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14. ABSTRACT

Hand and upper limb transplantation (a form of vascularized composite allotransplantation or VCA) is a new treatment option that aims to restore motor and mobility functions and sensation of the hand/arm. Upper extremity transplantation raises multiple ethical issues, particularly, about informed consent. The overall long-term objective of the proposed study is to optimize the informed consent process for people with upper limb amputations. The proposed study aims to: 1) Qualitatively assess the decision making and informed consent processes for hand transplantation; 2) Develop prototype educational materials (video, website, question prompt sheet) that provide patient-centered information to enhance understanding and reduce undue influence to pursue hand transplantation, and that are sensitive to different levels of dysfunction, residual limbs, health literacy levels, and different racial/ethnic groups; and 3) Formatively evaluate the educational materials through usability testing on people with upper limb amputations' and VCA candidates' understanding, satisfaction, and usability.

To date, a draft of the website content has been written and edited by all members of the research team. The website domain name ('Within Reach') has been purchased, the logo developed, and the website is being developed. One video was conducted with an individual with an upper limb amputation, and two videos with clinicians scheduled in September. A total of 11 people with upper limb amputations have participated in a cognitive interview (n=5) or In-Depth Interview (n=6). An initial draft of the Question Prompt Sheet has been developed based on In-Depth Interviews. Preliminary analysis of the In-depth Interviews reveals a general preference for informing people about the option of upper limb transplantation close to the time of the amputation, and no undue pressure to pursue upper limb transplantation. Participants' reported information needs about upper limb transplantation including: the process of getting an upper limb transplant, the hand or arm functioning post-transplant, the appearance of the graft, the risks of having an upper limb transplant, the rehabilitation process, recipients' experiences with the transplant, and the status of the VCA field.

15. SUBJECT TERMS
Ethics ,Hand Transplantation,UE Amputation, Informed Consent, Decision MakingVascular Composite Allotransplantation (VCA) Reconstructive transplantation, Education, In-Depth interviews, Focus groups
Thematic analysis, Qualitative research,Communication

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TABLE OF CONTENTS

1. INTRODUCTION:

Little is known about the informed consent process for upper extremity (UE) Vascularized Composite Allotransplantation (VCA). Consequently, the amount and type of information provided to patients about UE VCA varies. Such variation may contribute to people with UE amputations being inadequately informed, under-prepared, and feeling unduly pressured when considering this option. This study aims to examine the decision-making process, psychosocial concerns, and information needs about UE VCA among people with UE amputations, and to develop educational materials (i.e. website, videos, question prompt sheet) to help people with UE amputations make informed treatment decisions.

2. KEYWORDS:

Ethics
Hand Transplantation
UE Amputation
Informed Consent
Decision Making
Vascular Composite Allotransplantation
Vascular composite Allograft
VCA
Reconstructive transplantation
Education
In-Depth Interviews
Focus groups
Thematic analysis
Qualitative research
Communication

3. ACCOMPLISHMENTS:

What were the major goals of the project?

Specific Aim 1: Qualitatively assess the informed consent process for upper extremity-VCA transplantation.

Major Task 1: Submit IRB documents for local IRB review
Timeline: 9 months, 100% completed (NU and JHU), 75% (WR)

- Milestone #1: HRPO approval
  Timeline: 6-9 months, HRPO approvals at NU and JHU

Major Task 2: Recruit and consent human subjects

- Subtask 1: Place advertisements in newsletters and fliers in clinics
  Timeline: 9 months, 100% complete (NU, JHU), 3% (WR)
- Subtask 2: Submit internal requests, and contact collaborators and community clinics to obtain lists of eligible potential participants for recruitment, at all sites
  Timeline: 9 months, 100% complete (NU), 90% (JHU), 0% (WR)
- Subtask 3: Recruit participants and obtain informed consent
  Timeline: 10-15 months, 15% complete for NU goals, 0% complete for JHU or WR goals

Major Task 3: Conduct cognitive interviews, in-depth interviews, and online focus groups to assess: UE amputees' information needs, understanding of VCA risks, benefits, alternatives, and procedures, perceptions of voluntariness for UE VCA, candidates' perceptions of the informed consent process, and decision-making about UE VCA

- Subtask 1: Conduct cognitive interviews with (n=12) participants
  Timeline: 10-11 months, 100% complete (n=5) (NU only)
- Subtask 2: Revise in-depth interview guide based on cognitive interview feedback
  Timeline: 10-11 months, 100% complete

- Subtask 3: Submit revised in-depth interview guide for local IRB and HRPO review
  Timeline: 11-12 months, 100% complete (NU, JHU), 0% complete (WR)
- Subtask 4: Conduct in-depth interviews with (n=50) participants: UE amputees (n=25), VCA candidates (n=17), VCA participants (n=5), VCA recipients (n=3)
  Timeline: 12-18 months, 12% complete
- Subtask 5: Conduct online focus groups with UE amputees (n=25)
  Timeline: 12-18 months, 0% complete
- Subtask 6: Transcribe in-depth interviews and online focus groups
  Timeline: 12-18 months, 12% complete
- Subtask 7: Conduct qualitative data analysis
  Timeline: 10-21 months, 5% complete
- Subtask 8: Co-author manuscript on Aim 1 findings
  Timeline: 18-24 months, 10% complete
- Milestone #2: Manuscript on informed consent, information needs for VCA
  Timeline: 18-24 months, 10% complete

