2015 Annual Meeting

NORTHERN NEW ENGLAND
CLINICAL ONCOLOGY SOCIETY

NNECOS
ASSURING ACCESS TO HIGH QUALITY CANCER CARE

Program & Abstracts

So. Portland, ME
October 23-24, 2015
Welcome to So. Portland and the 2015 NNECOS Annual Meeting!

Thank you for joining us for our annual meeting at the Portland Marriott at Sable Oaks. In addition to the fabulous slate of speakers presenting the latest in clinical advances and practice updates, we invite you to also take advantage of the opportunity to network with colleagues from across the region. Together, professionals must participate in the political, economic, and scientific debates that challenge the cancer care community nationwide.

Please be sure to take the time to visit with the representatives of the companies who have helped to support our society throughout the year in the NNECOS Networking Lounge, located in the Casco Bay Ballroom.

At the conclusion of the meeting, we ask that you complete and submit your evaluation, allowing you to obtain educational credit, and providing feedback to help shape future educational events.

2015 Annual Meeting Planning Committee

Lori Aubrey, Martha Byrne, Rob Ferguson, Charlene Forcier, Steve Larmon, Amy Litterini, Kathy McBeth, Elizabeth McGrath, Ken Meehan, Nicole Messier, Tom Openshaw, Sunil Patel, Amy Stansfield, Doug Weckstein, Tracey Weisberg, Marie Wood

CONTENTS

Welcome ................................................................................................................................. 2
Agenda ................................................................................................................................. 3
Abstract Table of Contents .............................................................................................. 5
2015 Annual Meeting Abstracts ....................................................................................... 7
2015 Member Practices ..................................................................................................... 28
Research Funding Opportunities .................................................................................... 30
2015 Corporate Supporters ............................................................................................. 31
### AGENDA
**FRIDAY, OCTOBER 23, 2015**

**PALLIATIVE CARE SYMPOSIUM**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 8:30 AM    | OPENING KEYNOTE: Addressing Religion and Spirituality in the Care of Patients with Advanced Cancer  
**Andrea Enzinger, MD** |
| 9:30 AM    | CONCURRENT SESSIONS: Nuts and Bolts of Outpatient Care  
**Mark Wrona, MD, Jim VanKirk, MD**  
Consider the Conversation - Part 1  
**Carol Schoneberg-Robinson, HSM, Judy McInness, Rev. Larry Greer, MA, Tom Keating, MD, Stephanie Carpenito, RN** |
| 10:25 AM   | BREAK                                                                                     |
| 10:40 AM   | CONCURRENT SESSIONS: Cancer Related Anorexia and Cachexia  
**Charles Loprinzi, MD**  
Consider the Conversation - Part 2 |
| 11:40 AM   | GENERAL SESSION: Early Referral to Palliative Care  
Panel; **Moderated by Carol Schoneberg-Robinson, HSM; Bonnie Glynn, Jim Van Kirk, MD, Mark Wrona, MD, Tom Keating, MD.** |
| 12:30 PM   | SYMPOSIUM LUNCH                                                                 |

### ANNUAL MEETING BEGINS
**12:00 PM LUNCH/EXHIBITS**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 1:00 PM    | OPENING SESSION: Current Challenges of Survivorship  
**Ann H. Partridge, MD, MPH** |
| 2:00 PM    | CONCURRENT SESSIONS: 2:00 - 3:30 PM EXTENDED PANEL  
Components of Survivorship: Physical Activity, Nutrition and Psychosocial Health  
**Rob Ferguson, PhD, Amy Litterini, DPT, Robert Zembroski, DC, CACNB, MS; Denis B. Hammond, MD - Facilitator**  
2:00 - 2:45 PM How Oncologists Will Get Paid: An Update on Payment Reform, **Christian A. Thomas, MD** |
| 3:30 PM    | NETWORKING BREAK                                                                            |
| 4:00 PM    | ELAINE TOWLE LECTURE: Oncology Medical Homes: Why & How?  
**Barbara McAneny, MD** |
| 5:00 PM    | ASCO ADVOCACY  
**Caitlin Demchuk, MPP**  
10TH ANNUAL ABSTRACT POSTER SESSION  
Cocktail Reception |
| 5:30 PM    | DINNER PROGRAM  
10:00 PM | 6:45 PM WELCOME                                                                               |
| 7:00 PM    | 2ND ANNUAL STEVEN M. GRUNBERG, MD MEMORIAL LECTURE: Chemotherapy Induced Peripheral Neuropathy, **Charles Loprinzi, MD**  
8:30 PM BUSINESS MEETING |
8:35 AM GENERAL SESSION
Interpretation of Genomic Tests: Identifying Potential Therapies / Clinical Trials
Lajos Pusztai, MD

9:30 AM CONCURRENT SESSIONS
Unanticipated Consequences of Tumor-based Genomic Testing
Susan Miesfeldt, MD

Nutrigenomics for the Cancer Patient, Robert Zembroski, DC, CACNB, MS

10:45 AM CONCURRENT SESSIONS
Genomics Track
• 10:45 AM Tumor Genomic Profiling: Generating Useful Clinical Reports
  Nikoletta Sidiropoulos, MD
• 11:30 AM Molecular Tumor Board; Marie Wood, MD, Moderator

Research Panel: What does the nurse need to know?
Patricia A. Gowland, RN, MSN, OCN, CCRC; Carol Hawkes, RN, MS; Kathryn Carpenter, RN, BSN, DHMC, Moderated by Karen Wilson, MS.

12:00 PM LUNCH/EXHIBITS

12:55 PM ABSTRACT PRESENTATIONS
• Plasma Ghrelin Levels in Patients with Pancreatic Ductal Adenocarcinoma; Ananta Bhatt, MD
• Using a Molecular Tumor Board to Review Potential Mutation Driven Treatment Decisions; Jason Peterson, MS

• Contribution of Extended Family History in Assessment of Risk for Breast and Colon Cancer; Benjamin Solomon, MD

12:55 PM Surgical Breakout
American College of Surgeons Commission on Cancer Quality Tools; Brad Waddell, MD, FACS

2:00 PM CONCURRENT SESSIONS
CLL: An update on how novel drugs and discoveries are changing treatment paradigms
Jens Rüeter, MD

Surgical Breakout: Treatment of Hepatic Metastases from Colorectal Cancer
Richard J. Barth, Jr., MD

Nursing Leadership Panel
Emma Dann, RN, MS, OCN; Nicole Messier, RN, BSN; Dawn Whitten, RN, BSN, OCN, CBCN; Facilitated by Elizabeth McGrath, DNP, APRN, AGACNP-BC, AOCNP, ACHPN, DHMC

3:00 PM CONCURRENT SESSIONS
Multimodality Management of Gastric Cancer
John S. Macdonald, MD

Surgical Breakout: Minimally Invasive Thoracic Oncologic Surgery
Tracey Weigel, MD

New Drug Updates - Nivolumab, Pembrolizumab and Blinatumumab
Robert Cade, PharmD, BCOP

4:00 PM NETWORKING RECEPTION FOR SURGICAL ONCOLOGISTS (BY INVITATION)
Somatic Mutation Profiling Using a 50 Gene Cancer Panel: The Dartmouth Experience
F. de Abreu, J. Peterson, C. Amos, W. Wells, G. Tsongalis .............................................. 7

Plasma Ghrelin Levels in Patients with Pancreatic Ductal Adenocarcinoma*
A. Bhatt, H. Lee, J. Mills, et al................................................................. 7

