Anatomical Pathology Patient Interest Association (APPIA) TOPS Tissue Handling Guidelines illustrate an ongoing education initiative to improve the understanding of pre-analytical factors and promote standardization in tissue workflows.

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**Anatomical Pathology Patient Interest Association, Raleigh, N.C.*

Introduction:

According to the World Health Organization, cancer accounted for nearly 1 in 6 deaths globally in 2020, however, as deadly as cancer is, many cancers can also be cured if detected early and treated effectively[1]. Receiving the right diagnosis and the right treatment at the right time is vitally important to a patient's probability of a successful fight against cancer. Thanks to advancing technologies and an increasing emphasis on precision medicine related to biomarker testing, the processes for appropriately handling and preparing clinical tissue samples have only grown in importance.

Determining cancer in a patient often begins with acquiring a tissue sample. The journey of a patient's tissue sample from acquisition to diagnosis, however, is a long, multi-step process. All the steps of collection, handling, and processing of clinical tissue samples make up what is referred to as the pre-analytical portion of the process. Unfortunately, pre-analytics in anatomic pathology often involve multiple manual processes that are wrought with the potential for error. In fact, an estimated 60-70% of laboratory-associated errors involve pre-analytical factors[2]. Examples include errors like insufficient or prolonged fixation, incorrect patient identification, improper grossing thickness, inadequate tissue processing, etc. Inconsistencies and errors during pre-analytical processes have the potential to negatively impact the quality of the tissue and the downstream analytical testing, ultimately jeopardizing the patient's diagnosis.

Those involved in the process of delivering a final patient result, whether they are laboratory professionals or pathologists, hold the responsibility for ensuring the quality of specimens for testing. Proper education and standardization of best practices in pre-analytics are keys to empowering pathology professionals to optimize tissue preservation and quality that enables the delivery of an accurate diagnosis in an efficient fashion.

The Tissue Optimization and Pre-Analytical Standardization (TOPS) Tissue Handling Guidelines developed by the Anatomical Pathology Patient Interest Association (APPIA) is part of an ongoing education initiative to improve the understanding of pre-analytical factors and promote standardization in tissue workflows.

Materials & Methods:

The TOPS guidelines are separated into the ten (10) main sequential steps of the pre-analytical process and list the industry best practices related to each step. The ten primary steps include tissue specimen labeling, tissue specimen handling, time to fixation, tissue specimen storage and transportation, tissue grossing and in-lab fixation, duration of fixation, tissue processing, tissue embedding, microtomy, and slide and block storage.

Content for the best practices was aggregated from known and respected industry sources, including the American Society of Clinical Oncology (ASCO), College of American Pathologists (CAP), and Clinical and Laboratory Standards Institute (CLSI) guidelines.

Once the information was collected, the APPIA board, which consists of industry professionals throughout anatomical pathology, organized and reviewed the content to ensure proper alignment within the ten sequential steps. A 2-page infographic was then created from the resulting content and best practices to be distributed to laboratories as an educational aid.

In addition, the material has been presented via webinar and on the APPIA webpage

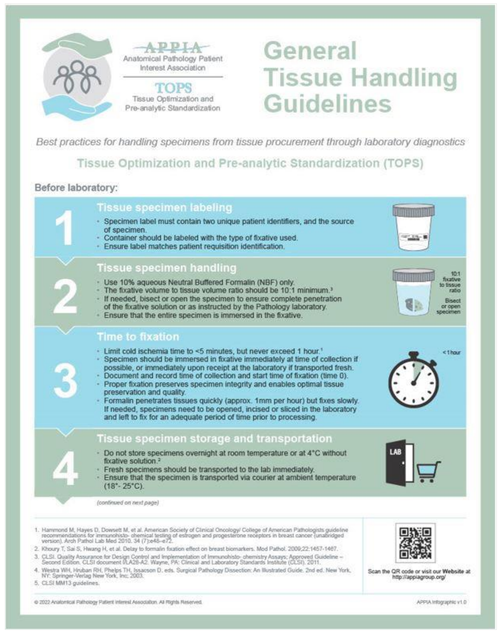
Conclusions:

