AN OVERALL REPORT ON THE STATUS OF COMMUNITY MEDICAL CENTERS’ CANCER PROGRAM WITH A SPECIAL EMPHASIS ON LYMPHOMA.
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The Community Medical Centers’ Cancer Committee is pleased to introduce its 2013 Annual Report. The program continued to have steady growth over this last year. Community Medical Centers has been accredited by ACOS/CoC since the 1970s and has set many new standards that will need to be met by 2015.

Over the past year, we have been working diligently to meet the new standards that are required by ACOS. These standards are focused on patient care from the time of diagnosis, through treatment, and afterward. In addition to breast and lung cancer navigation programs we’ve had in place for the past few years, we also added navigation programs for patients diagnosed with gastrointestinal, head and neck cancers. Our navigators in these areas are helping patients through their initial diagnosis of cancer and guiding them through the very complex treatments these cancers require – helping patients and their families to understand and prepare for their treatment and proceeding in a timely manner. We are excited to soon bring further navigation, palliative care and survivorship programs that will continue to enhance the patient care experience.

This year’s report has a special emphasis on Lymphoma. Oncologist Haifaa Abdulhaq, M.D., will present the program’s data for the last 10 years. She compares Community Medical Centers’ results to national outcomes.

On behalf of the Cancer Committee, I wish to thank all of those who contributed to this report. The Cancer Committee consists of dedicated professionals from multiple disciplines. Their commitment and hard work have resulted in the program’s continued growth and success. I look forward to this coming year’s achievements.

Dina Ibrahim, MD

Cancer Committee Chairman
Community Oncology Associates
Community Medical Centers
The 2013 Cancer Committee Members are listed below in alphabetical order:

Dina Ibrahim, MD  
Medical Oncologist, Cancer Committee Chairman  

Mary Leyser, CTR  
Cancer Registry Supervisor, Community Regional Medical Center  

Dineshi Liyanage, MD  
Palliative Care, Clovis Community Medical Center  

William Pitts, MD  
Pathologist, Pathology Associates  

Crystal Rodriguez, RN  
Rehabilitation, Oncology Services Community Regional Medical Center  

Nancy Shuster-Artis, RN  
Quality Management Coordinator, Community Regional Medical Center  

Dina Ibrahim, MD  
Medical Oncologist, Cancer Committee Chairman  

Mary Leyser, CTR  
Cancer Registry Supervisor, Oncology Services Community Regional Medical Center  

Dineshi Liyanage, MD  
Palliative Care, Clovis Community Medical Center  

William Pitts, MD  
Pathologist, Pathology Associates  

Crystal Rodriguez, RN  
Rehabilitation, Oncology Services Community Regional Medical Center  

Nancy Shuster-Artis, RN  
Quality Management Coordinator, Community Regional Medical Center  

Lori Soto, RN  
Inpatient Oncology Manager, Community Regional Medical Center  

John Strubert  
Radiology Diagnostic Manager, Clovis Community Medical Center  

Uma Swamy, MD  
Radiation Oncologist, California Cancer Center  

Christine Swift, RN, MSN, CHPN, CCRN  
Palliative Care Manager, Community Regional Medical Center  

Harminder Toor, RN  
Administration, Home Health Services Community Health Center - Sierra  

Laura Valenzuela, RN  
Oncology Services Community Regional Medical Center  

Chris Ann Venugopal  
Nursing Administrator, Fresno Heart & Surgical Hospital  

Jeff Zweifel, RN  
Oncology Services Clovis Community Medical Center  

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Laura Valenzuela, RN  
Oncology Services Community Regional Medical Center  

Chris Ann Venugopal  
Nursing Administrator, Fresno Heart & Surgical Hospital  

Jeff Zweifel, RN  
Oncology Services Clovis Community Medical Center
Dear Colleagues,

It is my distinct privilege and honor to report on the status of our cancer program in this year’s annual report. Since 2009, I have served as Community Medical Centers’ Cancer Liaison Physician (CLP) to the American College of Surgeons Commission on Cancer.

As the CLP, I have the opportunity to serve as a clinical champion of efforts to improve the cancer care for Community. During this time period, I have seen our program grow and further develop our mission for excellent state-of-the-art and comprehensive care of cancer across all of our facilities. This work is often “behind the scenes” and many of the people who contribute to this effort often go unrecognized. Members of our Cancer Committee have worked hard over the past few years to continue our mission and improve our performance overall. I would like to take this opportunity to thank everyone on behalf of the Committee for all of their efforts and dedication.

