

## **Evaluation of different diagnostic strategies using additional information**

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In order to diagnose the presence or absence of diagnostic condition, one or more diagnostic tests may be necessary. Information theory can be more effective than traditional methods for evaluating and comparing these diagnostic strategies. This theory views information as a reduction in uncertainty of whether a patient does or does not have a disease. This change in uncertainty will differ between positive and negative test results. Diagnostic tests which are used in diagnostic procedure are expected to reduce the initial uncertainty sequentially. Therefore performances of diagnostic tests are evaluated in a stepwise fashion. The predictive value of a test serves as an initial probability for the next test. Additional information of diagnostic procedures can be calculated. For each test applied, when this procedure is repeated, the cumulative information can be obtained both for ruling in and ruling out the disorder.

Radiograph types which are used for oral diagnosis and treatment in dentistry, will be evaluated for correct diagnosis for different regions of the mouth. For each region, the additional information contribution of radiograph types will be demonstrated by using a series of tests with known sensitivities and specificities. When these radiographies are used sequentially the information provided by each step will be calculated by means of positive and negative predictive values. Finally cumulative information of a diagnostic sequence will be calculated and performances of different diagnostic procedures will be compared for the different regions of mouth.