

Message

From: Daniel Young [/o=Theranos Organization/ou=First Administrative Group/cn=Recipients/cn=dyoung]
on behalf of Daniel Young [/o=theranos organization/ou=first administrative group/cn=recipients/cn=dyoung]
Sent: 9/2/2013 8:17:52 PM
To: Jeffrey Blickman [jblickman@theranos.com]
CC: Daniel Edlin [dedlin@theranos.com]
Subject: RE: 3 info-graphic questions for our website

Here is some info. Please let me know how you would like to communicate this.

Anemia testing:

- Anemia is initially diagnosed hemoglobin values:
 - In men, less than 13 g/dL
 - In women, less than 12 g/dL
 - Reticulocyte index ≥ 2.5

Indications for anemia:

- Fatigue, weakness, pallor, dizziness, fainting

Types of anemia:

1. Iron-deficiency anemia
 - a. Is the most common form of anemia, and may be due to blood loss or poor absorption of iron
2. Vitamin-deficiency anemia
 - a. May result from low levels of vit-B12 or folate (poor diet) or poor absorption
3. Aplastic anemia
 - a. Rare form when the body stops making RBC
4. Hemolytic anemia
 - a. Occurs when RBC are broken up in the bloodstream or in the spleen
5. Sickle-cell anemia
 - a. Inherited hemolytic anemia when the hemoglobin protein is abnormal

Testing for diagnosis **Iron-deficiency anemia:**

- Iron deficiency is common in menstruating and pregnant women, children, and others with a diet history of excessive cow's milk or low iron-containing foods.
- Testing for diagnosis includes:
 - CBC
 - Low Hgb and HCT
 - Low MCV
 - Serum ferritin (low)
 - Iron (low)
 - Total iron binding capacity (high)
 - Transferrin (high)
 - Iron saturation (low)
 - Peripheral smear or blood slide
 - Small oval-shaped cells with pale centers
- In patients such as men, postmenopausal women, or younger women with severe anemia, the doctor may recommend additional testing. These tests may include the following:
 - Fecal occult blood test
 - Urine test for blood or hemoglobin

- Endoscopy to look for gastrointestinal tract abnormalities
- Gynecologic evaluation

Typical testing approach/sequence:

- 1) CBC with platelet count and automated diff and reticulocytes
- 2) Peripheral smear or blood slide
- 3) Evaluation of RBC indices from CBC test (looking at MCV, MCHC)
- 4) Iron, Iron Binding Capacity, Ferritin
- 5) Vitamin B12 and Folate

Thanks,
Daniel

From: Jeffrey Blickman
Sent: Thursday, August 29, 2013 10:33 PM
To: Daniel Young
Cc: Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

Daniel – did you have a chance to put your thoughts together on the anemia reflex example?

From: Jeffrey Blickman
Sent: Tuesday, August 27, 2013 11:01 PM
To: Daniel Young
Cc: Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

Elizabeth was thinking that we would show Hemoglobin reflexing to B12, Iron, and other standard anemia related tests. I think algorithm would be hard to display graphically, no?

From: Daniel Young
Sent: Tuesday, August 27, 2013 10:03 PM
To: Jeffrey Blickman
Cc: Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

HIV reflex to NAA is becoming more common.

For anemia, can I provide a reflex algorithm, but it would be of my own creation. Is that ok?

From: Jeffrey Blickman
Sent: Tuesday, August 27, 2013 4:07 PM
To: Daniel Young
Cc: Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

Daniel Y. – couple reflex test related questions:

1. Is the reflex test HIV w/reflex to NAA a commonly done reflex test or is that something special to Theranos?
Elizabeth wants to show a uniquely Theranos reflex to show our value add, and brought up the anemia example again
2. Can you answer my earlier questions around the anemia example:

- a. What test sets off the reflex test(s)?
- b. What tests would get auto-reflexed and in what order?

Thanks,
Jeff

From: Jeffrey Blickman
Sent: Tuesday, August 13, 2013 9:04 PM
To: Daniel Young
Cc: Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

Daniel – on the reflex test graphic on website, Elizabeth wanted to take a look at what the anemia example would look like. We’re going to use the HIV example, but wanted to evaluate in parallel. Would you be able to outline that for me tonight or in the morning?

