

## Impact Objectives

- Community-based research focusing on the oral-systemic connection
- Explore how oral health connects to systemic health

# A picture of health

*Dr Atsushi Izawa is conducting community-based research on the connection between oral and systemic health in an effort to shed more light on this understudied topic, ultimately improving the prognosis for those with systemic diseases*



### What are you currently researching?

We conduct community-based studies that

focus on the oral-systemic connection. We believe that chronic sustained periodontitis is a potential cardiovascular risk. Our team, the Dental and Medical Collaboration for the Advanced Medical Prevention (D-CAMP) in Matsumoto, has demonstrated that the number of lost teeth was significantly associated with the presence of atherosclerotic cardiovascular diseases, cardiometabolic diseases, and skeletal diseases. Oral health, especially the number of teeth, should be a window into the systemic health.

### Why is the link between oral health and the presence or development of systemic diseases an important topic to study?

There is a substantial need to examine a number of points, including: that not all systemic diseases are associated with oral health; and the specificity, characteristics, and/or significance of each association still requires to be elucidated. It has not been clearly demonstrated whether the association between oral health and systemic diseases is causal relation or simple coincidence. The evidence of a causal link has not been strong enough to be noted in clinical guidelines

or consensus reports for the prevention, diagnosis and treatment of related diseases. An important question is whether periodontal therapy could improve the status of systemic diseases.

### Your latest work is focusing on community-based research on the oral-systemic connection. What does this entail?

Based on the results of our study, the D-CAMP in Matsumoto is taking an interprofessional team approach to providing public health education and optimal healthcare and services. Our approach may pave the way for pre-primary prevention. Our focus is not only on the pathophysiological aspects, but also on lifestyle and/or socio-behavioural aspects of the link between periodontal disease and co-morbidities. My research contribution is also recognised and acclaimed as a regional contribution of Shinshu University.

### Are there any results from this work that you are particularly pleased with?

The results of our community-based study are in line with previous reports demonstrating possible associations between oral health and systemic diseases. Moreover, the most important thing for us is that our study supports previous findings published by Dr Jun-ichi Suzuki of University of Tokyo, Japan, and reveals the correctness of his hypothesis and idea.

### What can you do to make sure this work helps to establish preventive medical strategies?

This question is the most important for us when it comes to designing our future plan. The D-CAMP is constructing an interprofessional team to translate research findings to real-world health promotion. It should be noted that we need to carefully present our data, because limited evidence exists not only for the causal association between oral and systemic diseases, but also for any benefits of periodontal treatment.

### What is your main target for the pre-primary prevention? Who will receive the benefit of oral health care most?

Patients in a dental clinic should be referred to medical check-up if they have chronic or treatment-resistant periodontitis. This is because the sustained periodontal inflammation may be associated with the development of remote organ injury. Dental and medical collaboration is strongly recommended for diabetic patients with periodontitis, as a bidirectional relationship between periodontitis and diabetes has been demonstrated. Successful periodontal treatment can improve, at least partly, glycaemic control of diabetic patients. ►

# Community-based oral research

Researchers from the Dental and Medical Collaboration for the Advanced Medical Prevention in Matsumoto, Japan, are exploring the connection between oral and systemic health in the hopes of improving health and reducing healthcare costs

Dr Atsushi Izawa of Shinshu University, Japan, is part of the Dental and Medical Collaboration for the Advanced Medical Prevention (D-CAMP) in Matsumoto, Japan, whose work is geared towards ensuring healthy longevity in Matsumoto city. The team at D-CAMP is conducting community-based research that focuses on the connection between oral and systemic health.

A key research project they are working on is called 'A community-based epidemiological survey of the relationship between oral health and the presence of systemic diseases'. This important research was prompted by earlier studies that demonstrated a link between oral health and systemic diseases. However, there are lots of unanswered questions in this area which Izawa and his team are seeking to answer. 'There is conflicting knowledge regarding the association between oral health and systemic diseases, and the

causal link has not been fully elucidated', explains Izawa. Some of the key points the researchers are seeking to shed light on include the specifics of the association between systemic diseases and oral health and whether these associations are causal or coincidental. They are also working on discovering stronger evidence on this link so that it can potentially be included in clinical guidelines, as well as exploring whether periodontal therapy could have a positive impact on systemic diseases.