Novel Combination Therapy for Successful Management of Concomitant Post-Transplant CLL Relapse and Graft-Versus-Host Disease
E. Brosnan, J. Hill .................................................................................. 8

Venous thromboembolism prevention in the ambulatory cancer clinic (VTE-PACC): a quality improvement intervention targeting education and prevention at the University of Vermont Cancer Center (UVM-CC)
D. Douce, N. Zakai, et al ....................................................................... 9

Establishing a safe effective chemotherapy desensitization program
N. Fine .................................................................................................. 10

Implementation of a College of American Pathologists Accredited Institutional Biorepository
T. Gallagher, J. Gonzalez, G. Tsongalis, W. Wells ........................................ 10

Esophagectomy in an Octogenarian with Adenocarcinoma of the Esophagus
N. Geissen, D. MacGillivray, T. Weigel .................................................. 11

Post-Transplant Telehealth; Bridging Distance with Technology
J. Hickman, K. Meehan, S. Brighton, K. Wilcox ....................................... 12

Successful Use of Glucarpidase as Treatment for High Dose Methotrexate Nephrotoxicity
A. Hill, E. Bengtson, J. Hill .................................................................. 13

Determining if distress screening leads to the necessary referrals and care for oncology patients
K. Jackson, E. McGrath ........................................................................ 13

Acute inflammatory response and tumor proliferation in human breast cancer
T. James, M. Rincon ............................................................................. 14

Developing Interprofessional Cancer Care Teams: Essentials for Quality Improvement
T. James, J. Page ................................................................................... 15

Digital Imaging as a Quality Control Metric for Next Generation Sequencing
K. Kelly, V. Spotlow, A. Ras, et al ........................................................... 16

Hemophagocytic Lymphohistiocytosis: A Rebellion from the Body’s Immune System
S. Khadanga, H. Rehman, B. Solomon .................................................. 16
Incidence and impact of venous thromboembolism (VTE) in older patients with metastatic colorectal carcinoma—SEER-MEDICARE analysis
   I. Lal, S. Kumar, B. Littenberg, S. Ades

Spinal cord infarction and pulmonary embolism—Recognizing delayed adverse vascular events after splenectomy in hereditary spherocytosis: a case report and literature review
   I. Lal, C. Holmes

Comparison of the NCCN-Distress Thermometer and Hospital Anxiety and Depression Scale in cancer survivors
   E. McGrath, N. Riblet

Solid tumor profiling via next-generation sequencing to identify tumor-specific actionable variants
   S. Patterson, C. Statz, et. al

Using a Molecular Tumor Board to Review Potential Mutation Driven Treatment Decisions*
   J. Peterson, L. Tafe, I. Gorlov, et. al

Survivorship care in the state of Maine
   E. Pike, M. Saier, L. Gerhardt, K. Powers

Rare presentation of GI adenocarcinoma in Neurofibromatosis type 1
   H. Rehman, M. Barry

The Maine Cancer Biospecimen Portal: Building a Resource Across Institutions to Promote and Facilitate Cancer Research
   J. Rueter, L. Shopland, I. Emery, et. al

Contribution of Extended Family History in Assessment of Risk for Breast and Colon Cancer*
   B. Solomon, T. Rounds, M. Woods

Assessing Cancer Communication Experiences
   C. Thomas, I. Agnew, A. Williams, et. al

Generating a Molecular Tumor Registry in an Outpatient Oncology Practice
   C. Thomas, J. Maccario, J. Reddy

Somatic Mutation Analysis in Myeloid Disease Using a Targeted Gene Panel and Massively Parallel Sequencing
   S. Turner, J. Rand, F. de Abreu, et. al

Evaluation of the relationship between psychological distress and risk for breast cancer

Evaluation and Comparison of Chemotherapy-induced Toxicities between Obese and Non-obese Patients with Gynecologic Malignancies
   D. Wang, A. Kappelman

* Indicates abstract selected for podium presentation.
Somatic Mutation Profiling Using a 50 Gene Cancer Panel: The Dartmouth Experience

F. de Abreu, J. Peterson, C. Amos, W. Wells, G. Tsongalis

Department of Pathology, and Center for Genomic Medicine; Department of Community and Family Medicine; Geisel School of Medicine at Dartmouth; Dartmouth Hitchcock Medical Center; Norris Cotton Cancer Center

Background: Since implementing a next generation sequencing assay, our laboratory has performed the assay on more than 1,000 patient tumors. Molecular profiling allows us to identify mutations which can improve personalized patient care. Here we describe our molecular findings for solid tumors which included mostly lung adenocarcinomas, colon adenocarcinomas, glioma/glioblastomas, melanomas, and breast carcinomas.

Methods: At least 10 ng of genomic DNA were used to prepare barcoded libraries using the AmpliSeq Cancer Hotspot Panel v2. Samples were multiplexed and sequenced on Ion Torrent 318 chips using the Ion PGMTM System. Variants were identified using the Variant Caller Plugin (v.4.0), and annotation and functional predictions were performed using Golden Helix SVS (v.7.7.8).

Results: A total of 1,005 samples passed initial QC. Samples were classified into two categories, wild-type (127), and positive for somatic mutations (750). Somatic variants of different types and in different genes were classified as clinically actionable (60%) and non-actionable (40%).

Conclusions: The use of NGS in routine clinical laboratory practice allowed for the detection of tumor profiles that are essential for the selection of targeted therapies and identification of applicable clinical trials, contributing to the improvement of personalized patient care in oncology.

Plasma Ghrelin Levels in Patients with Pancreatic Ductal Adenocarcinoma*


Dartmouth-Hitchcock Medical Center/ Norris Cotton Cancer Center

Background: Cancer cachexia is a common finding in pancreatic adenocarcinoma (PDAC) and negatively impacts quality of life and prognosis. Ghrelin is a growth hormone-releasing peptide that may be important in helping to prevent cachexia via appetite stimulation and inhibiting fat malabsorption. We aimed to determine if patients with PDAC have inappropriately low plasma ghrelin levels.
Background: Allogeneic stem cell transplant (allo-SCT) remains a potentially curative option for a variety of hematological malignancies. Nevertheless, relapse of disease following transplant represents a formidable challenge and a significant cause of post-transplant mortality. Further, relapse with concomitant graft-versus-host disease (GvHD) is an almost untreatable clinical scenario, since withdrawal of immune suppression is paramount to treatment of the malignancy, yet increasing immunosuppression is the cornerstone of GvHD therapy. Rituximab is an anti-CD20 antibody known to be effective in treating chronic lymphocytic leukemia (CLL) and a subset of patients manifesting GvHD after transplant via B cell depletion. Ibrutinib, an inhibitor of Bruton’s tyrosine kinase is also active in CLL and potentially in GvHD via inhibition of IL2-inducible T cell kinase, targeting Th2 cells and B lymphocytes. We present the case of an elderly patient with high-risk CLL, post-transplant relapse and GvHD successfully treated with combination Rituximab and Ibrutinib therapy.

Methods: A 69 year old man with high-risk CLL underwent allo-SCT complicated by extensive GvHD and relapsed disease while on immunosuppression. He was treated with 6 months of combination Rituximab/Ibrutinib therapy (Ibrutinib 420mg daily; Rituximab 375mg/m2 weekly x4, then monthly). Response was measured by PET/CT restaging.
Results: Pre treatment PET/CT scan revealed extensive adenopathy, consistent with active CLL/SLL. Follow-up scan after 6 months of therapy showed no evidence of disease. In addition, the patient had marked reduction in cutaneous GvHD.

