



中山醫學大學附設醫院

甲狀腺癌診療指引

本臨床指引參考國家衛生研究院、美國ATA、與美國NCCN版本

甲狀腺癌多專科醫療團隊編修

甲狀腺癌治療指引制訂日期
2026/04/13 Version 9.1
2025/11/17 Version 9.0
2024/11/25 Version 8.0
2023/11/27 Version 7.0
2022/11/14 Version 6.0
2021/12/27 Version 5.0
2020/12/28 Version 4.0
2019/12/09 Version 3.0
2018/11/20 Version 2.0
2018/01/19 Version 1.0

癌症委員會主任委員	癌症委員會執行長	癌症中心主任	抗癌藥物安全小組	團隊負責人



修訂內容

頁數	原文	修訂/增修
1	穿刺結果: Suspicious for follicular neoplasm 、 Suspicious for malignancy 、 Malignant 採 手術	穿刺結果: Suspicious for follicular neoplasm 、 Suspicious for malignancy 、 Malignant ， 新增路 徑: active surveillance(限 cT1aN0M0)

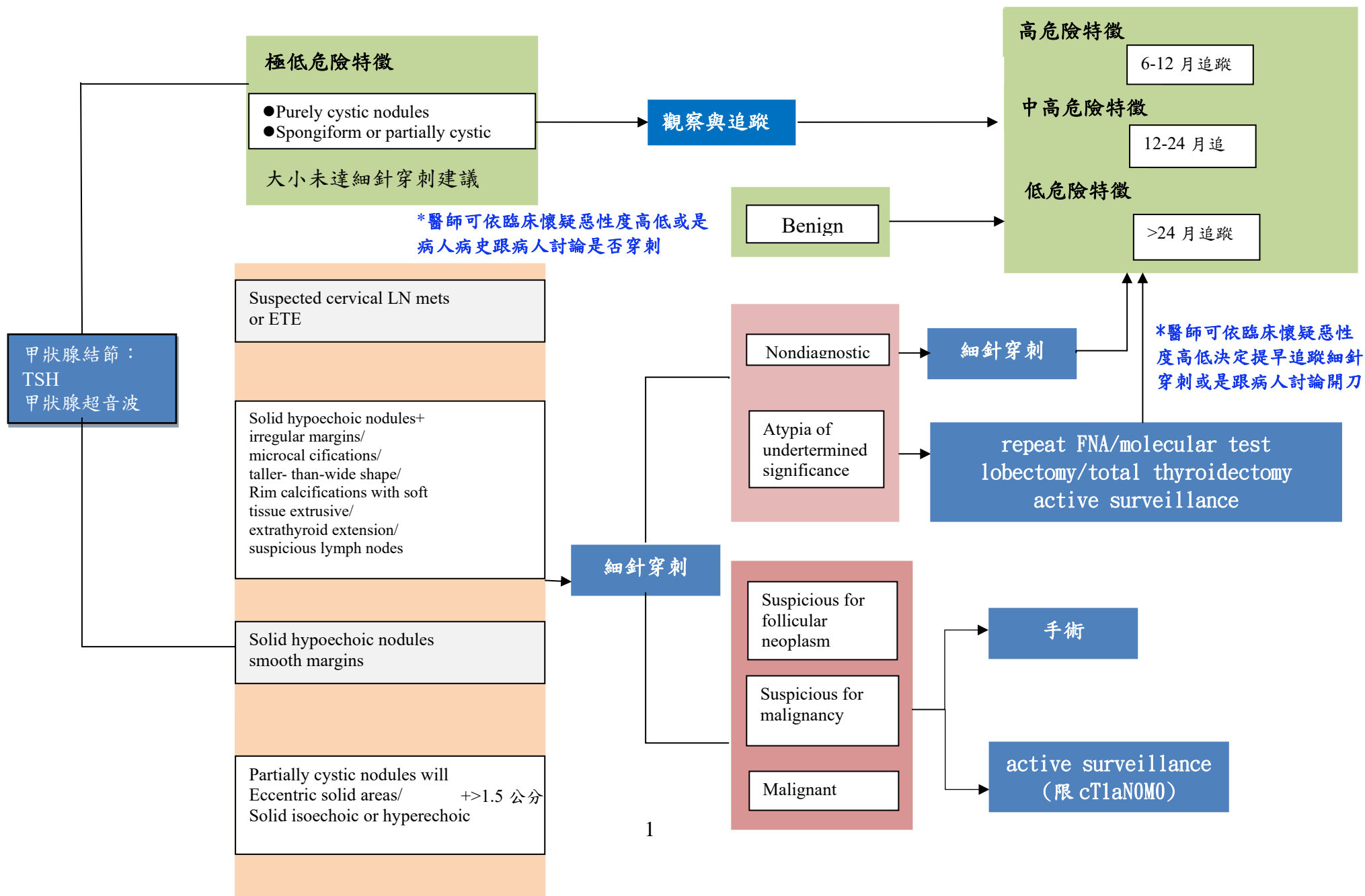


目 錄

一、	甲狀腺結節	1
二、	甲狀腺癌術前評估	2
三、	手術治療方式	3
四、	術後評估與治療	6
五、	2025 ATA Risk of Recurrence Categories for Differentiated Thyroid Cancer	7
六、	術後碘-131 治療原則	8
七、	手術及碘-131 治療後追蹤	12
八、	復發或轉移治療建議	14
九、	碘-131 治療無效治療建議	16
十、	放射線治療	18
十一、	標靶治療處方及免疫治療及化療處方	19
十二、	AJCC 8 edition	26
十三、	甲狀腺完治定義	28
十四、	參考文獻(Reference)	29



一、甲狀腺結節





二、甲狀腺癌術前評估

一般術前評估：

胸部 X 光

心電圖

一般血液學

肝、腎功能檢查

+

甲狀腺癌術前評估：

*主要檢查

頸部超音波 + 淋巴結評估

*選擇性檢查

- 頸部 CT 或 MRI (建議使用在聲帶麻痺、出血壓迫、有基因風險、淋巴結轉移、遠端轉移)
- B、C 型肝炎檢查
- 會診 ENT 做 Laryngoscopy for vocal cord mobility(如：頸部手術過)



三、手術治療方式

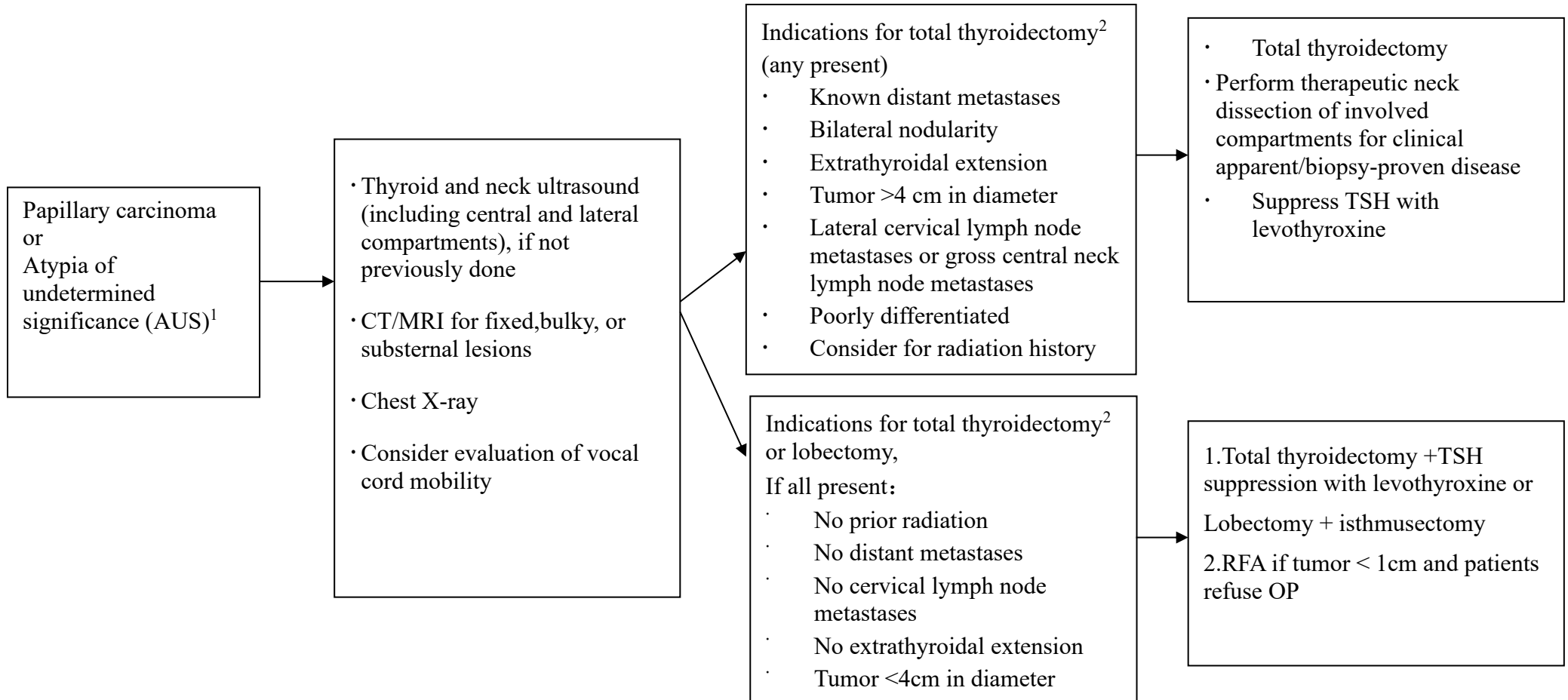
1. 乳突癌 (Papillary Carcinoma)

