



Physicians Caring for Texans

TexMed 2017 Clinical Abstract

Please complete all of the following sections and include supporting charts and graphs in this document. Submit a total of two documents - this document and the Biographical Data and Disclosure Form to posters@texmed.org by midnight March 17, 2017.

Procedure and Selection Criteria

- Submissions not directly related to quality improvement or research may be accepted and should follow the standardized format outlined below. Content should enhance knowledge in the field of clinical care and be relevant to a given patient population.

PROJECT NAME: Epidemiology of Bloodstream Infections in Solid Organ Transplant Recipients

Institution or Practice Name: UT Southwestern Medical Center

Setting of Care: Hospital

Primary Author: Terrence Liu

Secondary Author: Dr. Ricardo La Hoz, Dr. David Greenberg

Other Members of Project Team:

Is the Primary Author, Secondary Author or Member of Project Team a TMA member (required)?

Yes No

Please provide name(s) and their role in the project:

TMA Member Name:

Dr. Ricardo La Hoz, Co-Author

TexMed Poster Session Specialty Subject Area: Please check if these apply.

Enhanced Perioperative Recovery

Disaster Medicine and Emergency Preparedness

Clinical

Background (15 points max): *Describe the purpose for sharing the content. What caused this subject matter to be approached? Why is this content important to share? What is the potential impact if this content is not shared?*

Infection represents one of the most common and serious complications following solid organ transplantation (SOT). Depending on the type of transplant and time elapsed after transplantation, infectious complications can be the leading, second or third most common cause of death post-transplantation. Bloodstream infections (BSIs) represent a common infectious complication in this population with a cumulative incidence of 5-18% at 365 days post-transplant. Reported BSIs-associated mortality ranges from 10-50%. Despite the prevalence of this complication there is a lack of contemporary data regarding risk and prognostic factors of BSI in SOT recipients.

Our overarching goal of this project is to decrease the burden of BSI amongst SOT recipients at UTSW Medical Center.

Intended Stakeholders (15 points max): *Identify those individuals, organizations, or interest groups that could be potentially impacted by this information or benefit by obtaining this information.*

The UT Southwestern Transplant Program physicians stand to benefit by gaining new insight on infectious complications that ultimately impacts patient care. Describing the epidemiology of infections occurring in the transplant recipient population is the critical first step to improving clinical care of a particularly vulnerable patient population. Data gathered from the epidemiology of infectious complications are instrumental in identifying risk factors for BSI acquisition, prognostic factors, sources of infection, and areas for quality improvement. Transplant recipients benefit downstream by experiencing improved outcomes that result from improved clinical care.

Description of Accomplished Work (25 points max): *Provide an overview of the work that was accomplished, including any specific methods, tools or techniques. Also, include any milestones or key accomplishments. Note charts, graphs and tables here and send as addendum with abstract form.*

The novelty of our study is the methodology used for data collection. With the support of a UTSW Center for Translational Medicine Service Package Grant we were able to design a database of SOT recipients using novel data mining techniques. The funds also allowed us to manually validate the data extraction process. The database currently has the ability of including SOT recipients into the cohort and extracting more than 500 variables in an automated manner. The database is housed in the UTSW Clinical Research Data Warehouse and includes information from the following sources: UTSW electronic medical record, Scientific Registry of Transplant Recipients, and Social Security Death Index. I joined the research team in 2016, as part of UTSW Summer Elective for Medical Students. Since then I have participated of each step of the development of the database including submission of the current study protocol to the UTSW Institutional Review Board. The current proposal represents the first research project derived from the newly created database.

In this project thus far, we have described the epidemiology of BSI amongst SOT including the following parameters: cumulative incidence at 365 days post-transplantation, source of infection using the on the criteria proposed by the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN), proportion of BSI occurring before 1, between 1-6, and beyond 6 months post-transplantation, proportion of patients presenting with severe sepsis and septic shock based on the definitions outlined in the Third International Consensus Definitions for Sepsis and Septic Shock, 30 day mortality, and the survival curve analysis of transplant recipients who did and did not experience BSI. See addendum for figures.

We are currently working on describing the risk factors for acquisition of BSI amongst SOT recipients and prognostic factors associated with mortality. To achieve these aims we will perform a multivariate analysis that will include transplant related, donor, surgical and recipient variables.