Conclusions: This represents a novel use of combination therapy to target both relapsed disease and GvHD, suggesting a potential role for post-transplant prophylaxis, as well.

Venous thromboembolism prevention in the ambulatory cancer clinic (VTE-PACC): a quality improvement intervention targeting education and prevention at the University of Vermont Cancer Center (UVM-CC)

D. Douce1, N. Zakai1, M. Cushman1, Y. Ji2, S. Ades1, K. Devine1, S. Lakoski1, C. Holmes1

1University of Vermont Medical Center, 2Exeter Hospital Center for Cancer Care

Background: Patients starting chemotherapy face a 12% incidence of developing a venous thromboembolism (VTE) within the first 12 months of treatment. Current guidelines recommend use of prophylactic low molecular weight heparin in hospitalized or postoperative cancer patients, and targeted prophylaxis for high risk ambulatory patients. The Khorana score is a validated tool to identify cancer patients starting chemotherapy who are at high risk of VTE. The UVM-CC initiated a quality improvement project to reduce VTE incidence in ambulatory cancer patients starting therapy by identifying high risk patients using a modified Khorana score and starting prophylaxis.

Methods: A multidisciplinary team developed an electronic screening tool for adults starting outpatient therapy at the UVM-CC that will predict risk of VTE. Process development and implementation occurred over a 1.5 year period prior to roll-out October 2015. Patients with a modified Khorana score ≥3 are referred to our hematology clinic for education on VTE and VTE prophylaxis recommendations. Follow up will assess VTE prophylaxis usage, bleeding complications, and VTE incidence. Incidence rate ratios will be used to compare VTE rates to the historical rates at UVM-CC.

Results: At the UVM-CC 1,893 patients initiated chemotherapy between 2012-2014, and 212 developed VTE for an overall incidence of 11.1%. After initiation of our protocol, we will be able to detect a 4% or greater absolute reduction or a 38% relative reduction in VTE.

Conclusions: A multidisciplinary approach utilizing the electronic health record and a VTE assessment tool is feasible and may reduce VTE rates in this population.
Establishing a safe effective chemotherapy desensitization program

N. Fine
Lahey Hospital and Medical Center

Background: All chemotherapy agents have the potential to cause hypersensitivity reactions (HSR). The incidence of HSRs is on the rise owing to increased exposure to more allergenic anti-tumor medications. (Castells-Guitart, 2014; Kadoyama K, et al., 2011) In the past, re-treatment of patients with moderate to severe HSRs was contraindicated. Development of drug desensitization protocols has allowed highly sensitized patients to receive lifesaving therapy and be protected from anaphylaxis. The Lahey Hospital and Medical Center (LHMC) desensitization program was developed in 2010, to respond to patients who experienced severe HSRs, with limited treatment alternatives.

Methods: A retrospective review of all patients who received desensitization therapy from 2010-2015. Factors evaluated included: specific drug, dose completion, infusion reaction management, and type of protocol (initial vs rapid).

Results: established by Castell. (Castells, et al, 2008) The LHMC data demonstrated that in the past 5 years, 13 patients underwent 21 desensitization treatments with one of three agents: Cisplatin, Carboplatin, and/or Oxaliplatin. The overall “ordered dose” completion rate was 95% (20/21). Five of these patients “graduated” to the outpatient chemotherapy clinic to complete their planned therapy.

Conclusions: The data demonstrated success of the LHMC desensitization program. Factors that contributed to success included: patient screening, skin testing, validated treatment protocols, critical care monitoring, utilization of a “nurse activated hypersensitivity order set”, and an experienced chemoprotetor nurse. The data confirmed the safety of the desensitization procedure to protect sensitized patients from anaphylaxis allowing them to continue lifesaving therapy.

Implementation of a College of American Pathologists Accredited Institutional Biorepository

T. Gallagher¹, J. Gonzalez², G. Tsongalis¹, W. Wells³

¹Dartmouth Hitchcock Medical Center, ²Geisel School of Medicine at Dartmouth, ³Norris Cotton Cancer Center

Background: There is an increasing need for accurately curated and processed biospecimens for use in clinical and translational research. We have developed the infrastructure to accommodate requests for biobanking from clinical investigators
and their collaborators at our institution. Here we describe the general workflow for our biobanking process with a focus on the acquisition of patient consent, initial procurement of specimen and annotation.

**Methods:** Over the course of the past year, we have developed a study request form that includes notification of patient consent, institutional review board approval, and study information such as contacts, specimen types, and storage/transport. Our workflow includes a clinical request through eDH which provides notification of incoming specimens, a unique identifier is assigned, and clinical data accumulated.

**Results:** To date we have established this workflow for the acquisition and storage of highly annotated biospecimens in our robotic Sample Access Manager (SAM). Our SAM accommodates 4,800 2.0 mL vials and 200 96-well plates. This allows for the storage of tissue and fluid aliquots as well as extracted nucleic acids.

**Conclusions:** To meet accreditation requirements, we have designed and validated a clinical workflow that satisfies these and allows us flexibility in meeting the needs of our clinical researchers.

---

**Esophagectomy in an Octogenarian with Adenocarcinoma of the Esophagus**

**N. Geissen, D. MacGillivray, T. Weigel**

*Maine Medical Center*

**Background:** Esophageal cancer is generally a disease of older adults, with peak incidence shifting toward the 70-79 years age group. It is well recognized that the elderly population experience higher morbidity and mortality rates following major surgery. This fact has previously led to many considering advanced age as a contraindication to major surgery. Currently, the surgical treatment of esophageal cancer is increasingly accepted in patients over age 70, with less reported in those over 75 years. Advances in minimally invasive surgical techniques have led to shorter hospital length of stay with similar oncologic success as compared to open techniques. These advancement have resulted in a more surgical options for patients previously deemed either too high risk or not surgical candidates.

**Methods:** We present a case of an 86 year old active male with Barrett’s esophagus from 27-35cm and focal invasive adenocarcinoma at 30cm. He was treated with definitive chemoradiation as he was not thought to be a surgical candidate due to age. Two years later, he returned with invasive adenocarcinoma at 30cm and underwent robotic, laparoscopic, thoracoscopic assisted Ivor-Lewis esophagectomy.

**Results:** At 6 month follow-up, the patient was driving and enjoying his normal daily activities of gardening and spending time with his girlfriend. He was tolerating a regular diet without supplemental feedings.
Conclusions: With proper patient selection and advances in minimally invasive techniques, esophagectomy can be carried out with acceptable risk in an elderly patient with increased interval between treatment and surgery.

---

**Post-Transplant Telehealth; Bridging Distance with Technology**

J. Hickman, K. Meehan, S. Brighton, K. Wilcox

*Dartmouth Hitchcock Medical Center - Norris Cotton Cancer Center*

**Background:** This service was created to test the impact of telehealth on patients who have received a hematopoietic stem cell transplant at Dartmouth-Hitchcock Medical Center (“Dartmouth-Hitchcock”) and who present a difficulty in meeting post-transplant follow-up plans due to distance of travel between home and Dartmouth-Hitchcock.

**Methods:** The Blood and Marrow Transplant (“BMT”) Program at Dartmouth-Hitchcock purchased 3 standard iPad tablets with cellular service which was to be further customized by the Center for Telehealth. The customization included the installation of video chat software which would be housed and managed through Dartmouth-Hitchcock secure network servers.