Specific Aim 2: Develop educational materials (video, website, question prompt sheet) that provide patient-centered information about upper extremity VCA

Major Task 1: Develop the website

Timeline: 12-26 months, 30% complete

- Subtask 1: Set up server, obtain web domain, establish ADA standards compliance
  Timeline: 12 months, 60% complete
- Subtask 2: Establish learning objectives to guide content based on information obtained from Aim 1, clinical expertise in UE, VCA, military health, ethics, and adult learning theories
  Timeline: 12-14 months, 25% complete
- Subtask 3: Write initial draft of website content, create and revise prototypes and wireframes of website design and functionality for review in phase 1 telephone focus groups
  Timeline: 15-18 months, 50% complete
- Subtask 4: Create graphics, logo, website name, and illustrations, purchase photographs, based on phase 1 focus groups, and for review in phase 2-3 focus groups
  Timeline: 15-21 months, 20% complete
- Subtask 5: Submit website content and telephone focus group moderators guide to local IRBs and HRPO for review
  Timeline: 19 months, 0% complete
- Subtask 6: Recruit and conduct 9 telephone focus groups
  Timeline: 19-24 months, 0% complete
- Subtask 7: Transcribe telephone focus groups
  Timeline, 19-24 months, 0% complete
- Subtask 8: Iteratively analyze telephone focus group data to inform revisions of website content and website design for further review in subsequent telephone focus groups
  Timeline, 19-26 months, 0% complete
- Subtask 9: Iteratively review and provide feedback on website design, instructional design, and functionality to Advantage Marketing website developers
  Timeline: 19-26 months, 10% complete
- Subtask 10: Revise website design and content
  Timeline, 19-26 months, 0% complete

Major Task 2: Create Video Testimonials (n=15)

- Subtask 1: Establish goals and learning objectives of videos
  Timeline: 20 months, 100% complete
- Subtask 2: Recruit and audition amputees for videotaping
  Timeline: 21-24 months, 6% complete
- Subtask 3: Videotape UE amputee and clinician testimonials
  Timeline: 21-24 months, 20% complete
- Subtask 4: Edit and link in video testimonials into website
  Timeline: 21-24 months, 5% complete

Major Task 3: Develop the Question Prompt Sheet (QPS)

- Timeline: 12-26 months, 10% complete
- Milestone #3: Complete VCA-QPS development
  Timeline: 12-26 months, 0% complete

Specific Aim 3. Formatively evaluate the educational materials through usability testing

- Subtask 1: Prepare 6 task scenarios of topics or sections to find on the website during usability testing
  Timeline: 25-26 months, 0% complete
- Milestone #4: Complete UE VCA website
- Timeline: 31-33 months, 0% complete
- Milestone #5: Manuscript on website development and usability testing for UE VCA,
- Timeline: 36 months, 0% complete

What was accomplished under these goals?

Specific Aim 1: Qualitatively assess the informed consent process for upper extremity-VCA transplantation.

Major Task 1: Submit IRB documents for local IRB review

- Subtask 1: Prepare protocol, recruitment letters, consent forms, and advertisements for local IRB review, hire staff – **100% Complete**
  - An IRB reliance agreement was executed by NU and WR on 10/23/19 (Jan)
- Subtask 2: Submit IRB approval and necessary documents for initial HRPO review - **100% Complete (NU and JHU), 75% (WR)**
  - Northwestern IRB submitted: 6/9/19
  - Northwestern IRB approved: 7/10/19
  - Johns Hopkins IRB submitted: 10/22/19
  - Johns Hopkins IRB approved: 1/29/20
  - Walter Reed IRB submitted: 11/19/19
  - Walter Reed IRB (administrative review) approved: 4/27/20
  - NU received IRB approval for the modification in which Walter Reed is performing opt-in recruitment 3/13/20
  - WR drafted the data sharing agreement, which is pending Defense Health Agency (DHA)/HRPO review/approval, after obtaining IRB approval (July)
  - WR drafted the CRADA/DSA, which is pending final approval by the business agreement office at WR, after obtaining IRB approval (July)
  - NU submitted WR IRB protocol to the NU IRB as the IRB of record for initial WR approval: 9-17-20
- Milestone #1: HRPO approval
  - Northwestern HRPO approved: 1-8-20
  - John's Hopkins HRPO approved: Dr. Henderson: 6-5-20, Dr. Brandacher: 3-30-20
  - Walter Reed HRPO: first revisions received from HRPO: 8-1-20, re-submitted to HRPO: 8-4-20; review is not yet approved and is still in process
- Subtask 3: Develop the in-depth interview guide and focus group moderator's guide - **100% complete**
- Subtask 4: Training of research teams (via lecture presentations and readings) at all sites - **100% complete** (Jan)
  - Hiring was completed at: NU, Johns Hopkins, Walter Reed
  - NU created a Manual of Operations and Procedures (MOP)
  - Dr. Gordon trained research staff at NU, WR/USU, and JHU on: organ transplantation, VCA, UE VCA, informed consent, VCA ethics; study objectives, deliverables, and timeline; qualitative methods, qualitative interviewing techniques, In-Depth Interview guide questions; operations, recruitment processes, data entry and management
  - All databases were created for data entry for each data collection activity in REDCap, tracking the recruitment process, tracking compensation for participants
  - Created a consort diagram for routine reporting
  - Held weekly multi-site team meetings since 9/9/19

