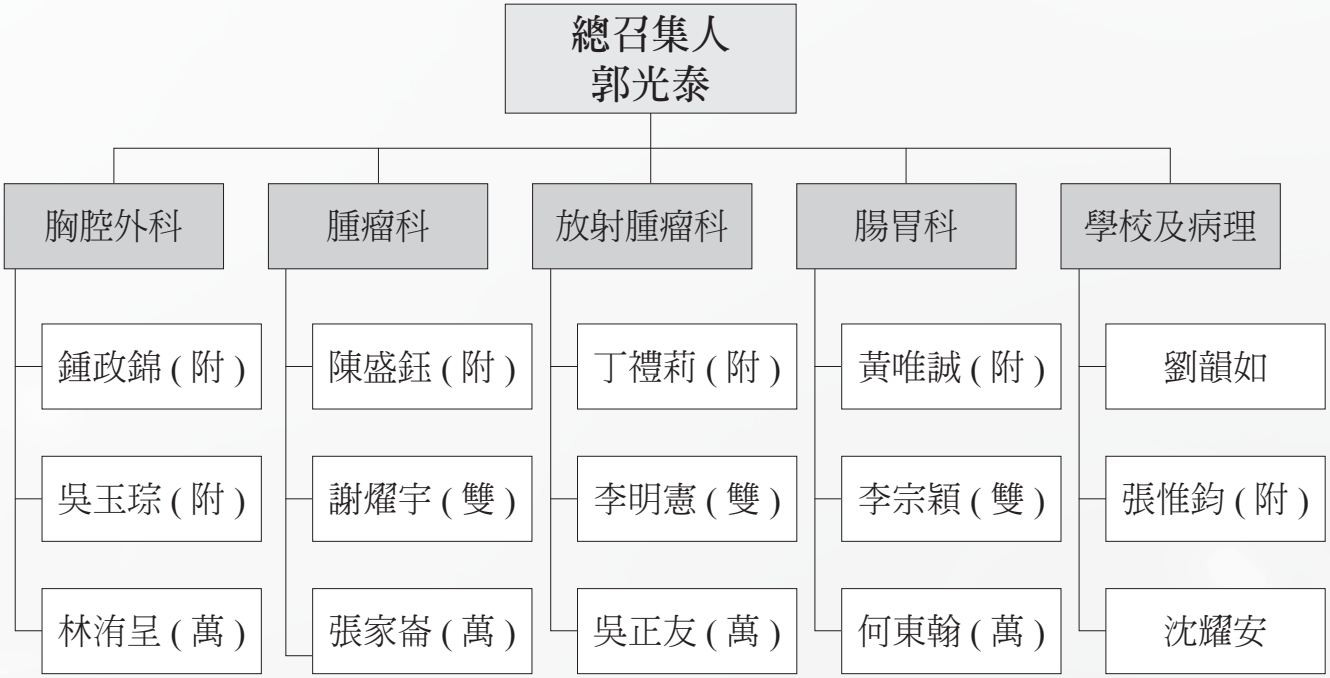
食道癌診療準則

食道團隊成員


總召集人
郭光泰
胸腔外科
腫瘤科
放射腫瘤科
腸胃科
學校及病理
鍾政錦 (附)
吳玉琮 (附)
林洧呈 (萬)
陳盛鈺 (附)
謝燿宇 (雙)
張家崙 (萬)
丁禮莉 (附)
李明憲 (雙)
吳正友 (萬)
黃唯誠 (附)
李宗穎 (雙)
何東翰 (萬)
劉韻如
張惟鈞 (附)
沈耀安

114 年版與上一版差異：

114 年版	115 年修訂版
I. 影像檢查與分期 1. 影像檢查文字修改爲 Abdomen CT 及 Pelvis CT。 2. 若已執行 FDG-PET/CT，則可不要求 Abdomen CT 或 Chest CT (not required if FDG-PET/CT is done)。 3.EUS 執行要求從「Essential」改爲 「Recommended」	**I. 食道腺癌分子檢測** 原指引 HER2 testing，新增 CLDN18.2 彈性的可選項目。
II. 食道鱗狀細胞癌 (SCC) 治療分期 1. T1a, Tis, T1b 階段分期改以 Pathologic staging (P staging) 爲主。 2. Endoscopic resection (ER) is recommended for the accurate staging2。 3. 修訂 cT2, N0 的 High-risk lesion 定義爲僅包含 G3 (Poorly differentiated)	**II. 新輔助治療前 PD-L1 檢測** 整條刪除 PD-L1 檢測要求。
III. 治療結果與輔助治療 R1, R2 resection 後續治療需依照 NCCN guidelines 執行 5FU-based Chemotherapy。Surveillance 的部分，確認使用 Nivolumab 屬於 Category 1	**III. 新輔助治療後再分期（Re-staging）** 1. 原 PET prefer →列爲 PET 必要 1. 將術前上消化道內視鏡（UGI/ 胃鏡）列爲必要，確保手術切緣（margin）free；刪除 Optional ，不強制要求切片（Biopsy），僅在發現可疑病灶時才進行

114 年版	115 年修訂版
IV. 轉移 / 晚期癌症分子檢測 修訂爲 Perform microsatellite and PD-L1 testing (if not done previously), if metastatic cancer is suspected。 新增說明：NGS may be considered via validated assay HER2 testing for adenocarcinoma	**IV. 食道腺癌治療文字修訂** 將指引中的「Chemoradiation」替換爲 **「Systemic Therapy」（全身性治療）
V. 追蹤頻率 If asymptomatic: H&P every 3-6 個月 for 1–2 y, then every 6–12 個月 for 3–5 y6。 刪除 "then annually" (每年) 的字眼	**V. 食道腺癌病理分期 比照 NCCN** 遵循 2025 年最新版 NCCN 指引，將食道腺癌的 T1 與 T2 分期合併
VI. 影像文字調整 "Imaging as clinically indicated" 修訂爲 "Imaging studies as clinically indicated"	

Pretreatment Workup

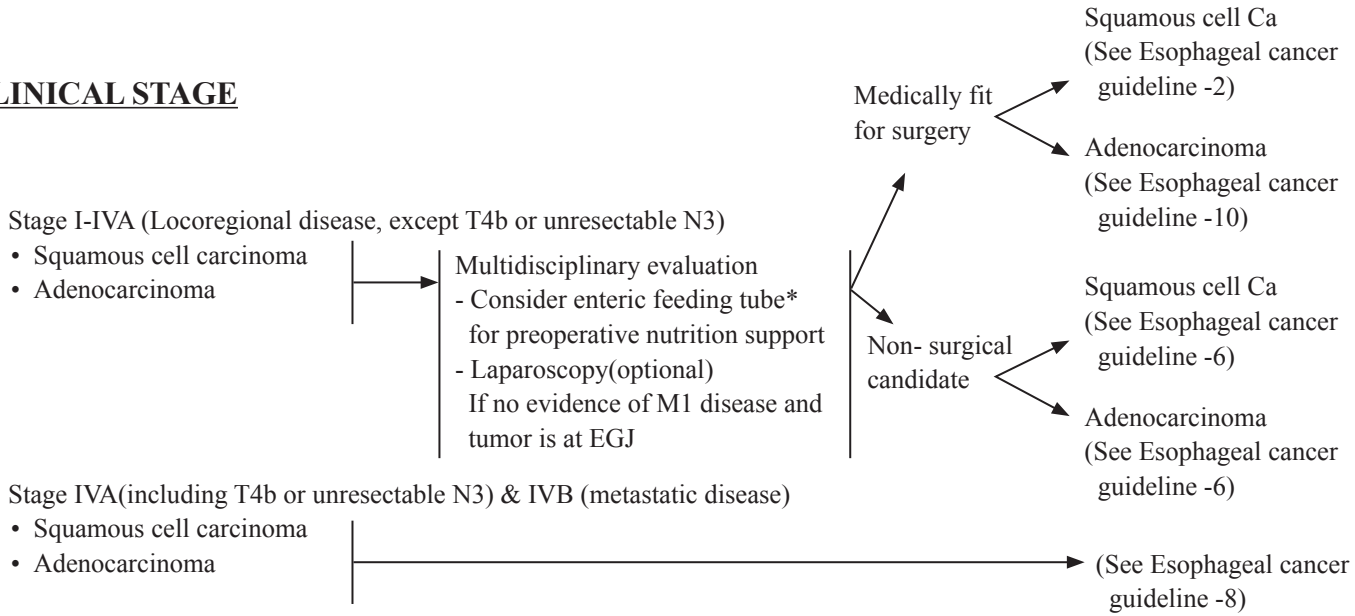
必要檢查

- Upper GI endoscopy and biopsy
- Chest / abdomen CT
- PET-CT evaluation (skull base to mid-thigh) if no evidence of M1 disease
- Endoscopic ultrasound(EUS), if no evidence of M1 un-resectable disease or luminal obstruction
- Bronchoscopy, if tumor is at or above the carina with no evidence of M1 disease
- Complete blood count (CBC) and comprehensive Chemistry profile
- HER2-neu testing ± CLDN18.2 testing if metastatic adenocarcinoma is documented/ suspected
- Nutritional assessment and counseling
- Screen for family history
- 原位癌要有 Upper GI endoscopy and biopsy & Chest / abdomen CT

選擇性檢查

- Pelvic CT with contrast as clinical indicated
- Endoscopic resection (ER) is recommended for the accurate staging of early stage cancers(T1a or T1b). Early-stage cancer can best be diagnosed by ER
- Biopsy of metastatic disease as clinically indicated
- Universal testing for microsatellite instability (MSI) by PCR/next-generation sequencing (NGS) or MMR by IHC is recommended in all newly diagnosed patients as clinically indicated
- Next-generation sequencing (NGS)) should be considered
- Smoking cessation advice, counseling, and pharmacotherapy as indicated
- Biopsy of metastatic disease as clinically indicated

