PRE-CONGRESS WORKSHOP 1
SPSS Statistical Methods In Cancer Research

Professor Dr Norsa'adah Bachok
University Sains Malaysia, Malaysia

Statistical method has an important role in cancer research. The correct implementation of statistical methods is crucial to the quality and rigor of any scientific endeavour. The objectives of the workshop are to inculcate research in clinical practices and the participants to be able to understand and interpret common statistical methods in cancer research when reading scientific papers. This workshop provides a package of important statistical considerations in cancer research. These include statistical concepts, methods and their application which are key to the understanding and interpretation of results. Participants will learn hands-on about the choice of statistical procedures, analyses of the associations, building prediction model, assessing the fitness of these models and quoting the results from the output and then making interpretation and conclusions. The statistical analyses included in the workshop are multiple logistic regression, Kaplan Meier (KM) survival analysis and multiple Cox regression. The strength of association can be measured by odds ratio or hazard ratio. The level of significance of the association is shown by the 95% confidence interval and p value. Multiple binary logistic regression is one of the popular choices when analysing multiple association factors with a single binary outcome. Survival analysis is a technique for analysing “time-to-event” or “failure-time” data. KM survival curve can determine the median survival time of patients’ survival and the survival probability rates. Meanwhile, the Cox regression is used to identify prognostic factors of survival among cancer patients. At the end of the session, all the participants analyse the data, present and interpret the results.

PRE-CONGRESS WORKSHOP 2
BRACHYTHERAPY IN GYNECOLOGICAL CANCERS

3D Radiological Anatomy Of Uterus And Cervix

Professor Dr Anushya Vijayananthan
University Malaya Medical Centre, Malaysia

Anatomy is an essential component of medical education as it is critical for the accurate diagnosis in organs and human systems. The mental representation of the shape and organization of different anatomical structures is a crucial step in the learning process. Radiology can play a critical role in helping physicians recognize gross anatomical structures and their relationships to one another. The rapid development and application of imaging in medicine over the past 20 years has led to a better assessment and understanding of organ function in health and disease. In parallel, the emergence of increasingly sophisticated mathematical models, image processing, and visualization tools in the field of biomedical imaging research has enabled sophisticated three-dimensional (3D) representation of anatomical structures. Detailed animations and interactive 3D models of the human body, such as the Visible Human 3D Anatomical Structure Viewer, have been developed using collected data to facilitate learning of anatomy, radiological, and surgical procedures. With the advent and wide availability of multi-detector CT scanners, it is now a routine to obtain data in living patients that can be reconstructed at 1 mm or smaller increments. This volume of data can be used to demonstrate the degree of anatomical variation between patients for medical education purpose and also for planning of treatment. A thorough understanding of 3D anatomical relationships is vital in interpretation of most types of imaging studies, in surgical approaches to treatment of disease, and in physical diagnosis of most parts of the body other than the skin.
Venezia Applicator – A New Way to Treat Combined Interstitial/Intracavitary Image Guided Adopted Brachytherapy

Mr Ulrich Krumme

The retroEMBRACE Study is a retro-perspective study of data collected in a network of 12 institutions worldwide, initiated by the GEC ESTRO Gyn Working Group. Data from 852 patients have been collected. The inter-institution and inter-patient dose variations in EMBRACE-I and Retro-EMBRACE have provided a unique opportunity to investigate the dose and volume effects for tumor targets and organs-at-risk (OAR). Retro-EMBRACE showed that IGABT results in excellent pelvic control with limited major (grade 3-5) morbidity. The ability to achieve adequate dose to target volumes depended on the brachytherapy technique used; for large tumors, use of combined intracavitary-Interstitial (IC/IT) brachytherapy significantly increased local control without increasing morbidity. For this study, 610 patients with LACC from the retroEMBRACE accrued patients were included. 

As a conclusion, the currently going EMBRACE II study recommends the use of combined IS/IC applicators, especially for LACC with 30 ccm volume and above. In EMBRACE institutions performing mainly IC brachytherapy half of the patients with CTVHR volume larger than 30 ccm received D90 doses of less than 85 Gy. Suboptimal local control is predicted for the patients not achieving the 85 Gy (EQ2D) constraint. The ability to reach dose constraints for both targets and OARs relies on a change of practice, which mainly involves increased use of IC/IS brachytherapy. IGABT requires volumetric imaging, preferably MRI, and the availability of advanced IC/IS applicators. Evidence Based Medicine becomes more important in the process of decision making of hospital administration. retroEMBRACE provides the evidence, based on well conducted research, to proof the advantages of using IC/IS applicators and the use of IGABT, especially for LACC. Using the findings of these studies, Elekta developed the Venezia Applicator to help clinicians to achieve the strict dose constraints as outlined in the EMBRACE II Study. The possibility to “build” and configure the applicator to match the lateral extension, even for IIb tumors, as well as any vaginal involvement allows to achieve higher D90 to HR CTV while minimizing D2 cc to OAR, that are difficult or impossible to achieve with conventional intracavitary techniques. The applicator uses a click mechanism and no screws or bolts are needed to fix the ovoids or any other attachment. First results from e.g. LUH Munich, which has published first results using the Venezia Applicator [5], confirm this hypothesis.

Rationale Of Image-Guided Adaptive Brachytherapy In Cervical Cancer

Associate Professor Dr Pittaya Dankulchai
Siriraj Hospital, Thailand

The standard treatment for locally advanced cervical cancer is external beam radiotherapy (EBRT) with concurrent cisplatin-based chemotherapy followed by brachytherapy. The imaging technological developments in radiotherapy have been evoked an increasing interest in the potential benefit of dose adaptation to customize target volumes. Image-Guided Adaptive Brachytherapy (IGABT) using computed tomography (CT) and magnetic resonance imaging (MRI) have been used for treatment planning in both EBRT and brachytherapy, incorporating three-dimensional (3D) techniques to shape the dose distribution to the tumor and avoid adjacent normal organs at risk (OAR). In cervical cancer both the European GYN GEC-ESTRO network group and American Brachytherapy Society (ABS) have developed guidelines for IGABT in cervical cancer. They show that the therapeutic ratio, relating target coverage and sparing of OAR, can be significantly improved by IGABT. Most studies showed around 10% of overall pelvic failure rate and 3%-6% of grade 3-5 late radiation toxicity with 5 years of median follow up time. The GYN GEC-ESTRO recommendations I-IV have been used as the conceptual framework for the implementation of IGABT worldwide and are embedded into the new ICRU Report 89 “Prescribing, Recording, and Reporting Brachytherapy for Cancer of the Cervix”. The new applicators with greater flexibility for source placement are taken into account the individualized patient and tumor. For imaging modality, MRI is the best for morphologic tumor contouring; however, MRI is not available for all centers especially in low and middle income countries. CT-guided and ultrasound-based IGABT are beneficially developed to substitute MRI-guided IGABT in countries with limited resources. IGABT has resulted in a significant improvement in pelvic control across all stages with reducing severe morbidity. For optimum services, brachytherapy equipment, imaging, and qualified personnel are the crucial issues for implementation of IGABT.
In the existing of high and advance technology development in radiotherapy heading to the use state of art technique to deliver radiation dose. This technique calls as Stereotactic Radiosurgery (SRS) or Stereotactic Body Radiation Therapy (SBRT). Main play role of SRS/SBRT is to deliver a large radiation dose in small fractions thus SRS/SBRT delivery leads to be expected to deliver a more potent biological effect of the target. There are some requirements of SRS / SBRT process before implemented this technique to treat patients. It may include precise localization of the target lesion in the treatment planning process; account for tumor motion due to respiration or other changes in the body; highly conformal dose distribution to the target volume including a steep dose gradient to minimize dose to surrounding healthy tissue sparing; and image-guidance at the time of dose delivery for verification and adjustment of the target localization. The machine should capable to treat using sub millimetre mechanical accrue of the gantry rotation, couch and collimator. Gamma Knife and CyberKnife is well known machine to deliver the SRS technique. Meanwhile LINAC base machine required precise, accurate and comprehensive commissioning before proceed with SRS/SBRT technique. Therefore, the technical quality assurance (QA) for SBRT requires high confidence in all phases of the treatment process. In conclusion immobilization, localization, pretreatment dose verification, and image guidance for patient positioning are predetermined before starting the treatment.

Errors And Margins In IGRT

Dr Tharmarnadar Ganesh
Manipal Hospitals Dwarka, India

Although image guidance ensures accuracy and precision in treatment delivery to the intended target volume, its clinical implementation requires thorough understanding of its methodology and its integration into the overall radiation oncology workflow. One of the most important applications of the image guidance is its role in defining the clinical target volume (CTV) to planning target volume (PTV) margins that are specific to each clinic. These margins are determined from the systematic error and the random error in patient setup using the margin recipe of van Herk. The CTV-to-PTV margin according to van Herk’s formula is 2.5 times the systematic error plus 0.7 times the random error underlining the importance of addressing the systematic component in trying to reduce the CTV-to-PTV margins. Setup error is not the sole factor that determines the CTV-to-PTV margin. Organ movements and organ delineation have their own associated errors which also must be taken into account in defining this margin. In fact organ delineation error is the largest contributor to the CTV-to-PTV margin. Image guidance has no role in determining organ delineation error. Its role in organ movements is limited. IGRT technologies are available in the treatment delivery machine located at the fag end of the radiation oncology workflow. However the IGRT methodology affects the entire RT process in a significant way. Every effort must be made to ensure that IGRT technology does not result in false confidence on overall accuracy and precision of treatment delivery. The online and offline correction strategies followed in the clinic must be based on the margins included at the time of contouring and shall be well-understood and appreciated by one and all. Clinical implementation of any IGRT technology must be based on sound evidence from clinic specific results obtained and the feedback loops into the workflow at several stages.
SPEAKER ABSTRACTS

Motion Management

Associate Professor Dr Ung Ngie Min
University of Malaya Medical Centre, Malaysia

The development of advanced radiation technologies, including intensity-modulated radiation therapy (IMRT), stereotactic body radiation therapy (SBRT) and proton therapy, has resulted in increasingly conformal radiation treatments. Recent evidences for the importance of minimizing dose to normal critical structures has led to incorporation of these advanced treatment modalities into radiation therapy (RT). While such technologies have allowed for improved dose delivery, implementation requires improved target accuracy with treatments, placing increasing importance on evaluating tumour motion at the time of planning and verifying tumour position at the time of treatment. This presentation reviews the management of motion in radiation therapy. An overview is given of magnitudes and variability of motion of various structures and organs. Techniques for monitoring motion in real time by use of surrogates are reviewed. Imaging techniques displaying motion in the treatment room for pre-treatment as well as real-time imaging for localization and verification are covered, and their use for various motion-management treatment delivery techniques is discussed. Finally, a perspective of the future of motion management in radiation therapy is given.

A Physicist Initial Experience: Comparison Between Halcyon And Tomotherapy

Mr Lum Liang Soo
Beacon International Specialist Centre, Malaysia

The Varian Halcyon and Accuray Tomotherapy HD are both mature technologies for advance treatment techniques in external beam radiotherapy (EBRT). A comparison is made between these two technologies in terms of machine specification, Treatment Planning System capability on planning and QA, as well as treatment execution. In this presentation, we will discuss some notable differences between these two machines. For one, the Halcyon uses a broad radiation beam whereas the Tomotherapy uses a fan beam (helical) during treatment delivery. In addition, the couch is static throughout the treatment delivery on the Halcyon while the Tomotherapy’s couch moves through the bore during helical treatment. The former is equipped with a staggered Multi-leaf Collimator (MLC) while on the other hand the latter has a binary MLC. A Nasopharyngeal Cancer (NPC) plan was planned separately by using a VMAT technique for the Halcyon and Helical IMRT for the Tomotherapy. These two plans are then compared dosimetrically with respect to homogeneity index, conformity index and organs at risk (OAR) sparing effects using the same scoring methods. Both treatment plans provided comparable good results that can be utilised for treatment execution. Based on the observations, patient throughput for Halcyon can be very high due to its fast imaging and treatment time but complex treatment techniques might be more achievable on the Tomotherapy machine. In summary, there is no definite conclusion to the superiority of either modality over the other as each to their own has its fortes. The aim of this presentation is to showcase that with the radiotherapy modalities equipped in hand, the user should always use it to its full potential in order for the patients to harness its true clinical benefits.
SPEAKER ABSTRACTS

Medical Cyclotron For Nuclear Medicine Applications

Mr Mohamad Aminudin Bin Said
National Cancer Institute, Malaysia

Cyclotrons is a particle accelerator widely used to produce wide range of radioisotope. In this presentation, the basic theory of cyclotron operation and the subsystem available in medical applications briefly discussed. This presentation also focus with the different design between several cyclotron available in Malaysia. Application of cyclotrons discussed detail involves the production of short-lived radioisotope for use in nuclear medicine imaging, especially Positron Emission Tomography (PET). The advantages of PET imaging offered reliable quantitative non-invasive diagnostic technique is being increasingly used in neurology, cardiology and oncology area. The principle of radiation safety while operating operating cyclotron and major preventive maintenance requirement also briefly described.

Radiation Protection In Radiology, Radiotherapy And Nuclear Medicine

Dr Husaini Bin Salleh
Malaysian Nuclear Agency, Malaysia

Dealing with ionizing radiation should accompany with awareness of possible hazard. The person in charge should has responsibility to ensure that all risk related to ionizing radiation is reduced as minimum as possible to patient, staff and public. Diagnostic radiology, radiotherapy and nuclear medicine have their own nature of works and different level of risks. What in common is the use of ionizing radiation. Paragraph 2.12 of GSR Part 3 states: “The application of the requirements for the system of protection and safety shall be commensurate with the radiation risks associated with the exposure situation.” Based on this statement the Graded Approach is applicable which is a concept that underpins the application of the system for protection and safety. The three factors relevant to dose reduction (time, distance and shielding) should be combined in the design to optimize occupational and public radiation protection. For any radioactive material used in medicine, ensuring safety and security of sources such as locking and control of access are also important issues. Each of the areas of radiology, radiotherapy and nuclear medicine were separated with little or no combined usage initially. This has changed, with hybrid imaging systems involving both diagnostic radiology and nuclear medicine expertise, and with the planning, guidance and verification stages of radiotherapy increasingly involving both imaging and radiotherapy expertise. Some of hybrid imaging modalities might be used in a nuclear medicine or a radiotherapy facility, rather than a diagnostic radiology facility. An overview of radiation protection for these three areas is necessary to suit with the new technology used in medical radiation for benefit of patient, staff and public.
Cancer patients often show skin adenexal changes due to variety of reasons. The status of skin, nail and hair reflect the nutritional status of an individual. Remote malignancy may also present with changes in the cutaneous adenexa as a part of paraneoplastic process. Systemic antineoplastic drugs are also known for their changes in the nails, hair and skin. Studies have reported 84% patients have at least one cutaneous finding which can be attributed to cancer chemotherapy.

