St. Luke's Medical Center
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St. Luke's Medical Center

CLINICAL OUTCOMES

VOLUME 2

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Published in the Philippines
by ST. LUKE'S MEDICAL CENTER

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CLINICAL OUTCOMES

Volume 2

MESSAGE

We are defined by what we do and accomplish.

Already a recipient of the coveted Joint Commission International (JCI) accreditation since 2003, the St. Luke's healthcare system also gained international recognition from Germany-based accrediting organization Temos, Investors in People (IiP), and the Readers' Digest Most Trusted Brand Platinum Award for achieving excellence that highlight compliance to global level standards in medical care and patient safety and experience, as well as the high trust and confidence of the general public on the St. Luke's brand of healthcare.

We have likewise received recognition from the Diplomatic Council, a European-based advocacy organization, with their citation of both the Quezon City and Global City Hospitals as among those of only 20 "Best Hospitals Worldwide for 2014".

Our Breast Centers have also been certified by the American College of Radiology (ACR) for their quality Mammograhy and Ultrasound services, with the Global City hospital also cited for Stereotactic Biopsy services and being named a Breast Imaging Center of Excellence outside the Americas.

But more than just taking pride in the accolades we have received, we have set the higher goal to effectively transform ourselves into an internationally recognized academic medical center committed to educating outstanding medical professionals and to the development of leading-edge medical technologies and practices that create positive patient outcomes.

Our vision is to become an internationally recognized Academic Medical Center by 2020 -- where medical doctors and researchers continuously look for and develop ways to prolong and improve the quality of life of the sick and where we can transform this new knowledge into the clinical standard of the future through our academic medical school.

It is in line with this direction that St. Luke's has taken the initiative to continuously conduct empirical research on the clinical performance of the various Institutes, Departments and Centers (IDCs) of our two hospitals. This effort is manifested in the continued publication of the Clinical Outcomes which documents actual evidenced-based results of various medical procedures done in St. Luke's.

Through this publication, we aim to demonstrate our steadfast commitment to create value to our patients and to work towards providing the best patient service and experience that is comparable with the world's best medical centers.

Likewise, this Clinical Outcomes Report also documents recent medical developments put in place in St. Luke's that put us at par with international healthcare practices, while promising to achieve higher clinical success rates and outcomes in the future. We are sharing this documentation to the broader medical community, to patients, to partners and to all our shareholders so that everyone can contribute to the higher goal of better healthcare for all in the country.

Our sincerest appreciation goes to our patients and to the general public who have continued to trust and believe in St. Luke's through the years and to our people and associates who have maintained the highest levels of professionalism and commitment to the targets we have laid out through our vision.

St. Luke's Medical Center

Quezon City · Global City

We love life.



"But more than just taking pride in the accolades we have received, we have set the higher goal to effectively transform ourselves into an internationally recognized academic medical center."

EDGARDO R. CORTEZ, MD

President and CEO

MESSAGE



Delivering outstanding healthcare through the years is no accident.

In its long and rich history, St. Luke's-Quezon City has worked tirelessly to deliver excellent medical care for the Filipino public. Proof of its outstanding record, it was the first hospital in the country and the second in Asia to have garnered the internationally recognized Joint Commission International (JCI) accreditation in 2003.

Behind the hospital's lofty success has been the corps of its well-known doctors who have attained recognition as experts in their respective fields and who have provided passionate and caring health services to the public. They have been supported by professional clinical, nursing and administrative staff who are also dedicated to the highest standards of service and well-being for patients over the years.

Our medical school, the St. Luke's College of Medicine-William H. Quasha Memorial, is designed to produce on a continuing basis outstanding medical talents who carry the torch of dedication to quality and compassionate caring that has distinguished St. Luke's as a center of healthcare excellence in Asia.

Our expansive offering of residency and fellowship programs across various medical disciplines train new physicians to become world-class specialists. We have also established the Research and Biotechnology Group which leads in exploring and testing the latest discoveries and findings in medical science to improve patient outcomes.This publication shows these in its finest form.

In aspiring to establish top-quality medical processes and treatment protocols, we are gratified to continue with the effort to provide evidence-based empirical research through this second volume of the Clinical Outcomes Report.

In this, we reiterate our commitment to give our patients the very best healthcare that matches that of anywhere in the world so that we will continue to deserve your trust and confidence now and into the future.

JOSE B. MORAN, MD

SVP and Head of Medical Practice Group
and Medical Director - Quezon City

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SVP and Head of Medical Practice Group
and Medical Director - Quezon City



MESSAGE

Providing the best experience ever possible for our patients --- the sine qua non of a medical institution --- is a vital and continuing goal of St. Luke's Medical Center.

With the second Clinical Outcomes Report of St. Luke's, the one truism that comes to the fore, as it did in the maiden issue, is that people are the very foundation that make a service organization.

This is best exemplified by the collective efforts that make up the medical family--- from the ranks of our doctors who pursue their medical practice with the best protocols and systems and ultimately the best treatment possible, to the staff of nurses and the rest of the medical team, and to the ranks of the patients themselves who are given a new lease on life, thanks to the latest technology, medical care and diagnostics procedures.

St. Luke's now serves a broader and truly international market because of excellence as the institution has reaped various awards and citations for its industry-leading technology in the treatment and recovery of their patients. These measures of recognition reveal the earnest efforts of the institution to be truly world-class in its mission, as it formally marks the all-important threshold of becoming an internationally recognized academic medical center by the year 2020.

We wish to congratulate everyone who has played an integral part of the total effort to ensure the best medical care to our patients, who, in the final analysis, are the ultimate beneficiaries of our entire endeavor.

MARILEN TRONQUED-LAGNITON
SVP and Head, Marketing Group





ST. LUKE'S MEDICAL CENTER

A LEADER IN PHILIPPINE HEALTHCARE

From its humble beginnings as a small dispensary clinic in Manila in1903, St. Luke's Medical Center has since established itself as a forerunner in the Philippine healthcare industry with two highly respected and internationally recognized hospitals in Quezon City, and Bonifacio Global City in Taguig City.

Its reputation as a pioneer in bringing world-class health services to the country lies in its relentless efforts in investing in the latest and most advanced medical technologies, continuous medical training for its doctors and nurses, and continuous improvement of medical and patient services as seen in its affiliations with prestigious institutions and accreditations from the most respected healthcare accrediting bodies worldwide.

This passion to continuously deliver state-of-the-art healthcare is fueled by its unwavering focus on its patients.

As part of its vision to become an internationally recognized academic medical center by 2020, St. Luke's thus shares this Clinical Outcomes Report with colleagues in the medical profession and patients all over the world as testament to its goal of achieving the best possible clinical outcomes and imparting its knowledge and expertise to those who wish to learn about the hospitals' innovating strides in Philippine healthcare.

VISION

St. Luke's Medical Center will be an internationally recognized academic medical center by 2020.

MISSION

We are committed to deliver state-of-the-art healthcare because at St. Luke's Medical Center, the needs of our patients come first.

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Clinical Outcomes

Towards Redefining Healthcare

Compassionate service and care for the sick demands the best possible treatment to ease and manage, if not totally control infirmity and suffering, and improve the lives of individual patients.

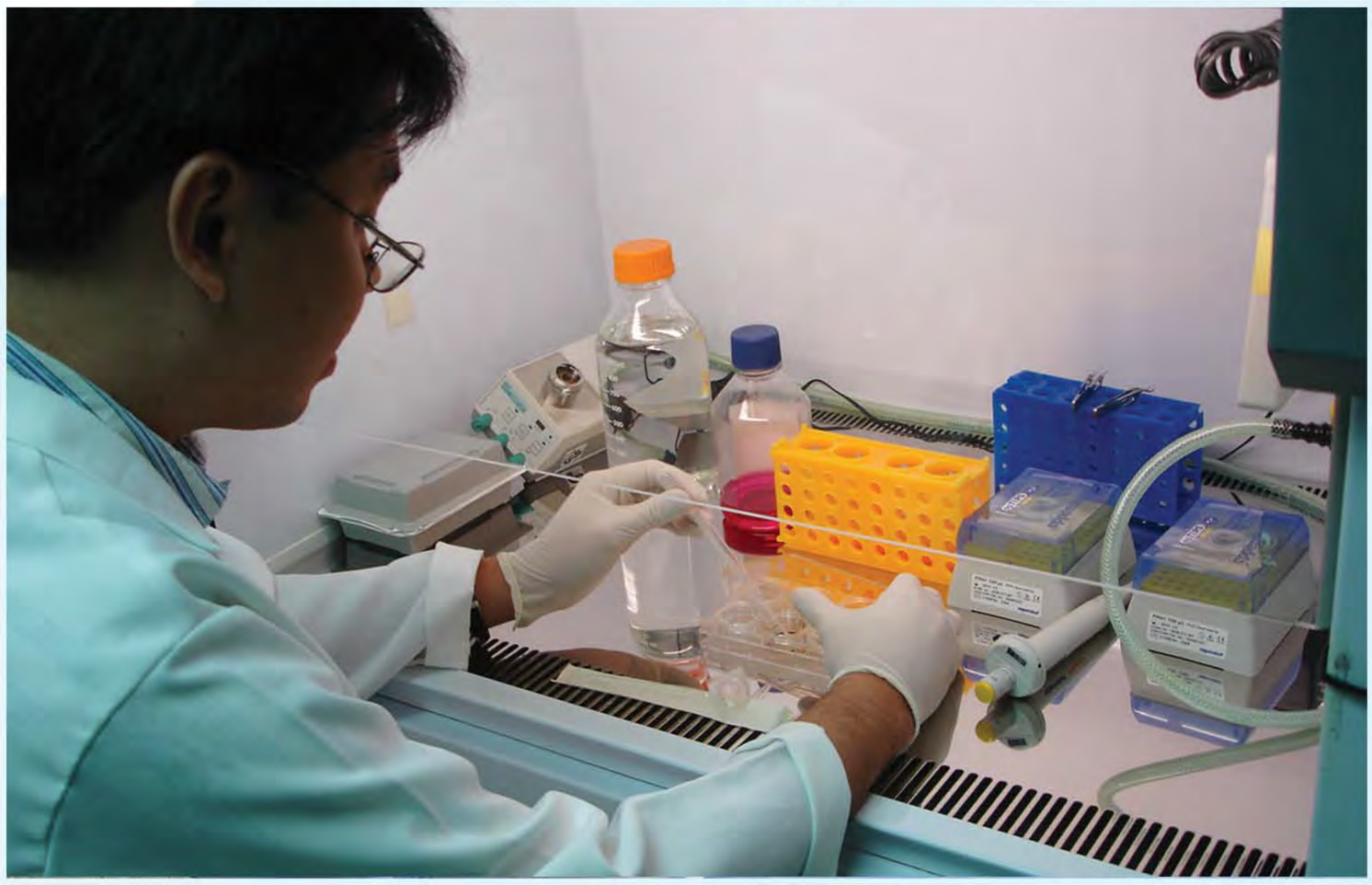
Clinical outcomes research by physicians and medical researchers are designed to assess the end-results of medical treatment and care for patients and evaluate the effectiveness of specific healthcare interventions. The goal is to improve health and set quantifiable standards and benchmarks of healthcare so that we will continue to deliver superior medical care and have a positive impact on people's lives.

Now on its 2nd edition, St. Luke's Medical Center's Clinical Outcomes publication documents and reports evidence-based clinical outcomes in several areas of medical diagnostics, treatment and patient care.

Our clinical outcomes in various medical fields are comparable to, if not better than, the performance of the best hospitals in the USA, Asia and Europe. We have delivered superior patient care outcomes in cardiovascular, eye, obstetrics and gynecologic, urologic, cancer, dermatological and orthopedic procedures, and other areas such as assisted reproductive processes.

In line with our vision to be an internationally recognized academic medical center, we are giving full support to outcomes research and measurements across the St. Luke's organization.







This is a leap forward for the Philippine medical establishment, and we are blazing a trail so that healthcare practice and standards are constantly measured and monitored so that continuous improvements can be made.



CANCER INSTITUTE

Cancer is one of the world's most dreaded disease. Early detection, diagnosis and management of this modern-day malady have, however, been known to improve the chances of survival and quality of life.

At St. Luke's Cancer Institute, a comprehensive and aggressive multidisciplinary approach to cancer management coupled with sophisticated technology, cutting-edge research and personalized care and treatment from the country's leading cancer specialists ensure that patients receive the appropriate therapy and support needed for their condition.

Aside from diagnosis, management, treatment, rehabilitation, and aftercare, St. Luke's Cancer Institute extends emotional and psychological support to cancer patients. The Cancer Institute is supported by various departments.

- **Surgical Oncology Section** - seasoned cancer surgeons who received extensive training from international and local hospitals perform the most delicate procedures.

- **PET Center** - operates the PET/CT Scanner, the latest and most advanced medical imaging equipment in the country. It provides a more accurate picture of the cancer's location and eliminates discrepancies that may result from PET scan and CT scan.





• **Department of Radiation Oncology** - offers a wide array of industry leading therapeutic and radiologic oncology equipment. These include a Linear Accelerator, High Dose Rate Brachytherapy, Stereotactic Radiosurgery for both the brain and body, Stereotactic Radiotherapy, 3D Conformal Radiation Therapy, Intensity Modulated Radiation Therapy (IMRT) and Radiotherapy Simulator.

It also has specially designed support programs and services for patients that include cancer screening and education, chemotherapy prevention, diagnosis, and curative, palliative and supportive treatment. A Cancer Ambulatory Care Unit offers chemotherapy, minor surgical procedures, blood transfusion, and bone marrow aspiration, among others.

A Pilot Study on the Outcome of Cytoreductive Surgery with Hyperthermic Intraperitoneal Chemotherapy as a Treatment Strategy in Peritoneal Carcinomatosis

Cecilio S. Hipolito, Jr., MD

Peritoneal carcinomatosis is a rare type of cancer that affects the peritoneum, which is the thin layer of tissue that surrounds the organs in the abdomen area. Peritoneal carcinomatosis develops when existing abdominal cancers, including appendix, colon, stomach, ovarian, rectal, and pancreatic cancers, spread into the peritoneum. This causes the tumors to spread to the peritoneum.



Dr. Cecilio "Jay" Hipolito is the Head of HIPEC Services at St. Luke's-Global City.

The spread of an abdominal cancer to the peritoneum usually means that the abdominal cancer is in an advanced stage. Peritoneal carcinomatosis is a common feature of terminal patients with abdominal cancers. The survival period from the time of diagnosis is just approximately an average of three months.

Peritoneal carcinomatosis used to be generally considered to be an untreatable condition for many years. This was due to the fact that complete surgical removal of the cancerous cells in the peritoneum is almost impossible and systemic chemotherapy delivered intravenously is ineffective.

However, studies in the 1980s in the United States led to the development of the technique involving the perfusion of heated fluid containing chemotherapeutic agents into the peritoneum (See Sidebar Article). Further improvements led to the establishment of the hyperthermic (i.e., heated) intraperitoneal

chemotherapy (HIPEC) which became the gold standard in the modal treatment of peritoneal cancer.

Hyperthermic Intraperitoneal Chemotherapy (HIPEC)

Hyperthermic intraperitoneal chemotherapy (HIPEC) is the treatment protocol that involves the delivery of highly concentrated, heated chemotherapy directly to the peritoneum and the abdomen during cytoreductive surgery.

With HIPEC, chemotherapy is directly delivered to cancer cells in the abdomen. This allows for higher doses of chemotherapy treatment. The hyperthermic solution improves the absorption of chemotherapy drugs by tumors and destroy microscopic cancer cells that remain in the abdomen after surgery.

Before patients receive HIPEC treatment, doctors perform cytoreductive surgery to remove visible tumors within the abdomen. After the removal procedure, the heated chemotherapy solution is delivered to and circulated for approximately 1 ½ hours in the abdominal cavity to penetrate and destroy remaining cancer cells.

HIPEC Now Available in the Philippines

Although the treatment modalities have been available in the United States since the early 1990s, the HIPEC procedure is now available for the first time in the Philippines through St. Luke's.

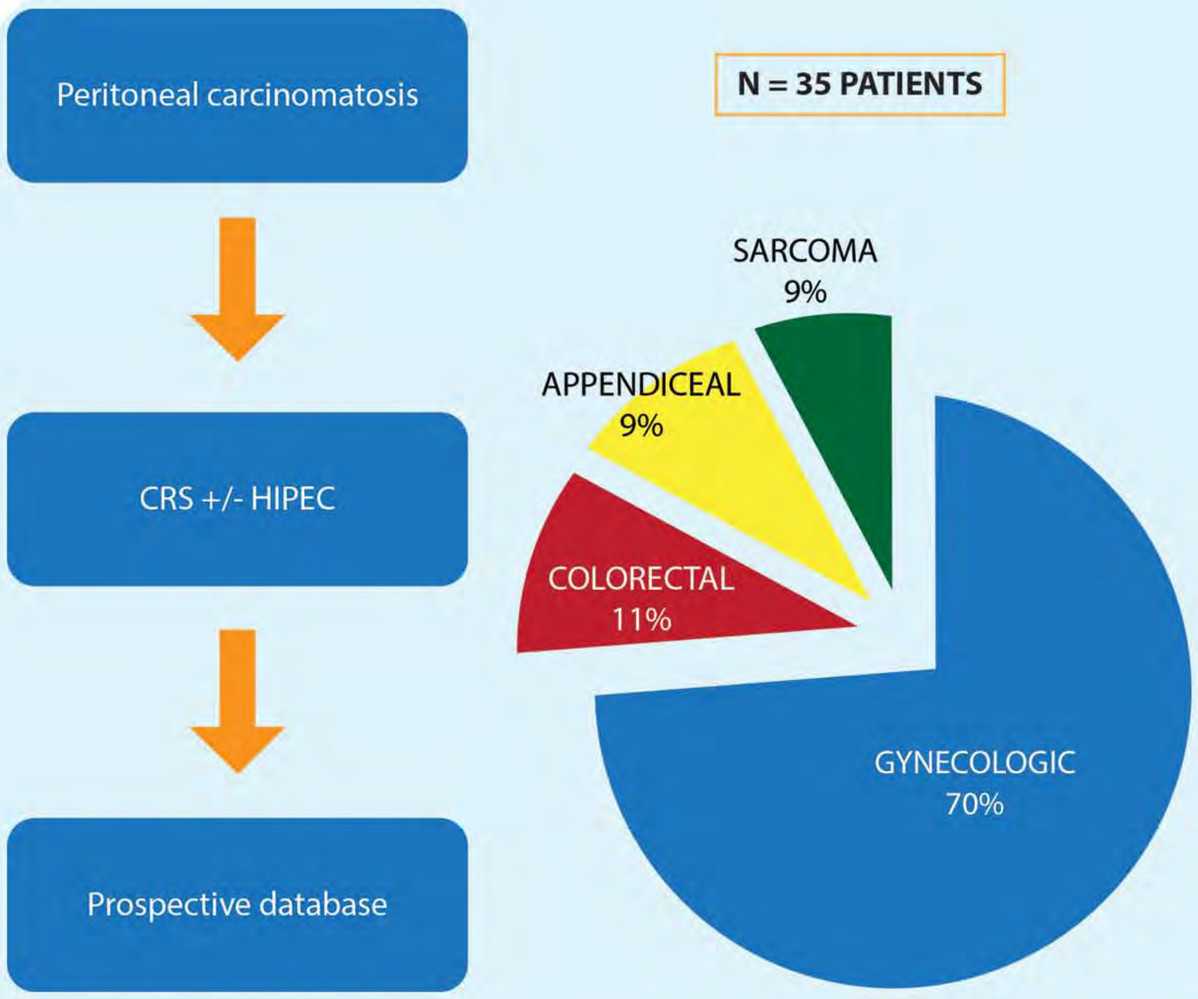


Figure 1

St. Luke's Cancer Institute makes use of industry-leading equipment to deliver the hyperthermic chemotherapy solution to eradicate residual cancer cells. The highly-skilled team of surgical oncologists, medical oncologists, and gyne-oncologists provides the most up-to-date Peritoneal Surface Malignancy Service involving the combination of cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC), as well as personalized care to patients with advanced malignancies.

Studies have shown that the combined CRS and HIPEC treatment protocol has increased the overall survival (OS) rate to range from 22 to 64 months after treatment, increasing substantially from the CRS and systemic chemotherapy protocol of 6 to 12 months OS.

Pilot Study

Because the Cancer Institute has undertaken CRS and HIPEC protocol (shortened as CRS + HIPEC) as a treatment modality since January 2012, the Institute conducted a pilot study to measure the survival rate and clinical outcomes of patients with peritoneal carcinomatosis.

The study covered a prospective, non-randomized sample involving 35 patients who underwent the procedure from January 2012 to December 2013. The composition of patient cancer types is presented in Figure 1, which shows gynecologic cases having the highest incidence (71 percent).

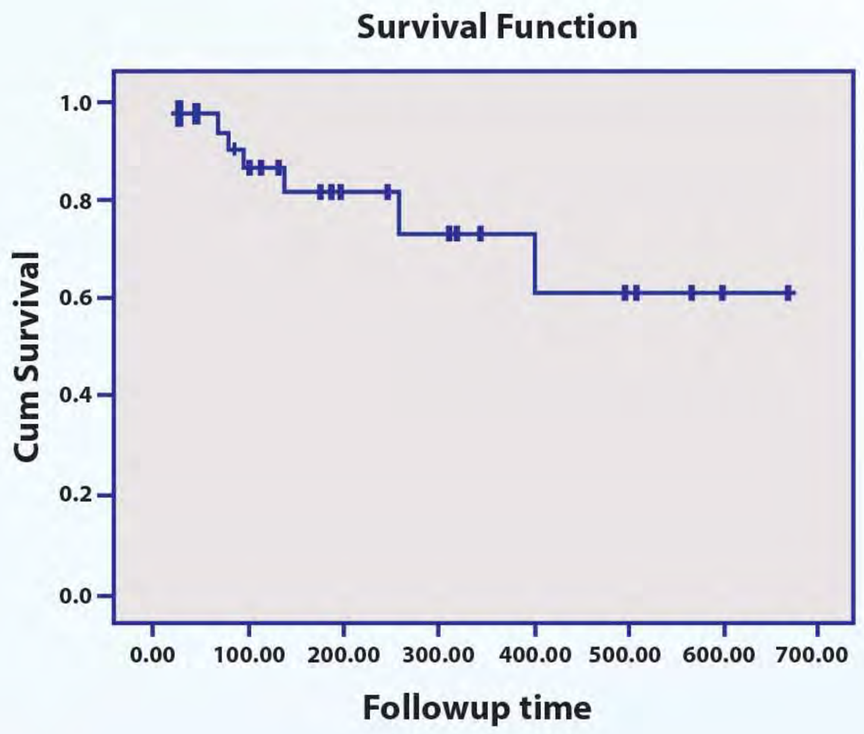
The outcome parameters measured were Overall Survival (OS) and Disease-Free Survival (DFS) in terms of months (Figure 2 below). During the two-year study period, both parameters were tracked for all 35 patients, and showed a positive outcome of OS = 16.38 +/- 1.89 and DFS = 13 +/- 3.87 (Figure 2)

Figure 2

Median Ff-up: 7 months

OVERALL SURVIVAL

Mean OS: 16.38 months +/- 1.89



DISEASE-FREE SURVIVAL

Median DFS: 13 months +/- 3.87
(95% CI 5.65-20.82)

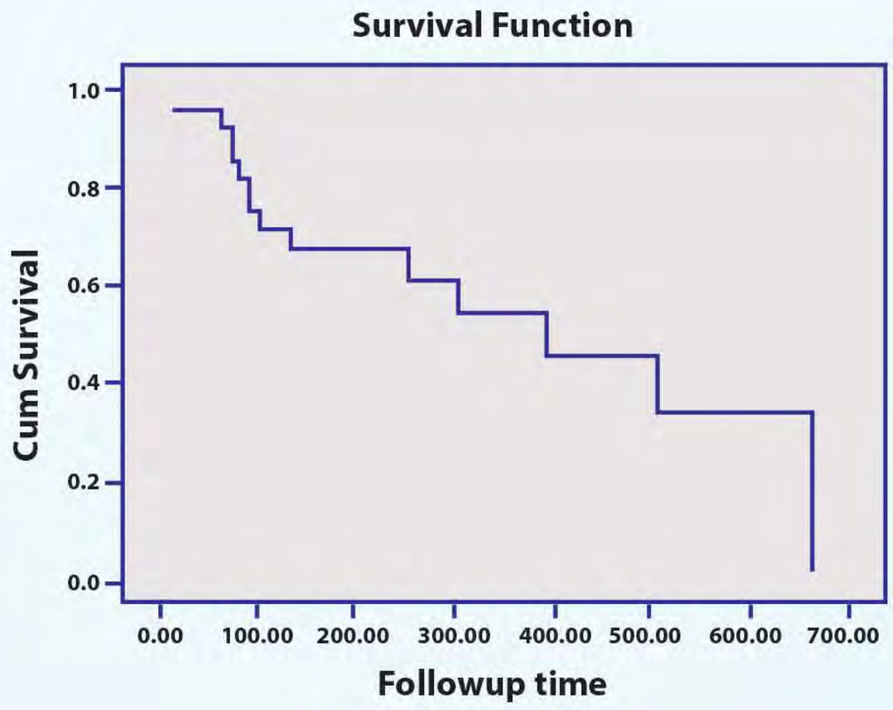


Figure 3

Rates (%)	St. Luke's Study	International Centers
Mordibity rate	34.29%	12 - 52%[5]
Re-operation rate	17.14%	11%[6, 7]
Mortality rate	5.7%	0.9 - 10%[5, 8, 9, 10]



The combined CRS and HIPEC treatment protocol has increased the overall survival rate of cancer patients.

THE ST. LUKE'S HIPEC TEAM

Surgical Oncologists
Dr. Edgardo R. Cortez
Dr. Arturo S. De La Peña
Dr. Cecilio S. Hipolito, Jr.

Gynecologic Oncologists
Dr. Jay Arnold F. Famador
Dr. Mary Christine F. Palma

Medical Oncologists
Dr. Gerardo Thomas H. Cornelio
Dr. Carlos Dy
Dr. Charity Charisse N. Viado-Gorospe

Anesthesiologists
Dr. Olivia C. Flores
Dr. Eric V. Nagtalon

Appendiceal origin peritoneal cancer had the higher one-year survival rate (at 100 percent), compared to 73 percent for ovarian cancer and 67 percent for colorectal cancer origin peritoneal cancers.

The morbidity rate of 34.29 percent of St. Luke's CRS + HIPEC treatment protocol as determined by the study compares favorably with the 12 to 52 percent incidence in other medical centers abroad that were covered in international studies. Mortality rate stood at 5.7 percent, in contrast to the 0.9 to 10 percent range reported in foreign centers (Figure 3).

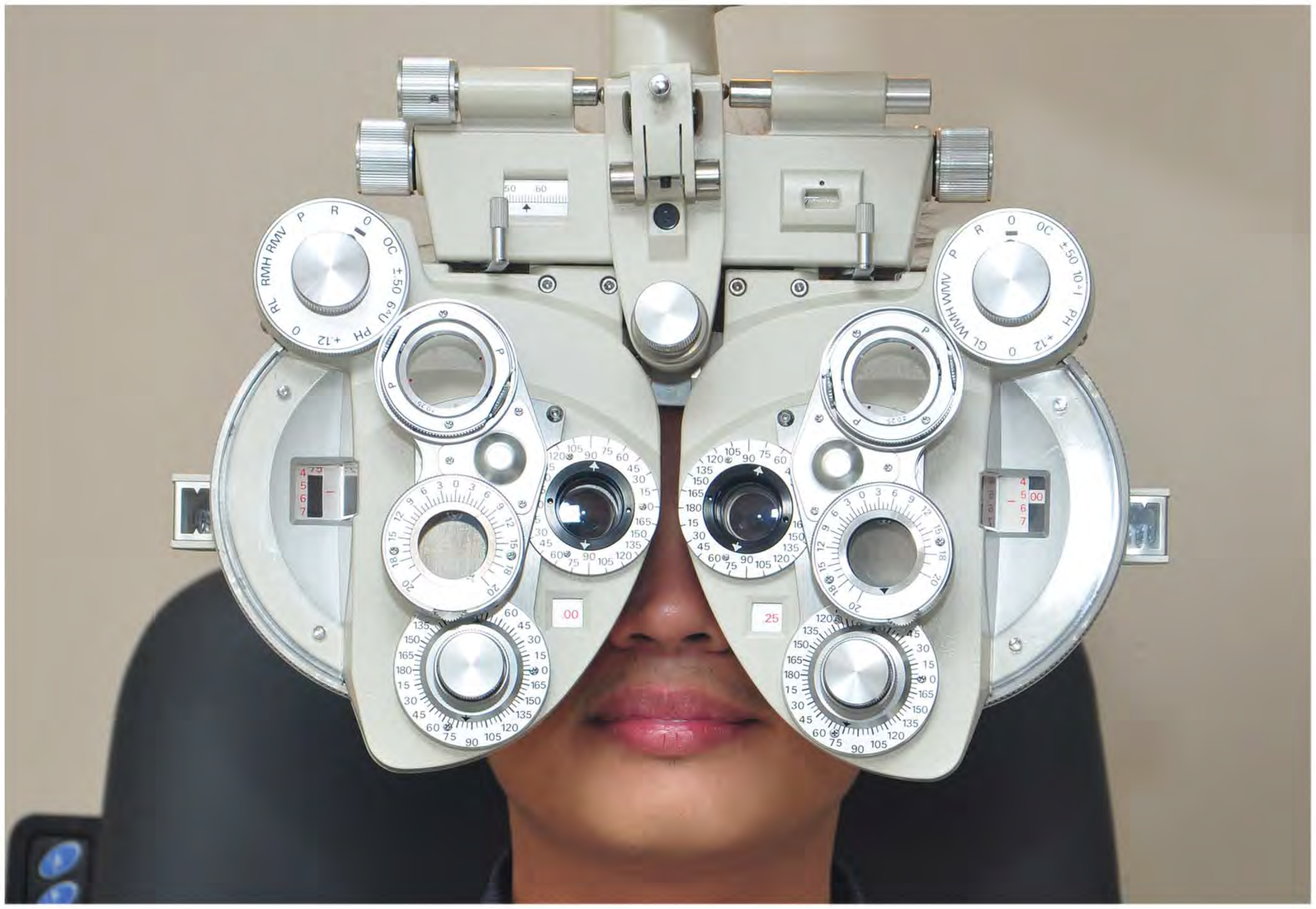
The study proved that long-term survival is reasonably achievable for the CRS + HIPEC protocol in the Philippines, with the country initial experience clinical survival mortality and morbidity outcomes comparable with that performed in centers in the developed countries of the world.

It is expected that clinical outcomes will improve with greater experience and improvements in the learning curve among medical professionals performing it in the coming years.

Hyperthermic Intraperitoneal Chemotherapy (HIPEC)

HIPEC was originally conceived in the 1980s because there were findings that hyperthermia, or the application of heat, affected tumor cells due to their heat sensitivity, low pH condition and low oxygen tension. Later experimental studies demonstrated the synergistic effects of chemotherapy and hyperthermia on tumor cells which resulted into an increase in cell membrane permeability and active drug transport in the affected area.

The systemic chemotherapy delivery, which circulates throughout the body, has not been useful in cases of peritoneal cancer. The idea of intraperitoneal perfusion of heated fluid containing chemotherapeutic agents became the basis of further developments that led to the establishment of the HIPEC procedure.



EYE INSTITUTE

They say that eyes are the windows of the soul. But to ensure its health, this means providing the utmost care for this most mystifying organ and preserving this primary and most important of man's senses -- sight.

St. Luke's Eye Institute, one of the most modern eye centers in the Philippines, precisely aims to provide world-class eye care, with cutting-edge technology in the following specialties and subspecialties:

- Comprehensive Eye Care
- Cataract Surgery
- Cornea and External Disease
- Glaucoma
- LASIK/Refractive Surgery
- Neuro-ophthalmology
- Oculofacial, Plastic and Orbital Surgery
- Oncology and Ocular Tumors
- Pediatric Ophthamology and Adult Strabismus
- Retina/Vitreous Surgery
- Uveitis
- Visual Rehabilitation

Established in 2009, St. Luke's Medical Center's Eye Institute is recognized as a leader in the visual sciences. It delivers services spanning the broad spectrum of ophthalmic care. The expertise of its internationally trained and renowned consultant staff perfectly complements its tradition of excellence and record of outstanding patient care.

The dedication to excellence in patient care, best-in-class medical expertise, research and technology, and customer service combine to make St. Luke's Eye Institute the world-class eye facility that it is today.





The excellence of our eye care services is anchored on the Institute's complete and advanced diagnostic and therapeutic facilities, including an exclusive operating room facility available 24 hours a day throughout the year. Its equipment and medical doctors are at par with the top hospitals of the world.

The Institute boasts of globally trained ophthalmologists who specialize in specific fields of pathologies that affect the eyes of various patients. Its eye care services include:

- Cataract Surgery
- Glaucoma Workup and Treatment
- Inflammatory Diseases of the Eye
- Evaluation and Treatment of Visual Field Defects, Gaze Disturbances, Diplopia (double vision), Nystagmus (voluntary and involuntary eye movement), Amaurosis fugax (loss of vision in one eye)
- Delicate Retina and Vitreous (thick, transparent substance that fills the center of the eye) Surgery
- Visual Evaluation and Testing for Infants and Toddlers and Fundus Examination of Newborns and Infants
- Orthoptic Exercises to stimulate normal vision in a lazy eye and improve binocular vision
- Corneal Infections and Pathogens

Cataract Surgery

Noel G. Chua, MD; Jose Maria D. Martinez, MD

Cataract is the leading cause of reversible blindness in the Philippines and afflicts middle-aged and senior individuals. Cataract surgery, called by the technical term Phacoemulsification with lens implantation, is the mode of treatment for this disease that afflicts more than 400,000 Filipinos.



Dr. Noel Chua (seated) is the Head of the Eye Institute at St. Luke's-Global City. He is assisted in clinical outcomes research for catract surgery by Dr. Jose Maria "Biboy" Martinez.

At the St. Luke's Eye Institute (SLEI), those suffering from this common eye ailment can be assured of the best possible surgical treatment in the country, due to its industry-leading quality medical services backed by the most modern equipment and techniques.

Patients enjoy best corrected visual acuity (BCVA) of 20/40 or better, in 91.22% of all cases. As a benchmark, SLEI adheres to the latest audit of Britain's National Health Service which showed that BCVA after surgery was 6/12 (Snellen) or better in 93% of patients.

In a recent outcomes study for the first ten months of 2012, SLEI has outperformed clinical outcomes for the cure rate for the procedure as compared to international benchmarks:

- Post-operative refractive improvement outcome reached 88.95% against the international standards of 82%, while complication rate was only 0.8%compared to 2-2.4% registered in hospitals abroad.
- Complete pre- and post-operative measurements from surgeries performed during the period showed that 91.22% of patients had a better than or equal to 20/40 vision after the operation.
- Of the sample, 51 patients suffered from ocular co-morbidities such as glaucoma, corneal scar, irregular astigmatism, myopia, scleral buckling, retinitis pigmentation and maculardisease. Post-operative measurements showed better than or equal to 20/40 vision achievement in 94.8% of the patients, without ocular co-morbidities and 80.39% with ocular co-morbidities.

The effectiveness statistics were based on patients aged 27 years and above who underwent cataract surgery totaling 229 patients (or 62.4% of the total of 367) during the study period. Majority of the patients (173 or 75.55%) were above 61 years old.



Cataract surgery patients at St. Luke's enjoyed best corrected visual acuity (BCVA) of 20/40 or better in over 90% of cases.

Summary of Clinical Outcome Findings of Cataract Surgeries, Eye Institute, January - December 2013

Domain	Desired Outcome	SLEI Performance	UK Benchmark
Efficacy	Post-operative BCVA 20/40 or better	94.54%	91%[2]-93%[3]
Accuracy	Post-operative Refractive Outcome Within 1 diopter	87.24%	82%[2]
Safety	Complication rate	1.65%	2%[2]-2.4%[3]

[1] Cubillan L, Philippine National Survey of Blindness, University of the Philippines, Manila

[2] Zaidi F, Corbett M, Burton B et al, Raising the benchmark for the 21st century-the 1000 cataract operations audit and survey: outcomes, Consultant-supervised training and sourcing NHS choice, Br j Ophthalmol, 2007,91:731-736

[3] Jaycock P, Johnston RL et al, The cataract national dataset electronic multicenter audit of 55567 operations: updating benchmark standards of care in United Kingdom and internationally, 2009, 23, 38-49

FemtoLASIK Surgery

Winston L. Villar, MD

A refractive error is a common eye condition characterized by reduced visual acuity or image clarity of a person's vision. It is a disability that afflicts a significant part of the population anywhere around the world.



Dr. Winston Villar is the Head of the Vision Laser Service at St. Luke's-Quezon City.

A refractive error occurs when the shape of the eye interferes with light (reflecting an object or scene) it sees as it passes through it. The interference causes an incorrect focus of the seen image on the retina (back of the eye) which transmits the information to the brain. The most frequent and easiest fix to correct this error is for patients to wear corrective eyeglasses or contact lenses. However, these methods only provide temporal relief of the condition.

The three most common types of refractive errors are: myopia (nearsightedness), hyperopia (farsightedness) and astigmatism (from an irregularly shaped cornea). All of these conditions cause light rays to focus elsewhere but on the retina.

While the general corrective "treatment" for refractive errors is the use of prescription eyeglasses or contact lenses, some people have opted for a more permanent solution to these conditions using Refractive Laser Surgery.

FemtoLASIK Eye Surgery

Laser-based refractive surgery has been proven to be a safe and effective procedure affording a more permanent form of vision correction.

Laser refractive surgery using the popular LASIK (Laser In-Situ Keratomileusis) modality became the most widely used and most common alternative solution to permanent vision correction in the 1990s. LASIK surgery previously involved the use of a microkeratome (a mechanical device with a steel blade) but nowadays a Femtosecond laser is used to incise the surface of the cornea (the clear front part of the eye) to create a flap. This is followed by a refractive laser ablation to reshape it in order to improve visual acuity.

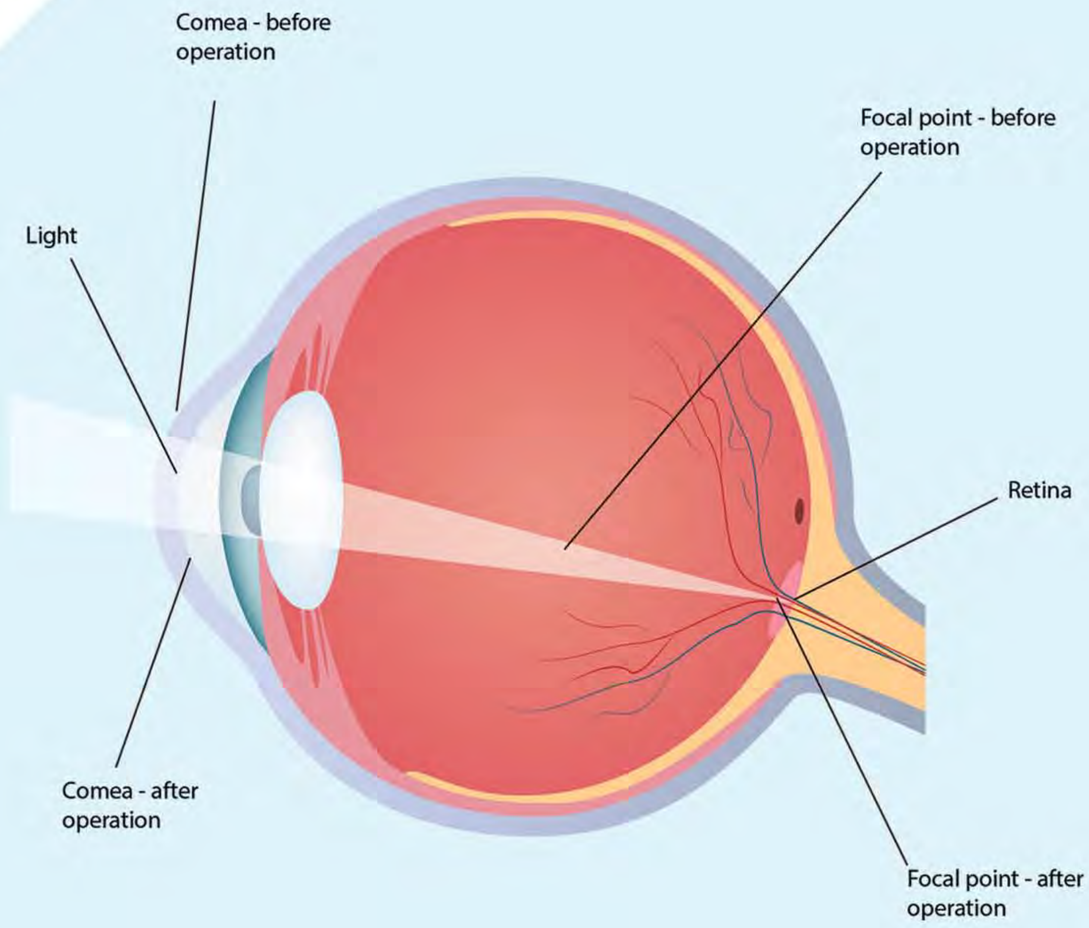


Figure 1. The Eye Structure and Ophthalmic Surgery

With the corneal correction, light traveling through the it becomes properly focused onto the retina.

LASIK is still the current laser refractive procedure of choice to treat refractive disorders. Millions of this procedure have been performed around the world because of its proven general efficacy and safety.

The procedure has demonstrated immediate postoperative improvement of visual acuity and minimal patient discomfort. Side effects such as dry eyes, reduced vision in low light and visual distortions such as glare can have been observed in less than 1% of cases and diminishes over time. Flap-related complications, inflammation or infection have been a very rare occurrence.

With advancement in technology and research, the Femtosecond laser was developed to address flap-related complications and has since been used successfully in ophthalmic surgery since 2001. In FemtoLASIK refractive surgery, the high-frequency femtosecond laser replaced the mechanical device (microkeratome) used to incise and create a precise corneal flap in preparation for the refractive laser procedure (Figure 1).

Femtosecond lasers have been designed to be extremely precise, with lower risks of complications that revolve around flap creation. This has led to safer and more reproducible procedure outcomes. FemtoLASIK or 'bladeless' LASIK as compared to microkeratome LASIK have reduced the incidence of postoperative dry-eye symptoms, halos and impaired night vision, as well as the likelihood of flap related complications.

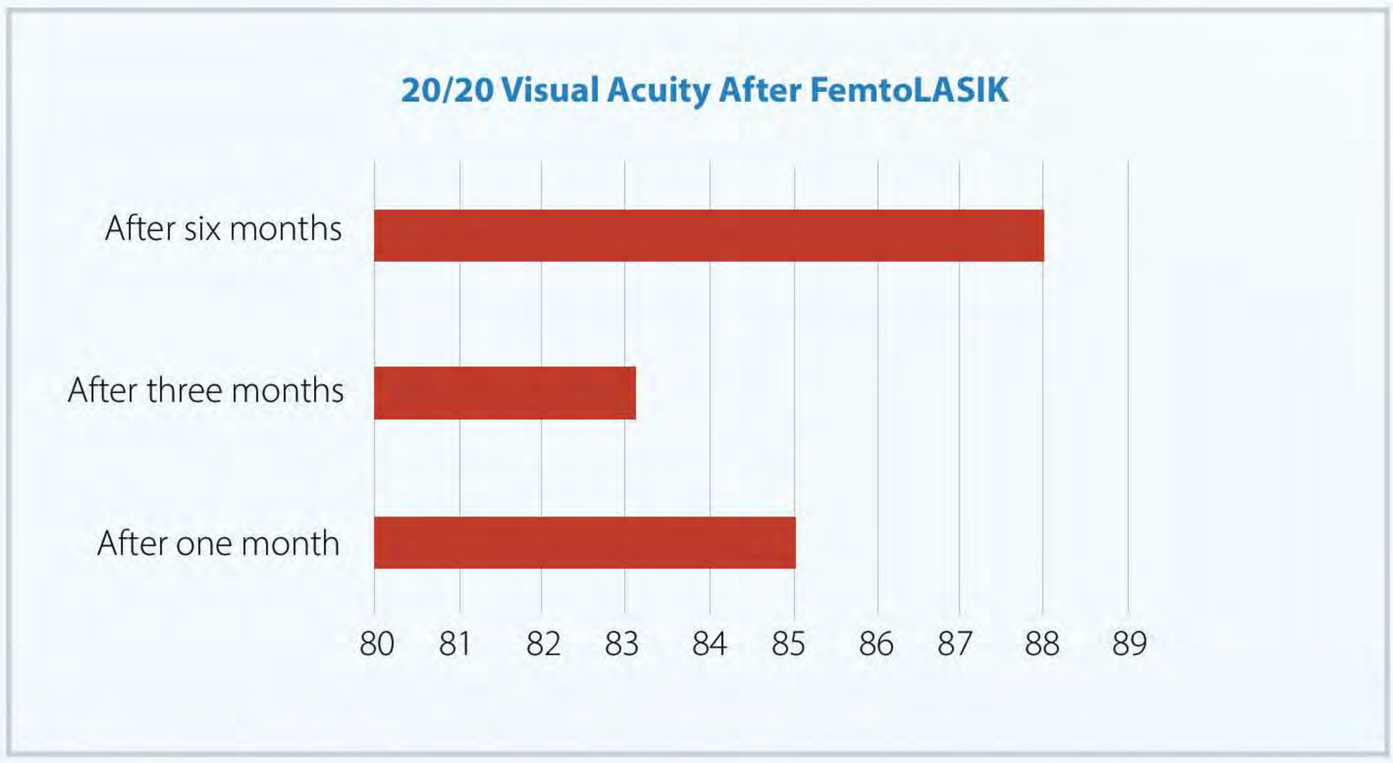
Retrospective Census of FemtoLASIK

The charts of 239 patients who underwent FemtoLASIK at the Vision Laser Center of St. Luke's-Global City from January 2012 to December 2013 were reviewed.

The postoperative visual acuity of the 239 cases were compared to preoperative spectacle corrected visual acuity (SCVA) of 598 patients who did not undergo the procedure within the study period.

All FemtoLASIK patients exhibited a visual acuity of 20/40 or better within just a month after the operation. All patients in the control group also had an SCVA of 20/40 or better visual acuity.

Table 1. Proportion of FemtoLASIK Patients who Attained 20/20 Vision after Surgery



None of the cases under study exhibited adverse side effects from the surgery, particularly visual distortions (glare or halos), dry eyes and flap-related complications . All were sent home after the operation, and almost all patients experienced a return-to-normal functioning after one or a few days from the procedure.

The number of cases who had 20/20 vision was 85 percent and 83 percent after one month and after three months, respectively. At the sixth postoperative month, the proportion of FemtoLASIK cases who achieved a visual acuity of 20/20 was higher at 88 percent (Table 1).



The use of Femtosecond lasers or 'bladeless' LASIK has contributed to safe ophthalmic outcomes.

88 percent of patients had 20/20 vision six months after FemtoLASIK compared to 84 percent of patients who just had SCVA intervention.

98 percent of those who underwent the procedure achieved 20/25 visual acuity after one month and after three months, still at a very high 97 percent six months out.

Common Refractive Disorders

Myopia or near-sightedness occurs when the optics do not match the length of the eyeball. This can arise from a cornea or crystalline lens with too much curvature (refractive myopia) or an eyeball that is too long (axial myopia). The elongation causes light rays to "undershoot" the image or focus anterior to the retina, resulting in a blurred image. Corrective eyeglasses use a concave lens which causes the divergence of light rays before they reach the cornea.

Hyperopia or far-sightedness arises from a cornea or crystalline lens with not enough curvature (refractive hyperopia) or an eyeball that is too short (axial hyperopia). This can be corrected with convex lenses which cause light rays to converge prior to hitting the cornea.

Cylindrical errors cause astigmatism, and this occurs when the optical power of the eye is too powerful or too weak across one meridian. This condition causes an irregular blurring of the image that is projected onto the retina. This defect can be corrected by cylindrical lenses that refract light more in one meridian than the other.



HEART INSTITUTE

The heart is a muscular organ which pumps blood through the blood vessels of the circulatory system. It is the center of the cardiovascular system, and serves the vital function of providing blood with oxygen and nutrients throughout the body, while also involved in the removal of metabolic wastes. Cardiovascular diseases are now known to be the most common cause of death globally.

The St. Luke's Heart Institute is the first private heart facility of excellence in the Philippines. It provides patients the latest diagnostic and therapeutic modalities in the management of cardiovascular diseases.

The Institute is composed of adult and pediatric cardiologists, cardiovascular surgeons, radiologists and pathologists, ably supported by nurses, physical and rehabilitation therapists and medical technicians. Together, they form the cream of the crop in their respective fields in the country.

The Institute is proud of a locally documented 98% success rate for coronary artery bypass graft (CABG) as well as percutaneous cardiovascular interventions recognized to be the best in the Philippines. It has also a 99% success rate in open-heart surgeries and 98.9 % survival rate in coronary angioplasty and stenting, making St. Luke's clinical outcomes comparable with the world's best medical centers.

The St. Luke's Heart Institute has acquired nothing but the latest and most innovative technologies to complement the knowhow and skills of its cardiovascular medical team.





These include the FD20 AlluraClarity Intervention Suite and Xper FD10 CATHLAB system for cardiovascular imaging, 256-Slice CT Scanner for capturing the body's skeleton, organs and blood vessels in full 3D images, Cardiac Magnetic Resonance Imaging (MRI), a non-invasive magnetic field scan to produce detailed, three-dimensional images of the heart and other neighboring structures, Single Photon Emission Computerized Tomography (SPECT) for evaluating coronary artery disease and heart muscle viability, among others.

Always a frontrunner in cardiovascular care, it is currently the only facility in the country to offer catheter ablation for atrial fibrillation guided by a 3D imaging system, and a Women's Heart Health Unit which caters to female cardiovascular patients. It also introduced a 24/7 door-to-balloon system of care for ST-Elevation Myocardial Infarction (STEMI) which prioritizes STEMI patients and observes universal acceptance and no diversion.

With a sterling track record in heart care, St. Luke's Heart Institute delivers total quality management for the accurate diagnosis and management of cardiovascular disorders.

Transcatheter Aortic Valve Replacement (TAVR): An Effective Treatment for Aortic Valve Stenosis

Fabio Enrique B. Posas, MD

Aortic Valve Stenosis (AS) is a medical condition wherein the heart's aortic valve narrowing prevents it from opening fully, thus, obstructing blood flow. This obstruction forces the heart to work harder to pump blood throughout the body. This eventually weakens the heart muscle and compromises the pumping function of the heart. Left untreated, AS may lead to angina, syncope (LOC) and heart failure. The onset of symptoms is often fatal and is associated with markedly increased risk for sudden cardiac death and shortened life expectancy.



Dr. Fabio Enrique Posas is an interventional cardiologist. He is the Head of the Cardiac Catheterization Laboratory at St. Luke's-Global City.

The underlying cause of the majority of adults diagnosed with AS is due to calcium deposits which stiffens the valve's leaflets and narrows the valve orifice. Aortic valve stenosis in younger populations is often due to congenital valve disease such as bicuspid aortic valves or rheumatic heart disease. Risk factors associated with aortic valve degeneration include age, a deformed aortic valve, high blood pressure, high cholesterol, type 2 diabetes, smoking, chronic kidney disease and previous rheumatic heart fever.

Patients with severe AS may experience symptoms such as chest pain (angina), feeling faint or fainting (syncope), fatigue, difficulty breathing, heart murmur or palpitations. However, some patients might not exhibit any symptoms right away and are best diagnosed through routine physical examinations and when necessary, ultrasound studies of the heart (2D echo).

The typical treatment for severe AS is via open heart surgery. Unfortunately, this standard method is not suitable for all patients. A significant number of AS patients may not wish to have open heart surgery or are elderly, frail or unable to tolerate the rigors of surgical treatment. Until recently, such patients had no options for treatment.

It is for these patients, who were once deemed inoperable or high risk or who refuse open Surgical Aortic Valve Replacement (SAVR) for whom the innovative Transcatheter Aortic Valve Replacement (TAVR) is most applicable and life-saving. The TAVR is a minimally invasive procedure that utilizes catheters and bioprosthetic valves to replace the diseased aortic valve.

SLMC TAVR Registry

Baseline Demographic Characteristics n=61

Variables	n=61
Sex n (%) Male Female	 31 (51) 30 (49)
Mean age (Range)	77.83 (52-91)
Mean Logistic EuroSCORE	12.94 (1.09-78.11)
Mean STS score (Range)	9.82 (1.24-55.31)
Mean AVA (Range) cm2	0.64 (0.3-1.25)
Mean LVEF (%) (Range)	56.72 (15-78)
Permanent Pacer n (%)	16 (26)
LOH stay - Days (range)	9.7 (3-41)
Mean Follow up (Days)	545.59 (30-1355)

Co Morbidities	N=61 (%)
Hypertension	61 (100)
COPD	37 (61)
CAD Prior MI Prior PCI Prior CABG	48 (79) 17 37 13
Diabetes mellitus	30 (49)
Renal failure ESRD HD dependent	30 (49) 5
Peripheral vascular disease	26 (43)
Chronic atrial fibrillation	24 (39)
Idiopathic pulmonary fibrosis	2 (3)
Prior AVR	1 (1.6)
Prior MVR	1 (1.6)

Table 1. Baseline Demographic Characteristics of Patients

A bioprosthetic valve is implanted through a catheter which is usually inserted via the femoral artery at the groin area. The catheter is guided up to the diseased aortic valve using x-rays and ultrasound. Once in position, the bioprosthetic valve is deployed. TAVR can also be done through other approaches like subclavian, trans-external iliac, trans-apical or via direct aortic puncture.

This less invasive procedure is ideal for high to very high risk patients with multiple and complex co-morbidities, the elderly and frail since it does not require open heart surgery nor the use of a heart-lung machine. TAVR's benefits include rapid recovery time, shorter hospital stay and less blood transfusion. It is also less physically taxing for patients compared to traditional surgery as it can even be done without general surgery or general anesthesia (fully percutaneous) and does not entail cuts and incisions.

TAVR is performed by a multidisciplinary team of specialists composed of interventional cardiologists, a cardiothoracic surgeon, cardiac interventional imaging specialists and cardiac anesthesiologist. Other specialties involved in the management of these patients include critical care, pulmonology, cardiac rehabilitation, cardiac catheterization laboratory staff and critical care nurses.

Outcomes

TAVR was first performed in the Philippines by the St. Luke's Medical Center TAVR Team on February 2012. As of October 2015, the TAVR Team has seen a total of 61 TAVR procedures. A census study was conducted to measure the effectiveness and success rate of the procedure from February 2012 to October 2015 which covered a total of 61 patients.

Of the 61 patients, all had multiple co-morbidities such as hypertension, diabetes, coronary artery disease (CAD), chronic obstructive pulmonary disease (COPD), renal failure, peripheral artery disease, chronic atrial fibrillation, idiopathic pulmonary fibriosis, and previous aortic valve or mitral valve replacements. (Table 1)

The severity of each patient's condition pre-TAVR is evident in their New York Heart Association Functional Classification (NYHA) which identifies cardiac disability or the degree of physical impairment caused by a cardiac condition. Twenty-four patients were in NYHA II, 26 had NYHA III and 11 patients fell under NYHA IV. (Table 2) The procedure is depicted by the STS and Logistic Euroscores. (Table 1)

Among the 61 TAVRs performed, 60 had procedural success defined as patient alive, access, delivery and deployment of the bioprosthetic valve at the correct anatomical location with successful retrieval of the delivery catheter, no significant gradients and no significant leaks. (Table 3)

Of all the cases performed, 59 used Core valves, 3 of which used the new Evolut R. Two cases utilized Lotus valves, a new retrieval device. In terms of valve size, 26 patients used a 29 mm valve, 19 patients had a 26 mm, 9 patients had a 31 mm, 5 of them had a 23 mm, and 2 had a 27 mm, amounting to a total of 61.