- All team members created biographical descriptions for the website
- Dr. Brandacher provided guidance to all research staff: via PowerPoint presentation on UE VCA, amputation
- Newly hired research study personnel at all sites completed training as of September, 2020

Major Task 2: Recruit and consent human subjects

- Subtask 1: Place advertisements in newsletters and fliers in clinics - **100% complete** (NU, JHU), 3% (WR)
  - Posted fliers that advertised the study at the Shirley Ryan AbilityLab in Chicago, IL (July)
  - Posted fliers that advertised the study at the WR National Military Medical Center (WRNMMC) in Bethesda, Maryland (July)
  - Purchased and posted advertisements in:
    - On the Move e-newsletter, appearing in July, September, and November 2020 editions.
    - Amplitude e-newsletter, appearing in August, October, December 2020 editions
- Subtask 2: Submit internal requests, and contact collaborators and community clinics to obtain lists of eligible potential participants for recruitment, by research staff at all sites - **100% complete (NU), 100% complete (JHU), 0% complete (WR)**
  - Contacted health care providers at the Shirley Ryan Ability Lab to obtain a list of eligible participants (Apr)
  - JHU Obtained list of eligible potential participants (July)
  - NU downloads updated EDW database bi-weekly – has identified n=25 potential participants to date
  - JHU Contacted n=42 online support groups for people with UE amputations to advertise study
- Subtask 3: Recruit participants and obtain informed consent by staff - **15% complete for NU goals, 0% complete for JHU or WR goals**
  - NU obtained informed consent from n=5 cognitive interview participants
  - NU obtained informed consent from n=11 patients for in-depth interviews
  - NU obtained informed consent from n=4 patients for online focus groups

Major Task 3: Conduct cognitive interviews, in-depth interviews, and online focus groups to assess: UE amputees' information needs, understanding of VCA risks, benefits, alternatives, and procedures, perceptions of voluntariness for UE VCA, candidates' perceptions of the informed consent process, and decision-making about UE VCA

- Subtask 1: Conduct cognitive interviews with (n=12) participants - **100% Complete** (n=5) (NU only)
- Subtask 2: Revise in-depth interview guide based on cognitive interview feedback – **100% Complete**
- Subtask 3: Submit revised in-depth interview guide for local IRB and HRPO review – **100% complete (NU, JHU), 0% complete (WR)**
  - NU received approval by IRB and HRPO (July)
  - JHU received approval by IRB, but HRPO review is pending (July)
- Subtask 4: Conduct in-depth interviews with (n=50) participants: UE amputees (n=25), VCA candidates (n=17), VCA participants (n=5), VCA recipients (n=3) – **12% Complete**
  - Research team developed new systems for working remotely (i.e. study participant compensation delivery methods, audio recording and storage, telephone logistics) (July)
  - NU conducted n=6 in-depth interviews with participants with UE amputations
- Subtask 5: Conduct online focus groups with UE amputees (n=25) **0% Complete**
  - Purchased vBulletin software program license to host online focus groups (July)
  - Installed software and developed forum to host online focus groups
- Subtask 6: Transcribe in-depth interviews and online focus groups – **12% Complete**
  - N=6 of 6 in-depth interviews have been transcribed
- Subtask 7: Conduct qualitative data analysis – **5% Complete**
  - Developed an initial codebook (deductive codes) for in-depth interview analysis (Apr)
  - Research team completed qualitative analysis training (July)
  - NU research team began inductive coding of in-depth interviews
- Milestone #2: Manuscript on informed consent, information needs for VCA – **10% Complete**
  - Abstract was accepted as a poster for the 2020 ATC annual meeting (Apr)
  - Completed first draft of the qualitative manuscript Introduction and Methods section (July)

Specific Aim 2: Develop educational materials (video, website, question prompt sheet) that provide patient-centered information about upper extremity VCA.

