (8%).

Conclusion
The marked variations across centres suggest a need for standardised patient information on trial benefits. Significant disparities in inclusion highlight the importance of improved patient awareness regarding trial benefits. Enhanced information could reduce non-inclusion rates, supporting equitable BC care in Denmark.

#6: AI-based delineation tools reduce delineation time and increase delineation consistency: A prospective clinical study

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Abstract
Introduction
AI-based delineation tools (AI-DT) are often motivated by more consistent delineations and delineation time reductions. However, the actual benefits in clinical practice using such tools remain unknown. In this paired prospective trial, we investigated if using AI-DT followed by manual correction reduces delineation time in comparison to manual delineations in MR-guided brachytherapy for cervical cancer.

Materials and methods
An in-house model was trained on 210 clinical T2-MR scans from 82 patients from our institution. Regions of interest (ROIs) included bowel, bladder, rectum, sigmoid, HR-CTV, and GTV, delineated following EMBRACE II guidelines. Delineation times from 32 individual patients with 64 PDR treatments were collected from Dec. 2023 to Dec. 2024. Each patient received two treatments, with AI-based delineations provided for only the first treatment. We investigated the delineation time reduction and agreement between AI-based delineation and manual delineations. Statistical analysis of delineation time reduction was performed using linear mixed models (LLM), with AI-based delineation time reduction as a fixed effect. Secondly, we looked at the magnitude of change oncologists applied to the AI delineations before approval using the mean surface distance (MSD).

Results
The LMM estimated a delineation time reduction of 10.1 minutes [95% CI: 7.4 - 12.0] using AI-based delineations. This corresponds to a relative time reduction of 31%. Oncologists rated the quality of AI-generated contours positively, though minor inaccuracies, such as in the rectum-sigmoid transition, were noted. For all ROIs the MSD was below 2.1 mm.

Conclusion
Our findings demonstrate that an in-house developed AI-DT, trained on clinical data without any manual curation, can reduce delineation time by 31% in MR-guided brachytherapy for cervical cancer. AI-based delineations support more consistent delineations between oncologists.

#7: Local recurrence with and without a tumour-bed boost: a post-hoc analysis of the DBCG IMN2 study

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Abstract
Introduction
In early-stage breast cancer, a tumour-bed boost (TBB) reduces the risk of local recurrence (LR) by around 50% but increases the risk of breast induration. LR incidences of 3% at 5 years and 6% at 10 years have been proposed as thresholds where benefits outweigh the detrimental effects of a TBB. Therefore, this post-hoc analysis of the Danish Breast Cancer Group (DBCG) IMN2 study aimed to investigate LR rates to identify indications for a TBB.

Material and methods
From the DBCG IMN2 study, 2,430 node-positive patients operated with breast-conserving surgery were included for analysis. Radiotherapy was 3D-conformal. TBB was delivered sequentially as 10Gy/5Fx (41-49 years) and 16Gy/8Fx (≤40 years or margin < 2mm). Patients with and without a TBB were analysed separately. Prespecified subgroups included known prognostic risk factors.

Results
Median follow-up was 13.7 years, and the cumulative incidence of LR was 1.7% (95% CI, 1.2-2.2) at 5 years and 3.6% (95% CI, 2.9-4.3) at 10 years. In patients ≥ 50 years, 1,871 patients were treated without a TBB. Among these, 145 patients with an ER-/HER2- tumour had a 10-year cumulative incidence of LR of 8.3% (95% CI, 4.6-13.6). No other subgroups exceeded 6% at 10 years.

Conclusion
Our results suggest that node-positive patients 50 years or older with an ER-/HER2- tumour may obtain a clinically relevant benefit from a TBB. Based on these data, the DBCG has updated the Danish guidelines to recommend a 16Gy/8 Fx TBB for all patients with ER-/HER2- tumours, regardless of age.

#8: Patient-reported locoregional and general biopsychosocial late effects at more than 10 years after treatment for breast cancer

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Abstract
Purpose
The Danish Center for Breast Cancer Late Effects (DCCL) app-based questionnaire (DCCL-PRO) collects patient-reported outcomes on therapy-related morbidities and biopsychosocial late effects. The aim of this study was to characterize these outcomes in breast cancer (BC) survivors who received radiotherapy (RT) more than 10 years previously.

Materials and methods
Participants were BC survivors who had been included in two randomized RT trials: The DBCG HYPO and PBI trials. Patients were treated 2009-2016 for a T1-2N0 BC, with breast conserving surgery, RT, and systemic treatment. All survivors received an email with a link to a questionnaire covering locoregional and common biopsychosocial late effects (depression, anxiety, fear of cancer recurrence, insomnia, fatigue, pain, and cognitive impairment).

Results
A total of 1717 BC survivors received the questionnaire. In all, 1078 survivors (63%) responded, 94 (9%) had BC recurrence or other primary cancers, and 122 (11%) did not complete the questionnaire, resulting in 862 (50%) complete responses at median 12.6 years after RT. Responders reported being highly satisfied (76%) or satisfied (11%) with the breast cosmetic outcome, leaving 14% dissatisfied or very dissatisfied. Sensory disturbances in the breast area, axilla, arm, or hand were reported by 278 (32%) of the survivors. With levels varying from moderate to severe, 225 (29%) survivors reported insomnia, 155 (29%) fear of cancer recurrence, 107 (13%) pain, 97 (11%) fatigue, 32 (8%) depressive symptoms, 57 (7%) cognitive impairment,

and 12 (6%) anxiety within the last 7 days. An exploratory cluster analysis of concurrent biopsychosocial late effects will be presented at the conference.

Conclusion
The response rate was acceptable and while self-reported satisfaction with the breast cosmetic outcome was high, both loco-regional, treatment-specific symptoms and general, biopsychosocial late effects were prevalent even more than ten years after treatment.

2. Clinical trials II
#9-17

#9: Circulating cell-free HPV DNA as a valuable tool for post-treatment assessment of treatment response and monitoring of recurrence in cervical cancer patients

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Abstract
Introduction
In previous studies, we demonstrated that pre-treatment detection of circulating cell-free HPV DNA (ccfHPV DNA) may serve as a marker for disease severity in cervical cancer (CC). By analyzing post-treatment blood samples from the same patients, we aim to explore the potential of ccfHPV DNA in detecting residual disease and predicting future recurrences.

Materials and methods
Using a targeted HPV panel based on Next Generation Sequencing (NGS), we analyzed follow-up blood samples from 141 CC patients (25 with and 116 without recurrence) from our prior studies. Samples were collected up to three years after diagnosis, with the end-of-treatment (EOT) sample being defi ned as the blood sample taken between three and nine months after treatment.

Results
Among patients without recurrence (N = 116), ccfHPV DNA was undetectable in all post-treatment blood samples, except for two patients with a transient positive result. In the 25 patients with recurrence, 14 (56%) had detectable ccfHPV DNA during follow-up, up to 17 months prior to clinical detection of recurrence. The EOT blood sample was available for 22 of these patients, and here, 10 (45.5%) were ccfHPV DNA positive. Furthermore, a positive EOT ccfHPV DNA result was significantly associated with later recurrence. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) for recurrence within 50 months based on EOT ccfHPV DNA status were 45%, 98%, 83%, and 90%, respectively. Among patients with recurrence and undetectable ccfHPV DNA at EOT (N = 12), 5 (41.7%) became ccfHPV DNA positive in a later follow-up.

Conclusions
Our findings suggest that pre-treatment ccfHPV DNA status can assess disease severity and inform treatment decisions. EOT blood samples may detect residual disease and predict recurrence, while later follow-up samples may identify future recurrences, often earlier than clinical detection

#10: Dynamic Spectral Imaging Colposcopy vs. Conventional Colposcopy for Detecting CIN2+ in Women with HPV-positive or Low-Grade Cytology Referrals

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Abstract
Introduction
Optimizing diagnostic follow-up in cervical cancer screening is essential to maximize screening benefits and ensuring timely treatment. Dynamic Spectral Imaging (DSI) colposcopy, an innovative technology by artificial intelligence, may improve the sensitivity of cervical cancer diagnostics. Yet, its sensitivity to detect treatable high-grade cervical lesions, particularly in women referred with HPV-positive or low-grade cytology, remains uncertain. This study compared the sensitivity of DSI colposcopy with conventional colposcopy for detecting CIN2+ lesions.

Methods
In this Danish multicenter comparative cross-sectional study, 719 women aged ≥18 years referred for colposcopy with HPV-positive results and/or low-grade cytology were included. Participants underwent either DSI colposcopy at one center (n=411) or conventional colposcopy at two other centers (n=308). All participants had four cervical biopsies taken, with the most severe diagnosis serving as the gold standard.

Results
The sensitivity of the colposcopy-directed biopsy (CDB) for detecting CIN2+ was significantly higher in the DSI group than in the conventional group: 61.9% vs 49.5% ($p < 0.000$). However, within the DSI group, the sensitivity of the DSI-directed biopsy was equal to that of the CDB. Adding the DSI-directed biopsy to the CDB further increased sensitivity to 69.3%, which was comparable to the sensitivity achieved when combining the first two biopsies in the conventional group (68.3%, $p = 0.77$).

Conclusion
In a setting with decades of regular cervical cancer screening and sampling of four cervical biopsies, DSI technology did not demonstrate clinically improvement in sensitivity for detecting CIN2+ compared to conventional colposcopy in women referred with HPV positive screening result or low-grade cytology.

#11: Thermal ablation of Danish women ≥40 years of age with persistent cervical HPV infection; a small scale, randomized clinical trial

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Abstract
Background
Persistent HPV infection elicits extended monitoring or treatment. In Denmark, thermal ablation of the cervix is the primary treatment of benign conditions. Thermal ablation is a cervical heat treatment, where a defi ned area of the cervix is destroyed. This study evaluates whether thermal ablation destroys the HPV infected tissue in women with a persistent HPV infection to the point of eradicating the infection, as measured by HPV and DNA methylation status.

Method
131 women aged ≥40 years with screening defi ned HPV infection but without histologically verified neoplasia were enrolled. Sixty women were randomized into the intervention arm and 60 women constituted the control group. HPV and methylation status were monitored at 0-, 3- and 10-months follow-up. For ablation, the WISAP Probe was used. Ablation treatment was administered 2-3 days apart; at 650C for 2min, and at 1000C for 40s. HPV testing was conducted using the BD OnclarityTM HPV test paired with a full genotyping analysis (Seegene Anyplex). Methylation status was assessed using QIAsureTM FAM19A4/miR124-2 biomarkers.

Results
78% of women in the intervention arm (n=39) remained HPV positive for any genotype at conclusion of study compared to enrollment, vs. 64% (n=32) in the control arm. No significant difference was observed between detection of HPV infections in the intervention and control arms at any time point. FAM19A4/miR124-2 methylation status initially decreases in the intervention arm (-13%, n=3) at 3-month but ends up increasing in both arms above the initial level after 10-months follow-up.

Conclusion
In this study, thermal ablation does not change the HPV infection status of the cervix. The observed temporary changes in methylation status could indicate a healing process in the cervix post-thermal ablation, but ultimately leading to more women displaying a methylation positive profile. Thus, women treated with thermal ablation are at risk of recurrent cervical disease.

#12: Impact of a perioperative smoking and alcohol cessation intervention on health-related quality of life in patients undergoing radical cystectomy: a randomized controlled trial

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Abstract
Introduction
Radical cystectomy (RC) is considered the standard treatment for patients diagnosed with high-risk bladder cancer. It has been reported that approximately 60% of patients undergoing radical cystectomy will encounter one or more complications which may negatively influence postoperative health-related quality of life (HRQoL). The impact of a smoking and alcohol cessation intervention on HRQoL following radical cystectomy is unclear. This study aimed to evaluate the effect of a 6-week perioperative smoking and/or alcohol cessation intervention on HRQoL. A secondary objective was to assess the difference in HRQoL between patients with more than two complications and those with fewer.

Material and methods
From 2014 to 2018, 104 patients who smoked daily or consumed at least three alcohol units per day were enrolled in a multicentre randomized clinical trial. Participants were assigned to a 6-week intensive smoking and/or alcohol cessation program or standard care. HRQoL was assessed at baseline, 6- and 12 months using EORTC QLQ-C30 and BLM30. Linear regression models were used to analyze the association between intervention, complications, and HRQoL.

Results
There were differences in baseline demographic and lifestyle factors between groups. No significant differences in HRQoL were found between intervention and control groups. However, patients with more than two complications had significantly lower HRQoL on the QLQ-C30 scale, while no difference was observed on the BLM30. A study limitation is the 53% non-participation rate.

Conclusions
The cessation intervention did not significantly impact HRQoL in patients undergoing radical cystectomy. However, patients with more than two complications experienced reduced HRQoL, highlighting the importance of identifying at-risk patients preoperatively.

#13: Progressive resistance training during concomitant chemoradiotherapy and lean body mass in head and neck cancer patients – results from the randomized controlled DAHANCA 31 trial

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Abstract
Introduction
Head and neck cancer patients undergoing concurrent chemoradiation (CCRT) lose a significant amount of lean body mass (LMB) reducing muscle strength and functional performance. Progressive resistance training (PRT) may mitigate this loss and improve muscle strength and functional performance. Objective: To investigate the effects of PRT initiated at onset of CCRT on LBM, muscle strength and performance compared with usual care.

Materials and methods
At CCRT onset, 50 patients (of 72 planned according to sample size calculations) were randomized to either 12 weeks of PRT (36 sessions) or no-exercise usual care (CON). At baseline (T0), after 6 (T1) and 12 weeks (T2) Dual-Energy Absorptiometry evaluated total body mass (BM), LBM and fat mass (FM), 1 repetition maximum (1RM) chest press, and leg press tests assessed maximal muscle strength. 30 s sit-to-stand, and 30 s arm-curl assessed functional performance. Training adherence was logged and questionnaires enabled estimates of energy and protein intake in % of estimated need.

Results
From T0-T2, PRT patients lost 8.6±1.0 kg BM (10%), 3.4±0.6 kg LBM (6%) and 5.2±0.8 kg FM (21%) - according to the linear mixed model not significantly different from CON loosing 7.4±1.0 kg BM (9%), 3.4±0.6 kg LBM (6%) and 4.0±0.8 FM (17%). Maximal muscle strength decreased by 20% in PRT and CON with no significant group difference. Functional performance improved significantly more in PRT than CON. PRT patients adhered to 70% of all sessions. A prolonged energy and protein intake of 85% and 77% of estimated need during CCRT were reported in PRT patients.

Conclusions
When initiated at CCRT onset, PRT did not attenuate loss of LBM nor muscle strength, which is in contrast to the hypothesis and previous effects of PRT initiated post-treatment. Reduced statistical power, lower training adherence and prolonged energy and protein deficit both to CCRT side-effects may explain the lack of effect.

#14: Prognostic value of peritoneal fluid cytology in 224 patients with unresectable peritoneal metastasis treated with Pressurized Intraperitoneal Aerosol Chemotherapy (PIPAC)

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Abstract
Introduction
Patients with peritoneal metastasis (PM) respond poorly to systemic chemotherapy and have a short remaining life expectancy. Pressurized IntraPeritoneal Aerosol Chemotherapy (PIPAC) is a new method to treat PM patients palliatively. This study evaluated the prognostic value of peritoneal fluid (PF) cytology at baseline, prior to PIPAC 1.

Material and methods
Retrospective study of all PM patients treated with PIPAC at Odense PIPAC Center from 2015 to 2024. A single pathologist (SD) evaluated all specimens. Positive cytology was defi ned as malignant cells or cells suspicious of malignancy. Negative cytology was defi ned as atypical cells or no malignant cells. Clinical and follow-up data were collected.

Results
224 patients with primary tumors in the stomach (n= 64), colon (n= 51), ovaries (n=25), pancreas (n= 34), appendix (n=17), or “other” (n=33) were included. Negative and positive cytology at baseline was observed in 85 (38%) and 139 patients (61%). Patients with negative baseline cytology compared to patients with positive baseline cytology had a better performance status (p=0.046), a lower median ascites volume (20 mL vs 150 mL, p<0.01), a lower median peritoneal cancer index (PCI) (3.5 vs. 15, p<0.01), and a better histological response at PIPAC 1 (Peritoneal Regression Grading Score (PRGS) 1.0 vs 3.0, p<0.01).Positive baseline cytology was associated with worse overall survival (OS). The hazard ratio (HR) for all patients, gastric cancer, colon cancer, and pancreatic cancer were 1.64 (p<0.01), 2.10 (p<0.01), 2.24 (p=0.02), and 1.62 (p=0.20). At multivariate analysis adjusting for performance status, PRGS and PCI score, HR was 0.96 (p=0.88) for all patients, 0.70 (p=0.39) for gastric cancer and 1.19 (p=0.71) for colon cancer patients.

Conclusion
Our data indicate that patients with negative baseline cytology at PIPAC 1 have a better OS than patients with positive cytology, but multivariate analysis found no independent survival benefit.

#15: Esophagus-sparing radiotherapy for metastatic spinal cord compression. A randomized phase III clinical trial

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Abstract
Patients receiving palliative radiotherapy (RT) for complicated spinal metastases in the cervical and thoracic spine may develop dysphagia due to esophageal and pharyngeal irradiation. This phase III trial investigated if esophagus-sparing VMAT/IMRT could reduce patient-reported peak dysphagia without affecting ambulatory function compared to standard VMAT/IMRT. This dual-center, single-blind, phase III trial (NCT05109819) randomized adult patients with complicated spinal metastases (C1-T12) receiving 1–10 fraction RT to either conventional or esophagus-sparing VMAT/IMRT. Patient-reported outcomes (PRO-CTCAE) were collected daily for five weeks, and EQ-5D-5L, EORTC-QLQ-C30, weight, and analgesic use were assessed weekly for nine weeks. Co-primary endpoints were peak dysphagia (first five weeks) and ambulatory function (EQ-5D-5L mobility) at nine weeks, analyzed by Wilcoxon rank-sum test. The association between esophageal dosimetric parameters and “severe-or-worse” dysphagia was assessed. From May 2021–April 2024, 188 patients were randomized (standard: 92 included, 60 analyzed; esophagus-sparing: 96 included, 70 analyzed). Fourteen esophagus-sparing patients did not receive the intended intervention. These patients were recategorized as standard for per-protocol analysis. Dysphagia (any grade) occurred in 64% (standard) and 55% (esopha-gus-sparing) of patients. Intention-to-treat analysis found no differences in peak dysphagia (p=0.20) or ambulatory status (p=0.30). Per-protocol analysis found significant difference in peak dysphagia (p=0.50). Dosimetric parameters (D0.027cc-D5cc, V15Gy–V25Gy) correlated with “severe-or-worse” dysphagia. Esophagus-sparing VMAT/IMRT reduced patient reported dysphagia in the per-protocol analysis. Higher esophageal dose and larger irradiated volumes correlated with risk of “severe-or-worse” dysphagia, suggesting that esophagus-sparing RT may particularly benefit patients receiving high-dose, large-field radiation.

#16: Short course immunotherapy as curative-intended treatment in stage I-III mismatch repair deficient rectal cancer

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Abstract
Background
Neoadjuvant chemo-radiation followed by resection is standard treatment for patients with locally advanced rectal cancer (RC). A small subset of RC patients are mismatch repair deficient (dMMR). Checkpoint inhibitors (CPI) are the standard of care in dMMR colorectal cancer in the metastatic setting, and recent trials have demonstrated impressive efficacy in early CRC, even with a limited number of cycles. In the NICHE-II trial (Chalabi et al, NEJM 2024) 75 of 111 patients (67%) with colon cancer obtained pathological complete response after short course ipilimumab/nivolumab (ipi/nivo). In patients with RC, Cercek et al, (ASCO 2024) showed that 41 patients (100%) obtained clinical complete response (cCR) after 6 months of dostarlimab. Here we report data from a Danish investigator-initiated trial with stage I-III dMMR RC. EUCT 2022-500646-14-00.

Methods
The purpose was to evaluate the efficacy and tolerability of a single cycle of nivo (3 mg/kg days 1 and 15) and ipi (1 mg/kg day 1) in patients with dMMR RC. The primary endpoint was number of patients with cCR (no visible or palpable tumor). In case of definite regression but visible residual tumor, patients were offered a 2nd cycle ipi/nivo. Patients achieving a clinical, radiological, and molecular complete response (negative ctDNA) were offered a watchful waiting strategy without surgery.

Results
10 patients were treated; 7 patients received a single cycle, and 3 patients received 2 cycles of ipi/nivo. All 10 patients (100%) achieved cCR. Seven (70%) patients were tumor-agnostic ctDNA positive at diagnosis, all 7 patients turned negative after the first cycle of ipi/nivo. No patients needed any additional therapy, and no patients experienced local or distant recurrence (3-26 months follow-up).

Conclusions
Short-course ipi/nivo is exceptionally effective in locally advanced dMMR rectal cancer and may become an alternative to resection.

#17: Efficacy of a hospital-based intensive smoking cessation intervention in patients undergoing TURBT: A randomised controlled trial

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Abstract
Introduction
Smoking is a well-established risk factor for bladder cancer, and many individuals continue to smoke after diagnosis. Nonetheless, the investigation of smoking cessation interventions (SCIs) in the context of transurethral resection of the bladder tumour (TURBT) remains limited. This study aimed to assess the efficacy of a hospital-based intensive SCI compared to standard care among daily smokers undergoing TURBT.

Materials and methods
A two-arm parallel randomised controlled trial was conducted between December 2021 and March 2024 at two Danish urology departments. Thirty-eight daily smokers were randomised to one of two groups. The intervention group received a six-week hospital-based intensive SCI, which included weekly consultations with patient education, motivational counselling, and free nicotine replacement therapy. The control group received standard care, consisting of very brief advice and referral to an intensive SCI at a municipal clinic. The primary outcome was smoking cessation at the end of the intervention. Secondary outcomes included abstinence at six months, as well as assessment of quality of life and frailty. Analysis followed the intention-to-treat principle.

Results
At the end of the intervention, 37% of participants in the hospital-based group self-reported abstinence, compared to 6% in the standard care group (p = 0.04). At six months, 26% of the hospital-based group reported sustained abstinence, while no participants in the standard group remained abstinent at follow-up. No significant differences were observed between the groups in terms of quality of life or frailty measures.

Conclusion
Hospital-based delivery of intensive SCI was more effective than standard care in achieving short-term and longer-term self-reported abstinence among patients undergoing TURBT. Future research should explore whether such interventions influence post-operative recovery, cancer outcomes and long-term smoking behaviour.

3. Morbidity, late effects and rehabilitation I #18-28

#18: Self-management of cancer-related pain - the potentials of a group-based, multidisciplinary rehabilitation intervention

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Abstract
Introduction
Cancer-related pain (CP) is prevalent in 40–75% of cancer patients during or after their disease course. Pain problems affect quality of life and functioning. Many patients wish to improve their knowledge and learn skills for self-management of their everyday pain problems. Optimal self-management of CP requires communication with and inspiration from a multidisciplinary team of professionals. This study aims to present the patient-reported outcomes (PRO) from a complex intervention focusing on self-management (SM) of CP, provided as a group-based rehabilitation course.

Materials and methods
Each course included two residential stays at REHPA with 7-9 weeks of home practice in between. During the course, patients suffering from CP received 13 interdisciplinary sessions, covering different aspects of CP and SM. A booklet was developed to help each patient translate knowledge into actions and implement SM strategies. PRO were measured before and after the course and included data on pain intensity (PI), pain impact on daily functioning (PIDF), health status (HS), quality of life (QoL), and self-efficacy in managing pain (SE).

