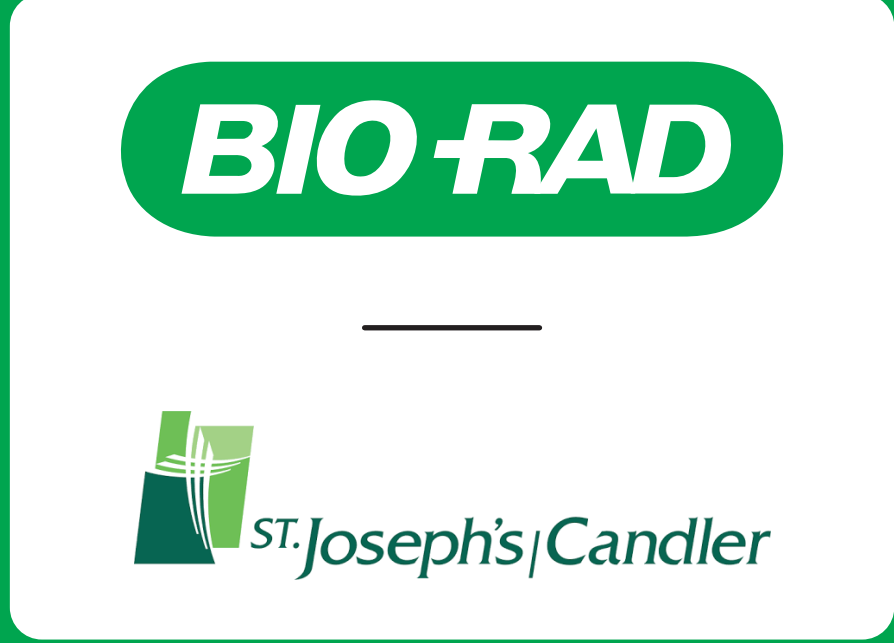


Streamlining the Labor-Intensive Process of Antibody Identifications in a Transfusion Medicine Laboratory Through Antibody Identification Software



Caballero D¹, Patel B¹, Hutchins K¹, Frick V¹, Jones B¹, Sumod-Ong C¹, Laufer M², Leamy M², Pesola T²

¹Joseph's/Candler Health System, Savannah, GA, USA
²Bio-Rad Laboratories, Inc. Hercules, CA, USA

Introduction

St. Joseph's/Candler Health System is a two-hospital, 714-bed system specializing in cancer care and treatment; open heart and other cardiac surgeries; orthopedics including joint replacements; women's health including obstetrics/gynecology and labor and delivery; and pediatrics. The health system includes a Heart Hospital, a Cancer and Research Pavillion, a Women's Hospital, an Institute for Neurosciences, and an Institute for Advanced Bone and Joint Surgery. Transfusion medicine is integral to these services.

Workforce limitations in transfusion medicine and immunohematology have increased the reliance on decision-support technologies. These laboratories are staffed by generalists rotating across all laboratory disciplines. The integration of Bio-Rad's IH-A[®]ID Software in IH-Com[™] Software with automated serologic testing reduces reliance on manual exclusion/interpretation, expertise, and labor demands while supporting timely antibody identifications. Thus, release of compatible blood products to the patients that need them in a timely manner is greatly improved.

By reducing antibody identification turnaround time, Bio-Rad's IH-A[®]ID Software with the IH-500[™] System made considerable contributions to workflow efficiency at St. Joseph's/Candler Health Systems Transfusion Medicine Laboratories. The system standardized the workflow, supported statistically guided antibody exclusion, enhanced confidence among generalist technologists, reduced manual steps at both hospital facilities, and ultimately reduced the time before compatible blood product release.

Study Design/Methods

Bio-Rad's IH-A[®]ID Software and IH-500 systems were implemented at both transfusion medicine laboratories at St. Joseph's Hospital and Candler Hospital, which are both located in Savannah, Georgia. Before validation, these transfusion medicine laboratories used automated serologic testing, but antibody exclusion remained a manual task. During validation, the software was introduced as a technologist decision-support tool. Workflow mapping was performed to compare steps and time requirements before and after implementation.

Results/Findings

Across technologists at both hospitals, manual antibody exclusion required approximately 8–15 min to interpret an 11-cell panel with autocontrol. When additional selected-cell testing was required, completion time increased by an average of 35–40 min. Comprehensive antibody identification including exclusion, transcription, and documentation required an additional 8–12 min. After implementation, antibody identification time was substantially reduced, enabling earlier crossmatching of antigen-negative red blood cells (RBCs) for transfusion.

