Diagnostic yield of CT Pancreas in late-onset diabetes and the association with pancreatic cancer: single-centre experience

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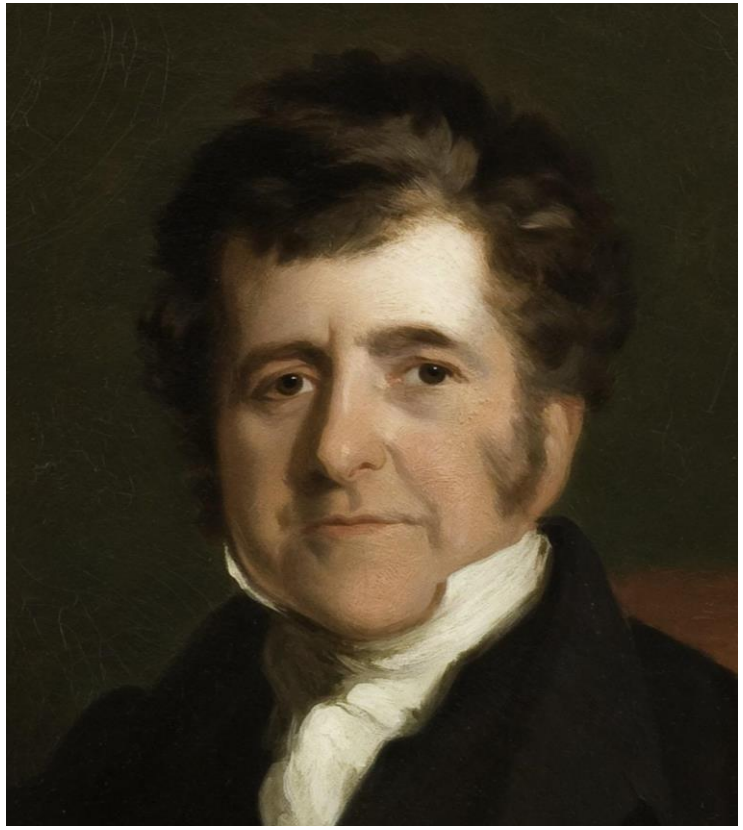
I. BACKGROUND

1833: first case report of pancreatic cancer preceded by diabetes written by Dr Richard Bright [1]



https://history.rcp.ac.uk/inspiring-physicians/richard-bright

Patient JB, 49 M, clerk in a wagon office

Mar 1827: increasing emaciation and thirst, urine "very sweet" → diagnosed with diabetes mellitus

Dec 1827: jaundice & steatorrhea "much resembling butter that had been melted and had become again solid"

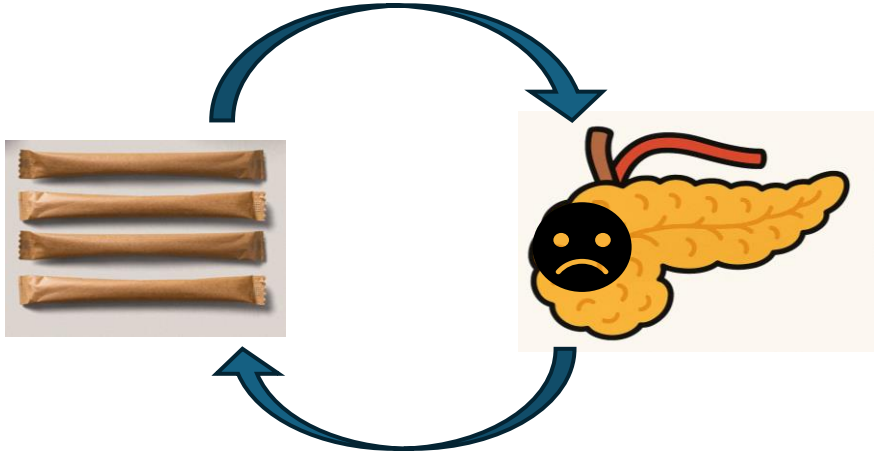
O/E: palpable liver edge, enormously distended gallbladder

Patient died Mar 1828, postmortem → "hard globular mass" at pancreatic head, dilated bile ducts, bilious ascites

Recognised association between pancreatic cancer & impaired glucose tolerance

- Up to 80% cancer patients diagnosed with hyperglycaemia or diabetes [2]
- PPV of new-onset diabetes in cancer detection varies from 0.09% (isolated symptom) to 22.3% (age ≥60 + jaundice + new diabetes) [3]
- Unstable/deteriorating diabetes may also be associated with cancer risk [4-6]

