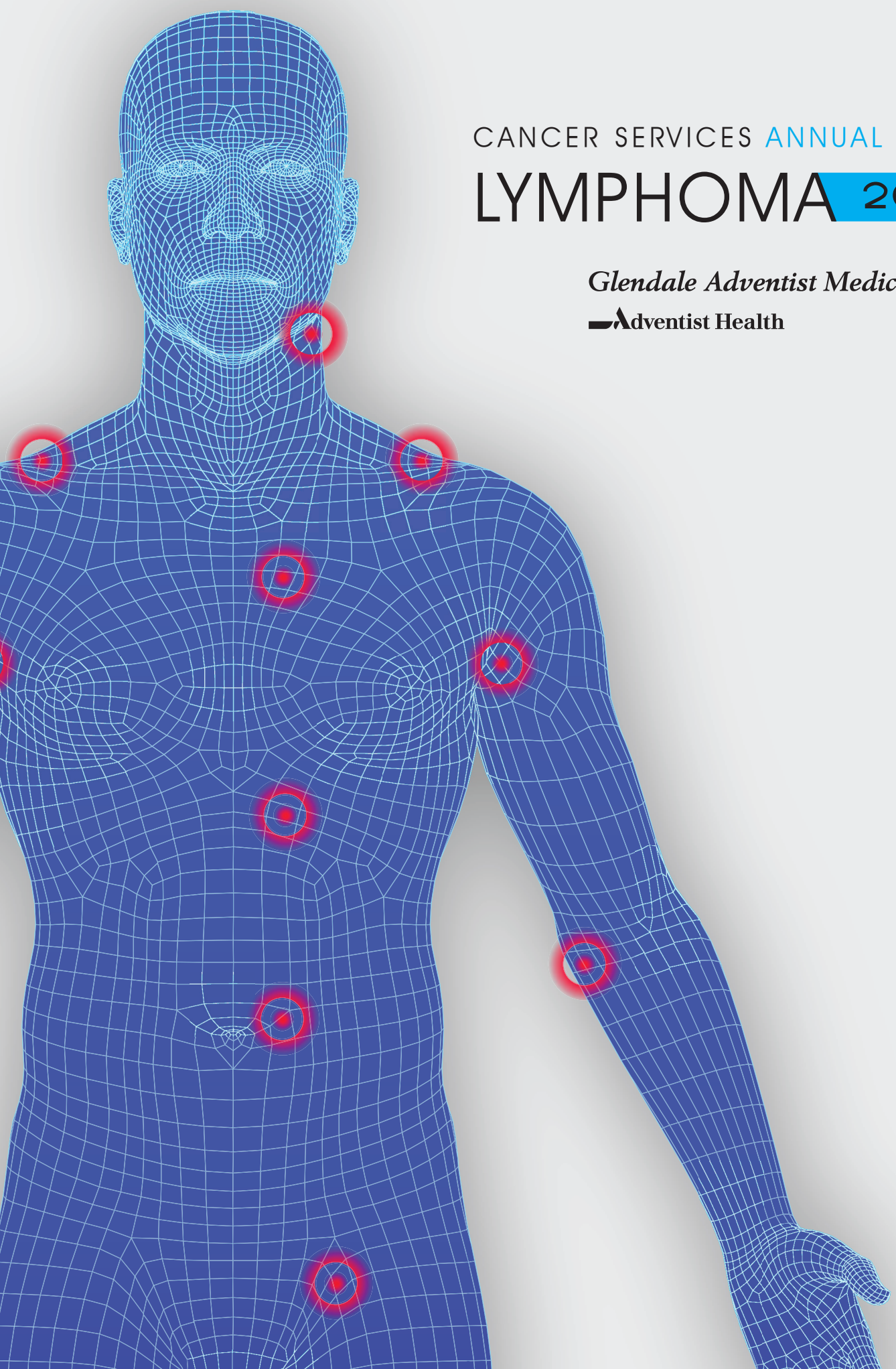

CANCER SERVICES ANNUAL REPORT

LYMPHOMA 2016

Glendale Adventist Medical Center

Adventist Health

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CANCER SERVICES ANNUAL REPORT

LYMPHOMA 2016

WELCOME TO THE 2016
CANCER SERVICES ANNUAL REPORT

KEVIN A. ROBERTS
President and CEO

SHARON CORREA
Vice President and Chief Information Officer

*Each year, Glendale Adventist Medical Center (GAMC) touches the lives of hundreds of cancer patients and families who place their trust in our physicians, nurses, technicians and support associates to provide the finest available care. A certified chemotherapy nurse in the cancer center, **Susanna Tamazyan, RN**, speaks volumes for the way our hospital approaches cancer care: "My patients are much more than a diagnosis; we make friends here."*

This is Susanna's 32nd year as a nurse and she takes pride in the personalized care that she and her colleagues provide in the cancer center. "We get to know our patients over a period of months, even years. . .we become part of their families," she explains. Her interest in patient well-being extends beyond actual treatment, as she often counsels patients on maintaining general health during treatment, healthy lifestyle, food and diet, exercise – even shopping ideas. "And we give lots of hugs here!" Susanna smiles.

Along the same line, cancer patients at GAMC are accorded the benefits of multi-disciplinary care, mirroring the hospital's long-standing mission of "promoting healing and wellness for the whole person." Integral to this approach are GAMC's tumor boards, which bring together cancer specialists from several departments to discuss and recommend the best possible care for each patient.

STRENGTHENING PATIENT NAVIGATION

Since 1976, GAMC has been recognized by the American College of Surgeons (ACoS) as a Comprehensive Community Cancer Program with many commendations. Cancer Services continues to earn additional honors for achieving the highest standards of patient care, including the recent ACoS Outstanding Achievement Award, its highest recognition.

However, we also know when key elements of the program should be strengthened. One of these areas is patient navigation, an important function that supports a patient's journey through the complexities of oncology care. During the coming months, we will be building on the success of our current patient navigation program and working to make it more efficient by increasing the spectrum of resources available to patients.

EXPERIENCE AND COMPETENCY

We often hear praise from patients treated in our cancer center. For example, The Healthcare Foundation's Cancer Care Guild recently honored **Trunita Crump-Knighton**, radiation therapist, with a Courage Award,

based in part on the accolades from her patients. Trunita represents the skill and experience represented among GAMC's Cancer Center associates who support the work of physicians and the hospital's entire cancer team.

With 33 years of experience in health care, including 25 years in radiation therapy, Trunita's "warm personality, cheerfulness and sense of humor" are often mentioned by her patients as a source of comfort and optimism.

Warmth and compassion are evident the moment patients call the Cancer Center and arrive at the front door. "I believe it's so important to greet patients and their family members with utmost respect and patience," says **Nicole Kalout**, radiation oncology coordinator, whose 21 years of experience with Adventist Health enables her to anticipate patients' needs even before they do. "This helps the whole process," Nicole continues. We establish a rapport so when patients come into the cancer center for the first time, they can have a calm and peaceful experience."

FOCUS ON NON-HODGKIN LYMPHOMA

With a focus on lymphatic cancer, this report will inform you about our physicians, nurses, technicians and other GAMC professionals who collaborate in making our Comprehensive Community Cancer Program the finest in the region. For the medical community in particular, the report contains extensive articles written by GAMC physicians on the latest information related to non-Hodgkin lymphoma (NHL) along with statistics reflecting the comprehensive scope of our cancer treatment program.

We are privileged to serve as colleagues to those devoting their careers in the fight against NHL lymphoma and other forms of cancer at Glendale Adventist Medical Center.

Outstanding Achievement Award

CANCER COMMITTEE
CHAIRMAN'S MESSAGE

BORIS BAGDASARIAN, DO
Hematology and Oncology, Chairman, Cancer Committee

Dear Colleagues and Friends,

As chairman of the Glendale Adventist Medical Center Cancer Committee, I am pleased to introduce the 2016 cancer services annual report.

The Glendale Adventist Medical Center Cancer Center continues to provide the highest quality, comprehensive cancer care for patients in our community. We have worked hard to promote common interests of the nation's leading academic and free-standing cancer centers that are focused on the eradication of cancer through a comprehensive and multidisciplinary approach. Our center of attention is based on strategic initiatives of service, evidence-based care and patient safety.

As medicine in general, and specifically cancer management, has evolved into a process reliant on evidence-based decisions and treatments, national guidelines have been designed for treatment decisions. These guidelines represent an accumulated experience. With regard to the spectrum of cancer, our compliance with these guidelines is measured and reported. Throughout the year, the cancer center identifies areas where improvment in the quality of care for our patients is needed. Multidisciplinary tumor boards are held to review prospective cases. In this forum, physicians and support staff are given an opportunity to discuss newly diagnosed cancer patients in a collegial and consultative setting. We discuss the patient's case thoroughly and form a consensus and recommendation regarding the best therapeutic management of our patients.

Cancer is not one illness. There are a vast variety of different malignancies and associated comorbidities, each requiring knowledge and experience to manage. The committee membership is diverse and includes a committed team of physicians and other health care professionals. The committee oversees a number of important activities within the GAMC Cancer Program, including planning of physician education, cancer screenings, compiling and reporting cancer statistics and developing and monitoring various quality improvement initiatives. Our cancer center continues to grow and provide patients with the very latest cancer care throughout our region and beyond.

In 2015, the survivorship care plans distribution was initiated to our patients, and we conducted prostate and hemoccult colorectal cancer screenings. We were happy to introduce our new Director of Cancer Services, **Dennis Quagliani** and our new member of the cancer registry, **Carolann Jared**.

It is with great pride and humility that we share this annual report outlining the Glendale Adventist Medical Center Cancer Center's continuing fight in our region. We are fully committed to putting our knowledge, experience and energy forward to ensure the best possible outcome for each patient. We understand our responsibility as the humble servants of those who seek our assistance. Through the continued efforts of our physicians and staff, we strive to make our community-based cancer program among the best in the nation. I thank all the physicians and clinical staff members of the cancer committee for their limitless dedication and devotion.

Courage Award honorees, Front row: Mina Shirvanian (left) and late Marilyn Gunnell. Back row: (left to right), Trunita Crump-Knighton, Jerry Wada, MD, and Alexx Anne Rex.

Bloomingdale's Glendale Manager Wiley Bartine and Hallie Freeman (holding flowers) with GAMC cancer center associates.

In memory of
Marilyn Gunnell

CANCER CARE GUILD
YEAR IN REVIEW

TINA PARSEGIAN
Cancer Care Guild President, CFS®, RFC®

"Where Life, Love and Hope Connect"

Glendale Adventist Medical Center's Cancer Care Guild is comprised of volunteers and donors whose focus is raising funds to provide free support services to cancer patients and their families in the community, regardless of where they received treatment.

2015 was an eventful time for the Guild. Among other activities, the Guild welcomed **Dennis Quagliani** as the new director of cancer services. Dennis played a key role in organizing the annual Cancer Survivors luncheon and presided over an inspirational Courage Awards dinner at Annandale Country Club. Honorees were GAMC oncologist, **Jerry Wada**, MD; GAMC radiation therapy technician, **Trunita Crump-Knighton**, **Alexx Anne Rex**, **Mina Shirvanian** and the late **Marilyn Gunnell**.

