

# UGM Students Invent Headset to Minimize Jaw Pain During Dental Treatment

Friday, 29 June 2018 WIB, By: Marwati




Dental treatments often cause discomfort, such as pain and stiffness in jaw area when opening the mouth wide. In fact, in several cases, patients experienced the pain in a long time and it may lead to masticatory muscle disturbance or Temporomandibular Disorder (TMD).

Fortunately, three UGM students have come up with a solution to this problem. The solution is Gadjah Mada Ultrasound Therapy or Gusta.

The device was designed by Amri Siddiq Pangestu from Faculty of Engineering, Eltrin Khotimah Maharti and Nurzahra Sekar Ningrum from Faculty of Dentistry. It was invented to induce muscle relaxation around the jaw area.

Amri explained that Gusta is an innovative medical that can emit ultrasonic waves in the right frequency. Hence, the device can bring comfort and relaxation to the muscles in the jaw area, in order to minimize the possibility of jaw stiffness and discomfort, as well as TMD.



Ultrasonic waves have long been used in the medical field. The wave is known to relieve muscle pain and stiffness with its mechanical and thermal effects, hence it can increase the surrounding tissue temperature and blood flow.

Gusta is comprised of seven main components, including a microcontroller, ultrasonic wave generator, input-output, headphone, temperature sensor, LCD, and ultrasound transducer. The device operates by converting electrical signals into ultrasonic waves with its settings.

“In its application, a patient uses the headset by adjusting it to their jaw joint. Then, the power button is switched on to activate the device, and the frequency is adjusted to the patient’s comfort level,” said Amri in a press conference at Fortakgama Room UGM, Friday (6/29).

Nurzahra added, before emitting the device frequency, a gel will be given to minimize skin contact that may feel uncomfortable and to maximize the effect of ultrasonic wave emission.

Aside from giving relief to the patients, this device also assists doctors during dental treatments because it is equipped with an LCD that displays the temperature and frequency of Gusta.

“This device can reduce patient discomfort during dental treatments. Therefore, it can maintain the loyalty of patients in doing dental and oral care.”

The team spent up to Rp11 million for this invention. When it is commercialized, the device can be sold for Rp2.5 million.

The prototype was created by the UGM Karsa Cipta Student Creative Program 2018 that also received research and development fund from Ministry of Research, Technology, and Higher Education.

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