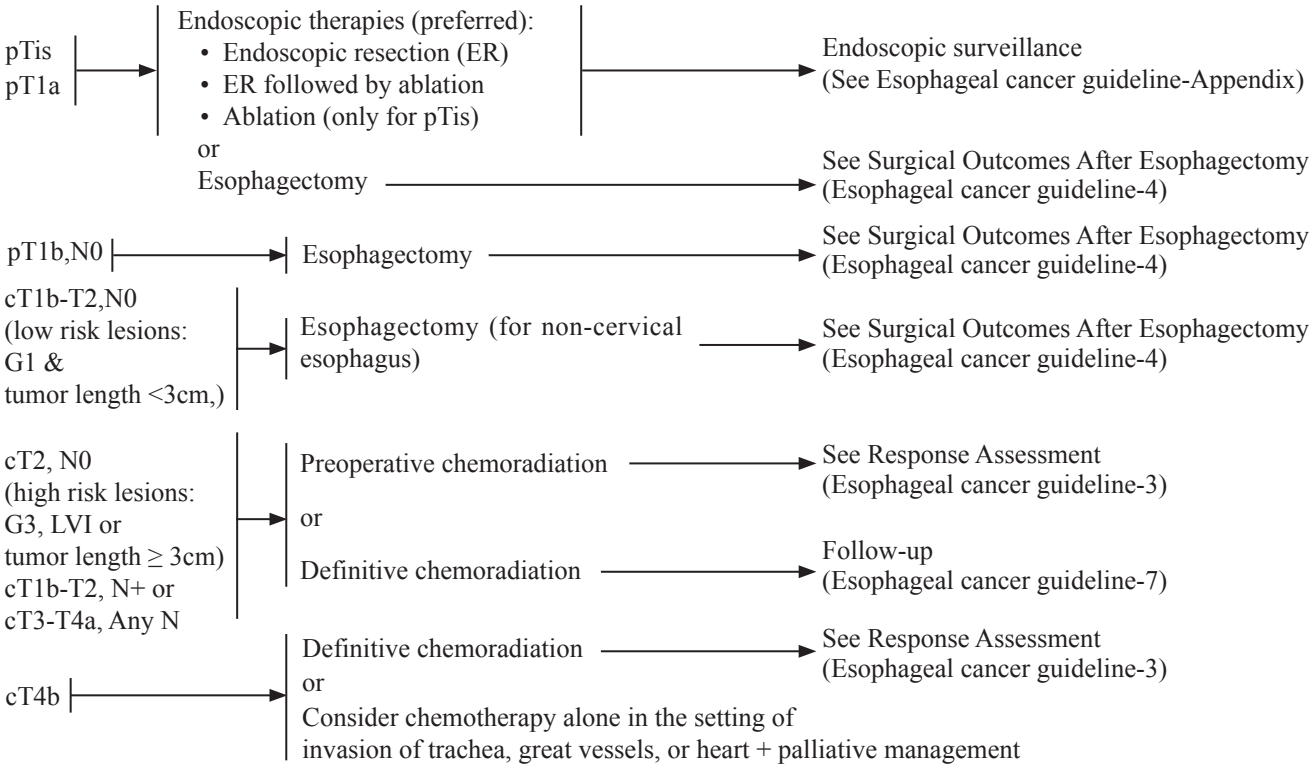
Pretreatment Workup



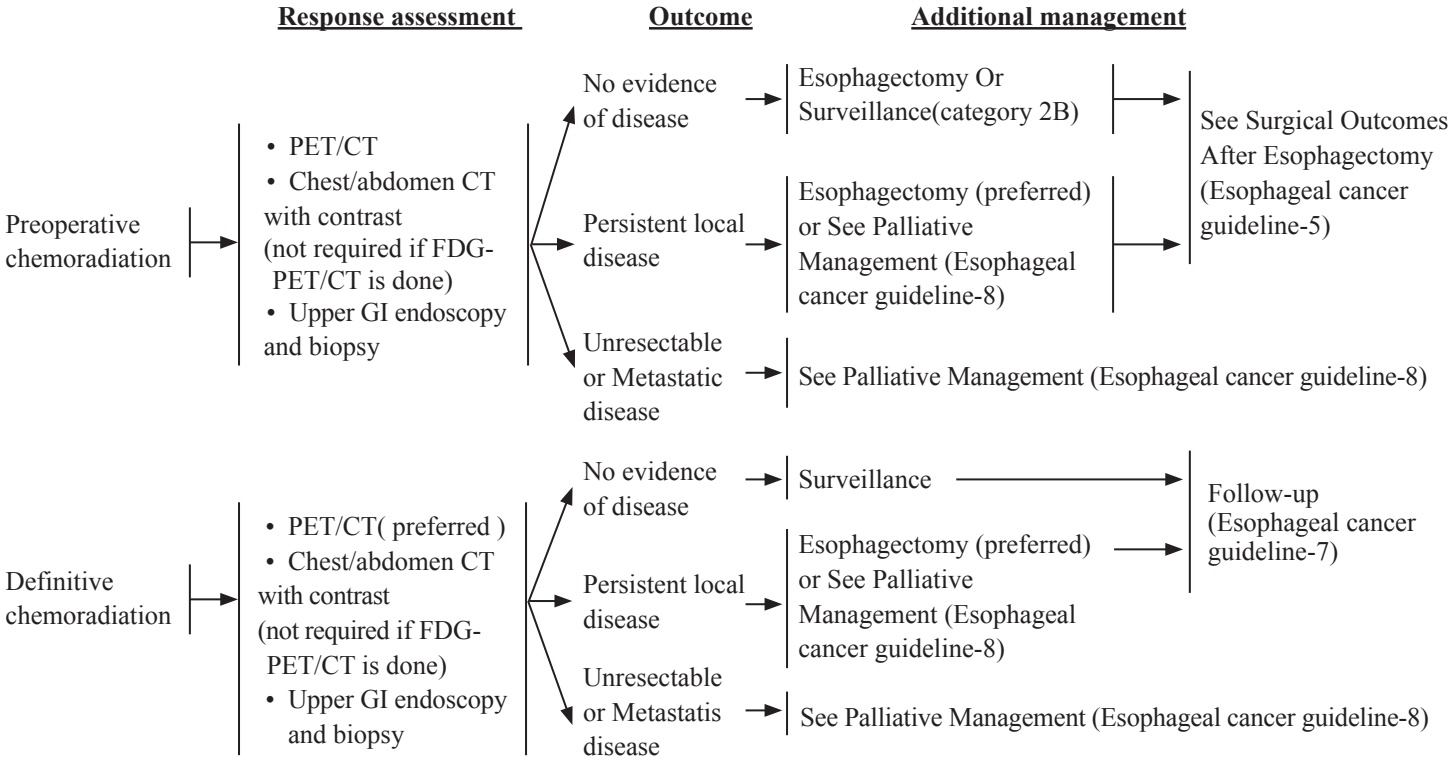
* Percutaneous gastrostomy tube (PCG) may be considered for patient with cervical esophageal tumors receiving definitive chemoradiation or for patients with marginally resectable disease.

《Esophageal cancer guideline-2》

Squamous cell carcinoma: primary treatment options for medically fit surgery patients



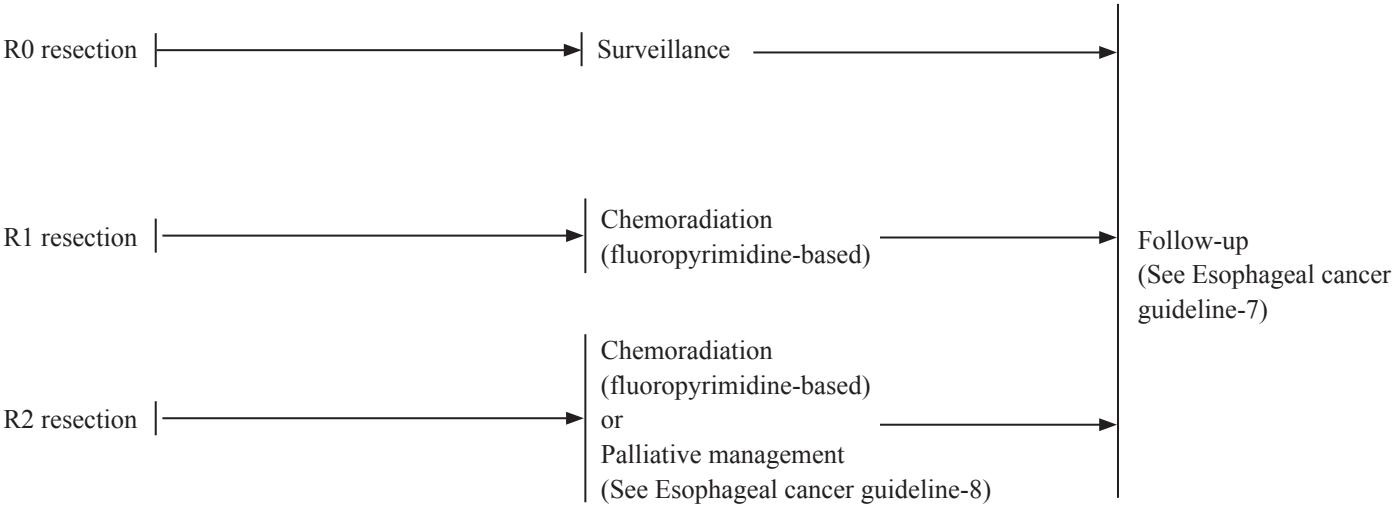
Squamous cell carcinoma: response assessment



《Esophageal cancer guideline-4》

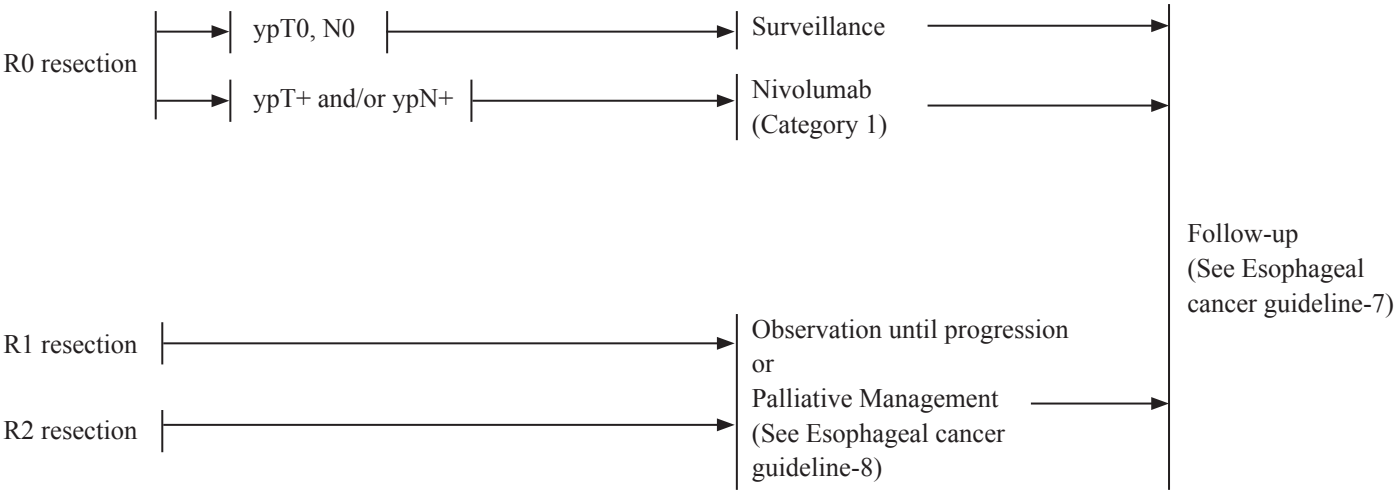
Squamous cell carcinoma: surgical outcomes

Patients **Have Not** Reveived Preoperative Chemoradiation



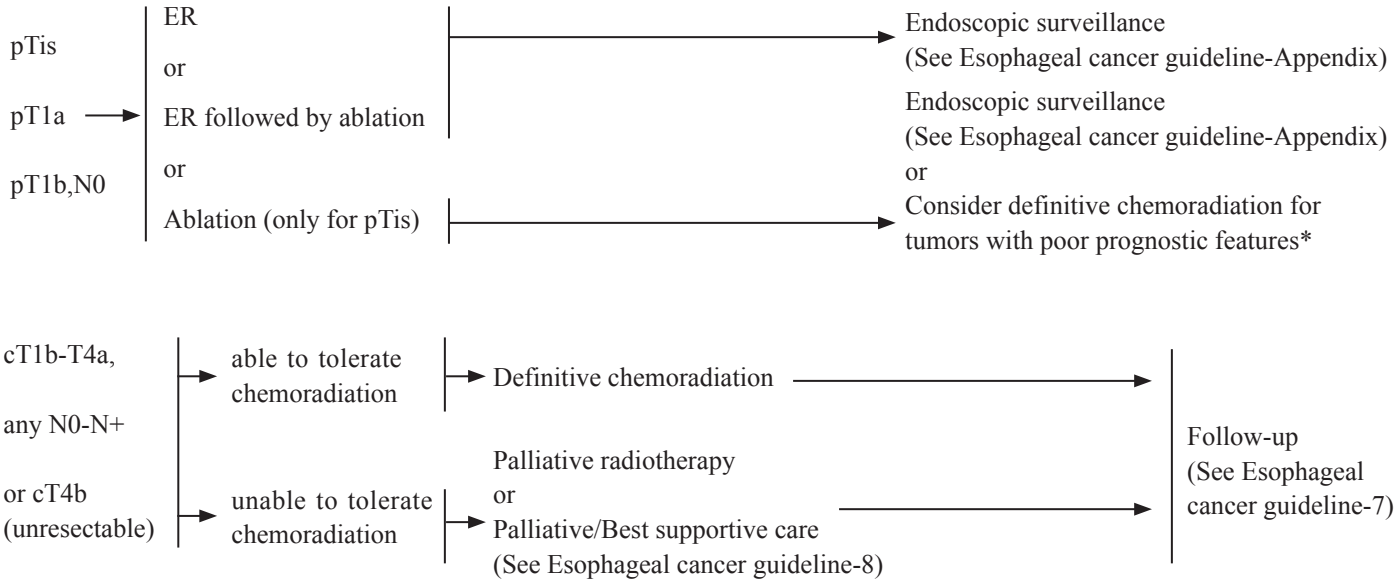
Squamous cell carcinoma: surgical outcomes

Patients **Have** Reveived Preoperative Chemoradiation



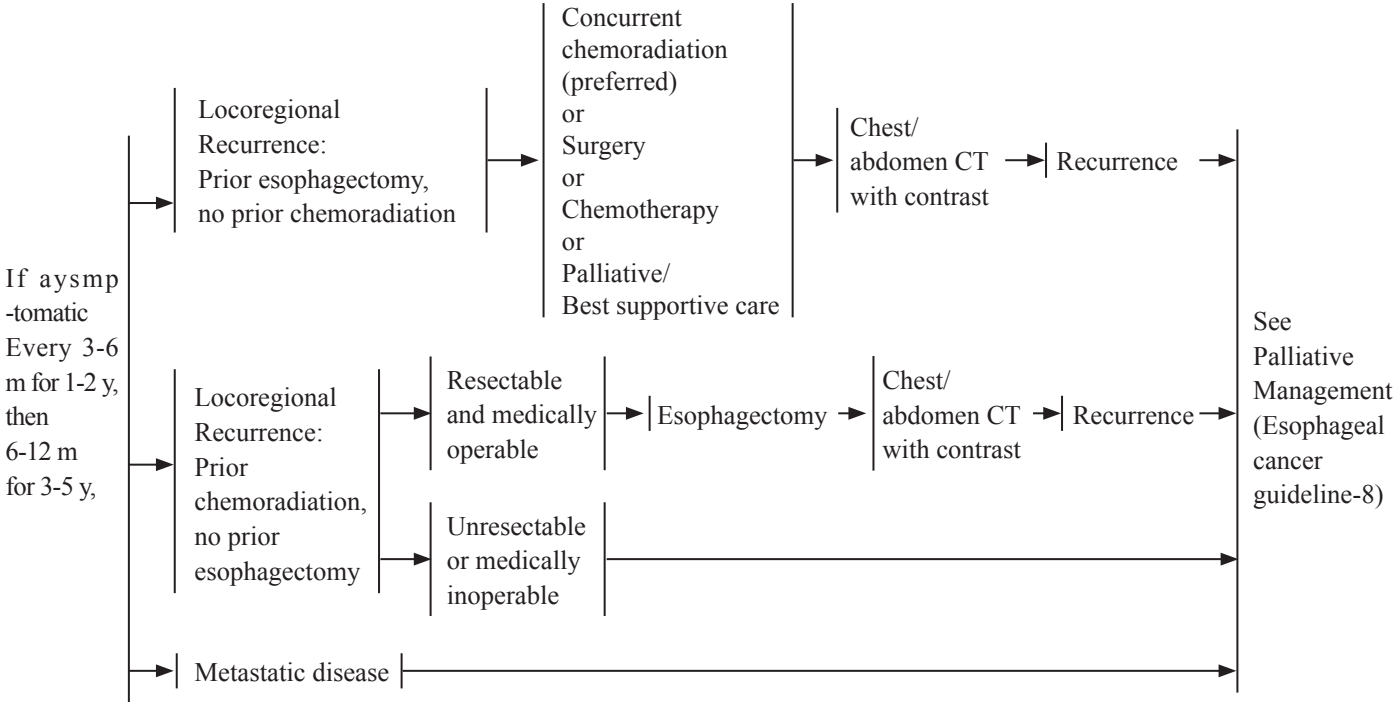
《Esophageal cancer guideline-6》

Squamous cell carcinoma &adenocarcinoma : non-surgical candidate



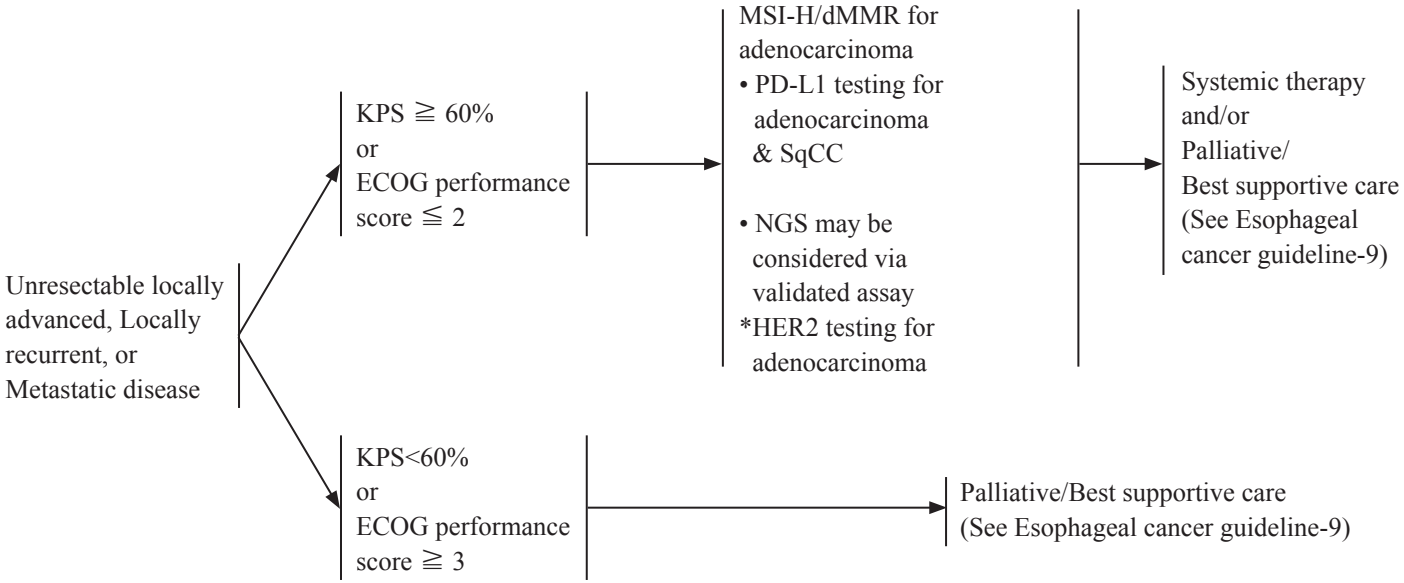
* Poor prognostic features: positive margin(s), max. tumor diameter > 2cm, G2/3, LVI or more