**Skin changes**

Hyperpigmentation is a common adverse reaction seen in patients undergoing chemotherapy, and is due to stimulation of melanin synthesis by the increased action of adrenocorticotrophic hormone. The sites most commonly involved are dorsum of hands and feet. The drugs known to cause hyperpigmentation are 5 FU, cyclophosphamide, csplatin, doxorubicin, gemcitabine and ifosfamide. It can be prevented by avoiding excessive sun exposure. Hand-foot syndrome causes redness, swelling, pain and blisters, on the palms and soles. Capecitabine, 5 FU and liposomal doxorubcin are associated with HFS, wherein a small amount of medicaton leaks out of capillaries of palms and soles, damaging the surrounding tissue. Urea based creams help prevent HFS. EGFR is normally present in the skin and EGFR inhibitors are known interfere with the signalling cascade in the epidermis and adenexal epithelia. Toxicity of all the TKIs concentrates on skin and adenexa. Acneform eruptions occurs frequently with EGFRI, t about 6-8th week of therapy. Discontinuation of therapy and oral applications of metronidazole creams, emollients, moderately potent corticiosteroids.

**Hair changes**

Alopecia is a common and psychologically distressing adverse effect of chemotherapy. 58% of patients reported to have alopecia after chemotherapy. The cessation of mitotic activity in the hair matrix results in a narrow weakened hair shaft. Drugs causing alopecia are 5FU, adriamycin, vincristine, cyclophosphamide, doxorubicin, etoposide and cisplatin. The severity of alopecia is related to the dosage, duration and regime. USFDA has approved cool hair cap to be used while the patient is on chemotherapy. Due to cool temperature, the blood vessels in the scalp constrict, reducing blood flow to the hair follicles. That means less chemotherapy can get into the hair follicle cells. Proper counselling prior to start of treatment usually leads to acceptance of this side effect, since the hair loss is reversible with good re-growth is seen after cessation of treatment.

**Nail changes**

Nail changes usually appear weeks after initiation of therapy, possibly due to slow rate of growth of the nail plate Among nail changes, melanonychia is the commonest followed by Beau’s lines and Mee’s lines. Drugs found responsible for melanonychia are adriamyn, etoposide, etooside and cisplatin. Unlike other cutaneous side effects that are easily treatable with simple therapies, nail disorders can be painful and resistant to treatment.

To sum up, dermatological adverse events are often reported as the causes for discontinuation of cancer directed therapy, and therefore need attention, but they are seldom life threatening.
SPEAKER ABSTRACTS

Hair Growth Cycle And Influence Of Chemotherapy

SRN Mardhiana Binti Mohd Ali
Parkcity Medical Centre, Malaysia

The three stages of hair growth cycle are the anagen, catagen, and telogen phases. Each strand of hair on the human body is at its own stage of development. Once the cycle is complete, it restarts and a new strand of hair begins to form. On average, the growth rate for human hair is about 1.25 centimetres or 0.5 inches per month, or about 15 centimetres or 6 inches per year. Most chemotherapy drugs work by attacking rapidly dividing cells. Rapid cell replication is one of the hallmarks of cancer; however, hair follicle cells also grow and divide quickly. Consequently, the chemotherapy drugs usually inhibit hair growth. The dose and type of medicine will determine the severity of hair loss. Once the course of chemotherapy has ended, new hair growth may begin after three to 10 weeks. Through the years, attempts have been made to reduce hair loss by using tight bands or ice caps. These techniques may reduce hair loss by reducing blood flow to the scalp and limiting chemotherapy exposure to hair follicles. Management of hair loss focuses on patient’s comfort, or discomfort with baldness and on keeping their head warm, as well as protection from the sun. They can considering a wigs, cap and scarf to keep their head confortable.

Expert Quote:
“There are studies that show that for many women, losing their hair is worse than losing a breast. That’s because you can conceal the loss of a breast, but hair loss is so obvious and apparent.”
--- Marisa Weiss, M.D., chief medical officer, Breastcancer.org

Dermatological Intervention In Skin Toxicity

Dr Tang Jyh Jong
Raja Permaisuri Bainun Hospital, Malaysia

There has been a rapid emergence of numerous targeted agents in oncology over the last decade. This exciting paradigm shift in drug development has resulted in high response rates and extended survival in patients with metastatic/advanced malignancies. Their mode of action is the indirect activation of cytotoxic T-cells through the blockade of inhibitory receptors of immunomodulatory pathways, such as cytotoxic T-lymphocyte-associated antigen-4 (CTLA-4), programmed cell death protein-1 (PD-1) and its ligand (PD-L1). Despite their impressive therapeutic effects, they can also induce immune-related toxicity, affecting various organs including the skin. Cutaneous adverse effects are among the most frequently observed toxicities with many targeted agents, and their intensity can range from self-limiting to life threatening toxicity. In light of the often life-saving nature of emerging oncotherapeutics, it is critical that clinicians must understand the mechanisms and recognize clinical signs and symptoms of such toxicities in order to provide effective clinical management. The most common adverse cutaneous reactions include maculopapular rash, lichenoid reactions, vitiligo and pruritus, with severity Grade 1 or 2. These toxicities tend to subside under symptomatic treatment so that permanent discontinuation of therapy is not commonly necessary. Less frequent but eventually life-threatening skin side effects, including Stevens-Johnson syndrome, Drug Reaction with Eosinophilia and Systemic Symptoms and Toxic Epidermal necrolysis, have also been reported and requires permanent discontinuation of the immunotherapy. Early recognition and adequate management, however, are critical to prevent exacerbation of the lesions, to limit treatment interruption and to minimize quality of life impairment.

SPEAKER ABSTRACTS

Care Of Nails During Cancer Therapy

SRN Mardhiana Binti Mohd Ali
Parkcity Medical Centre, Malaysia

Apart from losing a hair, another side effect of chemotherapy is damaged nails. Nails are after all quickly dividing cells, just like hair. They can become discolored, brittle, can lift, turn yellow, develop beau’s lines, which are dark lines that run across the nails, there can be indentations and they can also come off. There are a few tips for patient to manage the nail’s changes such as Use clear polish to help keep nails strong, avoid artificial nails and colored polish, especially dark colors, wear gloves when washing dishes and gardening, care for nails and cuticles gently, Increase iron in patient’s diet, cut back on or avoid caffeine, wear comfortable shoes that allow adequate room for their toes. Even if the nails disappear during chemotherapy, or become lined or discolored, the skin and nail cells will start growing again at a healthy rate when treatment ends. New nail tissue will push the damaged nails out of the way. Some people enjoy watching this occur as it is a sign that chemotherapy is done and they are entering the recovery stages. Fingernails grow three times faster than toenails, so allow more time to see improvements on your toes.

SYMPOSIUM 1A-GYNECOLOGICAL ONCOLOGY

1A 01

Options in Managing Platinum Resistant Ovarian Cancers, The Current Practice

Dr Vicknesh Visvalingam
Selayang Hospital, Malaysia

In the Real World Practice of Oncology, Managing Platinum Resistant Ovarian Cancers (PROC) are an Enigma. The Current International Standards of Ovarian Cancer Management are A) Cytoreductive Surgery – optimal cytoreduction with no macroscopic disease B) Systemic Treatment with a Taxane and Platinum for 6 cycles C) Variations in dose dense, schedule and route of delivery including dose dense paclitaxel, intraperitoneal chemotherapy and the use of biological agent bevacizumab. 25% of patients relapse 6 to 12 months after first line and 30% relapse after 12 months of first line. The Goals of Therapy for PROC are single agent chemotherapy, bevacizumab with chemotherapy, PARP inhibitor monotherapy (Germline or Somatic BRCA mutation tumours) and Pembrolizumab monotherapy (MSI – high tumours). In Current treatment options in PROC, no superior single agent chemotherapy has been identified with doublets having similar response to single agents. PARP inhibitors Olaparip and Rucaparib have been approved for patients with BRCA mutations PROC who have received multiple prior lines of therapy. Emerging PARP inhibitor Niraparib has shown some promise in the Phase 2 OUADRA Trial for PROC. In the AURELIA Trial, Bevacizumab added to Chemotherapy improves response, Progression Free Survival (PFS), Quality of Life (QoL) but does not improve Overall Survival (OS). Current Clinical Developement in PROC are other Anti – Angiogenesis Agents, , Folate Receptor Inhibitors, Immunotherapeutic Strategies, Drug Candidates Targeting Mutant P53 and Targeted Therapy against Signaling Pathways. Platinum Resistant is associated with poor overall survival outcomes. Clinical Trials may remain the best opportunity for many patients.
Endometrial Cancer: Fertility Preserved Treatment

Dato Dr Mohd Rushdan Md Noor
Hospital Sultanah Bahiyah, Malaysia

Conservative treatment for early endometrial cancer is not a standard treatment. Hormonal treatment is the only acceptable conservative medical treatment for fertility preservation. Conservative surgical treatment has limited data and only acceptable if combined with hormonal therapy. Patient must be managed by multidisciplinary team comprises of Gynae Oncologist, Reproductive Medicine Specialist, experienced Radiologist and Pathologist. Thorough pre-treatment work-up with adequate counselling MUST be done to select the suitable patient. Selection of patients is the most critical and must be done thoroughly. In considering the modality of treatment, safety, efficacy and no adverse effect to future fertility are the most important factors. Only 40% of patients responded to treatment conceived and up to 35% have recurrent disease. Close follow-up with imaging and endometrial biopsy must be done during treatment. Following treatment, patient should be referred for fertility treatment immediately or continue with maintenance progestin therapy. Failure to conceive, obesity, not on maintenance therapy, treated with other progestin other than MPA are known risk factors for recurrent. Patient who has completed their family following conservative hormonal treatment for early endometrial cancer should be counsel for definitive surgical treatment.

Latest Guidelines In The Management Of Cervical Cancer

Dr Chia Yin Nin
Gleneagles Hospital Singapore

Current guidelines in the management of cervical cancer include use of radical surgery (RS) followed by radiation therapy (RT) or concurrent chemoradiation (CCRT) for early stage cervical cancer. For locally advanced cervical cancer the current standard of care is chemoradiation. With the new FIGO staging guidelines that incorporate lymph nodes and radiological examinations into present staging, the use of EUA may no longer be necessary. Instead, pre-operative PET scans and MRIs are recommended for staging purposes to assess the paraaortic lymph nodes and parametrium respectively. In terms of RS, robotic surgery initially appeared promising but recent studies seem to suggest a higher mortality rate. Instead, laparotomy is still recommended as the gold standard. For adjuvant therapy post RS, while the therapeutic effect of adjuvant chemotherapy alone has not yet been established, there have been a few retrospective studies suggesting that it is at least similar to that of RT or CCRT. As such, we can anticipate the frontline Paclitaxel/Carboplatin + Avastin + Atezolizumab study and the therapeutic effects of chemotherapy alone in the near future. There has also been new studies evaluating the efficacy of neoadjuvant chemotherapy for locally advanced cervical cancer but recent results just published did not indicate survival advantage. In fact, the evidence for neoadjuvant is inferior overall survival. Finally, in terms of recurrent, metastatic, or persistent cervical cancer previously treated with chemotherapy, latest research points in the direction of Tumour Infiltrating Lymphocyte adoptive therapy, which has received FDA breakthrough designation status, and may thus receive approval if promising data continues. In addition, mutational profiling looks to be promising, as 5% of all cervical cancer, mostly adenocarcinoma, have HER2 mutations and respond well to HER2 TKIs. The response rate is 27%, and the clinical benefit is 54%. Thus, in the next 5-10 years, this may be the direction treatment guidelines will advance in.
**SYMPOSIUM 1A-GYNECOLOGICAL ONCOLOGY**

**1A 04**

**Transperineal Brachytherapy In Cervical Cancer**

**Professor Dr D.N. Sharma**

*All India Institute of Medical Sciences, India*

Globally, carcinoma of uterine cervix is the fourth most common malignancy among women. Majority of patients in developing countries present in locally advanced stage and the standard treatment consists of external beam radiotherapy (EBRT) with concurrent chemotherapy followed by intracavitary brachytherapy (ICBT). If ICBT is not feasible either due to distorted anatomy or inadequate dosimetry, then interstitial brachytherapy (IBT) should be considered. IBT consists insertion of multiple needles/catheters into the primary tumor and parametria through the perineum with the help of a template. The various indications of transperineal IBT in cervical cancer are: 1) bulky cervical growth, 2) extensive parametrial involvement, 3) obliterated cervical os, 3) narrow vagina, 4) gross vaginal extension and 5) recurrent disease. Due to the risk of trauma to normal structures like bowel and bladder, use of ultrasound imaging (especially trans-rectal) is suggested during the transperineal IBT implant procedure. Although low-dose-rate and pulsed-dose-rate systems have been used but high-dose-rate (HDR) is the most popular dose rate system for IBT. Results of IBT in cervical cancer vary due to varying techniques and lack of standard dose fraction schedules. Even though American Brachytherapy Society (ABS) has recommended 3 sessions of weekly implants, most studies using HDR-IBT for cervical cancer have used single implant with multiple fractions ranging from 2-6 fractions using 4-6 Gy per fraction dose. The overall local control rates with HDR-IBT in cervical cancer ranges from 28% to 88%. The results of our study have shown local control rate of 62% and 3-yr overall survival rate of 46%. Various studies in the literature have revealed the long term toxicity rate of 7-28% although with image guided brachytherapy the toxicity rate is declining over the years. To conclude, transperineal brachytherapy is very useful technique in cervical cancer patients not suitable for ICBT.

