中山醫學大學附設醫院

胰臟癌診療指引

本臨床指引參考NCCN、ESMO版本

依據中山醫學大學附設醫院胰臟癌小組經驗作編修

2026/04/10	Version7.1
2025/12/26	Version7.0
2024/12/13	Version6.0
2023/11/24	Version5.0
2022/12/23	Version4.0
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2020/12/25	Version3.0
2019/12/27	Version3.0
2018/11/23	Version2.0
2018/03/16	Version1.0

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

修訂紀錄

頁數	Version 7.0	Version 7.1
	前言: 根據世界衛生組織估計，胰臟癌在全世界發生率排名第十三個，在所有癌症死亡率排名第八，在 2002 年統計中全世界大約將近 227,000 位病人死於這一種高度惡性的疾病，其發病的速度與現行缺乏有效的療法，讓其發生率與死亡率幾乎相同。民國 104 年，胰惡性腫瘤發生個案數占全部惡性腫瘤發生個案數的 2.13%，當年因此惡性腫瘤死亡人數占全部惡性腫瘤死亡人數的 4.16%。發生率的排名於男性 12 位、女性為第 13 位；民國 104 年初次診斷為胰惡性腫瘤者共計 2,237 人，占消化器官及腹膜個案數的 5.98%；當年死因為胰惡性腫瘤者共計 1,948 人；根據	刪除

	衛生福利部 111 年死因年報統計，胰臟癌為國人死因為第 7 位，死亡率排名於男性為第 7 位、女性為第 5 位。 胰臟癌是一個高度惡性的疾病，約 90%的病人無法以手術根除治療，整體而言，五年的存活率低於 5%。病理上胰臟癌的病人大約 90%以上都是屬於胰腺癌（adenocarcinoma），另外少數是胰島細胞的神 經內分泌腫瘤（NET,Neuroendocrine tumor）及囊狀腫瘤(cystic tumor)等。大部份診斷出胰臟癌的病人被發現時都已經是進行性疾病來呈現，統計發現只有 10%的病人能進行手術。絕大多數的病人發現時已經是局部侵襲性疾病或已發生轉移。治療的目標通常是緩解症狀（palliative），治癒（cure）幾乎是不可能，緩和的化學療法目的是能提高存活率或末期生活品質。 本院自民國 107 年召集相關	

	專科制定胰臟腺癌治療指引，近年來藉由「多專科醫師參與團隊會議共同討論」的機制，參酌 NCCN 指引及相關文獻，進行制定，以期更貼近國內民情及國際胰臟癌診療潮流。	
1	選擇性檢查： EUS PET ERCP with stent placement(for Obstructive Jaundice)	選擇性檢查： EUS PET ERCP with stent placement(for Obstructive Jaundice) 新增 Genetic testing for inherited mutations

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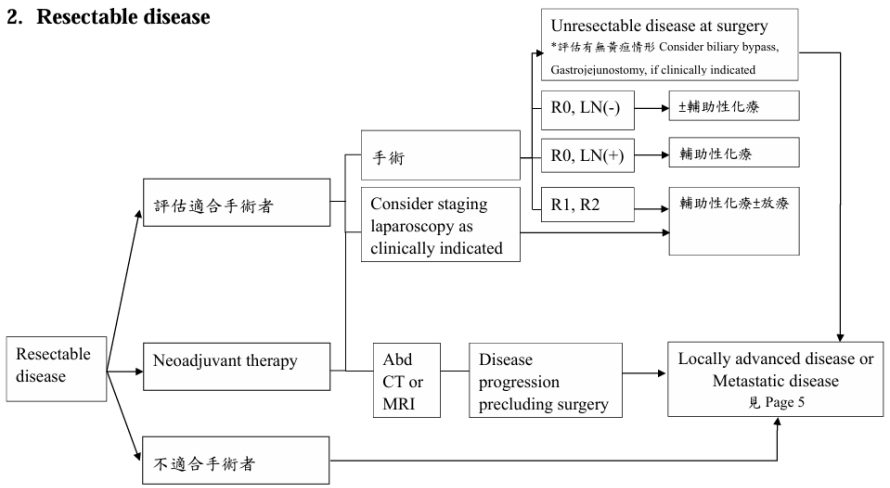

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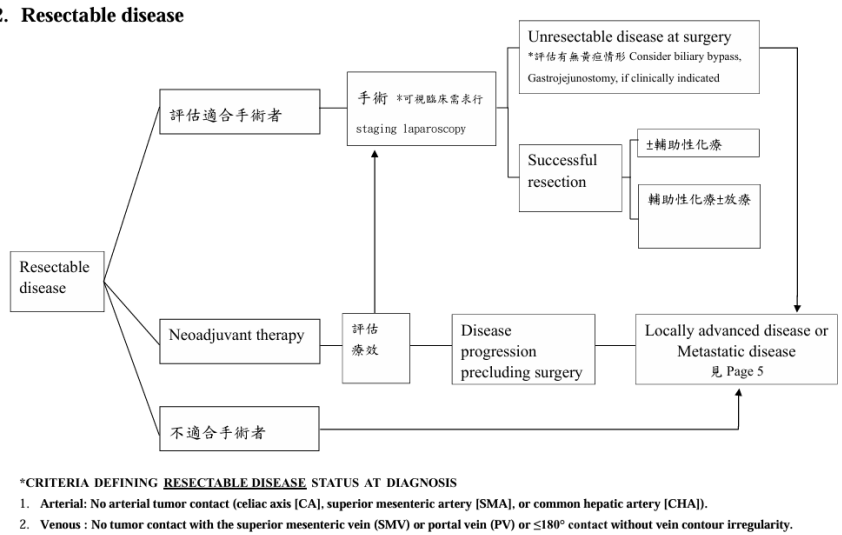

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<td>18</td>
<td>Adjuvant chemotherapy
Regimen: Gemcitabine + Tegafur/gimeracil/oteracil 複方製劑

原文獻： Ueno, H., Ioka, T., Ikeda, M., Ohkawa, S., Yanagimoto, H., Boku, N., ... & Tanaka, M. (2013). Randomized phase III study of gemcitabine plus S-1, S-1 alone, or gemcitabine alone in patients with locally advanced and metastatic pancreatic cancer in Japan and Taiwan: GEST study. Journal of Clinical Oncology, 31(13), 1640-1648.</td>
<td>文獻修改為：