In addition, guild members wish to express their appreciation for a $2,000 perpetual grant from Bloomingdale's, New York, initiated by the Glendale store, to support the Cancer Center's Positive Image Center/Ingeborg's Place Apart. This generous, ongoing contribution will be used to provide free wigs, hats, scarves and knitted caps to cancer survivors, individual and group counseling and an array of classes, including chair yoga, art, jewelry making, knitting and fitness.

Members of the Guild and I were also pleased to participate in and support other cancer-related activities during the year.

This past year has been a wonderful experience serving as president of the Guild. Working alongside a generous and compassionate group of Guild volunteers, in addition to the highly skilled staff of professionals representing the Cancer Center and Healthcare Foundation, is an honor and privilege.

New Guild members are always welcome. For further information, please contact the GAMC Healthcare Foundation at **(818) 409-8055**.

Cancer free and thankful for her experience at GAMC, Cathy Yanez takes a relaxing walk in Descanso Gardens.

SPOTLIGHT

SURVIVOR

A story about courage

Cathy Yanez held herself together long enough to get the information she needed from the doctor. Then, soon as she hung up the phone, she cried.

The date was November 18, 2013.

The week prior, Glendale Adventist Medical Center (GAMC) physician, **David Yun**, MD, ear, nose and throat specialist, removed a lump from Cathy's right tonsil. The pathology report was not good news. At age 51 and otherwise in good health, Cathy Yanez had developed a form of lymphatic cancer, identified as B-cell, Marginal Zone, non-Hodgkin lymphoma, stage 2A.

The lymphatic system, tissues and other organs that produce, store and carry white blood cells that fight infections and other diseases are important for filtering germs and cancer cells from various parts of the body. Lymphoid tissue is found in many places, including the tonsils.

"I had a pit in my stomach," Cathy felt after learning she had cancer. "I felt nothing but fear because this journey didn't come with a manual." Dr. Yun referred her to GAMC Oncologist, **Boris Bagdasarian**, DO, and within two days, she had an appointment in his office.

SURVIVOR'S STORY

"Dr. Bagdasarian looked at me and said, 'don't worry, we're going to get you through this,'" Cathy recalls. "And he gave me a hug. I needed hugs."

Cathy sought a second opinion at City of Hope. Looking back on that experience, she is glad that she took that important step, "because the treatment Dr. Bagdasarian recommended turned out to be 100 percent correct," she explained. The initial treatment included: Four cycles (once every three weeks) of Treanda® with Rituxan followed by 2 ½ weeks of radiation therapy in GAMC's Cancer Center.

"Dr. Bagdasarian told me I'd have a fighting chance…the chances of remission were high," Cathy remembers. Her journey through chemotherapy was not easy. There's no denying how she felt during the days following infusion. Fortunately, as a financial trust administrator, she was able to work from home for a few days following her treatments.

"I was able to work throughout…I wanted to keep a sense of normalcy," she relates. "I thought, let me try this and see how far I can go." During the radiation phase, she was strong enough for the five-day-a-week treatments in the morning while also continuing her work.

Ten months following her initial diagnosis, Dr. Bagdasarian shared the results of Cathy's latest PET scan: she was cancer-free! "It was one of the best days of my life," she gleamed. "I was so happy I asked him twice."

However, her journey was not yet complete. Opting for a higher success rate for ongoing remission, Cathy decided to continue therapy for two more years with a series of Rituxin "maintenance" infusions. She is undergoing a treatment regimen every six months, scheduled to end in May 2016.

Today, Cathy reflects on being a cancer patient at Glendale Adventist Medical Center. "I had nothing but positive, positive, positive experiences here," she says. "Dr. Bagdasarian and nurses in the infusion center, were always upbeat, always helpful." At GAMC's Cancer Center, where Cathy underwent radiation therapy, she has the highest praises for medical director, **Sara Kim**, MD; Nurse Navigator, **Sharon Feinberg**; radiation therapists; and everyone as being "so welcoming, so patient and kind."

Pausing for a moment, Cathy calmly folded her hands and added, "I believe God led me here."

> "I had nothing but positive, positive, positive experiences here," said Cathy.

COMMUNITY OUTREACH

TRACEY SANDERS
Positive Image Coordinator

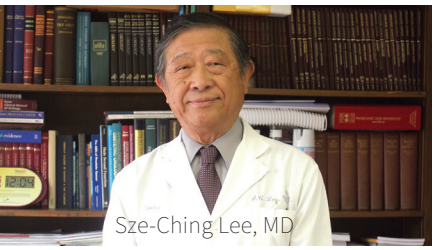
Glendale Adventist Medical Center's (GAMC) Cancer Services reaches out to our community by hosting and participating in a number of health-related activities. Highlights include:

BRAS FOR A CAUSE

April 18, 2015. This annual Soroptimist of Glendale-sponsored event raises money and awareness for breast cancer. Supported by cancer services at GAMC, a group of cancer patients and survivors submitted an entry for Bras for a Cause and attended the fundraiser dinner.

CANCER SURVIVORS' DAY

June 12, 2015. The "Family Is the Best", Hawaiian themed event was attended by over 200 cancer survivors and their caregivers. The "Flame of Hope" awards were presented to: Melina Thorpe, former cancer services director and keynote speaker, and Annika Young, a young donor at the cancer center. A special feature of this event also included a performance by the "Can-Dancers" (pictured) and featured a special performance by GAMC's President and CEO, Kevin A. Roberts.



Sze-Ching Lee, MD

PROSTATE SCREENING

October 8, 2015. A prostate cancer screening was held at the Cancer Center with 74 participants. Of the 74 patients, 45 had normal findings, 11 exhibited signs of benign prostatic hypertrophy and 18 had abnormal/suspicious findings which may indicate prostate cancer. Participating physicians were Sze-Ching Lee, MD; Sara Kim, MD; Kamyar Ebrahimi, MD; and family practice residents, Arthur Babakhanians, MD, and Evan Kim, MD.

RELAY FOR LIFE

October 24-25, 2015. Cancer Services supported this yearly 24-hour relay event. Relay For Life is a community based fundraising event to raise funds to improve cancer survival, decrease the incidences of cancer and improve the quality of life for cancer patients and their care takers.

PINK POLICE CRUISER VISITS GAMC

October 13 and 28, 2015. The Glendale Police Department, along with GAMC's Cancer Center, supported Breast Cancer Awareness month by displaying the new bright pink Ford Explorer police cruiser in the GAMC Cancer Center parking lot.

Patients, guests and employees were invited to write inspirational messages and sign the Glendale Police Department cruiser! Special guests included an appearance by Glendale Police Department's finest K-9, 'Yudy.'

CANCER PREVENTION THROUGH GOOD NUTRITION

November 16, 2015. Cancer Services, in collaboration with Choose Health LA Kids Team Healthcare Foundation, held a "hands-on" cooking and nutrition class. The event helped to promote a healthy lifestyle and educate participants on the benefits of making the right food choices.

COMMUNITY **SUPPORT**

Free Classes and Services at **GAMC Cancer Services**

Positive Image Center/Ingeborg's Place Apart

Wigs, hair cuts, caps and scarves provided free of charge. Services provided from a licensed cosmetologist. Appointments are encouraged.

Chair Yoga

Learn gentle yoga movements and relaxation techniques. Good for any level of fitness. Held Mondays and Wednesdays from 5:30PM-6:30PM at the staff training center on the GAMC campus. Wear comfortable clothing.

Knitting Class

Learn the art of knitting. No previous experience required. Needles, yarn and instruction are provided. Classes are every Monday from 11:00AM-1:00PM in the Cancer Center conference room.

Fun with Art

Express your creativity with other survivors. Classes are the second and fourth Friday of each month from 10:00AM-12:00PM in the Cancer Center conference room.

Jewelry Making Class

Learn to design and create jewelry. Supplies are provided. Classes are held the third Friday of each month from 12:00PM-2:00PM in the Cancer Center conference room.

Look Good Feel Better

Cope with skin changes and hair loss using cosmetics and skin care products donated by the cosmetic industry. A trained volunteer cosmetologist gives individual consultation on the proper application of makeup. This class is sponsored by the American Cancer Society. Registration is required to attend.

Fitness Classes

Recapture strength and balance during and after treatment and recovery. Classes held at the **GAMC Therapy & Wellness Center**. Tuesdays and Thursdays from 10:00AM-11:00AM. Mandatory assessments are required prior to first class.

Free Support Groups, Counseling, Classes and Imaging Services at **GAMC Cancer Services**

Cancer Support Group

This support group is designed for cancer survivors at any stage of cancer, from the newly diagnosed to those with years of survivorship. Caregivers are welcome. Meetings are held every Wednesday from 11:00AM-12:30PM in the Cancer Center conference room.

Caregiver Support Group

This support group is open to caregivers and loved ones of cancer survivors. Meetings are held every Tuesday from 11:00AM-12:00PM in the Cancer Center conference room.

Cancer Grief and Loss Support Group

This support group is open to survivors and anyone affected by cancer loss. Meetings are held the second and fourth Wednesday of each month from 6:00PM-7:30PM in the Cancer Center conference room.

Brain Tumor Support Group

This support group is open to people with primary brain tumors and brain metastases. Caregivers are welcome. Meetings are held the first and third Wednesday of each month from 6:00PM-7:30PM in the Cancer Center conference room.

Individual and Family Counseling

Individual and family counseling for cancer survivors provided at no charge. Counseling allows participants to explore issues related to the cancer experience.

MY THOUGHTS. MY JOURNEY.
A DIARY OF DIAGNOSIS, TREATMENT AND TRIUMPH.

by **BLISS A. SALEEBYAN**

Bliss is a 19 year old UCLA graduate with a passion for writing and power-lifting. She hopes to pursue a future in publishing and teaching, having just been hired as a substitute teacher.

> "It's working; it's really working. Mind over matter is the way to go, as I count my blessings every single day"

I was born at Glendale Adventist Medical Center, but never did I think I would end up here as a patient. It was early December when I went to the Emergency Department for chest pain with a swollen face and neck that made me look like a giant chipmunk. The doctors gave me the terrifying news that I had a large "mass" in my chest AND Pulmonary Embolism! How many things could be wrong in my body? To think that I missed my gym workout for an unsuspected allergy only to find that was something much more serious. *Breathe*, I thought to myself.

My time in the hospital felt like the longest days of my life! As wonderful as the ICU nurses were, I was looking forward to leaving. Then again, I guess I could have died if my heart ended up collapsing. That pericardiocentesis was a literal life-saver. The painful part was over. It was a matter of waiting…

Six days at the hospital and not once had I cried in front of a doctor, but I finally cracked. Cancer!? My oncologist described it as a "rare and aggressive" non-Hodgkin lymphoma, Stage 3. One month until all my hair was to be gone, and I'm only 19. I never imagined that I would have to hear the word "chemo" or have anything to do with that monster called cancer. I found myself entwined in a battle that was only just beginning.

My first day of chemo was December 16, 2015. We waged war on this thing that was quietly growing inside me for so long. Primary Mediastinal Large B-cell Lymphoma, I will conquer you - starting now! The marathon began: one chemo cycle, chest biopsy, bone marrow biopsy, heart procedure, picc line insertion AND removal, portacath surgery and countless blood draws later, and I was finally home for Christmas!

