BTIG

Equity Research
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Industry Report

Medical Technology

TTOO, AXDX: Survey Takeaways

Survey Says Price Matters A Lot

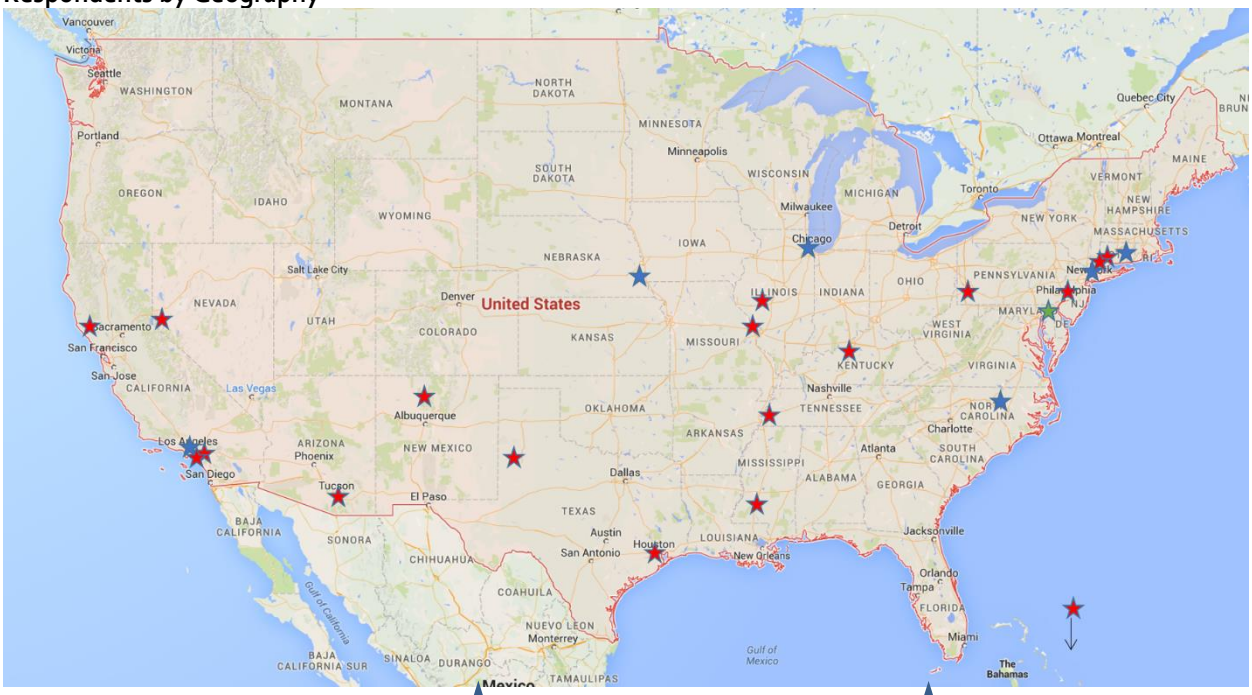
TTOO's current *Candida* pricing likely a hurdle to adoption (bacteria more important); enthusiasm for AXDX's ID/AST should it work as proposed.

- **We surveyed U.S. infectious disease (ID)/critical care (CC) physicians and clinical microbiology lab directors/managers**. For survey #1, we received 35 complete responses from ID/CC docs, with the majority coming from ID docs in an academic setting. For survey #2, we received 17 complete responses from clinical microbiology lab directors/managers. Our takeaways are mainly related to our coverage of TTOO (Neutral), but we also offer some tidbits on AXDX (Neutral).
- **Respondents see value in knowing whether a high-risk patient is or is not infected with *Candida* within 3-5 hours of a blood draw; however, this did not necessarily translate into a strong likelihood of T2Candida adoption.** On a scale of 1 to 5 (1 being useless and 5 being extremely valuable), the ID docs ranked the value of the information that T2Candida provides at a 4.5 (avg.), yet their likelihood to adopt the test was a 3.6. Lab directors ranked the value of the information at a 4.1, yet their likelihood of adoption was a 2.1.
- **T2Candida pricing cited as likely to be the greatest hurdle to adoption in both surveys.** At T2's current price point of ~$250/test, the ID docs would only adopt the panel in ~26% of their high-risk patients; this level of adoption grew to 32% at $200, 45% at $150, 59% at $100, and 82% at $50. Among lab directors the results were similar: 9% adoption at $250, 18% at $200, 37% at $150, 51% at $100 and 78% at $50. Waiting for the bacteria panel to be approved, the replacement of other instruments/assays being more timely/important over the next 12-18 mos., and *Candida* not being a concern also ranked high as common reasons why a doc or lab would not adopt T2Candida.
- **T2Bacteria more likely to be adopted**, with ID docs averaging a 4.4 (out of 5) and lab directors averaging a 3.7 on likelihood of adoption.
- **Both surveys indicate a strong interest in AXDX's ID/AST system should the final data look positive**, with the value of the information that the ID/AST is expected to provide (susceptibility/resistance of bacterial pathogens within 4-5 hours of positive blood culture) ranked at a 4.6 (out of 5) among ID docs and a 4.4 among lab directors. Awareness of the ID/AST system was also high among lab directors, with 77% reporting that they were familiar with the system.
- **These results indicate to us that the ability to test for bacteria is what will be needed to drive the adoption of new platforms.**

Survey #1: Infectious Disease/Critical Care Physicians

35 Complete Responses – 29 Centers Represented – Completed May/June 2015

Respondents by Geography



= 1 hospital = 2 hospitals = 3 hospitals

Question 1: Are you familiar with T2 Biosystems' T2MR Platform and/or T2 Biosystems' Candida Panel?

Yes	57.1%
No	42.9%

Question 2: Which of the below best describes your specialty?

By Respondent	
Infectious disease - academic setting	74.3%
Infectious disease - community setting	14.3%
Critical care - academic setting	2.9%
Critical care - community setting	5.7%
Emergency medicine - academic setting	0.0%
Emergency medicine - community setting	2.9%
By Center	
Infectious disease - academic setting	69.0%
Infectious disease - community setting	17.2%
Critical care - academic setting	3.4%
Critical care - community setting	6.9%
Emergency medicine - academic setting	0.0%
Emergency medicine - community setting	3.4%

Questions 3 – 5: Patient Volumes

Approximately how many patients do you see annually?	Cumulative total	54,111
	Average	1,546/physician
	Median	1,000/physician
	Range	200 - 5,500/physician
Of these patients, what percent would you define as high-risk/at-risk for developing sepsis?	Average	49.7%
	Median	50%
	Range	5 - 100%
Approximately how many patients that you define as high-risk/at-risk for developing sepsis do you see annually? *(calc. based on the above questions)*	Cumulative total	27,813
	Average	795/physician
	Median	400/physician
	Range	60 - 5,000/physician

Question 6: Thinking about your institution, please rank the following potential causes of sepsis in the order of MOST COMMON (1) to LEAST COMMON (7).

	Average	Median
Bacteremia	1.0	1
Fungemia	2.5	2
Viremia	3.6	4
Bacteremia AND Fungemia	3.7	3
Bacteremia AND Viremia	4.8	5
Fungemia AND Viremia	6.0	6
Bacteremia, Fungemia, AND Viremia	6.4	7

Question 7: Please rank the following potential causes of sepsis in the order of MOST CONCERNING (1) to LEAST CONCERNING (7).