Squamous cell carcinoma & adenocarcinoma follow up – recurrence – palliative management



《Esophageal cancer guideline-8》

Squamous cell carcinoma & adenocarcinoma : unresectable locally advancer, locally recurrent, or metastatic disease



Principles of Palliative/Best Supportive Care

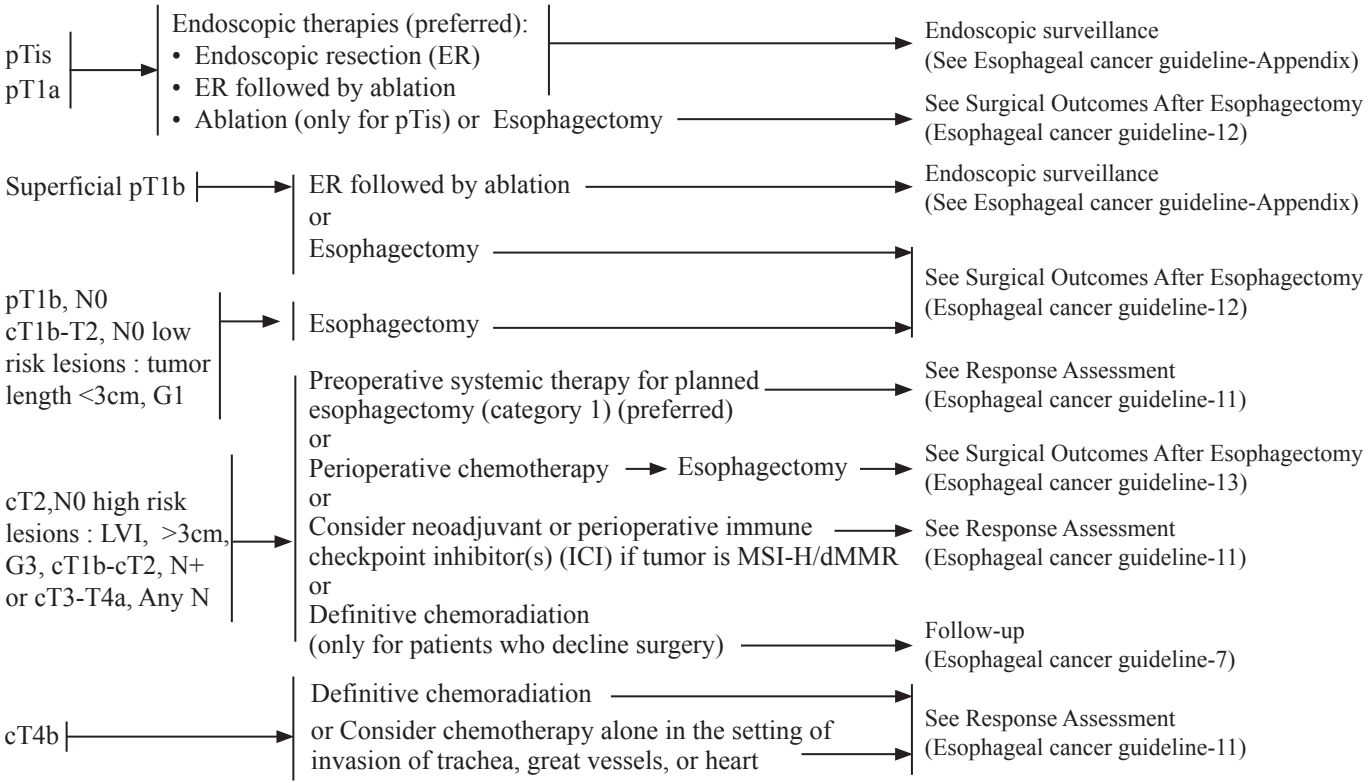
最佳支持性療護的目標是預防和減輕痛苦，無論疾病處於哪個階段或是否需要其他治療，都要爲病患及其家人提供盡可能最佳的生活質量。 對於食道癌，緩解主要症狀的介入措施可能會顯著延長餘命。 採取跨多專科團隊的醫療模式更顯得重要。因此，鼓勵採取多專科團隊的醫療模式對食道癌患者進行安寧療護。

Dysphagia

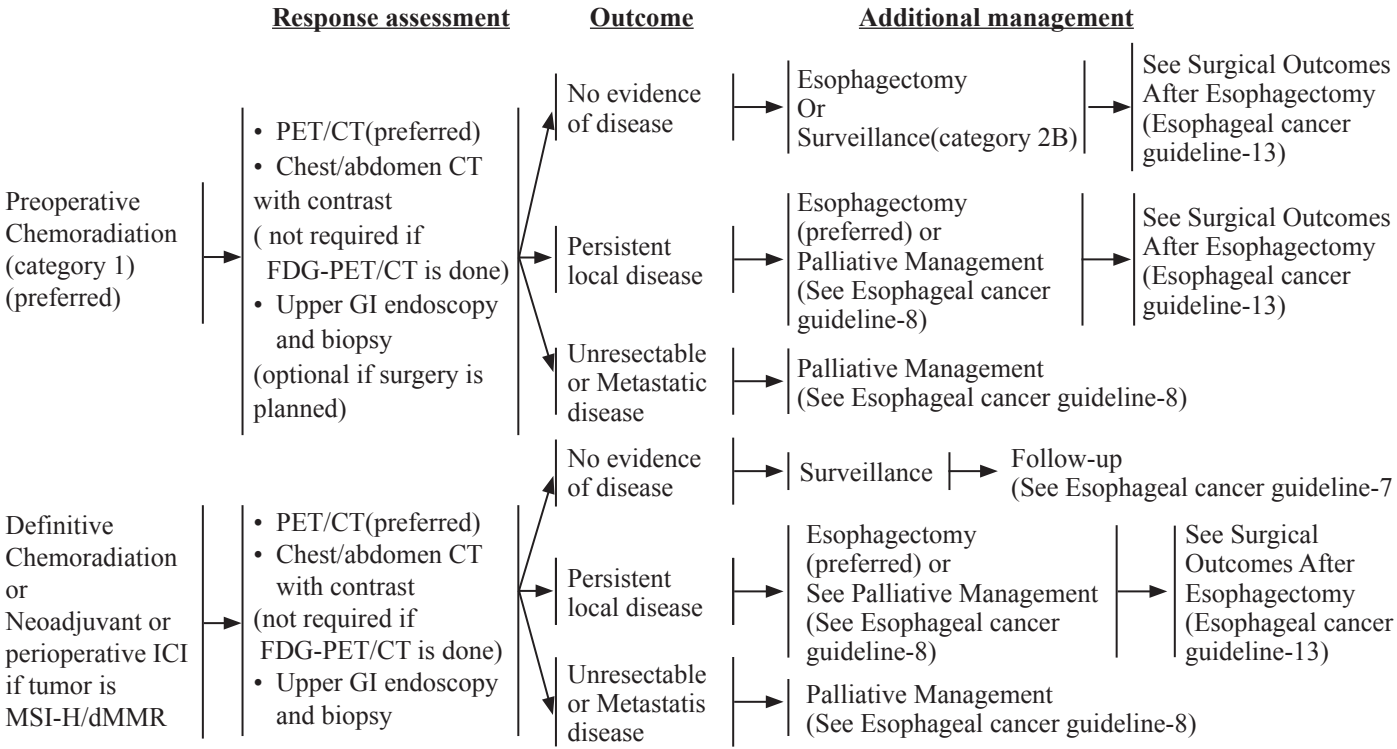
- Assess the extent of disease and the functional degree of swallowing impairment, preferably through a standardized scoring scale and confirm the etiology of dysphagia
- Dysphagia grading scale
  - Grade 0: Able to eat solid food without special attention to bite size or chewing
  - Grade 1: Able to swallow solid food cut into pieces less than 18 mm in diameter and thoroughly chewed
  - Grade 2: Able to swallow semisolid food (consistency of baby food)
  - Grade 3: Able to swallow liquids only
  - Grade 4: Unable to swallow liquids or saliva
- Dysphagia arising from esophageal cancer most often is due to obstruction, but on occasion may be primarily due to tumor-related dysmotility.
- Patients with dysphagia who are not candidates for curative surgery should be considered for palliation of their dysphagia symptoms, based on symptom severity. This can be achieved through multiple modalities, although placement of an esophageal stent is most commonly utilized. In contrast, stent placement is generally not advised in patients who may undergo curative surgery in the future due to concerns that stent-related adverse events may preclude curative surgery in the future.