Ninety-eight percent of the 61 cases had both procedural and surgical success defined as patient alive, access, delivery and deployment of the bioprosthetic valve at the correct anatomical location with successful retrieval of the delivery catheter. Ninety-eight percent of patients did not experience cardiac mortality within the critical 30 days post-TAVR. Thirty day all-cause mortality was 6.5%. (Table 4)

Table 2. NYHA Functional Class

SLMC TAVR Registry

Procedural Indications n=61

TAVR indication	n=61
- Severe, symptomatic, calcific AS	59 (97%)
- Severe, symptomatic, Bicuspid valve stenosis	7 (11%)
- Degenerated CE Perimount Bioprosthetic valve*	1 (1.6%)
- Severe, symptomatic native valve aortic insufficiency	1 (1.6%)
NYHA Class - n (%)	
II	24 (39)
III	26 (43)
IV	11 (18)

* Symptomatic, severe valvar and para valvar aortic insufficiency

Table 3. Procedural Results Post TAVR

SLMC TAVR Registry

Procedural Results n=61

	n=61 (%)
Procedural success* - n (%)	60 (98)
General Anesthesia	57 (93)
Hybrid beating heart LIMA to LAD and TAVR	1
Fully Percutaneous	4 (7)
Total valves implanted	68
Patients requiring single valves	54 (89)
Patients requiring 2 valves	7 (11)
Intra procedural valve migration or dislocation	7 (11)
Valve in valve implantation	4
Valve deployment at descending aorta then single valve at optimal location	1
Emergency valve removal and re-implantation	2
Contrast Volume cc	160+/-40
Valve Implantation without pre Dilatation - n (%)	10 (16)
Left main protection - n (%)	5 (8)

* Successful vascular access, delivery and deployment of device, successful retrieval of delivery system, device in proper anatomical position, mean aortic valve gradient < 20 mmHg, aortic regurgitation < 2, patient alive

The St. Luke's TAVR Team's proficiency in implementing the procedure could also be seen in its 98% success in procedural parameters which included successful vascular access, delivery, deployment and retrieval of the TAVR device. Correct device positioning, no severe aortic replacement re-intervention and a mean aortic valve gradient of less than 20 mmHg was also achieved in 98% of patients. (Table 5) Seven patients required valve in valve implantation due to residual significant paravalvar leaks immediately after index valve implantation.

Mid-term Follow up

Mean follow up of our patient cohort was 545.59 days (Range of 30 - 1355 days). Survival was 82%. Valve performance beyond 30 days has remained stable, mean gradient is 10.56 mmHg (Range of 2.2 - 23.82 mmHg), Mean Aortic Valve Area (AVA) of 1.74 cm2 (Range of 1.1 - 2.9 cm2). Ninety-four percent of the surviving patients are in NYHA Functional Class I. Only one patient has moderate to severe paravalvular regurgitation. All mortality following TAVR was in extreme risk patients with multiple co-morbidities and very high mean STS and LE Scores (44 and 51 respectively).

Table 4. Procedural Outcomes Post TAVR

SLMC TAVR Registry

Procedural outcomes n=61

	N=61 (%)
Procedural success*	60 (98)
Surgical success**	60 (98)
30 day all cause mortality	4 (6.5)
Peri procedural CVA /Cerebral bleeding TIA RIND Subdural hematoma requiring drainage	3 (5) 1 1 1
Vascular access complications	1 (1.6)
Emergency cardiac surgery and relief of tamponade	1 (1.6)
Follow up - post 30 day stroke	1 (1.6)

* S
co
rel * Successful vascular access, delivery and deployment of device, successful retrieval of delivery system, correct position of the device in proper anatomical position, mean aortic valve gradient < 20 mmHg, aortic regurgitation < 2, patient alive out of Lab ? ** Procedural success, no cardiac mortality at 30 days

Table 5. Breakdown of Procedural Parameters and Complications

The SLMC TAVR Registry

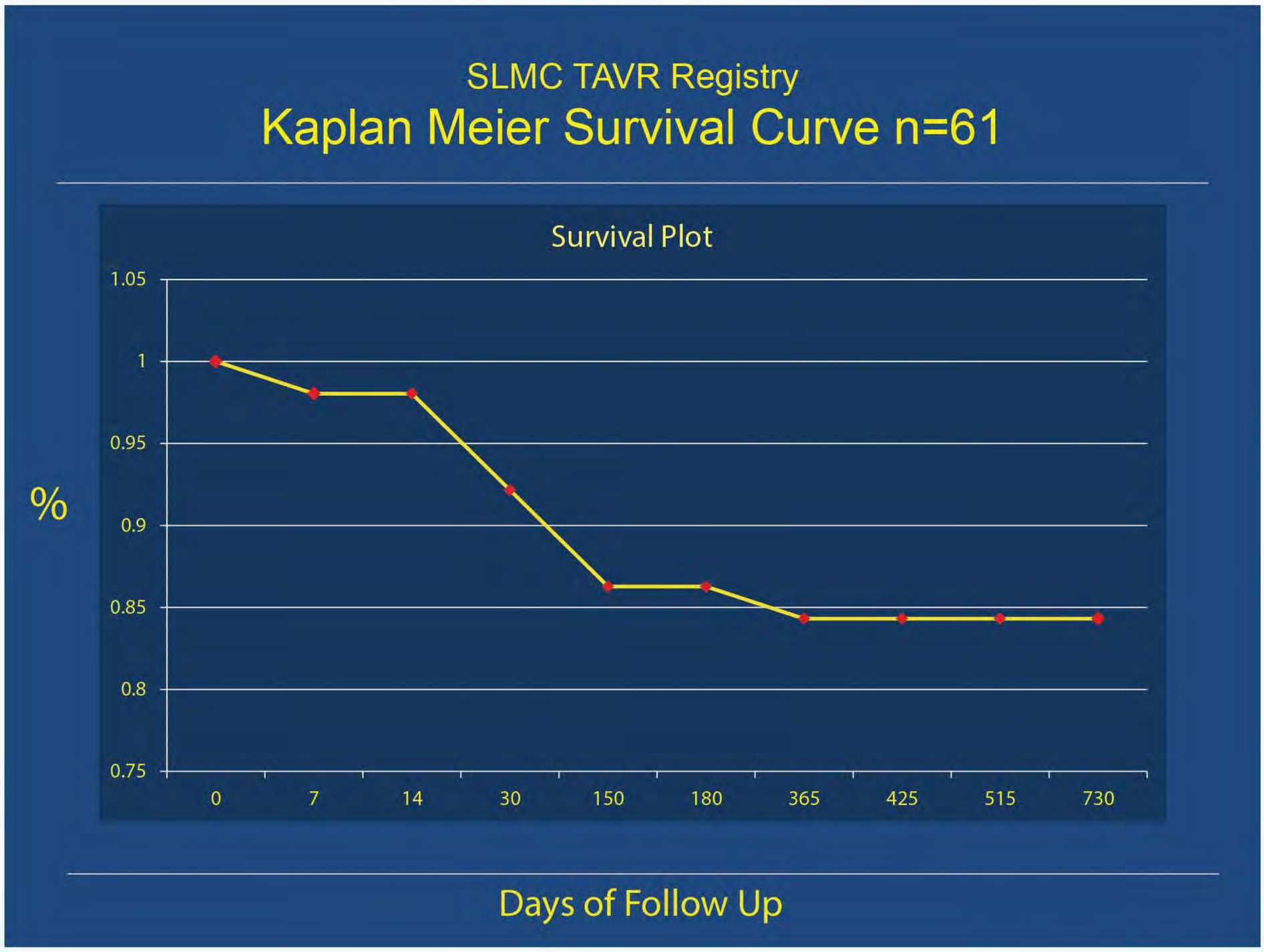
Procedural Outcomes n=60

Procedural Parameters	n=60 (%)
Successful vascular access, delivery and deployment of the device, successful retrieval of the delivery system	60 (98)
Correct position of the device in the proper anatomic position	60 (98)
Mean aortic valve gradient < 20 mmHg	60 (98)
Severe AR requiring re-intervention	1 (1.6)
Only one valve implanted at the proper anatomic position	93%

Major procedural complications	n=61
TIMI Major Bleed	2
Intra Operative ascending aortic dissection	1
Wire LV perforation and tamponade	1
Subacute valve related infection*	1

* * Secondary valve infection following urosepsis and E Coli bacteremia -3 months after implantation

Table 6. Kaplan Meier Survival Curve



Conclusion

At St. Luke's, TAVR can be successfully performed on high risk, complex or inoperable patients with 98% procedural success. This is at par or even better than other TAVR centers across the globe. The program's overall all-cause 30-day mortality rate of 6.5% is also within acceptable range compared to world reported literature.

TAVR is associated with stable and significantly improved valve gradients and AVA. Most post-TAVR patients remain in NYHA functional class I and do not experience any limitations during normal physical activity. Severe paravalvar leaks are rare. No valve degeneration has been reported. The observed mortality post-TAVR appears to be due to multiple, complex co-morbidities in extra high risk patients and not related to the procedure itself.

The St. Luke's TAVR Team continues to advance technology designed to harness technological advancements for the benefit of Filipinos. It is our commitment to find new solutions to patients' problems while minimizing their risks.



Figure 1. The TAVR Team

The St. Luke's TAVR Team led by Fabio Enrique Posas, MD (3rd from right) is composed of multidisciplinary specialists Estanislao De Castro, MD, Ferdinand Alzate, MD, Ofelia Najos Valencia, MD, Dahlia B. Estrera, MD, Ruth Divinagracia, MD, Ma. Paz Mildred Luque, MD, the Catheterization Laboratory Staff and Critical Care Nursing Team. Also in photo is TAVR specialist Eberhard Grube, MD during initial proctoring for TAVR.



Figure 2. The TAVR Team



Figure 3.
Image demonstrating a Core valve, a bioprosthetic valve, after deployment at the aortic valve position.

Catheter Ablation for the Treatment of Atrial Fibrillation

Edmund O. Ang, MD

Atrial fibrillation (AF) is the most common form of arrhythmia. Many Filipinos experience atrial fibrillation every year. This common heart disorder occurs when electrical signals in the heart become irregular, causing the heart's upper chamber to beat out of rhythm. Atrial fibrillation requires medical attention because it could lead to a life-threatening stroke and heart failure.



Dr. Edmund Ang is the Head of Cardiac Arrhythmia and Atrial Fibrillation Service at St. Luke's-Global City.

Some people with the disorder can have palpitations, chest pain, fatigue, shortness of breath, dizziness or confusion. The condition is diagnosed through an electrocardiogram, which measures the heart's electrical impulses.

The first and most important step in managing patients diagnosed with AF is to go on a blood thinner that helps prevent stroke. The other goal of treating atrial fibrillation would be to return to normal heart beat or maintain normal rhythm with the use of medications. Everyone reacts differently to medications and may need to try more than one medicine before it can be determined which works best with the fewest side effects.

However, medications prescribed to control heart rate maybe either ineffective or lead to unacceptable side effects in a significant proportion of people. In those cases, doctors could recommend a minimally invasive technique called catheter ablation to treat atrial fibrillation.

Catheter Ablation

Catheter ablation is a treatment for atrial fibrillation that is done by a specialized cardiologist known as cardiac electrophysiologist (EP), who deals with irregular heartbeats (arrhythmias).

It is a minimally invasive procedure and commonly used treatment for atrial fibrillation as well as other cardiac arrhythmias. Like other AF treatments, it is most successful in treating paroxysmal (episodic) atrial fibrillation, but much progress has been made in treating persistent (continuous) and longstanding persistent (continuous >1 year) atrial fibrillation as well.



Dr. Edmund Ang performs an Atrial Fibrillation Ablation.

It is done on a beating heart in a closed chest procedure. Small punctures are made in the groin and involve threading long, thin, flexible tubes called catheters into the heart. In some cases, a balloon catheter is used instead. Live X-ray images are used to carefully guide the catheter into the heart. The catheter's tip are then threaded through a tiny incision in the wall (septum) between the left and right atrium (upper heart chambers) and positioned to ablate abnormal tissue causing erratic electrical signals that cause the irregular heartbeat. These are usually located around the pulmonary veins (blood vessels connected to the left atrium) and its surrounding tissues.

Using a cardiac mapping system (specialized computer), a 3-dimensional model is constructed on a computer screen to represent the heart chamber. Sections of the heart are then mapped to locate these abnormal tissues. Subsequently, energy is applied to destroy targeted tissue that has been identified as causing the irregular heartbeats. Two types of energy that can be used in the procedure are radiofrequency to generate heat or liquid nitrogen to freeze the targeted areas of the heart and create a lesion of scar tissue. The resulting scar line then acts as a barrier between affected tissue and the rest of the healthy heart, stopping abnormal erratic electrical signals from travelling through the heart resulting in termination of the irregular heartbeats.

The outcome of an ablation procedure may not be known for approximately 6 – 8 weeks. Episodes of AF may still occur within this period of time and would not necessarily indicate that the procedure was unsuccessful and is part of the evolving process for healing after the ablation. To guard against AF during this period of time, many individuals are prescribed antiarrhythmic medication, which is later stopped.

Safety of Catheter Ablation for Atrial Fibrillation

The success rate of the procedure is generally very good, and depends on many factors, such as the duration of the condition, the presence of valve disease or coronary artery disease, the type of atrial fibrillation (paroxysmal or persistent) and the size of the atria. However, like any other invasive procedure, rare complications can occur. These complications include perforation of the heart, stroke, heart attack, narrowing of the pulmonary veins, bleeding at the entry site in the leg, and rarely, esophageal injury.

Success Rate of Atrial Fibrillation Ablation

The HRS/ EHRA/ ECAS (Heart Rhythm Society/European Heart Rhythm Association/European Cardiac Arrhythmia Society) Consensus Document on AF ablation recommends that success should be defined as freedom from symptomatic or asymptomatic AF, atrial tachycardia, or atrial flutter lasting ≥30 seconds at a 12-month follow-up after AF ablation. It is recognized that this definition of success can be strict and maybe best used for clinical trials only. Occasionally, from a clinical perspective, a marked reduction of symptomatic AF can be and is considered as a successful result as well from a patient's and a physician's perspective.



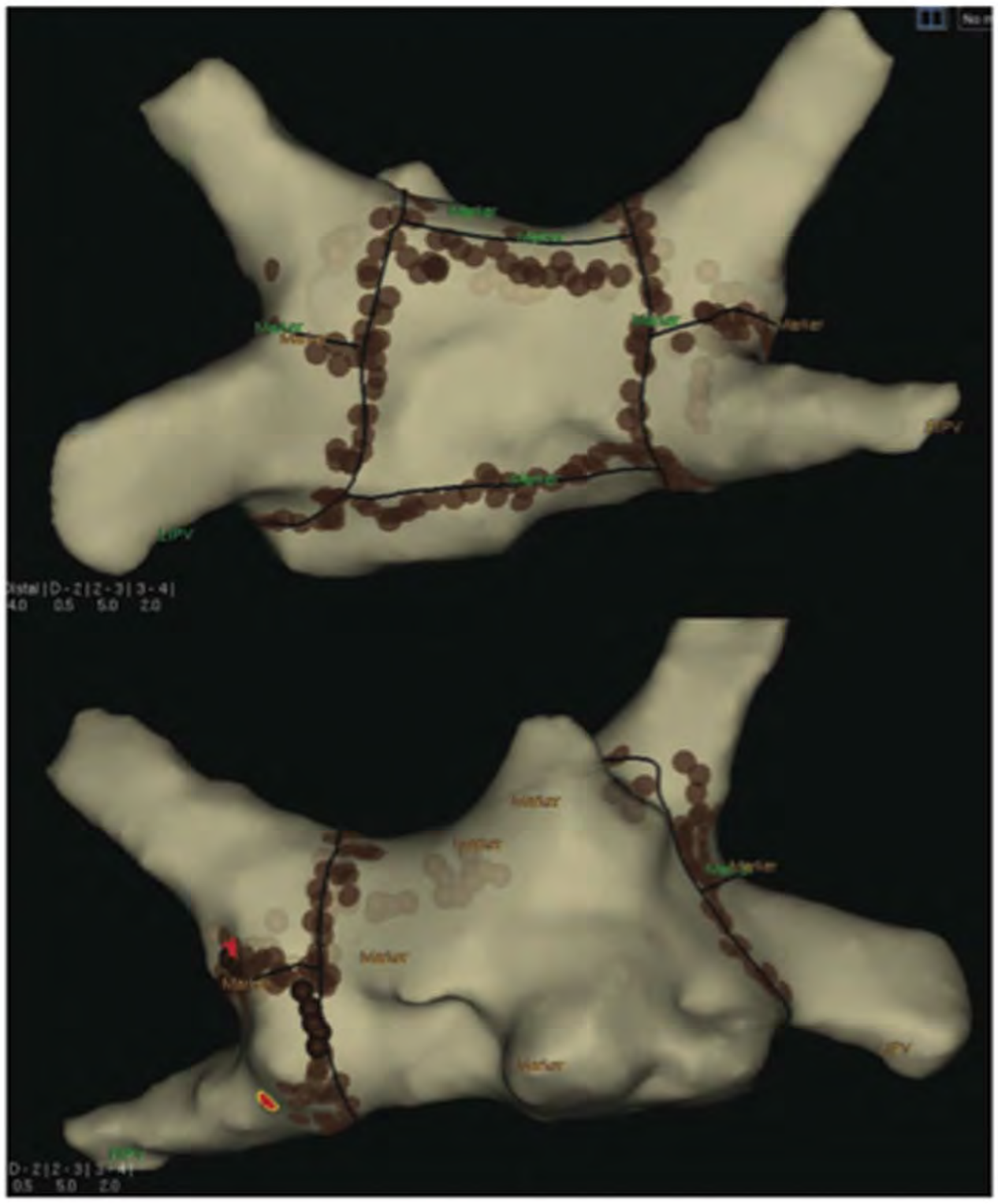
A cardiac mapping system gives the surgeon a 3-dimensional view of the heart chamber during atrial fibrillation ablation.

There were 20 patients that underwent catheter ablation for treatment of atrial fibrillation at St. Luke's-Global City over the first 18 months of the program. The proportion of successes free of antiarrhythmic drugs (AADs) was 75.0% with an additional 15.0% gained with the continued use of previously ineffective AADs (Table 1).

Although the number of patients are small, the success rates achieved with patients in St. Luke's-Global City is better than the success outcome of the worldwide survey for patients free of AADs of 70.0% and overall success rates of 80.0% (Table 2).

Table 1. Success Without Anti-Arrhythmic Drugs (AADs) Post Ablation

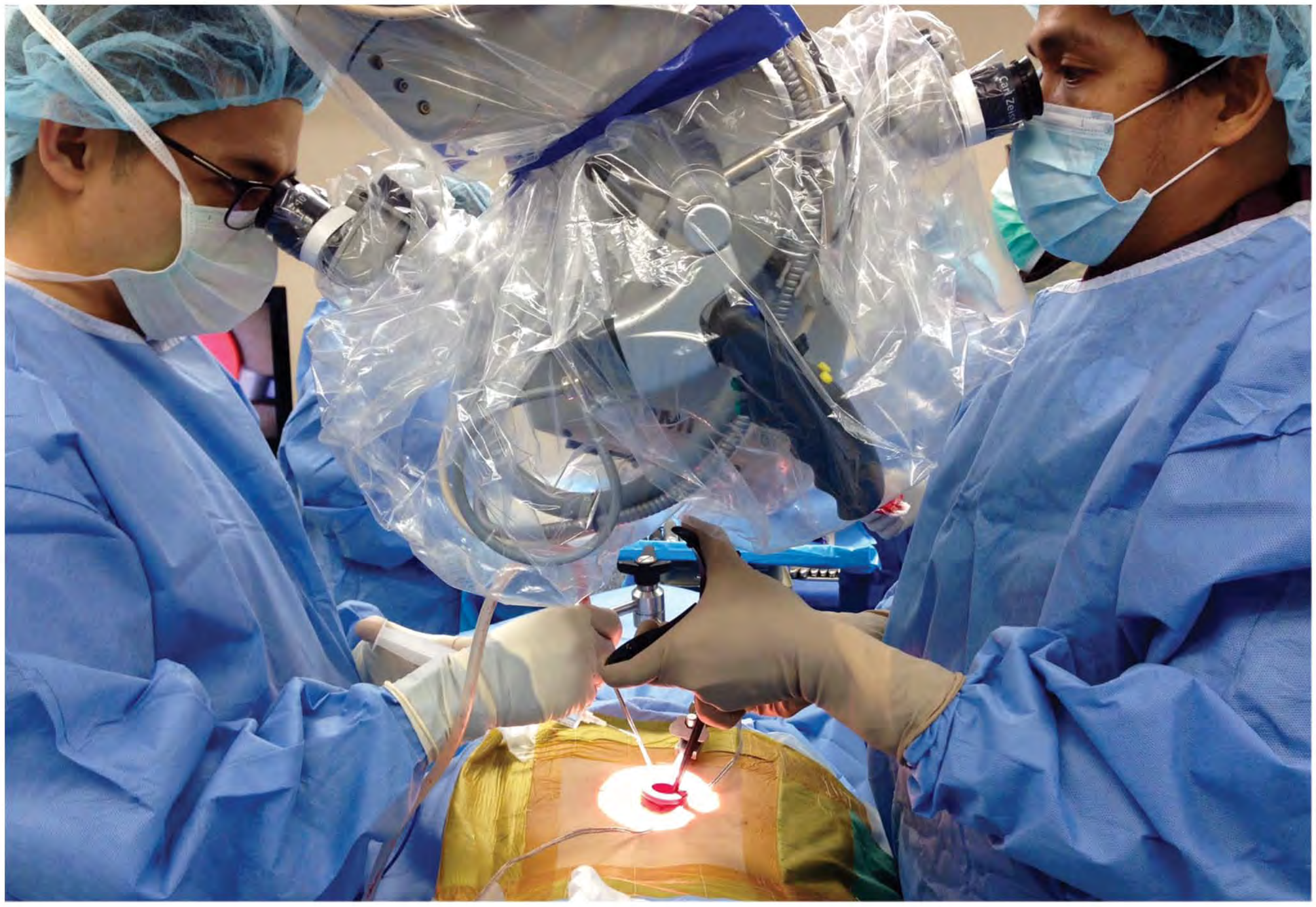
	St. Luke's Medical Center-Global City 2013-2014 Ablation Data		Cappato et al. 2010 Updated Worldwide Survey on AF Ablation	
Type of AF	No. of Patients	Success Rate	No. of Patients	Success Rate
Paroxysmal	8	80.0%	6580	74.9%
Persistent	7	70.0%	2800	64.8%



Views of the left atrium after complete pulmonary veins and posterior wall isolation of the first case.

Table 2. Overall Success of AF Ablation
(Combined success of patients with and without AADs post ablation)

	St. Luke's Medical Center-Global City 2013-2014 Ablation Data		Cappato et al. 2010 Updated Worldwide Survey on AF Ablation	
Type of AF	No. of Patients	Rate	No. of Patients	Rate
Paroxysmal	9	90%	7870	84%
Persistent	9	90%	3395	74.8%



INSTITUTE OF ORTHOPEDICS AND SPORTS MEDICINE

St. Luke's Institute of Orthopedics and Sports Medicine offers a complete line of high-technology screening tests and treatment modalities to address problems in the musculoskeletal system.

Diagnostics and screening processes usually begin with a medical history and thorough physical examination, and screening procedures which include, among others, Orthopedic Assessment, Complete High-Resolution Radiographic (X-ray) Studies, Computed Tomography Scan, Magnetic Resonance Imaging (MRI) and Total Body Bone Scan.

With decades of experience behind them and years of study and training in international centers abroad, the Institute's orthopedic consultants specialize in the treatment of various disorders of the muscles, tendons, ligaments, and joints.

The Institute is committed to improve the quality of life and the functional capacity of patients with varying degrees of orthopedic disease and the management of physical rehabilitation and conditioning programs.

It houses the Physical Medicine and Rehabilitation Center as well as the Sports Medicine Center which helps patients in their treatment and recovery from injuries and other medical problems.





The Center has also attended to the needs of the country's top athletes in their objective of enhancing their physical condition and competitiveness to optimal levels. It also provides comprehensive evaluation, design and monitoring of physical fitness programs.

The Institute has several subspecialties, namely Orthopedic Trauma Management, Sports Medicine, Spine Surgery, Pediatric Orthopedic Surgery, Correction of Limb and Foot Deformities, Hand and Microsurgery, Tumor Surgery, Joint Replacement, and Orthopedic Infection Management.

Complementing the Institute is the St. Luke's Bone Bank, which retrieves, processes, stores and distributes bones for clinical use. It adheres to the quality assurance criteria recommended by the American Association of Tissue Banks and the Asia-Pacific Association of Surgical Tissue Banking.

Outcomes for Arthroscopic Anterior Cruciate Ligament (ACL) Reconstruction Surgery

Institute of Orthopedics and Sports Medicine

One of the more common ailments of the knee is that occurring in the anterior cruciate ligament (ACL). Athletes who participate in highly physical and competitive sports like soccer and basketball and even non-contact but demanding sports like volleyball are likely to suffer from an ACL injury.

However, even non-athletes can suffer from an ACL injury. It impairs effective forward and lateral motion because the knee gives way when the ligament is damaged. The tear in the ACL is usually due to twisting injury particularly caused by non-contact sports.

Forms and Severity of ACL Injury

In general, an ACL injury is considered a sprain, and is classified based on extent of the damage. A mild injury occurs when the ACL has been slightly stretched, but is still functional which keeps the knee joint stable.

The second level of injury is often referred to as a partial tear, and involves injury to the ligament to the point where it becomes loose. Stability of the knee in this case becomes compromised.

The most severe injury is most commonly referred to as a complete tear of the ligament. In this case, the ligament has been split into two pieces, and the knee joint becomes completely unstable (Figure 1).

Apart from the knee instability, the injury is also accompanied by pain and swelling.

Partial ACL tears are not too common; most ACL injuries are complete or near complete tears.

Treatment Protocols

Treatment for an ACL tear will vary with the severity of the ACL injury of the patient and his individual needs.

Figure 1. Illustration of ACL injury



The less athletically active, usually older, patient may effectively be able to return to normal activity without surgery. Depending on the stability of the knee, a non-surgical intervention can be adopted such as wearing of a brace around the affected knee and a physical therapy program that can also be instituted to restore the knee to functionality.

Nevertheless, an ACL injury associated with instability of the knee generally requires surgery to regain the knee's full and active functioning. This is particularly true for professional and/or competitive athletes who require the full operational functionality of the knee to be able to resume normal sports activity.



Because of a less invasive surgical method, patients undergoing ACL Reconstruction Surgery are generally operated on an outpatient basis, with 100% successful outcomes.

ACL Reconstruction Surgery

ACL reconstruction surgery is a minimally invasive procedure involving small incisions made possible by the use of an arthroscope, a modern imaging equipment, and improved microsurgery techniques that have evolved through time. To surgically reconstruct the ACL and restore knee stability, the ligament must be reconstructed by replacing the torn ligament with a tissue graft. The tissue graft can be harvested from different tendons namely the hamstrings tendon, patellar tendon with bone plugs, and quadriceps tendon. Bone tunnels are drilled through the tibia and the femur, and the graft is fixed in the same direction as the native ACL using implants such as titanium screws.

This graft eventually gets incorporated within the bone tunnels and would function as the ACL, and in general, the athlete will be able to return to sports on the average of six months.

Because of a less invasive surgical method, the patient undergoing knee arthroscopy is generally operated on an outpatient basis. The benefits of less invasive techniques include less pain from the surgery, lower hospital stay and quicker recovery.

Outcomes

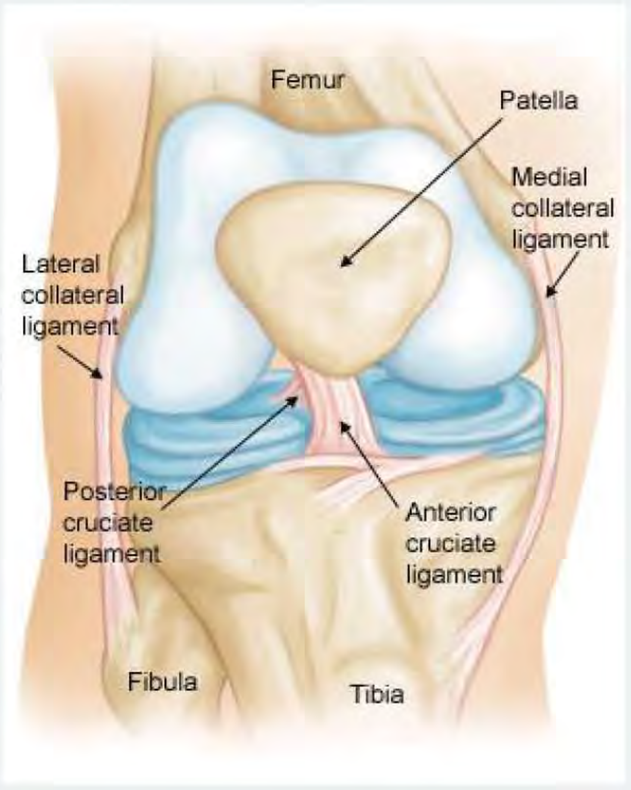
A total of 502 patients underwent arthroscopic ACL reconstructive surgery during the period from 2013 to 2014 in St. Luke's-Global City and Quezon City. Immediate post-operative observations monitored that 100% of the cases showed that the operated knees became tight and stable.

Minimal short-term post-operative complications were noted, particularly surgical site infection (0.60%) and arthrofibrosis that needed closed manipulation under anesthesia (0.60%). Revision surgeries were also minimal at 0.80%.

It is also noted that resumption to normal competitive activity requires rehabilitation and subsequent intensive strength conditioning within six to eight months during the interim time when the ACL assumes full healing. The Institute of Orthopedics and Sports Medicine has a full suite of physical and rehabilitation programs that complement the ACL reconstruction and other classes of sports-related surgeries.

What is the ACL?

Figure 2. Illustration of ACL injury



The anterior cruciate ligament (ACL) is located within the knee joint. It is at the backside of the femur (See Figure 2) and is attached to the end of the tibia. By holding the two major bones, it enables stability in movement and control rotation of the knee, which are crucial to physical activity. Three bones meet at the knee joint: the thigh bone (femur), shin bone (tibia), and knee cap (patella). These bones are connected and held together by four primary ligaments, one of which is the ACL.

Illustrations sourced from American Academy of Orthopaedic Surgeons; http://orthoinfo.aaos.org/topic.cfm?topic=a00549

"AWAKE" Spinal Surgery for Low Back Pain

Mario R. Ver, MD

Back pain remains one of the most common ailments facing modern man today. The cause may range from accident, infection, metabolic conditions, hereditary factors, to wear and tear that comes with age. Regardless of the cause, around 90% of the total population is bound to experience it at some point in their lives.



Dr. Mario Ver is the first orthopedic surgeon to perform "Awake" spinal surgery in the Philippines.

Most back pains are benign and the condition will improve in time with enough rest. Natural course for acute back pain is that 60% of those who experience it are bound to improve within three weeks while 80% will get better within eight weeks. Persistent back pain lasting more than three months or longer is classified as chronic where natural recovery is relatively slim and thus a more aggressive treatment may be necessary.

The most common cause of chronic low back pain is related to the problems with the discs in the spine of the body. These discs, being the spine's shock absorbers, are subjected to considerable stress and load.

Many factors such as trauma, strenuous activities, hereditary factors, or simply wear and tear associated with time, can damage the disc, to crack, bulge or become herniated.

This is commonly referred to as slipped disc. The worn-out protruding disc can compress the exiting nerves in the area to cause extreme pain down the leg or foot known as sciatica, or fluid leaks through the fibrous rim cracks, thus irritating the nerve ending that causes back ache. The pain often radiates down the legs or feet or cause leg discomfort, cramps or heaviness with complication associated with neurologic weakness.

The combination of the structural damages can cause pain in varying degrees for the patient to seek medical treatment. Damaged discs, being devoid of blood supply, cannot heal by themselves, and will continue to degenerate without intervention. Degeneration causes more pain, and result in further weakness and numbness of the affected nerves unless properly treated.

The condition not only debilitates the afflicted person but also can render him practically immobilized and unproductive.

Chronic Low Back Pain Treatment

The usual treatment modality for lower back disc-related problems begin conservatively with pain killers, muscle relaxants, or rehabilitation with physical therapy being the first level of treatment options.

However, if these modes of treatment fail after a reasonable period like three months, patients suffering from continued numbness or weakness of the lower extremities, associated with difficulty of urination or defecation, then surgical intervention remains one of the best treatment options available.

"Awake" spinal surgery is ideal for patients with low tolerance or contraindications to general anesthesia.



"Awake" Decompression Surgery

For decades, patients with chronic low back pain who do not respond to conservative procedures underwent the standard laminectomy and discectomy. Those procedures require the opening of the spinal column posteriorly by partially or wholly removing the lamina (the backbone) and surgically excising the herniated part of the affected disc. This gives the nerve root more space and decompresses the pinched nerve and cord in the spine.

Over time, in the late 70s, the procedure was improved using minimally invasive techniques featuring the utilization of microscopes for microsurgical procedures. The operating microscope offers the superior advantage of visually identifying the pain generators irritating the affected nerve root with better visualization, magnification and illumination for the surgeon and medical team. This resulted in smaller incisions, thus, less pain after surgery and better outcome.

The technique of using tiny excisions and refinements in microsurgery led to the transition in the delivery of anesthesia from the general mode, where patients become fully asleep, to the localized mode or through the epidural, which leaves the patient fully conscious or "awake" with sedation, if necessary.

Decompressing nerve roots in the lumbar spine utilizing progressive local anesthesia was introduced in the early 80s by my mentor Dr. Stephen Kuslich form Minneapolis, Minnesota. We performed our first spine surgery under this progressive local anesthesia for one level slipped disc in December 1993 at St. Luke's Medical Center-Quezon City. It was unprecedented at that time. Since then, hundreds of procedures have been done at St. Luke's with good outcome.

The most common cause of chronic low back pain is related to the problems with the discs in the spine of the body.



In 1997, the combination of local and epidural anesthesia was introduced to be able to tackle multilevel nerve roots decompression and even the more extensive spinal fusion while the patient is awake or sedated. The same success rate as the single level surgery was achieved. The results of which were published in the Journal of ASEAN Orthopedics 2000. This technique, however, is still not commonly performed in this country and even abroad because it requires a high level of skill and experience for a surgeon to perform this technically demanding procedure.

Benefits of Awake Surgery

With the use of local or epidural anesthesia, much superior clinical outcomes in nerve root decompression is achieved with this new spine surgery procedure. When the patient is awake, immediate feedback can be provided during the procedure, thus leading to better identification of irritated (compressed and inflamed) nerve and prevention of wrong level decompression.

Patients can relate to the surgeon any pain they experience when various spinal tissues are stimulated, particularly the pain generators, during the procedure. This is therefore much safer than conventional laminectomy/ laminotomy under general anesthesia because wrong level decompression is unlikely with the patient awake since the surgeon can verify the correct nerve root to decompress by replicating the symptoms. Surgeons are likewise gentler in handling the nerve roots, avoiding over retraction because of the patient's immediate feedback of pain or discomfort. Good nerve root decompression is also determined intraoperatively before closure when re-stimulating the freed nerve root will no longer cause pain.

Moreover, patients who chose the spinal surgery under "awake" anesthesia have quicker recovery time. They can stand up from the operating table and can be allowed to go home sooner (either as outpatient or overnight care).

This results in cheaper costs for the patients. Awake spinal surgery is also ideal for the patient who has low tolerance to and high risk to develop complications and contraindications from general anesthesia.

St. Luke's Experience

A review of the first 200 patients in 2002 revealed an outcome of good to excellent results of 94% and patient satisfaction rate of 96% comparable to the published report of Microlumbar Nerve Root Decompression (MLNRD) performed under general anesthesia. More recently (from August 2013 to August 2014), a prospective comparative study between MLNRD under "awake" and general anesthesia performed by the author was reported. Of the total 45 patients included in the study, 23 underwent "awake" anesthesia. Results showed no significant difference in the outcome, including patient satisfaction rate between the two groups. However, the MLNRD group performed under general anesthesia was more expensive.

Patients who choose "Awake" spinal surgery can immediately stand up from the operating table and can go home sooner either as an outpatient or overnight case.



Out of these 23 patients who underwent "awake" MLNRD, 12 were female and 11 were male. Mean age of those undergoing the surgery was 39, with the youngest patient consenting to this surgery being 22 years old and the oldest being 60 (2 patients). Most patients were admitted the night before in preparation for the surgery, and were deemed fit for discharge the day after surgery (mean total hospital stay of 3 days).

Operative time varied depending on the number of nerve roots to be decompressed, however the average operative time for a single, unilateral nerve root decompression was approximately 1 hour and 30 minutes. For each successive nerve root to be decompressed, an average of another 45 minutes was added to the aforementioned operative time.

At present, no patient that underwent awake spine surgery had a reoperation and there were no documented surgical site infections. From the operating table, all patients were able to stand up, march in place and ambulate a short distance with support until reaching their hospital bed. Upon lying down, each patient was immediately tested for motor and sensory function. All patients regained full motor function of the decompressed nerve roots, and only a handful reported post-operative sensory deficits similar to their pre-operative status. These patients regained full sensory function upon testing on the first post-operative day. All patients were allowed to ambulate around their respective hospital rooms and were instructed on exercises they could do to strengthen their abdominal and core muscles as part of their therapy. They were warned against certain positions such as bending forward from the waist and twisting of the torso.

At two weeks follow-up, more than 90% of patients reported high satisfaction rates and had only slight discomfort when resuming their daily activities. However after 1 year, all patients were very satisfied in terms of ability to walk, return to occupation, and strength in their legs. These patients reported being able to comfortably walk within and outside of their homes for distances similar to before their symptoms occurred. There were a few patients (10%) that reported non-bothersome residual back pain less than once a week after one year but with no pain in their legs or feet. Of mention is that one of the patients included in this report is a 30 year old, 4-month pregnant patient that underwent awake spine surgery for a herniated disc that caused inability to ambulate due to severe pain. Another recent case done in December 2014 was that of a resident orthopedic doctor who opted to undergo the procedure on an outpatient basis.

As these outcomes show, the breakthrough procedure has been proven safe, cost effective and able to deliver faster results for patients who are eager to return to their lives without unreasonable delay.



INSTITUTE OF PATHOLOGY

Precision, accuracy and speed are imperatives of clinical diagnosis and are the lifeblood of any laboratory – and the most critical elements in the effective treatment and cure of illnesses and physiological disorders.
St. Luke's Institute of Pathology lives up to its role in giving clarity to clinical puzzles and rendering judgment in diagnostic dilemmas, in the shortest possible time.

Known all over the country for the most complete line of laboratory services using top-of-the-line laboratory equipment, the Institute of Pathology has over the years ably assisted clinicians in the diagnosis, treatment and prognostication of diseases.

Its complement of competent medical professionals continues to rigorously track down the causes and nature of various killer diseases of the heart, lungs, and cancer, among others, in aid of medical research and development. A highly competent and thorough team of pathologists, medical technologists, and technicians using top-of-the-line laboratory equipment ensures the expeditious delivery of laboratory examinations, from the basic and routine to the most exhaustive and complicated.

In the field of Anatomic Pathology, the Institute has established the most comprehensive library of monoclonal antibodies for Immunohistochemistry, and has built a reputation as a referral center for difficult Surgical Pathology cases.

In Blood Banking, the Institute has become one of the few private blood





centers in the country with 100% volunteer blood supply, a major factor in assuring blood safety, quality and availability. Its apheresis operations have been expanded from component donor collection to therapeutic applications saving the lives of patients with immunologic, renal, hematologic and neurologic diseases not otherwise treatable by conventional methods. The Institute's Section of Cellular Immunology and Immunogenetics, which is well equipped with the latest automated immunology analyzers, combines the allied disciplines of Tissue Typing and Flow Cytometry, and offers the most extensive tests in the country.

Acknowledged as the finest in the country, the Institute's Histologic group is acknowledged in Philippine medicine as carrying out the best hispathological and frozen section procedures. It adheres to critical histology tests for complete and accurate clinical diagnoses which are necessary for the effective assessment and treatment of patients.

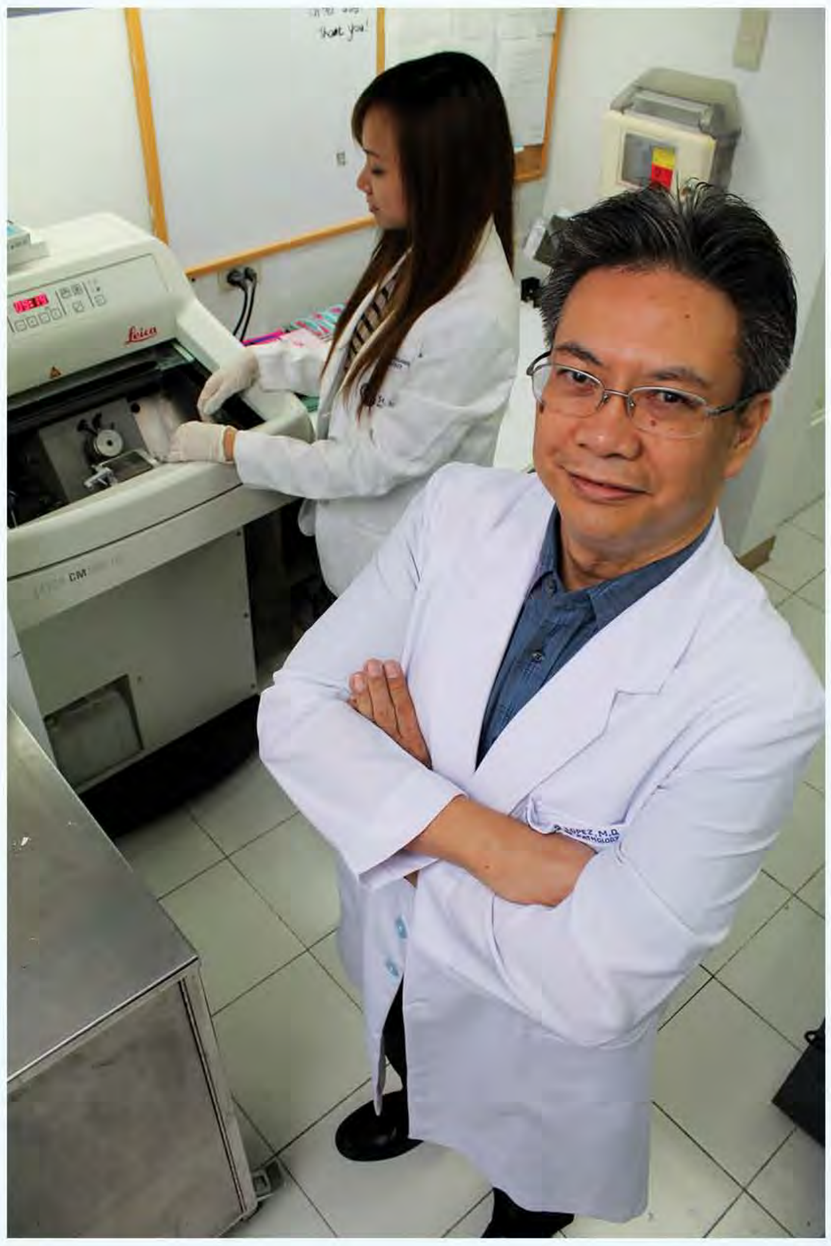
Evaluation of Frozen Section Procedure Diagnosis Versus Final Histopathological Diagnosis Accuracy

Rolando A. Lopez, MD

Timely, correct and accurate biopsy of a tissue during a surgical operation of a patient can mean the difference in the proper treatment and management of the illness and condition. Thus, the frozen section diagnostic procedure is of paramount importance to the surgical team.

During surgery, the surgeon has to make decisions intraoperatively and establish whether a lesion in a suspected area that needs to be resected is benign or malignant because this will determine further courses in the operative procedure. It is used most often in oncological (cancer) surgery.

The Frozen Section (FS) is a pathological laboratory procedure for the rapid microscopic examination and biopsy analysis of a tissue specimen while surgery is actually taking place. In this method, the dissected tissue is quickly frozen and sliced up to micro centimeters using a microtome mounted in a freezing device (cryostat).



Dr. Rolando Lopez is the Head of the Institute of Pathology at St. Luke's-Quezon City.

Because of time urgency, the frozen sections are mounted on a glass slide, and fixed immediately in liquid fixative and further processed for examination using the microscope. The advantages of this method are rapid processing time and less equipment requirement. However, the histological quality of the final slide is generally suboptimal, which makes diagnostic accuracy a major clinical outcome issue.

Raising the Bar in Philippine Pathological Accuracy

At the Institute of Pathology, the Frozen Section is a highly critical part of the work of the pathologist because of the urgency of the diagnosis required by a surgeon during an operation.

FS requires that the pathologists have special expertise and a wealth of experience in making judgments during intraoperative consultation with the surgical team because of

time pressure. He has to arrive at a correct diagnosis in a much shorter duration based on his experience, expert analysis and the knowledge of his specialty field and clinical medicine.

In view of the lower quality of the FS specimen, the accuracy of the FS histological diagnosis is generally lower than that when the traditional formalin fixed paraffin embedded tissue processing is conducted. While diagnosis can be rendered in both cases, fixed tissue histopathology provides the basis for the final accurate clinical diagnosis.

The accuracy of the frozen section readings is measured by the convergence in the intraoperative section histology reading and the longer-term diagnosis based on the histopathological interpretation of fixed specimens on a permanent tissue section. This convergence in reading (also called concordance rate) is expressed as the proportion of congruence in the diagnosis in both methods in percentage (also called concordant ratio). The 98 percent concordant ratio between the final clinical diagnosis and the hispathological diagnosis is considered the gold standard in pathological accuracy.The St. Luke's Institute of Pathology has established

The Frozen Section is a highly critical part of the work of a Pathologist because of the urgency of the diagnosis required by a surgeon during an operation.



protocols to raise the bar in pathological accuracy in the country. Tissue samples are read and rendered medical classifications by 14 anatomic pathologists who have extensively trained in some of the most recognized centers abroad. There are at least four to five tissue samples that are obtained and interpreted for each medical case to minimize false-negative or spurious findings.

Frozen Section Histological Census Study Outcomes

To measure the accuracy rate of the Institute of Pathology in Frozen Section and in clinical diagnosis of pathology cases in St. Luke's, a census study was conducted among 403 patients in St. Luke's-Quezon City who underwent the procedure from January to December 2013.

Out of the 403 census cases, there were valid measurement on 395 cases. A total of 392 cases with the FS diagnosis, representing 99.24 percent, matched that and were congruent to the final histopathological diagnosis (based on the traditional wax embedded tissue analysis method).

This concordant accuracy rate recorded in the study is higher than the results obtained from published studies conducted in Mayo Clinic (Rochester) and selected North American Hospitals.

Using an expanded case population that included St. Luke's-Global City in the same period, the FS to histopathological diagnosis concordant rate decreased to 98.2 percent, but is still above that of the Mayo Clinic and selected US hospitals (See Table 1).

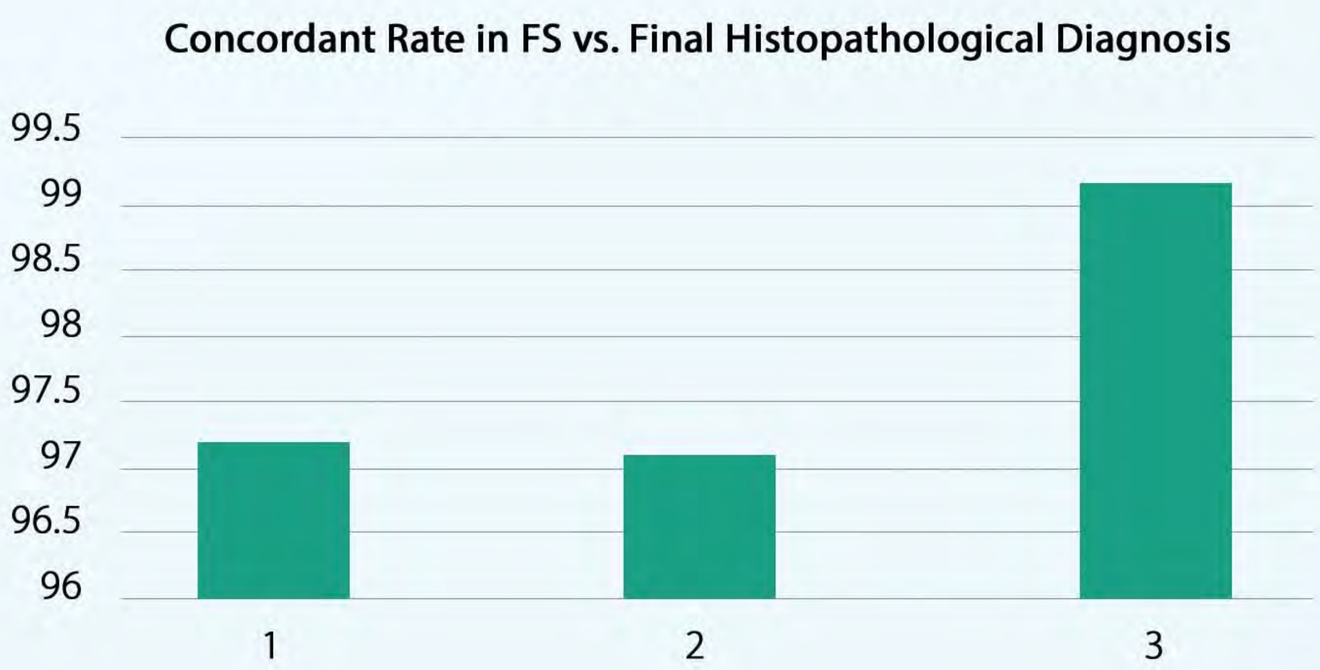
Table 1. Comparative FS Histology Concordant Rate in SLMC vs. Other Centers

Parameter	SLMC	Mayo Clinic	North American (34 Clinics)
No. of cases	1,152	24, 880	1, 952
Overall Rate of FS	98.2%	97.8%	96.8%

**JA Ferreiro, JL Meyers and DG Bostwick, Accuracy of Frozen Section Diagnosis in Surgical Pathology. Review of a 1-year Experience with 24,880 cases at Mayo Clinic Rochester, Mayo Clinic Proc, December 1995; 70 (12) 1137-41*
**PJ Howanitz, MD. GG Hoffman, M.D. and RJ Zarbo, M.D. . D.M.D. The Accuracy of Frozen Section Diagnosis in 34 Hospitals, Arch. Pathol Lab Med, 1990; 114;355-359*

St. Luke's-Quezon City has been conducting a longitudinal monitoring of concordant rates between FS diagnoses and final histopathologic diagnoses. Based on the three-year measurement, the rate was observed to have been generally on an uptrend from 2011 to 2013 (See Figure 1). The center has achieved nearly 100 percent concordant rates by year 2013.

Figure 1. Proportion of Census Case with Congruence in FS and Final Histopathological Diagnosis (St. Luke's-Quezon City; 2011 to 2013)



Conclusion

Overall accuracy of Frozen Section Diagnoses at the Institute of Pathology of St. Luke's Medical Center is higher than the accuracy rates obtained from the results of studies conducted in Mayo Clinic and selected North American Hospitals.

The Institute aims to further improve on the congruence in histological diagnosis and final clinical diagnosis to ensure the proper treatment decision-making for St. Luke's patients, in line with its commitment to provide the best medical care in the country.



Tissue samples are read and rendered medical classifications by anatomic pathologists who have trained in recognized centers abroad.

In general, tissue specimen taken from a patient by doing a biopsy or an operation is usually assessed by the pathologist on the following day after the specimen is adequately fixed in formalin. Occasionally, surgeons need pathologic information urgently in certain cases. Thus, an intraoperative pathological diagnosis on the tissue needs to be analyzed using the frozen section method.

Pap Smear Screening Turn-Around Times

Rodelio D. Lim, MD

There are many diseases and conditions that can affect a woman's health, from various forms of cancer as well as sexually transmitted diseases.



Dr. Rodelio Lim is the Head of the Institute of Pathology at St. Luke's-Global City.

One cancer that can be detected and cured with early diagnosis is cervical cancer. The Department of Health has ranked it as the 3rd leading cause of new cancer deaths in the Philippines in 2010. It affects relatively young women around age 30 and progressively increases with age and peaks between 45 - 55 years. In the Philippines, the cervix is still the second most common cancer site among women, next to the breast.

According to the World Health Organization, it is the second most common cancer among women in the world and is the leading cause of cancer-related deaths among women in the majority of developing countries.

Because cancer does not manifest symptoms at early stages, it is important that regular screening be conducted by the health system to ensure the well-being of women and the population as a whole.

The Pap smear screening procedure is the principal standard in the early detection of cervical cancer because it is the most reliable and most widely accepted over the last 50 years.

It has an established clinical evidence of high effectiveness rates in reducing cervical cancer incidence through early detection and management.

experienced by developing countries by as much as 90 percent through screening programs. Early detection and appropriate medical management were reported to have led to a five-year survival rate of 100% of women detected with precursor lesions, and up to 90% of women detected with early lesions.

Medical Procedure

The Pap smear test, shortened from the Papanicolaou test (following the inventor's name), is a procedure of collecting cells in a woman's vagina and cervix area and conducting a test to detect the presence of potentially pre-cancerous and cancerous processes in the female reproductive system. To obtain the sample, the vaginal canal is opened with a speculum and a stick with a brush is inserted to collect the cells from the surface and orifice of the cervix of the uterus and the endocervix.

The test aims to detect potentially pre-cancerous changes or cervical dysplasia, which are normally caused by the sexually transmitted human papillomaviruses (HPV). It can also be used to detect viral infection such as herpes, syphilis, genital warts and other microbiological conditions. The test may also detect infections and abnormalities in the endocervix and endometrium.

It remains the most common method of cervical screening in the United States and in the Philippines.

The Pap smear is one of the major and most common laboratory and screening procedure performed in St.Luke's.



Diagnostic Accuracy and Timeliness

In the St. Luke's Institute of Pathology, the Pap smear is one of the major and most numerous laboratory and screening procedures performed in the two hospitals. It has invested in automated state-of-the-art equipment that complements the expertise of its pathologists and medical technologists in providing accurate and timely readings for women patients.

The PREPSTAIN equipment utilizes the SUREPATH liquid-based technology that has put the Institute in the forefront of cervical cancer screening and has almost 100% quality and accurate pathological diagnosis of the status of the cervical cell samples.

Research to determine the efficacy of identifying and correctly diagnosing pre-cancer and cancer stage abnormalities has, however, not been conducted in the Philippines. As a diagnostic procedure, nevertheless, the Institute monitors the turn-around time from the receipt of the specimen in the laboratory to the provision of the reading and analysis of the pathologist.

St. Luke's Census

Statistics from the census of St. Luke's-Global City patients showed a total of 19,781 patients who underwent the procedure from the period January 2013 to December 2014.

During the period under review, the patients were classified whether they are patients of the Wellness Center and those who availed of the procedure in the regular hospital service (non-Wellness). The Wellness census totaled 6,044 patients (31%), while the non-Wellness census numbered 13,737 patients (69%).

For purposes of this study, the turn-around times (TAT) for the Pap smear among this census of patients were monitored to determine the efficiency of pathological work over time and to establish service level standards in different hospital facilities and settings.

TAT refers to the period of time from the receipt of the specimen in the laboratory to the release of the official report.