Longstanding type 2 diabetes predisposing to cancer (6-8x risk vs general population)



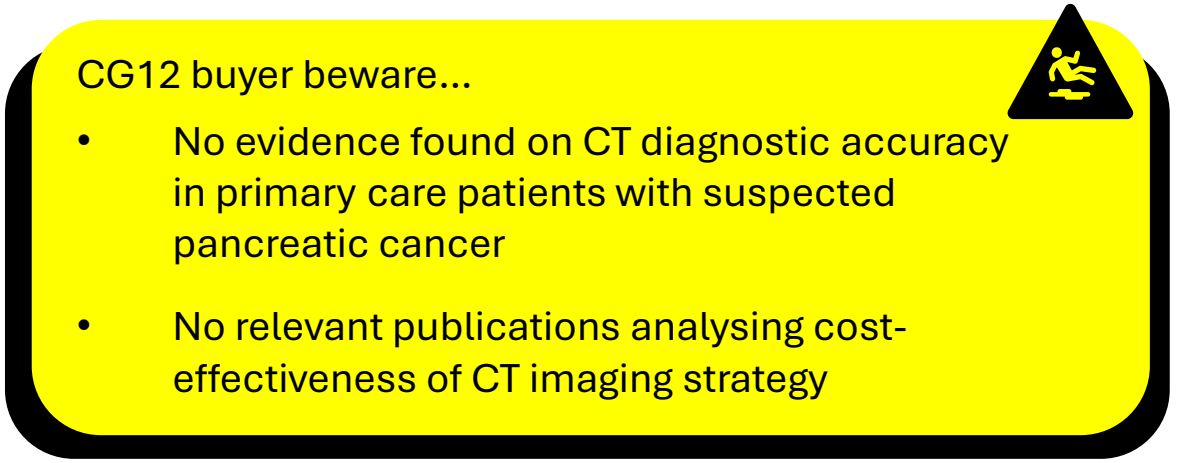
Pancreatic cancer itself inducing diabetes, type 3c diabetes

***Challenge**:* low incidence of pancreatic cancer prospectively diagnosed in adults with new diabetes

- 3-year cumulative incidence ≈ 0.6% [7,8]

NICE CG 12 “Suspected Cancer: recognition & referral” guidelines updated in 2015 [9]

- “Consider **urgent direct access CT** to assess for pancreatic cancer in people aged ≥60 with weight loss and new-onset diabetes” (*summarised*)
- Recommendations made with PPV threshold set at ≥ 3%



Challenge: high proportion of incidental CT findings and variability in reports [10]

- Wu et al: 52/93 patients with 57 incidental findings
- 12/57 (21%) findings prompted further evaluation → 2 extra-pancreatic malignancies
- One participating centre more frequently described pancreatic parenchyma and ducts: 92.9% vs 18.4% (p <0.0001)

Our study questions:

1. What is the trend of CT pancreas scans in patients with late-onset diabetes?
2. What proportion of requests are in accordance with NICE CG 12 recommendations (indications: age ≥60 + weight loss + diabetes)?
3. How many patients were diagnosed with pancreatic cancer on CT?
4. How many diagnosed with extra-pancreatic malignancy?
5. What CT protocol: pancreatic 3-phase vs single portovenous phase?

II. METHODS

METHODS

Cohort: patients with new-onset diabetes or deteriorating glycaemic control, where CT was performed to investigate underlying pancreatic pathology

Retrospective PACS search

Advanced search filter for diabetes-related keywords in CT referrals
(see next slide)

Second review of retrieved scans & accompanying information

METHODS

List of diabetes-related keywords:

- HbA1c
- Late onset DM/diabetes
- New onset DM/diabetes
- New DM/diabetes
- Hyperglycaemia
- Sugar/s
- Poor control DM/diabetes
- Poorly controlled DM/diabetes

Additional parameters:

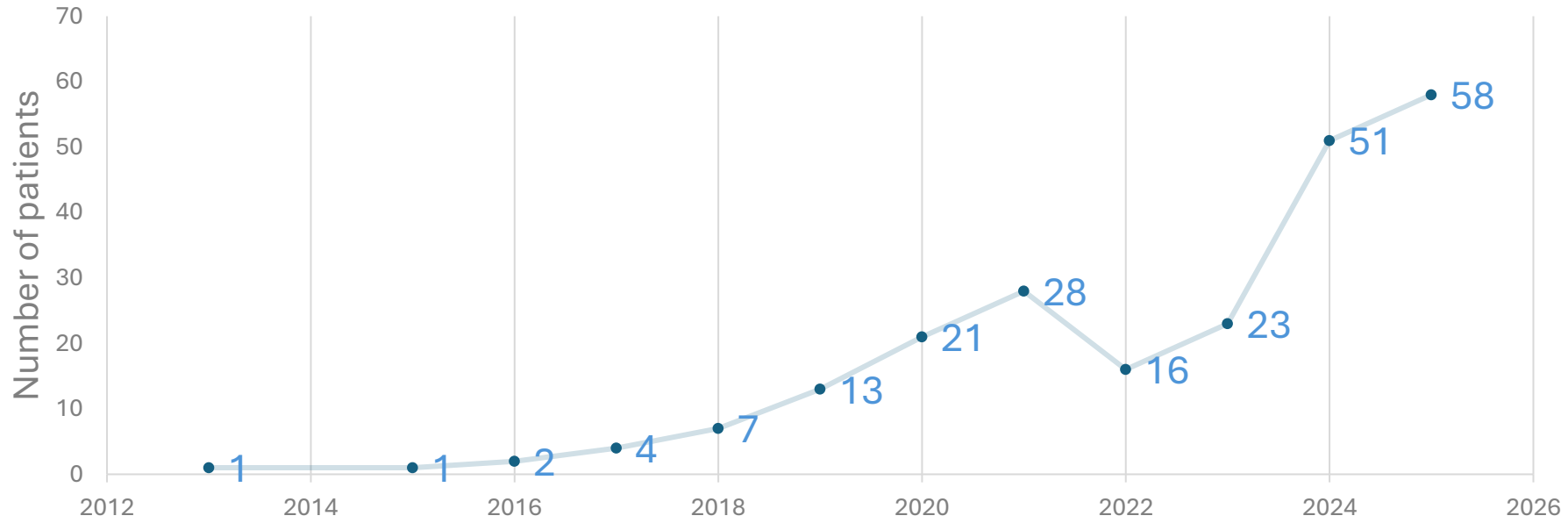
- Patient age
- Patient sex
- Referral source
- Referral information
- CT protocol
- Report findings: pancreatic & extra-pancreatic malignancy
- Clinical outcomes

III. RESULTS

RESULTS

Q: What is the trend of CT pancreas scans in patients with late-onset diabetes?

- Search period: Jan 2013 - Oct 2025
- Total 225 patients, steadily increasing number of referrals over study period
- 131 M > 94 F (M: 58.2%), aged 33-90y (median 61)
- 195/225 GP referrals > 30/225 hospital referrals (GP: 86.7%)



Q: What proportion of requests are in accordance with NICE CG 12 recommendations?

NICE CG 12 guideline *Age ≥60 + weight loss +* ***new-onset*** *diabetes*	More inclusive interpretation *Age ≥60 + weight loss +* ***deteriorating*** *diabetes*	Generous interpretation of NICE CG 12 *Age ≥60 + weight loss +* ***new*** *or* ***deteriorating*** *diabetes*
23/225 patients (10.2%)	63/225 patients (28%)	86/225 patients (38.2%)

RESULTS

Q: How many patients were diagnosed with pancreatic cancer on CT?

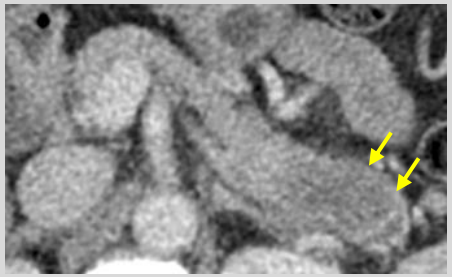
- 5/225 (2.2%) cancer positive, verified according to MDT consensus
- Stage T2, n=3 ; stage T3, n=1; stage T4, n=1
- Assuming a two-year lag time between cancer-associated diabetes and diagnosis [11], 0/116 CT-negative patients scanned between 2013-2023 found to have interval cancer*

** = No cancers recorded on NE London database after initial negative CT*

Jan 2017

52 M, **T3 disease**

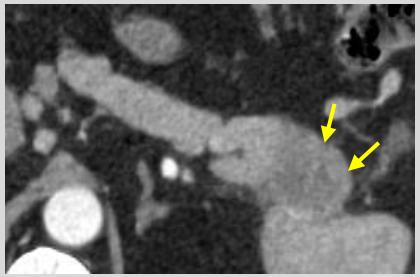
- *New onset diabetes, weight loss, night sweats*