A patient would become eligible for post-transplant telehealth due to distance between home and Dartmouth-Hitchcock or if the patient has identified difficulties in meeting the post-transplant discharge follow-up plan. There are no eligibility requirements around which type of transplant received. A patient designated to participate in telehealth will get an iPad upon discharge with instructions by a BMT staff member.

**Results:** Implementing the telehealth iPads to our service has resulted in patients being seen at their home by a Dartmouth-Hitchcock BMT provider. On average, the telehealth service has saved 8 hours, per patient, of driving associated with post-transplant follow-up visits while not impacting their post-transplant care.

**Conclusions:** Although this service is in its beginning stages, the transplant program will look to expand eligibility across the entire transplant process. The early benefit seen in the post-transplant patients participating in telehealth could be adapted to pre-transplant or active treatment phases of the transplant.
Successful Use of Glucarpidase as Treatment for High Dose Methotrexate Nephrotoxicity

A. Hill¹, E. Bengtson², J. Hill²

¹Department of Medicine, Dartmouth Hitchcock Medical Center, ²Department of Hematology-Oncology, Dartmouth Hitchcock Medical Center

Case Presentation: A 74 year-old man with history of a remote myocardial infarction and congestive heart failure was diagnosed with follicular lymphoma after biopsy of a T6-T10 paraspinal mass. He completed two cycles of Bendamustine/Rituximab and then received high dose methotrexate for CNS prophylaxis. Serum methotrexate level 24 hours later was 87 mcml/L, and his creatinine increased steadily over the next five days from baseline of 1.0 to a maximum of 4.47 mg/dL, despite ongoing bicarbonate drip with intact urine alkalinization. The leucovorin dose was increased, and he was given a total of 7,000 units of glucarpidase. Methotrexate levels gradually trended down, with development of a mild mucositis and pancytopenia. A pre-existing, small pleural effusion was found to have increased in size, and this was drained (exudative, without malignant cells). In addition, his aspirin was discontinued. Six weeks later, his creatinine returned to baseline.

Conclusions: Discussion: Methotrexate is a known cause of nephrotoxicity which in turn decreases its plasma excretion. Factors that may increase risk for impaired methotrexate clearance include cardio-renal insufficiency, pleural effusions, ascites, salicylates, other nephrotoxins and suboptimal urine alkalinization. Glucarpidase is a recombinant bacterial enzyme that hydrolyzes the carboxyl-terminal glutamate residue from methotrexate, producing the inactive metabolites DAMPA and glutamate, achieving a mean reduction in serum methotrexate levels of >88% in clinical trials. This case highlights the importance of judicious consideration of risk factors prior to high-dose methotrexate therapy and the successful use of glucarpidase as an alternative to hemodialysis in a patient with multiple occult underlying risks.

Determining if distress screening leads to the necessary referrals and care for oncology patients

K. Jackson, E. McGrath

Dartmouth Hitchcock Medical Center

Background: The National Comprehensive Distress Thermometer (NCCN-DT) has been validated as a tool to measure distress levels in oncology patients. However, it has not yet been shown if positive patient outcomes occur due to the use of the NCCN-DT. Once the level of distress is determined, appropriate action needs to be taken by the provider in order for the patient to receive the best care and show improvements in psychological health.
Methods: The NCCN-DT was used to screen 107 oncology patients for distress. NCCN-DT responses were statistically analyzed to determine how referrals were utilized for patients with distress levels above four.

Results: The two most common etiologies of distress were emotional and physical issues. Of the 39 patients with heightened distress, a total of 37 referrals were made the day the NCCN-DT was given. Referrals included 46% pertaining to emotional issues, 27% for physical issues, and 27% for practical issues. There were 6 declined referrals, with only 2 pertaining to emotional issues indicating that the majority of needed referrals were being accepted by patients.

Conclusions: The majority of referrals being made were for the major etiologies of distress; emotional and physical issues. The necessary referrals for patients with distress were accepted by the patients. It is inconclusive whether patients need referrals to another service or just a discussion with the oncology team in order to decrease distress levels.

Acute inflammatory response and tumor proliferation in human breast cancer

T. James, M. Rincon

University of Vermont

Background: Data suggests that acute inflammation may promote cancer cell proliferation and metastasis, through immune-related changes in the tumor microenvironment. Previous studies have not fully characterized this inflammatory response in human breast cancer.

Methods: Paraffin embedded samples were reviewed from patients undergoing tissue biopsies followed by surgical resection of breast cancer. Areas of malignancy were verified using epithelial cell marker stains (CK/AE1/AE3). Leukocytes were stained using polyclonal rabbit anti-human CD45 antibody. Tumor cell proliferation was determined using polyclonal rabbit anti-human Ki67 antibody.

Results: In 44 histologic samples we identified a statistically significant difference in the accumulation of inflammatory cells in proximity to the biopsy site (CD45 marker) compared to distant sites (p <0.0001). There was also an accumulation of eosinophils and macrophages in proximity of the biopsy site. The proliferative rate of tumor cells at the biopsy site was increased (Ki67) compared to distant sites (p <0.009).

Conclusions: Our results support the concept that disruption of the tumor microenvironment leads to an acute inflammatory response which increases the
proliferative capacity of the remaining tumor cells. These findings may have clinical implications for the metastatic potential of these cells. Mitigating strategies involving the administration of anti-inflammatory medications during invasive breast cancer procedures are currently being explored in a pilot clinical study.

---

**Developing Interprofessional Cancer Care Teams: Essentials for Quality Improvement**

**T. James, J. Page**

*University of Vermont*

**Background:** Cancer outcomes are improved when care is delivered by high-functioning teams. As patients journey across the cancer care continuum, optimizing coordination among several interdisciplinary care providers in various clinical care settings is essential for maintaining quality and reducing error. At a time of increasing expectations and pressure to demonstrate value in oncology care, implementing principles of effective team-based cancer care are required.

**Methods:** A systematic review of published literature published between 2010 and 2015 was performed in order to identify fundamental themes and best practices for establishing team-based care. Evidenced-based models for effective team performance were then defined and applied to the science of team-based care in oncology. Practical strategies for how to organize effective healthcare teams were derived.

**Results:** Teamwork involves delineating specific roles and responsibilities for interdisciplinary care, developing a culture of mutual support and enhancing skills in structured communication. The development of interprofessional collaborative competencies requires moving beyond profession-specific education to engage providers of different professions in team-based cancer care. Competencies for Interprofessional Collaborative Practice include 1: Values/Ethics for Interprofessional Practice, 2: Roles/Responsibilities, 3: Interprofessional Communication and 4: Teamwork Skills.

**Conclusions:** Team training techniques and strategies for collaborative practice can be successfully implemented in novel interprofessional curricula for cancer teams. Leaders of cancer programs can promote health care providers to acquire new knowledge, skills and attitudes that enhance interprofessional collaboration and improve cancer patient care.
Digital Imaging as a Quality Control Metric for Next Generation Sequencing

K. Kelly¹, V. Spotlow¹, A. Ras¹, S. Helm¹, J. Malcolm¹, R. Gandour-Edwards¹,³, J. Bourne¹, G. Tsongalis¹,²

¹ The Jackson Laboratory for Genomic Medicine; ²Dartmouth Hitchcock Medical Center and The Audrey and Theodor Geisel School of Medicine at Dartmouth; ³The JAX® Mice Clinical and Research Services Facility.