Results
Of 175 included patients, 140 (80%) completed the whole intervention. 47% suffered from high-impact chronic pain. Self-reported QoL and HS improved in 43% and 40%, and worsened in 25% and 21%, respectively. SE improved in 56%. PIDF and PI decreased in 30% and 49%, and increased in 10% and 30%, respectively. The main reasons why the 35 patients did not complete the course were mostly the progression of cancer or an infection.

Conclusions
Outcomes related to QoL and daily living with pain improved in many patients. More than half reported improved self-efficacy, indicating that self-management of CP is possible to achieve. Most patients with CP were able to complete the course. The next step is to refi ne the intervention further before pilot-testing it and planning a cluster randomized controlled trial in a municipal setting.

#19: Patient views on erectile dysfunction information prior to rectal cancer surgery: a qualitative analysis

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Abstract
Introduction
Erectile dysfunction is common after surgery for rectal cancer with a prevalence of moderate to severe erectile dysfunction up to 35% and preservation of sexual function is regarded as a core outcome for colorectal surgery. We wanted to investigate male patients' perspectives on preoperative education about the risk of erectile dysfunction after surgery for rectal cancer.

Material and methods
Using an interview guide, we performed individual semi-structured interviews of male patients who had surgery for rectal cancer within the past 3–12 months. The interviews were transcribed, condensed, coded, and analyzed with inductive qualitative content analysis.

Results
Nine male patients were included in the study. The perspectives summed in four main themes: importance of a partner to the preoperative counselling, survival as priority, but information as crucial; wishful thinking regarding surgery and the postoperative course, and the need for direct information to avoid unrealistic expectations. Patients described a general gratitude across the entire process, but a lack of follow-up regarding erectile function.

Conclusions
Survival and therefore surgery will always have priority over function, however, since patients have different preoperative erectile functions and different postoperative needs, the surgeon should actively engage in a discussion with the patient regarding the risk of developing erectile dysfunction. A partner or close relative should participate in the preoperative counseling.

#20: Chronic cancer-related pain – an overlooked and underserved problem – in many cancer patients' daily life

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Abstract

Introduction
Chronic cancer-related pain (CCRP) is insuffi ciently recognized. Awareness to this problem and other therapy-relevant pain characteristics is a prerequisite to improve patients' quality of life (QoL) and functional capacities in their daily lives.The aim was to describe and analyze pain related problems in patients attending cancer-related rehabilitation.

Materials and methods
From 2018 to 2022, 67% of 1335 patients attending cancer-rehabilitation courses in REHPA reported pain. In this cohort of 893 patients living with or after cancer, cancer-related pain problems were described and analyzed. Patient-related outcomes (PRO) were collected from all patients prior to the course. Multivariate, ordinal logistic regression was performed for 3 outcomes: Pain intensity, Pain distribution and Pain impact, using several, clinically relevant explanatory factors.

Results
Two thirds reported CCRP lasting longer than 6 months. Daily pain was present in 54% and frequently in 23%. Pain impacted daily life 'quite a bit' to 'very much' in 30%, and 2/3 reported pain in 3 or more of 7 body regions. Pain intensity (NRS: 0 to 10) was severe in 17% (NRS: ≥ 7) and moderate in 48% (NRS: 4 to 6). Higher Pain impact and Pain distribution were associated with pain duration>6 months (OR: 1.47, CI; 1.07-2.00) and (OR: 1.65, CI; 1.24-2.18), respectively. All 3 pain outcomes were associated with self-rated health and QoL. Pain intensity was associated with sleep problems (OR: 1.71, CI; 1.29-2.27) and Pain distribution with anxiety (OR: 1.89, CI; 1.30-2.75). Male sex (N=174) was associated with lower Pain intensity (OR: 0.66, CI; 0.46-0.94) and Pain distribution (OR: 0.41, CI; 0.28-0.60).

Conclusions
Chronic cancer-related pain (CCRP) is prevalent in a large proportion of patients, who seek rehabilitation. Pain distribution is often widespread and has a negative impact on many patients' daily activities. Management of CCRP should be a focus of interest in their rehabilitation.

#21: Evaluating HjerneRo – A Program for Managing Emotional Distress in Cancer Survivors with Psychological Late Effects – A Feasibility Study at the Late Eff ects Clinic, Oncology Department R, Odense University Hospital

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Abstract
Introduction
Many cancer survivors (CSs) experience persistent psychological late eff ects such as fatigue, cognitive impairment, and excessive worry, reducing quality of life. Metacognitive therapy has shown promise in alleviating these symptoms, but more evidence is needed on its feasibility in a structured, digital format. This study examines the implementation and perceived impact of HjerneRo, a brief psychologist-guided online metacognitive program for CSs with worry traits.

Materials and methods
This mixed-methods study recruited 10 CSs from the Late Eff ects Clinic at Odense University Hospital for a 4-week online program with two in-person workshops. Semi-structured post-intervention interviews (n = 9) were transcribed. Patient-reported outcomes were assessed at baseline, post-intervention, and follow-up using EORTC QLQ-C30, PSWQ, PHQ-9, FSS, ISI, and MCQ-30 to measure quality of life, worry traits, depressive symptoms, fatigue, sleep disturbances, and metacognitive beliefs.

Results
The sample included seven women and three men, with a mean age of 51.2 years [32-71]. Most participants (70%) had higher education, and breast cancer was the most common diagnosis (40%).Post-intervention, participants significantly improved quality of life (Hedges's g = 1.09, p = 0.010) and emotional functioning (g = 1.13, p = 0.008). Worry traits (g = 1.31, p = 0.004), depressive symptoms (g = 0.90, p = 0.022), and sleep disturbances (g = 1.10, p = 0.009) decreased. Negative metacognitive beliefs (g = 2.91, p = 0.010) also declined, suggesting better cognitive regulation. Interview data supported these findings, highlighting the program’s feasibility and impact on coping strategies. Final results will be presented.

Conclusion
HjerneRo appears feasible and has the potential to support CSs in managing emotional distress and improving quality of life, making it a valuable addition to survivorship care. These promising preliminary results require confirmation in a larger trial.

#22: Association Between Increased Fluid Retention and Postoperative Complications

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Abstract
Introduction
Extensive surgery is central in ovarian cancer treatment, involving significant blood loss, ascites loss, and surgical stress. Optimizing the postoperative period is crucial for patients' health before chemotherapy. This study investigates the association between commonly observed substantial fluidretention and postoperative complications.

Methods
The study is a retrospective cohort of 368 patients diagnosed with ovarian cancer (DC569) who underwent extensive surgery at Odense University Hospital between 2022-2025. Pre- and postoperative weight difference indicates perioperative fluid accumulation; divided into groups: 0-2.9%(group 1), 3-4.9%(2), 5-8.9%(3), and >9%(4). Postoperative complications were classified using Clavien-Dindo-Classification (CD), with complications >2 considered severe, requiring radiological or surgical intervention.

Results
Mean(SD) maximum weight gain was 5.2% (4.33%), age 66 (11.0), ASA 2.3 (0.57), Charlsons Comorbidity Index 1.1 (1.44), BMI 25.83 (6.02), Surgery Complexity Score 7.8 (2.93) and performance status 1.23 (1.54). Primary surgery was performed in 54% and interval debulking in 46%. 84% of cases were FIGO III-IV. A significant correlation between greater weight difference and higher CD was observed (Fisher’s exact test, P< 0.0005). The proportion of patients with CD >2 increased with greater weight gain: group 1: 19.4%, 2: 17.1%, 3: 35.2%, and 4: 47.9%, meaning that patients in the group who gained >9% experienced 28.5% more cases of severe complications (CD >2) compared to those with minimal weight gain. After adjusting for confounders (Surgical Complexity Score, age, ASA), patients gaining >9% had 3.7 times increased risk of severe complication compared to those gaining 0-2.9%.

Conclusions
We found a significant association between greater fluid retention and incidence of severe postoperative complications, suggesting that optimizing fluid management could reduce complication and improve recovery.

#23: Prevalence of concurrent severe self-reported late symptoms in cancer survivors: a cross-sectional study of sociodemographic, clinical, and lifestyle associations

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Abstract
Background
Despite advances in cancer treatment, survivors often experience persistent symptoms years after diagnosis. This study investigated the concurrence of symptoms and functional impairments among Danish cancer survivors, and examined associations with sociodemographic, clinical, and lifestyle factors.

Material and methods
We conducted a cross-sectional analysis using data from the nationwide SEQUEL questionnaire study (2022), including 40,766 cancer survivors diagnosed between 2010-2019. Twenty-two symptoms and five functioning domains were assessed using validated instruments (EORTC QLQ-C30, EORTC Item Library, GAD-7, PHQ-9). Sociodemographic, clinical, and lifestyle data were obtained from Danish registries and self-reports. To identify severe cases, each symptom and functional limitation were grouped above or below a predefined threshold according to guidelines. Ordinal logistic regression models examined factors associated with concurrent symptoms.

Results
Women reported higher mean concurrent symptoms (4.1) than men (3.3), with 25% of women and 16% of men reported ≥5 severe symptoms simultaneously. Lung cancer survivors had the highest symptom burden. Factors significantly associated with increased concurrent symptoms included short education, lower income, living alone, multiple comorbidities (CCI≥2), advanced disease stage, palliative treatment intent, current smoking, and higher BMI among both men and women with ORs ranging from 1.23-2.25 and 1.29-2.19, respectively. Factors associated with impaired functioning paralleled those observed for symptom burden.

Conclusion
Concurrent late symptoms are common among cancer survivors, with patterns varying by cancer type and patient characteristics and with clear socioeconomic gradients and lifestyle associations. These findings highlight subgroups who may benefit from targeted interventions and suggest the importance of addressing social determinants and lifestyle factors in survivorship care.

#24: Clinician-led Intervention to address Fear of Cancer Recurrence (CIFeR-DK) – A feasibility study

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Abstract
Introduction
Fear of Cancer Recurrence (FCR) is a common and highly distressing condition among cancer survivors. A brief clinician-delivered intervention for FCR (CIFeR) has been adapted into Danish (CIFeR-DK). The aim of the present study was to evaluate the feasibility of a large-scale RCT of CIFeR-DK in cancer patients and survivors with elevated levels of FCR. The hypothesis of the RCT is that CIFeR-DK signifi cantly reduces FCR compared to treatment as usual (TAU).

Materials and methods
Breast- and lung cancer patients treated at Aarhus University Hospital (AUH) were screened for FCR with the Fear of Cancer Recurrence Inventory-Short Form (FCRI-SF) before their fi rst follow-up consultation after curative intended treatment. Study eligibility was elevated levels of FCRI-SF (≥13). Oncologists were randomized to either deliver CIFeR-DK (N=11) or TAU (N = 15) at the scheduled consultation. Patients completed questionnaires at three time points: Screening (link in consultation letter), baseline (2 weeks before consultation), and post (one week after consultation).

Results
In total, 47 breast- and 33 lung cancer patients were screened for FCR, of which 30 (64%) breast- and 17 (52%) lung cancer patients were eligible. Eighteen breast (60%) and 8 lung cancer patients (24%) consented to participate, 5 received the CIFeR-DK intervention, 12 received TAU, 3 returned screening too late, and 6 are pending. At baseline, 15% of the included patients no longer fulfi lled the FCRI-SF inclusion criteria of ≥13.

Conclusion
Clinicians found the screening procedures, the e-learning module teaching clinicians CIFeR, and the delivery of CIFeR-DK feasible. To further enhance feasibility, some adjustments were made to the procedures (i.e., timing of questionnaires and randomization of oncologists). The forthcoming RCT aims to include a total of 312 patients curatively treated for breast-, lung- or ovarian cancer at AUH, Vejle Hospital, Aalborg University Hospital or Rigshospitalet.

#25: Prevalence, Risk Factors, and Interventions for Female Sexual Dysfunction After Anal Cancer Radiotherapy: A Systematic Review

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Abstract
Introduction
Radiotherapy (RT) for anal cancer (AC) ensures high survival, but its long-term effects on female sexual dysfunction (FSD) and gynecological dysfunction are unclear. This review examines (Q1) prevalence, (Q2) risk factors, and (Q3) interventions to inform clinical practice and identify future research areas.

Methods
Systematic searches in MEDLINE, EMBASE, CENTRAL, and CINAHL identified English-language studies on female sexual or gynecological dysfunction after curative-intent RT for AC. For prevalence estimates, only studies using modern RT techniques (IMRT/VMAT) were included. Two reviewers independently screened studies. Data were extracted using a Cochrane-adapted form and narratively synthesized due to heterogeneity.

Results
Of 2,450 screened studies, 31 met inclusion for Q1. Sample sizes ranged from 8 to 706 women; median age was 58–64 years. Designs included cross-sectional (n=8), prospective (n=13), and retrospective (n=10) cohort studies. FSD was assessed via PROMs or physician-rated. Two studies used vaginal dilator size to evaluate stenosis. Ten studies had baseline data; 13 reported dynamics over time. FSD prevalence ranged from 0.9% to 85%, including 65–85% in PROM-based studies. Dyspareunia (0.3–79%), stenosis (1–64.2%), and orgasm difficulty (24–50%) were frequent. Symptoms often persisted or worsened for up to 6 years. Twenty studies examined Q2; results were inconsistent. Age and menopausal status showed no clear predictive patterns. Dilator use was linked to better outcomes. RT dose associations were mixed; one study linked higher anterior vaginal wall doses to FSD. Six studies addressed Q3, focusing on education and counseling, with variable but positive trends.

Conclusion
Despite advancements in RT, FSD and gynecological issues persist as common complications following treatment for AC. Evidence regarding risk factors and interventions remains limited. Standardized assessment and personalized survivorship care are essential.

#26: Long-Term Pain Impact After Rectal Cancer Surgery: Trajectories and Predictive Factors from a Cohort Study

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Abstract
Background
Rectal cancer (RC) accounts for one-third of colorectal cancers worldwide, with survival rates improving due to advances in screening and treatment. However, chronic pain affects approximately 30% of RC survivors, impacting quality of life, physical function, and mental health. This study aimed to evaluate chronic pain prevalence, identify risk factors, and explore predictors of requesting contact concerning pain management following RC surgery.

Design
A prospective cohort study was conducted on RC patients undergoing surgery at three Danish hospitals. Patients completed the Rectal Cancer Pain Score at 3, 12, 24, and 36 and indicated if they wished to be contacted to discuss treatment options. Pain trajectories were depicted in a Sankey diagram. A mixed-effects model examined factors influencing changes in pain scores over time.

Results
Among 729 patients, 32% reported pain at 3 months, decreasing to 25% at 36 months. Some patients improved, while others developed increasing symptoms. 17% of patients requested contact due to pain. Only 13% of these were referred for further pain treatment, while 58% were referred for management of other late sequelae to the RC treatment. Female gender ($p = 0.001$), younger age ($p \leq 0.001$), obesity ($p \leq 0.003$), and radiotherapy ($p \leq 0.001$) were associated with higher pain scores.

Conclusions
Chronic pain in RC survivors is dynamic and influenced by identifiable risk factors over time. The findings underscore the need for proactive, tailored pain management strategies.

#27: Sexual dysfunction in cervix cancer survivors after surgery and/or radiochemotherapy: a Bayesian network analysis based on the SENECA study cohort

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Abstract
Introduction
This analysis aimed to construct multi-factorial explanatory models of sexual dysfunction based on the cross-sectional SENfolger Efter Cervix cAncer study (SENECA) study.

Methods
Patient reported outcomes (PRO) were collected during 2023 from 7792 healthy women and 2142 cervical cancer survivors treated between 2005–2022. Patients were treated with surgery and/or radio(chemo)therapy. PROs in the EORTC C30/CX24 questionnaires were analysed. Bayesian Network models were developed for sexual activity and dyspareunia in reference and cervical cancer cohorts, resulting in four explanatory models. The reference cohort served as a structural prior for the cancer models. Sexual activity models included participants with complete data (6706 reference, 1694 cancer), while dyspareunia models included those reporting sexual activity in the past four weeks (4521 reference, 996 cancer).

Results
Respondents were stratified by treatment modality; (1) Reference group (n=7792), (2) Radio(chemo)therapy with/without prior surgery (n=888), (3) Surgery alone (n=2108). Sexual inactivity was reported by 29%, 31% and 53% of reference, surgery and radio(chemo)therapy groups respectively, and dyspareunia by 23%, 39% and 54%. Sexual activity was directly associated with age, treatment modality and social functioning. Social functioning was associated with body image, cognitive and role functioning, global QoL, and financial difficulties, all of which associated strongly with fatigue. Dyspareunia was linked to vaginal functioning and soreness. Notably, the strong associations observed in the cancer cohort between fatigue and functional outcomes/QoL were absent in the reference cohort.

Conclusions
Sexual inactivity and dyspareunia were more common in cervical cancer patients, particularly in those treated with radio(chemo)therapy. Differences in explanatory factors between cancer and healthy cohorts highlight the need for cancer-specific approaches to sexual rehabilitation.

#28: Breast cancer-related lymphedema is associated with impaired physical, emotional and psychological health - a SEQUEL study

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Abstract
Background
Breast cancer-related lymphedema is a serious and common condition following breast cancer. It's impact on the lives of breast cancer survivors has not yet been sufficiently explkored in large scale studies in Denmark. In a cross-sectional questionnaire study, we assessed the association between upper limb swelling and physical, emotional and psychological health in Danish survivors of breast cancer.

Methods and materials
The Danish SEQUEL study provided questionnaire responses from 11833 women (response rate 43%) for analyses. Breast cancer-related lymphedema was assessed by self-report of swelling in the upper limb (none, mild, or severe). We assessed physical and emotional functioning using the EORTC QLQ-C30, anxiety using the General Anxiety Disorder scale, depression using the Physical Health Questionnaire – 9 items scale, and loneliness using the UCLA loneliness scale. Associations were analyzed using logistic regression models presenting odds ratios (OR) and 95% confidence intervals (CI).

Results
Respondents were aged 59 years at diagnosis (IQR 52, 66) and median time since diagnosis was 6.4 years (IQR 4, 9). One in four respondents had mastectomy, one third axillary lymph node dissection, 17% had radiotherapy and 69% received endocrine treatment. Upper limb swelling was reported at a severe degree by 9% and mild by 14%. We found significant associations between severe swelling and physical functioning (OR 3.9, CI 3.4-4-5), emotional functioning (OR 3.1, CI 2.6-3.6), anxiety (OR 2.6, CI 2.1-3.3), depression (OR 3, CI 2.5-3.6), and loneliness (OR 1.9, CI 1.4-2). The same associations were found for mild lymphedema, but with slightly lower estimates. We then adjusted for age, time since diagnosis, education, cohabitation, and comorbidity, but this did not change the estimates considerably.

Conclusion
Swelling is significantly associated with physical, emotional and psychological health in breast cancer survivors.

4. Morbidity, late effects and rehabilitation II #29-39

#29: Treatment for lymphedema and self-reported swelling among Danish survivors of prostate cancer – prevalence, clinical associations, and functional implications

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Abstract
Background and objective
Cancer-related lymphedema is an underdiagnosed complication of prostate cancer and its treatment. This study examines lymphedema prevalence, risk factors, and the effect on physical and emotional functioning among survivors of prostate cancer.

Methods
Using the Danish SEQUEL cohort, we identified 44,101 survivors diagnosed with prostate cancer (2010-2021). Lymphedema was assessed using data from the National Patient Registry about lymphedema treatment and a sub-cohort of 9619 men provided self-reported data on swelling in the leg(s). Physical and emotional functioning were assessed using the EORTC QLQ-C30. Associations were analyzed using Cox and logistic regression models.

Key findings and limitations
Among survivors, 2% received lymphedema treatment and 8% reported swelling. Lymphedema risk was higher for survivors with metastatic vs. low-risk disease (hazard ratio (HR) 5.38, 95% confidence interval (CI) 4.50-6.44), radical prostatectomy vs. active surveillance (HR 4.80, 95% CI 3.37-6.82), and radiation or endocrine therapy vs. watchful waiting (HR 3.44, 95% CI 1.92-6.15; HR 9.01, 95% CI 5.43-14.96, respectively). Survivors with obesity vs. healthy weight had a higher risk of swelling (odds ratio (OR) 3.52, 95% CI 2.87-4.34). Swelling was associated with impaired physical (OR 3.75, 95% CI 3.20-4.41) and emotional function (OR 4.41, 95% CI 3.44-5.62). Limitations include a lack of systematically collected lymphedema data by general practitioners and potential differential diagnoses for swelling.

Conclusions and clinical implications
Radical prostatectomy, radiation, endocrine therapy, metastatic disease, and obesity increase lymphedema risk. Self-reported swelling was associated with impaired physical and emotional functioning, underscoring the need for targeted monitoring and lifestyle interventions.

#30: Specification of Self-Reported Late-Term Impairments 3-7 Years after Primary Breast Cancer Treatment: A Nationwide Cross-Sectional Survey Study among Danish Breast Cancer Survivors

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Abstract
Introduction
Each year, about 5,000 Danish women are diagnosed with breast cancer. The 5-year survival rate is 90%, but late-term impairments affect up to 50% of survivors even 10 years post-treatment. The prevalence and severity of self-reported late-term impairments in Denmark, based on validated scales, remain unclear. As routine screening or treatment for late-term impairments is lacking, it is unknown to what extent Danish hospitals systematically registers these impairments. This study aimed to describe Danish breast cancer survivors´ characteristics, the prevalence and severity of late-term impairments, and their registration in the Danish National Patient Registry.

Material and methods
A nationwide cross-sectional survey invited 9,927 women to report late-term impairments, including shoulder impairment, lymphedema, fatigue, and neuropathy, with severity measured via validated patient-reported scales. Clinical data and diagnostic codes for “late-term effects” were extracted from the Danish National Patient Registry.

Results
The response rate was 60.9%. The 6,046 responders were on average 57 years at surgery, 53.5% had lower education, 62.7% were married, 56.7% BMI ≥25, and 54.4% had one or more co-morbidities. Overall, 60.7% reported at least one late-term impairment-s, distributed across shoulder impairment (75.3%), fatigue (56.9%), neuropathy (49.6%) and lymphedema (26.3%). Of these, 58.0% were reported as moderate to severe. Impairments were recorded in the Danish National Patient Registry: lymphedema (1.3%), fatigue (0.2%), shoulder impairment (0.1%), and neuropathy (0.1%).

Conclusions
58% of Danish breast cancer survivors reported moderate to severe late-term impairments 3-7 years post-treatment, yet these were rarely recorded in the Danish National Patient Registry. Future research should focus on timely detection of late-term impairments and organisational structures to secure sufficient registration in Danish hospitals.

#31: Professional roles in Danish clinics for general late effects after cancer – A qualitative study

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Abstract
Introduction
Late Effect Clinics (LECs) post-primary cancer treatment emerge. We explored healthcare professionals' experiences working in Danish LECs from a psychodynamic perspective seeking to understand how professionals from different disciplines navigate their roles and collaborate within the context of survivorship care.

Materials and methods
We employed a qualitative approach through three virtual focus groups with nurses, physicians, and psychologists (n=15) working in five different LECs with patients and caregivers affected by general late effects after cancer treatment. Data were analyzed using thematic analysis.

Results
Four themes were found: Transformation towards Person-Centered care; Therapeutic space as a precondition; Redefined professional boundaries; and Challenges due to traditional hospital structures. The themes revealed that patients with late effects and their caregivers require a bio-psychosocial and person-centered approach, with an emphasis on creating a therapeutic space as a prerequisite for cooperation. The professionals were willing to expand their professional boundaries but were challenged by systemic hierarchy and the constant need for competency and team development.

Conclusions
Experiences and dynamics within professional roles in Danish LECs have significant implications for rethinking the organization and professional development of care. These insights suggest the need to empower healthcare professionals, adapt to evolving professional roles, and enhance person-centered care in this unique survivorship context. Improved collaboration across roles could provide survivors with more cohesive, supportive care, though traditional hospital hierarchies pose challenges. Increased professional development promises a higher level of tailored, competent care for addressing complex late effects during survivorship.