**SYMPOSIUM 2A-BREAST CANCER**

**2A 01**

**Intratumoral Heterogeneity In Breast Carcinoma**

**Dr Subramanian Yegappan**

*Oncode Scientific Sdn Bhd, Malaysia*

Intratumor genetic heterogeneity refers to the coexistence of genetically distinct but clonally related cancer cells within the same patient. It can manifest itself as spatial or temporal heterogeneity. Spatial Heterogeneity is usually the result of a complex co-ordinated interplay between the tumour cells themselves, and also between the tumour cells and the different stromal elements, exemplified by Metaplastic Ca Breast. Temporal heterogeneity refers to differences between primary and metastatic or recurrent lesions, and pre-invasive and invasive disease in the same tumours. There is sufficient evidence to indicate considerable differences between the primary tumour and local or distant recurrences that may have an impact on the treatment decisions for patients with recurrent disease. Significant intratumoral genetic heterogeneity is likely to limit the efficacy of targeted therapies even prior to the acquisition of drug resistance. The Darwinian-like selection of pre-existing drug-resistant cell clones could contribute to the initial therapeutic resistance, and could also explain the emergence of such clones, due to genomic instability over the course of time in the progression of a tumour. Whether these therapy-resistance-causing mutations occurred prior to or during the course of therapy, they reflect significant intratumoral genetic heterogeneity which subsequently resulted in targeted therapy failure. This talk will address the issue of heterogeneity in these tumors.
**Purpose:** The aim of this lecture is to give an overview of the current patterns of practice in radiotherapy for breast cancer management in Asia.

**Methods:** A survey was conducted during the International Atomic Energy Agency (IAEA)/Regional Radiation Oncology Societies (RCA) Kick-off and Project Coordination Meeting in Gunma, Japan last May 2018. The event was attended by radiation oncologist representatives from 21 countries from the Asia-Oceania region. A total of 20 survey questionnaires were sent to the corresponding representatives which consisted of 22 multiple choice questions divided into 12 categories.

**Results:** The survey had a 95% response rate. Out of the 19 respondents, 18 respondents were from Asia and 1 from Oceania. Majority of the participants came from lower middle income countries (56%) and the remaining were either high income (22%), upper middle income (17%), and low income countries (5%). Majority are government operated facilities (89%). Most of the breast cancer patients were diagnosed with locally advanced disease (78%). Surgical procedures for early staged breast cancer (stage I-II) were usually via breast conserving surgery (71%) while locally advanced stage diseases were mostly treated with modified radical mastectomy (90%).

In terms of radiotherapy, early and locally advanced breast cancer patients were predominantly treated using external beam radiation in 82% and 95%, respectively. Majority of which were 3D-CRT in 45% and 41%, respectively, followed by IMRT in 21% and 26%, respectively. Most radiation oncologists still utilize conventional fractionation (mostly 50 Gy in 25 fractions) in treating early (50%) and locally advanced diseases (60%). However, hypofractionation (mostly 40 Gy in 15 fractions) are increasingly being adopted in 45% and 50%, respectively. Timing of radiotherapy usually starts at 4-6 weeks after chemotherapy or surgery (83%) and more than half reported to deliver adjuvant radiotherapy after breast reconstruction or flap placement. Most common acute side effect of breast radiotherapy is radiation dermatitis (94%) while the most common chronic side effect is telangiectasia (47%).

Palliative radiotherapy in breast cancer is most commonly offered for pain (32%), brain metastases (30%), bleeding breast mass (21%) and bone metastases (17%). Brain metastases is usually treated with whole brain radiotherapy using 2D conventional radiotherapy delivering 30 Gy in 10 fractions (50%), while bone metastases is also commonly treated using 2D conventional radiotherapy with 8 Gy in 1 fraction (36%).

**Conclusion:** Patterns of practice for breast radiotherapy are widely varied in Asia. Technological advancements, accessibility to treatment, socioeconomic status, and, physician and patients’ choice contribute to the different practices employed in breast cancer radiotherapy in Asia. Radiotherapy for breast cancer in Asia continues to evolve with constant research, professional education and trainings, creation of practice guidelines, and regional/international collaborations tailored to the Asian population.
SPEAKER ABSTRACTS

SYMPOSIUM 2A-BREAST CANCER  
2A 03

Low Dose Tamoxifen In DCIS  
Dr Tan Chih Kiang  
National Cancer Institute, Malaysia

Adjuvant Tamoxifen at 20mg/day has been the standard of care for patient with Ductal Carcinoma in Situ (DCIS) that was estrogen receptor (ER) positive. Tamoxifen is a relatively safe drug and effective in preventing breast cancer recurrence. However, its side effects of menopausal symptoms, endometrial cancer, deep-vein thrombosis, and pulmonary embolism could be barriers for its use as preventive measure. There is emerging evidence to support the use of lower dose of Tamoxifen for this group of patients, with comparable risk reduction but a significantly reduced risk of serious events.

SYMPOSIUM 2A-BREAST CANCER  
2A 04

Advances In The Treatment Of TNBC  
Dr Mastura Md Yusof  
Pantai Hospital Kuala Lumpur, Malaysia

Triple negative breast cancer (TNBC) is the least common but most aggressive breast cancer subtype that is characterized by early and higher rates of relapse, greater metastatic potential, and worst overall survival. It has the highest association with gBRCA mutation and more often affects young women. Standard of care with chemotherapy remains challenging and has rarely achieved clinically meaningful improvement in outcomes in patients with TNBC. Recent efforts focused on comprehensive profiling of both cellular composition and tumour molecular features to identify novel targets for effective therapeutic strategies. In addition, appropriate patient selection and risk stratification for improved pathways for treatment decisions, deliveries and surveillance hopefully leads to improved survival in this patient population.
Practice changing recent advances in Neuro-Oncology includes several novel insights in imaging, greater knowledge of molecular understanding and genetic profile of a wide range of both adult and paediatric primary central nervous system (CNS) tumours, interesting updates on the impact of surgery, impact of adjuvant therapies including high-precision radiotherapy (RT) and systemic therapy and finally newer data on demographics as well as palliative care and long-term survivorship.

The advances are summarised as follows:

1. Robust knowledge of demographics of various CNS tumours collected and presented as CBTRUS. Increasing focus on teenage and young adult (TYA) brain tumours.
2. Contemporary imaging techniques of fMRI, biological imaging parameters such as perfusion, rCBV, ASL, non-FDG PET imaging, immediate post-op MRI within 24-48 hours and very importantly the new set of guidelines laid by RANO to differentiate between tumour and pseudo-progression in various sites.
3. Prospective data collection favouring immediate vs delayed surgery in adult low-grade gliomas as well as recognition of maximal safe resection, including intra-operative neuro-monitoring has improved outcomes in gliomas. Endoscopic resections and other techniques with a view to preserve function are also being increasingly accepted.
4. Tremendous insights on the impact of molecular markers leading to an update of WHO 2016 classification of CNS tumours being adopted throughout the world. Childhood tumours such as medulloblastoma, ependymoma profiled extensively with personalised therapy being explored at the moment accordingly.
5. Significant refinement of radiation delivery methodologies, including image guided IMRT, modern pencil beam proton therapy and level-1 evidence to support these to preserve neuro-cognition, memory, neuro-endocrine function, demonstrated improved outcomes in childhood primary and adult metastatic brain tumours.
6. Impact of addition of chemotherapy to RT in high risk low grade and intermediate grade gliomas, has been demonstrated on the basis of large cooperative studies. While the data for targeted agents, anti-angiogenic therapies including preliminary data for immunotherapy for malignant high-grade gliomas did not live up to the promise, next generation trials will hopefully address some of these challenges.
7. Increased focus on long-term survivorship in brain tumour patients leading to modification of treatment paradigms and increasing global cooperation for standardised patient reported outcomes is being intensely pursued.
SPEAKER ABSTRACTS

Plenary Lecture 2
PL 02
Redefining The Role Of Brachytherapy In The Era Of Precision Cancer Treatment

Professor Dr D.N. Sharma
All India Institute of Medical Sciences, India

Brachytherapy is defined as the therapeutic use of encapsulated radionuclides within or close to a tumor. Brachytherapy treats the tumor from within outwards and the radiation does not travel through normal tissue to reach the tumor as with external beam radiotherapy (EBRT) techniques. Therefore, it is highly conformal form of RT and provides better dose distribution as compared to most modern EBRT techniques like IMRT, SBRT and proton beam therapy. Significant developments over the last three decades have renewed the interest in brachytherapy practice. The advent of artificial radioisotopes and remote afterloading techniques have reduced the radiation exposure hazards. Innovative imaging modalities (CT Scan, MR imaging, transrectal ultrasound and PET scan) and sophisticated computerized treatment planning systems have helped to achieve an increased positional accuracy and superior, optimized dose distribution and excellent clinical outcome. Compared to the 1990s, the use of brachytherapy has increased substantially and it is expected to continue growing in the future as it becomes ever more precise and efficient. The common diseases treated with brachytherapy include prostate cancer, cervical cancer, head and neck cancer, gynecological cancers, breast cancer and many other tumors. Brachytherapy has been proved to be very effective and safe way of treatment, providing a good alternative to surgical removal of the prostate, breast, and cervix, while reducing the risk of certain long-term side effects. For cervical cancer, brachytherapy remains an integral part of the radiotherapy management. Due to the enthusiasm and hype related to modern EBRT techniques like IMRT/SBRT, there has been an unsuccessful effort to replace intracavitary brachytherapy. Several studies have shown that the use of SBRT/IMRT (instead of ICRT) has compromised the survival of cervical cancer patients.

KEYNOTE ADDRESS
KA 01
Cancer Control Plan For Malaysia: What Do We Need?

Dato’ Professor Fuad Ismail
University Kebangsaan Malaysia Medical Centre, Malaysia

Cancer as a disease is both frightening and emotional for patients. The burden of cancer can only increase with an aging population and a shift in the epidemiology of disease to non-communicable ones. We are fortunate to have many new therapies every year with improvement in patient outcomes but these new drugs come at a very high cost. Similar to Moore’s law of doubling computing power every year, cost of cancer therapies appear to double in less than 1 decade. Out of pocket payments bankrupt half of the patients in Malaysia and the burden is on the government to provide affordable care. In the myriad of treatments available, it is difficult to choose who may benefit from treatment but the time has come for us to choose wisely in providing therapies which are of value in terms of price, quantity and quality of life to the patients. Preventing and early detection of cancer seems like a low-lying fruit but is difficult to get. Screening programs need to be re-examined for cost-benefit ratio to the population. Less obvious means of reducing cancer incidence such as control of obesity is a more difficult subject to approach. The spectrum of care must also include rehabilitation and palliative care of advanced disease. More needs to be done for patients with hospice care and mobilising help within society. This needs an increase in the workforce of the cancer team of doctors, nurses, pharmacists, therapies and many others. We need research specific to the need of Malaysia broadening the scope of care to many rather than the cutting edge to potentially benefit a few. By working together in a more cohesive manner, the path to cancer control would be clearer for the country.
**SYMPOSIUM 1B - GIT MALIGNANCIES**

**1B 01**

**Anal Canal Cancer - An Update**

Dr Muthukkumaran Thiagarajan  
*Hospital Kuala Lumpur, Malaysia*

Squamous cell carcinoma of the anal canal were managed with abdominoperineal resection in the yesteryears with significant compromise in quality of life at the expense of moderate survival benefit. With the initial introduction of chemoradiotherapy as a preoperative therapy, it was later accepted that this modality alone without surgery could be curative. In current practice, radical surgery is reserved as a salvage therapy following failure or recurrence post chemoradiation. Attempts at alteration of chemotherapy agents, radiotherapy dose escalation, introduction of advanced radiation technique and use of targeted therapy has not significantly impacted improvement in survival in the curative setting. This presentation will explore some of the latest updates on recent trials as well as future outlook in the treatment strategy of anal cancer.

**SYMPOSIUM 1B - GIT MALIGNANCIES**

**1B 02**

**Tissue Agnostic Therapy In Colorectal Cancer (CRC)**

Associate Professor Ho Gwo Fuang  
*University of Malaya Medical Centre, Malaysia*

Aberrant activation of epidermal growth factor receptor (EGFR) pathway leads to downstream RAS, v-Raf murine sarcoma viral oncogene (RAF), mitogen-activated protein kinase (MEK), and extracellular signal-regulated kinase (ERK) phosphorylation and activity, leading to cell proliferation and oncogenesis. Targeting EGFR using monoclonal antibodies such as cetuximab and panitumumab, has been effective in treating metastatic CRCs without mutation of MAPK signalling pathway. However, 40-50% of CRCs patients have downstream mutations of KRAS, NRAS and MAPK signalling pathway causing resistance to anti-EGFR treatment. Monoclonal antibodies against VEGF and VEGF receptors are effective against mCRCs dependent on angiogenesis. These antibodies are less dependent on specific mutations in the cancer cells. BRAFV600E mutation occurs in 8–12% of mCRC and is mutually exclusive of RAS mutations. Presence of a BRAF mutation results in a poor prognosis with median OS less than 6 months after the failure of first-line mCRC therapy. Combined MEK, BRAF, EGFR inhibition using binimetinib, encorafenib, and cetuximab has been effective for patients with BRAFV600E mCRC (BEACON trial). 3-5% of CRCs caused by Lynch syndrome. These cancers are linked to microsatellite instability (MSI) in the cellular mechanisms that control repair of DNA. MSI is not confined to hereditary CRC and is found in around 15% of colon cancers. Checkpoint inhibitors, eg pembrolizumab, are effective against mCRCs with MSI. HER-2 gene amplification occurred in 3% of mCRC, and slightly higher (5%) in RAS wild-type mCRCs. HERACLES-A trial combined therapy with lapatinib and trastuzumab in patients with KRAS wild-type, HER-2 amplified mCRC patients, and showed an ORR of 30.3%, TTP of 5.5 months. PIK3CA mutations in exon 9 and/or 20 is found in approximately 10–15% of CRC. This mutation may be a predictive biomarker for treatment response to aspirin in patients with CRC.