Kao, Y. C., Tang, C. Y., Chen, M. H., Hung, Y. P., & Chiang, N. J. (2025). 379P Real-world comparison of TS-1, gemcitabine, and combination adjuvant chemotherapy in resected pancreatic cancer. Annals of Oncology, 36, S1903.</td>
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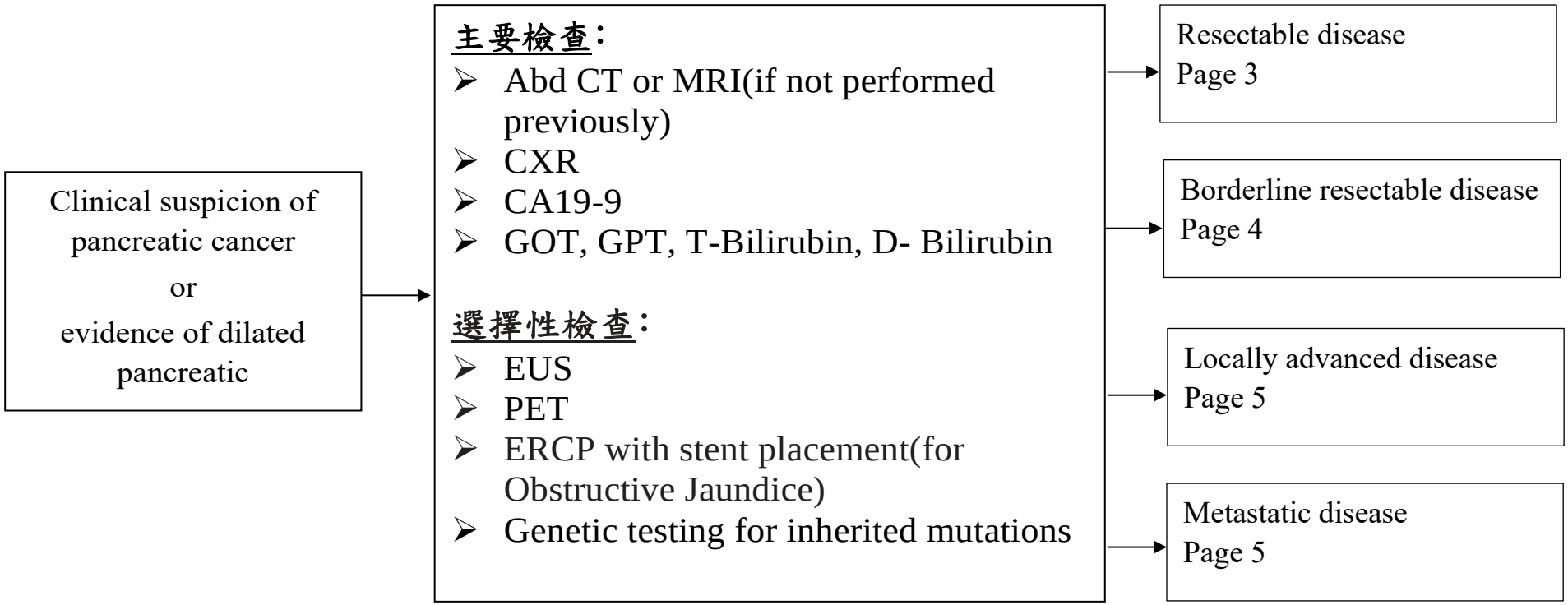
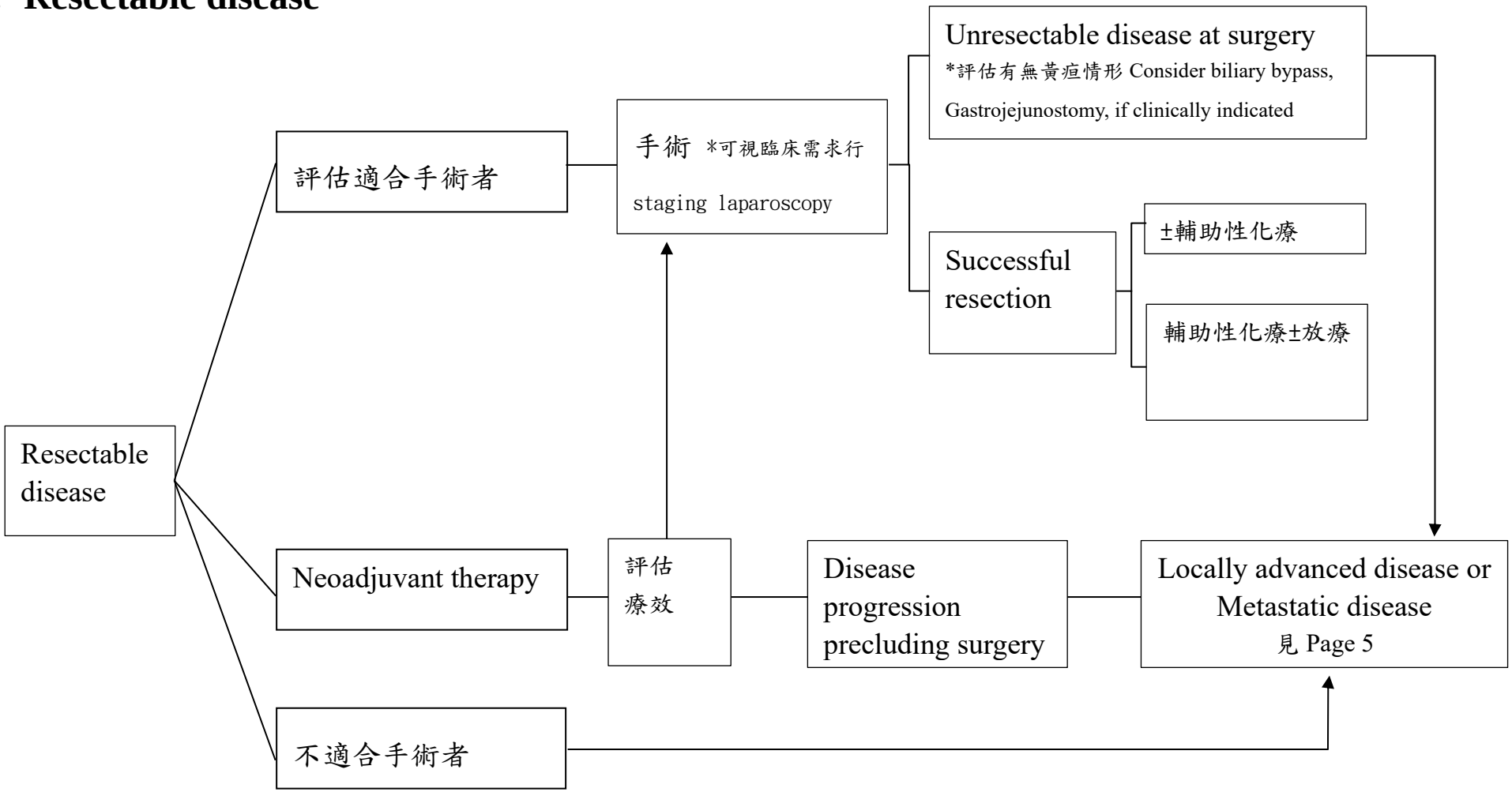
目錄

一、胰臟腺癌診療指引流程圖

1. 評估



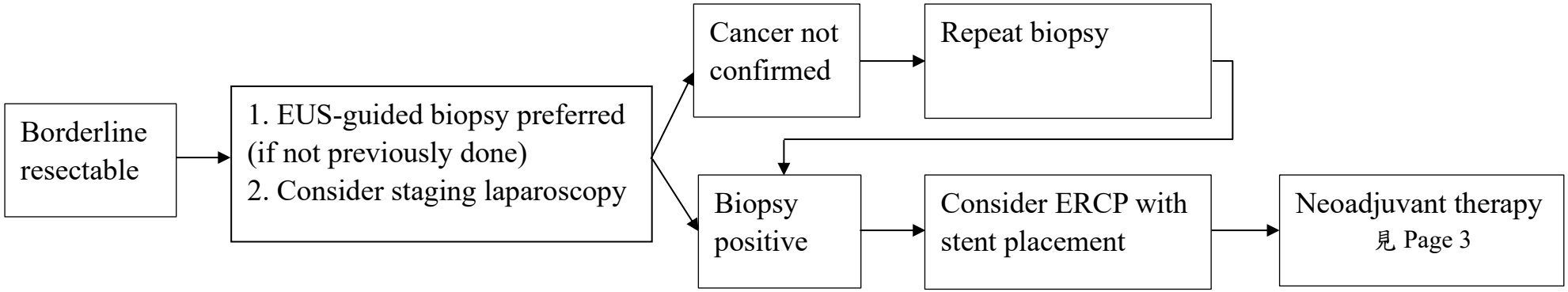
2. Resectable disease



***CRITERIA DEFINING RESECTABLE DISEASE STATUS AT DIAGNOSIS**

1. **Arterial: No arterial tumor contact (celiac axis [CA], superior mesenteric artery [SMA], or common hepatic artery [CHA]).**
2. **Venous : No tumor contact with the superior mesenteric vein (SMV) or portal vein (PV) or ≤180° contact without vein contour irregularity.**

