

Utility of FileMaker Pro Database in Generating Clinical Pathology Consult Reports

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INTRODUCTION:

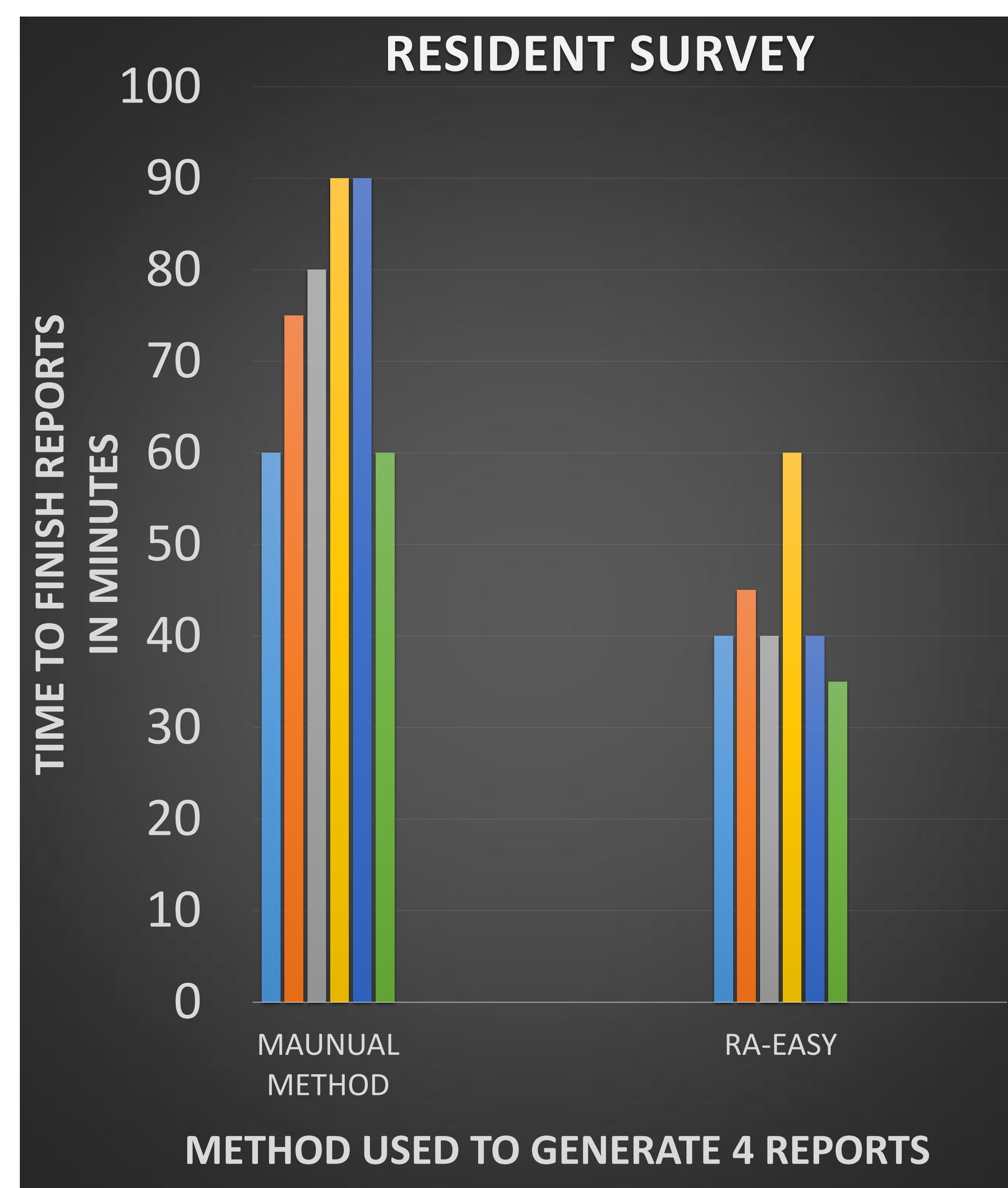
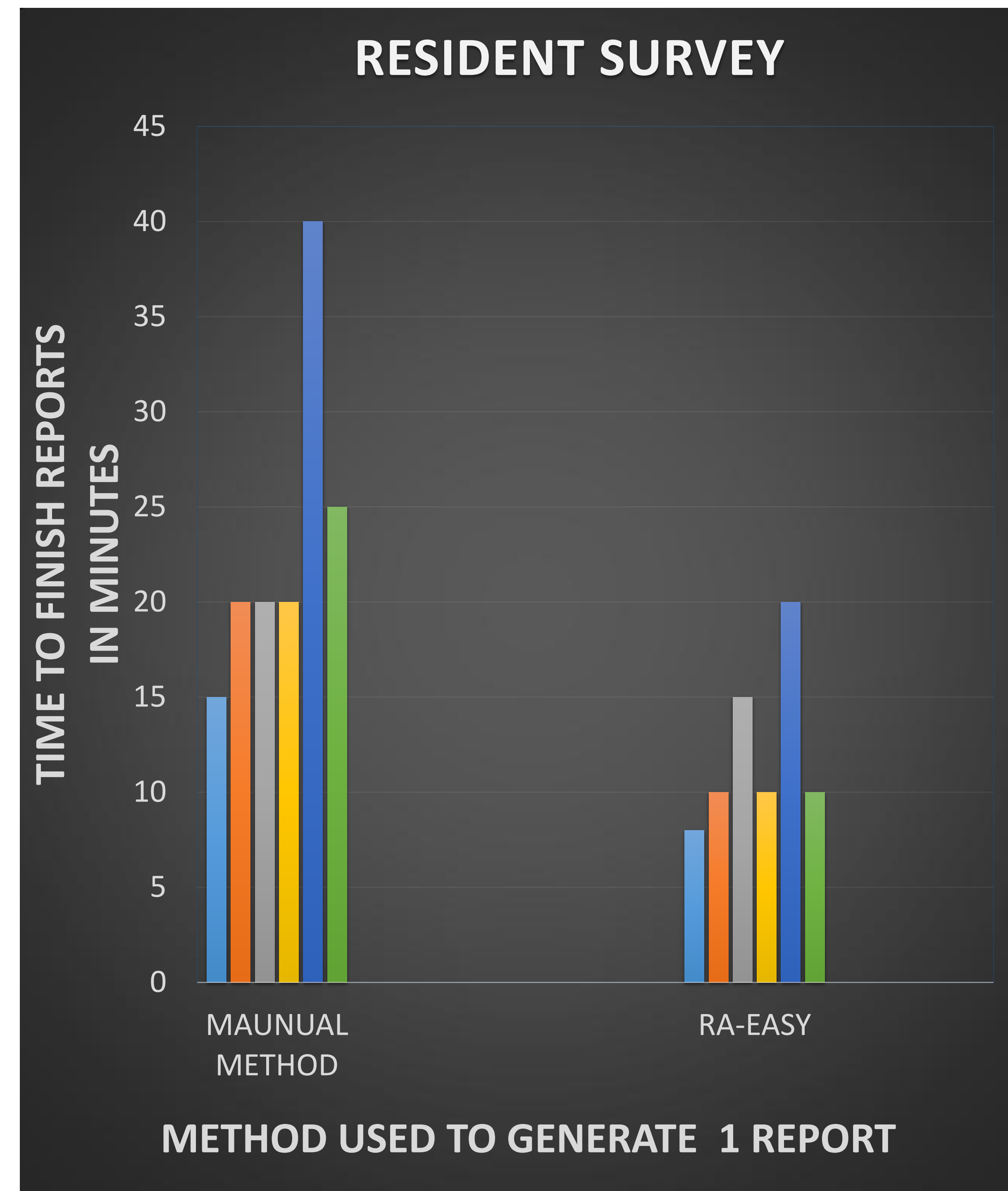
We recently developed a Clinical Pathology Consult Service that uses best-practice algorithms for the workup of certain autoimmune disorders. Using templates, the average time to generate a report was approximately 3 per hour. As a result, we sought to automate the process further to reduce workload and ensure accuracy. The software that was developed to accomplish this purpose for Rheumatoid Arthritis consults, called RA-EASY is described herein.