**SYMPOSIUM 1B - GIT MALIGNANCIES**

**1B 03**

**Systemic Treatment In Hepatobiliary Cancer (HBC)**

Dr M. Amir Shah  
*Gleneagles Penang, Malaysia*

Hepatobiliary malignancies are not as common as other cancers such as Breast, Colorectal, Lung or Gynaecological malignancies, yet form a lethal group of cancers with high mortality rates. Broadly, it can be divided to Hepatocellular cancer and Biliary tract cancers. Incidence and prevalence are quite regionally and geographically dependent, as risk factors vary from country to country. HCC has higher incidence in countries with higher prevalence of Hepatitis B or C Infection, such as Africa and Asia. However, Biliary tract cancers are more common in the Western Hemisphere. Treatment is based on staging, patient performance status, comorbidities, and age of patient. Overall prognosis is poor for these group of patients, even when detected in early stages. Options of systemic treatment includes chemotherapy, targeted therapy, monoclonal antibodies, and Immunotherapy. Many clinical trials are ongoing combining 2 or more treatment modalities, such as chemotherapy or targeted therapy with Immunotherapy.
**SYMPOSIUM 1B- GIT MALIGNANCIES**

**1B 04**

**How Low Is Low In Rectal Cancer Surgery?**

**Professor Dr Luqman Mazlan**  
Pantai Hospital Kuala Lumpur, Malaysia

Rectal cancer surgery is the most common procedure done by surgeons who manage colorectal cancers because more than two thirds of these cancers occur in the rectosigmoid region and below. These surgeries are a challenge even to the most experience surgeons because of the deep anatomy of the pelvis especially in male patients. Although the principles of oncological resection have been well established, the choice of performing a permanent stoma and creating a very low anastomosis which could result in poor defecatory function is a dilemma every surgeon will encounter. This is compounded further by the advancement of surgical techniques and technology which makes sphincter saving surgeries more attractive and an increasingly viable option. This lecture will present the current options available for rectal cancer surgery as well as the latest evidence for the various techniques of surgery including oncological and functional outcomes.

**SYMPOSIUM 2B- PROSTATE CANCER**

**2B 01**

**Challenges In The Management Of Prostate Cancer In Malaysia**

**Dato Dr Selvalingam Sothilingam**  
Pantai Hospital Kuala Lumpur, Malaysia

Prostate Cancer (PCa) is the commonest cancer affecting men in Western countries. However in Malaysia it remains as the 4th most common cancer among men but may soon be rising to 3rd position. There is a rise in the incidence of prostate cancer throughout Asia and Malaysia is not spared. This may be due to various factors including early diagnosis with better diagnostic test, increased utilization of PSA, better awareness among public and health care providers , a more ‘western’ based diet, sedentary lifestyle and increasing metabolic disease, genetic pooling and increasing aging population.Whilst there is more awareness and better diagnostic tools in diagnosing prostate cancer, the mortality rate from prostate cancer remains high. This is further emphasized by the fact that 54% of patient presenting with PCa in Malaysia are at an advanced stage. Does this indicate the need for more awareness campaigns and increased use of PSA to screen symptomatic and high risk patients? Is there a variation in the health seeking behavior of the various ethnic groups? Or is this linked to genetic factors within Asian men that predisposes them to more advanced cancers.Treatment of advanced PCa is very costly and imposes a financial burden to the country, the patients and family unit. There are no doubt excellent life prolonging drugs are now available but the Action Study (which was based among countries in South East Asia) has shown that many families face financial catastrophe due to the financial burden of purchasing these drugs over a period of time. Would the pharmaceutical companies, government and public be able to reduce this financial burden? It would therefore make more sense to advocate for early detection where treatment can be potentially curable and although there may be high cost in some of the treatment strategies, especially with the use of robotic assisted radical prostatectomy, this would still be far less that the cost of treating advanced prostate cancer. Men should therefore not shy away from screening and early consult with physicians when they experience troubling urinary symptoms. Malaysia needs more advocates in the form of cancer survivors, health care professionals, public and media to encourage men to step forward. Not excluding the support from the Health Ministry in providing a budget for the promotion of Men’s Health.
SYMPHOSIUM 2B- PROSTATE CANCER  
2B 02

Application Of Absorbable Hydrogel Spacer To Reduce Radiation Dose To Rectum In Precision Radiotherapy  

Dr Michael Chao  
Genesis Care Victoria, Australia

Radiotherapy (RT) is an established curative treatment method for prostate cancer. Optimal tumor control rates can only be achieved with high local doses, however this is associated with a considerable risk of rectal toxicity. RT complications may include rectal bleeding, frequency, urgency, mucus and rarely ulcers and even fistulas. Apart from already widely adapted technical advances, as intensity-modulated radiation therapy (IMRT), the application of spacers placed between the prostate and rectum has been increasingly used in the last years. Biodegradable spacers such as polyethylene glycol (PEG) hydrogel can be injected in a short procedure under transrectal ultrasound guidance via a transperineal approach. A rectal to prostate separation distance of about 1 cm is usually achieved which effectively excludes the rectal wall from the high RT doses. This is important as the risk of rectal toxicity depends on the volume of rectum that receives high RT doses. Several studies have shown well tolerated injection procedures and treatments. The US pivotal study by Mariados et al. reported a significant 73% reduction in the mean rectal volume receiving 70Gy or rV70 (12.4% vs 3.3%). In addition, 97.3% of patients achieved a >25% reduction in rV70. Apart from considerable reduction of rectal irradiation, this US pivotal study also demonstrated a reduction of rectal toxicity after hydrogel injection in men undergoing prostate image-guided IMRT. The risk of grade 1+ rectal toxicity was reduced from 9.2% to 2%, with no patients in the hydrogel spacer arm developing grade 2 toxicity after 3 years of follow up. Bowel quality of life was also significantly improved. In addition, the risk of grade 1+ urinary incontinence was also reduced from 15% to 4% and the risk of impotence was almost halved from 62 to 33%. The results are encouraging for continuing evaluation in dose escalation, hypofractionation, stereotactic radiotherapy or re-irradiation trials in the future.

SYMPHOSIUM 2B- PROSTATE CANCER  
2B 04

Management Of Oligometastatic Prostate Cancer: The Controversy  

Dr Adlinda Binti Alip  
University of Malaya Medical Centre, Malaysia

The hypothesis that local therapies may cure metastatic disease arise from the description by Hellman and Weichselbaum that oligometastatic is an intermediate state of distant spread, reflecting disease with low, slow and late metastatic spreading capacity. We also know that dissemination to form new metastasis is a frequent phenomenon which does not always originate from the primary tumour. This has given rise to the idea of early elimination of metastases may avoid subsequent dissemination. How about the ‘micrometastatic’ disease? In this talk I will through the current status and evidence on management of oligometastatic prostate cancer.
My Experiences With Chemotherapy

Dr Teoh Soong Kee
KPI Ipoh Specialist Hospital, Malaysia

In June 2013, I had gastric pain and underwent gastroscopy, which showed a lymphoma ulcer in my stomach. The PET Scan and EUS indicated that the tumour was at stage 2a. Cytogenetic studies showed that my diffuse large B-cell lymphoma had none of the danger markers. The haematologist prescribed the R-CHOP regime: Rituximab with Cyclosphamamide, Vincristine, Adriamycin and Prednisolone. During my chemotherapy, I took four months leave and avoided public places. I had mild side-effects from the six courses of chemotherapy. I had slight nausea for the first few days, but no vomiting. I never had any fever or infection except for herpes zoster on my thigh after the fourth chemotherapy. I was left with just 10% of hair. Some mouth ulcers occurred but they were not painful. There were several episodes of leucopenia, which were corrected with Granocyte injections. I never had diarrhoea. Many friends and relatives gave a lot of advice, most of which was sensible, but there were also suggestions on alternative treatment. As a doctor, I had to consider the evidence-based therapies. I avoided extremes in my diet. Much of the food was home-cooked. I preferred noodles and beehoon, rather than bread or rice. For the first few days after chemo, I would take porridge with minced meat and eggs. I drank fresh coconut water and fresh fruit juices, which included apples, carrots, cucumber, celery, beetroot and oranges. I consumed Ensure, organic soya milk or yoghurt drinks daily. I drank plenty of water in between, to make up to at least 2 litres per day. During those difficult days, God gave me the gift to write more than ten poems, expressing my distress and cry to God. Throughout these months, I felt the reassurance and comfort. My family had been very supportive, especially my dear wife. I kept my relatives and friends informed and had been touched by the outpouring of words of encouragement and concern.

Emotional Burden Of Cancer Patients

Professor Dr Esther Ebenezer
UnikL Royal College of Medicine, Malaysia

Most people will experience strong emotions after a cancer diagnosis, and also at various times during and after treatment. Cancer is a serious disease, the treatment may take a long time and can be demanding with periods of waiting and uncertainties. Experiencing a range of emotions is common when faced with terminal illness as mentioned by Elizabeth Kubler-Ross. Most patients go through various emotions such as shock, denial, anger, fear, guilt, loneliness, loss of control, bargaining, acceptance and so on. Everyone is different in their own way to deal with emotion. But with good support system these emotions can be managed with minimal sombre impact. Apart from these emotions, psychiatric comorbidities are common in cancer patients. Anxiety disorders are highly prevalent up to 44%. Anxiety may persist throughout the disease process, affecting the patient’s quality of life significantly. Similarly, about 50% of cancer patients experience sleep disorders usually associated with pain, hospitalisation, medication and cancer related fears. Insomnia is often under-recognised as it is perceived as a normal reaction to cancer. About a third of patients with cancer go-through depression, however often under-diagnosed due to entanglement of the symptoms with cancer. Comorbid depression is associated with poor outcome, longer hospitalization, increased burden to family, reduced survival and increased risk of suicide. Delirium is acute confusional state and almost half of cancer patients experience delirium. Delirium is associated with poorer outcome and generates high levels of distress for patients and their families. All range of emotions and psychiatric commodities warrants attention to improve the quality of life. Apart from pharmacotherapies, psychotherapy also plays a vital role in the management of patients with cancer.
SYMPHOSIUM 1C- CANCER SURVIVOR ISSUES
1C 03

Outshined By Reality Of Cancer: Cancer Survivor Story
Dr Rozilawati Ahmad
Universiti Kebangsaan Malaysia, Malaysia

The “Outshine” project is a photo series shot by photographer Ahmad Yusni. This photo series shows both the dark and colourful chapter of living with cancer we’re not used to seeing: the reality. Cancer has always been a dark chapter in human history. Cancer has the capacity not just to disrupt life plans, but is a mortal threat to living, erasing lives of much potential and all could-have-beens. At the same time, cancer is also a constant reminder that as human beings, we owe our existence to God. Cancer is rarely black and white. The truth is more often to be found in its hues of grey. Ahmad Yusni shows the dark chapter of his brother’s (Mohammad Sani) final 39 days with cancer. Alfatihah. Without dark, no colour has depth. This exhibition highlight in-depth colourful stories of 14 warriors. The 14 warriors featured in this photograph exhibition are living exemplars of generosity in their willingness to share their inspirational stories about their respective cancer journeys. A deliberate heterogenous strata of cancer survivors were selected to reflect diversity in terms of different age groups, socioeconomic status and educational backgrounds, as well as different cancer types and stages. On the surface, this is a cancer awareness campaign, digging deeper aims to expose the deeper fragility of humanity from which unbelievable strength arises. “Outshine” is not a showcase of cancer and illness but a celebration of life, humanity and love. “Outshine” exhibition by Ahmad Yusni bring to life the thousands of emotions in the hearts of those affected by cancer. “Outshine” is not a showcase of cancer and illness but a celebration of survivorship, support and empowerment. “Outshine” is one of the community project by CanWell (Cancer Wellness group, Universiti Kebangsaan Malaysia). Currently “Outshine” being showcase in many cancer awareness programs and the biggest exhibition held was in January-February 2019 at National Art Galler, Kuala Lumpur. CanWell, UKM dedicated in providing supports for cancer prevention nationwide through research, education, advocacy and outreach. Our work sparked the collaborative engagement on the possibility of preventing cancer, focusing not just on treatment but living pre, with and post cancer modules. All of Canwell project is design to improve cancer literacy aiming to reduce the incidence and mortality due to cancer and to improve the quality of life for cancer patients. CanWell is dedicated to ensure optimum utilization of available resources, adaptive use of technology and active community participation.

SYMPHOSIUM 1C- CANCER SURVIVOR ISSUES
1C 04

Role Of Physical Exercise For Cancer Patients And Survivors
Professor Dr Chen Chee Keong
Universiti Sains Malaysia, Malaysia

There is sufficient evidence to indicate that exercise is safe and provide many benefits for individuals with cancer during and at post-treatment. Some of the benefits include better quality of life and well-being, increased muscle strength and improved aerobic fitness. In addition, regular exercise among cancer patients and survivors has been shown to prevent cachexia and reduces cancer-related fatigue. In 2018, the Clinical Oncology Society of Australia has launched a position statement that recommends exercise to all patients with cancer as part of their treatment regimen and this statement has been endorsed by 25 international leading health and care organisations. Nevertheless, it has been recognised that exercise is not the only and vital factor for determining the success of any cancer treatment procedures but rather playing its role to improve the quality of life as well as other benefits among cancer patients and survivors mentioned above. One of the main concerns of prescribing exercise for this vulnerable group of individuals is the exercise contraindications. To address this issue, a safety reference guideline has been developed to ensure the safe delivery and involvement in the exercise programmes for individuals with cancer. Steps should also to taken to ensure participation adherence in order to meet the exercise guidelines. Some of these steps include identification of the patients’ readiness and intention to initiate and maintain the prescribed exercise intensity and frequency and providing individualised exercise programme. Despite all the well-documented evidence and exercise promotion among cancer patients, it has been reported that exercise participation among cancer survivors in Malaysia is low. Hence, cancer patients and survivors in Malaysia ought to be encouraged by clinicians (oncologists in particular) and other health care providers to perform exercise on a regular basis when these individuals are deemed fit to do so.
**SPEAKER ABSTRACTS**

**SYMPOSIUM 2C- HI-TECH RADIOTHERAPY**

**2C 01**

**Halcyon System In Radiotherapy**

Dato' Dr Hj. Mohamed Ibrahim  
*Beacon International Specialist Centre, Malaysia*

Halcyon is a new generation of linear accelerator and uses an innovative platform that incorporates IMRT or RapidArc® radiotherapy combine with image guidance to deliver precise high dose of radiation treatment. Halcyon enables clinician to treat a large variety of tumour throughout the body. It has a next-generation dual-layer multileaf collimator (MLC) that delivers focus radiation dose which conforms to the shape of the tumour while minimizing the expose to the surrounding tissue. This also offers a high dose of conformality with low dose of radiation to the organ at risk. The key features of Halcyon are the speed and accuracy. It is able to treat patients very quickly and efficiently. The cone-beam CT imaging can be completed in approximately 15 seconds and with its 4 RPM gantry speed it’s able to deliver high speed of radiation treatment. Most of the treatment that can be completed within 10 minutes. With Halcyon, complex IMRT treatment can be planned and delivered very quickly and therefore enhancing patient’s through put for radiation treatment. The 100cm bore diameter contributes a comfortable and less intimidating environment for the patient. With its rapid speed and high accurate through put, it is an ideal machine for very busy radiotherapy department. In our experience, we are able to treat up to 60 patients a day within 9 hours in a typical working day. It has been reported that the machine is able to treat over a 100 patients a day in some very busy institutions. The type of patients and treatment using Halcyon will be discussed during the lecture.