Background: The JAX Cancer Treatment Profile (JAX-CTP) test provides physicians with a comprehensive tumor genomic profile in order to better predict response to a specific therapy. One aspect of testing that can affect sequencing results is the quality and quantity of tissues. Here we describe incorporation of advanced digital imaging using the Aperio CS2 SlideScope as a QC indicator.

Methods: H&E slides of varying tumor types were scanned using the Aperio CS2 SlideScope. These images were saved locally and then sent electronically to an offsite pathologist through a secure file transfer for determination of tissue adequacy and percent tumor cell content. This study was performed under CLIA and CAP federal regulations.

Results: The Aperio CS2 SlideScope was extremely effective at scanning and saving the H&E slides images. We were able to send the images to our offsite pathologist, who was able to access the files and provide significant insight on the quality of the samples. The metrics that were assessed were the neoplastic content, status of diffuseness, and the area of highest tumor concentration.

Conclusions: Implementation of digital imaging allowed is to enhance our JAX-CTP clinical assay workflow with better QC checks before processing of samples has begun.

Hemophagocytic Lymphohistiocytosis: A Rebellion from the Body’s Immune System

S. Khadanga, H. Rehman, B. Solomon

University of Vermont Medical Center

Background: Hemophagocytic lymphohistiocytosis (HLH), due to excessive activity of histiocytes and lymphocytes, is a rare but aggressive disease. If untreated, patients with HLH may live for a few months and die due to multi-organ failure.

Methods: We present two cases of HLH
Case 1: 72 yo female with history of polycythemia vera (JAK2 +) and CLL with autoimmune hemolytic anemia s/p Rituximab presented with night sweats and fever. Peripheral smear showed 83% blasts and bone marrow biopsy revealed ALL with complex cytogenetics. She was treated with vincristine, dexamethasone and doxorubicin. Course was complicated by VRE bacteremia, pseudomonas UTI, and she continued to have febrile neutropenia, despite adequate antibiotics. Repeat BMB was done to evaluate persistent neutropenia and revealed histiocytes with RBCs inside them, s/o hemophagocytosis. Diagnosis of HLH was made (splenomegaly, fever, hypertriglyceridemia & positive sCD25/sCD163), treatment initiated with steroids and Etoposide, however, refractory cytopenias precluded further therapy and was transitioned to comfort care.

Case 2: 69 yo male presented with nightly fevers for 6 weeks, hepatosplenomegaly and pancytopenia. Bone marrow biopsy showed non-caseating granulomas and CD163+ staining. He was given Etoposide and Dexamethasone with good response, however, liver biopsy revealed hepato-splenic T-cell lymphoma. Following, he received ICE and allotransplant and is doing well.

Conclusions: HLH is a rare but lethal hematologic disease and should be considered in the differential for febrile cytopenias as early diagnosis & treatment can be life saving. These cases highlight the association of HLH due to underlying hematologic malignancies.

Incidence and impact of venous thromboembolism (VTE) in older patients with metastatic colorectal carcinoma-SEER-MEDICARE analysis

I. Lal, S. Kumar, B. Littenberg, S. Ades

The University of Vermont Medical Center

Background: VTE is associated with increased morbidity and mortality in patients with metastatic cancer and is the second leading cause of death in cancer patients receiving chemotherapy. Colorectal cancer (CRC) is the third most common cancer in US. With improvement in survival of CRC patients due to newer therapies, the relationship between VTE and CRC is not well defined in the contemporary era. The objectives of this retrospective study are to describe VTE incidence and mortality in a contemporary cohort of older patients with metastatic CRC.

Methods: We used the Surveillance, Epidemiology and End Results (SEER) Medicare database for patients ≥ 65 years old with stage IV CRC diagnosed after January 2004 and followed through 2010. Primary outcomes were incident VTE events and mortality. Associations between risk factors and outcome were analyzed using Cox models.

Results: Out of 266,246 patients with CRC, 11,094 patients met all the eligibility
criteria. 50.5% were men. 82% were white. Median age was 77 years (65 – 94). The conditional incidence of VTE was 15% at 1 year and 22% at 3 years. Preliminary results show decreased risk of VTE was associated with male gender (HR 0.80, 95% CI 0.72-0.91), and Asian race (HR 0.41, 95% CI 0.28-0.59).

**Conclusions:** VTE is a frequent complication among older patients with advanced CRC. Risk of VTE is highest within the first year following diagnosis. Further results including impact of numerous established risk factors on VTE diagnosis and mortality will be presented at the meeting.

---

### Spinal cord infarction and pulmonary embolism—Recognizing delayed adverse vascular events after splenectomy in hereditary spherocytosis: a case report and literature review

I. Lal1, C. Holmes2,  
*The University of Vermont Medical Center*

**Background:** Patients with Hereditary Spherocytosis (HS) frequently undergo surgical splenectomy to control hemolysis. Sepsis is the most feared complication after splenectomy. There is also a reported increased risk of vascular complications. We report a case of spinal cord infarction and pulmonary embolism in a patient thirty years post-splenectomy for HS. To best of our knowledge, this is the first reported case of spinal cord infarction several years after splenectomy for HS.

**Methods:** A 43-year-old female with a history of HS, presented to the hospital with sudden onset of back pain and chest pain for 3 days. This was associated with progressive numbness and weakness in the lower extremities, which extended to upper extremities over 4 days. MRI revealed cord infarction from C4 to T2 level. Hospital day 5, the patient developed shortness of breath and was found to have bilateral pulmonary embolism.

**Results:** A thrombophilia panel including FVL, prothrombin gene mutation, anti-phospholipid antibodies, protein C, S and anti-thrombin deficiency and PNH was normal. Autopsy confirmed the arterial and venous thrombosis and an incidental finding of right lung carcinoid was noted.

**Conclusions:** Splenectomy for HS and other hematologic conditions is associated with an increased life-long risk of arterial and venous complications. Further investigations are required to more clearly define the balance of the potential benefits versus the deleterious effects of splenectomy in HS. While the association between carcinoid tumors and thromboembolic disease is unknown, additive risk factors may contribute to the development of thrombosis in patients with HS.
Comparison of the NCCN-Distress Thermometer and Hospital Anxiety and Depression Scale in cancer survivors

E. McGrath¹, N. Riblet²

¹DHMC - Norris Cotton Cancer Center, ²VA Medical Center

Background: The National Comprehensive Cancer Network Distress Thermometer (NCCN-DT) is a well-known tool for screening for distress in patients with cancer. However, there is limited research on the use of the NCCN-DT in cancer survivors and researchers have drawn conflicting conclusions about the reliability of the NCCN-DT for detecting clinically significant psycho-social distress among cancer survivors.

Methods: This study compared distress and anxiety scores measured among gastrointestinal cancer survivors in order to determine the validity of the NCCN-DT in this population. NCCN-DT was used to measure distress, and the Hospital Anxiety Depression Scale (HADS) was used to measure depression and anxiety. This cross-sectional study was completed at an academic National Cancer Institute designated Comprehensive Cancer Center and included 30 individuals who survived GI cancer.

Results: Respondents were primarily male, married, aged 60 years or older, and 50% were between 2-12 months post treatment. Fifty-six percent of respondents were either colon or rectal cancer survivors. Using the recommended cut-off scores for NCCN-DT (>4) and the HADS (>7), the NCCN-DT performed moderately well at identifying cases of anxiety (sensitivity=83.33%, specificity=50%; PPV=86.96%, NPV=42.86%) and performed poorly at identifying cases of depression (Sensitivity=75.86%, specificity=0%; PPV=95.65%, NPV=0%).