	Average	Median
Bacteremia AND Fungemia	2.66	2
Bacteremia, Fungemia, AND Viremia	3.03	1
Bacteremia	3.06	3
Fungemia	3.6	4
Bacteremia AND Viremia	4.69	5
Fungemia AND Viremia	4.89	5
Viremia	6.09	7

Questions 8 – 13: Questions on *Candida* Epidemiology

Of the patients that you would define as high-risk/at-risk for developing sepsis, what percent would you further characterize as high-risk/at-risk for developing candidiasis?	Average	35.3%
	Median	25%
	Range	5 - 100%
Approximately how many patients that you would define as high-risk/at-risk for developing sepsis, would you further characterize as high-risk/at-risk for developing candidiasis? *(annually; calc. based on the above questions)*	Cumulative total	15,003
	Average	429/physician
	Median	112/physician
	Range	6 - 5,000/physician
What percent of the total patients that you treat at your institution develop Candidiasis?	Average	6.6%
	Median	4%
	Range	<1% - 30%
How many of the total patients that you treat at your institution develop Candidiasis? *(annually; calc. based on the above questions)*	Cumulative total	3,007
	Average	86/physician
	Median	48/physician
	Range	4 - 300/physician
What percent of the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis develop Candidiasis?	Average	11.70%
	Median	8%
	Range	1 - 40%
How many of the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis develop Candidiasis? *(annually; calc. based on the above questions)*	Cumulative total	3,413
	Average	96/physician
	Median	34/physician
	Range	5 - 750/physician

Question 14: Is the prevalence of candidiasis among patients at your institution that are considered high-risk/at-risk of developing sepsis rising, falling, or remaining relatively constant?

Rising 21%+	0.0%
Rising 11-20%	5.7%
Rising 6-10%	11.4%
Rising 3-5%	17.1%
Rising 1-2%	17.1%
No change	42.9%
Falling 1-2%	2.9%
Falling 3-5%	2.9%
Falling 6-10%	0.0%
Falling 11-20%	0.0%
Falling 21%+	0.0%

Question 15: What is driving the increase or decrease in the prevalence of candidiasis among patients considered high-risk/at-risk of developing sepsis within your institution?

Drug resistant isolates
Sicker patients; more transplant patients; more use of imune suppressive drugs.
increasing potent immunosuppressive agents
Overuse of antibiotics. More immunosuppressed patients
Antibiotic stewardship
There is no change
Longer hospital stays, longer days of indwelling lines, older patients
sicker patients
We look for it more.
Antibiotic stewardship
longer antibiotic courses
increased use of antibacterials
Antibiotic use
more immunocompromised patients
There does not seem to be either an increase or a decrease.
Use of indwelling catheters, overuse of antibiotics
immune compromise
Increased severity of comorbid illnesses.
more broad spectrum abxs, more central access, more surgeries, sicker patients overall including more severely immunosuppressed, more transplants and BMT procedures
Immunosuppression - chemotherapy, transpant, etc.
broad-spectrum antibiotic use, increased transplantation
overuse of antibiotics the number patients with lines in-situ
Early recognition and early empiric therapy
No change. We use a lot of TPN
Prophylaxis and early treatment of at risk patients
Increased number of severely ill patients. Also number of patients exposed to broad spectrum antibiotics increasing putting at risk for candidemia.
Broad spectrum antibiotics, stronger cytotoxic chemotherapy
Antibiotic and line usage
Broad antibiotics usage with severe immunosuppressives.

Questions on Use of Antibiotics/Antibacterials

Question 16: Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, what percent would you estimate receive empiric antibacterials when an infection is suspected or initial symptoms of infection are present?

Less than 5%	0.0%
6-10%	2.9%
11-15%	0.0%
16-20%	0.0%
21-30%	2.9%
31-40%	0.0%
41-50%	0.0%
51-60%	0.0%
61-70%	2.9%
71-80%	22.9%
81-90%	17.1%
91%+	51.4%

Question 17: What antibiotic(s) do you typically use for empiric antibacterial treatment? If you use a variety, please list your top 3 regimens.

	# of times listed
piperacillin/tazobactam	16
vancomycin	14
vancomycin + cefepime	13
vancomycin + piperacillin/tazobactam	13
meropenem	8
cefepime	6
vancomycin + meropenem	6
levofloxacin	4
vancomycin + meropenem + piperacillin/tazobactam	1
vancomycin + levofloxacin	1
vancomycin + ceftazidime	1
vancomycin + aztreonam	1
cefepime + piperacillin/tazobactam	1
meropenem + ceftriaxone	1
metronidazole	1
ceftaroline	1
tobramycin	1
ceftazidime + tobramycin	1
ampicillin + sulbactam	1
ceftriaxone	1
ceftriaxone + azithromycin	1
fluconazole	1
daptomycin	1

Question 18: What is the estimated daily cost of empiric antibacterial treatment?

Unknown/do not know	31.4%
$100 or less	8.6%
$101 - $200	11.4%
$201 - $300	14.3%
$500	11.4%
$501 - $750	5.7%
$800	2.9%
$1,000 or ~$1,000	14.3%

Question 19: Thinking about the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis, what is the average duration of empiric antibacterial treatment?

2-3 days	28.1%
4-5 days	18.1%
6-7 days	26.7%
8-10 days	14.3%
11-14 days	12.9%

Question 20: Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, what percent begin treatment with empiric antibacterials in each of the following time periods?

Prior to initial blood draw/culture	22.4%
Immediately (within one hour) of initial blood draw/culture	47.3%
Within 12 hours of initial blood draw/culture	19.7%
Within 12-24 hours of initial blood draw/culture	6.4%
Within 25-48 hours of initial blood draw/culture	2.6%
More than 48 hours after initial blood draw/culture	1.6%

Questions on Use of Antifungals

Question 21: Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, what percent would you estimate receive empiric antifungals when an infection is suspected or initial symptoms of infection are present?

Less than 5%	20.0%
6-10%	20.0%
11-15%	17.1%
16-20%	17.1%
21-30%	5.7%
31-40%	5.7%
41-50%	5.7%
51-60%	5.7%
61-70%	0.0%
71-80%	0.0%
81-90%	0.0%
91%+	2.9%

Question 22: What antifungal(s) do you typically use for empiric antifungal treatment?

	# of times listed
fluconazole	24
micafungin	17
caspofungin	4
voriconazole	3
amphotericin b	2
anidulafungin	1
posaconazole	1

Question 23: What is the estimated daily cost of empiric antifungal treatment?

Unknown/do not know	37.1%
Under $100	17.1%
$100 - $199	11.4%
$200 - $299	14.3%
$300 - $399	2.9%
$400 - $499	5.7%
$500 - $599	5.7%
$600 - $699	2.9%
$1,000 or ~$1,000	2.9%

Question 24: Thinking about the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis, what is the average duration of empiric antifungal treatment?

No answer	2.9%
2-3 days	13.8%
4-5 days	25.2%
6-7 days	30.9%
8-10 days	4.3%
11-14 days	20.0%
>14 days	2.9%

Question 25: Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, what percent begin treatment with empiric antifungals in each of the following time periods?