I lost hair on New Year's Day. What a way to start the year - a mouth full of sores and a head not so full of hair. *Oh well, better go in for my appointment*, I somewhat defeatedly thought to myself...11!!! My white blood count was up to 11! I was healthier than most normal people; I could finally go to the gym! Happy New Year to me!

Round two of chemo started, and I felt so at home at Glendale Adventist Medical Center. The nurses and doctors are just incredible. With a week to kill, I thought, *let's knock out some cancer cells so I can get back to my squats at the gym*.

On February 2, my x-rays showed "no significant mediastinal or hilar adenopathy." Seven weeks into treatment, only three rounds of chemo, and my tumor was almost gone? Poof! Just like that? Ten centimeters practically melted away as I sat with a tube pumping chemicals into me. The nurses and doctors all said that I was responding miraculously well! I just didn't expect this kind of progress.

It's working; it's really working. Mind over matter is the way to go, as I count my blessings every single day.

AN INNER SANCTUARY **OF THE HEART**

ALICE ZULLI
Chaplain

True silence is a key to the immense and flaming heart of God[1].

In 1985 my sister was diagnosed with breast cancer. She decided to enjoy a long-awaited trip to Australia and New Zealand with her husband before facing any treatment. I held my breath. When she finally attended her appointment at City of Hope, I exhaled.

In 1989, I spoke to my brother in Georgia. He had been in treatment for prostate cancer. I said, "I can come now or come to your funeral." He said, "Come now, baby sister." I did. And I held my breath.

In 1998, my brother in Washington, DC was diagnosed with prostate cancer. In 2012, my sister had a second event with breast cancer. Both my brother and sister sought the best medical care provided. I held my breath. My sister is doing fine, but after living with prostate cancer for 17 years, my brother passed away on October 15, 2015. *God knows our heart in ways we can never know.*

I am so grateful to work at GAMC. The clinical staff throughout the hospital are "superstars," and the staff in our beautiful Cancer Center are amazing. They touch people in ways that allow the immense heart of God to penetrate their fears and suffering. They comfort, console, remain hopeful and positive, collect tears and rejoice in smiles.

When we feel fractured and fragmented and suffer with the push of many obligations and the fears associated with cancer, we need to quiet ourselves and enter the immense heart of God. John 14:27 reminds us, "My peace I give to you." Stop holding your breath. Breathe deeply and fold gently into the heart of God.

1. Catherine De Hueck Doherty. Poustinia: Christian Spirituality of the East for Western Man (Notre Dame, Ind.: Ave Maria, 1983), p.21.

AMERICAN CANCER SOCIETY

MAKING AN IMPACT IN THE FIGHT TO END CANCER

CHRISSY KIM
American Cancer Society

As a global grassroots force of more than 2.5 million volunteers, the American Cancer Society is fighting to end all cancers. As the largest, private, not-for-profit investor in cancer research, the Society has contributed to a 20 percent decline in overall cancer death rates in the United States since the early 1990s. That means there are 14 million cancer survivors alive today in the United States. The progress that has been made is remarkable, but we won't rest until we finish the fight.

Non-Hodgkin lymphoma (NHL) is a diverse group of cancers and one of the most common in the United States, accounting for about four percent of all cancers. In 2015, the American Cancer Society estimated that 71,850 adults and children in the U.S. were diagnosed with NHL, and 19,790 people died from these cancers. NHL death rates have decreased steadily since the late 1990s.

"Lymphoma" refers to cancers of the lymphatic system, made of immune system cells that help fight infections. Bean-sized lymph nodes are found throughout the body, including in the chest, abdomen, pelvis, thymus, spleen, adenoids and tonsils, digestive tract and bone marrow. They can sometimes be felt in the neck, under the arms, and in the groin. Lymphomas can start almost anywhere and do not always form tumors. Hodgkin lymphoma and non-Hodgkin lymphoma (NHL) behave, spread and respond to treatment differently.

NHL can cause many different signs and symptoms, depending on its location. Sometimes it doesn't cause any symptoms until it has grown quite large. Common signs and symptoms include enlarged lymph nodes (sometimes felt as lumps under the skin); swollen abdomen; feeling full after a small amount of food; chest pain or pressure; shortness of breath or cough; unexplained fever or weight loss; night sweats; extreme fatigue and anemia. The main treatments for NHL are chemotherapy, radiation, immunotherapy, targeted therapy and stem cell transplant. In rare cases, surgery is also used.

The average American's risk of developing NHL is about 1 in 50. NHL can occur at any age, but about half of patients are older than 66. Although some types of NHL are among the more common childhood cancers, more than 95 percent of cases occur in adults. The types of NHL seen in children are often very different from those seen in adults.

Researchers have found that NHL is linked with a number of risk factors, but the causes of most lymphomas are unknown. Risk may be affected by factors such as age (60+); gender (males are at higher risk), race and ethnicity. (In the U.S., Caucasian are

at higher risk than are African Americans and Asian Americans); radiation exposure; immune system deficiencies (HIV, organ transplants); some autoimmune diseases (Lupus, celiac sprue); and certain infections (HIV, Helicobacter Pylori). Exposure to toxins such as benzene and certain herbicides, may be linked with increased risk. Research to clarify these possible links is still in progress.

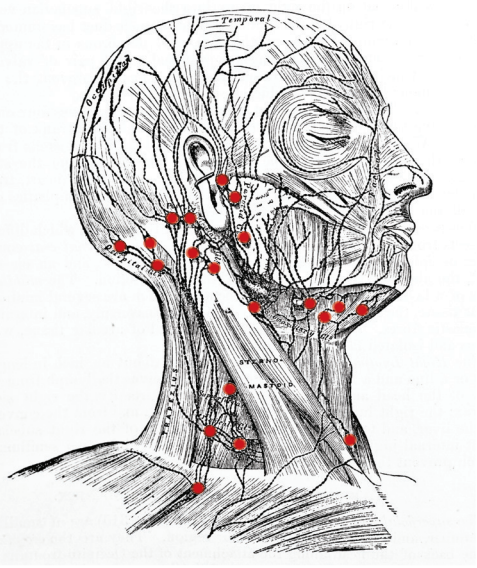
Some chemotherapy drugs may increase the risk of developing NHL many years later. For example, patients who have been treated for Hodgkin disease have an increased risk of later NHL, but it's not totally clear if this is related to the disease itself or if it is an effect of the treatment. Doctors are looking for ways to treat cancer and carry out organ transplants without increasing lymphoma risk, but the benefits of these treatments still usually outweigh the small risk of developing lymphoma many years later.

At present, not enough is known about NHL to say for sure if it can be prevented. Healthy behaviors such as not smoking, eating well and keeping a healthy weight may help. We do know these habits have positive health effects that extend beyond risk of lymphoma or other cancers. Obesity or a diet high in fat and meats may increase NHL risk, so staying at a healthy weight and eating a healthful diet may help lower risk. More research is needed to confirm this.

The American Cancer Society currently funds 22 lymphoma research grants totaling $22.45 million, and 35 grants totaling almost $18 million into childhood cancers. About $5.65 million is at work in basic research to improve early detection and diagnosis; almost $21.66 million into cancer control, survivorship and outcomes and $14.56 million into cancer causes/etiology.

The American Cancer Society's free patient and caregiver services programs include multilingual support 24/7, assistance with local transportation and lodging for patients who must travel long distances for treatment. Local offices provide free wigs and headcoverings for female cancer patients, and the Society's Look Good Feel Better program teaches women and teens how to cope with treatment's appearance-related side effects. Through the Society's many programs, there are numerous volunteer opportunities, such as driving patients to treatment, helping mobilize community members to participate in Relay for Life, donate and shop at Discovery shops and much more. Call your American Cancer Society at (800) 227-2345 or visit cancer.org for more information.

The American Cancer Society could not accomplish its lifesaving mission without the dedication of committed partners like Glendale Adventist Medical Center. Together we are creating a world with less cancer and making an impact in the fight to end all cancers.



The American Cancer Society currently funds 22 lymphoma research grants totaling **$22.45** million.

MULTI-DISCIPLINARY TUMOR CONFERENCES

DENISE CLEVELAND, RHIT, CTR
Cancer Data Manager

Multi-disciplinary Surgical & Breast Tumor Board Conferences:

A forum that provides our cancer specialists an opportunity for meaningful discussions relating to the treatment of cancer on an individual patient basis. This promotes excellence in cancer patient care.

Glendale Adventist Medical Center Tumor Board Conferences are held weekly on Wednesdays at 7:00AM in Committee Rooms A/B.

The breast tumor board is held the first Wednesday of the month and co-moderated by a radiologist specializing in mammography, breast MRI and disease relating to the breast. The Surgical Tumor Boards are held subsequent Wednesdays.

The cancer registry staff gathers the information required for discussion including: medical history and pertinent pathology and radiology materials for review. Multi-disciplinary tumor boards are moderated by a surgeon, medical oncology or radiation oncologist. Both prospective and retrospective cases are discussed. Sometimes a case may be represented for further follow-up education and to report outcome. Physicians are encouraged to bring any and all cases where treatment discussions would benefit both them and their patients for further care.

Tumor boards provide the presenting physicians with the opportunity to obtain treatment information from the multi-disciplinary perspective. Physicians take with them the treatment recommendations to advise their patients accordingly of their treatment options.

The American College of Surgeons requires that the number of cases presented annually is proportional to 15 percent of the analytic caseload and represents the institution's case mix. Our 2014 analytic caseload was 618, and 17 percent of this caseload was presented at the tumor board conferences.

Total cases presented at tumor board are both analytic and non-analytic. Some of these cases are analytic from neighboring hospitals that may not have tumor boards.

The cancer registry participates in Cancer Program Practice Profile Reports (CP3R) and the Rapid Quality Reporting System (RQRS) for quality of care, based on monitoring compliance with evidence-based guidelines supported by the American College of Surgeons.

2014 PRIMARY SITES DISCUSSED	CASES
AMPULLA	1
BLADDER	5
BRAIN	3
BREAST	18
CERVIX, UTERINE	2
COLON	5
ESOPHAGUS	1
INTESTINE – SMALL	1
KIDNEY	2
LIVER	7
LUNG	6
LYMPHOMA	7
NASOPHARYNX	1
PANCREAS	5
PROSTATE	6
RECTUM/ANAL	9
SKIN – MELANOMA	1
SOFT TISSUE	3
STOMACH	3
TESTIS	3
THYMUS	1
THYROID	1
UTERINE	1
UNKNOWN PRIMARY	10
TOTAL:	**102**

This total reflects sites presented. Some were represented at following meetings for further discussion and outcome.