3. Borderline resectable



***CRITERIA DEFINING BORDERLINE RESECTABLE DISEASE STATUS AT DIAGNOSIS**

1. **Arterial:**

   (1) Pancreatic head/uncinate process:

   - **Solid tumor contact with CHA without extension to CA or hepatic artery bifurcation allowing for safe and complete resection and reconstruction.**
   - **Solid tumor contact with the SMA of ≤180°.**
   - **Solid tumor contact with variant arterial anatomy (eg, accessory right hepatic artery, replaced right hepatic artery, replaced CHA, and the origin of replaced or accessory artery) and the presence and degree of tumor contact should be noted if present, as it may affect surgical planning.**

   (2) Pancreatic body/tail:

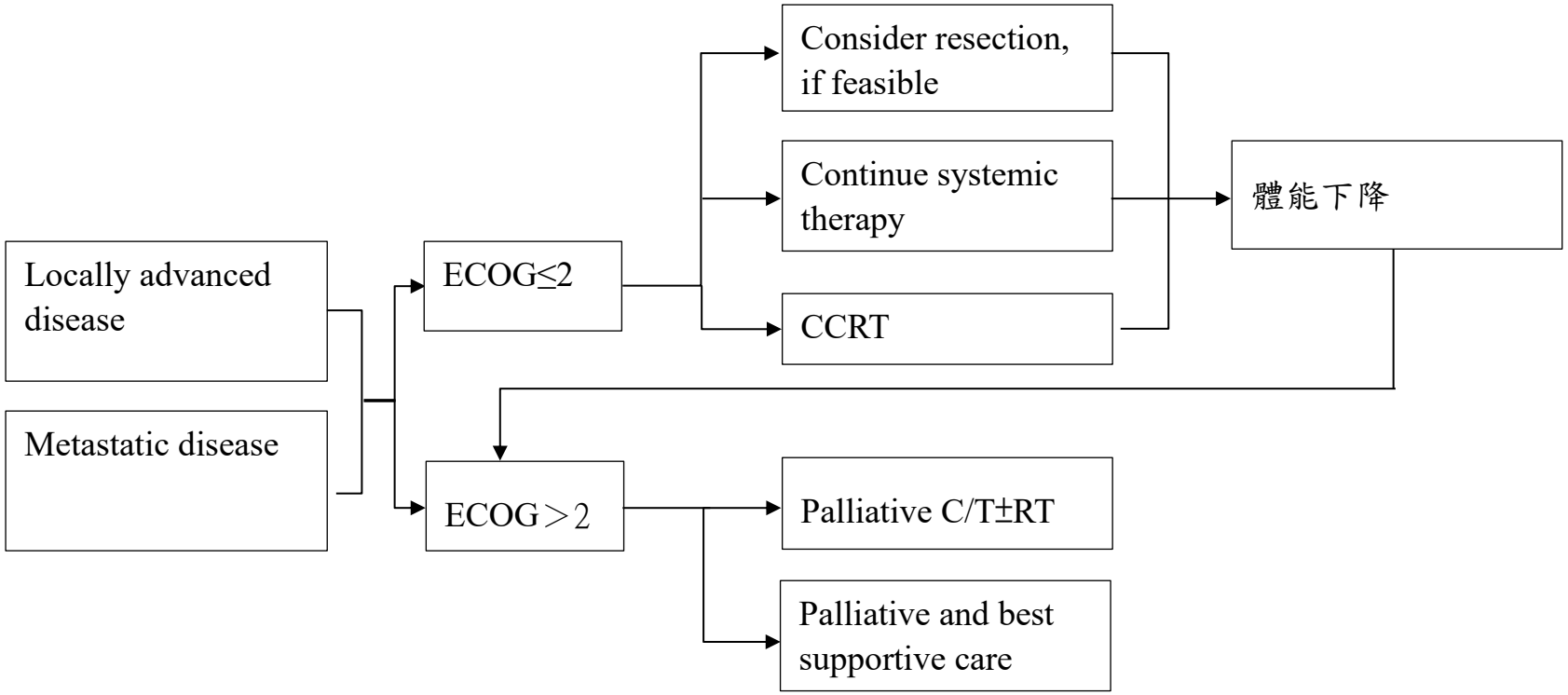
   - **Solid tumor contact with the CA of ≤180°.**

2. **Venous :**

   (1) Solid tumor contact with the SMV or PV of >180°, contact of ≤180° with contour irregularity of the vein or thrombosis of the vein but with suitable vessel proximal and distal to the site of involvement allowing for safe and complete resection and vein reconstruction.

   (2) Solid tumor contact with the inferior vena cava (IVC).

4. Locally advanced disease and metastatic disease



***CRITERIA DEFINING LOCALLY ADVANCED DISEASE STATUS AT DIAGNOSIS**

1. **Arterial:**

   (1) Head/uncinate process:

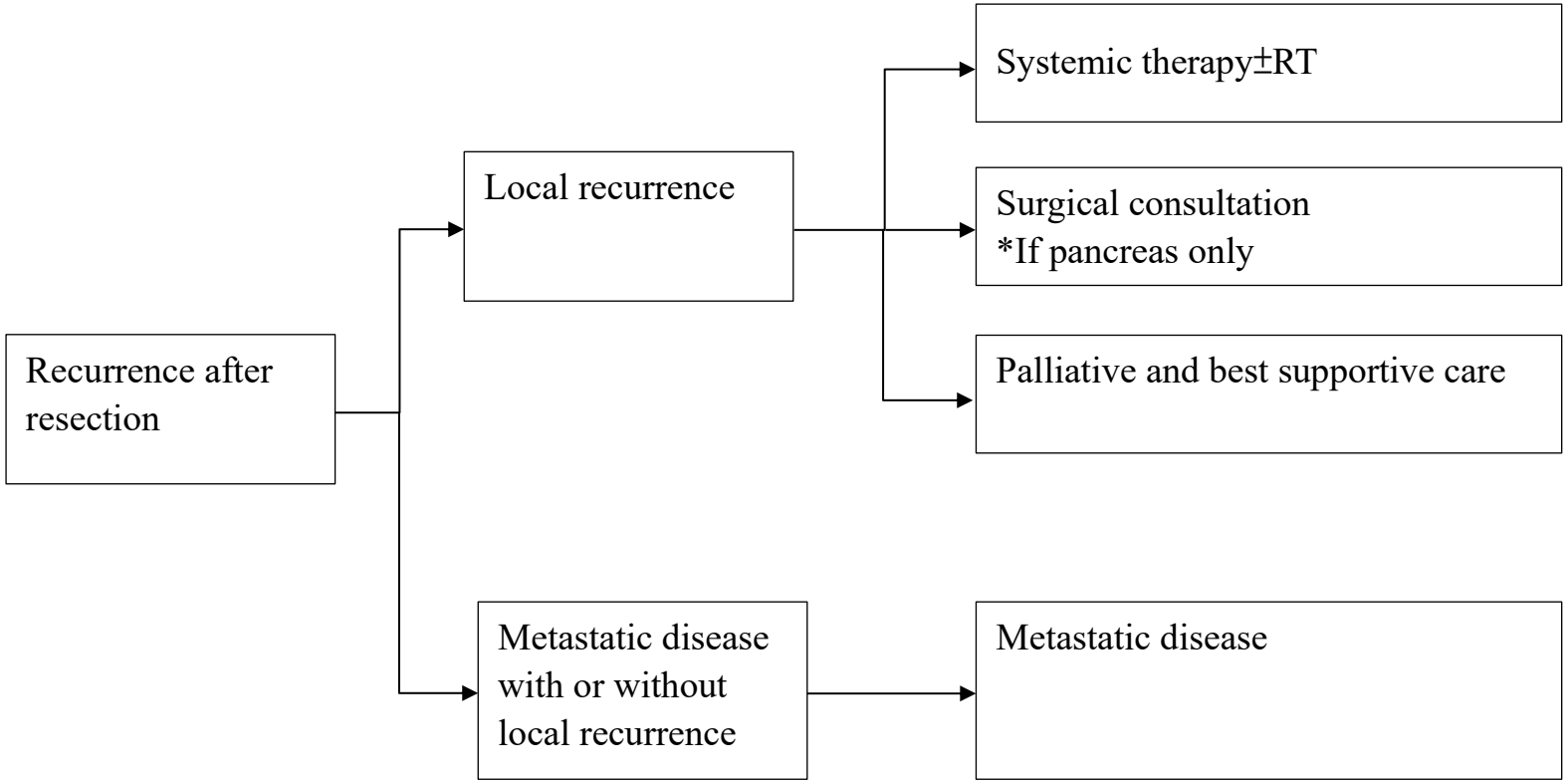
   - **Solid tumor contact >180° with the SMA or CA.**