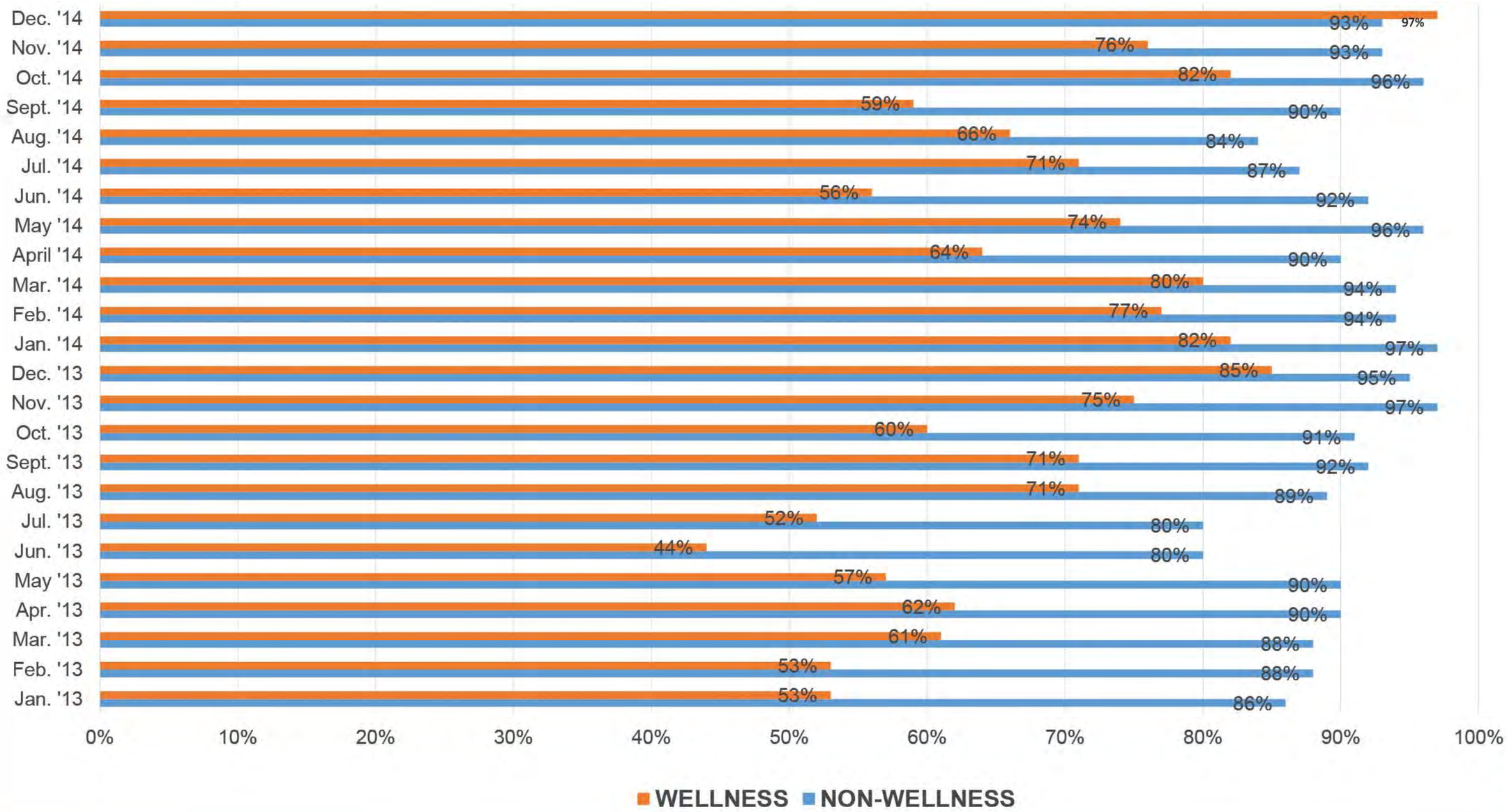
The Pap smear helps in the early detection of cervical cancer, contributing to a reduction in incidence and prevalence by as much as 90 percent.

Clinical Outcomes

The set TAT for Wellness patients is within 24 hours (that is not > 24 hours), while that for non-Wellness patients is between 24 hours to 48 hours.

In measuring TAT compliance, the proportions of the total census and for the Wellness patient classification who were served within the standard were computed for each monthly period during the period in review and plotted in a linear time scale (Table 1).

Chart 1. Pap Smear Turn-Around Time Compliance (in Percent)



As observed, the compliance rate based on percentage of Wellness and non-Wellness census achieving the TAT standard has improved over the two-year period. The challenge for the Institute is to maintain this improvement that has been achieved, which translates to better service to patients in terms of timely deivery of their test results.

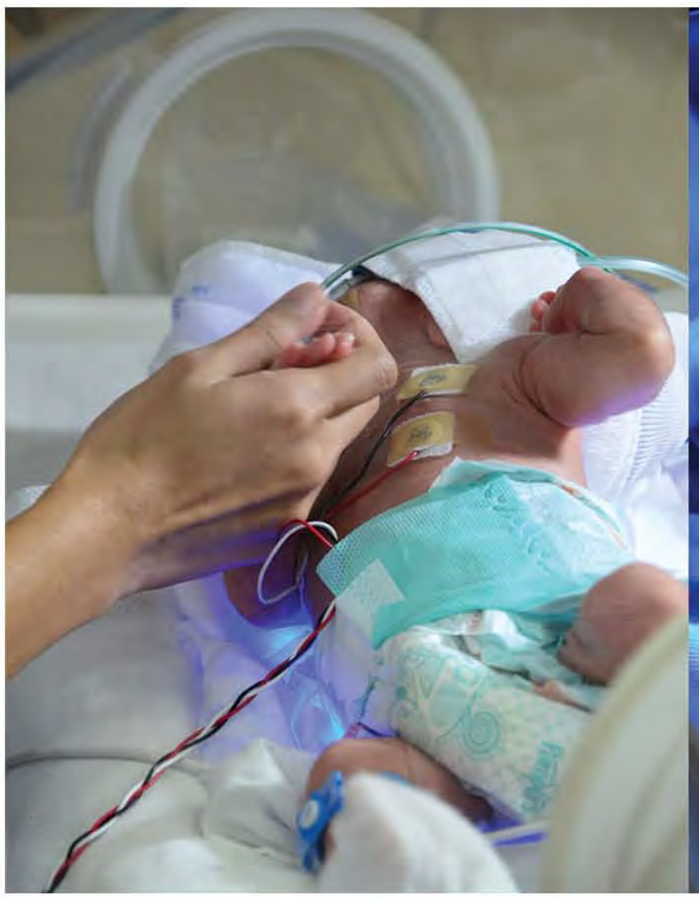
The Histopathology Section of the Institute is in the process of completing a laboratory information system to automate the process and to integrate monitoring of TAT and other operational parameters in the second half of 2015.



INSTITUTE OF PEDIATRICS AND CHILD HEALTH

The Institute of Pediatrics and Child Health (IPCH) provides optimum healthcare from the day life is delivered to the world. It has excellent facilities which include a pediatric unit, pediatric and neonatal intensive care facilities and outpatient emergency unit.

The neonatal period (from birth to 28 days of age) is a time of great risk to infants. The section on Neonatology is staffed by the country's leading and most experienced practitioners in this subspecialty. Neonatologists man the Neonatal Intensive Care Unit (NICU) to safeguard the lives of infants in this crucial stage of development. A Pediatric Intensive Care Unit (PICU) also provides specialized care to pediatric patients with unstable and life-threatening abnormalities of vital organ systems.







Another subspecialty in the Institute is Pediatric Emergency Medicine (PEM) which is specially designed to handle the treatment of child emergencies which differ from treatments provided to adults. St. Luke's Emergency Room (ER) physicians see a variety of cases that include cardiac, respiratory, infectious, as well as trauma patients, both in the early newborn period up to 18 years of age.

Assisted Ventilation Among Newborns with Respiratory Distress Syndrome Admitted at the Neonatal Intensive Care Unit of St. Luke's-Global City

Imelda Consunji Vinzon-Bautista, MD, FAAP, DPPS, DPSNbM;
Trina Vei M. Valdez, RN; Jaynelou V. Villaluna, RN

The Neonatal Intensive Care Unit and Intermediate Care Unit (NICU-IMCU) at St. Luke's Medical Center-Global City is one of the country's most modern neonatal intensive care unit. It is a 37 bed, state-of-the-art facility designed to address the needs of critically-ill, premature newborns as well as term newborns with problems and abnormalities requiring specialized care and treatment.



Dr. Imelda Bautista (right) is the Head of the Neonatal Intensive Care Unit of St. Luke's-Global City. With her are (from left) NICU nurses Jaynelou Villaluna and Trina Vei Valdez.

Infants in the NICU-IMCU Complex have a 24 hour/7 days a week access to in-house neonatologists. All neonatologists are board-certified specialists who have met the requirements of education, training, and experience by Philippine Society of Newborn Medicine. The unit provides access to Pediatric subspecialists, surgeons and support services that allow treatment across the full range of neonatal problems. It provides four levels of care including:

- Intensive Care
- Intermediate Care
- Isolation Unit Care
- Outborn Unit Care

The NICU is equipped with the latest technology and offers the most modern treatment modalities to provide the highest level of care.

St. Luke's-Global City Study on Neonatal RDS

To determine the profile and explore the clinical outcomes of treatment modalities for Respiratory Distress Syndrome (RDS) as part of the NICU care in St. Luke's-Global City, the Institute of Pediatrics and Child Health and Section of Neonatology undertook an empirical study of 179 patients admitted at St. Luke's-Global City from August 2013 to June 2015.

Respiratory Distress Syndrome is a known problem associated with infants born before the gestational age of 37 weeks. RDS is defined as "a deficiency of pulmonary surfactant, a phospholipid protein mixture that decreases surface tension and prevents alveolar collapse. It is produced by Type II alveolar cells increasing quantities from 32 weeks gestation".

Assisted Ventilation Modalities

Neonates with RDS usually undergo three respiratory modalities in the delivery of assisted oxygen or ventilation as initial management of respiratory distress. These are: Mechanical Ventilation (MV), Nasal Intermittent Positive Pressure Ventilation (NIPPV), and High Flow Nasal Cannula (HFNC). The ventilation provides the necessary oxygen to the infants and enables them to breathe while those on mechanical ventilator may receive additional surfactant therapy.

Respiratory distress syndrome is a common problem among infants born before the gestational age of 37 weeks.



Endotracheal Intubation (ETT) and Mechanical Ventilation (MV)

This modality is a major therapy for infants with RDS manifesting as hypoxemia, respiratory acidosis or apnea. Surfactant is administered through the ETT in order to decrease the surface tension of the alveoli to promote better respiration and oxygenation. Ventilator settings are adjusted frequently to minimize damage to the lung tissue.

Nasal Intermittent Positive Pressure Ventilation (NIPPV)

This non-invasive modality provides synchronized ventilatory breaths via the nasal prongs in addition to continuous positive airway pressure (CPAP). NIPPV is used to delay or prevent the need for endotracheal intubation and mechanical ventilation. Its use after extubation decreases the chance of reintubation. NIPPV decreases the work of breathing without altering the breathing patterns and synchrony in premature neonates with RDS.

High Flow Nasal Cannula (HFNC)

This is a non-invasive respiratory support device that provides continuous positive pressure ventilation that reduces the work of breathing and delivers heated and humidified gas at high flow rates through the nasal cannula. It has been associated with improvement in lung mucociliary clearance, washout of nasopharyngeal dead space and oxygen delivery. HFNC may reduce the need for intubation or provide support post extubation.

Preterm babies with breathing problems often require help from a mechanical ventilator that provides regular breaths through a tube in the windpipe. The process of extubation or removal of this tube does not always go smoothly and the tube may need to go back in if the baby cannot manage extubation. HFNC and NIPPV are ways of supporting babies' breathing in a less invasive way with the use of nasal prongs, therefore, cause less damage to the lungs. HFNC and NIPPV may be used after extubation to reduce the number of babies that need to have the endotracheal tube reinstated. HFNC provides steady pressure to the back of the nose that is transmitted to the lungs, helping the baby breathe more comfortably. NIPPV provides the same support, but also adds some breaths from the ventilator. As part of the over-all treatment protocol and on top of the artificial ventilation to support breathing, intubated neonates were given surfactant -- a lipid-protein compound necessary for normal lung function. RDS neonates are usually born either without or with insufficient surfactant in their lungs. Exogenous surfactant is administered via endotracheal tube at a dose of 4 ml/kg. This may be considered a major factor why neonates can be easily weaned from the ventilator, thus avoiding the development of chronic lung disease.

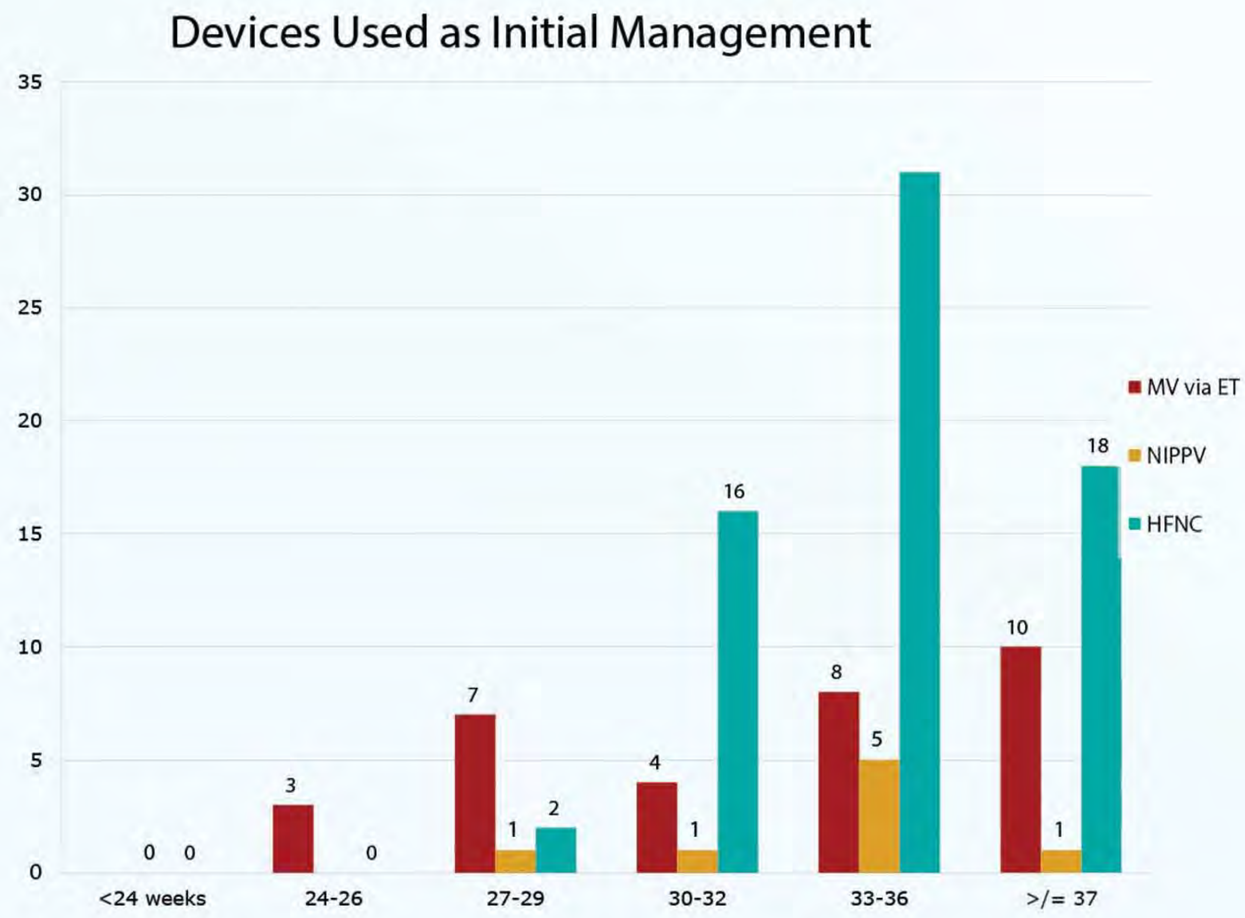
Outcomes

There were 179 preterm babies admitted at the St. Luke's-Global City NICU from August 2013 to June 2015. Out of the 179 patients, 59% of cases had RDS while others had Transient Tachypnea of the Newborn (TTN) and other conditions aside from RDS. Those with TTN (7.82%) are neonates who manifested breathing problems, but only required Low Flow Nasal Cannula (LFNC) as breathing support.

Most of the neonates admitted with RDS fell between the age of gestation (AOG) of 33-36 weeks (40%), followed by those above or equal to 37 weeks AOG (27%), then 20% from 30-32 weeks AOG, 2.8% from those belonging to 24-26 weeks and 9.35% of those 27-29 weeks AOG. There were no patients included in the study belonging to less than 24 weeks gestational age or younger.

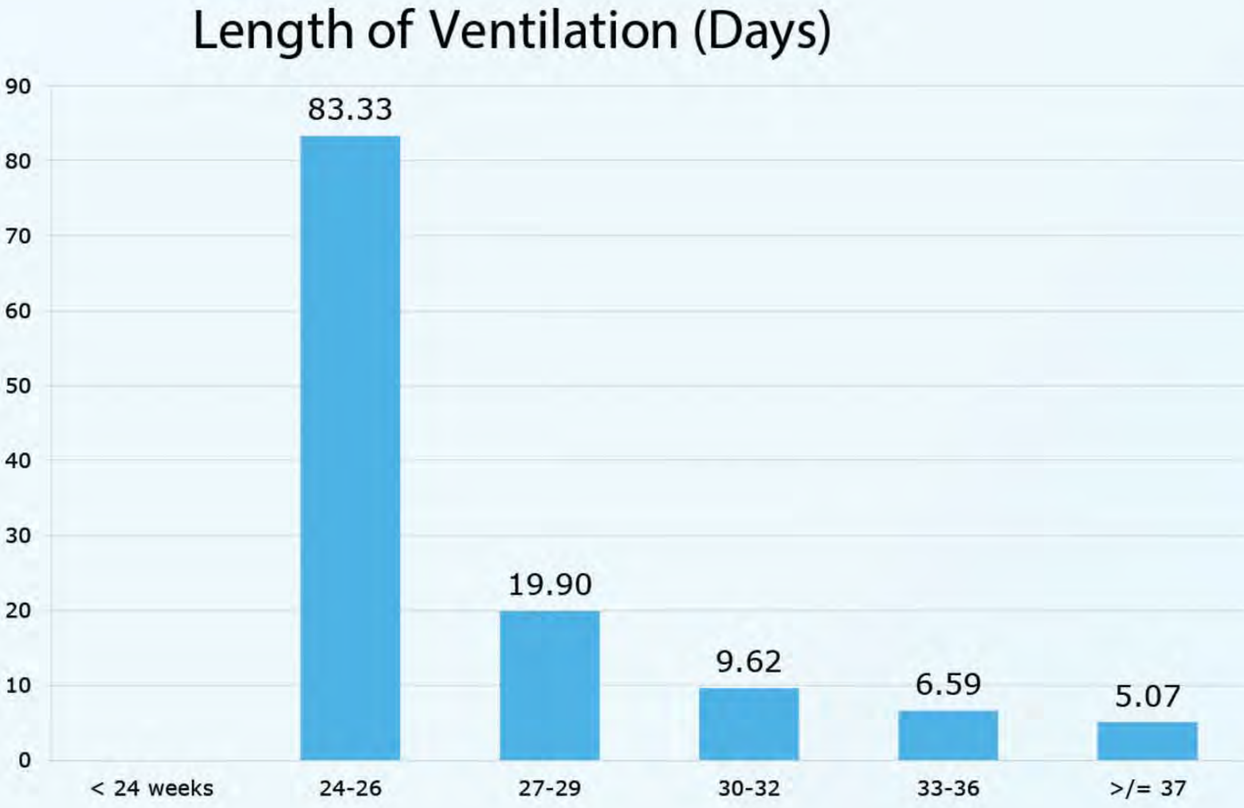
Neonatologists do not intubate at all times. Emphasis is given on less invasive types of respiratory support such as HFNC and NIPPV. Data shows more than half of the population (62.6%) were hooked to HFNC as initial management of respiratory distress while only a little more than one fourth of the population (30%) were intubated and the rest (7%) were hooked to NIPPV (Figure 1). 2013 data from Vermont Oxford Network shows that nasal CPAP before ETT ventilation accounts for 50% of the total population. This implies that St. Luke's-Global City is adherent to international standards in the care and management of RDS.

Figure 1. Profile of Patients Initially Placed on Each Type of Respiratory Support



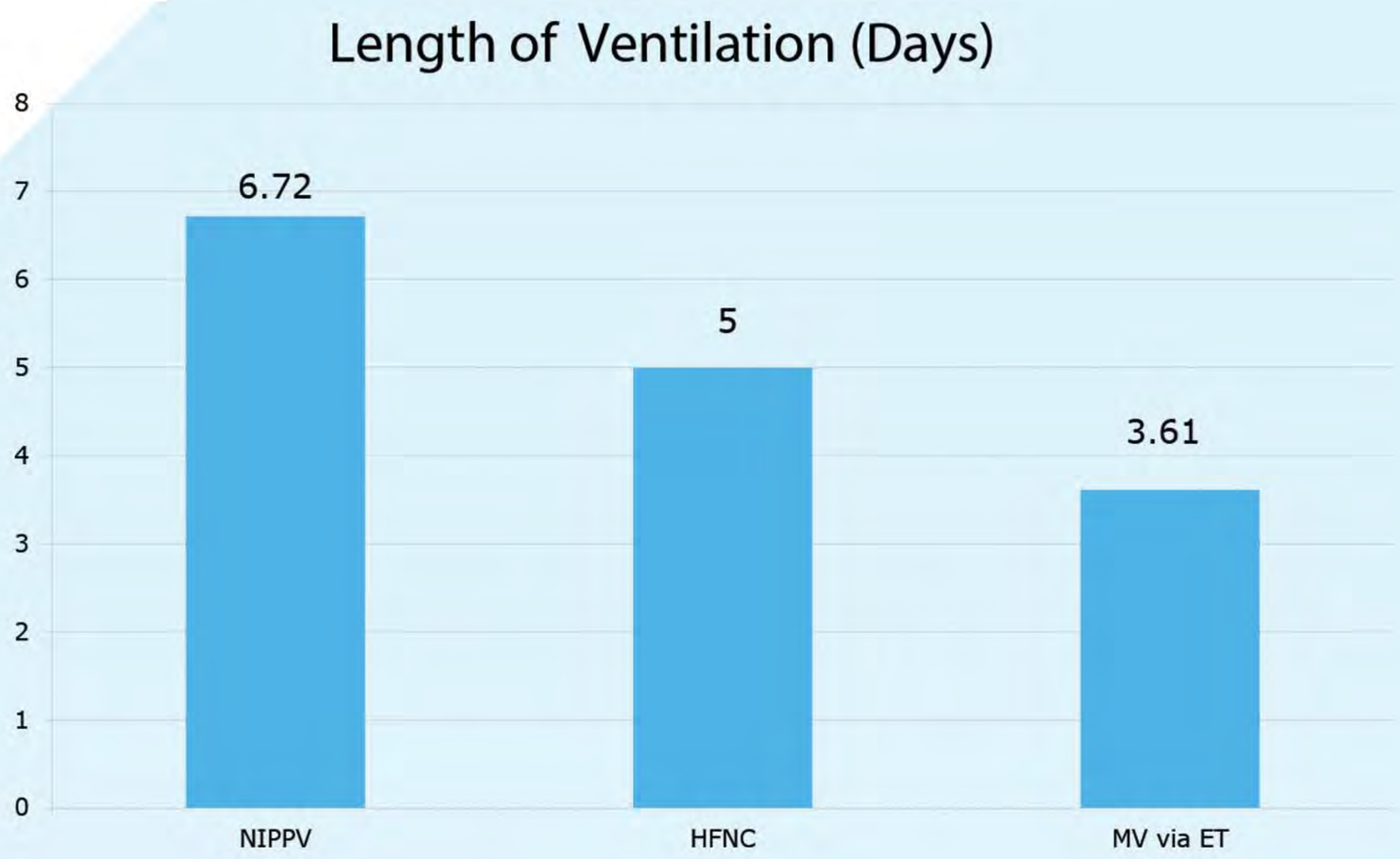
The older the gestational age, the shorter the length of ventilation. Premature infants whose lungs began producing surfactant are more able to breathe on their own, thus requiring less respiratory support as they mature. Data shows premature babies born less than 27 weeks gestational age have the longest duration in respiratory support (Figure 2).

Figure 2. Mean Length of Ventilation According to Age of Gestation (AOG)



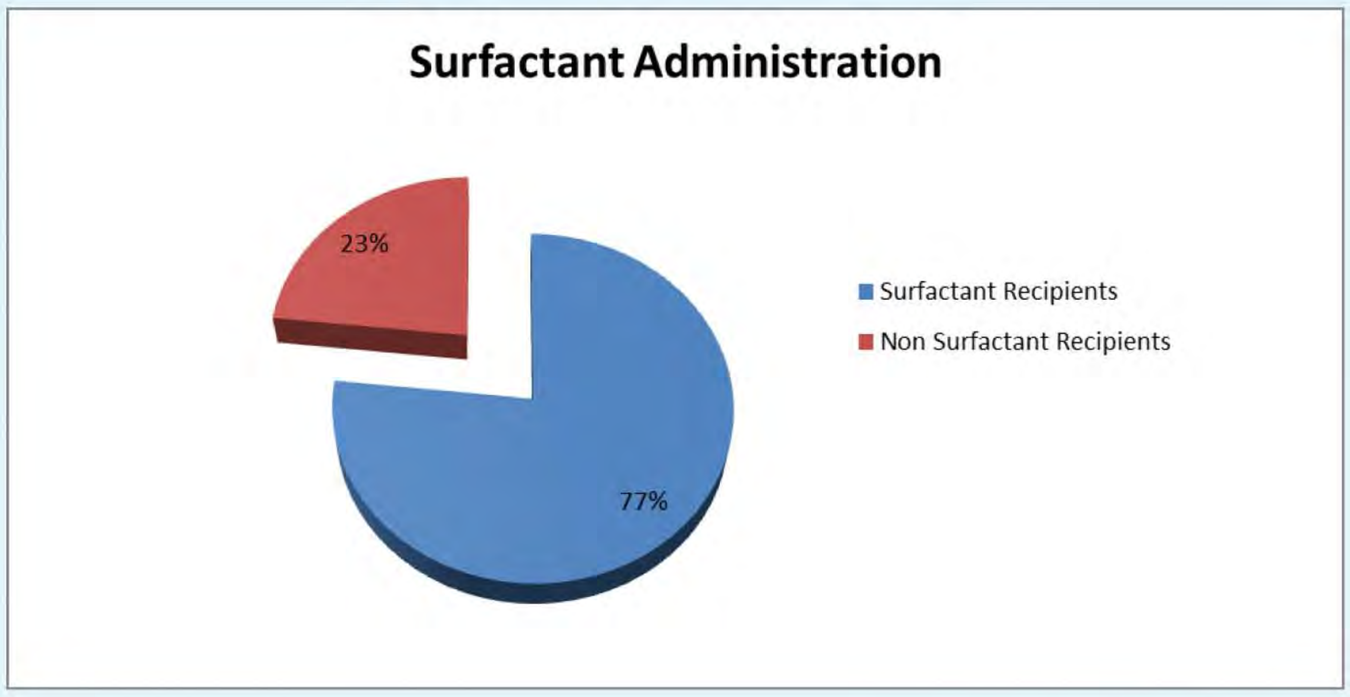
The more invasive the procedure, the shorter the duration. At St. Luke's-Global City, the average days of babies hooked to mechanical ventilation via ET is 3.61 days. Babies were weaned from mechanical ventilation then they were hooked to NIPPV (6.72 days) or HFNC (5 days) as step down from intubation (Figure 3).

Figure 3. Mean Length of Ventilation for Each Type of Respiratory



77% of intubated patients (38) were given exogenous surfactant. 73% of identified RDS patients were premature and required surfactant treatment to reduce the complications of RDS (Figure 4).

Figure 4. Surfactant Administration



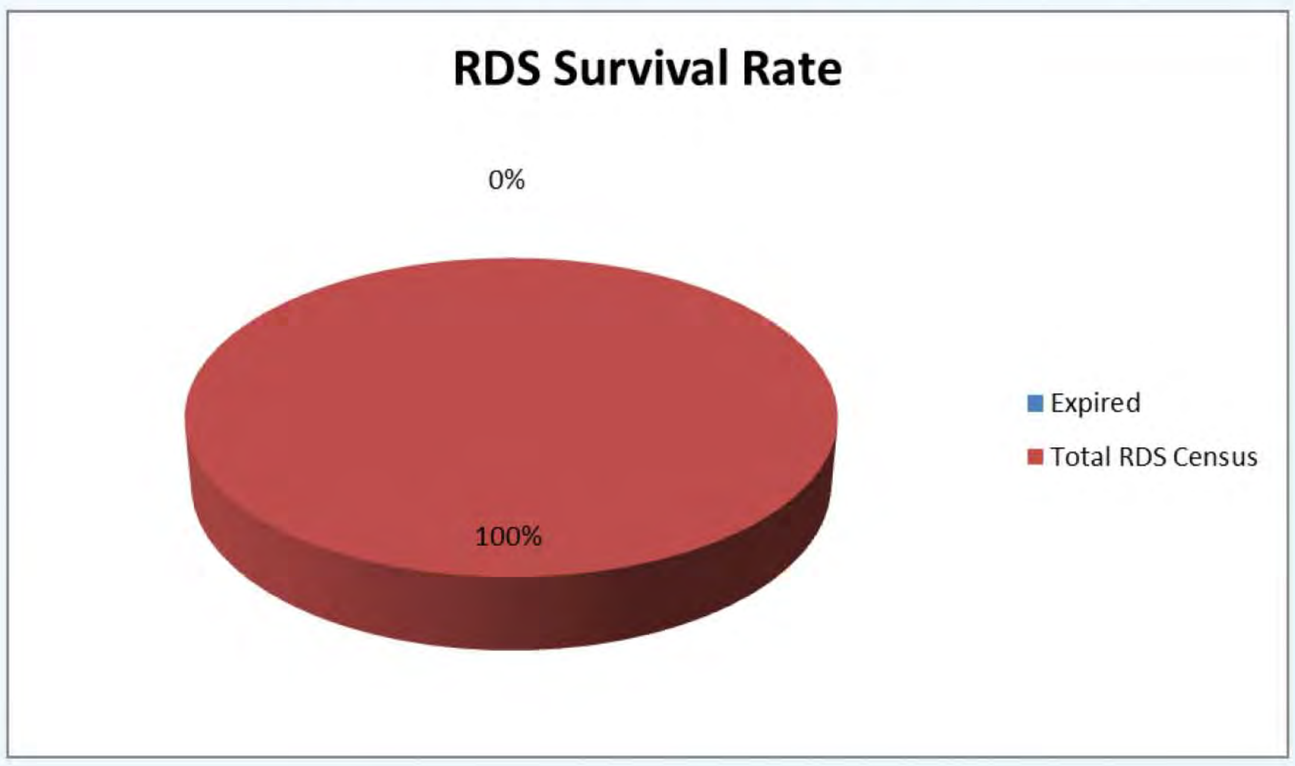
Out of 179 patients, only 11 died from causes other than RDS (8.4% of the total poupulation). These are 2 cases of Kasabach-Merritt, 2 cases of Hypoplastic Heart Syndrome, 1 case of Hypoplastic lungs, 3 cases of perinatal asphyxia/hypoxic-ischemic encephalopathy (HIE), 1 case of spinal muscular atrophy, 1 case of Dandy Walker Syndrome, and 1 case of 21 weeks AOG weighing 800 grams. Vermont Oxford Network 2013 data shows that mortality rate accounts for 12% for all infants. This implies that St. Luke's provides an excellent care that is comparable to international standards in terms of care and management of patients with RDS.

All babies identified with RDS (107) were able to go home alive, showing 100% survival rate and success rate because all RDS patients were totally weaned off from respiratory support. None went home with oxygen (Figure 5).



All neonates at the St. Luke's-Global City NICU who suffer from respiratory distress sydrome (RDS) are successfully discharged after treatment.

Figure 5. RDS Patient's Survival Rate



Conclusion

From the study conducted from August 2013 to June 2015, 107 patients were identified with RDS from a total of 179 patients admitted at St. Luke's-Global City NICU. The results of the study are as follows:

- Mortality rate from RDS with this particular group of patients from SLMC-GC NICU was 0%, which far outweighed international statistics (Vermont Oxford Network 2013 with 12% mortality rate).
- As initial management of RDS, HFNC was the most preferred modality.
- Patients hooked to NIPPV stayed longer than those on HFNC.
- Length of ventilation for infants on mechanical ventilation was only about 3-4 days. Mean length of HFNC use was 5 days, while mean length of NIPPV use was 6-7days.
- None of the babies were sent home with oxygen. All 107 babies were able to be weaned off from respiratory support. Thus, 100% survival rate for patients with RDS was achieved.
- Intubation in combination with surfactant therapy has been proven to be effective in reducing mortality rate, particularly for the extremely premature infants.
- The use of HFNC and NIPPV has reduced the incidence of intubation particularly for the term and near-term babies.

Overall, because of SLMC-GC NICU Team doctors' and nurses' expert and dedicated care, positive clinical outcomes were achieved in the St. Luke's Medical Center-Global City NICU.

What is Respiratory Distress Syndrome?

Respiratory distress syndrome (RDS) is a breathing disorder that commonly afflicts preterm newborn infants. It is more common in premature infants born about 6 weeks or more before their due dates. The incidence and severity are related inversely to the gestational age of the infant.

RDS is more common in premature infants because their lungs aren't able to make enough surfactant. Surfactant is a liquid that coats the inside of the lungs. It helps keep them open so that infants can breathe in air once they're born.

Without enough surfactant, the lungs collapse and the infant has to work hard to breathe. He or she might not be able to breathe in enough oxygen to support the body's organs. The lack of oxygen can damage the baby's brain and other organs if proper treatment isn't given.



INSTITUTE OF RADIOLOGY

Precise and reliable detection of the disease, injury or medical condition is the first step to accurate diagnosis and the effective treatment and healing of a patient. St. Luke's is committed to providing its patients the best imaging diagnostics necessary for outstanding clinical outcomes.

The Institute of Radiology lives up to this commitment by providing internationally recognized consultants who are experts in imaging studies and by using the most modern equipment -- many of which are not available in other hospitals in the country. As a group serving the therapeutic institutes and centers, it boasts of the most advanced medical radiology equipment, the newest equipment being the 3-Tesla MRI, 256-slice CT scanner, Computerized Radiography System and the fully automated Picture Archiving and Communication System (PACS).

The PACS is a computerized system that combines the MRI, CT, X-ray, Ultrasound, Cathlab and Nuclear Medicine images of patients and allows medical imaging doctors to access, manipulate, and enhance the images anywhere in the computers connected in the two hospitals of St. Luke's. Through online connection, St. Luke's referring physicians can likewise access patient PACS files and provide immediate feedback to patients and to doctors who need the diagnostic findings.

The Institute is also an internationally recognized center of excellence in medical radiology and imaging. It has over 40 radiologists who are all Fellows of the Philippine College of Radiology, and are supported by highly trained





and board certified radiologic technologists and nurses. St. Luke's is one of the first hospitals in the country to develop dedicated organ-based and special interest sub-specialties in radiologic imaging, including neuroradiology, head and neck imaging, breast imaging, chest and cardiac imaging, gastrointestinal and genitourinary radiology, and pediatric radiology, among others.

Drawing from world-class expertise and state-of-the-art systems and facilities, the Institute has initiated an International Fellowship Program in Radiology where Radiologists from other Asian countries come and enroll to take up post-specialty training. The Institute has adopted a strong academic culture, and is engaged in various research endeavors.

In recognition of its achievement, St. Luke's Medical Center - Global City's Breast Center was accredited by the American College of Radiology (ACR) as a Center of Excellence in 2014. The achievement makes St. Luke's only the second facility outside the US, Canada and the US territories to be recognized as such and accredited by ACR for Mammography, Breast

Ultrasound and Stereotactic Breast Biopsy services. The distinction is a testament to St. Luke's Medical Center's commitment to provide superior imaging services that comply with the highest standards in radiologic outcomes and safety.

General Patient Outcomes in Radiology

Bernard F. Laya, MD

The Institute of Radiology's arsenal of expertise, medical imaging equipment, technology and processes stand above the rest.



Dr. Bernard Laya is the Head of the Institute of Radiology at St. Luke's-Global City.

Apart from putting together the country's most modern and advanced imaging systems, the Institute's highly trained Radiologists as well as medical and non-medical staff have mastery of leading-edge technologies in the execution of highly specialized radiological procedures.

The Institute performs leading-edge imaging technology such as CT Coronary Angiography, Cardiac MRI, Calcium Scoring, Low-Dose Chest CT (for early lung cancer screening), Perfusion Studies, and f-MRI and MR Spectroscopy.

The Institute matches its advanced expertise and facilities with adherence to service standards in providing the best possible medical imaging solutions to patients and referring physicians who expect nothing but the best from St. Luke's.

St. Luke's Census

St. Luke's-Global City handled a total of 153,325 radiology cases in 2014. Three out of four (75%) of all cases were outpatients, while the balance of 25% were patients who had availed of radiologic procedures while confined in the hospital (Chart 1).

The number of St. Luke's radiologic census has been increasing through the years. The number of cases increased 26% from 121,128 cases in 2013 to the 153,325 cases reported in 2014 (Table 2). The increase between 2012 to 2013 was 20%.

The Institute has classified its imaging services to five (5) basic procedures: CT Scan, Diagnostic X-ray, General Ultrasound, Magnetic Resonance Imaging (or MRI) and breast imaging

St. Luke's is the first hospital in the Philippines to have a 256-slice CT Scan.



(such as mammograms and other procedures). About six out of ten (61%) consisted of general X-ray cases, followed in incidence by ultrasonography at 17%. MRI cases – which normally involve specialized diagnostics -- showed the least number at only 5%.

Chart 4 shows that the increase in number of cases has been across the board in all five units of the Institute of Radiology in Global City. The highest growth was registered in diagnostic X-ray (32% in 2014 vs. 2013), while the least growth was experienced in breast imaging cases (8% growth in 2013 vs. 2012).

Chart 1. St. Luke's-Global City Census of Radiology Cases in 2014

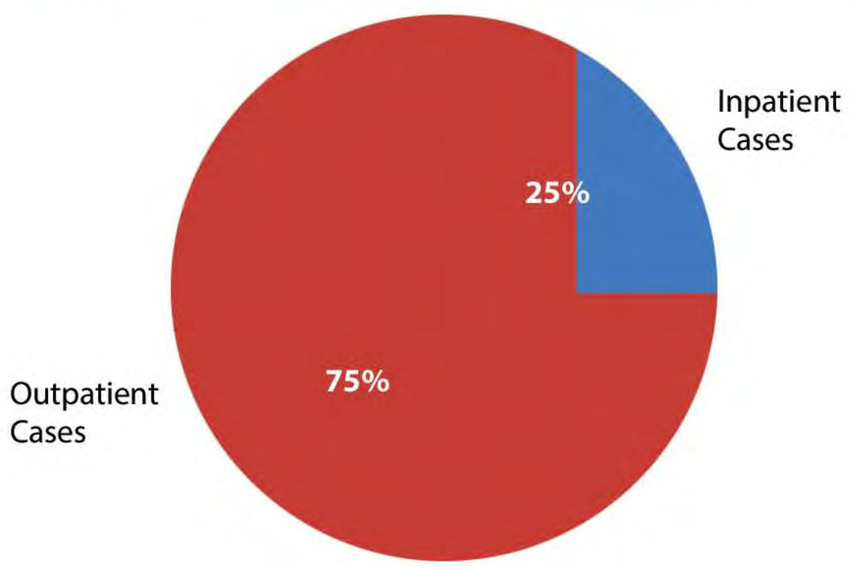
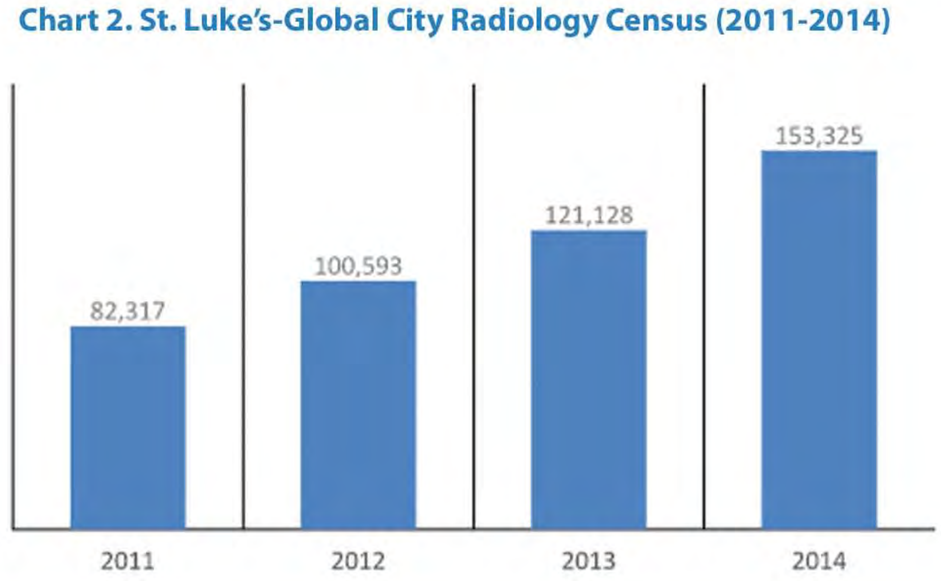


Chart 2. St. Luke's-Global City Radiology Census (2011-2014)



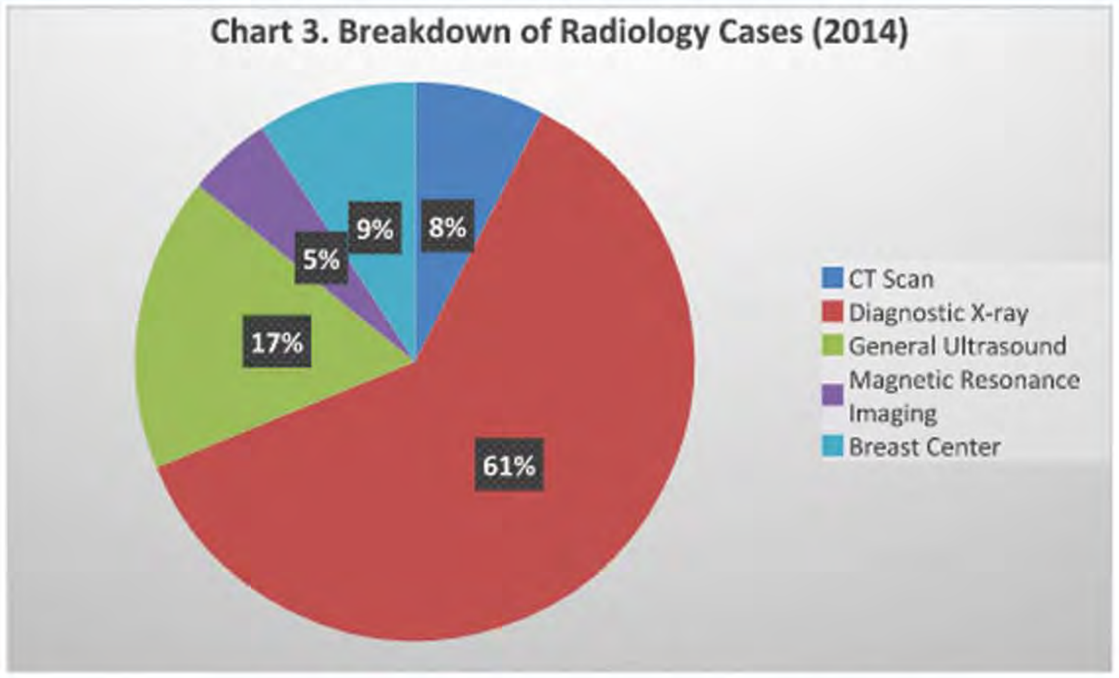
Service-Oriented Processes

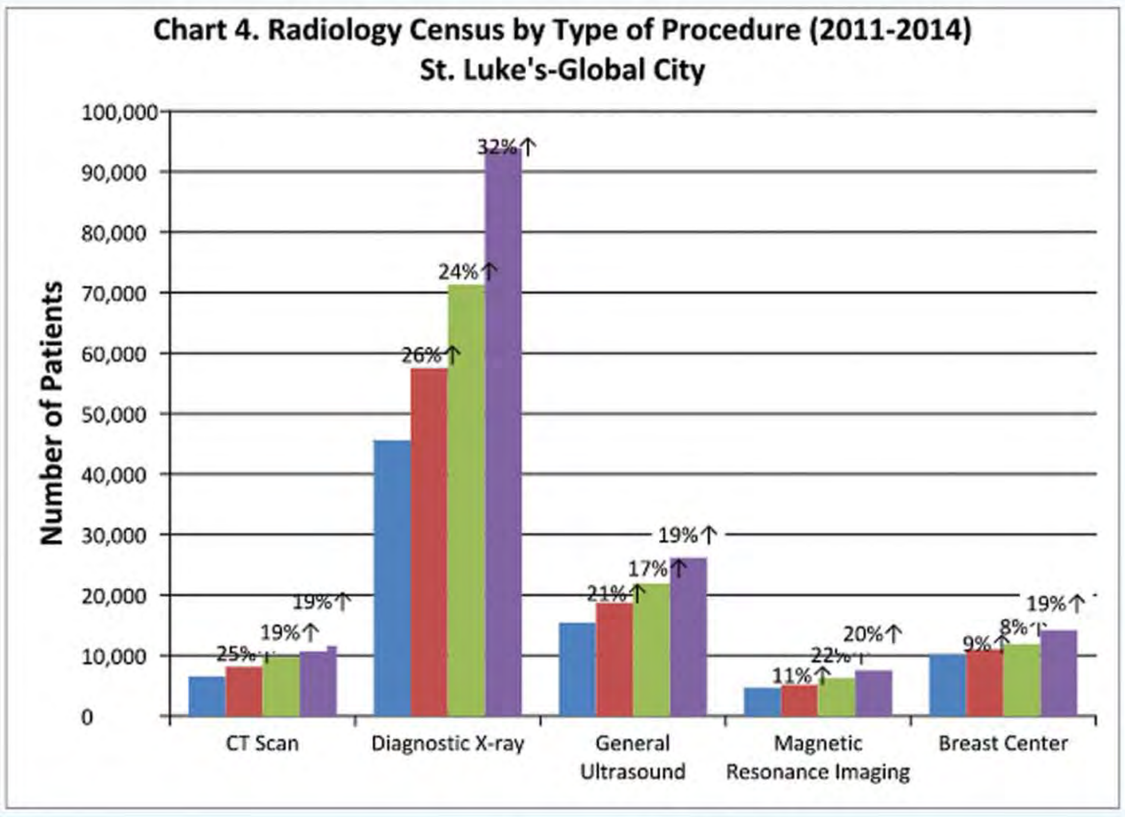
The Institute is committed to delivering the highest quality and efficiency in radiology services in the country.

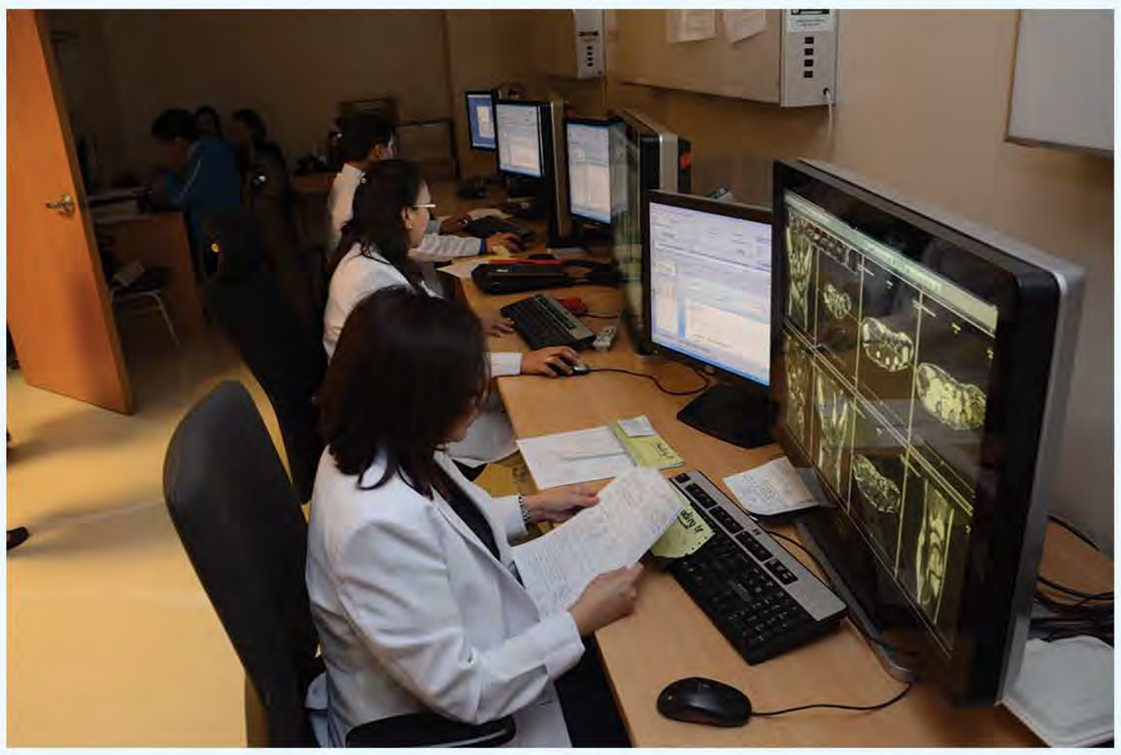
To ensure the highest level of accuracy, it has pioneered in the tandem reading process for CT scans, MRI, and breast imaging studies of patients. Under this system, two radiology consultants are required to read and render separate and independent interpretations of an imaging study. This results in significantly higher accuracies in St. Luke's imaging diagnostics, far exceeding the international standard of 67 to 75%.

In addition, the prompt and efficient delivery of expert diagnostic reading and interpretation from the conduct of radiology procedures is an important service parameter for the Institute. The standard turnaround time for routine ultrasound and radiographic studies is less than 12 hours. For CT scan, MRI and breast imaging studies, the turnaround time of 24 hours is the norm.

Patients who are emergency and critical cases, as well as those confined in the hospital, are given top priority as part of the protocol. In these cases, a verbal report is relayed to the referring physician in less than an hour after the study has been completed, to expedite their assessment and diagnosis. An official written report is released thereafter.







A standard protocol in the Institute in both the Quezon City and Global City hospitals is the 100% availability of a senior radiology medical consultant 24-hours a day and 365 days of the year. This is proof positive of St. Luke's overriding commitment to providing the best service to its patients, everyday throughout the year.

St. Luke's pioneered in tandem reading which resulted in higher accuracies in imaging diagnostics.



Patient safety is of paramount importance when it comes to imaging.

Patient Safety

Of paramount importance in this Institute is patient safety from radiation. The Institute has adopted the universally accepted policy to limit all human radiation exposures to be kept at minimum possible levels to ensure their safety, while still remaining effective in the attainment of imaging objectives. Various radiation dose reduction measures including automatic dose modulation and iterative reconstruction (iDose) software are available. It adheres to the "As Low as Reasonably Achievable" or ALARA principle.

In line with its safety protocols, a medical physicist plays a permanent role in the Institute's organizational structure. He is responsible for the maintenance of exact amount of radiation exposure levels depending on the diagnostic procedure prescribed for each unique medical case. The physicists are on hand in all imaging sections in St. Luke's hospitals throughout the year, which provide assurance and confidence that radiation and imaging protocols are within the international standards as prescribed by the American College of Radiology.

Moreover, the highly trained radiology nurses are trained in pre-procedure patient safety evaluation, acute cardiovascular life support (ACLS) and in handling of radiologic safety events and issues such as: adverse contrast reactions and extravasation, radiation safety, and MRI compatibility of medical devices and foreign bodies. Contrast administration safety is a prime concern of the Institute and is monitored closely for compliance to determined guidelines. Each patient undergoing an imaging study using intravenous (IV) contrast dye undergoes proper evaluation and risk assessment prior to the imaging study.



INSTITUTE OF SURGERY

St. Luke's Institute of Surgery boasts of many of the country's highly trained surgical specialists with world-class knowhow and expertise backed by the newest technologies and equipment in this field.

Its capability in surgical procedures ranges from the most routine to the most intricate, demanding and complex procedures. It is committed to provide the highest quality of patient care and safety as recognized by the Joint Commission International (JCI), the world's most prestigious healthcare accreditation body.

The Main Operating Room complex, where all major surgeries are done, is composed of several operating room theaters designed for a wide range of surgical procedures.

It is fitted with climate-controlled technology and has anti-static flooring, fire-proof glass dividers and a Laminar Airflow system to enhance and maintain environmental sterility. Each theater is equipped with the latest anesthesia machines with built-in scavengers and HEPA-filters, cardiac monitors and other highly advanced equipment necessary to deliver accuracy, efficiency and safety of the surgical procedure.

During these procedures, surgeons gain real-time computerized access to all laboratory, diagnostic and radiologic images via digital monitors through the hospital's Picture Archiving and Communications System (PACS). The latest, most innovative and sophisticated surgical instruments are also available for a variety of advances in surgery such as sutureless surgical procedures, virtually no-scar surgery, transplant surgery, Hyperthermic Intraperitoneal Chemotherapy (HIPEC) treatment for advanced cancer, and many more. Access to up-to-date journals on evdence-based surgical management is also available.

The Institute also offers a wide variety of MIS applications such as laparoscopic (lap) cholecystectomy for gallbladder stones, appendectomy, hernia surgery, lap bariatric and metabolic surgery, lap colon surgery, laparoscopic staging of tumors and other advanced laparoscopic procedures. Because of the small surgical incisions and the expertise of our surgeons, patients enjoy the benefits of less pain, minimal blood loss, shorter hospital stay and faster return to normal activity.





In 2010, St. Luke's made history by introducing the first advanced robotic surgery system in the country –the third generation da Vinci Si Surgical system. With sophisticated robotic surgical technology, St. Luke's surgeons now provide patients with the best possible healthcare with very minimal risk and the promise of a faster recovery. Following St. Luke's vision of becoming an internationally recognized academic medical center, the Institute continues to pursue excellence by conducting multiple surgical training and simulation workshops at the Advanced Surgical Training and Simulation Laboratory (ASTSL). It is the first and only multispecialty training hub in the country to have the most advanced virtual simulators, the LAP Mentor with haptic feedback and the GI-Bronch Endoscopic simulator, that are utilized in the continuous training of surgical skills. These allow surgeons to practice repeatedly before the actual handling of a patient, thus enhancing skills and increasing patient safety during surgery.

A steady increase in the number of advanced surgical simulation workshops using these high fidelity simulators shows why the Institute of Surgery continues to be at the forefront of the advances in surgery.

Clinical Outcomes in Robotic Surgery

Jeffrey Jeronimo P. Domino, MD

Until the recent past, surgery has always been considered by most patients as a very traumatic, painful and life-changing procedure.

Minimally invasive surgery (MIS) is a surgical technique that has been in use for performing surgery for more than the past 20 years. It is a highly specialized surgery that offers great patient benefits such as minimal pain, less trauma, less hospital stay, faster return to work or activity and minimal or virtually no scar. It has been commonly used for diseases and conditions in most surgical specialties in St. Luke's Medical Center.

The advancement and success of minimally invasive surgery has been attributed to the fast development of technology in the field of medicine, and to the continued advancement of the expertise of surgeons. One such cutting-edge technology is the use of the Robotics in the field of Minimally Invasive Surgery.



Dr. Jeffrey Domino is the Head of the Minimally Invasive and Robotic Surgery Center (MIRS Center) at St. Luke's-Global City and Quezon City.

Changing the Experience of Surgery

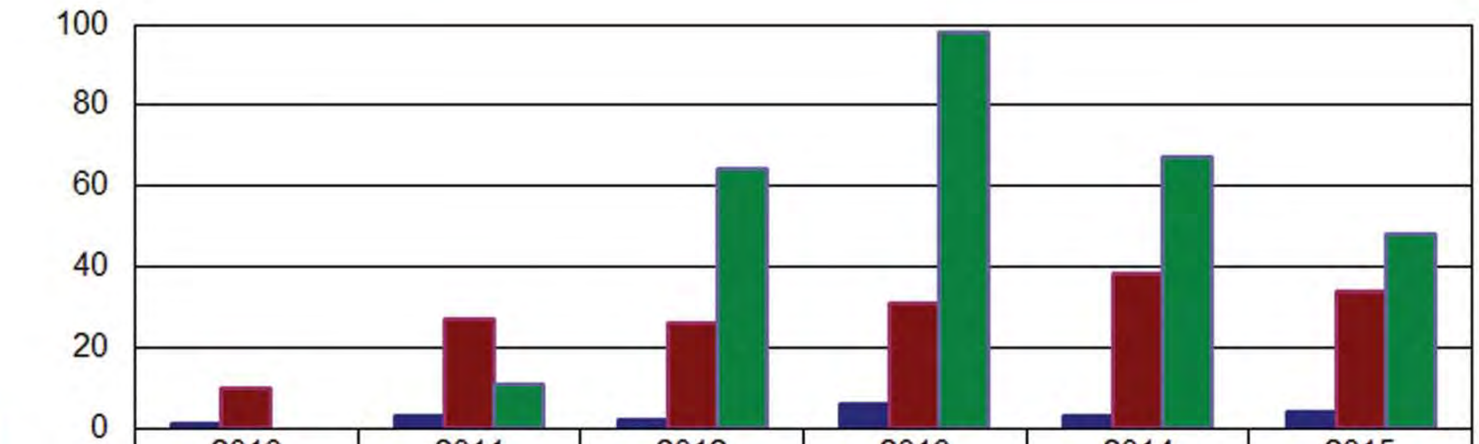
Robotic surgery is at the forefront of minimally invasive surgery at St. Luke's Medical Center.

Robotic surgery, also called robotically-assisted surgery, is the next generation of technological development in the area of MIS. It was developed to enhance the capabilities of surgeons performing laparoscopic surgery particularly in operations of certain organs with limited maneuverable space.

Advanced robotic systems perform the actual surgical procedures on the patient with the trained robotic surgeon directing and controlling the procedure through a telepresence manipulator in the computer console inside the operating room. The robotic manipulator is a remote interface that allows the surgeon to perform normal movements intuitively with the robotic arms.