**SYMPOSIUM 2C- HI-TECH RADIOTHERAPY**

**2C 02**

**Intraoperative Radiotherapy (IORT) In Early Breast Cancer**

Dr Harjit Kaur Perdaman  
*Prince Court Medical Centre, Malaysia*

Radiation therapy to the breast following breast conserving surgery has long been a standard of care. The daily trip for treatment at major hospitals in the city for 4 to 5 consecutive weeks often proves difficult for many. It often leads to default and risk of recurrence or patients opting for mastectomies even with very small and early cancers. IORT is now the novel treatment modality for select and suitable patients with early cancers using the ZIESS INTRABEAM SYSTEM. The single 20Gy dose delivered at the time of surgery in a short period of time makes it a brilliant breakthrough in the treatment of early breast cancer. It does not increase the cost significantly and trial results had shown good outcome to date. IORT has been practiced in Malaysia over the past 2-3 years in a few major hospitals in the country. A brief presentation and updates on indications, methods, results to date and possible complications will be discussed here.
Liver directed therapy is gaining popularity for both primary and secondary liver tumors. Though radiofrequency ablation (RFA), transarterial chemoembolization (TACE), stereotactic body radiotherapy (SBRT) and selective intra-arterial radiation therapy (SIRT) are the more commonly heard household names in liver directed therapy, it should not be forgotten that brachytherapy (BT) had been used by Radiation Oncologist to treat liver tumors long before the advent of the fore-mentioned methods. For Radiation Oncologist or brachytherapist who have performed brachytherapy to liver, they would have surely experienced the superiority of BT as compared to RFA, TACE or SBRT in terms of disease control and very manageable toxicity profile. While agreeing that SIRT may have better outcomes in widespread liver tumors, BT is shown to be superior when localized disease is concerned. It is a shame that many Radiation Oncologist around the globe, despite being part of the College of Radiologists have lost the skills of brachytherapy or decided not to be involved in any invasive procedures. The advent of the fancier newer technologies in Radiotherapy further compounded poor or limited training in brachytherapy during the registrar years may have contributed to this. Liver brachytherapy program at IPPT-USM was started in November 2018 with good support and encouragement from fellow Radiation Oncology colleagues in Germany. At current IPPT-USM in Penang proudly boast to be one of the few centres around the world which have an active liver brachytherapy program. With a case series of more than 30 patients and 38 procedures up to July 2019, there had been ample of clinical experience to be shared and there is strong interest from centres in Japan, Saudi Arabia, Hong Kong, Thailand and Singapore Radiation to come and learn from us. This will focus on the nearly forgotten but extremely efficacious trade of Radiation Oncologist : The Liver Brachytherapy – The Malaysian Experience.

The availability of Gallium-68 PSMA imaging modality has been predicted to give a positive impact in detecting early recurrence and subsequent management of advanced castrate resistant prostate cancer (CRPC). The sensitivity of this radiotracer imaging is about 96% in serum PSA level of more than 2 ng/mL in some of the studies performed in Europe. The diagnosis using this Gallium-68 labelled tracer could be effectively followed by therapeutic personalised radionuclide therapy using 177Lutetium-PSMA. It is performed in metastatic castrate resistant prostate cancer (mCRPC) patients who have failed to respond to hormonal treatment or chemotherapy. Radionuclide therapy is a molecularly targeted radiation therapy involving systemic administration of a radiolabelled peptide designed to target with high affinity and specificity receptors overexpressed on tumours. Prostate Specific Membrane Antigen (PSMA) is a type II transmembrane glycoprotein highly over-expressed in prostate cancer. It is upregulated in mCRPC patients. Lutetium-177 is a beta-emitting radionuclide with a half-life of approximately 7 days. It was first successfully used in treating patients with neuroendocrine tumour more than 10 years ago. The ease of availability and mode of administration have allowed clinicians to explore potential use and benefit of Lutetium-177 PSMA in mCRPC patients. This treatment could be delivered in an outpatient setting and well-tolerated by most patients. The presence of gamma emission also allows clinicians to perform post-therapy imaging to monitor response to treatment. Potential side effects such as reduced salivary flow and bone marrow suppression need to be considered in patients with extensive metastatic bone disease. Early clinical trials have demonstrated prolonged overall survival rate and quality of life.
PLENARY LECTURE 3
PL 03

The Proton Experience In Taiwan And The Judicious Use Of Proton Therapy In Developing World

Professor Dr Joseph Chang Tung-Chieh
Chang Gung Memorial Hospital-Linkou, Taiwan

The proton therapy was started to use since 2015 November after 6 patients and one-year safety observation clinical registration study. There were four gantries installed; two are conventional passive scanning beam and the other are pencil scanning beam. The pencil beam was started to serve patients since 2016/Dec. One of the passive scanning beam gantries was upgraded to pencil beam since 2019/Jan and planned to use in 2020. There had been more than 2,000 patients received proton therapy. The majority of patients are hepatoma (23.7%), head and neck (20.1%) Brain (including pediatrics, 14.6%) breast (9.4%) and lung (9.7%). The prostate cancer patients just only 1%. The local tumor control for hepatoma after proton therapy is 90.6% at two year follow-up. More than half (58.7%) are recurrent disease with median 5.5 cm tumor. The median age of patients is 66.8 (+/-11.8). The local tumor control does not relate to age, tumor size and tumor invasion to vessel or not. Only 2 patients had grade IV and no grade V complication noted. In head and neck including NPC cancer patients, there are significantly difference in feeding tube insertion, body weight loss, hematology complications and admission rate between proton therapy and photon therapy. There are both in trend that proton therapy had better survival outcome. Proton therapy also had better patient reported outcome in health-related quality of life in both diseases. There are also found that decrease complications in breast cancer, brain tumor and pediatric cancer patients. The more detail will be presented.

PLENARY LECTURE 4
PL 04

Repurposing Drugs In Oncology

Associate Professor Dr Bishal Gyawali
Queen’s University Kingston, Canada

Low-and middle-income countries (LMICs) share the biggest burden of cancer mortality in the world; however fall far behind the high-income countries (HICs) in cancer research and trials. Most of the new drugs in cancer are developed and trialed in HICs and are too expensive, beyond the reach of many LMICs. The benefits from these newer drugs are also very modest. Repurposing of drugs means using existing non-cancer drugs as treatment for cancer. This has several advantages, specifically in terms of short development time, known safety profile and importantly, cheaper drug costs. Thus, repurposing drugs in oncology has been identified as an important means to address the issue of lack of affordability of cancer drugs in LMICs as well as financial toxicity of cancer treatment globally. In this presentation, I will highlight the important opportunities and pitfalls with trials of repurposing drugs in oncology. I will also focus on how trials of repurposing drugs in oncology can be an opportunity for co-development partnerships between HICs and LMICs in the model of “reverse innovation”.

It is well accepted axillary surgery plays an important role in the loco regional control of the disease as well as providing important information on the prognosis and treatment plan for the patient. But the importance as local control depends on the extent of the lymph nodes involvement. With the introduction of screening mammogram, breast cancers are now detected at earlier stage and the prevalence of axillary lymph nodes metastasis has also reduced dramatically. This means a greater number of nodes negative patients undergoing unnecessary axillary surgery incurring greater risk of morbidity. Sentinel lymph nodes identify the first draining nodes to accurately stage the disease with low morbidity in clinically nodes negative patients. Until 5 years ago, patient with positive sentinel nodes will go through a completion axillary surgery either as immediate or delayed surgery. For patients with micrometasis, studies showed that a completion ALND confer no benefit on regional relapse or mortality. And for patients with negative sentinel nodes, the low recurrence rate has substantially reduced the upper limb morbidity compared to axillary dissection. Data on older women with breast cancer and clinical nodes negative, treated with systemic therapy show similar disease free and overall survival regardless whether the patient undergoes axillary surgery or not. The treatment of the axilla following is further analyzed in Z0011 trial. Even the study had premature termination, those patient with two or less positive sentinel node and received adjuvant systemic chemotherapy and whole breast irradiation was found to have similar risk of axillary recurrence compared to completion axillary dissection. Taking the idea of tangential radiotherapy treats about 50% of level 1 or 2 nodes, an AMAROS trial has similar result when the patient with breast conservation or mastectomy, randomized to either axillary dissection or axillary radiotherapy following positive sentinel nodes with lower rates of lymphoedema in the radiotherapy arm. Surgical excision of the lymph nodes in the axilla should remove sufficient nodes, so that the residual non-sentinel nodes can be adequately managed with adjuvant therapy, without compromising the clinical outcome.

The aim of adjuvant chemotherapy is to improve time to recurrence and eventually overall survival including cure. This is to be achieved with tolerable impairment to patient’s quality of life and long term sequelae. The MOSAIC study published in 2004, positioned adjuvant chemotherapy with 6 months of FOLFOX regimen as the standard of care in node positive resected colon cancer. The recommendation of adjuvant chemotherapy with "one size fits all" for 6 months may benefit some patients but certainly not all. 6 months of chemotherapy is associated with neuropathy leading to numbness, tingling and pain in a significant number of patients. In some, these side effects very much persists for a very long time affecting their quality of life. Recognising these concerns, there had been many trials comparing shorter versus 6 months of treatment looking at recurrence free survival and side effects. However they have not been able to demonstrate non inferiority of 3 months versus 6 months conclusively. Of utmost importance is the question whether the survival of those receiving shortened chemotherapy is significantly compromised? The IDEA (International Duration Evaluation of Adjuvant Therapy) Collaboration was presented in ASCO 2017. This collaboration pooled results from six prospective studies involving about 13,000 receiving 3 months compared to 6 months of oxaliplatin based chemotherapy (FOLFOX or XELOX) or Capecitabine adjuvant chemotherapy (CAPOX). They reported that in low risk Stage III colon cancer 3 months of FOLFOX chemotherapy, survival is comparable to the longer regimen with a much better safety profile. This finding however, does not extend to rectal carcinoma. Patients who are given single agent capecitabine or 5FU, it is important that they receive the full 6 months of treatment as shorter regimen is definitely inferior in terms of disease control.
De-escalation Therapy In Non-Hodgkin's Lymphoma

Associate Professor Dr Azlan Husin
Universiti Sains Malaysia, Malaysia

There is a growing interest and efforts on this concept of de-escalation therapy in cancer and lymphoma is no exception from this approach. Concerns about the possibility of avoidable short term toxicity exposed in good risk patients, the possibility of minimizing long term toxicities that could impact the quality of life (QOL) of the lymphoma survival and the success story of this approach in other cancer therapy has lead to relevant scientific researches done. However, the momentum of work that been done to explore this approach is overwhelmed by the other extreme approach, which is escalation therapy approach. Extrapolating from the method that is used in antibiotic de-escalation therapy, one would imagine to use this strategy by administrating a standard therapy for a particular patient in the initial few cycles then followed by a less intensive therapy in those selected patients who are identified to benefit from this approach with similar or better efficacy (disease free survival, time to treatment failure, overall survival) and better safety outcome (less treatment related toxicity, reduced cost and better QOL). This approach will require a tool(s) that is specific and cost effective enough to provide early treatment response assessment that able to identify patients that will benefit from de-escalation therapy. This can be achieved by demonstrating the remaining disease burden or minimal residual disease that patients may still harbour. This approach also known as response adapted strategy. Many lymphoma studies were basically utilise the risk adapted studies rather than response adapted studies. In this risk adapted strategy, patients who are identified as low risk were given lower intensity treatment or avoiding long term maintenance therapy; have shown to have similar clinical outcome. Whereas the studies that used interim treatment response assessment as a guide to de-escalate the treatment intensity are very few; and most of them used interim PET-CT as the tool of response assessment. Patients with low risk Hodgkin lymphoma were shown to benefit from this approach. But how about patients with non Hodgkin lymphoma?

De-escalated Management Of Low-Risk Medulloblastoma

Dr Rakesh Jalali
Apollo Proton Cancer Centre, India

Medulloblastoma is the most common malignant paediatric brain tumour, with an incidence between 2-6 per million population. Recent advancements on the role of molecular markers such as on the basis of gene expression, genetic aberrations, and DNA methylation, medulloblastoma is now classified into several molecular subgroups and also incorporated in the latest 2016 WHO Classification of Central Nervous System Tumours. While children with medulloblastoma carry a favourable long-term prognosis, this is tempered by several treatment related sequela seen including cognitive, physical, reproductive, social, and neurological deficits. Molecular sub-classification of medulloblastoma identifies WNT-positive medulloblastoma (WPM) as a highly favorable subtype with event-free survival (EFS) exceeding 90% when treating patients following near total or complete resection with standard dose craniospinal irradiation and boost radiation to the posterior fossa (XRT) followed by adjuvant chemotherapy. Several strategies are being explored to identify an appropriate de-escalation therapy for these and other favourable low-risk patients. A pilot study by Cohen et al at Johns Hopkins exploring the safety of omitting XRT in children with standard-risk WPM did not produce favourable results with 2 out 6 patients who met molecular criteria for WPM had local and disseminated relapses. A similar study conducted by the Neuro-Oncology group at Tata Memorial Hospital whereby out of the 7 patients accrued with WPM, 2 patients have developed disseminated relapses with controlled tumour bed about one year after completion of primary treatment (including chemotherapy). An ongoing Phase II trial study by the Children’s Oncology Group (COG) is evaluating how well reduced doses of radiation therapy to the brain and spine (craniospinal) and chemotherapy work in treating patients with wingless-type MMTV integration site family (WNT)-driven average-risk medulloblastoma, using reduced craniospinal radiotherapy (CSI) (18 Gray [Gy]) with a limited target volume boost to the tumor bed of 36 Gy for a total of 54 Gy and reduced chemotherapy approach. It seems that not only primary site radiotherapy, but also CSI may not be completely avoided even in low-risk WNT-pathway medulloblastoma and de-escalation of therapy should be proceeded with caution. Other favourable cohorts of SHH (infantile, non-p53 mutant) are also being studied to de-escalate the therapies. In WNT pathway tumours close to the CP angle, residual tumours after surgery may necessarily need not be considered high-risk and offered therefore average risk RT dose (23.4 Gy CSI + boost). Also all attempts to minimize the doses of radiation by most optimal techniques (Tomotherapy, IMRT/VMAT and proton beam) should be considered as well.

