




หน่วยนวัตกรรมพระราชมารดา
ในพระบาทสมเด็จพระเจ้าอยู่หัว

หน่วยนวัตกรรมพระราชมารดา ในพระบาทสมเด็จพระเจ้าอยู่หัว
H.M THE KING'S DENTAL SERVICE UNIT
มูลนิธินวัตกรรมพระราชมารดา ในพระบรมราชูปถัมภ์
Dental Innovation Foundation under Royal Patronage

ศันศิวา ปฐักิษิ พัสณา

Dental Innovation Foundation under Royal Patronage

Background and Objectives of Dental Innovation Foundation



**“When I have problems with my teeth,
I have dentists to treat me.
Do the people in remote areas have
dentists to treat them?”**

His Majesty King Bhumibol Adulyadej, King Rama 9
asked Lieutenant Colonel Doctor Sirisingha, Personal Dentist
(Lieutenant Colonel Doctor Si Sirisingha, the first director of the
H.M. the King’s Dental Service Unit.)

19 April 1970

The H.M. the King’s Dental Service Unit
commenced mobile dental operations on 19 April 1970
by beginning at Thap Sakae district, Prachuab Khiri Khan.



**H.M. the King’s Dental Service Unit
7 Universities + 1 Hospital**



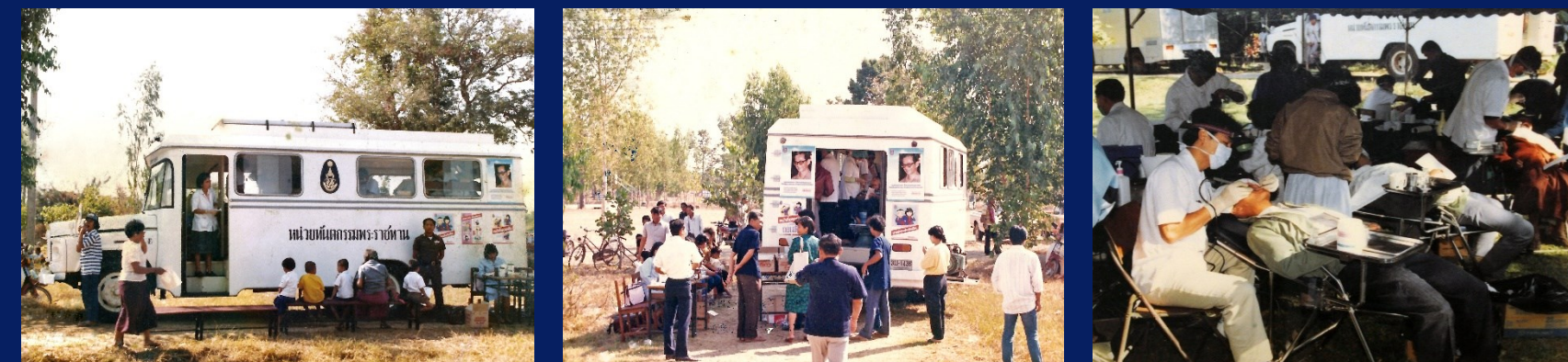
The North

The South

The Central region

The North East

& The East



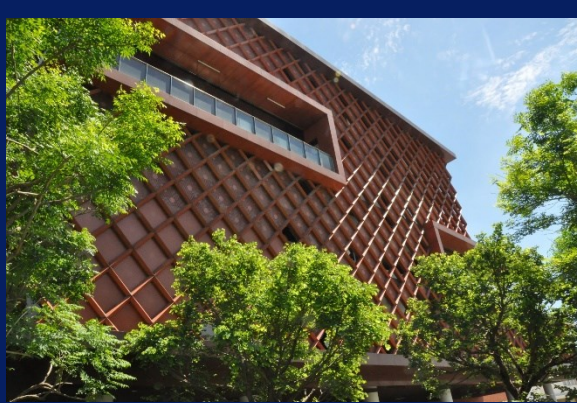


11 November 2009

His Majesty King Bhumibol Adulyadej, King Rama 9 granted permission to change the status of the center to foundation and named it as

“Dental Innovation Foundation under Royal Patronage H.M. the King’s Dental Service Unit”.