   (2) Pancreatic body/tail:

   - **Solid tumor contact of >180° with the SMA or CA.**
   - **Solid tumor contact with the CA and aortic involvement.**

2. **Venous : Not currently amenable to resection and primary reconstruction due to complete occlusion of SMV/PV.**

5. Recurrence after resection



三、胰臟癌診斷共識

胰臟癌是現有人類罹患的惡性腫瘤當中，最嚴重、最具侵襲性且預後不佳的一種。直至末期才有較顯著的臨床症狀及此種癌細胞快速生長的特性，意味著大多數的病人當發病時，只能接受緩和治療。但唯有手術切除腫瘤，才能提供這些病人較好的長期存活機會。胰臟癌由細胞生長出來的惡性腫瘤。約 92%的胰臟癌為腺癌，它源自外分泌體發生率在頭部約 70%、體部約 20%、尾部約 10 % 。

胰臟癌早期大部分都沒有症狀，腫瘤到一定的程度才會出現腹痛甚至於背等非專一性的症狀，體重減輕腹痛和消化不良等症狀當腫瘤壓迫到膽管時病人會出現黃皮膚搔癢甚至於灰白色糞便，但若病灶發生在體部或尾，人可能沒有任何症狀直到腫瘤長得很大才有腹部疼痛，胃口不佳體重減輕等症狀。

治療前的準備檢查（work-up）包括：

(一)腹部電腦斷層檢查(Abdominal CT)：可觀察腫瘤本身、臨近器官是否受侵犯或淋巴腺是否轉移，也可發現是否遠端轉移的發生。

(二)腹部核磁共振(Abdominal MRI)：用於偵測膽胰管病變腫瘤本身與鄰近器官及血管、淋巴腺侵犯程度。

(三)胸部 X 光檢查(Chest x-ray)：主要是檢查肺部是否有轉移。

(四)內視鏡超音波(Endoscopic Ultrasound EUS)：用於偵測腫瘤大小及侵犯程度及切片取樣，對於早期胰臟癌的診斷有極高價值。

(五)正子攝影檢查(PET scan)：檢查及觀察腫瘤本身及腫瘤與鄰近器官有無異常情形及轉移的訊息，但對於胰臟癌的早期診斷尚未有定論，是一項可以參考的影像檢查。

(六)抽血檢查(GOT、GPT 及 Bilirubin T/D)：有些胰臟癌的患者因腫瘤侵犯，導致肝功能異常及黃膽指數升高。

(七)腫瘤標記 CA19-9:此腫瘤指標特異性不高，也有良性疾病導致於腫瘤指標升高，目前多用於胰臟癌追蹤檢查參考。

四、胰臟癌分期 8th AJCC T-N-M 分期

Primary Tumor(T)	
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma in situ This includes high-grade pancreatic intraepithelial neoplasia (Panln-3),intraductal papillary mucinous neoplasm with high-grade dysplasia,intraductal tubulopapillary neoplasm with high-grade dysplasia, and mucinous cystic neoplasm with high-grade dysplasia.
T1	Tumor≦2 cm in greatest dimension
T1a	Tumor ≦0.5 cm in greatest dimension
T1b	Tumor >0.5 cm and <1 cm in greatest dimension
T1c	Tumor 1-2 cm in greatest dimension
T2	Tumor >2 cm and ≦4 cm in greatest dimension
T3	Tumor >4 cm in greatest dimension
T4	Tumor involves :Celiac axis,superior mesenteric artery, and/or common hepatic artery,regardless of size

Regional Lymph Node (N)	
NX	Regional LNs cannot be assessed
N0	No regional LN metastases
N1	Metastasis in1-3 regional LNs
N2	Metastasis in 4 or more regional LNs

Distant Metastasis (M)	
M0	No distant metastasis
M1	Distant metastasis

T-N-M Stage Grouping			
T	**N**	**M**	**Staging**
Tis	N0	M0	0
T1	N0	M0	IA
T1	N1	M0	IIB
T1	N2	M0	III
T2	N0	M0	IB
T2	N1	M0	IIB
T2	N2	M0	III
T3	N0	M0	IIA
T3	N1	M0	IIB
T3	N2	M0	III
T4	Any N	M0	III
Any T	Any N	M1	IV

五、胰臟癌治療共識

手術治療仍是目前最佳的選擇，施行手術決定於腫瘤是否侵犯重要大血管或轉移，接受手術治療者可增加存活期，但大多數病患被發現時，已侵犯至周邊淋巴結、血管或神經，無法做切除性手術，只好做姑息性手術，將阻塞之膽管與腸道作繞道引流手術，使黃疸減退。雖然不能去除其病因，倒也可以改善生活品質。

近年來有許多不必開刀的方法也能用來疏通受阻塞之膽管，例如用內視鏡將膽汁引流管由十二指腸乳頭部，逆向插入總膽管下端，以引流膽汁並改善阻塞性黃疸，也可以改善生活品質。單獨使用化學治療與放射線治療的效果都很不理想，死亡率仍然很高。依據臨床症狀和影像學檢查結果，胰臟癌治療方式如下：

(一)臨床上疑似胰臟癌、胰腺擴張或膽管狹窄

1. 影像學檢查發現胰臟腫瘤，無遠端轉移：需評估是否黃疸，無黃疸以手術治療為首要治療；若有黃疸予支架或經皮穿肝膽道攝影引流術，之後評估是否可手術切除；若有黃疸、無症狀且為局部侵犯性胰臟腫瘤，行活體組織切片檢查確診後，予化學治療或緩和性治療，當活體組織切片檢查無法確診，仍需再次行切片檢查。

2. 影像學檢查未發現胰臟腫瘤，無遠端轉移：行內視鏡逆行性膽胰管造影術(ERCP)或核磁共振胰膽管顯像(MRCP)，若影像學檢查仍疑似胰臟腫瘤，可會診外科評估手術的必要性。

3. 無論影像學檢查是否發現胰臟腫瘤，但有遠端轉移： 於轉移部位行活體組織切片檢查，依病理報告結果執行化學治療或支持性治療。

(二)適合手術切除

1. 腫瘤可切除的：行手術切除後未發現遠端轉移狀況，術後予化學治療±放射線治療。

2. 腫瘤不可切除的：無黃疸且活體組織切片檢查確診則考慮予化療或放射線治療必要時緩和性手術，有黃疸且活體組織切片檢查確診行支架或膽管繞道手術，之後評估身體體能狀態，體能良好者考慮予化學治療±放射線治療；體能差者考慮予姑息性化學治療或緩和性治療。當活體組織切片檢查無法確診，建議再次行切片檢查。