Tumour bed boost rather than whole posterior fossa as a smaller RT volumes has already been shown to be a new standard of care as per a larger cooperative randomized trial.
Metronomic Therapies: The Next Generation Multi-Targeted Therapies

Professor Dr Shripad D. Banavali
Tata Memorial Center, India

The world is headed towards cancer pandemic. By 2050, 27 million new cancer cases will be diagnosed worldwide, 70% of these will be in Low & Middle Income Countries (LMIC). By 2050, there will be 17.5 million cancer deaths or 50,000 cancer deaths a day! Even after waging the “war against Cancer” for years, most of the advanced cancers, especially in adult patients, are still not curable. On top of that many of the new chemotherapeutic drugs or “targeted therapies” give a small, if at all, benefit over the existing therapies and come at a very high price! However, the expensive investigations, expensive medicines & the expensive supportive care required to deliver aggressive chemotherapies, have made these modern therapies out of reach of most patients having cancer in LMICs. Even oncologists in High Income Countries (HICs) have started questioning their utility. Thus, the most important challenge at present in oncology is not just finding cures for patients with cancer, but to develop affordable, cost-effective therapies. In this context, the silent revolution of “Metronomic Therapies” is slowly sweeping across the globe. Metronomic Rescheduling of Anticancer Treatment (MSAT) has now grown beyond the anticipated scope of antiangiogenic chemotherapy, with accumulating evidence demonstrating that these treatments may also act by immune modulation and could ultimately lead to re-induction of tumor dormancy. An increasing number of drugs, not initially developed as anticancer agents, are currently being used in metronomic protocols in order to increase treatment efficacy. Interestingly, these ‘repositioned’ agents can target cancer cells, the tumor vasculature or, more broadly, the tumor microenvironment. The identification of potential biomarkers for stratification of patients and identifying responses to metronomic chemotherapy, evaluating new response criteria to metronomic chemotherapy, correctly elucidating individual tumor biology and their potential of response to MSAT, and achieving uniformity of administration and dosage with MSAT are some of the many questions that remain to be answered.

Radiomics describes multiple techniques of feature extraction from clinical imaging. These features are commonly quantitative in nature and require computational methods for evaluation. These features are then used to diagnose, prognosticate or follow progress of the given pathology. The use of artificial intelligence in the evaluation of radiomic features has caused both excitement and fear in Radiologists as traditional markers of disease visible to the human eye begin to be replaced. We review recent radiomic studies of brain tumors, the different strategies employed to extract features and computational models used to evaluate these features. We discuss the challenges and obstacles in the clinical implementation of the findings of these studies and the future implications.
Radiogenomics - The Personalized Radiotherapy

Associate Professor Dr Tho Lye Mun
Sunway Medical Centre, Malaysia

Radiation therapy remains an important modality in the cure of about 30% of cancers. Predicting radiotherapy response remains elusive and has traditionally been based on clinical and histopathological factors. However, newer inroads are being made in the field of molecular markers but they are not ready for routine clinical application. Tumour types that are known to be radiosensitive include small cell cancer, squamous cell cancer etc. Viral associated tumours also demonstrate radio sensitivity such as HPV associated head and neck and cervical cancer and EBV associated NPC. On the other hand, there are tumours which are intrinsically radio resistant such as sarcomas and renal cell cancer. Transcriptome gene expression profiling suggests radiosensitivity is associated with DNA damage, cell cycle and chromatin defects. In the field of neuro-oncology, MGMT and 1p19q LOH are markers of radiation efficacy. Whilst radioresistance is associated with increased expression of cell signaling pathways such as JAK/STAT and PI3K, a stem cell state and an inflammatory micro environment. The presence of a high tumour mutational burden and heterogeneity may also drive resistance. Finally emerging evidence suggests that there exists therapeutic synergy between immunotherapy (in particular PD1 and PDL1 inhibitors) with radiotherapy. Lymphocyte depletion has long been known to be associated with poorer survival outcomes and reasons to therapy. Further research is required to unravel these mechanisms and optimize sequencing and dose of the therapies. However, increased toxicity is also noticed with combined therapy and this should also be factored into consideration.

Impact of Gene Profiling On Cancer Treatment Outcome

Dr John Low Seng Hooi
Sunway Medical Centre, Malaysia

Cancer is a genetic disorder. Mutation in specific human oncogenes lead to cancer development, progression and metastases. Identification of specific driver mutations and genetic alterations in cancer have completely revolutionized the treatment landscape in oncology. Specific drugs have been developed to target these mutations with outcomes far superior to conventional chemotherapy with less adverse effects. 42% of drug approved by FDA in 2018 are targeted medicines. It is envisaged that in the near future, cancer treatment will be determined by these specific gene mutations more so than the site of origin of the disease. IHC, FISH and RT-PCR are some of the available techniques to detect these mutations, either individually or in a specific panel by grouping the known actionable mutations for a specific cancer site. However, the number of actionable targets are rapidly increasing. Comprehensive Genetic Profiling using Next Generation Sequencing (NGS) has the advantage of simultaneously identifying all the potential targetable mutations in the cancer. It gives us an overview of the cancer genetic profile including the tumor mutational burden. Deep sequencing can identify rarer mutations for clinical research. Liquid biopsy NGS can serially monitor the dynamic changes in these mutations and for treatment responses. It is without a doubt that we have entered the era of personalized medicine and oncologists need to be well versed with cancer genomics in order to provide the best care for our patients.
**SYMPOTIUM 4A - ONCO-GENOMICS**

**4A 04**

Treatment Of BRCA Mutant Breast Cancers

Dr Ahmad Radzi Ahmad Badruddin  
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Approximately 50% of newly diagnosed breast cancer cases are associated with factors related to hyperoestrogenic conditions, such as early age at menarche, older age at first live birth, older age at menopause, and obesity. Genetically, the majority of genomic alterations in breast cancer are sporadic and just 5–10% are germ-line mutations are classified as hereditary. Mutations in BRCA 1 which are located on chromosome 17 and BRCA 2 genes on chromosome 13 are highly penetrant and increase the lifetime risk of breast cancer up to 70% and 40 - 70% respectively. Patients with germline BRCA1/2 mutations breast cancer, are more susceptible to DNA-damaging agents and a new class of drugs known as poly(ADP-ribose) polymerase (PARP) inhibitors. The concept of synthetic lethality will be discussed to explain the mechanism for PARP inhibitors, and the different classes of PARP inhibitors and how they differ from one another. Currently FDA has approved Olaparib and Talazoparib in metastatic BRCA1/2 germ-line mutant patients. The OlympiAd Trial and Embraca Trial are the respective phase 3 Trials that showed the improvement in PFS in patient with MBC previously treated with chemotherapy. So far, the signals that we get from the phase 3 trials are that the PARP Inhibitors are active in gBRCA mutations with minimal side effects and well tolerated compared to chemotherapy. Due to the bone marrow toxicity that are seen in combination with chemotherapy, the current usage of PARP inhibitors are restricted to single agent usage only. Other DNA repair genes have not been validated in clinical trials as a useful biomarker for response to PARP Inhibitors. Studies in the early stage breast cancer –adjuvant and neoadjuvant, are currently being evaluated to see if this new modality of treatment can be used in gBRCA 1/2 mutants breast cancer in the maintenance setting after standard adjuvant chemotherapy or in combination with chemotherapy to induce higher pCR.

**SYMPOTIUM 3B - PALLIATIVE CARE**

**3B 01**

When Inaction Is Better Than Action In Terminal Cancer

Dr Aaron Hiew Wi Han  
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A simple thing we learn pretty early on in the clinical setting is the SOAP notes. Subjective, Objective, Assessment and Plan. And when it comes to Plan; it invariably consist of requesting for test and investigation, initiating a new medication therapy etc. Even when there is nothing to do, there will still be a plan to do something ie Continue the same plan. However, in medicine, doing more is not always better. What can we do (or not do) that can help improve patient outcomes? All this while taking into account the benefits and harms of these actions (or inactions)?
Who Should Manage Cancer Pain?

Dr Richard Lim BL
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The obvious answer to the question “who should manage cancer pain?” in truth would be that every single clinician has a role to play when it comes to managing cancer pain. This is certainly what is expected of all clinicians especially if we were to follow the age old adage of “To cure sometimes, to relieve often and to comfort always”. So if a clinician managing a patient with cancer recognises that pain is present in the patient, then he or she is obliged to manage this. This is why the WHO had come out with the analgesic ladder in the 1980s so that all doctors would have a guideline as to how to address pain in cancer patients. Today, in Malaysia, we recognise pain as the 5th vital sign and this most certainly applies to cancer pain as well. The cancer pain guidelines also mention how a multidisciplinary and multimodal approach to managing cancer pain is recommended. Hence, it is useful to recognise the different modalities that may be applicable in cancer pain management and who might have the necessary skill sets to deliver such treatment. Pharmacological management is probably the most straightforward and anybody who is able to follow the WHO analgesic ladder should be able to handle 80-90% of cancer pain. Palliative care specialists however may excel in this and are best when managing patients with multiple co-morbidities. Pain specialists may be useful to address difficult pain where interventions such as nerve blocks or spinal analgesia are required. Oncologists play an important role in providing palliative radiotherapy that is useful in some conditions. Apart from that, physiotherapists and occupational therapists may provide physical interventions to improve pain and function. Finally, psychological, social and spiritual care should also be addressed to relieve “Total Pain”.

Interventional Techniques In Cancer Pain Management

Dr Ng Kim Swan
Hospital Selayang, Malaysia

Pain is among the commonest symptoms experienced by cancer patients. About 75% of the cancer pain are dominated by the malignant tumor itself, the remaining 25% are mostly secondary to the cancer treatment complications. The cancer related pain syndromes are often complex, thus the management of this cancer pain is often challenging. Fortunately, up to 90% of the cancer pain can be easily managed by simple oral analgesics, as shown in the WHO analgesic ladder for cancer pain management; But the remaining 10 – 15% of the cancer pain are difficult to manage, thus in 1996, WHO has identified a forth step known as “invasive therapy” to manage these difficult cancer pains. The invasive therapy include regional nerve block catheters, intra-thecal opioids with or without local anesthetics and neuro-ablative techniques. The use of invasive therapy to manage these difficult pain helps to optimize the patients’ physical condition thus giving them a better Quality of Life in Health — especially in cancer patient who is only looking for a quality End of Life. Early and adequate pain control in these patients has been shown to lengthen the disease prognosis too. The few case sharing and management, highlighted on how less can we do to support these cancer patient who is constantly suffer in pain, to enjoy quality life even though it was only for a short span of their life.
Palliative care can be defined as an approach that improves the quality of life (QoL) of patients and their families, facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial, and spiritual. However, referral of patients to palliative care often occurs too late in the trajectory of illness. Early referral to palliative care can facilitate timely diagnosis and treatment of symptoms, provide psychosocial support and counseling, and involve empathetic communication with patients about their prognosis and advance care planning. Indeed, early integration of palliative care may reduce caregiver distress and aggressive measures at the end of life. In 2007, Temel et al in a randomized control trial demonstrated early palliative care (EPC) combined with anticancer therapy in advanced NSCLC QoL as well as overall survival (OS). After this study, other trials also started to investigate the role of adding EPC to standard care (SC) to improve OS and patient-related outcomes for advanced cancer patients. In 2017, Massimo Ambrogi et al in a systematic review of the studies evaluated the impact of EPC on OS and QoL compared to SC only, for advanced lung cancer patients, found that both OS and QoL were better for patients in EPC groups. A recent Cochrane Review examining EPC in advanced cancer included 7 randomised studies (5 mixed cancer types, 1 pancreatic cancer and 1 NSCLC), demonstrated a small evidence of a slight increase in health-related quality of life and decrease in symptom intensity with EPC provision, This systematic review had concluded that effects from EPC on survival and depression were uncertain, and more studies would be required to clarify the uncertainties.

During our clinical practice, we see patients consuming complementary and alternative medicine (CAM) without knowledge of oncologist. Some of these compounds and botanicals are seriously affecting end-organs leading to hepatotoxicity, hematotoxicity and renal damage to name a few. Enriched antioxidant therapy during chemotherapy or radiotherapy could alter the effectiveness of treatment outcome. A large retrospective analysis from National Cancer Database (2004-2016) in USA showed increased death rate amongst cancer patients consuming CAM therapy. The discontinuance of mainstream cancer therapy is highest among patients subscribing to alternative therapy.

The cultural and social media impact of CAM on patient is quite significant even in most developed countries like USA and Europe. CAM is considered organic, natural and backed by thousand years of experienced by untrained practitioners. There are supporters of such therapies from Governments, educated masses as well as untrained practitioners of CAM, as there is lack of strict regulations to curb such unethical practices. There is no evidence to support or reject use of CAM, as mainstream doctors hesitate to perform research on above agents. Due to growing interest of CAM amongst cancer patients many popular cancer institutions in USA started practicing combination of standard oncology treatment along-with best of traditional and complementary medications called Integrative oncology.

Research on few CAM agents showing some benefit in cancer such as acupuncture, yoga, exercise, honey, Indian and American ginseng to reduce treatment related side-effects. Therefor there is a need for clinical trials using CAM agents in cancer to prove or disprove above unproven therapies.
Addressing Sexual Issues Among Cancer Patients

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Sexuality encompasses feelings about one’s body, interest in sexual activity, the needs for touch, communication of one’s sexual needs to a partner and ability to engage in satisfying sexual activity. These are completely changed in some cancer patients. Sexual issues and functions among cancer patients are frequently overlooked by healthcare providers despite being identified as an essential aspect of patient care. With the advancements of medical treatments and interventions, the survival rate among cancer patients have improved tremendously in the past decades. This contribute to longer life expectancy but at the same time leading to some distressing situations in their life including related to sexual issues. These sexual problems arise not only from cancer which usually result in disease specific distress but also from harsh interventions in their treatments. Most cancer patients often have permanent treatment induced sexual dysfunctions, altered gonadal functions and significant disfigurement which disrupt their body image and self-perception. Patients and sometimes medical professionals turned oblivious when it comes to discussing sexual issues among cancer patients. Patients most of the times are embarrassed and feels there are other issues that needs more attention rather than talking about their sexual problems. Patients and their partners should be counseled from the beginning of cancer diagnosis regarding their sexual health since this problem may be rooted before the commencement of treatment especially in gynecological and urological cancers. Medical professionals on the other hand are usually not comfortable, finds it challenging to discuss personal issues with patients and avoid discussing sexual issues to prevent uncovering issues with which they feel unable to handle. Integrated and holistic approach should be taken by providing patients with appropriate screening, information and support. Healthcare providers should take a leading role in providing sex related information and support to cancer patients and their partners who is adjusting to new sexual roles and explore treatments and alternative to expressing their sexual role. Training on dealing with sexual issues among the medical practitioners should be planned to make sure this issue is adequately addressed.