細針抽吸結果

評估

手術方式考量

治療

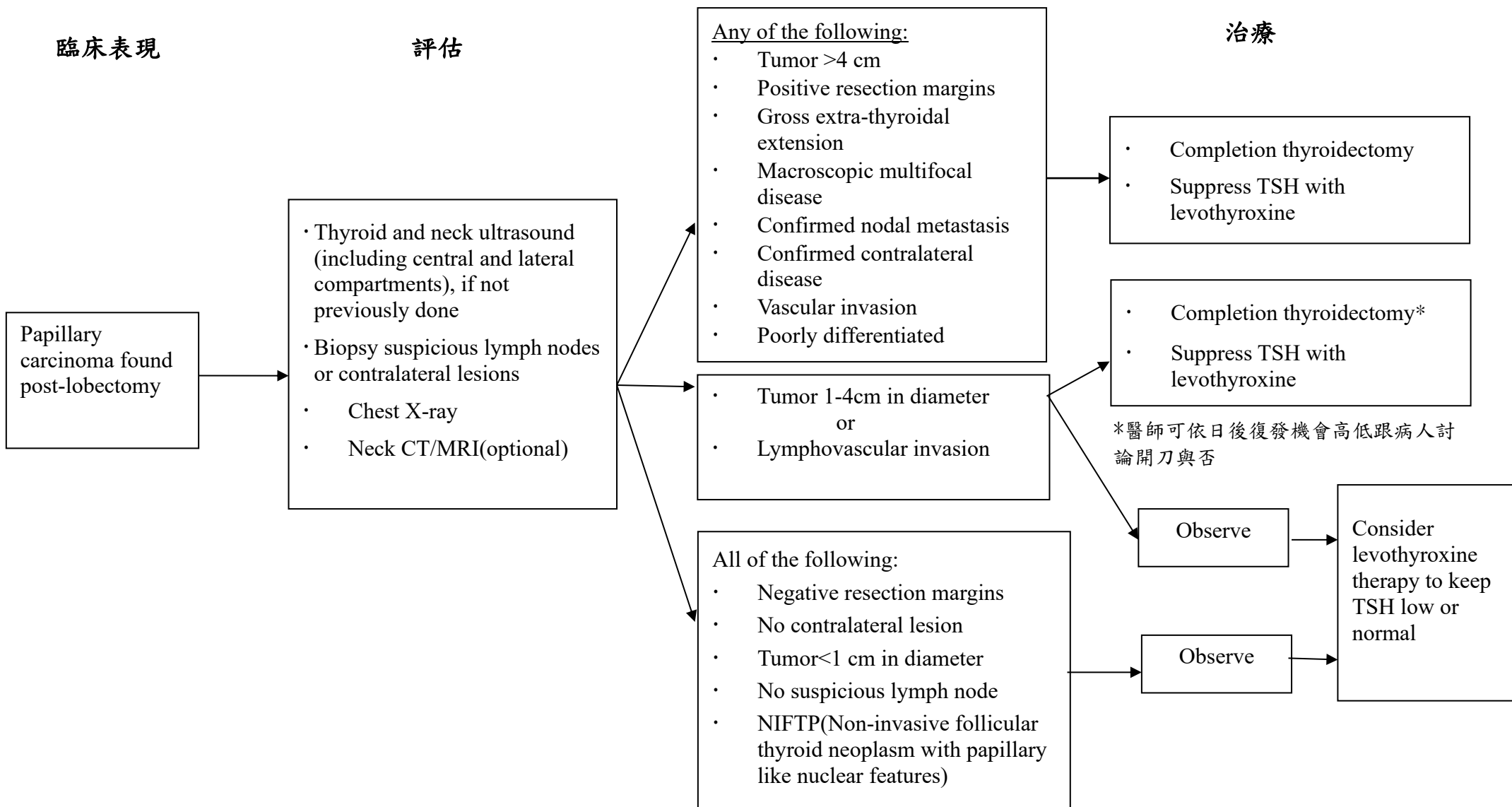


¹AUS with high clinical suspicion of malignancy may consider lobectomy or total thyroidectomy for definitive diagnosis/treatment

²For those who underwent total thyroidectomy, lesion site lobectomy with frozen section might be considered



2. 術前認為良性之病灶，作單葉切除術後確認為乳突癌(Papillary carcinoma found post-lobectomy)



