

**Bumrungrad introduces an innovation in genomic medicine by opening the ‘Preventive Genomics & Family Check-up Services Center,’ advancing the hospital’s leadership in medical technology.**

With the success of the Human Genome Project (HGP), one of the world’s largest international research projects, genetic science is considered to have evolved by leaps and bounds, leading to various modern medical developments and innovations. With the greater knowledge of genomics, how to decode genomes, it is now possible to make use of data from genetic testing for treatment as well as prevention purposes. Gene testing now is also more accessible and affordable and thus is more widely used. Bumrungrad also used this technology in the prevention of patients as well.

Gene assay is a test to detect abnormalities in the DNA or the gene code, which helps identify the risk of developing certain diseases and potential drug allergy. In this way, it provides a proactive approach in preventing diseases, suggesting guidelines for behavioral change to reduce the risk. It can also help doctors in deciding on the most effective medication or treatment option for individual patients.

**Pharmacist Artirat Charukitpipat, Chief Executive Officer of Bumrungrad International Hospital** revealed, “With its more than 40 years of experience, Bumrungrad Hospital has upgraded to a hospital in quaternary care through the use of advanced medical & technological innovations, enabling the diagnosis and treatment of increasingly complex & severe cases. Pioneering innovations, like genetic testing, at the hospital, is one of numerous ways Bumrungrad demonstrates its commitment to the unceasing development of its body of knowledge, and searching for the latest innovations & appropriate technologies in order to fulfill our duty to provide the highest quality treatment and care possible to our patients.”

**Dr. Isorn Sookwanish, Director of Bumrungrad’s Preventive Genomics and Family Check-up Services Center** revealed, that the hospital has established the center to provide comprehensive services by a multidisciplinary medical team, from pre-examination consultation, gene testing, laboratory analysis of specifically-certified standards, to lab result interpretation by medical genetics specialists. On identifying any hereditary risk, the case is transferred to specialists for consultation or treatment plans for optimum efficiency.

At present, Bumrungrad is using the Next Generation Sequencing technology for mutation detection in Bumrungrad’s own laboratory as well as overseas labs cooperating with Bumrungrad. As certified laboratories by the College of American Pathologists (CAP), they reflect the international standards in the lab processes to achieve accuracy and consistency in the quality of the diagnoses and laboratory results.

The " Preventive Genomics and Family Check-up Services Center" offers preventive genetic testing services to detect potential risks covering four main areas:

1. Hereditary cancers including breast, ovarian, uterine, colon, prostate, and thyroid cancers
2. Heart diseases, divided into three groups: arrhythmia, aortic aneurysm and rupture, and heart failure or heart attack, all posing a risk of sudden death
3. Fertility planning issues, such as x-linked recessive gene, Down syndrome, cystic fibrosis, deafness, thalassemia, Myasthenia Gravis (MG), and other genetic conditions or disorders
4. Drug allergy prevention, by predicting the patient's possible allergic reaction and response to medication, covering drugs commonly used to treat diabetes, heart problems, hypertension, Alzheimer's, sleep problems as well as psychiatric drugs.

**Dr. Chanin Limwongse, Medical Genetics Specialist at Bumrungrad International Hospital,** said, "Nowadays, genetic technology is easily accessible. As a physician, I feel it is necessary to understand and apply the knowledge for patients' maximum benefits and safety. Testing kits of 15-20 years ago might not yield much prediction accuracy. But I have to admit that with more knowledge now, genetics specialists are prepared to propose which genes should be tested that could provide high prediction accuracy in line with medical indications.

After careful consideration, Bumrungrad has decided on gene-testing kits found most suitable for disease groups and offering life-long benefits for patients. Consultation for effective prevention and treatment is of no less importance to make the patient feel at ease. The hospital will always keep the patients informed should there be any discoveries in the future of new genes that could pose them at additional risk of certain disease or allergies.

For the benefits of preventive genetic testing of the "Preventive Genomics and Family Check-up Services Center," it helps identify the risk of developing certain diseases, diagnose hereditary diseases, suggest appropriate personalized treatment plan for individual patients, help with fertility planning, and reduce the risk of drug allergy and improper dosing. In the past, this kind of test would be suitable for those with a family history of cancer, heart disease, or death with unknown cause or while exercising. However, genetic testing now focuses on prevention, looking for risks in healthy people. It can be performed for people of any gender or age as the effects of the gene will not change throughout life.

