A Proposed Set of Metrics to Reduce Patient Safety Risk From Within the Anatomic Pathology Laboratory

Peter Banks, MD, Richard Brown, MD, Alex Laslowski, MS, Yvonne Daniels, MS, Phil Branton, MD, John Carpenter, MD, Richard Zarbo, MD, Ramses Forsyth, MD, PhD, Yan-hui Liu, MD, Shane Kohl, MD, Joachim Diebold, MD, Shinobu Masuda, MD, Tim Plummer, MS, Elsie Dennis, MD

Lab Med (2017) 48 (2):195-201

Alex.Laslowski@MonashHealth.org

Background: Anatomic pathology laboratory workflow consists of 3 major specimen handling processes. Among the workflow are preanalytic, analytic, and postanalytic phases that contain multistep subprocesses with great impact on patient care. A worldwide representation of experts came together to create a system of metrics, as a basis for laboratories worldwide, to help them evaluate and improve specimen handling to reduce patient safety risk.

Method: Members of the Initiative for Anatomic Pathology Laboratory Patient Safety (IAPLPS) pooled their extensive expertise to generate a list of metrics highlighting processes with high and low risk for adverse patient outcomes.

PREANALYTIC PHASE

Specimen Procurement

1 (a) Sample lost in delivery or empty container

2(b) Case assigned to wrong pathologist

3 (c) Incorrect prioritization assigned (eg, rush vs routine handling)

Accessioning

4 (a) Patient-specimen identity mismatch

5 (b) Portions of specimen missing or anatomic site mismatch

6 (c) Inadequate specimen condition (eg, absent or minimal fixative)

7 (d) Incorrect specimen processing workflow selected (eg, wrong grossing protocol, missed research protocol tissue preparation—note: some labs may delay this step until the grossing process)

8 (e) Slow turnaround time

9 (f) Delay in specimen accessioning

ANALYTIC PHASE

Grossing

10 (a) Patient-subject mismatch on dictation

11 (b) Mislabeling of cassettes

12 (c) Specimen/tissue contamination within cassette (as introduced by contact with tools, equipment or other specimens)

13 (d) Cassettes found open or empty after processing

14 (e) Special processing incorrectly ordered (eg, rapid for biopsies, slow for large fatty tissues, etc)

15 (f) Tissue blocks too thick or too wide for cassettes

16 (g) Incorrect tests ordered (eg, special stains, IHC, decal)

17 (h) Incorrect prioritization assigned (eg, rush vs routine)

18 (i) Wrong color coded cassette(s) used

19 (j) Slow turnaround time

20 (k) Number of cases remaining ungrossed at end of day or shift as appropriate

Processing

21 (a) Errors in processing (eg, fluids not sufficient for run or incorrectly placed)

22 (b) Cross contamination of tissues between cassettes

23 (c) Tissue incompletely decalcified, too hard or too soft; sections appear "burned" or otherwise unsatisfactory

24 (d) Interruptions in scheduled runs

Embedding

25 (a) Tissue specimens incorrectly paired with cassette; completely or in part (manual step permits human errors with sample orientation of specimen in cassette)

Sectioning

26 (a) Incorrect case sections on slides

27 (b) Microtomy deficiencies (eg, unneccessary depletion of block, sections compressed, disrupted or wrinkled)

28 (c) Incorrect block orientation

29 (d) Incorrect sectioning protocol used

Staining and Coverslipping

30 (a) "Floaters" present on slide

31 (b) Inadequacies of primary staining compromises interpretation

32 (c) Inadequate quality of conventional special stains

33 (d) Inadequate quality of IHC or ISH slides and/or controls

34 (e) Coverslipping errors (eg, bubbles, scratches, missing coverslip)

Case Assembly

35 (a) Slides mismatched or missing for particular case

36 (b) Delay in case assembly without cause (eg, held for special stains that have already been sent to pathologist)

37 (c) Slow turnaround time

38 (d) Insufficient management of case load

POSTANALYTIC PHASE

Pathologist Signout

39 (a) Dictation case mismatch, total or in part (eg, addendum to different case)

40 (b) Specimen related errors (eg, deficiencies in quality of slide or tissue contaminants not appreciated)

41 (c) Typographical/proofreading deficiencies

42 (d) Slow turnaround time for entire case signout

42 (e) Reports needing amendments

Intraoperative Procedures: Frozen Section

44 (a) Mislabeled or missing slide or cassette (with hand labeleing)

45 (b) Specimen labeling errors, including separate or subsequently submitted portions

46 (c) Mismatch in frozen section log book

47 (d) Slow turnaround time (eg, threshold is ±20 minutes)

Results: Our group developed a universal, comprehensive list of 47 metrics for patient specimen handling in the anatomic pathology laboratory. Steps within the specimen workflow sequence are categorized as high (blue) or low risk (black). In general, steps associated with the potential for specimen misidentification correspond to the high-risk grouping and merit greater focus within quality management systems. Primarily workflow measures related to operational efficiency can be considered low risk.

Conclusion: Our group intends to advance the widespread use of these metrics in anatomic pathology laboratories to reduce patient safety risk
and improve patient care with development of best practices and interlaboratory error reporting programs.

MonashHealth