The Commission on Cancer (CoC) Accreditation program encourages hospitals across the nation, treatment centers and other facilities to improve their quality of patient care through various cancer-related programs. These programs focus on prevention, early diagnosis, pretreatment, rehabilitation, surveillance for recurrent disease, support services, and end-of-life care. Five elements are key to the success of a CoC-accredited cancer program:

1. The clinical services provide state-of-the-art pretreatment evaluation, staging, treatment, and clinical follow up for cancer patients seen at the facility for primary, secondary, tertiary, or end-of-life care.
2. The cancer committee leads the program through setting goals, monitoring activity, evaluating patient outcomes, and improving care.
3. The cancer conferences provide a forum for patient consultation and contribute to physician education.
4. The quality improvement program is the mechanism for evaluating and improving patient outcomes.
5. The cancer registry and database is the basis for monitoring the quality of care.

We are eagerly awaiting our CoC survey in October of 2014. During our last survey by the CoC, Community received a “Three-Year Accreditation with Commendation.” This was a great achievement and placed us among the top programs in the country taking care of cancer. In just three short years, with an increase of 10% in our total cancer patient volume (2,775 cases), Community has continued to meet our increasing patient needs by providing state-of-the-art cancer care. Our commitment to pursue and improve the Central Valley’s cancer care has lead us to spearhead, influence and increase recruitment of medical as well as surgical oncology specialists to the area, where we were once lacking.

Over the last three years, our proactive approach to continue building on our multidisciplinary care across all of our facilities has led to a stronger foundation in the care that is offered to our cancer patients. We have seen an extension in our various ancillary services that we offer. As such, I would like to highlight some of our achievements.

**MULTIDISCIPLINARY CANCER CONFERENCES**

We have had a steady increase in the number of these conferences offered across all of Community’s facilities. Our Lung Nodule Program continues to decrease the time interval from diagnosis to treatment of patients with newly identified lung lesions. Our new Cancer Conference at Clovis Community has been an exciting addition to our growing cancer needs and in a short time period grown to become a strong proponent of multi-disciplinary evaluation and care. There are not enough words to thank all of our colleagues at our Radin Breast Care Center, which has earned two national accreditations for excellence in breast cancer care. Radin is one of nine Certified Quality Breast Centers of Excellence in the
CANCER LIAISON PHYSICIAN REPORT  
BABAK EGHBALIEH, M.D., FACS

country, meeting standards set by the National Quality Measures for Breast Centers. Furthermore, the American College of Radiology (ACR) has named Radin as a Breast Imaging Center of Excellence in mammography, breast ultrasound and stereotactic or needle biopsy.

The Cancer Conference at Community Regional continues to offer a forum for our multitude of subspecialty cancer patients to receive a comprehensive review. We are very excited about the HPB/GI Oncology Conference that during the last 18 months, on a weekly basis, has spearheaded our efforts and representation of physicians as well as non-physicians dedicated to meet the increasing demands of this cancer population in the Central Valley. With the continued increase in brain tumors in the Central Valley, our neuro-oncology conference allows us to bring state-of-the-art treatment plans, including CyberKnife technology to our patients. We are excited and anticipating the start of our very own dedicated Head and Neck Multidisciplinary Cancer Conference soon. This has been one area that did not really have a home in the past for dedicated review, and we are fortunate to have physician leader champions behind this effort.

PATIENT NAVIGATION

A patient-centered approach is at the forefront of the accreditation standards by the Commission on Cancer (CoC) of the American College of Surgeons (ACS) for hospital cancer programs such as Community Medical Centers. As of 2010, we were at the forefront of multidisciplinary care and started the only Lung Nodule program in central California and one of only a handful in the nation. As part of this program, we cannot thank Kathy Norkunas enough for her amazing dedication and superb care as our Lung Nodule nurse navigator. During the latter part of last year, we had a new addition to our navigation program. Robin Munoz, RN, is our hepatobiliary-pancreatic as well as Head and Neck program nurse navigator. In just a short time, she has proved to be an excellent addition to our team and we are fortunate to have her. Beverly McCann has been our navigator for breast cancer at the Radin Center and continues to provide superb care. We are very excited to continue the growth of our Navigation program, and as such have delineated a specialty-based phased integration of other nurse navigators over the next 25 months.

During this past year we have continued our proactive approach to treatment of cancer and extended our services across the board for our cancer patients. Our success with our inpatient palliative care services has increased momentum for an outpatient-based palliative care program.

