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Remote monitoring as the primary method of clinical trial oversight is increasingly common due to advancements in technology which allow SDV to be performed without site visits. However, remote monitoring often changes the workflow of the clinical trial site staff. This study aims to determine how remote monitoring affects the time allocation of site staff toward duties related to monitoring visits, and to identify which tasks are most affected when the sponsor uses a remote monitoring strategy. A survey was sent out to clinical research staff within BSWRI. Research staff tended to spend less time toward remote monitoring duties than on-site monitoring duties. Submitting source documents, regulatory, and AE documentation were identified as more time-consuming for remote monitoring, while preparing for visits and assisting the monitor while on-site were identified as more time-consuming for on-site monitoring. This study identified potential targets for improvements in the workflow of clinical trial sites.

A PILOT STUDY INTO THE IMPACT OF REMOTE  
MONITORING ON THE TRIAL SITE

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INTERNSHIP PRACTICUM REPORT

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IN CLINICAL RESEARCH MANAGEMENT

By  
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## CHAPTER I

### INTRODUCTION

The Clinical Oncology Research Coordination office in the Charles A. Sammons Cancer Center at Baylor University Medical Center in Dallas manages over 150 investigator initiated and pharmaceutical industry sponsored clinical trials that take place at the Baylor Dallas campus, ranging from phase 1 studies testing investigational products for the first time in humans, to large, multinational phase 3 trials. The Charles A. Sammons Cancer Center hosts clinical trials researching and treating a wide variety of hematologic cancers and solid tumors in adult patients.

This practicum project addresses the workflow of the clinical research site staff with regard to various monitoring strategies used in pharmaceutical industry sponsored clinical trials. When a pharmaceutical or medical device company conducts a clinical trial, they have a responsibility to ensure that the investigators that they have selected conduct the trial in a safe, and ethical manner, ensure study assessments are being performed, and that data is being captured accurately. Historically, this has been accomplished through the practice of on-site monitoring, where representatives of the pharmaceutical company sponsoring the study periodically visit the trial site and manually review medical records, informed consent documents, drug accountability logs, regulatory documents, and any other documentation relevant to the study [1]. Phase 2 and 3 clinical trials are often conducted across many different domestic and international sites, and performing on-site visits is costly and resource intensive. As a result, alternative monitoring strategies such as remote monitoring have been increasingly adopted by pharmaceutical companies as a method to reduce the cost of monitoring. Rather than physically visiting the trial site, during a remote monitoring visit, the monitor will receive the

documents that they need to review from the trial site via fax or email, and perform all source data verification remotely. Since the data under review by the monitor is typically in the electronic medical record, or patient and regulatory binders, remote monitoring requires the site staff to submit this documentation electronically, which is potentially time and resource intensive. The goal of this practicum report is to determine the impact of remote monitoring on the time spent by the research site staff towards monitoring visits and to identify the tasks that change when a sponsor utilizes a remote monitoring strategy. By establishing the changes in the workflow of the clinical research staff, trial sites can adapt to these new methods that appear to be the future of clinical research.

## CHAPTER II

### BACKGROUND

The ever-increasing cost of bringing an investigational drug to market is well documented. In 2013, the total out of pocket cost of pre-market approval research and development per new drug was estimated at \$1395 million USD, up from \$524 million in 2000 [2]. During the same time frame, the likelihood that a drug in clinical testing receives approval has decreased from 21.50% to 11.83%. The driving force behind the increase in cost and decrease in regulatory approval is multifactorial. One possibility is that clinical trials are becoming increasingly complex [3]. The shift in the pharmaceutical industry towards targeting chronic illnesses requires longer and more complex trials to measure safety and efficacy end points, and regulatory requirements may be driving pharmaceutical companies to collect more data than is scientifically necessary. Additionally, pharmaceutical companies and investors are more likely to fund investigational products with new therapeutic targets in hope of entering the marketplace with fewer competitors [4]. Development of these drugs tends to have a higher degree of uncertainty and lower probability of success compared to new drugs within established therapeutic classes, but also often come with market exclusivity if they are approved. With out-of-pocket R&D costs growing at a 9.3% annual rate the past decade, it is little wonder why pharmaceutical and device companies, as well as contract research organizations (CROs), are looking for ways to reduce research costs [2]. Cost increasing factors such as increasing regulatory burden and rewarding the development of novel therapeutic targets represent shifts in the industry as a whole, and arguably fall outside the control of the individual pharmaceutical company or CRO. Companies who run clinical trials must then examine the individual components of their trial expenses to determine where costs can be reduced. One area of

significant expense is the monitoring of trial sites to ensure the study is being conducted by the protocol and the data being collected is valid. One recent study analyzing clinical trial contracts and grants estimates that site monitoring accounts for around 14% of phase III trial costs [5].

Another study found in a survey covering 97% of all phase III studies conducted in Sweden, that 50% of phase III costs were associated with good clinical practice (GCP) related activities, with 50% of these costs going towards source data verification (SDV) [6]. The same study indicated that 72% of the surveyed companies did not agree that current GCP monitoring guaranteed a reliable scientific outcome.

Frequent on-site monitoring and 100% source data verification, where every entry on every case report form (CRF) is checked against the source document from which it was extracted from, such as the subject's medical records, has been the industry standard for monitoring clinical research [7]. Typically, a monitor is sent to the trial site within two weeks after enrollment of the first subject, and then returns every six to eight weeks for the duration of the study [1]. The frequency and duration of monitoring visits may be adjusted throughout the course of the trial based on the enrollment and performance of the trial site. During a visit, the monitor will compare data that has been entered into the electronic data capture (EDC) system with the subject's medical records, ensure that enrolled subjects meet eligibility criteria, review informed consent documents, and visit facilities involved in the study, such as the pharmacy or laboratory. After the monitoring visit, the monitor will typically create a visit report which outlines what was reviewed, any findings or deviations, and what actions were taken to correct any problems with protocol compliance or subject safety. The practice of 100% SDV is argued by some to be a conservative interpretation of the US Food and Drug Administration (FDA) and

International Conference on Harmonization E6 (ICH E6) guidelines, which outline the necessity of data verification but do not specify the nature or extent [7]. The ICH E6 guidelines outline monitoring responsibilities of the sponsor:

The determination of the extent and nature of monitoring should be based on considerations such as the objective, purpose, design, complexity, blinding, size, and endpoints of the trial. In general there is a need for on-site monitoring, before, during, and after the trial; however in exceptional circumstances the sponsor may determine that central monitoring in conjunction with procedures such as investigators' training and meetings, and extensive written guidance can assure appropriate conduct of the trial in accordance with GCP. Statistically controlled sampling may be an acceptable method for selecting the data to be verified [8].

A recent addendum to the ICH guidelines from November 2016 recognizes the need for alternative monitoring strategies and clarifies that the sponsor can choose their monitoring based on the needs of the trial.