3. 若發現疾病已轉移，可選擇化學治療±放射線治療或緩和性治療。

4. IORT(Intraoperative Radiation Therapy)術中放射線治療

適用於可切除(R1 or R2 resection)胰臟腫瘤，對於殘餘腫瘤增加局部控制。

(三)局部侵犯性腫瘤且無法手術切除

1. 活體組織切片檢查確診：考慮化學治療或緩和性治療，執行化學治療後評估是否可手術切除，手術切除後仍需化學治療，無法手術切除則考慮化學治療或緩和性治療。

2. 活體組織切片檢查未確診：建議再次行切片檢查，依病理報告結果執行化學治療或支持性治療；若是仍持續無法病理檢查確診，召開多專科癌症團隊會議討論或緩和性治療。

(四)有轉移的胰臟癌：評估是否有黃疸，若有黃疸應予支架或經皮穿肝膽道攝影引流術；無黃疸則建議予以化學治療或緩和性治療。

(五)手術切除後復發的胰臟腺癌考慮活體組織切片檢查或正子攝影檢查，之後評估疾病是否為局部復發、遠端轉移或同時局部復發與遠端轉移，其治療方式如下：

1. 局部復發：考慮化學治療±放射線治療、化學治療或緩和性治療。

2. 遠端轉移或同時局部復發與遠端轉移：建議予以化學治療或緩和性治療。

六、胰臟癌追蹤共識

胰臟癌本身是一相當惡性的疾病，整體治療效果差，僅少數患者經手術治療後有機會存活超過5年以上，需定期回診追蹤檢查，以提早偵測出疾病復發和轉移狀況，於治療後前 2 年每 3 個月回診接受理學檢查、腫瘤指標(CA19-9)及腹部超音波或電腦斷層或核磁共振或正子攝影(選擇性自費項目)檢查，之後 3 至 5年每 6 個月回診檢查一次。

七、藥物處方

Neoadjuvant Therapy (Resectable/Borderline Resectable Disease)

Regimen	**modified FOLFIRINOX**				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	Notes
Oxaliplatin	85 mg/m2	IV	drip 2hrs, on Day 1	every 2 weeks x 6-12cycles(If clinical condition is indicated)	
Leucovorin	400 mg/m2	IV	drip 2hrs, on Day 1		
Irinotecan	150-180 mg/m2	IV	drip 90mins, on Day 1		
Fluorouracil	2400 mg/m2	IV	drip 46hrs infusion		
Ref.	*Cecchini, M., Salem, R. R., Robert, M., Czerniak, S., Blaha, O., Zelterman, D., ... & Lacy, J. (2024). Perioperative modified FOLFIRINOX for resectable pancreatic cancer: a nonrandomized clinical trial. JAMA oncology, 10(8), 1027-1035.*				

Regimen	**Fluorouracil (5-FU) + leucovorin + irinotecan + oxaliplatin (FOLFIRINOX)**				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	Notes
Oxaliplatin	85 mg/m2	IV	drip 2hrs, on Day 1	every 2 weeks	
Leucovorin	400 mg/m2	IV	drip 2hrs, on Day 1		
Irinotecan	180 mg/m2	IV	drip 90mins, on Day 1		
Fluorouracil	400 mg/m2	IV	bolus, on Day 1		
Fluorouracil	2400 mg/m2	IV	over 46 h infusion		
Ref.	*Conroy, T., Desseigne, F., Ychou, M., Bouché, O., Guimbaud, R., Bécouarn, Y., ... & Ducreux, M. (2011). FOLFIRINOX versus gemcitabine for metastatic pancreatic cancer. New England journal of medicine, 364(19), 1817-1825.*				

Regimen	**Gemcitabine + cisplatin**				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	Notes
Gemcitabine	1000mg/m2	IV	on Day1, Day 15	every 4 weeks x 2-6 cycles	
Cisplatin	50mg/m2	IV	on Day1, Day15		
Ref.	*Volker Heinemann et al. Randomized Phase III Trial of Gemcitabine Plus Cisplatin Compared With Gemcitabine Alone in Advanced Pancreatic Cancer. J Clin Oncol 24:3946-3952; 2006.*				

Regimen	**Gemcitabine + albumin-bound paclitaxel**				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	Notes
nab-paclitaxel	125mg/m2	IV	on Days 1, 8, and 15	every 4 weeks	
Gemcitabine	1000mg/m2	IV	on Days 1, 8, and 15		
Ref.	*Von Hoff, D. D., Ervin, T., Arena, F. P., Chiorean, E. G., Infante, J., Moore, M., ... & Renschler, M. F. (2013). Increased survival in pancreatic cancer with nab-paclitaxel plus gemcitabine. New England journal of medicine, 369(18), 1691-1703.*				

Regimen	**TS-1 + Gemcitabine + Oxaliplatin + Leucovorin(SLOG)**				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	Notes
TS-1	35mg/m2 BID (Max daily dose 120mg)	PO	Day 1-7	every 2 weeks	
Folinic acid	20mg/m2 BID	PO	Day 1-7		
Gemcitabine	800mg/m2	IV	Day 1		

Oxaliplatin	85mg/m2	IV	Day 1		
Ref.	*Chiang, N. J., Tsai, K. K., Hsiao, C. F., Yang, S. H., Hsiao, H. H., Shen, W. C., ... & Chen, L. T. (2020). A multicenter, phase I/II trial of biweekly S-1, leucovorin, oxaliplatin and gemcitabine in metastatic pancreatic adenocarcinoma–TCOG T1211 study. European Journal of Cancer, 124, 123-130.*				

Adjuvant Chemotherapy regimins

說明:

1. CONKO-001 試驗顯示，對於可切除的胰臟腺癌患者，術後使用 gemcitabine 作為輔助化學治療，與單純觀察相比，可顯著改善 disease-free survival (DFS)及 overall survival (OS)。
2. ESPAC-3 研究結果顯示，術後使用 5-FU／leucovorin 相比使用 gemcitabine，整體存活期（OS）無顯著差異。兩組比較時，中位存活期分別為 23.0 個月 與 23.6 個月。
3. ESPAC-4 試驗支持使用 capecitabine（劑量為 1660 mg/m²/日，第 1－21 天，每 4 週為一個療程），其療效優於 gemcitabine。

Regimen	**Tegafur/gimeracil/oteracil 複方製劑**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
TS-1	BSA≧1.5m2: 120mg/day BSA1.25-1.5m2: 100mg/day BSA<1.25m2 : 80mg/day	PO	Day 1-28	every 42 days	
or					
TS-1	BSA≧1.5m2: 120mg/day BSA1.25-1.5m2: 100mg/day BSA<1.25m2 : 80mg/day	PO	Day 1-14	every 21 days	
Ref.	*Ueno, H., Ioka, T., Ikeda, M., Ohkawa, S., Yanagimoto, H., Boku, N., ... & Tanaka, M. (2013). Randomized phase III study of gemcitabine plus S-1, S-1 alone, or gemcitabine alone in patients with locally advanced and metastatic pancreatic cancer in Japan and Taiwan: GEST study. Journal of Clinical Oncology, 31(13), 1640-1648.*				

Regimen	Capecitabine				
Drug	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Capecitabine	850 mg/m2 PO BID	PO	on Days 1–21	every 4weeks	
Ref.	*Kim, H. S., Yi, S. Y., Jun, H. J., Lee, J., Park, S. H., Lee, J. K., ... & Park, J. O. (2010). Definitive chemoradiation therapy with capecitabine in locally advanced pancreatic cancer. Anti-cancer drugs, 21(1), 107-112.*				

Regimen	Gemcitabine				
Drug	Dosage	Route of administration	Times	Frequency/Duration	Notes
Gemcitabine	1000mg/m2	IV	D1, 8, 15, days	Q28days x6cycles	
Ref.	*Helmut Oettle et al. Adjuvant Chemotherapy With Gemcitabine vs Observation in Patients Undergoing Curative-Intent Resection of Pancreatic Cancer. (JAMA. 2007; 297:267-277).* *H Ueno et al. A randomised phase III trial comparing gemcitabine with surgery-only in patients with resected pancreatic cancer: Japanese Study Group of Adjuvant Therapy for Pancreatic Cancer.(British Journal of Cancer 2009, 101, 908 – 915) .*				