Inspiration is present all around us as we recognize the accomplishments of our staff and courageous patients. Many patients participate in clinical trials to improve the therapies and options available to others in the future. The volunteers and staff at Community are also gratefully thanked for their service and helpful advice. As we approach the years ahead, we remain committed to growth and improvements in the exceptional services at our facilities. Our staff, nurses and physicians are champions of compassionate patient care and talented in their expertise of oncology. I hope to continue my primary responsibility as the Cancer Liaison Physician to monitor and interpret our program’s performance, as well as our data, to evaluate and improve the quality of care at Community.

Sincerely,

Babak (Bobby) Eghbalieh, MD FACS  
Cancer Liaison Physician Commission on Cancer,  
American College of Surgeons
CANCER COMMITTEE
A successful cancer program depends on the effective leadership of a quality cancer committee. Responsibility for goal setting, planning, initiating, implementing, evaluating and improving cancer-related activities for patient care lies in the hands of the facility’s capable leadership. Composed of dedicated and caring professionals, Community’s Cancer Committee is multidisciplinary and represents the full scope of cancer care for our patients. Physicians representing each of the diagnostic and treatment services, along with non-physician representatives from administrative, clinical, and supportive services, round out the leadership team, overseeing care to patients in four facilities: Community Regional Medical Center, Clovis Community Medical Center, Fresno Heart & Surgical Hospital and the California Cancer Center. In addition to providing direction for cancer program activities, the Cancer Committee also sets annual goals for clinical practice, community outreach, programmatic endeavors and quality improvements.

ACOS ACCREDITATION
Community Medical Centers’ Cancer Program, which includes all of its facilities, has been accredited by the American College of Surgeons (ACOS) since 1980. The Commission on Cancer Accreditation (CoC) program focuses on quality of care via performance metrics and quality improvement, ensuring patient-centered care. The CoC encourages hospitals, treatment centers and other facilities to demonstrate commitment to quality of care for their patients. The CoC accreditation is nationally recognized by organizations such as the Joint Commission, American Cancer Society, Aetna, CMS, NQF and National Cancer Institute as having established performance measures for the provision of high quality cancer care. Community Medical Centers achieved the Teaching Hospital Accreditation in 1999. We achieved our last accreditation in 2011 and will be surveyed in 2014.

ONCOLOGY SUPPORT SERVICES
Community’s Oncology Program has been designed to incorporate a trans-disciplinary approach to cancer care designed to address the multidimensional factors associated with cancer care to enhance biomedical care and promote quality of life for patients and families. Community’s Cancer Program has met several of the new ACOS standards by integrating psychosocial distress screening and service provision into routine oncology care, launching the patient navigation program, and development of the survivorship care plan process.

Nurse Navigation provides oncology patients with a single point of contact for questions and concerns while serving as a vital link between the patient and the healthcare providers to facilitate timely access to care throughout all phases of treatment and into survivorship.

Psychosocial Oncology services are essential to ensure holistic, comprehensive, trans-disciplinary cancer care for patients and their loved ones. Psychosocial support is initiated early in care to ensure effective interventions are provided to address the practical, psychological, social and spiritual needs associated with a cancer diagnosis for patients and families across the illness trajectory.

Nutrition services provide patients with clinical support and education regarding the variety of complex nutritional needs inherent of cancer treatment, recovery and prevention.

Speech Language Pathology rehabilitation is a vital component to multidisciplinary cancer care, providing proactive comprehensive assessments of the multifaceted impact on speech, voice, swallowing, cognition and language associated with radiation therapy, chemotherapy, and surgery. SLP rehabilitation offers a myriad of clinical and rehabilitative interventions both pre- and post-treatment while ensuring patients and families are educated regarding a variety of conditions.

MEDICAL ONCOLOGY
Medical Oncology Service is provided by several medical oncology groups at Community Medical Centers. Consultations and treatments are provided at Deran Koligian Ambulatory Care Center. Chemotherapy is also administered at Community Ambulatory Infusion Center. The Deran Koligian Ambulatory Care Center is staffed by UCSF Medical Oncologists Trials.
RADIATION ONCOLOGY

Community Regional Medical Center and the California Cancer Center offer the latest in radiation therapy technology – providing our patients state-of-the-art radiation therapy. At California Cancer Center, two new Elekta Infinity Accelerators recently went into clinical operation – providing clinicians with the most advanced tools for image guided radiation therapy (IGRT), intensity modulation radiation therapy (IMRT) and volumetric modulated arc therapy (VMAT), ensuring our patients have the best available treatment delivered in a comfortable environment. The pre-treatment planning process is supported by a radiation therapy specific large bore CT scanner also recently installed. Our clinicians use a state-of-the-art Philips Medical’s treatment planning system to customize optimal treatments for each patient.