The sponsor should develop a systematic, prioritized, risk-based approach to monitoring clinical trials. The flexibility in the extent and nature of monitoring described in this section is intended to permit varied approaches that improve the effectiveness and efficiency of monitoring. The sponsor may choose on-site monitoring, a combination of on-site and centralized monitoring, or, where justified, centralized monitoring. The

sponsor should document the rationale for the chosen monitoring strategy (e.g., in the monitoring plan) [8].

Similarly, the FDA has recently developed guidelines encouraging the use of risk based and remote monitoring strategies.

FDA is issuing this guidance to provide FDA's current recommendations regarding monitoring practices and to encourage sponsors to consider a change in approach to monitoring. FDA believes that risk-based monitoring could improve sponsor oversight of clinical investigations. This guidance is therefore intended to make it clear that risk-based monitoring, including the appropriate use of centralized monitoring and reliance on technological advances (e.g., e-mail, webcasts, online training modules), can meet statutory and regulatory requirements under appropriate circumstances [9].

FDA encourages greater use of centralized monitoring practices, where appropriate, than has been the case historically, with correspondingly less emphasis on on-site monitoring [9].

Both government regulatory agencies and international organizations have recently updated their guidelines to acknowledge that sponsors can employ monitoring strategies other than 100% on-site SDV provided that it can be justified for the study at hand.

On-site SDV consumes a large portion of the budget of a clinical trial, with the cost of each site visit alone estimated at \$1500 in 2009 [10]. As such, reducing the cost of SDV by reducing the frequency of site visits and employing alternative monitoring methods such as risk based and remote monitoring have become attractive. Remote monitoring has the potential to reduce the frequency and length of on-site monitoring visits by allowing the remote access to medical records and other relevant study documents [11]. SDV is often the most time-consuming aspect of monitoring visits, and the ability for monitors to perform SDV remotely would allow them to travel for monitoring duties only when an on-site presence is required, such as ensuring proper storage of the investigational product and visiting facilities relevant to the study. There are several proposed methods in which remote monitoring could be used to reduce overall clinical trial costs. Using a full-cost pharmaceutical industry economic model, [12] estimated that the total trial cost could be reduced by 21.1% by using remote monitoring techniques that included reducing the number of visits per site from 24 to 4 over 48 months and on-site SDV from 100% to 10%. Total trial cost reductions of 59% to 90% were predicted by combining remote monitoring strategies with other measures, such as a 25% reduction in the number of sites, use of an EDC and a shorter CRF, and use of a more streamlined clinical trial model sometimes adopted by government sponsored trials [12]. Another study using hypothetical data based on average trial parameters predicted a 23.5% reduction in the total cost of phase III oncology trials, mostly attributable to the reduction in travel expenses by reducing site visits from every 6 weeks to 10 weeks, using an EDC, and limiting trials sites to the United States [13]. Uren, *et al.*[14]were able to cut travel costs by two thirds by switching to a remote monitoring strategy in an already ongoing oncology trial. Over a 6-month period, two on-site visits and four remote monitoring visits were performed without an increase in the number of

data queries generated. The authors also pointed out that the savings could be re-invested into increasing patient enrollment by sponsoring subject travel expenses and increasing the number of trial sites outside of metropolitan areas.

While there is an obvious benefit to reducing the frequency of on-site visits, it is imperative to ensure the quality of data verification is not reduced in doing so. Bakobaki *et al.*[15] addressed whether queries found during on-site monitoring visits could also be identified by remote monitoring strategies. Out of 268 queries, they were able to identify 76 (28.4%) remotely using the existing study database and EDC, and an additional 179 (66.8%) queries by implementing additional remote monitoring strategies and uploading source documents for the monitor to review. Only 13 (4.9%) queries were determined unlikely to be detected using remote monitoring techniques and required direct on-site review of the subject binder. Of these 13 queries, all were determined to be unlikely to affect the results of the trial. Another study, which randomized adult and pediatric subjects due for a study visit to either have their trial data monitored by on-site SDV or remote SDV via remote access to the electronic medical record (EMR) showed similar results [11]. Remote monitoring was able to verify 99.5% of data points in the adult arm and 100% of data points in the pediatric arm. Monitors did take slightly longer time per item and per CRF page to review data remotely than on-site. However, this was attributed to a lag in communication with the sites, and does not account for the reduction in travel time. Notably, this study only evaluated SDV, and did not address other monitoring responsibilities such as informed consent documentation, regulatory documentation, and drug accountability. Journot *et al.* [16] evaluated an existing system in a hospital research department that remotely monitored informed consent documents prior to subject enrollment. Remote

review of the informed consent documents detected 80% of nonconformities, with an additional 20% being detected on site, demonstrating remote monitoring of the ICF, and possibly other regulatory documents, as a feasible alternative to on-site review. However, the authors noted that this procedure came with a learning curve, and added to the workload of both the clinical research associates and the trial site staff.

Given the substantial cost of GCP related activities and growing body of evidence that little quality of data verification is lost through remote monitoring, sponsors view this as an area prime for reform. Nevertheless, remote monitoring has its own challenges. Information security is often a concern when allowing source data to be accessed or sent off site. Subject identification and health information needs to be protected, and documents that are typically stored on site need to be de-identified before they are scanned or faxed to the sponsor [17]. Allowing off-site access to EMRs can be problematic as well. Hospitals and clinics need to ensure that monitors do not access medical records in a non-secure location, such as outside of the office or in the presence of people not authorized to view protected health information [14]. There is also concern that having remote access to the EMR would increase the frequency of which the monitor performs SDV, and increase the overall number of queries. Uren *et al.* [14] accounted for this by scheduling remote monitoring visits with a frequency similar to on-site visits and planning which CRFs would be reviewed in advance. Additionally, there are monitoring responsibilities performed on-site that are difficult to transfer off-site. For instance, while handling and storage of the investigational product can be documented, on-site visits allow the monitor to ensure that the product is handled and stored as specified by the sponsor [17]. Any non-compliance can be quickly identified by the monitor and addressed immediately. On-

site monitoring also allows the sponsor to ensure that the trial site is keeping proper records and that source documents are being reviewed and signed off on by the principal investigator.

Widespread implementation of a remote monitoring system requires coordination and adaptation from not only the sponsors, but the trial sites as well. The majority of the current literature on remote monitoring addresses the quality of SDV compared to traditional on-site monitoring and the financial impact on the part of the sponsor. Little research has been done concerning the impact of remote monitoring upon the day-to-day workload and responsibilities of the trial site. Investigative site work burden increased at an annual rate of 10.5% between 1999 and 2005 [3]. Much of this is attributable to increases in protocol complexity and the number of study related procedures that trial sites are required to perform. In this timeframe, the number of unique study procedures per protocol increased 6.5% annually, and the total number of study procedures per protocol increased 8.7% annually. The average length of the CRF grown from 55 pages to 180 pages per protocol, an increase of 227% [3].