The specific procedures are carried out and manipulated using robotic end-effectors with the surgical instruments at the end of four robotic arms inside a specific body part of the patient after the incision.

Table 1. Total Number of Robotics Cases Per Year (2010 - September 2015)



	2010	2011	2012	2013	2014	2015
GS	1	3	2	6	3	4
URO	10	27	26	31	38	34
GYNE	0	11	64	98	67	48

St. Luke's Pioneering Initiative

St. Luke's Institute of Surgery holds the distinction of being the first medical center to have undertaken a robotic surgical procedure using advanced third generation robotic equipment in 2010. By September 10, 2015, it reached the signal milestone and distinction of having performed 473 surgical procedures using the da Vinci Si Surgical System (Table 1).

The Institutes of Surgery, Urology, and Obstetrics and Gynecology have been using the da Vinci Si Surgical System, a state-of-the-art robot with four arms, for minimally invasive surgical procedures for over four years now.

The third generation da Vinci Si Surgical System is equipped with a high-definition, 3D imaging system which allows the exact depth perception and maximum interview visual display of the surgical area. The surgeon sees things closely, accurately and exactly, which was previously not possible in traditional laparoscopic surgery.

The robot is equipped with EndoWrist technology and Intuitive motion. EndoWrist mimics a human's wrist movement while the Intuitive motion ensures that movements are delivered in real time. The robotic arms can also control the involuntary tremors of a surgeon's hands, which makes minute and delicate procedures even more precise and safe for patients.

Clinical Outcomes

St. Luke's has recorded pioneering achievements in robotic surgery, including the first robotically-assisted Nissin Fundoplication and endoscopic thyroidectomy in the country. The Institute of Urology also performed the first robotically-assisted partial nephrectomy in the Philippines.

A census study of all robotic cases was conducted by the Institute of Surgery to establish the profile of patients who underwent the procedure and determine clinical outcomes over a span of four years from the time robotic surgery was introduced.

A total of 473 patients underwent robotic surgery from 2010 to 2015 and were covered in the study (Table 1). The number of cases reached its peak in 2013 with a total of 135 cases, or 29% of the census. The statistics show an increasing trend in the number of patients, evidently due to the increasing awareness of the presence of this revolutionary surgical technique in St. Luke's.

The most number of procedures have been gynecologic (predominantly hysterectomies and myomectomies) which accounted for 61 percent of the population. General surgery cases had four percent, while urology cases (mostly prostate related) comprised 35 percent of the census (Figure 1).

The parameter involving hospital stay for the census was recorded for the purpose of measuring not just the number of days of confinement, which reflects the recovery period of the patient after the surgery. This can also be attributed to the smaller wounds, lower risks of complications and less tissue trauma associated with robotic surgery.

The data revealed the predominance of short (two to four days) hospital stay compared to long stay and the medium (5 – 7 days) hospital stay for the census till 2014. On closer examination, there is an increasing number of shorter hospital stay from 2010 to 2013 (Table 2).

Short-term (2 – 4 days) stay accounted for two out of three (66% percent) of all cases, while only 27% in the census had medium term (5 – 7 days) hospital confinement. The minority (7 percent) had long (> 7 days) stays.

Figure 1. St. Luke's Robotic Surgery Case Breakdown (As of September 2015)

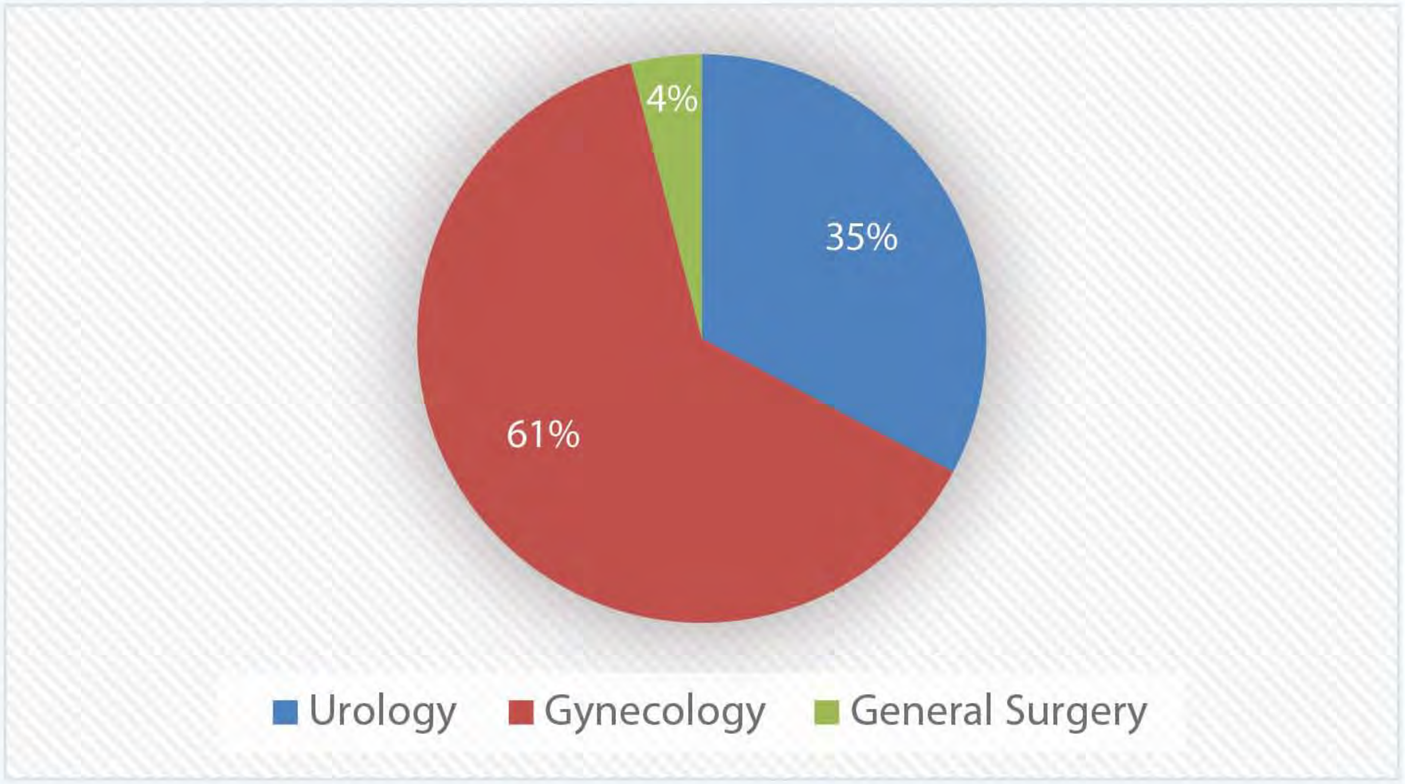
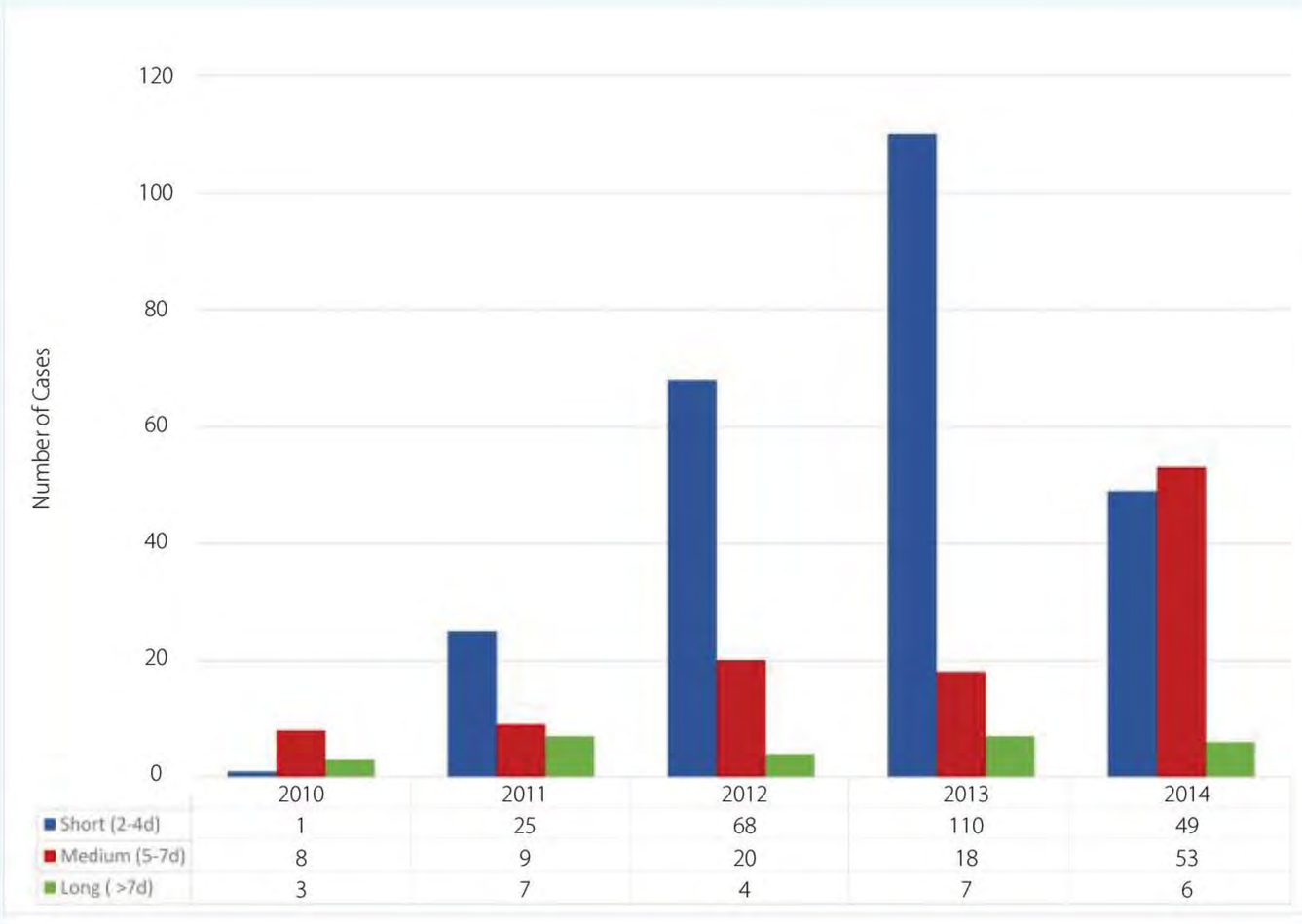


Table 2. Duration of Hospital Stay Among Robotics Assisted Cases (2010-2014)



	2010	2011	2012	2013	2014
Short (2-4d)	1	25	68	110	49
Medium (5-7d)	8	9	20	18	53
Long (>7d)	3	7	4	7	6

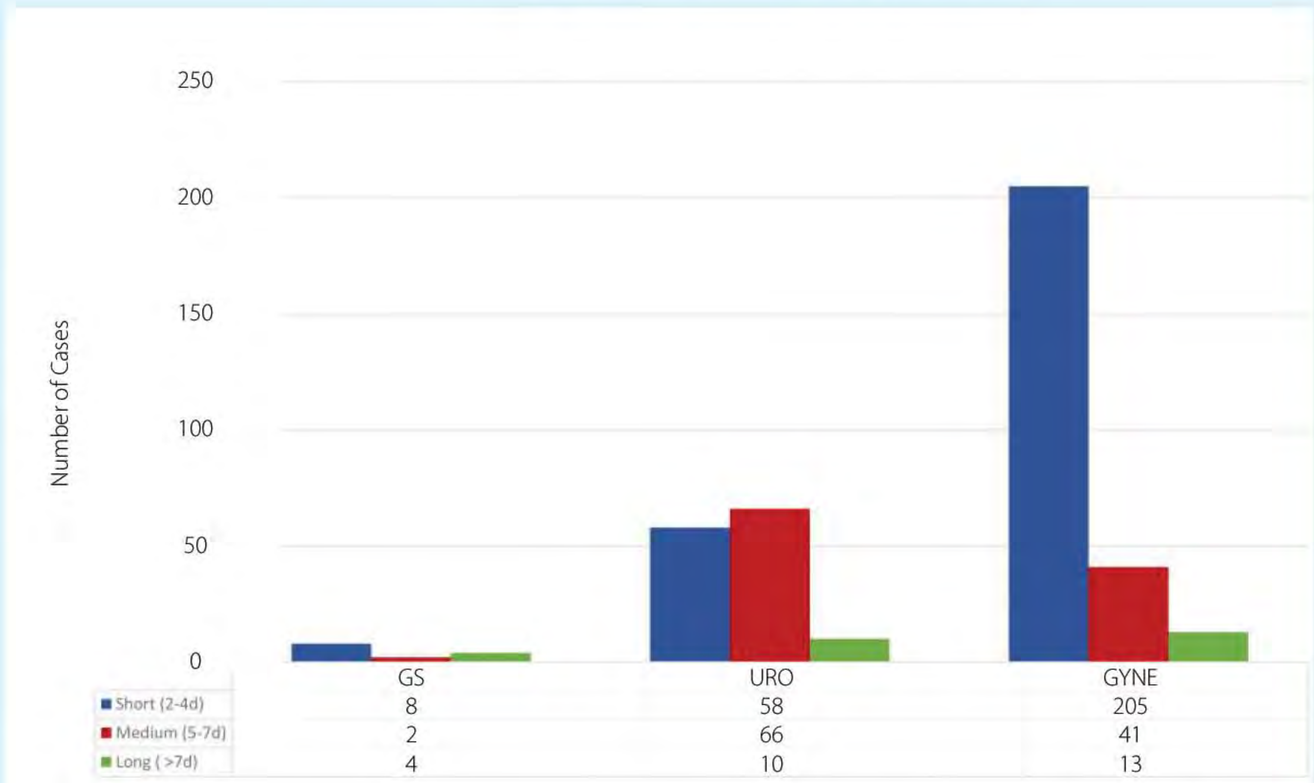
In 2010, when the first robotic assisted operations were performed, medium to long confinement outnumbered short stays at a 11:1 ratio. However, from 2011 to 2012, the recorded short hospital stay cases significantly accelerated over long and medium term confinement (Table 2). By 2012, short-term confinements numbered 68 out of 92 of the census (74 percent). By 2013, short term patients accounted for 110 out of the total 135 cases and the proportion to the total further increased to 81 percent that year.

The results reflect the increased expertise of robotic surgeons and the improvement in hospital stay outcomes as a result of accumulated experience in handling of robotic surgical cases in St. Luke's.

Broken down by surgical procedure, gynecologic cases had the highest proportion of short-term confinements at 205 (out of 271 or 76 percent) from as early as the first year of the availability of the robotic surgical technique (Table 3).

The surgical efficacy and success rates for all three complex of robotic surgeries are equal to, if not better than, open or laparoscopic surgery, given other parameters such as the level of advancement of the disease in each of the cases.

Table 3: Duration of Hospital Stay Among Robotics Assisted Cases (2010-2014) Per Specialty



From the surgeon's console, the robot can mimic a human wrist's movement through EndoWrist technology.



Therefore, robotic surgery has changed and revolutionized surgery in the Philippines. St. Luke's is proud to be at the forefront of this development to make available to Filipinos the latest in medical technology that promises the best possible clinical outcomes, patient safety and satisfaction.



INSTITUTE OF UROLOGY

Urology is the branch of medicine that focuses on the diseases and disorders of the male and female urinary tract system and the male reproductive organs. The vital organs fall under urology, principally the kidneys, adrenal glands, ureters, urinary bladder, urethra, and the male reproductive organ (testes, epididymis, vas deferens, seminal vesicles, prostate and penis).

The Institute of Urology is dedicated to providing the most modern diagnostics and treatment to patients afflicted with disorders and diseases of the male and female urinary system and the male reproductive system.

St. Luke's is at the forefront of cutting-edge of surgical technology in the field of urologic medicine. Its urologists and support nursing and technical staff are well-trained in minimally invasive surgical procedures, with robotic-assisted surgery at the leading edge. As back-up, the Institute employs real-time ultrasound guidance, fiber-optic endoscopic equipment and various diagnostic and treatment lasers for various urinary conditions.

The staff is composed of board-certified and fellowship-trained urologists who are experts in the different aspects of genito-urinary malignancy, urinary obstruction, urinary stone disease, pediatric urology and male sexual dysfunction.





The Institute currently employs urologic treatment using the state-of-the-art da Vinci robotic-assisted surgery. Complex urological procedures such as nephrectomy (kidney removal) or partial nephrectomy (nephron-sparing surgery) and even radical prostatectomy can be performed safely and with minimal post-operative risks through the robotic system.

With advances in medical technology and investment in leading edge therapeutic equipment, the Institute is providing the best healthcare with superior clinical outcomes in treatment and success and better benefits in terms of shorter hospital stay, less blood loss, improved pain management and faster recovery to normal functioning for the patient.

Robotic Assisted versus Open Radical Prostatectomy: A Comparative Study of Clinical Outcomes

Josefino C. Castillo, MD, DPBU, FPCS, FPUA

Prostate cancer is a disease generally afflicting older men with malignant (cancer) cells in the tissues of the prostate. The prostate is a gland in the male reproductive system located below the bladder and in front of the rectum. About the size of a walnut, it surrounds the urethra, the tube that empties urine from the bladder. The prostate gland produces fluid that is one of the components of semen.



Dr. Josefino Castillo is the Head of the Institute of Urology at St. Luke's-Global City.

Prostate cancer is the most common non-skin malignancy in men and accounts for more deaths than any other cancer, except for lung cancer. In fact, microscopic evidence of prostate cancer is found at autopsy in most men. The American Cancer Society estimated that 218,890 new cases of prostate cancer were diagnosed in the United States in 2007.

In the Philippines, Radical Prostatectomy is still the standard surgical treatment for clinically localized prostate cancer, particularly in patients with life expectancy of more than 10 years. The affected prostate is accessed through an open incision that enables the surgeon open visualization and manual manipulation of the affected organ. However, this major surgery is associated with a host of complications and sequelae, including blood loss, postoperative urinary incontinence and erectile dysfunction.

In order to reduce the invasiveness of traditional open surgery and to improve functional results, Laparoscopic Radical Prostatectomy (LRP) was developed. However, it has the disadvantages of steep learning curve, reduced range of motion, two-dimensional vision, impaired eye-hand coordination, and reduced haptic sense.

To address these surgical difficulties, robotic technology was explored combining ten times optical magnification, three-dimensional vision, and instruments yielding seven (7) degrees of freedom. All these enable surgeons to perform meticulous, precise and truly accurate movements that are fundamental in preserving anatomic structures. When applied to radical prostatectomy, robotic surgery might yield real advantages, not only in terms of shorter learning curves but also in the ability to improve functional results without impairing oncologic outcomes. The surgeon is 100% in control of the da Vinci system, which translates the hand movements into smaller, more precise movements of tiny instruments inside the body.

Robotic Surgery

The Robot-assisted Radical Prostatectomy (RARP) began in 2000 with the first cases done in France and Germany. Later, in 2004, the RARP technique was standardized and became known as Vattikuti Institute Prostatectomy, which led to the significant popularity of RARP both in the United States and Europe. It has been estimated that 75% of radical prostatectomy now use the da Vinci platform (Intuitive Surgical Inc., Sunnyvale, CA, USA).

St. Luke's acquired the da Vinci Si Robot system for use in complex urologic, gynecologic and general surgery procedures in November 2010. For the record, the first RARP in the country was performed in St. Luke's-Global City.



One of the tests to detect prostate cancer is though a prostate biopsy.

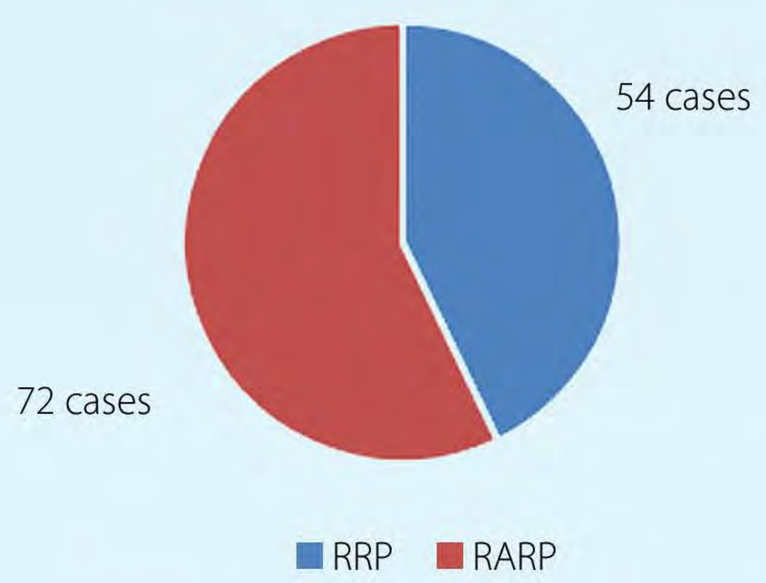


Figure 1. Frequency Count by Type of Radical Prostatectomy Procedure

RRP and RARP Census

To date, St. Luke's has performed a total of 54 cases of open Retropubic Radical Prostatectomy (RRP), from 2006-2013, and a total of 72 cases of RARP covering the period 2010-2013 (Figure 1).

In comparing the surgical outcomes of these two surgical modalities, it is important to consider the non-procedural clinical factors that affect the outcomes.

These variables include the surgeon's surgical experience, clinical patient characteristics and the specific characteristics of the cancer in each patient. These data from our series were derived from 13 different surgeons, who performed open RRP, while 14 different surgeons

performed RARP. All robotic assisted surgeries used the trans-peritoneal six-port approach with the da Vinci platform.

For both surgical groups, the patients' characteristics in terms of age and body mass index were comparable with no significant statistical difference (Table 1). The oncologic status of both surgical groups likewise showed no statistical difference in terms of pathologic tumor stage distribution. No significant difference was noted for Gleason score characteristics between the two groups. The Gleason score is used to help evaluate the prognosis of prostate cancer. The higher the Gleason score, the more aggressive the cancer.

Table 1. Comparative Profiles of RRP and RARP Census

Profile RRP	(N = 54)	RARP (N = 72)	P Value*
Age	62.10 +6.50 [43-75]	63.21+7.35 [43-79]	0.349
BMI Level	24.46 +3.70 [17-32]	25.84+3.19 [15-35]	0.241
Gleason's score: <6	17(31.4)	22(30.5)	0.8116
Gleason's score: 7	26(48.1)	40(55.5)	0.2764
Gleason's score: 8-10	10(18.5)	10(13.8)	0.9999

**p value indicates probability of the computed statistic (difference between RRP and RARP means) occurring at a significant distance versus zero (i.e. no difference).*

Perioperative and Functional Outcomes

According to the latest report of meta-analysis in 2012 by Novara et al, the operative time showed no statistical difference between the two surgical approaches. Indeed, in the landmark study by Ficarra in 2009, the RARP was more time-consuming than RRP in the earlier phase of the learning curve, but such differences disappeared with the passage of time and a larger robotic cohort of cases.

In the series of cases at St. Luke's, comparative analysis on operative time also showed no statistical difference between RRP and RARP. This is consistent with the current statistical data obtained in the St. Luke's Medical Center Census (Table 2).

Initially, operative time for RARP was more time-consuming than RRP in the earlier phase of the learning curve (Level 2B) but such differences disappeared with a larger robotic cohort of cases (Level 2B). That is particularly true in our series at St. Luke's, when the cases were plotted into three chronologic clusters of 25 cases. The trend of operating time is generally decreasing.

The same comparative analysis report on perioperative blood loss by Novara in 2012, pooled effect estimate showed in favor of RARP. Transfusion rate was likewise significantly lesser in RARP compared to RRP. In our series, with a weighted mean difference of 436 ml the estimated blood loss is statistically significantly in favor of RARP.

Systematic review comparative analysis on hospital stay showed that RARP had the shortest hospital stay (1.4 days in US studies, 4.0 days in non-US studies), RRP had the longest length of stay (3.1 days in US studies, 9.9 days in non-US studies). In the St. Luke's study, average hospital stay among the RARP patients was significantly shorter than RRP. The mean hospital days were likewise comparable to the evidence reported in international studies.

Long term functional outcomes for patients were also measured as a further important aspect of comparison between the two radical prostatectomy procedures. Observations on the 12-month continence and potency rates of the census patients were made in connection with the study.

From the systematic meta-analysis review article by Ficarra1 in 2012, when comparing the two surgical modalities, there was a 3.8% absolute risk reduction of urinary incontinence in RARP, which also shows a significant advantage in favor of RARP. Comparatively, in the census, measurement on12-month continence was statistically significantly higher among RARP patients relative to RRP cases. The RARP continence rate had 23% margin of difference in absolute risk reduction compared to RRP (Table 3).

In the same Ficarra study (2012), absolute risk reduction for erectile dysfunction was 23.6%, which was statistically significant advantage in favor of RARP. Significantly better 12-month potency rate was observed among RARP patients than RRP cases. The difference of 27.7% between the two represents the absolute risk reduction of erectile dysfunction that RARP patients experience over the RRP cases.

Table 2. Comparative Perioperative Outcomes of St. Luke's RRP and RARP Census

Outcomes	RRP	RARP	Weighted Mean Difference	P Value*
Operation Time	269.8±56.4 [180-520]	275.8±171.03 [120-600]	-6.01	0.804
Estimated Blood Loss (in Li.)	647.08 ± 295.18 [Range: 300-1500]	210.9±95.16 [20-700]	436.15	<0.001
Blood Transfusion	31(57.4%)	1(2%)	Odds Ratio=0.0104	< 0.001
Hospital Stay	6.8 ± 2.2 [Range: 4-17]	4.3±1.8 [2-14]	2.45	<0.001
Catheter Duration (In days)	12.0±2.4 [7-21]	8.5±3.6 [7-14]	3.53	<0.001

Table 3. Comparative Functional Outcomes in St. Luke's Census of RRP and RARP Cases

Outcome	RRP(N=46)	RARP(N=57)	Odds Ratio	P Value
12-Month Continence	32 (70%)	53(93%)	2.11 [95% CI 1.23- 4.10]	0.003
12-Month Potency Rate	28(60%)	50(87.7%)	1.44 [95% CI 1.01-2.12]	0.002

Conclusion

The comparative census study of RARP and RRP modalities using St. Luke's single institution caseload data shows that perioperative and functional outcomes are statistically significantly better in the RARP procedure over the RRP procedure.

In addition, St. Luke's clinical outcomes are at par (if not better) than and consistent with the current evidences of international centers abroad. The census findings are a testament to the outstanding expertise of the Medical Center's urologic surgeons and medical staff.

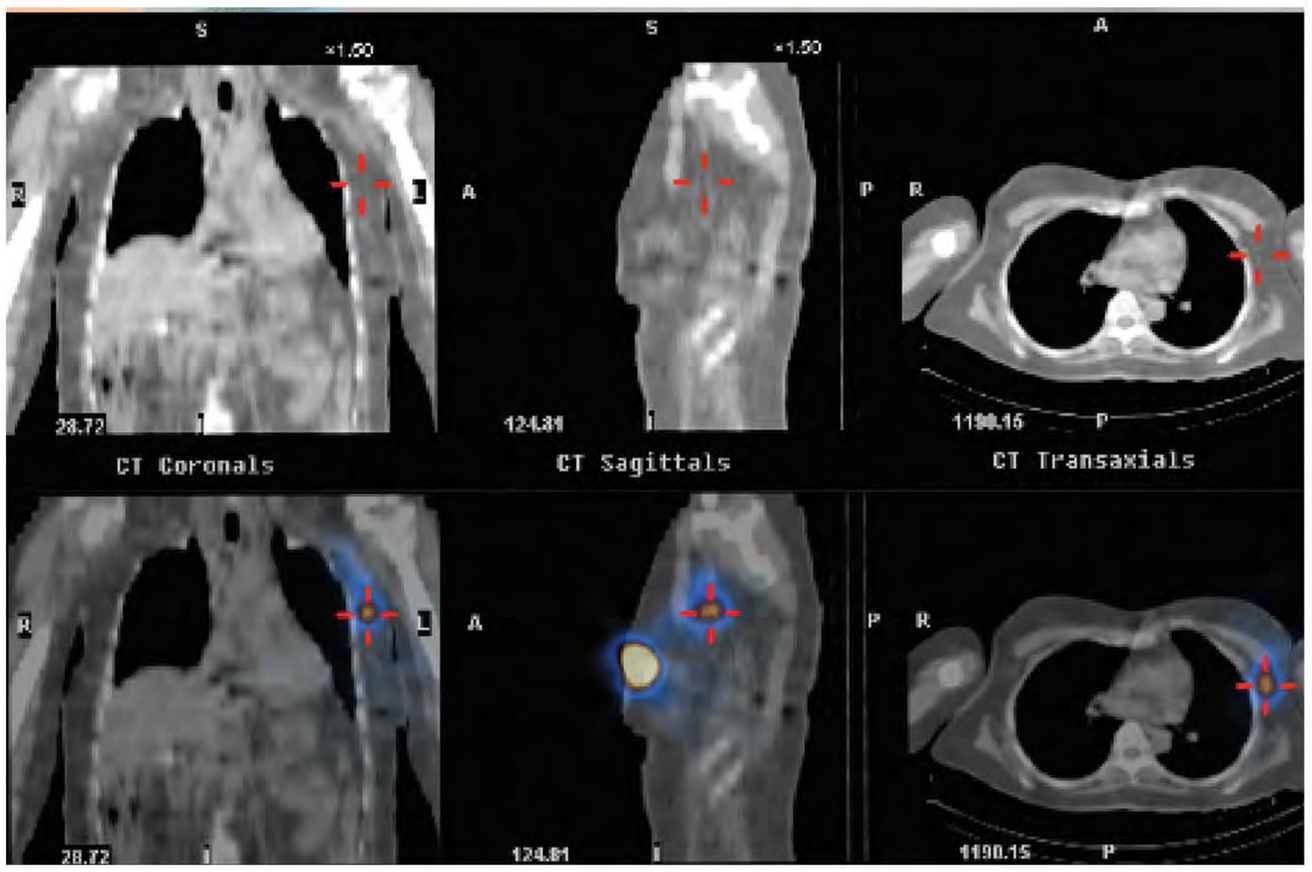


DEPARTMENT OF NUCLEAR MEDICINE

The Department of Nuclear Medicine plays a crucial role in the diagnosis and treatment of a variety of diseases. Diagnostic information is obtained through the safe use of small amounts of radioactive materials. Larger amounts of radiation can be administered to specific target tissues and organs during radionuclide therapy.

It is equipped with state-of-the-art technology that provides the best diagnostic tools in the country, such as Positron Emission Tomography/ Computerized Tomography (PET/CT), Single Photon Emission Computerized Tomography/ Computerized Tomography (SPECT/CT), Radioimmunoassay, and Bone Densitometry. In fact, the PET Center at St. Luke's Medical Center-Quezon City is the first of its kind in the country and has since pioneered the practice of this modality.

The Department offers a wide array of tests for the evaluation of medical conditions affecting the cardiovascular, endocrine, gastrointestinal and central nervous systems to name a few. Furthermore, the diagnostic utility of nuclear medicine has been extended into the operating room, enabling surgeons to perform Radioisotope-Guided Surgery (RGS), such as sentinel lymph node biopsy and parathyroidectomy. With the use of RGS, the extent and duration of surgery can be minimized with less post-operative complications.





Aside from FDG PET/CT, the Department also offers a multitude of tests for detecting cancer. One of these is Scintimammography, which allows the detection of breast cancer in individuals not eligible for conventional X-ray mammography.

In Scintimammography, a small amount of radioactive tracer is injected in a vein, and potentially cancerous breast lesions are identified based on their ability to take up the radiotracer.

Selective Internal Radiation Therapy (SIRT)

Eric B. Cruz, MD

Liver cancer collectively refers to both primary hepatocellular carcinoma (HCC) and metastatic disease from other types of cancer, such as colorectal carcinoma. Based on the April 2011 data of the World Health Organization (WHO), it is the 3rd most common malignancy, and is ranked 15th among the leading causes of death in the Philippines.



Dr. Eric Cruz is a nuclear medicine consultant at St. Luke's Medical Center who specializes in SIRT.

According to local data, it is the 3rd most common malignancy in men, and the 6th in women, with a 5:1 male-to-female prevalence. Most die within a year after diagnosis, and the five-year survival rate without treatment is less than 5%. With early diagnosis and aggressive treatment, 5-year survival can be improved to as much as 35%. In 2011, some 11 out of every 100,000 Filipinos reportedly die from liver cancer, though this incidence was likely underestimated due to the likelihood of a greater number of undocumented cases.

Beginning in 2009, St. Luke's Medical Center, through the Department of Nuclear Medicine and the Section of Vascular and Interventional Radiology, introduced Selective Internal Radiation Therapy (SIRT), a revolutionary treatment alternative for liver cancer. SIRT is an approved option for patients with advanced primary and secondary liver tumors who are not eligible for surgery that significantly improves their survival.

Using state-of-the-art technology, SIRT delivers high-dose radiation only to liver tumors. Microscopic, biocompatible, radioactive, polymer plastic beads called SIR-Spheres microspheres are introduced within these targeted liver masses where the emitted radiation kills nearby cancer cells. Because of this selective iiradiation of liver tumors, normal liver tissue--and the rest of the patient's body--receives minimal levels of radiation.

SIRT utilizes state-of-the-art technology that delivers target-specific radiation directly to liver tumors.



SIRT is an internationally recognized effective treatment that prolongs the survival of patients with inoperable liver cancer. Multicenter studies conducted abroad have shown that using SIRT alone can afford patients a longer survival of 6.9 to 24.9 months. When used as an adjunct to systemic chemotherapy or transarterial chemoembolization (TACE), patients can survive up to 42 months.

The survival of our patients at St. Luke's Medical Center who have undergone SIRT has been at par with that of patients who have been treated in other centers abroad.

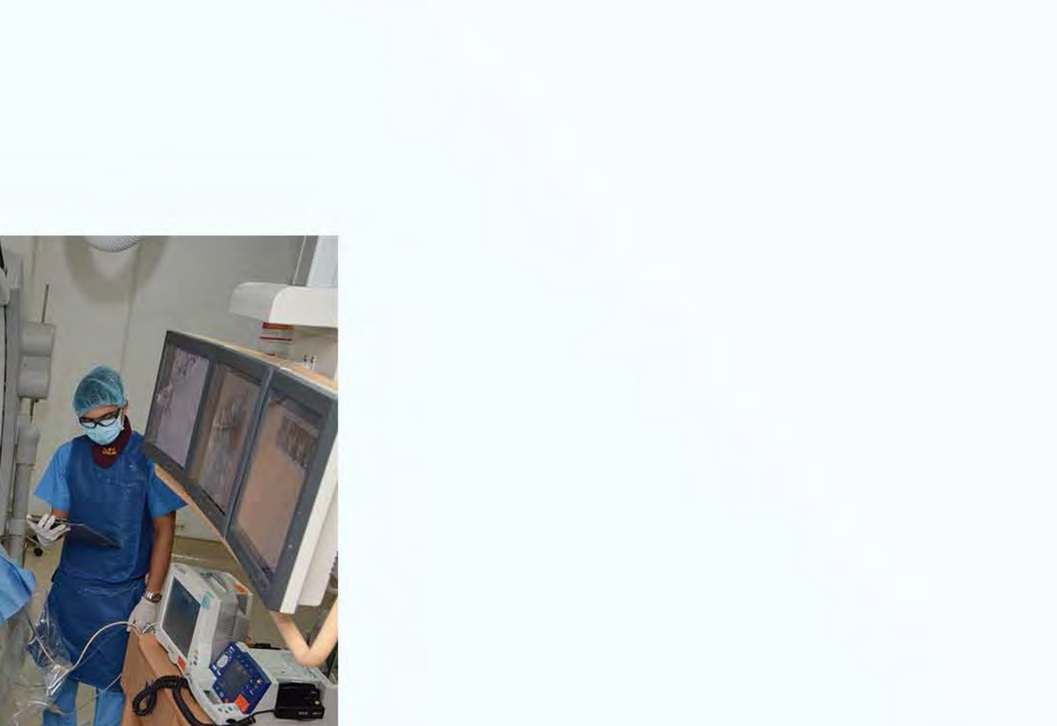
From the time SIRT was introduced at St. Luke's Medical Center, a total of 17 patients have undergone the procedure as of October 2013. Some of these patients had systemic chemotherapy, TACE or other forms of liver cancer therapy before or after SIRT. Four of these patients are currently enrolled in an international multicenter study, hence their current status cannot be divulged at the present. However, five of the remaining 13 patients, are still alive to date.

Based on the study by Cruz and Mendoza (2013), Kaplan-Meier analysis of data from the 13 patients revealed a median overall patient survival of 15.0 months (46.7 ± 15.44%). Survival rate during the first three months was 100%; only by the 4th month after SIRT did the survival rate go down to 83.33%. HCC patients had longer survival than patients with metastatic colorectal carcinoma (i.e. 15.0 months [45 ± 17.43%] and 0.5 months [50 ± 35.4%], respectively). Since 2013, the number of SIRT procedures performed at St. Luke's has increased, and the observed patient survival has improved likewise.

The applicatiion of SIRT for liver metastases from uveal melanoma and neuroendocrine tumors has already been documented, and studies that look into the use of SIRT for other metastastic malignancies are currently being conducted abroad.

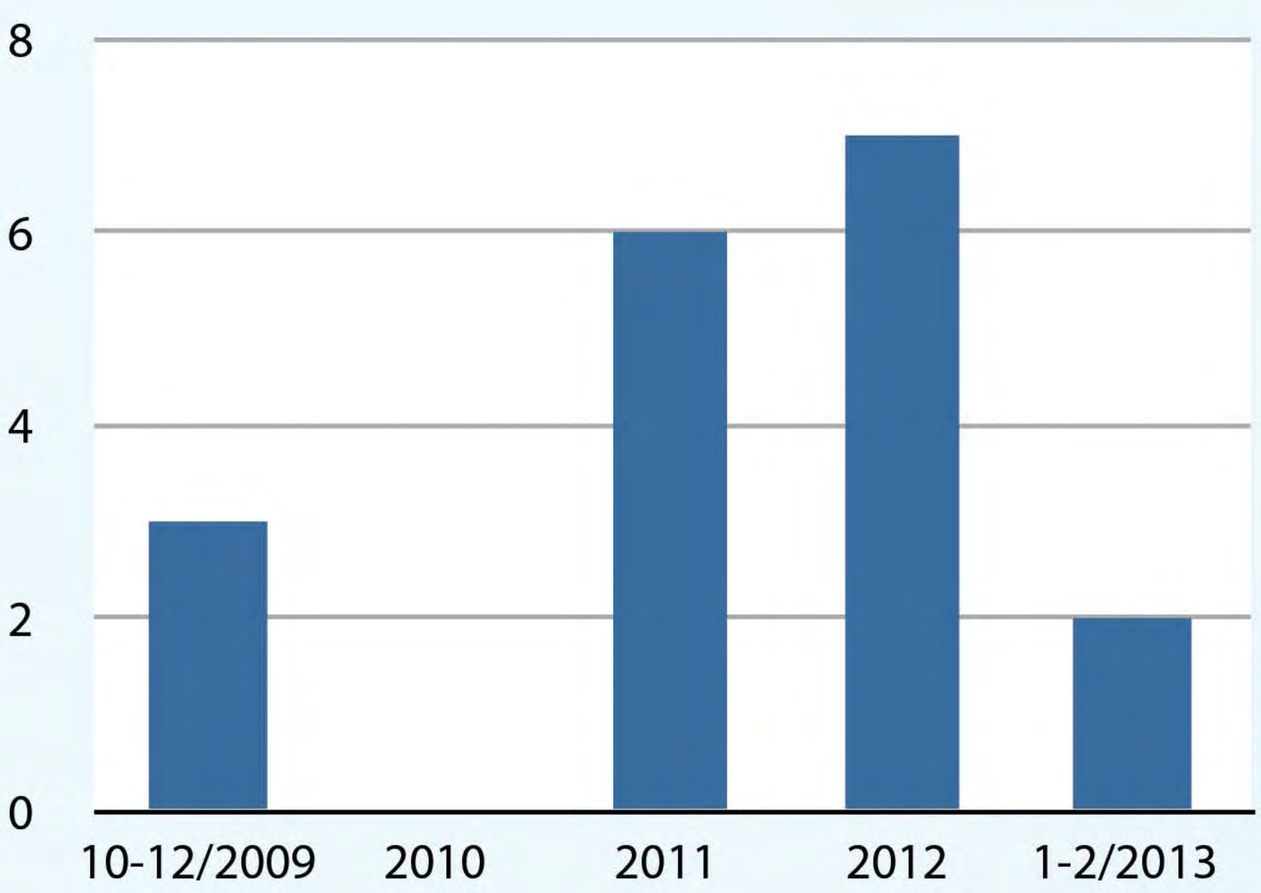
SIRT is a safe procedure. Several centers have reported procedure-related mortality as low as 1.8%. To date, the SIRT team at St. Luke's has had no intraoperative mortalities nor any SIRT-related morbidities.





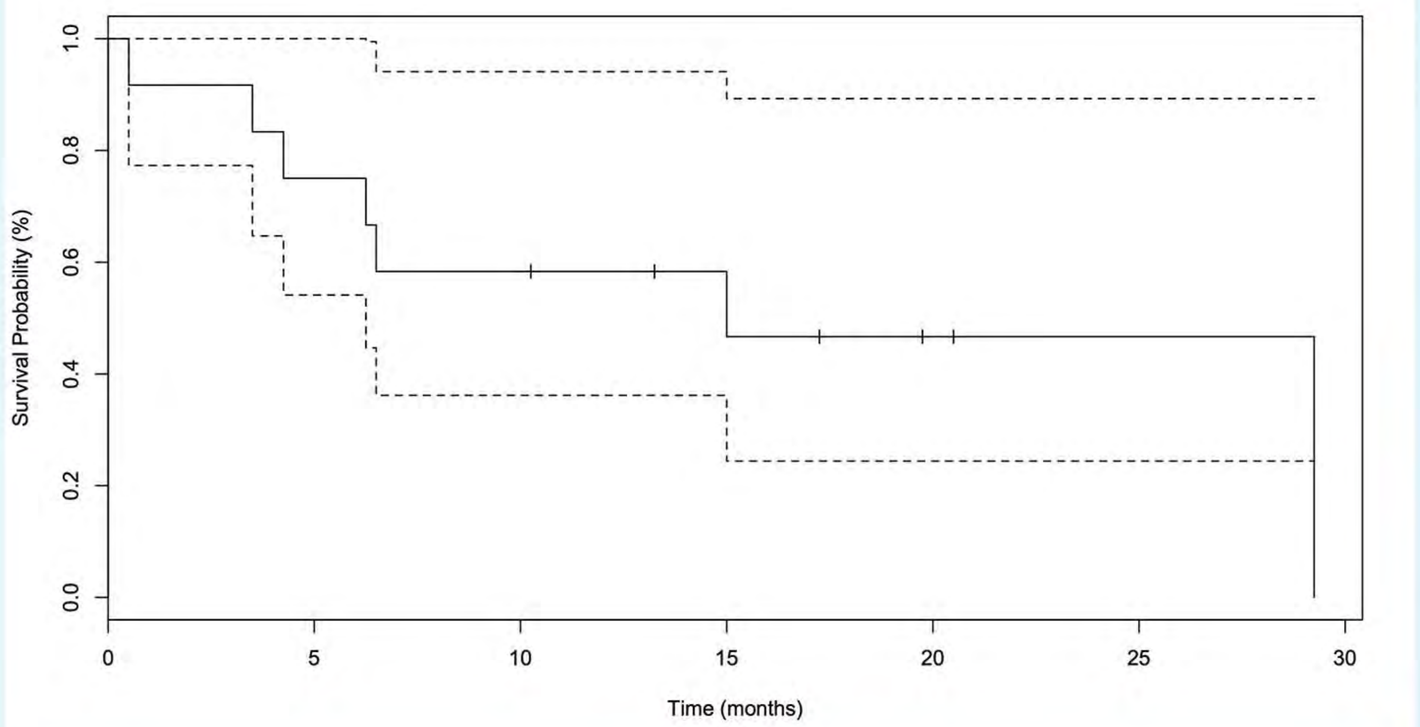
Dr. Angelito G. Tingcungco (front row, second from the left), Head of the Section of Vascular and Interventional Radiology, performs hepatic angiography as part of SIRT.

Number of SIRT Patients (October 2009 to February 2013)





Liver specialist Dr. Ian Cua explains SIRT to a patient.



Patients who underwent SIRT at St. Luke's had an overall median survival of 15 months by Kaplan-Meier analysis, comparable to previously reported survival rates in other centers abroad ranging from 3.6 to 18.6 months (Gray et al., van Hazel et al., Sharma et al., and Nace et al.).

What is SIRT?

SIRT is conducted by a multidisciplinary team that includes the attending physician, a liver specialist, a nuclear medicine physician, an interventional radiologist, and others trained to work with radiation.

The process entails the slow introduction of radioactive microparticles directly into the tumor through arterial catheterization of the liver. Since liver malignancies are mainly supplied by the liver's arterial blood supply, SIR-Spheres microspheres are delivered to the target tumors through a catheter inserted in the femoral artery at the upper thigh and threaded through the hepatic artery into the targeted tumor. These microsphere particles average 32 microns in diameter, making them small enough to get trapped in the capillary beds of the tumor.

Once permanently implanted inside the tumor, the microspheres destroy the liver tumor primarily through local irradiation, and secondarily by reducing the tumor's blood supply.

The beta radiation from the particles slowly destroys malignant cells within a 2.5mm radius, thus effectively decreasing the size of the tumor. Radiation is wholly contained within the patient's body and is continually delivered over approximately two weeks.



DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

Women have very special health needs and conditions because of their unique role in procreation. Which is why medicine has devoted specific fields of study dedicated to the health of women and the female reproductive system. Obstetrics refers to the medical study and practice of reproductive health and deals with pregnancy, childbirth and the postpartum period.

Gynecology is involved in diagnosis and treatment of the conditions and diseases related to the female reproductive systems (vagina, uterus and ovaries) and the breasts.

Among most medical practitioners in this field, the specialties of gynecology and obstetrics are combined for the complete delivery of specialized healthcare for women.

St. Luke's Medical Center offers the full spectrum of women's healthcare services, including yearly checkups, prenatal care and childbirth deliveries, post-delivery maternal care and specific gynecologic treatment and surgeries for particular conditions. The Department of Obstetrics and Gynecology puts prime importance to women's health, assuring female patients the best care in relation to their reproductive system.





The Department is equipped with up-to-date ultrasound machines and staffed by outstanding clinicians in OB-Gynecology who deliver top-quality expertise in evaluation, diagnosis and management of each patient.

It provides a whole spectrum of OB-gynecologic diagnostic procedures, supported by advanced diagnostic imaging services that aid Ob-Gyn consultants in the management of pregnancies of patients, as well as the detection and diagnosis of the pathology and abnormalities in women's reproductive anatomy (uterus, cervix, uterine endometrium and ovaries) and the pelvic floor.

The Department has thus achieved the lofty stature as a center of excellence in women's health in the Philippines.

Precision Robotic Surgery in Gynecology

Jennifer Marie B. José, MD, FPOGS, FPSURPS, FPSGE

Abnormalities in the gynecologic tract and reproductive system have become a common occurrence among women in this day and age.

Thus, it is not surprising that cysts, polyps, tumors and cancer can grow in the female reproductive anatomy which often requires surgical removal to prevent deterioration of the condition and other complications which may worsen the morbidity and mortality outlook for the patient.

Gynecological surgery refers to surgery on the female reproductive system, including procedures for benign conditions, cancer, infertility, incontinence and prolapses.



Dr. Jennifer José is the first Filipino robotic surgeon to be certified internationally by Intuitive Surgical, Inc., makers of the da Vinci Si surgical system.

The Next Generation Gynecologic Surgery Technology

Laparoscopic procedures for gynecologic surgery have now become more widely accepted in clinical practice in the United States and other developed countries, and is rapidly gaining support in the Philippines.

Laparoscopy is a type of minimally invasive procedure which involves making a small incision for the operation, instead of a long cut in the target region in open surgery.

The laparoscope, a thin rod with a lighted telescope at the end, is inserted through the tiny incision which provides visual display of the area, and small surgical instruments are placed inside which allows the surgeon to perform the indicated procedure.

Since 2005, surgical medicine has now adopted the groundbreaking next-generation procedure – robot-assisted surgery, which is even less invasive than laparoscopic surgery.

The proprietary da Vinci robotic surgical system was cleared for use in gynecologic surgery, and many surgeons have embraced because of its advantages of advanced instrumentation, high definition 3-D optics for more precise imaging, ergonomics and more precision in autonomous surgical control.

Complex and delicate specialized surgeries such as hysterectomy, removal of malignant gynecological tumors, myomectomy (removal of uterine fibroids), endometriosis, and pelvic organ prolapse repair, can be more precisely performed using robotic surgery.

Although individual studies vary, robot-assisted gynecologic surgery has generally resulted similar or better clinical outcomes than laparoscopic surgery, but with the advantage of decreased blood loss, much lower risk of infection, shorter hospital stay and lessened post-operative pain and faster recovery for the patient and return to normal activities.

St. Luke's Pioneering Robotic Surgery Facilities

In the Philippines, St. Luke's Medical Center holds the distinction of being the country's first institution to invest in the cutting-edge third generation robotic da Vinci Si Surgical System. It was acquired use in complex urologic, gynecologic and general surgery procedures in November 2010.

By 2014, it reached the milestone of the undisputed distinction of having performed over 300 robotic surgical procedures. The team also achieved the feat of handling the most number of gynecologic robotics cases in the Philippines, making St. Luke's one of the leading exponents of and the most experienced Philippine medical institution in robotic surgery in Southeast Asia. Robot-assisted gynecologic surgeries are performed on the following procedures:

- Hysterectomy [surgical removal of the uterus]
- Myomectomy [surgical removal of myomas, tumors]
- Oophorectomy [surgical removal of the ovaries]
- Oophorocystectomy [surgical removal of the cyst in the ovaries]
- Tubal reanastomosis [reattachment of the fallopian tubes]
- Sacrocolpopexy [suspension of the vaginal vault to the sacrum]

St. Luke's is the first to be and remains the only center in the Philippines equipped with the most advanced robotic surgery equipment. And its Robotic Gynecologic Surgery Section boasts of a core group of four (4) doctors who have been certified by the US-based Intuitive Surgical, Inc., makers of the da Vinci Si system.

Retrospective Robotic Gynecologic Surgery Outcomes

St. Luke's has performed the most number of gynecologic robotics cases in the Philippines at 289 patients since the da Vinci Si system has been put in place in 2010 up to September 2015. Gynecologic cases account for the highest utilization rate for robotic surgery in St. Luke's.

In this census of gynecologic patients, the majority of cases consisted of hysterectomy (59 percent) and myomectomy (20 percent). The balance consisted of adnexal surgery - oophorectomy and oophorocystectomy (11 percent) and sacrocolpopexy (5 percent). There were cases of uterosacral ligament fixation, tubal reanastomosis and bilateral lymph node dissection.

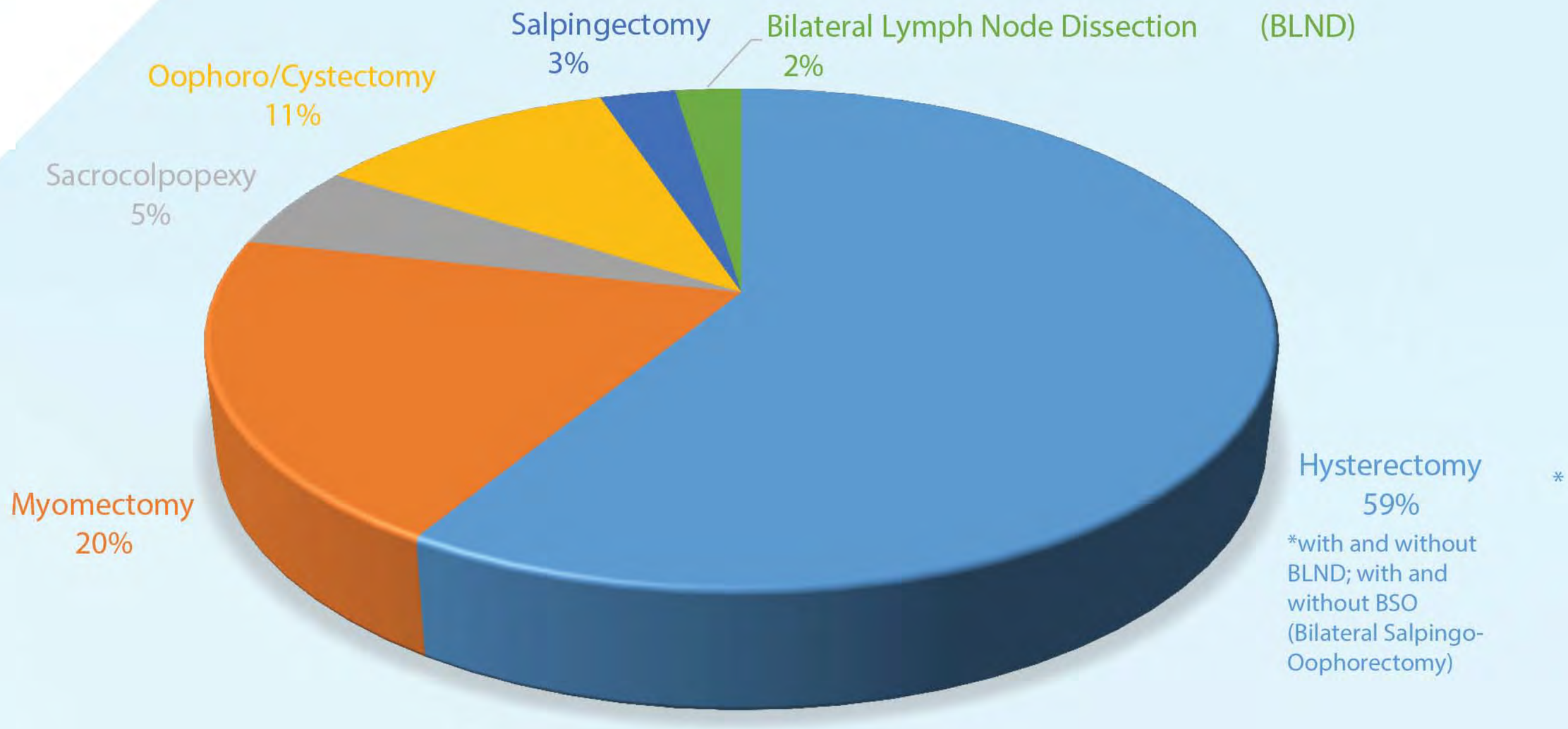
Clinical outcomes were observed and measured for this census of patients in terms of treatment effectiveness and non-medical management parameters. All 289 cases exhibited 98 percent success, as well as 100% absence of infection incidence and minimal proportion of blood transfusions during the operations. The complication rate is 0.85%. The average hospital stay ranged from just 2 to 4 days, considerably lower than open surgery of the equivalent procedure. Anecdotal testimonies of return to normal activities a few days after the operation were also recorded for a significant number of patients. Patients have also experienced much lower psychological anxieties and pain due to the utilization of this procedure.

Because robotic surgery is the least invasive surgical procedure, it is highly suited to the elderly patients (above 65 years old). There were 2 cases who were more than 80 years old who were part of the census. Robotic surgery likewise has the benefit of leaving no unsightly scars on patients.

Conclusion

St. Luke's commitment to invest and put in place leading edge technology and state-of-the-art equipment such as the da Vinci Si Surgical System has certainly given the Philippine public, and even those outside the country, access to medical resources and the best care to help them live long healthy and productive lives.

Robotic Gyne Cases 2011-2015
(289 cases)





DEPARTMENT OF RADIATION ONCOLOGY

Radiation oncology is a technology-based medical specialty that involves the use radiation therapy to treat various types of cancers. Radiation therapy utilizes precise targeted and regulated doses of high-energy radiation to directly kill cancer cells or to destroy the chromosomes of the cells that prevent them from further subdividing and growing. It is given either as a therapeutic modality alone or in combination with surgery and/or chemotherapy.

St. Luke's Medical Center's Department of Radiation Oncology is at the forefront of this leading edge technology-based medical protocol which features highly trained specialists and consultants and state-of-the-art cancer treatment facilities, some of which are only available in St. Luke's. These equipment include:

- High Dose Rate Brachytherapy
- Computerized Linear Accelerator
- Stereotactic Radiosurgery (SRS)
- Intensity-Modulated Radiation Therapy (IMRT)
- Respiratory-Gated Radiation Therapy





The Department boasts of one of the country's most capable center for radiation treatment and palliative systems because of cutting-edge equipment, complemented by highly qualified and an extensively trained team of experts including radiation oncologists who are supported by a multidisciplinary team of specialists in diagnostic radiology, medical oncology, surgery, gynecology and pathology, as well as specialty nurses.