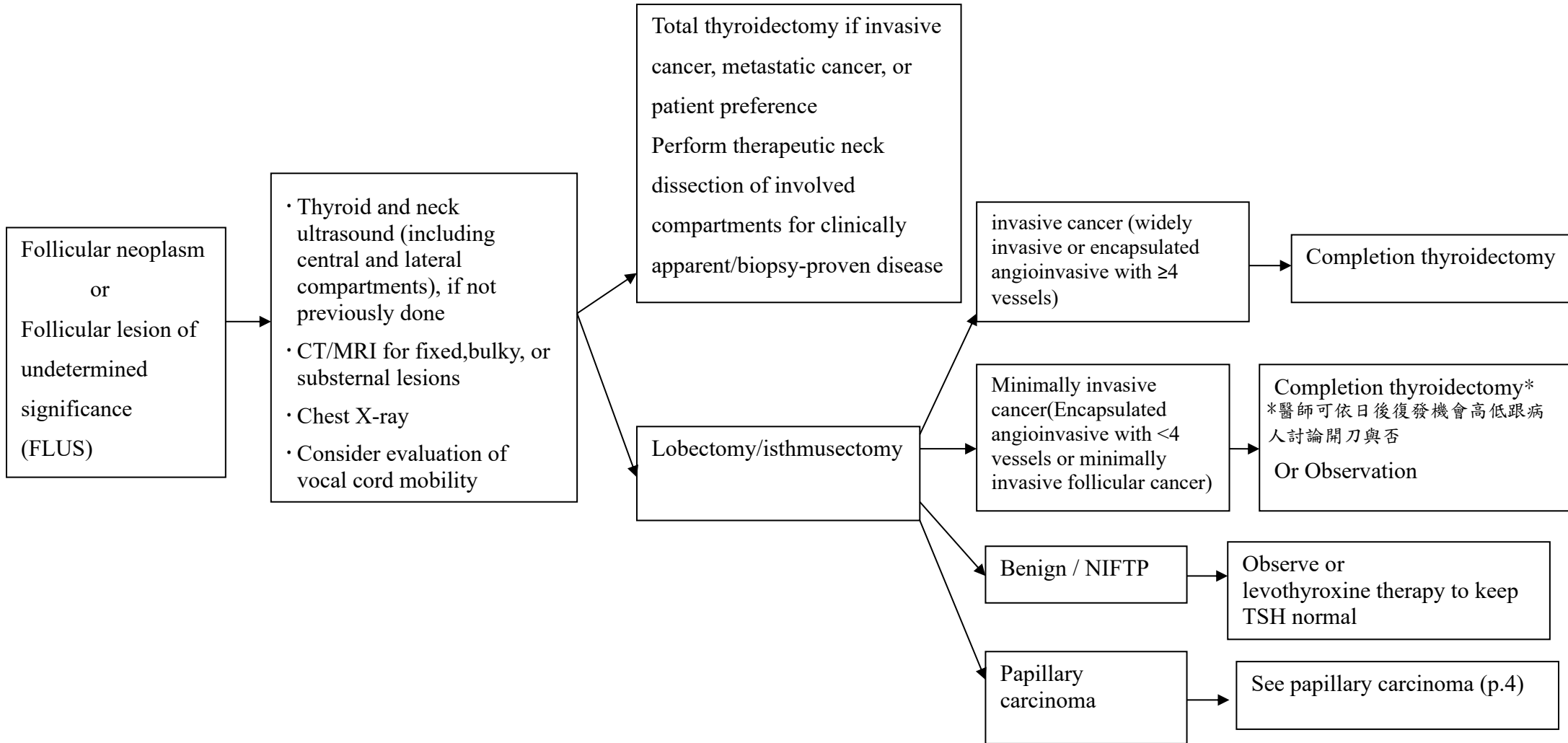


3. 濾泡癌 (Follicular Carcinoma)

細針抽吸結果

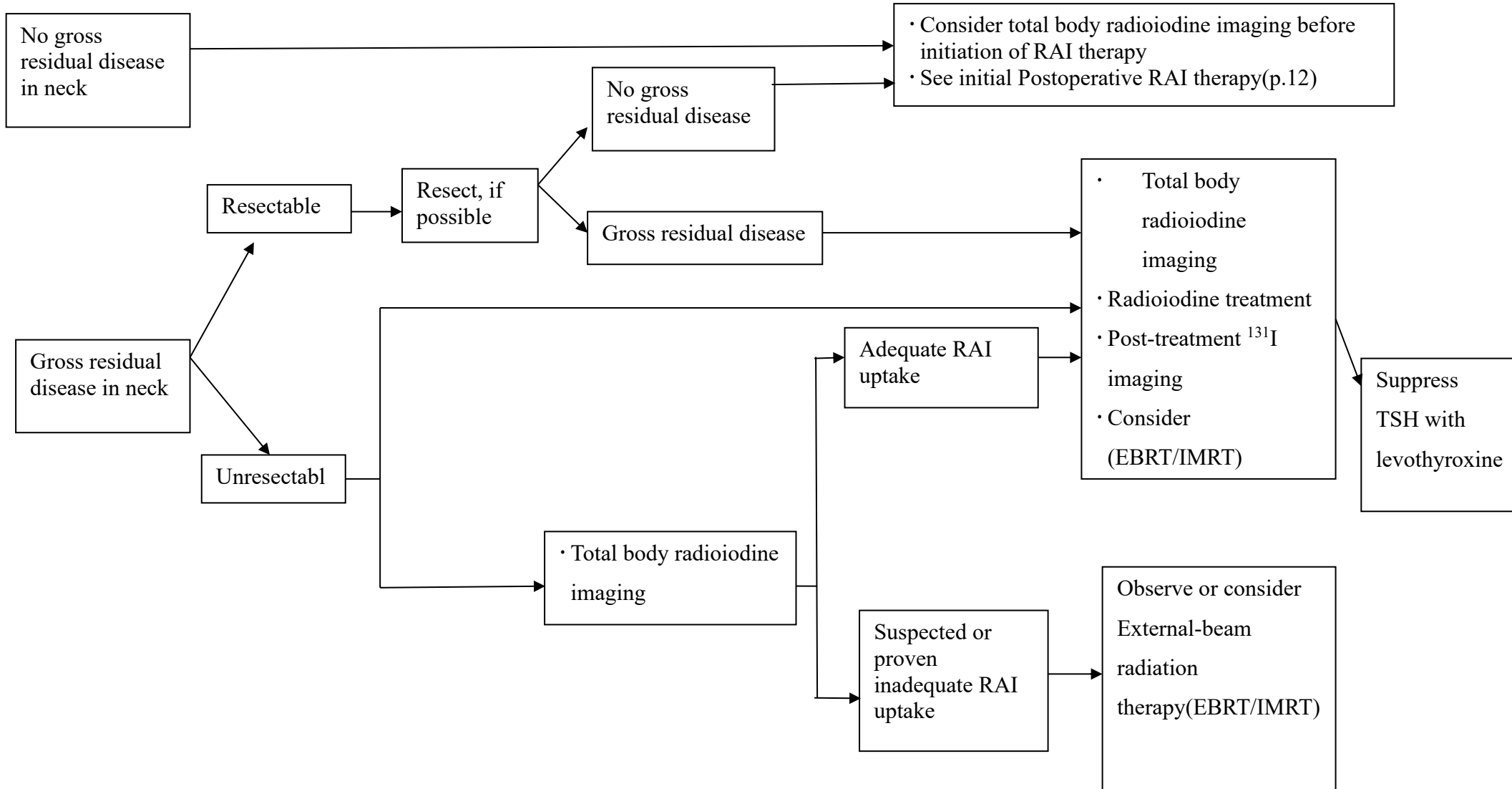
評估

治療





四、術後評估與治療





五、2025 ATA Risk of Recurrence Categories for Differentiated Thyroid Cancer

癌症類型	Low risk (<10%)	Low-intermediate risk (10–15%)	Intermediate-high risk (16–30%)	High risk (>30%)
Papillary Thyroid Carcinoma (PTC)	<ul style="list-style-type: none"> •單發、局限於甲狀腺內之T1a腫瘤(≤1 cm) •無血管侵犯、無顯微鏡外侵犯 •無淋巴結轉移(N0) 	<ul style="list-style-type: none"> •多發性T1a(≤1cm)伴顯微鏡外侵犯 •限於頸部的少數微小淋巴轉移(<5個、<2 mm) 	<ul style="list-style-type: none"> •顯著外侵犯(gross ETE) •≥5個淋巴轉移或直徑>2 mm但<3 cm •Tall cell, Columnar cell 或 Diffuse sclerosing variant 	<ul style="list-style-type: none"> •巨大或多部位轉移性淋巴結(>3 cm) •遠端轉移(M1) •腫瘤邊緣陽性(R1/R2) •BRAF V600E+TERT promoter mutation
Follicular Thyroid Carcinoma (FTC) / Invasive Encapsulated Follicular Variant of PTC (IEFVPTC)	<ul style="list-style-type: none"> •僅限於被膜侵犯或輕微血管侵犯(<4個血管) •無遠端轉移 	<ul style="list-style-type: none"> •血管侵犯中度(4–5個血管)但無遠端轉移 	<ul style="list-style-type: none"> •廣泛血管侵犯(>5個血管)或顯著被膜穿透 •腫瘤>4cm或局部侵犯鄰近組織 	<ul style="list-style-type: none"> •廣泛侵犯或有遠端轉移(骨、肺等) •TP53 或 TERT promoter mutation陽性
Oncocytic Thyroid Carcinoma (OTC)	<ul style="list-style-type: none"> •局限性、被膜完整、無血管侵犯 	<ul style="list-style-type: none"> •輕度血管侵犯、腫瘤≤4 cm 	<ul style="list-style-type: none"> •廣泛血管侵犯或顯著局部侵犯 	<ul style="list-style-type: none"> •遠端轉移 •非放射性碘親和(RAI-refractory) •TP53 或 DAXX/ATRX mutation 相關高危型



六、術後碘-131治療原則

2025 ATA — Postoperative Radioiodine (¹³¹I) Therapy by Risk Category

Risk Category	Typical RAI Recommendation	Typical ¹³¹ I Activity (GBq / mCi)	Primary Goal of Therapy	Clinical Context / Comments
Low risk (<10%)	Usually not recommended	1.1–1.85 GBq (30–50 mCi) <i>if used</i>	None or remnant ablation only	<ul style="list-style-type: none"> • No gross ETE, no LN metastases, no vascular invasion • RAI can be omitted if stimulated Tg <1 ng/mL and negative ultrasound • If used, low-dose ablation may be considered for remnant visualization only.
Low-intermediate risk (10–15%)	Consider RAI based on postoperative Tg, histology, and age	1.1–3.7 GBq (30–100 mCi)	Remnant ablation ± adjuvant therapy	<ul style="list-style-type: none"> • For limited nodal disease (≤5 LN, all <2 mm) • RAI may be beneficial in older patients or those with adverse histology (tall cell, diffuse sclerosing) • Post-therapy scan usually negative or mild uptake in remnant only.
Intermediate-high risk (16–30%)	Advised to receive RAI	3.7 GBq (100 mCi) typical; may range 1.1–5.55 GBq (30–150 mCi)	Adjuvant therapy (eradicate microscopic residual disease)	<ul style="list-style-type: none"> • For multiple LN metastases (>5 nodes, any >2 mm), minimal extrathyroidal extension, vascular invasion, or Tg >10 ng/mL • Post-therapy scan may show nodal uptake • RAI improves recurrence-free survival per SEER and meta-analyses.



