TRIO STUDIO: Recruitment and Study Design for Kidney Transplantation Microbiome Study

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# TABLE OF CONTENTS

| Topic of Studio: Recruitment and Study Design for Kidney Transplantation Microbiome Study | ................................................................. | 3 |
| Attendees: | .................................................................. | 3 |
| Summary: | .................................................................. | 3 |
| Top 3 Actions Proposed by the Studio Participants | .................................................................. | 3 |
| TRIO Studio Problem Description: | .................................................................. | 4 |
| Main problem for the studio participants to solve: | .................................................................. | 7 |
| Studio Methodology | .................................................................. | 7 |
| Design Science Method | .................................................................. | 7 |
| Design Thinking Based Solutions: | .................................................................. | 8 |
| Problem visualized with Insights | .................................................................. | 8 |
| High level insights: | .................................................................. | 10 |
| Solutions Generated by Design Thinking Approach Team: | .................................................................. | 11 |
| Appendix 1 | .................................................................. | 13 |
| Appendix 2 | .................................................................. | 13 |
| Appendix 3 | .................................................................. | 14 |
| Addendum 1 – 30-Day Follow Up | .................................................................. | 17 |
| Addendum 2 – 90-Day Follow Up | .................................................................. | 18 |
| Addendum 3 – 1 Year Follow Up | .................................................................. | 20 |
TRIO STUDIO: Recruitment and Study Design for Kidney Transplantation Microbiome Study

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Facilitator: Santosh Basapur, IIT Institute of Design

Attendees:
Tharani Jeyaram, UChicago; Pratik Shah, M.D., UChicago; Jyotsna Soundararajan, UChicago; Cynthia Tom Klebba, Loyola; Drew Simon, RUMC; Raj C. Shah, RUMC; Keiichi Sato, IIT; Nurie Dervishi ITM, UChicago; and Sherry Robison, ITM UChicago.

Summary:
Pratik Shah, M.D., Section of Nephrology, University of Chicago Medicine, introduced his study as a single-center, prospective, observational cohort study. Subjects who will be asked to participate in the study are adult kidney transplant recipients with no diagnosis of irritable bowel disease or on probiotics. Dr. Shah and his team plan to enroll 40 subjects on the study in a year. Dr. Shah requested the studio audience to ideate solutions for two questions:

1. How do we get pre-transplant time-matched stool samples from our subjects?
2. How do we recruit from other ITM institutions for this study?

Design Thinking approach was used to solve the problems faced by Dr. Shah and his team.

Top 3 Actions Proposed by the Studio Participants to Dr. Shah:

1. **Expand Collaboration to Other Physicians:** Attend weekly meetings for gastroenterology, nephrology, microbiome physicians, infectious disease, etc. to tell them about the study, gain some interest from other departments and recruit their patients.

2. **Patient Awareness Engagement:** Explain to patients what they are contributing, educate on microbiome, what is their quality of life and 30% of people face diarrhea post kidney transplant.

3. **Home Visits to Collect Samples:** Establishing a relationship with patients by going to their home or dialysis center to collect the samples would build trust and relationships. Shipping samples by Federal Express to the Clinical Research Center would assist the patients that live far away.
TRIO Studio Problem Description:

Pratik Shah, M.D., Section of Nephrology, University of Chicago Medicine, introduced his study. He explained the hypothesis of genetic markers in gut microbial populations before transplantation, and/or changes in microbial community structures soon after transplantation could predict which patients are at risk for developing diarrhea. Dr. Shah’s study is currently a single-center, prospective, observational cohort study. Subjects that will be asked to participate in the study are adult kidney transplant recipients with no diagnosis of irritable bowel disease or on probiotics. Dr. Shah and his team plan to enroll 40 subjects on the study in a year. The study is funded through a one year grant and the funding will end at the end of 2019.