#32: Muscle Fitness In Children And Adolescents With Newly Diagnosed Cancer: Baseline Data From A Multicenter Randomized Controlled Trial

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Abstract
Introduction
Maintaining muscle health is significant for children undergoing cancer treatment, yet the extent of these impairments in the early stages of treatment remains sparsely investigated. Therefore, we investigated muscle fitness —muscle strength, power, and endurance in children with newly diagnosed cancer compared to community controls.

Materials and methods
We compared parameters of muscle strength (assessed by isometric knee-extension strength), muscle power (by countermovement jump), and muscle endurance (by 60-second sit-to-stand test) between 114 children and adolescents with newly diagnosed cancer (57% boys; median age 12 years, IQR 8–15) and 221 community controls (61% boys; median age 12 years, IQR 9–14). Children with cancer were assessed within 31 days of treatment initiation (mean = 11.3 days); of these, 79 were tested within 14 days (mean = 7.1 days).

Results
Compared to community controls, children with cancer demonstrated substantially lower knee-extension strength within 14 days of treatment initiation (mean difference: –4.86 kg; 95% CI: –10.00 to 0.27), and significantly lower strength within 31 days (–5.24 kg; 95% CI: –9.87 to –0.61). Countermovement jump performance was significantly lower in children with cancer within 14 days (–8.82 cm; 95% CI: –12.56 to –5.08) and 31 days (–9.19 cm; 95% CI: –12.39 to –5.99). Similarly, 60-second sit-to-stand performance was significantly reduced within 14 days (–12.81 repetitions; 95% CI: –16.13 to –9.48) and 31 days (–13.53 repetitions; 95% CI: –16.45 to –10.61). Adjusting for age and sex did not alter the clinical interpretation of the results.

Conclusion
Children with newly diagnosed cancer have impaired muscle fitness within the first weeks and month of treatment. Our results suggest that rehabilitation should be implemented early during treatment to counteract the loss of muscle strength, power, and endurance, with the potential to support motor development and maintain sense of normality.

#33: Association between Increased Fluid Retention and Prolonged Postoperative Hospital Stay after Extensive Surgery in Ovarian Cancer Patients

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Abstract
Introduction
Ovarian cancer surgery is extensive and associated with significant bleeding, ascites loss, and surgical stress. Postoperative overhydration is clinically recognized and may prolong hospitalization (LOS), potentially delaying chemotherapy and affecting survival. This study investigates the impact of postoperative overhydration on length of hospital stay.

Methods
The study is conducted as a retrospective cohort study, where we collect data from 368 patients with Ovarian cancer (DC569) who underwent extensive surgery at Odense University Hospital (OUH) in the period 2022-2025. The difference between pre- and postoperative weight is used as an indicator of perioperative fluid accumulation.

Results
The mean (SD) maximum gained weight was 5.2% (4.33), ASA 2.3 (0.57), Charlsons Comorbidity Index 1.1 (1.44), age 66 (11.0), BMI 25.83 (6.02), Surgery complexity score (SCS) 7.8 (2.93) and performance status 1.23 (1.54). Primary surgery was performed in 54% and interval debulking in 46%. FIGO stages were: I (37 patients), II (14), III (98), and IV (219). We found a statistically significant association between patients gaining more than 7% of their baseline weight and postoperative hospitalization length (Fisher's exact test, P<0.0005). After adjusting for confounders (age, Surgical complexity score, ASA, Clavien-Dindo classification) patients gaining >7% had a mean LOS that was 3.18 days longer than patients who gained <7% (95% CI [1.62, 4.74], P <0.0005).

Conclusion
Postoperative weight gain exceeding 7% significantly prolong LOS. Whether an active management of postoperative fluid retention can reduce hospital stay remains to be explored.

#34: Undskyld, men jeg har jo fået kræft, hvorfor skal jeg se en fysioterapeut?

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Abstract
Introduktion
Medicinsk behandling af lymfekræft er intensiv og medfører betydelige bivirkninger. Patienter med nedsat funktionsniveau er særligt udsatte for komplikationer, som uforudsete indlæggelser, infektioner, tab af selvhjulpenhed og livskvalitet. Vurdering af patientens funktionsniveau i forbindelse med behandlingsplanlægningen er derfor vigtig for at mindske risikoen for alvorlige komplikationer.

Formål
At undersøge patienters oplevelse af at få målt deres funktionsniveau via validerede tests inden igangsætning af behandling.Studiet er en del af et større projekt som har til formål at udvikle, implementere og evaluere systematisk test af funktionsevne hos patienter med lymfekræft.

Materialer og metode
Semistrukturerede interviews blev gennemført med 8 af 10 patienter, der var funktionstestet før behandlingsstart. Anvendte tests omfattede kognitiv screening af orientering-hukommelse-koncentrations, 30 sek. rejse-sætte-sig test, samt 10 meter- og 6 minutters gangtest. Interviewene fandt sted 3-4 uger efter testene og efter opstart af behandling, ved et planlagt sygehusbesøg eller telefonisk. Alle interviews blev optaget, transskriberet og analyseret med indholdsanalyse.
Resultat
Følgende temaer blev identificeret:“Nydiagnosticeret - en fysioterapeut? “, som omhandlede en undren over at skulle se en fysioterapeut i kræftudredning. “Funktionstest”, testene gav en forståelse for, at funktionsniveau har betydning for behandlingsforløbet. “Kemo svækker”, patienterne udtrykte overraskelse over hvor meget kemoterapien førte til træthed og følelse af fysisk forfald. “Opfølgning efter behandling” pegede på et ønske om opfølgende tests for at vurdere behandlingens påvirkning af kognition og fysisk formåen.

Konklusion
Studiet viser, at patienter med lymfekræft finder funktionstestene lette at udføre og meningsfulde i forhold til at forstå kemoterapiens indvirkning. Der er et stort ønske om opfølgende vurderinger for at evaluere funktionsniveauet efter behandlingen.

#35: Go Pre or Stay Sub? Immediate Implant-Based Breast Reconstruction: A Systematic Review and Meta-analysis

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Abstract
Introduction
The aim of this study is to compare postoperative complications between prepectoral and subpectoral implant-based breast reconstruction in non-irradiated patients.

Methods
This systematic review and meta-analysis was conducted following PRISMA guidelines. Literature search were performed in PubMed, Embase, Cochrane Library, and ClinicalTrials.gov. Meta-analysis assessed implant loss, while odds ratios (OR) were used to compare other postoperative complications, such as dehiscence, seroma, infection, necrosis and re-operation. The Clavien-Dindo system was applied to standardize the comparison of complication severity.

Results
The literature search identified 1087 studies. Eighteen met the inclusion criteria. A meta-analysis of 11 studies showed no significant difference in implant loss between the prepectoral (1,045 cases) and the subpectoral (1,485 cases) groups (OR = 1.00, p = 1.00). Furthermore, the application of the Clavien-Dindo classification of postoperative complications revealed no significant differences in the severity or frequency of complications between the two implant placements. No significant diff erences were found for other postoperative outcomes including seroma, dehiscence, hematoma, infection, necrosis and re-operations.

Conclusion
Prepectoral and subpectoral implant-based breast reconstruction have comparable outcomes for implant loss. There were no significant difference in the severity or frequency of complications when standardized using the Clavien-Dindo classification system. These findings suggest that prepectoral placement is as safe as subpectoral placement in appropriately selected patients. Future studies should focus on standardizing complication reporting to enhance comparability between subpectoral and prepectoral implant placement across studies, thereby improving surgical decision-making.

#36: Participant profile for cervical cancer survivors and non-cancer comparisons in a Danish population-based cross-sectional study of late effects after cervical cancer

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Abstract
Introduction
Prior studies suggest that cervical cancer survivors (CCsurv) experience a considerable burden of late effects, which may negatively impact their quality of life. The overall aim of this study is to explore patterns of late effects and the related factors in this patient group. The current study examines differences in sociodemographic and lifestyle factors between CCsurv and controls.

Methods
In a nationwide cross-sectional study, CCsurv diagnosed between 2005 and 2022 were invited via e-Boks. As a comparison group, cancer-free, age-matched women were invited. Patient-reported outcomes (PROs) were collected via an electronic survey, while socio-demographic and clinical data were obtained from Danish registers and clinical databases. PROs included validated scales for quality of life, fatigue, pain, urinary and bowel dysfunction, psychological health, cognitive function, workability, physical function, and lifestyle factors.

Results
We invited 4162 CCsurv and 34485 controls. Responses from 2142 CCsurv and 7792 controls were available for analyses, yielding response rates of 51.5% and 22.6%, respectively. No mean age (p=0.57) or BMI (p=0.29) difference was found between CCsurv and controls, but significant differences in other sociodemographic and lifestyle factors were observed. A higher proportion of CCsurv lived alone (22.7% vs. 15.3%), had lower than upper secondary education (52.7% vs. 43.4%), and were not working (38.4% vs. 31.10%). A higher proportion of CCsurv were smokers (20.0% vs. 14.5%), while CCsurv reported a slightly lower number of drinks per week (3.0(5.5) vs. 3.5(5.0), all p<0.001). Finally, a smaller proportion of CCsurv engaged in vigorous physical activity for more than 1 hour/week (39.6% vs. 42.5%, p=0.03).

Conclusions
Differences in sociodemographic and lifestyle factors were identified between cervical cancer survivors and cancer-free comparisons. These differences will be explored in future publications from the study.

#37: Decline in circadian robustness in lung cancer patients during immunotherapy is associated with increased risk of disease progression and death

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Abstract
Introduction
Sleep and circadian disruptions have been linked to increased mortality in the general population. In cancer patients, sleep and circadian disruptions are common and may potentially influence prognostic outcomes. However, sleep and circadian parameters are understudied in the context of cancer treatments, especially new treatments such as immune checkpoint inhibitors (ICIs). In this report, we explored associations of sleep and circadian rhythm trajectories with prognosis in patients treated for non-small cell lung cancer (NSCLC) patients.

Methods
From September 2019 to December 2021, 49 treatment-naïve NSCLC patients were enrolled in this prospective study. Weekly assessments of insomnia severity and circadian robustness were undertaken, and total sleep time estimated from sleep diaries every third week during the first five months of treatment. Follow-up data on time-to-treatment discontinuation, disease progression, and cancer-related death were obtained from medical records. We estimated hazard ratios (HRs) for these outcomes based on Insomnia severity, total sleep time, and circadian robustness, dichotomized at the median.

Results
Cox regression analyses indicated that patients with circadian robustness levels below the median were three times more likely to experience disease progression (HR=3.75; p=.005) and cancer-related death (HR=3.07; p=.028). No significant associations were found between insomnia severity, total sleep time, and prognostic outcomes.

Conclusion
Poorer circadian robustness was found to be a significant marker of disease progression and death. If these results are replicated, future studies should focus on investigating interventions to improve circadian regularity and explore effects on circadian robustness and prognostic outcomes.

#38: Characteristics, treatment, and outcome of recurrent gastro-oesophageal adenocarcinoma after perioperative chemotherapy and radical resection - a national longterm real-world follow-up

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Abstract
Background
High-level evidence of treatment of patients with relapse following multi-modal treatment for gastro-esophageal adenocarcinoma is almost absent.

Methods
In a nationwide cohort of 202 patients, radically resected after perioperative chemotherapy (CTx) in the period May 2008 to June 2010, and followed-up “on demand”, we identified 89 patients with recurrence within 12 years. We registered alarming symptoms, diagnostic work-up, recurrence sites and treatment. For patients receiving CTx, we assessed response, dose of perioperative platinum, and treatment-free interval.

Results
Median (m) time to recurrence was 456 days, 91% of recurrences occurred within 3 years. Recurrence was a 99% fatal event with a mOS of 138 days. In a univariate analysis, patients with histopathological IUCC stage ypN3 (Hazard ratio (HR) 2.59; (1.09; 6.16), p=0.031), Eastern Coorporative Oncology Group Performance status higher than 3 (HR: 5.82; (2.30; 14.72), p=<0.001), not receiving postoperative CTx (HR: 2.36; (1.39; 3.99); p=0.001), weigtloss over 10% (HR: 2.06; (1.09; 3.88), p=0.026), or entering best supportive care (HR: 4.96; (3.03; 8.13), p=<0.001), had significantly predicted short OS from recurrence. Most frequent alarming symptoms were pain, weight loss and lost appetite. 54% had recurrence at multiple sites, while 10% had a solitary recurrence. One third did not receive specific treatment (mOS 30 days), while six patients received palliative radiotherapy only (mOS 90 days). Three patients had initial curative surgery, but all progressed, while one was cured by salvage surgery. 60% were treated with CTx, in 2/3 platinum-based. mPFS on CTx was 119 days, and mOS was 178 days. Response rate was 35%.

Conclusions
In this real-world cohort without systematic follow-up, recurrence was a 99% fatal event. Efficacy of palliative CTx was comparable to that of 2nd-line treatment.

#39: Prognostic value of sarcopenia and low hand grip strength on postoperative complications following esophagectomy

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Abstract
Introduction
Esophageal and gastroesophageal junction cancers have poor survival rates despite curative intended treatment. Esophagectomy is a high-risk procedure with complications exceeding 50%. Sarcopenia and low handgrip strength (HGS) are linked to worse surgical outcomes. This study aims to assess the impact of sarcopenia and low HGS on postoperative complications, length of stay, and readmissions.

Materials and methods
This prospective observational cohort study included patients with esophageal adenocarcinoma scheduled for esophagectomy following neoadjuvant oncological treatment. Body composition was assessed using dual-energy x-ray absorptiometry (DXA), with cut-off values for low muscle mass based on the European Working Group on Sarcopenia in Older People (EWGSOP) and a Danish reference population. Muscle strength was measured using HGS with a manometer, applying cut-off points from both EWGSOP and a Danish reference. Postoperative complications within 30 days were classified by type and according to Clavien-Dindo, with grade >3 defi ned as severe.

Results
A total of 186 patients underwent esophagectomy (mean age: 65.2 (±8.5) years). Based on Danish regional cut-off values, 26% of patients had sarcopenia based on low muscle strength, which was associated with an increased risk of anastomotic leakage (RR 3.33 [1.19-9.31]), but not pulmonary or other medical complications. Low muscle mass was identified in 2.6% of patients using regional criteria and 16.3% using international criteria, with no observed association with postoperative complications.

Conclusion
Sarcopenia, assessed by low handgrip strength, was a strong predictor of anastomotic leakage after esophagectomy for cancer and outperformed DXA in predicting postoperative outcomes.

5. Patient involvement #40-47

#40: Uncovering Barriers to Proactive General Practice Involvement in Advance Care Planning for Patients with Life-Threatening Illness

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Abstract
Introduction
Advance Care Planning (ACP) enables patients with life threatening diseases to define values and preferences and has been shown to ensure patient-centered care. However, ACP conversations are offered inconsistently in general practice. This study aims to explore general practitioner's (GP) and patient's perceived barriers to facilitation of ACP in general practice early in trajectories of lung cancer.

Materials and methods
This study is part of a larger project aimed at developing a model for ACP facilitation in general practice. Data were collected from two sources:1.Workshops with GPs: Four workshops were conducted with eighteen GPs. The discussions were transcribed verbatim and analyzed.2.Pilot testing with patients: A preliminary version of the ACP model was pilot tested with patients newly diagnosed with lung cancer. Patients were recruited from the Department of Oncology, and if they consented to participate, their GP was invited to conduct the ACP conversation. To date, seven patients have enrolled, while all invited patients (N=29) were asked about their reasons for accepting or declining participation.

Results
Preliminary findings suggest that GPs prioritize caring for patients with life-threatening illnesses and find a structured approach to ACP acceptable. However, timing of advance care planning conversations is critical, and uncertainty about addressing end-of-life matters with newly diagnosed patients emerges as a key barrier. Patients' barriers include the burden of multiple hospital appointments, an absence of a strong relationship with their GP, and coping strategies incompatible with discussing future care preferences.

Conclusion
While GPs recognize the importance of ACP, timing of the conversations remains an issue to be addressed. Addressing barriers related to healthcare logistics, patient-GP relationships, and individual coping strategies will be essential in developing a model for ACP facilitation in general practice.

#41: Patient and caregiver education on immunotherapy: Enhancing self-efficacy and self-management in cancer care

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Abstract
Introduction
Immunotherapy has improved cancer treatment since its introduction for malignant melanoma in 2011. However, this treatment can lead to severe immune-related side effects if not managed timely. Effective patient and caregiver education is essential for better side effect management and treatment outcomes. This integrative review aimed to elucidate how different educational methods on immunotherapy, efficacy, and toxicity management affects patients with cancer and their caregivers' level of self-efficacy and self-management when dealing with side effects.

Materials and methods
An integrative review was conducted. EMBASE, MEDLINE, CINAHL, PsycINFO, and Scopus were searched for original qualitative and quantitative studies without publication date restrictions. Studies on educational interventions related to immunotherapy and how it affects adult patients' and caregivers' self-efficacy and self-management of side effects were included**.**

Results
Of 4182 references screened, seven studies were included. Three themes emerged: (a) Feasibility of various strategies in patient education, (b) The effect of patient education on self-efficacy, and (c) Determinants to improve self-management of side effects. Overall, patient education positively influenced self-efficacy and ability to act on side effects. Follow-up phone calls or electronic Patient Reported Outcomes (ePRO) may further empower patients to take an active role in their cancer care and enhance early detection of side effects.

Conclusions
While traditional patient education methods (oral/written information) remain valuable, integrating digital technologies is promising to enhance the understanding of immunotherapy. Education, especially when combined with follow-up phone calls or ePRO, can improve self-efficacy and health-related quality of life. However, health literacy plays a critical role in the treatment and management of side effects, emphasizing the need for tailored educational approaches.

#42: Addressing Decisional Needs in Proton Therapy Clinical Trials for Head and Neck Cancer: Development and Feasibility Testing of a Patient Decision Aid

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Abstract
Introduction
Proton therapy for pharyngeal and laryngeal cancer is available only through an RCT comparing outcomes of proton versus photon radiotherapy. Patients receive information about the RCT during a clinical encounter, alongside discussions about diagnosis and standard treatment.

Aim
This study explored patient and physician perspectives on participation in a proton radiotherapy RCT for head and neck cancer, developed a patient decision aid (PtDA) to support informed, value-based decision-making, and assessed its feasibility in clinical practice.

Methods
Interviews with patients and oncologists explored perspectives and decision-making needs. Participant observation in radiotherapy clinics examined trial communication and decision-making challenges. These insights informed the development of a clinical trial PtDA through an iterative user-centered design process, incorporating think-aloud interviews to refine content and structure. Feasibility of integrating the PtDA into clinical workflows was assessed through semi-structured interviews with patients and healthcare professionals.

Results
Patient barriers to trial participation included existential distress, limited RCT knowledge, preference for staying close to home, and uncertainty regarding clinical equipoise. Physicians faced challenges with time constraints, discrepancies between trial protocols and clinical practice, and difficulties effectively communicating trial information. The PtDA addressed these issues by structuring decision-making, presenting balanced information, and integrating tools to support deliberation. Physicians varied in their approaches to incorporating the PtDA into trial discussions. PtDA effectiveness depended on patient coping strategies and physician-patient communication dynamics.

Conclusion
The PtDA supported some patients in making informed decisions. However, the effectiveness was influenced by patients' coping mechanisms and physician-patient communication dynamics.

#43: Patient Perspectives on Participation in the DBCG Proton Trial: A Qualitative Research Study

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Abstract
Background and purpose
Participation in clinical trials is critical to advancing oncological treatments, yet equitable trial access remains challenging. Ensuring diverse patient inclusion strengthens external validity and enhances the generalisability of trial outcomes. However, barriers to trial participation persist, and the factors influencing patient enrolment are not fully understood. This study investigates the patient perspective on participation in the randomised controlled DBCG Proton Trial.

Patients, material and methods
Candidates for the DBCG Proton Trial were selected for interviews. Patients were purposefully selected to ensure geographical and perspective-based diversity, including randomised and non-randomised patients from all eight radiotherapy clinics in Denmark. Qualitative, semi-structured interviews were conducted via telephone, transcribed, and systematically analysed using an inductive approach to identify the patient perspective on trial participation.

Results
A total of fifteen patients were interviewed. 28 codes were identified and grouped into five themes encompassing the patients' motivators and barriers to trial participation. Common key factors were: distance to the treatment facility, timing of trial information, decisional support, clinical equipoise and patient needs. The key factors were consistent between randomised and non-randomised patients.

Conclusions
Distance to the proton treatment facility appeared as the most important barrier to participation in the DBCG Proton Trial, refl ecting a common challenge in clinical trial enrolment. The primary motivator for those considering participation was the prospect of reduced late effects. The decision was challenging for most patients, with often one individual, dominant factor ultimately guiding their final choice.

#44: Empowering Survivors: Co-designing a Mobile Health App for Patient-Led Rectal Cancer Follow-Up

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Abstract
Introduction
Traditional follow-up programs for rectal cancer (RC) survivors in Denmark often fail to meet patient needs, with limited evidence supporting their effectiveness. The increasing number of cancer survivors highlights the necessity of sustainable, patient-centered models that support self-management and improve quality of life.This study describes the development of the Advanced Digital Care Guide (ADCG), a mobile health intervention designed to enhance self-management, education, and follow-up care for RC survivors post-surgery through a patient-led, app-based approach.

Material and methods
Utilizing a holistic framework; CeHRes Roadmap, we engaged in a user-centered development process using a mixed-method approach including literature reviews, stakeholder consultations, focus group session with RC survivors, interviews and iterative usability testing.

Results
Thematic analysis identified four core user values: ease of use, support and empowerment, personalization, and availability. These informed the app's modular structure, which includes symptom guides, educational resources, chat and telephone access to healthcare professionals, and patient-reported outcome tracking. Usability testing with RC survivors (n=5) showed high satisfaction, particularly with the app's clarity, structure, and ability to enhance patient confidence and self-management. Feedback also revealed the importance of customizable content delivery and notification settings.

Conclusions
The ADCG represents a promising digital solution to modernize and personalize survivorship care for RC patients. By promoting patient-led follow-up and self-management, the app has potential to improve patient outcomes and optimize healthcare system efficiency. Future research will evaluate its clinical effectiveness, scalability, and impact on health equity.

#45: Diagnosespecifikke patientbehov og -oplevelser i kræftforløbet – indsigter fra Barometerundersøgelsen 2023

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Abstract
Introduktion
Kræftpatienters behov og oplevelser varierer markant afhængigt af diagnose. Diagnosespecifik viden er nødvendig for at skabe differentierede og målrettede forbedringer i kræftforløbet.

Metode
Analyserne er baseret på Kræftens Bekæmpelses Barometerundersøgelse 2023 del 1 og 2 og inkluderer over 6.000 besvarelser. Analyserne er gennemført på tværs af 12 diagnosegrupper ved brug af deskriptiv statistik.

Resultater
Patienter med:Brystkræft ønsker oftere ændringer i opfølgningen og savner kontakt med praktiserende læge. Prostatakræft får oftere hjælp til sex- og samliv, men mangler hjælp til psykiske senfølger. Modermærkekræft scorer højt på tryghed og information, men modtager sjældnere hjælp til psykiske og fysiske senfølger. Tyktarmskræft kender mindre til tegn på tilbagefald og senfølger og bliver sjældnere talt med om deres behov for hjælp. Endetarmskræft får mere hjælp til hjemmehjælp og hjemmesygepleje, men føler sig mindre inddraget i opfølgningen. Øvrig mave-/tarmkræft får hjælp til kost og genoptræning, men vurderer samarbejdet i sundhedsvæsenet dårligere. Lungekræft ønsker sjældnere ændringer i opfølgningen, men savner hjælp til sex-/samliv. Urinvejskræft vurderer hjælpen fra praktiserende læge og kommunen som god, men mangler viden om tegn på tilbagefald. Kræft i kvindelige kønsorganer føler sig inddraget i beslutninger og møder sundhedsprofessionelle, der tager deres bekymringer alvorligt. Lymfomer/kræft i bloddannende væv oplever tryghed og sammenhæng i opfølgningen, men oplever oftere uhensigtsmæssige vægtændringer. Hoved-/halskræft får oftere hjælp til ernæring, men vurderer praktiserende læges indsats ringere og efterspørger bedre koordinering. ”Øvrig kræft” har god viden om symptomer og høj tryghed, men flere oplever fejl i opfølgningen.