PRIMARY SITES **COMPARISON***

Primary Site	2007	2008	2009	2010	2011	2012	2013	2014
All Sites	547	567	578	624	627	609	564	618
Oral Cavity/Pharynx	9	12	15	20	17	21	24	14
Esophagus	3	5	2	8	5	2	3	2
Stomach	19	11	23	18	20	17	14	17
Colon	46	51	55	57	56	59	44	49
Rectum & Rectosigmoid	21	23	23	21	16	18	18	14
Pancreas	15	11	16	21	14	19	14	15
Lung	45	53	65	82	62	63	57	79
Leukemia, Myeloma & Hematopoietic	22	24	22	26	27	23	24	26
Soft Tissue	4	1	3	4	3	6	4	5
Melanoma of the Skin	10	7	6	7	11	14	5	14
Breast	88	120	101	91	120	115	103	131
Corpus Uteri	17	14	21	15	21	18	17	23
Ovary	5	11	8	10	16	17	11	6
Prostate	38	30	29	43	40	33	32	32
Bladder	30	21	25	32	40	26	32	29
Kidney/Renal	8	21	7	10	12	14	16	15
Brain/Nervous System	47	49	36	55	47	29	27	33
Endocrine	32	26	41	34	39	35	36	26
Lymphatic System	28	28	32	27	27	29	33	40
Unknown Primary	9	7	8	14	4	9	10	5

* Includes analytic cases only (diagnosed and/or received first course treatment at GAMC).

PRIMARY SITE
TABLE 2014

Sorted from Most to Least Common

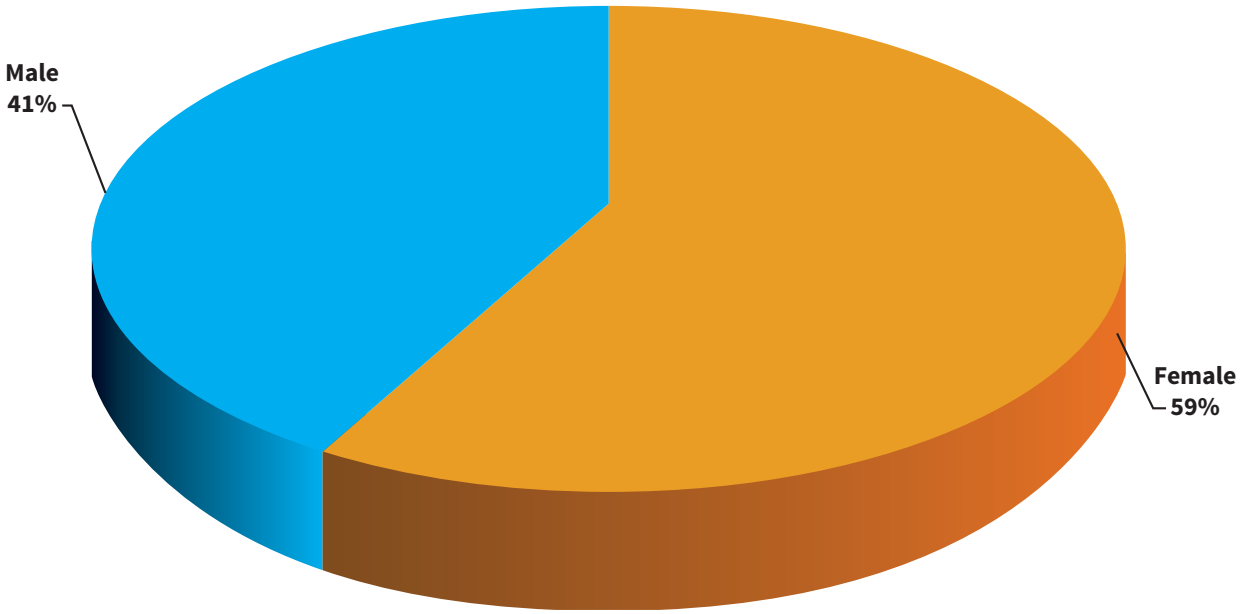
Site Group	Total Cases	Class		Sex		Stage					Not Applicable	Unknown
		Analytic	NonAn	M	F	Stage 0	Stage I	Stage II	Stage III	Stage IV		
ALL SITES	670	618	52	273	397	32	145	108	79	115	79	60
BREAST	144	131	13	0	144	17	39	36	16	8	0	15
LUNG/BRONCHUS-NON SM CELL	71	67	4	42	29	1	9	7	11	33	2	4
COLON	51	49	2	19	32	2	7	9	16	9	0	6
NON-HODGKIN LYMPHOMA	39	38	1	22	17	0	13	5	6	13	0	1
BLADDER	36	29	7	30	6	7	15	5	1	1	0	0
PROSTATE	33	32	1	33	0	0	6	15	3	8	0	0
CORPUS UTERI	24	23	1	0	24	1	10	2	2	3	0	5
OTHER NERVOUS SYSTEM	23	21	2	8	15	0	0	0	0	0	21	0
STOMACH	19	17	2	10	9	0	1	1	2	8	1	4
THYROID	19	19	0	3	16	0	12	2	3	2	0	0
LEUKEMIA	18	16	2	11	7	0	1	1	0	1	13	0
PANCREAS	16	15	1	9	7	0	1	6	0	5	0	3
RECTUM & RECTOSIGMOID	15	14	1	7	8	2	1	6	1	0	1	3
LUNG/BRONCHUS-SMALL CELL	15	12	3	10	5	0	1	1	3	7	0	0
MELANOMA OF SKIN	15	14	1	8	7	0	1	2	3	2	0	6
KIDNEY AND RENAL PELVIS	15	15	0	7	8	0	9	1	3	2	0	0
BRAIN	12	12	0	3	9	0	0	0	0	0	12	0
LIVER	9	9	0	5	4	0	2	0	1	3	1	2
OVARY	8	6	2	0	8	0	1	1	2	2	0	0
MYELOMA	7	6	1	5	2	0	0	0	0	0	6	0
SOFT TISSUE	7	5	2	5	2	0	2	2	1	0	0	0
CERVIX UTERI	7	5	2	0	7	0	1	1	0	3	0	0

PRIMARY SITE
TABLE 2014
(continued)

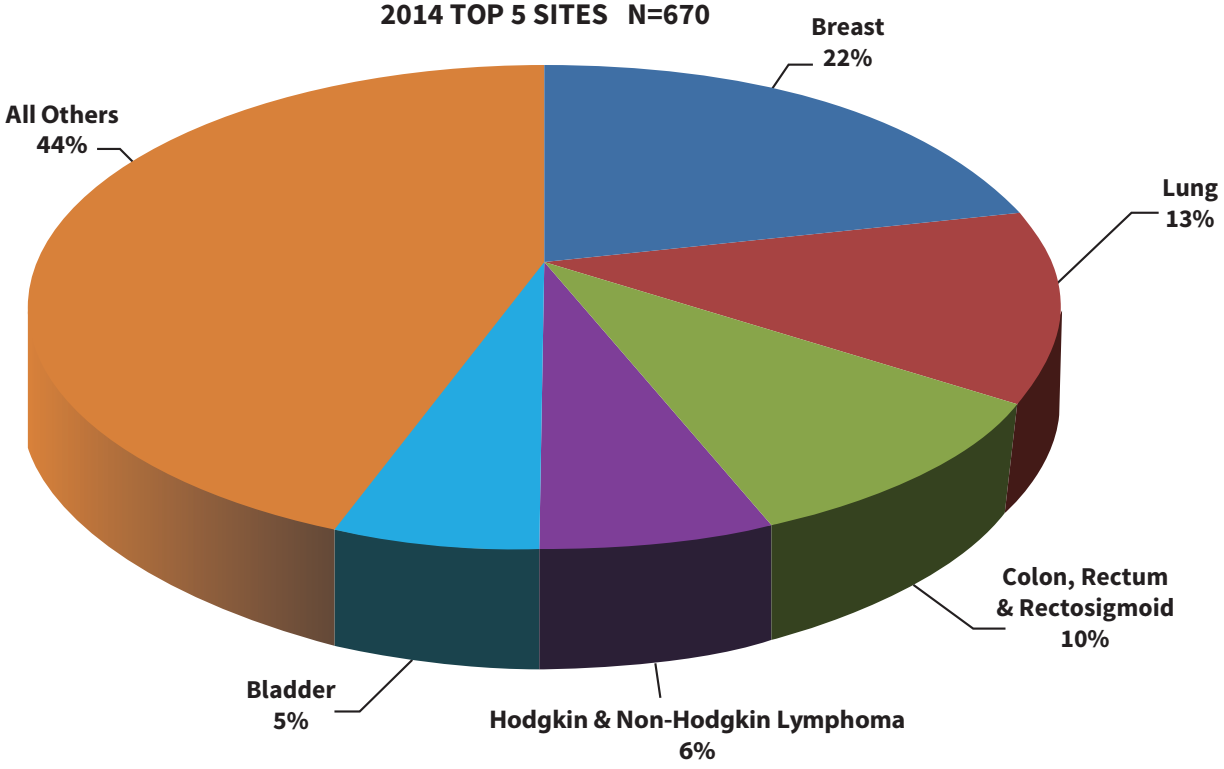
Site Group	Total Cases	Class		Sex		Stage					Not Applicable	Unknown
		Analytic	NonAn	M	F	Stage 0	Stage I	Stage II	Stage III	Stage IV		
OTHER ENDOCRINE	7	7	0	4	3	0	0	0	0	0	7	0
OTHER DIGESTIVE	6	6	0	2	4	0	0	0	0	0	6	0
UNKNOWN OR ILL-DEFINED	5	5	0	3	2	0	0	0	0	0	5	0
TONGUE	4	4	0	3	1	0	2	0	0	1	0	1
SMALL INTESTINE	4	3	1	1	3	0	0	0	1	1	0	1
LARYNX	4	4	0	4	0	0	1	1	1	0	0	1
OTHER HEMATOPOIETIC	4	4	0	2	2	0	0	0	0	0	4	0
UTERUS NOS	4	3	1	0	4	0	1	1	0	0	0	1
TESTIS	4	3	1	4	0	0	3	0	0	0	0	0
URETER	4	4	0	3	1	1	3	0	0	0	0	0
NASOPHARYNX	3	3	0	2	1	0	0	1	1	1	0	0
ANUS/ANAL CANAL/ANORECTUM	3	2	1	0	3	0	0	1	0	0	0	1
GALLBLADDER	3	3	0	1	2	0	1	0	1	1	0	0
ESOPHAGUS	2	2	0	1	1	0	1	0	0	0	0	1
BILE DUCTS	2	2	0	2	0	0	1	0	0	0	0	1
HODGKIN DISEASE	2	2	0	0	2	0	0	0	0	0	0	2
SALIVARY GLANDS, MAJOR	1	1	0	0	1	0	0	0	0	1	0	0
FLOOR OF MOUTH	1	1	0	1	0	0	0	0	0	0	0	1
TONSIL	1	1	0	0	1	0	0	0	1	0	0	0
PLEURA	1	1	0	1	0	0	0	0	0	0	0	1
PENIS	1	1	0	1	0	0	0	1	0	0	0	0
OTHER URINARY	1	1	0	1	0	1	0	0	0	0	0	0

FACTS AND **FIGURES**

2014 MALE/FEMALE RATIO N=670

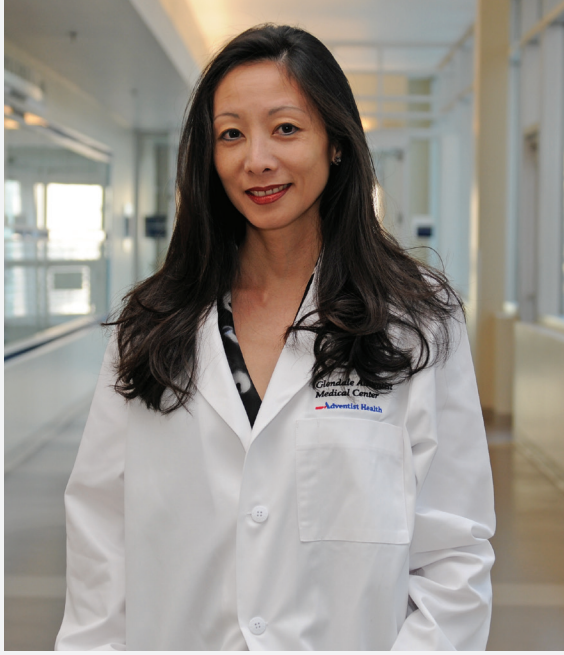


2014 TOP 5 SITES N=670



ROLE OF IMAGING IN NON-HODGKIN LYMPHOMA

LINH CHEN, MD
Diagnostic Radiology, Medical Director of Women's Imaging



Histologic analysis is used to make a definitive diagnosis for patients with suspected lymphoma. Once the diagnosis of lymphoma is made, the extent and sites of disease must be determined to assess prognosis and to plan therapy.