六、術後碘-131治療原則-續

2025 ATA — Postoperative Radioiodine (¹³¹I) Therapy by Risk Category-續

Risk Category	Typical RAI Recommendation	Typical ¹³¹ I Activity (GBq / mCi)	Primary Goal of Therapy	Clinical Context / Comments
High risk (>30%)	Strongly recommended	3.7–5.55 GBq (100–150 mCi)	Adjuvant and therapeutic (treat known disease)	<ul style="list-style-type: none"> Gross ETE, LN >3 cm, distant metastases (M1), positive margins Post-therapy scan often reveals iodine-avid disease Repeat or dosimetry-guided RAI may be indicated TSH should be maximally stimulated (>30 mIU/L).
Distant metastases (RAI-avid)	Yes – Required	3.7–7.4 GBq (100–200 mCi) or dosimetry-guided	Treatment of known metastatic disease	<ul style="list-style-type: none"> Lung, bone, or brain metastases that uptake RAI May repeat every 6–12 months depending on Tg and imaging response Monitor cumulative dose <22–26 GBq (600–700 mCi) to avoid marrow toxicity.
RAI-refractory or post-therapy scan negative	No further RAI	—	—	<ul style="list-style-type: none"> If Tg persistently elevated but post-therapy scan negative → define as RAI-refractory DTC (see Recommendation 59–61) Proceed to TKI (lenvatinib, sorafenib, selipercatinib, etc.) or targeted therapy per genotype.



六、術後碘-131治療原則-續

*碘-131 劑量

小劑量

門診：<30mCi for ablation

大劑量

同位素病房：80 mCi, 100 mCi, 120 mCi, 150 mCi, 200 mCi

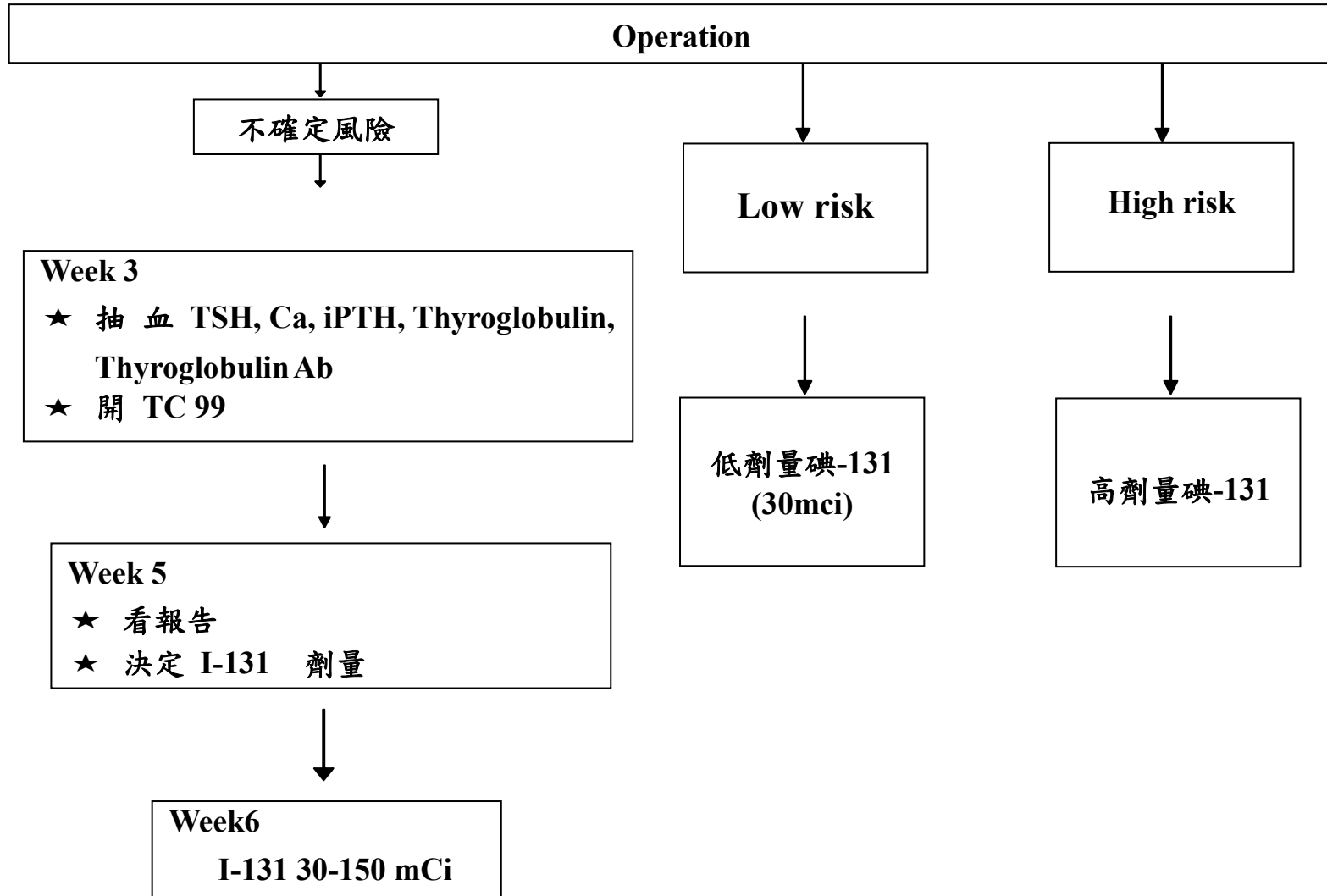
*年紀>70 建議 100-150 mCi

*腎功能不全 建議劑量少一點

*高復發風險 建議 100-200 mCi



CSMUH Post-operation follow-up protocol





七、手術及碘-131治療後追蹤

Response Category	Definition (ATA 2025)	Typical Tg / Imaging Features	Approx. Recurrence Risk (per 2025 ATA)
Excellent response	No biochemical or structural evidence of persistent thyroid cancer (i.e., remission).	<ul style="list-style-type: none"> - Suppressed Tg <0.2 ng/mL or stimulated Tg <1 ng/mL- Negative imaging (US/WBS/CT) - Stable or undetectable anti-Tg antibody (TgAb) 	1–4% overall; <2% in low-risk; up to 15% in initial high-risk group
Indeterminate response	Nonspecific findings on imaging or mildly elevated Tg levels; TgAb stable or declining; may represent minimal residual tissue but not structural disease	<ul style="list-style-type: none"> - Stimulated Tg 1–10 ng/mL or mild TgAb positivity - Nonspecific imaging findings (no proven disease) 	5–20% depending on histology and baseline risk



Biochemically incomplete response	Elevated Tg or rising TgAb levels without radiological evidence of disease	<ul style="list-style-type: none">- Stimulated Tg >10 ng/mL or increasing Tg/TgAb trend- No visible lesions on imaging	20–53% recurrence or persistence; combined biochemical + structural up to 85%
Structurally incomplete response	Structural (imaging or biopsy-proven) evidence of disease recurrence, often with elevated Tg and/or TgAb	<ul style="list-style-type: none">- Lesion on ultrasound, CT, PET, or WBS- Tg or TgAb usually elevated	>80% show persistent disease or progression