As sponsors design more complex protocols that collect more data points, trial sites must find ways to adapt to this change in workload. The Ontario Institute for Cancer Research (OICR) addressed this issue by creating the Ontario Protocol Assessment Level (OPAL) [18]. This tool attempts to rate the workload of oncology clinical trial protocols by assigning them a score based on parameters such as the phase of the trial, the number of procedures and processes, type of intervention being studied, and adjusting that score based on several optional elements such as whether the trial is inpatient or outpatient, or industry sponsored versus investigator initiated. The OPAL score can then be used to determine the workload that the protocol puts on

each staff member working on the trial, as well as the entire department. Notably, this system does take into account whether the study uses either on-site monitoring or 100% source document submission (i.e. remote monitoring) in calculating the total OPAL score, but applies the same weight to both monitoring techniques. OPAL is potentially a useful tool for evaluating the burden that a particular protocol places on the clinical trial site and determining how the trial site's resources and manpower should be allocated to efficiently handle multiple studies, but does not factor in differences in sponsor monitoring methods.

## SIGNIFICANCE

Much of the current literature concerning remote monitoring addresses the viability of remote monitoring in ensuring protocol compliance, patient safety, and the potential cost saving benefits for the sponsors and contract research organizations. A review of the current literature showed that little research has been done into how remote monitoring affects the trial site. Implementing a remote monitoring system potentially changes responsibilities of both the monitor when they conduct a site visit, and the clinical research site staff when they prepare for a visit. Reducing the number of on-site visits may reduce the workload that certain responsibilities put on the site staff, such as escorting the monitors to various facilities involved in the study and spending time with the monitor resolving queries. However, remote monitoring may also add responsibilities to site staff, or increase the frequency of existing responsibilities related to monitoring visits. Such responsibilities include uploading regulatory documents, consent documents, and source data, providing records of correspondences, and facilitating remote access to medical records either electronically or by manually uploading documents [15]. Documents that are sent electronically to the monitor often need to be de-identified as well. Many of these procedures are time consuming and either require additional staff or add to the workload of the research coordinators, research nurses, and research assistants. By anticipating the workflow and staffing impact that remote monitoring puts on the trial site, the site can adequately prepare to meet the changing industry practices.

## SPECIFIC AIMS

When a sponsor conducts a monitoring visit, the site coordinators, research nurses, and research assistants typically devote time to prepare for the visit, and spend time answering questions and addressing queries while the monitor is present. During a visit, the monitor will verify data entered into the electronic data capture (EDC) system against source data and medical records, check documentation such as drug accountability logs, informed consent forms, and regulatory forms, and ensure that the site is in compliance with the protocol as written by the sponsor. Remote monitoring allows the sponsor to perform several, or in some cases, all of these duties off-site. This is accomplished by uploading source documents directly to the monitor, uploading any documentation that would normally be checked by the monitor during a visit, and communicating with the monitor over phone, email, or teleconference. Remote monitoring benefits the sponsor by reducing the frequency of site visits and lowering travel costs. These benefits potentially extend to the trial site as well.

Monitoring visits can be time consuming, sometimes lasting several days, and off-site monitoring could decrease the amount of time the site staff needs to spend with the monitor. However, when monitoring is conducted off-site, the monitor still needs access to the necessary documents for review and verification. This frequently involves de-identifying and faxing or scanning a large amount of paperwork to the monitor, and resolving problems over the phone or email. Such responsibilities are time consuming and may require the site to allocate additional resources to these duties. In order to do so, the specific duties that remote monitoring affects need to be identified.

**Aim 1:** Determine whether or not there is a difference in the total time spent on tasks related to remote monitoring compared to on-site monitoring.

**Aim 2:** Identify additional tasks that remote monitoring requires the site to perform.

**Aim 3:** Identify tasks that remote monitoring allows the site to no longer perform.

## METHODS

A survey was sent out to clinical research staff within Baylor Scott and White Research Institute via email using Qualtrics, an online survey platform, using UNTHSC's institutional subscription. The survey and protocol was submitted and approved by the Baylor Scott and White IRB and the University of North Texas Health Science Center IRB. A list of BSWRI research staff as of June 30<sup>th</sup>, 2017 was obtained and potential participants were selected from the list based on their job titles. The survey targeted clinical research coordinators, research nurses, research assistants, and research enrollment analysts within various clinical research departments at BSWRI. Although there is variation in the tasks of clinical research employees between different departments within BSWRI, in general, the clinical research coordinators and research nurses oversee the day to day operation of the trial and carry out tasks such as consenting research subjects, ensuring that protocol mandated assessments are performed within the protocol specified timeframe, and coordinating various departments, such as imaging centers and pharmacies, that are involved in the study. Research coordinators and nurses work closely with the principal investigator in managing the research subjects and handle much of the face-to-face interaction with the subjects. Research assistants and research enrollment analysts generally handle duties such as processing and shipping blood draws and tissue samples, entering source data into the CRF, and assisting the coordinators with their responsibilities. In practice, there is often crossover in the responsibilities of different roles within a research department. Larger departments may have regulatory coordinators that handle IRB submissions and regulatory compliance, while in smaller departments these duties are often performed by the coordinators and nurses themselves. Research coordinators and nurses may handle their own CRF data entry, while research assistants and enrollment analysts may consent patients and perform various

scheduled study assessments. The job titles that the survey targeted were selected based on their likelihood of having experience with on-site and remote monitoring. Although there are other roles within the clinical trial site that interact with monitors, such as pharmacists, sub-investigators, and principal investigators, the positions targeted in this survey represent the employees who likely have the most interaction with monitors.

The survey was sent out on Wednesday, September 13<sup>th</sup>, 2017 to 134 employees with the previously identified job titles, and remained open until Monday, September 25<sup>th</sup>, 2017. Given that the response rate of email surveys is about 33%, about 44 replies were expected [19]. Because the number of potential participants in the survey was limited to the number of clinical research employees within BSWRI, a power analysis was not performed. Potential participants were sent an email which contained the cover letter, a brief description of the purpose of the survey and who the survey was targeting, and a link to the survey itself. The survey was designed to take about 5 minutes to complete. Clinical research employees who have experience with remote monitoring were identified by directing respondents to different surveys based on how they answered the question “are you currently or have you in the past been involved in a study that used remote monitoring?” Since on-site monitoring with 100% SDV continues to be the industry standard for overseeing clinical trials, it was reasonable to assume that all research staff who have worked on pharmaceutical sponsored clinical trials have experience with such studies, and all respondents were asked about their experience with on-site monitoring. Only participants who indicated that they had worked on clinical trials that used a remote monitoring strategy were displayed questions that asked about their experience with remote monitoring.