Major Task 1: Develop the website

- Subtask 1: Set up server, obtain web domain, establish ADA standards compliance – **60% Complete**
  - Two website domain names were purchased: WithinReach.info and GraspInsight.org (Apr)
  - Chose 'WithinReach.info' for website domain name (July)
  - Began website evaluation internally for 'Health on the Net' certification (75%) (July)
- Subtask 2: Establish learning objectives to guide content based on information obtained from Aim 1, clinical expertise in UE, VCA, military health, ethics, and adult learning theories - 25**% Complete**
- Subtask 3: Write initial draft of website content, create and revise prototypes and wireframes of website design and functionality for review in phase 1 telephone focus groups – **50% Complete**
  - The team wrote and edited first and second drafts of website content (Apr)
  - PIs and collaborators provided feedback on website content (Apr)
  - Completed 'Steps to getting an upper limb VCA' informative content (July)
  - Completed 'Upper Extremity VCA Timeline' informative content (July)
  - Refined website glossary terms (July)
  - Compiled news story quotes from UE VCA recipients (July)
  - First draft of website prototype developed (i.e. design, navigation, text formatting) (July)
- Subtask 4: Create graphics, logo, website name, and illustrations, purchase photographs, based on phase 1 focus groups, and for review in phase 2-3 focus groups – **20% Complete**
  - Research team chose website logo and color scheme developed by marketing team (July)
  - Possible UE VCA photographs to use on website have been compiled and will be selected and purchased at a later date, depending on website content (July)
- Subtask 9: Iteratively review and provide feedback on website design, instructional design, and functionality to Advantage Marketing website developers – **10% Complete**
  - A meeting was held between NU's research staff, NU's video production staff, and Advantage Marketing staff to discuss and revise the website design (e.g., content, logo, and name), instructional design, and functionality (Apr)
  - A 2nd meeting was held between NU's research staff, NU's video production staff, and Advantage Marketing staff to discuss and revise the website design (July)

Major Task 2: Create Video Testimonials (n=15)

- Subtask 1: Establish goals and learning objectives of videos – **100% Complete**
  - NU's research staff and video production staff held a meeting to establish the goals and learning objectives of videos (Apr)
  - The video production staff for each site held a meeting to discuss and coordinate video production plan (Apr)
  - The video questions for people giving testimonials have been developed (Apr)
- Subtask 2: Recruit and audition amputees for videotaping - **6% Complete**
  - n=1 amputee was recruited for a video
- Subtask 3: Videotape UE amputee and clinician testimonials - **20% Complete**
  - n=1 upper limb amputee, and n=1 clinician videos completed at NU
  - n=1 clinician video scheduled
- Subtask 4: Edit and link in video testimonials into website - **5% Complete**
  - NU research staff have begun initial video editing process

Major Task 3: Develop the Question Prompt Sheet (QPS)

- Subtask 1: Prepare draft of QPS based on Aim 1 results **10% Complete**
  - Drafted a preliminary QPS based on cognitive interviews (Apr)
  - Extracted questions from all in-depth interviews conducted to date to populate the QPS draft
  - Research team reviewed the QPS draft to improve organization and clarify question wording

What opportunities for training and professional development has the project provided?

Brianna Kuramitsu, Research Coordinator, Sr. at Northwestern University, attended the 28th International Congress of The Transplantation Society (TTS 2020) September 15-16

How were the results disseminated to communities of interest?

- Dr. Gordon presented the study at the DOD RTRP Stakeholders Meeting on 11/7/19
- Dr. Gordon presented a poster on VCA ethics at the American Transplant Congress 2020 annual meeting
- An abstract on VCA ethics was accepted for oral presentation in a VCA panel proposal organized by Dr. Gordon at the American Society for Bioethics and Humanities in October, 2020
- An abstract on VCA ethics was submitted to the American Society for Reconstructive Transplantation (ASRT) 2020 Biannual meeting, pending notification.

What do you plan to do during the next reporting period to accomplish the goals?

During the next quarter, we plan to continue to: conduct in-depth interviews, prepare manuscript #1, film videos and edit them for testimonial segments, refine the QPS based on in-depth interviews, prepare manuscript #2 on the QPS, refine website content based on in-depth interviews.

During the next reporting period, we will:

- Continue to refine website content and materials based on in-depth interviews
- Continue to develop the navigation, formatting, and usability of the website
- Create graphics, illustrations, and purchase photos for website prototype
- Continue to hold weekly research team meetings
- Post and share study fliers in clinics and at virtual and support groups
- Recruit and consent individuals for in-depth interviews and online focus groups (NU only)
- Complete in-depth interviews
- Conduct online focus groups (NU only)
- Transcribe in-depth interviews
- Refine the Question Prompt Sheet based on in-depth interviews
- Begin qualitative data analysis of in-depth interviews and online focus groups
- Submit abstracts to the American Society of Reconstructive Surgery, the American Society for Bioethics and Humanities, and the American Transplant Congress
- Prepare manuscript #1 on the in-depth interviews
- Prepare manuscript #2 on the QPS
- Film videos and edit them for testimonial segments

4. IMPACT:

What was the impact on the development of the principal discipline(s) of the project?

Cognitive and in-depth interviews conducted thus far provide insights into UE amputees' information needs, psychosocial concerns, and decision-making processes for UE VCA. Preliminary findings suggest people with UE amputations have limited awareness of UE VCA. Additionally, people with UE amputations desire information about upper limb transplantation, including the process for getting an UE VCA, expectations for recovery and functionality, and recipient experiences with UE VCA. From the In-Depth Interviews, several factors were identified as influencing participants' decisions to hypothetically pursue or not pursue UE VCA. For example, some participants reported having adapted to their amputation, and, as a result, they were less receptive to the idea of undergoing UE VCA. Relatedly, participants generally agreed that the best time to be informed about UE VCA is near the time of amputation, either before the scheduled surgery or within the first couple weeks or months thereafter. These preliminary findings support the need for UE VCA programs to address patients' information needs and psychosocial concerns to facilitate decision-making and the informed consent process. Our next steps will be to continue conducting the In-Depth Interviews to expand upon and identify other themes. We will leverage study findings to inform the development of educational materials that include a website, videos, and a question prompt sheet, to make UE VCA information more accessible to people with UE amputations in order to facilitate informed decision-making and the informed consent process in the future.

