

Back-end Systems: Using the EHR: Part Six - Create BC Lab Reports

The screenshot displays a LabCorp EHR interface. On the left, there is a patient report header with LabCorp logo and patient information. Below this, there are sections for Patient Details, Specimen Details, and Physician Details. A table lists ordered items with columns for TESTS, RESULTS, FLAG, UNITS, REFERENCE INTERVAL, and LAB. On the right, a large table titled 'Blood Chemistry Report' shows a list of markers with their values, functional ranges, and lab ranges. The table includes markers such as Glucose, Hemoglobin A1c, Uric Acid, BUN, Creatinine, and various electrolytes and hormones.

Marker	Value	Functional Range	HLR Low	HLR High	Lab Range
1					
2					
3	Glucose	75 - 90	65	99	65 - 99
4	Hemoglobin A1c	4.4 - 5.4	4.8	5.6	4.8 - 5.6
5	Uric Acid	3.7 - 6.0	3.7	8.6	3.7 - 8.6
6	BUN	13 - 19	8	24	6 - 24
7	Creatinine	0.85 - 1.1	0.76	1.27	0.76 - 1.27
8	BUN/Creatinine Ratio	#D/V/DI	8 - 19	8	19
9	eGFR if Non-African American			80	> 59
10	eGFR if African American			80	> 59
11	Sodium	135 - 140	134	144	134 - 144
12	Potassium	4.0 - 4.5	3.5	5.2	3.5 - 5.2
13	Chloride	100 - 106	97	108	97 - 108
14	CO2	25 - 30	18	29	18 - 29
15	Calcium	9.2 - 10.1	8.7	10.2	8.7 - 10.2
16	Parathyroid Hormone, Intact	30 - 60	15	65	15 - 65
17	Phosphorus	3.0 - 4.0	2.5	4.5	2.5 - 4.5
18	Magnesium	2.0 - 2.6	1.6	2.3	1.6 - 2.3
19	Protein, total	6.6 - 7.4	6.0	8.5	6.0 - 8.5
20	Albumin	4.0 - 5.0	3.5	5.5	3.5 - 5.5
21	Globulin	2.4 - 2.8	1.5	4.5	1.5 - 4.5
22	A/G ratio	#D/V/DI	1.5 - 2.0	1.1	2.5
23	Bilirubin, total	0.1 - 1.2	0.0	1.2	0.0 - 1.2
24	Alkaline Phosphatase	42 - 107	39	117	39 - 117
25	LDH	140 - 190	121	224	121 - 224
26	AST	10 - 25	0	40	0 - 40
27	ALT	10 - 26	0	44	0 - 44
28	GGT	5 - 29	0	65	0 - 65
29	TIBC	275 - 425	250	450	250 - 450
30	UBC	175 - 350	150	375	150 - 375
31	Iron	40 - 135	40	155	40 - 155
32	Iron saturation	17 - 45	15	55	15 - 55
33	Ferritin	30 - 100	30	400	30 - 400
34	Vitamin B-12	450 - 2000	211	646	211 - 646
35	Folate, Serum	> 5.0		3.1	> 3.0
36	Calcitriol (1,25 di-OH Vitamin D)	19.9 - 79.3	19.9	79.3	19.9 - 79.3
37	Vitamin D, 25-hydroxy	35 - 60	30.0	100.0	30.0 - 100.0
38	Cholesterol, total	150 - 240	100	199	100 - 199
39	Triglycerides	50 - 100	0	149	0 - 149
40	HDL	55 - 85	0	40	> 39
41	LDL	0 - 175	0	99	0 - 99
42	T. Chol / HDL Ratio	#D/V/DI	< 3	0	5
43	Triglycerides / HDL Ratio	#D/V/DI	< 2	0	3.8
44					
45					

Once the LabCorp results are opened, it is important to select the correct tab down here. For this patient, it's a female, so I'll delete the Men tab.

