



## CELSA - Collaborative research project - Application form - COVER PAGE

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<b>3. Non confidential and public friendly summary (max. 2000 characters)</b>
<b>Project title:</b> Harmonization of the use of cone-beam computed tomography for developmental disorders in the maxillofacial region
<b>Summary:</b> Several developmental disorders affect the maxillofacial region, and require surgical intervention at an early age. For optimal treatment planning and follow-up, the use of medical imaging is pivotal. In recent years, the use of cone-beam computed tomography (CBCT) for dental and maxillofacial applications has risen exponentially. It is currently considered as the imaging modality of choice for several dental applications. It has also been increasingly used for developmental disorders, such as cleft lip and palate (CLP). However, because young children have a high sensitivity to ionizing radiation, it is essential to justify and optimize each CBCT examination, adhering to the fundamental principles of radiation protection. Currently, both of these issues are addressed at the level of individual clinical centres, and a consistency is lacking. This project aims to harmonize the use of CBCT for developmental disorders by addressing the following two aspects of radiation protection: 1. Justification of CBCT examinations throughout the treatment process. This task aims to evaluate, for different developmental disorders, at which stage the use of CBCT is indicated (i.e. when the benefit outweighs the risk). The benefit will be assessed through a retrospective assessment of treatment decision and treatment outcome for a sample of patients at both involved centers, whereas the risk will be estimated as a population-based lifetime attributable cancer risk, derived from patient-specific radiation dose simulation. 2. Optimization of CBCT examinations. This task aims to develop a standardized approach for the optimization of CBCT for developmental disorders, ensuring that the radiation dose for each examination is as low as reasonably achievable. Specifically, it comprises the development and application of objective image quality criteria that can be used to determine the clinical acceptability of a CBCT scan.
<b>4. List 5 key words</b>
Dentistry, Cone-beam computed tomography, Cleft lip/palate, Developmental disorders, Optimization