In addition, the Charles and Anne Matoian Oncology unit located at Community Regional has a CyberKnife stereotactic radiation therapy system. CyberKnife is the only robotic radiation therapy system in existence that is dedicated to stereotactic radiation therapy delivery. The CyberKnife is the only system that can verify tumor locations and track any movements during the treatment process so that adjustments as needed are made. Community Regional also has a Siemens Primus Linear Accelerator that provides 3D conformal radiation therapy and IMRT services. The following list of advanced radiation therapy treatments are available through the Community Radiation Oncology departments:

- Stereotactic Radio Surgery (SRS), Stereotactic Body Radiation Therapy (SBRT), Image-Guided Radiation Therapy (IGRT), Volumetric Modulated Radiation Therapy (VMAT), Intensity Modulated Radiation Therapy (IMRT), 3D Conformal Radiation Therapy (CRT), Prostate Seed Implants (Brachytherapy), Partial Breast Irradiation (Brachytherapy), High Dose Rate (HDR) Brachytherapy.

CANCER REGISTRY

The Cancer Registry at Community Medical Centers was established in 1964 to help monitor trends and outcomes of cancer incidence in our community. The Cancer Registry is made up of professionals responsible for the collection and management of accurate and timely cancer patient information. The registry follows approximately 17,000 patients annually. Quality cancer data is central to the nation’s fight against cancer, and cancer registrars are the first link in capturing that data.

The registry provides members of the hospital medical staff with data which enables them to evaluate diagnostic and treatment approaches, analyze quality of care, study survival rates, and ultimately improve the overall care provided by Community Medical Centers and the California Cancer Center. Cancer Registrars are data information specialists that collect and code patient-level data for cancer registries. The registries provide essential information to healthcare providers and health officials to better monitor and improve cancer treatment, conduct research and target cancer prevention and screening programs. They manage a wide range of demographics and medical data on those with cancer and some of the benign tumors as well. The information is both submitted and utilized by state and national cancer registries to enable cancer programs to accurately determine cancer patient populations, formulate plans for improvement and measure outcomes of treatment and survival. This data is included in numerous publications including the Annual Report to the Nation on the Status of Cancer, a collaboration of the American Cancer Society, the Centers for Disease Control and Prevention, the National Cancer Institute, and the North American Association of Central Cancer Registries, all of which use cancer registry data to provide up-to-date information on cancer occurrences and trends.

The registry collects all treatment data for diagnosis and/or treatment of patients at our hospitals. This allows for a lifetime follow-up of all patients. We have five certified cancer registrars that added about 2,000+ new cases each year between our multiple sites.

The Cancer Registry also is responsible for coordinating the multidisciplinary cancer conferences and helping with outpatient screening clinics, along with other educational programs. As previously mentioned, last year, we helped achieve Community Medical Centers’ Cancer Program, the American College of Surgeons’ three-year accreditation with seven out of eight commendations.
CANCER CONFERENCE

Community Regional Medical Center and Clovis Community Hospital provide physicians with many opportunities to present cancer cases in several Cancer Conferences throughout the Community Medical Centers system. Physicians may present individual cases in an open forum to discuss diagnosis and make recommendations for workup and treatment. A full patient presentation includes medical history, pathology, radiology, and TNM staging. These meetings are multidisciplinary and prospective. Cancer Conferences promote ongoing education for residents and medical staff while providing an opportunity to learn about new treatments and open clinical trials. Speakers are selected from both local and national Institutions of Excellence to address topics of cancer care and research. Community, with UCSF-Fresno, provides unique access to specialty physicians through Cancer Conferences, research and collaboration.

COMMUNITY REGIONAL MEDICAL CENTER
General Cancer Conference:
Every Wednesday, 7:30 AM
Hepatobiliary (HPB) Conference:
Every Thursday, 12:00 PM
Cyberknife: Every Wednesday, 12:00 PM
Lung Nodule Conference: Every Monday, 5:00 PM

CLOVIS COMMUNITY HOSPITAL
Clovis Cancer Conference:
3rd Thursday of every month, 12:30 PM
Radin Breast Conference: Every Friday, 1:00 PM

If you have any questions concerning the Cancer Conferences, please call Mary Leyser, CTR 451-3641.

