**To:** Elizabeth Holmes[eholmes@theranos.com]; Sunny Balwani[sbalwani@theranos.com]
**Cc:** Daniel Young[dyoung@theranos.com]; Christian Holmes[cholmes@theranos.com]
**From:** Daniel Edlin
**Sent:** Sat 6/1/2013 11:57:35 PM
**Importance:** Normal
**Subject:** RE: Demo report coordination
**Received:** Sat 6/1/2013 11:57:36 PM
Theranos Lab Report, _____.pdf

Great. The changes have been made to the attached report. I will send it shortly.

---

**From:** Elizabeth Holmes
**Sent:** Saturday, June 01, 2013 4:56 PM
**To:** Sunny Balwani
**Cc:** Daniel Young; Daniel Edlin; Christian Holmes
**Subject:** Re: Demo report coordination


Agree b

On Jun 1, 2013, at 7:48 PM, "Sunny Balwani" <sbalwani@theranos.com> wrote:

> We should do that because that's what all computerized LIS systems will do. No fuzzy logic...

---

**From:** Elizabeth Holmes
**Sent:** Saturday, June 01, 2013 4:47 PM
**To:** Daniel Young
**Cc:** Daniel Edlin; Sunny Balwani; Christian Holmes
**Subject:** Re: Demo report coordination


Ok let's send it out after these changes. I assume it is best practice to leave the H and L respectively for the ones that are just one point out of range - I have seen some reports that don't flag it.

On Jun 1, 2013, at 7:44 PM, "Daniel Young" <dyoung@theranos.com> wrote:

> Total Hb should have a "L" next to it.
>
> I think "Basic Cell Blood Count" makes sense since we do not have platelets this time.
>
> Otherwise I think it is good to go.

---

**From:** Elizabeth Holmes
**Sent:** Saturday, June 01, 2013 4:42 PM
**To:** Daniel Edlin
**Cc:** Daniel Young; Sunny Balwani; Christian Holmes
**Subject:** Re: Demo report coordination


Pending my last email,

Daniel - assuming you agree with the three out of ranges (at least two are clearly right on the edge) - we'll send it out now.

On Jun 1, 2013, at 6:31 PM, "Daniel Edlin" <dedlin@theranos.com> wrote:

The final report is attached.

Thanks,

Dan

---

**From:** Elizabeth Holmes
**Sent:** Saturday, June 01, 2013 3:29 PM
**To:** Daniel Edlin
**Cc:** Daniel Young; Sunny Balwani; Christian Holmes
**Subject:** Re: Demo report coordination

Go ahead and prepare final report I'll review in parallel

On Jun 1, 2013, at 5:57 PM, "Daniel Edlin" <dedlin@theranos.com> wrote:

> Sorry about that, that's correct.
>
> ---
>
> **From:** Daniel Young
> **Sent:** Saturday, June 01, 2013 2:54 PM
> **To:** Daniel Edlin; Elizabeth Holmes
> **Cc:** Sunny Balwani; Christian Holmes
> **Subject:** RE: Demo report coordination
>
> You mean Mumps IgG has been added to CMP section, and total Hb is with CBC panel, correct?
>
> ---
>
> **From:** Daniel Edlin
> **Sent:** Saturday, June 01, 2013 2:51 PM
> **To:** Elizabeth Holmes; Daniel Young
> **Cc:** Sunny Balwani; Christian Holmes
> **Subject:** RE: Demo report coordination
>
> Please see the updated report attached. Note that Total Hb has been added to the Complete Metabolic Panel section.
>
> I will insert the name once finalized and before sending the report out.
>
> Per the two data points below: the report does not include results for an HbsAg test, and we didn't specify what we would be testing in the meeting and thus we may not have even tested for her out of range result.
>
> Please indicate if any changes need to be made to the report or if there are any questions.
>
> Thanks
>
> ---
>
> **From:** Elizabeth Holmes
> **Sent:** Saturday, June 01, 2013 2:36 PM
> **To:** Daniel Young
> **Cc:** Daniel Edlin; Sunny Balwani
> **Subject:** Re: Demo report coordination

Two other data points on this patient:

1.  She mentioned she would be positive for hbsag and had been vaccinated for it

2.  She mentioned she "had one thing" in her blood that would be abnormal.

On Jun 1, 2013, at 5:11 PM, "Daniel Young" <dyoung@theranos.com> wrote:

- For Measles, the cut-off value is around 142 mIU/mL, but this was not age controlled and a relatively small cohort.  There are no national standards for this.