METHODS:

FileMaker Pro Database was used as the platform for creating RA-EASY to facilitate Rheumatoid Arthritis consult reports. The results of laboratory tests, physical examination, and imaging studies are entered into text boxes, followed by clicking a button in the user interface to generate reports. A complete draft will appear on the right panel that incorporates all the data input to generate a diagnostic conclusion. The draft is based on a comprehensive algorithm consisting of over 700 lines of database execution scripts. This algorithm thoroughly analyzes all the patient's data before rendering a complete report. The draft can be edited to incorporate any further clinical judgment by the user for the final report. The user can then copy and paste this report into the laboratory information system (LIS) to release the final report. A draft for an e-mail message to the ordering physician, which summarizes the report findings, is also created by the software and displayed in the left panel. An online version of RA-EASY has been made available on our departmental intranet for clinical reporting.

RESULTS:

Using RA-EASY, efficiency in writing reports is now increased to five reports per hour compared to three with the manual method. In addition, fewer typographical errors were noted due to the nature of automation.



RA-EASY: Rheumatoid Arthritis-DSRIP Reporting Templates

Case No (JC-xx-xxxx) Patient Name MRN PCP Name
 1522-test2 Joe Anderson 123456789 J Caskey

Pathologist Pathology Resident RFICCP Test Date
 Semyon Risin, M.D., Ph.D. T Smith 2-15-2015

RF level [0-15 IU/mL] CCP level [0-19 U] CRP level [0.0-0.3 mg/dL] ESR level [0-20 mm/hr] TSH level [0.36-3.74 mIU/L] Uric Acid level [2.6-6.0 mg/dL] Vitamin D level [30-100 ng/mL]
 50 150 1200 45 5.2

Hepatitis panel
 Neo for [HCV, IgG/IgM] [HBs Ag] [HAV, IgM], and [HBc Ab, IgM]
 Neg

Joint involvement Duration
 >10 joints with at least 1 small joint 6 weeks or more

Details of Joint Exam and Duration Details of Imaging results
 Many painful joints in both hands Many abnl joints of both hands on X Ray

Enter data on Panel above and click here to get full interp report and InBox Msg

InBox Message

Patient Name: Joe Anderson
 MRN: 12345
 PCP's Name: J Caskey

CLINICAL PATHOLOGY CONCLUSION AND RECOMMENDATIONS
 Please see the complete note in the chart, located under results review, then clinical pathology reports.
 - A diagnosis of rheumatoid arthritis is a possibility. A referral request for a rheumatology consult has been placed.

If you have further concerns, please send me a short note. Thank you for your referral.
 Semyon Risin, M.D., Ph.D. # 22773

Serial No Date Created Date Modified Modified By
 144 2/25/2015 3/27/2015 nnguyen

To Revise Input: Re-enter data and Click here to Blank out Interpretation & InBox Message Boxes.
 Blank out Interp/Message

UTHealth Andy Nguyen, MD Version 3/27/15

SUMMARY (not for data entry)

RF HPos CCP HPos Acute phase reactants Pos Hepatitis Neg ACR/EULAR Scores

TSH N/A Uric Acid Neg Vitamin D N/A ACR/EULAR Total Score 10 Joint 5 Duration 1 RF/CCP 3 APR 1

Interpretation

CLINICAL PATHOLOGY CONCLUSION AND RECOMMENDATIONS
 - A diagnosis of rheumatoid arthritis is a possibility

A referral request for a rheumatology consult has been placed

COMMENTS

Both the rheumatoid factor (RF) and the anti-CCP antibodies from 2-15-2015 are positive at high titers. The sensitivity of RF and anti-CCP antibodies is approximately 70%. However, anti-CCP antibodies are much more specific for rheumatoid arthritis (90-98%).

The ESR and CRP protein are also elevated, markers that can be used to monitor the clinical status of patients with possible rheumatoid arthritis.

The possibility of RA will be dependent on the number and types of joints involved.

The patient's clinical presentation consists of involvement of >10 joints with at least 1 small joint.

The patient's had symptom duration of 6 weeks or more.

Radiographic imaging showed: Many abnl joints of both hands on X Ray

Taking all of these findings together, a diagnosis of rheumatoid arthritis is a possibility. A referral request for a rheumatology consult has been placed.

The electronic medical record has been reviewed for relevant history by resident physician Dr. T Smith.

I have personally reviewed the test results and concur with the resident's interpretation.

If you have further concerns, please send me a short note. Thank you for your referral.

Quick Start Guide

Comment: Residents were given additional questions with free text to write their answers on the pros and cons of the system. Overall, additional criticism for RA-easy was associated more with formatting preferences of the end user rather than any glitches or failures in the system

CONCLUSIONS:

FileMaker Pro is a powerful tool in generating clinical pathology consult reports with regards to efficiency and accuracy.

References:

Quesada A, Jabcuga C, Nguyen A, Wahed A, Nedelcu E, Nguyen AND. Interpretation of coagulation test results using a web-based reporting system. *Lab Med.* 2014;45:343-356

Jaso J, Nguyen A, Nguyen AND. A synoptic reporting system for peripheral blood smear interpretation. *Am J Clin Pathol.* 2011;135:358-364.