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## ABSTRACTS: VOLUME 6, SPECIAL ISSUE

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### ABSTRACT

#### Detection of Acute Stroke Using the Alberta Stroke Program Early CT Score (ASPECTS)

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**Background:** In 2022, cerebral strokes ranked fourth as the leading cause of death in the Palestinian Ministry of Health, accounting for 11% of all deaths. The Alberta Stroke Program Early CT Score (ASPECTS) is a quick, semi-quantitative way to assess ischemic lesions and predict prognosis in patients with ischemic stroke. It is a straightforward, reliable method for evaluating early ischemic changes in the blood supply region of the middle and posterior cerebral arteries. The primary basis for this strategy is the visual observation of doctors. However, the low inter-reader agreement could lead to mistakes in the final diagnosis because of the doctor's varying degrees of experience. To aid medical professionals in their diagnosis and assessment, this work proposes the use of non-contrast computed tomography (NCCT) as the basis for the ASPECTS technique of acute ischemic stroke.

#### Research Questions:

1. How do the score findings predict functional outcomes in individuals with acute ischemic stroke?
2. How could ASPECTS be used to track and assess stroke progression in non-contrast CT scans?



3. What role do ASPECTS play in therapy decision assistance for patients with acute ischemic stroke?

4. How could ASPECTS aid healthcare practitioners in making accurate and timely diagnosis?

**Objectives:**

1. Describe the most common appearance signs the Alberta Stroke Program Early CT Score (ASPECTS) used in detecting early ischemic changes (EIG) and stroke evaluation.
2. Examining the most commonly affected territory in a cerebral infarction
3. Analyze the proportion of patients with good and bad clinical outcomes.
4. Matching of ASPECTS with doctor's reports

**Methods:** Our study will follow a retrospective study design. So in January 2024, we collected 62 patients from Jericho Government Hospital and Palestine Medical Complex Hospital who had suffered acute middle and posterior cerebral artery ischemic strokes. After reading and analyzing the brain non-contrast computed tomography images, an experienced radiologist used ASPECTS, region-level ASPECTS, and a dichotomized ASPECTS score ( $\leq 7$  vs.  $>7$ ).

**Results:** ASPECTS matched CT results 100%, and even better, it is anticipated that the implementation of ASPECT would assist radiologists in promptly identifying regions of ischemia, thus enabling immediate medical intervention and ultimately improving the patient's condition.

**Conclusions:** ASPECTS superiorly verified his trustworthiness, accuracy, and precision in most cases by providing more detailed information and identifying the damaged brain regions and any minor signs. This involved identifying the acute signs of stroke in the non-contrast CT scans by ASPECTS.



**PalStudent Journal**  
A Palestinian Scientific Journal for the Youth



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**Keywords:** ASPECTS, non-contrast CT scan, early ischemic changes, acute ischemic stroke, middle cerebral artery region (MCA), posterior cerebral artery region (PCA).

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