Regimen	modified FOLFIRINOX				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	otes
Oxaliplatin	85 mg/m2	IV	drip 2hrs, on Day 1	every 2 weeks x 6-12cycles(If clinical condition is indicated)	
Leucovorin	400 mg/m2	IV	drip 2hrs, on Day 1		
Irinotecan	150-180 mg/m2	IV	drip 90mins, on Day 1		
Fluorouracil	2400 mg/m2	IV	drip 46hrs infusion		

Ref.	*Cecchini, M., Salem, R. R., Robert, M., Czerniak, S., Blaha, O., Zelterman, D., ... & Lacy, J. (2024). Perioperative modified FOLFIRINOX for resectable pancreatic cancer: a nonrandomized clinical trial. JAMA oncology, 10(8), 1027-1035.*

Regimen	**Gemcitabine + Tegafur/gimeracil/oteracil 複方製劑**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Gemcitabine	1000mg/m2	IV	drip 30min, on Day 1, 8	every 21days x 3-6cycles	
S-1	BSA≧1.5m2: 100mg/day BSA1.25-1.5m2: 80mg/day BSA<1.25m2 : 60mg/day	PO	Day 1-14		
Ref.	*Kao, Y. C., Tang, C. Y., Chen, M. H., Hung, Y. P., & Chiang, N. J. (2025). 379P Real-world comparison of TS-1, gemcitabine, and combination adjuvant chemotherapy in resected pancreatic cancer. Annals of Oncology, 36, S1903.*				

Regimen	**Gemcitabine + capecitabine**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Gemcitabine	1000mg/m2	IV	Day 1, 8, 15 days	every 4 weeks x 6cycles	
capecitabine	1,660 mg/m2 was given in two divided doses per day	PO	Day 1-21		
Ref.	*Neoptolemos, J. P., Palmer, D. H., Ghaneh, P., Psarelli, E. E., Valle, J. W., Halloran, C. M., ... & Büchler, M. W. (2017). Comparison of adjuvant gemcitabine and capecitabine with gemcitabine monotherapy in patients with resected pancreatic cancer (ESPAC-4): a multicentre, open-label,*				

	randomised, phase 3 trial. The Lancet, 389(10073), 1011-1024. *Cunningham D, Chau I, Stocken DD, et al. Phase III randomized comparison of gemcitabine versus gemcitabine plus capecitabine in patients with advanced pancreatic cancer. J Clin Oncol 2009;27:5513-5518.*

Concurrent Chemoradiation Regiemns

Regimen	**Capecitabine**				
Drug	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Capecitabine	625–825 mg/m2 PO BID	PO	on Days 1–5	With radiation	adjuvant gemcitabine treatment advised
Ref.	*Kim, H. S., Yi, S. Y., Jun, H. J., Lee, J., Park, S. H., Lee, J. K., ... & Park, J. O. (2010). Definitive chemoradiation therapy with capecitabine in locally advanced pancreatic cancer. Anti-cancer drugs, 21(1), 107-112.*				

Regimen	**Gemcitabine**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Gemcitabine	300 mg/m2	IV	weekly	With radiation	HRQL data support the use of capecitabine- over gemcitabine-based chemoradiation.
Ref.	*Hurt CN, Mukherjee S, Bridgewater J, et al. Health-related quality of life in SCALOP, a randomized phase 2 trial comparing chemoradiation*				

	therapyregimens in locally advanced pancreatic cancer. Int J Radiat Oncol Biol Phys 2015;93:810-818.

Regimen	**TS-1**				
Drug	Dosage	Route of administration	Times	Frequency/ Duration	Notes
TS-1	40 mg/m2 BID	PO	from day 1 to 14 and from day 22 to 35	With radiation	
Ref.	*Kim, H.M., Bang, S., Park, J.Y. et al. Phase II trial of S-1 and concurrent radiotherapy in patients with locally advanced pancreatic cancer. Cancer Chemother Pharmacol 63, 535–541 (2009).*				

Advanced/Metastastic regimens

Regimen	**modified FOLFIRINOX**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Oxaliplatin	85 mg/m2	IV	drip 2hrs, on Day 1	every 2 weeks	
Leucovorin	400 mg/m2	IV	drip 2hrs, on Day 1		
Irinotecan	150-180 mg/m2	IV	drip 90mins, on Day 1		
Fluorouracil	2400 mg/m2	IV	drip 46hrs infusion		
Ref.	*Cecchini, M., Salem, R. R., Robert, M., Czerniak, S., Blaha, O., Zelterman, D., ... & Lacy, J. (2024). Perioperative modified FOLFIRINOX for resectable pancreatic cancer: a nonrandomized clinical trial. JAMA oncology, 10(8), 1027-1035.*				

Regimen	**Fluorouracil (5-FU) + leucovorin + irinotecan + oxaliplatin (FOLFIRINOX)**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Oxaliplatin	85 mg/m2	IV	drip 2hrs, on Day 1	every 2 weeks	
Leucovorin	400 mg/m2	IV	drip 2hrs, on Day 1		
Irinotecan	180 mg/m2	IV	drip 90mins, on Day 1		
Fluorouracil	400 mg/m2	IV	bolus, on Day 1		
Fluorouracil	2400 mg/m2	IV	over 46 h infusion		
Ref.	*Conroy, T., Desseigne, F., Ychou, M., Bouché, O., Guimbaud, R., Bécouarn, Y., ... & Ducreux, M. (2011). FOLFIRINOX versus gemcitabine for metastatic pancreatic cancer. New England journal of medicine, 364(19), 1817-1825.*				

Regimen	**Gemcitabine + albumin-bound paclitaxel**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
nab-paclitaxel	125mg/m2	IV	on days 1, 8, and 15	every 4 weeks	
Gemcitabine	1000mg/m2	IV	on days 1, 8, and 15		
Ref.	*Von Hoff, D. D., Ervin, T., Arena, F. P., Chiorean, E. G., Infante, J., Moore, M., ... & Renschler, M. F. (2013). Increased survival in pancreatic cancer with nab-paclitaxel plus gemcitabine. New England journal of medicine, 369(18), 1691-1703.*				

Regimen	**Gemcitabine + albumin-bound paclitaxel+TS-1+Leucovorin(GASL)**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
nab-paclitaxel	125mg/m2	IV	on day 1	every 2 weeks	

Gemcitabine	800mg/m2	IV	on day 1	Until progression	
Leucovorin	30mg BID	PO	day 1-7		
TS-1	60-100mg/day	PO	day 1-7		
Ref.	*Su, Y. Y., Bai, L. Y., Huang, C. J., Chiu, C. F., Wang, H. T., Du, J. S., ... & Chen, L. T. (2024). 1528P TCOG T5221 trial: A phase II randomized study of gemcitabine and nab-paclitaxel in combination with S-1/LV (GASL) or oxaliplatin (GAP) as first-line treatment for metastatic pancreatic cancer. Annals of Oncology, 35, S932-S933.*				

Regimen	**Gemcitabine**				
Drug Combination	Dosage	Route of administration	Times	Frequency /Duration	Notes
Gemcitabine	1000mg/m2	IV	D1, 8, 15, days	every 4 weeks	
Ref.	*Helmut Oettle et al. Adjuvant Chemotherapy With Gemcitabine vs Observation in Patients Undergoing Curative-Intent Resection of Pancreatic Cancer. (JAMA. 2007; 297:267-277).* *H Ueno et al. A randomised phase III trial comparing gemcitabine with surgery-only in patients with resected pancreatic cancer: Japanese Study Group of Adjuvant Therapy for Pancreatic Cancer.(British Journal of Cancer 2009, 101, 908 – 915) .*				

Regimen	**Gemcitabine + cisplatin**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Gemcitabine	1000mg/m2	IV	on Day1, day 15	every 4 weeks	
cisplatin	50mg/m2	IV	on Day1, day15		
Ref.	*Volker Heinemann et al. Randomized Phase III Trial of Gemcitabine Plus Cisplatin Compared With Gemcitabine Alone in Advanced Pancreatic Cancer. J Clin Oncol 24:3946-3952; 2006.*				

Regimen	**TS-1 + Gemcitabine + Oxaliplatin + Leucovorin(SLOG)**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
TS-1	35mg/m2 BID(Max daily dose 120mg)	PO	Day 1-7	every 2 weeks	
Folinic acid	20mg/m2 BID	PO	Day 1-7		
Gemcitabine	800mg/m2	IV	Day 1		
Oxaliplatin	85mg/m2	IV	Day 1		
Ref.	Chiang, N. J., Tsai, K. K., Hsiao, C. F., Yang, S. H., Hsiao, H. H., Shen, W. C., ... & Chen, L. T. (2020). A multicenter, phase I/II trial of biweekly S-1, leucovorin, oxaliplatin and gemcitabine in metastatic pancreatic adenocarcinoma–TCOG T1211 study. European Journal of Cancer, 124, 123-130.				