What was the impact on other disciplines?

Preliminary findings suggest a need to better inform and prepare patients in decision making and the informed consent process for UE VCA. Findings from this research may inform future research in other types of VCA organ programs to identify information needs and improve the decision-making process for patients.

What was the impact on technology transfer?

Nothing to report

What was the impact on society beyond science and technology?

Nothing to report

5. CHANGES/PROBLEMS:

Changes in approach and reasons for change

Nothing to report

Actual or anticipated problems or delays and actions or plans to resolve them

Staff Turn-Over: Northwestern University experienced a delay in hiring a staff manager in 2019. The staff manager resigned after 1 month (Jan, 2020). The new manager was hired in Aug, 2020. One staff member resigned in July, 2020, which slowed productivity. At JHU, one staff with expertise in qualitative research left and was replaced with another. At WR, two staff members resigned and two new individuals joined the team. All members of the team have been trained in the study protocol and interviewing.

IRB delays: Walter Reed received IRB approval on 4-27-2020, however, due to updating of study documents, the team submitted a modification on 09-08-2020 to WR IRB that added new personnel to the protocol, removed team members who had departed, updated a few study documents with new team member contact information and version numbers, and added a slight modification to the recruitment process. Additionally, NU, as the IRB of record, needed to approve these modifications, which WR sent to them on 09-16-2020, as well as update the in-depth interview guide with a few minor changes. On 10-05-2020, NU IRB approved all these modifications. WR staff submitted the NU IRB letter of approval to WR IRB on 10-06-2020. Upon receipt of WR IRB approval, the WR team will submit an addendum adding the new version of the in-depth interview guide to the protocol. Once this submission has also been approved by the WR IRB, the WR team will submit all materials to HRPO for final approval. Although administrative delays are partly outside the team's control, the staff works diligently to complete tasks quickly and follow-up with the IRB and other administrative entities until tasks are completed.

Although the in-depth interview guide was in good shape after completing the cognitive interviews at NU in early spring 2020, we wanted JHU to perform 1-2 cognitive interviews with their VCA candidates. JHU submitted a request to obtain the names and contact information of VCA candidates, participants, and recipients for recruitment. Two major delays emerged unexpectedly: 1) obtaining this contact list unexpectedly took weeks to months; 2) we learned that for such individuals, because they are part of a separate IRB protocol for undergoing upper extremity VCA, required that the clinicians involved in the aforementioned IRB protocol, approve our access to this patient population. Additionally, those clinicians had to undertake a 2-step recruitment process of mailing letters followed by telephone calls to obtain permission by the patients in order for our DOD study research team to contact them for recruitment. Because this process was taking an unexpectedly very long time, we decided to proceed with submitting the IRB modification of the revised in-depth interview guide to NU and JHU so that we can begin conducting the in-depth interviews. The positive outcome of this is that JHU now has their patient contact list (from 2015-present) prepared and ready to use and recruitment letters have been sent to individuals on this list. JHU's IRB has approved the modification of the revised in-depth interview guide, and it is currently under HRPO's review. As soon as HRPO approves the modification, JHU may begin recruitment for the in-depth interviews. JHU has since obtained their patient contact list from prior to 2015. It appears like these delays were inevitable, and we believe that our decision to proceed will now allow our recruitment process to move forward smoothly.

COVID 19: Due to the current pandemic, researchers from all study sites are working remotely at home. Team meetings are still held weekly and productivity remains constant. Fortunately, all data collection activities were originally planned for telephone or online research, thus, continuing with that plan should be fine. However, other aspects of our research have slowed productivity: filming the video testimonials had to be cancelled due to COVID. However, we can now successfully videotape through Zoom. We are also permitted to video-tape in person at NU and JHU. Additionally, working from home has presented an IRB-related challenge to the recruitment of eligible participants who do not have an email address. Research staff do not have the capacity to print recruitment letters, gain access to office supplies, or postage to send recruitment letters by postal mail to eligible participants without an email address. While NU's IRB permitted cold calling, JHU's IRB did not permit cold calling for such eligible participants. Due to COVID, staff at JHU are not able to attend support group meetings for people with UE amputations. However, JHU staff have been contacting support groups, which have agreed to disseminate study fliers to support group members to increase interest in participating.

Recruitment challenges: At NU and its partner Shirley Ryan, all potentially eligible patient participants have been contacted to request study participation. Additionally, advertisements about the study have been posted in several social media venues including Reddit, and in purchased online newsletters. Those advertisements yielded 3 responses. Although 3 people provided informed consent to partake in online focus groups, only 1 person could be reached and, due to 1 being too few for a focus group, we conducted the in-depth interview instead. In the next period, we will ramp up our efforts to leverage social media to increase study participation. Additionally, we expect IRB and HRPO approvals to be granted to JHU and WR, which will open the bottleneck to recruitment.

