

## AHA/ASA GUIDELINE

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# 2024 Guideline for the Primary Prevention of Stroke: A Guideline From the American Heart Association/American Stroke Association

*Endorsed by the Preventive Cardiovascular Nurses Association and the Society for Vascular Surgery*

*The American College of Obstetricians and Gynecologists supports the value of this clinical document as an educational tool*

*The American Academy of Neurology affirms the value of*



*statement as an educational tool for neurologists*

**AIM:** The “2024 Guideline for the Primary Prevention of Stroke” replaces the 2014 “Guidelines for the Primary Prevention of Stroke.” This updated guideline is intended to be a resource for clinicians to use to guide various prevention strategies for individuals with no history of stroke.

**METHODS:** A comprehensive search for literature published since the 2014 guideline; derived from research involving human participants published in English; and indexed in MEDLINE, PubMed, Cochrane Library, and other selected and relevant databases was conducted between May and November 2023. Other documents on related subject matter previously published by the American Heart Association were also reviewed.

**STRUCTURE:** Ischemic and hemorrhagic strokes lead to significant disability but, most important, are preventable. The 2024 primary prevention of stroke guideline provides recommendations based on current evidence for strategies to prevent stroke throughout the life span. These recommendations align with the American Heart Association’s Life’s Essential 8 for optimizing cardiovascular and brain health, in addition to preventing incident stroke. We also have added sex-specific recommendations for screening and prevention of stroke, which are new compared with the 2014 guideline. Many recommendations for similar risk factor prevention were updated, new topics were reviewed, and recommendations were created when supported by sufficient-quality published data.

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## TOP 10 TAKE-HOME MESSAGES

1. From birth to old age, every person should have access to and regular visits with a primary care health professional to identify and achieve opportunities to promote brain health.
  2. Screening for and addressing adverse social determinants of health are important in the approach to prevention of incident stroke. This updated guideline includes an orientation to social determinants of health, acknowledging its impact on access to care and treatment of stroke risk factors. Therefore, screening for social determinants of health is recommended in care settings where at-risk stroke patients may be evaluated, with the acknowledgment that evidence-based interventions to address adverse social determinants of health are evolving.
  3. The Mediterranean diet is a dietary pattern that has been shown to reduce the risk of stroke, especially when supplemented with nuts and olive oil. However, low-fat diets have had little impact on reducing the risk. This guideline recommends that adults with no prior cardiovascular disease and those with high or intermediate risk adhere to the Mediterranean diet.
  4. Physical activity is essential for cardiovascular health and stroke risk reduction. This guideline includes a summary of high-quality data showing that prolonged sedentary behavior during waking hours is associated with an increased risk of stroke. Therefore, we provide a new recommendation for screening for sedentary behavior and counseling patients to avoid being sedentary, as well as a call for new studies of interventions to disrupt sedentary behavior. This is in addition to the recommendation to engage in regular moderate to vigorous physical activity.
  5. Glucagon-like protein-1 receptor agonists have been shown to be effective not only for improv-
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ORIGINAL ARTICLE

# Lower Serum Albumin Level: A Prospective Risk Predictor of Hepatocellular Carcinoma in Patients With Chronic Hepatitis B Virus Infection

Yusheng Song, Haiyan Chen, Jinlong Li, Feifei Zhong, Yunbing Liu, Hui Liu , Shaogui Wan 

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univariate and multivariate analyses. We evaluated the discrimination accuracy of ALB level in predicting HCC development by receiver operating characteristic (ROC) curves. Dose-dependent and time-dependent effects of ALB level on HCC risk prediction were demonstrated, respectively, using a restricted cubic spline and a Fine and Grey competing risk model. Referred to patients with higher ALB level, those with lower ALB level exhibited significantly increased risk of HCC development after adjustment for host variables (dichotomised analyses: hazard ratio = 3.12, 95% confidence interval 1.63–5.97,  $p = 8.23 \times 10^{-4}$ ,  $p_{\log\text{-rank}} = 5.97 \times 10^{-4}$ ; tertile analyses: hazard ratio = 2.07, 95% confidence interval 1.63–2.64,  $p = 3.77 \times 10^{-9}$ ,  $p_{\log\text{-rank}} < 2.00 \times 10^{-16}$ ; quartile analyses: hazard ratio = 2.10, 95% confidence interval 1.56–2.84,  $p = 9.87 \times 10^{-7}$ ,  $p_{\log\text{-rank}} < 2.00 \times 10^{-16}$ ). There was a statistically increasing trend on HCC risk which was found following by the decrease of ALB level ( $p_{\text{trend}} < 0.0001$ ). Similar findings were present by the Kaplan–Meier analysis, cumulative incidences of HCC development were significantly higher in patients with lower ALB levels, with the  $p$  value obtained from log-rank test were all  $< 0.0001$ . The result of dose-dependent effect showed hazard ratio (HR) value of HCC risk was gradually decreasing as the increasing of ALB level, with non-linear correlation being statistically significant (Wald  $\chi^2 = 20.59$ ,  $p = 0.000$ ). HR value in lower ALB level remained persistently prominent by fluctuating around 2.73 in the whole follow-up time by adjusting for host variables. Sub-cohort analysis by ROC revealed that the discrimination ability of the ALB model was performed better than Child-Pugh (C-P) model in both cohort of patients with 1-year (area under curve [AUC] 0.762 vs. 0.720) and 2-year exclusion window (AUC 0.768 vs. 0.728). The AUC added by ALB level was demonstrated significantly from host model to full model. Lower ALB level was significantly associated with an increased risk of HBV-related HCC and could provide extra useful clinical utility to other host features, which might be a promising non-invasive indicator for surveillance on HCC development.