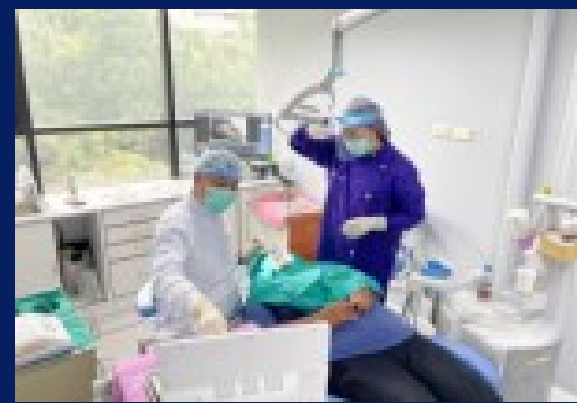
The job of the foundation is to publicize the King’s public affairs in the dentistry’s aspect, to produce innovative products related to dental works based on research and development, and to promote permanent selfcare of oral health in the future.



Medical Food Manufacturing



Medical Devices Manufacturing



Dental Clinic



Vision

“Being organization supporting the work of the H.M. the King’s Dental Service Unit by cooperating with another networks units and providing opportunities for people to receive the benefits from dental research and development invented in the country.”

Mission

1. Disseminate His Highness kindness to the Thai people on dental public health.
2. Conduct research and development of dental products to meet international standards in order to solve the dental public health problems effectively.
3. Support dental services by cooperating with another networks units, using innovative products produced within country.
4. Develop the organization to maximize its potential to produce innovative products continuously and sustainability.





Objective

The Objectives of Dental Innovation Foundation under Royal Patronage, His Majesty the H.M The King's Dental Service Units are to :

1. Carry out His Majesty The King's directive and generosity for Thai people in dental public health aspect.
2. Celebrate the honor of His Majesty the King and to broadcast his kindness to Thai people in dental health aspects.
3. Facilitate the operation of the His Majesty the H.M The King's Dental Service Units.
4. Study, search, improved and produce equipment, materials, medicines and medicinal supplies for public use which meet the international standard. And to transfer the knowhow (s) to produce products that general public can access.
5. Establish a medical facility to enhance and support access to dental care services and provide assistance to disadvantaged patients.
6. Establish an institute dedicated to the research and development of scientific and technological advancements to facilitate the economic and social progress of the nation.
7. Conduct operations providing laboratory diagnostic services and research in medical science and public health, as well as health-related products, and support other activities associated with the medical industry.
8. Support and develop the personnel of the foundation in management and academia them to effectively employ appropriate technologies to enhance their capabilities in education research and development to public health.
9. Support and promote a person, a group of persons, an organization or an alliance of multiple institutes to create and develop dental inventions and innovation based on Thai wisdom.
10. Carry out any activities related to dental public health which serve people and the nation as a whole.
11. Co-operate with the government service, departments and other non-profit organizations for charity or public service.
12. Not get involved with any political parties.