Prior to initial blood draw/culture	14.7%
Immediately (within one hour) of initial blood draw/culture	23.6%
Within 12 hours of initial blood draw/culture	20.7%
Within 12-24 hours of initial blood draw/culture	13.9%
Within 25-48 hours of initial blood draw/culture	12.1%
More than 48 hours after initial blood draw/culture	14.9%

Question 26: Thinking about the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis, in what percent do you begin treatment with empiric antifungals after a blood culture comes back positive, but before the organism causing the positive culture is identified as a fungus?

<5% of pts	25.7%
6-10% of pts	8.6%
11-20% of pts	11.4%
21-30% of pts	14.3%
31-40% of pts	0.0%
41-50% of pts	0.0%
51-60% of pts	0.0%
61-70% of pts	2.9%
71-80% of pts	0.0%
81-90% of pts	2.9%
90%+ of pts	34.3%

Question 27: Thinking about the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis and that you suspect as being infected by *Candida* and/or that test positive for *Candida*, at what time interval are you typically able to confirm the presence of *Candida*? At what time interval are you typically able to confirm the species of *Candida*?

Time interval	Confirm presence?	Confirm species?
<8 hrs	0.0%	0.0%
8-12 hours	6.1%	0.0%
13-24 hours	15.2%	15.2%
25-32 hours	24.2%	9.1%
33-48 hours	24.2%	24.2%
49-60 hours	21.2%	15.2%
61+ hours	9.1%	36.4%

Question 28: How often do you adjust a patient's empiric antifungal therapy post the identification of *Candida* and/or the species of *Candida* present?

<5% of the time	2.9%
6-10% of the time	5.7%
11-20% of the time	17.1%
21-30% of the time	22.9%
31-40% of the time	8.6%
41-50% of the time	8.6%
51-60% of the time	20.0%
61-70% of the time	2.9%
71-80% of the time	0.0%
81-90% of the time	2.9%
91%+ of the time	8.6%

Question 29: In your patients that you define as high-risk/at-risk for developing sepsis, what percent of the time do you utilize each of the following treatment protocols?

Do not use antifungal therapy at all	24.9%
Start empiric antifungals when a fungus is suspected to be the cause of infection, but then stop the use of empiric antifungal therapy and replace it with a more appropriate antifungal post detection and identification of the species of fungus	27.3%
Start empiric antifungals when a fungus is suspected to be the cause of infection, but then decrease the use of empiric antifungal therapy and add a more appropriate antifungal post the identification of the species of fungus	21.0%
Start empiric antifungals when a fungus is suspected to be the cause of infection and then continue using empiric antifungal therapy and add an additional more appropriate antifungal post identification of the species of fungus	5.7%
Start empiric antifungals when a fungus is suspected to be the cause of infection and then just continue using empiric antifungal therapy post the identification of the species of fungus	4.0%
Start empiric antifungals when a fungus is suspected to be the cause of infection, but then stop the use antifungal therapy completely post the result of a fungus not being present	12.0%
Start appropriate antifungals only after the detection and identification of the species of fungus	5.2%

Questions on Clinical Utility

Questions 30-32: Questions on Clinical Utility of T2Candida

	Mortality Only	Length of Hospital Stay Only	Length of ICU Stay Only	All of the Above	Mortality + Length of Hospital Stay Only	Mortality + Length of ICU Stay Only	Length of Hospital Stay + Length of ICU Stay Only	None of the above
Based on currently available data, do you believe that the **use of empiric antifungals within the first 12 hours** of suspicion/symptoms of infection can reduce any of the following in patients that you define as high-risk/at-risk for developing sepsis?	23%	9%	0%	9%	6%	0%	**49%**	6%
Do you believe that the use of **appropriate antifungals** (i.e. those recommended for a specifically identified species of fungus/fungi) **within the first 12 hours** of suspicion/symptoms of infection **could have a greater impact** on reducing any of the following in patients that you define as high-risk/at-risk for developing sepsis **vs. the use of empiric antifungals within the first 12 hours**?	29%	3%	9%	0%	3%	0%	**49%**	9%
Do you believe that the use of **appropriate antifungals** (i.e. those recommended for a specifically identified species of fungus/fungi) **within the first 12 hours** of suspicion/symptoms of infection **could have a greater impact** on reducing any of the following in patients that you define as high-risk/at-risk for developing sepsis **vs. the use of empiric antifungals within the first 72 hours**?	29%	9%	0%	0%	0%	0%	**54%**	9%

Questions 33-34: Thinking about the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis, at what time interval do you believe the administration of empiric antifungals derives the greatest benefit? At what time interval do you believe the administration of appropriate antifungals derives the greatest benefit?

	Empiric	Appropriate
Within 12 hours of a suspected infection/symptoms of infection	82.9%	68.6%
Within 13-24 hours of a suspected infection/symptoms of infection	14.3%	25.7%
It does not matter	2.9%	5.7%

Questions on Likelihood of Adopting T2's T2Candida Panel and Sensitivity to Pricing

Question 35: On a scale of 1 to 5 *(1=useless; 5=extremely valuable)*, how valuable is the ability to know whether a patient that is considered high-risk/at-risk for developing sepsis is or is not infected with *Candida* and the species of *Candida* within 3-5 hours of a blood draw?

1 = useless	0.0%
2	2.9%
3	2.9%
4	37.1%
5 = extremely valuable	57.1%
Average	4.5 out of 5.0

Question 36: Looking at the published data for T2's *Candida* Panel (we provided a table with T2's overall sensitivity and specificity data as published in *Clinical Infectious Diseases*) and recognizing that the turnaround time for the panel is 3-5 hours following a blood draw, at each of the following price points, in what percent of the patients that you define as high-risk/at-risk for developing sepsis would you order T2's *Candida* Panel if it was available to you?

n = 33	Average	Median	Range	0%	1 - 10%	11 - 20%	21 - 30%	31 - 40%	41 - 50%	51 - 60%	60 - 70%	71 - 80%	81-90%	91 - 100%
$250/test	26%	20%	0 - 100%	30%	15%	15%	6%	0%	21%	3%	0%	3%	3%	3%
$200/test	32%	20%	0 - 100%	27%	12%	12%	9%	0%	15%	6%	0%	12%	0%	6%
$150/test	45%	40%	0 - 100%	18%	12%	6%	9%	6%	9%	6%	3%	9%	0%	21%
$100/test	59%	50%	0 - 100%	9%	6%	6%	12%	9%	9%	0%	0%	9%	3%	36%
$50/test	82%	100%	10 - 100%	0%	0%	0%	6%	3%	12%	6%	0%	15%	3%	55%

Question 36b: We conducted a price sensitivity analysis considering the volume of high-risk patients each physician sees annually and the percentage of high-risk patients for whom each physician would use T2Candida in at each price point.

	# of pts	Sales ($M)	0%	1 - 10%	11 - 20%	21 - 30%	31 - 40%	41 - 50%	51 - 60%	60 - 70%	71 - 80%	81-90%	91 - 100%	Total
$250/test	7,198	1.8	0.0	0.1	0.2	0.1	0.0	0.6	0.1	0.0	0.2	0.2	0.2	1.6
$200/test	9,084	1.8	0.0	0.0	0.1	0.1	0.0	0.4	0.2	0.0	0.5	0.0	0.3	1.6
$150/test	12,993	1.9	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.3	0.0	0.8	1.7
$100/test	16,749	1.7	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.9	1.5
$50/test	24,451	1.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.7	1.1

Questions 37-38: Likelihood to Adopt TTOO's T2Candida Panel

	Average	1	2	3	4	5
On a scale of 1 to 5 (1=extremely unlikely to adopt; 5 = very likely to adopt) how likely is it that your hospital/institution will adopt T2 Biosystems' *Candida* Panel?	3.2 out of 5	6%	11%	46%	29%	9%
On a scale of 1 to 5 (1=extremely unlikely to adopt; 5 = very likely to adopt) how likely are you to adopt T2 Biosystems' *Candida* Panel?	3.6 out of 5	9%	3%	29%	37%	23%

Question 39: Please discuss why you are likely or unlikely to adopt T2 Biosystems' *Candida* Panel?