Original Article

## Preoperative Ultrasound Radomics to Predict Posthepatectomy Liver Failure in Patients With Hepatocellular Carcinoma

Liyun Xue PhD, Juncheng Zhu PhD, Yan Fang MD, Xiaoyan Xie PhD, Guangwen Cheng PhD, Yan Zhang MD, Jinhua Yu PhD ✉, Jia Guo PhD ✉, Hong Ding PhD ✉

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## Methods

This multicenter study proposed a deep learning model (PHLF-Net) incorporating dual-modal ultrasound features and clinical indicators to predict the PHLF risk. The datasets were divided into a training cohort, an internal validation cohort, an internal independent testing cohort, and three external independent testing cohorts. Based on ResNet50 pretrained on ImageNet, PHLF-Net used a progressive training strategy with images of varying granularity and incorporated conventional B-mode and elastography images and clinical indicators related to liver reserve function.

## Results

In total, 532 HCC patients who underwent hepatectomy at five hospitals were enrolled. PHLF occurred in 147 patients (27.6%, 147/532). The PHLF-Net combining dual-modal ultrasound and clinical indicators demonstrated high effectiveness for predicting PHLF, with AUCs of 0.957 and 0.923 in the internal validation and testing sets, and AUCs of 0.950, 0.860, and 1.000 in the other three independent external testing sets. The performance of PHLF-Net outperformed models of single- and dual-modal US.

## Conclusions

Preoperative ultrasound imaging combining clinical indicators can effectively predict the PHLF probability in patients with HCC. In the internal and external validation sets, PHLF-Net demonstrated its usefulness in predicting PHLF.

Radiofrequency Ablation of T1N0M0  
Papillary Thyroid Cancer: First Experience in  
the United States



To date, there is no clear consensus on the optimal management strategy for papillary thyroid carcinoma (PTC) less than 2 cm. Whereas surgery is a standard treatment, active surveillance (AS) and thermal ablation (TA) have recently been suggested as alternative treatment options. The 2015 American Thyroid Association Guidelines endorsed AS as an alternative to immediate surgery for low-risk PTC measuring up to 1 cm (papillary thyroid microcarcinoma [PTMC], T1a). Active surveillance is gaining a certain degree of consensus as an acceptable management option for low-risk PTMC worldwide. A meta-analysis on AS revealed a 6.9% disease progression rate (5.3% with size enlargement, 1.6% with lymph node metastasis) based on pooled 5-year follow-up data.<sup>1</sup> Ongoing clinical trials are exploring the possibility of extending the size threshold for AS to 2 cm (T1b).<sup>2</sup>

A recent multicenter prospective cohort study of AS for PTMC revealed a 9.6% disease progression rate (8.3% with size enlargement, 1.5% with lymph node metastasis) based on pooled 5-year follow-up

patients with small, low-risk PTC. A meta-analysis of TA with 5-year follow-up data showed a 0% disease progression rate with no conversion surgery, even with the inclusion of young patients.<sup>5</sup> After that 5-year meta-analysis study of TA, 4 additional studies with follow-up exceeding 5 years have reported disease progression rates ranging from 0% to 2.6% and conversion surgery rates due to patient anxiety ranging from 0% to 1.1%.<sup>6-9</sup> These studies included young patients and showed promising results.

In comparing AS and TA, TA demonstrated a slightly lower disease progression rate and a lower rate of conversion surgery due to anxiety during follow-up, and TA can be used as an effective option for treating young patients. In addition, whereas T1b has a slightly higher disease progression rate under AS, T1b showed outcomes comparable to those of T1a with TA, indicating strong potential for future applications.<sup>10</sup>

The study by Rachmasari et al,<sup>11</sup> published in this issue of *Mayo Clinic Proceedings*, demonstrated that T1 PTCs were

moderate sedation. Although general anesthesia might increase patient comfort during the procedure, it can also hinder the detection of complications. The 2023 American Thyroid Association Guidelines recommend local anesthesia and, when necessary, advises that patient cooperation, comorbidities, ability to interact, and procedural tolerance should be considered. Whereas local anesthesia with injected lidocaine provides adequate analgesia for most patients, conscious sedation administered by an anesthesiologist or another provider with the appropriate authorization and credentials may occasionally be required.