《Esophageal cancer guideline-10》

Adenocarcinoma: primary treatment for medically fit surgery patients

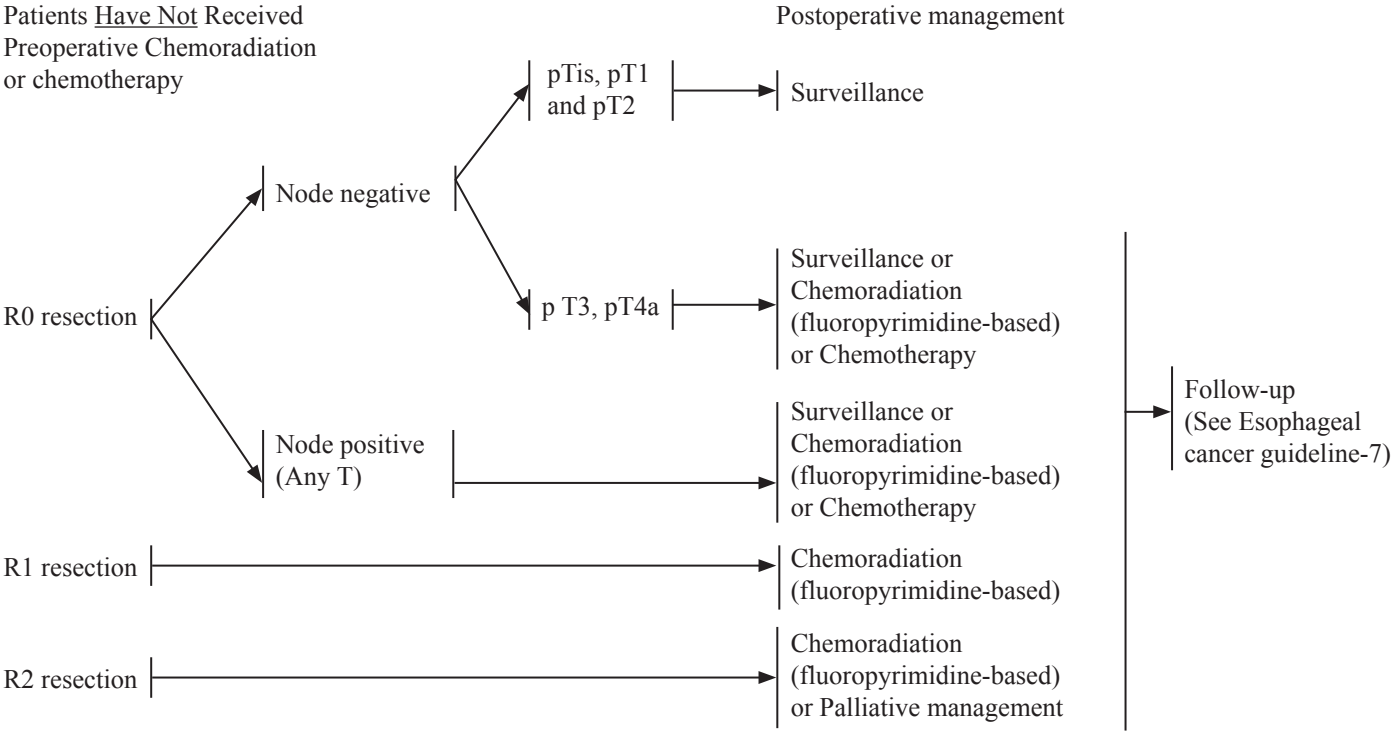


Adenocarcinoma: response assessment

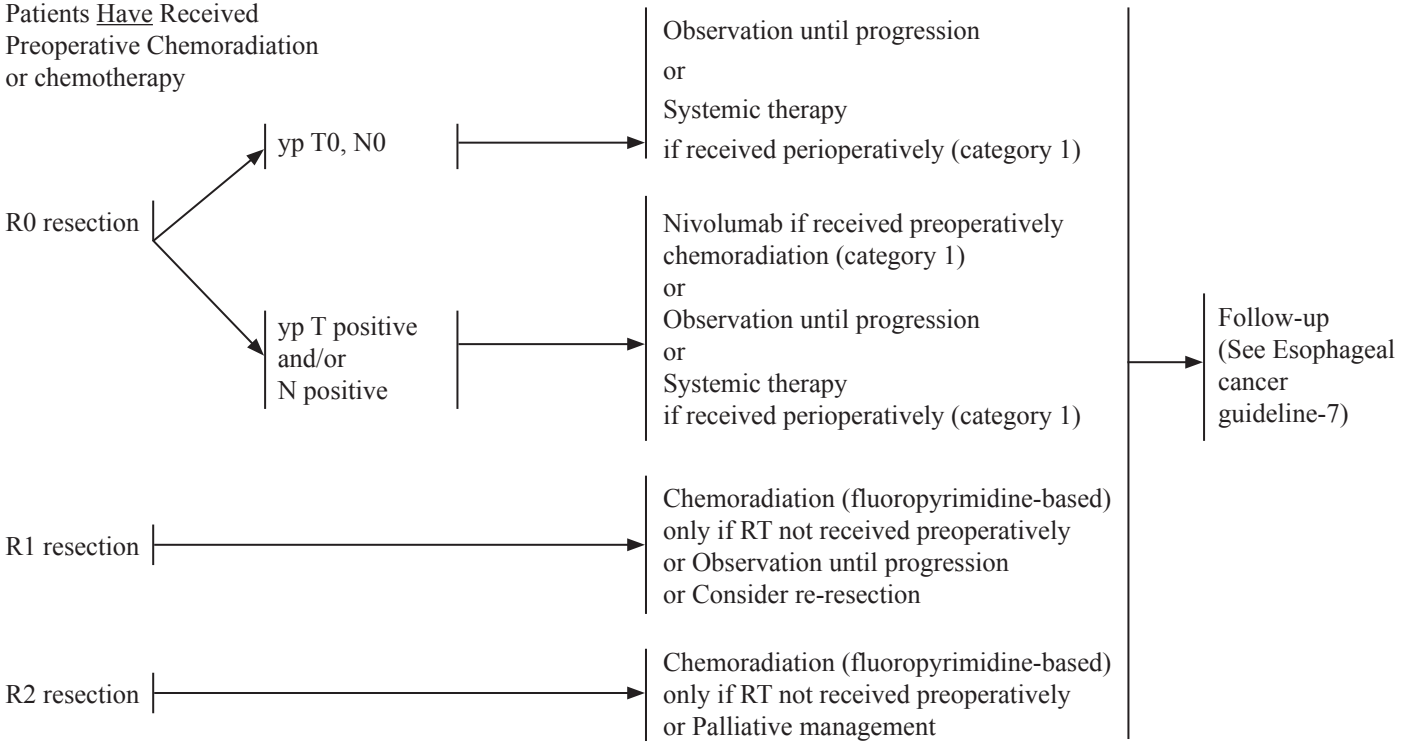


《Esophageal cancer guideline-12》

Adenocarcinoma: surgical outcomes



Adenocarcinoma: surgical outcomes



《Esophageal cancer guideline-Appendix》

Principles of Endoscopic Staging and Therapy

Treatment of Symptoms

- Esophageal dilation can be performed with the use of dilating balloons or bougies to temporarily relieve obstruction from tumors, or treatment-related strictures. Caution should be exercised to avoid overdilation, to minimize the risk of perforation.
- Long-term palliation of dysphagia can be achieved with endoscopic tumor ablation by Nd:YAG laser, PDT and cryoablation, or endoscopic and radiographic-assisted insertion of expandable metal or plastic stents.
- Long-term palliation of anorexia, dysphagia, or malnutrition may be achieved with endoscopic or radiographic-assisted placement of feeding gastrostomy or jejunostomy. The placement of a gastrostomy in the preoperative setting may compromise the gastric vasculature, thereby interfering with the creation of the gastric conduit in the reconstruction during esophagectomy and should be avoided.

Post-Treatment Surveillance

- Consider deferring assessment endoscopy with biopsy to 6 weeks or later after completion of preoperative therapy in patients whom avoidance of surgery is being considered.
- EUS exams performed after chemotherapy or radiation therapy have a reduced ability to accurately determine the present stage of disease. Similarly, biopsies performed after chemotherapy or radiation therapy may not accurately diagnose the presence of residual disease.
- Endoscopic surveillance following definitive treatment of esophageal cancer requires careful attention to detail for mucosal surface changes, and multiple biopsies of any visualized abnormalities. Strictures should be biopsied to rule out neoplastic cause. EUS-guided FNA should be performed if suspicious lymph nodes or areas of wall thickening are seen on cross-sectional imaging.
- Endoscopic surveillance after ablative therapy or ER of early-stage esophageal cancer should continue after completion of treatment. Biopsies should be taken of the neosquamous mucosa even in the absence of mucosal abnormalities as dysplasia may occasionally be present beneath the squamous mucosa.
- Endoscopic surveillance should also include a search for the presence of Barrett esophagus and four-quadrant biopsies to detect residual or recurrent dysplasia. The ablation of residual or recurrent high-grade and low-grade dysplasia using RFA or cryoablation should be considered.
- Patients who have received therapeutic ER should have endoscopic surveillance.

Principles of Pathologic Review

- Pathology review 的目的包括：
  - Classification of tumor
  - Determine the extent of invasion
  - Establish status of cancer involvement of surgical margins
- 所有手術病理報告都應該依照食道癌 WHO 分類
- 所有手術病理報告都應該依 AJCC/UICC TNM 8th edition 分期
- 手術病理報告應包括下列項目
  - Histologic type
  - Histologic grade (G1: well differentiated; G2: moderately differentiated; G3: poorly differentiated)
  - Microscopic tumor extension
  - Margin status

Principles of Pathologic Review

病理報告根據標本的不同應包括下列項目：

- Biopsy: invasion, if present; high-grade dysplasia in Barrett esophagus; histologic type; Grade; Presence or absence of Barrett esophagus; Universal testing for MSI by PCR/NGS or MMR by IHC is recommended in all newly diagnosed patients
- Endoscopic resection (ER): include all elements as for biopsy specimen plus the depth of tumor invasion; lymphovascular invasion (LVI), and the status of mucosal and deep margins; Universal testing for MSI by PCR/NGS or MMR by IHC is recommended in all newly diagnosed patients
- Esophagectomy, without prior chemoradiation: include all elements as for ER specimen plus the location of the tumor midpoint in relation to the EGJ, whether the tumor crosses EGJ, lymph node status, and the number of lymph nodes recovered; Universal testing for MSI by PCR/NGS or MMR by IHC is recommended in all newly diagnosed patients, if not previously performed
- Esophagectomy, with prior chemoradiation :
  - the tumor sites should be thoroughly sampled, with submission of entire EGJ or ulcer/tumor bed for specimens without grossly obvious residual tumor
  - For pathology report, include all elements as for esophagectomy without prior chemoradiation, plus assessment of the treatment effect
  - Assessment treatment effect: 術前治療反應與預後相關。目前採用 The modified Ryan scheme in the CAP Cancer Protocol for Esophageal Carcinoma

Description	Tumor Regression Score
No viable cancer cells (complete response)	0
Single cells or rare small groups of cancer cells (near complete response)	1
Residual cancer with evident tumor regression, but more than single cells or rare small groups of cancer cells (partial response)	2
Extensive residual cancer with no evident tumor regression (poor or no response)	3

Principles of Biomarker Testing

- HER2 狀態，微衛星不穩定性（MSI）狀態的分子測試，程序性死亡配體 1（PD-L1）表達和 NTRK 基因融合檢測被用於預測局部晚期，不可切除或轉移性食道癌和 EGJ 癌的臨床治療用藥選擇
- Assessment of overexpression or amplification of Her2 in Esophageal and EGJ Cancer
  - For patients with inoperable locally advanced, recurrent, or metastatic adenocarcinoma of esophagus or EGJ for whom trastuzumab therapy is being considered
  - Immunohistochemical criteria for scoring HER2/neu expression

	Surgical Specimen Expression Pattern, Immunohistochemistry	Biopsy Specimen Expression Pattern, Immunohistochemistry	HER2 Overexpression Assessment
0	No reactivity or membranous reactivity in <10% of cancer cells	No reactivity or no membranous reactivity in any cancer cell	Negative
1+	Faint or barely perceptible membranous reactivity in ≥10% of cancer cells; cells are reactive only in part of their membrane	Cluster of five or more cancer cells with a faint or barely perceptible membranous reactivity irrespective of percentage of cancer cells positive	Negative
2+	Weak to moderate complete, basolateral or lateral membranous reactivity in ≥10% of cancer cells	Cluster of five or more cancer cells with a weak to moderate complete, basolateral, or lateral membranous reactivity irrespective of percentage of cancer cells positive	Equivocal
3+	Strong complete, basolateral, or lateral membranous reactivity in ≥10% of cancer cells	Cluster of five or more cancer cells with a strong complete, basolateral, or lateral membranous reactivity irrespective of percentage of cancer cells positive	Positive

- HER2 IHC is performed first, followed by FISH methods in cases showing 2+ (equivocal) expressions by IHC. Cases with HER2: CEP17 ratio >=2 or an average HER2 copy number >=6.0 signals/cell are considered positive by FISH.

Principles of Biomarker Testing

◆ *Microsatellite Instability (MSI) or Mismatch Repair (MMR) Testing:*

- 所有新診斷的食道癌和食道胃結合部癌應透過聚合酶鏈反應 (PCR)、NGS 或 IHC MMR 進行 MSI 通用檢測。 根據 CAP DNA 錯配修復生物標記報告指南，結果被解釋爲 MSI 高 (MSI-H) 或錯配修復缺陷 (dMMR)。 測試只能在臨床實驗室改進修正案 (CLIA) 批准的實驗室中進行。 MSI-H 或 dMMR 腫瘤患者應轉診至遺傳學顧問，以在適當的臨床背景下進行進一步評估。
- MMR Interpretation
  - ◊ No loss of nuclear expression of MMR proteins: No evidence of dMMR (low probability of MSI-H)
  - ◊ Loss of nuclear expression of one or more MMR proteins: dMMR
- MSI Interpretation
  - ◊ MSI-stable (MSS)
  - ◊ MSI-low (MSI-L)
  - – 1%–29% of the markers exhibit instability
  - – 1 of the 5 National Cancer Institute (NCI) or mononucleotide markers exhibits instability
  - ◊ MSI-H
  - – ≥ 30% of the markers exhibit instability
  - – 2 or more of the 5 NCI or mononucleotide markers exhibit instability

◆ *PD-L1 Testing:*

- PD-L1 IHC testing may be considered on locally advanced, recurrent, or metastatic esophageal and EGJ cancer in patents who are candidate for treatment with PD-1 inhibitors
- Assessment of PD-L1 Protein Expression
  - Pembrolizumab as a second-line treatment option for esophageal SCC with PD-L1 expression levels by combined positive score (CPS) of >=10, and as a third-or subsequent-line treatment option for EGJ adenocarcinoma with PD-L1 expression levels by CPS >=1, as determined by an FDA-approved companion diagnosed test
  - CPS is determined by

$$\text{CPS} = \frac{\text{\# of PD-L1-positive cells (tumor cells, lymphocytes, macrophages)}}{\text{Total \# of tumor cells}} \times 100$$

Principles of Biomarker Testing

◆*次世代定序 (Next-Generation Sequencing ,NGS):*

- 目前，多種標靶治療藥物例如 : trastuzumab, pembrolizumab/nivolumab, and entrectinib/larotrectinib, selpercatinib, and dabrafenib / trametinib, 已被 FDA 核准用於食道癌和食道胃結合部癌。 Tratuzumab 基於 HER2 過度表現測試。選擇免疫節點抑制劑的使用是基於 PCR 檢測 MSI 或 IHC 檢測 NGS/MMR、PD-L1 免疫組織化學表達或 NGS 檢測高腫瘤突變負荷 (TMB)。 FDA 核准使用選定的 TRK 抑制劑治療 NTRK 基因融合陽性實體瘤，並核准使用 selpercatinib 治療 RET 基因融合陽性腫瘤。 Dabrafenib/trametinib 已被批准用於治療具有 BRAF V600E 突變的腫瘤。當可用於測試的組織有限，或患者無法進行傳統的活檢時，單一生物標記的連續測試或使用有限的分子診斷面板可能會很快耗盡樣本。在這些情況下，透過在 CLIA 批准的實驗室中進行的經過驗證的 NGS 檢測進行全面的基因組分析可用於識別 HER2 擴增、MSI 狀態、MMR 缺陷、TMB、NTRK 基因融合、RET 基因融合和 BRAF V600E 突變。 應先考慮使用 IHC/ISH/ 靶向 PCR，然後視情況進行 NGS 檢測。

◆ *Liquid Biopsy*:

- The genomic alterations of solid cancers may be identified by evaluating circulating tumor DNA (ctDNA) in the blood, hence a form of “liquid biopsy.” Liquid biopsy is being used more frequently in patients with advanced disease, particularly those who are unable to have a clinical biopsy for disease surveillance and management. The detection of mutations/alterations in DNA shed from esophageal and EGJ carcinomas can identify targetable alterations or the evolution of clones with altered treatment response profiles. Therefore, for patients who have metastatic or advanced esophageal/esophagogastric cancers who may be unable to undergo a traditional biopsy or for disease progression monitoring, testing using a validated NGS-based comprehensive genomic profiling assay performed in a CLIA-approved laboratory may be considered. A negative result should be interpreted with caution, as this does not exclude the presence of tumor mutations or amplifications.