Conclusions: Findings suggest that the NCCN-DT may not be reliable to identify distress in cancer survivors. Further research is needed to confirm the clinical utility of the NCCN-DT as a screening tool for identifying distress in cancer survivors.

Solid tumor profiling via next-generation sequencing to identify tumor-specific actionable variants

S. Patterson¹, C. Statz¹, G. Stafford², X. Woo², V. Spotlow¹, R. Liu¹, G. Ananda¹, G. Tsongalis¹,³, and S. Mockus.¹

¹The Jackson Laboratory for Genomic Medicine, ²The Jackson Laboratory for Mammalian Genomics, ³The Geisel School of Medicine at Dartmouth and Dartmouth Hitchcock Medical Center

Background: Different tumor types are often associated with reoccurring mutations. Performing somatic profiling to identify actionable gene variants characteristic of specific tumors may guide targeted approaches to treatment, as well as uncover new
therapeutic targets. To this end, we used a next-generation sequencing approach to identify characteristic actionable variants across various solid tumor types.

**Methods:** DNA from FFPE sections of solid tumor samples was sequenced using The Jackson Laboratory Cancer Treatment Profile (JAX-CTP), a 358-gene targeted panel, and submitted to the Clinical Genomics Analytical bioinformatics pipeline for analysis.

**Results:** Data from 124 samples from several tumor types demonstrated somatic variants within 32 actionable genes, with frequent variants in MYC (16.6%), KRAS (14.1%), TP53 (14.1%), BRAF (8.8%), and PIK3CA (8.3%). KRAS variants were present in 7/7 (100%) pancreatic cancer samples, and BRAF variants were present in 8/9 (89%) melanoma samples. Colorectal cancer samples had frequent BRAF (9/42; 21%), KRAS (11/42; 26%), PIK3CA (7/42; 17%) and TP53 (6/42; 14%) variants. MYC amplification was most prevalent in breast cancer (11/18; 61%). In ovarian cancer samples, KRAS and MYC variants were most frequent (5/17; 29% each), along with JAK3 and PIK3CA variants (2/17; 6% each).

**Conclusions:** Detecting and analyzing gene variants may allow for a more comprehensive approach for treating cancer. This process can be facilitated by utilizing the JAX-CTP in combination with a comprehensive knowledgebase, the JAX Clinical Knowledgebase, to link detected gene variants to treatment approaches, supported by efficacy evidence, and relevant clinical trials to aid in clinical decision-making.

**Using a Molecular Tumor Board to Review Potential Mutation Driven Treatment Decisions**


*Dartmouth-Hitchcock Medical Center / Norris Cotton Cancer Center / Dartmouth*

**Background:** Oncologists are often uncomfortable with interpretation of genetic data as an approach to predict drug sensitivity and resistance. We established a Molecular Tumor Board (MTB) at our institution to interpret molecular data and provide treatment recommendations.

**Methods:** Tumor DNA was sequenced in our CLIA-certified laboratory to identify mutations in a 50-gene panel cancer hotspot panel. Cases were evaluated by a MTB composed of molecular and surgical pathologists, medical oncologists, basic research scientists, and genetic counselors. Cases were evaluated by the MTB mostly as a request for recommendations on targeted therapies and potential germline mutations.

**Results:** Tumors exhibited a wide range of genetic heterogeneity: 71 different mutations were found across 30 genes among the first 34 cases presented. In
>50% of cases, the MTB recommended treatment with a targeted agent based on evaluation of molecular profile and disease/treatment histories. Four patients were subsequently treated with a MTB-recommended targeted therapy; 2 of whom have experienced clinical benefit lasting >10 months.

**Conclusions:** Case evaluation by a multidisciplinary group of individuals in the context of a MTB shapes treatment options and decisions. The most commonly encountered reasons that MTB-recommended therapy was not administered stemmed from inability or unwilling to travel to a clinical trial and genetic profiling at a very late stage of disease. Increasing access to targeted therapies should be a priority for our regional cancer centers.

## Survivorship care in the state of Maine

**E. Pike, M. Saier, L. Gerhardt, K. Powers**

*University of New England*

**Background:** Over 8,000 Mainers are diagnosed with cancer annually and in 2009, the age adjusted incidence of cancer was the highest in the nation. Mortality rates have decreased due to improved diagnostic and treatment techniques; however, the impairments experienced by cancer survivors are often not adequately recognized or managed.

**Methods:** In collaboration with the Survivorship Team updating the Maine Comprehensive Cancer Control Plan (MCCCP) 2016-2020, 24 cancer treating hospitals in Maine were contacted and a survey was completed with 14. The supportive resources available to cancer survivors were assessed with questions based on the components of survivorship care recognized as essential in the MCCCP. With this information, we 1) assessed baseline achievement of the current MCCCP rehabilitation and survivorship goals, and 2) created an algorithm to help guide healthcare professionals through rehabilitation referral for survivors.

**Results:** Inconsistency was noted throughout the state regarding the percentage of survivors being referred to rehabilitation services, access to survivorship navigation and the utilization of quality of life measures. We also found less than 50% of the hospitals were currently using survivorship care plans.

**Conclusions:** In Maine, there is a need for improved standardization of survivorship services, increased patient access and improved knowledge and awareness of oncology and primary care providers regarding referral for survivorship services. Standardized care could not only help improve quality of life for cancer survivors in Maine, but also potentially reduce healthcare financial burden. Use of the proposed algorithm could lead to increased integration of rehabilitative services for cancer survivors.
Rare presentation of GI adenocarcinoma in Neurofibromatosis type 1

H. Rehman, M. Barry

The University of Vermont Medical Center, The University of Vermont Cancer Center

Background: Neurofibromatosis type I is an autosomal dominant genetic disorder with a known predisposition to gastrointestinal stromal tumors and neuroendocrine malignancies, however adenocarcinomas of GI tract are relatively rare in patients with NF1. GI malignancies commonly metastasize to liver, however metastases to bones are quite uncommon. We present a case of neurofibromatosis type I patient, who presented with a metastatic upper GI adenocarcinoma involving thoracic spine.

Methods: A 66-year-old woman, with a diagnosis of NF1 and cerebral glioma, presented with bilateral LE weakness and pain. Imaging showed a T3 lytic lesion, and biopsy revealed adenocarcinoma with upper GI (possibly small intestine/pancreaticobiliary) origin. Her symptoms progressed rapidly requiring T3 laminectomy, T2 and T4 laminotomies, & resection of epidural tumor. Her LFTs and CA-19-9 were normal. An EGD revealed a polyp in the stomach, which on biopsy showed extensive high-grade dysplasia. Foundation 1 testing showed mutations in NF1, PIK3CA, TP53, APC and GATA. Patient’s course was complicated by malignant seroma formation in the spine. Her weakness improved after surgery, radiation, and steroids initially, but subsequently progressed despite intervention.

Results: She was started on FOLFOX, and has completed 2 cycles to date. FDA-approved targeted agents based on her mutations (such as Everolimus, Sirolimus, Trematinib) or a clinical trial would be possible options at time of progression.

Conclusions: Adenocarcinoma of upper GI origin is not strongly associated with NF-1, and bony metastasis are uncommon in GI adenocarcinoma, but this case illustrates the importance of a broad differential diagnosis and potential targeted treatment options based on tumor mutation analysis.