- For Rubella, we have not established a cut-off.

Dan, for Bilirubin, total, can you change the reference range to 0.1 – 1.0, and remove the "L" indicator, please?

Calcium while low, does not seem overly concerning.  Dan, can you change the range to 8.4 – 10.7?  It does not change the outcome, but shows the result to be closer to the reference range.

Chloride and Sodium are just on the edge of our reference range.

HDL is slightly low as well, and is not too concerning.

-Daniel

**From:** Elizabeth Holmes
**Sent:** Saturday, June 01, 2013 1:36 PM
**To:** Daniel Young
**Cc:** Daniel Edlin; Sunny Balwani
**Subject:** Re: Demo report coordination

Yes. And not include in the other run. Do let me know if there's a negative 'cut off' that has been otherwise established -

On Jun 1, 2013, at 4:30 PM, "Daniel Young" <dyoung@theranos.com> wrote:

We could label Measles IgG and Rubella IgG "Positive" for both NY and PA results, making them qualitative instead of quantitative results.

So then the only difference would be for Mumps

IgG. So we can show this result in the non-infectious panel area of the report as Positive?

-Daniel

---

**From:**Elizabeth Holmes
**Sent:** Saturday, June 01, 2013 1:18 PM
**To:** Daniel Young
**Cc:** Daniel Edlin; Sunny Balwani
**Subject:** Re: Demo report coordination

Agree on the PA measles result. We'll only include that one from PA. I would integrate the PA only infectious results with the rest of the report results and then only call out as infectious the ones we show for both PA and NY.

On Jun 1, 2013, at 4:13 PM, "Daniel Young" <dyoung@theranos.com> wrote:

> Furthermore for Measles IgG, the value in the first run was 42 mIU/mL, which is low - below the level we would expect from a subject who was previously infected or vaccinated for measles. Greater than 95% of women about 50 years of age in the US test positive for Measles IgG. So this is another indication that the higher values in the second run are better.
>
> -Daniel
>
> ---
>
> **From:**Daniel Young
> **Sent:** Saturday, June 01, 2013 12:26 PM
> **To:** Elizabeth Holmes; Daniel Edlin
> **Cc:** Sunny Balwani
> **Subject:** RE: Demo report coordination
>
> Yes, I trust the second run in PA. Over 90% of people approximately 50 years of age should test positive for Mumps IgG based on published seroprevalence studies.
>
> So I think that all the higher values from the second run are likely better as well.
>
> -Daniel

**From:** Elizabeth Holmes
**Sent:** Saturday, June 01, 2013 11:45 AM
**To:** Daniel Edlin
**Cc:** Daniel Young; Sunny Balwani
**Subject:** Re: Demo report coordination

Daniel - is our read that the second run in PA is the most accurate for all three discrepancies?

On Jun 1, 2013, at 1:08 PM, "Daniel Edlin" <dedlin@theranos.com> wrote:

> Thanks, Daniel. Please find the revised report incorporating the correction/updates suggested below to the Chem14/CBC sections.
>
> Elizabeth – please advise on how to report the infectious panel results. I filled a 35 ul BTD for the NYC draw, so I doubt that there would have been an issue with volume. We are still waiting to hear back from Mike regarding the anti-coagulant concentration on the 35ul BTD.
>
> Thanks,
>
> Dan
>
>> **From:** Daniel Young
>> **Sent:** Saturday, June 01, 2013 9:14 AM
>> **To:** Elizabeth Holmes; Daniel Edlin
>> **Cc:** Sunny Balwani
>> **Subject:** RE: Demo report coordination
>>
>> Some correction/updates for this patient report:

- Alaninine Aminotransferase: should be ref range 7 -45

- Alkaline Phosphatase: ref range 39 – 100

- Creatinine: ref range 0.5 – 0.8

- Sodium: technically is it just low;

- Total Hb: ref range should be 12 -15.5; patient is low

For Mumps IgG, I am inclined to believe that the run in PA is correct (positive) for a number of reasons. First, it is very likely that the subject is positive, since IgG means that they had an infection of mumps sometime in the past or have been immunized. Also, all tests ran higher in the second run in Palo Alto, suggesting that to me that the assay runs were a little low in the run in NYC (not sure why). There could have been too little sample in the first run, a problem in the dilution, or an issue with the cartridge.