D-CAMP's work is both collaborative and community-based, and is divided into four phases. 'We take a multi-step approach to advancing medical prevention,' outlines Izawa. He notes that the first step is community-based research to explore the link between oral health and the presence of systemic diseases. They then progress to clinical collaboration between dentists and physicians to identify and to intervene subjects with high health risk. 'Step three encourages participation of health professionals, including dental hygienists, nurses/public health nurses and pharmacists, to organise interprofessional teamwork, and step four entails public health education and the promotion of optimal healthcare and services.' Their work has been well supported by Shinshu University, which has received the highest award for a university for regional contribution in Japan between 2012 and 2015.

A number of key researchers are involved in the work, one of whom was Dr Jun-ichi Suzuki who sadly passed away earlier

this year. Suzuki was integral to the work and indeed inspires the future work. 'Dr Jun-ichi Suzuki was a former dean of the D-CAMP. His effort and ambition were the most significant among the members,' Izawa says. 'After graduating from Shinshu University School of Medicine, he published a large number of basic and clinical studies in the field between dental and general medicine, especially in the cardiovascular field. His efforts and results of his research are strong enough to encourage us to initiate community-based research.' Suzuki also facilitated professionals in healthcare to organise a multidisciplinary team which enable progression of the collaboration so they could translate evidence into public health promotion.

## FAR-REACHING BENEFITS

In step one of the work Izawa and the team examined 6,068 subjects who underwent oral health screening in Matsumoto. They combined the number of teeth and periodontal status (as determined by the community periodontal index) with systemic disease categories on each individual National Health Insurance claim. The researchers ascertained that there was a significant association between the number of lost teeth and the presence of atherosclerotic, cardiometabolic and skeletal diseases. Step two will involve the D-CAMP team initiating a collaboration between Matsumoto City Medical Association and Matsumoto Dental Association. 'In our following steps, we are promoting public health education and providing optimal healthcare and

*We are promoting public health education and providing optimal healthcare and multidisciplinary services through an interprofessional team*

multidisciplinary services through an interprofessional team,' says Izawa. 'Our approach may pave the way towards pre-primary prevention, which also involves the lifestyle and/or socio-behavioural aspects of the link between periodontal disease and co-morbidities.'

The researchers were unable to conclude causal link from their retrospective cross-sectional study but were successful in demonstrating the role of periodontitis on the pathophysiology of tooth loss. 'The chronic periodontal inflammation provokes resorption and loss of alveolar bone and remodelling of gum tissue, which results in loss of teeth,' observes Izawa. 'Chronic sustained periodontal inflammation accompanied with upregulation of cytokines subsequently enhance remote inflammatory reactions, which could deteriorate physiological function of remote organs.' Although the key motivation for their work is to improve the quality of life of patients and reduce healthcare costs, there are other key, far-reaching benefits to the research.

'There is no doubt that an increase in cerebral/cardiovascular diseases and dementia will be a major public health burden,' points out Izawa. He notes that there is a high need for non-invasive and inexpensive strategies to provide effective prevention for diseases that are more common to an ageing society. These, he says, are predominantly associated with atherosclerosis. 'A recent meta-analysis demonstrated that periodontal therapy reduced the total medical cost and number

of hospitalisations of patients with either Type 2 Diabetes, coronary heart disease, and cerebral vascular disease. We believe and would like to demonstrate that periodontal therapy is beneficial as a future preventative strategy.'

## CHALLENGES AND FUTURE PLANS

The researchers have made great strides towards achieving their goal of cementing proof of the relationship between systemic and oral diseases, but are encountering challenges in their mission. For example, the critical interaction between oral health and the development of systemic diseases is not something that is agreed on by all doctors. In addition, not all dentists fully understand the importance of periodontal disease and not all people are aware of the importance of oral health. 'Generally, people do not like dental treatment and do not go to dentist unless having trouble accompanied by toothache. In fact, some patients don't visit dentist even if it is recommended,' says Izawa. 'Therefore, effective collaboration between dentists and medical doctors is still hard to establish, but important.'

Looking ahead, Izawa and his team have a number of goals in mind. For example, they plan to explore interventions for treating periodontitis and evaluate how effective they are at preventing the development of systemic disease. The team also has plans to create a 'personal health record' that will include the dental and medical history and status of people in order that this data can be used in relation to health history, medical cost and clinical course of co-morbidities. ●

## Project Insights

The project team would like to express their sincere thanks to Dr Jun-ichi Suzuki, an advisor of D-CAMP, who passed away February 26, 2018 at age 52. His contributions were integral to the success of this work.

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Dr Atsushi Izawa graduated from Shinshu University School of Medicine in 1994, and engaged in basic, clinical and epidemiological researches including three years at Harvard Medical School in Boston. His recent projects include epidemiological studies for metabolic syndrome among young adults, and the association of oral health with the presence of systemic diseases.



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