Konklusion
Resultaterne dokumenterer et behov for mere differentierede indsatser i kræftopfølgningen, baseret på konkrete og udtalte forskelle i patienternes oplevelser og ønsker.

#46: Interventions for integrating dialogue about complementary and alternative medicine in clinical cancer practice: A scoping review

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Abstract
Introduction
Around 30 – 50 % of patients with cancer use complementary and alternative medicine (CAM) such as herbs, acupuncture and healing, as an adjunct to cancer treatment. Although many wish to discuss the safe use of CAM with their health professionals, the conversation rarely happens. Studies have shown that dialogue about CAM may increase patients' quality of life and trust in conventional cancer treatment. Several studies have attempted to develop and test interventions integrating the dialogue about CAM in clinical cancer practice, but no review has mapped the different interventions. The purpose of this scoping review was to provide an overview of available interventions aiming to integrate dialogue about CAM in conventional clinical cancer practice.

Materials and methods
The Joanna Briggs Institute (JBI) Methodology for Scoping reviews was used for conducting the review. Reporting followed the PRISMA-ScR checklist. Screening was done by two independent reviewers. Systematic searches were carried out in January 2024 in the databases Medline, CINAHL, Embase, AMED, PsychInfo, Web of Science, Scopus, Cochrane Central Register and ProQuest Dissertations and Theses. Updated searches and screening were carried out in February 2025.

Results
Twenty-seven articles were included, some reporting on the same intervention. The interventions were organized into four categories: 1) Educational courses for health care professionals, 2) Educational courses for patients, 3) In-consultation dialogue tools, and 3) Websites on evidence-based CAM-knowledge. Some interventions consisted of a combination of these categories.

Conclusion
Preliminary results demonstrated that several interventions about improving dialogue between healthcare professionals and patients exist, but were rarely evaluated with validated outcome measures. Ensuring more standardized, validated outcome measures might be beneficial for future research. Final results will be presented at the conference.

#47: Undersøgelse af behandlingspræferencer blandt patienter med follikulært lymfom: Resultater fra kvalitative gruppeinterviews

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Abstract
Introduktion
Patientinddragelse i kræftbehandling er i fokus. Ved follikulært lymfom (FL), en langsomt voksende, kronisk lymfekræft med god prognose, kan behandlingsvalg være svære pga. flere ligeværdige muligheder. Selvom ingen behandling forbedrer overlevelsen mere end andre, er der forskelle i bivirkninger, behandlingsvarighed, administrationsform og varighed af remission. Vi har gennemført fokusgruppeinterviews for at forstå hvilke egenskaber ved behandling der betyder noget for patienter med FL.

Metode
Vi gennemførte 5 fokusgruppeinterviews med 13 patienter. Data består af lydoptagelser og transskriptioner. Interviewene fulgte en interviewguide med to temaer: ”God behandling” og ”Fælles beslutningstagning og patientinddragelse”, hver med tre spørgsmål og én øvelse. For ”Fælles beslutningstagning og patientinddragelse” var spørgsmålene:- Kan I beskrive jeres tidligere oplevelse med at have modtaget behandling?- Kan I fortælle om, hvordan beslutningen om tidspunkte for behandling og type af behandling blev truffet? - Er det jeres oplevelse at I som patienter inddrages i beslutninger omhandlende jeres lymfekræft?

Resultater
Analysen er i gang. 13 patienter deltog (7 kvinder, 6 mænd), medianalder 61 år (47–78). 12 har modtaget systemisk behandling (1–4 behandlingslinjer), én patient har kun fået strålebehandling. Foreløbige resultater viser, at patienterne har stor tillid til lægen. Læges holdning til og anbefaling af en behandling vægter højt hos patienterne. Tid til næste behandling vægtes højt – også uden øget overlevelse. Tidsbegrænsede behandlinger opleves positivt. Akutte bivirkninger bekymrer mindre, mens risiko for kroniske bivirkninger fylder mere.

Konklusion
Tid til næste behandling og tidsbegrænset behandling er identificeret som vigtige behandlingsegenskaber. Vi vil identificere yderligere 3–5. Disse egenskaber skal bruges i et landsdækkende Discrete Choice Experiment til at undersøge behandlingspræferencer hos danske patienter med FL.

6. Basic and translational cancer research #48-58

#48: Improving targeted treatment opportunities of cancer patients via functional CRISPR-Select platform

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Abstract
Introduction
Understanding the clinical impact of genetic variants is essential for advancing precision medicine in cancer. In particular, genetic screening of patients with breast and ovarian cancers often identifies numerous BRCA1/BRCA2 variants classified as "variants of uncertain significance" (VUS). These VUS remain unclassified due to a lack of familial data and functional assessments. Accurately interpreting these variants is crucial for clinical decision-making and selecting targeted therapies, such as PARP inhibitors (PARPi) and chemotherapy.

Materials and Methods
In this study, we utilized CRISPR-Select, a cutting-edge technology that enables the analysis of genetic variants at the endogenous locus with built-in controls, to assess 54 rare VUS located in the PALB2-binding domain (PBD) of BRCA2. The pathogenic potential of these variants was evaluated in the presence or absence of three therapeutic agents: PARPi, Cisplatin, and Mitomycin C.

Results
Our results revealed significant functional deficiencies in several variants, notably those in the exon 2-donor splice region, as well as variants in the Trp31 amino acid (W31G, W31L, and W31C), all of which are critical for BRCA2 function. Additionally, the T10K and G25R variants displayed intermediate functional effects, suggesting that these may represent hypomorphic variants. Using these functional data in conjunction with the latest ClinGen BRCA1/2 Variant Curation Expert Panel guidelines, we were able to classify 49 of the 54 VUS as either likely benign (n=45) or likely pathogenic (n=4).

Conclusions
By combining cutting-edge technology with expert curation recommendations, we successfully resolved the clinical significance of numerous variants, contributing to more accurate genetic counseling and personalized treatment strategies. The application of CRISPR-Select has the potential to significantly improve patient care by enabling faster and more reliable variant classification in cancer genetics.

#49: The impact of kidney, liver, and immune function on circulating tumor DNA detection in muscle-invasive bladder cancer

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Abstract
Introduction
The kidneys and liver play key roles in metabolism and clearance of circulating molecules, including nucleic acids. To advance the clinical utility of circulating tumor DNA (ctDNA), it is essential to examine factors potentially affecting plasma ctDNA levels, including those influencing cell-free DNA and ctDNA clearance. This study evaluated associations between plasma ctDNA detection and biochemical markers indicative of kidney, liver and immune function in patients with muscle-invasive bladder cancer (MIBC), along with their prognostic potential.

Materials and methods
Tumor-informed plasma ctDNA analysis was available for 276 MIBC patients treated at Aarhus University Hospital. Biochemical measurements collected within 10 days of an available ctDNA test were retrieved from the patients' electronic health records (median: 0 days [IQR: 0-2 days]). Statistical analyses included Wilcoxon rank-sum test, Spearman's correlation and Bonferroni correction.

Results
No significant correlations were observed between ctDNA detection and kidney and liver function markers. Leukocyte levels (P = 0.0045, n = 147), neutrophils (P = 0.0021, n = 135) and neutrophil-to-lymphocyte ratio (P = 0.0008, n = 77) were positively correlated with ctDNA detection. Multivariable logistic regression including tumor stage at diagnosis confirmed significant correlations between ctDNA detection and leukocytes (P = 0.00322, n = 146), neutrophils (P = 0.00152, n = 134) and NLR (P = 0.00185, n = 77). No biochemical parameters were associated with pathological downstaging or recurrence.

Conclusions
Detection of ctDNA was unaffected by kidney and liver function fluctuations, ensuring the reliability of using ctDNA to monitor tumor burden and treatment response. Increased immune cell levels were observed for ctDNA-positive patients, but the evaluated biochemical parameters showed no prognostic value. Further studies are warranted to confirm these findings.

#50: Gastrin-releasing peptide receptor as theranostic target in breast cancer. A preclinical study of the theranostic pair 55Co- and 177Lu-RM26

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Abstract
Introduction
Advanced metastatic estrogen receptor-positive breast cancer often develops resistance to standard treatments, requiring novel therapeutic strategies. The gastrin-releasing peptide receptor (GRPR), overexpressed in various cancers, including breast cancer, is a promising target for radionuclide therapy. RM26, an antagonist that specifically targets GRPR, has shown promising kinetics in other cancer models. This study evaluates the theranostic capabilities of 55Co-/177Lu-RM26 in estrogen receptor-positive breast cancer cells and assesses the diagnostic potential of 55Co-RM26 in a breast cancer mouse model.

Materials and methods
The in vitro binding specificity of 57Co- and 177Lu-RM26 were assessed in breast cancer cells. The therapeutic efficacy of 177Lu-RM26 was assessed using a viability assay in vitro. The biodistribution of 57Co-RM26 was studied in breast cancer-bearing mice (n = 4/group), sacrifi ced at 4 and 24 hours post-injection (pi), with a blocking group at 4 hours pi. 55Co-RM26 PET/CT imaging was performed at 4 and 24 hours pi, with or without GRPR blocking.

Results
In vitro studies revealed high, specific cell-associated binding of both 57Co-RM26 and 177Lu-RM26. 177Lu-RM26 significantly reduced cell viability at all activity concentrations >0.63 MBq/mL, with cell viability below 1% at concentrations ≥5 MBq/mL. Biodistribution studies revealed high, specific tumor uptake of 57Co-RM26, significantly surpassing all other tissues at boththime points, with the kidneys and pancreas showing the second- and third-highest uptakes, respectively. PET/CT imaging with 55Co-RM26 clearly visualized the tumor at 24 hours pi, while GRPR-expressing tissues cleared over time. GRPR blocking significantly reduced tumor uptake in PET images at 24 hours pi.

Conclusion
These findings suggest that the theranostic pair 55Co-/177Lu-RM26 holds significant promise as a theranostic agent for estrogen receptor-positive breast cancer.

#51: Perioperative tumor-agnostic ctDNA is associated with the risk of recurrence in patients with non-metastatic colorectal cancer

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Abstract
Introduction
Recurrence after surgery for colorectal cancer is a major cause of cancer-related death. Circulating cell-free tumor DNA (ctDNA) is being used in the postoperative setting to detect residual disease. However, perioperative ctDNA analysis immediately after surgery may identify minimal residual disease in a timely to stratify patients for early adjuvant treatment.

Materials and methods
In this Danish cohort study, we included patients who underwent curative-intent surgery for localized colorectal cancer between 2016 and 2019 at Slagelse Hospital. We investigated the association between perioperative and longitudinal ctDNA analysis with recurrence, and the tumor microenvironment in patients undergoing curative intent surgery for non-metastatic CRC. ctDNA was assessed using a tumor-agnostic hypermethylated cfDNA test, tumor-infiltrating lymphocytes was quantified via immunohistochemistry and a digital algorithm, while the tumor microenvironment was investigated via a mRNA expression-based approach.

Results
Among 120 patients, ctDNA test was available in 106 patients on postoperative day (POD) 1 and POD2 and 88 patients on POD3. A total of 15 patients (12.5%) experienced recurrence. Serial positive ctDNA tests on POD1-3 were associated with recurrence (p-value = 0.004). ctDNA positivity within one to three months after surgery was likewise associated with recurrence (p-value = 0.039).

Conclusions
Our results suggest that ctDNA measured immediately after surgery may identify patients at risk of recurrence.

#52: Whole genome sequencing reveals germline structural rearrangements, highly polymorphic in Danes, with major impact on the colorectal cancer transcriptome and patient prognosis

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Abstract
Introduction
Germline structural variations (SVs) are a major source of genetic diversity in the genome, yet their expected roles in cancer progression and impact on patient prognosis remain understudied. We here identified germline SVs in 347 Danish stage II-III colorectal cancer (CRC) patients and investigated associations with tumor gene expression and patient prognosis.

Materials and methods
Germline SVs were identified and genotyped using whole genome sequencing (WGS) of normal DNA from 347 CRC patients and the novel pangenome reference. Gene expression in 347 tumors and 134 normal mucosa samples were evaluated by RNA sequencing. Associations between SV genotype and relapse-free survival (RFS) were evaluated using Cox regression analysis.

Results
We genotyped an average of 25.545 common germline SVs per individual (allele freq.>0.05; size>=50bp) of which 14.174 per individual were validated by Nanopore sequencing. Association analysis identified hundreds of SV -expression associations, including 196 associations linked to patient RFS. Notably, we found a frequent ~55 kb germline deletion on chromosome 5q, which disrupts the structure of the BTNL8 and BTNL3 genes and is associated with reduced expression. BTNL8 and BTNL3 encode intestinal colonocyte-specific receptors that modulate colonic immune tolerance through binding of colonic gamma delta (γδ) T-cells and deletion of this locus is associated with Crohn's disease. Here, we provide first evidence that the germline genotype of the BTNL8 and BTNL3 locus affects the prognosis of patients with proximal colon cancer (DEL/DEL vs. WT/WT: HR=1.78, p=0.030) and we validate this association in an independent cohort of 339 Danish CRC patients (DEL/DEL vs. WT/WT: HR=1.61, p=0.035).

Conclusion
We identified germline SVs in Danish CRC patients genome-wide and highlight their potential as biomarkers for precision oncology, including a novel prognostic impact of germline BTNL8 and BTNL3 deletion in proximal colon cancer.

#53: Reversibility of chemotherapy-induced DNA methylation changes in granulocytes from breast cancer survivors

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Abstract
Introduction
Chemotherapy is well known to cause DNA damage, but its impact on epigenetics of non-cancerous cells and tissues—particularly the reversibility of therapy-induced changes—remains largely unexplored. Previous studies have identified DNA methylation alterations at the VMP1/MIR21 locus in blood cells of breast cancer (BC) patients following chemotherapy. This study investigates whether adjuvant chemotherapy induces changes in DNA methylation and gene expression of VMP1/MIR21 in granulocytes from postmenopausal BC patients, and whether potential therapy-induced changes are reversible within the first two years post-treatment.

Materials and methods
Blood samples were obtained from 30 postmenopausal BC patients before, shortly after, and every six months for up to two years after chemotherapy, and from 10 healthy age- and BMI-matched controls. DNA methylation of four CpG sites in the gene body of VMP1, which is situated in the promoter region of MIR21, was analyzed by pyrosequencing and VMP1/MIR21 expression levels were measured by qPCR.

Results
VMP1/MIR21 DNA methylation levels decreased shortly after compared to before chemotherapy (10 percentage points decrease, $p<0.0001$), but gradually returned to pre-treatment levels at later visits, with a significant increase already 6 months after completed chemotherapy (6 percentage points, $p = 0.002$). Gene expression levels of VMP1 and MIR21 remained unchanged.

Conclusions
In conclusion, chemotherapy induced a transient reduction in DNA methylation of the VMP1/MIR21 locus in granulocytes from postmenopausal BC patients.

#54: Rapid clonotyping of chronic lymphocytic leukemia using nanopore flongle flow-cell sequencing of IGH rearrangements

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Abstract
Introduction
IGH clonotyping is essential for diagnosing and monitoring chronic lymphocytic leukemia (CLL), utilizing stable clonotypic IGH rearrangements for classification and measurable residual disease (MRD). Short-read NGS (Illumina MiSeq) has limitations in read length, cost, and flexibility. Oxford Nanopore Technologies (ONT) offers real-time, long reads with minimal infrastructure. This study evaluates Flongle flow-cell ONT sequencing for clonotyping in CLL, assessing accuracy, reliability, and clinical feasibility.

Materials and methods
IGH clonotyping was performed on DNA from 11 CLL patients using LymphoTrack Dx IGH FR1 Assay (Invivoscribe). Amplicons were purified (AMPure XP), quantified (Qubit HS DNA Kit), and libraries prepared with ONT Ligation Sequencing Kit (SQK-LSK114). Sequencing was on a MinION Mk1C with Flongle flow cells. Super-accuracy base-calling used Dorado 0.9.1 (NVIDIA Tesla V100 GPU). Clonotypes were identified by Smith-Waterman alignment (SWIGH-SCORE) and IgBlast (NCBI), comparing to IMGT germline for SHM. Parallel MiSeq sequencing was done for comparison.

Results and discussion
Flongle sequencing yielded a median 319,588 reads/sample (IQR: 161,403–406,761), comparable to MiSeq (median: 324,535; p=0.69). Median read length matched expected amplicons (470 bases, IQR: 447–486). Super-accuracy achieved Q20 in 88%, Q30 in 76%, and a 0.1% error rate. Clonotype concordance was 100% between ONT and MiSeq, with strong correlation for clonal burden estimates ($r=0.86$, $p<10^{-4}$), showing ~10% underestimation by ONT. SHM concordance was high ($r=0.98$, $p<10^{-4}$), differentiating IGHV mutational status. ONT showed rapid turnaround and but faced some batch variability. Optimizing DNA input and multiplexing strategies could enhance efficiency.

In conclusion, Flongle sequencing is clinically accurate, rapid, and cost-effective for IGH clonotyping in CLL, supporting potential integration into routine diagnostics and monitoring protocols.

#55: MRI T1 relaxation time in evaluating neoadjuvant treatment of rectal cancer – preliminary results

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Abstract text - maximum 2000 characters

Purpose
Evaluation of neoadjuvant treatment response in rectal cancer patients is challenging. T1 relaxation time (T1RT) has shown promising results in a single study. Our aim is observe the difference in T1RT in rectal cancer before and after neoadjuvant treatment.

Materials and methods
The study is prospective and blinded, and included rectal cancer patients undergoing neoadjuvant radiotherapy +/- chemotherapy. T1RT was measured using manually contoured regions of interest in a dedicated software. Measurements were done at staging and at restaging 6-8 weeks after radiotherapy. The T1RT findings were not disclosed at the preoperative MDT conference. Complete response was defi ned as ypT0N0 at histopathological examination of the resected specimen, or by clinical complete response on MRI and endoscopy in case of non-operative treatment. The regional ethics committee approved the study and it was registred with clinicaltrials.gov (NCT05876026). A paired t-test is performed assuming the data follows a normal distribution.

Results
Inclusion is ongoing with preliminary results reported from 27 patients (16 males) with a mean age of 61.2 years (range 36 – 83). The cT-category changed after neoadjuvant treatment from 5 observations of T1-2 tumours, 15 T3 and 7 T4 to 10 cases of complete response ycT0, 2 ycT1-2, 15 ycT3. T1RT decreased significantly from 1379 ms (95%CI: 1296 – 1462 ms) to 1003 ms (95%CI: 833 – 1172 ms), p = 0.0001, after neoadjuvant treatment.

Conclusion
T1RT decreased 27% after neoadjuvant therapy in this pilot study. The complete dataset from the full study will explore if T1RT could predict a complete response.

#56: Next-generation sequencing reveals mutations in PTCH1 and SMO genes of the hedgehog pathway in eyelid basal cell carcinoma

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Abstract
Introduction
Basal cell carcinoma (BCC) of the skin constitutes the most common type of cancer. In relation to the eyelid, BCC has been reported to account for up to 94% of the total eyelid malignancies in Caucasian populations. It most commonly presents on the lower eyelid, presumably due to its association with exposure to ultraviolet radiation. Molecular studies on BCC have shown great variations in the mutational profile, attributing to the heterogeneous nature of the tumor from different areas of the skin. Surprisingly, no studies on the mutational profile of eyelid BCC in Caucasians have been reported. The aim of this study was to investigate the mutational profile of eyelid BCC in Danish patients.

Materials and methods
25 histologically confirmed BCC tumors surgically removed from patients treated at the Department of Ophthalmology, Hospital Sønderjylland, were collected for this study. DNA was extracted from the tumor samples and analyzed using targeted next-generation sequencing (NGS) of 161 genes (Oncomine Comprehensive Assay v3), which includes TP53, RB1, and several parts of the hedgehog (Hh) pathway, including PTCH1, SMO, and SUFU.

Results
Of the 25 samples of eyelid BCC, 22 samples (88%) were found to harbor a mutation in the Hh pathway in either the PTCH1 (n = 13, 52%) or the SMO gene (n = 8, 32%), or both (n = 1, 4%). This pathway is involved in the regulation of cell homeostasis and tissue regeneration, where PTCH1/SMO mutations serve as the target for vismodegib, a novel therapeutic drug, in cases of advanced or metastasizing BCC. In addition, mutations were detected in the TP53 (n = 9, 36%) and RB1 (n = 7, 28%) or both (n = 1, 4%) genes.

Conclusions
The vast majority of lower eyelid tumors in our study were found to harbor a mutation of the therapeutically actionable Hh pathway, in either the PTCH1 or the SMO gene.

#57: Can Ketone Bodies Enhance Chemotherapy's Efficacy in Diffuse Large B-Cell Lymphoma

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Abstract
Introduction
The predominant aggressive lymphoid neoplasm among adults is diff use large B-cell lymphoma (DLBCL). The standard first-line treatment of DLBCL is the multiagent regimen consisting of rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP) which result in remission rates above 75%. However, sometimes comorbidities or severe side effects of the R-CHOP treatment require treatment delay, dose reduction, drug substitution or discontinuation with potential impact on treatment efficacy. Patients above 80 years routinely receives 50% reduced regimens to avoid toxicity. We set out to investigate if the addition of ketone bodies to conventional chemotherapy can potentiate the effect of chemotherapy, hence reduce the needed dosing and/or improve outcomes in the elderly patients. Ketone bodies serve as a natural energy source derived from lipid metabolism. While cancer cells thrive in sugar-rich environments, a ketogenic state with low glucose availability induces oxidative stress, potentially rendering them more susceptible to chemotherapy.

Methods
The effect of adding a ketone compound (Na-D/L-betahydroxybutyrate) were investigated in four DLBCL cell lines. Subsequently, DLBCL cells were treated with different concentrations of the ketone compound in combination with increasing doses of CHOP. The cell viability was assessed by MTS assays and propidium iodide flow analyses.

Results
Addition of ketone body decreased cell viability in all four DLBCL cell lines. Additionally, ketone body affected the cytotoxic effect of CHOP in a cell line dependent manner. Low ketone doses (5-10mM) increased the effect of CHOP in two of the four cells lines, while high ketone doses (>20mM) enhanced the killing effect in all four cell lines.

Conclusion
Simultaneous addition of ketone bodies to chemotherapy treatment enhances the cytotoxic effect on DLBCL cell lines observed in even low doses of CHOP. However, it needs further examined in in vivo model systems.

#58: Etablering af præklinisk tumormodelsystem til udvikling af nye personlige behandlingsstrategier for high-grade serøs ovariecancer

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Abstract
Introduktion
High-grade serøs ovariecancer (HGSC) er den mest almindelige og aggressive form for ovariecancer med en 5-årig overlevelse på 42%. Der er ca. 600 nye tilfælde i Danmark årligt. Standardbehandlingen er carboplatin og paclitaxel, hvilket de fleste patienter i starten reagerer godt på, men størstedelen udvikler med tiden resistens. Alt for ofte fejler kliniske forsøg med nye behandlinger, hvilket bl.a. skyldes mangel på translationelle, prækliniske metoder, der mere akkurat kan repræsentere tumorens forudsætninger i kroppen, og som kan tage højde for forskelle patienterne imellem.