Changes that had a significant impact on expenditures

We conducted fewer cognitive interviews than planned due to achieving saturation, and delays in JHU's IRB approvals. Thus, there may be a small portion of funding left for this data collection activity. However, due to the need for at least 2 research staff at NU to be engaged in qualitative data analysis, we used the unspent funds to purchase qualitative data analysis software. Due to IRB and HRPO delays and study participant delays, fewer participants have been recruited than expected. Thus, expenditures are lower than expected. However, as soon as the IRB and HRPO approvals are obtained, we expect to complete all data collection activities, which is draw down upon the budget.

Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents

Significant changes in use or care of human subjects

Nothing to report

Significant changes in use or care of vertebrate animals

Nothing to report

Significant changes in use of biohazards and/or select agents

Nothing to report

6. PRODUCTS:

Publications, conference papers, and presentations

Journal publications.

Nothing to report

Books or other non-periodical, one-time publications.

Nothing to report

Other publications, conference papers and presentations.

Kuramitsu B, Berumen C, Sung HC, Ferzola A, Brandacher G, Henderson M, **Gordon EJ**. Informed Consent and Decision Making for Upper Extremity VCA. Poster presented at the American Transplant Congress. Philadelphia, PA. [D-234] June 2, 2020.

Kuramitsu B, Berumen C, Sung HC, Ferzola A, Cooney C, Brandacher G, Henderson M, Tintle S, **Gordon EJ**. Paper presented on the panel, "VCA Ethics: How do we determine flourishing in VCA transplantation?" (EJ Gordon, Panel Organizer), at the American Association of Bioethics and Humanities Virtual Annual Conference, October 15, 2020.

Kuramitsu B, Berumen C, Ferzola A, Sung HC, Scarton D, McHugh T, Schultheis A, Riggleman T, Taylor J, Cooney C, Henderson M, Tintle S, Brandacher G, **Gordon EJ**. Patients' Psychosocial Perceptions, Information Needs, and Decision Making about Upper Extremity VCA. Abstract submitted for presentation at the American Society for Reconstructive Transplantation 2020 biannual meeting. Notification is pending.

Website(s) or other Internet site(s)

Nothing to report

Technologies or techniques

www.WithinReach.info

This website is still being built, and is thus not yet open to the public.
This website will serve as a neutral decision aid that provides a wealth of information about upper limb VCA designed to help people make informed decisions about upper limb transplantation.

Inventions, patent applications, and/or licenses

Nothing to report

Other Products

Nothing to report

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS:

What individuals have worked on the project?

Note: **All calendar months are reported as true calendar months, not annualized.**

Name: Dr. Elisa Gordon
Project Role: Initiating Principal Investigator
Researcher Identifier (e.g. ORCID ID): 0000-0003-0969-1998
Nearest person month worked: 2.0
Contribution to Project:

Study Oversight at Northwestern University and across all study sites, coordinated communications with Partnering PIs and collaborators, trained staff, prepared abstracts and manuscript drafts, led qualitative data analysis, assisted with online recruitment, and the development of educational materials, participated in weekly team meetings.

Name: Brianna Kuramitsu
Project Role: Research Study Coordinator, Sr.
Nearest person month worked: 6.0
Contribution to Project:

Managed communications across all study sites, performed participant recruitment, data collection, and data analysis, contributed to the development of educational materials and preliminary codebook, prepared abstracts and manuscript drafts, participated in weekly team meetings.

Name: Jessica Gacki-Smith
Project Role: Research Project Manager
Nearest person month worked: 1.0
Contribution to Project:

Name: Cindy Berumen
Project Role: Research Study Coordinator
Nearest person month worked: 4.0
Contribution to Project:

Assisted with recruitment, data collection, the development of educational materials and preliminary codebook, prepared abstracts and manuscript drafts, participated in weekly team meetings.

Name: Dr. Greg Dumanian
Project Role: Co-Investigator, Hand surgeon
Researcher Identifier: 0000-0002-0389-5191
Nearest person month worked: 1.0
Contribution to Project:

Assisted with the Electronic Data Warehouse (EDW) request by identifying numbers of hand surgery eligible participants. Participated in a video.

Name: Dr. Sally Jensen, PhD
Project Role: Co-Investigator, Psychologist
Researcher Identifier: 0000-0002-2078-3263
Nearest person month worked: 1.0
Contribution to Project:

Provided guidance on UE amputee support groups and first draft of website content.

Name: Dr. Macey Henderson
Project Role: Partnering Principal Investigator
Researcher Identifier: 0000-0002-4239-1252
Nearest person month worked: 0.90
Contribution to Project:

Provided oversight to the study at JHU, provided input on website materials, provided expertise on VCA, assisted in recruitment strategy and video production for JHU.

Name: Dr. Gerald Brandacher
Project Role: Partnering Principal Investigator
Researcher Identifier: 0000-0001-7790-441X
Nearest person month worked: 1.08
Contribution to Project:

Provided training on VCA, provided input on educational materials under development.