St. Luke's has heavily invested in these advanced facilities in cancer care in line with its commitment to make available the most effective medical technology and processes in the country, while ensuring compassionate and quality patient care.

Managing Nasopharyngeal Carcinoma with Intensity Modulated Radiation Therapy

Miriam Joy C. Calaguas, MD; Diana Francesca P. Tuaño, MD

Nasopharyngeal carcinoma (NPCA) is a malignant neoplastic disease of the nasopharynx.

It has demonstrated marked geographical variation in terms of incidence. It is rare in the United States and Western Europe with its rate of incidence posted at 0.5 to 2 per 100,000. In Asia, it has been endemic, specifically in Southern China and Malaysia, where the incidence may reach a total of 25 cases per 100,000 per year. Intermediate risk regions include Southeast Asia, North Africa and the Middle East, and the Arctic.



Dr. Miriam Calaguas (right) is the Head of the Department of Radiation Oncology at St. Luke's-Quezon City. With her is chief resident Dr. Diana Tuaño.

Methods

Management of NPCA typically entails chemotherapy and radiation both given concurrently. Conventional radiotherapy or Intensity Modulated Radiation Therapy (IMRT) may be done to deliver the prescribed dose to the faciocervical area. Several studies have shown that the use of IMRT (with or without chemotherapy) increases the rate of locoregional control to 90+%.

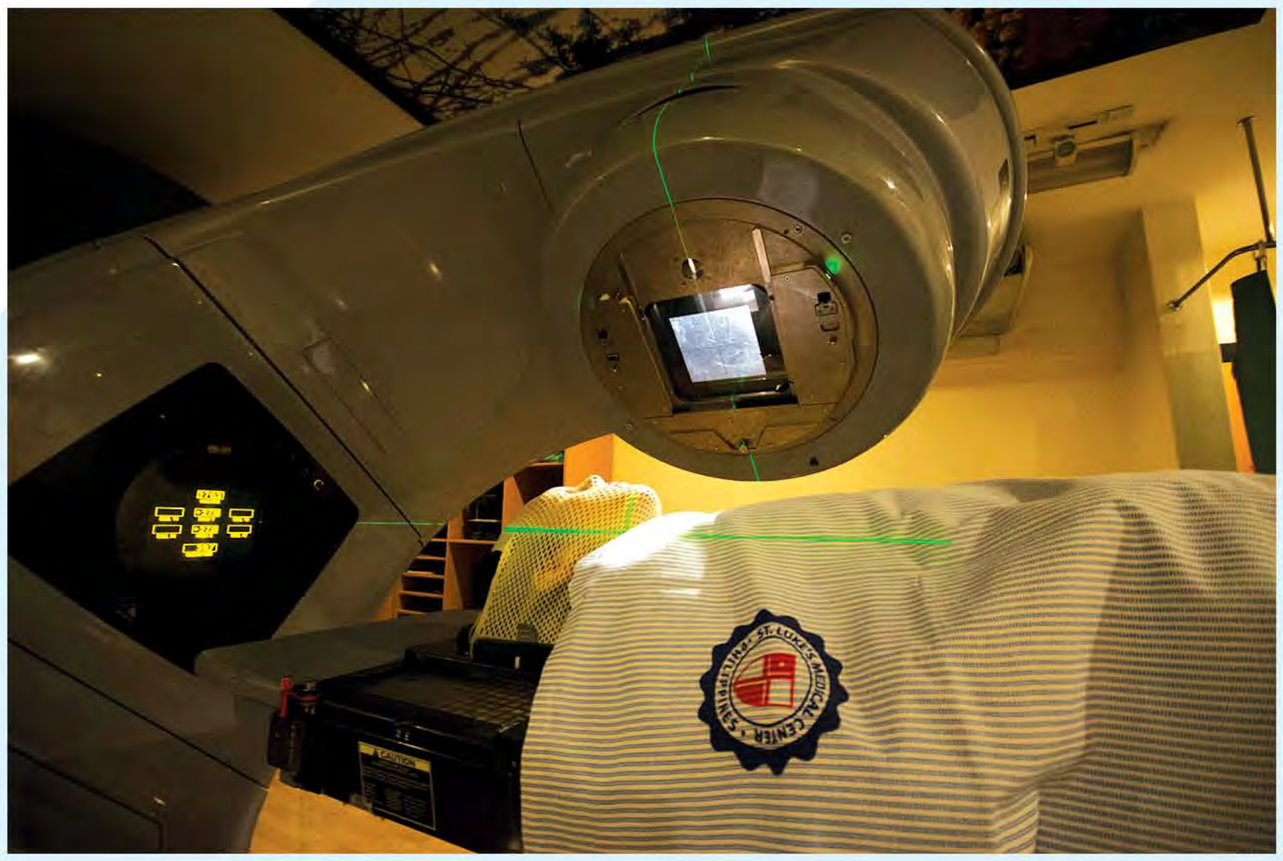
Of the 127 NPCA cases in St. Luke's Medical Center from 2006-2010, 61 % were given radiation treatment via the IMRT modality. Only 50 of these cases were included in the study analysis due to the inability to meet the inclusion criteria. All 50 cases were in advanced stages (II B – IV B) and majority were WHO type 3: undifferentiated type. All patients included in the study completed their radiation treatment.

Results/Outcomes

A total of 36% of these patients proceeded with their 7-week concurrent chemo-radiation therapy course without treatment interruptions. 40% had a treatment interruption for a few days (less than a week). A treatment interruption of more than 21 days decreased local tumor control from 67% to 34%.

The consensus is that prolongation of treatment time due to interruptions is likely to be detrimental. It was noted that the treatment interruptions of the patients were due to radiation-induced side effects such as mucositis, esophagitis and xerostomia.

In terms of the locoregional control rate, IMRT proves to be an effective treatment for nasopharygeal carcinoma.



Of the 50 follow-up imaging scans done 3 years post-treatment, 13 patients (26%) had complete nodal and local disease resolution, 29 of the 50 patients (58%) had tumor regression, eight patients (16%) had tumor progression and none of the patients showed a stable disease condition after 3 years. Aside from the treatment interruptions, the prevailing histology of undifferentiated carcinoma probably contributed to the outcome as well. In summary, 42 of the 50 patients included in the study (84%) had good locoregional control as displayed by resolution or regression of local and nodal disease. This value of 84% is somewhat similar to the locoregional control rates seen in many institutions in the world (Table 1). The consistently excellent locoregional control rates imply that nasopharyngeal carcinoma is very much responsive to treatment and that complete resolution or cure is possible.

Figure 1. 3-Year Locoregional Control

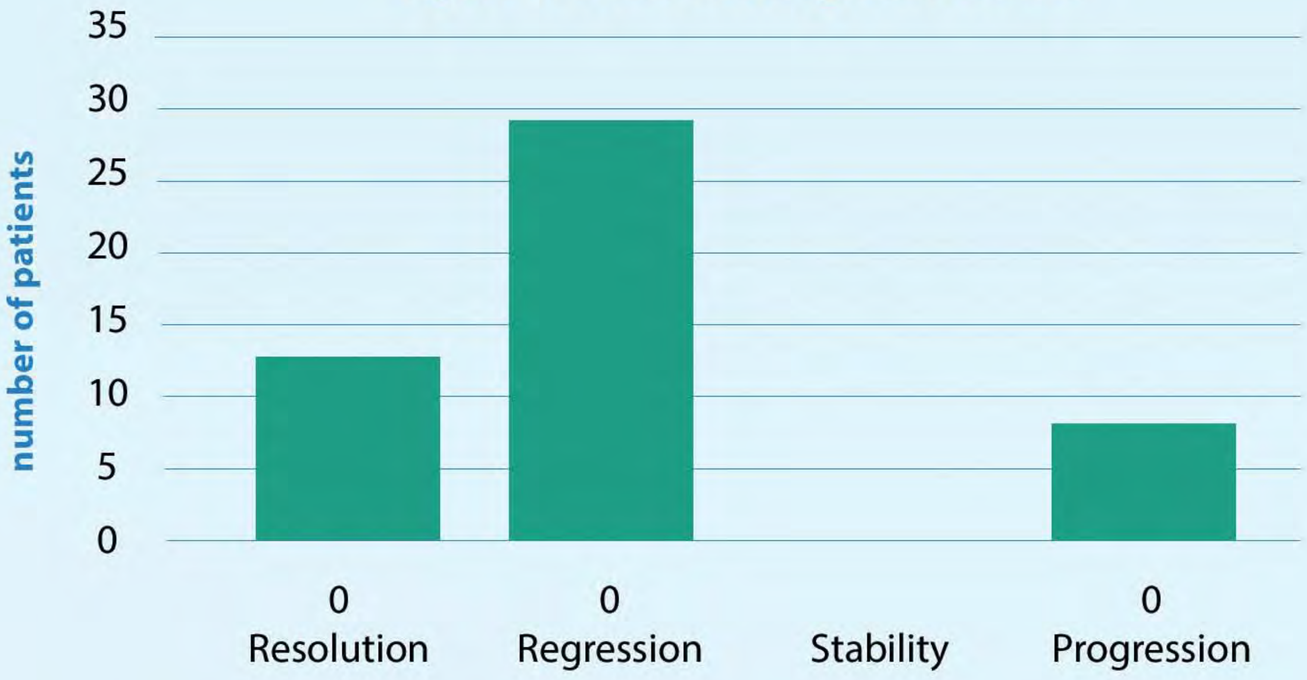


Table 1. Comparison of the 3-Year Locoregional Control Rate of St. Luke's Medical Center with Other Institutions

Institution	3-Year Locoregional Control Rates
St. Luke's Medical Center, Philippines	84%
Yijing Hospital Fourth Military Medical, China	93.9%
Memorial Sloan-Kettering Cancer Center, New York	93%
Chang Guong Memorial Hospital Kaohsiung Medical Center, Taiwan	84.2%

The extensive analysis applied in this study demonstrates the comparable effectiveness of the IMRT modality in the treatment of NPCA in St. Luke's Medical Center in terms of locoregional control rate. The numerical value of 84% attained by St. Luke's Medical Center for the locoregional control rate is approximately similar to the control rates seen in other international institutions.



AESTHETIC CENTER

Aesthetics is a philosophy and belief on the creation and appreciation of physical beauty. Since the dawn of medicine, man has strived to enhance beauty and restore the normal appearance of persons whose face and other parts of the body have been physically injured or those whose physical features are aesthetically challenged.

St. Luke's Aesthetic Center is a center of excellence dedicated to provide the best technology and modalities in surgical and non-surgical options to patients seeking solutions to their aesthetic problems.

Because aesthetics carries great value among individuals, medicine developed a special branch of surgery called aesthetic surgery that is concerned with the correction and enhancement of a person's face and other parts of the body. Apart from procedures for cosmetic purposes, aesthetic surgery includes reconstructive surgery, which is performed to correct disfigurement caused by burns and traumatic injuries, as well as congenital abnormalities such as cleft palates.

Highly skilled, Philippine Board of Plastic Surgery-certified surgeons work hand-in-hand with other Board-certified related specialists such as dermatologists, eye and ear, nose and throat surgeons,





psychiatrists, nutritionists, dentists and other allied medical professionals to ensure outstanding aesthetic results and comfort and safety for all these patients.

The Center provides a comprehensive array of procedures that include facial enhancement and rejuvenation, facelift, rhinoplasty for the nose, blepharoplasty for the eyelids, body contouring, breast augmentation and reduction, butt enhancement, liposuction, abdominoplasty, endoscopic aesthetic procedures, hair restoration and aesthetic dermatological procedures.

Scientific and advanced procedures coupled with the topnotch expertise and skills of St. Luke's doctors and aesthetic surgeons have resulted in superior aesthetic outcomes, as well as patient satisfaction, in an environment of professionalism and confidentiality.

Asian Upper Eyelid Fold Reconstruction: Pre-Tarsal Orbiclaris Excision Technique

Victor B. Lopez, MD

Asians have unique anatomical structure and shape with respect to the eyes, nose and upper facial area.



Dr. Victor Lopez is the Head of the Aesthetic Center at St. Luke's-Global City.

An Asian upper eyelid is characterized by a poorly defined, if not absent, upper eyelid fold. Approximately one-half of all Asians do not have an upper eyelid crease. This seems to affect more those of Chinese, Korean, and Japanese descent[1]. The other half of the Asian population has some form of upper eyelid crease, although this may not be as prominent as those found in Caucasians.

Asian eyelids differ from Western eyelids on several points. The following are but some of the differences:

Asians have shallower orbits and less prominent brows than Caucasians. The more prominent brow of the Western bone structure creates the deep superior sulcus almost absent in the Asian. The tarsal plate widths of Asian eyelids are narrower which also accounts for the narrower eyelid fold of Asians even if present.

Furthermore, the fat distribution of the Asian eyelid is less distinct and appears bulkier than the more defined Western Upper eyelid fat pads.

The presence of medial canthal folds in Asians even among those with upper eyelid creases distinguishes the Asian eyelids from the Western type of eyelids.
The eyelash direction in Asian upper eyelids are also usually directed downwards[2] following the surrounding structures that hold it.

And finally, there is the absence of levator muscle attachment on the upper eyelid skin in approximately half of Asian eyelids, and a poor degree of attachment in the other half of the population. The former results in the absence of an eyelid fold while the latter results in a poorly defined fold[3]. And somehow, a combination of all the above mentioned Asian eyelid characteristics contributes to the bulkier anterior pre-tarsal upper eyelid of Asian eyes.

Because of all these differences, upper eyelid fold reconstruction techniques applicable to Caucasians may not always result in a natural-looking upper eyelid fold in an Asian face. And so while a significant number of patients seeking surgery may expect to have a deep, well-defined upper eyelid similar to the western models they see in the magazine ads[4], both surgeon and patient must take into consideration the anatomy peculiar to Asian eyes in order to avoid unrealistic expectations and disappointments.

Several techniques have been described and employed for the creation of lid folds, However not one technique can be applied to the majority of Asian eyes. Most of these techniques currently used by surgeons require a need to anchor the skin to the deeper eyelid structures, and because of the reasons explained above, this may sometimes lead to extrusion, soft tissue reaction and or infection, not to mention unnatural results.

The Asian Eyelid Reconstructive Surgery

Taking into account the anatomy of the upper eyelids common to Asians, important but subtle modifications are described in this technique to create an adequate upper eyelid crease.

The pre-tarsal area was undermined and debulked by excising a strip of pretarsal orbicularis muscle. This not only creates a flatter pretarsal area but will also ensure a permanent adhesion between the pretarsal skin and the tarsal plate creating a permanent crease. Skin sutures were anchored to the underlying subcutaneous tissue just enough to stretch the pretarsal skin and lift the upper eyelid lashes. These steps avoid the creation of a deep crease and "rounding" of the pretarsal skin that usually contributes to the unnatural appearance of the Asian eye that may sometimes happen when anchored to the Levator complex. Excision of fat pads gives the patient a deepening and a more concaved upper eyelid area.

A permanent natural-looking Asian eyelid crease was achieved in all the patients with good satisfaction rate for both the doctor and the patients. The eyelid creases in all the subjects were natural looking. The pretarsal areas were flat and the lashes were directed upwards.

Incision scars in these subjects took at least four to eight months to blend with the surrounding skin. It may appear wide and hyperemic for a few months after which it can become hypopigmented in some cases before the color eventually blends with the surrounding skin. The average time it took for the incision scar to blend to the surrounding skin is six and a half months.

Clinical Outcomes

One hundred eleven (111) Asian patients were included in this study from January 2010 to November 2014. The age of the subjects ranged from 16 to 63 years of age with an average of 36 years of age. Approximately 20% were male. Of these patients, 58 had none or minimal or unilateral eyelid creases.

All surgeries were performed by one surgeon using a carbon dioxide laser using the same surgical technique. None of the patients had previous eyelid surgery. The cases were documented by preoperative and post-operative photographs taken at 6 days, 3 months, and 6 months after surgery.

The surgical technique described above has been proven to be suited for Asian eyes, taking into account the peculiar Asian upper eyelid anatomy. The technique creates a less bulky pretarsal area, corrects lash ptosis[5], and creates a permanent, definite lid crease without the need to leave buried sutures or use full thickness sutures. Pretarsal segments of the eyelid post operation has resulted in flat structure, producing a natural looking upper eyelid crease.

The orbicularis excision technique achieved natural and aesthetically appealing results in all 111 patients included in the study. In all patients, the eyelid creases achieved were permanent and symmetrical. Thus, the study found that the technique produced an overall natural-looking "Asian" upper eyelid crease and satisfaction from both the patients and the Center's surgeon.

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Before Surgery



After Surgery



BREAST CENTER

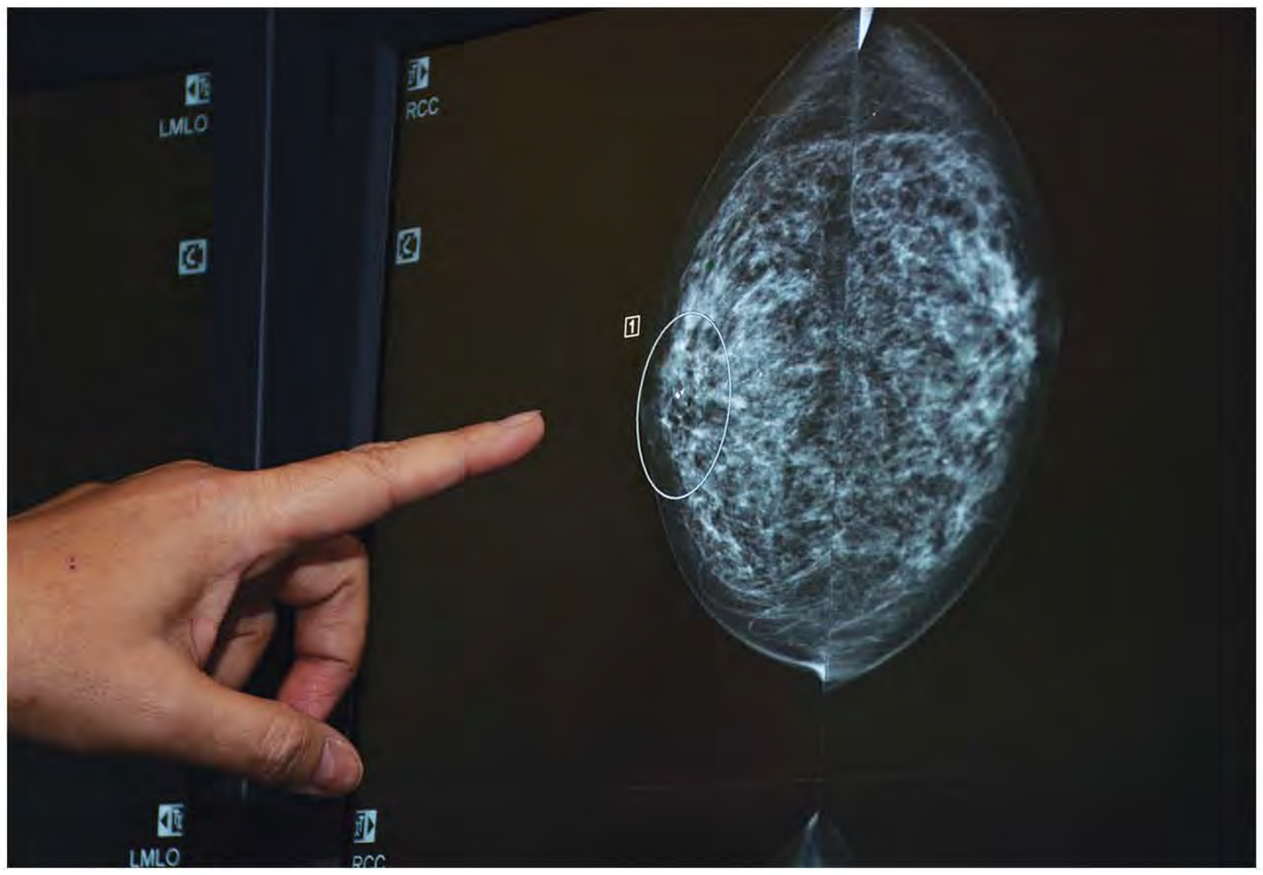
St. Luke's Medical Center-Quezon City's Breast Center is dedicated to provide women with the highest level of breast care.
The Center offers a comprehensive breast disease care program, offering a full spectrum of clinical and support services, from screening and diagnosis to treatment and counseling. It provides innovative, integrated, high quality and cost-effective care.

The Breast Center stands at the forefront of breast cancer treatment and research. It provides the patient access to the most advanced diagnostic tests and therapies including state-of-the-art mammography, high-resolution breast ultrasonography, a minor operating-procedure room for Fine Needle Aspiration, Core Needle, Stereotactic, Needle Localization procedures, and Excision/Incision biopsies.

Patients who visit the Breast Center will be able to get imaging procedures faster, easier and more comfortable – from scheduling appointments to providing definitive timely results.

One of the modalities for an accurate diagnosis of breast lesions at the Breast Center is the Mammotome, an innovative, minimally invasive biopsy device that is expected to significantly expand women's access and choice of a biopsy procedure. It is an ultrasound-guided vacuum-assisted Breast Biopsy System that facilitates a fast, highly accurate diagnosis of primarily ultrasound-detected, and some mammogram-detected suspicious lesions with minimal tissue trauma and patient discomfort.

At the St. Luke's-Quezon City Breast Center, double reading of all screening and diagnostic mammograms and breast ultrasound is implemented. A primary Breast Radiologist first interprets and creates a report on breast examination. After which, another Breast Radiologist would read the same set of examinations. If the second reader concurs, the final report is approved





and signed as official by both Radiologists. However, if discrepancy in reading occurs, a third Radiologist is requested to resolve the discordance in the interpretation. In addition, peer review is also conducted to analyze the differences in reading. The practice of double reading in the Breast Center has been beneficial in providing patients with screening and diagnostic reports of higher standards.

The biggest facility of its kind in the country, the Breast Center adopts a patient-centered and multidisciplinary approach that adheres to international standards of care. The St. Luke's-Quezon City Breast Center is the first Center in the country to be accredited by the American College of Radiology (ACR) for Mammography in 2011 and 2014, and for Breast Ultrasound in 2012 and 2015.

The Breast Center has a multidisciplinary team of specialists to facilitate prompt evaluation, immediate results and coordinated treatment and follow-up. Specialists include surgical oncologists, medical oncologists, radiation oncologists, pathologists, plastic and reconstructive surgeons, physiatrists, psychiatrists, pain and palliative care specialists.

The Best Protection is Early Detection: Breast Cancer Detection Rate and Positive Predictive Value of Mammography

Maria Cecilia M. Pagdanganan, MD

Breast cancer is the leading cancer among women worldwide, with the Philippines having the highest incidence of breast cancer in the Asian continent. An estimate of 3 out of 100 Filipino women will contract the disease before age 75, and 1 out of 100 will die before age 75, according to the Philippine Society of Medical Oncology in 2012.



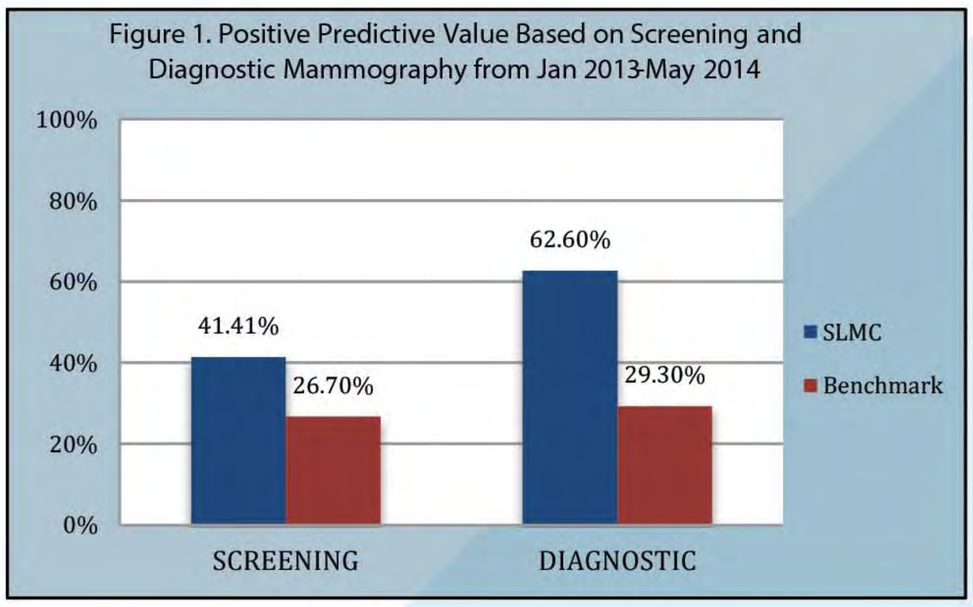
Dr. Maria Cecilia Pagdanganan is the Head of the Breast Center of St. Luke's-Quezon City.

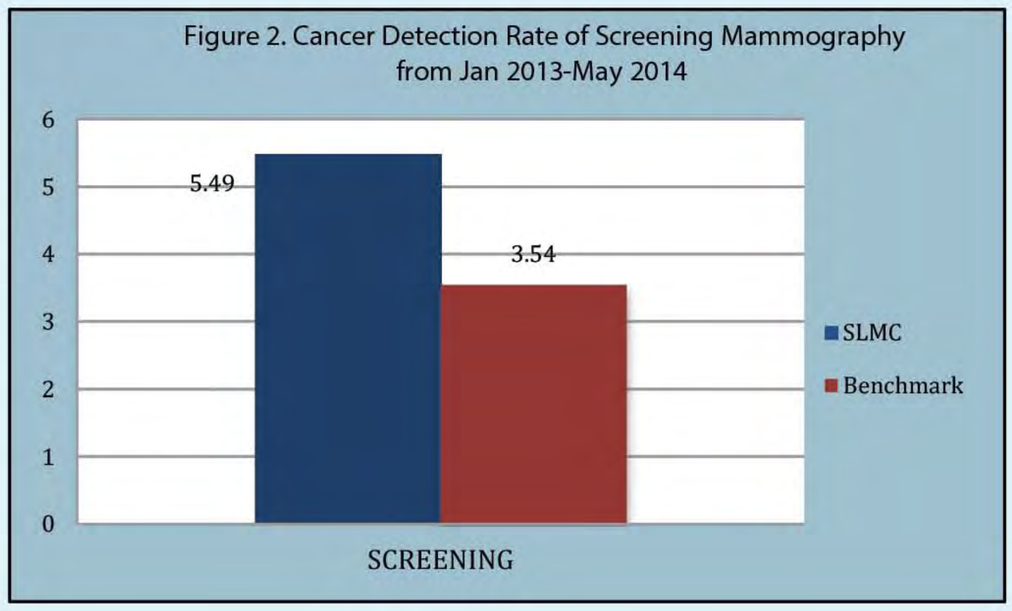
The aim of breast cancer screening is early detection, even before symptoms appear. Early diagnosis, intervention, and postoperative treatment, result to a decrease in breast cancer mortality through the years.

Mammography is the preferred screening examination for breast cancer. It is widely available, well-tolerated and inexpensive. Digital mammography is especially useful in identifying tumors in women with dense breast tissue, which is the case for most Filipino women. Digital mammography is a digitized imaging study of the breast using X-rays which can detect breast mass even before it can be felt and can pinpoint even the smallest calcium deposits which may or may not be cancerous. It can be a screening mammogram, which is ordered for women, 40 years of age and above, who have no signs or symptoms of breast diseases. It can also be a diagnostic mammogram, which is intended for patients who have symptoms.

Regular screening mammography reduces mortality from breast cancer by at least 50% in women 50 to 69 years of age.

A true-positive mammogram is a screening mammographic examination with a positive interpretation that is followed by the diagnosis of invasive breast cancer or ductal carcinoma in situ within 12 months. Cancer detection rate is the number of cancer cases following a positive mammogram divided by the total number of screening mammographic examinations.

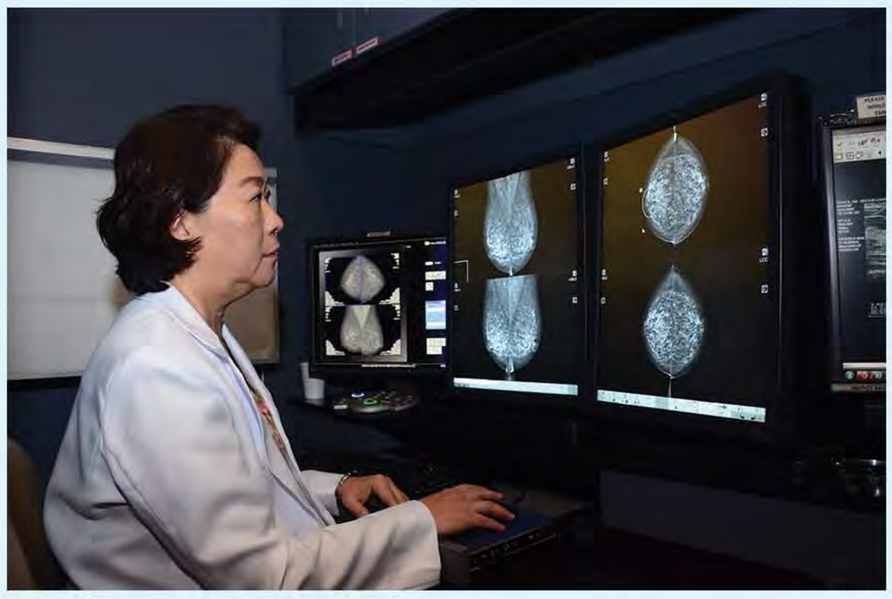




The Outcomes

There were a total of 13,736 patients who underwent mammography between January 2013 to May 2014. Among these, 7,472 patients had screening mammography, and 6,264 patients had diagnostic mammography. The St. Luke's Quezon City Breast Center acquired invaluable benchmarking data on the positive predictive value (PPV) of diagnostic and screening mammography from the Breast Cancer Surveillance Consortium (BCSC) of the National Cancer Institute involving 296 radiology facilities between 1994-2009. Another benchmarking data on the cancer detection rate (CDR) of screening mammography was obtained from the National Mammography Database (NMD) of the American College of Radiology.

Positive predictive values of St. Luke's-Quezon City Breast Center were: 41.41% for screening mammography and 62.60% for diagnostic mammography (Figure 1). Cancer detection rate for screening mammography was 5.49, indicating better outcomes as compared to the BCSC and NMD benchmarks (Figure 2).



Digital Mammography is instrumental in identifying early stages of breast cancer.

Through quality facilities and highly competent healthcare staff, the St. Luke's-Quezon City Breast Center was able to achieve better outcomes compared to the recognized benchmarks. This affirms the high caliber of imaging quality and service of St. Luke's-Quezon City's Breast Center in diagnostic and screening mammography.



Regular screening mammography leads to early detection and helps reduce mortality from breast cancer.



CENTER FOR ADVANCED REPRODUCTIVE MEDICINE AND INFERTILITY (CARMI)

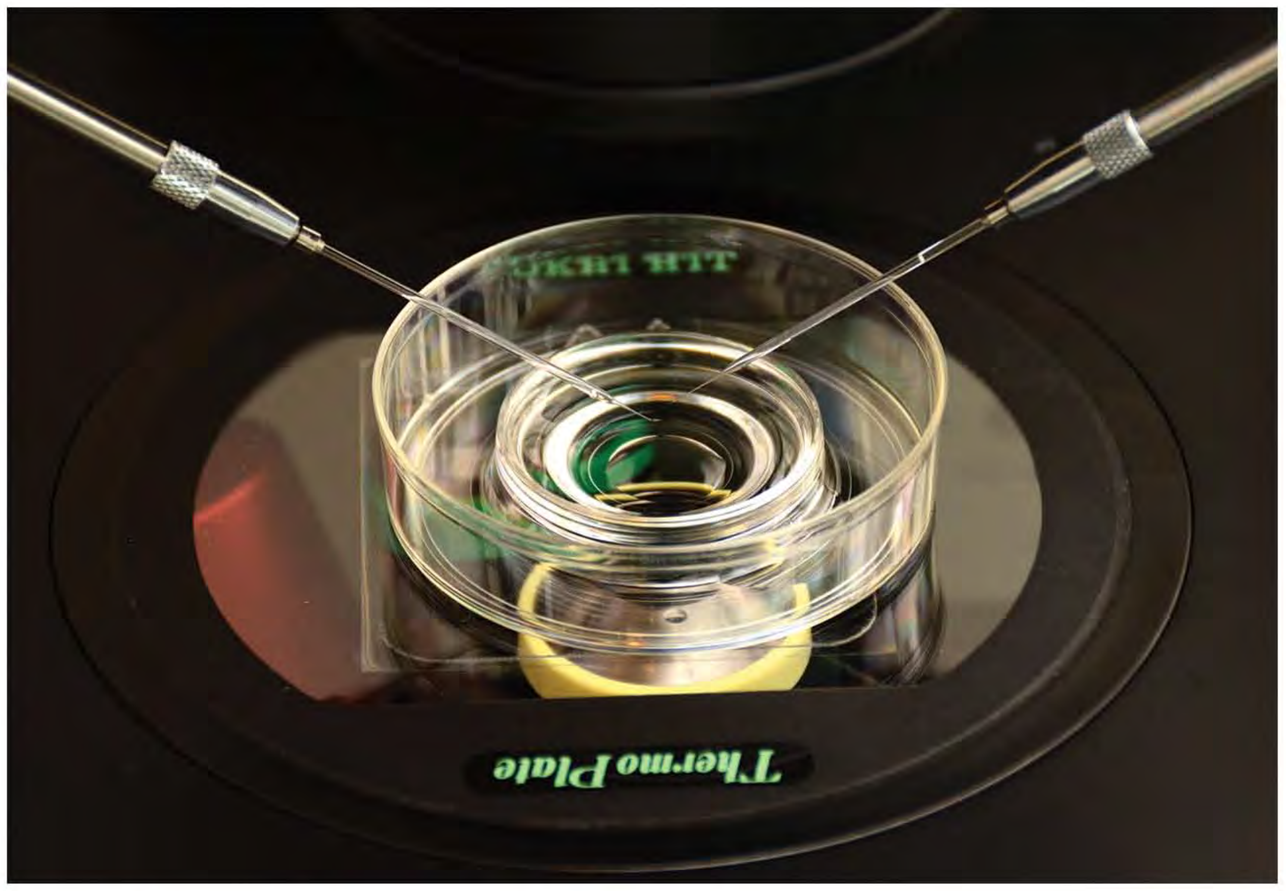
Infertility and conception are important issues to a significant and increasing proportion of couples in the Philippines. With fast-paced and busy lifestyles, couples now tend to marry at a later age and more and more, both husband and wife have separate full-time careers. These are factors that contribute to a higher incidence of infertility.

While there are no statistics in the country, it has been reported that one of every 10 women in the United States younger than 45 years old is infertile.

The Center for Advanced Reproductive Medicine and Infertility (CARMI) was founded in October 2011 in St. Luke's-Global City and offers fully integrated comprehensive fertility services to accurately diagnose infertility problems and to assist couples who want to conceive a baby. It is the Philippines' first and only hospital-based IVF center.

Highly-trained specialists, compassionate nurses, and experienced scientists provide personalized quality care to CARMI patients. They are assisted by urologists, acupuncturists, geneticists, and weight management specialists.

CARMI has state-of-the-art facilities that are among the most advanced in Asia. It has a sophisticated laboratory that can carry out necessary fertility diagnosis. It offers advanced assisted reproductive technology (ART) services





such as in vitro fertilization (IVF), gamete inter-fallopian transfer (GIFT), in-vitro maturation, surgical sperm retrieval, intra-cytoplasmic sperm injection and embryo/gamete conservation.

The Center has achieved numerous firsts in fertility medicine in the country. It was the first to offer state-of -the-art diagnostic tests such as the Anti-Mullerian Hormone (AMH) testing for ovarian reserve and sperm DNA Fragmentation Test (Halo Test), as well as in-house acupuncture service as a complementary treatment protocol for infertility.

More significantly, it was in CARMI where the first IVF pregnancies after micro-TESE, time lapse videography and laser assisted hatching (LAH) were achieved. It was also the first to have ovarian tissue cryopreserved in a patient with breast cancer.

CARMI IVF Clinical Outcomes

Virgilio M. Novero, Jr., MD

In-Vitro Fertilization (IVF) is the process of fertilization by which the female egg (ovum) harvested from the woman is manually fertilized by the sperm of the male outside of the body (i.e. in vitro) in a laboratory dish.



Dr. Virgilio Novero, Jr. is the Head of CARMI at St. Luke's-Global City.

The fertilized embryo is cultured for two to six days in a growth medium and is then physically implanted in the uterus of the same female parent's or in a surrogate woman's uterus, with the intention of establishing a successful pregnancy.

IVF is indicated for females who have blockage problems with their fallopian tubes or have had tubal disease from endometriosis and infections. These problems prevent the natural fertilization of the egg by the male sperm in the fallopian tube (i.e. in vivo, or in the natural location in the tube). Women with ovulation disorders, advanced age with or without decreased ovarian reserve, uterine fibroids, or with a genetic disorder or unexplained infertility are candidates for IVF treatment.

Another cause of infertility that IVF aims to address is in cases when the male has low sperm count or low sperm quality. An adjunct procedure called intracytoplasmic sperm (ICSI) injection is done whereby the sperm, even though the cells are fewer than normal, is directly injected into the egg through IVF. When indicated, the use of ICSI has been found to increase the success rates of IVF.

IVF is one of the gold standards in assisted reproductive technology (ART) for treatment of infertility. Due to the prohibitive cost, IVF is mostly attempted only after less expensive options have failed.

Census Study and Outcomes of CARMI IVF Cases

In its first year of operations, St. Luke's Center for Advanced Reproductive Medicine and Infertility (CARMI) attracted some 200 In-Vitro Fertilization (IVF) patients – a pioneering feat for a local IVF

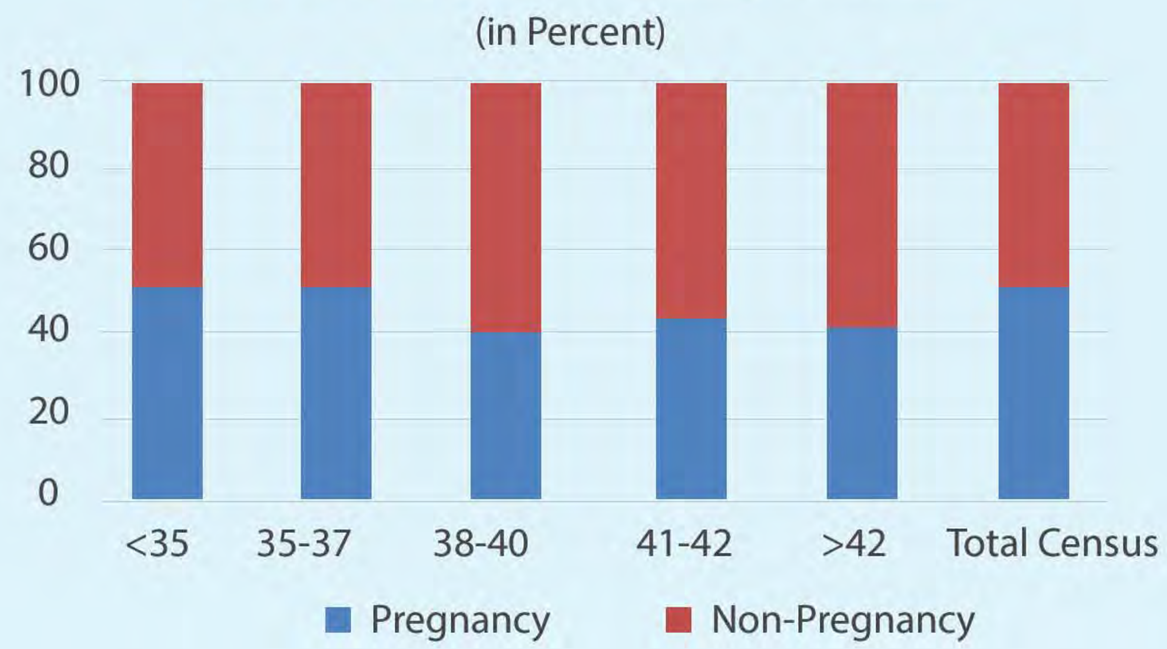
laboratory. Because of its advanced facilities and above par track record in its first year, CARMI has become one of the top fertility centers in Southeast Asia.

By the end of 2013, CARMI's total caseload increased to more than 700. During the period in review, 277 underwent In-Vitro Fertilization (IVF).

A total of 280 egg retrievals were conducted from the population, all of which were put in the laboratory's embryo holding facility. The IVF laboratory is a certified clean-room facility.

CARMI has achieved consistently high success rates for 2013. It achieved an overall clinical pregnancy rate of 42.86 per cent, representing 105 conceptions out of the total of 221 patients who have been administered embryo transfers. The 2013 clinical pregnancy rate is comparatively the same as that in the first census in 2012 at 43 percent.

Chart 1. SLMC CARMI Pregnancy Outcomes



The 42.86 percent clinical pregnancy rate is higher than the world average of 31 per cent, based on 2003 World ICMART report. This is also higher than the many national averages of developed countries which are popular for their IVF services. (Palermo et al F & S 2012)

CARMI registered an average embryo transfer count of 2.44 for the 251 cases in which the procedure was administered. This count is lower than the 2.87 embryo transfers the previous year (2012), but still exceeds the average figures in Europe (2.16) and Japan (2.07) as reported by Palermo et. al (F & S 2012).

Age cohort analyses reflect highest pregnancy rate at ages 34 years old and below (Table 1). As the age of patients increase, the fertility potential is reduced compared to that seen in younger women. Despite this, there is an overall pregnancy rate of 43.83% as of 2014. Furthermore, there is an increase in pregnancy rate of 6.3% among patients who have completed the IVF cycle.

Chart 1 also shows that the earlier IVF treatments are administered, the higher are the chances for conception. This is the case for the two younger age groups, particularly the less than 35 years old age group which had a success rate of 52.33 percent, and followed by the 35-37 age bracket which achieved a 48.78 percent success rate in 2013.

A total of 50 patients (22.62 percent) out of the 221 IVF census with embryo transfer achieved live birth for their babies in 2013. Compared to the previous year, live birth rate achieved by CARMI slightly declined from the reported 35.6 percent in 2012. This was principally due to the higher incidence of vitrified eggs and vitrified embryos, as well as no egg retrievals in 2013 (64 cases).

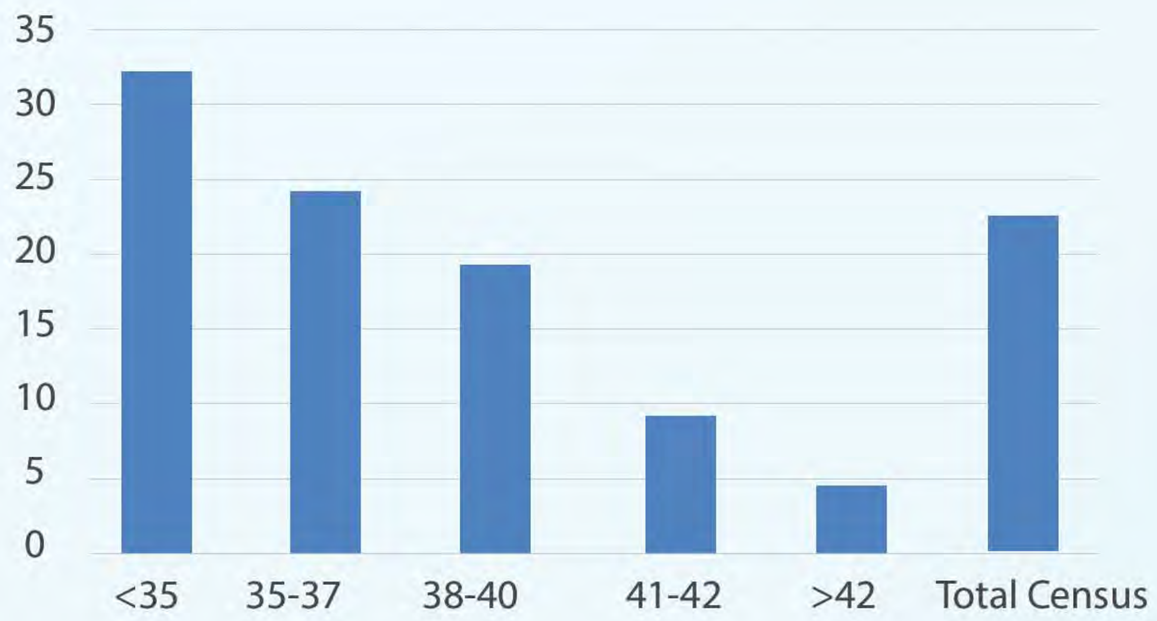
The same pattern in clinical outcomes in relation to the age of the female patient is also observed for the live birth rates as in clinical pregnancy (Chart 2). That is, live birth rates were significantly higher at 32.56 percent when the female case is less than 35 years old. The trend shows a downward movement as the age of the female patient increases to the older segments.

Table 1. CARMI Pregnancy Rate per Age Group (2011-2014)

Age Group	Pregnancy Rate (%)
≤34 years old	49.35%
35-39 years old	42.86%
≥40 years old	39.77
Total	43.83%

Chart 2. Live Birth Incidence

(Percentage of Embryo Transfer Cases)





CARMI's outcomes are comparable to IVF centers in the US and Asia. To date, over 100 babies have been born as a result of CARMI's assisted reproductive technologies.

Conclusion

The continued success of CARMI in delivering superior clinical outcomes relative to international centers stem from cutting-edge technology and laboratory design that have been put in place when it was founded more than two years ago and its highly-trained team of infertility specialists and support staff.

The Center has made IVF more accessible to more Filipinos as it offers prices at levels less expensive than that offered abroad.

The Center aims to invest further in new equipment that will enable more accurate round-the-clock monitoring of embryos in the laboratory using time-lapse videography with parameter controls over salinity, PH and temperature levels to ensure embryo health. This will ensure that higher quality embryos are transplanted to the patient's uterus which will lead to better pregnancy and live birth outcomes.



DERMATOLOGY CENTER

Since time immemorial, beauty has been one of man's ultimate aspirations. The attainment of beautiful skin, however, is an inevitable effect of achieving normal, healthy skin that is free from inflammation, marks, blemishes, scales, papules or pustules. More importantly, the psychological, emotional, social and physical well-being of a person appear to be closely intertwined with the aesthetic and health status of the skin.

Thus, a key goal of the practice of dermatology and skin care is improving the overall quality of life of affected individuals challenged by a spectrum of skin concerns ranging from unsightly moles, birthmarks and vascular lesions, to skin disorders with a more medical aspect and potentially severe outcomes such as psoriasis, atopic dermatitis and skin cancers.

The Dermatology Center at both St. Luke's-Global City and St. Luke's-Quezon City offers a comprehensive array of services being equipped with state-of-the-art aesthetic and therapeutic skin care devices and treatment protocols for adult and pediatric patients of all skin types. It is a centralized diagnostic and therapeutic facility staffed by board-certified Dermatology consultants with excellent qualifications and credentials having trained in some of the world's renowned dermatological institutions.

The Dermatology Center has specific units which afford a higher level of patient care.

Its Laser and Energy-Based Unit is globally at par offering the latest in technology backed by international scientific studies and publications. It is anchored on the Pulsed Dye Laser which is considered a gold standard in treating vascular (blood vessel) lesions.





Its other outstanding devices are:

- Pigment & Tattoo Removal (Q-switched Alexandrite & NdYAG Lasers)
- Hair Removal (Long-pulsed Alexandrite & NdYAG Lasers)
- Nonablative Skin Rejuvenation (Long-pulsed NdYAG Laser)
- Fractional & Ablative Laser Resurfacing (Erbium Yag Laser)
- Body Sculpting and Skin Tightening (Ultrasound & Radiofrequency)

The other units of the Dermatology Center offering special services are the following:

- Photodermatology Unit (treatment option for psoriasis, vitiligo)
- Mohs Micrographic Surgery Unit (precise removal of skin cancers)
- Dermatohistopathology Unit (microscopic skin biopsy reading)
- Environmental Dermatology Unit (patch test with 70 allergens, photo patch test)
- Hair Unit (hair growth disorders, hair transplant)
- Pediatric Dermatology Unit

Pulsed Dye Laser: A Promising Addition in the Treatment of Nail Deformity

Lonabel A. Encarnacion, MD, FPDS

Nail dystrophy, or trachyonychia, is a relatively common medical condition affecting both children and adults. Any kind of deformity of the nail may be classified as nail dystrophy. The nail may appear as thickened, opaque and lusterless, or it may be thinned, shiny and studded with pits, or thickened in curling.



Dr. Lonabel Encarnacion is the Head of the Dermatology Department at St. Luke's-Quezon City.

This report is based on an article published in the Journal of the Philippine Dermatological Society entitled "Pulsed dye laser for nail dystrophy: A clinical retrospective case series" authored by Drs. Pearl Weena Marie E. Sabido, Lonabel A. Encarnacion & Mia Angela C. Verzosa in the May 2014 issue. [1] This study was done at the Dermatology Center in St. Luke's Medical Center-Quezon City.

[1] *Sabido PWME, Encarnacion LA, Verzosa MA. Pulsed dye laser for nail dystrophy: a clinical retrospective case series. Journal of the Philippine Dermatological Society May 2014 Vol 23 No.1 pp. 33-37*

The cause of nail dystrophy is generally unknown, or it may be associated with psoriasis, fungal infection of the nail, the common wart or pincer nails. Regardless of the cause, inflammation is believed to play a major role in the occurrence of nail dystrophy. While the condition is not life threatening, deformed nails may bring a host of psychosocial and functional impairment to the patient.

Novel Treatment: The Pulsed Dye Laser

Treatment is difficult and may initially be complicated by non-response to these underlying conditions to conventional treatment. Precisely because of this, adjunctive measures have been sought to augment the treatment regimen that St. Luke's Dermatology Center offers these patients.

A female patient with 20-nail dystrophy on fingers and toes.

There is normal nail growth on fingers and toes after 3 sessions and nails look completely normal after 2 years.

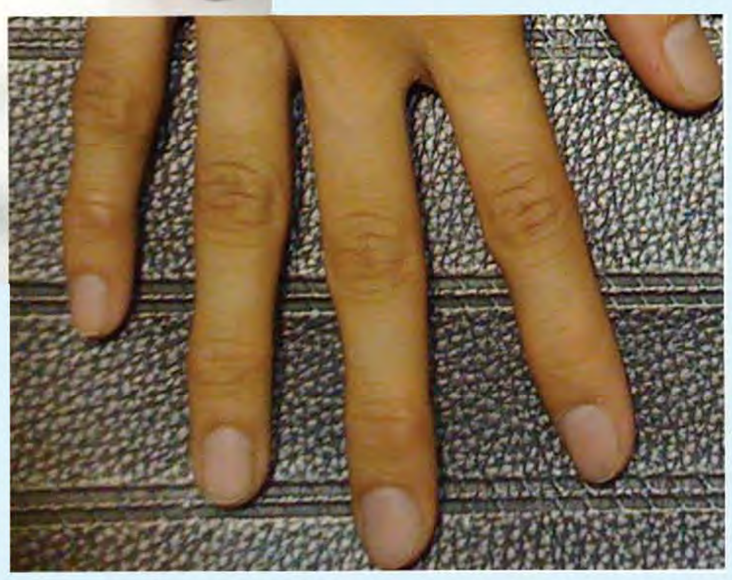


2008



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2010

One such treatment is known as pulsed dye laser (PDL), a type of laser that targets blood vessels and indirectly diminishes the inflammation which causes nail dystrophy. PDL is hypothesized to stimulate tissue remodeling, and is also reported to kill fungal elements by way of the heat it releases.

The pulsed dye laser (PDL) delivers energy at a wavelength and duration that has been optimized for the selective treatment of vascular lesions. It has been used in the treatment of warts, port wine stains, hemangiomas, hypertrophic scars, and telangiectasias. Pulsed dye lasers have been used as an alternative to surgical excision or carbon dioxide lasers.

Hypothesis

Because nail dystrophy is attributed to an abnormal nail growth from a faulty nail matrix (at the base of the nail where it is formed), this vascular laser may be used to modify or rectify the resultant nail matrix scar supported by faulty blood supply.

There have been literature reports on treatment using the PDL demonstrating efficacy in treating resistant plaque-type nail psoriasis as an alternative to conventional therapies.

Outcomes

The St. Luke's Dermatology Center has been at the forefront of using laser technology for the treatment of skin and other external disorders affecting patients. A specific area where it has achieved satisfactory results has been in treating nail dystrophy.

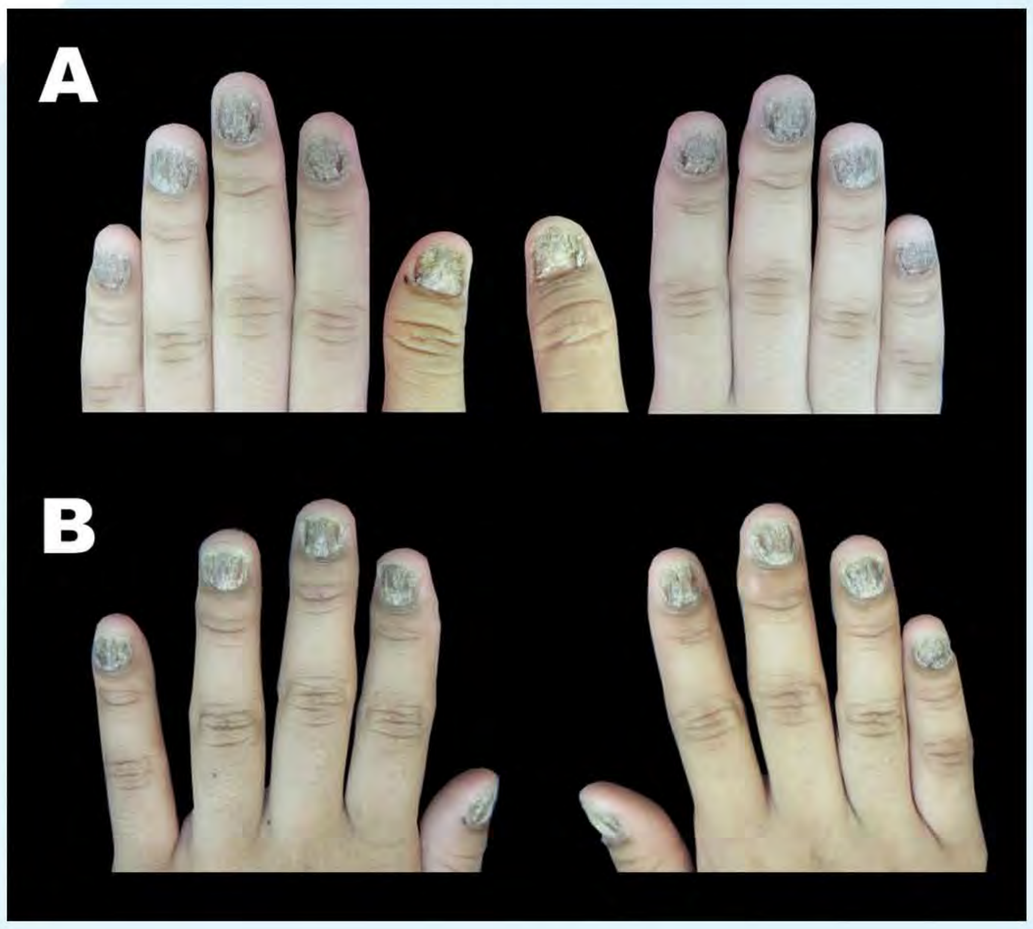
From 2002 to August 2013, the Dermatology Center of St. Luke's Medical Center-Quezon City treated a total of 28 patients with nail dystrophy using PDL after they had been non-responsive to generally nail anti-fungal treatments. The patients' ages ranged from 3 years old to 80, the affected being nails of fingers and toes.

