Research article

JHEP|Reports

Rectus femoris ultrasound identifies sarcopenia and predicts poor outcomes in patients with acute decompensation of cirrhosis

Authors

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Impact and implications:

Sarcopenia is strongly associated with adverse clinical outcomes in patients with cirrhosis. However, its assessment remains infrequent in clinical practice because of the reliance on CT-based SMI measurements, which are costly, expose patients to radiation, and require specialized software. This study demonstrates that bedside ultrasound measurement of RF-CSA is a simple, accurate, and reliable alternative for assessing sarcopenia in patients with decompensated cirrhosis. RF-CSA not only correlates well with SMI, but also independently predicts sarcopenia, complications, and 90-day mortality. Its strong prognostic value underscores its potential for routine use in clinical practice. Moreover, RF-CSA assessment is easy to learn, highly reproducible across different operators, and feasible for point-of-care application. These findings support the integration of ultrasound-based muscle assessment into routine cirrhosis management, enabling early risk stratification and potentially guiding targeted interventions to improve patient outcomes.

Background & Aims: Sarcopenia is common and associated with poor outcomes in decompensated cirrhosis. While computed tomography (CT) scan, with measurement of skeletal muscle index (SMI) at L3, is the gold standard for assessing sarcopenia in patients with cirrhosis, it is costly, exposes patients to radiation, and requires specialized software. This study evaluated the accuracy of bedside ultrasound measurement of the rectus femoris cross-sectional area (RF-CSA) in assessing sarcopenia and its prognostic value in patients with cirrhosis.

Methods: A prospective two-phase study was conducted. Phase 1 analyzed correlations between RF-CSA and SMI, as well as other sarcopenia predictors, in 77 patients. In phase 2, RF-CSA was measured at the bedside in 203 patients with acute decompensation of cirrhosis, followed up until death, liver transplant, or 90 days. Interoperator reliability was assessed in 38 patients using the intraclass correlation coefficient (ICC).

Results: RF-CSA strongly correlated with SMI ($r = 0.748$, $p < 0.001$), outperforming muscle thickness and anthropometric parameters. RF-CSA was an independent predictor of sarcopenia (hazard ratio (HR) = 0.27, $p < 0.001$) and demonstrated high discrimination ability for sarcopenia (AUROC = 0.90 in men and 0.92 in women). Lower RF-CSA was independently associated with an increased risk of developing sepsis, acute kidney injury, shock, and overt hepatic encephalopathy. RF-CSA was an independent predictor of 90-day mortality (subdistribution HR = 0.57, $p = 0.006$). Intra- and interoperator reliability were high (ICC = 0.980 and 0.947, respectively, $p < 0.001$ for both).

Conclusions: RF-CSA assessment by thigh ultrasound is an accurate, reliable, and easy point-of-care tool for assessing sarcopenia in patients with decompensated cirrhosis. It is also associated with the risk of complications and mortality.