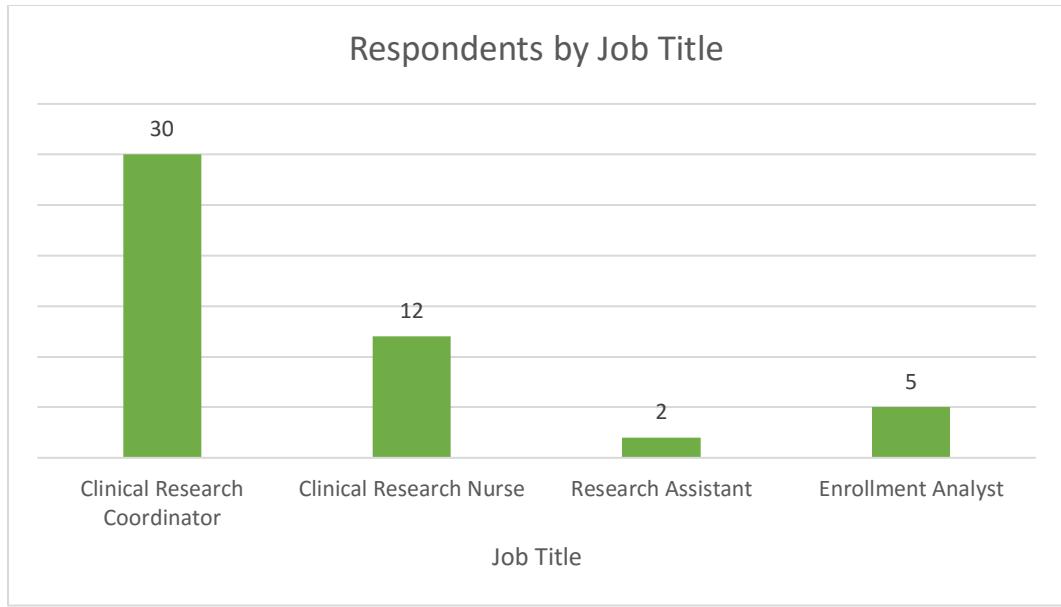
The survey aimed to identify whether or not there was a difference in total time allocation to duties of the site staff related to remote monitoring compared to on-site monitoring. Total time dedicated toward on-site monitoring versus remote monitoring was compared across all subjects using a t-test. Time allocation toward on-site versus remote monitoring was also compared within individuals involved in studies with both types of monitoring using a paired t-test. These tests were run by a Baylor statistician using SPSS statistical software. Respondents who indicated that they work on pharmaceutical industry sponsored clinical trials were also asked to rank tasks related to both remote monitoring and on-site monitoring based on their relative time consumption. These rankings were used as a descriptive comparison between the responsibilities that are required of the site staff during on-site monitoring visits and remote monitoring visits. The results of these rankings were condensed into three categories based on the percentage of respondents who gave each task a particular rank. For each task, respondents who ranked it 1 or 2 were grouped into “most relative time consumption”, rankings of 3, 4, or 5 were grouped into “moderate”, and rankings of 6 or 7 were grouped into “least”. The relative ranking for each task was compared between remote monitoring and on-site monitoring. Research employees were also asked what field of clinical research they worked in, the number of hours per week they worked, and their job title. This information was collected to create a demographic profile of the participants of the survey.

Respondents who indicated they had experience with remote monitoring were asked to indicate whether they believe various tasks save or consume time relative to on-site monitoring on a Likert scale ranging from significantly less time consuming to significantly more time consuming. These responses give a qualitative description of how research staff is dedicating

their time toward for each type of monitoring, and what duties are changed the most when a sponsor conducts remote monitoring. Respondents also had the opportunity to include additional tasks that either on-site or remote monitoring required them to perform, as well as additional tasks that they may perform during an on-site visit, but not a remote monitoring visit. The purpose of these responses was to capture any responsibilities that may have been missed in the survey questions and to potentially identify a trend that could be analyzed in future research. These responses were recorded in a free text box at the end of both the on-site and remote monitoring sections of the survey, and were not included in the statistical analysis.

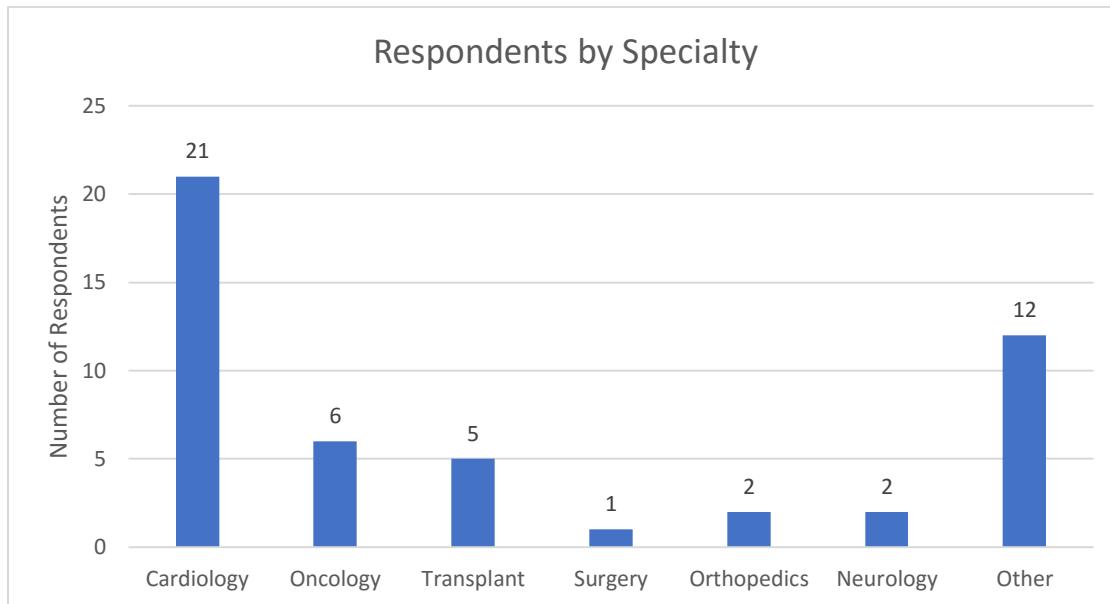
## RESULTS

The survey had a response rate of 36.6%, with 49 responses out of the 134 BSWRI clinical research employees that were contacted. The majority of the respondents identified themselves as clinical research coordinators or research nurses, with only 14% identifying as a research assistant or enrollment analyst (Figure 1). One respondent indicated under “other” that they were both a research coordinator and nurse. This respondent was categorized as a clinical research nurse, as most clinical research nurses also serve in the role of coordinators. Most of the respondents were full time employees, with 48 out of 49 indicating that they work over 31 hours per week. About 43% (21) of the respondents to the survey work in cardiology, with about 33% (16) indicating that they work in oncology, transplant, surgery, neurology, or orthopedics. There was a degree of variability to the remaining 12 respondents who answered “other,” with 4 of these indicating that they cover multiple fields, and the other 8 working in a variety of fields such as rehabilitation, infectious diseases, and lysosomal storage diseases (Table 6A). 38 respondents said that they work on pharmaceutical or medical device sponsored clinical trials, with 31 of these indicating that they either currently or have in the past worked on clinical trials where the sponsor primarily utilized remote monitoring.



