PRESS RELEASE

September 19, 2019

Expediting personal identification using dental findings with AI and image analysis in preparation for a major earthquake in the Nankai Trough

- Measures for unprecedented disasters from innovations in personal identification methods -

A research group made up of the Vice Center Director Hideyuki Takano of The University of Tokushima Oral Management Center, Professor Kenji Terada of The University of Tokushima Department of Information Science and Intelligent Systems, and Lecturer Yukihiro Momota of The University of Tokushima Graduate School of Health Biosciences Research Division Field of Oral Internal Medicine (department chair: Masayuki Azuma), will be collaborating with Medihome, Inc (representative director: Tatsuya Kando) from September 19, 2019 to conduct research in expediting personal identification using intraoral image analyses and AI for x-rays in preparation for large-scale disasters such as a major earthquake in the Nankai Trough.

[Background of this research]

The Great East Japan Earthquake in 2011 saw 15,897 casualties, 2,533 missing persons, and caused extreme amounts of damage. Approximately 10% of the victims were identified using their dental findings. It was made evident during these personal identifications the importance of storing detailed records of dental findings while one is alive, and the necessity of swift collection of dental findings at the time of a disaster. Currently, most comparisons are conducted manually. A major earthquake in the Nankai Trough, something feared to occur sooner or later, has the possibility of causing roughly 20 times the damage that the Great East Japan Earthquake caused. This calls to concern that the current methods cannot provide sufficient support. This is why it is thought that drastic digitization is necessary for accurate collection and storage of information while people are alive and the swift collection and analysis of information at the time of disaster.

This is why a joint research venture will begin with the originator of this research, “The University of Tokushima Oral Management Center” playing a central role, “The University of Tokushima Department of Information Science

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and Intelligent Systems" and their advanced image analysis technologies, "The University of Tokushima Graduate School of Health Biosciences Research Division Field of Oral Internal Medicine" and their abundant expertise in the dental and oral fields, and "Medihome, Inc." and their strengths in AI and image analysis technologies. This joint venture will begin on September 19, 2019.

[Details of the research]

Personal identification of victims during disasters can be conducted using facial features and clothes in the early stages, however, as time passes, this can become difficult. As those methods become difficult, dental findings are used for confirmations. Judgement at this stage is extremely important in order to return the remains to their families as soon as possible. Personal identification with dental findings are conducted using a dental chart. A dental chart is created by documenting the state of the mouth of the remains. Next, a patient chart or x-rays are ordered from a nearby dental clinic, and that citizen's dental chart is created. Their identity is then specified by comparing these 2 dental charts.

The number of victims predicted from a major earthquake in the Nankai Trough is 320,000 people across all of Japan, and 30,000 people in Tokushima Prefecture. Around 12,000 victims are predicted to be received in the first week. Knowing that 1 dentist was able to take charge of around 20 remains per day during the Great East Japan Earthquake, this would require anywhere from 200 to 400 dentists for every day. There are approximately 800 dentists in Tokushima Prefecture, but with the possibility that over 50% of these dentists will become victims themselves, it is predicted that there will be a shortage of dentists that are able to work on personal identification.

In addition, as it occurred in the Great East Japan Earthquake, dental clinics may be washed away by tsunamis or burn down, making it difficult to collect patient charts and x-ray photographs. This is why oral information and x-ray photographs need to be digitized and stored. This research aims to find a solution to these problems.

[Cooperation with all organizations]

Image data analysis technologies boasted by the Terada Lab at The University of Tokushima Department of Information Science and Intelligent Systems will be used to automatically analyze and digitize oral photographs and 3D scan data for information regarding the number of teeth, cavities, fillings, crowns, and other information. In addition, the AI and image analysis technologies boasted by Medihome, Inc. will be used to digitize examination

and x-ray findings. This data will be stored in a database, and will be used to conduct swift identification comparisons when any large-scale disasters like a major earthquake in the Nankai Trough occur.

We are building an “Awa Ai Net,” a way to connect the major medical institutions and nursing homes in Tokushima Prefecture together to allow them to reference medical information with each other of residents that have agreed. In the future, we are aiming to store data in this type of medical network, and put it to effective application during large-scale disasters.

This research initiative has been published online in the UK journal Impact.
『The development of personal identification method by image analysis technology of dentition』
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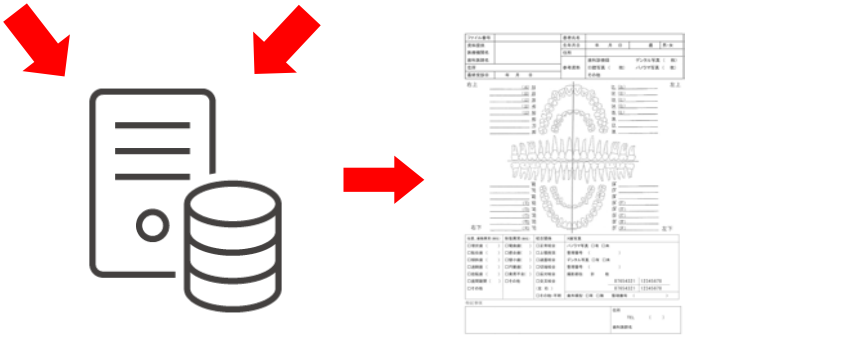
Expedited collection of dental

Expedited collection of x-ray findings due



Store information in a

Create dental charts and the like
Use for personal identification during disasters

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