Materialer og metoder
OVACAN-projektet er et samarbejde mellem Kræftens Bekæmpelse, Gynækologisk Afdeling på Rigshospitalet (RH) og Regionens Bio- og GenomBank. Der indsamles tumorbiopsier fra 60 patienter fra RH i forbindelse med deres operation, og herfra isoleres kræftceller, der dyrkes til tumororganoider og bruges til eksperimenter med alternative behandlingsstrategier. Desuden indsamles også fi broblaster og immunceller fra patienterne, som skal bruges til co-kulturer, der er mere repræsentative for tumorens mikromiljø.Organoidernes respons på behandlinger evalueres ved konfokal fl uorescensmikroskopi (ImageXpress®), hvor bl.a. celledød (propidiumiodid) og proliferation (Ki67) måles. Deres følsomhed overfor carboplatin og paclitaxel testes m.h.p. at sammenholde disse resultater med sekventeringsdata.

Resultater
Siden maj 2023 er der blevet indsamlet og dyrket tumororganoider fra 30 patienter samt matchende fi broblaster og immunceller fra 7 af disse. Immunfarvninger med Pax8 og WT1, bekræfter at organoiderne bevarer HGSC-fænotypen. Evaluering af celledød efter behandling med carboplatin og paclitaxel viser varierende følsomhed organoiderne imellem.

Konklusion
Vi har succesfuldt etableret et tværfagligt, nationalt samarbejde, hvor vi indsamler og dyrker tumororganoider til brug i et præklinisk tumormodelsystem m.h.p. at udvikle nye personlige behandlingsstrategier for HGSC.

7. Palliation and psychosocial support #59-68

#59: Serious Illness Conversations and Quality of End-of-life Care in Patients with Hematological Malignancies - a Retrospective Study

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Abstract
Introduction
Patients with hematological malignancies frequently receive aggressive, poor-quality end-of-life care. In oncology, serious illness conversations conducted early in the illness trajectory, focusing on patients' goals, values, and priorities, have been associated with improved end-of-life care and decreased symptoms of anxiety and depression. Yet, evidence of their impact in hematology remains limited. Aim: This study explores the association between receiving a serious illness conversation and the quality of end-of-life care and the timing of serious illness conversations in patients with hematological malignancies.

Materials and methods
Single-center retrospective study. Data on receipt of serious illness conversations and end-of-life care (hospitalizations, specialized palliative care referrals, place of death, receipt of anticancer treatment) were extracted from electronic healthcare records. Logistic regression, adjusted for sex, age, and diagnosis examined differences between patients who did and did not receive a serious illness conversation. Setting/participants: The study included patients with hematological malignancies, who died between 2020 and 2022 and received anticancer treatment within the last 12 months at a university hospital in Denmark.

Results
Among 311 patients (median age 74 years, 43% female), 63 (20%) received a serious illness conversation. Patients receiving conversations had significantly higher odds of referral to specialized palliative care (OR: 2.67, 95%CI [1.44; 4.91]) and lower odds of receiving anticancer treatment within 30 days (OR: 0.19, 95% CI [0.10; 0.37]) and 14 days (OR: 0.21, 95%CI [0.09; 0.46) before death.

Conclusion
Serious illness conversations are associated with reduced aggressive end-of-life anti-cancer treatment and increased referrals to specialized palliative care.

#60: Nurturing patient trust: A qualitative study of the interaction between vulnerable lung cancer patients and nurse navigators in the intervention study Navigate

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Abstract
Introduction
Patient trust is fundamental to ensure optimal cancer care, especially for vulnerable patients who may face additional challenges. However, there is a limited understanding of what it entails for nurses to establish and maintain trust among vulnerable patients. Grounded in the concept of Trust Work, this study aimed to shed light on nurses' eff orts to nurture patient trust.

Materials and methods
Drawing on qualitative insights from the NAVIGATE study, a multicenter randomized controlled trial targeting vulnerable lung cancer patients, we explored the interaction between nurses and patients in clinical encounters. A total of 16 patients and eight nurses, were included representing five Danish hospital sites. We analyzed 45 audio-recorded clinical encounters between patients and nurses across one year of follow up-care. 15 of these encounters were also observed in the clinics or patients' homes. Semi-structured interviews were conducted among all involved patients and nurses. Analyzes were based on thematic analysis principles.

Results
We found that nurses’ nurturing of patient trust implied three aspects: 1) recognition, 2) witnessing or guarding, and 3) involvement or detachment. These aspects were shaped by the following contextual factors: Nurses’ availability of time and continuity, nurses' professional affiliation and role, and nurses' relation to colleagues and their institution.

Conclusion
This study highlights nurses’ critical role in nurturing patient trust and identifies critical contextual factors, which is important for the future development of care targeting vulnerable cancer patients.

#61: The effects of a digital caregiver app aiming to improve perceived information from and communication with health care professionals – A cluster randomised controlled trial

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Abstract
Introduction
Improved attention and information to cancer patients' caregivers was found in the Danish caregiver trial 'HERMES': the HERMES intervention included 14 questions on paper from the Cancer Caregiving Task, Consequences and Needs Questionnaire (CaTCoN) about the caregiver's (unmet) needs for information followed by a nurse conversation. The aim of this 'HERMES II' study was to investigate whether a caregiver-empowering app 'Info to you' with same functionality but without the proactive nurse management would have similar positive effects.

Method
A stepped wedge randomised controlled trial (April 2021–Aug.2023) included caregivers to cancer patients from eight hospitals. Caregivers received standard care (control) or standard care plus the app (intervention). Caregivers receiving the intervention were encouraged to complete the 14 app questions before the patient's consultations at the hospital and to show the results to the health care professionals (HCPs). At baseline, 3- and 6-months follow-up, the caregivers completed a questionnaire including CaTCoN and emotional functioning. The differences between the change scores in the intervention and control group were investigated using multiple linear regression.

Results
The caregivers (N=310) were median 62 years old, 48% were men, and 71% were a spouse/cohabiting. The app was used at least once by 69% of the caregivers in the intervention group, whereas 12% talked to an HCP about their answers in the app. No intervention effects were found in the primary outcome 'Quality of information from and communication with HCPs' (p=0.94) or the secondary outcomes (information, attention, involvement, emotional function).

Conclusion
After the successful but resource-intensive HERMES intervention, we investigated a caregiver-empowering app without HCP management. No intervention effects were found – while the app successfully identified unmet information needs it was rarely used to initiate the needed conversations.

#62: Quality of life in a Danish real-world prospective lung cancer cohort during palliative immunotherapy

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Abstract
Introduction
Immune checkpoint inhibition (ICI) has improved survival in patients with non-small cell lung cancer (NSCLC), but data on long-term quality of life (QoL) in real-world (RW) cohorts are sparse, especially in subgroups not represented in randomized controlled trials.

Material and methods
A prospective, non-randomized single-center study assessed QoL in patients with advanced NSCLC receiving palliative ICI (2018–21) using EQ-5D-5L and EORTC QLQ-C30 at baseline and at 9, 18, 26, 52, and 104 weeks of treatment. Immune-related adverse events (irAEs) were documented. QoL data were analyzed with linear mixed models, with subgroup analyses on age, line of treatment, comorbidities, performance status (PS), polypharmacy (PP), brain metastases, and reasons for treatment termination. Kaplan-Meier estimates compared survival in subgroups with improved vs. impaired self-reported Global health status/QoL (GHS) during initial 18 treatment weeks.

Results
166 patients were included (Mean age 68 years). QoL scores (GHS, EQ-VAS, EQ-index) significantly improved at all visits vs. baseline. QoL was not affected by age or line of treatment, but by PP and PS. Self-reported nausea/vomiting and insomnia improved by week 9 (p=0.02) and fatigue and appetite loss by week 18 (p=0.01). At baseline, EQ-VAS and EQ index scores were higher for patients completing two years of ICI than those discontinuing due to irAEs (p=0.01/<.001) and maintained higher throughout. Baseline GHS was alike between the two groups, but those treated for two years had significant early GHS improvement. Impaired GHS within 18 weeks of ICI correlated with reduced survival (p=0.003).

Conclusions
RW NSCLC patients benefit from ICI with significant symptom relief and improved QoL. Higher baseline QoL was associated with a greater likelihood of completing a 2-year ICI course. Early GHS impairment at 18 weeks correlated with poorer survival, supporting QoL as a valuable tool for predicting long-term outcomes.

#63: One step closer to the end of life – a qualitative study of brain tumor patients' experience of recurrence

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Abstract
Introduction
High-grade gliomas (HGG) are aggressive brain tumors with an average survival time of less than two years, and all patients eventually experience recurrence. However, little is known about how patients and their families cope with recurrence. This study explored their experiences and coping mechanisms related to fear and reality of recurrence.

Materials and methods
Semi-structured interviews were conducted with 15 HGG patients and 14 family members, aged 22-79, as part of a larger study on recurrence. The interviews were transcribed, coded, and analyzed using an inductive phenomenological hermeneutical approach, with fi ndings grouped into themes.

Results
The analysis identified three interrelated themes illustrating the complex experiences related to an HGG recurrence: (1) Navigating the fear of recurrence describes coping strategies throughout the disease, whereas (2) Facing reality and preparing for death, and (3) Redefining hope in the era of recurrence, shed light on patients' and family members' experiences following the recurrence diagnosis.

Conclusions
Fear of recurrence is prominent among patients with HGG and their families, and they strive to live their lives while coping with the looming fear. Despite knowing the prognosis, the recurrence diagnosis often comes as a shock and triggers reflections on death and end-of-life. Patients experience the recurrence as imposing a shift toward preparing for death and redefining hopes. These insights might be used to tailor support for patients and families and guide the timing of advance-care-planning discussions.

#64 Employing skin self-examination and fear of cancer recurrence management in early-stage melanoma follow-up: Evaluation of the MELACARE intervention in a randomised controlled trial

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Abstract
Introduction
This study aimed to evaluate the MELACARE intervention, a nurse-led follow-up program incorporating skin self-examination (SSE) education and psychosocial support to address the fear of cancer recurrence (FCR) and promote patient empowerment in early-stage melanoma survivors. This study assessed the MELACARE intervention's impact on FCR, psychological well-being, SSE performance, and healthcare usage compared to standard physician-led follow-up.

Materials and methods
A two-group randomised controlled trial was conducted at Herlev and Gentofte Hospital, Denmark. Participants included 153 patients with surgically treated melanoma (stages IA–IIA). Patients were randomised to either the MELACARE intervention (n=78) or control (n=75). The intervention involved nurse-led sessions focusing on SSE techniques and metacognitive strategies. Outcomes included FCR (primary), distress, anxiety, depression, health-related quality of life (HRQoL), workability, patient activation, and SSE frequency and confidence at six months.

Results
At six months, FCR and psychological symptoms were reduced in the intervention group compared to controls, but differences were not statistically significant. Intervention patients reported improved HRQoL (p=0.02) and patient activation (p=0.003). Confidence in SSE was higher in the intervention group, with most performing SSE at recommended intervals. The two groups did not diff er in the number of scans, extra consultations, or biopsies.

Conclusions
The MELACARE intervention may improve HRQoL and patient activation but did not reduce FCR or psychological symptoms. High fidelity of delivery and patient adherence highlight its potential utility. The MELACARE approach may empower melanoma survivors through structured SSE education and psychosocial support and promote self-management. Future analysis of two and five-year follow-ups will further investigate long-term safety and efficacy.

#65: NADA-akupunktur i et specialiseret palliativt sengeafsnit: Patienters og pårørendes oplevelser

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Abstract
Introduktion
Over de sidste tre årtier har non-farmakologisk behandling med øreakupunktur, herunder NADA-akupunktur, vundet frem i vestlige samfund som en metode til lindring af kræftrelaterede symptomer. Denne behandlingsmetode anvendes som et supplement til konventionelle behandlingsformer med det formål at fremme velvære og hjælpe patienter med at håndtere de udfordringer, deres sygdom medfører.

Materialer and metoder
Studiet er kvalitativt og baseret på en hermeneutisk tilgang med anvendelse af induktiv tematisk indholdsanalyse. Data blev indsamlet i et specialiseret palliativt sengeafsnit i Danmark ved hjælp af semistrukturerede interviews med 10 patienter og 15 pårørende, afholdt enten individuelt eller som familieinterviews. Deltagerne havde forud for interviewene modtaget mellem 1 og 9 behandlinger med NADA-akupunktur.

Resultater
Efter tematisk indholdsanalyse blev fi re temaer identificeret: Kommunikation om behandling med NADA-akupunktur, Lindring af lidelse skaber ekstra energi og indre styrke, At dele NADA-akupunktur med familien er gavnligt, Oplevet fysisk og psykisk velvære efter NADA-akupunktur.

Konklusioner
Studiet viser, at patienter og pårørende oplever lindring af lidelse samt øget velvære efter behandling med NADA-akupunktur, herunder forbedret søvn, bedre humør og øget ro i kroppen. Behandlingen bidrager til øget energi og indre styrke, hvilket hjælper både patienter og pårørende med at håndtere de udfordringer, sygdommen medfører. At modtage NADA-akupunktur som familie skaber en følelse af fællesskab, og styrker familiens kommunikation og mestring. Studiets resultater kan understøtte sundhedsprofessionelle i, hvordan de tilbyder og anvender NADA-akupunktur til patienter indlagt i et specialiseret palliativt sengeafsnit og deres pårørende. Ved aktivt at tilbyde NADA-akupunktur til både patienter og pårørende understøttes en familieorienteret tilgang i klinisk praksis, som fremmer familiens oplevelse af samhørighed.

#66: Interventions to improve treatment adherence and symptom management among vulnerable cancer patients – a scoping review of existing evidence

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Abstract
Background
Cancer patients who are vulnerable due to socioeconomic, ethnic, or geographical factors often experience a greater symptom burden and are less likely to adhere to recommended cancer treatment compared with other cancer patients. We conducted a scoping review to describe the evidence from randomized controlled trials (RCTs) investigating the effect of interventions to improve cancer treatment adherence and symptom management among vulnerable cancer patients (Registered at Open Science Framework: osf.io/p5kxw).

Methods and analysis
Five databases were searched for studies published prior to February 2024: PubMed, Web of Science, Scopus, PsycINFO, and CINAHL. We summarized the studies and findings in terms of intervention type, delivery mode, and effectiveness and performed quality assessment using the revised Cochrane risk-of-bias tool for randomized trials.

Results
A total of 2,782 studies were screened, and 40 studies were included with half (N = 20) involving breast cancer patients. Interventions were primarily targeted at patients with an ethnic minority background (N=16) or disadvantaged socioeconomic status (N=9). Twenty-one studies reported significant improvements in primary outcomes such as quality of life, patient-centered communication, and treatment adherence. Effective interventions were often characterized by combining culturally adapted multiple components such as psychoeducation or navigation either in person or combined with telephone sessions. Still, 38 studies were characterized as having a high risk of bias.

Conclusion
Despite the limited methodological quality of many of the RCTs, this review suggests that interventions comprising especially psychoeducation and navigation may improve quality of life, patient engagement, and treatment adherence in vulnerable cancer patients. It is promising that inequality in cancer may be addressed through targeted interventions during and after cancer treatment.

#67: Når det ukendte rammer: Hvordan kræftrelateret usikkerhed påvirker familier i den tidlige sygdomsfase - Et integrativt review

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Abstract
Introduktion
Usikkerhed ved sygdom påvirker patienter med kræft og deres pårørendes oplevelse af kræftsygdommen og er forbundet med dårligere psykologisk mestring og nedsat livskvalitet. Dette integrative review undersøger, hvordan usikkerhed ved sygdom påvirker den voksne patient med kræft og deres voksne pårørende i de første 12 måneder efter en kræftdiagnose og hvilke interventioner, der kan reducere usikkerhed.

Metoder
Der blev søgt litteratur i databaserne Cinahl, PubMed, PsycINFO og Cochrane. Vi inkluderede kvalitative, kvantitative og mixed-methods studier og data blev analyseret gennem en constant comparison-analyse.

Resultater
217 artikler blev screenet, hvoraf 12 artikler blev inkluderet. To hovedtemaer med undertemaer blev identificeret: (1) Usikkerhed ved sygdom og dens følelsesmæssige påvirkning og (2) Interventioner til at reducere usikkerhed ved sygdom. De første 12 måneder efter en kræftdiagnose er karakteriseret ved høj usikkerhed, der hæmmer patienter og pårørendes evne til at bearbejde information. Usikkerhed opleves både som en trussel og en mulighed for håb. Mange patienter skjuler deres egen usikkerhed for ikke at belaste deres pårørende, hvilket ofte medfører, at deres egne følelsesmæssige behov bliver tilsidesat i forsøget på at beskytte familien. Ud af de 12 artikler, omhandlede fem af dem interventioner. Alle interventionerne inkluderede information og viden om sygdommen, behandling, procedure og symptomer. Usikkerhed ved sygdom blev reduceret, når interventionen blev iværksat 4-12 uger efter diagnosen, og var målrettet patienten og dennes familie.

Konklusion
Usikkerhed ved sygdom påvirker både voksne patienter med kræft og deres voksne pårørende og bør anskues som en fælles oplevelse. Familiebaserede interventioner, som leveres tidligt efter en kræftdiagnose og tilpasses den enkelte families behov, ser ud til at være mest effektiv og bør integreres i klinisk praksis for at reducere usikkerhed ved sygdom hos familier ramt af kræft.

#68: “Resilient Caregivers” – a randomized trial of a resilience-based intervention for psychologically distressed partner caregivers of cancer patients

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Abstract
Introduction
The aim of this study was to evaluate the effectiveness of ‘Resilient Caregivers,’ a resilience-based intervention for partner cancer caregivers (ClinicalTrials.gov ID: NCT04610034).

Materials and methods
Participants were recruited through the Oncology Department at Herlev Hospital, Herlev cancer counseling center and Odense cancer counseling center in Denmark. Partners (married or unmarried) of patients receiving cancer treatment and experiencing distress (>4 on the distress thermometer) were eligible. Participants were randomized 1:1 to either the intervention or usual care, stratified by sex and age (≤/> 50 years). ‘Resilient Caregivers’ consists of seven manualized group sessions (2.5 hours each), developed according to a resilience framework focusing on meta-reflective skills, coping strategies and values clarification in relation to being a partner of a patient with cancer. We used validated measures to assess anxiety as our primary outcome. Secondary outcomes included resilience, depression, distress and quality of life. Questionnaire data were collected at baseline, 3, 6 and 12 months, and analyzed using mixed models for repeated measures.

Results
Between April 2021 and May 2023, 80 partners were included (39 intervention, 41 control). Most were female (74%), > 50 years old (80%) and had at least a bachelor’s degree (86%). Data collection was completed in July 2024. Compared to the control group, participants in the intervention group showed higher levels of improvement on almost all outcomes but the improvements for the secondary outcomes were not significant.

Conclusions
The Resilient Caregivers program improves anxiety among distressed partner caregivers of cancer patients and may potentially be implemented in cancer counseling centers in Denmark to improve support for informal caregivers.

8. Personalised medicine, screening and early diagnostics
#69-78

#69: Exploring the prognostic potential of circSCORE in patients with relapsed/refractory mantle cell lymphoma

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Abstract
Introduction
Mantle cell lymphoma (MCL) is a B-cell non-Hodgkin lymphoma subtype characterized by biological and clinical heterogenicity presenting with variable prognosis, response rate, and a continuous relapse pattern. At relapse, treatment management is individualized, mainly based on clinical assessment, and no optimal prognostic biomarker in relapsed/refractory (R/R) MCL has been established. The circular RNA-based risk-score, circSCORE, was recently proposed as a promising prognosticator in newly diagnosed, younger patients with MCL. This study investigated the prognostic potential of circSCORE in R/R MCL in both nodal (lymph node (LN)) and non-nodal (bone marrow (BM) and peripheral blood (PB)) relapse tissue.

Materials and methods
RNA was extracted from 65 relapse samples consisting of first relapse LN samples (n=20) from patients previously treated first line in the Nordic MCL2 and MCL3 trials, and either BM (n=34) or PB (n=11) samples from patients with R/R MCL included in the Nordic MCL6 trial, taken at trial baseline. Kaplan Meier estimates and Cox regressions were used to evaluate the association between circSCORE risk groups (high versus low) and outcome.

Results
Survival analyses showed significant inferior outcome for circSCORE high-risk compared to low-risk for both progression free survival (PFS) (hazard ratio (HR) 1.99, p-value 0.041) and overall survival (OS) (HR 2.29, p-value 0.019) in the pooled cohort. The same tendencies were displayed when exploring the non-nodal samples only. Furthermore, circSCORE retained prognostic impact for PFS, but not OS, when adjusted for Ki67, MIPI, and TP53 mutation status in multivariable Cox regression models.

Conclusions
This study presents the prognostic potential of the circular RNA-based risk-score, circSCORE, in R/R MCL along with demonstrating promising application in non-nodal tissues, indicating that circSCORE, if further validated, might serve as an easily obtainable prognosticator in R/R MCL.

#70: Participant-related risk factors for false positive faecal occult blood test results in screening for colorectal cancer – a systematic review and meta-analysis

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Abstract
Introduction
Both guaiac faecal occult blood test (gFOBT) and faecal immunochemical tests (FIT) are used for screening for colorectal cancer and have undesirably high false positives (FP) rates. There is evidence that FP rates differ by sex. However, whether FP rates consistently vary with other factors remains uncertain.

Materials and methods
We systematically searched MEDLINE, EMBASE, Cochrane Central, MedRxiv and BioRxiv up to April 2022, screened the reference lists of relevant systematic reviews, and tracked citations of included studies through Web of Science. An updated search primo January 2025 is in progress. Eligible studies included average-risk or symptomatic populations ≥18 years who were screened with either of the FOBT. We calculated relative risks (RR) of false positive rates (FPR) and RR of positive predictive values (PPV) of available risk factors. For each factor reported in at least two studies, we conducted a meta-analysis using random-effects models.

Results
We included 90 studies with 17,728,741 participants. Males had higher FPR and PPV for both tests than females. In populations tested with gFOBT, age groups differed in PPVs, e.g., the PPV for 65-69-year-olds was 2.16 (95%CI: 1.47, 2.86) times the PPV for 50-54-year-olds. Populations tested with FIT had significantly different FPRs when comparing age groups, use of antiplatelet agents, use of antithrombotic agents, and presence of hypertension. For instance, the FPR for anti-platelet users was 1.33 (95% CI: 1.08, 1.58) times the FPR for non-users. Regarding PPVs differences were found across age groups, use of aspirin, use of proton pump inhibitors, alcohol intake, smoking, diarrhea, diabetes mellitus [PPV (95% CI): 1.30 (1.01, 1.58)], and metabolic syndrome [PPV (95% CI): 1.35 (1.13, 1.56)].

Conclusions
FP test results are influenced by age, medication use, metabolic conditions, and lifestyle factors. These insights can help refine screening protocols.

#71: Pre-Surgery Physical Performance and AI-Driven Mortality Risk Prediction in Colorectal Cancer Surgery: An Observational study of 114 patients

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Abstract

Introduction
Colorectal cancer (CRC) is the third most common cancer worldwide, with surgery as a primary curative treatment. However, postoperative complications occur in 25% of all patients and 31% of elderly patients, negatively impacting recovery and physical function. Prehabilitation help reduce these risks, but selecting the right patients is crucial for optimizing outcomes and cost-effectiveness. This study evaluates baseline physical performance in patients stratified using an AI-based decision support tool (DST) and the impact of multimodal prehabilitation on high-risk patients.

