



## **Academy of Prosthodontics Annual Scientific Session VIRTUAL May 21 – 22, 2021**

### **Program Speaker - Susanne Scherrer, DDS, PhD**

#### **Title**

Zirconia – Strength, Weaknesses, Opportunities and Threats (SWOT)

#### **Abstract**

Zirconia described as “ceramic steel” in 1975 by Garvie in a publication in Nature is currently used as the replacement material for metal in prosthetic rehabilitations including implantology. It has a favorable biological and esthetic outcome, interesting toughening mechanism when stressed thanks to its phase transformation capacity and its processing uses CAD-CAM technologies. There are however many zirconia materials on the market with differences in their mol% of Yttria needed to stabilize the zirconia in a tetragonal or cubic crystallographic phase. These phases, will determine the final mechanical and optical properties. This presentation is meant to provide an understanding of the zirconia material using a short SWOT analysis. “Strength and Opportunities” will be discussed along with “Weaknesses and Threads”. Some clinical failures (tooth supported, implant-supported and cantilever reconstructions) will be presented based on microscopy (SEM) evidences of failure origins and location on the fractured zirconia parts. These cases will highlight issues related to lab processing, framework design, connectors, surface treatment, occlusal contacts and risk assessment depending on the type of zirconia used.

#### **Learning Objectives**

1. Understand the phase transformation toughening capability of a zirconia
2. Understand the differences between the zirconias with respect to Yttria mol% and the consequences on the mechanical and optical properties
3. Learn from failure analysis of clinical cases
4. Keep in mind the SWOT when dealing with zirconia reconstructions

#### **Biography**

Susanne S. Scherrer graduated in 1984 with a DDS from the University of Geneva in Switzerland. She continued with a part time training in Fixed Prosthodontics from 84-89 and obtained a doctoral degree (Dr.med.dent) in 1986. From 1989-91 she was a Visiting Assistant Professor at the University of Texas HSC at San Antonio in the Department of Restorative Dentistry. In 2003 she obtained her Privat Doctent title (PD) from the University of Geneva and is since 2015 Associate Professor. She is currently Head of Biomaterials and Head of Continuing Education at the University Clinics of Dental Medicine, in Geneva. She was President of the IADR-DMG (2001-02) and President of the Academy of Dental Materials (2002-04). In 2014 she was awarded the IADR-Distinguished Scientist Wilmer Souder Award from the Dental Materials Group. She is a fellow of the Academy of Dental Materials and a fellow of the Academy of Prosthodontics. She serves on the Editorial Boards of the Journal of Dental Research and the Swiss Dental Journal. Her primary area of research and publishing involves dental ceramics, mechanical

properties, clinical longitudinal trials and failure analysis using fractography. She has worked as a general practitioner from 1984 until 2015 in extramural family private practices half of her time.