I am not sure how best to report the results for the first run. But I do think that the "negative" for Mump IgG is wrong from the first run. We could not report Mumps for either run, or correct it for the first run.

-Daniel

The discrepancy will be a problem. We need to see if we can correct for it.

On Jun 1, 2013, at 6:26 AM, "Daniel Edlin" <dedlin@theranos.com> wrote:

> For some context re: the infectious disease panels:
>
> Test #1 – sample was collected using a BTD, deposited directly into a cartridge, and run onsite. The cartridge had been shipped to NYC in standard packaging (in Styrofoam with ice packs).
>
> Test #2 – sample

was aliquoted from the BCD 2.1 nanotainers, pipetted directly into a cartridge, and run at Theranos.

Both cartridges were run on the same reader.

Thanks,

Dan

---

**From:** Daniel Edlin
**Sent:** Saturday, June 01, 2013 3:18 AM
**To:** Daniel Young
**Cc:** Elizabeth Holmes; Sunny Balwani
**Subject:** RE: Demo report coordination

Hi Daniel,

Please find today's lab report attached, for review. The subject is a female in her 50s.

It looks

like there is some discrepancy between the two Infectious Panel runs – any thoughts on why this is the case?

Note that I grouped Total Hb with the Complete Metabolic Panel assays, but please advise if it should be in a different section. If any other adjustments need to be made do let me know.

Thanks,

Dan

---

**From:** Daniel Young
**Sent:** Friday, May 31, 2013 10:34 PM
**To:** Daniel Edlin
**Subject:** Re: Demo report coordination

I will review results by 9am.

Thanks,

Daniel

On May 31, 2013, at 10:26 PM, "Daniel Edlin" <dedlin@theranos.com> wrote:

Hi Daniel,

 Given that the samples are being run at this late hour, I just want to touch base with you to ensure that we're coordinated for these reports.

 A couple questions about the results reporting:

- Can you please confirm the units below and the reference ranges for these assays?
 - Will any of the reference ranges change for the other assays given that the subject today was a female? For reference I have attached a spreadsheet comparing the reference ranges for last two demos we did – the one from earlier this week (male subject), and the last time we took the sample and sent it back from Phoenix (female subject).  I have highlighted the differences in yellow.

 Also – assuming that results are to you and me overnight, when do you think you will be able to review these tomorrow?  I'll base my schedule on your availability so that we can finalize the reports and get them to EAH for approval as soon as possible.

Thanks,

Dan


**From:** Surekha Gangakhedkar
**Sent:** Friday, May 31, 2013 1:27 PM
**To:** Daniel Edlin; Daniel Young
**Subject:** Results for Infectious run this morning

Here are the results:

| | Assay | Result | Units |
|---|---|---|---|
| 5/31_Run 1 | HSV1 antibody | Negative | Qualitative |
| | Chagas IgG | Negative | Qualitative |
| | Rubella IgG | 6 | IU/mL |
| | Measles IgG | 42.07 | mIU/mL |
| | Mumps IgG | Negative | Qualitative |
| | HIV 1/2 antibody | Negative | Qualitative |

**From:** Daniel Edlin
**Sent:** Friday, May 31, 2013 11:59 AM
**To:** Surekha Gangakhedkar; Sukhdev Bainiwal; Sandhya Kaippa
**Cc:** Daniel Young
**Subject:** RE: Sample running right now


Surekha or Sandhya,
Can you please send the 3.0 results to Daniel Y?

Daniel can you please review and provide reference ranges as
well for the lab report?

Note that the same donor gave blood for the 3.0 run as well as
the run scheduled for tonight, and we will be comparing results.

Thanks,
Dan

Sent from my Windows Phone

---

**From:** Surekha Gangakhedkar
**Sent:** 5/31/2013 2:28 PM
**To:** Daniel Edlin; Sukhdev Bainiwal; Sandhya Kaippa
**Cc:** Daniel Young
**Subject:** RE: Sample running right now

Sharada confirmed that the run time is around 1 hr 15 min.