Materials and methods
This cross-sectional study included 114 CRC patients scheduled for curative-intent surgery at Zealand University Hospital (February 2023–June 2024). Patients were stratified into low-risk (≤5% predicted 1-year mortality) or high-risk (>5%). High-risk patients received a 4-week multimodal prehabilitation program, while low-risk patients received standard care (ERAS). Primary outcomes included baseline comparisons of hand-grip strength (HGS) and 30-second sit-to-stand (STS) between risk groups. Secondary outcomes assessed changes in STS, HGS, and the 6-minute walk test (6MWT) after prehabilitation in high-risk patients.

Results
73 high-risk and 41 low-risk patients were included. Low-risk patients performed significantly better at baseline in HGS (40.6 ± 13.9 kg vs. 28.7 ± 8.7 kg, $p < 0.001$) and STS (16.2 ± 4.4 reps vs. 9.3 ± 3.5 reps, $p < 0.001$). Follow-up data were available for 54 high-risk patients (74%). STS improved significantly (9.0 to 10.5 reps, $\Delta = 1.5$, $p < 0.001$), and 6MWT increased (298.8 m to 335.7 m, $\Delta = 36.9$ m, $p = 0.001$), while HGS remained unchanged (27.58 kg to 27.65 kg, $\Delta = 0.07$, $p = 0.87$).

Conclusion
The AI-based prediction model effectively identified patients with low physical performance for prehabilitation. The 4-week prehabilitation program improved functional outcomes in high-risk patients, supporting its role in perioperative care.

#72: Development and validation of a new lung cancer risk model

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Abstract
Introduction
Screening for lung cancer (LC) leads to earlier detection and reduced LC mortality. The aim of this study was to develop a risk model informed by blood tests to qualify risk stratification in LC screening.

Materials and methods
Our risk model was developed in ever-smokers in the Copenhagen General Population Study (CGPS, n=62,947) and validated in ever-smokers aged ≥50 years in the Copenhagen City Heart Study (CCHS, n=3,195). Clinical, questionnaire-based, and biochemical variables were employed to predict 6-year LC risk. We compared our new model with the PLCOm2012 model.

Results
There were 689 and 68 events of 6-year LC in the CGPS and the CCHS. The final risk model included five questionnaire-based variables (pack-years, years of smoking cessation, educational level, former cancer, pneumonia within last 10 years) and six biochemical variables (hemoglobin, monocytes, platelets, CRP, Ca2+, AHRR methylation).In the CGPS, the new model yielded an AUC of 0.765 compared to an AUC of 0.717 using the PLCOm2012 model for detection of all 6-year LC ($p<0.0001$). Corresponding AUCs were 0.774 vs 0.746 for stage I-II LC ($p=0.051$) and 0.765 vs 0.714 for detection of stage III-IV LC ($p<0.0001$). At a fixed specificity level of 77.7% (as would be achieved using the NELSON or NLST criteria), sensitivities were 57.6% vs 39.2% for LC in women ($p<0.0001$) and 61.4% vs 54.7% for LC in men ($p=0.0039$). Mean age at examination was 73.1 years (SD 7.42) in individuals detected by the new model vs 75.4 years (SD 6.57) in individuals detected by the PLCOm2012 model ($p<0.0001$). In the CCHS, results were similar with an AUC of 0.784 for the new model and 0.720 for the PLCOm2012 model ($p=0.0057$).

Conclusions
The new risk model was based on few clinical questions and a single blood draw and was more sensitive compared to the PLCOm2012 model for detection of 6-year LC. In particular, the new model identified more women and younger individuals.

#73: Clinical performance of HPV testing in self-collected vaginal samples using a low-cost sampling device versus clinician-collected cervical samples for detection of high-grade cervical intraepithelial neoplasia in a referral population

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Abstract
Introduction
In Denmark, women aged 23-64 are invited for cervical cancer screening, with non-participants able to order a specially-designed vaginal self-sampling device (Evalyn brush) for HPV testing. This demand-based approach reduces costs and waste of unused devices, but up to one-third of the women offered vaginal self-sampling remain unscreened. A simpler, inexpensive self-sampling device for vaginal self-sampling could be mailed directly to the women's home address, potentially improving screening participation and supporting WHO's goal of cervical cancer elimination. This study investigated the clinical relative accuracy of HPV testing using the low-cost and simple Viba-brush device for vaginal self-sampling in detecting high-grade cervical intraepithelial neoplasia (CIN2+/CIN3+) compared to clinician-collected cervical samples.

Materials and methods
In a cross-sectional study, paired vaginal samples (Viba-brush device) and cervical samples were obtained from 324 women aged 23-64 years (median age: 36.0 years (IQR: 29-46) referred for colposcopy and biopsy taking or a cervical excision. Samples were tested using Allplex HR HPV DNA extended genotyping assay. Of the 324 women, 144 (44.4%) had <CIN2, 180 (55.6%) had CIN2+, and 138 (42.6%) had CIN3+.

Results
In the total study population (n=324), preliminary results showed that HPV testing in vaginal samples was less sensitive for CIN2+ (ratio: 0.94, 95% CI: 0.90-0.98, pMCN=0.01) and CIN3+ (ratio: 0.92, 95% CI: 0.87-0.98, pMCN=0.01) with no significantly difference in specificity for <CIN2 (ratio: 0.84, 95% CI: 0.63-1.13, pMCN=0.4) compared to cervical samples.

Conclusion
HPV testing using the Viba-brush was less sensitive for detecting CIN2+/CIN3+ than cervical samples, but remains a promising low-cost device for vaginal self-sampling. Further optimization is needed before potential implementation.

#74: PET-positive extra-axillary lymph nodes in high-risk primary breast cancer: a retrospective study of location, treatment planning, and follow-up

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Abstract
Introduction
To explore the clinical management and follow-up of non-resected PET-positive extra-axillary lymph nodes in women with primary breast cancer.

Materials and methods
Women with primary breast cancer referred for an additional staging FDG-PET/CT at Odense University Hospital from January 2016 to February 2024 were included retrospectively. This study assessed FDG-PET/CT-based stage migration through a comprehensive review of patient medical records, pathology reports, scan reports, and images. In-depth characteristics, clinical management, and follow-up after the detection of extra-axillary lymph node metastasis in the periclavicular and internal mammary nodes (IMN) were included for analysis.

Results
In total, 615 patients were included. Following FDG-PET/CT, 377 (61%), 95 (15%), and 143 (23%) were staged with early, extra-axillary, and metastatic breast cancer, respectively. After definitively including 83 patients with extra-axillary breast cancer, the sites of lymph node metastases were infraclavicular (47/83, 57%), supraclavicular (31/83, 37%), and IMN (35/83, 42%). The majority received standard radiotherapy (74/83, 89%), mainly including locoregional levels without an additional boost to PET-positive nodes. At a median follow-up of 4.9 years, 27 patients (33%) had a new malignant event, predominantly due to recurrent breast cancer (23/83, 28%). Of these, 91% (21/23) presented with distant metastasis, only one had an isolated locoregional recurrence, and 57% (13/23) died within a median of 2.9 years after initial diagnosis.

Conclusion
In patients upstaged due to detection of extra-axillary PET-positive lymph nodes, most of these nodes were located at the infraclavicular level. Despite medical treatment and radiotherapy after surgery, approximately one-third of the patients experienced distant failure within five years of follow-up. These findings highlight the need for improved therapeutic strategies for patients with high-risk primary breast cancer.

#75: Large-scale, controlled study comparing analytical quality of three HPV self-sampling devices for cervical cancer screening

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Abstract
Introduction
HPV self-sampling is a silver bullet to increase cervical cancer screening attendance. The Capital Region of Denmark has operated HPV self-sampling targeting screening non-attenders as an integrated element in the screening program since 2017. As part of the continuous improvement of the program, we are currently evaluating the sample quality and women´s choice of three HPV-self sampling devices: the Evalyn® (Rovers, the Netherlands), the FLOQSwab® and the Sensigrip (both Copan, Italy). Whereas the Evalyn is currently used in Denmark, the FLOQ alternatives are under consideration as new first line choice.

Methods
Women invited for HPV self-sampling, were offered a kit with two self-sampling devices of the following combinations: 1) Evalyn and FLOQSwab, 2) Evalyn and the Sensigrip 3) FLOQSwab and Sensigrip. The Women were asked to sample with both received devices (randomized order) and return them to the laboratory for analysis. The three devices were analysed using the same laboratory protocol of resuspension in a tube with CBD-buffer and tested for HPV with the clinically validated BD Onclarity™ assay on the BD COR™ platform (BD IDS, Sparks, MD).

Results
A total of 1131 women returned two paired devices, resulting in 900 Evalyn brushes, 552 FLOQSwab swabs and 810 Sensigrip swabs with three internal control datapoints and one datapoint per detected HPV genotype per device. Pooled data showed no differences in internal controls. Pairwise analysis of HPV positive devices showed that Evalyn and FLOQ has an overall concordance of 98% (n=334), Evalyn and the prototype 96 % (n= 527) and FLOQ versus prototype was 98% (n=220).

Conclusion
The analytical quality was uniform between the three devices with respect to detection of human betaglobin and HPV. This study concludes that the 3 self-sample devices are equivalent regarding analytical and clinical diagnostic quality, and choice of screening device can be made based on other parameters than quality.

#76: The clinical utility of DNA methylation biomarkers ASCL1 and LHX8 in first-void urine for high-grade cervical intraepithelial neoplasia detection

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Abstract
Introduction
First-void urine (FVU) collection for high-risk HPV testing may enhance cervical cancer prevention among under-screened women. We evaluated the clinical performance of DNA methylation markers ASCL1 and LHX8 in HPV-positive FVU and paired clinician-collected cervical samples (CS) to detect high-grade cervical intraepithelial neoplasia (CIN2+/CIN3+). Methylation-based triage of HPV-positive FVU was compared with HPV16/18 and extended HPV16/18/31/33/52 genotyping.

Materials and methods
We analyzed 286 paired FVU and CS samples from 163 women with CIN2/3 and 123 controls (≤CIN1) recruited at colposcopy clinics (median age: 35 years, IQR: 29-45). HPV testing (Allplex HPV DNA extended genotyping) and ASCL1/LHX8 methylation analysis (multiplex quantitative methylation-specific PCR) were performed. ROC curves and AUC values assessed marker performance for detecting CIN2+/CIN3+.

Results
In HPV-positive FVU, methylation analysis achieved an AUC of 0.76 for CIN3+ and 0.74 for CIN2+), corresponding to sensitivities of 79.2% (95% CI: 71.0-85.9%) for CIN3+ and 75.5% (95% CI: 68.1-81.9%) for CIN2+, and a specificity of 57.0% (95% CI: 47.8-65.8%) for ≤CIN1. In CS, AUCs were 0.84 (CIN3+) and 0.80 (CIN2+). Methylation-based triage of HPV-positive FVU was comparable to extended genotyping (CIN3+: 79.2% vs 73.6%, p=0.35 & CIN2+: 75.5% vs 71.0%, p=0.35 and ≤CIN1: 57.0 vs 59.3%, p=0.79), and significantly more sensitive than HPV16/18 genotyping (CIN3+: 79.2% vs. 40.8%, p<0.01 & CIN2+: 75.5% vs 38.7%, p<0.01), though with lower specificity (≤CIN1: 57.0% vs. 88.6%, p<0.01).

Conclusions
ASCL1/LHX8 methylation analysis in HPV-positive FVU is a promising tool for detecting high-grade cervical disease. It outperformed HPV16/18 genotyping in sensitivity and matched extended genotyping, supporting its potential as a direct triage method for women testing HPV-positive in FVU.

#77: Predicting Taxane Response in Danish Breast Cancer Patients

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Abstract

Introduction

Taxanes, including docetaxel and paclitaxel, are standard chemotherapeutic agents used in neoadjuvant, adjuvant and metastatic breast cancer (MBC). However, typically only about 30% of patients with MBC respond favorably, meaning that the majority endure potential side-effects like long-term neurotoxicity without significant benefit. This low response rate and the lack of validated biomarkers to predict benefit highlight the need for personalized treatment strategies.

Materials and methods

A predictive model was developed by first correlating mRNA expression data from the Cancer Cell Line Encyclopedia (CCLE) with docetaxel IC50 values from the Genomics of Drug Sensitivity in Cancer (GDSC). A tumor-specific variance filter derived from >6,000 patient tumor samples was applied to retain clinically relevant features. Multiple gene signatures were generated by applying statistical filters and subsequently trained and cross-validated via L2-regularized Cox regression in a Danish Cohort ('DBCG') (PMID: 31654283) of MBC patients treated with docetaxel (n = 164). Their predictive performance was evaluated by comparing hazard ratios (HR) for time to progression (TTP) above or below 6 months. The best model, with a median HR of 0.33 across 100 iterations, comprises 137 genes and was independently validated in Danish women with MBC treated with paclitaxel from the DBCG cohort (n = 41).

Results

The hazard ratio (HR) for the best performing model was 0.35 in a categorical model comparing paclitaxel-treated patients with response scores >50 versus ≤50 (two-sided p-value = 0.0505, 95% CI = 0.12-1.00, TTP as endpoint).

Conclusions

Here, we have developed and clinically validated a predictor of taxane response in breast cancer through a gene filtering strategy from cell line and tumor data and machine learning on mRNA expression and time-based disease progression data. We plan to further validate this model in independent datasets of women receiving taxanes for MBC.

#78: National multidisciplinær vurdering af planocellulær esophaguskarcinom – et dansk kvalitetsprojekt

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Abstract
Introduktion
Multidisciplinære team (MDT)-konferencer er centrale for vurdering og behandling af patienter med esophaguscancer. Tidligere studier har dokumenteret forbedret stadieinddeling, behandlingskvalitet og overlevelse ved MDT-baseret beslutningstagning, men ettidligere nationalt studie i Danmark viste betydelig uoverensstemmelse om operabilitet og endelig behandlingsplan. I Danmark varetages udredning og behandling på fire højt specialiserede centre. DEGC initierede derfor et national MDT-konference projekt med det formål at vurdere og harmonisere behandlingen for patienter med planocellulært karcinom i esophagus

Materialer og metoder
Studiet er et prospektivt, observationelt kohortestudie af patienter henvist til national MDT efter vurdering på lokalt MDT. Data om klinisk TNM-stadieinddeling (cTNM), resektabilitet, behandlingsintention og foreslået behandling blev sammenlignet mellem lokal og national MDT. Enighed blev vurderet vha. observer agreement (%) og Krippendorff's alpha

Resultater
Der blev inkluderet 60 patienter fra 4 centre. Der var høj overensstemmelse i TNM-stadieinddeling mellem lokal og national MDT (observer agreement: T=85%, N=83%, M=97%; Krippen-dorff's α: T=0.85, N=0.76, M=0.65)

- Behandlingsforslag var derimod mere varierende med kun 82% enighed ved endelige behandlingsstrategi
- Overensstemmelse om resektabilitet var lavere (observer agreement: 75%; α=0.55), mens behandlingsintention havde høj enighed (observer agreement: 90%)
- I 13% af tilfældene var der direkte diskrepans mellem lokal og national MDT's behandlingsforslag
- National MDT ændrede behandlingsforslaget i 11 ud af 60 tilfælde (18%).

Konklusioner
Der var generelt stærk konsensus omkring TNM-stadieinddeling mellem lokale og nationale MDT-konferencer i Danmark. Den størstevariation sås i vurdering af behandlingsstrategi og resektabilitet, hvilket understreger behovet for en national MDT-platform for at sikre ensartet, evidensbaseret behandling på tværs af behandlingssteder

9. Personalised medicine, biomarkers and diagnostics
#79-89

#79: Targeting EMT-driven metastatic breast cancer with mitotic inhibitors

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Abstract
Introduction
Metastatic breast cancer is the leading cause of cancer death in women and remains an incurable disease. The epithelial-to-mesenchymal transition (EMT) is widely recognized as a key driver of metastasis. However, the inherent heterogeneity and plasticity of EMT states pose significant challenges for therapeutic targeting. In this study, we characterized EMT heterogeneity in the "aggressive front" of primary tumors and circulating tumor cells (CTCs) in the bloodstream and explored repurposing of mitotic inhibitors to target EMT-driven plasticity.

Materials and methods
CTCs were isolated from whole blood of metastatic breast cancer patients (n=3) by gradient separation and enrichment with EpCAM beads and cultured in low-attachment plates with optimized media. Patient-derived organoids (PDOs) were developed from the center and periphery of primary breast tumors (n=3), by mechanical and enzymatic tumor digestion, and cultured in a submerged model. EMT markers expression was determined by RT-qPCR and immunocytochemistry. The effect of an AURKA inhibitor on the growth and invasion of PDOs was analyzed with a live-cell imaging instrument.

Results
Invasive cells showed enrichment of the mesenchymal markers vimentin, Zeb1, and Twist, and reduced expression of the epithelial markers E-cadherin and EpCAM, compared to epithelial-like MCF-7 cells. Vimentin and N-cadherin levels were lower compared to mesenchymal-like MDA-MB-231 cells, and SNAI1/2 and fibronectin expression was reduced relative to both epithelial- and mesenchymal-like cells, indicating an intermediate EMT state. AURKA inhibition with alisertib effectively blocked the growth of PDOs generated from invasive cells.

Conclusions
These findings highlight the therapeutic potential of AURKA inhibitors for targeting hybrid EMT states present in CTCs and invasive regions of primary tumors, offering a strategy to combat metastatic disease and potentially transform current breast cancer treatment.

#80: Neutrophil-to-Lymphocyte ratio as a prognostic marker in advanced small bowel adenocarcinoma

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Abstract
Introduction
Small bowel adenocarcinoma (SBA) is a rare malignancy, comprising 1-2% of all gastrointestinal cancers. Recent evidence highlights the potential prognostic value of inflammatory markers in advanced cancer, with the neutrophil-to-lymphocyte ratio (NLR) being a readily available and simple tool. While NLR has been explored as a marker in metastatic colorectal cancer, its prognostic role in SBA remains unstudied.

Materials and methods
This retrospective single-center study included 93 patients diagnosed with advanced SBA between 2010 and 2023 and treated at Copenhagen University Hospital Herlev and Gentofte. Baseline NLR was measured at the first visit before the initiation of first-line oncological treatment. Patients were categorized based on the median NLR (4.18). The primary endpoint was overall survival (OS), while secondary endpoints were progression-free survival (PFS) on first-line chemotherapy and overall response rate (ORR). Univariate Cox regression was applied to assess the association between NLR and OS.

Results
High pretreatment NLR levels were significantly associated with shorter OS and PFS. Patients with high NLR had an OS of 8.4 months (95% CI, 5.1-14.9) compared to 15.8 months (95% CI, 11.5-26.7) for those with low NLR ($p<0.01$). PFS was also significantly shorter in the high NLR group (5.23 months vs 9.67 months, $p<0.01$), compared to the low NLR group. The ORR was more favorable in the low NLR group. Log-transformed NLR showed a significant association between high NLR and worse OS (HR 1.74, 95% CI 1.28-2.35, $p<0.01$).

Conclusions
Elevated NLR is a significant adverse prognostic marker in advanced SBA, correlating with shorter OS and PFS. These findings underscore the potential of NLR as an accessible and cost-efficient prognostic biomarker in SBA. Further studies are needed to confirm the biological background behind the inflammatory state and assess their clinical implication.

#81: Evaluating the prognostic role of the PAM50 signature and selected immune-related signatures for recurrence in patients with T1abN0 breast cancer

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Abstract
Introduction
De-escalation of adjuvant treatment in patients with T1abN0 breast cancer is discussed internationally. Identification of new prognostic factors in these patients may assist this de-escalation. The PAM50 signature and tumor inflammation signature (TIS), Programmed Cell Death Protein 1 (PD-1) and Programmed Cell Death Ligand 1 (PD-L1) signatures are possible prognostic factors for recurrence.

Materials and methods
Danish patients with T1abN0 breast cancer diagnosed between 2007-2016 were identified, the NanoString Breast Cancer 360 Panel was performed on tissue samples from cases with recurrence matched 1:1 with controls without recurrence (n = 234). The association between gene signatures and recurrence was analyzed with conditional logistic regression.

Results
Patients with the basal-like subtype had higher values of TIS, PD-1 and PD-L1 scores compared with other subtypes. Patients with higher PD-L1 score had significantly lower odds of recurrence (odds ratio [OR] 0.61, P = .01). Likewise, an increased TIS score was associated to lower, but nonsignificant odds of recurrence (OR 0.76, P = .07). Patients with human epidermal growth factor receptor 2 (HER2)-enriched subtype had significantly higher odds of recurrence compared with patients with luminal A subtype (OR 4.8, P = .03).

Conclusion
PAM50 and immune-related signatures provide important prognostic information in patients with T1abN0 breast cancer, which may refine the risk assessment in these patients.

#82: NIMBLE | Non-Invasive Malignancy Classifiers using Blood-Biomarkers for Lung Nodule Evaluation

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Abstract
Introduction
Lung nodules are frequent findings on chest CT scans. Most will represent benign lesions, but a fraction will be malignant. Subsequent invasive investigations entails a high risk of adverse events and should be reserved to those with highest risk of lung cancer. Current risk assessment only includes patient characteristics and radiological parameters. The NIMBLE study will investigate if blood tests can inform and improve the early risk assessment in these patients.

Materials and methods
The NIMBLE project plan to enroll 1,500 patients referred for assessment of a lung nodule to the Dept. of Pulmonary Medicine at Gentofte Hospital. Patients will donate a blood sample which will be analyzed directly for standard blood tests and frozen at -80°C for later analysis of protein tumor markers, methylation of leukocyte DNA, and cell-free tumor DNA. Blood tests, patient characteristics and radiological parameters will be combined using artificial intelligence to develop two algorithms to identify low-risk patients and high-risk patients, respectively. Validation set will be the remaining 20% of patients.

Results
From May 22nd, 2024 to March 27th, 2025, 600 patients have been included in the study. Distribution of nodule sizes resembles that of a large reference data set. Among included patients with a final diagnosis, lung cancer was diagnosed in 19,3%. As expected, patients with lung cancer had on average larger nodules (21 vs. 10mm), were older (73 vs. 68yo), had more cumulative pack-years (32 vs. 21), and lower leukocyte methylation ratio (61.5% vs. 68.0%) compared to patients with benign diagnoses.

Conclusions
We have established the logistics to effectively enroll patients with small lung nodules with a size distribution resembling that of a reference distribution. A substantial fraction of included patients has been diagnosed with lung cancer and as expected, these patients were older, with increased pack-years and presented with larger nodules.

#83: Natural killer cell activity and response to neoadjuvant treatment in breast cancer patients

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Abstract

Introduction

No biomarkers exist to monitor the effects of neoadjuvant treatment for breast cancer. Natural killer cell activity (NKA) has shown prognostic potential in other cancers. Prednisolone, administered to avoid allergic reactions to taxan-based chemotherapy, is known to modulate the immune response. The purpose of this study was to examine the association between NKA and breast cancer treatment and the effect of prednisolone to NKA.

Materials and methods

Breast cancer patients planned for neoadjuvant treatment had blood samples drawn into NK Vue(TM) tubes at baseline, before every neoadjuvant treatment cycle, pre- and postoperatively. The tubes were incubated at 37°C for 20-24 hours. Plasma levels of IFNγ were then quantified by ELISA as a surrogate marker of NKA. A cutoffof 250pg/mL IFNγ differentiated normal from low NKA. Administration of supportive prednisolone before blood sampling was registered. Study endpoints were overall survival (OS) and invasive disease-free survival (IDFS).