Table 1. Patients with Nail Dystrophy who underwent PDL at the St. Luke's Dermatology Center from 2002 to August 2013

Pt no.	Associated condition	Age (yrs)	Sex	Affected nails	Number & frequency of sessions	Response to treatment	Concomitant treatment
1	Psoriasis	4	F	Fingers: All Toes: All	3 sessions every 4 weeks, then 1 more session after 2 years	Normal nail growth on all fingers after 3 sessions; L5 and R3 toenails noted to be completely normal after 2 years, with marked improvement of the remaining nails	None
2	Psoriasis	65	M	Fingers: All	3 sessions every 4 weeks	New normal nail growth after 3 sessions	None
3	Psoriasis	15	F	Fingers: L2, L3, L4, L5, R2, R3, R4, R5	3 sessions every 8 weeks	New normal nail growth after 3 sessions	None
4	Onychomycosis	59	M	Toe: R1	1 session	No change noted after 1 session	Amorolfine
5	Onychomycosis	45	F	Fingers: All	3 sessions every 4 weeks	New pink nail growth noted after 2 sessions	Itraconazole tabs
6	Onychomycosis	59	F	Toes: All	1 session	No change noted after 1 session	Itraconazole tabs
7	Onychomycosis	45	M	Toe: L1	3 sessions every 4 weeks	New normal nail growth after 3 sessions	None
8	Onychomycosis	44	M	Toes: L5, R1, R5	2 sessions 4 weeks apart	No change noted after 2 sessions	Itraconazole tabs, amorolfine nail lacquer
9	Onychomycosis	42	F	Toes: L1. R3	2 sessions 4 weeks apart	No change noted after 2 sessions	Terbinafine tabs
10	Onychomycosis	55	F	Toe: R1	2 sessions 4 weeks apart, then 1 more session after 12 weeks	Normal nail growth after 3 sessions	Itraconazole tabs
11	Onychomycosis	57	M	Fingers: 8 Toes: All	3 sessions 4 weeks apart	No change noted after 3 sessions	Itraconazole tabs
12	Onychomycosis	3	M	Finger: R4	1 session	No change noted after 1 session	None
13	Onychomycosis	7	F	Fingers: L1, L3, L4, R1, R2, R3, R4 Toe: L1	4 sessions 4 weeks apart	New pink smooth nail growth	Amorolfine nail lacquer
14	Pincer nail	80	F	Finger: L3	3 sessions every 8 weeks	Marked improvement after 3 sessions	Amorolfine nail lacquer
15	Pincer nail	46	F	Toe: R1	3 sessions every 4 weeks	Improved nail discoloration (limited to distal aspect), normal new pink nail growth	Amorolfine nail lacquer
16	Periungual wart	16	F	Fingers: R3 Toes: R1, R5	3 sessions every 4 weeks	Some good nail growth on R3 finger	None
17	Periungual wart	37	F	Toes: L1, R1	5 sessions every 4 weeks	Some good nail growth after 3 sessions	Imiquimod cream
18	Idiopathic	51	F	Fingers: All Toes: All	3 sessions every 4 weeks	Clear, lighter colored new nail growth after 3 sessions	Amorolfine nail lacquer
19	Idiopathic	12	F	Fingers: All Toes: All	3 sessions every 4 weeks	Nails noted to be thinner, smoother, and lighter in color after 3 sessions	Amorolfine nail lacquer
20	Idiopathic	13	F	Fingers: All Toes: All	3 sessions every 4 weeks	Thinner nails noted after 3 sessions, new normal nail growth	Amorolfine nail lacquer, itraconazole tabs
21	Idiopathic	8	M	Fingers: L2, L4, L5, R2, R3, R4 Toes: L1, L4, R1	12 sessions every 4 weeks	Smooth, pink nail growth by 3 session	None
22	Idiopathic	7	M	Fingers: All Toes: L1, L2, L4, R1, R4	3 sessions every 4 weeks	New pink nail growth after 3 sessions	None
23	Idiopathic	8	F	Fingers: All Toes: All	3 sessions every 4 weeks	Normal-looking pink nail growth after 3 sessions	Amorolfine nail lacquer
24	Idiopathic	48	M	Fingers: All Toes: All	1 session	Unknown	None
25	Idiopathic	77	F	Fingers: All Toes: L1, L5, R1, R5	5 sessions every 4 weeks	Normal-looking, non-dystrophic nail growth noted by 3rd session	Amorolfine nail lacquer
26	Idiopathic	31	M	Fingers: All Toes: All	3 sessions every 4 weeks	Improvement noted by 2nd session	None
27	Idiopathic	41	F	Fingers: L1, L3, R1 Toes: L3, R3, R5	3 sessions every 4 weeks	Clear, normal-looking new nail growth after 3 sessions	None
28	Idiopathic	55	F	Finger: L2	3 sessions every 4 weeks	Less dystrophy after 3 sessions	None



Treatment of nail dystrophy with pulsed dye laser showed very encouraging results.



A 12-year-old female (Patient 19) with trachyonychia or idiopathic nail dystrophy of all fingernails and toenails.

A: at baseline.
B: one month after 3 sessions of PDL.

New nail begins to appear at the nail base. The rest of the nail is thinner, less rough and lighter in pigmentation.



How Pulsed Dye Laser Works in Nail Dystrophy

A dystrophic nail may be due to a variety of conditions such as psoriasis, fungal infection of the nail, or some other inflammatory disorder.

When there is inflammation, redness occurs due to the dilation of blood vessels in the affected area. The Pulsed Dye Laser targets the hemoglobin in the blood to collapse the affected blood vessels as well as prevent activity of inflammation mediators, correcting the inflammation.

Additionally, heat in the blood vessels dissipate and remodel the surrounding tissue that may have been scarred due to chronic inflammation where the nail originates (nail matrix). If the nail deformity is due to fungal infection, Pulsed Dye Laser can inhibit fungal growth from heat brought about by the laser.

Technology-Based Solutions Conquer Skin Problems

Ma. Pilar L. Leuenberger, MD, FPDS;
Andrea Mae A. Briones, RN

The skin plays a large role in achieving a status of wellness among individuals of different backgrounds, age groups, skin types and other factors. Superficial moles, unwanted hair growth, raised or depressed wound scars, vascular lesions (e.g. spider veins), tattoos and distinctly colored birthmarks are common skin concerns with readily available treatment options.



Dr. Ma. Pilar Leuenberger is the Head of the Dermatology Center at St. Luke's-Global City.

The Laser and Energy-Based Unit of the Dermatology Center at both St. Luke's-Global City and Quezon City addresses inborn to acquired skin disorders that may be both a medical and aesthetic concern of the patient. Both St. Luke's Dermatology Centers have been at the forefront of making available the necessary dermatologic technology and protocols in treating both local and international patients.

The principle of selective photothermolysis underlies the scientific success of our medically advanced laser devices as it is a prerequisite to achieving a good outcome of laser light and skin tissue interaction.

Pulsed Dye Laser

St. Luke's was the first to offer state-of-the-art pulsed dye laser treatment in the Philippines. The pulsed dye laser is the gold standard in the treatment of vascular lesions, offering effective and safe results for patients. It may be started as early as in the first three months of life if with an urgent indication such as bleeding, ulceration or rapid enlargement of a superficial hemangioma which may potentially block a body orifice.

When precision high-energy laser beams are applied to affected areas, the laser light is absorbed by the blood flowing in the vessels. It is then rapidly converted to heat which ultimately facilitates the destruction of the micro blood vessels that feed the abnormal growth in such lesions. The laser is calibrated at a defined wavelength to effectively reach the targeted structures which are largely in the uppermost portion of the second layer of the skin.

Outcomes

In a census of patients who underwent treatment from 2010 to 2013 in the Laser & Energy-Based Unit of the St. Luke's-Global City Dermatology Center, 67 percent of adults and children with superficial hemangiomas who received two to six pulsed dye laser treatments had an overall improvement rate of at least 50 percent in terms of decreased redness and flattening. Meanwhile, a total of 71 percent of patients with portwine stain lesions who underwent three to nine pulsed dye laser sessions achieved a 50 to 90 percent clearance of the lesions. Majority of the cases had not had prior laser treatment and the degree of improvement was notably influenced by the number of treatments received as this translated to a more thorough destruction of the target structures.



St. Luke's was the first to offer pulsed dye laser treatment in the Philippines.

During the same period, patients with a "Nevus of Ota" gray to dark gray facial birthmark were treated at the same center with the Q-switched alexandrite laser. Ninety percent received two to nine treatments and achieved a 50 to 90 percent clearance or significant lightening of their birthmark. As with facial port wine stains, Nevus of Ota lesions have a "quality of life" fabric as evidenced by patients who gained significant self-confidence as their lesions faded.

St. Luke's was likewise the first in the country to offer a stand-alone high-technology Q-switched alexandrite laser. Black-based tattoos were the best responders in cases of tattoo removal using this device. Sixty percent of this patient subset received three to twelve treatment sessions and a 50 percent clearance or greater was appreciated. Excellent outcomes of 90 to 95 percent fading of the tattoo pigments were dictated by the number of treatments received and quality of tattoo ink used.

Hair Removal/ Reduction using the *Alexandrite or NdYAG Laser*

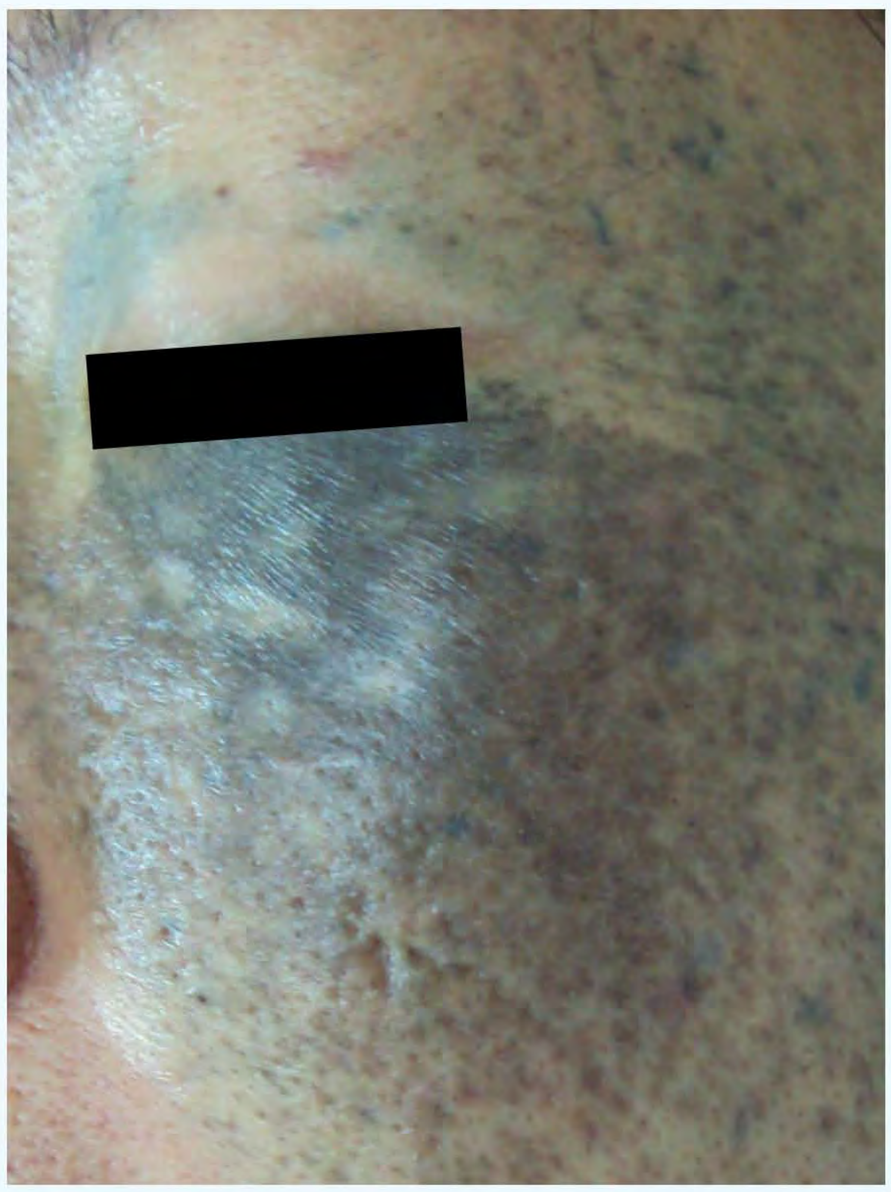


Before

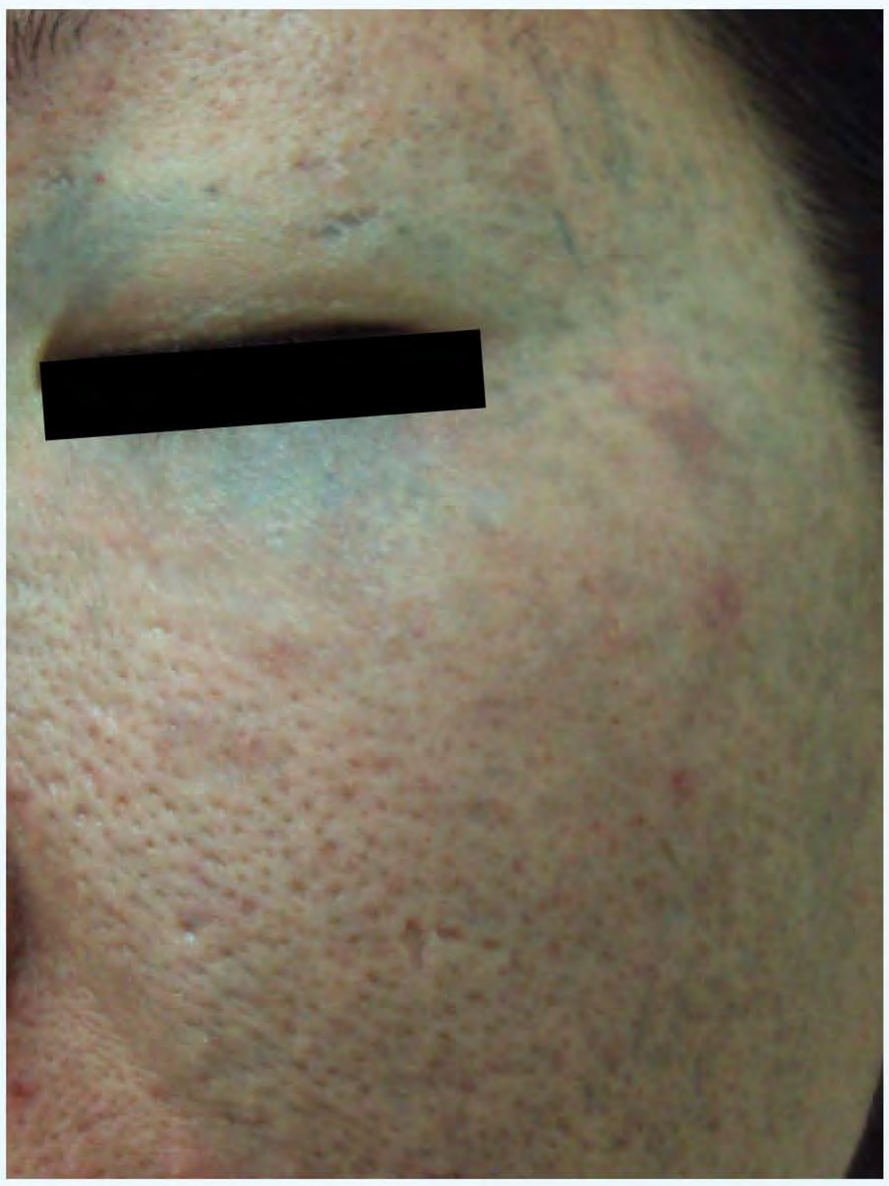


After

Treatment of Nevus of Ota using the Q-switched Alexandrite Laser



Baseline



After 8 Treatments
total no. of treatments = 9

Courtesy of A. Esguerra, MD

The Laser and Energy-Based Unit also treated patients with unwanted dark, coarse hair in various areas. In the same census from 2010 to 2013, 54 percent of patients treated in the armpit area completed three to 14 treatment sessions using the millisecond alexandrite laser. A 90 to 95 percent reduction in hair regrowth was observed with complete conversion of coarse hair to fine hair. A total of 63 percent treated in the upper lip area completed two to six sessions, while a total 67 percent of patients treated in the bikini area received three to five sessions. In both groups, 90 to 95 percent positive outcome was achieved in terms of hair reduction. The baseline density and coarseness of the hairs in the different body sites along with patient expectations were significant parameters in the number of laser treatments needed for the best outcome.

Treatment of *Portwine Stain using Pulsed Dye Laser*



Baseline



After 2 Sessions

Courtesy of M. Leuenberger, MD

Laser skin resurfacing or alteration of topography is the usual approach in improving small raised benign lesions such as syringomas, depressed chronic scars and signs of aging skin such as fine wrinkles. Small raised lesions are capably flattened while depressed lesions are stimulated to become shallow to barely noticeable. Treatment with the fractional erbium yag laser at both St. Luke's Dermatology Centers is an outpatient procedure which is usually well tolerated with topical anesthetics, oral analgesics and surface air cooling. The number of sessions advised for the best clinical outcome is set by the baseline status of the skin lesions and realistic expectations of the patient.

Photodermatology Treatment Clinical Outcomes

Maria Deanna Santos-Ramiscal, MD; Cyndi Fatima Santos, RN

Exposure to the sun's rays, particularly ultraviolet (UV) radiation, is good for the skin. Over time, modern medicine has discovered the curative benefits of sunlight and applied these in the treatment of various skin disorders.

Psoriasis is one of the common dermatological conditions that can be treated with phototherapy, or the use of ultraviolet light, particularly ultraviolet A (UVA) and ultraviolet B (UVB). People afflicted with psoriasis have red, scaly patches on the skin, and phototherapy helps relieve the symptoms of this chronic disease.

Aside from the treatment of psoriasis, phototherapy has also shown a wider therapeutic spectrum and is used in a variety of other conditions including vitiligo, atopic eczema, chronic hand and foot dermatitis, pityriasis rosea, pityriasis lichenoides, polymorphic light eruption, generalized itching, cutaneous T cell lymphoma, lichen planus, and sclerosing skin conditions.

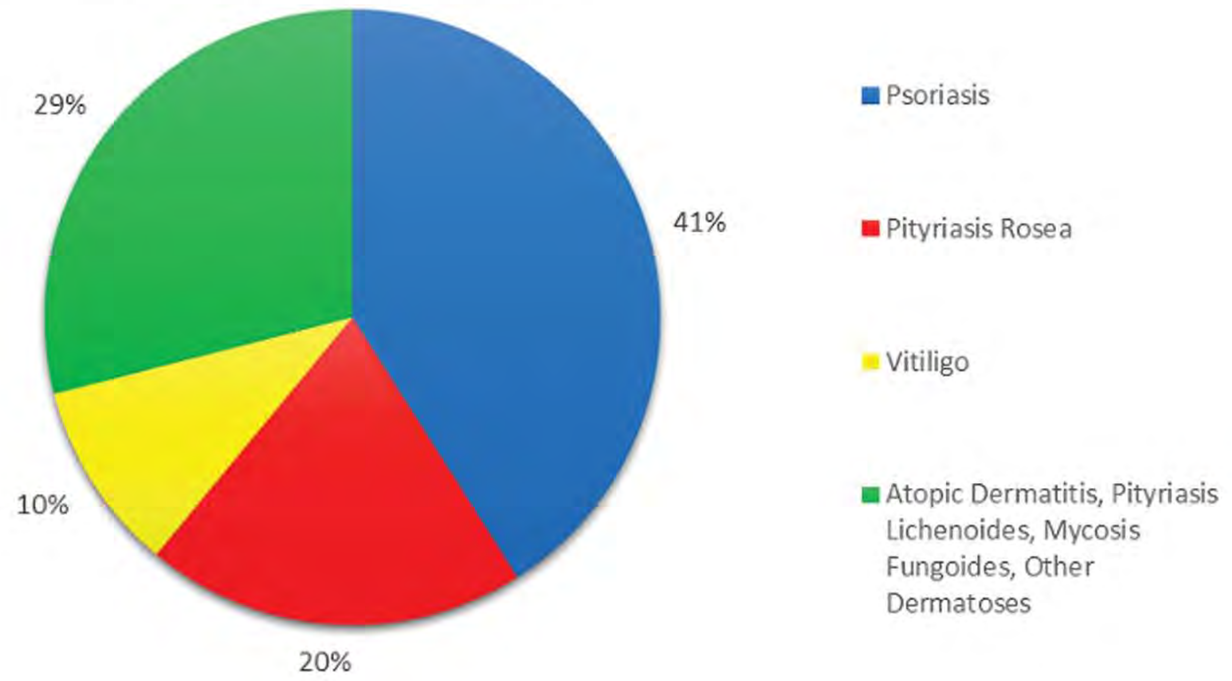


Dr. Deanna Ramiscal (right) is the Head of the Photodermatology Unit of St. Luke's-Global City. She is assisted by Dermatology Center Nurse Cyndi Santos.

Another form of UV treatment is photochemotherapy, which is the combined use of UVA radiation and drug psoralen, which sensitizes the skin to increase the effect of UVA (PUVA: Psoralen + UVA). In phototherapy, ultraviolet radiation exerts its effects in the skin by reducing inflammation. These treatments are usually given two to three times a week, with an average of 15-30 treatments. They may not offer cure, but may cause remission of certain skin problems. Maintenance therapy, or periodic sessions after the main treatment phase, may prolong remission times.

In the St. Luke's Photodermatology Unit, patients are treated with narrowband UVB (NBUVB) and bath UVA treatment, whole body or localized - hand/foot PUVA. NBUVB utilizes light panels and cabinets in maximizing the delivery of radiation in the 311-312 nanometer (nm) range in

Table 1. St. Luke's-Global City Photodermatology Unit Census
January 2010-November 2013



the UVB spectrum, considered the most beneficial component of natural sunlight. Patients who do not respond to NBUVB are usually given PUVA.

Outcomes

A total of 132 patients were treated with NBUVB (127) and Photochemotherapy (5) from January 1, 2010 to November 30, 2013. 41% of cases were psoriasis, 20% pityriasis rosea, 10% vitiligo, and the rest were atopic dermatitis, pityriasis lichenoides, mycosis fungoides and other dermatoses. (Table 1)

During the period in study, 37 patients were treated with Hand/Foot PUVA from December 1, 2012 to November 30, 2013. Of these, 46% had chronic hand dermatitis, 32% dyshidrotic dermatitis, while the others had psoriasis, chronic foot dermatitis, vitiligo and plantar keratoderma.

In 63% of psoriatic patients, 75% clearance of the skin was observed after 6-8 sessions, or 2 weeks of treatment. After which, the frequency of treatment was decreased to twice weekly until complete clearance was achieved, which was after an average of 20-30 sessions. No complications were reported after the treatment protocol.

Remission times were prolonged using maintenance therapy, given in tapering doses of once weekly, once in 2 weeks, and once a month sessions.

When methotrexate is combined with NBUVB therapy, there is a reduction in dose-related toxicity by a reduction in cumulative dosage of UVB and methotrexate required to achieve clearance.

In vitiligo patients, follicular repigmentation (return of skin color) was achieved after an average of 15 NBUVB sessions.

For patients with pityriasis rosea, clearance of lesions was achieved after an average of 4-5 sessions.

In sum, phototherapy is a safe, efficacious and cost effective treatment for a variety of dermatoses and is generally without systemic immunosuppressive effects. It is well tolerated by children, pregnant women and is a good therapeutic option for psoriatic patients with diabetes, and patients with hepatic and renal problems.



75% clearance of the skin was observed in 63% of psoriatic patients after undergoing 6-8 sessions of phototherapy.

Common Skin Disorders

Psoriasis is a chronic skin condition that affects people of all ages. It is characterized by red, scaly patches on the skin that can range from a few spots anywhere on the body to large areas. The cells in the reddish patches undergo rapid growth. The condition is not contagious and will not spread from one part of the body to another, or from one person to another.

Vitiligo is a condition that causes depigmentation of the skin in parts of the body, particularly the hands and the extremities. The visible indications of vitiligo is the presence of pale patchy areas of depigmented skin which may start initially small, but often grow and change shape. Skin lesions may also affect on the face near the mouth, eyes and nose.

Atopic dermatitis (eczema), is a class of medical conditions whose symptoms include persistent and recurring itchy, red, and dry or crusty skin caused by inflammation. In certain persons, the affected skin rashes may blister, crack and bleed, which thus lead to severe discomfort. It commonly affects children, although adults can also get it. Treatment includes oral medications, steroid creams and light therapy.

Pityriasis rosea



Before



After

Psoriasis

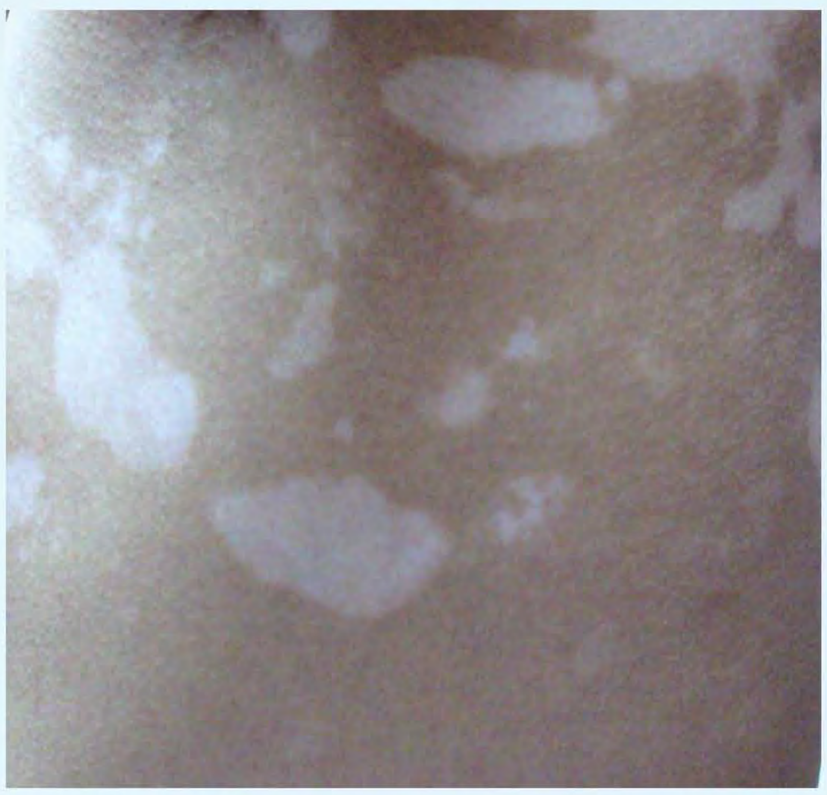


Before

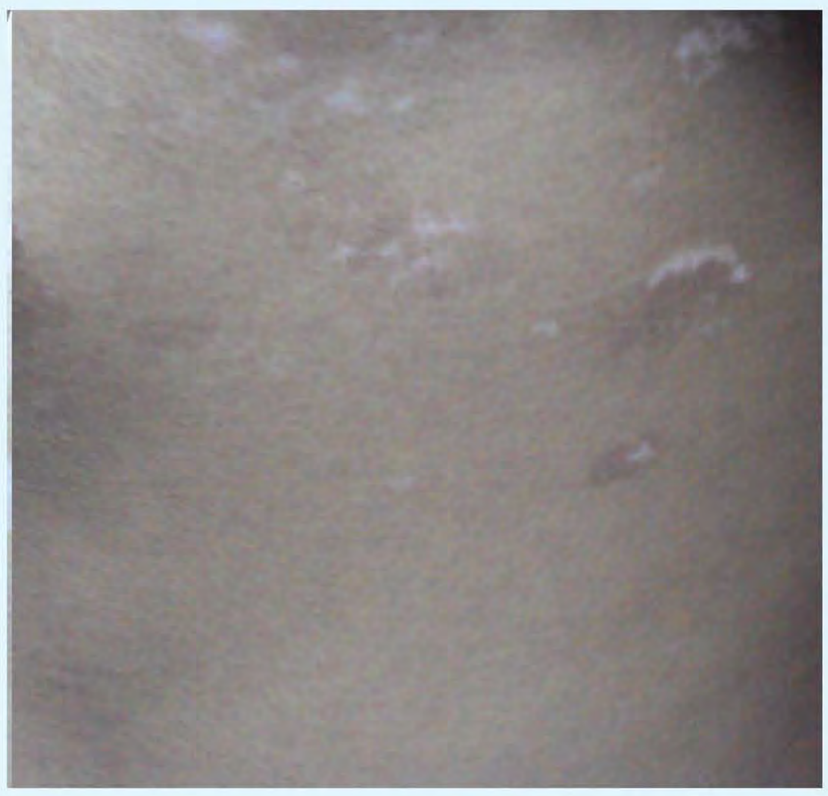


After

Vitiligo



Before



After

Mohs Surgery: Precision Surgery for Skin Cancer

Cynthia Ciriaco-Tan, MD

Skin cancer is a predominant medical problem of Caucasian people because of their white skin and their inability to be protected from the harmful effects of radiation from the sun. In the 1970s, it reached near-epidemic proportion in the United States, accounting for a third of all cancers and had increasing incidence by 65% yearly.



Dr. Cynthia Tan is the Head of the Mohs Micrographic Surgery Unit at St. Luke's-Quezon City.

In the Asia-Pacific, Australia has the highest incidence of skin cancer per year. Singapore has reported increasing cases from 1960 to the present, as well as Korea. In spite of the absence of systematic and complete monitoring in the country, a significant and increasing number of afflicted patients have been documented by various dermatologic centers, including the Dermatology Center in St. Luke's Medical Center.

Current treatment options involve both non-surgical (topical anticancer medications, electrodessication, radiotheraphy, cryotherapy, photodynamic therapy and laser treatment) and surgical techniques.

Due to its high cure rate, the currently preferred surgical technique for the treatment of Non Melanoma Skin Cancer (NMSC -- the most common skin cancer class) is Mohs Micrographic Surgery (MMS). It is the microscopically-controlled excision of skin cancer with the use of oblique frozen sections. The technique, pioneered by Dr. Frederic Mohs in the United States during the 1930s, found its way to the Philippines only in 2003, when St. Luke's Medical Center established the first Mohs Micrographic Surgery Unit in the country.

In traditional wide excision, a large portion of the affected area is cut with equal margins and removed. On the other hand, MMS involves precise surgery wherein the surgeon systematically removes the cancer cells by excising the affected cancer tissue layer by layer, and examining all margins of each layer under the microscope for remaining cancer cells. This process is repeated until a cancer-free level is attained.

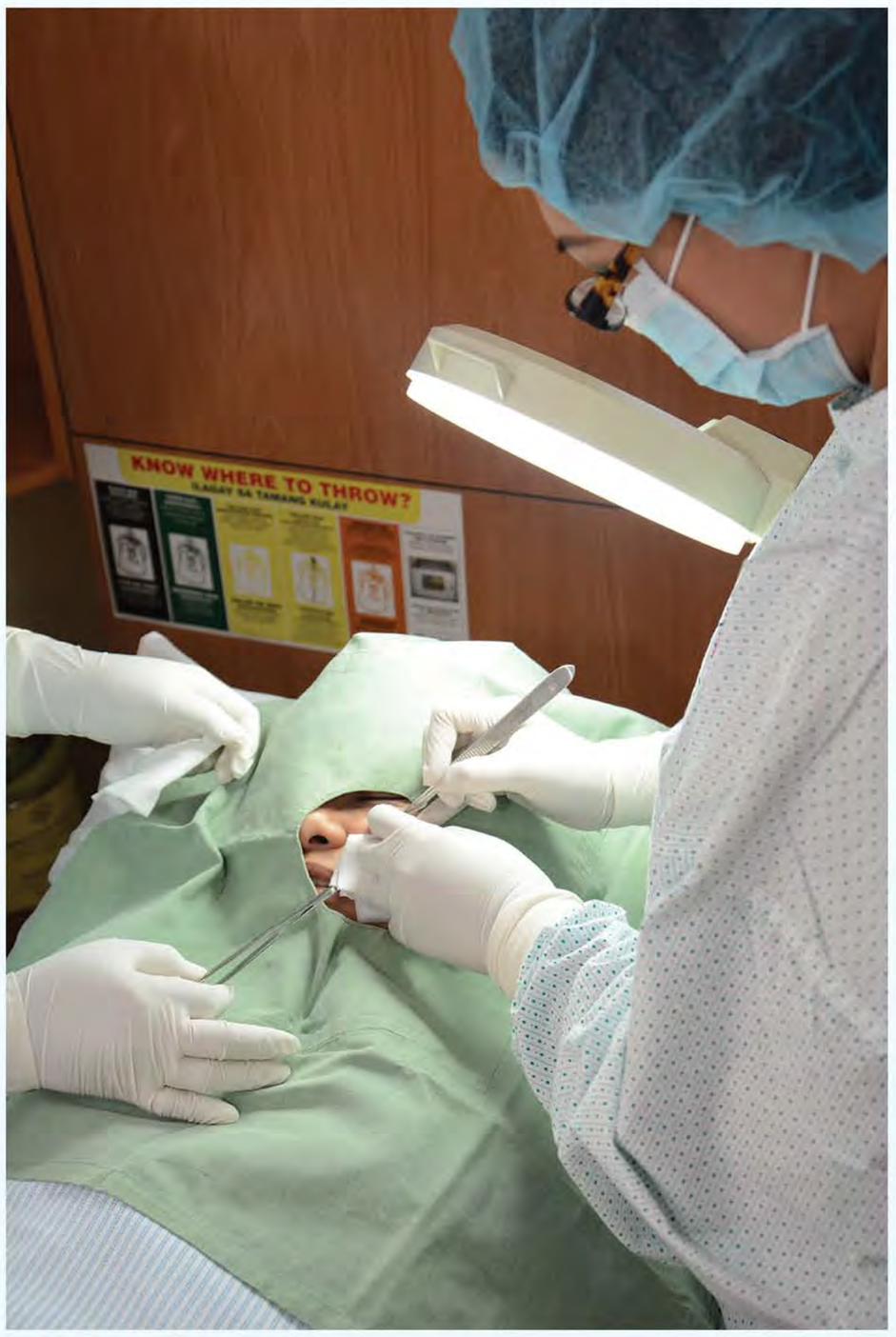
Since most NMSC's grow contiguously but asymetrically, the process of Mohs excision may follow the contour and depth of the cancer tissue, with the objective of sparing as much normal tissue as possible. This precision surgery therefore significantly reduces the chances of disfiguring the patient, since NMSC occurs mostly in the facial region, while maintaining a high cure rate.

It eliminates the guesswork in skin cancer removal that used to be present in wide excision. It has thus produced the best therapeutic and cosmetic results for patients. MMS has the highest cure rate among all procedures for the treatment of skin cancer at more than 95%. The traditional cure rate for wide excision surgery is 65-67%.



Excised tissue specimens are repeatedy examined to ensure the removal of cancerous tissue.

Mohs Micrographic Surgery has the highest cure rate among all procedures for the treatment of skin cancer at more than 95%.



Patient success rate at St. Luke's for Mohs Micrographic Surgery is documented at 100% for primary cases.

Specifically, patient cure rate based on more than 300 cases in St. Luke's Mohs Micrographic Surgery Unit has been documented to be 100% for primary cases (i.e. cases without recurrence), within a 10-year period. This is superior to the rates achieved by dermatologic centers in Korea (which had a 97% cure rate), and those in Japan and Singapore as reported in a medical paper involving a five-year study period.

St. Luke's Mohs Micrographic Surgery Unit is the first Mohs center in the Philippines, and boasts of having the pioneer (Dr. Cynthia Ciriaco-Tan) of Mohs Surgery in the Philippines. A significant proportion of NMSC Mohs cases in St. Luke's are referred cases from within and outside of the country. Half of the patients are foreigners and half are Filipinos.

What is Skin Cancer?

The universally accepted and principal cause of skin cancer is overexposure to sunlight. It has been shown that it is the intermittent blistering sunburn type that predisposes one to skin cancer.

Ultraviolet (UV) rays (usually from 10 am to 3 pm) can induce DNA mutation of skin cells, causing uncontrolled growth, hence the development of cancer. Although the brown skin is expected to be resilient to this mutation (because of the protection given by the melanin pigment), it should be noted that most Filipinos nowadays have changed their lifestyle -- getting crazy over whiteners, going outdoors to the beach, wearing more revealing clothes, etc. Moreover, the thinning of the ozone layer due to pollution has increased the penetration of UV light to the earth.

Other etiologic factors of skin cancer include: medical/industrial X-ray exposure, occupational exposure to arsenic and coal, scarring from burns, family history, and immune status of patients. There are also predisposing skin lesions to skin cancer like congenital nevi/moles, dysplastic moles, solar keratoses, warts, vitiligo, albinism, etc.

Dermatologists divide skin cancer into two types: (1) melanoma and (2) non-melanoma (NMSC). Melanoma is cancer of the pigment cells (melanocytes) of the skin. It is one of the deadliest cancers, spreading fast to the lymph nodes and other organs of the body within a few months from its discovery. Changing moles or nevi should be screened for the 5 cardinal signs of melanoma: A - Asymmetry of the mole; B - (irregular) Borders; C- (variegated/heterogenous) Color within the lesion ; D – (more than 6 mm) Diameter; and E – (changes in) Elevation of the mole. Any positive cardinal sign should alert the patient and physician into doing diagnostic exams to rule out the possibility of melanoma.

On the other hand, NMSC is the most common form of skin cancer, the two most common types are: basal cell carcinoma and squamous cell carcinoma. Basal cell carcinoma (BCC) appears to arise from the epidermis and hair follicle and by itself is the most common of all skin cancers.

The typical appearance is a small dome-shaped pearly white bump with blood vessels on the surface. It resembles a pimple that bleeds, heals and recurs. Although it rarely metastasizes (i.e., spreads to other organs of the body), BCC locally invades the area and may cause substantial disfigurement.

Squamous cell carcinoma (SCC) accounts for the second most common type of skin cancer. It is cancer of the keratinizing layer of the skin. It may just appear like flat red patches with adherent or sticky scales on the skin or may come in the form of large masses or wart-like lesions. Unlike BCC, SCC has the propensity to metastasize so that early intervention is needed.

In general, the following signs and symptoms should alert a patient into consulting a physician to rule out skin cancer: 1. Changes in the surface of a mole (oozing, bleeding, scaling, new bump); 2. Spread of pigment (from border of the lesion to surrounding skin); and 3. Changes in sensation over the lesion (itchiness, tenderness or pain).



DIABETES, THYROID AND ENDOCRINE CENTER

The endocrine system is a network of organs and glands in the human body that produce and secrete hormones that control important body functions.

These can range from bone and cell growth, sleep, sexual activity, metabolism and the ability to process calories into energy needed by the body. Abnormalities in the functioning of the system leads to disorders such as diabetes, thyroid disease, sexual dysfunction and a host of other hormone-related conditions.

The Diabetes, Thyroid and Endocrine Center of St. Luke's offers comprehensive diagnosis and treatment in disorders of the endocrine system that include the pineal, hypothalamus, pituitary, thyroid, parathyroid, thymus, and adrenal glands, as well as the pancreas and gonads (ovaries and testes).

Internationally trained endocrine specialists are available to diagnose and treat common as well as rare conditions of the endocrine glands among people of all ages. Pediatric endocrinologists are





available to handle endocrine problems occurring among children.

Advanced, state-of-the-art technologies are utilized to screen patients of endocrine disorders such as diabetes, metabolic disorders, cancer and hormonal problems. Endocrinologists work alongside physicians from other subspecialties such as ENT-HNS specialists, surgeons, and nuclear medicine specialists to allow a comprehensive and multidisciplinary diagnosis and treatment. This is essential is identifying endocrine disorders involving hormonal imbalance (i.e. the glands producing too much or too little of the hormone).

The Center also offers dynamic tests and endocrine panels for pituitary adrenal, thyroid and gonadal/ infertility disorders and Diabetes Mellitus. Recently, the Center opened the first Insulin Pump Clinic in the Philippines. The Insulin Pump Clinic installs pumps and continuous glucose monitoring devices.

Outcome Studies on Ultrasound Guided Fine Needle Aspiration Biopsy of Thyroid Nodules at the Diabetes, Thyroid, and Endocrine Center

Roberto C. Mirasol, MD; Natalie Bernice T. Ong, MD

Thyroid nodules are a common problem encountered in clinical practice. Epidemiologic studies have shown that the prevalence of thyroid nodules ranges from 4 to 23%, depending on the study population and iodine status of the area. In the Philippines, the latest national survey conducted in 2008 estimated the prevalence to be at 8.9%. The clinical significance of these nodules rests with the need to detect the small percentage of patients with thyroid malignancy so that immediate surgical intervention can be instituted.



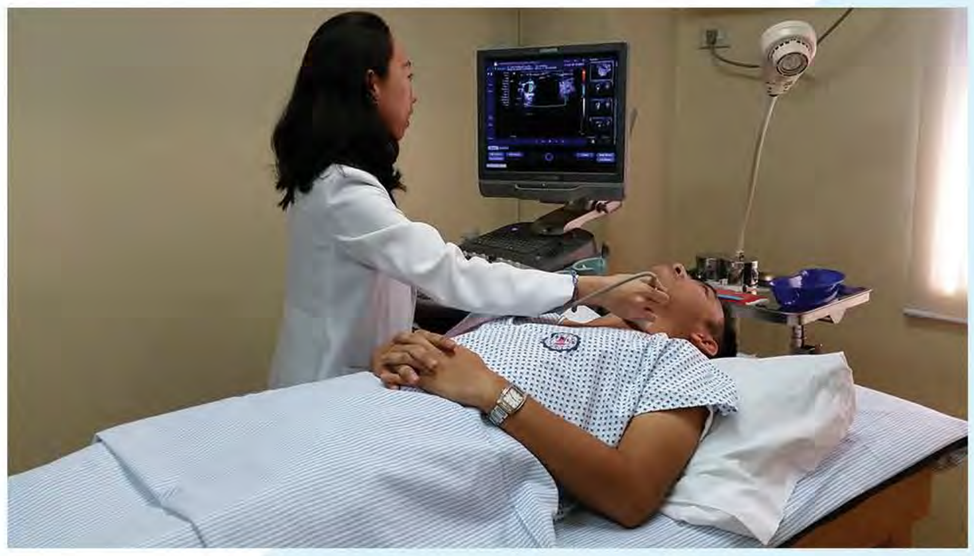
Dr. Roberto Mirasol is the Head of the Diabetes, Thyroid and Endocrine Center at St. Luke's-Quezon City.

Fine-needle Aspiration Biopsy (FNAB) is the gold standard for the pre-operative evaluation of thyroid nodules and has significantly reduced the number of surgeries performed unnecessarily for diagnostic purposes.

Ultrasound Guided Fine Needle Aspiration Biopsy (FNAB) Procedure

The St. Luke's Medical Center Diabetes, Thyroid, and Endocrine Center (DTEC) was established in 2003. In 2007, performance of ultrasound guided fine needle aspiration biopsy by endocrinologists was commenced, initially utilizing the ultrasound machine of either the Breast or Aesthetic Center. In 2013, the center acquired its own ultrasound equipment paving way to perform the procedure within the center. To date, the center is able to conduct around 1,000 FNAB procedures per year.

At the St. Luke's DTEC, all ultrasound guided fine needle aspiration biopsies are carried out by an endocrinologist or ENT specialist affiliated with the institution. All biopsy procedures are performed in the same unit, using the same ultrasound equipment (Sonosite Micromaxx) and biopsy tray setup. Informed consent is signed by all patients prior to undergoing the said procedure.





All ultrasound guided fine needle aspiration biopsies are performed at the St. Luke's DTEC using the Sonosite Micromaxx Ultrasound Equipment and Biopsy Tray Setup.

After signing the informed consent, a thorough history and physical examination is conducted on the patient. A local anesthetic, 1% Lidocaine (EMLA, Astra Zeneca), is administered over the area in question. The patient is then asked to assume a supine position with a rolled towel or pillow placed behind the cervical spine to hyperextend the neck. Two ultrasound radio technicians will alternately assist the endocrinologist/ENT specialist in nodule localization and measurement using a 10-MHz transducer prior to biopsy. The overlying skin is cleansed with Povidone Iodine or 70% alcohol. Fine needle aspiration biopsy is performed under direct ultrasound visualization with a 23- or 25-gauge needle attached to a 10mL disposable syringe with the syringe plunger pulled back by 2-3 mL placed on the nodule. This is followed by a single or multiple excisions made through the nodule. Some endocrinologists make use of a mechanical syringe holder during the procedure. The aspirated sample is placed on appropriately labeled glass slides, smeared, and fixed in 95% ethyl alcohol and sent to pathology for analysis.

Study Findings

The outcome research is based on one retrospective and two cross sectional studies conducted among patients who underwent thyroidectomy following ultrasound guided fine needle aspiration biopsy (USG-FNAB) at the Diabetes, Thyroid, and Endocrine Center. Information on demographic data of study population, ultrasound findings, and the cytologic, frozen section examination, and histologic reports were abstracted from the patient's medical record and pathology report. The accuracy of USG-FNAB was assessed by comparing the initial cytology result with the final frozen section and histopathology report.

To assess the accuracy of USG-FNAB vs. intraoperative frozen section examination, the following were analyzed: Sensitivity – the proportion of patients with malignant thyroid disease and positive cytologic findings; Specificity – the proportion of patients without malignant thyroid disease and negative cytologic findings; Positive predictive value – the chance that a patient who tests positive for FNAB truly has the disease; Negative predictive value – the chance that a patient who tests negative for FNAB truly does not have the disease; and Accuracy rate – proportion of correct results (true positive and true negative) in relation to all cases studied.

From January 2007 to December 2009, a total of 2,239 nodules were subjected to USG-FNAB at the St. Luke's DTEC. 251 nodules were surgically excised following USG-FNAB. Frozen section examinations (FSE) were taken from 90 out of 251 nodules. The USG-FNAB yielded 90.3% (n=1,721) adequate specimens and 9.7% (n=185) inadequate specimens. The histologic examination of the 251 surgically excised nodules revealed 182 (73%) benign and 69 (27%) malignant nodules. Table 1 shows the correlation of USG-FNAB with definitive histologic diagnosis. The sensitivity, specificity, positive and negative predictive values and accuracy rate of USG-FNAB cytology are 70.3%, 92.8%, 76.5%, 90.4%, and 87.2% respectively.[3]

The diagnosis by frozen section was benign in 56 cases (62%), malignant in 10 cases (11%) and deferred in 24 cases (27%). Table 2 shows the correlation of FSE with definitive histologic diagnosis. By FSE, the sensitivity, specificity, positive and negative predictive values, and accuracy rate are 83.3%, 100%, 100%, 96.4%, and 96.7% respectively.[3]

Ultrasound Guided Fine Needle Aspiration Biopsy Procedure.



Table 1. Distribution of Cases According to the Results of the Fine Needle Aspiration Biopsy Cytology and Final (Definitive) Histopathology Diagnosis[3]

Fine Needle Aspiration Biopsy	Histology (n=251)										
	Benign Lesion					Malignant Lesion					
	NG (n=152)	FA (n=17)	HA (n=5)	LT (n=8)	Sub total	PTC (n=60)	FTC (n=5)	HC (n=3)	MTC (n=1)	Sub total	Total
Benign (n=114)	90	7	1	5	103	9	1	1	0	11	114
Malignant (n=34)	8	0	0	0	8	25	0	0	1	26	34
Indeterminate (n=74)	32	8	4	3	47	22	3	2	0	27	74
Inadequate (n=29)	22	2	0	0	24	4	1	0	0	5	29
Totals					182					69	251

NG, nodular goiter; FA, follicular adenoma; Huthle cell adenoma; LT, lymphocytic thyro iditis; PTC, papillary thyroid carcinoma; FTC, follicular thyroid carcinoma; HC, Hurthle cell carcinoma; MTC, medullary thyroid carcinoma

SENSITIVITY 70.3% SPECIFICITY 92.8% PPV 76.5% NPV 90.4%

Table 2. Distribution of Cases According to the Results of the Frozen Section Examination Cytology and Final (Definitive) Histopathology Diagnosis[3]

Frozen Section Exam	Histology (n=90)										
	Benign Lesion					Malignant Lesion					
	NG (n=57)	FA (n=10)	HA (n=3)	LT (n=2)	Sub total	PTC (n=16)	FTC (n=1)	HC (n=1)	MTC (n=0)	Sub total	Total
Benign	51	0	1	2	54	2	0	1	0	2	56
Malignant	0	0	0	0	0	10	0	0	0	10	10
Deferred	6	10	2	0	18	4	1	2	1	6	6
Totals					72					18	90

NG, nodular goiter; FA, follicular adenoma; Huthle cell adenoma; LT, lymphocytic thyroiditis; PTC, papillary thyroid carcinoma; FTC, follicular thyroid carcinoma; HC, Hurthle cell carcinoma; MTC, medullary thyroid carcinoma

SENSITIVITY 83.3% SPECIFICITY 100% PPV 100% NPV 96.4%

Table 3. Accuracy of Combined USG-FNAB and FSE in the Diagnosis of Nodular Thyroid Malignancy[3]

Index	Concordant Findings (Combined FNAB and FSE) N=35	USG-FNAB Findings Discordant with FSE N=6	FSE Findings Discordant with USG-FNAB N=6
% Sensitivity	83.3	25	75
% Specificity	100	0	66.7
% PPV	100	33.3	100
% NPV	96.7	0	66.7
Accuracy Rate	97.1	16.7	83.3

FNAB, fine needle aspiration biopsy; FSE, frozen section examination; PPV, positive predictive value; NPV, negative predictive value

Table 4. Index of Accuracy of USG-FNAB and Palpation Guided FNAB (suspicious for follicular neoplasm not included in data analysis)[2]

Index	USG-FNAB	Palpation FNAB
% Sensitivity	78.57%	30.77%
% Specificity	91.67%	100%
% Positive Predictive Value	86.84%	100%
% Negative Predictive Value	85.94%	81.25%
Accuracy Rate	86.2%	82.69%

A diagnostic accuracy of up to 97.2% was achieved when USG-FNAB and FSE were combined and when their findings were concordant. When USG-FNAB and FSE diagnoses were discordant, the FSE showed superior accuracy (83.3%) than cytology (16.7%) (Table 3). In the groups of nodules with indeterminate or inadequate cytology, the diagnostic accuracy of frozen section is 100%.[3]

In our study, the adequacy rate of USG-FNAB is 90.3%. Worldwide, the adequacy rate of FNAB ranges from 70-100% and our result is comparable to published studies.[3]

A follow-up study was conducted last 2013 wherein the authors compared the diagnostic accuracy of USG-FNAB vs. palpation guided thyroid biopsy. 129 patients who underwent FNAB followed by thyroidectomy were included in the study. Each site of the thyroid nodule that underwent FNAB was considered as one case. 118 nodules were biopsied under ultrasound guidance while 57 nodules were biopsied under palpation guidance. Histologic examination of all the excised specimens showed 113 benign lesions (64.5%) and 62 malignant lesions (35.4%). Ultrasound Guided FNAB group yielded a sensitivity of 78.57%, specificity 91.67%, positive predictive value 86.84%, negative predictive value 85.94% and accuracy rate of 86.2%. Palpation Guided FNAB group yielded a sensitivity of 30.7%, specificity 100%, positive predictive value 100%, negative predictive value 81.25%, and accuracy rate of 82.69% (Table 4). Non-diagnostic yield were 4% and 12% for the USG-FNAB and palpation guided FNAB groups respectively.

In this more recent study, it was noted that Ultrasound guided FNAB compared with palpation guided FNAB had higher sensitivity and accuracy rate. It significantly lessens the diagnostic yield by three-fold. The improved diagnostic yield and accuracy justify the additional cost of the procedure.[2]

One of the gray areas that create confusion among pathologists and physicians is the classification of "indeterminate" lesions in thyroid cytology. There is great variability in the way cytopathologists identify, interpret, and report such aspirates, especially when the uncertainty relates to follicular lesions. Clinicians have tended to lump interpretations such as "follicular lesion," "atypical," "follicular neoplasm," "indeterminate for neoplasia," and "suspicious for malignancy" into a single "indeterminate for malignancy" category for conceptual and even management purposes.

Thus, in 2013, another cross sectional study was conducted to determine the management and outcome of adult patients who underwent FNAB of thyroid nodule, with a cytologic diagnosis of atypia or follicular lesion of undetermined significance.

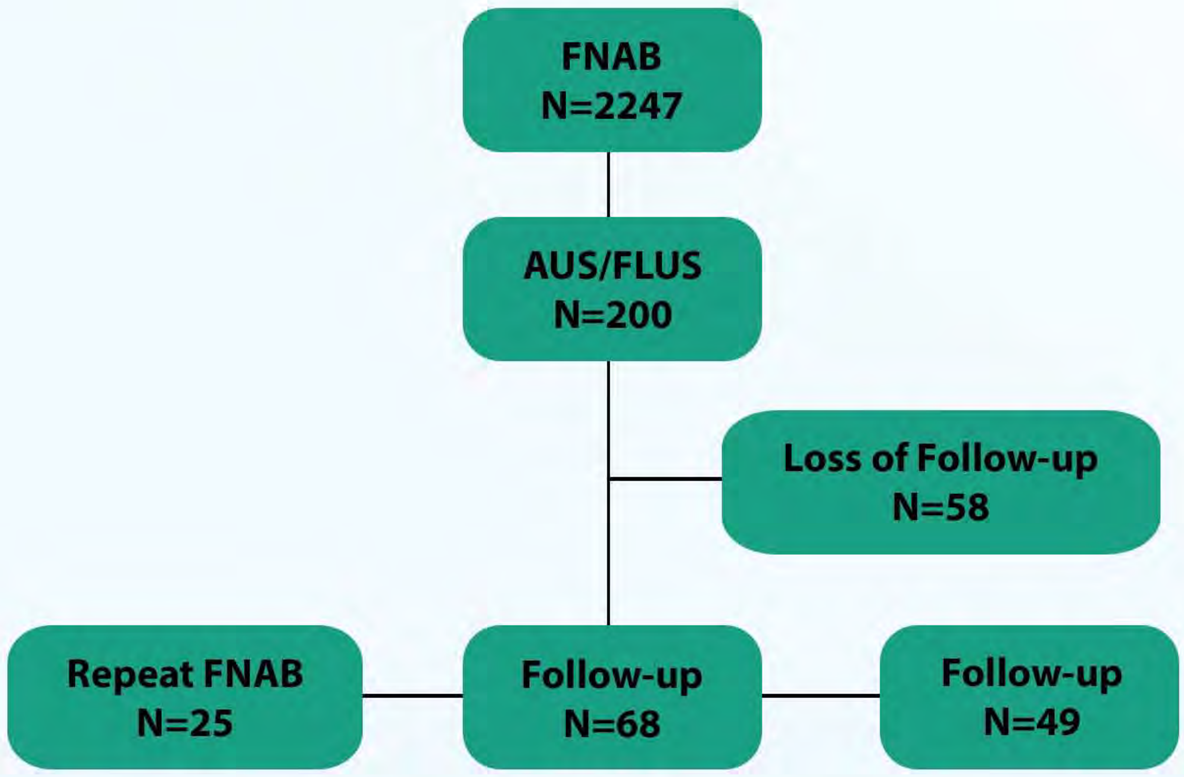


Figure 1. Management of Fine-Needle Aspiration Biopsy at St. Luke's Medical Center from January 2012 to October 2013

Among the 2247 patients who underwent fine-needle aspiration biopsy of the thyroid nodule at St. Luke's Medical Center from January 2012 to October 2013, a total of 200 (8.9%) had a cytologic diagnosis of atypia or follicular lesion of undetermined significance (AUS/FLUS). Of the 200 patients, 25 (12.5%) underwent repeat fine needle-aspiration biopsy, while a total of 68 (34%) underwent surgery. 52 patients were reassessed with a clinical examination and an ultrasound (Figure 1).[1]

Table 5 shows that among those who underwent repeat fine needle aspiration biopsy (n=25), 10 (40%) had benign results, 12 (48%) were AUS or FLUS and 3 (12%) were consistent with malignancy (papillary carcinoma). Surgery was performed in 3 of the 25 patients. After a repeat biopsy of the 68 patients who underwent surgery, 44 were benign and 24 were malignant with a malignancy rate of 35.3%.

Preoperatively, there were no ultrasound characteristics or microscopic descriptions significantly associated with malignancy (Table 6).

