Volumetric Echography in Obstetrics and Gynaecology –
From Mere Hope to Substantial Progress

- Habilitation Thesis -
Summary

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The habilitation thesis is an important moment, and it requires a thorough overview of my activity in the past twelve years.

Since the beginning of my career, I have been involved in the ultrasound diagnosis in Obstetrics and Gynaecology, both in clinical activity, as well as in research. Since then, I have also witnessed the exceptional speed at which ultrasound systems have evolved in terms of resolution and performance.

The probes needed for volumetric reconstructions have become accessible for over twenty-five years ago. This technique is no longer novelty – countless studies have been published, and 3D/4D are the focus of many sessions in the most renowned congresses and international conferences. And yet the question of their clinical application in Obstetrics and Gynaecology still constitutes a heated debate. This issue has made for a considerable part of my work in the past few years.

There is no doubt that 3D Echography offers impressive images of the fetal structures. However, the majority of fetal medicine specialists are hesitant; the scientific added value in the antenatal diagnosis, beyond just producing „nice images”, is yet to be proven.

On the other hand, volumetric ultrasound has progressed at an outstanding speed in Gynaecology. So far numerous clinical applications have been proposed, accepted by the majority of medical professionals. A good example of this is the diagnosis of uterine congenital anomalies. The 3D Echography appears to have established itself as the strongest investigation that can simultaneously evaluate the internal contour (the endometrial cavity) and the external one (the fundus contour) of the uterus in the coronal plan (which is inaccessible in 2D). It can also show the relationship between them, and has the potential of fully characterise the uterine morphology. Currently, many steps are being taken in order to propose 3D Echography as the gold standard, so that other types of investigations (such as hysterosalpingography, hysteroscopy, laparoscopy, nuclear magnetic resonance) may be compared against it, in terms of accuracy and benefits.

The habilitation thesis is a synthesis of my professional and academic activity succeeding my PhD Thesis: *Third trimester pregnancy Echographic research. Ultrasound Examination – between expectations and limitations. It’s role in optimization of pregnancy management in high obstetrical risk pregnancies* (MECTS No. 3824, 03.05.2006).
The habilitation thesis is structured into three chapters, according to CNATDCU recommendations.

The first chapter (A) succinctly presents my scientific, professional and academic achievements. The chapter is divided into three subchapters: the first describes the results of my research in the antenatal diagnosis, and the second describes the results of research in volumetric echography. The last subchapter deals with the significance of interdisciplinarity in research, and my conclusions.

My personal achievements are to be seen in the current context of research in prenatal diagnosis, and are highlighted by three oral communications at the Fetal Medicine Foundation World Congress, something unprecedented for Romania (2011, 2013, 2016).

The results of my research in Craiova Unit of Prenatal Diagnosis have been orally communicated to the most significant international scientific manifestations, the most recent one being the ISUOG World Congress (International Society of Ultrasound in Obstetrics and Gynecology), where I have had a record number of oral presentations. Even more so, the unit I now run has had its activity presented in this congress from 2007 onwards.

The most significant publication within the field of the Habilitation Thesis is the first one to be published in the world-leading journal on Ultrasound in Obstetrics and Gynaecology, by single affiliation authors (University of Medicine and Pharmacy Craiova): Tudorache Ştefania, Cara M, Iliescu D., Novac L., Cernea N., First trimester two- and four-dimensional cardiac scan - intra and interobserver agreement, Ultrasound Obstet Gynecol 2013, Nr.6, Vol.42, 659-668.


The project, among other things, achieved the goal of aiding the next generation of leaders in the field of research in prenatal ultrasound diagnosis, and has helped build collaborations and international experience exchanges with research groups in the field.

I have completed a Master Program in Health Services Management (University of Medicine and Pharmacy Craiova), 2015-2016, with a mark of 9.83.
Among the acquired skills I can say I have a better scientific understanding of the management process, and it has helped me with undertaking personal responsibility regarding managing activities within the clinical practice.

I have been thesis coordinator for PhD fellows and Bachelor students alike, and I have undertaken daily activities of theoretical and practical education of our residents.

I am also the first Romanian to have been extended an invitation into an international research group focused on volumetric echography (3D Special Interest Group ISUOG). I am part of the editorial board of an international journal, as well as being a reviewer for numerous publications in international journals.

Chapter B is titled “Career Evolution Strategies”. This chapter reveals my vision in regards to the best strategies for developing the activity of the Prenatal Diagnosis Unit, as well as identifying opportunities for developing my academic career within our University. An important subchapter reunites developing strategies of international academic cooperation. Another one discusses modalities for improving the prenatal screening techniques in Romania.

After presenting my Habilitation Thesis I intend to begin the necessary formalities in order to lead PhD theses. This objective implies a certain volume of work and immense responsibility, both on a personal level, as well as from the point of view of the doctoral school that I shall represent.

I will continue to attend conferences and congresses, and work even harder to raise the visibility of the Prenatal Diagnosis Unit Craiova and UMF Craiova, focusing mainly on:

- Optimizing prenatal diagnosis
- 2D, 3D, 4D fetal echocardiography. Antenatal diagnosis of isolated cardiac congenital disease
- Echography in Gynaecology. 3D screening for mullerian congenital anomalies.

The third chapter (C) presents bibliographical references associated with the content of the first two chapters.

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