The 2017 World Health Organization classification of tumors of the pituitary gland, in addition to hormone immunohistochemistry, recognizes the role of other immunohistochemical markers including but not limited to pituitary transcription factors. Recognizing this novel approach, the fourth edition of the WHO classification has abandoned the concept of “a hormone-producing pituitary neuroendocrine tumor” and adopted a pituitary adenohypophyseal cell lineage designation of the adenomas with subsequent categorization of histological variants according to hormone content and specific histological and immunohistochemical features. This new classification does not require a routine ultrastructural examination of these tumors. The new definition of the Null cell adenoma requires the demonstration of immunonegativity for pituitary transcription factors and adenohypophyseal hormones Moreover, the term of atypical pituitary neuroendocrine tumor is no longer recommended. In addition to the accurate tumor subtyping, assessment of the tumor proliferative potential by mitotic count and Ki-67 index, and other clinical parameters such as tumor invasion, is strongly recommended in individual cases for consideration of clinically aggressive adenomas. This classification also recognizes some subtypes of pituitary neuroendocrine tumors as “high-risk pituitary neuroendocrine tumors” due to the clinical aggressive behavior; these include the sparsely granulated somatotroph adenoma, the lactotroph adenoma in men, the Crooke's cell adenoma, the silent corticotroph adenoma, and the newly introduced plurihormonal Pit-1-positive adenoma (previously known as silent subtype III pituitary neuroendocrine tumor). An additional novel aspect of the new WHO classification was also the definition of the spectrum of thyroid transcription factor-1 expressing pituitary tumors of the posterior lobe as representing a morphological spectrum of a single nosological entity. These tumors include the pituicytoma, the spindle cell oncocytoma, the granular cell tumor of the neurohypophysis, and the sellar ependymoma [1].

1)
Mete O, Lopes MB. Overview of the 2017 WHO Classification of Pituitary Tumors. Endocr Pathol. 2017 Sep;28(3):228-243. doi: 10.1007/s12022-017-9498-z. Review. PubMed PMID: 28766057.