**Figure 1:** Number of respondents by Job Title

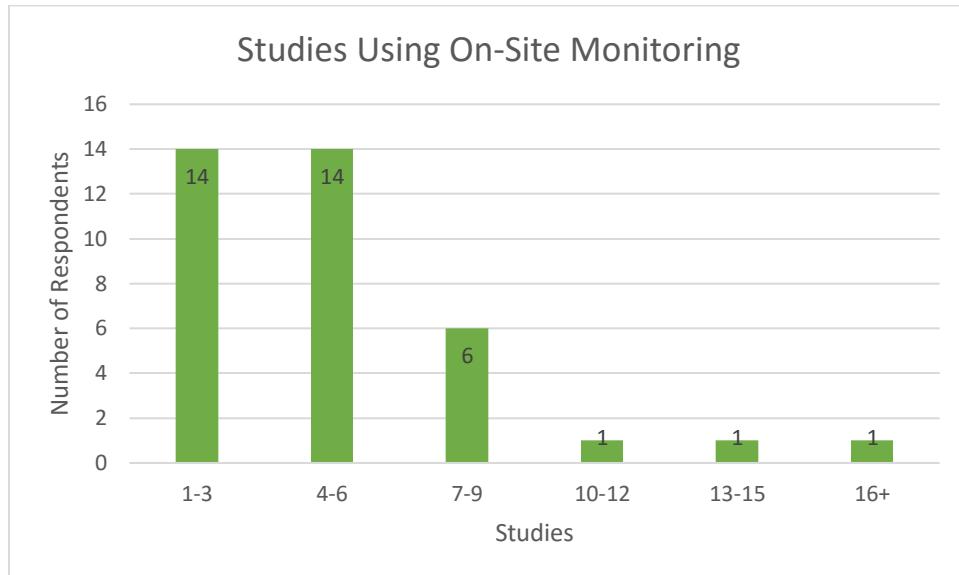
Note: Includes one employee who responded “research nurse and coordinator” categorized as a research nurse



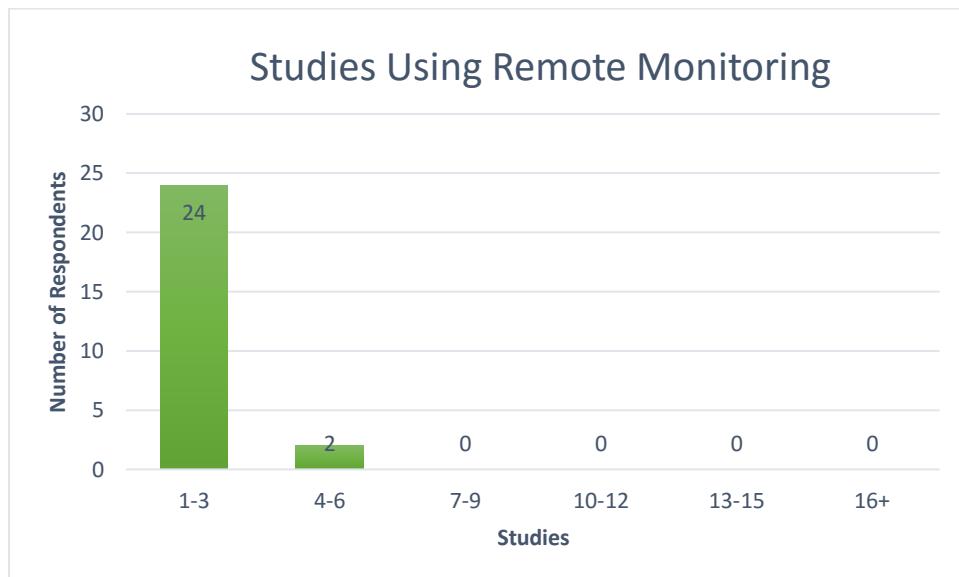
**Figure 2:** Number of respondents by specialty

When comparing all respondents who had experience with on-site monitoring with all respondents who had experience with remote monitoring, research employees tended to have more studies that used on-site monitoring than studies that primarily used remote monitoring,

with about 62% indicating that they have 4 or more studies that use on-site monitoring and only about 8% having 4 or more studies that use remote monitoring (Figures 3 and 4).

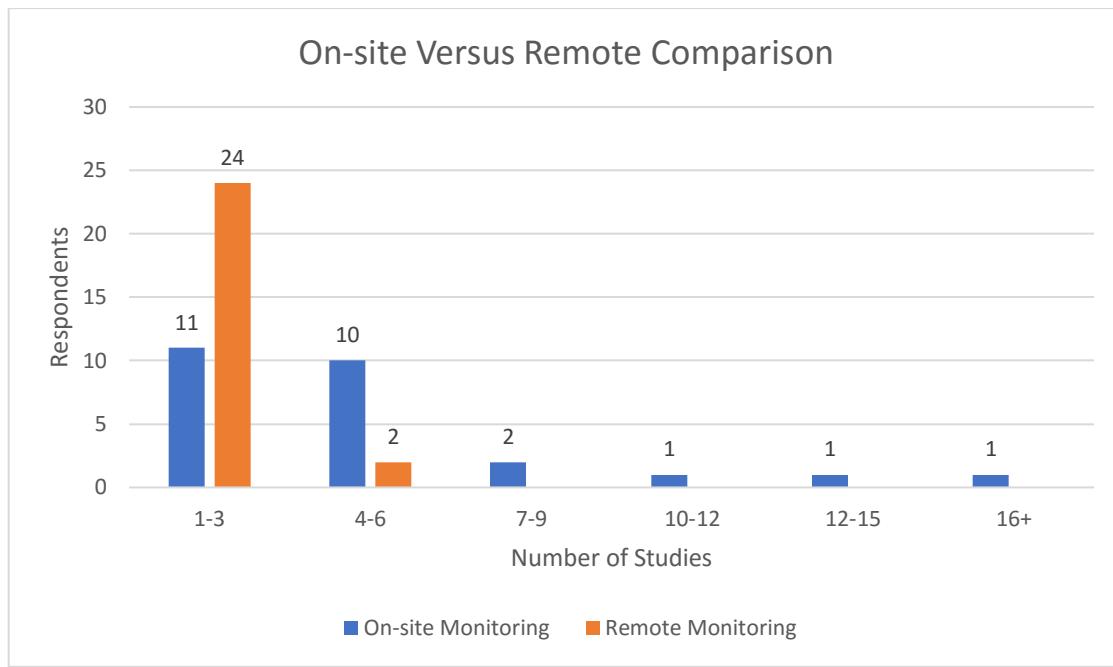


**Figure 3:** Number of studies using on-site monitoring among all respondents



**Figure 4:** Number of studies using remote monitoring among all respondents

This comparison holds up when comparing respondents who work on both studies that use on-site monitoring and studies that use remote monitoring, with about 58% of these respondents reporting that they work on 4 or more studies that use on-site monitoring and only about 8% reporting that they work on 4 or more studies using remote monitoring (Figure 5).



