Should the use of the terms “Positive” and “Negative” Allen’s Test be abandoned?

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“Positive” and “Negative” Test Results

- A “positive” test result indicates that a condition, attribute, or lesion is present
- A “negative” test result indicates that the condition, attribute, or lesion is absent
- A “false positive” test result indicates that the condition, attribute, or lesion is present when it is actually absent (false positive = non-specific)
- A “false negative” test result indicates that the condition, attribute, or lesion is absent when it is actually present (false negative = insensitive)

Some Familiar Clinical Tests

- “Methacholine Challenge Test”: a subject’s reactivity to methacholine chloride serves as “the gold standard” for hyperreactivity of airways; defined as a reduction in FEV1 > 12% from baseline
- “PPD (purified protein derivative) Test”: a positive PPD indicates that the subject has been exposed to active tuberculosis; presence of a flare and wheal
- “Cardiac Enzyme (LDH, CK, CPK, SGOT) Test”: a positive test suggests that the patient may have sustained an MI; sensitive, but not very specific
- “Troponin Test”: a positive test result indicates that the patient has sustained an MI; highly sensitive and highly specific

History of the Allen’s Test

- First described by Edgar van Nuys Allen, M.D. in 1929
- The hand of the recumbent (conscious or unconscious) patient is raised to a vertical position to drain blood away from the hand/forearm prior to external occlusion of the radial/ulnar arteries at the wrist
- Alternatively, the (conscious) patient refrains from raising his/her arm, and expresses blood from the hand/palm by “making a fist” several times in succession after external radial/ulnar compression is applied
- This is the so-called “Modified Allen’s Test”

Lesion of Interest in Allen’s Test

- In normal subjects (98%+ of the general population), the palmar arch connects the radial and ulnar arteries
- In the presence of a competent palmar arch, perfusion of the thumb and index finger will persist in the face of radial artery spasm
- If the palmar arch is incompetent, radial artery spasm of long duration could result in ischemia and infarction of the thumb and forefinger
Widespread Confusion about Allen’s Test

- many clinical instructors teach Allen’s Test interpretation incorrectly
- even the World Health Organization defines a Positive Allen’s Test incorrectly on their website!
- because so many practitioners have been taught incorrectly, one can only guess what the notation “positive” or “negative” Allen’s Test really means
- the ultimate authority, of course, is not the popularity of one definition over the other, but rather the manner in which the test was initially described by Edgar van nuys Allen himself! (decidedly NOT a case of “majority rules”)

“Solution” Number One

1) abandon the use of Allen’s Test altogether
- an untenable stance, because scrapping it would jeopardize patient safety
- clinicians should continue to use Allen’s Test routinely in preparation for a percutaneous radial artery puncture
- failure to do so could be considered negligent

Solution Number Two

2) don’t invoke the term “positive” or “negative” at all, but simply chart “collateral circulation absent” or “collateral circulation present”
- render these mutually exclusive responses user-selectable by means of a radio button within the documentation portion of the EMR
- incorporating a free-text field in this portion of the record would not work, because the operator might still choose to key in “positive” or “negative”, which would be ambiguous

Solution Number Three

3) present two mutually exclusive options for the documenter, and clarify the meaning of the terms “positive” and “negative” in the process
- radio button one: “collateral circulation present, consistent with a negative Allen’s Test”
- radio button two: “collateral circulation absent, consistent with a positive Allen’s Test”
- this EMR configuration avoids confusion about the result, and teaches at the same time

Our Research Project

- we composed a questionnaire which incorporated a scenario wherein brisk collateral circulation in the context of an Allen’s Test was portrayed
- respondents were directed to select either “Positive Allen’s Test” or “Negative Allen’s Test”
- 95% of the respondents chose the incorrect response
- 5% chose the correct response

Allen’s Test Research Project Questionnaire

Consider the following scenario: You are a practitioner who works in a medical center which employs an electronic medical record (EMR) system. An ABG analysis has been ordered for your patient, and you undertake a modified Allen’s Test in preparation for performing a percutaneous radial artery puncture. You simultaneously apply compression to the patient’s radial and ulnar arteries at the wrist, and the patient “makes a fist” three times in succession. As he subsequently opens his hand, you observe that his entire palm, fingers, and thumb are blanched. At that point, you decompress his ulnar artery while maintaining compression on the radial artery. After about one second has elapsed, you observe that his entire palm, all four digits, and his thumb acquire a now, almost floral hue, indicating good collateral circulation. The documentation screen embedded within the EMR system displays as shown below, which requires you to select the so-called “radio button” corresponding to your observation.

On this hand-copy image, please circle the radio button that you would choose in order to document your observations:

Results of Modified Allen’s Test:
Positive
Negative
A Patient Safety Issue

- when the results of any clinical test are rendered meaningless due to widespread confusion about the interpretation of the documentation of that test, patient safety is being compromised
- we need to rectify this situation!

Good News/Bad News

- if you chose the correct response, that’s good news...
  - ...but the bad news is: it doesn’t matter!
- if you chose the incorrect response, that’s bad news....
  - ....but the good news is: it doesn’t matter!
- the best news: we can choose to scrap this confusing documentation practice once and for all!
- Let’s do this!

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