To solve the 6+6 dental problems

1 Tooth and root decay



3 Periodontal disease



5 Dry mouth



2 Tooth loss and problems wearing dentures



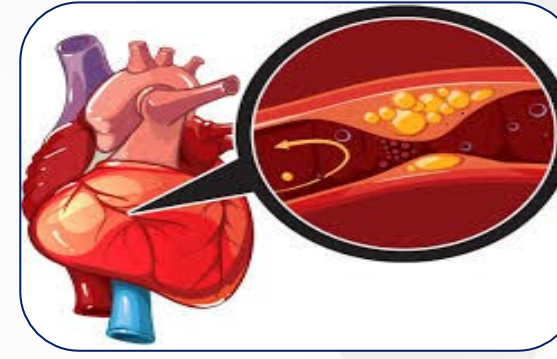
4 Tooth erosion



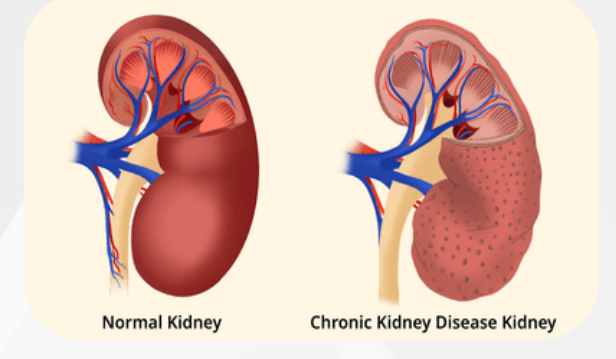
6 Oral sore/cancer of the mouth



Other oral conditions related to the systemic illness:



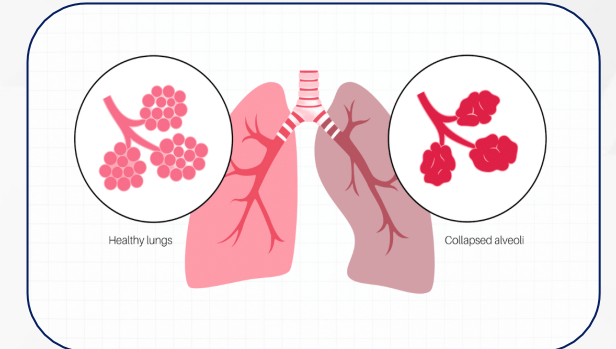
1. Coronary artery disease



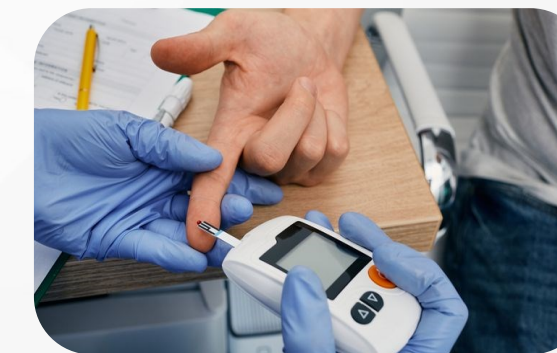
2. Chronic kidney disease



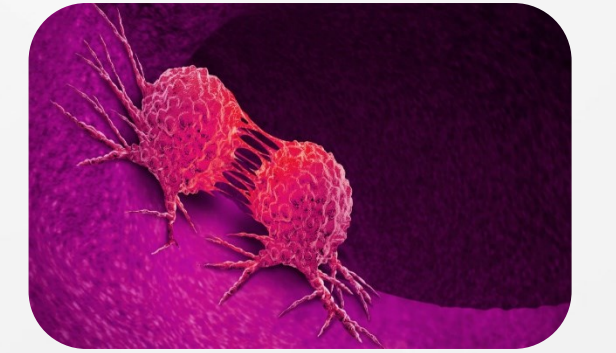
3. Obesity



4. Emphysema



5. Diabetes



6. Cancer

Research and development products by DIF

3 Groups :

1 Groups of innovative medical food and pharmaceutical products

2 Groups of innovative medical device products

3 Group of innovative medical services

Medical food & Pharmaceutical products



Medical services



Medical devices

Groups of innovative medical food and pharmaceutical products

Medical food

- Nutri jelly



Pharmaceutical products

- Vetiver mouth wash
- Refreshing mouth spray
- Vetiver doitung toothpaste



Medical food products : Nutri jelly (AOF)

Research and development of Innovative product for Oral Cancer Patients



Innovation food for head and neck cancer patients that is easy to consume, nutritionally balanced and has a pleasant tastes. This helps reduce hospitalization costs and improves the mental well-being of patients and their families.