Despite these concerns, the study by Rachmasari et al is notable as the first RFA study for PTCs published in the United States, demonstrating the potential for treating both T1a and T1b PTCs, with no disease progression observed up to 2 years of follow-up and maintaining normal thyroid function without major complications. The insightful and noteworthy study by Rachmasari et al highlights the feasibility of using RFA for small PTCs in the United States. We eagerly anticipate future prospective, long-term follow-up data.

# Pain Management in Liver Disease

Up to 80% of people with cirrhosis experience moderate to severe pain. How to safely manage that pain while avoiding related risks.

Oct 15, 2024 | ⌚ 8 Min Read | Jeffrey J. Bettinger, PharmD, Pain Management Clinical Pharmacist; William Amarquaye, PharmD, Clinical Hospital Pharmacist

- Liver disease encompasses various conditions, including metabolic dysfunction-associated steatotic liver disease and alcoholic liver disease, with cirrhosis being a critical cause of mortality.
- Cirrhosis pain, including ascites and muscle cramps, is experienced by up to 80% of patients with liver disease.
- Medication selection must account for compromised hepatic clearance and potential systemic toxicity.

## Summary

Due to the wide-spanning physiologic changes that take place during the development and progression of liver disease, pain management can be challenging. While there are several limitations that span across pain medication classes when treating individuals with cirrhosis, there still are good options that may be useful to optimize.

*Disclosures: Dr. Bettinger reported being on the Scientific Advisory Board for PainScript, LLC, and a consultant Scilex Holding Company.*

*Dr. Amarquaye had no disclosures.*

RESEARCH

Open Access

# Efficacy of melatonin for prolonged disorders of consciousness: a double-blind, randomized clinical trial



Xinrui Wen<sup>1,2†</sup>, Jie Yu<sup>1†</sup>, Genying Zhu<sup>1,3†</sup>, Jinhua Wang<sup>1</sup>, Yangyang Sun<sup>5</sup>, Jiajia Zhou<sup>1</sup>, Jiaye Cai<sup>4</sup>, Fanxia Meng<sup>1</sup>, Yi Ling<sup>1</sup>, Yi Sun<sup>4</sup>, Jiajia Zhao<sup>1</sup>, Fangping He<sup>1</sup>, Qisheng Cheng<sup>1</sup>, Chuan Xu<sup>4</sup>, Jian Gao<sup>5</sup>, Jingqi Li<sup>5</sup> and Benyan Luo<sup>1\*</sup>

## Abstract

**Background** Sleep is essential for the recovery of patients with disorders of consciousness (DoC). However, few approaches targeting sleep were applied. Melatonin has been shown to enhance sleep efficiency with virtually no side effects. This study explored melatonin's benefits for patients with prolonged DoC, as well as the underlying mechanisms involved.

**Methods** A cohort of 46 patients with prolonged DoC were randomly assigned to either the melatonin treatment group or the placebo group. Assessments were conducted using the Coma Recovery Scale-Revised (CRS-R), electroencephalography (EEG), and polysomnography (PSG) before and after the intervention, with follow-up CRS-R evaluations performed 6 months post-treatment.

**Results** Compared to the placebo, melatonin demonstrated a significant improvement in CRS-R scores after a 2-week period in patients with unresponsive wakefulness syndrome (UWS) ( $F_{\text{group*time}} = 6.86, P = 0.032; F_{\text{group}} = 4.03, P = 0.045$ ) and this improvement was particularly pronounced in visual scores ( $F_{\text{group*time}} = 7.03, P = 0.030; F_{\text{group}} = 4.90, P = 0.027$ ). Moreover, patients with UWS who received melatonin exhibited a higher relative spectral density of the alpha band in the frontal lobe compared to those who received placebo ( $F_{\text{time-mel}} = 4.55, P = 0.033$ ) and benefited for their prognosis after 6 months (Pseudo  $R^2 = 0.370, F = 12.03, P = 0.034$ ).

**Conclusions** Overall, melatonin intervention seems to have a better response in UWS patients with preserved sleep cycles. These positive effects may not be solely attributed to improvements in the patients' sleep quality.

**Trail registration** ClinicalTrials.gov: NCT05285124.

## **Conclusions**

In this study, melatonin was found to increase the level of consciousness in UWS patients and have a positive influence on UWS patients 6 months later, especially in UWS patients exhibiting structured sleep patterns. It also can greatly elevate frontal relative PSD at alpha frequency band in UWS patients. Furthermore, the beneficial effects of melatonin intervention were not attributed to enhancements in the patient's sleep. In conclusion, our findings demonstrate that melatonin might benefit for a part of UWS patients, which was associated with their sleep patterns. This research provided a reference for the treatment of specific subcategories of prolonged DoC.

THE END