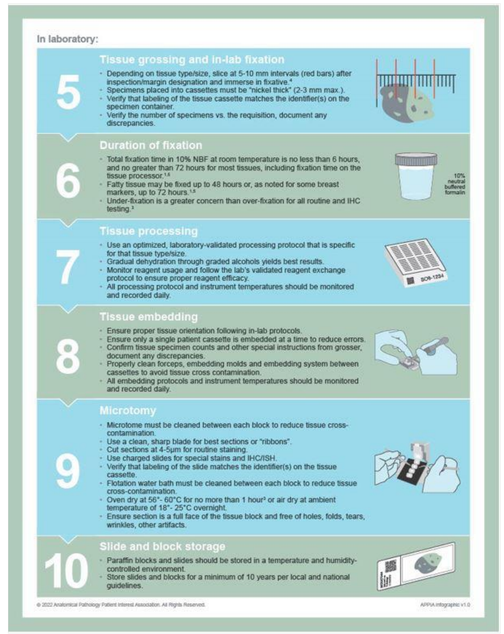
Optimization of patient outcomes in tissue-based testing can benefit from improving pre-analytical factors, beginning with specimen procurement and collection, and including the important steps of specimen fixation, transportation, and all in-laboratory processes for the eventual histopathologic evaluation by a pathologist. APPIA's TOPS Tissue Handling Guidelines promote and reinforce best practices and support the goals of laboratories to provide the best patient care.

Results:

The TOPS Guidelines are presented in an illustrated, 10-step infographic that outlines best practices for handling specimens from tissue procurement through laboratory diagnostics, including the pre-analytical steps of acquisition, fixation, and transportation of the specimen before it arrives in the laboratory for analysis. TOPS is APPIA's first education program for the entire health care delivery team emphasizing the importance of pre-analytics while serving the interests of patients.

The TOPS Program was introduced to audiences on November 29, 2020, by APPIA and Dr. David G. Hicks, Director of Surgical Pathology, Department of Pathology and Laboratory Medicine at the University of Rochester Medical Center, Rochester, New York in a webinar entitled: "Optimize Patient Outcomes by Improving Pre-Analytics". The TOPS program is endorsed by the National Society of Histotechnology (NSH). *Click on the infographic below for an expanded view:*





Citations:

[1] "Cancer." World Health Organization, 03 Feb. 2022, https://www.who.int/news-room/fact-sheets/detail/cancer.

[2] Compton, C. et al. Preanalytics and Precision Pathology: Pathology Practices to Ensure Molecular Integrity of Cancer Patient Biospecimens for Precision Medicine. Arch Pathol Lab Med 1 November 2019; 143 (11): 1346–1363. doi: https://doi.org/10.5858/arpa.2019-0009-SA

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http://appiagroup.org/tops

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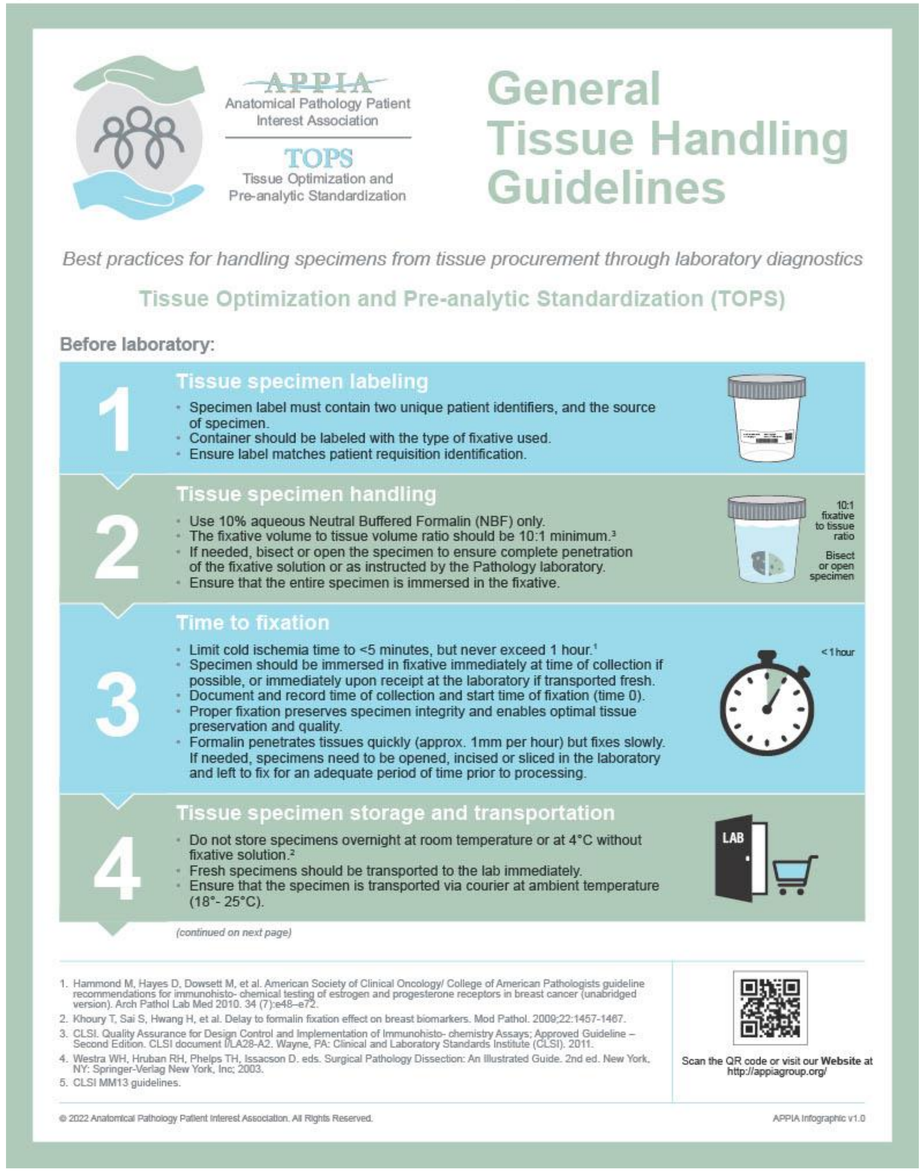