八、復發或轉移治療建議

2025 ATA — Management of Recurrent or Metastatic Differentiated Thyroid Cancer

Clinical Setting	Recommended Management	Supporting Notes / Key Evidence
Locoregional residual or recurrent disease (neck or thyroid bed)	Surgery — preferred when feasible (therapeutic central or lateral neck dissection) Percutaneous ethanol injection (PEI) — alternative for high-risk surgical candidates Radiofrequency ablation (RFA) — option for small-volume recurrent lesions, especially when surgery contraindicated	<ul style="list-style-type: none"> • Decision based on extent, anatomic location, growth rate, patient comorbidities, and prior surgery • Recurrence after “excellent response” usually <15%; rising Tg/TgAb requires PET/CT or cross-sectional imaging to localize lesions
Oligometastatic or solitary distant metastases	Local therapy — surgery, thermal ablation (RFA, microwave), or stereotactic radiation if technically feasible	<ul style="list-style-type: none"> • May provide long-term control or even cure in selected cases • Considered when disease is slow-growing and iodine-refractory (RAIR)
Iodine-avid distant metastases (lung/bone)	RAI therapy (¹³¹ I) — dosimetry-guided or empiric 100–200 mCi (3.7–7.4 GBq)	<ul style="list-style-type: none"> • Repeat every 6–12 months if uptake persists and disease regresses • Favorable genotypes include RAS mutation and RET fusion; BRAF V600E, TERT, TP53 predict resistance



RAI-refractory disease (no uptake or progression despite RAI)	<p>Systemic therapy:</p> <ul style="list-style-type: none"> • Multikinase inhibitors (lenvatinib, sorafenib) for progressive symptomatic disease • Selective targeted therapy (RET, NTRK, BRAF, ALK inhibitors) per genomic profile • Immunotherapy (PD-1 blockade) in selected clinical trial settings 	<ul style="list-style-type: none"> • Localized oligoprogression may still benefit from local therapy before systemic initiation • Goal is to delay systemic toxicity and preserve quality of life
Symptomatic bone metastases	External beam radiotherapy (EBRT) or RFA/cryotherapy, ± bisphosphonate or denosumab.	• ATA notes bone metastases in ~25% of advanced DTC; often non-RAI-avid
Brain metastases	Surgery or stereotactic radiosurgery (SRS) ± systemic therapy	• RAI only if iodine-avid; otherwise local control prioritized
Follow-up / monitoring after recurrence treatment	<ul style="list-style-type: none"> • Tg/TgAb every 3–6 months initially • Neck ultrasound and/or diagnostic imaging per risk level • PET/CT if biochemical progression without localization 	• Dynamic reassessment of “response to therapy” (Excellent / Biochemical / Structural incomplete) guides TSH suppression and surveillance intensity



九、碘-131治療無效治療建議

Therapeutic Modality	ATA 2025 Recommendations / Evidence	Key Clinical Context
1. Systemic therapy (Multikinase Inhibitors, MKI)	Lenvatinib 與 Sorafenib 為首選 VEGFR MKI 治療進展性 RAIR DTC；可延長 PFS 與 disease control rate。	適用於症狀性或影像學持續進展病人。
2. Selective targeted therapy (Genotype-directed)	RET fusion positive → Selpercatinib 或 Pralsetinib (首選一線)。 NTRK fusion positive → Larotrectinib 或 Entrectinib (若病灶小且無症狀，可觀察)。	精準治療為 RAIR 管理核心；需 NGS 確認基因型。
3. Re-differentiation therapy	可考慮 MEK 抑制劑 (Selumetinib 等) 或 BRAF/MEK(Dabrafenib/trametinib) 聯合療法 以恢復碘親和性；屬研究性或臨床試驗建議。	適合部分 BRAF 或 RAS 突變病人，可重新嘗試 RAI。
4. Local therapy for oligometastatic lesions	若為少數轉移且緩慢進展，可採手術、RFA、SBRT 等局部治療。	延緩全身治療時機，改善局部控制。



5. Supportive care / Bone targeted therapy	骨轉移可使用 EBRT、RFA、Bisphosphonate 或 Denosumab 以緩解症狀。	約 25 % RAIR DTC 有骨轉移。
6. Immunotherapy / Clinical trials	指南鼓勵參與 PD-1 或多靶點免疫治療臨床試驗。	針對多線治療失效或 genomic wild-type 患者。



十、放射線治療

Differentiated, Medullary, or Poorly Differentiated (non-anaplastic)

Thyroid Cancer

- Adjuvant RT for high-risk disease (after R1 resection)
 - Microscopic disease (thyroid bed, involved resected lymph node regions): 60–66 Gy in 1.8–2 Gy per fraction
 - Elective nodal regions: 50–56 Gy in 1.6–2 Gy per fraction
- Salvage RT after R2 resection or inoperable patients
 - Gross disease: 66–70 Gy in 1.8–2 Gy per fraction
 - Microscopic disease (thyroid bed, involved resected lymph node regions): 60–66 Gy in 1.8–2 Gy per fraction
 - Elective nodal regions: 50–56 Gy in 1.6–2 Gy per fraction
- Palliative RT of metastases
 - Bony or soft-tissue metastases²²
 - For patients with oligometastatic disease and good performance status consider higher doses (45–60 Gy) in 1.8–2 Gy daily fractions, or SBRT following principles for treatment of oligometastases
 - For patients with widely metastatic disease and/or poor performance status limiting life expectancy, consider 8 Gy in 1 fraction; 20 Gy in 5 daily fractions; 30 Gy in 10 daily fractions
 - CNS metastases
 - ≤4 metastases – consider stereotactic radiosurgery (SRS) either following surgical resection or as monotherapy
 - Multiple metastases:
 - ◆ Consider enrollment on clinical trial for SRS versus whole brain radiation therapy (WBRT) (with or without hippocampal avoidance)
 - ◆ WBRT – 30 Gy in 10 daily fractions; consider 45 Gy in 1.8 Gy daily fractions for good performance status.

Anaplastic Thyroid Cancer

- Adjuvant RT after R0 or R1 resection^{14,25-27}
 - Microscopic disease/high-risk regions: 60–66 Gy in 1.2 Gy twice daily fractions or 1.8–2 Gy daily fractions
 - Elective nodal regions can be treated with SIB: 45–54 Gy in 0.8–1.0 Gy twice-daily fractions or 1.6–1.8 Gy once-daily fraction
 - Chemoradiation may be considered on an individual basis.
- Salvage RT after R2 resection or inoperable patients
 - Gross disease: 66–70 Gy in 1.2 Gy twice-daily fractions or 1.8–2 Gy daily fractions
 - Microscopic disease/high-risk regions: 60–66 Gy in 1.2 Gy twice daily fractions or 1.8–2 Gy daily fractions
 - Elective nodal regions can be treated with SIB: 45–54 Gy in 0.8–1.0 Gy twice-daily fractions or 1.6–1.8 Gy once-daily fraction
 - Chemoradiation may be considered on an individual basis.¹³
- Palliative neck RT : 20 Gy in 5 daily fractions, 30 Gy in 10 daily fractions, 45 Gy in 15 daily fractions
- Palliative RT of metastases
 - Bony or soft tissue metastases : 8 Gy in 1 fraction; 20 Gy in 5 daily fractions; 30 Gy in 10 daily fractions
 - CNS metastases : Whole brain radiation – 30 Gy in 10 daily fractions



十一、標靶治療處方及免疫治療處方與化療處方

1. 標靶治療處方(Kinase Inhibitor Therapy)

藥名(學名)	Lenvatinib 24mg Oral Daily
健保給付	用於放射性碘治療無效之局部晚期或轉移性的進行性(progressive)分化型甲狀腺癌(RAI-RDTC)： (1)需經事前審查核准後使用，每次申請之療程以3個月為限，送審時需檢送影像資料，每3個月評估一次。 (2)Lenvatinib 與 sorafenib 不得合併使用。(109/8/1)
Ref.	<i>Schlumberger M, Tahara M, Wirth LJ, Robinson B, Brose MS, Elisei R, Habra MA, Newbold K, Shah MH, Hoff AO, Gianoukakis AG, Kiyota N, Taylor MH, Kim SB, Krzyzanowska MK, Dutcus CE, de las Heras B, Zhu J, Sherman SI. Lenvatinib versus placebo in radioiodine-refractory thyroid cancer. N Engl J Med. 2015 Feb 12;372(7):621-30. doi: 10.1056/NEJMoa1406470. PMID: 25671254.</i>