New technology takes time to get adopted (3,3)
If data are correct would be a highly valuable tool particularly if there is high risk of fungal infections (maybe not needed in ALL patients with suspected sepsis as most of these will be bacterial, depending on price,3 but in immune compromised patients or those pre-treated with antibiotics this would be very valuable. (4,5)
will depend upon the proce point and cost/risk sharing agreement potential (3,3)
low incidence of candidal infections present in ED patients even with sepsis (2,3)
Its a very useful tool to treat candida infections early. (5,5)
Cost to institution (3,3)
would use if hospital adopts (3,3)
High diagnostic value and relatively low price compared to unnecessary empiric anti fungal therapy (4,5)
Cost is a factor but the hospitals look at cost of identification more of a economic issue than cost of an antibiotic (3,5)
cost (4,4)
Quick test to diagnose candida. (2,4)
Cost effective for at risk patients (5,4)
accuracy and precision with the advantage of a rapid result (3,5)
rapid diagnosis in immunosuppressed patients (5,5)
rapidity in diagnosis (3,4)
Expensive (3,3)
lower sensitivity for glabrata species. several other technical advances compete (3,3)
The sensitivity data are above. I would like to also know the specificity data.
It will help early identification of specific pathogens (4,1)
Cost, cost, cost. Final decision is made by the administration and they only care about the bottom line, which is how many technical staff can they fire. (1,1)
Seems like it would be a nice adjunct for diagnosis of invasive candidal infections. It would be nice if susceptibility information could also be obtained. (3,4)
Cost will be of paramount importance (4,4)
limited by institutional protocols (3,4)
I do not make those decisions in my hospital (4,3)
Would be extremely useful to distinguish C. species from C. glabrata due to resistances (3,4)
Has good sensitivity and specificity in published cohorts, but cost is unknown, and issues of adoption of new technology in the micro lab are complicated
I am likely b/c I see the value of knowing this information. My hospital is unlikely b/c it represents a completely new instrument that offers only a single
It depends on the hospital if they will adopt or not. If it saves money and decreases length of stay, then likely they will adopt to it. (3,3)
Rapid detection and speciation of candida infections has great impact in critically ill patients (3,5)
Rapid use and ID of species, especially if fungemia of high grade is present Ability to selectcorrectantifungal based on ID Fast turnaround (3,4)
Unlikely due to up front cost of hardware that is limited to detection of candidemia hitch affects only 2% in our population. Not cost effective. We use
cost, single use platform. Limited utility. Best data for ruling out, not in. Difficult to identify patient population to best apply to. (2,2)
If low cost will inform patient management decision in meaningful way, limit unnecessary antibiotic use (4,5)
Depends on academic center (4,4)
Likely to. It would be a big help in time to abx. (4,4)

Question 40: Prior to running this survey, we spoke with several physicians who had expressed various reasons a hospital or physician would not adopt T2's *Candida* Panel. In an effort to understand what the greatest barriers to adoption may be, we listed several of the comments we had heard and asked physicians to rank them on a scale of 1 to 5. *(1=very unlikely to be a common reason a critical care/infectious disease/emergency department physician would not adopt T2's Candida Panel; 5= very likely to be a common reason a critical care/infectious disease/emergency department physician would not adopt T2's Candida Panel).*

	Average
Pricing of $200-250/test	3.54
Waiting for the bacteria panel to be approved	3.09
The quantity/quality of available data on the test's sensitivity and specificity	3.03
Skepticism around T2's panel having an impact on reducing mortality and/or hospital/ICU length of stay	3.00
Candida not being a concern due to its low prevalence	2.94
Skepticism around T2's panel impacting the use of antibacterials or antifungals	2.86
The adoption of other emerging technologies is more important at this time	2.77

Clinical Utility of TTOO's T2Bacteria Panel and AXDX's ID/AST System

Question 41: If T2 Biosystems was able to demonstrate similar levels of sensitivity and specificity with a multiplex diagnostic panel that could detect and provide information on the speciation of the major bacterial pathogens associated with sepsis that are frequently not covered by first-line antibiotics within 3-5 hours of a blood draw on a scale of 1 to 5 *(1=very unlikely to adopt; 5=very likely to adopt)*, how likely would you be to adopt such a technology?

1 = very unlikely to adopt	2.9%
2	0.0%
3	5.7%
4	37.1%
5 = very likely to adopt	54.3%
Average	4.4 out of 5.0

Question 42: What factor(s) would drive your decision to adopt or not adopt such an offering?

Accuracy and reliability of the test (5)
accuracy of data and cost (5)
cost/efficacy (5)
Cost and effectiveness of the test. (5)
hospital's adoption, and that would likely be based on cost and accuracy (5)
sensitivity specificity and cost (5)
cost of test (5)
Quick results. (5)
costeffectiveness (5)
cost, speed (5)
Cost of system and testing (5)
Cost, ease of use, presence of technical staff in micro lab (5)
high sensitivity and specificity decrease length of time to identification of organism is known cost savings outweigh the expense (5)
Test accuracy, simplicity and speed of detection (5)
Rapidity of results (5)
Ability to target therapy soon, especially for critically ill patients with MDR organisms (5)
Cost (5)
cost (5)
cost (4)
lab resources - people and space costs (4)
price and decreased length of stay (4)
Cost (4)
Turn around time and cost (4)
The pathogens included in the panel. The ability to detect resistance mutations. (4)
Cost and real world data (4)
access, cost (4)
data available, sensitivity, specificity. How much impact in clinical outcome (4)
price (4)
Availability of alternative technologies that better integrate with existing lab system. Cost. Complexity of assay. (4)
Cost, sensitivity/specificity (4)
cost, work flow. Patient identification. pathogens included. resistance determinants (mecA, vanA/B) needed on bacterial panel. (4)
Cost (3)
other technical advances compete with this technology (3)
most treatment is based on clinical grondsmore clinical experience (1)