Feb 2024

58 M, **T2 disease**

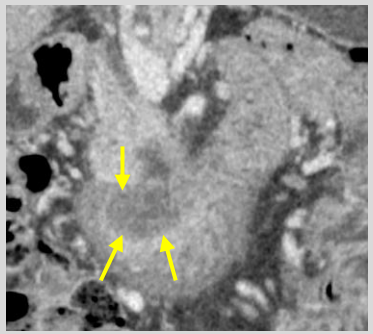
- *Deteriorating diabetes, weight loss, indigestion*



Aug 2024

72 M, **T2 disease**

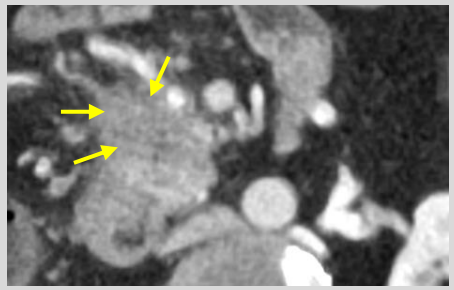
- *Deteriorating diabetes, weight loss, epigastric pain*



Feb 2025

66 F, **T2 disease**

- *Deteriorating diabetes, indigestion*



Jun 2025

75 M, **T4 disease**

- *New onset diabetes, weight loss, epigastric discomfort*

RESULTS

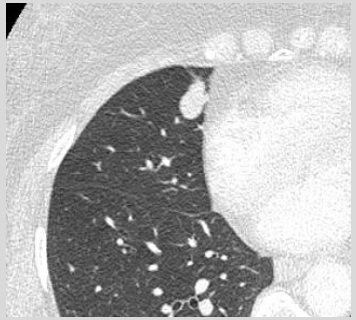
Q: How many diagnosed with extra-pancreatic malignancy?

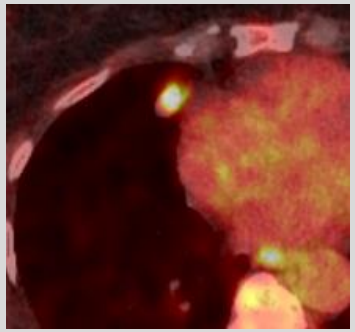
- 3/225 (1.3%) with extra-pancreatic malignancy on CT

Bronchial carcinoid

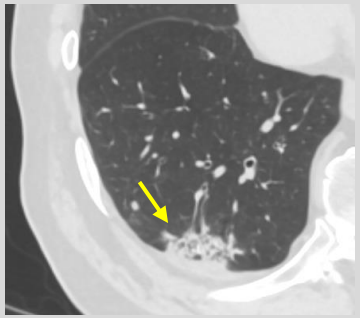
74 F

- Partially imaged lung nodule
- Formal CT: 18 mm lesion, FDG-avid
- Typical carcinoid, Ki67 <1%



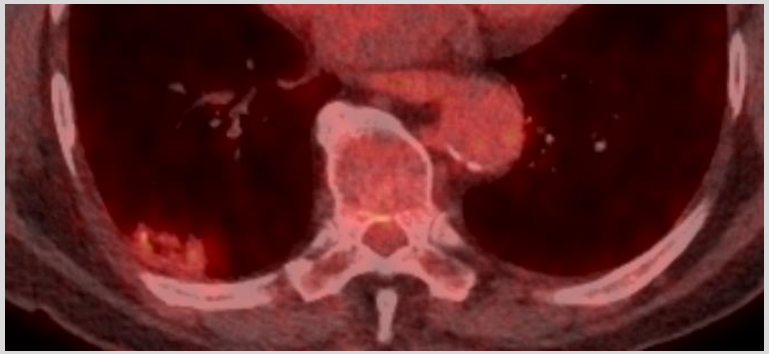


Lung cancer



83 M

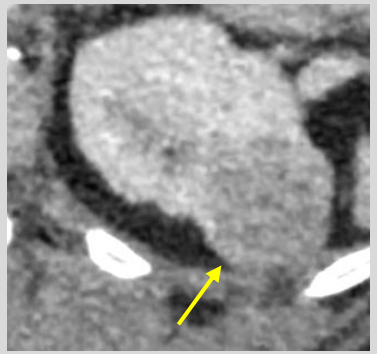
- Spiculated right lower lobe lesion
- Faintly FDG-avid
- pT2b N0 M0 RLL adenocarcinoma