**From:** Daniel Edlin
**Sent:** Friday, May 31, 2013 11:27 AM
**To:** Sukhdev Bainiwal; Sandhya Kaippa
**Cc:** Daniel Young; Surekha Gangakhedkar
**Subject:** RE: Sample running right now


Sandhya and Surekha indicated that the run time should have
been 43 minutes. Did something change?

Sent from my Windows Phone

---

**From:** Sukhdev Bainiwal
**Sent:** 5/31/2013 2:25 PM
**To:** Daniel Edlin; Sandhya Kaippa
**Cc:** Daniel Young
**Subject:** RE: Sample running right now

It took<duration>1:25:52.227343</duration>

There is no errors in the log. Will have to investigate the debug
log; to get more info. I think the normal time is 1hr 15 min.

Sukhdev

**From:** Daniel Edlin
**Sent:** Friday, May 31, 2013 11:04 AM
**To:** Sukhdev Bainiwal; Sandhya Kaippa
**Cc:** Daniel Young
**Subject:** RE: Sample running right now


Why did it take so long to run?

Sent from my Windows Phone

---

**From:** Sukhdev Bainiwal
**Sent:** 5/31/2013 2:01 PM
**To:** Daniel Edlin; Sandhya Kaippa
**Cc:** Daniel Young; Elizabeth Holmes
**Subject:** RE: Sample running right now

Successful log  is received on the server from reader e000325.

 Sukhdev


**From:** Daniel Edlin
**Sent:** Friday, May 31, 2013 10:47 AM
**To:** Daniel Edlin; Sandhya Kaippa
**Cc:** Sukhdev Bainiwal; Daniel Young; Elizabeth Holmes
**Subject:** RE: Sample running right now


Cc Ing sukhdev and Daniel. Please advise asap.
Thanks.
Sent from my Windows Phone

---

**From:** Daniel Edlin
**Sent:** 5/31/2013 1:45 PM
**To:** Sandhya Kaippa
**Subject:** RE: Sample running right now

What can be done to fix this?

Sent from my Windows Phone

---

**From:** Sandhya Kaippa
**Sent:** 5/31/2013 1:44 PM
**To:** Daniel Edlin
**Subject:** RE: Sample running right now

Log has not arrived the server. Still in 'getprotocol' state.


**From:** Daniel Edlin
**Sent:** Friday, May 31, 2013 10:41 AM
**To:** Sandhya Kaippa
**Cc:** Surekha Gangakhedkar; Daniel Young
**Subject:** RE: Sample running right now

What is the status? It's already been running for 1 hr 15 mins and
has been stuck on 99% for about 8 minutes.

Sent from my Windows Phone

---

**From:**Sandhya Kaippa
**Sent:**5/31/2013 1:31 PM
**To:**Daniel Edlin
**Subject:**RE: Sample running right now

Yes I do and a get protocol request with
barcode126245639802500014

**From:**Daniel Edlin
**Sent:** Friday, May 31, 2013 10:30 AM
**To:** Sandhya Kaippa
**Subject:** Sample running right now
**Importance:** High

Hi Sandhya,

We are currently running the infectious diseases panel (126) on
e000325. Have you seen a heartbeat and has it registered on the
server?

Sent from my Windows Phone

<Demo Reference Range Comparison.xlsx>

<Demo Patient
5.31.xlsx>

<Theranos Lab Report 5.31.pdf>

# theranos

**Theranos Test Report Technology Demonstration**

Theranos, Inc.
1601 S. California Ave, Palo Alto CA 94304                                              05/31/13

## PATIENT INFORMATION

| | |
|---|---|
| PATIENT NO. | |
| D.O.B. | Unknown |
| AGE / GENDER | N/A / F |
| PT MEDICATIONS | Unknown |
| ORDERING MD | N/A *Technology Demonstration* |

## TEST DETAIL

| | |
|---|---|
| SPECIMEN (S) COLLECTED | 5/31/2013 |
| LAB ACCOUNT NO. | N/A *Technology Demonstration* |
| SPECIMEN (S) COLLECTED | Blood |
| DATE REPORTED | 5/31/2013 |
| COMMENTS | N/A *Technology Demonstration* |