LabCorp Patient Report
Specimen ID: 208-544-9108-0
Acct #: 04333985
Phone: (310) 849-6300
Sunja K Schweig MD
2140 Shattuck Ave Ste 606
BERKELEY CA 94701

TESTS

TESTS	RESULT	FLAG	UNITS	REFERENCE	INTERVAL	LAB
Glucose, Serum	83		mg/dL	65 - 99		01
Hemoglobin A1c	5.2		%	4.8 - 5.6		01
Uric Acid, Serum	4.5		mg/dL	2.5 - 7.1		01
BUN	15		mg/dL	6 - 24		01
Creatinine, Serum	0.78		mg/dL	0.57 - 1.00		01
eGFR If NonAfrican Am	93		mL/min/1.73	>59		01
eGFR If African Am	107		mL/min/1.73	>59		01
BUN/Creatinine Ratio	19			9 - 23		01
Sodium, Serum	139		mmol/L	134 - 144		01
Potassium, Serum	4.4		mmol/L	3.5 - 5.2		01
Chloride, Serum	97		mmol/L	97 - 108		01
Carbon Dioxide, Total	23		mmol/L	18 - 29		01
Calcium, Serum	10.0		mg/dL	8.7 - 10.2		01
PTH, Intact	21		pg/mL	15 - 65		01
Intact PTH						01

Interpretation

Intact PTH	Calcium (mg/dL)
Normal	15 - 65
Primary Hyperparathyroidism	>65
Secondary Hyperparathyroidism	>65
Non-Parathyroid Hypocalcemia	<65
Hypoparathyroidism	<15
Non-Parathyroid Hypocalcemia	15 - 65

Age is 44, so it's not a menopausal woman. Then, I can look at several of the different markers for the lab ranges. For example, uric acid you want just for the women, and the women alternate is different.

Here, it is 2.5 and 7.1, so I'll use Women Alternate. Delete the Women tab. Fill in the patient's name, date of collection. Then, I can just start going down the report and fill in the result value here.

2016.07.26 Jane Doe LabCorp Results (CR 6116).pdf

LabCorp BC Report.xlsx [Read-Only]

TESTS	RESULT	FLAG	UNITS	REFERENCE INTERVAL	LAB
Neutrophils	65		%		01
Lymphs	29		%		01
Monocytes	4		%		01
Eos	1		%		01
Basos	1		%		01
Neutrophils (Absolute)	2.6		x10E3/uL	1.4 - 7.0	01
Lymphs (Absolute)	1.2		x10E3/uL	0.7 - 3.1	01
Monocytes (Absolute)	0.1		x10E3/uL	0.1 - 0.9	01
Eos (Absolute)	0.1		x10E3/uL	0.0 - 0.4	01
Baso (Absolute)	0.0		x10E3/uL	0.0 - 0.2	01
Immature Granulocytes	0		%		
Immature Grans (Abs)	0.0		x10E3/uL	0.0 - 0.1	01

01 SO LabCorp San Diego 13112 Evening Creek Dr So Ste 200, San Diego, CA 92126-4108 Dr Qinghao Yang, MD/PhD

02 BN LabCorp Burlington 1447 York Court, Burlington, NC 27215-3361 Dr. William F Hancock, MD

For inquiries, the physician may contact Branch: 800.888.1113 Lab: 858.668.3789

Prepared: 7-31-16 (LM)

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Date Issued: 07/30/16 1:09 ET

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Okay, once I have all the markers filled in, down here I'm going to put my date and initial stamp so that we know who filled out the BC report.

Then, I'm just going to go through and do a few checks. The first thing that I want to do is look for any rows that are highlighted as out of range for both functional and lab values and just verify that the result I typed in looks appropriate.