**Figure 5:** Comparison of the number of studies using on-site and remote monitoring among respondents who had experience with both methods

Of the all respondents who indicated that they have worked on clinical trials that used on-site monitoring, an average of 7.69 hours per week per study was reported to be spent on duties related to the on-site monitoring visits ( $n=35$ ) (Table 1). For respondents who indicated that they have experience with clinical trials that primarily used remote monitoring ( $n=24$ ), an average of 5.00 hour per week per study were reported to be spent on duties related to remote monitoring

visits ( $p < 0.05$ ). Hours dedicated toward on-site and remote monitoring visits were also compared using the respondents who indicated that they had experience with both monitoring methods. Due to several of the respondents not completing either the on-site or remote monitoring portion of the survey, this group was smaller than the total number of respondents who indicated that they have worked on studies with remote monitoring. Within this comparison group ( $n=23$ ), the average time in hours spent per week per study on duties related to monitoring visits was 8.13 for on-site and 4.39 for remote monitoring, which was highly significant ( $p < 0.001$ ) (Table 2). Respondents reported spending a range of 2 to 20 hours per study per week toward on-site monitoring and 1-10 hours toward remote monitoring.

	On-site	Remote
Mean	7.69	5.00
Standard Deviation	5.13	4.20
Range	2-20	1-19
P-value		<0.05

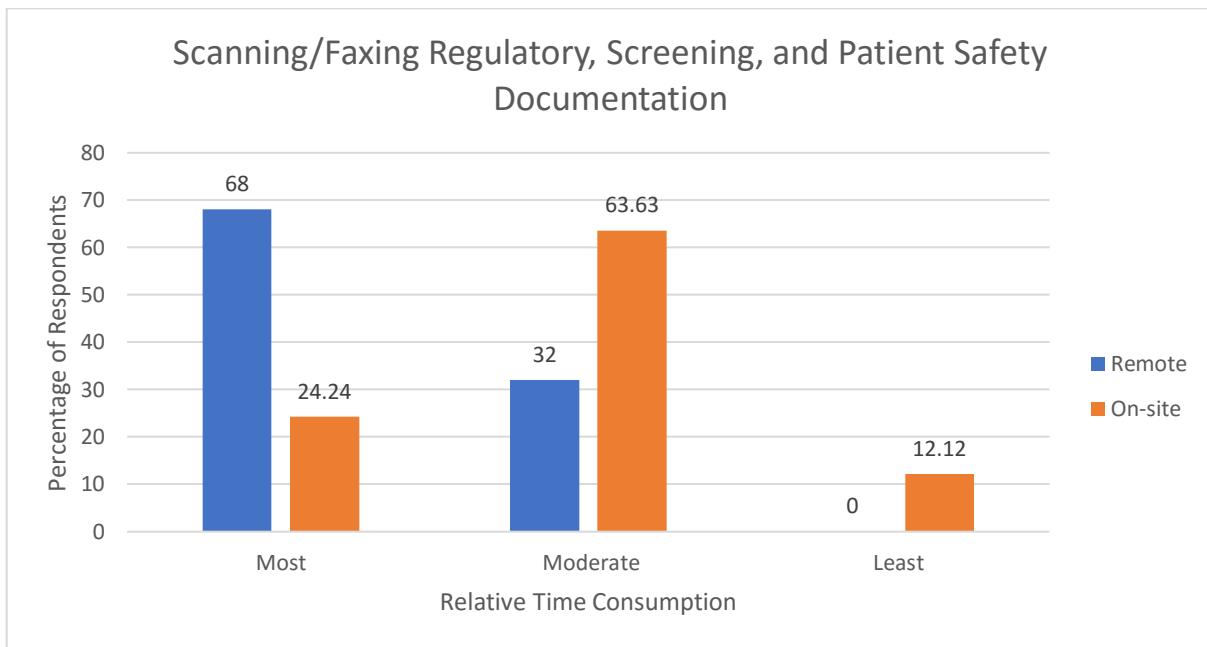
**Table 1:** Hours per week per study spent toward monitoring duties. T-test comparing all respondents.

	On-site	Remote
Mean	8.13	4.39
Standard Deviation	5.41	3.15
Range	2-20	1-10
P-value		<0.001

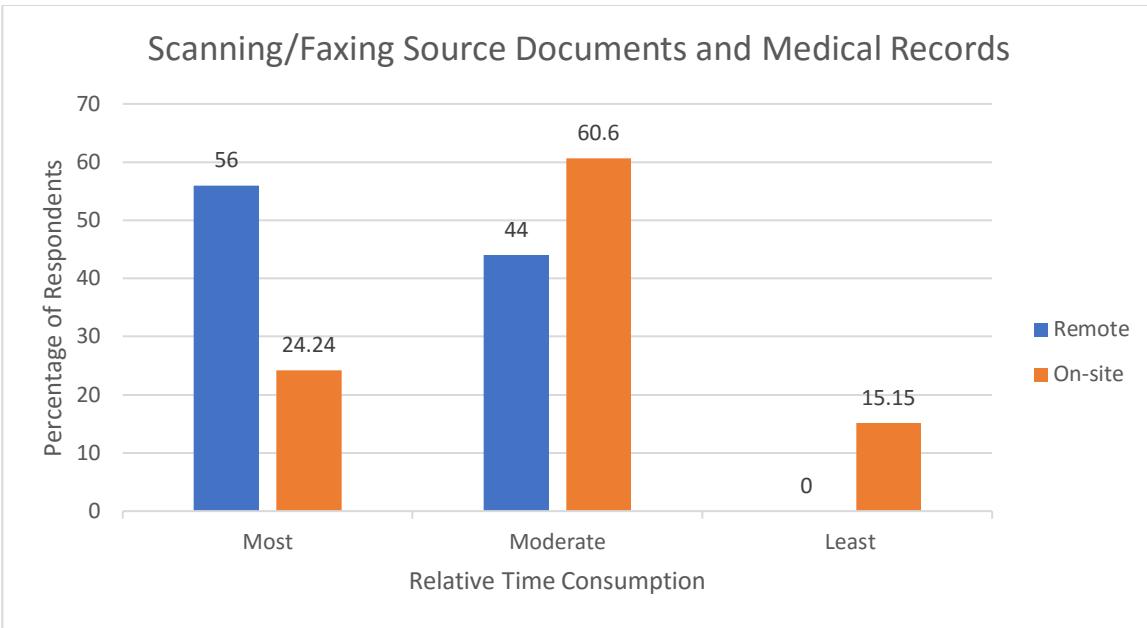
**Table 2:** Hours per week per study spent toward monitoring duties. Paired t-test comparing respondents with experience with remote and on-site monitoring

When ranking responses, scanning and faxing source documents/medical records, and faxing/scanning regulatory, screening, and patient safety documentation were ranked the as the