Subjects who receive a transplant from a deceased donor will be asked to provide a stool sample when they enroll, 24-hours immediately prior to transplant, and post-transplant at 1 week, 1 month, 3 months, 6 months and at each episode of diarrhea. Deceased donor kidney transplants are difficult to predict which makes it hard to collect the stool samples, especially pre-transplant. Living donor kidney transplants are scheduled in advance and are easier to collect the samples. Kidney transplantation is the treatment of choice for patients with end-stage renal disease. Post-transplant diarrhea is a common debilitating complication after kidney transplantation (approximately 30%). A significant portion of post-transplantation diarrhea remains unexplained.
Subjects who receive a transplant from a living donor will be asked to provide a stool sample 1 month prior to transplant, 1 week prior and post-transplant at 1 week, 1 month, 3 months, 6 months and at each episode of diarrhea. Subjects will self-collect their stool sample in the kits provided by the research team. They will then bring the stool samples to their clinic visits. They also will have blood drawn and give urine at their visits. The stool samples, blood and urine will be stored in the Clinical Research Center at University of Chicago. Once samples from 6 subjects are received, they will be sent to Marine Biological Lab for 16S and shotgun sequencing.

Current efforts include generating a list of patients with highest probability of kidney transplant but this is difficult to predict. Collaboration with other kidney transplant medical centers with higher percentage of living donor kidney transplants has been unsuccessful as they are not interested in this research or they do not have the research teams in place.

Dr. Shah requested the studio audience to ideate solutions for two questions:

1. How do we get pre-transplant time-matched stool samples from our subjects?

2. How do we recruit from other ITM institutions for this study?
Figure 1. Dr. Shah presenting his kidney transplant study
Main problem for the studio participants to solve:
The goal is to collect time matched stool samples from kidney transplant recipients at serial time points before and after transplantation and analyze the diversity, composition and functional capacity of the microbiota over time. Dr. Shah and his team are doing this to help better understand post-transplantation diarrhea.

Dr. Shah’s call to action: “How do we get pre-transplant time-matched stool samples from kidney transplant patients (specifically deceased donor kidney transplant recipients)? How do we recruit from other ITM institutions for this study?”

Studio Methodology
Design Thinking approach used as part of the studio to solve this problem.

Design Science Method
We used the Design Science approach with five steps:

1. Created a free form mind map of the problem and identification of issues – Mind Mapping technique

2. Actionable insights were identified

3. Generated ideas to address issues

4. Synthesized solutions from the smaller ideas – Creative integration of smaller ideas led by Design Thinking Expert facilitator was done using white boards.

5. Solutions were proposed and were rated by the team on implement-ability (0-4 scale)
Design Thinking Based Solutions:

Problem visualized with Insights

The group first discussed the problem and its context yielding the following context diagram as well as the stakeholder map:

![Mind Map of Issues](image)

**Figure 2 Mind Map of Issues**
Figure 3 Stakeholder Map
High level insights:
Following the context discussions, insights were generated as follows:

Ideas:

Smaller sample size is alright (Not necessary to get 40 people)

Move collaboration call from Nephrology to G.I - they might have more research + ideas

Participatory design of trial

Engage patient advocacy group

Co-ordinator collects samples at subjects home

Testimonials of Transplanted patients
- Chicago police chief’s testimonial

Handouts/Brochures

Collect only stool sample
- Easier to explain to study
- Dialysis centre

Figure 4 Ideas as listed during discussion
Solutions Generated by Design Thinking Approach Team:
Five relatively implementable solutions were created to solve the issues of recruitment. They are as follows:

1. **Expand Collaboration to Other Physicians**: Attend weekly meetings for gastroenterology, nephrology, microbiome physicians, infectious disease, etc. to tell them about the study, gain some interest from other departments and recruit their patients.

2. **Patient Awareness Engagement**: Explain to patients what they are contributing, educate on microbiome, what is their quality of life and 30% of people face diarrhea post kidney transplant.

3. **Home Visits to Collect Samples**: Establishing a relationship with patients by going to their home or dialysis center to collect the samples would build trust and relationships. Shipping samples by Federal Express to the Clinical Research Center would assist the patients that live far away.