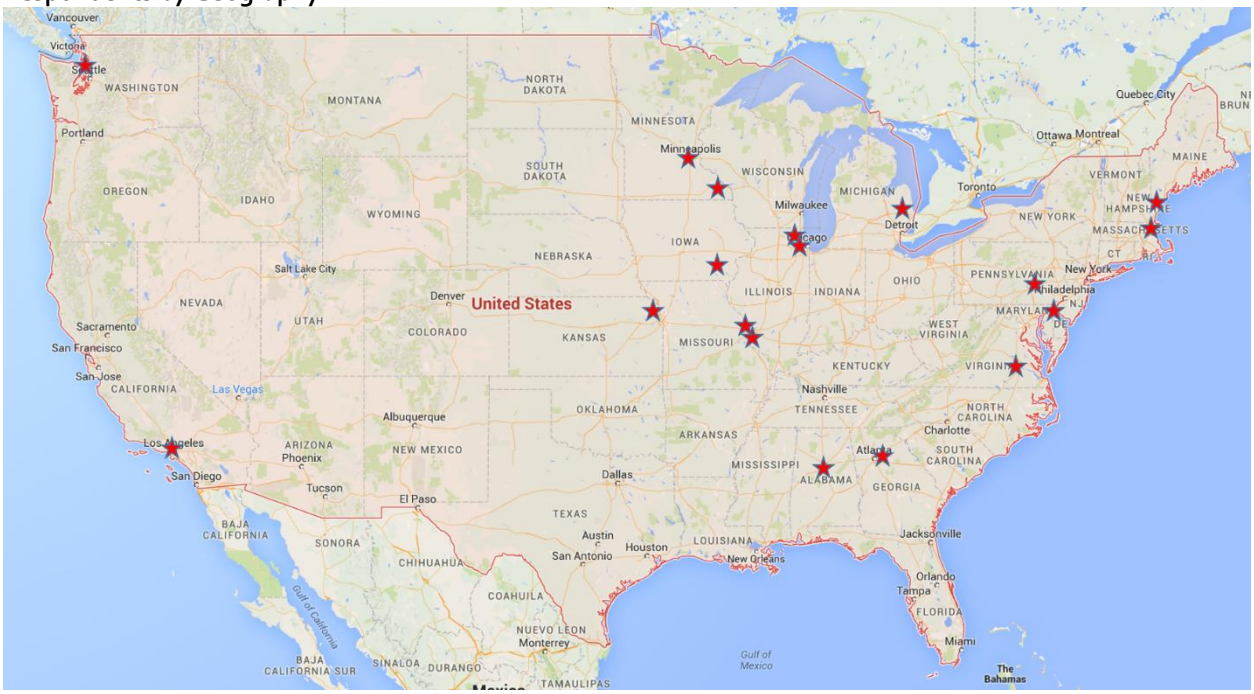
Questions 43-49: Clinical Utility of TTOO's T2Bacteria Panel and AXDX's ID/AST System

Scale: 1 = useless; 5 = extremely valuable		Average	1	2	3	4	5
Related to TTOO: prior to positive blood culture	Thinking about the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis, on a scale of 1 to 5, how valuable would being able to detect and identify a bacterial pathogen within 3-5 hours of a blood draw be to you?	4.7	0%	0%	3%	20%	77%
Related to AXDX: assumes TTOO's bacteria panel is successful	Thinking about the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis, on a scale of 1 to 5, how valuable would being able to identify bacterial pathogen(s) within one hour of a positive blood culture be to you? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is also available.*	4.2	0%	6%	20%	26%	49%
Related to AXDX: assumes TTOO's bacteria panel is NOT successful	Thinking about the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis, on a scale of 1 to 5, how valuable would being able to identify bacterial pathogen(s) within one hour of a positive blood culture be to you? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is NOT available.*	4.6	0%	3%	3%	23%	71%
Related to AXDX: assumes TTOO's bacteria panel is successful	Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis and assuming sensitivity of 93%+ and specificity of 93%+, on a scale of 1 to 5, how valuable would information on susceptibility (BUT NOT RESISTANCE) of bacterial pathogens within 4-5 hours of a positive blood culture be to you? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is also available.*	4.1	0%	3%	17%	49%	31%
Related to AXDX: assumes TTOO's bacteria panel is successful	Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis and assuming sensitivity of 93%+ and specificity of 93%+, on a scale of 1 to 5, how valuable would information on resistance (BUT NOT SUSCEPTIBILITY) of bacterial pathogens within 4-5 hours of a positive blood culture be to you? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is also available.*	3.9	0%	6%	23%	43%	29%
Related to AXDX: assumes TTOO's bacteria panel is successful	Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis and assuming sensitivity of 93%+ and specificity of 93%+, on a scale of 1 to 5 (1 = useless and 5 = extremely valuable), how valuable would information on susceptibility AND resistance of bacterial pathogens within 4-5 hours of a positive blood culture be to you? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is also available.*	4.6	0%	6%	0%	23%	71%
Related to TTOO: assumes AXDX is successful	Thinking about the patients that you treat at your institution that you define as high-risk/at-risk for developing sepsis and assuming equal sensitivity and specificity at both time periods, on a scale of 1 to 5 (1 = no advantage and 5 = very important advantage), how much of an advantage is knowing whether bacterial pathogens are present AND their identification within 3-5 hours of an initial blood draw vs. within 10-12 hours of an initial blood draw?	4.3	3%	6%	3%	37%	51%

Survey #2: Microbiology Lab Managers/Directors

17 Complete Responses – 17 Centers Represented – Completed May/June 2015

Respondents by Geography



★ = 1 hospital

Question 1: Which of the following best describes your lab?

Lab primarily affiliated with academic medical center(s)	70.6%
Lab primarily affiliated with community medical center(s)	23.5%
Veterans Affairs Medical Center	5.9%

Questions 2-4: Blood Culture Volumes

How many blood cultures did your lab perform in 2013?	**Cumulative Total**	478,788
	Average	28,164
	Median	25,698
	Range	5,800 - 75,000/lab
How many blood cultures did your lab perform in 2014?	**Cumulative Total**	484,219
	y/y growth	1.1%
	Average	28,483
	Median	27,771
	Range	6,200 - 70,000/lab
How many blood cultures do you expect your lab to perform in 2015?	**Cumulative Total**	490,800
	y/y growth	1.4%
	Average	28,871
	Median	27,800
	Range	6,500 - 75,000/lab

Questions 5 – 10: Blood Culture Volumes – Patients Considered High-Risk for Developing Sepsis

In 2013, what percent of the blood cultures performed in your lab were from patients defined as high-risk/at-risk for developing sepsis?	Average	35.8%
	Median	25.0%
	Range	3 - 100%
Number of blood cultures performed in 2013 from patients defined as high-risk/at-risk for developing sepsis? *(calc. based on above questions)*	Cumulative Total	220,577
	Average	12,975/ab
	Median	7,200/lab
	Range	290 - 67,500/lab
In 2014, what percent of the blood cultures performed in your lab were from patients defined as high-risk/at-risk for developing sepsis?	Average	37.4%
	Median	25.0%
	Range	3 - 100%
Number of blood cultures performed in 2014 from patients defined as high-risk/at-risk for developing sepsis? *(calc. based on above questions)*	Cumulative Total	230,080
	y/y growth	4.3%
	Average	13,534/lab
	Median	7,500/lab
	Range	434 - 63,000/lab
In 2015, what percent of the blood cultures performed in your lab do you expect to be from patients defined as high-risk/at-risk for developing sepsis?	Average	38.1%
	Median	25.0%
	Range	5 - 100%
Number of blood cultures performed in 2015 from patients defined as high-risk/at-risk for developing sepsis? *(forecast; calc. based on above questions)*	Cumulative Total	236,770
	y/y growth	2.9%
	Average	13,928
	Median	8,750/lab
	Range	520 - 67,500/lab

Question 11: If the percentage of blood cultures from patients defined as high-risk/at-risk at developing sepsis is increasing or decreasing at your lab, please explain why.