Objective:

To research and develop innovative food products for patients with head and neck cancer, ensuring they are consumable and promoting an improved quality of life for the patients.

Target:

- Patients with head and neck cancer
- Smokers

Status:

- The study findings indicate that the group receiving the nutrition jelly with PEITC effectively maintains the stability of lesions, preventing progression significantly better.
- The results are being prepared for publication in a journal (clinical efficacy testing)
- an application for Novel Food certification as well as for foods with specific purposes.



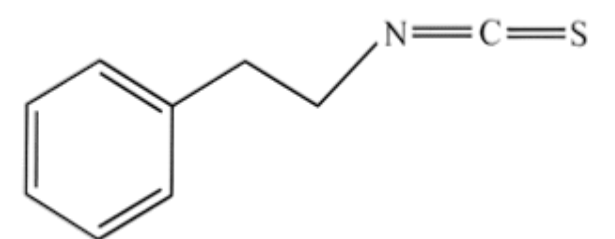
Medical food products : Nutri jelly (AOF)

Research and development of Innovative product for Oral Cancer Patients



Project Administrator
Assoc. Prof. Dr. Dunyaporn Trachootham
Assoc. Prof. Dr. Aroonwan Lam-ubol

β -phenylethyl isothiocyanate (PEITC)



Cabbage



Broccoli

1. Food for improve quality of life (AOF 1)

Innovative food product for patients with head and neck cancer, aiming to improve their quality of life and alleviate malnutrition. These products are registered with the Food and Drug Administration, Thailand (FDA Thai) and have obtained Halal certification from the Central Islamic Council of Thailand, ensuring that they comply with Islamic law and can be used by Muslim consumers.

2. Anti Oral Cancer Food (AOF 2)

Innovative food products that contribute to the treatment of patients. It's add **β -phenylethyl isothiocyanate (PEITC)** in the product. PEITC is Phytochemicals promote detoxification in cancer. The research aims to investigate natural substances that selectively inhibit cancer cells in the head and neck region, while minimizing adverse effects on normal epithelial cells. The ultimate objective is to enhance the quality of life for patients with head and neck cancer."



Journal : Supportive Care in Cancer
Publishing house : Springer Link
Title : Nutri-jelly may improve quality of life and decrease tube feeding demand in head and neck cancer patients



Journal : Food and function
Publishing house : The Royal Society of Chemistry Publishing
Title : Sensory acceptable equivalent doses of β -phenylethyl isothiocyanate (PEITC) induce cell cycle arrest and retard the growth of p53 mutated oral cancer *in vitro* and *in vivo*



Journal : Thai Journal of Toxicology
Publishing house : The Toxicological Society of Thailand
Title : Clinical safety of Nutri-PEITC jelly : A Pre Post Study in Healthy Volunteers

Pharmaceutical products : Vetiver mouth wash (VMW)

Study of the effectiveness of vetiver extracts for disinfectants to prevent tooth and periodontal disease.



“Vetiver grass can be used for many things. Dentist have tried to think about what benefits they can provide to dentistry and tell us about it”

His Majesty King Bhumibol Adulyadej, the Great’s Speech.



The proposals made by His Majesty the King are sincerely kind and will benefit the dentistry profession in all respect. A research project titled “Vetiver grass, sufficient economy and dental application”. The project has started in consultation and cooperation with Chiangmai University’s Faculty of Pharmacy and Faculty of Dentistry to examine the qualities of vetiver oral care products. The Surat Thani and Mae Tia species of vetiver grass exhibited antibacterial properties for dental care.



Growing area



- Mae Fah Luang Foundation under Royal Patronage (Doi Tung development project, Chiang Rai)

Pharmaceutical products :

Study of the effectiveness of vetiver extracts for disinfectants to prevent tooth and periodontal disease.

Objective:

Vetiver grass-based oral disinfectant for specialized dentistry with microbe-inhibiting.