Timeframe and Budget (20 points max): *Provide the start and end dates for the work along with any financial implications that were incurred due to the work accomplished. Note charts, graphs and tables here and send as addendum with abstract form.*

My primary roles as a student researcher will be the following: 1) finalize data collection 2) adjudicate and classify, in collaboration with my mentors, episodes of BSI based on predetermined criteria, 3) perform multivariate analysis to establish risk factors for acquisition as well as prognostic risk factors associated with mortality. The UTSW Medical School 2nd year curriculum has 10 weeks allocated for Scholarly Activities, which allows for dedicated research time (2/27/17 – 5/7/17). In collaboration with my mentors, we have developed a timeline to achieve the specific aims during that time, working full time 40 hours/week, and partial time 5 hours/week during my clinical rotations during 2017. In addition I plan to participate of the weekly research meetings held by the study team, and will have one-on-one meetings with my mentors and our collaborators at the different stages of the research project.

Funding for this project was supported by the National Center for Advancing Translational Sciences of the National Institutes of Health" under award Number UL1TR001105.

Intended Use (25 points max): *Describe how this information could be used moving forward to impact patient care.*

With this epidemiologic study and the establishment of an infectious disease database for transplant recipients at our institution, we hope to bridge the gap of knowledge of infectious complications in this vulnerable patient population. Specifically, we hope that establishing a database creates a platform in which these data can be easily accessed, queried

and visualized by investigators. In doing so, we hope this serves as a springboard for the development of new clinical research and quality improvement projects to decrease the burden of infectious complications in transplant recipients.

Addendum:

Table 1. Demographics			
Characteristic	All transplant patients (n=837)	Patients with negative cultures (n=777)	Patients with ≥ 1 positive culture (n=60)
Sex			
Male	541 (65%)	502 (65%)	39 (65%)
Female	296 (35%)	275 (35%)	21 (35%)
Age			
Mean \pm SD	53.8 \pm 13.2	53.8 \pm 13	53.6 \pm 15
Median (Range)	57 (14-83)	57 (14-80)	57 (16-83)
Race			
White	560 (67%)	522 (67%)	38 (63%)
African American	128 (15%)	119 (15%)	9 (15%)
Asian	27 (3%)	25 (3%)	2 (3%)
Other	76 (9%)	68 (9%)	8 (14%)
Unknown	46 (6%)	43 (6%)	3 (5%)
Organ			
Heart	152 (18%)	140 (18%)	12 (20%)
Kidney	217 (26%)	206 (26%)	11 (18%)
Liver	147 (18%)	133 (17%)	14 (23%)
Lung	296 (35%)	277 (36%)	19 (32%)
Simultaneous	25 (3%)	21 (3%)	4 (7%)

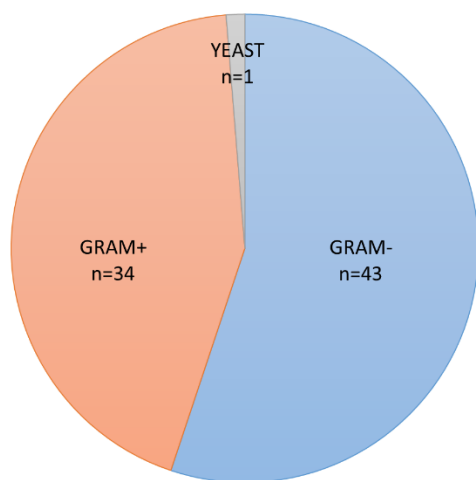


Figure 1. Distribution of BSI episodes by Gram staining of causative organism

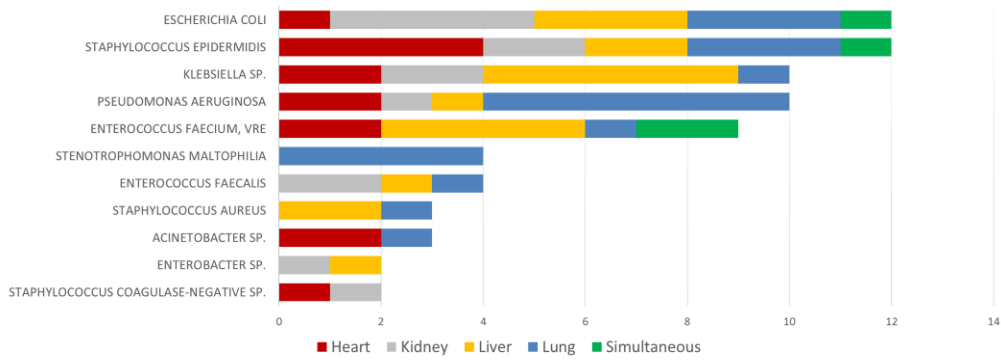


Figure 2. Distribution of BSI episodes by major causative organisms and transplanted organ