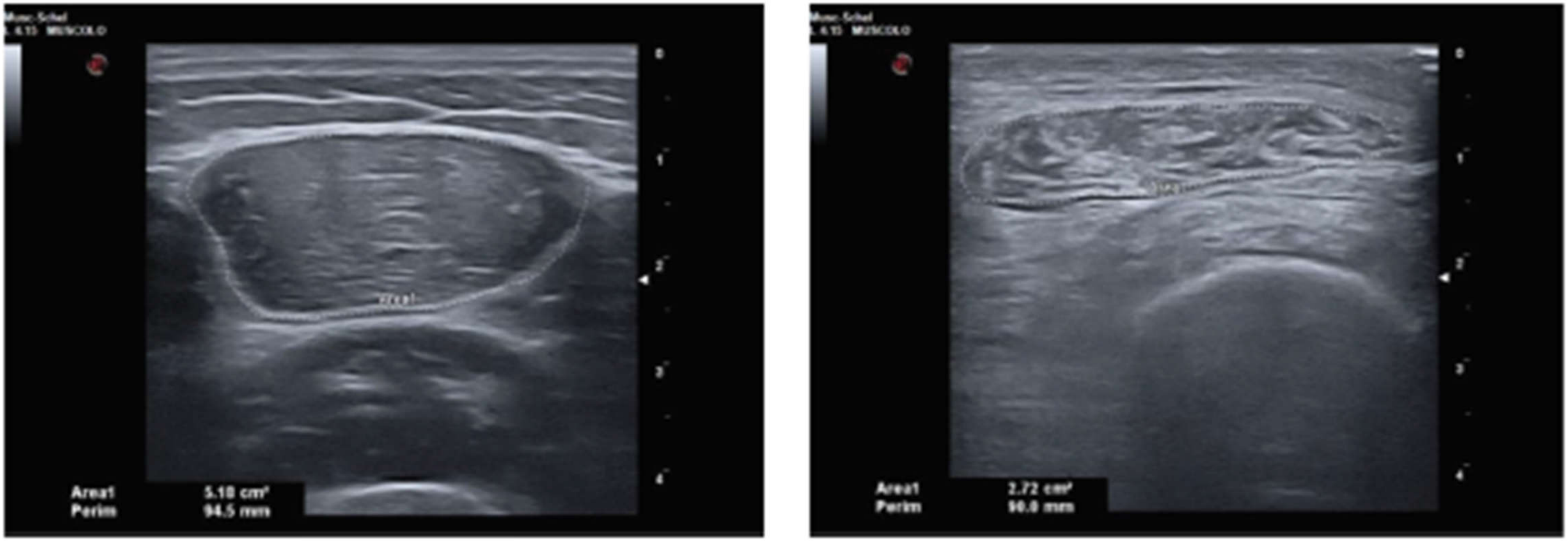
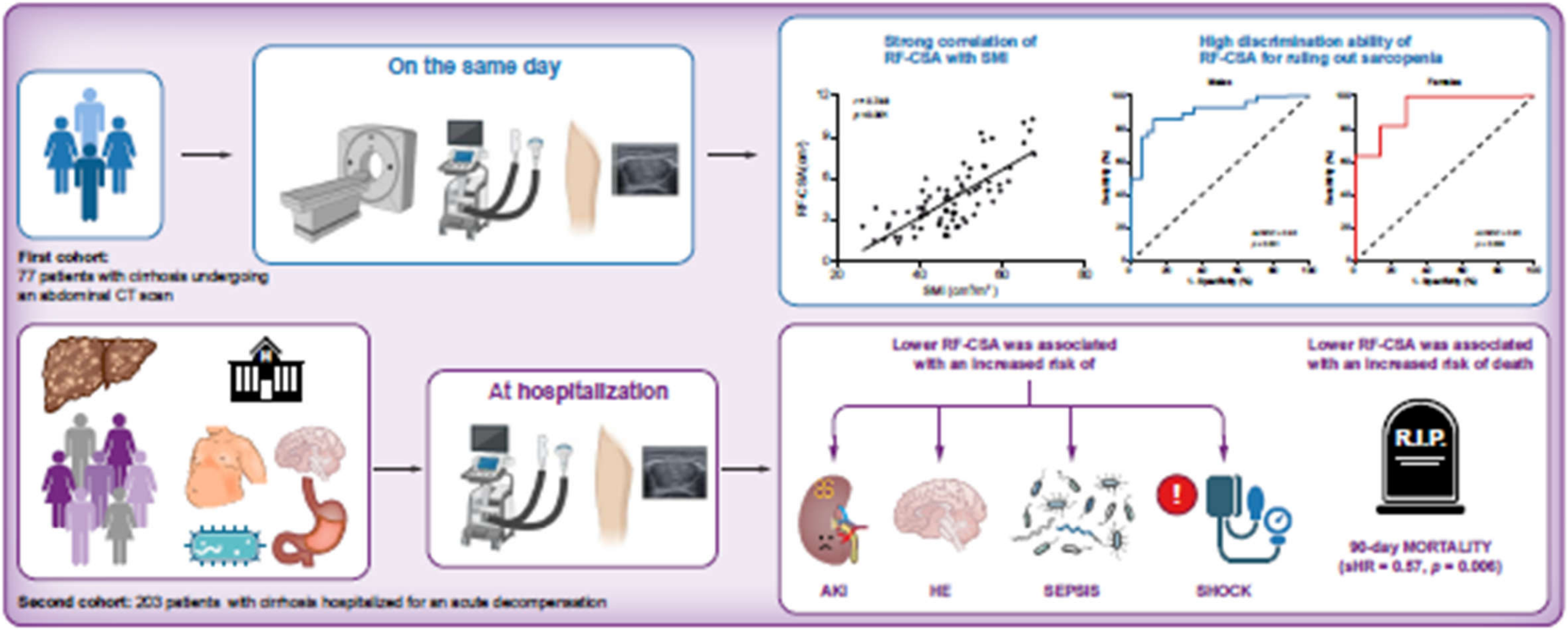