Target:

The elderly who has micro bacterial and exhibited antibacterial in oral.

Status:

1. The production industries of Vetiver mouthwash



2. Study of the effectiveness of mouthwash containing vetiver extracted in reducing gingivitis and cariogenic disease.



Due to the vetiver grass's properties, which include antibacterial action in various oral disease, a variety of oral health care products can be deeply investigated further.



Refreshing mouth spray



Vetiver doitung toothpaste

Groups of innovative medical device products

Metallic group



Dental Implant (DI)



Human Plate and Screw (HP&S)



Craniofacial Implant (CFI)

Biomaterial group



Fluoride Vanish (FLV)



Resin Pit and Fissure Sealant (RPS)



Oral Moisturizing Jelly (OMJ)



Dental Soft Brush

Digital for Dentistry



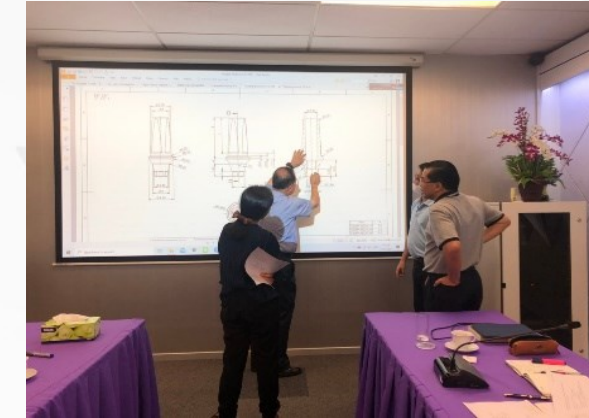
Website : Special Care Dentistry

Medical device products : Dental Implant (DI)

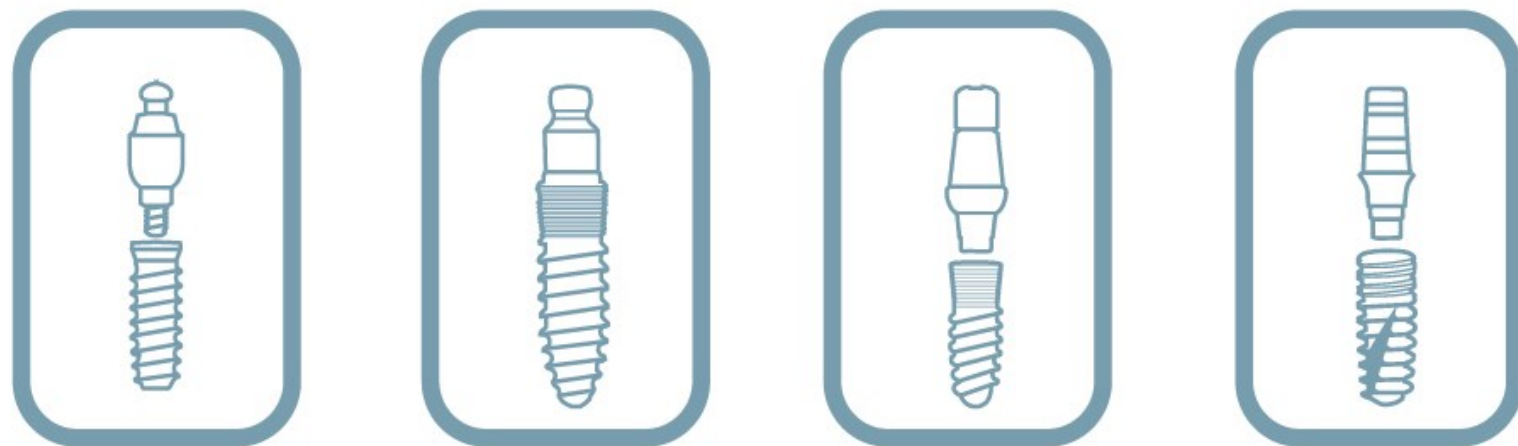
Design and Development of Dental Implant



“This implant is good, better than our natural teeth”
“The Princess Mother might have live longer if she has implant”



After the dentists inserted implants to His Majesty King successfully, the King was quite happy.