LUNG NODULE PROGRAM

The Lung Nodule Program, developed through a collaboration with Community Regional Medical Center and UCSF Fresno, is one of only a handful in the country — and the first in central California. The goal of the program is to provide optimal diagnosis and management of lung cancer at all stages using a coordinated multidisciplinary approach. Patients are evaluated by the Lung Nodule multidisciplinary team in an expedited manner. This program simplifies the process for the patient while alleviating unnecessary procedures and office visits. This process is coordinated by the program nurse navigator who ensures timeliness of follow-up and treatment. With timely treatment, careful consideration is given to the options of minimally invasive surgery, Cyberknife® therapy and more optimizing treatments. The multidisciplinary team consists of professionals in the fields of: thoracic surgery, pulmonology, medical oncology, radiation oncology, diagnostic radiology, vascular and interventional radiology and pathology. To expedite the evaluation and treatment of lung nodules, Community Regional Medical Center’s Lung Nodule clinic team of experts conduct weekly meetings to evaluate new cases and recommend customized courses of treatment, if necessary.

Radin Breast Care

The Marjorie E. Radin Breast Care Center at Clovis Community Medical Center continues to be the only breast center in central California that holds two Breast Care of Excellence certifications. These certifications have been awarded to us from the highly regarded American College of Radiology (ACR) and the National Quality Measures for Breast Centers (NQMBoC). To achieve the Breast Center of Excellence from the ACR we have achieved accreditation in three modalities, which include mammography, ultrasound guided biopsy and stereotactic guided biopsy. Certification from the NQMBoC includes passing many high quality measures such as data collection and benchmarking. These certifications are one of the most important parts to being a successful breast center.

We are proud to announce the implementation of tomosynthesis, also known as 3D mammography. This is the latest breakthrough in breast imaging. Both 2D and 3D mammography are performed as a combination examination, which results in better visualization of fine details. This exciting breakthrough has a positive impact on breast cancer screening and diagnosis. Tomosynthesis helps aid the elimination of overlapping breast tissue, which improves our ability to find cancers earlier or find cancer that may be missed on 2D alone. This new modality offers greater accuracy in determining size, shape and location of abnormalities. 3D mammography can also decrease false positives, which often results in a greater peace of mind for patients.

The nurse navigator at the Radin Breast Care Center coordinates our weekly multidisciplinary breast conference and clinic. Patients referred to the clinic are followed throughout their continuum of care by our navigator. She ensures that the patient is given education about the treatment process, helps facilitate appropriate and timely treatment based on the plan of care outlined in the conference. She will look to evidence-based prac-
tice using NCCN guidelines for our breast care patients. She is also involved in outreach and breast health education through multiple events in our community throughout the year.

Our center also has the support services of a social worker who meets with patients and their families. She is available for brief counseling as well as assisting with resources during their treatment course. She also oversees our English and Spanish speaking support groups for patients and their families.

The Radin Breast Care Center now offers risk screening and a monthly High Risk Clinic. Their patients’ risks are assessed by our care coordinator and scheduled for the High Risk Clinic as indicated. This service is available to women who are referred by their primary care provider and women who have their breast imaging at our facility.

At the Radin Breast Care Center, taking care of patients is a privilege. We are proud to say we have the latest technology in breast care services to serve our community.

COMMUNITY OUTREACH
As an accredited ACOS facility, Community Medical Centers is committed to delivering a minimum of three yearly educational events and screenings for Central Valley residents. The goal for each of the programs is to provide free resources to the Valley’s underserved population as well as current patients and their families.

Education includes helping the community better understand cancer and its risks, including early detection and ways to prevent, diagnose, and treat. Each effort includes a combination of education, screening, treatment, and support activities.

CYBERKNIFE®
CyberKnife is a revolutionary tool that allows physicians to perform life-saving surgery where before there was no surgery possible. It uses a robotic arm to pinpoint and destroy tumors in the same way that technology guides cruise missiles. Patients experience no pain, no incision, no anesthesia and require minimal recovery time. The CyberKnife system is proven to be the most accurate, real-time, image-guided robotic radiosurgery system in the world. The combination of the image-guidance system and the multi-jointed robotic arm allows CyberKnife to compensate for patient movement, sparing patients the pain and inconvenience associated with the conventional head frame that is fixed to the patient’s skull. CyberKnife’s ability to track and compensate for patient movements (like breathing) also allows this remarkable tool to treat tumors in areas of the body where older systems like Gamma Knife cannot. Since CyberKnife treatment is a simple and painless outpatient procedure, patients can focus on other things and get back to their normal activities quickly. Community Regional has treated more than 450 patients with CyberKnife. Various cancer sites treated are lung, liver, prostate, metastatic melanoma and CNS tumors, to name a few. If you would like any more information on CyberKnife, please call (559) 459-2752.