藥名(學名)	Sorafenib 400mg Oral Twice daily
健保給付	用於放射性碘治療無效之局部晚期或轉移性的進行性(progressive)分化型甲狀腺癌(RAI-RDTC)：(106/1/1) (1)放射性碘治療無效之局部晚期或轉移性的進行性(progressive)分化型甲狀腺癌。 (2)需經事前審查核准後使用，每次申請之療程以3個月為限，送審時需檢送影像資料，每3個月評估一次。 (3)Sorafenib 與 lenvatinib 不得合併使用。(107/7/1)
Ref.	<i>Brose MS, Nutting CM, Jarzab B, Elisei R, Siena S, Bastholt L, de la Fouchardiere C, Pacini F, Paschke R, Shong YK, Sherman SI, Smit JW, Chung J, Kappeler C, Peña C, Molnár I, Schlumberger MJ; DECISION investigators. Sorafenib in radioactive iodine-refractory, locally advanced or metastatic differentiated thyroid cancer: a randomised, double-blind, phase 3 trial. Lancet. 2014 Jul 26;384(9940):319-28. doi: 10.1016/S0140-6736(14)60421-9. Epub 2014 Apr 24. PMID: 24768112; PMCID: PMC4366116.</i>



藥名(學名)	Cabozantinib 60mg Daily
健保給付	(1)適用於治療成人及 12 歲以上兒童曾接受 VEGFR 標靶治療後惡化、放射碘治療無效或不適用放射碘治療的局部晚期或轉移性分化型甲狀腺癌病人。 (2)須經事前審查核准後使用，每次申請療程以 3 個月為限，送審時需檢送影像資料，每 3 個月評估一次，無疾病惡化方可繼續使用。 (3)每日限用 1 粒。
Ref.	<i>Elghawy, O., Barsouk, A., Xu, J., Chen, S., Cohen, R. B., & Sun, L. (2024). Real world outcomes of cabozantinib therapy in poorly differentiated thyroid carcinoma. European Thyroid Journal, 13(6).</i>

For BRAF V600E mutation that has progressed following prior treatment with no satisfactory alternative treatment options

藥名(學名)	Dabrafenib/trametinib Dabrafenib 150 mg PO Twice daily Trametinib 2mg PO Once daily
健保給付	無
Ref.	<i>Subbiah V, Kreitman RJ, Wainberg ZA, Cho JY, Schellens JHM, Soria JC, Wen PY, Zielinski C, Cabanillas ME, Urbanowitz G, Mookerjee B, Wang D, Rangwala F, Keam B. Dabrafenib and Trametinib Treatment in Patients With Locally Advanced or Metastatic BRAF V600-Mutant Anaplastic Thyroid Cancer. J Clin Oncol. 2018 Jan 1;36(1):7-13. doi: 10.1200/JCO.2017.73.6785. Epub 2017 Oct 26. PMID: 29072975; PMCID: PMC5791845.</i> <i>Subbiah, V., Kreitman, R. J., Wainberg, Z. A., Cho, J. Y., Schellens, J. H. M., Soria, J. C., ... & Keam, B. (2022). Dabrafenib plus trametinib in patients with BRAF V600E-mutant anaplastic thyroid cancer: updated analysis from the phase II ROAR basket study. Annals of oncology, 33(4), 406-415.</i>

For NTRK gene fusion positive

藥名(學名)	Larotrectinib 100 mg PO Twice daily
健保給付	用於放射性碘治療無效之局部晚期或轉移性的進行性 (progressive) 甲狀腺癌。
Ref.	<i>Drilon A, Laetsch TW, Kummar S, DuBois SG, Lassen UN, Demetri GD, Nathenson M, Doebele RC, Farago AF, Pappo AS, Turpin B, Dowlati A, Brose MS, Mascarenhas L, Federman N, Berlin J, El-Deiry WS, Baik C, Deeken J, Boni V, Nagasubramanian R, Taylor M, Rudzinski ER, Meric-Bernstam F, Sohal DPS, Ma PC, Raetz LE, Hechtman JF, Benayed R, Ladanyi M, Tuch BB, Ebata K, Cruickshank S, Ku NC, Cox MC, Hawkins DS, Hong DS, Hyman DM. Efficacy of Larotrectinib in TRK Fusion-Positive Cancers in Adults and Children. N Engl J Med. 2018 Feb 22;378(8):731-739. doi: 10.1056/NEJMoa1714448. PMID: 29466156; PMCID: PMC5857389.</i> <i>Waguespack, S. G., Drilon, A., Lin, J. J., Brose, M. S., McDermott, R., Almubarak, M., ... & Cabanillas, M. E. (2022). Efficacy and safety of larotrectinib in patients with TRK fusion-positive thyroid carcinoma. European journal of endocrinology, 186(6), 631-643..</i>



藥名(學名)	Entrectinib 600mg PO Once daily
健保給付	無
Ref.	<i>Bazhenova, L., Hescot, S., Folprecht, G., Daga, H., Massarelli, E., Lamartina, L., ... & Carrizosa, D. (2022, September). Entrectinib in patients with ntrk fusion-positive (ntrk-fp) thyroid cancer: updated data from startrk-2. In Endocrine Abstracts (Vol. 84). Bioscientifica.</i> <i>Doebele RC, Drilon A, Paz-Ares L, Siena S, Shaw AT, Farago AF, Blakely CM, Seto T, Cho BC, Tosi D, Besse B, Chawla SP, Bazhenova L, Krauss JC, Chae YK, Barve M, Garrido-Laguna I, Liu SV, Conkling P, John T, Fakih M, Sigal D, Loong HH, Buchschacher GL Jr, Garrido P, Nieva J, Steuer C, Overbeck TR, Bowles DW, Fox E, Riehl T, Chow-Maneval E, Simmons B, Cui N, Johnson A, Eng S, Wilson TR, Demetri GD; trial investigators. Entrectinib in patients with advanced or metastatic NTRK fusion-positive solid tumours: integrated analysis of three phase 1-2 trials. Lancet Oncol. 2020 Feb;21(2):271-282. doi: 10.1016/S1470-2045(19)30691-6. Epub 2019 Dec 11. Erratum in: Lancet Oncol. 2020 Feb;21(2):e70. doi: 10.1016/S1470-2045(20)30029-2. Erratum in: Lancet Oncol. 2020 Jul;21(7):e341. doi: 10.1016/S1470-2045(20)30345-4. Erratum in: Lancet Oncol. 2020 Aug;21(8):e372. doi: 10.1016/S1470-2045(20)30382-X. Erratum in: Lancet Oncol. 2021 Oct;22(10):e428. doi: 10.1016/S1470-2045(21)00538-6. PMID: 31838007; PMCID: PMC7461630.</i>

For RET fusion positive

藥名(學名)	Selpercatinib 120 mg PO (< 50 kg) or 160 mg PO (≥ 50 kg) Twice daily
健保給付	無
Ref.	<i>Bradford, D., Larkins, E., Mushti, S. L., Rodriguez, L., Skimmer, A. M., Helms, W. S., ... & Singh, H. (2021). FDA approval summary: selpercatinib for the treatment of lung and thyroid cancers with RET gene mutations or fusions. Clinical Cancer Research, 27(8), 2130-2135.</i> <i>Wirth LJ, Sherman E, Robinson B, Solomon B, Kang H, Lorch J, Worden F, Brose M, Patel J, Leboulleux S, Godbert Y, Barlesi F, Morris JC, Owonikoko TK, Tan DSW, Gautschi O, Weiss J, de la Fouchardière C, Burkard ME, Laskin J, Taylor MH, Kroiss M, Medioni J, Goldman JW, Bauer TM, Levy B, Zhu VW, Lakhani N, Moreno V, Ebata K, Nguyen M, Heirich D, Zhu EY, Huang X, Yang L, Kherani J, Rothenberg SM, Drilon A, Subbiah V, Shah MH, Cabanillas ME. Efficacy of Selpercatinib in RET-Altered Thyroid Cancers. N Engl J Med. 2020 Aug 27;383(9):825-835. doi: 10.1056/NEJMoa2005651. PMID: 32846061; PMCID: PMC10777663.</i>