Chest radiography provides preliminary information about involvement of the mediastinum and lungs, with positive yield in approximately 25 percent of patients with non-Hodgkin lymphomas (NHLs). It may demonstrate hilar or mediastinal adenopathy, pleural or pericardial effusions and parenchymal involvement.

Computed tomography (CT) of the neck, chest, abdomen and pelvis is the most widely used test for initial staging, assessing treatment response and conducting follow-up care.[1] CT of the neck should be performed in order to evaluate cervical and supraclavicular nodes and involvement of Waldeyer ring.[2] Chest CT allows detailed evaluation of the mediastinum, chest wall, pulmonary parenchyma and pleura or pericardium. Abdominal/pelvic CT is effective in detecting enlarged abdominal and pelvic nodes and involvement of the liver, spleen, kidneys, mesentery and peritoneum. If possible, both oral and intravenous contrast should be administered to enhance accurate delineation of lymphadenopathy and solid organ involvement.

A bone scan is ordered only in patients with bone pain, elevated alkaline phosphatase or both. Gallium scans are an option in selected cases of NHL. These scans can detect initial sites of disease, reflect therapy response and detect early recurrences. This scan is positive in nearly all patients with aggressive lymphomas and in approximately 50 percent of patients with indolent lymphomas at diagnosis.

MRI, pre- and post-contrast, of the brain and spinal cord should be obtained of patients who are suspected of having primary CNS lymphoma, lymphomatous meningitis, paraspinal lymphoma or vertebral body involvement by lymphoma. MRI can also be performed to identify focal areas of marrow involvement in those patients suspected to have bone marrow involvement but in whom random bone marrow biopsy findings have been negative.

Ultrasound has a definite role in both initial evaluation and follow-up of involvement of superficial lymph nodes. It is also the best method to detect testicular infiltration[3] and should be used to image the opposite testis in male patients with a testicular primary lesion.

Whole body F-18 2-deoxyglucose (FDG) positron emission tomography (PET) scan is often used for initial staging of patients with NHL. However, its greatest utility is in mid-treatment management. Studies have shown that incorporating FDG-PET into CT-based treatment planning in patients with lymphoma resulted in beneficial changes in management, volume definition and normal tissue dosimetry for a significant amount of patients.[4,5] It is also extremely useful in post-treatment evaluation and chronic surveillance to differentiate early recurrences or residual disease from fibrosis or necrosis. PET has a higher predictive value for relapse than CT imaging.[6] In patients with diffuse large B-cell lymphoma, PET scanning had a sensitivity of 94 percent and a specificity of 100 percent, whereas iliac crest biopsy had a sensitivity of 40 percent and a specificity of 100 percent[7].

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CANCER CLINICAL TRIALS
KEEPING IT LOCAL

LILY VILLALOBOS, MHA, CCRC
Clinical Research Director

Clinical trials are part of the long and careful process to determine if promising approaches to cancer prevention and treatment are safe and effective. The majority of today's cancer treatments are based on the results of past clinical trials. Because of the tremendous progress made through this research, more people than ever are surviving cancer and improving quality of life.

Glendale Adventist Medical Center's Office of Integrated Research (OIR) brings cancer clinical trials and clinician researchers together to discover improved treatments and diagnostic technologies in all areas of cancer. The connection between research and clinical care is especially important within cancer, as clinical trials can be an important treatment option for patients with specific health needs. Patients do not have to travel to receive high-quality cancer care that includes such treatment options.

As part of the exceptional standards that accompany the accreditation awarded to GAMC's Cancer Center by the American College of Surgeons as a Comprehensive Community Cancer Program, we are able to effectively coordinate cancer research activities. These include involving the various applications of treatments among surgeons, medical and radiation oncologists, diagnostic radiologists, pathologists and other cancer specialists, resulting in improved patient care. Some of the most common types of cancer treated in our community are breast, prostate, colon and brain cancer. Building relationships within the oncology research community has helped to expand our research activities, thereby offering patients treatment options that include innovative therapies targeted at reducing the burden of cancer.

Clinical trials conducted through the OIR support the hospital's mission, "To share God's love with our community by promoting healing and wellness for the whole person." Current ongoing clinical trials being conducted at GAMC include breast cancer and the study of solid tumors. Expansion of the types and number of cancer clinical trials is underway.

If you are interested in participating in clinical research trials at GAMC, please contact the Office of Integrated Research at (818) 409-8009.

ROLE OF RADIATION IN NON-HODGKIN LYMPHOMA

SARA H. KIM, MD
Radiation Oncology, Medical Director

Non-Hodgkin lymphoma (NHL) is a monoclonal expansion of malignant B or T cells that lacks the pathologic characteristics of Hodgkin disease. NHL is a heterogenous disease with greater than 50 distinct categories of histologic subtypes. NHL is further divided into indolent, aggressive and highly aggressive subtypes, based on histology. Prognosis and treatment of non-Hodgkin lymphoma depends on the histology.

Patients typically present painless adenopathy. In general, work-up consists of history and physical exam, lab exams, PET/CT scan and bone marrow biopsy.

In aggressive NHL, such as diffuse large B-cell lymphoma, consolidation radiation after chemotherapy (R-CHOP) has shown to increase local control and event-free survival[1]. MD Anderson reported significantly higher five year overall survival and progression free survival in patients who received consolidative radiation after complete response from R-CHOP (Phan, JCO, 2010).

Radiation is standard treatment for early stage indolent NHL, such as follicular lymphoma. Radiation is also used for palliation in advanced stage indolent NHL, with excellent response rates.

There are numerous extra-nodal NHL disease sites in which radiation plays a role in treatment.

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CONTINUING MEDICAL EDUCATION 2015

March 25, 2015

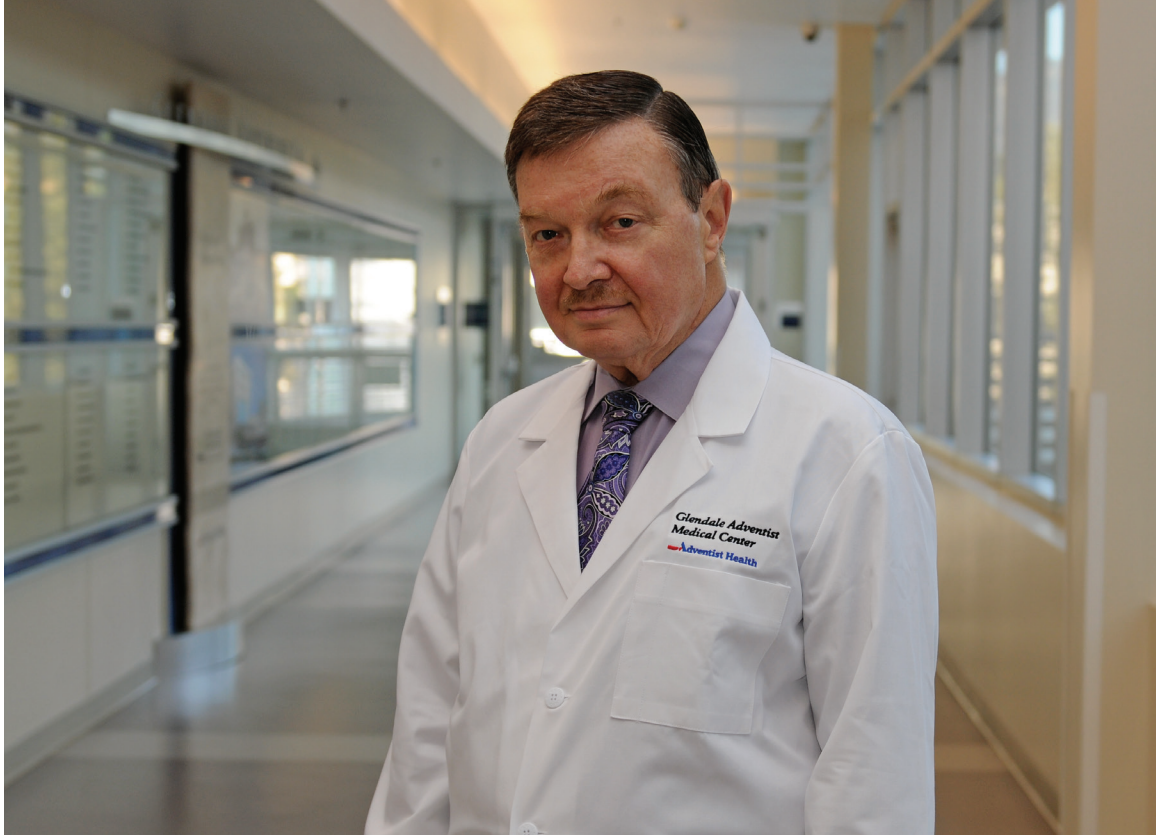
Lung Cancer Screening

Peter Julien, MD, chief thoracic imaging director, radiofrequency ablation, Cedars-Sinai Medical Center.

April 8, 2015

Current Trends in the Early Detection and Treatment of Breast Cancer

Lily Lai, MD, associate clinical professor, department of surgery, associate director for Committee on Cancer, Comprehensive Cancer Center, City of Hope.



PATIENT
EXPERIENCE
1

LYMPHOMA
THE PATIENT EXPERIENCE

JOHN GUNNELL, MD
Hematology, Oncology

In follow-up to the 2007 annual report on lymphoma, which was quite didactic and described the classification therapies, we will take five fellow Glendale region citizens who had unique lymphoma – lymphocytic leukemia experiences.

Our first case, Mary, a 33-year old young mother was found to have extensive lymphadenopathy in multiple lymph glands in her body. She, at that time, was treated in the early 1970s at USC. As a Glendale resident, our group followed her, and we completed five years of outpatient chemotherapy for advanced staged follicular lymphoma, and the patient achieved remission.

In 2006, the patient again developed diffuse lymphadenopathy. She returned to receive additional chemotherapy, this time as a young grandmother, and she was treated with six cycles of outpatient chemotherapy and achieved yet another remission.