Table 5. Result of Repeated Fine Needle Aspiration Following an Initial Result of AUS/AFUS [1]

Result	No of Cases (%) N=25
Benign	10 (40)
Cystic Colloid Goiter	8 (32)
Lymphocytic Thyroiditis	2 (8)
AUS/AFUS	12 (48)
Malignant	3 (12)

Table 6. Multivariate Analysis for Malignancy [1]

Variables	Odds Ratio (95% CI)	P-value
Age	0.989 (0.903-1.083)	0.811
Sex	0.645 (0.038-11.055)	0.762
Size	0.190 (0.037-0.989)	0.048
Complex	0.309 (0.029-3.317)	0.332
Echogenicity	6.353 (0.582-69.342)	0.129
Ill-defined margins	0.108 (0.003-3.953)	0.226
No microcalcification	0.000 (0)	0.999
With Microcalcification	0.000 (0)	0.999
No vascularity	19.095 (1.053-346.144)	0.046

Based on these findings, the recommendation of the Bethesda System to do a repeat FNAB in these thyroid nodules in three months should, therefore, be practiced.[1]

Conclusion

Ultrasound guided fine needle aspiration biopsy is an accurate preoperative test for the evaluation of nodular thyroid disease. It helps to distinguish malignant from benign lesions. Moreover, compared with palpation guided biopsies, ultrasound guided biopsies alone and in combination with frozen section examination improves the accuracy rate of thyroid cancer detection. For thyroid lesions with indeterminate cytology, the recommendation of the Bethesda System of doing a repeat FNAB should be reconsidered.

Acknowledgment: This article was written by Dr. Natalie Bernice T. Ong in behalf of the consultants and fellows-in-training of the Diabetes, Thyroid, and Endocrine Center. It was based on three published, peer-reviewed studies conducted by the fellows-in-training and consultants of the section.

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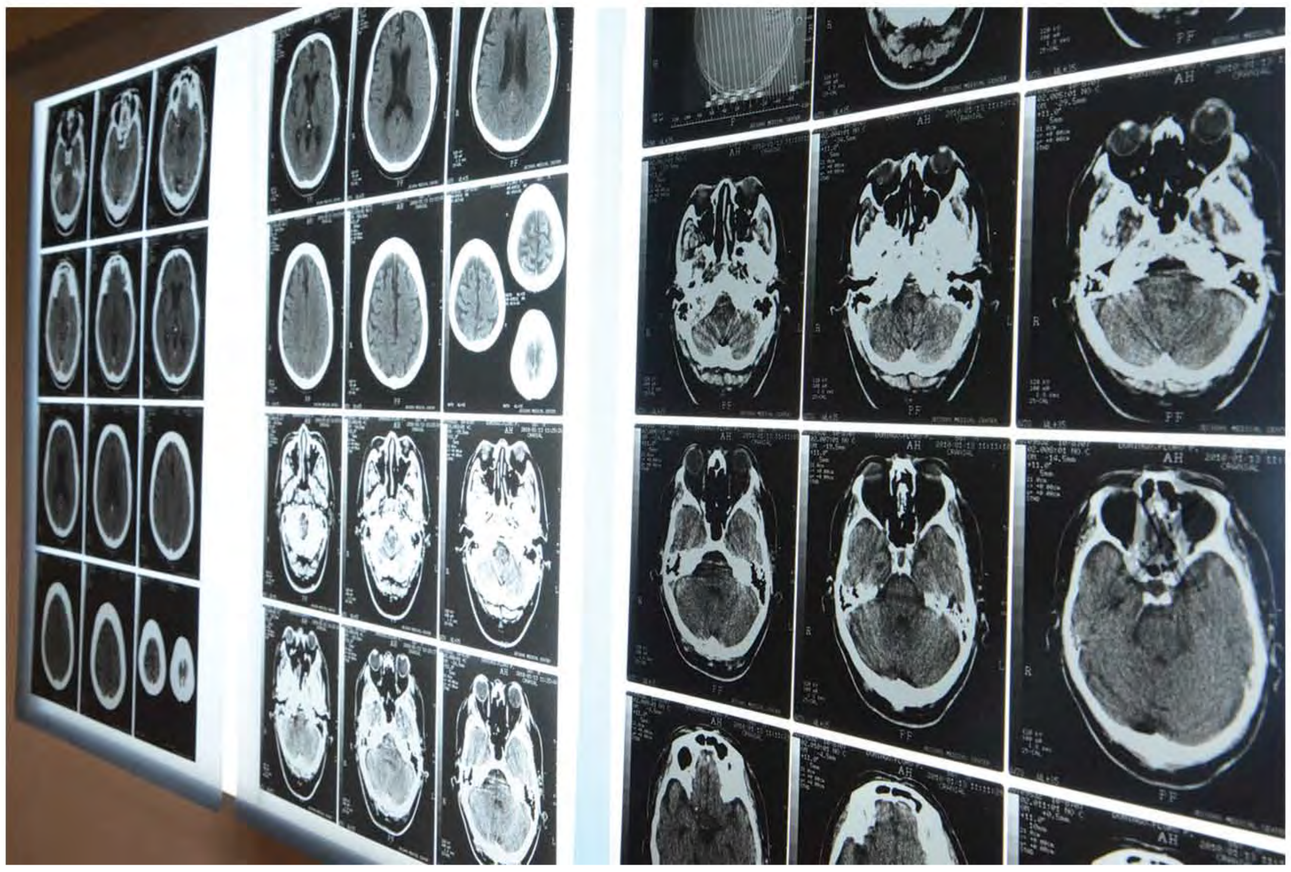


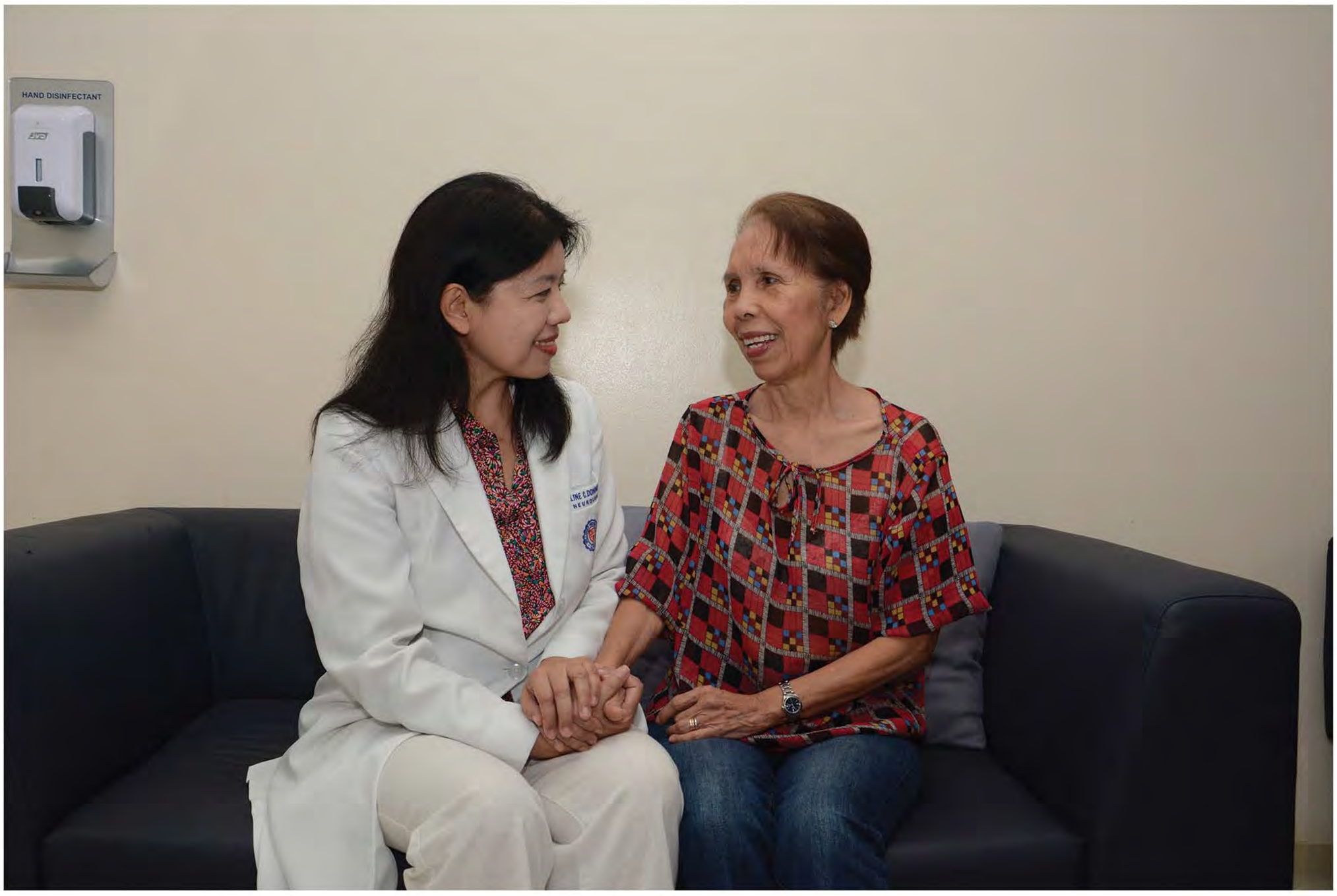
MEMORY CENTER

A major diagnostic and treatment facility of the St. Luke's Institute for Neurosciences, the Memory Center is a hospital-based, outpatient, multidisciplinary service providing a range of detailed clinical assessments, management and advisory services for individuals with memory problems and dementia, including Alzheimer's disease.

The Institute for Neurosciences is a center for excellence in the field of neurology, neurosurgery and psychiatry in the Philippines. It boasts of the country's leading medical consultants and professionals in the field and the most advanced and comprehensive diagnostic and treatment facilities for neurological disorders.

The Memory Enhancement Program (MEP) provides a full suite of Cognitive Rehabilitation Therapy for individuals with memory and cognitive difficulties. The program is managed by a multidisciplinary team of neurologists, psychologists, nurse clinicians, an occupational therapist, speech and language pathologist, and a data manager.





Therapy is person-centered and highly involves family participation. Sessions last for 60 minutes each per week for six weeks.

Pilot Development Protocol Outcomes for Memory Patients

Jacqueline C. Dominguez, MD

Impairment in memory, executive functions (attention, judgment and problem solving, multitasking), language and other cognitive faculties often occur after a stroke.

The set of symptoms associated with loss or impaired cognition that affects a person's ability to function independently in daily life is called the dementia syndrome. Dementia can worsen over time and impacts significantly on the person's quality of life if not alleviated. While the most common form of dementia is Alzheimer's Disease (AD), up to 40% of people who suffer a stroke will have dementia, and the prevalence significantly increases with repeated strokes. This is called Vascular Dementia (VaD) or Vascular Cognitive Impairment (VCI).



Dr. Jacqueline Dominguez is the Head of the Memory Center at St. Luke's-Global City.

Cognitive impairment in VCI is due to lack of perfusion or blood supply to parts of the brain that are responsible for cognition, For instance, impairment in language (aphasia) is observed if the left part of the brain is involved.

The St. Luke's Memory Center provides diagnostic and treatment services for cognitive and behavioral disorders in a holistic, patient-centered and team-based approach. The Center continuously develops non-pharmacologic interventions and validates these interventions by way of pre- and post-assessments.

Aside from standard of care for these conditions, non-pharmacologic or non-drug interventions have been applied as an important part of neurologic care. The Memory Center provides non-pharmacologic interventions for patients with memory or dementia-related disorders after a stroke.

Table 1. Demographic and Clinical Characteristics of Patients for CBT with Cerebrolysin® Infusion therapy

INITIALS	AGE	GENDER	NATIONALITY	NO. OF YEARS OF EDUCATION	DIAGNOSIS
RDB	63	male	Filipino	18	Cerebrovascular disease; Post-stroke Aphasia
RAB	83	male	Filipino	19	Cerebrovascular disease ; Subcortical Ischemic Vascular Disease
ETG	54	male	Filipino	14	Cerebrovascular disease; Post-stroke Aphasia
MJS	76	male	Filipino	12	Vascular Cognitive Impairment-Subcortical Ischemic Vascular Disease
EDS	77	female	Filipino	15	Vascular Cognitive Impairment-Subcortical Ischemic Vascular Disease

Cognitive Behavioral Therapy

This therapy is administered to improve the patient's specific impairments in memory, orientation, attention, language, visuospatial and constructional skills, and executive functioning. When present, behavioral difficulties that arise from the patient's condition (e.g., frustration, depression, etc.) are addressed. The therapy is provided by a clinical psychologist.

Speech and Language Therapy

This therapy is primarily done to restore impaired language abilities and strengthen intact modalities to support communication through language exercises (e.g., reading, writing, naming, etc.), hierarchical cueing strategies, and other impairment-based treatments. A speech and language pathologist provides this therapy.

Pilot Study of Cognitive Behavioral Therapy with Cerebrolysin®

The St. Luke's Memory Center conducted a pilot study to explore and test the effectiveness of the Center's new intervention protocol that involves cognitive therapy in combination with an intravenous infusion of Cerebrolysin®. Cerebrolysin® is a neuropeptide agent. (See sidebar article)

This observational study was done on patients with cognitive impairment due to stroke from 2012 to 2013. Patients with VCI underwent cognitive therapy with the psychologist while patients with post-stroke aphasia underwent speech and language therapy.

Each patient underwent at least six weekly 1-hour sessions of cognitive therapy or speech and language therapy, while receiving 30cc of the neuropeptide (Cerebrolysin®) which was infused during the therapy sessions. The observation period lasted for six weeks.

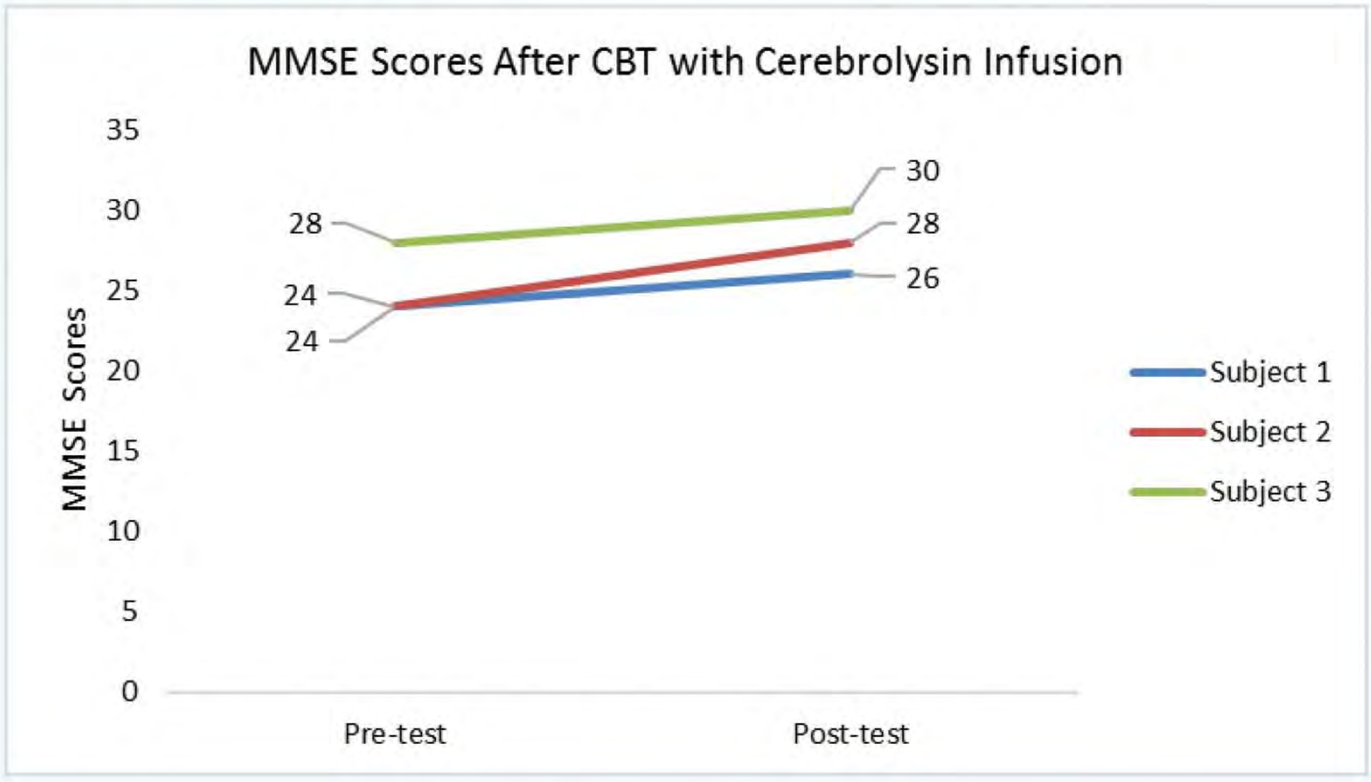
The statistical effects of the intervention on cognition and language was determined by comparing the pre- and post-intervention scores on the Mini-Mental State Examination (MMSE) and the Revised Western Aphasia Battery (R-WAB) using mean difference sample T-test.

Study Findings and Outcomes

Five (5) patients underwent baseline assessment and the intervention described. Mean age was 69 years; four were males. Three had VCI and two had post-stroke aphasia.

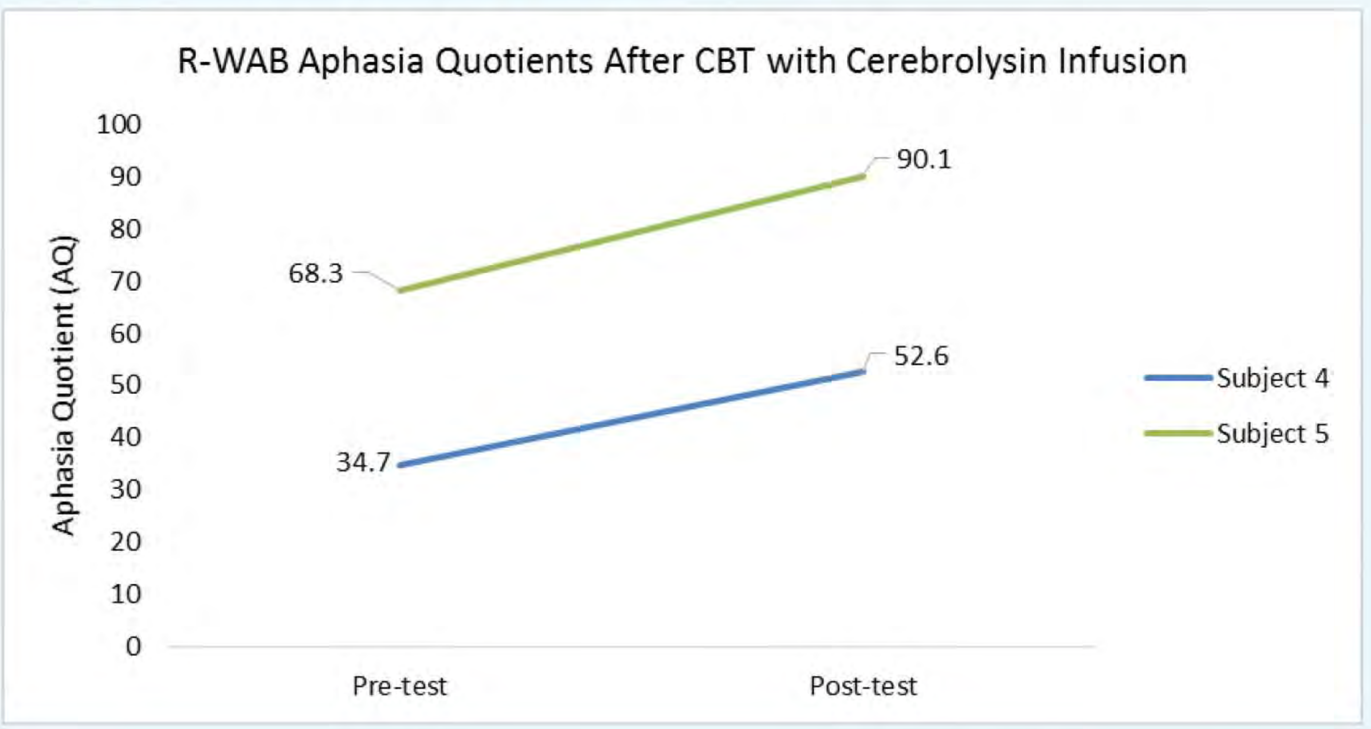
After the intervention, patients who underwent cognitive therapy had noticeably higher MMSE scores. Statistical analysis yielded a finding of significant improvement between the pre-test scores and the post-test scores. This is evident in all of the three VCI patients during post-treatment evaluation ($F = 16$, $p<0.05$). (Figure 1)

Figure 1. Pre-test and post-test scores on the MMSE scores of VCI subjects who underwent cognitive intervention protocol



For the aphasia (language deficit) patients who received speech therapy, post-test results showed an increase in the Aphasia Quotient of the R-WAB, at 21.8 and 17.9 point increment. Subject 4 exhibited an improvement in all oral language subtests/areas especially in auditory comprehension, lexical retrieval, and spontaneous speech, while Subject 5 showed significant increases in fluency, auditory comprehension, and naming abilities (Figure 2). The T-test likewise showed statistical significance between the pre and post-test R-WAB scores in both subjects.

Figure 2. Pre-test and post-test scores on the R-WAB scores of aphasia subjects who underwent speech therapy





Cognitive Behavioral Therapy is performed by a clinical psychologist.

Although the study involved a small sample size, the statistical analysis yielded positive success outcomes for the five subjects observed. No adverse effects on the patients were monitored during the six-week study period.

With this evidence-based evaluation, the St. Luke's Memory Center plans to make this developmental treatment protocol into a standard program for VCI and aphasia patients, and eventually apply it to patients who are suffering from Alzheimer's disease.

What is Cerebrolysin®?

Cerebrolysin® is a peptide-based drug that has pharmacodynamic neurotrophic and neuroprotective characteristics mimicking endogenous neurotrophic factors and is parenterally administered by a licensed nurse or doctor. Neuroprotective and neurotrophic agents have opened new avenues in stroke treatment and increase the potential for survival and rehabilitation.

Cerebrolysin® is known to protect the nerve cells from the hazards of the ischemic cascade. It serves as an alternative treatment approach to the single-target drugs such as cholinesterase inhibitors and NMDA receptors.

Based on several clinical trials, Cerebrolysin® has been found to be safe and well-tolerated by patients. Clinical tests have showed significant improvement in the cognitive and functional ability of an individual, as well as behavioral symptoms and the clinical global impression. The beneficial outcome of Cerebrolysin® were maintained for up to several months after treatment indicating a delaying effect to the disease.



RHEUMATOLOGY, ALLERGY AND IMMUNOLOGY CENTER

The Rheumatology, Allergy and Immunology (RAI) Center is a unique, dedicated facility at St. Luke's which aims to be the foremost center in the Asia Pacific region to address the diagnosis, treatment and management of a wide range of rheumatologic and immunologic conditions.

These conditions can range from simple forms of allergies to complicated conditions like systemic autoimmune diseases such as rheumatoid arthritis. Since its inception, the Center has served and helped patients from around the world including the US territories in the Pacific. The Center is ably staffed by local and international board-certified rheumatologists, allergologists and immunologists with individual expertise on specific diseases under this extensive field.

Immune system disorders involve the intricate interplay between the innate and adaptive immunity that could be brought about by an acute allergic hypersensitivity reaction usually presenting in childhood but could persist during the adult years. Test modalities that identify particular environmental and food allergens are





utilized in this Center. Defects in the immune system due to long standing immune dysregulation and autoantibody production like systemic lupus erythematosus are seen and managed by clinicians who also have concurrent faculty and scientific appointments in various international and local peer organizations tackling such rheumatic diseases.

Playing a Key Role in the Local Development and Safe Use of Biologic and Intravenous Immunoglobulin (IVIG) Therapies

Evan Glenn S. Vista, MD, FPRA, FACR

In recent years, immune therapies have revolutionized the treatment of patients with major rheumatologic and immunologic diseases. Indeed, these therapies, particularly biologics and Intravenous Immunoglobulin (IVIG), have become an integral part of management by rheumatologists, allergologists and immunologists of St. Luke's Rheumatology, Allergy and Immunology (RAI) Center.



Dr. Evan Vista is a St. Luke's Research Professorial Chair in Rheumatology.

Biologics, as they are called, represent a new class of drugs introduced a decade ago to combat rheumatoid arthritis (RA) and other autoimmune disorders. A "biologic" drug copies the effects of substances naturally made by the body's immune system. Biologic agents are genetically engineered drugs involving a complex process wherein the human genes that normally guide the production of these natural human proteins are used in non-human cell cultures. These drugs can lessen inflammation typically seen among auto-inflammatory diseases by interfering with biologic substances that can cause or worsen inflammation. These new biologic agents are targeted treatments affecting directly at the molecular level abnormalities of the immune system that lead to the joint inflammation and other abnormalities in rheumatic diseases and thus help treat their symptoms.

IVIG on the other hand, are polyvalent immunoglobulin class G antibodies made from pooled plasma donors that have so-called pleiotropic effects on the body's innate immunity, including the regulation of our immune cells, the B and T cells. There are several approved and novel indications for IVIG use and the RAI Center has, on record, a decade of experience in the use of this blood product effectively and safely.

Biologic agents have been duly approved by both the international and local Food and Drug Administration to treat from moderate to severe rheumatic conditions such as rheumatoid arthritis, systemic lupus erythematosus, systemic vasculitis,

juvenile arthritis, inflammatory bowel diseases, psoriatic arthritis and ankylosing spondylitis. Patients with these systemic autoimmune or auto inflammatory conditions usually receive biologics if they have not responded to an adequate trial dose of one or more of the traditional disease-modifying antirheumatic drugs (DMARD).

Local Development of Biologic and IVIG Protocols

These biologic drugs are locally available and widely used at the RAI Centers in the Global City and Quezon City sites. The patient sample is representative of those seen among major registries worldwide[1]. For several years, the RAI Center has had extensive experience and indeed pioneering efforts in using approved biologic therapies in rheumatic diseases globally.

St. Luke's RAI Center has participated in numerous international multicenter clinical trials and collaborations for the drug development of biologics (Table 1). St. Luke's rheumatology consultants and fellow trainees serve as the principal and co-investigators in these landmark clinical studies that serve to accelerate advances in the field of rheumatology[2].



Biologic therapies for patients with rheumatic disease have shown a dramatic reduction in swelling and slowed disease progression.

Patients who receive biologics are adequately assessed and screened, then given follow up with physician-and-patient reported outcome measures to assess overall improvement. These infusion and injection procedures are administered both in the ambulatory and inpatient setting using a designed protocol that conforms to St. Luke's clinical pathway template.

Table 1. Summary Table of 5 Years Cumulative Number of Biologic Use for St. Luke's RAI Center Global City and Quezon City (Source: RAI Center Global City & Quezon City Annual Census Reports and 2013 Rheumatology Fellows Report)

Drug Name	2009 (SLMC-QC only)	2010 (SLMC-GC Opens)	2011	2012	2013	Total
Belimumab	49*	30*	9 (Year of Release)	6	4	98
Infliximab	22	43	112*	40*	22	239
Ocrelizumab	17	3*	6* (Study discontinued)	-	-	26
Rituximab	13	11	8	7	27	66
Tocilizumab		1 (Year of Release)	62*	11	24	98
Ustekinumab	-	-	1 (Year of Release)	1	-	2
IVIG	10	5	15	43	36	109
Grand Total= 638 Infusions						

**Includes Drugs in Development **Includes Biosimilar Infliximab Study*

Cases observed in the study for biologic therapy for patients with these rheumatic diseases have shown dramatic reduction in joint pain swelling and slowed, or even stopped, radiographic disease progression, finally resulting in improved quality of life. Knowing that musculoskeletal conditions has great impact in thedisability index among all chronic conditions and relative effect on the quality of life, patients treated with these medications have better chances of normal productive life and contribution of their share to society[3, 4].

Outcomes

Biologic agents may be used singly, but they are often used with other traditional DMARDs designed to increase the benefit as well as limit potential side effects, the most significant being the higher risk of infection. The safety of the use of biologics at St. Luke's RAI Center with regard to infection was recorded to be lower than the established Danish DANBIO registry pegged at 43%, including both serious and non-serious types of infection[1].

Standard screening procedures of patients who are potential clients for biologics are currently practiced and developed by St. Luke's rheumatologists and have been adapted in the Asia Pacific region[5].

An inception study that will serve as the St. Luke's rheumatic disease registry aimed at capturing real-time clinical observations of patients as to the long-term efficacy and safety of biologics is currently in development.

Infusion procedures are administered using a designed protocol that conforms to St. Luke's clinical pathway template.



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WEIGHT MANAGEMENT AND BARIATRIC-METABOLIC SURGERY CENTER

The Weight Management and Bariatric-Metabolic Surgery Center (WMBMSC) is the first and only hospital-based multidisciplinary center for adult and pediatric weight management and comprehensive bariatric and metabolic surgery services.

The Center's unique approach towards the management of weight issues and obesity is multidisciplinary, adhering to the best practice guidelines and international safety standards. Its goal is to promote a healthy lifestyle for patients by providing a nutritionally balanced diet while maintaining an ideal or realistic weight.

Its physicians and staff have received training in reputable centers and are board-certified in their specialties. These include bariatric and metabolic surgeons, anesthesiologists, cardiologists, pulmonologists, endocrinologists, physiatrists, pediatricians, psychiatrists and clinical nutritionists. They are members of local and international societies recognized for their high level of competency and credibility. Assisting them are highly trained nurses,





dieticians, psychologists, physical therapist and fitness trainers. Working together for the benefit of a patient's overall heath, the Center's clinical outcomes are at par with the best centers in the world.

Its medically supervised services include overweight and obesity screening, diagnostic examinations and procedures, specialist consultations and risk assessment, and the creation of a tailored program specific to a patient's needs and capabilities. Its bariatric and metabolic surgeries include minimally invasive procedures such as laparoscopic adjustable gastric banding (LAGB), laparoscopic sleeve gastrectomy, laparoscopic Roux-en-Y gastric bypass, laparoscopic duodenal switch, and robotic-assisted bariatric surgery. These surgeries are accepted treatments for obesity, diabetes, hypertension and other associated illnesses.

Multidisciplinary Weight Management Outcomes

Roberto C. Mirasol, MD, FPCP, FPSEM
Maria Katrina Mallonga-Palanginan, MD

Obesity has become a malady of the modern world. And worse, the incidence has reached epidemic proportions worldwide.



Dr. Roberto Mirasol is the Head of the Diabetes, Thyroid and Endocrine Center and previous Head of the Weight Management Center at St. Luke's-Quezon City.

Worldwide prevalence of obesity is 1.6 billion and overweight is 400 million. The World Health Organization (WHO) has estimated that in 2015 there will be a precipitous increase to a staggering 2.3 billion overweight and 700 million obese persons around the globe.

The Philippines is not spared from this epidemic. According to the survey done by the Food and Nutrition Research Institute in 1998, 20 out of 100 Filipinos were overweight. Ten years after (2008) the initial survey, an increase to 27 out of 100 Filipinos was found to be overweight.

Obesity is associated with several health risks: diabetes, hypertension, coronary artery disease, dyslipidemia, and cancer, among others. More importantly however, a prospective study by the American Cancer Society in 1982 showed an increase in risk of cardiovascular death with increasing BMI (body mass index) in adults who never smoked and who had no history of disease at enrollment.

The St Luke's Weight Management and Bariatric-Metabolic Surgery Center (WMBMSC) has conducted a retrospective study of its patients who have undergone any one or combination of its treatment protocols for weight loss from 2003-2009. These include diet therapy, multidisciplianary weight management, weight maintenance and surgical therapy, specifically Laparoscopic Adjustable Gastric Banding (LAGB) and Laparoscopic Sleeve Gastrectomy.

The objective of the study was to document and determine if there had been a statistically significant reduction in the pre- and post-treatment weight and weight related outcome metrics of the different treatment options done at St. Luke's Medical Center for weight loss.

For purpose of this Clinical Outcomes Report, the focus is given on the Multidisciplinary Weight Management (MWM) Program of the Center. The retrospective study assessed the weight and BMI loss of 82 adult Filipino patients who completed the therapeutic phase hospital-based program.

Multidisciplinary Weight Management Program

The MWM program for the management of overweight and obese patients was first introduced by St. Luke's Medical Center in the Philippines in 2003.

The treatment team, composed of a nutritionist-dietitian, endocrinologist, psychiatrist, cardiologist, pulmonologist, physiotherapist and physical therapist, administers the program. Patients enrolled in program undergo an extensive evaluation.

The weight management program (Table 1) consists of nutritional counseling; counseling and cognitive-behavioral modification by a psychiatrist; rehabilitation medicine for exercise prescription; an assessment by an endocrinologist of the type and severity of obesity; evaluation of secondary causes of obesity, evaluation and treatment of endocrine related diseases like diabetes, dyslipidemia and metabolic syndrome; and a therapeutic exercise program by a physical therapist.

Table 1. Components of the Multidisciplinary Weight Management Program

Number of Sessions	Activity	Personnel
6	Nutritional Counseling	Nutritionist – Dietitian
2	Counseling and Cognitive Behavior Modification	Psychiatrist
4	Assessment of Obesity and Complications Screen	Endocrinologist
2	Exercise Prescription	Physiatrist
36	Exercise Sessions	Physical Therapist/Fitness Trainer
1	Cardio-Pulmonary Clearance	Cardiologist/Pulmonologist

Retrospective Study Findings

The outcomes research is based on a retrospective study comprising 82 adult Filipino patients who completed the therapeutic phase of multidisclipinary weight management program.

The 82 patients under study were classified and grouped together based on body mass index (BMI) into Overweight (n=18), Obese Class I (n=24), Obese Class II (n= 24) and Obese Class III (n=16). (Chart 1)

Data collected included the patient's age, sex, co-morbid conditions, and the baseline body weight (BW), BMI, and blood pressure (BP), and the BW and BMI and BP at the completion of therapeutic phase of the treatment program.

The patients were also classified as to the degree of outcome metrics, i.e. weight loss of (a) 0%; b <5%; (c) >5%.

Paired t-test was conducted to determine the statistical significance of difference between pre- and post-treatment BW, BMI, and BP measures of the patients. Moreoever, in order to establish correlation among continuous variables, Pearson r Product Moment Correlation was used as well as estimate of Linear Regression Model in predicting weight loss using baseline BMI and weight as dependent variables.

Fifty patients (61%) achieved the target ≥ 5% weight loss, 27 patients (32.9%) had <5% weight loss and 5 patients (6.1%) gained weight during the program (Chart 2). More female participants (56%) achieved ≥ 5% weight loss compated to the male

participants (44%), although this was not statistically significant (p=0.439). Among the different BMI categories, more patients classified as Obese Class i (34%) achieved weight loss of ≥ 5%, although this was also not statistically significant (p=0.683). (Chart 3)

Patients started the Therapeutic Phase of the program with a mean weight of 96.68 ± 26.87 kg. After the 12 weeks of the program, patients lost 5.94 ± 4.57 kg, which is 6.14% change from baseline. This was significant with p-value of <0.0001. Body mass index decreased by 6.0% from an initial mean of 35.91 ± 7.48 kg/m^2 after 3 months (p= <0.001). (Table 2)

Systolic blood pressure decreased by 8% from a mean baseline of 120.98 ± 12.73 mmHg to 115.24 ± 10.21 after 12 weeks (p= <0.0001). Mean diastolic blood pressure also decreased by 7% from baseline which reached statistical significance (p=0.004). (Table 2)

Across the different BMI categories, patients classified as Obese III had the highest percent weight loss at 7.1%, while Obese Class II patients achieved the lowest percent weight loss of 5.3%. However, these findings were not statistically significant.

Univariate analysis showed that initial BMI (r=-0.503, p<0.0001), initial weight (r=-0.0591, p<0.0001), and number of sessions (r=-0.372, p=0.0001) were inversely correlated with amount of weight loss patients (Table 3). However, after doing multivariate linear regression, only the initial weight and number of sessions were significant negative predictors of weight loss (Table 4).

Chart 1. Census of MWM Patients by Class of Obesity

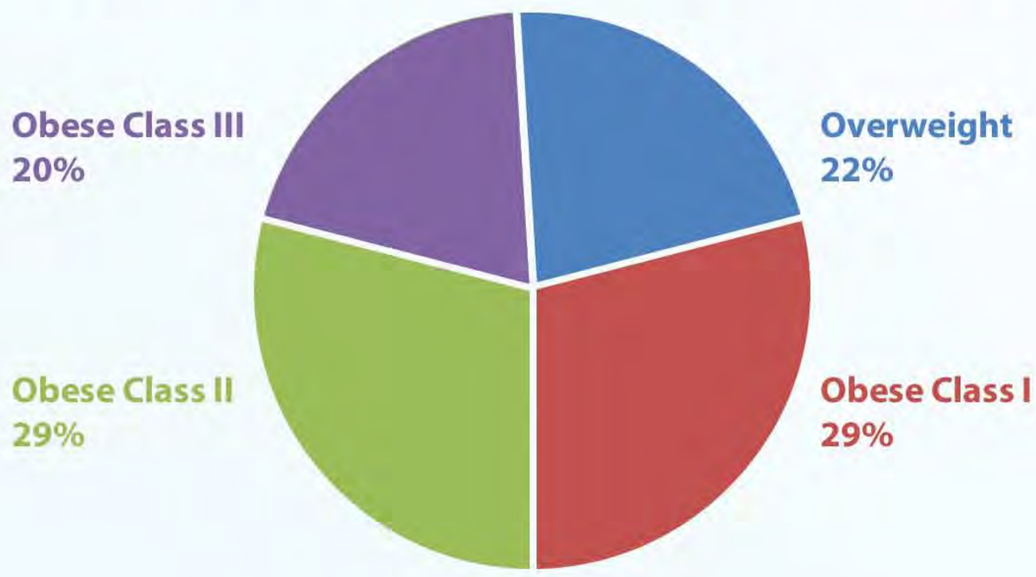


Chart 2. Proportion of Patients Who Lost Weight in Terms of Percentage Body Weight Loss

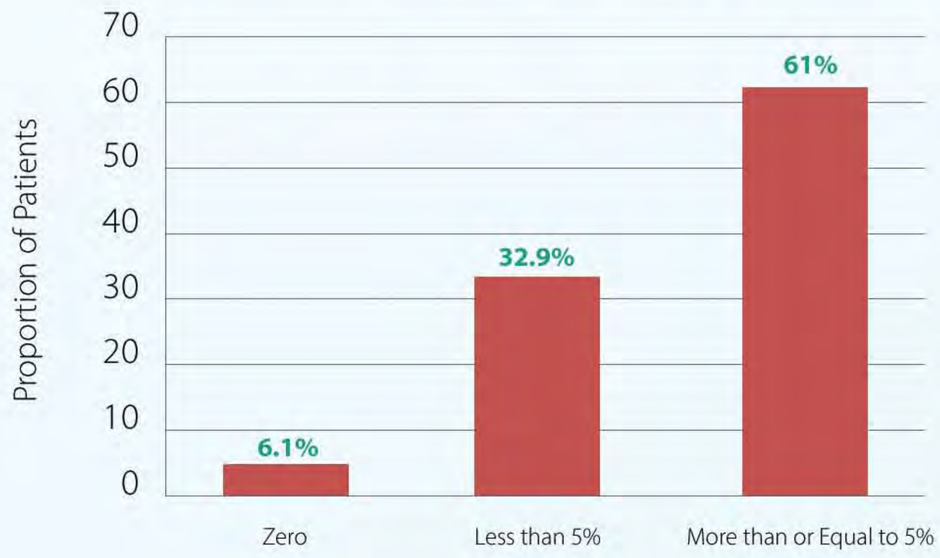
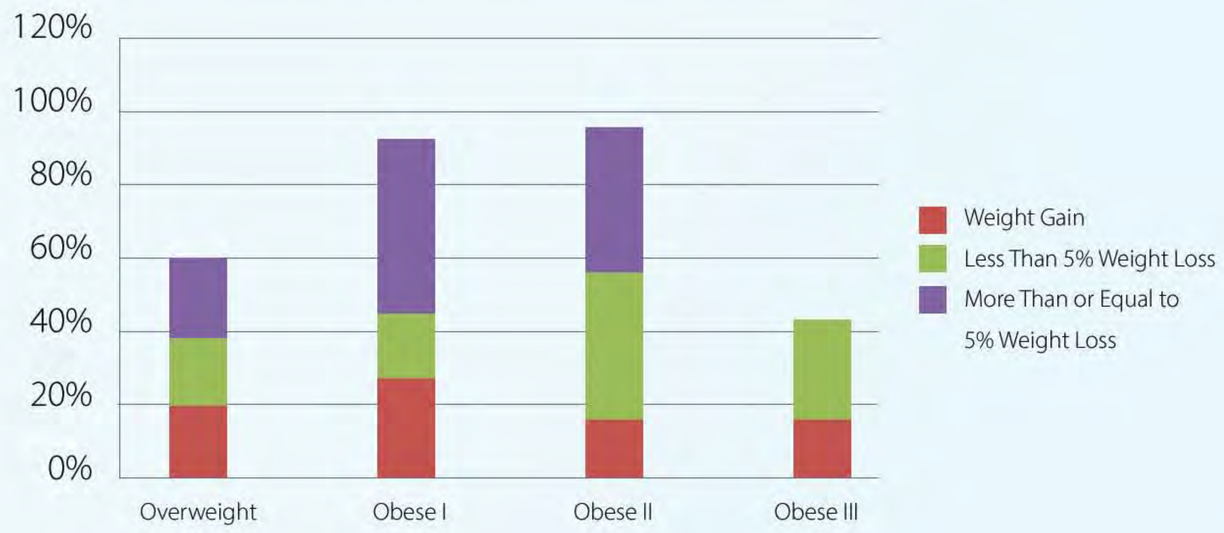


Chart 3. Proportion of Patients Who Achieved More Than or Equal to 5% Weight Loss Based on BMI at the End of the Therapeutic Phase



The study shows that the weight management program, which combines nutritional, physical and behavioral intervention, under a multidisciplinary team, resulted in a favorable outcome among overweight and obese Filipinos. The weight loss achieved in St. Luke's patients is comparable to the preliminary result of the study of Varsant et al, which showed a modest weight reduction of 6 kg. after 3 months of multidisciplinary obesity treatment in 30 obese women. The change in BMI seen in this study is also comparable to other published data. Norris and colleagues noted a decrease in BMI of 1.3 kg/m² (95% CI 0.8 to 1.9) when a multidisciplinary approach was utilized in the treatment of obesity among pre-diabetics. Improvements in systolic and diastolic blood pressures are comparable to the guidelines which state that at a 5% weight loss, there is a weighted mean reduction in systolic and diastolic blood pressure of approximately 3 and 2 mm Hg respectively.

Conclusion

The therapeutic phase of the multidisciplinary weight management program showed a favorable outcome as seen by decrease in body weight, body mass index and blood pressure in overweight and obese Filipino adults. The initial body weight and the frequency of attendance are not predictors of weight loss. Since the overall success of the program is the ability of each patient to sustain the lost weight, a follow-up study to evaluate the long-term effect of weight loss achieved after the treatment program is recommended.

Majority of patients who have completed St. Luke's Multidisciplinary Weight Management Program have successfully achieved their target body weight and body mass index.



Table 2. Changes in Clinical Parameters after 12 Weeks

	BASELINE		POST 12 WEEKS		DIFFERENCE			
Clinical Parameters	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Change Percentage	p-value
Weight, kg	96.68	26.87	90.73	24.45	5.94	4.57	6.14%	<0.0001
Body Mass Index, kg/m²	35.91	7.48	33.75	6.92	2.16	1.51	6.0%	<0.0001
Systolic Blood Pressure, mmHg	120.98	12.73	115.24	10.21	5.73	11.97	8%	<0.0001
Diastolic Blood Pressure, mmHg	79.51	5.86	77.32	5.68	2.20	6.67	7%	0.004

Table 3. Association of Variables with Achieved Weight Loss after 12 Weeks

	Correlation Coefficient	Magnitude of Correlation	p-value
Initial BMI	-0.503**	Moderate	<0.0001
Initial Weight	-0.591**	Moderate	<0.0001
Number of Sessions	-.372**	Moderate	0.001

Table 4. Predictors of Weight Loss

	Unstandardized Coefficients		
Model	B	Std. Error	p-value
(Constant)	-0.135	5.33	0.980
Initial BMI	0.187	0.0.127	0.146
Initial Weight	-0.152	0.035	<0.01
Number of Sessions	-0.226	0.047	<0.01

Multi-Linear Regression -R = 0.717, R^2=0.514

The author greatly acknowledges the support of the Research and Biotechnology Group of St. Luke's Medical Center-Quezon City for the research grant awarded.

The author also acknowledges the support of the endocrine fellows Dr. Ina Mallonga-Palanginan, Dr. Natalie Bernice Ong and bariatric surgeons Dr. Hildegardes Dineros, Dr. Edward Oliveros and the Weight Management staff headed by Ms. Nenette Umali.

The Fight Against Obesity and Diabetes

Edward D.C. Oliveros, MD

At no time in the history of mankind has obesity and diabetes become a serious malady as the present time due to the increasing economic progress and the ensuing unhealthy lifestyle attending modern society and man.



Dr. Edward Oliveros is the Head of the Weight Management & Bariatric-Metabolic Surgery Center at St. Luke's-Quezon City.

Because of high-fat eating patterns and metabolic and physiological conditions, certain affected persons have to resort to more intensive methods to address their obesity and diabetes. The most significant and sustained method to treat obesity and diabetes in the medical establishment is surgery for obesity and diabetes, or what is medically termed as Bariatric and Metabolic Surgery. This particular surgery focuses on the digestive system, specifically the stomach and small intestines.

Types of Weight Loss Surgeries

The three main types of weight loss surgeries are (1) Gastric Bypass, (2) Gastric Banding and (3) Sleeve Gastrectomy. The Gastric Bypass is the benchmark and current gold standard in that it offers the best outcomes and results for the patient. The procedure involves a permanent re-structuring of the digestive system in which the stomach size is reduced by stapling, thereby limiting food intake and intestines bypassed resulting in delayed contact of the intestinal enzymes with food with subsequent malabsorption. This results in a profound effect on glucose metabolism, hence an improvement on diabetes.

Gastric Banding, on the other hand, is a reversible procedure and entails implanting a silicone band around the upper portion of the stomach. This is the simplest and safest procedure and results in early fullness or satiety, leading to effective weight loss. The band can be tightened, for a longer feeling of fullness or satiety, or loosened, depending on the needs of the patient. This is advantageous for young female patients who desire pregnancy in the future wherein they gain weight during pregnancy and want to lose the excess weight after pregnancy. The band is an implant, so it can be removed as desired by the patient, making the surgery "reversible".

The Sleeve Gastrectomy is the newest among the three and involves removing about 70% of the stomach permanently. The stomach capacity is markedly lessened but the major difference in this procedure is the elimination of the appetite hormone called ghrelin. With a loss in appetite and significant loss of weight, diabetes control is just one of the effects of the surgery.

The U.S. National Institutes of Health recommends surgery for obese people with a body mass index (BMI) of at least 40, and for people with a BMI of 35 with coexisting medical conditions such as diabetes, hypertension, sleep apnea, arthritis, infertility, among others. However, continents such as Europe, Asia, and South America have made a consensus that bariatric surgery can be appropriate for those with a BMI of 35 to 40 with no comorbidities or a BMI of 30 to 35 with significant comorbidities.

Outcomes

In a study involving 114 patients who underwent Laparoscopic Adjustable Gastric Banding (LAGB) between January 2004 and December 2009 in St. Luke's Medical Center, individuals showed a substantial weight loss of 43% in two years after the operation. Majority of the patients were females at 61% and males 39% with ages ranging from 18 to 68 years. Filipino patients comprised 77% of the group while the rest were Asians at 12% and Caucasians the remaining 11%.

Laparoscopic gastric banding (LAGB) is an option that should be discussed with a surgeon for patients considering surgery for weight loss and BMI reduction.



Weight loss and the BMI reduction of patients who underwent LAGB from 2004 to the present were closely monitored at St. Luke's in aid of previous studies and to serve as stimulus for future prospective studies aimed at evaluating the effectiveness and safety of LAGB. The body mass index (BMI) of these patients went down to 21.55% two years after LAGB, thus a success rate of 48%, while a big proportion of those who attained successful weight loss rose from three months to two years wherein 48% of them losing 50% of their excess body weight on the second year. The highest proportion of patients who achieved successful weight loss of 50% and BMI reduction of 43.4% can thus be concluded to occur after two years from LAGB surgery (Table 1).

The most common comorbidity prior to LAGB was fatty liver (90%) followed by dyslipidemia (82%), while the most prevalent was pre-diabetes (37%) than Type 2 diabetes mellitus (25%).

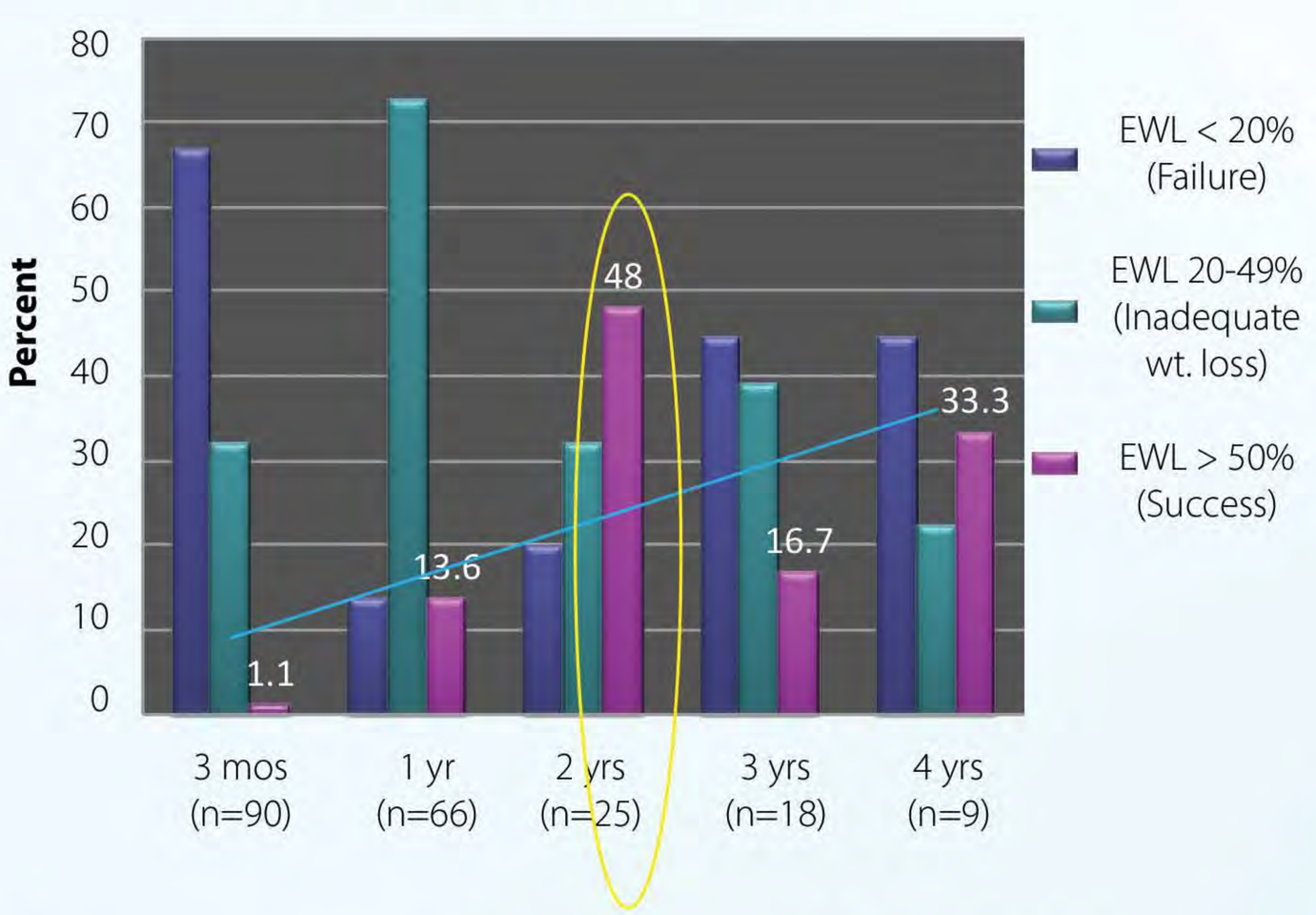
Bariatric Surgery in the Philippines was first performed at St. Luke's-Quezon City on March 2002. To date, St. Luke's performs the most number of bariatric surgeries with the most varieties and have reported the least number of complications with high success rates. Their success rates for LAGB in terms of excess weight loss and low complication rates are comparable with developed nations, if not better than established centers around the world.

What is Bariatric and Metabolic Surgery?

Bariatric and Metabolic Surgery are surgical procedures for the intervention and treatment of obesity and diabetes. It entails the manipulation of functioning normal organs in the digestive system to achieve a biological result (in this case, obesity treatment), which results in a better health condition of the patient. This type of surgery is commonly done by reducing the volume of food intake and re-routing food content directly to the small intestines.

The three established surgeries are all performed laparoscopically, that is, using small incisions through which a surgeon uses long, slender specialized instruments to perform the surgery under video-scopic guidance. This is minimally invasive surgery, enabling faster recovery and shorter hospital stay for patients. The three established surgeries are Laparoscopic Gastric Bypass (LGB), Laparoscopic Sleeve Gastrectomy (LSG), and Laparoscopic Adjustable Gastric Banding (LAGB). LAGB is restrictive and reversible; LSG restrictive, permanent, and metabolic; and LGB restrictive, permanent, malabsorptive, and permanent. LGB is the benchmark and current gold standard in that it offers the best outcomes and results for the patient, especially for diabetes. Whereas LAGB is the simplest and safest procedure and results in early fullness or satiety, leading to effective weight loss. These three surgeries form Bariatric and Metabolic Surgery and results in a significant and sustained weight loss in the treatment of obesity with effective long-term control of diabetes.

Table 1. Proportion of Patients Who Attained Successful Weight Loss after LAGB



To further improve outcomes, the Weight Management & Bariatric-Metabolic Surgery Center together with the Diabetes, Thyroid, and Endocrine Center of St. Luke's have recommended an intensive post-operative management program, or some feedback mechanism which would encourage patients here and abroad who underwent Bariatric and Metabolic Surgery to follow up at St. Luke's to arrive at a more comprehensive management after surgery.



BEFORE at 275 pounds. Diabetic & Hypertensive. On Insulin injections and maintenance meds.



AFTER at 142 pounds in 7 months. Diabetes in remission. Hypertension controlled and off meds.

A study in the Journal of the American Medical Association (JAMA) found that 73% of people with diabetes who underwent gastric banding combined with conventional therapy achieved remission. By contrast, just 13% of those people who received only conventional therapy went into remission.

Another study in JAMA of more than 22,000 people who underwent bariatric surgery showed the following:

- Diabetes was completely resolved or improved in 86% of patients.
- High blood lipids improved in 70% or more of patients.
- High blood pressure was resolved or improved in 78% of patients.

What's more, a study in the Annals of Surgery showed that 83% of 240 people who underwent gastric bypass were "cured" of their diabetes.



DENTISTRY AND ORAL SURGERY SERVICE

St. Luke's Dentistry and Oral Surgery Service is staffed by highly-skilled general practitioners, orthodontists, TMJ (temporomandibular joint) specialists, oral surgeons and hospital dentists. They are abreast with the current standards of practice as well as new developments in the different fields of dentistry.

They have in their arsenal the latest materials available and employ a repertoire of new procedures to achieve better results. High standards of infection control and sterilization are also maintained within their individual clinics.

Aside from the regular outpatient services offered in their private clinics, dental procedures can also be performed under sedation or general anaesthesia inside the hospital for patients with anxiety. In all treatments and procedures, they always strive to deliver the best possible outcome in the most patient-friendly manner.





A Case Study: The Association Between Periodontitis and Glycemic Control in Type 1 Diabetic Patients

Edmund Julian L. Ofilada, DDM

Diabetes (a.k.a. diabetes mellitus) is a group of metabolic diseases characterized by elevated blood sugar levels resulting from defects in insulin secretion, insulin action or both. Type 1 diabetes is primarily due to destruction of the cells in the pancreas that produce insulin.



Dr. Ed Ofilada is a St. Luke's 2013 Research Chair awardee in Dentistry and project coordinator for Project Oral Health for Juvenile Diabetics

Insulin facilitates the transfer of glucose from the bloodstream into the different organs of the body where glucose is used for energy. When there is not enough insulin (Type 1 diabetes), glucose is unable to enter most cells in the body and remains in the bloodstream, resulting in persistent hyperglycemia.

Persistent high blood sugar levels increase the risk for complications like heart attack, stroke, kidney failure, blindness, foot ulcers, among others.

Management of Diabetes

Glycemic control is at the core of diabetes management.

The Diabetes Control and Complications Trial (DCCT) in the US has shown that strict blood sugar control can reduce the risk of long-term complications. The clinical practice recommendations of the American Diabetes Association for the standards of medical care in diabetes suggest that the glycated hemoglobin (HbA1c) goal for patients in general is < 7 percent, but < 6 percent is preferred if this can be accomplished without significant hypoglycemia.