Principles of Biomarker Testing

- Assessment of *NTRK* gene fusions:
  - The FDA granted approval for the use of select TRK inhibitors for *NTRK* gene fusion-positive solid tumors
  - A two-step approach is used, which includes IHC first and confirmation of any positivity detected with IHC by Next generation sequencing (NGS)
  - TRK IHC as a screening tool:
    - IHC negative: No TRK expression
    - IHC positive: Detection of TRK expression, confirmation by NGS

- 若只有少量組織 (biopsy specimen) 可供檢測不同種類的 biomarker， 建議臨床醫師開立檢測請在病理申請單註明，同一次病理組織切片除了 HE，應預留組織空白片，以避免因蠟塊多次處理，造成腫瘤細胞消耗。

Principles of Endoscopic Staging and Therapy

1. 食道鱗狀細胞癌病患，在初步確診時，必須由專精影像強化技術 IEE 的內視鏡醫師進行一次上消化道內視鏡精查，以確認是否同時存在其他源於黏膜的癌症及癌前病變。(work up)
2. 所有食道癌病患，在進行手術或 CCRT 前，應會診胃腸科醫師討論是否施行內視鏡或外科性胃腸造口，以顧全病患治療前後的營養狀態。(principle of surgery)
3. 食道癌在接受治療前，除了已明確證實爲 M1 的病人外（如 CT scan、PET scan），應進行 EUS 診斷。(work up)
4. 關於早期食道癌：適用內視鏡切除的絕對適應症爲腫瘤深度侷限在 m1、m2 層，且 LN(-)；相對適應症爲腫瘤深度侷限在 m3、sm1 層，且 LN(-)；無法辨明情況下，可考慮行 diagnostic ESD。
5. 如果在上述測試完成後有足夠的組織可用，可以考慮用 NGS 做第二次檢測。
6. 食道癌病患若 EUS 發現 LN(+)，可選擇性加做 FNA/FNB。
7. 食道癌 CCRT 之後，可選擇性加做 EUS 做 re-staging。(optional)
8. 姑息性的內視鏡治療（例如：金屬支架擴張術、氬氣電漿凝固術局部消融…等），應於食道癌多科團隊會議中提出討論後執行。

註一：執行上消化道內視鏡精查時，應備有擴大型內視鏡、魯格爾試液（Lugol's solution）、稀釋醋酸、影像強化光源（例如 NBI、BLI 等），由具早期癌判斷能力的內視鏡醫師執行並撰寫報告。

註二：巴瑞特氏食道病患，須例行接受上消化道內視鏡精查，以確認是否發生癌變，精查應由專精影像強化技術 IEE 的內視鏡醫師執行。（有 dysplasia 者至少每年一次，無 dysplasia 者至少每三年一次。）

註三：應由食道癌共識會議向三院相關癌症多科團隊提出診療建議「所有口腔癌（含舌癌）、頭頸癌、下咽癌、喉癌等病患，在初步確診時及術後至少每年，必須由專精影像強化技術 IEE 的內視鏡醫師進行一次上消化道內視鏡精查，以確認是否同時存有食道癌及癌前病變。」

Principles of Surgery

- 手術前之臨床分期應使用胸腹部電腦斷層， 正子電腦斷層掃描 (PET-CT）及內視鏡超音波，以評估可否切除
- 治療前所有病患皆需諮詢胸腔外科醫師，接受是否可以耐受食道切除之生理評估
- 所有生理狀態適合食道切除，且爲局部可切除之胸腔 (超過環咽部 5 公分以下) 及腹腔食道癌患者，皆應考慮手術切除
- 食道交接處 (EGJ) 腺癌之病患皆應有 Siewert 分類
  - Siewert Type I: adenocarcinoma of the lower esophagus with the epicenter location located within 1cm to 5 cm above the anatomic EGJ
  - Siewert Type II: true carcinoma of the cardia with the tumor epicenter within 1 cm above and 2 cm below the EGJ
  - Siewert Type III: subcardial carcinoma with the tumor epicenter between 2 cm and 5 cm below the EGJ, which infiltrates the EGJ and lower esophagus from below
- Siewert type I 及 II 腫瘤應遵從食道癌及胃食道交接癌治療準則。 Siewert type III 則視爲胃癌，應遵從胃癌治療準則，然某些狀況下需增加部分食道切除，以獲取適當的之切除距離
- 腹腔內視鏡可以偵測放射線影像檢查無法找到之潛伏轉移病灶（Occult metastatic disease) 尤其是 Seiwert type II 及 III 腫瘤
- 腹膜積液細胞學檢查陽性與不良預後相關，應視爲 M1 疾患。患者若爲進展期之腫瘤，臨床分期 T3 或 N+ 疾患，應考慮接受腹腔內視鏡腹膜沖洗分期檢查 (laparoscopic staging with peritoneal washings)。
- 頸部食道癌或不超過環咽部 (cricopharygeal) 5 公分以上之食道癌應該以決定性放射化療 (definitive chemoradiation) 治療

Principles of Surgery

- 可切除的食道癌 Stage I-IVA(Locoregional disease, except T4b or unresectable N3)
  - Tis or T1a 腫瘤 (可考慮 EMR+Ablation 或手術)
  - T1b 腫瘤
  - T1-T3 腫瘤，即使局部淋巴腺已經轉移，多區域 (multi-station) 淋巴腺或巨大 (bulky) 淋巴腺轉移爲手術切除之 relative contraindication ，可否切除尚應考慮，如年齡、體能狀態、或治療反應等其他因素
  - T4a 腫瘤，侵犯至肋膜、心包膜或橫隔膜

- 不可切除的食道癌 Stage IVA(including T4b or unresectable N3) & IVB(metastatic disease)
  - cT4b 腫瘤 : 侵犯心臟、大血管、氣管、或鄰近器官包括肝、胰、肺及脾臟
  - 多區域 (multi-station) 淋巴腺或巨大 (bulky) 淋巴腺侵犯，大多數應視爲不可切除，然而淋巴侵犯可否切除尚應考慮，如年齡、體能狀態、或治療反應等其他因素
  - EJG 腫瘤患者合併鎖骨上淋巴轉移應視爲不可切除
  - 轉移第 IV 期之食道癌 (包括非區域淋巴腺 non-regional lymph node 轉移）

- 食道切除方式之選擇取決於腫瘤位置、可選擇重建之器官，手術者之經驗及喜好，以及病患之喜好
- 病患在術前引導期間無法經口進食以維持營養者可考慮食道擴張或空腸造瘻 (J-tube)，優於胃造瘻術 (會妨礙往後胃重建手術時胃管之健全）

Principles of Surgery

- 可接受之食道及胃交接腫瘤切除術式
  - Ivor Lewis esophagogastrectomy (開腹及右側開胸）
  - McKeown esohagogastrectomy (右側開胸、開腹及頸部吻合)
  - Minimally invasive Ivor Lewis esophagogastrectomy (腹腔鏡及微創右側開胸)
  - Minimally invasive McKeown esophagogastrectomy (胸腔鏡、微創開腹 / 腹腔鏡及頸部吻合)
  - Transhiatal esophagogastrectomy (開腹不經胸腔及頸部吻合)
  - Robotic minimally invasive esophagogastrectomy (機器手臂輔助微創術式)
  - Left transthoracic or thoracoabdominal approaches with anastomosis in chest or neck(左側開胸或胸腹聯合術式、胸腔或頸部吻合)
- 可接受之食道重建取代物
  - 胃（優先選擇）
  - 大腸
  - 空腸
- 可接受之淋巴擴清方式
  - 標準方式
  - 擴展方式（整體 En-bloc 方式)
- 至少需移除或評估 15 個以上之淋巴結以達到適當的淋巴分期 , 若術前接受過放射化學治療 , 雖適切需移除或評估之淋巴結數量仍然未知，仍建議移除或評估 15 個以上之淋巴結
- 患者經過決定性放射及化學治療後，仍有可切除之局部腫瘤，且沒有遠端轉移，可以考慮食道切除
- 食道切除，內視鏡食道黏膜切除，及其他燒灼術式，應在高容量之食道治療中心由有經驗的外科醫師或內視鏡醫師執行

Reference for principles of surgery

1. NCCN Practice Guidelines in Oncology, Esophageal Cancer, 2025 V4.
2. Janjigian, Y. Y., Al-Batran, S. E., Wainberg, Z. A., et al. (2025). Perioperative durvalumab in gastric and gastroesophageal junction cancer. N Engl J Med, 393, 217-230.
3. Hoeppner, J., Brunner, T., Schmoor, C., et al. (2025). Perioperative chemotherapy or preoperative chemoradiotherapy in esophageal cancer. N Engl J Med, 392, 323-335.
4. 3. Al-Batran, S. E., Homann, N., Pauligk, C., et al. (2019). Perioperative chemotherapy with fluorouracil plus leucovorin, oxaliplatin, and docetaxel versus fluorouracil or capecitabine plus cisplatin and epirubicin for locally advanced, resectable gastric or gastro-oesophageal junction adenocarcinoma (FLOT4): a randomised, phase 2/3 trial. Lancet, 393, 1948-1957.
5. Forbes, N., Elhanafi, S. E., Al-Haddad, M. A., et al. (2023). American Society for Gastrointestinal Endoscopy guideline on endoscopic submucosal dissection for the management of early esophageal and gastric cancers: summary and recommendations. Gastrointest Endosc, 98(2), 271-284.
6. Pimentel-Nunes, P., Libânio, D., Bastiaansen, B. A. J., et al. (2022). Endoscopic submucosal dissection for superficial gastrointestinal lesions: European Society of Gastrointestinal Endoscopy (ESGE) Guideline - Update 2022. Endoscopy, 54(6), 591-622.
7. Kato, K., Cho, B. C., Takahashi, M., et al. (2019). Nivolumab versus chemotherapy in patients with advanced oesophageal squamous cell carcinoma refractory or intolerant to previous chemotherapy (ATTRACTION-3): a multicentre, randomised, open-label, phase 3 trial. Lancet Oncol, 20(11), 1506-1517.
8. Hsu PK, Huang CS, Wang BY, Wu YC, Hsu WH. Survival Benefits of Postoperative Chemoradiation in Lymph Node-Positive Esophageal Squamous Cell Carcinoma. Ann Thorac Surg 2014;97:1734-41.(SCI)

9. Hsu PK, Huang CS, Wu YC, Chou TY, Hsu WH. Open versus Thoracoscopic Esophagectomy in Patients with Esophageal Squamous Cell Carcinoma. World J Surg. 2014;38:402-9. (SCI)
10. Hsu PK, Huang CS, Wang BY, Wu YC, Chou TY, Hsu WH. The Prognostic Value of the Number of Negative Lymph Nodes in Esophageal Cancer Patients after Transthoracic Resection. Ann Thorac Surg 2013;96:995-1001. (SCI)
11. Hsu PK, Chien LI, Huang CS, Hsieh CC, Wu YC, Hsu WH, Chou TY. Comparison of survival among neoadjuvant chemoradiation responders, non-responders and patients receiving primary resection for locally advanced oesophageal squamous cell carcinoma: does neoadjuvant chemoradiation benefit all? Interact Cardiovasc Thorac Surg. 2013;17:460-6. (SCI)
12. Wang BY, Liu CY, Lin CH, Hsu PK, Hsu WH, Wu YC, Cheng CY. Endoscopic Tumor Length Is an Independent Prognostic Factor in Esophageal Squamous Cell Carcinoma. Ann Surg Oncol. 2012;19:2149-58. (SCI)
13. Hsu PK, Wang BY, Huang CS, Wu YC, Hsu WH. Prognostic factors for post-recurrence survival in esophageal squamous cell carcinoma patients with recurrence after resection. J Gastrointest Surg. 2011;15:558-65. (SCI)
14. Hsu PK, Wang BY, Chou TY, Huang CS, Wu YC, Hsu WH. The total number of resected lymph node is not a prognostic factor for recurrence in esophageal squamous cell carcinoma patients undergone transthoracic esophagectomy. J Surg Oncol. 2011;103:416-20. (SCI)
15. Wang BY, Goan YG, Hsu PK, Hsu WH, Wu YC. Tumor length as a prognostic factor in esophageal squamous cell carcinoma. Ann Thorac Surg. 2011;91:887-93. (SCI)

Follow-up

- 病史和身體檢查
  - 每 3 到 6 個月一次，維持 1 到 2 年 .
  - 然後，每 6 到 12 個月一次，維持 3 到 5 年 .