Control ID: 6005805994
Surjya K Schwieg MD
 2140 Shattuck Ave Ste 606
 BERKELEY CA 94701

Patient Details:
 DOB: 12/26/1971
 Age (years): 044/07/26
 Gender: F
 Patient ID: 536

Specimen Details:
 Date collected: 07/26/2016 1032 Local
 Date entered: 07/26/2016
 Date reported: 07/30/2016 1808 Local

Physician Details:
 Ordering: A METT
 Referring:
 ID: NPI: 122524116

Ordered Tests:
 CMP14+LP+TP+TSH+SAC+CBC/D/P... Venipuncture, Non-LCA Kit Handling Fee

TEST	RESULT	FLAG	UNITS	REFERENCE	INTERVAL	LAB
Glucose, Serum	83		mg/dL	65 - 99		01
Hemoglobin A1c	5.2		%	4.8 - 5.6		01
Uric Acid, Serum	4.5		mg/dL	2.5 - 7.1		01
BUN	15		mg/dL	6 - 24		01
Creatinine, Serum	0.78		mg/dL	0.57 - 1.00		01
eGFR If NonAfrican Am	93		ml/min/1.73	>59		01
eGFR If African Am	107		ml/min/1.73	>59		01
BUN/Creatinine Ratio	19			9 - 23		01
Sodium, Serum	139		mmol/L	134 - 144		01
Potassium, Serum	4.4		mmol/L	3.5 - 5.2		01
Chloride, Serum	97		mmol/L	97 - 108		01
Carbon Dioxide, Total	23		mmol/L	18 - 29		01
Calcium, Serum	10.0		mg/dL	8.7 - 10.2		01
PTH, Intact	21		pg/ml	15 - 65		01

Blood Chemistry Report
 JANE DONE 7-26-16

Marker	Value	Functional Range	NR Low	NR High	LR Range
CRP-hs	0.41	< 1.0	0.00	3.00	0.00 - 3.00
Homocysteine	8.0	< 7.0	0.00	15.0	0.0 - 15.0
TSH	0.066	0.5 - 2.0	0.450	4.500	0.45 - 4.500
T4, total	9.7	8.0 - 12	4.5	12.0	4.5 - 12.0
T3, Total	29	28 - 35	24	39	24 - 39
T3, Free	3.9	2.5 - 4.0	2	4.4	2 - 4.4
T4, Free	1.55	1.1 - 1.5	0.82	1.77	0.82 - 1.77
Reverse T3	36.5	9 - 21	9.2	24.1	9.2 - 24.1
Thyroid - TPO Ab	8		0	34	0 - 34
Copper	101		72	166	72 - 166
Zinc	95		56	134	56 - 134
Zinc / Copper Ratio	0.97	> 0.85			
Serum Methylmalonic Acid (MMA)	162	< 300	0	378	0 - 378
WBC	4.0	5.0 - 8.0	3.4	10.8	3.4 - 10.8

Occasionally, if you make a mistake, for example on the ferritin, if I had typed in 600, it would be out of range for both. Just glancing at these values I would want, if I put 600 here, I would want to come back and check it on the result and make sure that is really what it is.

The image shows a LabCorp patient report on the left and an Excel spreadsheet on the right. The patient report includes a table with columns for TESTS, RESULT, FLAG, UNITS, REFERENCE INTERVAL, and LAB. The Excel spreadsheet shows a grid of lab results with columns for Marker, Value, Functional Range, IIR Low, IIR High, and Lab Range. Several values are highlighted in yellow, indicating they are outside the reference range.

TESTS	RESULT	FLAG	UNITS	REFERENCE INTERVAL	LAB
LDL/HDL Ratio	1.4		ratio units	0.0 - 3.2	01
C-Reactive Protein, Cardiac	0.41		mg/L	0.00 - 3.00	01
Homocyst(e)ine, Plasma	8.0		umol/L	0.0 - 15.0	01
TSH	0.056	Low	uIU/mL	0.450 - 4.500	01
Reverse T3, Serum	36.5	High	ng/dL	9.2 - 24.1	02
Zinc, Plasma or Serum	98		ug/dL	84 - 134	02
Methylmalonic Acid, Serum	162		mmol/L	0 - 378	02
WBC	4.0		x10E3/uL	3.4 - 10.8	01
RBC	4.58		x10E6/uL	3.77 - 5.28	01
Hemoglobin	13.7		g/dL	11.1 - 15.9	01
Hematocrit	42.3		%	34.0 - 46.6	01
MCV	92		fL	79 - 97	01
MCH	29.9		pg	26.6 - 33.0	01
MCHC	32.4		g/dL	31.5 - 35.7	01

TSH is pretty significantly lower than both of those, so I'm going to check out that one, but I did type it correctly.