Even if most patients are unsuccessful in bringing their blood sugar levels to near normal values, a 1% reduction in HbA1c level is associated with a relative risk reduction of 21% for any diabetes-related endpoint, 21% for diabetes-related deaths, 14% for myocardial infarction and 37% for microvascular complications. Because of these findings, great emphasis is placed on controlling blood sugar levels.



As a diabetes educator, a dentist can help improve diabetic outcomes.

Periodontal Disease and Diabetes

Periodontitis is an inflammatory disease caused by the dental biofilm. Biofilm or plaque is composed of numerous bacteria, comprising over 1,000 identified species, which is tenaciously adherent to the tooth surface. Initial stages usually consist of inflammation of the gingiva or gingivitis, characterized by redness, swelling and bleeding of the gums. Later stages consist of loss of periodontal attachment, resulting in bone loss around the tooth and tooth mobility.

The Scottsdale Project in 2007 was instrumental in organizing and synthesizing epidemiological data on disease association between periodontitis on the one hand and diabetes and cardiovascular disease on the other.

The currently accepted relationship between diabetes and periodontitis may be summarized by the following:

- Diabetes increases 2-3 times the risk for periodontitis
- Periodontitis increases the risk for poor glycemic control and likelihood of diabetes complications.

Treating Periodontitis Improves Diabetes

The joint European Federation of Periodontology/American Academy of Periodontology in 2013 examined recent evidence on the beneficial effects of periodontal treatment on diabetes outcomes and established new guidelines in patient care based on what recent research revealed.

A Cochrane meta-analysis on the effect of periodontal therapy on glycemic control showed a mean 0.4% reduction in HbA1c in diabetic patients.

Data from this meta-analysis mostly came from studies involving patients with Type 2 diabetes. Several studies on Type 1 diabetics reported mixed results on the effect of periodontal health on HbA1c levels after periodontal therapy.

Nevertheless, Williams and Mahan reported reductions in insulin requirements following periodontal therapy and tooth extraction in seven of nine patients, with eight of the nine patients having Type 1 diabetes (Journal of the American Medical Association, 1960). Miller and colleagues, studying a group of nine poorly controlled Type 1 diabetics with moderate-to-severe periodontitis, reported a decrease in mean HbA1c level from 8.7 percent to 7.8 percent post-treatment (1992).

These studies became the impetus for a study by the author based on case analysis of a 21-year old patient with Type 1 diabetes who underwent strict glycemic control and periodontal therapy.

Case Study Findings

The reported patient is a female diagnosed with Type 1 diabetes at age 7 during a diabetes ketoacidosis episode. She has been on twice a day insulin injections since then (she is now 22 years old). She had poor oral health, with periodontal pockets greater than 6 mm in most of her teeth except two. Moreover, six of her teeth were observed to have caries and two teeth were impacted.

She underwent oral care therapy from March to November 2013. Scaling and root planning on selected teeth were performed, but treatment was postponed to September due to financial constraints of the patient.

The patient's oral health significantly improved following treatment (Figure 1). Of the patient's 28 erupted teeth, 9 (32%) were extracted. In addition, improvedoral hygiene practices (toothbrush and dental floss) and chemotherapeutic mouthwash was employed to prevent recolonization by bacterial pathogens and to reduce gingival inflammation.

Figure 1. Subject's Teeth Profile Before and After Oral Therapy

March 2013



December 2013



Corollary to the oral care program, the patient underwent a strict everyday glucose testing and insulin injections to ensure control of hyperglycemia.

Nine weeks after the first treatment, the periodontal pocket depth measurements in 93 (82%) out of 114 sites and bleeding on probing scores in 11 (58%) out of 19 teeth decreased. Inflammation was likewise controlled. Importantly, there was a 50 percent reduction in the High Sensitive CRP (C-Reactive Protein) levels and a 46.7 percent decrease in the fructosamine assay levels. Fructosamine is used as a short-term marker of blood sugar levels based on albumin instead of hemoglobin.

The baseline H1Ac1 glycohemoglobin level of 8.3% prior to treatment decreased substantially to 7.1 % (see Table 1).

Improving their smiles gives diabetic patients self-confidence and lessens their sense of isolation.



Table 1. Observed Measurements of Parameters

	Ref Value	26-Sep-13	5-Nov-13	29-Nov-13	27-Dec-13
HbA1c	< 5.7 %	8.30%			7.10%
Fructosamine test	< 285 µmol/L	336.11 umol/L	238.65 umol/L	209.00 umol/L	
High Sensitive C Reactive Protein	0.00-0.5 mg/dL	0.56 mg/dl		0.28 mg/dL	

Conclusion

The case analysis of the Type 1 diabetes patient with the use of both periodontal intervention and diabetes self-management showed encouraging results.

Other studies employing periodontal intervention in Type 1 diabetics, showed significant improvement in periodontal parameters but not in glycosylated hemoglobin levels. Self-management motivation and available resources appear to be instrumental in achieving prolonged benefits in glucose control.

The net decrease of 1.2% in glycated hemoglobin levels in this patient, compared to results of previous studies, on Type 1 diabetic patients, is considerable. The finding was supported by (i) the improvement in clinical periodontal disease parameters following mechanical cleaning of the teeth, (ii) the initial 30% reduction in fructosamine levels 4 weeks following periodontal therapy, and the 50% reduction in CRP achieved with this patient.

However, these results, while encouraging, are based only on a single patient. Thus, there is a need for testing of a large prospective study of identified Type 1 diabetics with randomized control procedures. This is the next step to ensure more conclusive findings in the investigation of the link between periodontal health and diabetes.



NURSING CARE GROUP

Nursing is a profession that is at the frontline of healthcare. Nurses are registered professionals who are focused on the care and wellbeing of hospital patients. Their performance and effectiveness reflects to a large extent the general public perceptions about quality of healthcare services in a health facility.

In general, nurses work collaboratively with physicians, therapists, medical technologists and dieticians, and most notably the patient and his/ her family with the objective of delivering hospital services to treat illness and to improve quality of life.

In St. Luke's, the nurses are under the Nursing Care Group (NCG) in each of the two hospitals. The broad goal of the NCG is to provide continuous direct patient care and meet the needs of the patients, their families and significant others round-the-clock in line with the mission to provide the best healthcare and superior medical outcomes every day and in every way.

Nurses interface with the other health care systems in the hospital facility such as laboratory, diagnostics and imaging, medicine, logistics and support services (e.g. hospital equipment such as beds, specialized equipment such as oxygen, etc.). They perform the critical task of integrating and managing the individual patient's care through the various services performed by the hospital facility.

Patient Care Services is the largest department in the NCG and is responsible for the delivery of direct patient care in all clinical areas of the two St. Luke's hospitals. It is supported by four departments including Clinical Advancement and Informatics which is tasked with the design and implementation of staff development and training and nursing information technology systems.





A key initiative of St. Luke's as a medical institution is patient care and safety. NCG is integral to provide, organize and execute a total program for putting in place systems and standards in patient care, safety and quality assurance, in line with the requirements of accrediting agencies such as the JCI, Temos and the Magnet Recognition Program for nursing excellence.

Patient safety is a recent healthcare imperative identified by the World Health Organization which involves the systematic reporting, analysis, and prevention of avoidable medical negligence and mistakes that often leads to adverse healthcare outcomes for patients. In St. Luke's NCG, programs for the management of two nursing-centric healthcare events have been instituted: pressure ulcers and patient falls. The NCG has developed prevention and management protocols, patient safety advocacy education and quality measurement systems to ensure the highest level of compliance among frontline Patient Care nurses.

A Total Commitment to a Hospital-Wide Fall Prevention Program

Merry Grace E. Conserman, RN

A patient's safety from fall and related injury is one of the foremost concerns of any medical facility. This is a primary area of concern for the nursing profession in the hospital setting since the establishment of modern medicine.



Patient fall is the most common hospital accident, and this can result to serious negative outcomes primarily physical and emotional injuries and poor patient quality of life, increased hospital stay, and, finally, additional costs.

Merry Grace Conserman is a Research and Systems Manager of the Nursing Care Group at St. Luke's-Quezon City.

Falls are the most frequently reported adverse events in the adult inpatient setting in hospitals. In the United States, it has been reported in medical circles that as much as 32 percent of people older than 65 years suffer from unintentional falls and consequent injuries and sometimes even death.

Though patient falls are indeed common, they are preventable most of the time. In fact, in a study done by the Royal College of Physicians in 2012, injuries related to fall can be reduced by as much as 20 to 30 percent, thanks to a hospital-wide fall prevention program that includes multifactorial assessment and interventions.

Commitment to Patient Safety

St. Luke's is committed to safety and quality as a top priority through a comprehensive fall prevention program based on the best practices of leading hospitals worldwide. The program involves interdisciplinary collaboration among physicians, nurses, clinical pharmacists, physical therapists, nutritionists, safety engineers, biomedical technologists, patient experience officers and housekeepers.



A nurse ensures safety by assessing a patients' risk for fall.

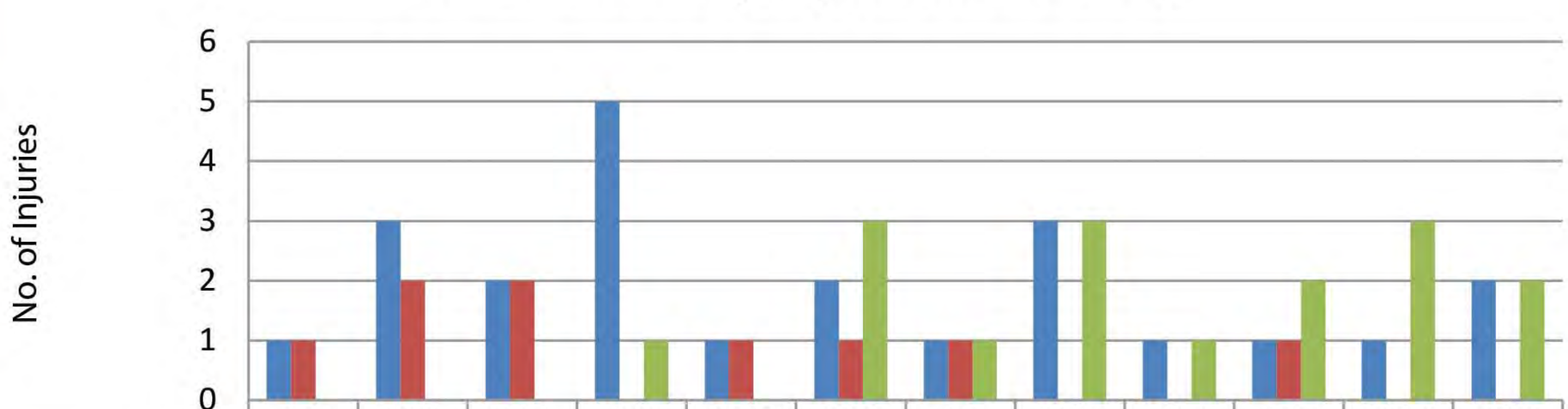
St. Luke's fosters an environment of consistent and continuing vigilance and monitoring of patients. The high-risk environment and patient profiles for fall are identified and fall preventive measures are immediately activated. The first step requires proper assessment and reassessment of all patients for risk for fall. These assessments are communicated at the unit level during shift endorsements to develop action plans that are age-specific so as to prevent incidents of fall in all ages.

Through daily census reporting and audits, both continuous monitoring and compliance are strictly implemented.

St. Luke's-Quezon City partners with patients in developing strategies for improvement. Every patient has a unique story to tell and this is evaluated to meet the patient's particular needs.

Every incident is recorded and communicated in a hospital-wide reporting system to respond immediately to the fall incident, investigate and develop long-term action plans.

Table 1. Fall Injury (2011 -2013)



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2011 INJURY	1	3	2	5	1	2	1	3	1	1	1	2
2012 INJURY	1	2	2	0	1	1	1	0	0	1	0	0
2013 INJURY	0	0	0	1	0	3	1	3	1	2	3	2

Clinical Outcomes

A total of 124 fall incidents have been reported from 2011 until 2013. Forty-eight of these patients, representing 39%, have incurred injuries due to fall but these were mostly minor injuries. Fall incidents were mostly attributed to the physiologic condition of the patients, the medications taken prior to the incident, and their mental status and condition.

The highest number of fall injuries was recorded in April 2011. The lowest total number of fall injuries was recorded in 2012. There were zero fall injuries in nine out of the 36 months (three-year) period (Table 1).



The Fall Prevention Team is an interdisciplinary collaboration among different units at St. Luke's.

Fall Program

St. Luke's is committed to continuously improve its fall prevention program by improving its fall projects, that is by achieving its target of zero incidence of fall and fall injuries.

St. Luke's has recently taken its commitment a notch further by enrolling in the National Database of Nursing Indicators (NDNQI) , the only national quality nursing database in the U.S. tasked with measuring quality of nursing care through nurse-sensitive indicators such as Falls, Pressure Sores, Restraints, and Health-Associated Infections. The data from St. Luke's is compared with the best hospitals in the world such as The John Hopkins Hospital, Baltimore, Maryland, Mayo Clinic and Robert Wood Johnson University Hospital, New Brunswick, New Jersey.

The ultimate goal of St. Luke's in this initiative is to gauge its performance with the standards of the best hospitals in the world and to continually increase the bar of excellence in the field.

Clinical Outcomes on Pressure Ulcers

Von Manilou O. Lagradilla, RN

Pressure ulcers (also known as decubitus ulcers or bedsores) are localized injuries to the skin and underlying tissue that usually occur over a bony prominence as a result of pressure, shear or friction. The most common sites are the patient's back and specifically the sacrum, coccyx (tailbone), heels or the hips, as well as other sites such as the elbows, knees, ankles and the back of the head (cranium).



Von Lagradilla (left) is Assistant Nurse Unit Manager at the Jonathan Dy Intensive Care Unit of St. Luke's-Quezon City. He is assisted by staff nurse Lance Aaron Asiatico.

Ill or injured individuals lying for extended periods at homes or other facilities and patients in hospitals are at risk of developing pressure ulcers due to long periods of exposure to pressure. The injuries to the skin and underlying tissue are painful and increase the risk of infection or other complications.

Pressure ulcers are generally preventable as long as good clinical practice is strictly followed. Despite this, it is increasingly common, and has resulted in unnecessary suffering in the individual, and can -- in extreme cases -- cause even death. In the US and in the modern hospitals here in the Philippines, best practices have been initiated to prevent and treat them using systemic effectiveness programs, collaborative management and safety interventions.

Clinical Prevalence

The medical profession quantitatively measures clinical evidence of pressure ulcers through prevalence rate. Prevalence is used to determine number of patients with pressure ulcers at a specific time during the confinement in the hospital. Importantly, it provides an indicator of the burden of pressure ulcers for a facility and the quality of patient care especially for patients who are at risk.

The prevalence rate for confined patients with pressure ulcer is called **Healthcare Acquired Pressure Ulcer (HAPU)**. While those who develop it prior to admission in a healthcare facility is called **Community Acquired Pressure Ulcer or CAPU**.

HAPU is benchmarked in the specific care units within the hospital or with other hospitals and against that of the CAPU prevalence rate to measure relative effectiveness of patient care by a medical center.

The primary preventive protocol is to redistribute pressure by turning the patient regularly. The benefit of turning has been well documented since at least the 19th century. In addition to turning and re-positioning the patient in bed or on a wheelchair, eating a balanced diet with adequate protein and keeping the skin free from exposure to urine and stool are of primary importance.

St. Luke's Pressure Ulcer Management Program

In line with its role as the frontline of patient care, St. Luke's Nursing Care Group (NCG) is charged with the responsibility of minimizing the incidence of pressure ulcers among patients in both the Quezon City and Global City Hospitals.

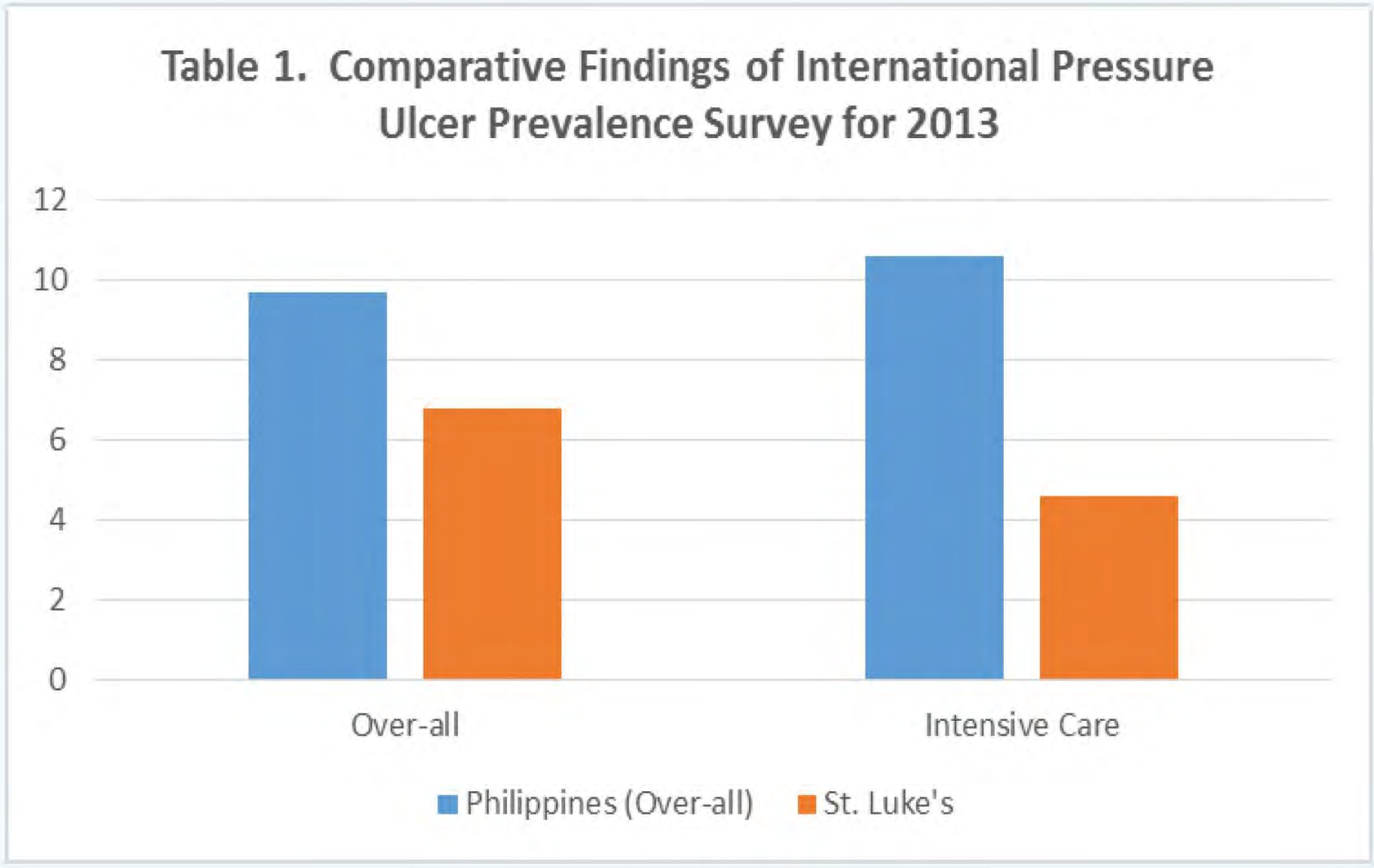
Pressure ulcer incidence among patients reflects the quality of nursing care and is one of the patient safety key results areas of the Group.

In July 2013, the Intensive Cluster of the NCG launched a pilot project with focus on pressure ulcer prevention and management. Most of the cases in the Neuro-Critical Care Unit (NCCU) are critically ill and bedridden due to stroke, paralysis and other neuro-related disease and are at risk for developing pressure ulcers.

An interdisciplinary team composed of Physicians, Nurse Managers, Clinical Nurses and Nursing Assistants in the Neuro-Critical Care Unit collaborated on a campaign aimed at improving the level of frontline nurses' awareness and understanding of pressure ulcer management. The purpose of this initiative is to institutionalize individualized pressure ulcer care planning and management.

Guided by the Lean Six Sigma quality system, the unit examined the causes of pressure ulcers and how these can be reduced. Process improvement strategies were formulated and put in place, which included the continuous education of frontline nurses and other health care team members on the patient risk profile assessment, identification and reporting of patients at risk and provision of appropriate individualized interventions and treatment.

The individualized plan of care is shared through shift reports, when giving patient assignments, during patient handoffs and interdisciplinary rounds. This ensured higher level of conformance to the pressure ulcer prevention and management program in the unit. Monitoring of HAPU incidence was then implemented to measure progress.



Clinical Outcomes

A total of 196 adult patients were admitted and confined in 2012 in the Neuro-Critical Care Unit-St. Luke's-Quezon City. Out of the total, seven (7) cases of HAPU were reported for a prevalence rate of 3.57%.

During the first half of 2013 and prior to the launching of the pressure ulcer campaign, the unit registered five (5) HAPU cases, corresponding to 4% of the 124 admitted adult patients.

Of the 118 adult admissions from July to December 2013, the unit achieved 100 pressure ulcer-free days and reported a zero incidence of HAPU. Comparing that data from the previous year at 5.74%, zero incidence brought down the annual prevalence rate to 2.06% in 2013, which represented an overall rate reduction of 42%.

In February 2014, the Intensive Cluster and the Nursing Care Group joined the annual International Pressure Ulcer Prevalence Survey conducted by the Hill-Rom Company with the goal of benchmarking the St. Luke's data on HAPU against other hospitals worldwide.

Overall, the national average HAPU prevalence rate was measured at 9.7% compared to 6.8% at St. Luke's-Quezon City in 2013 (Table 1). St. Luke's rates are 2.9% lower than national average. St. Luke's NCCU fared better than the national average with a prevalence rate of 4.6% against 10.6%.

In collaboration with the NCG's Nursing Informatics Unit, endorsement tagging of pressure ulcers in the Health Care System was launched for the purpose of monitoring and keeping track of flagged patients at risk for pressure ulcer.

As a result of the positive outcomes in the NCCU pilot project, the NCG launched the Skin Saver Champions (SSC) which is a cross-functional Performance Improvement program that aims to institutionalize the pressure ulcer prevention and management best practices learned in the initial implementation.

Under the program, SSCs were organized in operational Nursing Care Units in various institutes, departments and centers of St. Luke's. Each SSC team is committed to assessing, reporting and developing and implementing prevention and treatment programs to identified patients at risk. It is also tasked to convey the latest updates and evidence-based interventions for pressure ulcer management to all nurses in the unit.

The primary preventive protocol for pressure ulcers is to redistribute pressure by turning or re-positioning the patient regularly.



To further promote HAPU eradication, the St. Luke's Nursing Care Group participated in the National Database of Nursing Quality Indicators (NDNQI) Pressure Ulcer Assessment Survey Orientation with the goal of keeping track of nursing-sensitive indicators, including pressure ulcer incidence.

The NDNQI is the only national nursing quality database that compares measures against national, regional and international hospital benchmarks down to the unit level.

It also provides online nurse's training on skin assessment, staging of ulcers and implementing specific intervention in preventing pressure ulcers.

Breakthroughs and Innovations

Continuous innovation is the cornerstone of progress. This is especially true in medical practice.

Breakthroughs and innovations are about pushing beyond the boundaries of current norms and practice. It looks for new pathways and creating novel but effective solutions to problems and challenges in whatever field one is in.

In line with its commitment to bring the best healthcare for its patients, St. Luke's has made a name for itself in pioneering the incorporation of leading-edge technologies and medical processes into the clinical practice of its two hospitals, putting it in the forefront of healthcare in the Philippines.

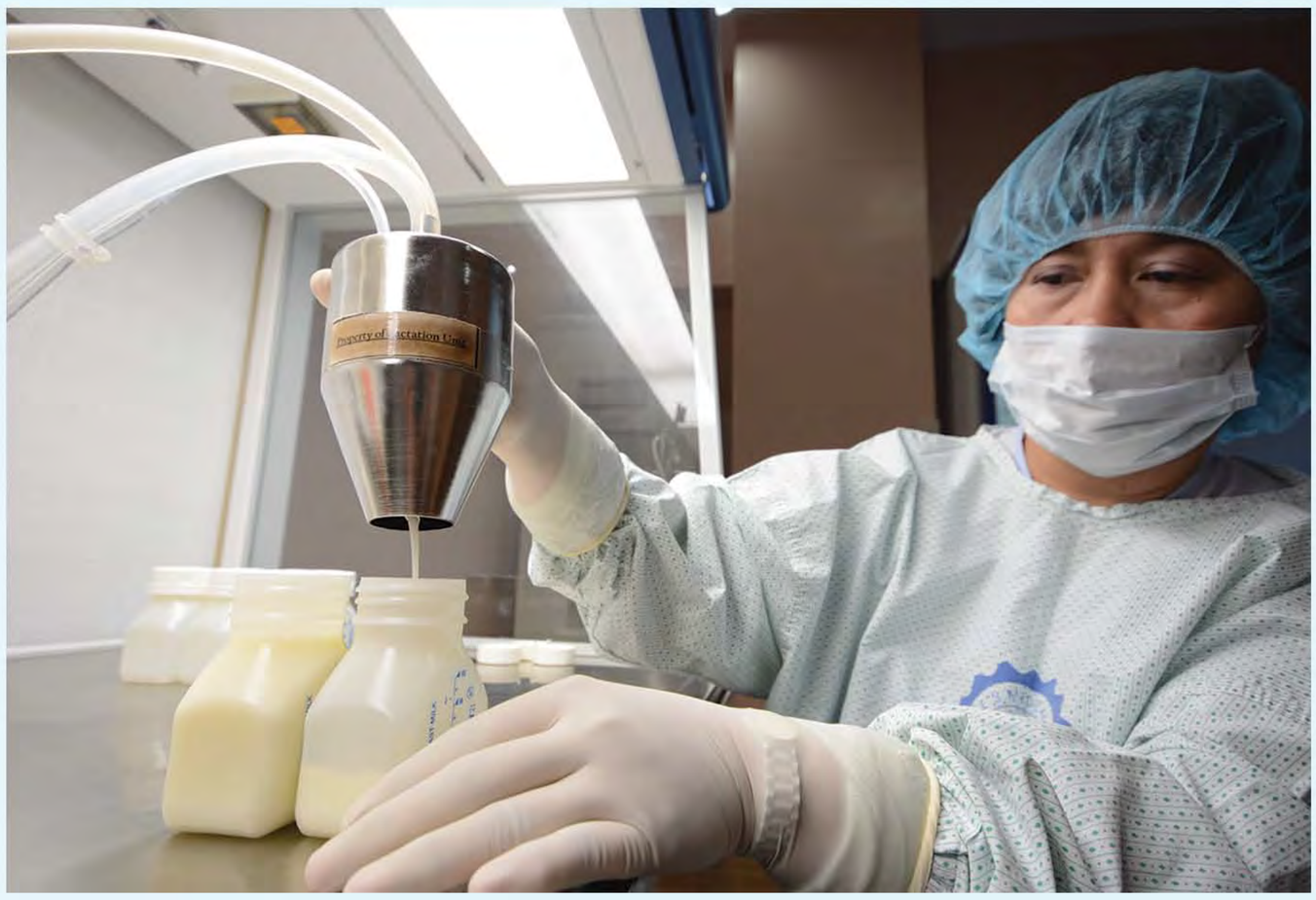
In St. Luke's, the search for medical breakthroughs is driven by the application of new diagnostic and treatment processes and protocols through systematic research and development. We make use of leading-edge technologies and equipment from leading institutions abroad and combine them with the experienced practice and insights of medical doctors to develop novel and creative treatment systems and procedures.

In research and biotechnology in the Philippines, St. Luke's continues to make remarkable progress particularly in the development of molecular diagnostic tests.

From pioneering minimally invasive techniques in cardiovascular and ophthalmologic procedures to life-saving equipment and services, our doctors relentlessly pursue the latest advances in medicine in the continuous improvement of skill and services.







We showcase these new and original medical protocols that are aimed not just at expanding general medical knowledge but also in improving the clinical outcomes that provide better quality of life and care for our patients.

St. Luke's Human Milk Bank: Continuing the "Mother-Baby Friendly" Tradition

Cristina Cornelio-Bernardo, MD, FPPS, IBCLC

St. Luke's Medical Center has always been an advocate and champion of natural breastfeeding in the Philippines. It has been recognized as a "mother-baby friendly" hospital by the Department of Health (DOH), and has actively contributed to increasing breastfeeding awareness among the general public.



Dr. Cristina Cornelio-Bernardo is the Chair of St. Luke's-Global City's Breastfeeding Working Group and Clinical Head of the Lactation Unit and Human Milk Bank.

Natural mother's milk is much more nutritious and safer to newly born infants and babies. It contains immune-protective hormones and organisms, live enzymes and growth factors that are not found in commercial formula milk. Thus, the DOH has consistently been promoting breastfeeding in the country.

In this light, St. Luke's has once again broken ground in this drive when it recently opened in June 2014 the country's first Human Milk Bank in a private hospital. Situated at St. Luke's - Global City, the Human Milk Bank makes available the collected pre-qualified and safe milk to sick and pre-term infants confined in both the Global City and Quezon City hospitals. Pre-term babies are generally prone to dangers particularly necrotizing enterocolitis. The milk will specifically benefit babies who are confined at St. Luke's Neonatal Intensive Care Unit (NICU). It will also serve infant patients whose mothers are unable to breastfeed.

Safety Protocols

The availability of mother's milk is important in a developing and tropical country such as the Philippines. Before St. Luke's, only the Philippine General Hospital, Philippine Children's Medical Center (PCMC), Dr. Jose Fabella Memorial Hospital, all owned by the Government, have a Milk Bank, showing the inadequate supply of safe human milk in the country.

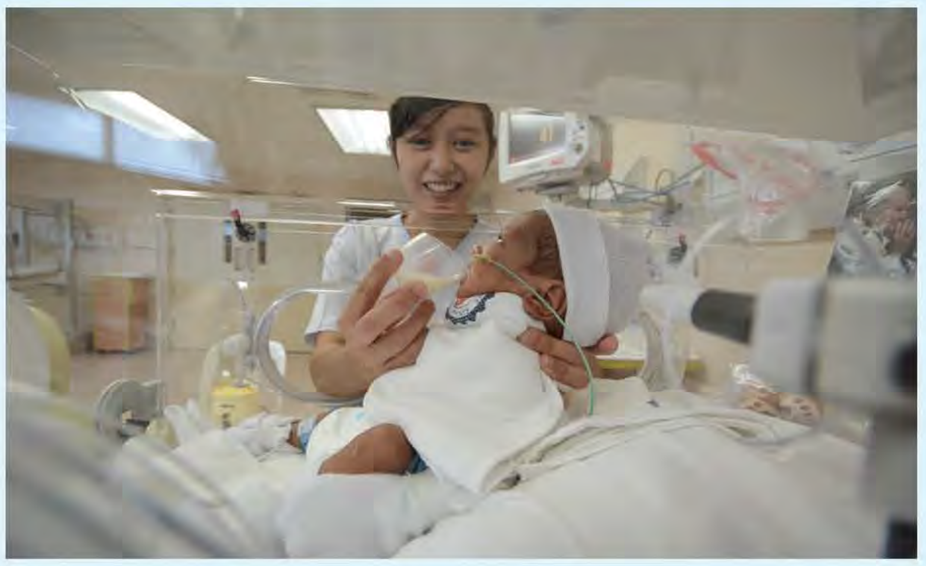
The major current practice involves informal sharing of mother's milk, which poses a risk for disease transfer.

Safety should be a paramount concern inasmuch as Hepatitis B, HIV, Cytomegalovirus (CMV), syphilis and Hepatitis C can be transmitted in the human mother's milk.

Under the protocol developed for the St. Luke's Human Milk Bank, lactating mothers are pre-screened and the breast milk is collected using hygienic processes and these are pasteurized to eliminate the possibility of Hepatitis B, HIV, Cytomegalovirus (CMV), syphilis and Hepatitis C contamination to the infant patients. The pasteurized milk is packed in sterilized flexible packaging, then frozen and stored until these are dispensed to infant patients and other babies who may have need for it.

Public Health and Safety

Human milk banking is part of the Infant and Young Child Feeding Program of the Philippines under the DOH. The establishment of the St. Luke's Human Milk Bank is not for profit but is geared towards social responsibility as a way to promote breastfeeding among mothers, particularly in the depressed communities.



Milk from the St. Luke's Human Milk Bank benefits babies confined at the hospital's Neonatal Intensive Care Unit (NICU).

The St. Luke's Human Milk Bank has entered into a partnership with the City Government of Taguig and 28 barangay communities in Taguig City in cooperation with a breast pump manufacturing company. Milk letting is conducted regularly with mother donors at the St. Luke's-Global City Lactation Unit.

The demand for safe and hygienic human milk has been growing because as much as 10% of babies are born prematurely. It also comes from mothers who may be ill or who are unable to express their breast milk for their babies.



Pasteurized mothers' milk is frozen and stored until these are dispensed to babies who need them.

The Acute Care and Trauma Surgery Team

Orlando O. Ocampo, MD

Acute care surgery is a recent evolving specialty in Surgery that addresses the need for immediate surgical care of emergency cases.



Dr. Orlando Ocampo is the Head of the Acute Care and Trauma Surgery Team at St. Luke's-Global City.

Acute Care Surgery encompasses three facets of general surgery -- emergency surgery, critical care and trauma care. A number of changes in the practice of surgery are responsible for the evolution of this new specialty:

- The desire to optimize the trauma surgeon cases by including emergency surgical non-trauma cases in their scope of care since there is a declining census of trauma cases due to increased public awareness and support for trauma prevention programs.
- A need to increase the operative experience of trauma surgeons in developed countries because majority of these are managed non-operatively.
- The field of surgery has become more focused with very specific specialties and highly specialized practice. This has led to diminished experience and skills in treating trauma and emergency surgical cases, as well as a general decreased interest among highly specialized surgeons in taking emergency calls.

The growing trend worldwide to promote acute care surgery as an important aspect in quality patient care provided the stimulus for St. Luke's- Global City to create a model to respond to the need for immediate, world-class care for both trauma and emergency general surgical conditions.

St. Luke's-Global City organized the first Acute Care and Trauma Surgery (ACTS) Team in the country in June 2011. The ACTS Team is a group of dedicated board-certified general surgery consultants who work 12-hour shifts to provide immediate surgical assessment and treatment for severely injured



The Acute Surgical Care Team is manned 24/7 by St. Luke's surgical consultants including the SVP and Head for Medical Practice Group and Medical Director for Global City Dr. Arturo S. De La Peña and Institute of Surgery Head Dr. Narciso S. Navarro, Jr. (front row, left and right, respectively)

trauma patients as well as patients with common surgical emergency conditions such as appendicitis, gallstones, diverticulitis, gut obstruction, perforated viscus, mesenteric ischemia, incarcerated hernias and intra-abdominal and soft tissue abscesses. They are complimented by various medical and surgical specialties, state-of-the-art diagnostics and a highly trained support staff.

St. Luke's-Global City's dedicated ACTS team has improved the Emergency Department response time and decreased the length of stay in the emergency room with rapid decision-making for patients requiring immediate surgery while ensuring the patient's safety at all times. In 2014, the ACTS team treated a total of 3,933 cases and gained a 94% satisfaction rating from the patients.

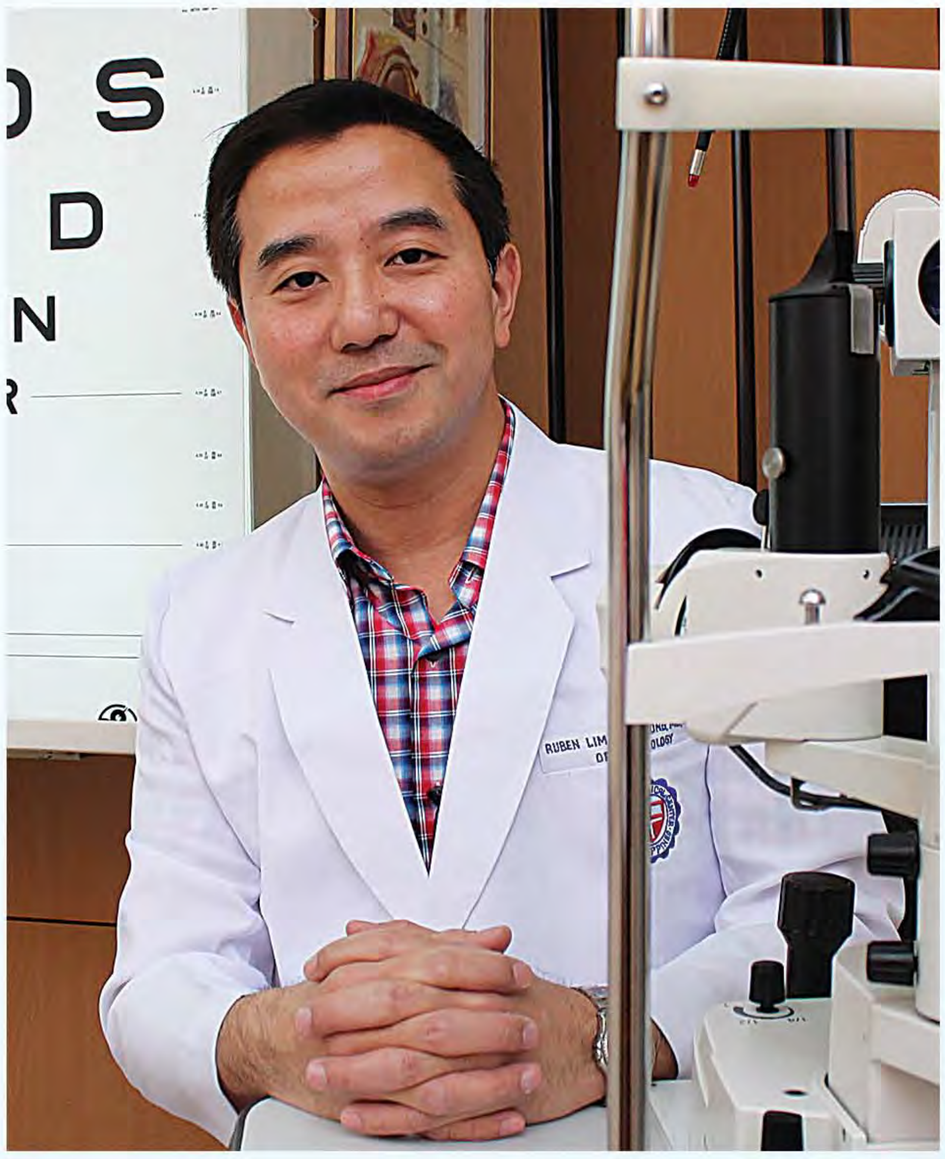
The ACTS team has also served as a role model for effective teamwork. Continuity of patient care is provided and assured by effective endorsement of cases from one trauma surgeon on duty to the next.

The ACTS team is continually improving by developing clinical pathways and treatment protocols for both trauma and common emergency surgical conditions. All members of the team will eventually have ATLS (Advanced Trauma Life Support) certification and the emergency room is undergoing renovations to improve expedient quality care.

After LASIK Comes SMILE, the New Toast of Refractive Eye Surgeons

Ruben Lim Bon Siong, MD

Eye and vision problems such as myopia, or nearsightedness, and astigmatism are common ailments that afflict millions of people in the Philippines and anywhere around the world.



Dr. Ruben Lim Bon Siong is Head of the St. Luke's Eye Institute in Quezon City and Head of the Vision Laser Service at St. Luke's Global City.

Nearsightedness is a condition in which close objects are seen clearly, but objects farther away appear blurred. Astigmatism is a condition that causes blurred vision due either to the irregular shape of the cornea, or sometimes the curvature of the lens inside the eye. Astigmatism frequently occurs with other vision conditions like nearsightedness (myopia) and farsightedness (hyperopia).

Depending on the degree, a person only need to wear glasses or contact lenses to enable them to engage in activities, like watching a movie or driving a car or reading a book. However, in extreme cases which involve situations that impair the normal functioning of an individual, or when he or she wishes to be totally free of the eyeglasses or contact lens, new methods were developed to address and correct these conditions.

Continuous Innovation and Technology Development

In principle, refractive laser surgery procedures permanently change the shape of the cornea, so that light rays are focused precisely on the retina enabling the patient to see images clearly and accurately.

The use of Femtosecond lasers in LASIK (Laser-assisted in-situ keratomileusis) has contributed to more precise, reproducible and safe surgical operation, with fewer likely collateral tissue damage and complication.

Although the procedures have effectively enhanced the patients' eyesight with many achieving the desired 20/20 vision, there remain some issues about the technology employed like corneal flap dislodgement and dry eye in LASIK and delayed visual recovery and pain in PRK (Photorefractive keratectomy). Side effects such as reduced vision in low lighting conditions, and visual distortions such as glare and haloes still occur in a small number of cases.

Cutting Edge Technology

The Eye Institute-Vision Laser Service of St Luke's Medical Center-Global City has recently made available the latest generation premium laser refractive surgery procedure for patients with nearsightedness and astigmatism: the Small Incision Lenticule Extraction or SMILE.



SMILE is an all-laser, bladeless procedure that is indicated for the correction of nearsightedness and astigmatism.

SMILE is an all-laser procedure where no blades are used for tissue removal and no stitches are made on the incisions. Since this laser technology is not affected by environmental conditions like temperature and humidity, this procedure produces more accurate and predictable results. Visual acuity improvement is fast and progressive. Moreover, the procedure is safe and painless, and is performed on an outpatient basis under eye drop anesthesia and can be completed in less than 15 minutes for both eyes. The patient can conveniently walk out of the hospital after the procedure. Visual improvement is rapid and the patient can resume most normal activities the following day.

Unlike LASIK where a corneal flap (a hinged slice of outer corneal tissue) is created, the SMILE procedure is performed without the flap. As a flap-free procedure, SMILE reduces dry eye symptoms and eliminates corneal flap-related complications such as wrinkling, button holes, displacement, dislocation and dislodgment. But more importantly, it maintains the structural integrity of the cornea by preventing weakening of the cornea.

SMILE can only be done using the US FDA-approved VisuMax (Carl Zeiss Meditech) femtosecond laser machine. It makes highly precise and ultra fine cuts at different levels of the cornea creating a lenticule (disc-shaped piece of tissue), whose magnitude corresponds to the nearsightedness and astigmatism correction needed. This piece of lenticule is separated from the overlying and underlying tissue layer of the cornea using a blunt dissector. And this is eventually extracted through a four millimeter laser-created smile-shaped incision at the side of the cornea, justifying the SMILE name.

True to the institution's overriding commitment to bring state-of-the-edge medical technology, St. Luke's Eye Institute-Vision Laser Service has invested in the country's first VisuMax and ReLEx-SMILE system in the country to offer this cutting-edge refractive laser surgery in the Philippines. The unit and the modalities are based on Joint Commission International (JCI) - accredited hospital standards.

The Vision Laser Service is a total refractive surgery center capable of correcting the entire range of refractive errors through ReLEx-SMILE, standard or customized Bladeless LASIK, PRK, LASEK, Bioptics, Phakic Lens Implantation, Refractive Lensectomy, Astigmatic Keratotomy, among others. It has performed thousands of highly successful procedures since 2000.

Endothelial Keratoplasty Indications and Outcomes:

Ma. Dominga B. Padilla, MD, FPAO

Corneal transplantation -- also known as corneal grafting -- is a surgical procedure where a damaged or diseased cornea is replaced by donated corneal tissue.



Dr. Dominga Padilla is the Head Executive Staff of PhilHealth and former Head of Outpatient Surgery at St. Luke's-Global City.

Indications for corneal transplantation include the need to improve visual acuity by replacing a cornea that has become opaque or distorted due to corneal degeneration and dystrophy, as well as scarring due to keratitis and trauma. Transplantation can also be reconstructive, i.e. to preserve corneal anatomy and integrity in patients with stromal thinning and descemetoceles, or to reconstruct the anatomy of the eye, e.g. after corneal perforation.

Transplantation Procedure

Full thickness corneal transplantation, also known as Penetrating Keratoplasty (PK), is a procedure that has been around as a standard surgical procedure since the 1950s.

It allows the graft to be taken from a donor with no known diseases or other factors that may affect the viability of the donated cornea for the recipient. The cornea is the transparent front part of the eye that covers the iris, pupil and anterior chamber.

It is still the most commonly performed type of corneal transplant in the world. It consists of replacing a disc shaped central portion of a scarred, swollen or disfigured cornea with a similarly sized cornea punched from healthy donor corneal tissue acquired from the Eye Bank. The donor tissue is then sutured into the recipient eye using sutures much finer than human hair.

However, as in all fields of medicine, enormous progress has been made in the field of corneal transplantation so that we now have procedures that allow us to replace only the parts that need replacement.

There is no need to replace the entire thickness of the cornea all the time anymore. Endothelial keratoplasty, particularly Descemet's Stripping Endothelial Keratoplasty (DSAEK), is one such procedure.

New Technology

DSAEK can be used for corneal diseases that stem mainly from an abnormality in the endothelium, the innermost layer of the cornea. The endothelium contains millions of pumps that are responsible for keeping the cornea thin and transparent.

When this layer is damaged, as can happen in genetic conditions such as Fuchs endothelial dystrophy, or as a result of long-standing glaucoma with uncontrolled eye pressure, or even as an aftermath of complicated cataract surgery; the cornea swells and vision blurs. Eventually the swelling or edema can lead to the formation of surface blisters or "bullae", a condition known as bullous keratopathy. This condition is also accompanied by considerable pain and discomfort.

DSAEK no longer requires the full penetration of the eye or the suturing of the graft to the recipient eye. In DSAEK, an area of around 8 mm of the abnormal endothelium is stripped away through a very small peripheral corneal incision. A very thin piece of donor corneal tissue, around 120 micrometers or less in thickness, which contains the healthy endothelium, is slipped into the eye. The donor tissue is prepared and pre-cut by the Eye Bank to ensure both quality and safety of the tissue. This donor tissue then opens up inside and is made to attach to the recipient cornea through an air tamponade without the need for sutures. Once attached, the pumps in the donor tissue then take over and the cornea can be rendered clear again.

DSAEK offers patients advantages such as less astigmatism, greater wound strength and faster recovery.



This relatively new procedure has revolutionized treatment of this type of disorder. Unlike a full thickness corneal transplant, the surgery can be performed with one or no corneal sutures. Patients may recover functional vision in days to weeks, as opposed to up to a year with full thickness transplants.

Outcomes

There are many advantages of this surgery over traditional penetrating keratoplasty. As there is no large penetrating wound and no sutures necessary to secure the donor tissue in place, there is much less astigmatism, greater wound strength, and much faster recovery.

Patients can go back to their normal activities, including sports, much sooner and without the fear of catastrophic wound rupture should they accidentally get trauma to the eye. Since the tissue being transplanted is much smaller than traditional penetrating keratoplasty, the chances of rejection are also less. Studies have shown that rejection rate after DSAEK is less than half of that of PK. And if it occurs, it is usually much less severe than rejection in PK such that with the proper eye drops it can be addressed adequately and is less likely to result in graft failure. Patients with endothelial transplants frequently achieve best corrected vision in the 20/30 to 20/40 range, although some reach 20/20 especially with thinner grafts. Optical irregularity at the graft/host interface may limit vision below 20/20. DSAEK is not for all types of corneal disease, however. For example, if the cornea has scars from infection or trauma involving the stroma, or if edema is so long standing that the cornea is already more than 900 micrometers thick centrally, then DSAEK will not be appropriate and a PK will have to be done.

St. Luke's Medical Center offers various types of corneal transplantation. It would be best for patients who are experiencing blurring of vision from any of the conditions that may require transplants, to have their eyes checked sooner rather than later so that they may still have options to choose from as to the type of transplant is concerned.

Renal Denervation

Jose Nicolas M. Cruz, MD

Hypertension or high blood pressure is a chronic medical condition in which the blood pressure in the arteries is elevated. Blood pressure depends on the contraction of the heart muscle (systole) and relaxation between beats (diastole). High blood pressure is said to be present if it is often at or above 140/90 mmHg.



Dr. Jose Nicolas Cruz is the Head of the Heart Institute at St. Luke-Global City. He is joined by Renal Denervation Team members Dr. John David Tan and Dr. Ryan Buendia.

Hypertension puts strain on the heart and prolonged uncontrolled high blood pressure often leads to hypertensive heart disease and coronary artery disease. It is a major risk factor for stroke, aortic aneurysm, heart attack and chronic kidney disease.

In the Philippines, about 26 percent of all deaths are caused by heart and vascular disease, according to Philippine Society of Hypertension based on the National Nutrition and Health Survey. Heart disease, which is often a predecessor of uncontrolled hypertension, is now considered a main cause of death in the country.

Resistant Hypertension

Although there are numerous safe and effective antihypertensive drugs to address high blood pressure, it has been estimated that patients of as much as 8 to 10 percent suffer from resistant hypertension.

It has been noted that as high as 70% of strokes and about 50% of deaths due to heart attacks are attributed to resistant hypertension. Uncontrolled hypertension also leads to higher rates of congestive heart failure and parenchymal kidney disease that may eventually require dialysis or kidney transplantation.

Resistant hypertension is defined as hypertension that remains above normal levels of blood pressure in spite of using three antihypertensive agents belonging to different drug classes (including a diuretic). Medical experts have also observed the increasing incidence of drug-resistant hypertension. This requires different treatment protocol.

Early studies have suggested that the renal nerves play a role in blood pressure regulation. In as early as the 1950s, surgical procedures that surgically disrupts the sympathetic nerves connecting the kidneys with

the central nervous system have been established to have helped reduce blood pressure.

Catheter-Based Renal Denervation Procedure

Renal sympathetic denervation (or renal denervation) is a novel non-surgical procedure. Nerves in the wall of the renal artery are ablated by applying radiofrequency pulses or ultrasound to the renal arteries. This causes reduction of sympathetic afferent and efferent nerve activity to the kidney, thus leading to lower blood pressure.

Renal sympathetic denervation (RDN) is an innovative non-surgical treatment and minimally invasive, endovascular catheter based procedure using radiofrequency ablation or ultrasound ablation technology. This new procedure reduces nerve activity in the sympathetic renal nerves by delivering high-frequency radio waves (RF waves) to specific nerves near the kidneys. It then eliminates hyperactive nerves that produce hormones that increase blood pressure.

The procedure involves endovascular access via the femoral artery with advancement of a catheter-mounted device into the renal artery. The device uses radiofrequency or ultrasound to ablate the renal nerves.



The St. Luke's Renal Denervation Team has successfully performed 4 RDN procedures since 2013.

St. Luke's Pioneers in New Medical Processes

Once again embodying St. Luke's commitment to providing modern and leading-edge medical technology to the country's healthcare system, St. Luke's-Global City's Heart Institute successfully performed the first renal sympathetic denervation in the country on July 1, 2013 to a patient experiencing resistant hypertension.

The breakthrough procedure was done by the St. Luke's Renal Denervation Team together with Dr. Tony S. Walton, one of the innovators of renal denervation and Interventional Cardiologist at the Victorian Heart Centre of the Epworth Hospital in Melbourne, Australia.

Complication rate is also extremely low. During the recent European Society of Cardiology Congress, studies have cited that renal sympathetic denervation is associated with reduced probability of cardiovascular death by as much as 30% compared to standard medical therapy.

This minimally invasive catheter-based procedure can be completed in as short as 50 minutes and significantly lowers and improves blood pressure control after a period of one to six months. To date, St. Luke's-Global City Heart Institute's Renal Denervation Team has performed 4 successful procedures since 2013.

Extracorporeal Membrane Oxygenator: Another Lease on Life

Karl Michael G. Reyes, MD

In life-and-death situations where a patient develops a severe but reversible illness, cardiac or respiratory failure often occurs and the body is unable to get sufficient or sustained blood supply or oxygen, ECMO is an option and can help in these situations.



Dr. Karl Reyes is the Head of ECMO Services in St. Luke's-Global City and Quezon City.

In these cases, the cure, while still possible, could just not come fast enough because the illness ravages the body, shutting down vital organ systems one at a time.

Enter the Extracorporeal membrane oxygenator (ECMO), a life support system that circulates the blood through an oxygenating system. ECMO is similar to a heart-lung machine that takes over the work of the heart and lungs during open heart surgery.

This is a form of advanced life support developed from the technology used in open heart surgery. It is not just utilized to supply blood and oxygen to the body for a few hours, but for several days to weeks.

Commitment to Pioneering Technology

St. Luke's-Global City pioneered in the putting up the ECMO in the Philippines in 2013. The ECMO unit comprises a team of highly trained technicians and specialists to provide this form of Extracorporeal Life Support that enables a patient the chance to recover and improve his chances at survival.

Whenever a patient is rushed to the hospital, the team of ECMO-certified physicians, technicians and nurses can quickly deploy the ECMO to stabilize the patient and be transported to the Intensive Care Unit (ICU). While here, our dedicated team of doctors will comprehensively work to both manage and stabilize all the patient's organ systems allowing the body to rest, and at the same time work to fight the disease itself that is causing the patient's organ injury.



The ECMO is used to treat a variety of life-threatening but potentially reversible conditions such as respiratory failure and acute heart failure.

Upon connection of the ECMO, the device will undertake the breathing function for the patient and remove blood from his body and pump back the oxygenated blood while treatment is being administered and he builds up the strength to fight the otherwise fatal disease. Once the illness is successfully treated, this will allow the body's lungs and heart to work on its own again. Hopefully soon after this, the patient is discharged and able to again lead a normal life.

ECMO Helps Prolong Lives

ECMO has enjoyed much success in both the United States and Europe and is used to treat a variety of life-threatening, but potentially reversible conditions. This therapy is available not only for adults but for infants and children as well.

Diseases that have improved success rates with ECMO therapy include respiratory failure from severe pneumonia or sepsis and acute respiratory distress syndrome; and cardiac failure from myocarditis, after extensive heart surgery, and other forms of reversible acute heart failure.

It is also used in witnessed cardiac arrest situations, in newborns with immature lungs or congenital diaphragmatic hernia, in trauma to temporize shock-states, as a bridge to corrective surgery such as in patients who have had massive heart attacks or in patients with critical congenital heart disease.

It is also used to increase chances of patient survival as a bridge to the next treatment option such as in patients who have terminal or end-stage heart or lung disease who are waiting for lung or heart transplant, or destination-therapy ventricular assist device. Lastly, the ECMO can buy time for physicians to keep patients alive, while they are still deciding on appropriate treatment.

In the past year that the ECMO team has been in operation, 50 % of patients who have undergone the procedure have been able to extend their lives for further treatment. It thus gives an even chance for critical-condition patients an equal, fighting chance for survival, where otherwise such potential did not exist without ECMO.

If there is even a glimmer of hope, or a chance for surviving, then the ECMO Team is there to help make that hope a reality.

ACKNOWLEDGEMENTS

The Corporate Communications Department of the Marketing Group wishes to thank the following people who without their contributions and support this book would not have been written:

The Office of the President and CEO
The Medical Practice Group
Cancer Institute
Eye Institute
Heart Institute
Institute of Orthopedics and Sports Medicine
Institute of Pathology
Institute of Pediatrics and Child Health
Institute of Radiology
Institute of Surgery
Institute of Urology
Department of Nuclear Medicine
Department of Obstetrics and Gynecology
Department of Radiation Oncology
Aesthetic Center
Breast Center
Center for Advanced Reproductive Medicine and Infertility
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Diabetes, Thyroid and Endocrine Center
Memory Center
Minimally Invasive and Robotic Surgery Center
Rheumatology, Allergy and Immunology Center
Weight Management and Bariatric-Metabolic Surgery Center
Dentistry and Oral Surgery Service
Nursing Care Group
The Lactation Unit and Human Milk Bank

The managers, doctors and staff of Emergency Medicine Services
The managers and staff of In-House Security
The managers, technicians and nurses of the Operating Room Complex, MAB OR, Cardiac Catheterization Laboratory and Neonatal Intensive Care Unit
Patient Experience Group
Outpatient Department
Medical Social Service Department
Health Services Outcomes Research
The managers and staff of the Marketing Group (Marketing Management and Channel Marketing, Business Development and Industry Relations)
St. Luke's Residents and Fellows for their diligence in research and data gathering
The medical secretaries who put up with our persistence with their patience and kind-heartedness
Jessa Mae Yanson, Marwell Leigh Eblacas and Concepcion Marie Toledo for their invaluable assistance and quiet calm during production
Jacky de Los Reyes, Kyle Sotelo and John Nicholai Vigilia for their creative input



#SLMCCorpComm

And the patients of St. Luke's Medical Center-Global City and Quezon City who put their trust in the capable hands of our doctors, nurses and non-medical staff.

#StLukesMarketingGroup

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