Regimen	**Tegafur/gimeracil/oteracil 複方製劑**				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	Notes
TS-1	BSA≧1.5m2: 120mg /day BSA1.25-1.5m2: 100mg/day BSA<1.25m2 : 80mg/day	PO	Day 1-28	every 42 days	
or					
TS-1	BSA≧1.5m2: 120mg /day BSA1.25-1.5m2: 100mg/day	PO	Day 1-14	every 21 days	

	BSA<1.25m2 : 80mg/day				
Ref.	*Ueno, H., Ioka, T., Ikeda, M., Ohkawa, S., Yanagimoto, H., Boku, N., ... & Tanaka, M. (2013). Randomized phase III study of gemcitabine plus S-1, S-1 alone, or gemcitabine alone in patients with locally advanced and metastatic pancreatic cancer in Japan and Taiwan: GEST study. Journal of Clinical Oncology, 31(13), 1640-1648.*				

Regimen	**Gemcitabine + Tegafur/gimeracil/oteracil 複方製劑**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Gemcitabine	1000mg/m2	IV	drip 30min, on day1,8	every 21days	
S-1	BSA≧1.5m2: 100mg/day BSA1.25-1.5m2: 80mg/day BSA<1.25m2 : 60mg/day	PO	day1-14		
Ref.	*Ueno, H., Ioka, T., Ikeda, M., Ohkawa, S., Yanagimoto, H., Boku, N., ... & Tanaka, M. (2013). Randomized phase III study of gemcitabine plus S-1, S-1 alone, or gemcitabine alone in patients with locally advanced and metastatic pancreatic cancer in Japan and Taiwan: GEST study. Journal of Clinical Oncology, 31(13), 1640-1648.*				

Regimen	**Gemcitabine+Oxaliplatin+Fluorouracil+Leucovorin(GOLF)**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Gemcitabine	800 mg/m2	IV	fixed-dose rate (10	Q2W/4-6cycles	

			mg/m2/min) infusion		
Oxaliplatin	85mg/m2	IV	2-h infusion		
Fluorouracil	3000mg/m2	IV	48-h infusion		
Leucovorin	150mg/m2	IV	48-h infusion		
Ref.	*"Ch'ang, HJ., Huang, CL., Wang, HP. et al. Phase II study of biweekly gemcitabine followed by oxaliplatin and simplified 48-h infusion of 5-fluorouracil/leucovorin (GOFL) in advanced pancreatic cancer. Cancer Chemother Pharmacol 64, 1173–1179 (2009).*				

Regimen	**Liposomal irinotecan(Onivyde)+ Leucovorin+Fluorouracil**				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	Notes
Onivyde	60-80 mg/m2	IV	drip 90 mins, on day 1	Q2W/cycles until progression	
Leucovorin	400 mg/m2	IV	drip 30 mins, on day 1		
Fluorouracil	2400 mg/m2	IV	46-h infusion		
Ref.	*Wang-Gillam, A., Li, C. P., Bodoky, G., Dean, A., Shan, Y. S., Jameson, G., ... & Wong, M. (2016). Nanoliposomal irinotecan with fluorouracil and folinic acid in metastatic pancreatic cancer after previous gemcitabine-based therapy (NAPOLI-1): a global, randomised, open-label, phase 3 trial. The Lancet, 387(10018), 545-557.*				
健保給付	1.與 5-FU 及 leucovorin 合併使用於曾接受過 gemcitabine 治療後復發或惡化之轉移性胰腺癌。(107/8/1) 2.與 oxaliplatin、5-FU 和 leucovorin 併用，作為轉移性胰腺癌成人病人第一線治療。(114/12/1) 3.需經事前審查核准後使用。				

Regimen	**Liposomal irinotecan+ Fluorouracil + leucovorin + oxaliplatin (NALIRIFOX)**				
Drug Combination	Dosage	Route of administration	Times	Frequency /Duration	Notes
Liposomal irinotecan	50mg/m2	IV	drip 90mins, on day 1	Q2W/Until progression	
Fluorouracil	2400mg/m2	IV	drip 46hrs infusion		
leucovorin	400mg/m2	IV	drip 2hrs, on day 1		
oxaliplatin	60mg/m2	IV	drip 2hrs, on day 1		
Ref.	*NALIRIFOX versus nab-paclitaxel and gemcitabine in treatment-naive patients with metastatic pancreatic ductal adenocarcinoma (NAPOLI 3): a randomised, open-label, phase 3 trial ；Published online September 11, 2023 https://doi.org/10.1016/S0140-6736(23)01366-1*				
健保給付	1.與 5-FU 及 leucovorin 合併使用於曾接受過 gemcitabine 治療後復發或惡化之轉移性胰腺癌。(107/8/1) 2.與 oxaliplatin、5-FU 和 leucovorin 併用，作為轉移性胰腺癌成人病人第一線治療。(114/12/1) 3.需經事前審查核准後使用。				

Regimen	**Gemcitabine+Fluorouracil+Leucovorin(GFL)**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
Gemcitabine	800mg/m2	IV	drip 30mins, on day 1	weekly for 3 of every 4 weeks	
Fluorouracil	2000mg/m2	IV	24-h, infusion		
Leucovorin	300mg/m2	IV	infusion with Fluorouracil		
Ref.	*Marantz, A., Jovtis, S., Almira, E., Balbiani, L., Castilla, J. L., Fein, L., ... & Lastiri, F. (2001, June). Phase II study of gemcitabine, 5-fluorouracil, and leucovorin in patients with pancreatic cancer. In Seminars in oncology (Vol. 28, pp. 44-49). WB Saunders.*				

Regimen	**Modified FOLFOX**				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	Notes
Oxaliplatin	85 mg/m2	IV	drip 120 mins, on Day 1	Q2w x 6–12 cycles	
Leucovorin	200 mg/m2	IV	46-h infusion		
5-FU	2600 mg/m2	IV	46-h infusion		
Ref.	*Chari S, Leibson C, Rabe K, et al. Probability of Pancreatic Cancer Following Diabetes: A Population-Based Study. Gastroenterology 2005;129:504–511.* *Huang Y, Cai X, Qiu M, et al. Prediabetes and the risk of cancer: a meta-analysis. Diabetologia 2014;57:2261–2269.*				

Regimen	**5-FU + leucovorin + irinotecan (FOLFIRI)**				
Drug Combination	Dosage	Route of administration	Times	Frequency/ Duration	Notes
irinotecan	180mg/m2	IV	on day 1	Q2W/cycle Until progression	
leucovorin	400mg/m2	IV	drip 2hrs, on day 1		
5-FU	400mg/m2	IV	bolus		
5-FU	2400mg/m2	IV	46-h infusion		
Ref.	*Cindy Neuzillet et al., FOLFIRI regimen in metastatic pancreatic adenocarcinoma resistant to gemcitabine and platinum-salts. WJG;2012 September 7；18(33): 4533-4541.*				

