

**Supplementary Table 1. Recommendations for Korean Thyroid Association Pediatric Thyroid Cancer Management Guideline**

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V.1. Preoperative Evaluation

V.1.1. Preoperative Imaging

V.1.1.A. In pediatric thyroid cancer patients with confirmed ETE or LNM, imaging studies, including lateral neck and mediastinal lymph nodes, should be performed to determine the surgical extent. Recommendation Level 1

V.2. Considerations for High-Risk Groups for Thyroid Cancers

V.2.1. Hereditary Tumor Syndrome

V.2.1.A. Genetic testing is recommended when hereditary tumor syndrome is suspected. Recommendation Level 1

V.2.2. Childhood Cancer Survivors

V.2.2.A. For pediatric cancer survivors who have received systemic or head and neck radiation, total thyroidectomy is recommended for the management of thyroid cancer. Recommendation Level 1

V.2.2.B. In pediatric cancer survivors who have received radiation or chemotherapy, treatment decisions should consider the increased risk of complications associated with radioactive iodine (RAI) therapy. Recommendation Level 2

V.3. Surgery

V.3.1. Principles of Surgery

V.3.1.A. In pediatric DTC patients, total thyroidectomy should be considered as the treatment of choice. Recommendation Level 2

V.3.1.B. For pediatric patients with low-risk PTC, lobectomy may be considered. Recommendation Level 3

V.3.1.C. In pediatric thyroid cancer patients with confirmed central or lateral LNM pre- or intraoperatively, therapeutic CND should be performed. Recommendation Level 1

V.3.1.D. Prophylactic CND may be performed in cases of advanced thyroid cancer (e.g., ETE, vessel invasion, or distant metastasis). Recommendation Level 2

V.3.1.E. Therapeutic lateral neck dissection should be performed in pediatric patients with evident lateral LNM preoperatively. Recommendation Level 1

V.3.1.F. Surgery for pediatric DTC should be performed by an experienced surgeon. Recommendation Level 3

V.4. Postoperative Risk Stratification and Follow-Up Based on Disease Status

V.4.1. Postoperative Initial Risk Stratification (3-Tier Pediatric Risk Classification)

V.4.1.A. Postoperative risk classification in pediatric thyroid cancer patients follows a 3-tier pediatric risk classification based on tumor size, ETE, and extent of metastasis. Recommendation Level 2

V.4.1.B. The low-risk category includes patients without ETE, with LNM classified as N0/Nx, or with minimal micrometastasis ( $\leq 0.2$  cm) in N1a after prophylactic CND. Recommendation Level 2

V.4.1.C. The intermediate-risk category includes extensive N1a LNM or micrometastasis in N1b. Recommendation Level 2

V.4.1.D. The high-risk category includes advanced primary tumors (T4) or extensive N1b LNM, potentially with distant metastasis. Recommendation Level 2

V.4.2. Postoperative Follow-Up

V.4.2.A. In intermediate- and high-risk groups, the measurement of TSH-stimulated Tg level and diagnostic RAI scan may be conducted within 12 weeks to determine the need for RAI therapy. Recommendation Level 2

V.4.2.B. If iodine uptake is observed in distant metastatic lesions or inoperable neck lesions on a diagnostic scan, RAI therapy can be administered. Recommendation Level 2

V.4.2.C. Pediatric thyroid cancer patients in growth spurts, where levothyroxine dosing may vary, should undergo follow-up every 3–6 months. Recommendation Level 2

V.4.2.D. Pediatric thyroid cancer patients with hypoparathyroidism, which may increase calcium and vitamin D requirements during growth phases, should also have follow-up every 3–6 months. Recommendation Level 2

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**Supplementary Table 1. Recommendations for Korean Thyroid Association Pediatric Thyroid Cancer Management Guideline (continued)**

V.5. RAI Therapy

- V.5.A. The decision for RAI therapy in pediatric thyroid cancer patients should be based on a multidisciplinary evaluation of benefits and risks. Recommendation Level 2
- V.5.B. RAI therapy is recommended for pulmonary micrometastasis with iodine uptake in pediatric DTC. Recommendation Level 1
- V.5.C. In pediatric patients with persistent lesions that cannot be surgically removed but show iodine uptake, RAI therapy may be considered. Recommendation Level 2
- V.5.D. In pediatric DTC patients, the dose for RAI therapy should be determined according to weight-based empirical dosing or the calculated maximum tolerable radiation dose, based on therapeutic goals. Recommendation Level 3

V.6. Treatment and Follow-Up for Recurrence or Persistent Lesions

- V.6.A. In pediatric patients with elevated Tg or Tg antibodies during follow-up, neck ultrasound should be performed as a priority. Recommendation Level 1
- V.6.B. For pediatric thyroid cancer patients with resectable recurrent lesions in the neck, surgery should be considered as the primary option. Recommendation Level 1
- V.6.C. In pediatric patients with inoperable recurrent neck lesions or new pulmonary metastasis during follow-up, a whole-body RAI scan should be conducted. Recommendation Level 1
- V.6.D. RAI therapy may be considered for inoperable recurrent neck lesions with iodine uptake. Recommendation Level 2
- V.6.E. Newly identified pulmonary metastasis in pediatric patients that shows iodine uptake should be treated with RAI therapy. Recommendation Level 1
- V.6.F. After RAI therapy, pulmonary metastatic lesions showing uptake should be monitored at appropriate intervals to assess treatment response. If progression persists, additional RAI therapy should be considered, balancing risks and benefits. Recommendation Level 2

V.7. Treatment for RAI-Refractory Pediatric DTC

- V.7.A. Pediatric patients with asymptomatic, non-progressive, RAI-refractory DTC may be monitored with continued TSH suppression therapy. Recommendation Level 2
- V.7.B. Genetic mutation testing of tumor tissue should be considered in pediatric patients with persistent or recurrent RAI-refractory thyroid cancer. Recommendation Level 3
- V.7.C. Systemic therapy based on identified genetic mutations may be considered for inoperable, progressive, RAI-refractory pediatric papillary thyroid cancer. Recommendation Level 2

ETE, extrathyroidal extension; CND, central lymph node metastasis; LNM, lymph node metastasis; DTC, differentiated thyroid cancer; RAI, radioactive iodine therapy; Tg, thyroglobulin; PTC, papillary thyroid cancer.