Okay, the next thing, I just need to glance at the reference intervals on the lab results and make sure they correspond to these. Occasionally you'll find different ones—like this one, the BUN is 6 to 24. You just need to change it in column G. You don't change it in column J.

When you're going through, you should actually look at what is written in column J to decide if it is correct with the reference interval in the LabCorp result. For example, you'll notice the eGFR says more than 59. Because of the conditional formatting, this reads a little bit differently than it does here, which is displayed, but it is correct.

It looks like the magnesium is different here. I need to change it in column G. UIBC is different. Iron is different. Once you get to the cholesterol, you can pretty much stop checking because the rest of the lab intervals never change.

Okay, now that I've checked all of that, I just want to go through and make sure that everything highlighted correctly. I'm just going to kind of glance at it.

Okay. Once I'm ready to save the BC report, we do always save a copy of the Excel spreadsheet. That way, in case we need to go back and make changes in the future for whatever reason, we can easily do that, and we don't have to start over the whole sheet.

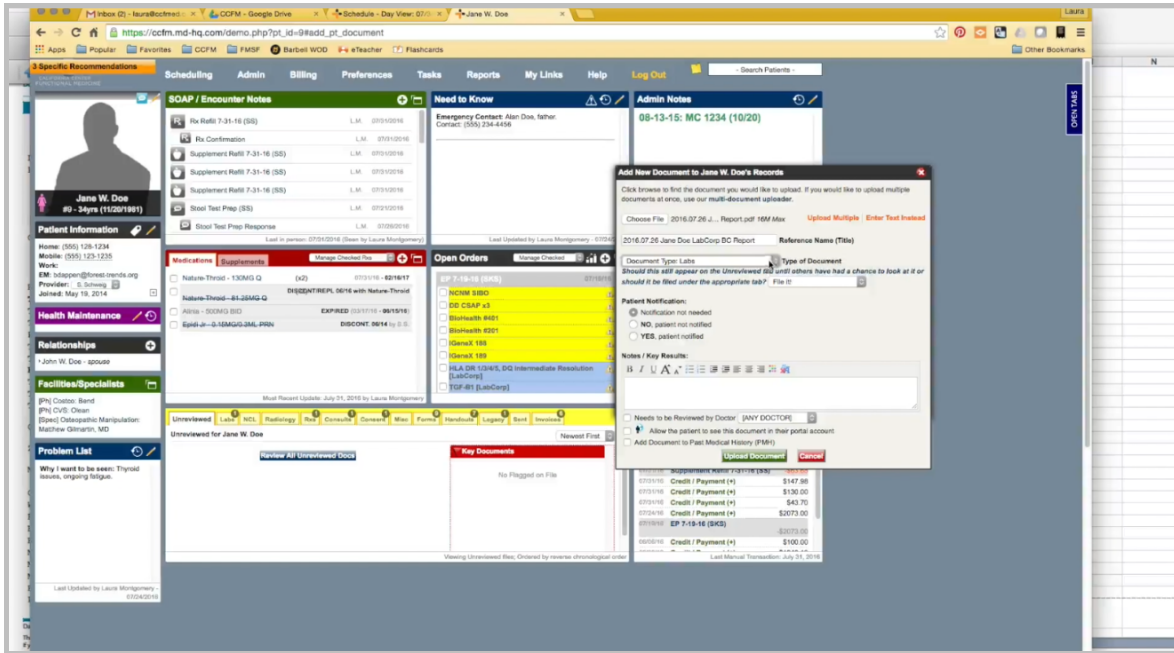
I just need to File, Save As, and put it in the designated place.