Fig. 1. Ultrasound measurement of RF-CSA by a planimetric technique in two male patients with cirrhosis, one without (left) and one with sarcopenia (right). The dashed line identifies the perimeter of the rectus femoris. RF-CSA, rectus femoris cross-sectional area.



Highlights:

- Sarcopenia is frequent in cirrhosis and linked to poor clin-

Impact and implications:

Sarcopenia is strongly associated with adverse clinical out-

Image-guided biopsy of breast lesions—when to use what biopsy technique

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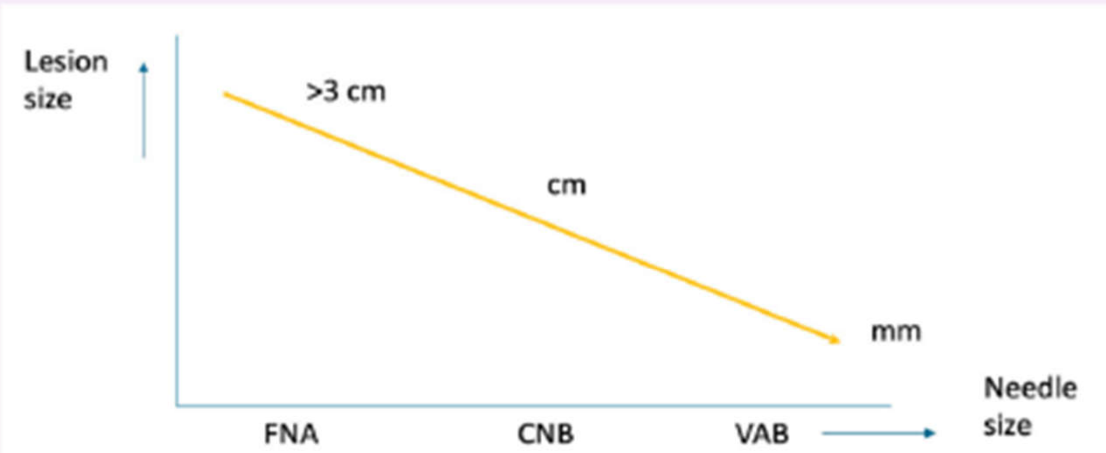
Abstract
In recent years, minimally invasive diagnostic options for breast lesions have expanded, but consensus on optimal biopsy techniques and imaging combinations remains lacking. This study, driven by an adapted RAND-UCLA Appropriateness Method and insights from eight experts in breast biopsy from across the world, aims to create consensus for selecting biopsy techniques. Highlighted findings suggest Vacuum-Assisted Biopsy (VAB) for lesions visible exclusively at mammography/tomosynthesis (with or without contrast enhancement) or MRI. Core-needle biopsy (CNB) takes precedence for masses over 5 mm visible under US. The selection of other biopsy techniques during US-guided procedures depends on lesion type, size, and sampling indication. VAB is preferred for smaller masses (< 5 mm), complex cystic and solid lesions with small solid parts, small intraductal masses, architectural distortions, and calcifications visible on US. In re-biopsy scenarios for inconclusive findings or high-risk lesions, the panel suggests two VAB extensions: Extended Vacuum-Assisted Biopsy (EVAB) for unambiguous lesion classification and Vacuum-Assisted Excision (VAE) for complete lesion removal. Furthermore, the panel provides detailed input on how to handle specific cases, such as re-biopsy for lobular neoplasia, flat epithelial atypia and atypical ductal hyperplasia. Surgical excision is advised for DCIS and benign or borderline phyllodes tumors found through initial CNB or VAB. In conclusion, an international expert group formulated recommendations on diagnostic breast biopsies under image guidance, aiming to ensure accurate diagnosis worldwide by providing practical advice on needle selection and biopsy approach.

