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**Touch Imprint Cytology of Core Needle Biopsy Specimens for the
Breast and Quick Stain Procedure for Immediate Diagnosis**

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Cytological assessment of conspicuous breast findings is not in widespread use in Germany. But the possibility of a rapid cytology-based test on cells obtained from CNB with subsequent histology combines the advantages of both methods. In the present study, the reproducibility and the validity of this approach was tested. The proportion of malignant findings is very high in the study cohort because of the characteristics of patients referred to a breast cancer centre of a university hospital. In the final histological diagnoses, the percentage of malignant cases is even higher because many cases with a benign result on CNB will not go on to surgery. In line with palliative care, some patients with malignant findings will forego an operation, so that a final histological result is missing in some cases. In the present study we used a quick stain method established in an earlier study on touch imprint specimens of breast resections, whereas in most other studies, staining was carried out using Diff-Quick. Our results showed an excellent sensitivity of 91.9% for the detection of a malignant tumors at a somewhat lower specificity (85.7%) on the basis of the final histology of the surgical specimen. Only a few benign findings, e.g. fibroadenomas, were difficult to interpret on cytology due the large number of cells. After adding Mayer's haematoxylin to the staining solution it was easier to discriminate between benign and malignant cases due to a better demonstration of myoepithelial cells. The percentage of results deemed inadequate in this study was 11.4% for investigator 1 and 19.0% for investigator 2. These values are comparable to those of other studies showing an overall inadequacy rate for TIC of 0 to 38% (mean=13%). Inadequate samples are found both for benign and malignant cases, but more often for benign lesions. In accordance with other trials, the number of samples rated as inadequate in this study was higher in benign cases. The high percentage of those for investigator 2 may be due to the fact that only the first 58 samples were evaluated; during the course of the study, the quality of the samples improved considerably. The correct rolling of the cores on the slide, good staining quality and a sufficient number of cores were important for good results. The sensitivity for malignancy in this study was high, which is comparable to similar studies. For certain types of histology, e.g. invasive lobular carcinoma, false-negative results were more frequent in our study; this was also found in other studies. For benign results, especially fibroadenomas in our study, the evaluation can be difficult. The cytological appearance of a rapidly-dividing fibroadenoma and papillomatosis are known to very closely resemble malignant cytology. While investigator 2 had no false-positive results, investigator 1 reported three false-positives. The comparison to investigator 2 shows that in the case of low quality preparation/staining and a low amount of material, one should refrain from the evaluation of the specimen. In earlier studies, the percentage of false-positive results ranged between 0 and 32%, showing the utmost importance of the need for high quality of specimens. The inter-observer variability of the specimens deemed adequate for evaluation was very high (kappa-value of 0.9502).

In conjunction with clinical and radiological findings as part of triple assessment, TIC is an option very quickly providing a diagnosis to the patient. Critical for its implementation into routine practice may be the lack of cytopathologists trained in this method. Future telemedicine applications may provide new possibilities, but this has to be investigated in further studies.