CANCER RESEARCH
Clinical trials are vital in studying all aspects of medicine, not just cancer. The stakes may seem higher when researching medicines to treat cancer, but all new treatments, drugs and medical devices included, must go through clinical trials before being approved by the FDA. At one time, clinical trials were available only at major medical centers. Patients now have more options which may include remaining close to home during a study, or even staying with their own doctors.

Community Medical Centers is dedicated to providing the latest cancer treatments to its patients. The Cancer Research staff monitors all new patient records for eligibility for enrollment in clinical trials supervised by a certified clinical research nurse. Radiation trials utilize the latest technology. Treatment modalities include 3DCRT, IMRT, IGRT, Brachytherapy and CyberKnife. Medical oncology clinical trials focus on the latest in chemotherapeutic agents and diagnostic tests to improve the outcomes and quality of life of patients.

For more information on clinical trials, please call Bonnie Harkins, California Cancer Center at (559) 451-3647.

Bonnie Harkins, RN OCN CCRP
Cancer Research Nurse
# Community’s 2012 Site Table

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Non Hodgkin’s lymphomas (NHL) are a heterogeneous group of lymphoproliferative disorders originating in B-lymphocytes, T-lymphocytes or natural killer (NK) cells.

Non Hodgkin lymphoma is one of the most common cancers in the United States accounting for about 4% of all cancers, and is more common in males than females. (Figure 1)

B-cell lymphomas are diagnosed in 80% to 85% of people with 15% to 20% being T-cell lymphomas. NK-cell lymphomas are very rare.

In 2014, an estimated 70,800 people will be diagnosed with NHL and there will be approximately 19,020 deaths due to this disease. 1

NHL is the seventh leading site of new cancer cases among men and women, accounting for 4% of new cancer cases and 3% of cancer-related deaths.

The incidence of NHL has increased dramatically between 1970 and 1995 and has moderated since the mid 90s. The increase has been attributed partly to human immunodeficiency virus (HIV) epidemic. However, much of the increase has been observed in patients in their sixth and seventh decades; a large part of this increased incidence has paralleled a major decrease in mortality from other causes.

Death rates from NHL have been decreasing since the late 1990s.

While NHL can occur at any age, about half of patients are older than 65. The risk of developing NHL increases throughout life. The aging of the American population is likely to lead to an increase in NHL cases during the coming years. (Figure 2)

Diffuse large B cell lymphoma (DLBCL) is the most common histological subtype of non-Hodgkin lymphoma (NHL), accounting for approximately 30 percent of patients with NHL.
The Fresno county population seems to follow the patterns seen in the country in terms of histology and race. (Figure 3)

The most common subtype of NHL in Fresno county is Diffuse Large B cell lymphoma (DLBCL) at 44.2% followed by Follicular Lymphoma at 20%, while T cell lymphomas account for nearly 5% of NHL. (Figure 4)

CLINICAL PRESENTATION AND DIAGNOSIS OF NHL

The clinical presentation of NHL varies tremendously depending upon the type of lymphoma and the areas of involvement.

Aggressive lymphomas commonly present acutely or subacutely with a rapidly growing mass, systemic B symptoms (ie, fever, night sweats, weight loss), and/or elevated levels of serum lactate dehydrogenase and uric acid.

Indolent lymphomas are often insidious, presenting only with slow growing lymphadenopathy, hepatomegaly, splenomegaly, or cytopenias.

Less common presentations include skin rash, pruritus, exaggerated (hypersensitivity) reactions to insect stings or bites, Ascites and pleural effusion.

A biopsy is required for the diagnosis and classification of NHL. Accurate histopathologic evaluation of lymphomas requires a tissue biopsy, preferably an intact lymph node. Only an excisional biopsy of an intact node consistently allows sufficient tissue for histologic, immunologic, molecular biologic assessment, and classification by experienced hematopathologists. In patients with disease in deep sites (eg, retroperitoneal nodes), image-guided core biopsies may provide sufficient tissue for diagnosis. 2
The immunophenotype of lymphoma cells can be determined by flow cytometry or by immunohistochemistry.

Immunophenotyping plays a crucial role in the diagnosis and subclassification of most forms of NHL. Chromosomal abnormalities may be detected using conventional karyotypic analysis, fluorescence in situ hybridization (FISH), or polymerase chain reaction (PCR) for abnormal gene products. A choice among these tests is made depending upon the clinical situation and the suspected diagnosis.