- 臨床檢查
  - 依臨床指示，生化檢驗及全套血液檢查。
  - 依臨床指示安排影像學檢查。
  - 根據臨床需求進行上消化道內視鏡檢查和組織切片。
  - 針對食道手術吻合口狹窄處進行擴張術治療。
  - 安排營養評估與諮詢。

《食道癌抗癌藥物治療指引》

115 年版與上一版差異

114 年版 修訂日 114/01/21	115 年版 修訂日 114/11/25
Perioperative Chemotherapy	Perioperative Chemotherapy ■ 修改 FOLFOX：Preferred → Other ■ 新增 FLOT + Durvalumab
Systemic therapy for metastatic or locally advanced cancer	Systemic therapy for metastatic or locally advanced cancer ■ 新增 Zolbetuximab-clzb + Chemo • FOLFOX • CapeOx ■ 新增 Tisleizumab-isgr + Chemo • Cisplatin + 5FU • Oxaliplatin + 5FU • Cisplatin + Capecitabine • Oxaliplatin + Capecitabine

Perioperative Chemotherapy

(Only for adenocarcinoma of the thoracic esophagus or EGJ)

Preferred Regimens

ECF modications

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Epirubicin	50	≥ 30 mins	d1	Q3W	6*	9
Cisplatin	60	≥ 2 hrs	d1	Q3W	6*	
Capecitabine	625 PO BID		d1-21	Q3W	6*	

*3(pre-op) + 3(post-op)

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Epirubicin	50	≥ 30 mins	d1	Q3W	6*	9
Oxaliplatin	130	2 hrs	d1	Q3W	6*	
Capecitabine	625 PO BID		d1-21	Q3W	6*	

*3(pre-op) + 3(post-op)

Oxaliplatin + Fluoropyrimidine

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1	Q2W	6*	19
Leucovorin	200	≥ 90 mins	d1	Q2W	6*	
5-FU	2600	22-24 hrs	d1	Q2W	6*	

*3 (pre-op) + 3 (post-op)

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	130	2 hrs	d1	Q3W	6#	23
Capecitabine	1000 PO BID		d1-14	Q3W	6#	

#3 (pre-op) + 3 (post-op)

FLOT

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Docetaxel	50	1 hr	d1	Q2W	8#	8
Oxaliplatin	85	2 hrs	d1	Q2W	8#	
Leucovorin	200	≥ 90 mins	d1	Q2W	8#	
5-FU	2600	22-24 hrs	d1	Q2W	8#	

#4 (pre-op) + 4 (post-op)

FLOT + Durvalumab

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Durvalumab	1500 mg	1 hr	d1	Q4W	2 pre + 2 post OP	8
Oxaliplatin	85	2 hrs	d1, 15	Q4W	2 pre + 2 post OP	
Docetaxel	50	1 hr	d1, 15	Q4W	2 pre + 2 post OP	
Leucovorin	200	≥ 90 mins	d1, 15	Q4W	2 pre + 2 post OP	
5-FU	2600	22-24 hrs	d1, 15	Q4W	2 pre + 2 post OP	
Followed by						
Durvalumab	1500 mg	1 hr	d1	Q4W	10	

Other Regimens

Oxaliplatin + Fluoropyrimidine

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1	Q2W	6#	22
Leucovorin	400	≥ 90 mins	d1	Q2W	6#	
5-FU	400	5 mins	d1	Q2W	6#	
5-FU	1200	22-24 hrs	d1-2	Q2W	6#	

#3 (pre-op) + 3 (post-op)

Cisplatin + Fluorouracil

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	100	≥ 4 hrs	d1	Q4W	6#	9
5-Fu	800	22-24 hrs	d1-5	Q4W	6#	

#2-3 (pre-op) + 3-4 (post-op)

Preoperative Chemotherapy

(Only for adenocarcinoma of the thoracic esophagus or EGJ)

Cisplatin + Fluorouracil

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	80	≥ 4 hrs	d1	Q3W	2#	10
5-Fu	1000	22-24 hrs	d1-4	Q3W	2#	

#2(pre-op)

Postoperative Chemotherapy

Preferred Regimens

Nivolumab only after preoperative chemoradiation with R0 resection and residual disease

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Nivolumab	240 mg	≥ 30 mins	d1	Q2W	8	49
Followed by						
Nivolumab	480 mg	≥ 30 mins	d1	Q4W	For max 1 year	

Other Recommended Regimens

Oxaliplatin + Capecitabine

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplain	130	2 hrs	d1	Q3W		16
Capecitabine	1000 PO BID		d1-14	Q3W		

Oxaliplatin + Fluorouracil

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1	Q2W		22
Leucovorin	400	≥ 90 mins	d1	Q2W		
5-FU	400	5 mins	d1	Q2W		
5-FU	1200	22-24 hrs	d1-2	Q2W		

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1	Q2W		19
Leucovorin	200	≥ 90 mins	d1	Q2W		
5-FU	2600	22-24 hrs	d1	Q2W		

Preoperative Chemoradiation Therapy of Esophageal Cancer

Preferred Regimens

Paclitaxel + Carboplatin

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	50	≥ 1 hr	d1	QW	5	1
Carboplatin	AUC 2	≥ 30 mins	d1	QW	5	

Oxaliplatin + Fluoropyrimidine

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1	Q2W	3(RT) + 3	2
Leucovorin	400	≥ 90 mins	d1	Q2W	3(RT) + 3	
5-FU	400	5 mins	d1	Q2W	3(RT) + 3	
5-FU	800	22-24 hrs	d1-2	Q2W	3(RT) + 3	

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1, 15, 29		For 3 doses	42
Capecitabine	625 PO BID		d1-5	QW	5	

Other Regimens

Cisplatin + Fluoropyrimidine

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	75	≥ 4 hrs	d1	Q4W	2(RT) + 2	2
5-FU	1000	22-24 hrs	d1-4	Q4W	2(RT) + 2	

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	15	≥ 1 hr	d1-5	Q3W	2	5
5-FU	800	22-24 hrs	d1-5	Q3W	2	

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	30	≥ 2 hrs	d1	QW	5	43
Capecitabine	800 PO BID		d1-5	QW	5	

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	100	≥ 4 hrs	d1, 29	Q35D	1	4
5-Fu	1000	22-24 hrs	d1-4, 29-32	Q35D	1	

Irinotecan + Cisplatin

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Irinotecan	65	≥ 90 mins	d1, 8, 22, 29		1	6
Cisplatin	30	≥ 2 hrs	d1, 8, 22, 29		1	

Paclitaxel + Fluorouracil

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	45	≥ 1 hr	d1	QW	5	7
5-FU	300	22-24 hrs	d1-5	QW	5	

Definitive Chemoradiation (Non-Surgical)
Preferred Regimens

Oxaliplatin + Fluoropyrimidine

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1	Q2W	6[#]	5
Leucovorin	400	≥ 90 mins	d1	Q2W	6[#]	
5-FU	400	5 mins	d1	Q2W	6[#]	
5-FU	800	22-24 hrs	d1-2	Q2W	6[#]	

[#]3 (RT) + 3 (post-RT)

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1, 15, 29		For 3 doses	42
Capecitabine	625 PO BID		d1-5	QW	5	

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1, 15, 29			3
5-FU	180		d1-33			

Paclitaxel + Carboplatin

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	50	≥ 1 hr	d1	QW	5	1
Carboplatin	AUC 2	≥ 30 mins	d1	QW	5	

Cisplatin + Fluoropyrimidine

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	75	≥ 4 hrs	d1	Q4W	2~4[#]	11
5-FU	1000	22-24 hrs	d1-4	Q4W	2~4[#]	

[#]2 (RT) + 2

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	30	≥ 2 hrs	d1	QW	5	41
Capecitabine	800 PO BID		d1-5	QW	5	

Other Regimens

Taxane + Cisplatin

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	60	≥ 1 hr	d1, 8 , 15, 22		1	12
Cisplatin	75	≥ 4 hrs	d1		1	

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Docetaxel	60	1 hr	d1, 22		1	13
Cisplatin	80	≥ 4 hrs	d1, 22		1	

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Docetaxel	30	1 hr	d1	QW	5	14
Cisplatin	30	≥ 2 hrs	d1	QW	5	

Irinotecan + Cisplatin

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Irinotecan	65	≥ 90 mins	d1, 8, 22, 29		1	6
Cisplatin	30	≥ 2 hrs	d1, 8, 22, 29		1	

Paclitaxel + Fluoropyrimidine

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	45-50	≥ 1 hr	d1	QW	5	7
5-FU	300	22-24 hrs	d1-5	QW	5	

Postoperative Chemoradiation (Including EGJ)

5-FU (bolus) + Leucovorin

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Lecucovorin	20	≥ 5 mins	d1-5	Q4W	1st, 3rd, 4th #	15, 44
5-FU	425	≥ 5 mins	d1-5	Q4W	1st, 3rd, 4th #	
Lecucovorin	20	≥ 5 mins	d1-4, 31-33	Q5W	2nd (with RT)	
5-FU	400	≥ 5 mins	d1-4, 31-33	Q5W	2nd (with RT)	

#Cycle 1st (pre-RT), and cycle 3rd, 4th (post-RT)

5-FU + Leucovorin modifications

1 cycle before + 2 cycle after chemoradiation

藥品名	劑量 mg/m^2	給藥日	頻率	週期	參考文獻
Capecitabine	1000 PO BID	d1-14	Q4W	1 + 2	45

2 cycle before + 4 cycle after chemoradiation

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Leucovorin	400	≥ 90 mins	d1	Q2W	2 + 4	58
5-FU	400	5 mins	d1	Q2W	2 + 4	
5-FU	1200	22-24 hrs	d1-2	Q2W	2 + 4	

With radiation

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
5-FU	225	22-24 hrs	d1-5 or 1-7	QW	5 with RT	47

藥品名	劑量 mg/m^2	給藥日	頻率	週期	參考文獻
Capecitabine	825 PO BID	d1-5 or 1-7	QW	5 with RT	46

Neoadjuvant or Perioperative Immunotherapy

Nivolumab and Ipilimumab followd by Nivolumab (MSI-H/dMMR)

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Nivolumab	240 mg	≥ 30 mins	d1	Q2W	Pre-OP X 6	54
Ipilimumab	1 mg/kg	≥ 30 mins	d1	Q6W	Pre-OP X 2	
Followed by surgery						
Nivolumab	480 mg	≥ 30 mins	d1	Q4W	Pre-OP X 9	

Pembrolizumab (MSI-H/dMMR)

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Pembrolizumab	200 mg	≥ 30 mins	d1	Q3W	Pre-OP X 2	55, 56
Followed by surgery						
Pembrolizumab	200 mg	≥ 30 mins	d1	Q3W	Pre-OP X 5	

Tremelimumab + Durvalumab (MSI-H/dMMR) (for neoadjuvant therapy only)

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Tremelimumab	300 mg	≥ 1 hr	d1	Q12W	Pre-OP X 1	57
Durvalumab	1500 mg	1 hr	d1	Q4W	Pre-OP X 3	

Systemic Therapy for Metastatic or Locally Advanced Cancer
(where local therapy is not indicated)

First-line Therapy

Trastuzumab (with chemotherapy)

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Trastuzumab	8 → 6 mg/kg	≥ 1 hr	d1	Q3W		17, 53

Trastuzumab (with chemotherapy)

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Trastuzumab	6 → 4 mg/kg	≥ 1 hr	d1	Q2W		17

Tislelizumab-isgr (with Fluorouracil and Cisplatin or Oxaliplatin)

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Tislelizumab-isgr	200 mg	60 → 30 mins	d1	Q3W		61

Preferred Regimens

± Nivolumab + Oxaliplatin + Capecitabine

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
± Nivolimab	360 mg	≥ 30 mins	d1	Q3W		50
Oxaliplatin	130	2 hrs	d1	Q3W		23
Capecitabine	850~1000* PO BID		d1-14	Q3W		

For adenocarcinoma (PD-L1 CPS: 1-4, category 2B; ≥ 5, category 1) or Squamous cell carcinoma.

*2023 NCCN & 團隊共識

± Nivolumab + Oxaliplatin + 5Fu

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
± Nivolimab	240 mg	≥ 30 mins	d1	Q2W		50
Oxaliplatin	85	2 hrs	d1	Q2W		22
Leucovorin	400	≥ 90 mins	d1	Q2W		
5-FU	400	5 mins	d1	Q2W		
5-FU	1200	22-24 hrs	d1-2	Q2W		

For adenocarcinoma (PD-L1 CPS: 1-4, category 2B; ≥ 5, category 1) or Squamous cell carcinoma.

Nivolumab + 5FU + Cisplatin

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Nivolimab	360 mg	≥ 30 mins	d1	Q3W	Max 2 years	50
Cisplatin	80	≥ 4 hrs	d1	Q3W	Max 2 years	54
Capecitabine	850~1000* PO BID		d1-14	Q3W	Max 2 years	

*2023 NCCN & 團隊共識

Pembrolizumab + Oxaliplatin + Capecitabine

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Pembrolizumab	200 mg	≥ 30 mins	d1	Q3W	Up to 2 years	51
Oxaliplatin	130	2 hrs	d1	Q3W	6	
Capecitabine	850~1000* PO BID		d1-14	Q3W	6	

*2023 NCCN & 團隊共識

Pembrolizumab + Oxaliplatin + 5Fu

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Pembrolizumab	200 mg	≥ 30 mins	d1	Q2W	Up to 2 years	51
Oxaliplatin	85	2 hrs	d1	Q2W	9	
Leucovorin	400	≥ 90 mins	d1	Q2W	9	
5-FU	400	5 mins	d1	Q2W	9	
5-FU	1200	22-24 hrs	d1-2	Q2W	9	

Pembrolizumab + Cisplatin + 5Fu

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Pembrolizumab	200 mg	≥ 30 mins	d1	Q3W	Up to 2 years	51
Cisplatin	80	≥ 4 hrs	d1	Q3W	6	
5-Fu	800	22-24 hrs	d1-5	Q3W	6	

Pembrolizumab + Cisplatin + Capecitabine

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Pembrolizumab	200 mg	≥ 30 mins	d1	Q3W	Up to 2 years	51
Cisplatin	80	≥ 4 hrs	d1	Q3W	6	
Capecitabine	850~1000* PO BID		d1-14	Q3W	6	

*2023 NCCN & 團隊共識

Zolbetuximab-clzb for HER 2 negative, CLDN 18.2-positive, adenocarcinoma

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Zolbetuximab-clzb	800 → 400	30-60 mins	d1	Q2W		59
Oxaliplatin	85	2 hrs	d1	Q2W	Up to 12 cycles	
Leucovorin	400	≥ 90 mins	d1	Q2W	Up to 12 cycles	
5-FU	400	5 mins	d1	Q2W	Up to 12 cycles	
5-FU	1200	22-24 hrs	d1-2	Q2W	Up to 12 cycles	

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Zolbetuximab-clzb	800 → 600	30-60 mins	d1	Q3W		60
Oxaliplatin	130	2 hrs	d1	Q3W	Up to 8 cycles	
Capecitabine	850~1000 PO BID		d1-14	Q3W	Up to 8 cycles	

Fluoropyrimidine + Cisplatin

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	100	≥ 4 hrs	d1	Q4W		18
5-FU	1000	22-24 hrs	d1-4	Q4W		

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	50	≥ 2 hrs	d1	Q2W		19, 20
Leucovorin	200	≥ 90 mins	d1	Q2W		
5-FU	2000	22-24 hrs	d1	Q2W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Cisplatin	80	≥ 4 hrs	d1	Q3W		21
Capecitabine	850~1000* PO BID		d1-14	Q3W		

*2023 NCCN & 團隊共識

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Nivolumab	3 mg/kg	≥ 30 mins	d1	Q3W	Max 2 years	53
Ipilimumab	1 mg/kg	≥ 30 mins	d1	Q6W		

Fluoropyrimidine + Oxaliplatin

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1	Q2W		19
Leucovorin	200	≥ 90 mins	d1	Q2W		
5-FU	2600	22-24 hrs	d1	Q2W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Oxaliplatin	85	2 hrs	d1	Q3W		47
Capecitabine	625 PO BID		d1-14	Q3W		

MSI-H/dMMR tumors (independent of PD-L1 status)