We are starting kidney transplants. So it might increase, but not sure how much
More immunocompromised patients on a yearly basis
Acquired large cardiac institute with large number of endocarditis cases
We have a fair number of outpatients who are at low risk of being septic, and a relatively fixed number of inpatients. It's about 50% every year, probably, though it's really hard to define this percentage and this is just a best guess.
i think at blood cultures detect sepsis in ~10-20% of cases, historical data supports this
More beds for high risk patients
Increase in total numbers of bottles due to outreach. Modified algorithm for sepsis work-up
All patients in our hospital are in acute care.
Due to increased severity of underlying diseases of the patients evaluated at our practices
Additional hospitals and outreach are becoming part of the health system
No increase or decrease

Question 12: What percent of the total blood cultures performed annually in your lab is from patients that you would define as high-risk/at-risk for developing sepsis specifically due to *Candida*?

Less than 5%	64.7%
6-10%	0.0%
11-15%	11.8%
16-20%	11.8%
21-30%	11.8%
31-40%	0.0%
41-50%	0.0%
51-60%	0.0%
61-70%	0.0%
71-80%	0.0%
81-90%	0.0%
91%+	0.0%
I do not know	0.0%

Question 13: Among patients at your institution that are considered high-risk/at-risk of developing sepsis, what is the estimated prevalence of candidiasis?

1% or less	41.2%
2%	11.8%
3%	17.6%
4%	0.0%
5%	17.6%
6%	0.0%
7%	0.0%
8-10%	5.9%
11-15%	0.0%
16-20%	0.0%
21%+	0.0%
I do not know	5.9%

Question 14: Is the prevalence of candidiasis among patients at your institution that are considered high-risk/at-risk of developing sepsis rising, falling, or remaining relatively constant?

Rising 21%+	0.0%
Rising 11-20%	0.0%
Rising 6-10%	5.9%
Rising 3-5%	11.8%
Rising 1-2%	5.9%
No change	64.7%
Falling 1-2%	0.0%
Falling 3-5%	0.0%
Falling 6-10%	0.0%
Falling 11-20%	0.0%
Falling 21%+	0.0%
I do not know	11.8%

Question 15: What is driving the increase or decrease in the prevalence of candidiasis within your institution?

Might increase if we have transplant patients
More patients immunicompromisedfor longer periods of time.
Immune suppressed patients - particularly organ transplant and cancer. The numbers are somewhat stable.
No change; we have a very low incidence and have looked at this formally.
We haven't seen much of a change from 2013 until now. But I would imagine that increased broad spectrum antibiotic usage and increased number of severely immunocompromised patients could increase the prevalence of candidiasis in the future.
more immunosuppresive therapy and more tranaplant related events, possibly more line involvment
We are a pediatric facility and our etiological agents of fever rarely involve candida
Continued and increased use of broad-spectrum antibacterial agents in patients with sepsis and for febrile neutropenic patients.
Transplant immunosupression

Question 16: Familiarity with T2 Biosystems and/or the T2Candida Panel

	Yes	No
Are you familiar with T2 Biosystems' T2MR Platform and/or T2 Biosystems' *Candida* Panel?	70.6%	29.4%

Question 17: Familiarity with Accelerate Diagnostics' ID/AST (RUO) System

	Yes	No
Are you familiar with Accelerate Diagnostics' Accelerate ID/AST (RUO) System?	76.5%	23.5%

Question 18: Thinking about your institution, please rank the following potential causes of sepsis in the order of MOST COMMON (1) to LEAST COMMON (7).

	Average	Median
Bacteremia	1.1	1
Fungemia	2.8	3
Viremia	2.8	2
Bacteremia AND Fungemia	4.1	4
Bacteremia AND Viremia	4.4	4
Fungemia AND Viremia	6.0	6
Bacteremia, Fungemia, AND Viremia	6.7	7

Question 19: Please rank the following potential causes of sepsis in the order of MOST CONCERNING (1) to LEAST CONCERNING (7).

	Average	Median
Bacteremia	2.8	1
Fungemia	3.2	3
Bacteremia AND Fungemia	3.2	3
Bacteremia, Fungemia, AND Viremia	3.2	4
Bacteremia AND Viremia	4.8	5
Fungemia AND Viremia	5.1	6
Viremia	5.8	7

Question 20: Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, what percent would you estimate receive empiric antibacterials?

Less than 5%	0.0%
6-10%	0.0%
11-15%	0.0%
16-20%	0.0%
21-30%	0.0%
31-40%	5.9%
41-50%	5.9%
51-60%	5.9%
61-70%	5.9%
71-80%	11.8%
81-90%	5.9%
91%+	58.8%
I do not know	0.0%

Question 21: Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, in what time period would you estimate that treatment with empiric antibacterials is typically commenced?

Prior to initial blood draw/culture	0.0%
Immediately (within one hour) after initial blood draw/culture	64.7%
Within 12 hours of initial blood draw/culture	29.4%
Within 13-24 hours of initial blood draw/culture	5.9%
Within 25-48 hours of initial blood draw/culture	0.0%
More than 48 hours after initial blood draw/culture	0.0%
I do not know	0.0%

Question 22: Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, what percent would you estimate receive empiric antifungals?

Less than 5%	29.4%
6-10%	17.6%
11-15%	5.9%
16-20%	23.5%
21-30%	5.9%
31-40%	5.9%
41-50%	0.0%
51-60%	0.0%
61-70%	0.0%
71-80%	0.0%
81-90%	5.9%
91%+	0.0%
I do not know	5.9%

Question 23: Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, in what time period would you estimate that treatment with empiric antifungals is typically commenced?

Prior to initial blood draw/culture	11.8%
Immediately (within one hour) after initial blood draw/culture	17.6%
Within 12 hours of initial blood draw/culture	35.3%
Within 13-24 hours of initial blood draw/culture	11.8%
Within 25-48 hours of initial blood draw/culture	0.0%
More than 48 hours after initial blood draw/culture	11.8%
I do not know	11.8%

Question 24: Typical Timeline to Confirm Presence and Species of *Candida*?

	Less than 8 hours after initial blood draw/culture	8-12 hours after initial blood draw/culture	13-24 hours after initial blood draw/culture	25-32 hours after initial blood draw/culture	33-48 hours after initial blood draw/culture	49-60 hours after initial blood draw/culture	61+ hours after initial blood draw/culture
Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis AND that do eventually test positive for *Candida* at what time interval are you typically able to confirm the presence of *Candida*?	0.0%	5.9%	23.5%	23.5%	41.2%	5.9%	0.0%
Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis AND that do eventually test positive for *Candida* , at what time interval are you typically able to confirm the species of *Candida*?	0.0%	0.0%	11.8%	23.5%	23.5%	35.3%	5.9%

Question 25: In approximately what percent of cases where Candidiasis is eventually diagnosed do blood culture results come back negative during the first 72 hours post an initial blood draw/culture?

Less than 5%	17.6%
6-10%	17.6%
11-20%	17.6%
21-30%	11.8%
31-40%	11.8%
41-50%	11.8%
51-60%	11.8%
61-70%	0.0%
71-80%	0.0%
81-90%	0.0%
91%+	0.0%

Question 26: On a scale of 1 to 5 (1=useless; 5=extremely valuable) how valuable do you think the ability to know whether a patient that is considered high-risk/at-risk for developing sepsis is or is not infected with *Candida* and the species of *Candida* within 3-5 hours of a blood draw is to the treating physicians that send samples to your lab?