The Maine Cancer Biospecimen Portal: Building a Resource Across Institutions to Promote and Facilitate Cancer Research

J. Rueter1, L. Shopland1, I. Emery2,4, T. Hoffert1, R. Aalberg2, P. Helbig1, S. LaPierre2, V. Sanders1, K. Mills3,4, T. Hill4, A. Sheikh4, M. Jones2, A. Breggia2

1Eastern Maine Medical Center, 2Maine Medical Center Research Institute, 3The Jackson Laboratory, 4Maine Cancer Foundation
Background: Maine has the third largest age-adjusted cancer incidence rate in the nation with over 8,000 Mainers diagnosed with cancer annually. According to the National Cancer Institute, one of the most widely recognized and significant roadblocks to progress in cancer research, is the lack of standardized, high-quality biospecimens.

Methods: The Maine Cancer Biorepository Portal (MCBP) was created in collaboration between Eastern Maine Medical Center (EMMC) and Maine Medical Center (MMC). This effort is supported by an infrastructure research grant to both institutions by the Maine Cancer Foundation.

Results: The MCBP will provide one-stop access to annotated cancer biospecimens located at the EMMC and MMC biorepositories. The portal will also provide access to research consulting services to aid investigators with research study design, sample selection, regulatory compliance, etc. and to foster research collaborations between physicians and scientists both regionally and nationally.

Conclusions: The services provided by MCBP will facilitate scientific investigations that could ultimately lead to improved cancer outcomes and a reduction in cancer mortality. The creation of this web portal serves as a leading example of how foundation funding can be used to streamline and optimize biomedical research in a climate of dwindling funding resources. By encouraging two institutions to build this collaborative portal, the Maine Cancer Foundation also acts as an important facilitator for collaborations across the basic science-clinical divide.

Contribution of Extended Family History in Assessment of Risk for Breast and Colon Cancer*

B. Solomon, T. Rounds, M. Wood

University of Vermont Medical Center

Background: Family history is important for identifying candidates for advanced screening and referral for cancer genetic counseling. We identified the percentage of individuals who would not receive recommended screening or referral if only a 1st degree family history was obtained.

Methods: Family histories were obtained from 626 women getting mammography at the University of Vermont between 5/00-5/01 using a validated questionnaire. ACS guidelines were used to determine eligibility for advanced breast or colon cancer screening. Eligibility for referral for genetic counseling for hereditary breast or colon cancer was determined using FHS-7 and modified Amsterdam II screening criteria, respectively.
Results: 499 histories were reviewed. For high risk breast cancer screening, 5 individuals met guidelines using 1st degree family history with an additional 13 meeting criteria when family history was extended. For high risk colon cancer screening, 50 individuals met criteria using 1st degree family history with an additional 12 meeting criteria when the family history was extended. 62% of candidates for genetic counseling for hereditary breast cancer and 67% of candidates for hereditary colon cancer were missed when using only 1st degree family history.

Conclusions: This is one of the first studies to demonstrate that 1st degree family history alone is not adequate for identification of all candidates for high risk screening and referral for genetic counseling for hereditary breast and colon cancer syndromes. Given our small sample, larger studies are required to confirm these findings.

Assessing Cancer Communication Experiences

C. Thomas³, I. Agnew¹, A. Williams², C. Thomas¹, K. Mazor³, P. Han², C. Battelli¹, D. Evans¹, M. Dugan¹ and T. Weisberg¹

¹New England Cancer Specialists, ²Maine Medical Center Research Institute, ³University of Massachusetts Medical School

Background: Patient-centered communication is an important for delivering high-quality cancer care. Physician-patient communication (PPC) can be assessed with the Patient Assessment of Cancer Communication Experiences (PACE). The current study determines the feasibility of PACE in an oncology practice. The study measures how patient reported outcomes (PROs) influence physician-patient interaction.

Methods: Patients were randomly asked to complete an anonymous survey after their visit. PPC interaction was ranked on a 5-point Likert scale (from 5=highest [always] to 1=lowest [never]). Patients undergoing chemotherapy completed a “chemotherapy” survey all other patients received a “core” survey.

Results: 135 patients returned a core survey (45% of eligible patients), 47 patients returned a PACE chemotherapy survey (38% of eligible patients). Surveys were scored as “perfect” (i.e. highest score) or “less then perfect” (all other scores). 31% of patients undergoing chemotherapy and 24% of other patients reported their PPC less than perfect, (1-4). Patients who scored less than perfect had higher levels of anxiety/depression than patients who reported the highest level of satisfaction. High levels of fatigue and higher cancer stages were associated with less than perfect ratings. Age, type of diagnosis, self-reported pain level and hemoglobin levels did not correlate with PPC scores.

Conclusions: Our study demonstrates that routine measurement of PPC is feasible. Patients who reported higher fatigue and emotional distress and who were at an advanced stage of their disease reported lower PPC satisfaction. We are planning to expand these observations and devise interventions to improve patient experiences with PPC.
Generating a Molecular Tumor Registry in an Outpatient Oncology Practice

C. Thomas, J. Maccario, J. Reddy

New England Cancer Specialists

Background: The use of targeted therapies to treat malignancies has increased significantly. Measuring the expression of molecular markers is necessary to use targeted agents. However, there is no uniform way to order or document the appropriate test results in medical records making it difficult to retrieve and analyze test results. The current study aimed at establishing a registry for molecular test results for patients with breast, lung or colon cancer for Jan 2014-June 2015

Methods: Electronic medical records for all patients for the specified time period with breast, colon or non-small cell lung cancer were queried. The following data were documented in Excel: patient demographics, diagnosis, type of molecular test and molecular abnormality

Results: For 38 of 136 patients (28%) with NSCLC, 19 of 68 (28%) patients with breast cancer and 8 of 38 patients (21%) with colon cancer molecular test results could be retrieved. 12 types of commercially available tests were utilized. The most common molecular abnormalities were: lung cancer (EGFR 8%, STK11 5%), breast cancer (her2/neu 24%, PIK3CA 24%) and colon (Kras 25%, Nras 13%)

Conclusions: Our study demonstrates that molecular profiles from patients with various malignancies is retrievable in 21-28% of all cases. Establishing a molecular database is feasible using chart abstraction and documentation in Excel. We are establishing a pathway to prospectively document all molecular test results to improve the percentage of patients undergoing molecular testing and to document the test results for future analysis

Somatic Mutation Analysis in Myeloid Disease Using a Targeted Gene Panel and Massively Parallel Sequencing

S. Turner, J. Rand, F. de Abreu, L. Toth, J. Peterson, P. Kaur, D. Ornstein, G. Tsongalis, E. Loo

Dartmouth-Hitchcock Medical Center / Norris Cotton Cancer Center

Background: Identifying specific mutations can be critical in the diagnosis, prognosis, and therapeutic management of myeloid diseases. Here we describe our institutional experience using the TruSight™ Myeloid Sequencing Panel in various myeloid neoplasms.
Methods: Eleven patient samples were chosen for evaluation. Barcoded libraries were prepared following the manufacturers guidelines using at least 50 ng of gDNA, and sequenced on the Illumina MiSeq System. Base-calling and sequence alignment were performed using the built in MiSeq Reporter Software. VCF files were generated using the Somatic Variant Caller and analyzed using VariantStudio v2.1.

Results: A total of 32 mutations were identified in 10 patient samples. The most common mutations identified involved TET2, TP53, ASXL1, CDKN2A, SRF2, and STAG2.