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Pembrolizumab	200 mg	≥ 30 mins	d1	Q3W		55

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Pembrolizumab	400 mg	≥ 30 mins	d1	Q6W		56

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Nivolumab	1 mg/kg	≥ 30 mins	d1	Q3W	4	57
Ipilimumab	3 mg/kg	≥ 30 mins	d1	Q3W	4	
Followed by						
Nivolumab	240 mg	≥ 30 mins	d1	Q2W	Max 2 years	

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Nivolumab	240 mg	≥ 30 mins	d1	Q3W	4	57
Ipilimumab	1 mg/kg	≥ 30 mins	d1	Q3W	4	
Followed by						
Nivolumab	240 mg (480 mg)	≥ 30 mins	d1	Q2W (Q4W)	Max 2 years	

Tislelizumab-isgr combination with Fluoropyrimidine and Cisplatin or Oxaliplatin

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Tislelizumab-isgr	200 mg	60 → 30 mins	d1	Q3W		61
Cisplatin	60-80	≥ 4 hrs	d1	Q3W		
5-FU	750-800	22-24 hrs	d1-5	Q3W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Tislelizumab-isgr	200 mg	60 → 30 mins	d1	Q3W		61
Oxaliplatin	130	2 hrs	d1	Q3W		
5-FU	750-800	22-24 hrs	d1-5	Q3W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Tislelizumab-isgr	200 mg	60 → 30 mins	d1	Q3W		61
Cisplatin	60-80	≥ 4 hrs	d1	Q3W		
Capecitabine	1000 PO BID		d1-14	Q3W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Tislelizumab-isgr	200 mg	60 → 30 mins	d1	Q3W		61
Oxaliplatin	130	2 hrs	d1	Q3W		
Capecitabine	1000 PO BID		d1-14	Q3W		

Other Regimens

Paclitaxel + Cisplatin/Carboplatin

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	200	≥ 3 hrs	d1	Q3W		24
Cisplatin	75	≥ 4 hrs	d2	Q3W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	90	≥ 1 hrs	d1	Q2W		25
Cisplatin	50	≥ 2 hrs	d1	Q2W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	200	≥ 3 hrs	d1	Q3W		26
Carboplatin	AUC 5	1 hr	d1	Q3W		

Docetaxel + Cisplatin

藥品名	劑量 mg/m^2 ★	輸注時間	給藥日	頻率	週期	參考文獻
Docetaxel	75-85	1 hr	d1	Q3W		27, 28
Cisplatin	70-75	≥ 4 hrs	d1	Q3W		

Fluoropyrimidine

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Leucovorin	400	≥ 90 mins	d1	Q2W		20
5-FU	400	5 mins	d1	Q2W		
5-FU	1200	22-24 hrs	d1-2	Q2W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
5-FU	800	22-24 hrs	d1-5	Q4W		29

藥品名	劑量 mg/m^2	給藥日	頻率	週期	參考文獻
Capecitabine	1250 PO BID	d1-14	Q3W		30

Taxane

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Docetaxel	100	1 hr	d1	Q3W		31, 32

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	250	≥ 3 hrs	d1	Q3W		33

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Paclitaxel	80	≥ 1 hr	d1	QW		34

Irinotecan + 5-FU (only for adenocarcinoma)

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Irinotecan	180	≥ 90 mins	d1	Q2W		35
Leucovorin	400	≥ 90 mins	d1	Q2W		
5-FU	400	5 mins	d1	Q2W		
5-FU	1200	22-24 hrs	d1-2	Q2W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Irinotecan	80	≥ 90 mins	d1	QW	6 + 2(off)[#]	48
Leucovorin	500	≥ 90 mins	d1	QW	6 + 2(off)[#]	
5-FU	2000	22-24 hrs	d1	QW	6 + 2(off)[#]	

[#]6 weeks treatment, followed by 2 weeks off

ECF

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Epirubicin	50	≥ 30 mins	d1	Q3W		38
Cisplatin	60	≥ 3 hrs	d1	Q3W		
5-Fu	200	22-24 hrs	d1-21	Q3W		

ECF modifications

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Epirubicin	50	≥ 30 mins	d1	Q3W		39, 40
Oxaliplatin	130	2 hrs	d1	Q3W		
5-Fu	200	22-24 hrs	d1-21	Q3W		

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Epirubicin	50	≥ 30 mins	d1	Q3W		39, 40
Cisplatin	60	≥ 3 hrs	d1	Q3W		
Capecitabine	625 PO BID		d1-21	Q3W		

藥品名	劑量 mg/m²	輸注時間	給藥日	頻率	週期	參考文獻
Epirubicin	50	≥ 30 mins	d1	Q3W		38
Oxaliplatin	130	2 hrs	d1	Q3W		
Capecitabine	625 PO BID		d1-21	Q3W		

DCF modifications

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Docetaxel	40	1 hr	d1	Q2W		36
Leucovorin	400	≥ 90 mins	d1	Q2W		
5-FU	400	5 mins	d1	Q2W		
5-FU	1000	22-24 hrs	d1-2	Q2W		
Cisplatin	40	≥ 2 hrs	d3	Q2W		

藥品名	劑量 mg/m^2	輸注時間	給藥日	頻率	週期	參考文獻
Docetaxel	50	1 hr	d1	Q2W		37
Oxaliplatin	85	2 hrs	d1	Q2W		
5-FU	1200	22-24 hrs	d1-2	Q2W		

參考文獻

1. Van Hagen P, Hulshof MC, van Lanschot, J.J, et al. Preoperative Chemoradiotherapy for Esophageal or Junctional Cancer. N Engl J Med 2012;366:2074-2084.
2. Conroy T, Galais MP, Raoul JL, et al. Definitive chemoradiotherapy with FOLFOX versus fluorouracil and cisplatin in patients with oesophageal cancer (PRODIGE5/ ACCORD17): final results of a randomised, phase 2/3 trial. Lancet Oncol 2014;15:305-314.
3. Khushalani NI, Leichman CG, Proulx G, et al. Oxaliplatin in combination with protracted-infusion fluorouracil and radiation: report of a clinical trial for patients with esophageal cancer. J Clin Oncol 2002;20:2844-2850.
4. Tepper J, Krasna MJ, Niedzwiecki D, et al. Phase III trial of trimodality therapy with cisplatin, fluorouracil, radiotherapy,and surgery compared with surgery alone for esophagealcancer: CALGB 9781. J Clin Oncol 2008;26:1086-1092.

5. Bedenne L, Michel P, Bouche O, et al. Chemoradiation followed by surgery compared with chemoradiation alone in squamous cancer of the esophagus: FFCD 9102. J Clin Oncol 2007; 25:1160-1168.
6. Sharma R, Yang GY, Nava HR, et al. A single institution experience with neoadjuvant chemoradiation (CRT) with irinotecan (I) and cisplatin (C) in locally advanced esophageal carcinoma (LAEC) [abstract]. J Clin Oncol 2009;27 (Suppl 15):Abstract e15619.
7. Ajani JA, Winter K, Okawara GS, et al. Phase II trial of preoperative chemoradiation in patients with localized gastric adenocarcinoma (RTOG 9904): quality of combined modality therapy and pathologic response. J Clin Oncol 2006;24:3953-3958.
8. Al-Batran SE, Hofheinz RD, Pauligk C, et al. Histopathological regression after neoadjuvant docetaxel, oxaliplatin, fluorouracil, and leucovorin versus epirubicin, cisplatin, and fluorouracil or capecitabine in patients with resectable gastric or gastro-oesophageal junction adenocarcinoma (FLOT4-AIO): results from the phase 2 part of a multicentre, open-label, randomised phase 2/3 trial. Lancet Oncol 2016;17:1697-1708.
9. Ychou M, Boige V, Pignon J-P, et al. Perioperative chemotherapy compared with surgery alone for resectable gastroesophageal adenocarcinoma: an FNCLCC and FFCD multicenter phase III trial. J Clin Oncol 2011;29:1715-1721.
10. Alderson D, Langley RE, Nankivell MG, et al. Neoadjuvant chemotherapy for resectable oesophageal and junctional adenocarcinoma: Results from the UK Medical Research Council randomised OEO5 trial (ISRCTN 01852072) [abstract]. J Clin Oncol 2015;33 (15_suppl):Abstract 4002.
11. Minsky BD, Pajak TF, Ginsberg RJ, et al. INT 0123 (Radiation Therapy Oncology Group 94-05) phase III trial of combined-modality therapy for esophageal cancer: highdose versus standard-dose radiation therapy. J Clin Oncol 2002;20:1167-1174.
12. Urba SG, Orringer MB, Ianettonni M, et al. Concurrent cisplatin, paclitaxel, and radiotherapy as preoperative treatment for patients with locoregional esophagealcarcinoma. Cancer 003;98:2177-2183.
13. Li QQ, Liu MZ, Hu YH, et al. Definitive concomitant chemoradiotherapy with docetaxel and cisplatin in squamous esophageal carcinoma. Dis Esophagus 2010;23:253-259.
14. Day FL, Leong T, Ngan S, et al. Phase I trial of docetaxel, cisplatin and concurrent radical radiotherapy in locally

advanced oesophageal cancer. Br J Cancer 2011;104:265-271.
15. Smalley SR, Benedetti JK, Haller DG, et al. Updated analysis of SWOG-directed intergroup study 0116: a phase III trial of adjuvant radiochemotherapy versus observation after curative gastric cancer resection. J Clin Oncol 2012;30:2327-2333
16. Noh SH, Park SR, Yang HK, et al. Adjuvant capecitabine plus oxaliplatin for gastric cancer after D2 gastrectomy (CLASSIC): 5-year follow-up of an open-label, randomized phase 3 trial. Lancet Oncol 2014; 15:1389-1396.
17. Bang YJ, Van Cutsem E, Feyereislova A, et al. Trastuzumab in combination with chemotherapy versus chemotherapy alone for treatment of HER2-positive advanced gastric or gastro-oesophageal junction cancer (ToGA): a phase 3, open-label, randomised controlled trial. Lancet 2010;376:687-697.
18. Lorenzen S, Schuster T, Porschen R, et al. Cetuximab plus cisplatin-5-fluorouracil versus cisplatin-5-fluorouracil alone in first-line metastatic squamous cell carcinoma of the esophagus: a randomized phase II study of the Arbeitsgemeinschaft Internistische Onkologie. Ann Oncol 2009;20:1667-1673.
19. Al-Batran S-E, Hartmann JT, Probst S, et al. Phase III trial in metastatic gastroesophageal adenocarcinoma with fluorouracil, leucovorin plus either oxaliplatin or cisplatin: a study of the Arbeitsgemeinschaft Internistische Onkologie. J Clin Oncol 2008;26:1435-1442.
20. Bouche O, Raoul JL, Bonnetain F, et al. Randomized multicenter phase II trial of a biweekly regimen of fluorouracil and leucovorin (LV5FU2), LV5FU2 plus cisplatin, or LV5FU2 plus irinotecan in patients with previously untreated metastatic gastric cancer: a Federation Francophone de Cancerologie Digestive Group Study--FFCD 9803. J Clin Oncol 2004;22:4319-4328.
21. Kang YK, Kang WK, Shin DB, et al. Capecitabine/cisplatin versus 5-fluorouracil/cisplatin as first-line therapy in patients with advanced gastric cancer: a randomised phase III noninferiority trial. Ann Oncol 2009;20:666-673.
22. Enzinger PC, Burtness B, Hollis D, et al. CALGB 80403/ECOG 1206: A randomized phase II study of three standard chemotherapy regimens (ECF, IC, FOLFOX) plus cetuximab in metastatic esophageal and GE junction cancer [abstract]. J Clin Oncol 2010;28 (Suppl 15):Abstract 4006.
23. Kim GM, Jeung HC, Rha SY, et al. A randomized phase II trial of S-1-oxaliplatin versus capecitabine-oxaliplatin in advanced gastric cancer. Eur J Cancer 2012;48:518-526.

24. Ilson DH, Forastiere A, Arquette M, et al. A phase II trial of paclitaxel and cisplatin in patients with advanced carcinoma of the esophagus. Cancer J 2000;6:316-323.
25. Petrasch S, Welt A, Reinacher A, et al. Chemotherapy with cisplatin and paclitaxel in patients with locally advanced, recurrent or metastatic oesophageal cancer. Br J Cancer 1998;78:511-514.
26. Gadgeel SM, Shields AF, Heilbrun LK, et al. Phase II study of paclitaxel and carboplatin in patients with advanced gastric cancer. Am J Clin Oncol 2003;26:37-41.
27. Ajani JA, Fodor MB, Tjulandin SA, et al. Phase II multi-institutional randomized trial of docetaxel plus cisplatin with or without fluorouracil in patients with untreated, advanced gastric, or gastroesophageal adenocarcinoma. J Clin Oncol 2005;23:5660-5667.
28. Kim JY, Do YR, Park KU, et al. A multi-center phase II study of docetaxel plus cisplatin as first-line therapy in patients with metastatic squamous cell esophageal cancer. Cancer Chemother Pharmacol 2010;66:31-36.
29. Ohtsu A, Shimada Y, Shirao K, et al. Randomized phase III trial of fluorouracil alone versus fluorouracil plus cisplatin versus uracil and tegafur plus mitomycin in patients with unresectable, advanced gastric cancer: The Japan Clinical Oncology Group Study (JCOG9205). J Clin Oncol 2003;21:54-59.
30. Hong YS, Song SY, Lee SI, et al. A phase II trial of capecitabine in previously untreated patients with advanced and/or metastatic gastric cancer. Ann Oncol 2004;15:1344-1347.
31. Albertsson M, Johansson B, Friesland S, et al. Phase II studies on docetaxel alone every third week, or weekly in combination with gemcitabine in patients with primary locally advanced, metastatic, or recurrent esophageal cancer. Med Oncol 2007;24:407-412.
32. Ford HE, Marshall A, Bridgewater JA, et al. Docetaxel versus active symptom control for refractory oesophagogastric adenocarcinoma (COUGAR-02): an open-label, phase 3 randomised controlled trial. Lancet Oncol 2014;15:78-86.
33. Ajani JA, Ilson DH, Daugherty K, et al. Activity of taxol in patients with squamous cell carcinoma and adenocarcinoma of the esophagus. J Natl Cancer Inst 1994;86:1086-1091.
34. Ilson DH, Wadleigh RG, Leichman LP, Kelsen DP. Paclitaxel given by a weekly 1-h infusion in advanced esophageal cancer. Ann Oncol 2007;18:898-902.