Graphical Abstract

Image guided biopsy of breast lesions – when to use what biopsy technique

EUROPEAN SOCIETY OF RADIOLOGY



- Biopsy under ultrasound guidance is usually prefered. A wide range of biopsy techniques is available.
- Biopsy under image guidance other than ultrasound should be performed using vacuum assisted biopsy (VAB).
- To obtain diagnostic certainty in equivocal breast lesions extended VAB (EVAB) may be considered.

This statement addresses the lack of evidence-based guidelines on optimal biopsy and imaging techniques for breast lesions by providing advice from an

Comparative efficacy of exercise modalities in knee osteoarthritis

Comparative efficacy and safety of exercise modalities in knee osteoarthritis: systematic review and network meta-analysis

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DATA SOURCES

PubMed, Embase, Cochrane Library, Web of Science, CINAHL, PsycINFO, AMED, PEDro, Scopus, ClinicalTrials.gov, ICTRP, and ClinicalTrialsRegister.eu from database inception to August 2024.

ELIGIBILITY CRITERIA FOR SELECTING STUDIES

Randomised controlled trials comparing different exercise modalities, including aerobic exercise, flexibility exercise, mind-body exercise, neuromotor exercise, strengthening exercise, mixed exercise, and control group for patients with knee osteoarthritis.

MAIN OUTCOME MEASURES

Primary outcomes included pain, function, gait performance, and quality of life, assessed at short term (four weeks), mid-term (12 weeks), and long term (24 weeks) follow-up. When exact time points were unavailable, data from adjacent time windows were used.

RESULTS

217 randomised controlled trials involving 15 684 participants were included. Moderate certainty evidence showed that, compared with the control

WHAT IS ALREADY KNOWN ON THIS TOPIC

Existing clinical guidelines consistently endorse multimodal treatment approaches, involving exercise, drug, and operative interventions, for managing knee osteoarthritis

Current guidelines provide limited information regarding the specific types of exercise interventions that should be recommended for patients with knee osteoarthritis

Current decision making is usually based on expert opinion and clinical experience

WHAT THIS STUDY ADDS

This network meta-analysis of 217 randomised controlled trials with 15 684 participants evaluates the relative benefit of five exercise modalities for knee osteoarthritis

Aerobic exercise may be the most beneficial exercise modality for improving pain, function, gait performance, and quality of life in knee osteoarthritis

The findings can help to improve the clarity of guideline recommendations regarding the most effective exercise interventions for patients with knee osteoarthritis