4. **Website**: Add to the website patient oriented information about kidney transplants, give information about research and have patient testimonials.

5. **Patient Voice in Trial Design**: Ask the patients about the study, what they would like happen, and how it can occur (bringing samples to clinic, sending samples, etc.). Have patients participate in quality of life after transplant sessions to help educate the physicians and study team.
Solutions:

Patient voice in Trial design (Participatory design) 5.

Patient awareness management
- Quality of life 2.
- 3%-people face
- What am I conditioning
- Microbiom education
- Citizen scientists
- Sharing analysis results to individuals who gave samples

Website
- Patient oriented information 4.
- Research Information
- Testimonials

Expand collaboration call to other physicians
- Attend weekly meetings 1.
- Gastroenterology
- Nephrology
- Microbiome researchers

Success stories of stool collection in complicated studies might help

Home Visits for samples

Shipped by Fedex packages/ Collect at dialysis appointment, Funding application for sampling study 3.

Figure 5 Solutions as visualized on whiteboards

<End of Document. Thank you.>
Appendix 1.
Slides used by Pratik Shah, M.D., University of Chicago Medicine.

Appendix 2.
Session Pictures
Appendix 3.
Actual pictures of white board from the studio session.
TRIO STUDIO: Recruitment and Study Design for Kidney Transplantation Microbiome Study

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**Ideas**

- Smaller sample size is ok (not necessarily 25 to 40 pp)
- More collaborations will form
- Nephrology to GI - they might have

- Participating Design of trial
- Engage Patient Advocacy Group
- Coordinator collects samples @ Stay home
- Testimonies - transplant pt.
- Chicago Police Chief's testimonial

- Collect only stool sample - easier to explain to sub
- Diagnostics ETA

**Results to Participants**

- Scores
- Individual results
- Preliminary data analysis (6 samples so far)

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**Mind Map**

- PROOF of Concept with Smaller N
- Collection Kit
- Study Team
- Hospital
- QoL
- C. Life
- Other Microbiome

**Insights**

- Transplant Centers
- Expanded list of potential collaborators
- Not enough awareness of other issues after transplant
SOLUTIONS

1. Expand collaboration call to others.
   - Attend weekly meetings for
     - Gastroenterology
     - Nephrology
   - Microbiome researchers
   - Sell stool collection in
     - Complicated Medical Help

2. Home visits for samples
   - Shipped by FedEx package
   - Collect at dialysis app
   - Funding Application for sampling

3. Patient voice in trial design
   - Quality of life after transplantation
   - What am I contributing
   - Microbiome education
   - Citizen Scientists

4. Website
   - Patient oriented information
   - Research info
   - Testimonials

5. Activation

MIND MAP

- Long-term
- Time Course
- SHORE
- SEASHORE
Addendum 1 – 30-Day Follow Up
Suggestions Proposed by the Studio Participants:

1. **Expand Collaboration to Other Physicians:** Attend weekly meetings for gastroenterology, nephrology, microbiome physicians, infectious disease, etc. to tell them about the study, gain some interest from other departments and recruit their patients.

**Implementation and Results:**
Since Design Studio on November 28, 2018, Dr. Shah has presented his study to his department. He has also meet with other research coordinators, within his department, to educate them on the study in hopes of enrolling some of their patients.

2. **Patient Awareness Engagement:** Explain to patients what they are contributing, educate on microbiome, what is their quality of life and 30% of people face diarrhea post kidney transplant.

**Implementation and Results:**
Since Design Studio on November 28, 2018, Dr. Shah and his research coordinator, Jyotsna Soundararajan, are explaining to their potential participants on microbiome and the quality of life associated with kidney transplant.

Dr. Shah has also requested the help of the TRIO Communications Specialist to assist with a study flyer he can submit to the IRB for approval. Upon approval, he will pass them out to his patients and post them throughout the medical center.

3. **Home Visits to Collect Samples:** Establishing a relationship with patients by going to their home or dialysis center to collect the samples would build trust and relationships. Shipping samples by Federal Express to the Clinical Research Center would assist the patients that live far away.