## COMPLETE METABOLIC PANEL

| TEST NAME | PATIENT'S RESULTS | REF. RANGE | UNITS |
|---|---|---|---|
| Alanine Aminotransferase | 7 | 7 - 45 | U/L |
| Albumin | 4.3 | 3.2 - 5.0 | g/dL |
| Alkaline Phosphatase | 59 | 39 - 100 | U/L |
| Aspartate Aminotransferase | 27 | 8 - 48 | U/L |
| Bilirubin, Total | 0.1 | 0.1 - 1.0 | mg/dL |
| Calcium | L 7.8 | 8.4 - 10.7 | mg/dL |
| Carbon Dioxide (HCO3) | 29 | 20 - 31 | mEq/L |
| Chloride | H 110 | 99 - 109 | mEq/L |
| Creatinine | 0.8 | 0.5 - 0.8 | mg/dL |
| Glucose | 96 | 70 - 140 | mg/dL |
| Potassium | 4.5 | 3.5 - 5.0 | mmol/L |
| Sodium | L 131 | 132 - 146 | mmol/L |
| Total Protein | 7.1 | 5.7 - 8.2 | g/dL |
| Urea Nitrogen (BUN) | 22 | 8 -24 | mg/dL |
| Mumps IgG | Positive | | Qualitative |

Key: L = Slightly Below Reference Range, H = Slightly Above Reference Range, WNL = Within Normal Limits, * = Critical Value

## LIPID PANEL

| TEST NAME | PATIENT'S RESULTS | REF. RANGE | UNITS |
|---|---|---|---|
| Triglycerides | 68 | 0 - 200 | mg/dL |
| HDL Cholesterol | L 36 | > 40 | mg/dL |
| LDL Cholesterol | 122 | 0 - 130 | mg/dL |
| Total Cholesterol | 197 | 0 - 240 | mg/dL |
| VLDL Cholesterol | 14 | 5 - 30 | mg/dL |

Key: L = Slightly Below Reference Range, H = Slightly Above Reference Range, WNL = Within Normal Limits, * = Critical Value

## BASIC CELL BLOOD COUNT

| TEST NAME | PATIENT'S RESULTS | REF. RANGE | UNITS |
|---|---|---|---|
| Basophil Count | 0.02 | 0.0 - 0.1 | 10e3/uL |
| Eosinophil Count | 0.08 | 0.0 - 0.4 | 10e3/uL |
| Lymphocyte Count | 2.2 | 0.8 - 3.1 | 10e3/uL |
| Monocyte Count | 0.3 | 0.2 - 0.7 | 10e3/uL |
| Neutrophil Count | 3.8 | 1.3 - 7.0 | 10e3/uL |
| RBC Count | 4.58 | 4.32 - 5.72 | 10e6/uL |
| WBC Count | 6.4 | 3.2 - 10.6 | 10e3/uL |
| Basophil, % | 0.3 | 0 - 2 | % |
| Eosinophil, % | 1.3 | 0 - 6 | % |
| Lymphocyte, % | 34 | 15 - 43 | % |
| Monocyte, % | 4.9 | 4 - 8.9 | % |
| Neutrophil, % | 60 | 44 - 76 | % |
| Total Hb | L 10.4 | 12 - 15.5 | g/dL |

Key: L = Slightly Below Reference Range, H = Slightly Above Reference Range, WNL = Within Normal Limits, * = Critical Value

## INFECTIOUS DISEASE PANEL - TEST #1 (New York, NY)

| TEST NAME | PATIENT'S RESULTS | | UNITS |
|---|---|---|---|
| Chagas IgG | Negative | | Qualitative |
| HIV 1/2 antibody | Negative | | Qualitative |
| HSV1 antibody | Negative | | Qualitative |
| Measles IgG | Positive | | Qualitative |
| Rubella IgG | Positive | | Qualitative |

Key: L = Slightly Below Reference Range, H = Slightly Above Reference Range, WNL = Within Normal Limits, * = Critical Value

## INFECTIOUS DISEASE PANEL - TEST #2 (Palo Alto, CA)

| TEST NAME | PATIENT'S RESULTS | | UNITS |
|---|---|---|---|
| Chagas IgG | Negative | | Qualitative |
| HIV 1/2 antibody | Negative | | Qualitative |
| HSV1 antibody | Negative | | Qualitative |
| Measles IgG | Positive | | Qualitative |
| Rubella IgG | Positive | | Qualitative |

Key: L = Slightly Below Reference Range, H = Slightly Above Reference Range, WNL = Within Normal Limits, * = Critical Value

End Of Report

Patient ID No.

05/31/13