**Dr. Chanin Limwongse** added, "For the pre-pregnancy gene testing of couples to prevent inherited diseases affecting their offspring, Bumrungrad can screen and diagnose more than 300 congenital abnormalities associated with over 100 genetic diseases. This is unlike other tests that offer selective testing for specific diseases. With advanced technology, Bumrungrad considers gene testing kits based on genetic diseases in children of relatively high incidence including x-linked recessive gene, Down syndrome, deafness, thalassemia, Myasthenia Gravis (MG), and

other genetic conditions or disorders. The hospital decides on using the noninvasive prenatal testing (NIPT), which is a method of determining the risk that the fetus will be born with certain genetic abnormalities. This testing analyzes small free-floating fragments of DNA or cell-free DNA that are circulating in a pregnant woman's blood. This is used instead of amniocentesis, which carries a miscarriage risk."

Regarding genetic testing to prevent drug allergy **Assoc. Prof. Dr. Chonlaphat Sukasem, Bumrungrad's pharmacogenomics consultant**, explained. Sometimes the same drugs prescribed to patients can yield drug efficacies differently. Some patients may develop severe allergy to a drug. In fact, there are many factors related to drug. A very important one is the patient's own genetics that regulate protein functions related to drug response, affecting treatment and requiring dose adjustment. The drug allergy that causes highest concern for doctors is the severe skin allergy where the skin is peeling off like a burn or scald and might result in loss of organs or death. The drugs that Thai people tend to have severe allergic reactions to on the skin include sulfa drugs, gout medication, and anticonvulsants.

Gene testing is advantageous in that it helps personalize treatment, particularly and accurately suiting the disease, the patient, and the genetic code. Statistically, 17-18% of Thai people have risk genes. They may or may not have the drug allergy, depending on two factors: 1. They have the risk genes, and 2. they get sick and take drugs they are allergic to. Another group, those with cancer, may not respond to the drugs at all even after the dose adjustment. Without gene testing, doctors would not know of the lack of response or learn about it only after a relapse, thus wasting the patient's time, money and opportunities for quality life.

Bumrungrad's gene testing relies on two samples but highly accurate methods: 1. blood draw and 2. saliva collection. The hospital will conduct a thorough examination and evaluation. Use of herbal remedies and diets along with prescription drugs will also be assessed to determine their potential effects on drug response. A whole set of very useful data can thus be acquired: 1. the gene effects, 2. the suitability of the combinations, and 3. the suitability of the diet. Available at Bumrungrad is gene testing services to assess the risk of allergy to drugs normally used to treat diabetes, heart problems, hypertension, Alzheimer's, hormones related to sleep, rheumatoid arthritis, antacid, as well as psychiatric drugs and others in the general drug group like Antihistamines, and pain relievers.

**Dr. Isorn Sookwanish** concluded that the "Preventive Genomics and Family Check-up Services Center" can accommodate an unlimited number of visitors, with a multidisciplinary staff of over 20 members including genetics and other specialists, nurses, pharmacists, medical technologists, and other related personnel. Also provided is the teleconsultation service. Of note is that the Trakcare system used at Bumrungrad. This is a patient health information management system which links Electronic Medical Record (EMR) data to the hospital's overall system.

In this way, the system can prevent the doctor from prescribing drugs the patient is allergic to, with an alert popping up immediately on the screen. A gene testing report card is also provided so the patients can give it to their doctors at any other hospital when seeking medical treatment. Bumrungrad considers it of utmost importance the quality treatment of international standards and patient safety.

This gene testing service is also possible for those interested in the gene testing but living upcountry or overseas or unable to visit the hospital. Bumrungrad will send a test kit for you to collect saliva from the inside of the cheek. Once the cheek swabs are sent back to the hospital and the gene test results are available, the doctor will hold a teleconsultation session with you to discuss the results and give necessary advice and recommendations in detail. This obviously saves travel time and suits these days of New Normal.

Preventive Genomics and Family Check-up Services Center is located on the 3rd floor of the Bumrungrad Hospital Building. Or ask for more details at Tel. 1378 or Call 02-011-4890, 02-011-4891 from 8:00 am - 8:00 pm.

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