New Cancer Drug Approval Policies In Malaysia

Dr Yvonne Khoo Siew Khoon
National Pharmaceutical Regulatory Division (NPRA), Ministry of Health, Malaysia

The Centre for Product Registration at NPRA assesses product registration applications to support new drug approvals by the Drug Control Authority (DCA) in Malaysia. A considerable amount of time is spent assessing cancer drugs at our agency. A cancer drug product may be registered as a new chemical entity, biological or a generic product subject to product classification. Each category has its unique documentation requirements to provide evidence of product’s quality, efficacy and safety. In addition to existing product evaluation processes, NPRA has recently introduced new pathways towards new oncology product approval. These are the conditional registration and facilitated review pathways. These innovative approaches serve to reduce approval time, thus expediting local patient access to new cancer drugs.
Are Breast Cancers In Asians Different - Lessons From Genomic And Transcriptomic Profiling Of 576 Malaysian Breast Cancers

Professor Datin Paduka Dr Teo Soo Hwang
Cancer Research Malaysia, Malaysia

Breast cancer incidence in Asia is increasing because of changes in reproductive and lifestyle factors. Differences exist between breast cancers in women of Asian and European descent, including younger age of onset and correspondingly, higher prevalence of hereditary factors. Together, these suggest potential crucial differences at the molecular level. Here, we report whole exome sequencing, shallow whole genome sequencing and transcriptomic sequencing on 576 Malaysian breast cancers. Asian breast cancer show higher prevalence of Her2+ molecular subtypes and TP53 mutations, as well as higher immune scores compared with Caucasian breast cancers. These results underlie the molecular differences between Asian and Caucasian breast cancers and point to potential differences in therapy and outcome.

Are Biomarkers In Asian Cancer Patients Different - Challenges Of Biomarker Research In Malaysia From A Pathologist’s Perspective

Dr Ch’ng Ewe Seng
University Sains Malaysia, Malaysia

This talk takes the routinely examined breast cancer biomarkers as a case study to address the issue whether these biomarkers in Malaysia are truly different from the others. By extrapolating the challenges to accurately determine the status of these mandatory biomarkers, inherited challenges surmounting discovery and validation of new cancer biomarker will be highlighted. In this regard, this talk will emphasize the roles of pathologists as the guardian of cancer tissue in providing optimal research materials while safeguarding the patients’ interest for the best patients’ care. Recommendations are made on how to move forward to procure better research materials and accurate baseline cancer parameters for biomarker research.
Mass Spectrometry Imaging In Cancer Biomarker Discovery

Professor Dr Gurjeet Kaur
Universiti Sains Malaysia, Malaysia

Extensive research is done to identify biomarkers for use in early cancer detection, diagnosis, prognosis and monitoring therapeutic responses. There are various platforms to study biomarkers which include genomics, proteomics and metabolomics. Majority of the methods use fresh tissue or bodily fluids and compare differential patterns between normal and cancer. Formalin-fixed paraffin embedded (FFPE) tissues are routinely used for histopathology evaluation and diagnosis in pathology laboratories. They are easily available and provide a source of invaluable material namely DNA, RNA and protein for experiments in biomarker identification. Relatively few models allow spatial information of a biological molecule with preservation of tissue morphology. A sensitive technique, matrix-assisted laser desorption/ionization (MALDI) mass spectrometry imaging (MSI) can acquire a comprehensive proteomic analysis with spatial distribution and intensity of hundreds of peptides corresponding to proteins of interest from a single FFPE tissue section. Mass spectrometry (MS) is performed after antigen retrieval, enzymatic digestion and addition of matrix on a tissue section. In the mass spectrometer, a UV laser strikes the sample, ionizes the peptide sample and sorts ions based on mass to charge ratio. The detectors measure each ion collision producing a spectrum of m/z versus intensity. The m/z values allow peptide and protein identification using a database. Tissue microarrays consisting of hundreds of cancer tissue cores allows a large cohort to be studied using a similar approach. Recent research done by our group headed by Prof. Peter Hoffmann at University of South Australia, showed the value of MALDI-MSI in distinguishing endometrial cancers with and without lymph node metastasis. Specific N-glycans were also identified in different stages of ovarian cancer. An introduction to mass spectrometry imaging and its clinical applications will be shared during the talk.

CRC Research In UMBI - Paving The Ways For Precision Medicine In Malaysia

Dr Nurul Syakima Ab Mutalib
Universiti Kebangsaan Malaysia Medical Centre

Colorectal cancer (CRC) remains as the third most common cancer worldwide and the incidence is increasing in many parts of the world, including Malaysia. The expected rise in CRC burden in Malaysia underlines the importance of pursuing a deeper understanding of this cancer, particularly at the molecular level. The UKM Medical Molecular Biology Institute (UMBI) has been actively investigating the molecular pathogenesis of CRC to understand its genetic makeup, identify biomarkers for early detection and prognostication, study molecules involved in chemoresistance, and characterise the druggable genes for precision medicine. Most recently, UMBI is involved in an international effort to screen the status of microsatellite instability (MSI) status among our CRC patients. On the translational research front, we have come up with Colopredict, our patent-pending gene panel, which will enable doctors to select which Duke’s B and Stage 2 CRC patients who will benefit from chemotherapy. From our whole genome sequencing of CRC patients, at least 1 actionable variant was identified in KRAS, BRAF, PIK3CA, SMAD4 and FBXW7 genes, which are potentially involved in determining responses towards chemotherapeutic drugs such as 5-fluorouracil, cetuximab and panitumumab. In the era of immunotherapy, MSI status is imperative for selecting patients who will greatly benefit from the treatment. These in depth analyses of the molecular signatures illustrate a multidimensional and comprehensive genetic landscape that highlights the complexity of CRC and provides a road map to facilitate genome guided precision oncology in Malaysia.
SYMPOSIUM 01- DRUG DISCOVERY
01 01

2-Methoxynaphthalene-1, 4-Dione Suppresses PKC And Its Down-Stream Transcriptional Factor In Human Burkitt’s Lymphoma Cell

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Protein Kinase C and its down-stream transcriptional factors, NF-κB and AP-1 are involved in governing cancer cell growth, proliferation, survival, apoptosis, angiogenesis and metastasis. 2-Methoxy-1,4-Naphthoquinone (MNQ) isolated from the pericarps of Impatiens balsamina, Linn, has been studied to show cytotoxicity effects on various cancer cell lines, trigger apoptotic pathway and the upper stream modulator of many cancer pathways, and inhibit protein kinase C expression in Human Burkitt’s Lymphoma cells. Owing to its promising anti-tumour effects, further mechanistic studies was continued to investigate whether MNQ could possibly regulate the NF-κB and AP-1 transcriptional factors and COX-2 expression through PMA-induced PKC activation and to study the regulatory effect of MNQ on the key cancer genes in various signalling pathways in Human Burkitt’s Lymphoma cells. The findings demonstrated that MNQ suppressed the expression of NF-κB, AP-1 and COX-2 at 36.10 and 34.56 µM (IC50), and 80 µM (IC90), respectively, and it could possibly involve in controlling cell inflammatory responses in Human Burkitt’s Lymphoma cells. MNQ was also indicated to regulate other genes that are involved in apoptosis, tumour suppressor and cell cycle regulation. This study demonstrates that MNQ possesses regulatory effects on the abovementioned genes and could contribute to the suppression of carcinogenesis in human Burkitt’s lymphoma cells.

SYMPOSIUM 01- DRUG DISCOVERY
01 02

Targeting Metabolic Vulnerabilities in Triple Negative Breast Cancer

Associate Professor Dr Ivy Chung
University of Malaya, Malaysia

Triple negative breast cancer (TNBC) is considered to be more aggressive and have a poorer prognosis than other subtypes of breast cancer. Their growth are not fueled by the hormones estrogen and progesterone, and HER2 ligands. Thus, metabolic reprogramming may be key to the aggressive cell growth and survival in TNBC. Fatty acid binding protein 7 (FABP7), a lipid trafficking protein, is predominantly expressed in TNBC tumours, and is associated with longer survival. However, the mechanistic action of FABP7 in regulating the metabolism of TNBC remains unknown. Ectopic expression of FABP7 in TNBC cell line Hs5778T cells cultured in serum-starved condition leads to increased cell death, likely due to cell cycle arrest in S/G2 phase. A significant change in gene expression of enzymes involved in glucose-, glutamine- and fatty acid-metabolism were observed in these cells. Serum starvation-induced cell death in FABP7 overexpressing TNBC cells was potentially regulated by peroxime proliferator-activated receptor (PPAR)-α signalling, as the addition of PPAR-α antagonist led to a full phenotype reversal. Further, when another TNBC cell line MDA-MB-231 cells were treated with linoleic acid, a substantial increase of cell death was also observed, accompanied with a downregulation oflipoxygenase, 15-LOX-1 gene and its product, 13-HODE. This phenotype was attenuated with a rescue treatment using 13-HODE. The decrease in 13- HODE was potentially due to fatty acid partitioning modulated by FABP7, as demonstrated by an increase in fatty acid oxidation. Taken together, FABP7 affected TNBC cell survival by regulating lipid metabolism when fatty acid levels were dysregulated. Our study suggests that metabolic vulnerabilities driven by FABP7 can be explored as potential therapeutic implications, and FABP7 may act as a biomarker for such dependency.
**SYMPOSIUM 02- AWARENESS, EARLY DIAGNOSIS AND IMPROVED SURVIVORSHIP**

**02 01**

**Cancer Survivorship: Current Status And Research Opportunities In Malaysia**

Associate Professor Dr Nirmala Bhoo-Pathy  
*University of Malaya, Malaysia*

Findings from the ASEAN Costs in Oncology (ACTION) Study has shown that cancer survivors in Malaysian settings continue to report impaired quality of life and high levels of psychological distress at one year after diagnosis. This appears to suggest that they have many unmet needs. The assessment of needs for cancer care is a critical step in provision of high-quality care and improving the quality of life and well-being of cancer survivors and their families. From a healthcare provider’s perspective, inadequate understanding of patient’s needs may not only lead to unnecessary suffering to patients and their families, but also increase healthcare costs. Improved understanding on the needs of cancer patients will not only allow healthcare providers to tailor interventions to address patients’ needs but also to identify the relevant stakeholders outside the healthcare system to address some of the unmet needs. Between 2017 and 2018, our research group conducted a series of qualitative studies in several hospitals across Klang Valley, aimed at improving our understanding on the needs of men and women living with cancer in Malaysia. In this talk, key findings and policy implications will be presented.

**SYMPOSIUM 02- AWARENESS, EARLY DIAGNOSIS AND IMPROVED SURVIVORSHIP**

**02 02**

**Promoting Awareness Of Cancer And Early Detection In Malaysia: A Way Forward**

Professor Dr Tin Tin Su  
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Breast and colorectal cancer are the two most common cancers in Malaysia. There is no population-based cancer screening in Malaysia. Thus, most cancer cases are diagnosed through presentation of symptoms rather than regular screening. Low awareness coupled with stigma and erroneous beliefs delay help seeking behaviours, lead to late presentation and contribute to poor detection rates. Promoting cancer awareness through mass media may be effective in improving cancer-related knowledge and uptake in screening tests. However, research is sparse regarding the cultural translation and implementation of mass media campaigns in Malaysia (and Asia) in terms of raising awareness about colorectal and breast cancer. A collaborative partnership comprising researchers from Malaysia and the UK as well as policy makers, public health experts and non-government organisations from Malaysia was formed to design, deliver and evaluate the Be Cancer Alert Campaign (BCAC). Each awareness-raising campaign ran for five weeks (Colorectal Cancer in April 2018, followed by Breast Cancer in October 2018). Evaluation of the campaigns took place in Gombak district (Colorectal Cancer) and Petaling district (Breast Cancer) respectively, in the form of a pre-post randomly selected household survey and collection of service utilisation data. Over 65% of participants recognised BCAC materials when prompted post-campaign, in particular from TV advertisement and posters in clinics. Age, ethnicity and education were associated with campaign recognition. BCAC recognisers were significantly more likely to be aware of all CRC symptoms (when prompted) at follow-up and were more confident to notice symptoms compared to non-recognisers. The findings suggest an improvement in symptom awareness as a result of the BCAC. Differences between ethnic and age groups suggests that future mass media campaigns need to be further targeted to reduce disparities in campaign reach. Malaysia and most South-East Asian countries have a low middle-income economy, with limited resources for cancer control. Late-staged cancers impose a significant economic burden on patients, households, communities, employers, health systems and governments. Our proposed strategy for the implementation of the culturally sensitive mass media cancer awareness-raising campaign will serve as a blueprint for cancer prevention and control policy in South-East Asian countries where the burden of cancer is increasing and there are high cancer death rates.
Managing Rare Mutations Of Advanced Non-Small Cell Lung Cancer

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Years ago, we were treating lung cancer as a single anatomical disease. However, for the past two decades, with evolving knowledge in molecular pathway that drive lung cancer, we are adding agents that target specific molecular pathway to preferentially kill malignant cell. Exemplary instances namely EGFGR mutated and ALK rearrangement targeted treatments have transformed the care of advanced non-small cell lung carcinoma (NSCLC). These more common genotypic alterations have been extensively studied with great improvement of care seen in this area. As lung cancer is molecularly diverse, there is still huge unmet need in management of rarer mutations. Many discoveries of these rarer mutations were seen for the past few years with compounds being developed to target them. This led to approval of drugs like crizotinib, entrectinib for ROS1 rearrangement and dabrafenib in combination with trametinib for BRAF V600E mutated advanced NSCLC. Another major leap was in NTRK-positive advanced NSCLC whereby 2 drugs namely entrectinib and larotrectinib were approved based on their efficacy data. Furthermore, other mutations that are intensely studied now include MET alteration specifically MET exon 14 skipping mutations and MET amplification. Many MET inhibitors like crizotinib, cabozantinib and newer agents like capmatinib, tepotinib, savolitinib and glesatinib are being investigated with encouraging early phase data. Moreover, there are also some positive data for various targeted therapy designed for HER2 mutated and RET rearrangement advanced NSCLC. Numerous agents are also under investigation for KRAS-mutant and PIK3CA, AKT1, PTEN alterations. Many of these agents are still in early phase development and their results are eagerly awaited. Essentially, the advancement of knowledge in molecular make up of advanced NSCLC deriving from ever evolving genetic testing techniques together with increasing discovery of targeted therapies, oncologists are positing themselves one step closer to the highly coveted personalization of treatment in advanced NSCLC.