**STAGING**

A bone marrow aspiration with an adequate-size biopsy should be performed for all patients as part of their staging evaluation. This may help to determine the diagnosis, but also helps with staging.

Routine radiologic studies in NHL should include contrast enhanced computerized tomographic (CT) imaging of the chest, abdomen, and pelvis. This CT both serves to help determine disease stage at diagnosis and to provide a baseline study for comparison to determine response to treatment. Integrated positron emissions tomography (PET)/CT scanning is more sensitive and specific than CT in certain histologic subtypes of NHL; however, the fluorodeoxyglucose (FDG) avidity varies by NHL type making it a useful test in the initial evaluation of some (ie, diffuse large B cell lymphoma and Hodgkin lymphoma), but not all NHL.

The Ann Arbor staging system with Cotswold modification, originally developed for Hodgkin lymphoma, has been adapted for NHL staging. (Figure 5)

**TREATMENT**

The treatment of NHL varies widely depending on the subtype and the aggressiveness of the disease.

B cell NHL are classified to: Indolent, aggressive and highly aggressive NHL.

The International Prognostic Index (IPI) and its variants are the main prognostic tools used in patients with DLBCL. The IPI uses information regarding patient age, performance status, serum lactate dehydrogenase level, disease stage, and degree of extranodal involvement to determine a score that correlates with progression-free and overall survival after standard therapy.

- Gene expression profiling (GEP) by means of DNA microarrays is an evolving approach to classification and diagnosis of non-Hodgkin lymphoma and other malignancies. GEP subclassifies DLBCL to germinal center (GC) and Activated B cell (ABC) DLBCL. The role that GEP plays in the diagnosis and treatment of DLBCL is a matter of ongoing research.

- c-MYC translocation has emerged as an important independent risk factor for poor outcome.
TREATMENT OF DIFFUSE LARGE B CELL LYMPHOMA (DLBCL)

The initial treatment of DLBCL is dependent upon the extent of disease.

Limited stage disease (Ann Arbor stage I or II) is treated primarily with combined modality therapy consisting of abbreviated systemic chemotherapy with 3 cycles of Rituximab, cyclophosphamide, Adriamycin, vincristine and prednisone (R CHOP) and involved field radiation therapy (IFRT). Alternatively, full course (six to eight cycles of R CHOP) without radiation therapy may be used.

Patients with advanced stage disease (Ann Arbor stage III or IV) and patients with bulky (> 10 cm) stage II disease are treated primarily with 6-8 cycles of R CHOP.

In addition, there are some special scenarios (eg, testicular lymphoma) in which central nervous system prophylaxis is required. CNS prophylaxis may include high dose methotrexate or intrathecal methotrexate.

As our understanding about different variants of DLBCL increases, we will likely develop specific regimens that target pathways that are abnormal in specific variants. As yet, it is premature to alter treatment based upon the results of GEP analyses.

Autologus stem cell transplant could be considered in patients with high IPI in first remission as it was shown to improve disease free survival and overall survival in Intergroup S9704 study. 6

B cell lymphoma, unclassifiable, with features intermediate between DLBCL and Burkitt lymphoma has been proposed by the WHO as a category to classify those patients that do not truly fit into either category, and accounts for approximately 5 percent of cases previously categorized as DLBCL.7 Many cases in this subtype are referred to as “double hit” lymphomas, which are defined by a chromosomal translocation involving C Myc and BCL2 genes. These patients should be treated with more intensive regimens such as R Hyper CVAD or R DA-EPOCH (dose-adjusted cyclophosphamide, doxorubicin, etoposide, vincristine, prednisone plus rituximab.

TREATMENT OF FOLLICULAR LYMPHOMA (FL)

Follicular lymphoma (FL) is the most common subtype of indolent NHL, and accounts for about 22% of all newly diagnosed cases of NHL.

Involved-site radiotherapy (ISRT) remains the current standard of care for patients with early-stage FL.

Observation is still the standard practice for patients with advanced stage low tumor burden FL. In the clinical practice setting, treatment should only be initiated when a patient presents with indications for treatment (based on GELF criteria). 8

TREATMENT OF MARGINAL ZONE LYMPHOMA (MZL)

Extranodal MZL (also called MALT lymphoma) arises in a number of epithelial tissues. Gastric MALT often responds to therapy aimed at H pylori eradication while those with more advanced disease or those who progress after this initial
treatment are often treated with involved field radiotherapy (RT). H. pylori negative gastric MALT should be treated with radiation therapy without a trial of antibiotics.

