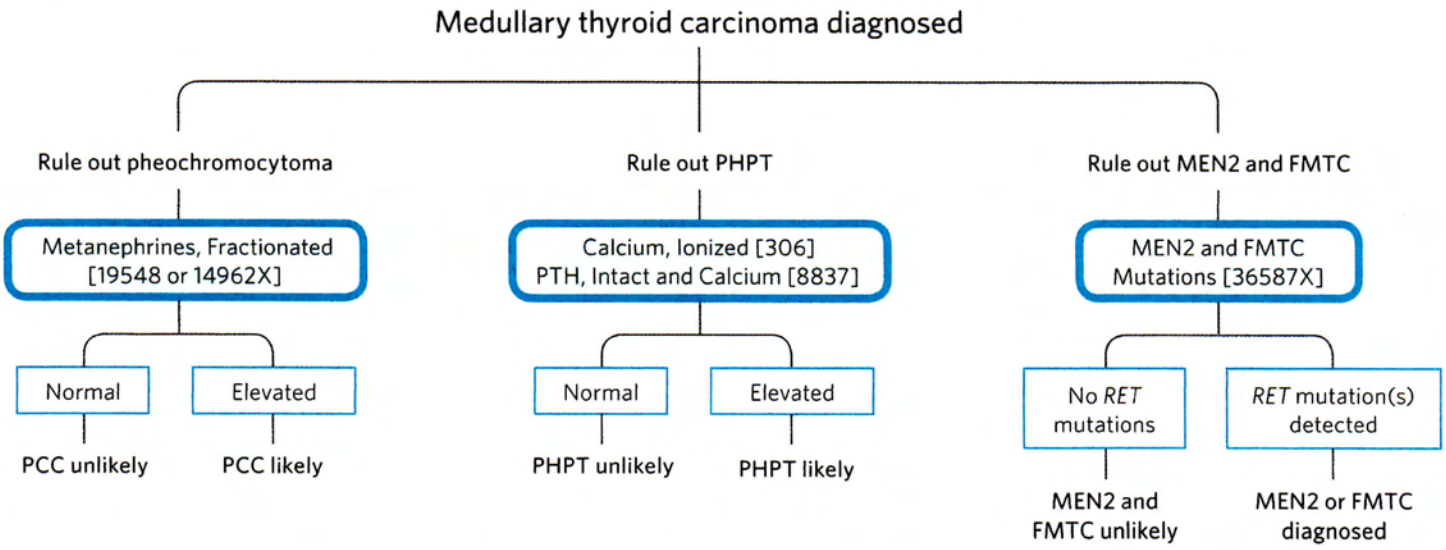
Figure 3. Rule Out Inherited MTC (MEN2 and FMTC)



Although 80% of MTC cases are sporadic, inherited syndromes such as MEN2 or FMTC should be ruled in or out before determining surgical strategy.[3] This is accomplished by testing for pheochromocytoma, which may occur in MEN 2A and 2B, and for primary hyperparathyroidism, which may occur in MEN 2A. *RET* mutations should be sought as an indicator of MEN2 and FMTC. Test codes are shown in brackets. MEN 2 indicates multiple endocrine neoplasia type 2; FMTC, familial medullary thyroid carcinoma; PHPT, primary hyperparathyroidism; PTH, parathyroid hormone; and PCC, pheochromocytoma.

This figure was developed by Quest Diagnostics based on references 3 and 5. It is provided for informational purposes only and is not intended as medical advice. A physician's test selection and interpretation, diagnosis, and patient management decisions should be based on his/her education, clinical expertise, and assessment of the patient.

Test Guide

Table 2. Additional Laboratory Testing for Medullary Thyroid Carcinoma (MTC) and Related Disorders[3,5]

Test Code	Test Name	Method	Specimen Requirements	Clinical Use
30742X	Calcitonin	ICMA	1 mL frozen serum (red-top tube [no gel]); 0.5 mL minimum	Monitor MTC for recurrent/ residual disease
306	Calcium, Ionized	Ion-specific electrode	2 mL RT serum (SST, red-top–plastic tube); minimum 0.6 mL. Centrifuge with the cap on and ship.	Rule PHPT in or out in patients with MTC
978	Carcinoembryonic Antigen (CEA)	ICMA	1 mL RT serum (red-top tube [no gel]); 0.5 mL minimum	Monitor MTC for recurrent/ residual disease
15018	CEA with HAMA Treatment	HAMA precipitation followed by ICMA	2 mL RT serum (red-top tube [no gel]); 1 mL minimum	
36587X	MEN2 and FMTC Mutations, Exons 10, 11, 13-16[a]	PCR and DNA sequencing	5 mL RT whole blood (EDTA, lavender-top tube); 3.0 mL minimum	Diagnose familial MTC and MEN2 in affected individuals and their family members
19548	Metanephrines, Fractionated, Free, LC/MS/MS, Plasma	LC/MS/MS	2.5 mL refrigerated plasma (EDTA, lavender-top tube); 1.5 mL minimum	Diagnose or rule out pheochromocytoma in patients with MTC
14962X	Metanephrines, Fractionated, LC/MS/MS, 24-Hour Urine	LC/MS/MS	5 mL RT urine; minimum 1.5 mL. After collection of 24-hour urine, record volume and add 25 mL 6N HCl.	
8837	PTH, Intact and Calcium	Immunoassay; spectrometry	2 mL frozen serum (red-top SST tube); 1.0 mL minimum. Spin and separate serum.	Diagnose or rule out PHPT in patients with MTC

ICMA, immunochemiluminometric assay; MTC, medullary thyroid carcinoma; RT, room temperature; PHPT, primary hyperparathyroidism; HAMA, human anti-mouse antibodies; MEN2, multiple endocrine neoplasia type 2; LC/MS/MS, liquid chromatography tandem mass spectrometry; PTH, parathyroid hormone.