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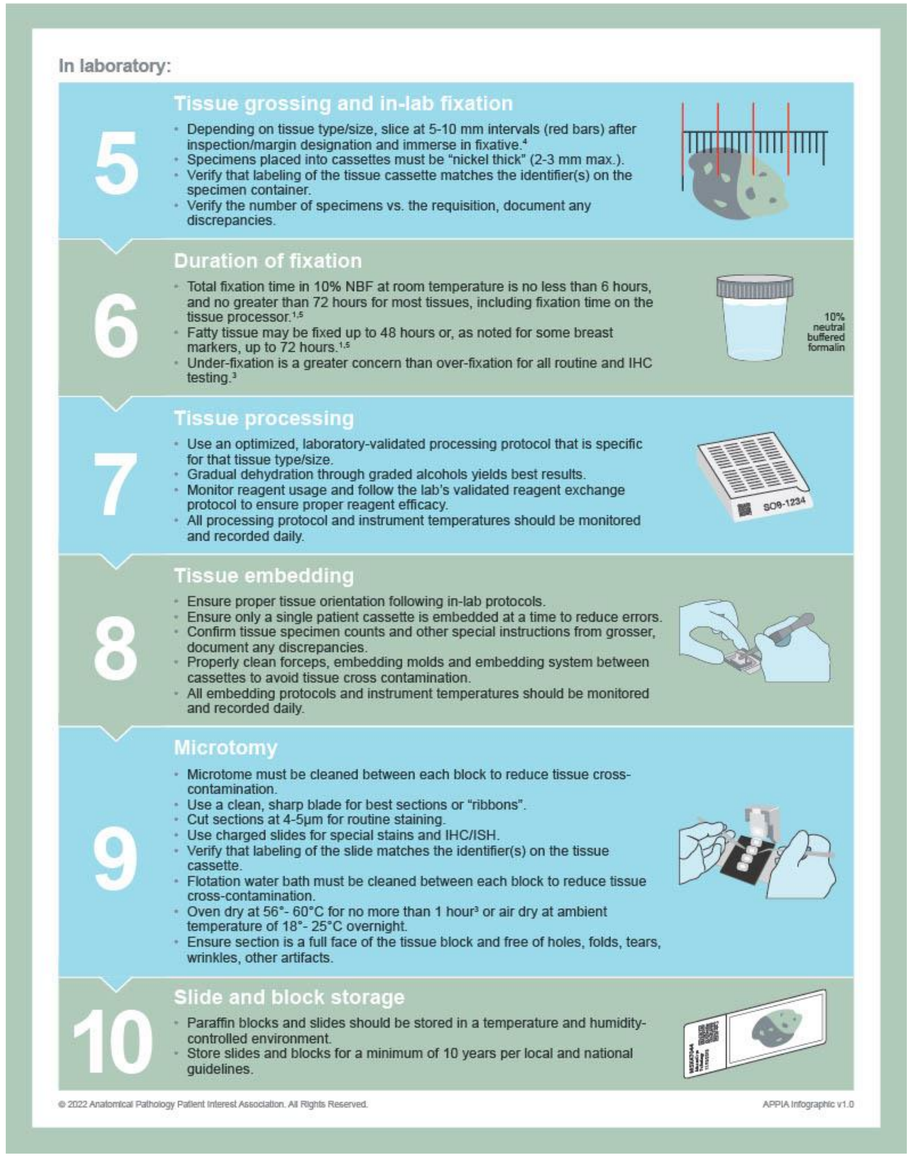

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