In 2015, at age 77, the patient developed again multiple lymph glands and is now completing six cycles of a regimen: Bendamustine and Rituxan. Throughout, she has held employment outside of home, functioned superbly well and spent the majority of her life succeeding in keeping her incurable lymphoma at bay. Her life was completely full in every aspect and her attitude was one of acceptance and optimism.

Fictitious names used to protect patient's identity.

PATIENT EXPERIENCE 2

Laura, at age 61, was a very active full-time RN. She was noted to have on her CBC a predominance of lymphocytes. It was in 1990 that a percentage of lymphocytes of the total WBC exceeded 50 percent. With her nursing background, she watched the abnormal CBCs until 1997. At that point, with the percentage rising to 72 percent, she was referred to hematology/oncology. The patient had an appropriate evaluation and determined that she had Stage 0, chronic lymphocytic leukemia in which she had no symptoms, no lymphadenopathy and only a lab abnormality. The patient has been followed at intervals that have now become every six months. The patient is now 86 years of age, and her most recent CBC revealed the lymphocyte percentage to be 83 percent of the total of 27,000 cells with totally normal red cells and white cells and again no lymphadenopathy or any other symptoms. This case illustrates how slow moving malignant lymphoid clones can be. Despite using the word leukemia, a patient can live a normal, untreated, symptom-free life in many cases.

PATIENT EXPERIENCE 3, 4 & 5

Three biologic cousins, all living in our community, and all sharing lymphoma at a very young age.

At age 17, Mark, a senior in high school, was involved in a motor vehicle accident in which he was thrown against the dash board, subsequently suffering from chest pain. The chest pain worsened, and within a couple of weeks, he was at our hospital with an x-ray showing swelling of the mediastinum between his lungs. This prompted immediate attention in the emergency room by a surgical colleague. In fairly short order, the patient was in the operating room with a suspected, possibly expanding hematoma. He had a cardiothoracic surgeon perform an open chest operation, revealing a large mass. That mass was biopsied and submitted to Robert Lukes, MD, an internationally recognized lymphoma histologist for lymphoma classification at USC. He called it convoluted T-cell lymphoma, a classification that is now somewhat dated. Mark was rapidly treated with chemotherapy which later was extended to include spinal canal injections due to the nature of his disease by neurologists from our staff. The chemotherapy was injected into the spine so that the medicine would extend onto his surface of the brain and the spine to obliterate any lymphoma cells that may have ventured into that site of the body and not otherwise be exposed to intravenous chemotherapy. He was given up to one year of chemotherapy. He had radiation therapy in GAMC's radiation

THE PATIENT EXPERIENCE

PATIENT
EXPERIENCE
3, 4 & 5
(continued)

department to the mediastinum. Mark is now in his 50th year and a very active individual in the community.

Mark's cousin, David, at age 30 developed breathing problems in his nose and nasal passages. This prompted him to breathe through his mouth. At the same time, he developed swelling throughout the neck. He had imaging done at our hospital that demonstrated extensive adenopathy in the neck, sinuses and nasopharynx. The biopsy showed a tumor that involved both carcinoma as well as massive lymphatic tissue in the lymph glands and was called nasopharyngeal tumor, advanced stage. David received chemotherapy with 5-FU/platinol, and thereafter, radiation therapy. David recovered and his physical exam returned to normal. Other than dry nasal passageways, his function is superb and he is now a 48-year old active entrepreneur in our community.

In 2010, the third cousin, Rose, came into the emergency room with cough, weakness, fever, night sweats and a rash that appeared. Rose is a highly gifted graduate of a prestigious university and employed in academia. She had imaging done at GAMC that showed fluid around the heart and very large masses between the heart and the base of both lungs, some of them measuring up to 7 cm. In the upper abdomen, there was also a sub-diaphragmatic mass. Being very ill, she was rapidly treated with multi-agent chemotherapy called Promacecytabom. This is a very aggressive high-dose regimen that has achieved cures in some of the highest stage and most aggressive lymphomas that we face. Her diagnosis was diffuse large B-cell lymphoma, Stage IV. Rose recovered fully and is presently at 32 years of age, fully involved in her career, showing no evidence of disease and no sequelae to the very aggressive treatment.

These three women and two men are all leading fully productive lives, having survived lymphoma that ranged from fairly mild with little to no treatment to highly aggressive treatment that interrupted their lives in some cases for several months. All were treated according to evidence-based guidelines for pathologic diagnosis and disease stage.

These living examples do illustrate the breadth of the lymphoma disease category. We also have a uniquely talented radiation therapy program in our own community at GAMC and at Loma Linda Medical Center that is second to none on the planet.

The collaboration of these fine institutions and staff with local community oncologists means that residents in Southern California have unique opportunities for treatment of malignant lymphoma.

SURGICAL CONSIDERATIONS IN LYMPHOMA

SAM CARVAJAL, MD
General Surgery

The majority of human malignancies can be treated by surgical excision for potential cure. Lymphoma is different. It is very unlikely that a single lymph node will be the only focus of lymphoma at the time of diagnosis. As a result, it is surgically impossible to remove all of the lymphoma in typical nodal lymphoma.

Although fine needle or core needle biopsies are often attempted when diagnosing lymphoma, the results are limited. Pathologists are able to make the most complete lymphoma diagnosis when a whole lymph node is removed. The majority of surgical involvement in nodal lymphoma is in the removal of a lymph node for diagnosis.

The easiest places to biopsy lymph nodes are in the neck, axilla and groin. Para-aortic, iliac and mesenteric lymph nodes can be biopsied by laparoscopy or laparotomy. Mediastinal lymph nodes can be biopsied via mediastinoscopy or thoracoscopy.

Primary extranodal lymphoma is often treated surgically. The most common sites are esophagus, stomach, small bowel, colon and spleen. Primary extranodal lymphoma is defined when the tumor predominantly involves the organ and any lymphadenopathy corresponding to the expected lymphatic drainage of the organ. Surgical treatment for extranodal lymphoma remains controversial. Because most lymphomas respond well to chemotherapy and radiation therapy, many oncologists argue that primary extranodal lymphoma does not require surgery. Unfortunately, when surgical removal is not performed, there is a high incidence of perforation from hollow organ lymphoma ranging from 5-25 percent when treated primarily with chemotherapy.

Almost 90 percent of the primary gastrointestinal lymphomas are of B-cell type. Different areas of the gastrointestinal tract are more likely to develop different types of extranodal lymphoma. Mucosa-associated lymphoid tissue (MALT) lymphoma is most commonly found in the stomach, while mantle cell lymphomas are typically seen in the terminal ileum, jejunum and colon. Enteropathy-associated T-cell lymphoma is usually found in the jejunum and follicular lymphoma in the duodenum. Of special note, MALT lymphoma and follicular lymphoma can be multifocal and found in different locations of the gastrointestinal tract. Finally, anaplastic large cell lymphomas are seen in the small bowel.

The pathogenesis of gastrointestinal lymphomas are thought to be dependent on an inflammatory process. Although the exact mechanism of mutagenesis is unknown, most gastric MALT lymphomas likely arise from Helicobacter pylori (H. pylori) infections. Human immunodeficiency virus, celiac disease, Campylobacter jejuni, Epstein-Barr virus, hepatitis B virus, human T-cell lymphotropic virus-1 and inflammatory bowel disease are all causes of inflammation in the gastrointestinal tract and, as a result, increase the incidence of lymphoma.

Esophageal lymphomas are typically treated nonsurgically. Early stage primary gastric *H. pylori* positive MALT lymphoma is often treated with antibiotics and proton pump inhibitors alone. Stage I and II *H. pylori* negative gastric MALT lymphoma is often treated by subtotal or total gastrectomy followed by adjuvant chemotherapy. Later stage gastric lymphomas are always treated with primary chemotherapy with surgery contemplated when complete response is not achieved. There are recent reports of radiation therapy alone achieving complete response in gastric lymphoma.

Stage I and II small bowel and colon lymphoma is often treated surgically with adjuvant chemotherapy. This is likely due to the frequent emergent presentation by the patient to the hospital with obstruction or bleeding.

Finally, primary splenic lymphoma is rare although the incidence may be increasing. The typical treatment is chemotherapy. There are increasing reports of surgical cure with splenectomy followed by chemotherapy in both stage I (spleen only), and stage II (spleen and hilum) primary splenic lymphoma.

NON-HODGKIN
B-CELL LYMPHOMA

CHANDRIKA SENEVIRATNE, MD
Pathology

There will be

72,580

people diagnosed with non-Hodgkin lymphoma in the year 2016.

Non-Hodgkin B-cell lymphoma is one of the most common cancers seen in the United States, accounting for about 4 percent of all malignancies. There will be 72,580 people diagnosed with non-Hodgkin lymphoma in the year 2016, according to the most recent estimate given by the American Cancer Society. This includes both adults and children. About 19,790 people will die from this disease. The average risk of developing non-Hodgkin lymphoma during one's life time is approximately 1 in 50.

B-cell neoplasms are classified based on the different stages of B-cell differentiation. Immature B-cell neoplasms arise from precursor B-cells in the bone marrow (B lymphoblastic leukemia/lymphoma). Mature B-cells tumors arise from peripheral B-cells (peripheral lymphoid tissue).

Mature B-cell neoplasms are divided into non-Hodgkin B-cell lymphoma and Hodgkin lymphomas.

Most common mature non-Hodgkin's B-cell lymphomas:

- Mantle cell lymphoma
- Follicular lymphoma
- Burkitt's lymphoma
- Diffuse large B-cell lymphoma
- Marginal zone B-cell lymphoma including extra nodal marginal zone lymphoma of mucosa associated lymphoid tissue (MALT lymphoma), splenic marginal zone B-cell lymphoma and nodal marginal zone lymphoma
- Lymphoplasmacytic lymphoma
- Chronic lymphocytic leukemia/small lymphocytic lymphoma

The classification of B-cell lymphomas is based primarily on morphology, which is based on cytology of cells and cell arrangement or architecture. The morphology assessment is performed under light microscopy.

NON-HODGKIN B-CELL LYMPHOMA

(continued)

Immuno phenotyping is the assessment of cellular proteins on the surface and within the cytoplasm of lymphoma cells. The combination of morphologic features and immunophenotyping (panel of antigenic markers) are necessary for accurate classification. Within a given entity, variation in immunophenotypic features can be seen. Therefore, immunophenotypic and genetic variations play an increasingly important role in the reporting of the classification of lymphoid malignancies. This facilitates the subsequent genetic testing of these cases on a day to day basis.

CLINICAL BEHAVIOR

B-cell neoplasms range in their clinical behavior from indolent to aggressive. A range in clinical behavior can be seen within one entity of lymphoma. Both morphology and immunophenotype change over time during the clinical course of the disease due to acquisition of additional genetic changes. For example, a patient with a high-grade lymphoma can relapse to a low-grade lymphoma or a patient with a low-grade lymphoma can relapse to a high-grade lymphoma.