Name: Hannah Sung
Project Role: Qualitative Research Data Analyst
Nearest person month worked: 6.0
Contribution to Project:

Qualitative expert at JHU, Participated in weekly meetings, assisted with the development of educational materials and preliminary codebook.

Name: Sarah Rasmussen
Project Role: Research Data Analyst
Researcher Identifier: 0000-0002-4644-3590
Nearest person month worked: 0.60 CM

Contribution to Project:

Assisted with initial IRB proposal at JHU

Name: Alex Ferzola
Project Role: Research Program Assistant
Nearest person month worked: 6.0
Contribution to Project:

Participated in weekly meetings, assisted with preparing a database of eligible participants, contributed to the development of educational materials and preliminary codebook.

Name: Carisa Cooney
Project Role: Co-Investigator, Psychologist
Researcher Identifier: 0000-0002-5475-206X
Nearest person month worked: 0.84
Contribution to Project:

Managed IRB preparation and submission at JHU, assisted with drafting website materials, assisted with obtaining a list of eligible patients.

Name: Dr. Scott Tintle
Project Role: Partnering Principal Investigator at WRNMMC
Researcher Identifier:
Nearest person month worked: 0.3
Contribution to Project:

Provided leadership, supervision, and guidance for the study and the WRNMMC research team, assisted with editing website materials

Name: Christopher Kim
Project Role: Research Assistant
Nearest person month worked: 1.55
Contribution to Project:

Supervised the regulatory submissions, participated in weekly meetings, assisted with drafting educational materials.

Name: Dylan Scarton
Project Role: Research Coordinator
Nearest person month worked: 0.15
Contribution to Project:

Provided supervisory and administrative oversight of the WRNMMC research team, assisted with regulatory submissions and award transfer, intermittently attended weekly meetings.

Name: Melissa Hewitt
Project Role: Research Assistant
Nearest person month worked: 0.75
Contribution to Project:

Supervised and prepared the regulatory submissions, participated in weekly meetings, assisted with drafting and editing conference presentations, interview guides, and educational materials.

Name: Christina Kunkle
Project Role: Research Coordinator
Nearest person month worked: 0.17
Contribution to Project:

Provided supervisory and administrative oversight of the WRNMMC research team, assisted with regulatory submissions and award transfer, intermittently attended weekly meetings.

Name: Jerika Taylor
Project Role: Program Manager
Nearest person month worked: 0.29
Contribution to Project:

Provided supervisory and administrative oversight of the WRNMMC research team, managed the subaward, created and modified, as necessary, all documents related to the finance and management of this subaward, and ensured all necessary agreements were established

Name: Andrea Schultheis
Project Role: Research Occupational Therapist
Nearest person month worked: 0.43
Contribution to Project:

Supervised the regulatory submissions, participated in weekly meetings, assisted with drafting educational materials.

Name: Tiffany Riggleman
Project Role: Research Certified Occupational Therapist Assistant
Nearest person month worked: 0.25
Contribution to Project:

Participated in weekly meetings, assisted with drafting educational materials.

Name: Terrance McHugh
Project Role: Research Assistant
Nearest person month worked: 0.40
Contribution to Project:

Participated in weekly meetings, assisted with drafting website materials.

Name: William Roddy
Project Role: Data Manager
Nearest person month worked: 0.01
Contribution to Project:

Served as the primary study Data Manager, reviewed the study protocol and recommended data collection and management strategies, initiated the first draft of the DSA application (DSAA).

Name: Joshua Reini
Project Role: Data Manager
Nearest person month worked: 0.09
Contribution to Project:

Replaced the previous study Data Manager, Mr. Will Roddy, as the primary Data Manager, assisted Mr. Roddy with the study protocol review and recommendations, collected information for the DSAA and completed its first draft, provided relevant knowledge and guidance to the WRNMMC study team regarding data management concerns.

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?

Nothing to report

What other organizations were involved as partners?

Shirley Ryan AbilityLab (SRAL)
Chicago, IL
Contribution to the project: NU collaborates with an SRAL clinician to assist with recruitment. NU posts fliers advertising the study for opt-in recruitment in the SRAL library.

David Rotter Prosthetics
Joliet, IL
Contribution to the project: David Rotter (prosthetist) shares fliers advertising the study to his clients to aid with recruitment, participated in a video.

Advantage Marketing
Chicago, IL
Contribution to the project: Assist with hosting, the design, and the development of the educational website "WithinReach.info"

8. SPECIAL REPORTING REQUIREMENTS:

COLLABORATIVE AWARDS:

QUAD CHARTS:

9. APPENDICES:

Appendix 1: Abstract accepted for poster presentation at American Transplant Congress 2020

Appendix 2: Abstract accepted for oral presentation in VCA panel at the American Society for Bioethics and Humanities 2020

Appendix 1:

B. Kuramitsu, C. Berumen, A. Ferzola, H. Sung, C. Kim, D. Scarton, T. McHugh, A. Schultheis, T. Riggleman, J. Taylor, M. Henderson, S. Tintle, G. Brandacher, E. Gordon. **Informed Consent and Decision Making for Upper Extremity VCA**. Poster presented at the ATC Annual Meeting. June 2020.