His Majesty the King referred to this implant as “Khao Aroi” since, with the implant, it would be a pleasure to consume rice deliciously.

Dental implants are a method for addressing the issue of tooth loss and serve as a good alternative for dealing with the flat mandible in the elderly. By securing artificial teeth firmly, dental implants enable chewing that is closer to the experience of natural teeth, allowing individuals who have lost their natural teeth to chew food more effectively.



Medical device products : Dental Implant (DI)

Design and Development of Dental Implant

Objective:

To develop a sustainable system for domestically produced dental implants, ensuring continuous effectiveness and improving access to treatment for tooth loss or disadvantaged individuals, thus enhancing their quality of life.

Status:

The Thai-made implant is employed to improve the stability of complete dentures, especially the lower one, which has a flat alveolar ridge and is prone to poor retention and becoming loose when speaking or chewing. Between 2007 and 2011, 18,400 elderly received two Thai-made implants each as part of the Royal Dental Implant Project honoring His Majesty the King's 80th Birthday Anniversary.



“Usability Engineering”

Medical device products : Human Plate and Screw (HP&S)

Research and Development of Innovative Product Human Plate and Screw



Objective:

To produce bone plates and screws for fixation on the human face domestically, with quality standards in accordance with international norms, in order to reduce the import of expensive products.

Human plate and screw is essential medical device used to treat and rehabilitate severe injuries to the jaw and facial bones (Maxillofacial). It is employed to stabilize fractures in the bones during the healing process, support osteosynthesis and heal patients about physical and psychological pain.



Target:

For use in the stabilization of fractures in the jaw and facial bones in adult patients during the bone healing process.

Status:

- The product is now ready for industrial-scale production.
- The detailed medical device registration has been duly approved with registration number 65-1-2-2-0000988.



Medical device products : Fluoride Vanish (FLV)

Research and Development of Innovative Product Fluoride Vanish



A product formulated for the application on tooth surfaces to reduce dental sensitivity. The fluoride interacts with the tooth surface and precipitates as calcium fluoride within the dental tubules, effectively decreasing permeability to external stimuli, thus aiding in the alleviation of tooth sensitivity.

Objective:

To produce fluoride varnish domestically, reduce the importation of expensive foreign dental devices and equipment.

Target:

To reduce tooth sensitivity.

Status:

Medical device products : Resin Pit and Fissure Sealant (RPS)

Research and Development of Innovative Product Light curing Resin Pit and Fissure Sealant

Dental sealants are a preventive measure against dental caries. This involves the application of a tooth-colored or clear material to seal the pits and fissures of teeth, thereby preventing food particles from becoming trapped and potentially leading to cavities.



Objective:

To research and develop light-curing resin dental sealants that can be produced domestically in Thailand, adhering to international standards, thereby replacing imports and ensuring comprehensive availability for the public.

Target:

Use for the prevention of pit- and-fissure occlusal carious lesions.

Medical device products : Oral Moisturizing Jelly (OMJ)

Research and Development of Innovative Product Oral Moisturizing Jelly



An innovative food product designed for individuals with xerostomia and reduced salivary function, such as patients undergoing radiation therapy in the head and neck region, is a clear gel with a pleasant aroma. This formulation provides hydration and maintains a soft gel consistency at room temperature (within the oral cavity).

Objective:

To develop oral moisturizing jelly to provide moisture in the oral cavity, promote and maintain oral balance effectively, and possess properties similar to natural saliva.

Target:

Individuals with xerostomia and reduced salivary flow (following radiation therapy in the head and neck region or due to systemic medication).

Status:

Medical device products

Dental Soft Brush

Research and Development of Product Dental Soft Brush



Craniofacial implants used to secure prosthetic devices for correcting facial deformities are an extension of dental implant technology.