Results

78 patients were included. 5-year IDFS was 88.1% (95% CI 73.7-94.9%) for patients with normal NKA and 71.5% (95% CI 40.6-88.2%) for patients with low NKA (p = 0.049) preoperatively. 5-year OS was 97.6% (95% CI 84.3-99.7%) for patients with normal NKA and 85.7% (95% CI 53.9-96.2%) for patients with low NKA preoperatively (p = 0.07). At the 5th and 6th treatment cycle IFNγ dropped and was 11 (IQR 0.75-135) and 7 (IQR 0-15), respectively, in patients receiving supportive prednisolone as opposed to 636 (IQR 203-1546) and 806 (IQR 180-1655) in patients not receiving supportive prednisolone (p < 0.0001).

Conclusions

IDFS was significantly longer for patients with normal preoperative NKA. Before 5th and 6th treatment cycle levels of IFNγ dropped which appears to be associated with treatment with supportive prednisolone in conjunction with taxan-based chemotherapy. Further studies are warranted to explore the impact of prednisolone on NKA in patients with cancer.

#84: Proteomic study of drug response preparedness in diffuse large B-cell lymphoma

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Abstract
Introduction
Diffuse large B-cell lymphoma (DLBCL) is a heterogenous disease with varying clinical outcomes. A substantial number of patients (~35%) are not cured after standard treatment with the combinatory regimen R-CHOP. The molecular background of the poor response is yet to be fully understood and biomarkers for identification and treatment stratification of these patients are in high demand. Therefore, this exploratory study aims to identify novel protein markers that are associated with R-CHOP treatment response in DLBCL.

Methods
Proteomic profiling of 16 baseline DLBCL cell lines were performed using LC-MS/MS. On the same cell lines, dose-response screens of individual compounds of R-CHO were conducted. To identify differential proteins between cell lines with resistance or sensitivity towards each drug, the proteomes of the two groups were compared. For clinical relevance, the cell line findings were compared with clinical cohorts that include proteome of diagnostic DLBCL samples with known R-CHOP response.

Results
A total of 98 proteins were differentially expressed between resistant and sensitive DLBCL cell lines for all drugs. Of these, 72% were also detected in clinical samples and for NSFL1C, GET4, RRP9, DUSP3, PRPSAP1, and PMPCB unidirectional differential expression were observed between cell lines and DLBCL patients. Upregulated proteins in vincristine resistant cell lines were associated with signaling by Rho GTPases in agreement with upregulation of members of the Rho GTPases in R-CHOP resistant patients.

Conclusion
This single-drug cell line proteomic study identified differentially expressed proteins between resistant and sensitive celllines for R-CHO whereof six proteins were also present with same significant expression patterns in patient samples. Furthermore, this study suggests clinical findings of significant upregulation of Rho GTPases in R-CHOP resistant patients to be associated with vincristine resistance, specifically.

#85: Molecularly matched targeted treatment outside clinical trials for refractory cancers – the Off-trial study

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Abstract
Introduction
Precision medicine programs have been established at all university hospitals in Denmark, utilizing comprehensive molecular profiling to identify potentially druggable alterations in end-stage cancer patients. After profiling, some patients receive targeted treatment in clinical trials, however a significant number of patients cannot be included in trials e.g. due to ineligibility or lack of relevant trials. A number of these patients are treated “offtrial” via regional authority permissions, compassionate use programs or as part of standard of care. However, data on these treatments are not systematically collected leading to a loss of valuable scientific knowledge.

Materials and methods
Clinical data from approx. 250 patients having undergone comprehensive molecular profiling and then treated outside clinical trials in DK from 2017-2024, will be collected and analyzed. Primary endpoints are overall response rate (ORR) and progression-free survival. Historical approval status of treatment, off-trial treatment type and current classification systems of druggability will all be assessed for each patient and associated to efficacy of targeted treatment.

Results
At Aalborg University Hospital 14 patients received 17 off-trial targeted treatments for newly identified molecular targets among approx. 300 patients screened. The ORR was 29%, with one complete responder and four partial responders. Additionally, five patients had stable disease. Further results will be presented at the meeting.

Conclusion
“the Off-trial study” will provide novel data on administration, use and efficacy of off-trial targeted treatment in Denmark. It will assess the link between drug approval status and efficacy to determine if non-approved or non-reimbursed drugs provide sufficient benefit to justify early access to precision medicine. Additionally, it will compare predictive tools for druggability to better guide future molecular tumor board decisions.

#86: The prognostic value of cell-free DNA kinetics during chemoradiotherapy in squamous cell carcinomas of the anus

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Abstract
Purpose
Reliable biomarkers for predicting prognosis and monitoring response during chemoradiotherapy (CRT) in squamous cell carcinoma of the anus (SCCA) are lacking. Quantification of cell-free DNA (cfDNA) using a direct fluorescent assay (DFA) may offer a minimally invasive solution. This study investigated the prognostic value of cfDNA kinetics during CRT.

Methods
Blood samples were prospectively collected at baseline, mid-therapy, and end-of-treatment (EOT) from SCCA patients undergoing CRT. cfDNA concentrations (ng/µL) were measured in serum using DFA. Baseline cfDNA levels were correlated with clinical characteristics using the Mann-Whitney U test and cfDNA changes during CRT using the Wilcoxon signed-rank test. Survival was assessed with Kaplan-Meier analysis and log-rank test. Hazard ratios (HR) were estimated with Cox regression.

Results
In total, 126 patients were included. cfDNA levels were available at baseline (n=126), mid-CRT (n=103), and EOT (n=108), with corresponding median levels of 0.78 ng/µL (95% CI: 0.72–0.85), 0.62 ng/µL (0.56–0.72), and 0.66ng/µL (0.58–0.74), respectively. Higher baseline cfDNA levels were observed in patients with advanced disease (T3–T4, N+, or M+) and performance status >0 ($p<0.05$), but baseline levels did not seem to affect outcome. cfDNA levels declined significantly during CRT ($p<0.001$). The median follow-up time was 22 months. A lower percentage decline was observed in non-responders (-9% 95%CI(-24;33)) compared to complete responders (-37% 95%CI(-44;-29)), p=0.002 and treatment failures (-18% 95%CI(-36;9)) compared to complete responders(-36% 95%CI(-44;-28)), p=0.02. Failure to eliminate below the baseline 75th percentile was associated with inferior disease-free survival HR=4.23 95%CI(1.50-11.93), p=0.003.

Conclusion
cfDNA quantification using DFA was feasible in SCCA and low cfDNA elimination during CRT was associated with poorer outcomes, supporting its potential as a prognostic biomarker in SCCA.

#87: Benchmarking Variant Effect Predictors for Gain-of-Function variants in Oncogenes

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Abstract
Introduction
The accessibility of tumour-genome sequencing for routine diagnostics is revolutionising oncology. The identification of tumour-specific variants can open new opportunities for targeted treatment in patients with otherwise terminal cancer. However, the sheer number of potential somatic variants identified can make it challenging to identify true pathogenic mutations in the haystack of benign variation. While recent years have seen a proliferation of in silico variant effect predictors (VEPs), these are primarily trained on germline variants where loss-of-function (LoF) is the dominant molecular mechanism of action. Tumour samples, by contrast, are characterised both by the presence of pathogenic LoF variants in tumour suppressor genes and a significant proportion of gain-of-function GoF variants in oncogenes. Through their different mechanism of action, GoF variants in oncogenes are notoriously difficult to classify using VEPs. In this project we assess 6 current gold-standard open source VEPs in an in-house catalogue of GoF variants.

Materials and methods
We used an internal catalogue of in-house expert curated somatic single-nucleotide variants. This included 106 GoF and 133 LoF variants, where a VEP was not used in the classification. We benchmark 6 current gold-standard VEPs against this database with focus on the GoF variants.

Results
AlphaMissense, REVEL and BayesDel were highly accurate for LoF variants, while AlphaMissense was the best performing for GoF variants albeit with lower accuracy than for LoF.

Conclusions
Early analyses show that this benchmarking will allow us to make recommendations of the applicability of germline-trained VEPs for somatic variants in tumour-suppressor and oncogenes.

#88: Protein biomarkers associated within immune-related toxicity identified by plasma proteome analysis in cancer patients treated with checkpoint inhibitors

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Abstract
Introduction
Immune related adverse events (IrAEs) associated with checkpoint inhibitor therapy are a growing challenge in oncology affecting an increasing number of patients and putting a substantial strain on health resources. Management strategies are generally consensus-driven or based on autoimmune conditions. For several of these conditions no irAE associated biomarkers are known for irAE staging and guidance of management. In this study, we apply proteome analysis to plasma to discover biomarkers with the potential to aid staging of irAE severity and clinical management.

Methods
Blood samples were collected from cancer patients experiencing irAE; at the onset, during and after high dose immunosuppressive management. The collected plasma samples and analyzed using LC-MS/MS and translated to protein abundances using Spectronautv18.6. Further data analysis was performed in R using the Limma package.

Results
Thirty-seven patients with grade 3-4 IrAEs (colitis, hepatitis or nephritis) were included in the study. A median of 905 proteins in the plasma. At the IrAE initiation timepoint, we found significant higher abundance of multiple acute phase and immune-related proteins. Further, we found enrichment of organ-specific proteins especially within hepatitis patients with the liver enzyme ALDOB as the most significant.

Conclusion
Our study identifies proteins associated with IrAEs and related to specific organ affection constituting relevant IrAE biomarker candidates.

#89: Toxicity prediction based on routine CT-scan and clinical data - Preliminary results from the CT-AI project

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Abstract
Introduction
Despite advancements in oncology, chemotherapy remains a cornerstone treatment. Current dosing strategies, based on height and weight, do not fully consider individual patient characteristics such as body composition. Lean body mass derived from routine CT scans has been shown to predict dose-limiting toxicity (DLT), but clinical implementation for dosing remains limited. Recent AI-driven auto-segmentation software provides accurate estimations of tissue compartments, offering a promising tool for more individualised dosing.

Materials and methods
This retrospective cohort study (2014–2024) was conducted at Aalborg University Hospital. It included patients receiving adjuvant chemotherapy for colorectal cancer (capecitabine/oxaliplatin) and lung cancer (cisplatin/vinorelbine), as well as palliative chemotherapy for metastatic prostate cancer (docetaxel). The primary outcome was DLT during the first two treatment cycles, defined as any dose reduction, delay, or discontinuation. Clinical and biochemical data were collected, and body composition was extracted from routine CT scans using AI-based software. Associations between these variables and DLT will be analysed.

Results
A total of 704 patients were included (mean age 68 ± 9 years, BMI 27 ± 5): 262 colorectal (55% women), 122 lung (45% women), and 320 prostate cancer patients. DLT occurred in 279 patients (40%). A higher incidence of DLT was observed among women: 66% women vs. 46% men in colorectal cancer, and 54% women vs. 51% men in lung cancer. Among prostate cancer patients, 22% had DLT.

Conclusions
The preliminary data show a high incidence of DLT, particularly among women, highlighting the need for further individualisation of dosing. Ongoing analyses will identify key predictors of toxicity to support risk stratification and optimal starting doses. Findings from this study are expected to have broader implications for other oncological treatments with similar pharmacological profiles.

10. Clinical epidemiology and database research I
#90-99

#90: Stage-dependent survival in Gastric Cancer: A Danish nationwide cohort study

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Abstract
Background
Gastric cancer remains a major clinical challenge with poor prognosis. This study investigated survival outcomes based on treatment strategy, tumor stage, and histology in Danish gastric cancer patients.

Methods
Between January 2013 and December 2021, 2,156 gastric cancers were registered in the Danish Esophagogastric Cancer Group database, covering 99% of all Danish gastric cancers. Data from national registries were analyzed, focusing patients diagnosed with intestinal and diff use type gastric cancers. Survival differences were evaluated using Kaplan-Meier curves and Cox regression, adjusting for tumor stage, treatment strategy, and patient demographics.

Results
Median survival was significantly higher with surgery ± perioperative chemotherapy (Surgery CT) than with palliative treatment. For the intestinal type, surgery ± CT resulted in a median survival of 45.2 months (95% CI [36.9–53.5]) versus 5.2 months (95% CI [4.6–5.7]) with palliative treatment. Patients with diff use type, treated with surgery ± CT had a median survival exceeding 128 months, compared with 6.3 months (95% CI [5.2–7.5]) in palliative cases. Patients receiving EOX/ECX had a lower risk of death (HR 0.73, p=0.03) compared to upfront surgery, while FLOT similarly reduced the risk of death (HR 0.70, p=0.04). No significant difference was observed between the two chemotherapy regimens. Palliative chemotherapy and radiotherapy improved survival over best supportive care (p<0.001). Advanced tumor stage was associated with worse survival, while histological subtype had no impact on survival outcomes.

Conclusion
This study emphasizes the survival benefit of multimodal treatment strategies, especially surgery combined with perioperative chemotherapy. Palliative interventions also improved outcomes in advanced disease.

#91: Identifying harmful weight changes and their impact on breast cancer outcomes: insights from the Nurses' Health Study

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Abstract
Background
This study aimed to identify specific weight gain thresholds associated with an increased risk of breast cancer mortality, providing crucial guidance for healthcare providers managing breast cancer patients.

Methods
The study was conducted using data from the Nurses' Health Study (N=121,700), a large prospective cohort of female registered nurses followed biennially for lifestyle and disease diagnosis. Women were included if they were diagnosed with stage I-III invasive breast cancer from June 1978 through June 2018 with weight assessed before diagnosis and at least one weight assessment ≥12 months after diagnosis. Weight changes were calculated as percentage of weight change from the last reported weight before diagnosis to the first postdiagnosis weight report. Weight change was then classified as (1) stable weight (-2% to +2%), (2) moderate weight loss (-2% to -5%), (3) major weight loss (< -5%), (4) moderate weight gain (+2% to +5%) and (5) major weight gain (> +5%). Stable weight was considered the reference group in statistical analyses. Multivariable Cox proportional models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) for breast cancer mortality according to pre-to-postdiagnosis weight changes.

Results
A total of 6803 women (median [IQR] age at diagnosis, 61[54-68] years) with information on weight changes were included. There were 1179 breast cancer mortalities with a median (IQR) follow-up of 8.5 (3.8-14.9) years. Multivariable analyses revealed increased breast cancer mortality hazards associated with major weight gain (HR 1.26, 95%CI: 1.05-1.50) vs women with stable weight. Women with major weight loss had greater risk, but it was not statistically significant (HR 1.14, 95% CI: 0.96–1.34). Moderate weight gain or loss was not associated with increased hazards.

Conclusion
A postdiagnosis weight gain exceeding 5% is associated with an increased risk of breast cancer mortality in women with breast cancer.

#92: Body Mass Index and colorectal cancer recurrence and mortality: a nationwide cohort study in Denmark

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Abstract
Introduction
Obesity may exacerbate the prognosis of colorectal cancer (CRC). We evaluated the impact of Body Mass Index (BMI) on CRC recurrence and mortality, and synergistic effects of patient, clinical and socioeconomic characteristics.

Materials and methods
From the Danish Colorectal Cancer Group database and population-based registries, we assembled a cohort of stage I-III CRC patients who underwent curative intent surgery during 2002-2020. CRC recurrence was identified using a validated algorithm incorporating diagnostic and treatment codes for metastases, along with pathology codes indicating recurrence. Patients were followed from 6 months post-surgery to recurrence, death, emigration, 4.5 years (i.e. 5 years post-surgery), or December 31, 2021. We calculated cumulative incidence functions (CIF) and used Cox regression modeling BMI via splines (reference=25kg/m2). Additionally, we explored synergistic effects of patient, clinical and socioeconomic factors through stratification and interaction analyses.

Results
We identified 33,926 CRC patients (median follow-up: 4.4 years for recurrence and 4.5 for mortality), 5,877 developed CRC recurrence (CIF=18.4%) and 6,568 died (CIF=21.8%). No clear associations were seen between BMI and CRC recurrence. Underweight (BMI<18.5kg/m2), and class II-III obesity (BMI>35kg/m2) were associated with increased mortality—the latter particularly among individuals aged 30-50 years, rectal cancer, and males. While the mortality seemed driven by obesity itself, age, male sex, short education, smoking and especially comorbidities amplified the mortality risk in underweight.

Conclusions
We found no clinically meaningful association between BMI and CRC recurrence. Underweight and class II-III obesity were associated with increased mortality, with notable variations by age, sex, tumor localization and comorbidities. Targeted interventions addressing increased mortality in these subgroups may improve outcomes for CRC patients.

#93: Lung cancer risk and mortality in patients with interstitial lung disease: A nationwide matched cohort study

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Abstract
Introduction
Interstitial lung disease (ILD) and lung cancer share common risk factors, leading to a heightened risk of lung cancer development and associated mortality in ILD patients. However, long-term studies in this fi eld are sparse. This study assesses the 10-year risk and prognosis of lung cancer in patients with ILD versus the general Danish population.

Methods
Utilizing Danish nationwide health registries, we included all patients with ILD (1995-2022), each matched with up to 10 individuals from the general population on birth year and sex. All individuals were followed for up to 10 years from ILD diagnosis to assess lung cancer incidence. Lung cancer patients were followed from diagnosis to death. Ten-year lung cancer risks were calculated, and 10-year overall mortality following lung cancer diagnosis was assessed, both using the Aalen-Johansen estimator.

Results
The study included 34,613 patients with ILD (men: 58%, median age: 64 years) and 318,082 matched comparators. Lung cancer incidence was 3.0% (95% CI: 2.8%, 3.2%) in patients with ILD and 1.6% (95% CI: 1.6%, 1.7%) in comparators. After lung cancer diagnosis, patients with ILD had higher 10-year mortality (80% versus 75%). Older age and male gender were associated with increased lung cancer risk and all-cause mortality.

Conclusion
Patients with ILD have an increased risk of lung cancer compared to matched comparators and further exhibit a higher mortality risk following lung cancer. Male gender and advanced age further elevate these risks. Due to the high risk, targeted surveillance programs should be considered to facilitate early detection and improve outcomes of lung cancer in ILD.

#94: National Real-world data for avelumab first-line maintenance therapy in meta-static urothelial carcinoma in Denmark

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Abstract
Introduction
Avelumab first-line maintenance therapy has been a standard of care for metastatic urothelial carcinoma (mUC) following non-progression after end of platinum-based chemotherapy in Denmark since June 2021. The aim of this real-world study is to establish the outcomes and safety of avelumab as first-line maintenance treatment in Denmark.

Materials and methods
This was a nationwide retrospective analysis of the first 125 consecutive patients with mUC treated with avelumab in Denmark. The data were collected from six onco-logical departments, with the first patient treated on July 16th, 2021. The data cutoff was July 2024. We assessed treatment duration, reason for treatment discontinuation, median overall survival (mOS), and toxicity.

Results
At data cutoff , 22 of 103 patients were still on treatment. A notably high proportion of patients had primary tumor in the upper urinary tract (35%), while the majority had bladder tumors (61%). First-line Cisplatin-based chemotherapy was administered in 54% of cases, carboplatin in 40%, and the remaining 6% of patients switched from cisplatin to carboplatin. The median number of avelumab cycles was 7.5, with dis-ease progression being the most frequent reason for discontinuation. The mOS from the start of avelumab was 23.8 months (95% CI 16.9 – NA). Grade 3 CTCAE toxicity included pneumonitis (3 cases), myositis (2 cases), skin rash (1 case), and liver affection (1 case). Grade 4 CTCAE toxicity included pancreatitis (1 case), liver affection (1 case), myositis (1 case), and myocarditis (1 case).

Conclusions
The observed mOS and toxicity in this Danish real-world cohort were comparable to follow up data from the registration trial, and several international real-world studies.

#95: Early-onset keratinocyte carcinoma and risk of other malignancy before age 50: a nationwide cohort study

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Abstract
Introduction
Keratinocyte carcinoma (KC) is the most common malignancy in Caucasians, primarily affecting individuals over 60. However, early-onset KC (eoKC) in younger individuals is a growing concern, as it may contribute to an increased future burden of skin cancer and may be linked to other early-onset primary malignancies. This study investigates the relationship between eoKC and other early-onset cancers to determine whether this patient group should receive enhanced surveillance and potentially genetic counseling.

Methods
We conducted a nationwide cohort study using data from Danish registries. The cohort included 1,263,544 individuals born between 1960 and 1972, followed from age 20 to 50. Individuals diagnosed with basal cell carcinoma or squamous cell carcinoma before age 40 were classified as eoKC. We analyzed the incidence of subsequent non-melanoma skin cancer (NMSC) and other primary cancers before age 50, comparing patients with eoKC to a control group.

Results
Within the cohort, 3,471 individuals were diagnosed with eoKC, resulting in an incidence rate of 14.5 per 100,000 person-years. The majority developed only one case of NMSC before age 50. Patients with eoKC had a significantly higher risk of developing other primary cancers before age 50 (HR 2.60, 95% CI: 2.34–2.90), with a higher risk in males (HR 3.14) than females (HR 2.17).

Conclusion
We found a significantly higher incidence of non-NMSC primary cancers in individuals with eoKC compared to those without KC. Our findings highlight the need to inform patients with eoKC and their healthcare providers about the increased risk of developing primary cancers other than NMSC.

#96: Impact of Waiting Time Before Surgery on Survival in Bile Tract Cancer

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Abstract
Background
Biliary tract cancer is characterized by an increasing incidence and low overall survival rates. The waiting time to receive first-line treatment may be considered an obstacle to successful treatment. However, controversy has arisen as different authors have concluded that extended waiting times for surgery in digestive cancers do not affect survival.

Methods
This was a retrospective, nationwide, multicenter, cohort study based on data from patients surgically treated for intrahepatic cholangiocarcinoma (iCCA), perihilar cholangiocarcinoma (pCCA), and gallbladder cancer (GBC) from 2013 to 2023. Survival was compared using the Kaplan-Meier estimator. Cox regression models were conducted to assess overall survival and linear regression models investigated predictors.

Results
A cohort of 464 patients was analyzed. The median waiting time from diagnosis to surgery for the entire cohort was 28.0 days, with an interquartile range (IQR) of 20.0-41.0 days. Subgroup analysis revealed a median waiting time of 31.0 (20.0-43.5) days for patients with iCCA, 32.0 days (IQR: 21.0- 43.0) days for patients with pCCA, and 27 days (IQR: 18.0-40.5) for patients with GBC. Survival rates did not show statistically significant differences when comparing patients with waiting times above or below the median for any cancer subtype (iCCA: p=0.13, pCCA: p=0.22, and GBC: p=0.47). Low performance status and exploratory laparotomy were factors associated with higher risk of mortality (p=0.025 and p<0.001, respectively). Gallbladder cancer (β = -4.61, 95% CI: -8.14 to -1.08, p= 0.010) and resection of extrahepatic bile ducts (β = 4.99, 95% CI: 0.27 to 9.55, p= 0.039) were predictors of waiting time.

Conclusion
Survival in patients with biliary tract cancer was not impacted by the waiting time from diagnosis to surgery. GBC and resection of the extrahepatic bile ducts predicted waiting time. Low performance status and exploratory laparotomy increased the risk of mortality.

#97: Risk Factors of Mortality in Blood Stream Infections: A Danish Cohort Study of Patients with B-Cell Malignancies

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Abstract
Introduction
Blood stream infection (BSI) is an important cause of mortality in patients with B-cell malignancies (BCM). The mortality may depend on causative pathogen and patient-related factors, but data are sparse. We aimed to describe the causative pathogens and identify risk factors of mortality after BSI in patients with BCM.

Materials and methods
We performed a cohort study of patients diagnosed with BCM in the North Denmark Region (2013-2022) using data from Danish cancer databases, a microbiology laboratory system, and electronic health records. Trends in distribution of causative pathogens during the study period was examined. Crude and adjusted logistic regressions were conducted to establish risk factors of early mortality after a BSI.