Challenges of early detection of pancreatic cancer

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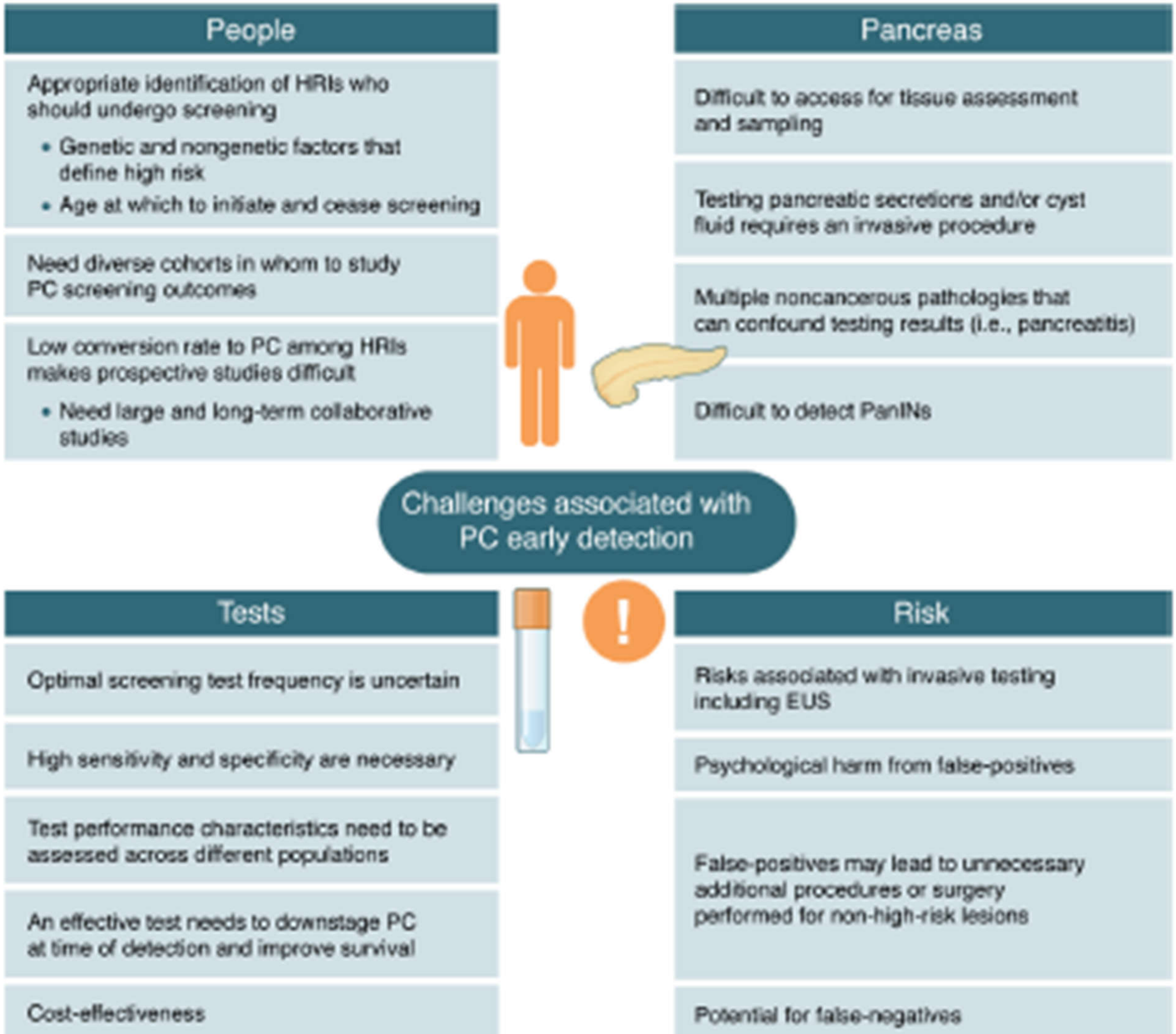
Pancreatic cancer (PC) is a devastating disease, due in part to its diagnosis frequently being made at an advanced stage. Ongoing efforts are aimed at identifying early-stage PC in high-risk individuals, as early detection leads to downstaging of I and improvements in survival. However, there are a myriad of challenges that arise when trying to optimize PC early detecti strategies, including selection of the appropriate high-risk individuals and selection of the test or combination of tests that should be performed. Here, we discuss the populations that are the strongest candidates for PC screening and review professional PC screening guidelines. We also summarize the current state of imaging techniques for early detection of PC a further review many studied biomarkers — ranging from nucleic acid targets, proteins, and the microbiome — to highlight th current state of the field and the challenges that remain in the years to come.


