

## Multiple Endocrine Neoplasia type 1 (MEN1)

### Identity

**Note** Multiple Endocrine Neoplasia type 1 or Wermer's syndrome (MEN1) is a complex disease predisposing to a variety of endocrine tumors multifocal and/or bilateral localization and uncommonly to non-endocrine tumors mainly of the skin and central nervous system

**Other names** Wermer's syndrome

**Inheritance** an autosomal dominant disorder with high penetrance (increasing with age: 90% by age 50 yrs) but variable expressivity (with phenotype/genotype correlations); frequency is unknown but estimated between 1/50000 and 1/30000

### Clinics

**Phenotype and clinics** Onset of the disease occurs commonly between 15 and 40 yrs and most patients (90-100%) present primary hyperparathyroidism related to multiglandular hyperplasia and/or adenomas; other endocrine lesions and relative percentages are neuroendocrine tumors of the pancreas (either functional such as gastrinomas, insulinoma, and more rarely glucagonoma, VIPoma or non functional) (50-70%), pituitary adenoma (20-40%), adrenocortical hyperplasia, adenomas or cancers (20-70%) and thymic/bronchial neuroendocrine tumors (5-10%); cutaneous lesions, such as angiofibromas, collagenomas, lentiginosis, melanocytic lesions and lipoma might occur in 5-10% of MEN1 patients; less common lesions are infratentorial papillary ependymoma, [rhabdomyosarcoma](#) and leiomyosarcoma, and [renal](#) and [thyroid](#) cancers

**Neoplastic risk** pancreatic neuroendocrine tumors such as gastrinoma have malignant evolution in 30 to 50% of the cases. Insulinoma might be frequently benign. Most aggressive tumors are glucagonoma and VIPoma (VIP: vasoactive intestinal peptide) in pancreas and some tumors occurring in the adrenal cortex.  
[pituitary adenomas](#) in MEN1 are classical benign lesions but complications might be related to local nervous compression by the tumor.  
parathyroid adenomas in MEN1 remain benign lesions  
cutaneous and CNS (Central Nervous System) lesions in MEN1 might be malignant in a few cases. Strikingly, melanomas, [ependymomas](#) and rare [astrocytomas](#) observed in the MEN1 context have better prognosis than the same lesions occurring sporadically

**Treatment** parathyroids : the recommended procedure is 3 and half parathyroidectomy and cautious exploration of the thymic tissues in

which ectopic adenomas and/or carcinoids (neuroendocrine tumors) have been described

pancreas : in most cases (insulinoma, glucagonomas, > 2cm non functional tumors, surgery is a best procedure and might be duodenopancreatomy in the heavy cases; nevertheless, in gastrinomas and non functional small tumors identified by US endoscopy, the best procedure is the medical (antacid) treatment and a careful follow-up of patients.

pituitary adenomas : the treatment is the same as for sporadic lesions

adrenal glands tumors : surgery is the best recommended procedure when lesions are clearly identified by imagery

thymic/bronchial carcinoids : they must be cured by surgery because they are malignant and alter prognosis in MEN1 patients

**Prognosis** according to the severity of the disease in a given patient, and to the quality of a regular follow up; mean age at death is relatively similar to that of the general population; nevertheless, death may occur early in life (10 to 50yr) due to the complications of hormonal secretions by tumors (hemorrhagic ulcers, malignant hypercalcaemia, carcinoid syndromes) or evolution of the malignant process (pancreatic neuroendocrine tumors and thoracic carcinoids): 50 yrs; a presymptomatic diagnosis improves survival data and might prevent earlier the main causes of death in this disease

## Genes involved and Proteins

### Gene Name

[MEN1](#)

Location 11q13

### DNA/RNA

Description 10 exons

### Protein

Description 610 amino-acids, 67 Kda; contains two nuclear localization signals

Expression wide

Function growth-suppressor gene

### Mutations

Germinal causes multiple endocrine neoplasia type 1

## External links

[GeneCards](#) [MEN1](#)

[GDB](#) [MEN1](#)

[OMIM](#) [131100](#)

[Orphanet](#) [Multiple endocrine neoplasia type 1](#)

[HGMD](#) [120173](#)

Other  
database [MEN1 mutation database](#)

Other  
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