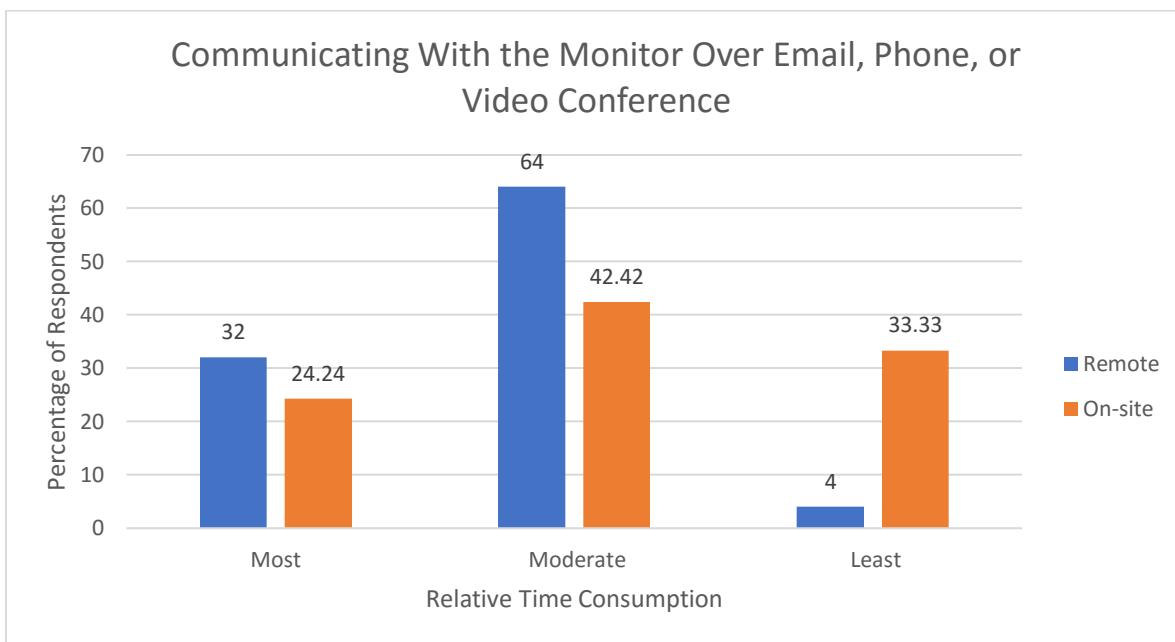
most time-consuming tasks for remote monitoring (Figures 6 and 7). Scanning and faxing lab and pharmacy records appeared to rank as more time consuming during remote monitoring, but was rarely ranked in the top two tasks (Figure 10). Communicating with the monitor tended to rank higher for remote monitoring than on-site monitoring, with 33% ranking this among the least time consuming tasks for on-site monitoring (Figure 8). Accompanying the monitor to visit other departments (Figure 9), resolving queries with the monitor on-site (Figure 10), and preparing for monitoring visits (Figure 11) all tended to rank as more time consuming for on-site monitoring than remote monitoring.



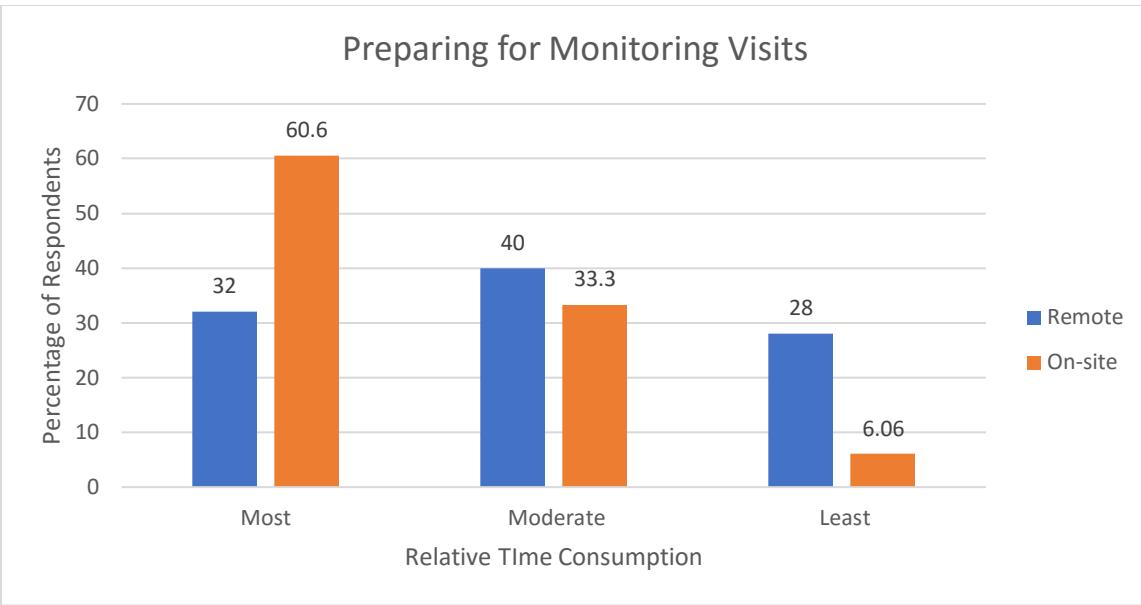
**Figure 6:** Comparison of scanning/faxing regulatory, screening, and patient safety documents among all respondents



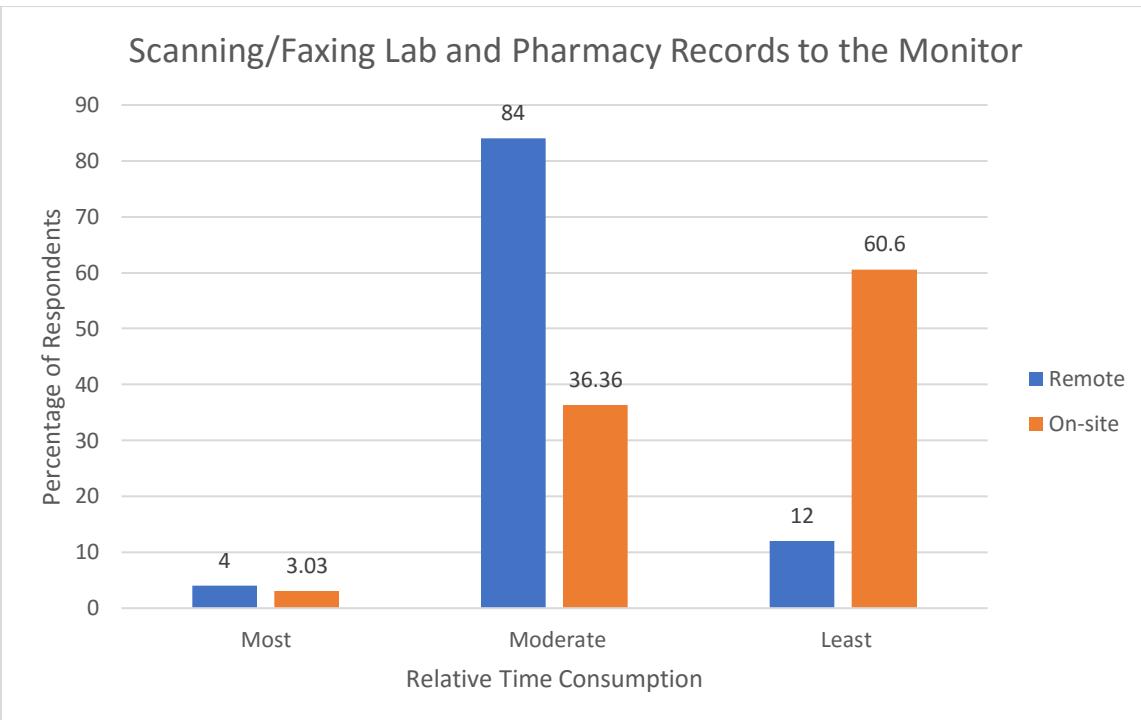
**Figure 7:** Comparison of scanning/faxing source documents and medical records among all respondents