Objective:

To research and develop effective and safe oral cleaning devices for the elderly that can be manufactured domestically, replacing imports from abroad, and to ensure widespread availability of these products to the public.

Target:

The elderly

Status:

Craniofacial Implant (CFI)

Design and Development of Craniofacial Implant (CFI)



Craniofacial implants used to secure prosthetic devices for correcting facial deformities are an extension of dental implant technology.

Objective:

To produce Craniofacial implants domestically, reduce the importation of expensive foreign dental devices and equipment.

Target:

The working group is responsible for designing and developing craniofacial implants to suit the anatomy of Thai people.

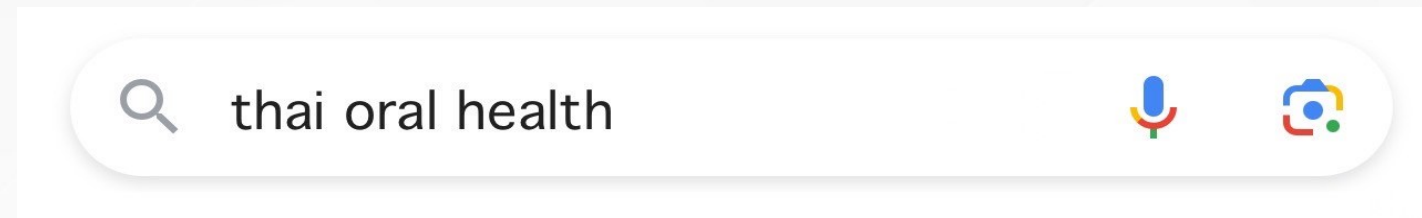
Status:

Digital for Dentistry

Website : Special Care Dentistry



The screenshot shows the mobile website interface for Thai Oral Health. At the top, there is a navigation menu icon on the left and a header with logos for the Ministry of Health and the Department of Oral and Maxillofacial Surgery. Below the header is a banner featuring three cartoon teeth with faces on a pink gum line. Underneath the banner is a photograph of dental professionals in a clinical setting. Below the photo are three menu items: 'สำหรับประชาชน' (For the public), 'บุคลากร' (Personnel), and 'สิทธิประโยชน์ทางทันตกรรม' (Dental benefits). A large heading 'บทความ/ข่าวสาร' (Articles/News) is positioned below the menu. At the bottom, there is a green banner with Thai text about a dental care program for the King and Queen, and a yellow banner with the text 'คุณสมบัติผู้เข้าร่วมโครงการ' (Program participant qualifications) and 'ขอเชิญผู้ที่สนใจ' (Inviting those interested). The mobile browser address bar at the very bottom shows the URL 'thaioralhealth.com'.



- We have a common goal to develop about oral health care by digital technology, which is encompass the activities related to supporting, prevention and rehabilitation of oral health.
- This includes about knowledge, services, innovations, and communication of oral health information.



Group of innovative medical services

Dental Clinic of Dental Innovation Foundation under Royal Patronage is open to provide opportunities for Thai people could access to dental service with quality and standard ,Carried out the Royal Guidance of H.M. the King's, the clinic provided all kinds of dental work : particularly complete dentures and dental implant preformed by experienced dentists. More over, this clinic has been designed to be the clinical evaluation for testing innovative products produced by The Dental Innovation Foundation under Royal Patronage. At present, Dental Clinic of Dental Innovation Foundation under Royal Patronage has been 1 branches.

Rama 9 Dental Clinic

Address : 157/4 Pradit Manutham Rd.,
Wangthonglang District, Bangkok 10310

 02-318-2515 Ext. 1222

 098-283-5313

Medical Food and Medical Devices Manufacturing

Office of the Royal Development Projects Board then supports the budget for producing medical food and medical devices to help Thai people to have better opportunity to access the innovative products invented within country



Retort Plant



UHT Plant



Food production process certification standards