Conclusions: The detection of clonal mutations in myeloid diseases is integral to predicting disease progression and directing treatment. Whereas single gene detection methods are time consuming and less cost effective, the TruSight™ myeloid sequencing panel allows for the identification of multiple mutations with a single test providing clinicians with more information to make more appropriate treatment decisions. In this study mutations were identified in 91% of samples, with the mutation assortment corresponding with previously described literature using whole genome or whole exome testing.

Evaluation of the relationship between psychological distress and risk for breast cancer

University of Vermont

Background: Women at increased risk for breast cancer have greater distress levels which impact both quality of life (QOL) and screening behavior. We investigated levels of cancer-related distress among different risk groups and the stability of distress levels over time.

Methods: The Impact of Events Scale (IES) is used to measure distress related to an identified stressor (risk for breast cancer). Women in the UVM High-Risk Breast Program who completed the IES at least once were identified. Linear regression was used to examine change in distress over time and to compare distress levels between risk groups.

Results: The cohort comprised 305 women at increased risk for breast cancer due to a strong family history (79%), a genetic mutation (9%) or benign breast disease (BBD, 16%). Mean IES score was 17 (CI 15.8, 18.6), and indicates high distress levels in this cohort. IES scores decreased over time (p=0.0021 and 0.0072 after 4 and 8 years, respectively). Women with genetic mutations had higher IES scores than those without (p=0.0361). Scores did not differ between the overall group and either women with a strong family history or women with BBD. IES scores were positively associated with the number of risk factors an individual had (1, 2, or 3 risk factors: p=0.0119).
Conclusions: We demonstrate that distress is similar among different risk categories and that distress decreases over time; to our knowledge these patterns have not been previously revealed. Targeting women with highest distress levels may improve both QOL and screening adherence.

Evaluation and Comparison of Chemotherapy-induced Toxicities between Obese and Non-obese Patients with Gynecologic Malignancies

D. Wang, A. Kappelman

Maine Medical Center

Background: Obesity is a major risk factor for cancer. The American Society of Clinical Oncology obesity guidelines recommend dosing patients on actual body weight, and recommend against the use of dose capping, as this may translate to worse outcomes. Nevertheless, there is a paucity of data regarding chemotherapy dosing in obese women with gynecologic cancers and the Gynecologic Oncology Group mandates dose capping for patients with body surface area (BSA) > 2 m² in its clinical trials. The primary objective of this study was to evaluate the incidence of grade 3 or 4 myelosuppression during any cycle of first-line chemotherapy in obese gynecologic cancer patients with a BSA ≥ 2 m² versus non-obese patients.

Methods: A retrospective chart review comparing chemotherapy-associated toxicities and progression-free survival in obese women (BSA ≥ 2 m²) with gynecologic malignancies with chemotherapy dosing capped at BSA 2 m² versus non-obese women diagnosed over a 2-year period. Inclusion criteria included women ≥ 18 years-old on first-line chemotherapy for a documented gynecologic malignancy. Exclusion criteria included any previous chemotherapy exposure, concurrent treatment with an investigational drug, initial dose reductions/adjustments besides BSA capping in obese patients.

Results: Preliminary results have identified 124 patients who meet study criteria (40 patients and 84 patients in the obese and non-obese group, respectively.) The incidence of grade 3 or 4 myelosuppression was lower in the obese group (15% vs. 25%, p = 0.21) with more patients experiencing treatment delays in the non-obese group. Further data collection is ongoing.
Celebrating Our 2015 Member Practices!

NEW ENGLAND Cancer Specialists

Waldo County Healthcare
MaineHealth

Dartmouth-Hitchcock
NORRIS COTTON CANCER CENTER
MEDICAL ONCOLOGISTS GROUP

Mercy
EMHS MEMBER

New Hampshire Oncology-Hematology PA

Dartmouth-Hitchcock
NORRIS COTTON CANCER CENTER
Kingsbury Pavilion

Central Maine Comprehensive Cancer Center
The Central Maine Medical Family

CHAMPLAIN VALLEY HEMATOLOGY ONCOLOGY
COLCHESTER ST ALBANS MIDDLEBURY

MaineGeneral
Harold Alfond Center for Cancer Care

Medicine University of Vermont MEDICAL CENTER

MEDICAL ONCOLOGISTS & MALIGNANT HEMATOLOGISTS GROUP
Your NNECOS Membership
Makes a Difference!

Your membership increases our visibility, voice, and influence on a national scale, and helps each and every oncology practice within Maine, New Hampshire and Vermont.

What NNECOS Membership Offers to You

• Networking opportunities with physicians, nurses, administrators and other health professionals in the region that share similar patient populations and reimbursement challenges.
• Educational resources in regards to reimbursement issues.
• Shared patient resources about specific diseases and financial resources to pay for the care of those diseases.
• Support for a nationally recognized quality improvement program, QOPI.®
• Networking and brainstorming opportunities to meet quality standards of Medicare, JCAHO, the Commission on Cancer and other accrediting and payer organizations.
• Opportunities to work with ASCO on legislative and advocacy programs.
• Access to funds for locally initiated research programs.
• Support of fellows, junior faculty, and nursing education in creating and presenting abstracts.
• Access to ASCO (Conquer Cancer) funding for regional quality improvement initiatives.
• Access to high quality CME accredited professional education programs presented at an economical price close to home.
• Opportunities to participate in local and regional advocacy programs.
• Opportunities to promote your cancer program through linkage to the NNECOS website.

Renew today at www.nnecos.org!
**Collaborative Research Funding Opportunity**

The Northern New England Clinical Oncology Society is seeking research funding proposals for investigative projects of value to the entire Northern New England community of cancer care providers. The society seeks to award one or more research grants to worthy proposals, **up to a total of $20,000**. Eligible candidates will be a current NNECOS member in good standing. Projects should be in alignment with the society’s mission to assure access to high quality oncology care in our region. Preference will be given to projects promoting collaboration amongst NNECOS institutions (academic and community). Awardees will be notified on or around December 31, 2015, be required to submit progress reports to NNECOS, and may be asked to present a final report of the research to the NNECOS annual meeting.

**Apply online at www.nnecos.org/research.**

Completed applications must be submitted no later than 11:00pm on December 1, 2015.

---

**Call for Proposals: Student Led Projects**

The Northern New England Clinical Oncology Society is seeking student-led funding proposals for projects of value to the entire Northern New England community of cancer care providers and cancer survivors. The society seeks to award one or more project grants to worthy proposals, **up to a total of $2,500 per cycle**.

Eligible candidates will be health care students in Vermont, New Hampshire and Maine in good academic standing with faculty mentor support. Projects should be in alignment with the grant goals of addressing issues of cancer survivorship and/or improving cancer awareness. Preference will be given to projects promoting interprofessional collaboration.

**Complete details available online at www.nnecos.org/student-research.**

Completed applications must be submitted no later than 11:00pm on May 1, August 1 and December 1, 2015, May 1, 2016 and August 1, 2016 for spring, summer and fall semester projects.
THANK YOU CORPORATE SUPPORTERS

The Northern New England Clinical Oncology Society gratefully acknowledges the following supporters. Their on-going support allows NNECOS to fulfill its mission to assure availability of and access to high quality cancer care in our region.
March 5, 2016
Spring Meeting & OCN Review Course
Grappone Center, Concord, NH

October 28-29, 2016
Annual Meeting & Palliative Care Symposium
Omni Mt. Washington, Bretton Woods, NH