Patients with advanced disease are treated with chemo immunotherapy similar to FL.

Patients with nodal MZL are treated in a similar fashion to patients with more common indolent lymphoma like FL.

**TREATMENT OF MANTLE CELL LYMPHOMA (MCL)**

Rituximab used in combination with aggressive chemotherapy regimens such as R Hyper CVAD has resulted in favorable PFS and OS outcomes and is commonly used in treatment of MCL.

**PERIPHERAL T CELL LYMPHOMAS**

With the exception of ALK positive Anaplastic T cell lymphoma, these lymphomas tend to be more aggressive than B cell lymphomas. While CHOP chemotherapy is the most commonly used regimen in treatment, more aggressive regimens which include etoposide may improve outcome and should be considered in younger patients.

Novel agents such as Lenalidomide, Bortezomib and Ibrutinib (Bruton tyrosine kinase inhibitor) have shown efficacy in certain subtypes of NHL and are being investigated in further clinical trials.

**HODGKIN LYMPHOMA**

Hodgkin lymphoma (HL) is an uncommon malignancy involving lymph nodes and the lymphatic system. Most patients are diagnosed between 15 and 30 years of age, followed by another peak in adults aged 55 years or older. In 2014, an estimated 9,190 people will be diagnosed with HL in the United States and 1,180 people will die from the disease. (Figures 6 and 7)

**Figure 6: Hodgkin’s Lymphoma - Sex**

- Female: 46.4%
- Male: 53.6%

**Figure 7: Hodgkin’s Lymphoma - Age at Diagnosis - 10-year study**

- 2-4 years: 0.7%
- 5-9 years: 2.7%
- 10-19 years: 17.6%
- 20-29 years: 25.7%
- 30-39 years: 15.5%
- 40-49 years: 12.8%
- 50-59 years: 12.8%
- 60-69 years: 8.1%
- 70-79 years: 5.4%
- 80-89 years: 0.7%
The WHO classification divides HL into two main types: nodular lymphocyte-predominant Hodgkin lymphoma (NLPHL) and classical Hodgkin lymphoma (CHL).

The past few decades have seen significant progress in the management of patients with HL; it is now curable in at least 80% of patients. The advent of more effective treatment options has improved the 5-year survival rates that are unmatched in any other cancer over the past four decades.

Clinical management of patients with CHL involves initial treatment with chemotherapy or combined modality therapy, followed by restaging at the completion of chemotherapy to assess treatment response.

In 2009, the Deauville criteria were defined for the interpretation of interim and end-of-treatment PET scans based on the visual assessment of FDG uptake in the involved sites. These criteria use a 5-point scale to determine the FDG uptake in the involved sites relative to that of the mediastinum and the liver.

The most commonly used chemotherapy in HL is Adriamycin, Bleomycin, Vincristine and Dacarbazine (ABVD). The number of cycles depends on the Ann Arbor stage of the disease and risk factors.

Patients with stage I-II bulky disease receive IFRT after the completion of ABVD chemotherapy.

Patients with relapsed disease are commonly treated with salvage chemotherapy followed by Autologous stem cell transplant.

Brentuximab Vedotin which is an immunotoxin comprised of a CD-30 directed antibody linked to the antitubulin agent monomethyl auristatin E (MMAE),10 has shows efficacy in patients with relapsed HL.

**COMMUNITY MEDICAL CENTERS 10-YEAR STATISTICAL REVIEW IN HL**

The Fresno county population seems to follow the patterns seen throughout the country in terms of histology and race. (Figure 8)

The most common subtype of HL in Fresno County is Nodular Sclerosing Hodgkin Lymphoma (NSHL) at 50.7%. (Figure 9, next page)
CLINICAL TRIALS AND FUTURE OF LYMPHOMA TREATMENT AT COMMUNITY MEDICAL CENTERS

In collaboration with our hematopathologists (Dr. Calvin Chen and Dr. Paul Atmajian) and with Community Medical Centers oncologists, a hematopathology conference will be started in 2014 for multidisciplinary discussion of our complex malignant hematology including complex lymphoma cases to improve patient outcomes.

We currently have a phase III randomized trial of Brentuximab Vedotin plus AVD Vs ABVD as front line therapy in patients with advanced HL.

As a member of Alliance Cooperative Group, other clinical trials in treatment of patients with follicular lymphoma and diffuse large B cell lymphoma will be open this year at Community Medical Centers.

Figure 9: Hodgkin’s Lymphoma Histology - 10-year Study

REFERENCES