Background
The field of upper extremity (UE) Vascularized Composite Allotransplantation (VCA) continues to advance with more patients undergoing the informed consent process each year. However, the informed consent process for UE VCA has not yet been standardized, and has not been empirically examined for its adequacy. Consequently, the amount, type, and personalization of information provided to patients about UE VCA likely varies. Such variation may potentially contribute to UE amputees being inadequately informed, under-prepared, and feeling undue pressure when considering this option.

Problem Statement
This paper examines the little known topic of UE amputees' and VCA candidates', participants', and recipients' perceptions of the informed consent and decision-making processes about UE VCA, as part of a broader Department of Defense-funded study. Patients' narratives have been an underutilized resource in shaping the informed consent process.

Approach
We will have conducted in-depth interviews among UE amputees, UE VCA candidates, participants, and UE transplant recipients (n=5-20) at three geographically distinct transplant and/or rehabilitation centers. Interviews will focus on participants' information needs, comprehension of information disclosed, perceptions of undue influence, and psychosocial factors affecting decision making for UE VCA. This paper will highlight informed consent elements distinct to UE VCA, as compared to other VCA organs and to solid organs.

Conclusions
UE amputees' insights can enable the informed consent process for UE VCA to become more patient-centered, and thereby help VCA candidates and participants become better prepared to undergo UE VCA. Our findings will be used to develop educational resources (e.g., a website, videos), which will provide comprehensive, standardized information to help potential recipients, their families, and the general public learn about UE VCA. Future research should assess differences in the informed consent and decision making processes across VCA organs.

Appendix 2:

E. Gordon. **Decision Making and Informed Consent for Upper Extremity VCA**. Paper presented in the Panel Session, "VCA Ethics: How do we determine flourishing in VCA transplantation?" at the American Society for Bioethics and Humanities Annual Meeting, October 2020.

This panel session examines the ethics of Vascularized Composite Allotransplantation (VCA), which involves transplants comprised of skin, muscle, nerve, tendon and/or bone as a functional unit to replace non-reconstructible tissues to restore function, quality of life, and social engagement, rather than promote survival. Examples include: face, arm, and uterus.

VCA challenges the ethical principles of non-maleficence, respect for persons, and voluntariness because: it is unclear if benefits outweigh risks to healthy individuals; few available data on functional and psychosocial outcomes limit patient's ability to provide informed consent; and patients' desperation may compromise voluntary decision-making.

This multidisciplinary panel involves clinicians, ethicists, behavioral scientists, and health policy experts from five institutions to examine these ethical issues and perceptions of "flourishing" among patients considering or receiving a uterus, face, or hand transplant and the public.

The first presentation examines public perceptions and misconceptions of VCA based on six focus groups (n=44), suggesting that public education is needed to enable family authorization for deceased donation.

The second presentation examines uterus transplant recipients' (n=20) process of treatment decision making and critically examines social assumptions about reproductive autonomy.

The third presentation examines preliminary interview data on upper limb amputees' (n=5) perceptions of factors that would influence decision-making, information needs for consent, and voluntariness.

The fourth presentation examines potential face transplant candidates' (n=6) perceptions of risks and benefits of face transplant versus alternative treatments, suggesting candidate information access and receptivity.

Each panelist and moderator will present in 13 minutes. The remaining 10 minutes will entail moderated discussion.

Ethical Factors Impacting Patients' Decisions to Pursue VCA

PI(s): CDR Scott Tintle, MD **Sponsor**: USAMRAA/CDMRP (prime); Northwestern University (sub) **Award Amount:** $158,826

Study/Product Aims

Aim 1: Qualitatively assess the informed consent process for upper extremity-VCA transplantation.

Aim 2: Develop educational materials (video, website, question prompt sheet) that provide patient-centered information about upper extremity VCA

Aim 3: Formatively evaluate the educational materials through usability testing

Approach

The overall long-term objective of the proposed study is to optimize the informed consent process for upper extremity VCA candidates.

Image source: https://www.hopkinsmedicine.org/transplant/news_events/double_arm_transplant.html

Accomplishments: All sites hired and trained new staff, NU conducted 6 in-depth interviews and filmed 2 videos, refined the QPS, purchased and posted advertisements, and submitted an abstract to ASRT.

Timeline and Cost

Activities / CY	19-20	20-21	21-22
Prepare regulatory documents, hire and train staff			
Conduct interviews, focus groups			
Develop website, videos, QPS			
Conduct usability testing			
Estimated Budget ($K)	**$31K**	**$50K**	**$44K**

Goals/Milestones

CY19 Goal – Preparation

☑ Prepare regulatory documents

☑ Hire and train study staff

CY20 Goals – Recruitment and analysis

☑ Conduct interviews and focus groups

☑ Analysis of interview and focus group transcriptions

☑ Develop educational materials: website and QPS

CY21 Goal – Formative evaluation

☐ Usability testing of website

☑ Prepare manuscripts and presentations

Comments/Challenges/Issues/Concerns

- Poster presented at the ATC; Paper presented at the ASBH
- Necessary adjustments due to COVID-19 pandemic prevented videos from being filmed
- IRB delays across sites slowed advancement of protocol

Budget Expenditure to Date: $31K