People
Appropriate identification of HRIs who should undergo screening
• Genetic and nongenetic factors that define high risk
• Age at which to initiate and cease screening
Need diverse cohorts in whom to study PC screening outcomes
Low conversion rate to PC among HRIs makes prospective studies difficult
• Need large and long-term collaborative studies
Pancreas
Difficult to access for tissue assessment and sampling
Testing pancreatic secretions and/or cyst fluid requires an invasive procedure
Multiple noncancerous pathologies that can confound testing results (i.e., pancreatitis)
Difficult to detect PanINs
Challenges associated with PC early detection
Tests
Optimal screening test frequency is uncertain
High sensitivity and specificity are necessary
Test performance characteristics need to be assessed across different populations
An effective test needs to downstage PC at time of detection and improve survival
Cost-effectiveness
Risk
Risks associated with invasive testing including EUS
Psychological harm from false-positives
False-positives may lead to unnecessary additional procedures or surgery performed for non-high-risk lesions
Potential for false-negatives
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improve cost-effectiveness.

Future directions and conclusions

While the goal of improving early detection of PC has been notably advanced over the past two decades, there remain many areas where iterative improvements can better identify individuals with early-stage PC or high-risk premalignant lesions. Continued accumulation of data encompassing single-gene PGVs, polygenic risk scores, and lifestyle risk factors may help refine the HRIs eligible for PC screening and the optimal initiation age and interval between screening tests. Figure 3 summarizes select current challenges in the PC early detection field.

The choice of imaging modality continues to evolve, as data hint at distinct benefits with both MRI and EUS. The application

MAYO CLINIC

MAYO CLINIC PROCEEDINGS

Shift Work and the Risk of Kidney Stones

Recognized since antiquity, kidney stones currently afflict approximately 1 in 10 people in the United States, with a prevalence that has almost tripled during the past 50 years.[1,2] Kidney stones may be silent or cause acute complications, especially pain that may be sufficiently severe to necessitate hospitalization.[3] Besides pain, kidney stones may acutely cause hematuria, urinary tract infections, sepsis, and acute kidney injury; kidney stones may be recurrent, with as many as 50% of afflicted individuals having a subsequent episode in 10 years; in the long term, kidney stones may predispose to chronic kidney disease.[3] Kidney stones, as shown by abundant evidence, may be associated with an increased risk for hypertension, cardiovascular diseases, and diabetes.[4] In addition to the acute and chronic complications that may be stone formation. For example, hypercalciuria, a risk factor for nephrolithiasis, is a consequence not just of renal processes but also of extrarenal processes involved in calcium homeostasis. In addition, systemic diseases such as the metabolic syndrome and diabetes promote the risk of kidney stones. The third concept emphasizes the importance of uncovering and avoiding risk factors that predispose to kidney stone formation or the recurrence of stone formation.

In this issue of *Mayo Clinic Proceedings*, He et al[5] uncover an unrecognized factor that predisposes to kidney stone events, namely, shift work. These investigators used the UK Biobank, which is a population-based cohort study begun in England, Wales, and Scotland wherein more than a half-million participants, in the age range of 40 to 69 years, were recruited from 2006 to which means that the solutes usually present in urine, relevant to stone formation, are in sufficiently high concentrations such that crystal formation should otherwise occur; such crystal formation and growth are prevented by the presence of inhibitors in the urine. Crystal formation and growth are also significantly reduced by a sufficiently high intake of fluids, which by the dictates of water balance leads to an increased urinary output and a relatively high urinary flow rate—this reduces urinary concentration of relevant solutes and thus the risk of stone formation. It is for this reason that a large daily intake of water is the cornerstone in the management of kidney stones. The second concept is that kidney stones represent not a disease isolated to the urinary tract but rather a reflection of systemic processes that eventuate in kidney more than 200,000 participants in the UK Biobank with a median follow-up of 13.7 years and in whom a kidney stone developed in almost 3000 participants. Notably, in their adjusted model, individuals who did shift work exhibited a higher risk of kidney stone events (with a hazard ratio of 1.15). Such kidney stone events were more likely to occur in participants who were younger than 50 years and those who were little involved in manual labor. Mediators of this increased risk were assessed, and such kidney stone events were linked to smoking, disturbed sleep patterns, increased sedentary time, decreased fluid intake, and increased body mass index.

Support for these novel observations is derived from recent observations from the Nurses' Health Studies (NHS).[6] The NHS was initially set up decades ago to examine

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