**Implementation and Results:**
In-home visits to collect samples will be done within the Chicago area. IF someone isn’t available to pick up the samples, a courier service has been retained to get the samples.

**Misc.:** Dr. Shah has submitted an amendment to the IRB in an attempt to call kidney transplant patients high up on the transplant list to see if they are interested in the study. This will help with recruitment as when someone is on the transplant list and a kidney becomes available, they will already be on the study and a pre-surgery sample would have been collected.
Addendum 2 – 90-Day Follow Up
Suggestions Proposed by Studio Participants

1. **Expand Collaboration to Other Physicians**: Attend weekly meetings for gastroenterology, nephrology, microbiome physicians, infectious disease, etc. to tell them about the study, gain some interest from other departments and recruit their patients.

**Implementation and Results:**

Since the 30-day follow-up, Dr. Shah has met with GI and explained the study to them and shared a case report form. He has also reached out to other ITM institutions and NWMH to see if they have interest in the study. No other institutions are interested.

2. **Patient Awareness Engagement**: Explain to patients what they are contributing, educate on microbiome, what is their quality of life and 30% of people face diarrhea post kidney transplant.

**Implementation and Results:**

Since the 30-day follow-up, Dr. Shah and his research team, are continuing to educate the patients on the study. They are also explaining to the potential subjects that there are no direct benefits and they are contributing to science.

Dr. Shah stated he would cite the ITM grant in any publications and has requested the help of the TRIO Communications Specialist to assist with a study flyer he can submit to the IRB for approval. Upon approval, he will pass them out to his patients and post them throughout the medical center.

3. **Home Visits to Collect Samples**: Establishing a relationship with patients by going to their home or dialysis center to collect the samples would build trust and relationships. Shipping samples by Federal Express to the Clinical Research Center would assist the patients that live far away.

**Implementation and Results:**

Since the 30-day follow-up, samples have been collected from participants via a courier service or a home visit.

4. **Website**: Add to the website patient oriented information about kidney transplants, give information about research and have patient testimonials.

**Implementation and Results:**
Dr. Shah and his research team have entered the study information to appear on the New Normal city wide research portal. The department has expressed concerns about patient testimonials on a website as there are no direct benefits to the subjects enrolled.

5. **Patient Voice in Trial Design:** Ask the patients about the study, what they would like happen, and how it can occur (bringing samples to clinic, sending samples, etc.). Have patients participate in quality of life after transplant sessions to help educate the physicians and study team.

**Implementation and Results:**

Dr. Shah and his research team are getting feedback from the enrolled subjects about the study, ways they can improve and any concerns about the collection of samples and the study.

**Misc.:** Dr. Shah and his research team have approached three subjects to enroll on the study and two are enrolled. Due to budget constraints, they have dropped their enrollment goal to eight to ten subjects. They will also attempt to extend the study if they don’t reach recruitment goals by September of 2019.
Addendum 3 – 1 Year Follow Up

**Misc.:** Dr. Shah has met his recruitment goal.

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**About the Institute for Translational Medicine (ITM)**

The ITM is a partnership between the University of Chicago and Rush in collaboration with Advocate Health Care, the Illinois Institute of Technology (Illinois Tech), Loyola University Chicago, and NorthShore University HealthSystem that’s fueled by about $35 million in grants from the National Center for Advancing Translational Sciences at the National Institutes of Health through its Clinical and Translational Science Awards (CTSA) Program.

We’re part of a network of more than 55 CTSA Program-supported hubs across the country working to slash the time it takes to develop and share new treatments and health approaches. We work with you and for you to make participating in health research easy, so that together we improve health care for all.

Join the movement and learn more about how we help researchers, physicians, community members, industry, government organizations, and others. Visit us at [chicagoitm.org](http://chicagoitm.org) and connect with us on Facebook, Twitter, Instagram, YouTube, and LinkedIn @ChicagoITM.

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