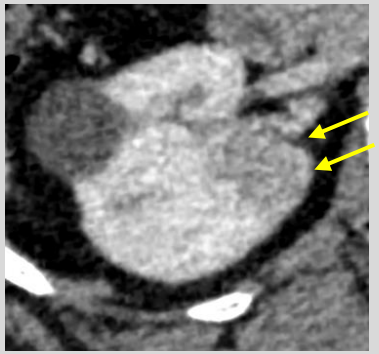


Renal cell carcinoma

73 F

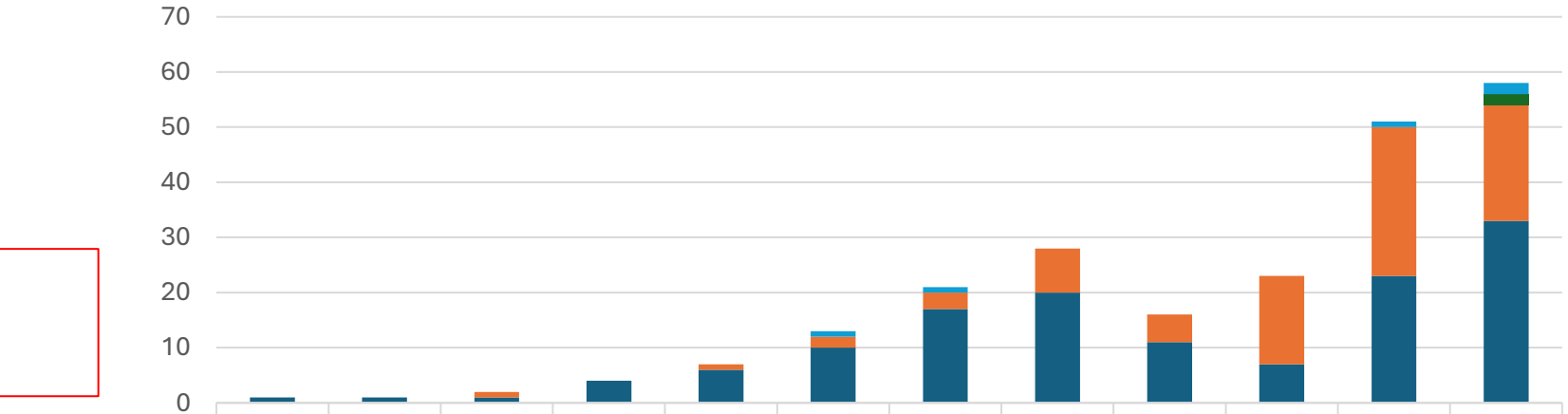
- Bilateral renal tumours, 30 mm left & 18 mm right
- No metastases
- Low grade clear cell RCC





Q: What CT protocol: pancreatic 3-phase vs single portovenous (PV) phase?

- Gradual increase in single PV phase scans over study period
- On retrospective review of 3-phase scans:
  - All cancers visible on PV phase
  - Modest added benefit of tumour conspicuity on arterial phase to PV phase



	2013	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Non C+						1	1				1	2
Split bolus												2
PV phase	0	0	1	0	1	2	3	8	5	16	27	21
3-phase	1	1	1	4	6	10	17	20	11	7	23	33

Comment:
Patient unwilling or unable to have intravenous iodinated contrast

Comment:
Incorrect split bolus protocol, radiographer vetting

IV. DISCUSSION

DISCUSSION

i. **Increasing CT referrals** querying pancreatic cancer in adults with late-onset diabetes

ii. **High GP uptake** (>85%) of direct access CT scans, probably due to increasing awareness of NICE CG 12 guidelines

iii. **Low number complying with NICE CG 12**, <40% if applying generous interpretation, including new cases and deteriorating glycaemic control

- Individualised decision-making & clinical concern outweighing NICE guidelines?

iv. **Low incidence** (approximately 2%) of pancreatic cancer diagnosed on CT scans over 12-year study period

v. **Low incidence of extra-pancreatic malignancies** (<2%), presenting as incidental asymptomatic findings in our cohort

vi. **No interval pancreatic cancers** within study cohort, assuming a 2-year lag period between cancer-associated diabetes and development of pancreatic cancer

vii. **PV phase scans generally adequate** for tumour detection

- Noncontrast of 3-phase study not essential; arterial phase of debatable importance in low incidence cohort
- If adopting single PV phase, only small numbers of patients to be recalled for arterial phase to finalise tumour stage and guide operative planning

CONCLUSION

Increasing trend of scanning late-onset diabetic patients for “?pancreatic cancer”

CT appears to have low yield for pancreatic cancer, even after applying NICE CG 12 guidelines

Guidelines on detecting pancreatic cancer would benefit from better patient risk stratification

Clearer guidance on CT protocols would assist radiology departments in managing resources

References

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