Immunotherapy

Regimen	**Pembrolizumab (if MSI-H, dMMR, or TMB-H [≥10 mut/Mb])**				
Drug Combination	Dosage	Route of administration	Times	Frequency/Duration	Notes
pembrolizumab	200 mg	IV		every 3 weeks	
or					
pembrolizumab	400mg	IV		every 6 weeks	
Ref.	*Storandt, M. H., Tran, N., Martin, N., & Jatoi, A. (2023). Pembrolizumab near the end of life in patients with metastatic pancreatic cancer: a multi-site consecutive series to examine survival and patient treatment burden. Cancer Immunology, Immunotherapy, 72(7), 2515-2520.*				

Target therapy

If NTRK gene fusion- positive

Regimen	Entrectinib
藥名(學名)	Entrectinib body surface area [BSA]>1.5 m2: 600 mg orally once daily BSA 1.11 to 1.5 m2: 500 mg orally once daily BSA 0.91 to 1.1 m2: 400 mg orally once daily
Ref.	*Doebele, R. C., Drilon, A., Paz-Ares, L., Siena, S., Shaw, A. T., Farago, A. F., ... & Demetri, G. D. (2020). Entrectinib in patients with advanced or metastatic NTRK fusion-positive solid tumours: integrated analysis of three phase 1–2 trials. The lancet oncology, 21(2), 271-282.*

Regimen	Larotrectinib
藥名(學名)	Larotrectinib BSA > 1.0 m2:100 mg，每天兩次 BSA < 1.0 m2:100 mg/m2，每天兩次 搭配或不搭配食物皆可，直至疾病惡化或直至出現不可接受的毒性。
Ref.	*O'reilly, E. M., & Hechtman, J. F. (2019). Tumour response to TRK inhibition in a patient with pancreatic adenocarcinoma harbouring an NTRK gene fusion. Annals of Oncology, 30, viii36-viii40.*

If RET gene fusion- positive

Regimen	Selpercatinib
藥名(學名)	Selpercatinib <50kg,120 mg orally twice daily, about every 12 hours

	>50kg,160 mg orally twice daily, about every 12 hours
Ref.	*Raez, L. E., Kang, H., Ohe, Y., Khanal, M., Han, Y., Szymczak, S., ... & Gilligan, A. M. (2024). Patient-reported outcomes with selpercatinib treatment in patients with RET-driven cancers in the phase I/II LIBRETTO-001 trial. ESMO open, 9(5), 103444.*

Patients who have response or stable disease after 4–6 months of chemotherapy may undergo a chemotherapy holiday or maintenance therapy.

If previous platinum-based chemotherapy:

Regimen	Olaparib 300mg BID
藥名(學名)	Olaparib 300mg BID 建議劑量為 300mg，每日口服兩次，隨餐或空腹服用，每日總劑量 600mg
Ref.	*Ahn, E. R., Rothe, M., Mangat, P. K., Garrett-Mayer, E., Calfa, C. J., Alva, A. S., ... & Schilsky, R. L. (2024). Olaparib in patients with pancreatic cancer with BRCA1/2 mutations: Results from the targeted agent and profiling utilization registry study. JCO Precision Oncology, 8, e2300240.*

八、放射線治療原則

1. Resectable/Borderline resectable
   - Neoadjuvant RT: 50-60Gy in 20 fractions, 50-60Gy in 1.8-2.0 fractions
   - then followed by surgery 4-8 weeks after the end of RT
2. Locally advanced/unresectable
   - Definitive RT:
   - Standard fractionation: 50-60 Gy in 1.8-2.0 fractions
   - Hypofractionation: 60-66Gy in 20-22 fractions, or 36-40Gy in 5 fractions (SBRT)
3. Resectable
   - Adjuvant RT: initial 45-54Gy in 1.8-2.0 fractions, then additional 9-10Gy as boost
4. Palliative RT:
   - Non-metastatic/Metastatic: 25-40Gy in 5-8 fractions for palliation of symptoms or durable local tumor control
5. Recurrent
   - 45-60Gy in 20 fractions
   - 36-40Gy in 5 fractions (SBRT)
   - 30-45Gy in 3 fractions (SBRT)
   - Clinical trials:
6. IORT: 20-25Gy in one fraction

Organ	Volume segmented	Irradiation type (partial organ unless otherwise stated)[†]	Endpoint	Dose (Gy), or dose/volume parameters[†]	Rate (%)	Notes on dose/volume parameters
Liver	Whole liver – GTV	3D-CRT or Whole organ	Classic RILD[††]	Mean dose <30-32	<5	Excluding patients with pre-existing liver disease or hepatocellular carcinoma, as tolerance doses are lower in these patients
	Whole liver – GTV	3D-CRT	Classic RILD	Mean dose <42	<50	
	Whole liver – GTV	3D-CRT or Whole organ	Classic RILD	Mean dose <28	<5	In patients with Child-Pugh A preexisting liver disease or hepatocellular carcinoma, excluding hepatitis B reactivation as an endpoint
	Whole liver – GTV	3D-CRT	Classic RILD	Mean dose <36	<50	
	Whole liver –GTV	SBRT (hypofraction)	Classic RILD	Mean dose <13 <18	<5 <5	3 fractions, for primary liver cancer 6 fractions, for primary liver cancer
	Whole liver – GTV	SBRT (hypofraction)	Classic RILD	Mean dose <15 <20	<5 <5	3 fractions, for liver metastases 6 fractions, for liver metastases
	>700 cc of normal liver	SBRT (hypofraction)	Classic RILD	D_{max} <15	<5	Critical volume based, in 3–5 fractions
Kidney	Bilateral whole kidney[‡]	Bilateral whole organ or 3D-CRT	Clinically relevant renal dysfunction	Mean dose <15–18	<5	
	Bilateral whole kidney[‡]	Bilateral whole organ	Clinically relevant renal dysfunction	Mean dose <28	<50	
	Bilateral whole kidney[‡]	3D-CRT	Clinically relevant renal dysfuntction	V12 <55% V20 <32% V23 <30% V28 <20%	<5	For combined kidney
Stomach	Whole organ	Whole organ	Ulceration	D100[‖] <45	<7	
Small bowel	Individual small bowel loops	3D-CRT	Grade ≥ 3 acute toxicity[§]	V15 <120 cc	<10	Volume based on segmentation of the individual loops of bowel, not the entire potential peritoneal space
	Entire potential space within peritoneal cavity	3D-CRT	Grade ≥ 3 acute toxicity[§]	V45 <195 cc	<10	Volume based on the entire potential space within the peritoneal cavity

九、安寧緩和照護原則

若預期疾病難以治癒時，病人存活期小於 6 個月便適合安寧療護(Pomeranz & Brustman, 2005；Waldrop & Rinfrette, 2009）。若藉由症狀、檢驗數據、及確切的腫瘤診斷，證實臨床上該惡性腫瘤已經廣泛侵犯、或進展快速；功能分數（Palliative Performance Scale）低於 70%；拒絕進一步腫瘤治癒性治療，或者在治療之下仍持續惡化者，即可轉介緩和醫療團隊（彭等，2006）

十、完治率定義

癌別	分期	治療方式	完治率定義
胰臟癌	I 期	手術	手術完成即可算首次治療完成
	II 期	手術+輔助性化療	手術+輔助性化療滿 6 個月即可算首次治療完成
	III 期	手術+輔助性化療	手術+輔助性化療滿 3 個月即可算首次治療完成
	IV 期	Palliatiave OP	手術完成，即可算首次完成治療
		Palliatiave 化療	療程滿 3 個月就可算完成治療
		Palliatiave R/T	療程結束，即可算完成治療

備註:若個案治療期間因為疾病進展無法繼續治療，改採取安寧緩和治療，即可以算首次治療已完成

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