TESTS	RESULT	FLAG	UNITS	REFERENCE INTERVAL	LAB	MARKER	Value	Functional Range	LR Low	LR High	Lab Range
LDL/HDL Ratio	1.4		ratio units	0.0 - 3.2	01	Glucose	85	75-90	65	99	65 - 99
C-Reactive Protein, Cardiac	0.41		mg/L	0.00 - 3.00	01	Hemoglobin A1c	5.2	4.4 - 5.4	4.8	5.6	4.8 - 5.6
TSH	0.056	Low	uIU/mL	0.450 - 4.500	01	Uric Acid	4.5	3.2 - 5.5	2.5	7.1	2.5 - 7.1
Thyroxine (T4)	9.7		ug/dL	4.5 - 12.0	01	BUN	15	13 - 18	6	24	6 - 24
Free Thyroxine Index	2.8		%	1.2 - 4.9	01	Creatinine	0.78	0.7 - 1.0	0.57	1.00	0.57 - 1.00
Triiodothyronine (T3)	144		ng/dL	71 - 180	01	BUN/Creatinine Ratio	10	9 - 23	9	23	9 - 23
Triiodothyronine, Free, Serum	3.9		pg/mL	2.0 - 4.4	01	eGFR if Non-African American	93				> 99
Reverse T3, Serum	36.5	High	ng/dL	9.2 - 24.1	02	eGFR if African American	107				> 99
T4, Free (Direct)	1.55		ng/dL	0.82 - 1.77	01	Sodium	139	135 - 140	134	144	134 - 144
Thyroid Peroxidase (TPO) Ab	<1.0		IU/mL	0.0 - 0.9	01	Potassium	4.4	4.0 - 4.5	3.5	5.2	3.5 - 5.2
Thyroglobulin Antibody	<1.0		IU/mL	0.0 - 0.9	01	Chloride	97	100 - 108	97	108	97 - 108
Thyroglobulin Antibody measured by Beckman Coulter Methodology	<1.0		IU/mL	0.0 - 0.9	01	CO2	23	25 - 30	18	29	18 - 29
Copper, Serum	101		ug/dL	72 - 166	02	Calcium	10.0	9.2 - 10.1	8.7	10.2	8.7 - 10.2
Zinc, Plasma or Serum	98		ug/dL	56 - 134	02	Parathyroid Hormone, Intact	21	30 - 80	15	65	15 - 65
Methylmalonic Acid, Serum	162		nmol/L	0 - 378	02	Phosphorus	3.7	3.0 - 4.0	2.5	4.5	2.5 - 4.5
CBC, Platelet Ct, and Diff					01	Magnesium	2.1	2.0 - 2.6	1.6	2.3	1.6 - 2.3
WBC	4.0		x10E3/ul	3.4 - 10.8	01	Protein, total	7.0	6.9 - 7.4	6.0	8.5	6.0 - 8.5
RBC	4.58		x10E6/ul	3.77 - 5.28	01	Albumin	4.9	4.0 - 5.0	3.5	5.5	3.5 - 5.5
Hemoglobin	13.7		g/dL	11.1 - 15.9	01	Globulin	2.1	2.4 - 2.8	1.5	4.5	1.5 - 4.5
Hematocrit	42.3		%	34.0 - 46.6	01	AVG ratio	2.3	1.5 - 2.0	1.1	2.5	1.1 - 2.5
MCV	92		fL	79 - 97	01	Iron, total	0.3	0.1 - 1.2	0.0	1.2	0.0 - 1.2
MCH	29.9		pg	26.6 - 33.0	01	Alkaline Phosphatase	46	42 - 107	39	117	39 - 117
MCHC	32.4		g/dL	31.5 - 35.7	01	LDH	170	140 - 180	119	226	119 - 226
RDW	13.1		%	12.3 - 15.4	01	AST	23	10 - 23	0	40	0 - 40
Platelets	251		x10E3/ul	150 - 379	01	ALT	17	10 - 20	0	32	0 - 32
					01	GGT	7	5 - 21	0	60	0 - 60
					01	TIBC	278	275 - 425	250	450	250 - 450
					01	UICB	221	175 - 350	131	425	131 - 425
					01	Iron	57	40 - 135	27	159	27 - 159
					01	Iron saturation	21	17 - 45	15	55	15 - 55
					01	Ferritin	121	30 - 100	15	150	15 - 150
					01	Vitamin B-12	>1999	450 - 2000	211	946	211 - 946
					01	Folate, Serum	>20.0	>5.0		3.1	>3.0
					01	Calcitriol (1,25 di-OH Vitamin D)	55.9	19.9 - 79.3	19.9	79.3	19.9 - 79.3
					01	Vitamin D, 25-hydroxy	79.8	35 - 60	30.0	100.0	30.0 - 100.0
					01	Cholesterol, total	162	150 - 250	100	199	100 - 199
					01	Triglycerides	53	50 - 100	0	149	0 - 149
					01	HDL	71	55 - 85	40	> 39	> 39
					01	T. Chol / HDL Ratio	2.6	< 3	0	4.4	0 - 4.4
					01	Triglycerides / HDL Ratio	0.75	< 2	0	3.8	< 3.8