[a] This test was developed and its performance characteristics have been determined by Quest Diagnostics Nichols Institute. Performance characteristics refer to the analytical performance of the test.

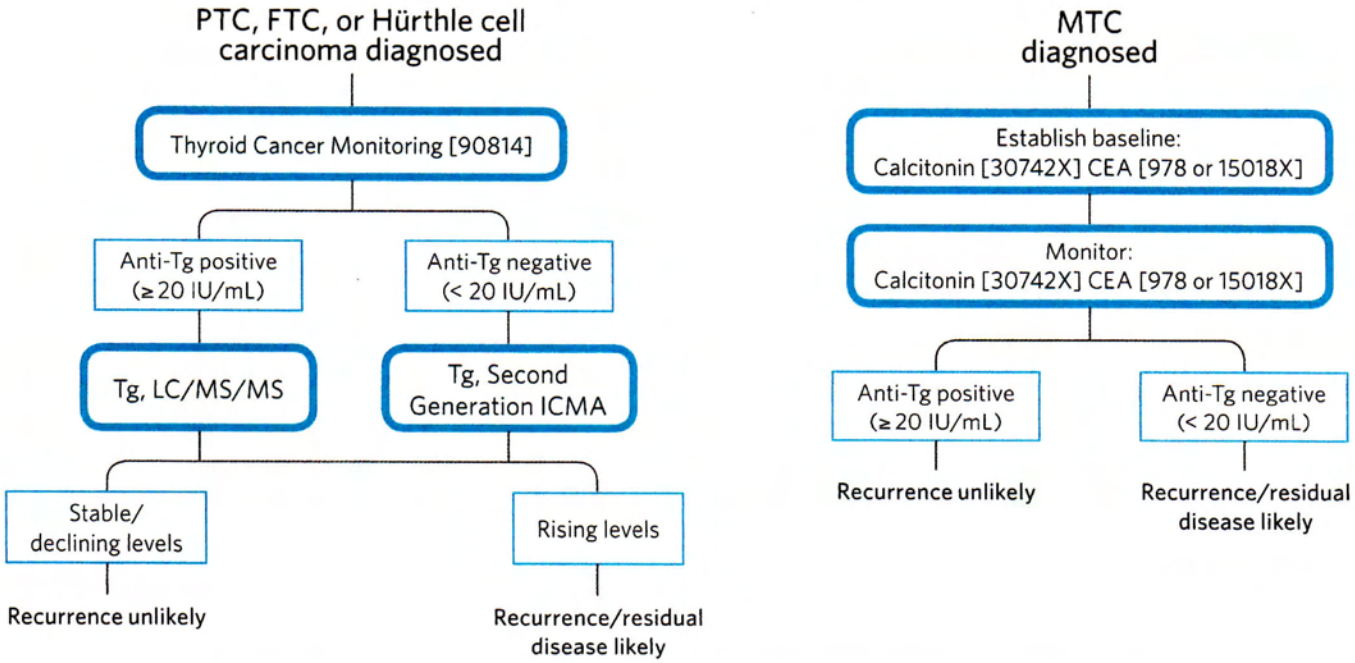
Table 3. Post-surgical Monitoring of PTC, FTC, and Hürthle Cell Carcinoma[2,3]

Test Code	Test Name	Method	Specimen Requirements	Clinical Use
90814	Thyroid Cancer Monitoring[a] Includes thyroglobulin antibody and reflex to thyroglobulin using either LC/MS/MS or ICMA (Second Generation, Beckman Coulter)	ECL with reflex to LC/MS/MS or ICMA	2.5 mL RT serum (red-top tube [no gel]); 1.5 mL minimum.	Monitor patients for recurrent/ persistent disease
30278	Thyroglobulin Panel Includes thyroglobulin antibody and thyroglobulin (Siemens)	ICMA	2 mL RT serum (red-top tube [no gel]); 0.8 mL minimum.	Monitor patients for recurrent/ persistent disease
19584X	Thyroglobulin Panel with HAMA Treatment Includes thyroglobulin antibody, sample pretreatment for HAMA, and thyroglobulin (Siemens)	ICMA	2 mL RT serum (red-top tube [no gel]); 1.5 mL minimum.	

LC/MS/MS, liquid chromatography tandem mass spectrometry; ICMA, immunochemiluminometric assay; ECL, electrochemiluminescence; RT, room temperature; HAMA, human anti-mouse antibodies.

[a] This test was developed and its performance characteristics have been determined by Quest Diagnostics Nichols Institute. Performance characteristics refer to the analytical performance of the test.

Figure 4. Post-thyroid Surgery Monitoring



Thyroglobulin measurements should be done 2-12 weeks post-surgery to detect residual disease and then every 6-12 months to detect recurrent disease. Such testing is most sensitive when thyroxine suppression therapy is stopped or when recombinant human TSH is used to stimulate thyroglobulin release.[3] Calcitonin and CEA should be measured before surgery to establish a baseline and then 2-3 months after surgery to detect residual disease. Monitoring should continue every 6-12 months thereafter to detect recurrent disease. Test codes are shown in brackets. PTC indicates papillary thyroid carcinoma; FTC, follicular thyroid carcinoma; MTC, medullary thyroid carcinoma; Tg, thyroglobulin; and CEA, carcinoembryonic antigen.

This figure was developed by Quest Diagnostics based on references 2, 3, and 5. It is provided for informational purposes only and is not intended as medical advice. A physician's test selection and interpretation, diagnosis, and patient management decisions should be based on his/her education, clinical expertise, and assessment of the patient.

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