EPIDEMIOLOGY

Mature B-cell neoplasms comprise over 90 percent of lymphoid neoplasms in our institution. Most lymphomas have a striking male predominance, male 55 percent versus female 45 percent at GAMC. Close to 150 cases of non-Hodgkin lymphomas were reported at our institution within the past five years. Of these, the majority of reported cases were diffuse large B-cell lymphomas (intermediate grade) and the other being follicular lymphomas (grade 1 to grade 3). Diagnosis is predominantly after age 60. *(See graphs on page 30).*

The etiologic causes for mature B-cell neoplasms are not specifically identified. However, immunosuppression causes such as viruses (Epstein-Barr virus), chronic antigenic stimulation and auto-immune diseases have been implicated in several types of lymphomas.

Establishing the diagnosis of lymphoma

Classification and diagnosis of B-cell lymphoma is complicated and requires a multi-methodology approach.

The diagnosis of lymphoma entails clinical, morphologic, immunophenotypic and molecular studies.

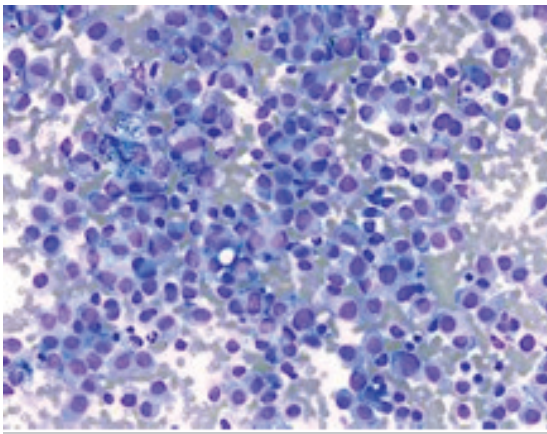
We utilize many techniques to make an accurate diagnosis in our institution.

Multiple biopsy techniques are advocated for the diagnosis of non-Hodgkin lymphoma, including:

1. Fine-needle aspiration (FNA) or core needle biopsy.
2. Excisional or incisional biopsy.
3. Bone marrow aspiration and biopsy.
4. Lumbar puncture (spinal tap).
5. Pleural or peritoneal fluid sampling.

Fine-needle aspiration or core needle biopsy

This procedure produces small samples suitable for cytological, immunophenotyping and genetic studies. This does not allow further assessment of tissue architecture. This method is predominantly used and is very useful as a preliminary diagnosis for further evaluation. It is especially useful in patients who are unable to tolerate invasive surgical procedures for intra-abdominal or intrathoracic diseases. It is also a valuable tool to detect recurrent lymphomas.



Examples of Aspirate smear of lymph node.

Excisional biopsy

This is generally the most appropriate biopsy for patients with a suspected diagnosis of lymphoma. This method almost always provides adequate tissue for accurate classification of the lymphoma. This procedure provides both cytological and architectural evaluation.

Bone marrow aspiration biopsy

This procedure is performed after the diagnosis of lymphoma for the purpose of lymphoma staging.

Lumbar puncture and peritoneal/ pleural fluid sampling will yield lymphoma cells which also aids in lymphoma staging.

The stage is determined to assess the extent of spread of the disease.

NON-HODGKIN B-CELL LYMPHOMA

(continued)

AJCC Cancer Staging – Hodgkin and Non-Hodgkin Lymphomas

Clinical

I	Involvement of a single lymphatic site (i.e. nodal region, Waldeyer's ring, thymus or spleen) (I); or localized involvement of a single extralymphatic organ or site in the absence of any lymph node involvement (IE) (rare in Hodgkin lymphoma).
II	Involvement of two or more lymph node regions on the same side of the diaphragm (II); or localized involvement of a single extralymphatic organ or site in association with regional lymph node involvement with or without involvement of other lymph node regions on the same side of the diaphragm (IIE). The number of regions involved may be indicated by a subscript, as in, for example, II3.
III	Involvement of lymph node regions on both sides of the diaphragm (III), which also may be accompanied by extralymphatic extension in association with adjacent lymph node involvement (IIIE) or by involvement of the spleen (IIIS) or both (IIIE,S). Splenic involvement is designated by the letter S.
IV	Diffuse or disseminated involvement of one or more extralymphatic organs, with or without associated lymph node involvement; or isolated extralymphatic organ involvement in the absence of adjacent regional lymph node involvement, but in conjunction with disease in distant site(s). Stage IV includes any involvement of the liver or bone marrow, lungs (other than by direct extension from another site), or cerebrospinal fluid.

Modifiers for Group

_ E Extranodal

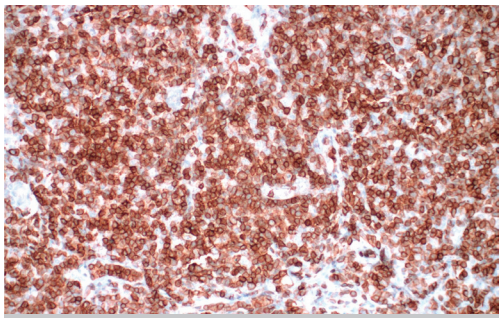
_ S Spleen

A & B Classification (Symptoms)

_ A Asymptomatic

_ B Symptoms: fevers, night sweats, weight loss

_ Stage Unknown



Example of immunohistochemical staining of lymphoma cells in B-cell lymphoma.

Ancillary testing for the diagnosis of lymphoma

Immunohistochemistry

A portion of the tissue sample is treated with an array of different antibodies against the lymphoid cells which distinguishes the different types of lymphomas. This complements the additional ancillary studies which are usually performed on our day to day cases.

Flow cytometry

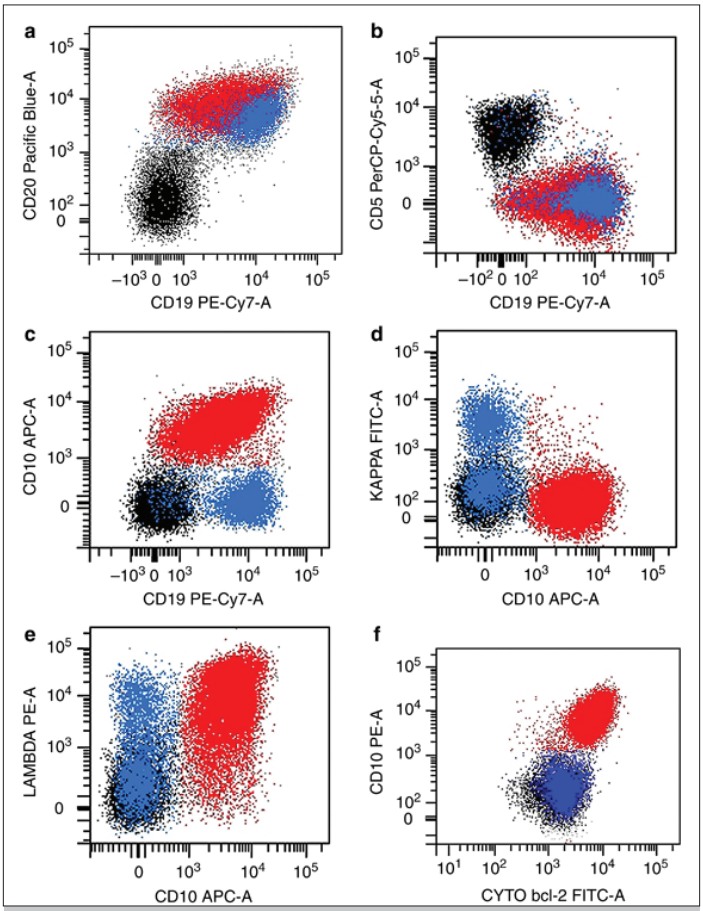
Plays an important role in the determination of cellular origin, degree of differentiation (maturation), prognosis and often post-treatment disease monitoring. Flow cytometry has become an indispensable tool in the diagnosis and subclassification of lymphomas. Flow cytometry is complex and requires correlation with clinical and laboratory data, as well as cytomorphologic features.

NON-HODGKIN B-CELL LYMPHOMA

(continued)

This methodology requires fresh, unfixed tissue which includes blood, bone marrow, fine-needle aspirate and body fluids. This is a useful test for distinguishing between a benign and a neoplastic process. In this method, the cells are tagged with fluorochrome-conjugated monoclonal antibodies directed towards a specific antigen. The intrinsic physical properties of the cells are measured with florescence emission as the fluorochrome tagged cells pass through a laser light. This method analyzes thousands of cells within seconds. Flow cytometry requires 10,000- 20,000 cells with good viability for accurate results. This may limit specimens such as cerebrospinal fluid, fine-needle aspirates and paucicellular lesions.

Flow cytometry has a high sensitivity for B-cell lymphoma proliferative disorders. Current treatments with high-dose chemotherapy result in significantly higher incidence of complete remission of this disease. This necessitates the use of more sensitive methodology to detect the persistence of low number of residual neoplastic cells (MRD) for better management of these patients.



Example of flow cytometry template in non-Hodgkin B-cell lymphoma.

Flow cytometry also helps in the detection of aberrant and unusual immunophenotypes. Aberrant phenotypes can be identified in 98 percent of B-cell lymphomas and its detection is vital in the management of these patients.

Molecular diagnosis of lymphoma

A diagnosis of lymphoma is a difficult diagnosis to make due to the heterogamous nature of this disease. It is a multicomponent and multicompartmental disease which is hard to diagnose as well as hard to treat.

Mature B-cell lymphoma has increasingly been associated with specific genetic alterations which is sometimes crucial for both the diagnosis and prognosis. Major molecular testing includes florescence in situ hybridization (FISH) and polymerase chain reaction (PCR), as well as classical cytogenetics.

FISH technique detects clonality by applying probes to receptor genes. These oncogene probes can also detect rearrangement of oncogene associated with a particular type of lymphoma.

The PCR technique is a very sensitive method that can detect minimal quantities of abnormal DNA for detection of minimal residual disease (MRD) following therapy.

Chromosomal translocations have been associated with specific types of lymphoma. This is detected by cytogenetic analysis. Knowledge of these translocations helps in the diagnosis and sub-classification of the lymphoma.

Next generation sequencing

This method involves sequencing the entire genome for gene mutations, opening new avenues for therapeutic interventions. It decreases subjectivity, lower rate of false positivity and increase in sensitivity. In the next few years, next generation sequencing in the use of mutational analysis in B-cell lymphomas will help in the treatment, follow-up and prognosis of this disease.

We use state-of-the-art tools for accurate diagnosis, together with the relevant clinical data to formulate an individualized treatment plan best suited for our patients' needs.