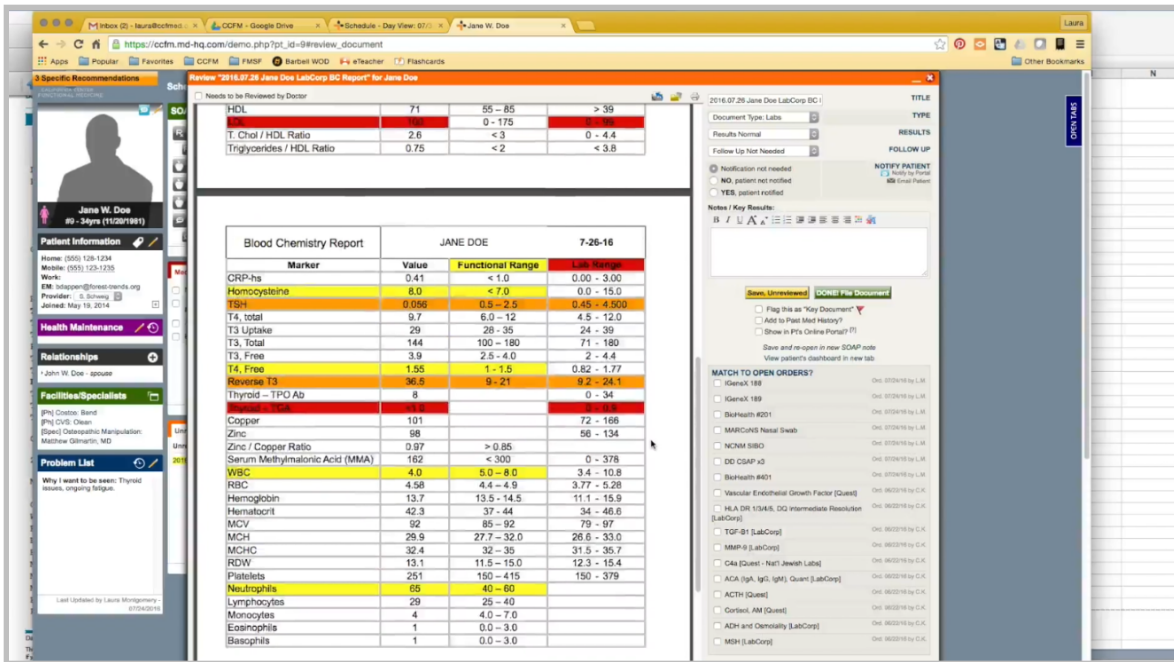
Now that I saved it, I'm ready to create the PDF to upload to the chart. I want to hide columns F and G. I also want to hide the column that has my prepared information.

Print: Desktop 3050 J610 series [D40164]
 Presets: Last Used Settings
 Copies & Pages: 1 of 2 pages, From: 1, to: 1
 Print What: Selection, Active Sheets, Entire Workbook
 Scaling: Fit to: 1 page(s) wide, 1 page(s) tall
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 PDF...
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Print. Save As a PDF.



Now, I need to go back to the patient's chart. Upload it as a lab, but I want to leave it in Unreviewed.



Here is the completed file.

It's also a good idea just to make sure that you would see the original LabCorp results here. Since this was just an example, I hadn't uploaded them to the chart, but if you didn't see them here, you would want to upload the LabCorp results as well before you delete them from the Dropbox.