1 = useless	0.0%
2	5.9%
3	23.5%
4	23.5%
5 = extremely valuable	47.1%
Average	**4.1 out of 5**

Question 27: Looking at the published data for T2's *Candida* Panel (we provided a table with T2's overall sensitivity and specificity data as published in *Clinical Infectious Diseases*) and recognizing that the turnaround time for the panel is 3-5 hours following a blood draw, at each of the following price points in what percent of patients that you define as high-risk/at-risk for developing sepsis would you expect T2's *Candida* Panel to be used/ordered routinely at your institution?

n = 17	Average	Median	Range	0%	1 - 10%	11 - 20%	21 - 30%	31 - 40%	41 - 50%	51 - 60%	60 - 70%	71 - 80%	81-90%	91 - 100%
$250/test	9%	0%	0 - 50%	59%	18%	6%	12%	0%	6%	0%	0%	0%	0%	0%
$200/test	18%	10%	0 - 50%	47%	12%	0%	12%	12%	18%	0%	0%	0%	0%	0%
$150/test	37%	25%	0 - 100%	29%	6%	12%	6%	0%	18%	6%	6%	6%	0%	12%
$100/test	51%	75%	0 - 100%	29%	0%	0%	12%	0%	6%	0%	0%	29%	6%	18%
$50/test	78%	100%	0 - 100%	6%	6%	0%	6%	0%	12%	0%	0%	0%	6%	65%

Question 27b: We conducted a price sensitivity analysis considering the volume of each lab and the percentage of high-risk patients each manager/director would expect the test to be ordered for at each price point.

	# of pts	Sales ($M)		0%	1 - 10%	11 - 20%	21 - 30%	31 - 40%	41 - 50%	51 - 60%	60 - 70%	71 - 80%	81-90%	91 - 100%	Total
$250/test	21,177	5.3		0.0	0.5	0.5	1.7	0.0	1.6	0.0	0.0	0.0	0.0	0.0	4.4
$200/test	53,458	10.7		0.0	0.3	0.0	1.4	1.9	3.8	0.0	0.0	0.0	0.0	0.0	7.4
$150/test	100,525	15.1		0.0	0.1	0.6	0.5	0.0	2.8	1.1	1.4	1.6	0.0	4.0	12.1
$100/test	146,228	14.6		0.0	0.0	0.0	0.7	0.0	0.6	0.0	0.0	5.2	1.2	4.0	11.7
$50/test	192,230	9.6		0.0	0.0	0.0	0.2	0.0	0.6	0.0	0.0	0.0	0.6	7.3	8.7

Question 28: On a scale of 1 to 5 *(1=very unlikely to adopt; 5=very likely to adopt)* how likely is it that your hospital/institution/lab will adopt T2 Biosystems' *Candida* Panel?

1 = very unlikely to adopt	29.4%
2	35.3%
3	35.3%
4	0.0%
5 = very likely to adopt	0.0%
Average	**2.1 out of 5**

Question 29: Please discuss why you are likely or unlikely to adopt T2 Biosystems' *Candida* Panel?

We do not have very many candida patients (3)
Cost and small percentage of overall positives as well as a high percentage of patients on empiric therapy (3)
Will physician act on the T2 data and stop antifungals if the test result is negative. The greatest savings and affect on patient care would be the discontinuation of antifungal therapy in a patient not infected with Candida. (3)
Need to know more about cost of platform. (2)
We don't have much candidemia as far as we can tell. A single-purpose platform would be extremely difficult to justify on those grounds. (1)
Our incidence of candidiasis is currently low. (2)
use, volume, cost involved in testing (3)
We see very few candida infections (2)
What we are likely to do is adopt one of the rapid detection amplification systems that identifies organisms from positive blood cultures. But we are having a very difficult time justifying the price. We will not be able to justify a stand-alone test for Candida. (1)
The price per reportable, when compared to other technologies will be the defining reason whether to implement this test in a low prevalence setting. (3)
Pediatric sepsis with Candida is rarely seen at our large pediatric institution (1)
Too expensive. Throughput is far too low for number of blood cultures handled and would have to be run on many cultures that are negative....needs a high throughput option or screening capacity. (2)
Need to see the system and determine if it will work in our situation. (3)
The major obstacle is the initial capital investment needed for the purchase of the T2 Biosystems instrument. (2)
Very few cases of fungemia. Do not have a transplant center. Would be important for oncology patients. (2)
We perform 33,000 blood culture per year. Would not know which ones to test on T2 and can't afford to test everybody. No effective algorithm to identify patients to test on T2 (1)
Very few episodes of candidemia at our institution (1)

Question 30: Prior to running this survey, we spoke with several lab directors who had expressed various reasons a hospital or physician would not adopt T2's *Candida* Panel. In an effort to understand what the greatest barriers to adoption may be, we listed several of the comments we had heard and asked our survey respondents to rank them on a scale of 1 to 5. *(1=very unlikely to be a common reason a lab would not adopt T2's Candida Panel; 5= very likely to be a common reason a lab would not adopt T2's Candida Panel)*

5 = very likely to be a common reason why a lab would not adopt T2Candida	Average
Pricing of $200-250/test	4.4
The replacement of other instruments/assays being more important/timely over the next 12-18 months	3.9
Candida not being a concern due to its low prevalence	3.8
Negotiation of a minimum number of samples/year contract	3.5
Waiting for the bacteria panel to be approved	3.4
Skepticism around T2's panel impacting the use of antibacterials or antifungals	2.9
Skepticism around T2's panel having an impact on reducing mortality and/or hospital/ICU length of stay	2.5
Critical care/infectious disease physicians not being interested in adopting the test	2.4
The quantity/quality of available data on the test's sensitivity and specificity	1.9
Purchasing from a small company	1.6
1 = very unlikely to be a common reason why a lab would not adopt T2Candida	

Questions Related to Bacterial Infections

Question 31: If T2 Biosystems' was able to demonstrate similar levels of sensitivity and specificity with a multiplex diagnostic panel that could detect and provide information on the speciation of the major bacterial pathogens associated with sepsis that are frequently not covered by first-line antibiotics within 3-5 hours of a blood draw on a scale of 1 to 5 (1=very unlikely to adopt; 5=very likely to adopt), how likely would your lab be to adopt such a technology?

1 = very unlikely to adopt	5.9%
2	5.9%
3	23.5%
4	41.2%
5 = very likely to adopt	23.5%
Average	3.7 out of 5

Question 32: What factor(s) would drive your decision to adopt or not adopt such an offering?