- What test would set off this reflex (CBC? RBC only? Hemoglobin only?)
- What tests get auto-reflexed to...and if there’s a particular order or if we would do them all
- o Here’s what I came across in my quick research as possibilities but not sure what approach we would theoretically take:
 - Iron – serum
 - ferritin serum
 - transferrin
 - total iron-binding capacity
 - Hemoglobin electrophoresis
 - reticulocyte count
 - B12
 - Folic Acid

Thanks,
Jeff

From: Daniel Young
Sent: Sunday, August 11, 2013 8:50 PM
To: Jeffrey Blickman; Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

Below is the reflex information. I am not sure exactly how you wanted to display this in the order form. Please let me know. Thanks.

- CBCD** CBC/ Auto Diff may reflex to Manual Diff or Smear Review if positive or flag
If WBC count is <2,000/mm³, a CBC with Manual Differential including a Buffy Coat smear will be performed.
Manual Differential performed Per Criteria Ranges.
- HCV** Hepatitis C Antibody reflexes to another test if positive
Reflex to direct detection of HCV RNA by nucleic acid amplification method or strip recombinant immunoblot assay (RIBA) using recombinant HCV-specific antigens
- HIV** HIV-1/2 Antibody Screen reflexes to Western blot or nucleic acid testing if positive
HIV-1/2 antibody confirmatory evaluation is a reflex test that includes HIV-1 Western blot (WB) assay and, when appropriate and at an additional charge, HIV-2 EIA, HIV-1 immunofluorescence, and HIV-2 antibody confirmation.
Nucleic acid testing (NAT) is used primarily for specific applications of HIV diagnosis (eg, acute infection when individuals might test false negative by serological methods, diagnosis of newborns born to HIV-positive mothers due to the presence of

maternal Ab).

When nucleic acid testing is used to diagnose acute infection, subsequent seroconversion should be documented. HIV-2 RNA nucleic acid testing follow-up evaluation of negative results on confirmatory HIV-1 RNA testing, when clinically indicated.

- SYP** Syphilis Screen reflexes to Syphilis Confirmation if positive
Specimens testing positive by the treponemal-specific assay are then tested by RPR to provide supplementary serologic data, as well as to provide an indication of the patient's disease state and history of treatment.
- AHEP** Hepatitis, Acute Panel: reflex to additional tests if positive
Confirmatory testing will be performed on all reactive hepatitis B surface antigen prenatal specimens as well as all other reactive specimens meeting certain signal-to-cutoff ratio (S/CO) levels.
If hepatitis Bc antibody total is positive, then hepatitis Bc antibody IgM is performed.
If hepatitis A antibody total is positive, then hepatitis A antibody IgM is performed.
- OBP** Obstetric Panel: Antibody Screen, HBsAg and SYP reflex to additional tests if positive
If Antibody Screen is positive, Antibody Identification will be performed.
If significant Antibody is identified, Antibody titer will be performed.
If RPR is reactive, a titer will be performed;
If non-reactive RPR Screen, T.Pallidium Antibody by TP-PA is performed.
If T.Pallidium Antibody positive, RPR Screen is performed.
If the Toxoplasma IgG is positive, Toxoplasma IgM will automatically be performed.
If Hepatitis B Surface Antigen is positive, neutralization test will automatically be performed; by definition, a specimen is confirmed as positive if the reduction in signal of the neutralized specimen is at least 50% and the non-neutralized control generates a signal greater than or equal to the assay cut-off.
- UAM** UA Dipstick reflexes to Auto Microscopic if positive
- UAC** UA Auto Complete reflexes if positive to Urine Culture and if Urine Culture is positive, reflex to Sensitivity

From: Daniel Young
Sent: Sunday, August 11, 2013 3:22 PM
To: Jeffrey Blickman; Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

OK, that is what I figured. Yes, we will have some changes/additions. I am providing the reflex info now...

From: Jeffrey Blickman
Sent: Sunday, August 11, 2013 3:21 PM
To: Daniel Young; Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

This is what Arne had us produce back in Oct/Nov, but definitely will need a very careful revisit by you and Elizabeth before launch, assume we'll want to look at our menu and most common orders to decide which tests make the cut. The sooner this can happen, the better so that it can be reformatted which is a very manual process.