References

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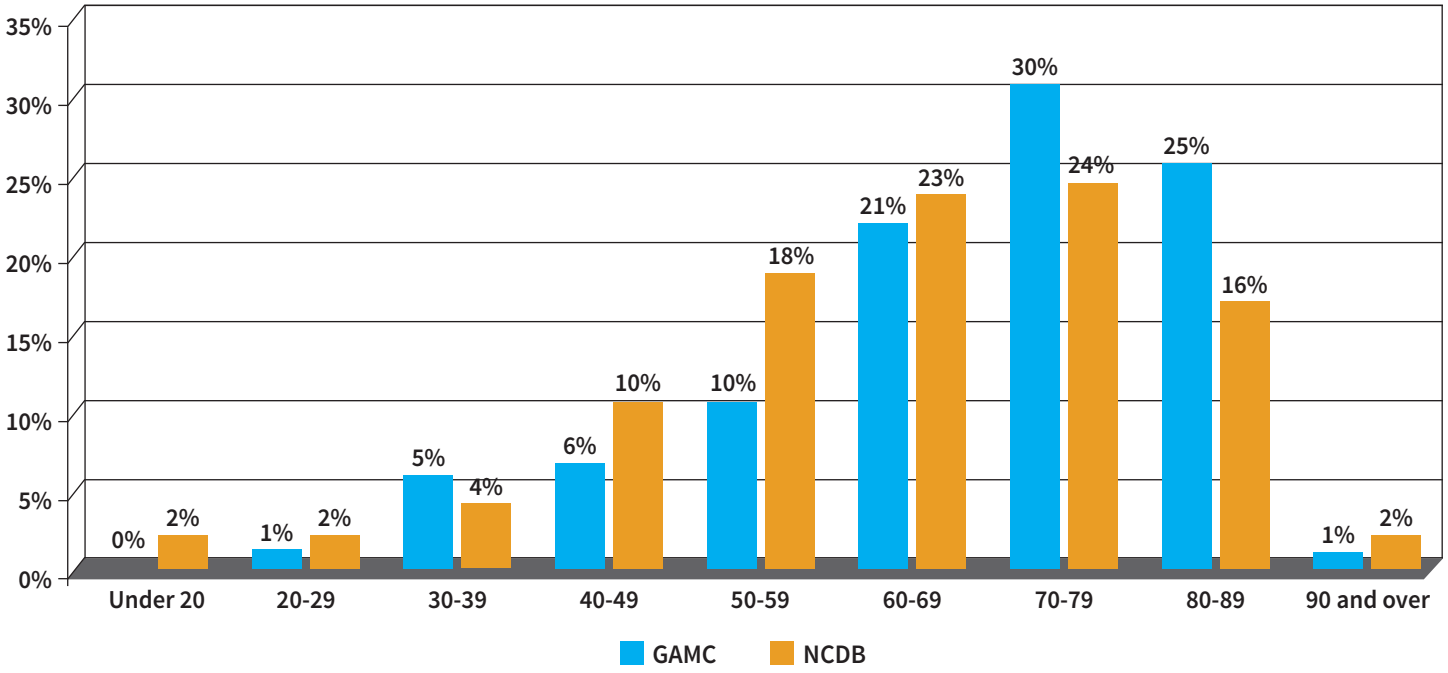
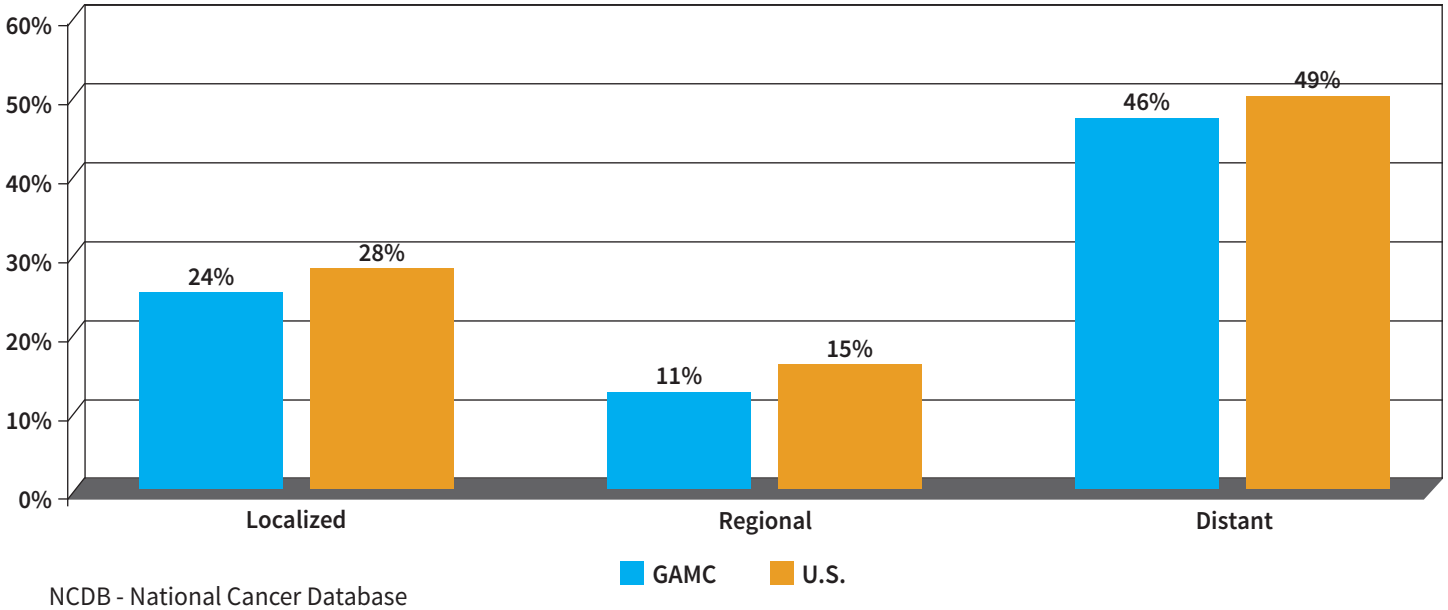
AGE & STAGE
FIGURES

Non-Hodgkin Lymphoma - Nodal 2004-2010
Age at Diagnosis
GAMC vs NCDB (Derived from all types of hospitals in U.S.)



Non-Hodgkin Lymphoma 2004-2010
Stage at Diagnosis
U.S. compared to GAMC



NCDB - National Cancer Database

CANCER COMMITTEE

A special thank you to the Cancer Committee members for their dedicated leadership and tireless efforts.

Front row seated (left to right): Chrissy Kim; Marion Watson; Gayle Craig; Lyn Samuel-Jeffers; Sharon Correa; Chandrika Seneviratne, MD; Irene Bourdon and Carolann Jared.

Second Row (left to right): Denise Cleveland, CTR; Sara Kim, MD; Susanna Tamazyan, RN; Sharon Feinberg, RN; Simon Keushkerian, MD; Linh Chen, MD; Sze-Ching Lee, MD; Karine Arakelyan; Al Garcilazo and Allen Molina, RN.

Back Row (left to right): Wende De Pietro, RN; Fernando Vazquez; Tracey Sanders; Cynthia Klinger, MFT; Sam Carvajal, MD; Boris Bagdasarian, DO and Dennis Quagliani.

CLASS OF CASE **COLLABORATION**

Class of Case

Analytic: Cases that are first diagnosed and/or receive all or part of their first course of treatment at Glendale Adventist Medical Center.

Non-Analytic: Cases that have been diagnosed and have received their entire first course of treatment elsewhere and are first seen at Glendale Adventist Medical Center for subsequent care.

Collaboration

In order to accomplish the wide-ranging and ambitious goals involved in designing and supporting a comprehensive community cancer program, many people have contributed and continue to give their energy and expertise.

The contributions and support of the medical staff, nursing staff and many other professionals who have offered their expertise for the implementation of our cancer program throughout the year are greatly appreciated.

Special appreciation is given to all members of the Cancer Committee and the Cancer Registry for their involvement in preparing this annual report.

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GLENDALE ADVENTIST MEDICAL CENTER

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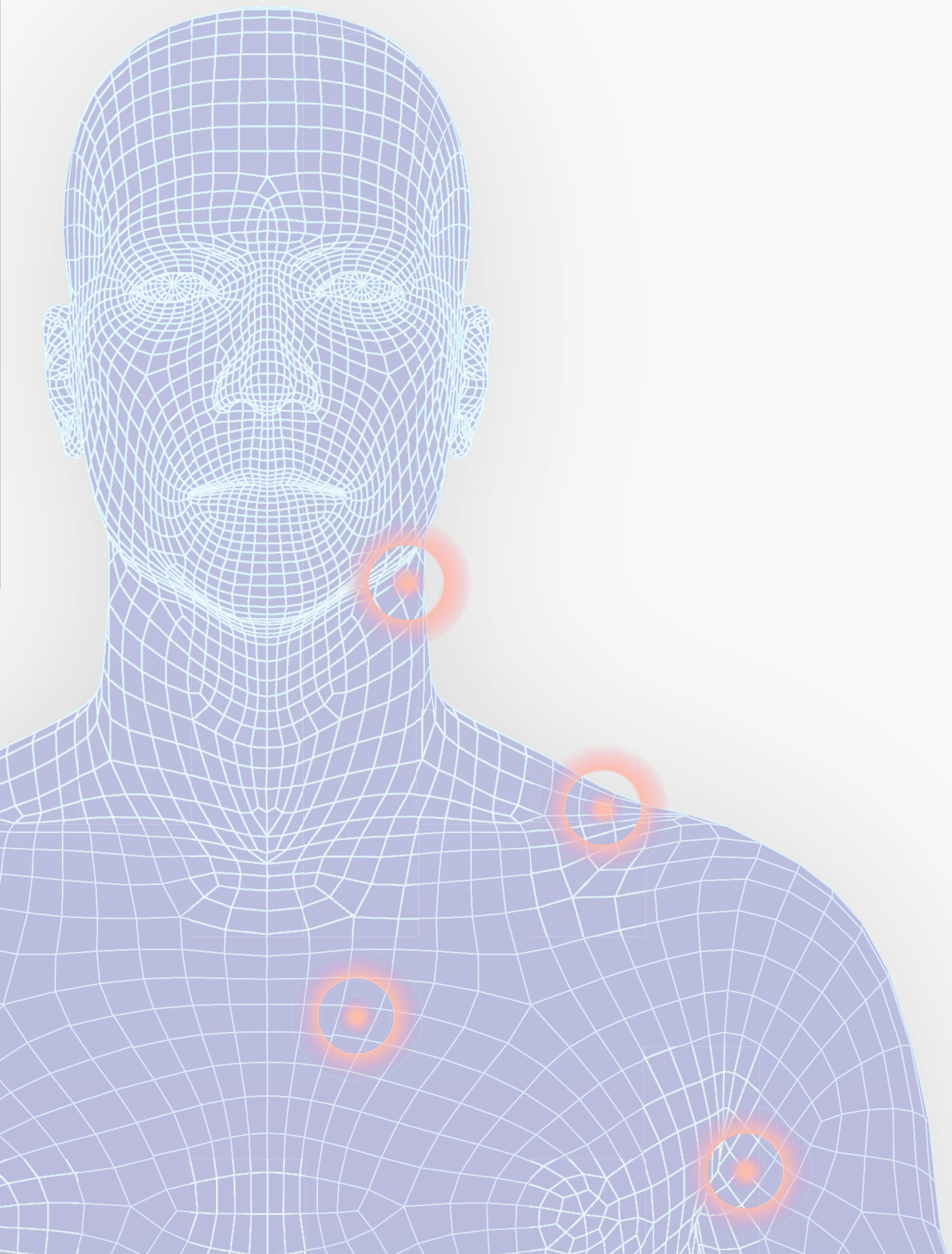

Our Mission

To share God's love with our community by promoting healing and wellness for the whole person.

Glendale Adventist Medical Center

Adventist Health