Results
Among 2778 patients with BCM, 1590 patients (57.2%) had minimum one blood culture (BC) drawn. A total of 339 patients (21.3%) had minimum one BSI with a median follow-up of 77 months (95% CI: 70—85). The remaining 1251 (78.7%) patients had only negative BCs with a median follow-up of 68 months (95% CI: 65—73). A total of 482 positive BCs were analyzed, and the most frequent causative pathogens were E. coli (24.7%), Klebsiella spp. (9.3%) and S. aureus (8.1%). During the 10-year period, the frequency of Gram-negative bacteremia (GNB) increased from 42.5% in 2013-2014 to 58.1% in 2021-2022. The 30- and 90-day mortality after fi rst episode of a BSI were 19.2% (95% CI: 15.2—23.9) and 28.0% (95% CI: 23.4—33.2), respectively. In comparison, the mortality after fi rst negative BC in patients who never had a BSI were 9.2% (95% CI: 7.7—11.0) and 15.6% (95% CI: 13.6—17.7), respectively. Analyses on risk factors of early mortality are presented at the conference.

Conclusions
BSIs remain a frequent complication in patients with BCM. GNB are dominating with E. coli as the most frequent pathogen, and almost one third of patients died within three months after their infection. Final conclusions are presented at the conference.

#98: Oncological outcomes in elderly patients with non-metastatic colorectal cancer - a nationwide cohort study

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Abstract
Introduction
Increasing life expectancy has lead to more octogenarian (80+ years) colorectal cancer (CRC) patients. This study estimates and compares oncological outcomes in octogenarian CRC patients compared to patients aged 70-79 years (septuagenarians).

Material and methods
This nationwide cohort study included all +70 years old Danish patients operated for UICC stage I-III CRC between January 2010 and December 2019. Overall survival (OS) was estimated using the Kaplan-Meier method. Recurrence status was determined for patients that were disease-free 6 months postoperative by applying a validated algorithm to data from nationwide health registries. The 5-year cumulative incidence functions (CIF) of recurrence and subsequent primary cancers were reported, and hazard ratios (Cox proportional hazards regression: HR, 95% CI) adjusted for patient and tumor characteristics were reported.

Results
Among 14,341 CRC patients, 5,003 (34.9%) were octogenarians. The 5-year overall survival was 50% (95% CI: 49%-51%) in octogenarians compared to 75% (95% CI: 74%-76%) in septuagenarians, HR=2.21 (95% CI: 2.09-2.35). The mortality ratio was highestin the early postoperative phase, with a synergistic effect between age and preoperative performance score assessment. The 5-year CIF of recurrence was 16% (95% CI: 15%-18%) in octogenarians compared to 18% (95% CI: 17%-19%) in septuagenarians, HR=0.94 (95% CI: 0.86-1.03). A smaller fraction of octogenarian recurrences were diagnosed at the timepoints of surveillance CT scans at 12 and 36 months postoperative (according to Danish guidelines); 24% in 80+ group vs. 30% in septuagenarians. The 5-year CIF of subsequent primary cancers did not diff er between the groups, HR=0.90 (95% CI: 0.78-1.03).

Conclusions
Short-term mortality was high in octogenarians, while the incidence of recurrence and SPCs were comparable to septuagenarians. Preoperative risk assessment seems important in order to achieve long-term disease-free survival.

#99: The impact of obesity on cancer mortality among patients undergoing systemic anti-cancer therapy

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Abstract
Introduction
Although obesity is prevalent among cancer patients, knowledge of its impact on cancer prognosis is challenged by limited registration of anthropometric data. In the North Denmark Region, weight and height are systematically recorded in the 'MedOnc' database to administer systemic anti-cancer therapy (SACT). This enabled us to investigate the impact of body mass index (BMI) at initiation of SACT on cancer mortality.

Materials and methods
We established a population-based cohort of adults residing in the North Denmark Region during 2008-2021,who were alive six months after being diagnosed with first primary cancer. The analyzed cohort comprised 8,504 (23%) patients initiating SACT within six months from diagnosis. BMI (weight/height^2) at SACT initiation was obtained from MedOnc. Associations between BMI and mortality were estimated in confounder-adjusted Cox regression models and flexible covariate effects with splines on BMI. Subanalyses explored the impact of cancer type, stage at diagnosis, treatment type and socioeconomic position.

Preliminary results
The distribution of BMI was 3% underweight (BMI<18.5); 42% normal weight (BMI=18.5-24.9); 35% overweight (BMI=25-29.9); 20% obesity (BMI ≥30). Across most cancer sites and covariates, we observed a U-shaped pattern with underweight and class II-III obesity (BMI≥35) associated with increased mortality; overweight and class I obesity associated with decreased mortality, compared with normal weight. These associations were most evident for breast, endometrium, ovarian, oral cavity, colon and stomach cancers, but inconsistent for lung, pancreas, urinary and rectum cancers.

Conclusions
For most, but not all, cancer sites, our preliminary findings indicate longer survival for patients who have overweight or class I obesity at initiation of SACT. To further explore this pattern, we advocate for national systematic registration of anthropometric measurements across the lifespan and cancer trajectory.

11. Clinical epidemiology and database research II #100-109

#100: Cancer care at the end of life: System wide expenditure in a national health service

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Abstract
Introduction
The provision of specialised palliative care (SPC) and timely discontinuation of cancer-directed treatments (CTT) are increasingly seen as important in cancer care at the end of life (EoL). EoL cancer care decisions are often initiated in the hospital, but little is known about associated expenditure in other parts of the health system.

Aim
Our primary objective: examine the total expenditure across different care settings associated with exposure to SPC and timely discontinuation of CTT for patients with cancer during the last month of life. Our secondary objectives: examine 1) how expenditure across care settings developed over time and 2) how SPC and timely discontinuation of CTT were related.

Materials and methods
Using the valid and full Danish register data, we conducted a nationwide matched cohortstudy (2011-2018) analyzed care expenditure in various settings during the last four weeks of life for cancer patients, estimating costs with GLM and GEE models, and using logistic regression to assess SPC and timely discontinuation of CTT.

Results
Toal EoL care expenditure in the last month of life was €3,140 (96% CI €-3,433 to €-2,848) lower for SPC patients, mainly due to reduced hospital costs. Individuals exposed to timely discontinuation of CTT had €3,430 (95% CI €-3,649 to €-3,211) lower costs per patient despite higher community, home-based, hospice, and primary care costs.

Conclusion
Our findings show how EoL care expenditure develops during cancer patients' final month of life and can inform policymakers about the potential implications across the health system of changes in EoL care patterns.

#101: Quality indicators and development targets in the clinical quality registries for cancers and non-cancer diseases

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Abstract
Introduction
The Danish clinical quality registries contribute to improving the quality of care, using indicators and development targets. Variations in fulfillment of development targets between registries was previously illustrated in cancer on national and regional level. This study aims to investigate fulfillment of development targets, across all registries for cancers and non-cancer diseases on hospital level.

Materials and methods
Annually summarized data from Danish clinical quality registries (2019-2023) were accessed on hospital level. The proportion of fulfilled development targets were presented overall and in strata according to whether the indicators were established or supplemental, whether they were describing process, results, or data quality, and whether the registry is covering a cancer or a non-cancer disease.

Results
The data evaluated 5,554,623 patient pathways on hospital level. A total of 639 indicators were included from 64 registries. Development targets were fulfilled for 57% of the indicators (median 58% IQR 44-76% range 3-100%). Among the established and the supplemental indicators 56% and 44% of the development targets were fulfilled, respectively. Across the registries, 44% of the process-, 68% of the result-indicators, and 69% of the data-quality indicators were fulfilled. Within the 23 registries covering cancer, 63% (median 60% IQR 49-76% range 12-95%) development targets were fulfilled. Within the 41 registries covering non-cancer disease, 54% (median 54% IQR 38-75% range 3-100%) development targets were fulfilled.

Conclusions
The Danish clinical quality registers varied in defining development targets, ranging from very conservative to very ambitious. Overall, the development targets were more ambitious for supplemental compared to established indicators, more ambitious for process indicators than for result- and data-quality indicators, and more conservative in registries on cancer than non-cancer disease.

#102: Social vulnerability and adherence to adjuvant endocrine therapy in premenopausal women with breast cancer – a Danish population-based cohort study

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Abstract
Introduction
Adjuvant endocrine therapy (AET) lowers breast cancer recurrence risk. Yet, many women do not adhere to the recommended five years of treatment. Social vulnerability describes a person's overall social situation. We investigated the association between social vulnerability and AET adherence.

Materials and methods
Using population-based registries, we assembled a cohort of premenopausal women diagnosed with stage I-III, estrogen receptor positive breast cancer in Denmark (2002-2011). We applied a registry-based social vulnerability index (rSVI), combining data on marital status, ethnicity, education, income, employment, psychiatric and somatic comorbidity (range 0–14). A score ≥5 defi ned social vulnerability. We obtained data on AET use from the Danish Breast Cancer Group and defi ned two adherence measures: 1) adherence patterns over five years using group-based trajectory modelling and 2) early discontinuation, as stopping AET >6 months before end of follow-up. We estimated the association of social vulnerability with AET adherence using age-adjusted multinomial and logistic regression. To assess the shape of the association between the continuous rSVI score and adherence, we used restricted cubic splines.

Results
Among 4,279 women, 10% were categorised as socially vulnerable. We identified three AET adherence patterns—high adherence (57%), slow decline (36%) and rapid decline (6.9%); 17% discontinued early. Socially vulnerable women had lower AET adherence than the remaining cohort. The odds ratios (OR) and 95% confidence intervals were 1.29 (1.04, 1.60) and 2.38 (1.72, 3.30) for slow and rapid decline, both compared with high adherence, and 1.77 (1.40, 2.24) for early discontinuation. The splines suggested positive, linear associations for continuous rSVI score and AET adherence.

Conclusions
Social vulnerability is associated with lower AET adherence. Our results may inform the development of targeted interventions to increase AET adherence.

#103: Optimering af udredningsforløbet for patienter henvist på mistanke om lungekræft: skal PET-CT foretages før eller efter første lægekontakt?

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Abstract
Introduktion
Omkring 1100 patienter kommer årligt til forundersøgelse i Infiltratenheden, Bispebjerg Hospital, på mistanke om lungekræft. Indtil 1. juli 2024 mødte patienterne som det første op til en samtale med en læge, som informerede om mulige invasive undersøgelser afhængigt af fund på en PET-CT scanning, som blev udført 1-3 dage efter samtalen. Efter 1. juli 2024 blev det indført, at patienterne fik foretaget PET-CT scanning før forundersøgelsen.Dette studie ser på, om den indførte ændring har nedbragt antallet af aflysninger af de på forhånd planlagte invasive undersøgelser på dagen samt hvorvidt den enkelte patients udredningsforløb er optimeret.

Metode
Studiet er et retrospektivt deskriptivt kohortestudie med inklusion af patienter >18 år i perioden 01.01.2024-31.11.2024 henvist under diagnosen ”Obs. pga. mistanke om kræft i lunge” til lungemedicinsk afd., BBH.

Resultater
196 patienter blev inkluderet, hvoraf 107 fik foretaget PET-CT efter forundersøgelsen mens 89 fik foretaget PET-CT før forundersøgelsen. I gruppen som fik lavet PET-CT efter forundersøgelse, blev 102 patienter (95%) informeret om bronkoskopi og EBUS, men kun 78 fik lavet undersøgelsen. I samme gruppe fik 64 (60%) information om CT-vejledt biopsi men blot 43 fik foretaget denne undersøgelse. I gruppen hvor PET-CT blev udført før forundersøgelsen blev 61 (69%) informeret om bronkoskopi og EBUS, hvoraf ingen blev aflyst, mens 32 (36%) blev informeret om CT-vejledt biopsi, hvoraf ingen blev aflyst.

Konklusioner
Dette studie viser at hvis PET-CT scanningen bliver foretaget før forundersøgelsen, er der meget færre ændringer i udredningsplanen end hvis PET-CT foretages efter forundersøgelse. Således bliver patienterne sparet for unødvendig information om invasive undersøgelser, eventuel bekymring og tiderne som ellers var reserveret til invasiv undersøgelse, kan frigøres til andre. Dette giver en bedre og mere målrettet patient-information samt en bedre udnyttelse af de daglige ressourcer.

#104: Natural Language Processing for Identifying Side Effects of Cancer Treatment from Electronic Health Records

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Abstract
Introduction
Adverse events of immune checkpoint inhibitors (CPIs) are often underreported and typically seen as an expected part of treatment. Many lack ICD-10 codes, limiting research on their prevalence and impact. However, these symptoms are frequently recorded in electronic health records (EHRs). Given the scale of such data, manual review is impractical, requiring automated methods. We developed a model that uses natural language processing (NLP), a technique that helps computers understand written text, to identify colitis in CPI patients.

Materials and methods
A doctor created an initial list of colitis-related terms, which served as a starting point for an NLP model. The model used information from 299,718 Danish EHRs to learn how these terms appeared in clinical text, enabling it to find additional, similarly used terms and account for variations in wording and synonyms. Two doctors independently reviewed the resulting list to ensure relevance. Once approved, we used the final word lists to scan CPI patients' records using a pattern-matching method, flagging entries that might indicate colitis.

Results
The initial list contained 48 terms. The NLP model identified 16,756 related terms, of which 5,647 were confirmed as relevant through expert review. These terms were used to generate over two million word combinations related to colitis symptoms. We tested the method on 67 patient records and found no false positives or negatives. Applied to a cohort of 946 CPI patients with 620,781 clinical notes, the model flagged 17,752 entries, eliminating 97% of non-relevant information and significantly reducing the burden of manual review to confirm suspected cases of CPI-related colitis.

Conclusions
This demonstrates that NLP models can optimise identification of CPI-related side effects, such as colitis, from unstructured EHR text. The approach is scalable, and can be adapted to detect other complications of cancer treatment, aiding research and clinical care.

#105: Risk-reducing and survival effects of risk-reducing surgeries in 3067 Danish BRCA1/2 carriers: a population-based study with matched controls

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Abstract
Introduction
Female BRCA1/2 carriers are at high lifetime risk of breast and ovarian cancer compared with the background population. Risk-reducing bilateral mastectomy (RR-BM) and salpingo-oophorectomy (RR-BSO) are preventive options carriers, but to optimize decision-making, we need more knowledge on the risk-reducing and survival effects of these surgeries. This study aimed to examine the oncological effects of risk-reducing surgeries in a nationwide Danish cohort with matched controls.

Material and methods
Between the years 2000 and 2022, we included 3,067 unaffected female BRCA1/2 carriers and 30,652 age-matched controls from the general population. Information on surgeries and outcomes were retrieved from health registers. The hazard ratios (HR) for breast cancer and overall mortality according to the risk-reducing surgeries were assessed using Cox proportional hazards models with 95% confidence intervals (CI).

Results
The median ages were 39 years, and the median follow-up times from the index date were 4.5 years. Compared to controls, BRCA1/2 carriers had a significantly increased HR for breast cancer before RR-BM (adjusted HR 7.40, CI 5.81–9.42) and higher overall mortality before RR-BM, although not statistically significant (adjusted HR 1.41, CI 0.99–2.02). RR-BM reduced the hazard rate of breast cancer by 94 % (adjusted HR 0.06, CI 0.01–0.25), while RR-BSO did not (adjusted HR =1.31, CI 0.90–1.91). Neither RR-BM nor RR-BSO statistically significantly reduced overall mortality, although RR-BM was borderline significant (adjusted HR for RR-BM 0.34, CI 0.10–1.15; adjusted HR for RR-BSO 0.93, CI 0.49–1.77).

Conclusions
RR-BM's large protective effect against breast cancer in BRCA1/2 carriers was confirmed, in contrast to that of RR-BSO. There were tendencies towards a reduction in overall mortality rates after RR-BM, and compared with controls, we saw tendencies towards higher mortality rates before RR-BM.

#106: Routes to cancer diagnosis in migrant populations in Denmark: A population-based nationwide cohort study

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Abstract
Introduction
Migrants are often diagnosed with cancer at more advanced stages than the background population, resulting in poorer outcomes. Prognosis is also associated with the route to cancer diagnosis (RtD), but our knowledge of diagnostic pathways for migrants is sparse. This study aimed to describe and compare the RtDs for migrant groups in Denmark.

Materials and methods
We conducted a nationwide cohort study using Danish registry data, including incident cancer patients aged ≥ 18 years, diagnosed between 2014-2018 (n = 154,647). 5.2% of the study population were migrants, defi ned by Statistics Denmark as individuals born abroad, where neither parent was both born in Denmark and a Danish citizen. Using the UN M49 Geoscheme, we categorized the study population into 15 groups based on country or region of origin, including a reference group of Danish origin. Each patient was assigned to one of six distinct RtDs. We used multinomial logistic regression models to assess the association between migrant group and RtD. Analyses were adjusted for sex and age.

Results
Preliminary: 44.6% of patients of Danish origin were diagnosed through a Cancer Patient Pathway (CPP), i.e., a fast-track referral from primary care, compared with 36.9% to 40.9% for migrants of African, Western Asian (excluding Turkey), Turkish, or German origin. Migrants from Germany, Turkey, Former Yugoslavia, Western Asia, and Africa were more likely to be diagnosed via unplanned hospital admission relative to a CPP from primary care compared with patients of Danish origin (RRRs: 1.32, 95% CI 1.11-1.57; 1.63, 95%CI 1.27-2.11; 1.26, 95% CI 1.03-1.55; 1.59, 95% CI 1.26-2.00; and 1.98, 95% CI 1.54-2.54 respectively).

Conclusion
Some migrant groups were more likely to be diagnosed through unplanned hospital admission relative to a CPP from primary care compared with patients of Danish origin, which might be related to the prognosis. The findings may help improve cancer workup for migrants in Denmark.

#107: Disparities in Standard First-Line Cancer Treatment and Survival for Patients with Immigrant Background: A Danish Register-Based Cohort Study

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Abstract
Introduction
As the immigrant population in Denmark grows and ages, an increasing number of individuals with immigrant backgrounds will require cancer care. Limited research has suggested worse outcomes for this group.

Methods
Using data from the Danish Multidisciplinary Cancer Groups, we established a cohort of 116,591 patients aged 50+ diagnosed with primary prostate, kidney, lung, colon, or rectum cancer in Denmark during 2011–2022. Associations between country of origin and 1) not initiating standard first-line treatment and 2) death were analyzed using multivariate regression and survival models adjusted for age, year of diagnosis, sex, education, cohabitation status, comorbidities, mental health, and stage at diagnosis.

Results
Most findings were not statistically significant, likely due to small sample sizes. Compared to Danish-born patients, patients from Western countries had an odds ratio (OR) of 1.25 [95%CI 1.02;1.52] for not initiating first-line treatment for prostate cancer. Patients from Central and Eastern Europe had an OR of 1.32 [95%CI 1.01;1.72] for not initiating first-line treatment for lung cancer. No statistically significant ORs for not initiating first-line treatment were observed for immigrants from Middle East or North Africa. Hazard ratios (HR) of death were lower across immigrant groups compared to Danish-born patients, although not all estimates were statistically significant. However, there were some indications for increased HR of death for rectum patients from Western countries and Central and Eastern Europe with HRs of 1.17 [95%CI 0.93;1.47] and 1.24 [95%CI 0.90;1.72], respectively.

Conclusion
Access to cancer treatment and overall survival vary by immigrant background for prostate, kidney, lung, colon, or rectum cancer, but no clear disparity pattern emerges across immigrant groups. Still, the results indicate potential disparities that could guide targeted interventions, but small sample sizes limit statistical power.

#108: Depression efter kræft: En populationsbaseret registerundersøgelse af forekomsten fordelt på kræfttype, køn, alder og tid siden diagnosen

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Abstract
Introduktion
En kræftdiagnose kan påvirke mental sundhed betydeligt, men vi mangler viden om højrisikogrupper. Vi ønskede at estimere kumulativ forekomst af depression blandt kræftoverlevere sammenlignet med kræftfrie personer samt at undersøge hvor stor en rolle køn, alder, prognose og tid siden kræftdiagnose spiller.

Metode
I dette landsdækkende registerstudie indgik voksne diagnosticeret med første primær kræft mellem 1997-2022 og kræftfrie personer matchet (1:5). Depression blev defineret via receptindløsning af antidepressiv medicin eller hospitalsdiagnose. Vi udførte analyser samlet og for de 25 mest udbredte kræftformer og anvendte Aalen-Johansen-estimator til at beregne 1- og 10-års kumulativ forekomst, og Poisson-regression til at estimere incidens rate ratio (IRR) i forhold til køn, alder, prognose og tid siden kræftdiagnose.

Resultater
Blandt 532.747 kræftoverlevere og 2.663.735 kræftfrie var den 10-årig kumulative forekomst af depression højere blandt kræftoverlevere(19,9%, 95% CI 19,8–20,6%) end kræftfrie(16,0%, 95% CI 15,9–16,0%). Første år efter diagnosen var risikoen for depression blandt kræftpatienter højst hos kvinder(IRR 1,07, 95% CI 1,04–1,10), ældre personer(IRR ≥80 vs. 60–69 år: 1,23, 95% CI 1,19–1,27) og blandt kræfttyper med den dårligste prognose(IRR overdødelighed <20% vs. ≥40%: 0,28, 95% CI 0,28–0,29). Alders- og kønsforskelle var væsentlig større blandt kræftfrie(IRR kvinder vs. mænd: 1,31, 95% CI 1,23–1,40; IRR ≥80 vs. 60–69 år: 2,45, 95% CI 2,38–2,52). Forekomsten af depression var forhøjet mere end ti år efter kræftdiagnosen, mens køns- og aldersspecifikke forskelle nærmede sig den kræftfrie kohorte.

Konklusion
Hver femte kræftoverlever behandles for depression inden for 10 år. Forekomsten er højest ved dårlig prognose og mindre afhængig af køn og alder end i befolkningen generelt. Depression er fortsat hyppig mere end 10 år efter diagnosen, hvilket understreger behovet for langvarig opmærksomhed på depression hos kræftoverlevere.

#109: Sex Differences in Stage at Diagnosis, Treatment, and Survival for Lung, Colorectal, and Head and Neck Cancers: A Danish Registry-Based Study

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Abstract
Introduction
Males generally experience lower survival than females for most non sex-specific cancers. The reasons behind this disparity remain insufficiently understood. One critical factor that correlates with survival is stage at diagnosis. Further, treatment decisions, largely influenced by cancer stage and comorbidity, impact survival outcomes. This study aims to investigate sex differences in stage, treatment, and survival for lung, colorectal, and head and neck cancers.

Materials and methods
We used data from the Danish Lung Cancer Registry, the Danish Colorectal Cancer Group, and the Danish Head and Neck Cancer Study Group. The cohort comprised individuals aged ≥30 years diagnosed with a non-small cell lung cancer or cancers of the colon, rectum, or head and neck in 2010-2021. Sex differences in stage were assessed estimating male-to-female (M:F) odds ratios (OR) via multinomial logistic regression models. Sex differences in treatment and five-year survival will be analyzed using binary logistic regression models and Cox proportional hazards models, respectively. For all estimates 95% confidence intervals (CIs) will be reported.

Results
For colon cancer, females had higher odds of being diagnosed at advanced stages (e.g., M:F OR stage IV: 0.94, 95% CI 0.91–0.97). Males diagnosed with rectal cancer had higher odds of stage II (M:F OR 1.16, 95% CI 1.09–1.23) and females had higher odds of stage III (M:F OR 0.92, 95% CI 0.87–0.97). For lung cancer, males had higher odds of advanced stage diagnosis (e.g., M:F OR stage IV: 1.15, 95% CI 1.11–1.18). Analyses for head and neck cancers as well as sex differences in treatment and survival are ongoing and will be presented at the conference.

Conclusion
Our findings reveal sex differences in cancer stage, potentially contributing to a male disadvantage in cancer survival. Understanding these disparities including the contribution from comorbidity and treatment is essential to improve cancer outcomes for both sexes.