For a multiple-antibody case, an experienced blood bank technologist could spend up to an hour (or more) definitively determining the antibodies. However, a less-experienced generalist can utilize the software and see which cells to choose instantaneously to complete the identification workup and prepare compatible RBCs for transfusion.

Workflow mapping showed substantial streamlining after implementation at both facilities (Figure 1). Twelve labor-intensive steps were eliminated (pink box, Figure 1), and antibody identifications were completed in approximately one quarter of the time previously required. These gains allowed technologists to redirect effort to time-sensitive tasks, including provision of phenotypically matched RBCs. The embedded statistical interpretation also improved confidence, particularly among less-experienced generalist staff.

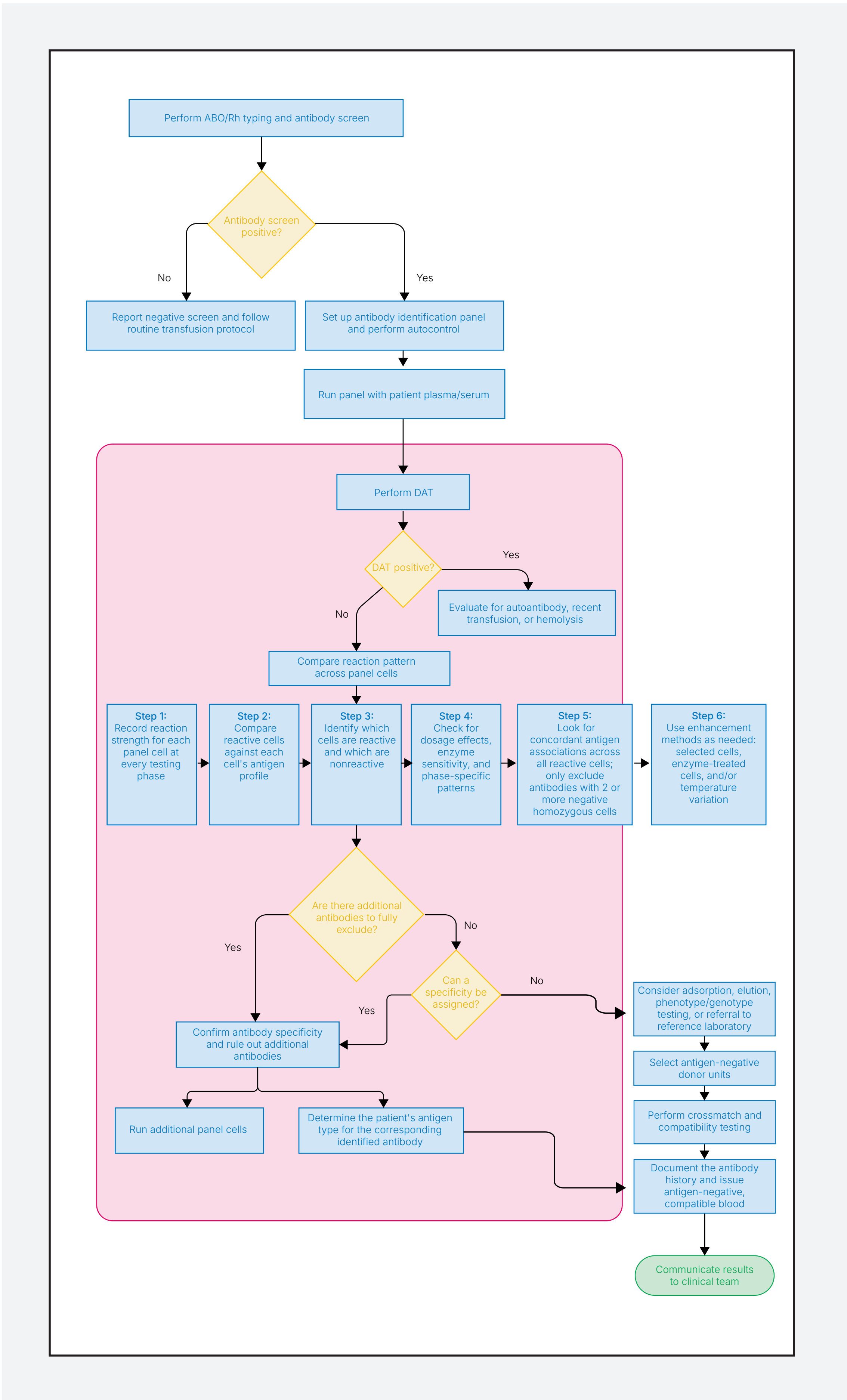


Fig. 1. Workflow process map. The manual steps within the pink box are eliminated with the use of the software.