藥名(學名)	Pralsetinib 400mg PO Once daily
健保給付	無
Ref.	<i>Kim, J., Bradford, D., Larkins, E., Pai-Scherf, L. H., Chatterjee, S., Mishra-Kalyani, P. S., ... & Singh, H. (2021). FDA approval summary: pralsetinib for the treatment of lung and thyroid cancers with RET gene mutations or fusions. Clinical Cancer Research, 27(20), 5452-5456.</i> <i>Subbiah V, Hu MI, Wirth LJ, Schuler M, Mansfield AS, Curigliano G, Brose MS, Zhu VW, Lebloulex S, Bowles DW, Baik CS, Adkins D, Keam B, Matos I, Garralda E, Gainor JF, Lopes G, Lin CC, Godbert Y, Sarker D, Miller SG, Clifford C, Zhang H, Turner CD, Taylor MH. Pralsetinib for patients with advanced or metastatic RET-altered thyroid cancer (ARROW): a multi-cohort, open-label, registrational, phase 1/2 study. Lancet Diabetes Endocrinol. 2021 Aug;9(8):491-501. doi: 10.1016/S2213-8587(21)00120-0. Epub 2021 Jun 9. Erratum in: Lancet Diabetes Endocrinol. 2021 Oct;9(10):e4. doi: 10.1016/S2213-8587(21)00247-3. PMID: 34118198.</i>

Consider if clinical trials or other systemic therapies are not available or appropriatef

藥名(學名)	Vandetanib Max 300mg Oral Daily
健保給付	適用於無法進行手術切除的局部侵犯或轉移性甲狀腺髓質癌，並且為症狀性及疾病侵襲性的患者。 1.需經事前審查核准後使用，每次申請之療程以6個月為限，送審時需檢送影像資料，每6個月評估一次。 2.出現疾病惡化或無法忍受之藥物不良反應，應立即停用。 3.每日最大劑量為300毫克。
Ref.	<i>Wells SA Jr, Robinson BG, Gagel RF, Dralle H, Fagin JA, Santoro M, Baudin E, Elisei R, Jarzab B, Vasselli JR, Read J, Langmuir P, Ryan AJ, Schlumberger MJ. Vandetanib in patients with locally advanced or metastatic medullary thyroid cancer: a randomized, double-blind phase III trial. J Clin Oncol. 2012 Jan 10;30(2):134-41. doi: 10.1200/JCO.2011.35.5040. Epub 2011 Oct 24. Erratum in: J Clin Oncol. 2013 Aug 20;31(24):3049. PMID: 22025146; PMCID: PMC3675689.</i>



2. 免疫治療處方

Regimen		Pembrolizumab				
Drug Combination(學名藥)	Dosage	Route of administration	Times	Frequency/Duration	Notes	
pembrolizumab	200 mg	IV	drip 30 mins, on day 1	every 3 weeks		
or						
pembrolizumab	400mg	IV	drip 30 mins, on day 1	every 6 weeks		
Ref.	<i>Oh, D. Y., Algazi, A., Capdevila, J., Longo, F., Miller Jr, W., Chun Bing, J. T., ... & Lebellec, L. (2023). Efficacy and safety of pembrolizumab monotherapy in patients with advanced thyroid cancer in the phase 2 KEYNOTE-158 study. Cancer, 129(8), 1195-1204.</i>					
健保給付						

Regimen		Nivolumab				
Drug Combination(學名藥)	Dosage	Route of administration	Times	Frequency/Duration	Notes	
Nivolumab	240 mg	IV	drip 30-60 mins, on day 1	every 2 weeks		
or						
Nivolumab	480 mg	IV	drip 30-60 mins, on day 1	every 4 weeks		
Ref.	<i>Kollipara R, Schneider B, Radovich M, et al. Exceptional response with immunotherapy in a patient with anaplastic thyroid cancer. Oncologist 2017;22:1149-1151. 12 Ma D, Ding XP, Zhang C, Shi P. Combined targeted therapy and immunotherapy in anaplastic thyroid carcinoma with distant metastasis: A case report. World J Clin Cases 2022;10:3849-3855.</i>					
健保給付						



3. 化療處方

Regimen		Paclitaxel			
Drug Combination(學名藥)	Dosage	Route of administration	Times	Frequency/Duration	Notes
Paclitaxel	60-80 mg/m ²	IV	drip 3 hrs, on day 1	weekly	
or					
Paclitaxel	135-150 mg/m ²	IV	drip 3 hrs, on day 1	every 3-4 weeks	
Ref.	<i>Smallridge RC, Ain KB, Asa SL, et al. American Thyroid Association guidelines for management of patients with anaplastic thyroid cancer. Thyroid 2012;22:1104-1139.</i>				
健保給付					

Regimen		Paclitaxel/carboplatin			
Drug Combination(學名藥)	Dosage	Route of administration	Times	Frequency/Duration	Notes
Paclitaxel	60-80 mg/m ²	IV	drip 3 hrs, on day 1	weekly	
carboplatin	AUC 2	IV	on day 1		
or					
Paclitaxel	135-150 mg/m ²	IV	drip 3 hrs, on day 1	every 3-4 Weeks	
carboplatin	AUC 5-6 IV	IV	on day 1		
Ref.	<i>Smallridge RC, Ain KB, Asa SL, et al. American Thyroid Association guidelines for management of patients with anaplastic thyroid cancer. Thyroid 2012;22:1104-1139.</i>				
健保給付					



Regimen		Doxorubicin			
Drug Combination(學名藥)	Dosage	Route of administration	Times	Frequency/Duration	Notes
Doxorubicin	20mg/m ²	IV	on day 1	weekly	
Ref.	<i>Bible KC, Kebebew E, Brierley J, et al. 2021 American Thyroid Association guidelines for management of patients with anaplastic thyroid cancer. Thyroid 2021;31:337-386.</i>				
健保給付					

Regimen		Docetaxel/doxorubicin				
Drug Combination(學名藥)	Dosage	Route of administration	Times	Frequency/Duration	Notes	
Docetaxel	60 mg/m ²	IV	on day 1	every 3–4 weeks		
doxorubicin	60mg/m ²	IV	on day 1			
or						
Docetaxel	20 mg/m ²	IV	on day 1	weekly		
doxorubicin	20mg/m ²	IV	on day 1			
Ref.	<i>Smallridge RC, Ain KB, Asa SL, et al. American Thyroid Association guidelines for management of patients with anaplastic thyroid cancer. Thyroid 2012;22:1104-1139.</i>					
健保給付						



十二、AJCC 8 edition

Differentiated and anaplastic thyroid carcinoma TNM staging AJCC UICC 2017

Primary tumor (T)

<i>Papillary, follicular, poorly differentiated, Hurthle cell and anaplastic thyroid carcinoma</i>	
T category	T criteria
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
T1	Tumor ≤ 2 cm in greatest dimension limited to the thyroid
T1a	Tumor ≤ 1 cm in greatest dimension limited to the thyroid
T1b	Tumor >1 cm but ≤ 2 cm in greatest dimension limited to the thyroid
T2	Tumor >2 cm but ≤ 4 cm in greatest dimension limited to the thyroid
T3	Tumor >4 cm limited to the thyroid, or gross extrathyroidal extension invading only strap muscles
T3a	Tumor >4 cm limited to the thyroid
T3b	Gross extrathyroidal extension invading only strap muscles (sternohyoid, sternothyroid, thyrohyoid, or omohyoid muscles) from a tumor of any size
T4	Includes gross extrathyroidal extension
T4a	Gross extrathyroidal extension invading subcutaneous soft tissues, larynx, trachea, esophagus, or recurrent laryngeal nerve from a tumor of any size
T4b	Gross extrathyroidal extension invading prevertebral fascia or encasing the carotid artery or mediastinal vessels from a tumor of any size

NOTE: All categories may be subdivided: (s) solitary tumor and (m) multifocal tumor (the largest tumor determines the classification).