Role Of Low Dose CT Scan In Lung Cancer Screening

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Lung cancer is the leading cause of cancer deaths worldwide. It is often diagnosed during the advanced stage of the disease, when treatment is non-curative. Chest X-ray is the popular choice to screen for lung cancer because it is cheap and widely available. However, the detection rate of early stage lung cancer using chest X-ray is very low. Low dose CT (LDCT) has slowly taken its place as the most sensitive imaging modality in detecting lung cancer at its early stage, when curative surgery can be offered to patients. The North American National Lung Screening Trial and Dutch-Belgian NELSON study have showed screening using LDCT can effectively reduce lung cancer mortality among high risk group. Studies have also proven that LDCT can detect lung cancer 4 times more frequently than a standard chest radiograph. It also improves the likelihood of detection of non-calcified lung nodule as small as 1mm. LDCT helps radiologists to further characterize the nodule which is important for nodule categorization, and subsequently determine proper management for patients.
**Experience Of SBRT In Early Lung Cancer**

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Lung cancer is one of the most common cancer not only in Malaysia, but also for the rest of the world. It carries a very high morbidity and mortality rate. Most of the lung cancer when diagnosed are in late stages and only less than 15-20% diagnosed in stage 1 or stage 2 disease. The standard of care of stage 1 or stage 2 disease has been surgery with or without adjuvant chemotherapy. In recent years the use of radiotherapy with the stereotactic technology has gathered a lot of interest among radiation oncologist. Using SBRT or Stereotactic Body Radiotherapy, we are able to target the cancer with using a high dose of radiation with high precision. SBRT requires short fractionation using high dose per fraction. However there is a need to limit or minimize or track respiratory movement. The radiation plan has to be conformal maximizing the dose to the target with a steep fall off to prevent surrounding tissue damage and there must be a means of verifying and identifying the tumour prior or during treatment. Why Extracranial SRT has gain an interest is because local recurrence with conventional doses of radiation still an important issue. Although dose escalation may help to reduce this, but minimizing surrounding normal tissue damage remains a priority and it maybe the expense of restricting the target dose. Margins are often given for conventional radiation to compensate for geographical mass but for SBRT, the enhanced capability to spare such normal tissue permits safe delivery of single or limited number of high dose radiation fraction to the target. The use of conformal treatment is not unique to SBRT but utilizing short dose regime with high dose fraction is the hallmark of SBRT. Recent study has been done comparing SBRT with surgery. The result and treatment outcome has been comparable. The key issue with SBRT is the dose fractionation. There are several dose fractionation regime available from single fraction to an average of 3 to 5 fractions and also given up to 10 fractions depending on the location of the tumour. Treating central tumours can be challenging as it increase the local airway complications. But with higher fractionation using 10 to 12 fractions, it has shown to reduce the risk of complication for central tumours. Therefore SBRT is now an alternative treatment for patient who are not fit for surgery or unsuitable for surgery. It can also be given for some large tumour with node negative disease as well as patients who have high morbidity for surgical treatment.

**Post CCRT Management Of Stage III Lung Cancer**

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Majority of lung cancer patients present at advanced stages. Half of patients present with Stage IV disease and another 20% with Stage III disease. Stage III Non small cell lung cancer, unlike other common solid tumours, carries a poor prognosis despite its treatment being radical in intent. The 5 year overall survival (OS) remains poor at 36% for IIIA and 19% for IIIB disease. Surgery remains the best option, but majority of patients would present with unresectable disease. In patients with unresectable disease, concurrent chemoradiotherapy (CCRT) has a superior outcome than sequential therapy, though the former consists of intensified treatment with significant adverse events in comparison to the latter. Only selected patients who are medically fit, good Performance Status and with disease technically encompassable in radiation field would be offered CCRT. Nonetheless, the relapse rate still remains high with short disease free interval. The recent Phase III PACIFIC trial demonstrated Durvalumab to be the first investigational agent to show significant improvement in progression free and overall survival in the subgroup of patients who did not progressed after CCRT. Three year OS is 57% in the durvalumab arm in contrast with 44% in the placebo arm (HR 0.69, 95% CI, 0.55-0.86) with a PFS of 16.8 months vs 5.6 months. The current challenge would be to put immunotherapy into real world clinical practice, and effectively recognising and dealing with issues in managing immunotherapy related adverse events (irAE) in order to maintain safety and to optimise outcomes.
PLENARY LECTURE 6  
PL 06

Cancer Management Using IBM AI Platform Watson For Oncology

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IBM in conjunction with Memorial Sloan Kettering Hospital (MSK) in New York City developed an Artificial Intelligence (AI) platform to support care decisions made by providers to oncology patients around the world. The platform, Watson for Oncology (WfO), allows the user to identify multimodal options for the patient based on training from clinicians at MSK. It provides treatment options supported by evidence. Watson for Oncology combines leading oncologists’ deep expertise in cancer care with the speed of IBM Watson to help clinicians as they consider individualized cancer treatment options for their patients. Watson for Oncology is a solution that is fueled by information from relevant guidelines, best practices, and medical journals and textbooks. Watson for Oncology’s domain knowledge is supplemented with relevant evidence from literature by leveraging natural language processing and advanced machine learning algorithms to search a corpus of over 300 medical journals, over 250 textbooks, and 15M pages of text. Watson for Oncology uses patient-centric insights and surfaces relevant articles that align with the patient characteristics as well as the treatment options under consideration to provide enhanced evidence. Watson for Oncology assesses information from a patient’s medical record, evaluates medical evidence, and displays potential treatment options ranked by level of confidence, always providing supporting evidence. Watson for Oncology extracts key attributes from a patient’s medical record using natural language processing to read and understand all the patient data in the medical record when integrated with an EMR. The oncologist can then apply their own expertise to identify the most appropriate treatment options for the patient. Watson for Oncology can be used in patient-facing visits, pre-visit planning, tumor boards, and educational training via secure computer access.

PLENARY LECTURE 7  
PL 07

Combined Modality Approach In Lymphomas

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Effective cancer treatment requires a multi-modality approach which is made possible by the holistic training of oncologists who treat patients. This safeguards the patient’s best interest in addressing patients’ clinical needs in a holistic and unbiased manner. This holds true for the treatment of lymphomas, the treatment options for which have increased significantly with the continuing development of biological agents, immunotherapeutic strategies, combination systemic chemotherapeutics and radiotherapy techniques. It is therefore increasingly important to understand the molecular aspects and rates of efficacy and toxicity for these options. And crucially to optimise ways to combine, sequence and integrate the different treatment options available to improve patient outcomes.
Giant cell tumour of bone is a benign locally aggressive primary bone tumor, which carries risk for local recurrences and pulmonary metastasis. The aggressive behaviour of giant cell tumour seems to occur in oriental population more frequently. Treatment of giant cell tumour of bone is basically surgical resection. The decision whether to perform an intralesional excision (curettage) or ‘en-bloc’ resection of the tumour is based on local tumour extension. Extended curettage with adjuvant treatment such as the use of phenol and methyl methacrylate reduces the incidence of recurrence to less than 10%. Our patients have either presented late or have recurrent lesions with surrounding soft tissue infiltration. Wide resection has been shown to be a good alternative for local control of stage III disease with 5% recurrence. Approximately 1-2% giant cell tumour of bone develops metastases that are histologically identical to the primary tumour. The incidence of pulmonary metastases was higher and, this raises a question mark about the actual behaviour of giant cell tumour in oriental population. Resection of limited nodule and long term denosumab treatment had shown to control pulmonary metastases. The controversial of chemotherapy in multiple pulmonary lesion is an option with long-term success in our series. Although numerous attempts have been made to predict the behaviour of GCT, there are no definite biological or histological parameters to determine the prognosis or aggressiveness of this lesion. A review of all histopathological evaluation did not reveal any evidence of malignant change despite being locally aggressive. The growth factors, suppressor gene and RANKL have been postulate to influence the aggressiveness of giant cell tumour and might be helpful for its future treatment.

Chemosensitivity Assay For Predicting Response To Chemotherapy

Current approved cancer drugs have only approximately 50% response rate as the first line of treatment because the cell lines traditionally used for preclinical drug development do not account for real life intra-tumor heterogeneity, tumor evolution, and patient- personalized response (i.e. sensitivity or resistance). Although Patient Derived Xenograft (PDX) models using immunodeficient mice are somewhat superior to cell lines as they are more clinically predictive models of cancer, however they are not exactly similar to parental tumours because of differences in histology, heterogeneity, and gene expression profiles. In addition, the combination of long latency times, high costs and low engraftment rates makes this a non-viable model for comparing cancer drug treatment options in the clinical setting in a clinically relevant time frame. Short term culture of patient derived tumors is limited by its proliferative capacity, which are difficult to keep alive in vitro. However, the advent of the patient derived organoid (PDO) model, mimicking the in vivo tumor very closely in terms of morphology, histology, heterogeneity, and gene expression, and can be established within weeks, will enable the investigation of patient specific responses (i.e. resistance or sensitivity) to cancer drugs in the clinical setting to become a practical reality, allowing the bridging of the gap between the genetics of cancer and clinical validation. We propose to use the in vitro Onco-PDO Assay using PDOs generated from patient biopsies or surgical resections at the neoadjuvant setting to predict responses to standard of care drugs.
Neuroendocrine tumors (NET) are a heterogeneous group of tumors. Subsets of this slow-growing tumor type are the gastro-enteropancreatic NETs (GEP-NETs) and bronchial NETs. Unfortunately, the majority of GEP-NET patients have metastatic disease at time of presentation and over the past decades, the incidence of GEP-NETs is rising. Peptide receptor radionuclide therapy (PRRT) has been administered for almost two decades and is an established effective therapeutic approach in the treatment of inoperable or metastatic gastroenteropancreatic (GEP), bronchopulmonary and other neuroendocrine tumours (NETs). This therapy is based on the fact that the majority of these NETs express a high number of high-affinity somatostatin receptors on their cell membranes. These receptors can be used for both imaging and therapy with radiolabeled somatostatin analogues. A patient with high uptake on somatostatin receptor (SSTR) PET imaging, without spatially discordant FDG-avid poorly differentiated disease that cannot be targeted, is highly to have a favourable response to therapy. In general, PRRT is well tolerated and it has yielded very promising results. Tumour shrinkage, biochemical and symptomatic responses are commonly observed. It also has favourable outcome in terms of both progression-free survival and overall survival.

52 years old Indian lady, non-smoker, was diagnosed with stage 4a lung adenocarcinoma, T3N1M1a in September 2012. EGFR exon 19 deletion detected. She was on Erlotinib from October 2012 to January 2016 with partial response. Her disease progressed in January 2016 as evidenced by worsening bilateral lung metastases and left hilar lymphadenopathy. A repeat lung biopsy was performed and HPE showed moderately differentiated adenocarcinoma with positive T790M mutation. She was subsequently enrolled in clinical trial, whereby she was treated with second line Olmutinib from March 2016 till 6 October 2017. Repeat CT scan in August 2017, however showed a single nodular enlargement of left lower lobe, there was no new distant metastasis. Repeat biopsy of this lesion was performed in September 2017 and HPE revealed small cell lung carcinoma. In view of this finding, she was treated with 4 cycles of Carboplatin/Etoposide with good response. She was subsequently given consolidation radiation therapy 40Gy in 15# to the lung in March 2018. Unfortunately 3 months later, her repeat CT scan showed disease progression with multiple enlarging nodules seen in both lungs, many of the nodules are found close to previous lung lesions. She was advised for osimertinib therapy but unable to afford. After discussion, we gave her 5 cycles of pemetrexed and CT showed stable disease after chemotherapy. A liquid biopsy was performed subsequently. There was exon-19 deletion but no T790M mutation. Tissue biopsy was pursued and it revealed adenocarcinoma. NGS testing only showed EGFR exon-19 deletion. With these findings, patient was started with osimertinib in January 2019. Her restaging CT prior osimertinib in December 2018 showed new brain metastasis but she opted for systemic therapy first. However her brain symptoms became more apparent shortly after that and thus, she was given WBRT in February 2019...
Controversies in Cancer Management – Case Study

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The presence of synchronous dual primary malignancy could pose a great challenge in their oncological management. We would like to share a case of this 44 year-old premenopausal lady with dual primary pathology; lung and breast cancer. She initially presented with intermittent cough for 1 year and was found to have a left upper lobe apical mass with mediastinal lymphadenopathy. Biopsy revealed that she has squamous cell carcinoma of the left lung. Patient denied prior history of tobacco smoking. PET CT further confirmed presence of a hypermetabolic lung mass at apicoposterior segment of left upper lobe measuring 5.5cm (SUV 20.3), mediastinal & hilar nodes, as well as an incidental finding of a hypermetabolic lesion at left breast measuring 1.3cm (SUV 9.7). No axillary lymph nodes identified otherwise. Biopsy of this left breast lesion confirmed presence of invasive carcinoma with positive ER/Mammaglobulin staining, and negative for CK5/6 and TTF1. Patient underwent thoracotomy and left upper lobectomy in March 2019. Intra-operatively tumour at left upper lobe was severely adhered to parietal pleura and was embedded to the lateral chest wall. The tumour was not removed in its entirety due to dense adhesions and close proximity to the subclavian artery. Concurrent chemoradiation to the left lung with IV Paclitaxel/Carboplatin was offered to this patient. As for the breast tumour, patient was started on Tamoxifen for disease control. She was also offered surgical intervention of either breast conserving surgery or mastectomy with axillary surgery. In view of the existence of dual primary malignancy with different histopathology at anatomically distinct sites, a multidisciplinary approach is required to ensure optimal timing and sequencing of multimodality treatment. Patient should be informed of the therapeutic challenges and decision for antitumour treatment strategy should be individualised.