Choosing the Best Formalin-Resistant Ink for Biopsy Specimen Labeling

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Accurate specimen identification is critical in the everyday practice of dermatology. Formalin, which is used to preserve tissue samples, also acts as a solvent and can cause fading of the ink used to label specimen containers. Herein, we identify commonly used pens and markers with various inks that are susceptible or resistant to accidental formalin exposure to ensure durability of specimen labeling.

Practice Gap

Many dermatology practices utilize pens and markers to label biopsy specimen containers, but the ink may have variable susceptibility to fading and smearing when exposed to moisture before processing. Specimen containers often are placed in plastic bags for transport. If formalin accidentally spills into the bag during this time, the labels may be exposed to moisture for hours, overnight, or even over a weekend. Effective labeling with formalin-resistant ink is crucial for maintaining the clarity of anatomic location and planning treatment, especially when multiple samples are obtained.

The Technique

We tested 12 pens and markers commonly used when labeling specimen containers to determine their susceptibility to fading due to accidental formalin exposure (Figure). Various inks were allowed to dry on sample specimen labels for 5 minutes before a thin layer of 10% buffered formalin was evenly distributed over the dried ink. Photographs of the labels were taken at baseline as well as 15 minutes, 1 hour, 3 hours, and 24 hours after formalin exposure.

Fading was observed in both the skin marker and gel panes after 15 minutes and peaked after 1 hour. Gel pens were most susceptible to fading on exposure to formalin, and the level of fading varied by ink color, with certain colors disappearing almost entirely (Figure). The solvent-resistant marker had a robust defense to formalin, as did both ballpoint pens.

Practice Implications

Given our findings, dermatology practices should avoid using gel pens to label specimen containers. Solvent-resistant markers performed as expected; however, ballpoint pens appeared to withstand formalin exposure to a similar degree and often are more readily available. Labeling biopsy specimens with an appropriate ink ensures that each sample is clearly identified with the appropriate anatomic location and any other relevant patient information.

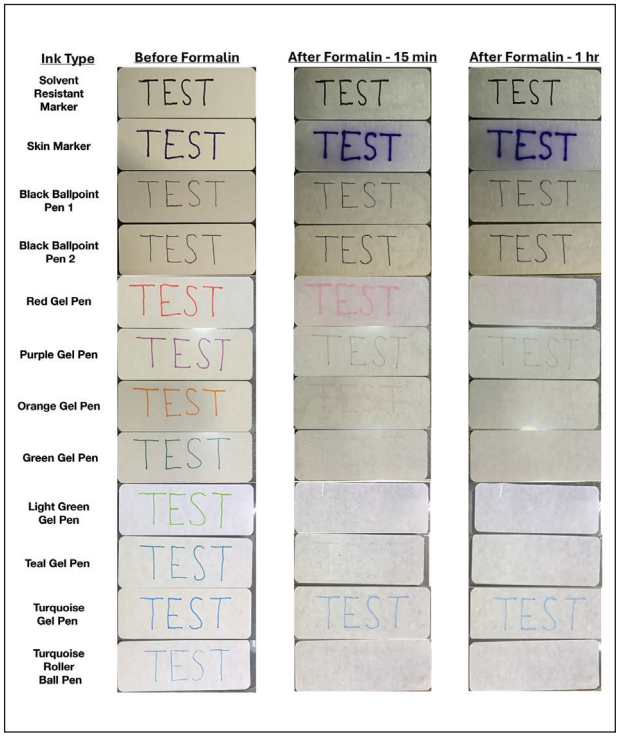

FIGURE. Sample specimen labels were marked with ink from a variety of pens and markers to determine their susceptibility to fading on exposure to formalin. The ink was allowed to dry for 5 minutes before a thin layer of 10% buffered formalin was applied over it. Photographs were taken at baseline as well as 15 minutes and 1 hour after formalin exposure.

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