Regional lymph nodes (N)

N category	N criteria
NX	Regional lymph nodes cannot be assessed
N0	No evidence of locoregional lymph node metastasis
N0a	One or more cytologically or histologically confirmed benign lymph nodes
N0b	No radiologic or clinical evidence of locoregional lymph node metastasis
N1	Metastasis to regional nodes
N1a	Metastasis to level VI or VII (pretracheal, paratracheal, or prelaryngeal/Delphian, or upper mediastinal) lymph nodes. This can be unilateral or bilateral disease.
N1b	Metastasis to unilateral, bilateral, or contralateral lateral neck lymph nodes (levels I, II, III, IV, or V) or retropharyngeal lymph node

Distant metastasis (M)

M category	M criteria
M0	No distant metastasis
M1	Distant metastasis



AJCC8 *Age at diagnosis for staging increased from 45 to 55

Differentiated thyroid cancer

<i>When age at diagnosis...</i>	<i>And T is....</i>	<i>And N is....</i>	<i>And M is....</i>	<i>Then the stage group is...</i>
<55 yrs	Any T	Any N	M0	I
	Any T	Any N	M1	II
≥ 55yrs	T1	N0/NX	M0	I
	T1	N1	M0	II
	T2	N0/NX	M0	I
	T2	N1	M0	II
	T3a/T3b	Any N	M0	II
	T4a	Any N	M0	III
	T4b	Any N	M0	IVA
	Any T	Any N	M1	IVB



十四、甲狀腺癌完治定義

癌別	期別		治療方式	完治定義
甲狀腺癌	治療期	1 期 2 期 3 期	OP	手術(單邊)→完治 手術(兩側全切)，I-131+ 抽血 (Thyroglobulin+Thyroglobulin-Antibody)，若無復發的證據→完治。
		4 期	OP OP→I-131 標靶 C/T	1.如有手術，手術後接受輔助性治療算完治 2.未手術，口服標靶藥物 or 化學治療三個月即算完治 3.治療中轉安寧療護算完治



十五、參考文獻(Reference)

1. Haddad, R. I., Bischoff, L., Applewhite, M., Bernet, V., Blomain, E., Brito, M., ... & Sliker, B. (2025). NCCN Guidelines® insights: thyroid carcinoma, version 1.2025: featured updates to the NCCN Guidelines®. *Journal of the National Comprehensive Cancer Network*, 23(7). Edmund, SC & Syed, ZA. The 2017 Bethesda System for Reporting Thyroid Cytopathology. *Thyroid* 2017;27:1341.
2. Ringel, M. D., Sosa, J. A., Baloch, Z., Bischoff, L., Bloom, G., Brent, G. A., ... & Wirth, L. J. (2025). 2025 American Thyroid Association management guidelines for adult patients with differentiated thyroid cancer. *Thyroid*®, 35(8), 841-985.
3. Cibas ES, Ali SZ 2009 The Bethesda System For Reporting Thyroid Cytopathology. *Am J Clin Pathol* 132:658–665.
4. Edge SB, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A (eds) *AJCC Cancer Staging Manual*. 7th edition. Springer-Verlag, New York, pp 59–64.
5. Pacini F, Castagna MG, Brilli L, Pentheroudakis G; ESMO Guidelines Working Group. Thyroid cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2012 Oct;23 Suppl 7:vii110-9..
6. Matuszczyk A, Petersenn S, Bockisch A, et al. Chemotherapy with doxorubicin in progressive medullary and thyroid carcinoma of the follicular epithelium. *Horm metab Res*. 2008; 40(3):210
7. Higashiyama T, Ito Y, Hirokawa M, et al. Induction chemotherapy with weekly paclitaxel administration for anaplastic thyroid carcinoma. *Thyroid* 2010;20:7-14.
8. Brose MS, Nutting CM, Jarzab B, et al. Sorafenib in radioactive iodine-refractory, locally advanced or metastatic differentiated thyroid cancer: a randomised, double-blind, phase 3 trial. *Lancet* 2014 Jul 26;384(9940):319-28
9. Brierley J, Tsang R, Panzarella T, et al. Prognostic factors and the effect of treatment with radioactive iodine and external beam radiation on patients with differentiated thyroid cancer seen at a single institution over 40 years. *Clin Endocrinol (Oxf)* 2005;63(4):418-427.
10. Chen J, Tward J, Shrieve DC, et al. Surgery and radiotherapy improves survival in patients with anaplastic thyroid carcinoma: analysis of the surveillance, epidemiology, and end results 1983-2002. *Am J Clin Oncol* 2008: 460-464.
11. Chow SM, Law SCK, Mendenhall WM, et al. Papillary thyroid carcinoma: prognostic factors and the role of radioiodine and external radiotherapy. *IJROBP* 2002;52(3):784-795.
12. Foote RL, Brown PD, Garces YI, et al. Is there a role for radiation therapy in the management of Hurthle cell carcinoma? *Int J Radiat Oncol Biol Phys* 2003;56(4):1067-1072.
13. Hay ID, Hutchinson ME, Gonzalez-Losada T, et al. Papillary thyroid microcarcinoma: a study of 900 cases observed in a 60-year period. *Surgery* 2008;144(6):980-987.
14. Kebebew E, Greenspan FS, Clark OH, et al. Anaplastic thyroid carcinoma. Treatment outcome and prognostic factors. *Cancer* 2005;103(7):1330-1335.
15. Schwartz DL, Rana V, Shaw S, et al. Postoperative radiotherapy for advanced medullary thyroid cancer- local disease control in the modern era. *Head Neck* 2008;30:883-888.
16. 衛生福利部中央健康保險署藥品-給付規定-第九節 抗腫瘤藥物 <https://www.nhi.gov.tw/ch/cp-7593-ad2a9-3397-1.html>
17. Regala, C., Silva, T. N., & Leite, V. (2025). The role of lenvatinib in different types of thyroid cancer. *Minerva endocrinology*.
18. Thomas, L., Lai, S. Y., Dong, W., Feng, L., Dadu, R., Regone, R. M., & Cabanillas, M. E. (2014). Sorafenib in metastatic thyroid cancer: a systematic review. *The oncologist*, 19(3), 251-258.
19. Elghawy, O., Barsouk, A., Xu, J., Chen, S., Cohen, R. B., & Sun, L. (2024). Real word outcomes of cabozantinib therapy in poorly differentiated thyroid



carcinoma. *European Thyroid Journal*, 13(6).

20. Subbiah, V., Kreitman, R. J., Wainberg, Z. A., Cho, J. Y., Schellens, J. H. M., Soria, J. C., ... & Keam, B. (2022). Dabrafenib plus trametinib in patients with BRAF V600E-mutant anaplastic thyroid cancer: updated analysis from the phase II ROAR basket study. *Annals of oncology*, 33(4), 406-415.
21. Waguespack, S. G., Drilon, A., Lin, J. J., Brose, M. S., McDermott, R., Almubarak, M., ... & Cabanillas, M. E. (2022). Efficacy and safety of larotrectinib in patients with TRK fusion-positive thyroid carcinoma. *European journal of endocrinology*, 186(6), 631-643.
22. Bazhenova, L., Hescot, S., Folprecht, G., Daga, H., Massarelli, E., Lamartina, L., ... & Carrizosa, D. (2022, September). Entrectinib in patients with ntrk fusion-positive (ntrk-fp) thyroid cancer: updated data from startrk-2. In *Endocrine Abstracts* (Vol. 84). Bioscientifica.
23. Bradford, D., Larkins, E., Mushti, S. L., Rodriguez, L., Skinner, A. M., Helms, W. S., ... & Singh, H. (2021). FDA approval summary: selpercatinib for the treatment of lung and thyroid cancers with RET gene mutations or fusions. *Clinical Cancer Research*, 27(8), 2130-2135.
24. Kim, J., Bradford, D., Larkins, E., Pai-Scherf, L. H., Chatterjee, S., Mishra-Kalyani, P. S., ... & Singh, H. (2021). FDA approval summary: pralsetinib for the treatment of lung and thyroid cancers with RET gene mutations or fusions. *Clinical Cancer Research*, 27(20), 5452-5456.
25. Brose, M. S., Capdevila, J., Elisei, R., Bastholt, L., Führer-Sakel, D., Leboulleux, S., ... & Schlumberger, M. (2024). Vandetanib in locally advanced or metastatic differentiated thyroid cancer refractory to radioiodine therapy. *Endocrine-related cancer*, 31(8).