

The POSEIDON Criteria and Its Measure of Success Through the Eyes of Clinicians and Embryologists

Sandro C. Esteves^{1*}, Carlo Alviggi², Peter Humaidan^{3,4}, Robert Fischer⁵, Claus Y. Andersen⁶, Alessandro Conforti², Klaus Bühler^{7,8}, Sesh K. Sunkara⁹, Nikolaos P. Polyzos¹⁰, Daniela Galliano¹¹, Michael Grynberg¹², Hakan Yarali¹³, Irem Y. Özbek¹³, Matheus Roque¹⁴, Lan N. Vuong^{15,16}, Manish Banker¹⁷, Laura Rienzi¹⁸, Alberto Vaiarelli¹⁸, Danilo Cimadomo¹⁸ and Filippo M. Ubaldi¹⁸

¹ ANDROFERT, Andrology and Human Reproduction Clinic, Campinas, Brazil, ² Department of Neuroscience, Reproductive Science and Odontostomatology, University of Naples Federico II, Naples, Italy, ³ Fertility Clinic Skive, Skive Regional Hospital, Skive, Denmark, ⁴ Faculty of Health, Aarhus University, Aarhus, Denmark, ⁵ Fertility Center Hamburg, Hamburg, Germany, ⁶ Laboratory of Reproductive Biology, Faculty of Health and Medical Sciences, University Hospital of Copenhagen, Copenhagen, Denmark, ⁷ Center for Gynecology, Endocrinology, and Reproductive Medicine, Ulm, Germany, ⁸ Department of Gynaecology, Jena-University Hospital-Friedrich, Schiller University, Jena, Germany, ⁹ Faculty of Life Sciences and Medicine, King's College London, London, United Kingdom, ¹⁰ Dexeus University Hospital, Barcelona, Spain, ¹¹ Istituto Valenciano de Infertilitat, Rome, Italy, ¹² Service de Médecine de la Reproduction et Préservation de la Fertilité, Hôpital Antoine Bécélère, Clamart, France, ¹³ Anatolia IVF, Ankara, Turkey, ¹⁴ ORIGEN, Center for Reproductive Medicine, Rio de Janeiro, Brazil, ¹⁵ Department of Obstetrics and Gynecology, University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam, ¹⁶ IVFMD, My Duc Hospital, Ho Chi Minh City, Vietnam, ¹⁷ Nova IVI Fertility, Ahmedabad, India, ¹⁸ GENERA, Center for Reproductive Medicine, Rome, Italy

This article represents a viewpoint on the POSEIDON criteria by a group of clinicians and embryologists. Its primary objective is to contextualize the Poseidon criteria and their metric of success for the relevant Frontiers Research Topic "POSEIDON's Stratification of Low Prognosis Patients in ART: The WHY, the WHAT, and the HOW". "Low prognosis" relates with reduced oocyte number, which can be associated with low or sometimes a normal ovarian reserve and is aggravated by advanced female age. These aspects will ultimately affect the number of embryos generated and consequently, the cumulative live birth rate. The novel system relies on female age, ovarian reserve markers, ovarian sensitivity to exogenous gonadotropin, and the number of oocytes retrieved, which will both identify the patients with low prognosis and stratify such patients into one of four groups of women with "expected" or "unexpected" impaired ovarian response to exogenous gonadotropin stimulation. Furthermore, the POSEIDON group introduced a new measure of clinical success in ART, namely, the ability to retrieve the number of oocytes needed to obtain at least one euploid blastocyst for transfer in each patient. Using the POSEIDON criteria, the clinician can firstly identify and classify patients who have low prognosis in ART, and secondly, aim at designing an individualized treatment plan to maximize the chances of achieving the POSEIDON measure of success in each of the four low prognosis groups. The novel POSEIDON classification system is anticipated to improve counseling and management of low prognosis patients undergoing ART, with an expected positive effect on reproductive success and a reduction in the time to live birth.