Table 2. Cumulative incidence and incidence rate of first positive blood culture over one year of follow-up

	Overall	Heart	Kidney	Liver	Lung	Simultaneous
Cumulative Incidence (%)	11.8	15.1	7.4	14.3	11.8	16
Incidence Rate (per 100 Person-days)	1.1	1.9	0.77	1.1	0.99	2.2

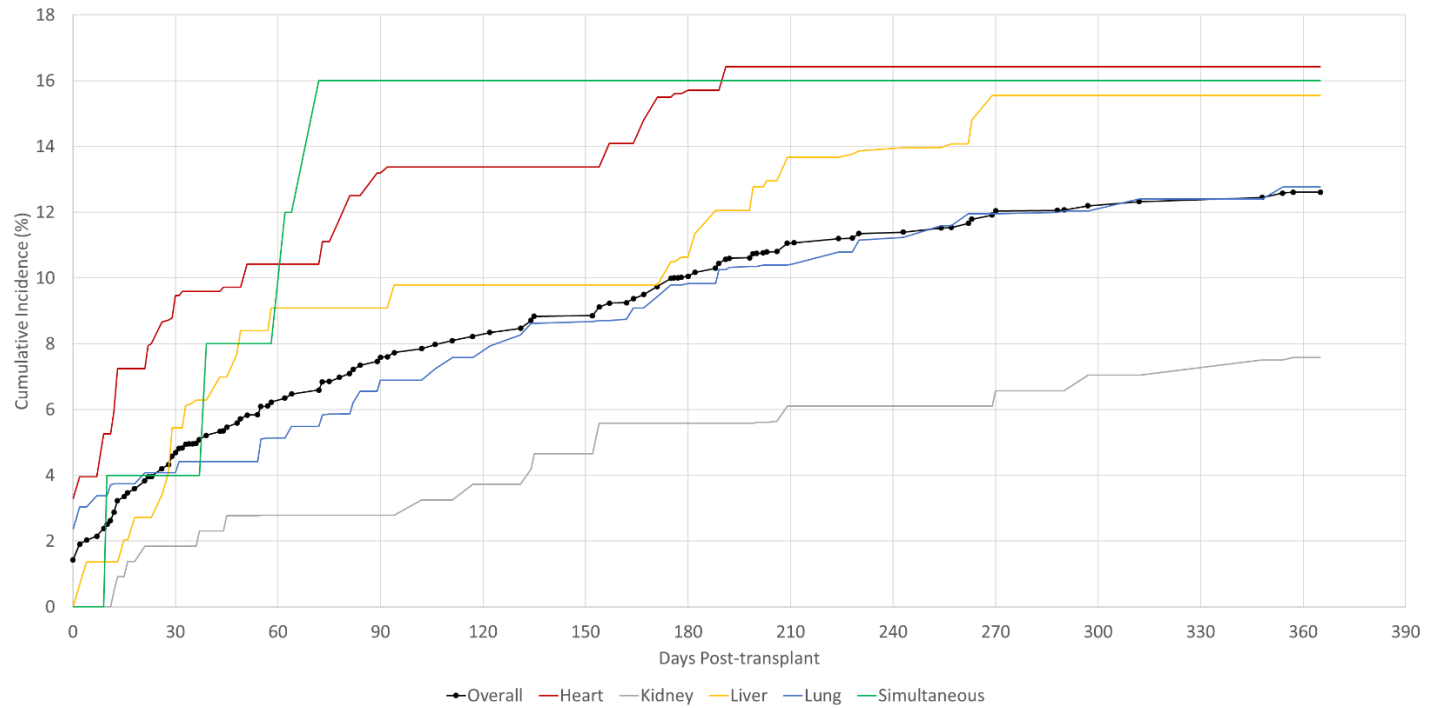


Figure 3. Cumulative Incidence of first positive blood culture by day post-transplant