From: Daniel Young
Sent: Sunday, August 11, 2013 3:17 PM
To: Jeffrey Blickman; Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

OK, as you will see, these two tests I listed are not on this order form. How are we deciding what is on this form?

From: Jeffrey Blickman
Sent: Sunday, August 11, 2013 3:14 PM
To: Daniel Young; Daniel Edlin
Subject: RE: 3 info-graphic questions for our website

Here's the order form, same as hard copy we looked at on Friday

Thanks for the stats Daniel

From: Daniel Young
Sent: Sunday, August 11, 2013 3:04 PM
To: Daniel Edlin
Cc: Jeffrey Blickman
Subject: RE: 3 info-graphic questions for our website

Here are two costly CPTs that we have developed (full CMS price listed):

83970 parathormone (PTH): \$58.46
86360 T cell absolute count/ratio: \$66.55

Do you have the latest lab order form?

-Daniel

From: Daniel Young
Sent: Sunday, August 11, 2013 2:50 PM
To: Daniel Edlin
Cc: Jeffrey Blickman
Subject: RE: 3 info-graphic questions for our website

1) fast turn around time: Streptococcus pneumoniae, is one of the most common causes of community-acquired pneumonia (CAP). Current criteria of diagnosis are based on sputum cultures. Many patients often receive antimicrobial agents before test results are back. Rapid test results will aid in getting the right medication for patients right when they need them. [We can also add to the Strep test, Haemophilus influenza and Moraxella catarrhalis, two other very bacteria that also cause CAP.] We can deliver results in under an hour, while most labs would return culture results in 5 days.

Still working on the others....

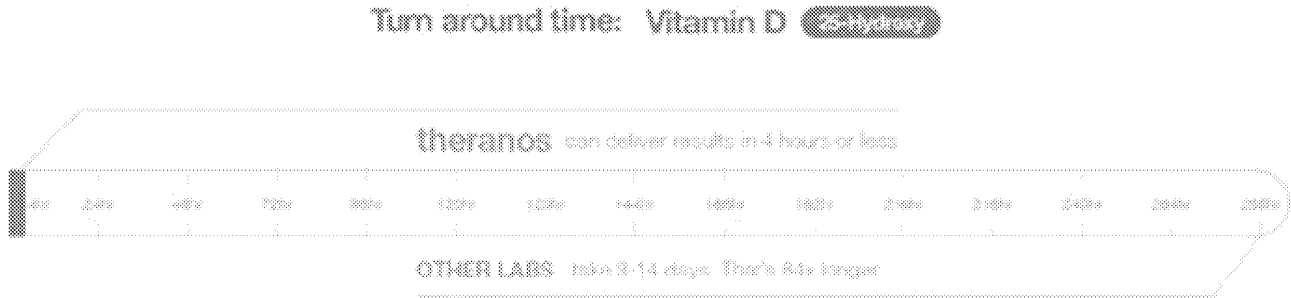
From: Daniel Edlin
Sent: Friday, August 09, 2013 2:10 AM
To: Daniel Young
Cc: Jeffrey Blickman
Subject: 3 info-graphic questions for our website

Hi Daniel,

We have a few questions related to info-graphics that we're planning to include on the website, and we were hoping you could lend your expertise:

1) Fast and meaningful turnaround times

a. For this graphic, we want to include an assay that typically takes a long time to test but that we have the ability to process quickly, and by providing answers faster it would make a meaningful impact on the diagnosis. Can you think of a specific assay that meets this criteria? Vitamin D doesn't quite work because it's not critical to have these results fast. Elizabeth suggested using a bacteria assay.



2) Lab order form - Pricing

a. We want to show an image of a test list highlighting a specific assay that is typically expensive, but at half the price. And we'd also show other tests that would come before/after it on our lab order form. Essentially what test would be noteworthy to show at 50% its Medicare price?

3) Lab order form - Auto-reflex testing

a. We want to show a snapshot of a lab form detailing a test and its associated auto reflex tests. Can you provide some example of a common test with its associated reflex tests, and (like #2) list any tests that would come before/after it on a lab order for

Thank very much, and please let us know if you have any questions.

-Dan