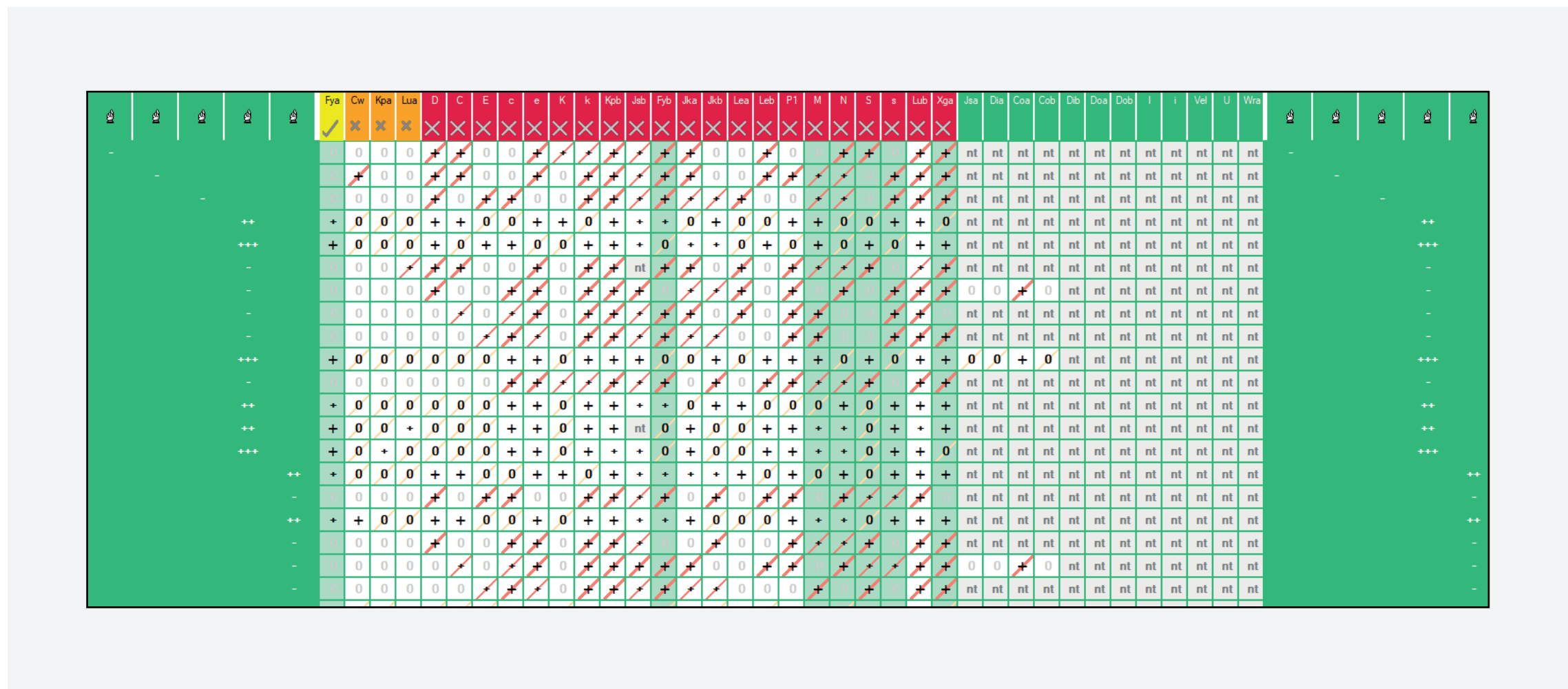


Fig. 2. Example of the IH-A[®]ID software supporting antibody identification and exclusion.

Conclusion

Identification software has practical value in clinical laboratories for positive antibody cases. Bio-Rad's IH-A[®]ID Software (Figure 2) improved efficiency and decision support in antibody investigation. By replacing a complex manual process with algorithm-based interpretation and a digital antigram worksheet, the software reduced transcription and exclusion errors, shortened turnaround time and select-cell testing, streamlined the workflow, and supported reliable antibody identification within a generalist clinical laboratory staffing model.

Having generalist medical technologists in the blood bank is challenging for Transfusion Medicine. IH-A[®]ID Software tools assisting in antibody identification, antibody exclusion, and clinical significance removes the necessity for a medical technologist with advanced specialist immunohematological expertise.

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