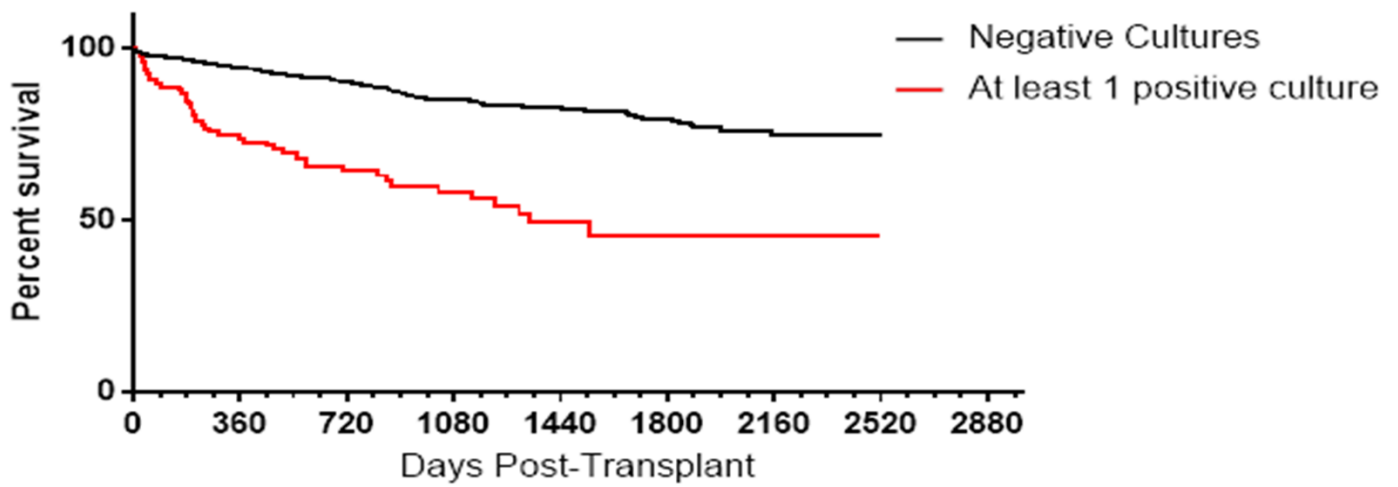


Figure 4. Kaplan Meier survival curve of all-cause mortality among solid organ transplant recipients (SOT) with negative cultures versus SOT recipients with at least one positive culture (P < 0.0001 by log-rank)

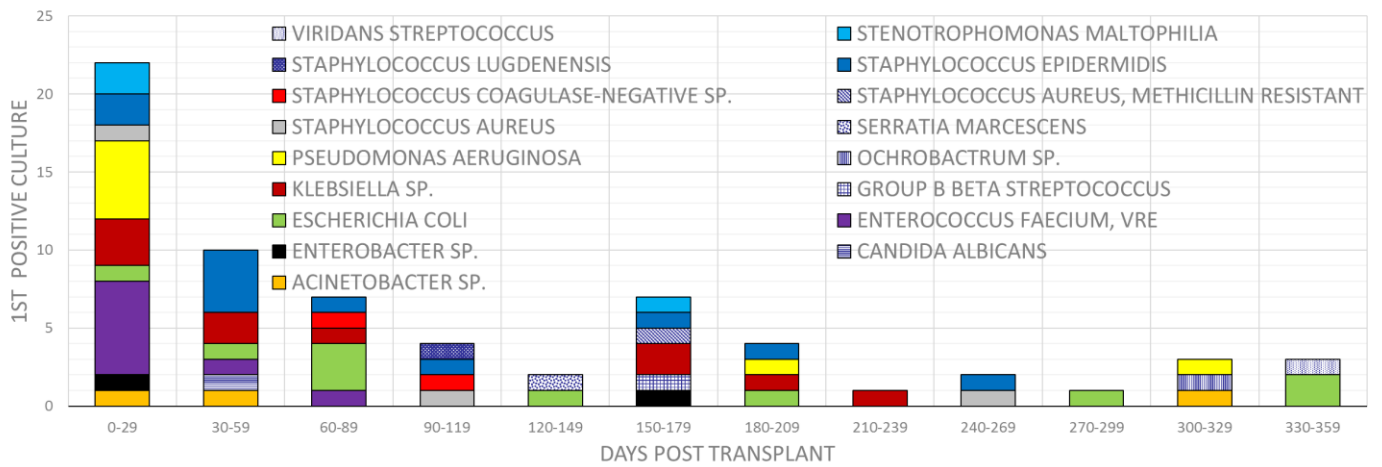


Figure 5. Onset of first BSI episode post transplantation