35. Guimbaud R, Louvet C, Ries P, et al. Prospective, randomized, multicenter, phase III study of fluorouracil, leucovorin, and irinotecan versus epirubicin, cisplatin, and capecitabine in advanced gastric adenocarcinoma: A French Intergroup (Fédération Francophone de Cancérologie Digestive, Fédération Nationale des Centres de Lutte Contre le Cancer, and Groupe Coopérateur Multidisciplinaire en ncologie) Study. J Clin Oncol 2014;32:3520-3526.
36. Shah MA, Janjigian YY, Stoller R, et al. Randomized multicenter phase II study of modified docetaxel, cisplatin, and fluorouracil (DCF) versus DCF plus growth factor support in patients with metastatic gastric adenocarcinoma: a study of the US Gastric Cancer Consortium. J Clin Oncol 2015;33:3874-3879.
37. Shankaran V, Mulcahy MF, Hochster HS, et al. Docetaxel, oxaliplatin, and 5-fluorouracil for the treatment of metastatic or unresectable gastric or gastroesophageal junction (GEJ) adenocarcinomas: Preliminary results of a phase II study. Gastrointestinal Cancers Symposium 2009:Abstract 47.
38. Elkerm YM, Elsaid A, AL-Batran S, Pauligk C. Final results of a phase II trial of docetaxel-carboplatin-FU in locally advanced gastric carcinoma [abstract]. Presented at the Gastrointestinal Cancers Symposium 2008. Abstract 38.
39. Ross P, Nicolson M, Cunningham D, et al. Prospective randomized trial comparing mitomycin, cisplatin, and protracted venous-infusion fluorouracil (PVI 5-FU) with epirubicin, cisplatin, and PVI 5-FU in advanced esophagogastric cancer. J Clin Oncol 2002;20:1996-2004.
40. Sumpter K, Harper-Wynne C, Cunningham D, et al. Report of two protocol planned interim analyses in a randomised multicentre phase III study comparing capecitabine with fluorouracil and oxaliplatin with cisplatin in patients with advanced oesophagogastric cancer receiving ECF. Br J Cancer 2005;92:1976-1983.
41. Cunningham D, Starling N, Rao S, et al. Capecitabine and oxaliplatin for advanced esophagogastric cancer. N Engl J Med 2008;358:36-46.
42. Le DT, Durham JN, Smith KN, et al. Mismatch repair deficiency predicts response of solid tumors to PD-1 blockade. Science2017;357:409-413.
43. Javle MM, Yang G, Nwogu CE, et al. Capecitabine, oxaliplatin and radiotherapy: a phase IB neoadjuvant study for esophageal cancer with gene expression analysis. Cancer Invest 2009;27:193-200.
44. Lee SS, Kim SB, Park SI, et al. Capecitabine and cisplatin chemotherapy (XP) alone or sequentially combined chemoradiotherapy containing XP regimen in patients with three different settings of stage IV esophageal cancer. Jpn J

Clin Oncol 2007;37:829-835.
45. Macdonald JS, Smalley SR, Benedetti J, et al. Chemoradiotherapy after surgery compared with surgery alone for adenocarcinoma of the stomach or gastroesophageal junction. N Engl J Med 2001;345:725-730.
46. Jansen EP, Boot H, Saunders MP, et al. A phase I-II study of postoperative capecitabine-based chemoradiotherapy in gastric cancer. Int J Radiat Oncol Biol Phys 2007;69:1424-1428.
47. Leong T, Joon DL, Willis D, et al. Adjuvant chemoradiation for gastric cancer using epirubicin, cisplatin, and 5-fluorouracil before and after three-dimensional conformal radiotherapy with concurrent infusional 5-fluorouracil: a multicenter study of the trans-tasman radiation oncology group. Int J Radiat Oncol Biol Phys 2011;79:690-695.
48. Lee HS, Choi Y, Hur WJ, et al. Pilot study of postoperative adjuvant chemoradiation for advanced gastric cancer: adjuvant 5-FU/cisplatin and chemoradiation with capecitabine. World J Gastroenterol 2006;12:603-607.
49. Wolff K, Wein A, Reulbach U, et al. Weekly high-dose 5-fluorouracil as a 24-h infusion and sodium folinic acid (AIO regimen) plus irinotecan in patients with locally advanced nonresectable and metastatic adenocarcinoma or squamous cell carcinoma of the oesophagus: a phase II trial. Anticancer Drugs 2009;20:165-173.
50. Kelly R, Ajani J, Kuzdzal J, et al. Adjuvant nivolumab in resected esophageal or gastroesophageal junction cancer following neoadjuvant chemoradiation therapy: first results of the CheckMate 577 study. [abstract]. Presented at the Oral Presentation presented at the ESMO 2020 Annual Meeting; September 19-21, 2020; Virtual Meeting.
51. Moehler M, Shitara K, Garrido M, et al. Nivolumab plus chemotherapy versus chemotherapy as first-line treatment for advanced gastric cancer/gastroesophageal junction cancer/ esophageal adenocarcinoma: first results of the CheckMate 649 study. [abstract]. Presented at the Oral Presentation presented at the ESMO 2020 Annual Meeting; September 19-21, 2020;Virtual Meeting
52. Kato K., Sun JM., M. S, et al. Pembrolizumab plus chemotherapy versus chemotherapy as first-line therapy in patients with advanced esophageal cancer: the phase 3 KEYNOTE-590 study. [abstract]. Presented at the Presented at ESMO Annual Meeting; September 19-21, 2020; Virtual Meeting.
53. Chung HC, et al First-line pembrolizumab/placebo plus trastuzumab and chemotherapy in HER2-positive advanced

gastric cancer: KEYNOTE-811. Future Oncol 2021;17:491-501.
54. Doki Y, Ajani JA, Kato K, et al. Nivolumab Combination Therapy in Advanced Esophageal Squamous-Cell Carcinoma. N Engl J Med. 2022 Feb 3;386(5):449-462.
55. Kojima T, Shah MA, Muro K,et al. KEYNOTE-181 Investigators. Randomized Phase III KEYNOTE-181 Study of Pembrolizumab Versus Chemotherapy in Advanced Esophageal Cancer. J Clin Oncol. 2020 Dec 10;38(35):4138-4148. doi: 10.1200/JCO.20.01888. Epub 2020 Oct 7. PMID: 33026938.
56. Lala M, Li TR, de Alwis DP, et al. A six-weekly dosing schedule for pembrolizumab in patients with cancer based on evaluation using modelling and simulation. Eur J Cancer. 2020 May;131:68-75. doi: 10.1016/j.ejca.2020.02.016. Epub 2020 Apr 15. Erratum in: Eur J Cancer. 2021 Feb;144:400. PMID: 32305010.
57. Janjigian YY, Shitara K, Moehler M, et al. First-line nivolumab plus chemotherapy versus chemotherapy alone for advanced gastric, gastro-oesophageal junction, and oesophageal adenocarcinoma (CheckMate 649): a randomised, open-label, phase 3 trial. Lancet. 2021 Jul 3;398(10294):27-40. doi: 10.1016/S0140-6736(21)00797-2. Epub 2021 Jun 5. PMID: 34102137; PMCID: PMC8436782.
58. NCCN Guideline v4.2024. Esophageal and Esophagogastric Junction Cancers. ESOPH-F 11 of 22.
59. Shitara K, Lordick F, Bang YJ, et al. Zolbetuximab plus mFOLFOX6 in patients with CLDN18.2-positive, HER2-negative, untreated, locally advanced unresectable or metastatic gastric or gastro-oesophageal junction adenocarcinoma (SPOTLIGHT): a multicentre, randomised, double-blind, phase 3 trial. Lancet. 2023 May 20;401(10389):1655-1668. doi: 10.1016/S0140-6736(23)00620-7.
60. Shah MA, Shitara K, et al. Zolbetuximab plus CAPOX in CLDN18.2-positive gastric or gastroesophageal junction adenocarcinoma: the randomized, phase 3 GLOW trial. Nat Med. 2023 Aug;29(8):2133-2141. doi: 10.1038/s41591-023-02465-7. Epub 2023 Jul 31. PMID: 37524953; PMCID: PMC10427418.
61. Xu J, Kato K, Raymond E, et al. Tislelizumab plus chemotherapy versus placebo plus chemotherapy as first-line treatment for advanced or metastatic oesophageal squamous cell carcinoma (RATIONALE-306): a global, randomised, placebo-controlled, phase 3 study. Lancet Oncol. 2023 May;24(5):483-495. doi: 10.1016/S1470-2045(23)00108-0.

一、治療範圍

1. 食道腫瘤或腫瘤原發部位
2. 淋巴轉移病灶
3. 高風險淋巴轉移範圍

二、治療劑量 / 次數

▲輔助性放射治療 (手術後)

1. 總劑量
   (a) 殘餘腫瘤 / 腫瘤原發部位：50~50.4 GyE *
   (b) 高風險範圍：45~50.4 GyE
   (c) 照射次數：25~28 次

▲根治性放射治療 (無手術)

1. 總劑量
   (a) 腫瘤：50~50.4 GyE *
   (b) 高風險範圍：45~50.4 GyE
   (c) 照射次數：25~28 次

*上段食道癌可考慮增加劑量至 60~66 GyE；中下段食道癌可考慮增加劑量至 60 GyE。

▲前導性放射治療 (手術前)

1. 總劑量
   (a) 腫瘤：45~50.4 GyE
   (b) 高風險範圍：45~50.4 GyE
   (c) 照射次數：25~28 次

或是
2. 總劑量
(a) 腫瘤：41.4 GyE
(b) 高風險範圍：41.4 GyE
(c) 照射次數：23 次

▲根治性質子放射線治療 (無手術)
1. 總劑量
(a) 腫瘤：60~70 GyE
照射次數：30~35 次
(b) 高風險範圍：36~40 GyE
照射次數：20 次

▲近接放射線治療
主治醫師於遠隔放射治療後評估追加近接放射線治療
腫瘤表面處方劑量 : 3Gy x 4 次 或 5 Gy x 3 次

三、治療方式：

使用強度調控放射治療技術，包含弧形及螺旋放射規畫，可考慮搭配影像導引治療，治療選擇可使用同步照射高與低危險部位的方式或先給予整個照射部位部份劑量照射後，再針對高危險部位加強劑量。

四、參考文獻：

1. International Commission on Radiation Units and Measurements. ICRU Report No 50: Prescribing, Recording and Reporting Photon Beam Therapy. Bethesda, MD: ICRU Publications 1993.
2. Cooper JS, GUO MD, Herskovic A, et al. Chemoradiotherapy of locally advanced esophageal cancer: long-term follow-up of a prospective randomized trial （RTOG 85-01）. Radiation Therapy Oncology Group. JAMA 1999;281:1623-1627.

3. International Commission on Radiation Units and Measurements. ICRU Report No 62: Prescribing, Recording and Reporting Photon Beam Therapy. Bethesda, MD: ICRU Publications 1999.
4. Shi XH, Yao W, Liu T. Late course accelerated fractionation in radiotherapy of esophageal carcinoma. Raiother Oncol 1999; 51: 21-26.
5. Gaspar L.E., Winter K., I Kocha W., Coia L.R., Herskovic A., Graham M. A phase I/II study of external beam radiation, brachytherapy, and concurrent chemotherapy for patients with localized carcinoma of the esophagus (Radiation Therapy Oncology Group Study 9207): Final report. Cancer. 2000;88:988–995
6. Minsky BD, Pajak TF, Ginsberg RJ, et al. INT 0123 （Radiation Therapy Oncology Group 94-05） phase III trial of combined-modality therapy for esophageal cancer: high-dose versus standard-dose radiation therapy. J Clin Oncol 2002; 20: 1167-1174.
7. Kleinberg L, Forastiere AA. Chemoradiation in the management of esophageal cancer. J Clin Oncol 2007; 25:4110-4117.
8. Willett CG, et al. Principles and Practice of Radiation Oncology. 5th edition: Philadelphia: Lippincott Williams & Wilkins; 2007. pp. 1131-1153.
9. Gao XS, Qiao X, Wu F, et al. Pathological analysis of clinical target volume margin for radiotherapy in patients with esophageal and gastroesophageal junction carcinoma. Int J Radiat Oncol Biol Phys 2007;67:389-396.
10. Suntharalingam M, Winter K, Ilson D, et al. Effect of the addition of cetuximab to paclitaxel, cisplatin, and radiation therapy for patients with esophageal cancer: The NRG Oncology RTOG 0436 Trial. JAMA Oncol. 2017 Feb 1;3(2):152-158.
11. Biere SS, van Blankenstein W, Noordman BJ, et al. Patient-reported outcomes following cetuximab addition in RTOG 0436 esophageal cancer trial: insights from long-term follow-up. Qual Life Res. 2024 Dec;33(12):3471-3480
12. P. van Hagen, M.C.C.M. Hulshof, J.J.B. van Lanschot, et al. Preoperative Chemoradiotherapy for Esophageal or Junctional Cancer. N Engl J Med 2012; 366:2074-2084.
13. Shapiro J, van Lanschot JJB, Hulshof MCCM, van Hagen P, et al. Neoadjuvant chemoradiotherapy plus surgery versus surgery alone for oesophageal or junctional cancer (CROSS): long-term results of a randomised controlled trial. Lancet Oncol. 2015 Sep;16(9):1090-1098.

14. Ono T, et al. Clinical Results of Proton Beam Therapy for Esophageal Cancer: Multicenter Retrospective Study in Japan. Cancers (Basel). 7:993, 2019
15. Lin SH, et al. Randomized Phase IIB Trial of Proton Beam Therapy Versus Intensity-Modulated Radiation Therapy for Locally Advanced Esophageal Cancer. J Clin Oncol. 38: 1569-79, 2020
16. NCCN clinical practice guidelines in oncology for esophageal and esophagogastric junction cancers. Version 1, 2026.
17. QUANTEC