Cost (5)
Price and accuracy (4)
Discussions with physician groups to see how this technology would affect practice. (4)
Cost of test and platform. (4)
Overall cost, appreciation that anyone would actually do anything with the result (and that we have the resources to actually intervene). (4)
Ease of use, validation/verification of test system as advertised, and price. (5)
volumes, costs (2)
Pricing, complexity of testing, TAT. (4)
There are so many other priorities: Maldi-Tof, front-end automation of the microbiology laboratory for example. We have limited capital resources and must prioritize. (3)
1. pricing 2. estimated annual test volumes 3. ability to multiplex for other organisms (4)
Clinical and demographic composition of patients (3)
Needs to be able to handle many blood cultures at once as we in the lab are unable to differentiate between a Blodd culture drawn because a patient is at severe risk of sepsis vs a low risk patient from the ED. If we were to adopt this technology I would want to use it for all 75000 blood cultures I handle per year. (5)
ease of use and cost of reagents (4)
Amount of initial capital costs, annual maintenance costs, and cost/test (3)
Turnaround time and cost (5)
90% of our blood culture are no growth. Would not know which patients to test on T2. Can't afford to run 30,000 negatives just to find a few positives. (1)
Price, performance characteristics, availability of competing technologies on platforms already installe in the lab (3)

Question 33: Clinical Utility of TTOO's T2Bacteria Panel and AXDX's ID/AST System

	Scale: 1 = useless; 5 = extremely valuable	Average	1	2	3	4	5
Related to TTOO: prior to positive blood culture	Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, on a scale of 1 to 5 (1=useless; 5=extremely valuable), how valuable do you think being able to detect and identify a bacterial pathogen within 3-5 hours of a blood draw would be for your treating physicians?	4.5	0%	6%	6%	18%	71%
Related to AXDX: assumes TTOO's bacterial panel is successful	Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, on a scale of 1 to 5 (1 = useless and 5 = extremely valuable), how valuable do you think being able to identify bacterial pathogen(s) within one hour of a positive blood culture would be for your treating physicians? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is also available.*	4.5	0%	0%	0%	47%	53%
Related to AXDX: assumes TTOO's bacterial panel is NOT successful	Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis, on a scale of 1 to 5 (1 = useless and 5 = extremely valuable), how valuable do you think being able to identify bacterial pathogen(s) within one hour of a positive blood culture would be for your treating physicians? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is NOT available.*	4.5	0%	0%	12%	24%	65%
Related to AXDX: assumes TTOO's bacterial panel is successful	How valuable do you think information on susceptibility (BUT NOT RESISTANCE) of bacterial pathogens within 4-5 hours of a positive blood culture would be for your treating physicians? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is also available . Assume sensitivity of 93%+ and specificity of 93%+.*	4.3	0%	12%	12%	12%	65%
Related to AXDX: assumes TTOO's bacterial panel is successful	How valuable do you think information on resistance (BUT NOT SUSCEPTIBILITY) of bacterial pathogens within 4-5 hours of a positive blood culture would be for your treating physicians? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is also available. Assume sensitivity of 93%+ and specificity of 93%+.*	3.9	6%	0%	24%	41%	29%
Related to AXDX: assumes TTOO's bacterial panel is successful	How valuable do you think information on susceptibility AND resistance of bacterial pathogens within 4-5 hours of a positive blood culture would be for your treating physicians? *In this scenario please assume that a technology that is able to detect and identify bacterial pathogens within 3-5 hours of a blood draw is also available. Assume sensitivity of 93%+ and specificity of 93%+.*	4.4	0%	0%	24%	12%	65%
Related to TTOO: assumes AXDX is successful	Thinking about the patients at your institution that you define as high-risk/at-risk for developing sepsis and assuming equal sensitivity and specificity at both time periods, on a scale of 1 to 5 (1 = no advantage and 5 = very important advantage), how much of an advantage do you think knowing whether bacterial pathogens are present AND their identification within 3-5 hours of an initial blood draw vs. within 10-12 hours of an initial blood draw would be for your treating physicians?	4.0	0%	0%	35%	29%	35%

Question 34: In your view, what is the greatest unmet need in infectious disease diagnostics today?

Better antibiotics
Direct from specimen testing.
Rapid and extremely reliable Identification and Susceptibility data directly from patient specimens
Rapid identification of bacterial pathogens from blood without waiting for positive blood culture.
Non-culture-based methods of diagnosis that actually work.
Rapid susceptibility testing!
sepsis; unmet clinical needs regarding diagnostics we have struggled with ie. syphilus ect...
rapid resistance/susceptibility info.
Simultaneous direct detection of pathogen in blood AND resistance mechanisms.
Rapid (< 8 hours from blood draw) organism identification AND antimicrobial susceptibility/resistance determination.
Rapid, accurate susceptibility data
Rapid susceptibility testing and high throughput screening options.
Accurate rapid methods
Rapid (<2 hrs), reliable (>95% reproducible), and sensitive (>95%) detection of infectious pathogens in patients with sepsis
Rapid identification coupled with rapid antimicrobial susceptibily
host (cellular) markers to determine when infection is present
Direct from specimen identification of organisms

Appendix: Analyst Certification and Other Important Disclosures

Analyst Certification

I, Karen Koski, hereby certify that the views about the companies and securities discussed in this report are accurately expressed and that I have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report.

I, Sean Lavin, MD, hereby certify that the views about the companies and securities discussed in this report are accurately expressed and that I have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report.

I, Andrea Alfonso, hereby certify that the views about the companies and securities discussed in this report are accurately expressed and that I have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report.

Regulatory Disclosures

Analyst Stock Ratings Definitions

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BUY – A stock that is expected at initiation to produce a positive total return of 15% or greater over the 12 months following the initial recommendation. The BUY rating may be maintained following initiation as long as it is deemed appropriate, notwithstanding price fluctuations that would cause the target to fall outside of the 15% return.

SELL – A stock that is expected at initiation to produce a negative total return of 15% or greater over the next 12 months following the initial recommendation. The SELL rating may be maintained following initiation as long as it is deemed appropriate, notwithstanding price fluctuations that would cause the target to fall outside of the 15% return.

NEUTRAL – A stock that is not expected to appreciate or depreciate meaningfully over the next 12 months.

NOT RATED – A stock that is not rated but that is covered by BTIG.

Distribution of Ratings and Investment Banking Clients
BTIG must disclose in each research report the percentage of all securities rated by the member to which the member would assign a "buy", "neutral" or "sell" rating. The said ratings are updated on a quarterly basis. BTIG must also disclose the percentage of subject companies within each of these three categories for whom the member has provided investment banking services within the previous twelve months. **Stocks in coverage as of the end of the most recent calendar quarter (June 30, 2015): 129**

Distribution of BTIG's Research Recommendations (as of June 30, 2015):
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BUY: 83%; NEUTRAL: 17%; SELL: 0%

For purposes of FINRA ratings distribution rules, BTIG's stock ratings of Buy, Neutral and Sell fall into Buy, Hold and Sell categories, respectively.

Company-Specific Regulatory Disclosures

T2 Biosystems, Inc. (TTOO)

Valuation
Our T2 Biosystems rating is Neutral. Our DCF suggests that TTOO's current fair value is ~$330M, which is within 15% of current levels. BTIG does not provide price targets on Neutral-rated stocks.

Risks
Risks to our rating include: commercial execution, competition, clinical data, M&A, need for additional capital, regulatory, and IP.

Accelerate Diagnostics, Inc. (AXDX)

Valuation
Our Accelerate Diagnostics rating is Neutral. BTIG does not provide price targets on Neutral-rated stocks. Based on various assumptions on the number of placements, % of systems sold vs. placed via reagent rental, price per sold system, samples run per system, average number of days each system is actively utilized, number of tests run per system per day, and price per test, if we assume 2017 is the company's first full year of commercialization in the U.S. we can get to revenue of anywhere between ~$10M and $93M for 2017. Assigning a rich 8-10x multiple to the highest revenue scenario would yield a valuation of ~$750M - $930M. If we were to take our modelled 2018 revenue of ~$73M, which would be a very impressive sales number for the product's (and company's) second full year of commercialization and assigned a more appropriate revenue multiple of 6-8x, we would get to a valuation of ~$440M - $584M.

Risks
Risks to our rating include: clinical data, regulatory, commercial execution, competition, need for additional capital, manipulation, projected timelines, IP and M&A.

Other Disclosures

Additional Information Available Upon Request

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