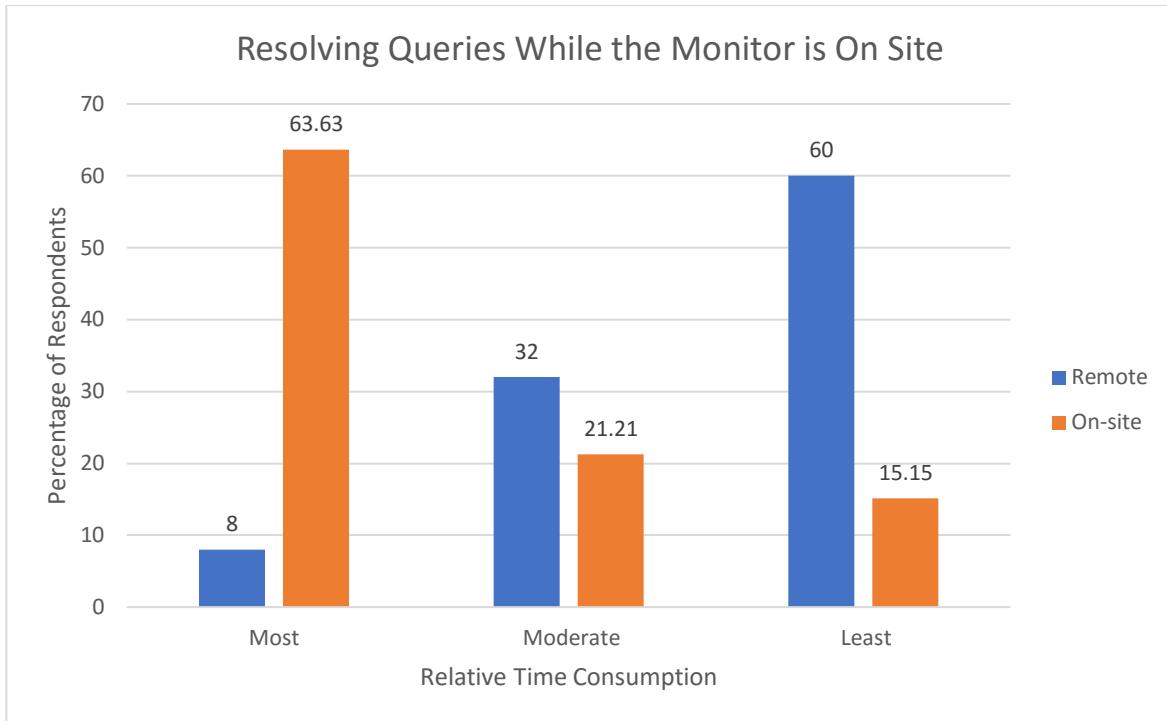
**Figure 8:** Comparison of communicating with the monitor over email, phone, or video conference among all respondents



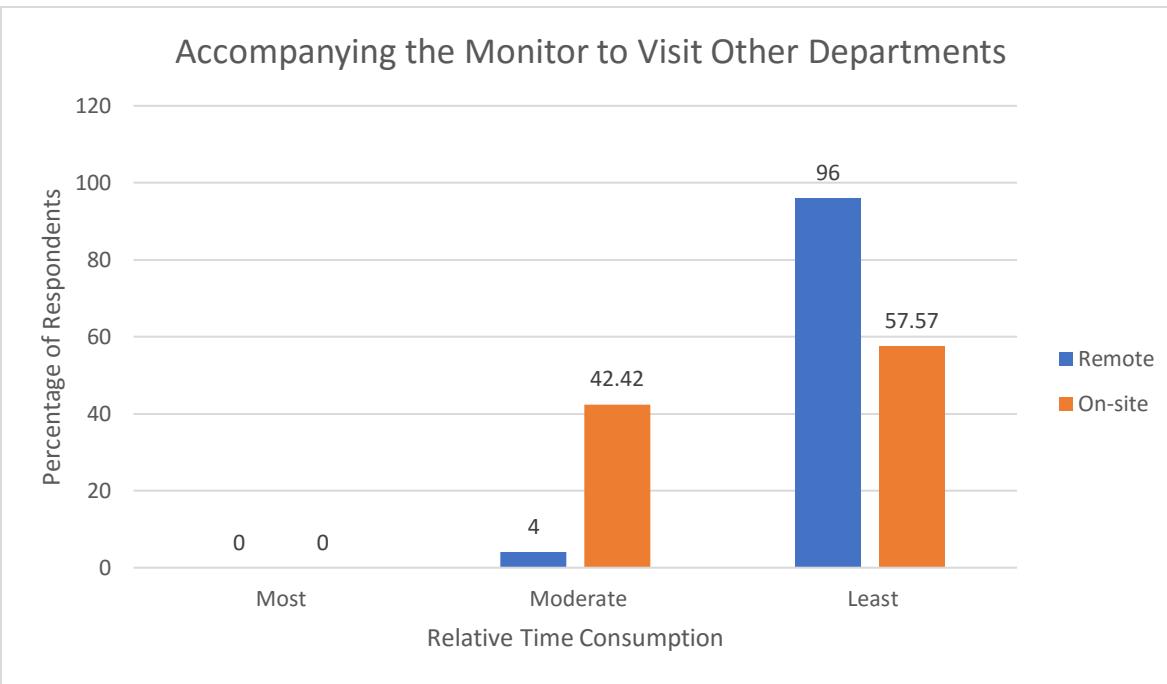
**Figure 9:** Comparison of preparing for monitoring visits among all respondents



**Figure 10:** Comparison of scanning/faxing lab and pharmacy records to the monitor



**Figure 11:** Comparison of resolving queries while the monitor is on site



**Figure 12:** Comparison of accompanying the monitor to visit other departments

When asked to identify whether a task takes more or less time during a remote monitoring visit compared to an on-site visit, most respondents indicated that submitting regulatory, medical record, screening, and patient safety documentation to the monitor took somewhat or significantly more time for remote monitoring visits (Table 3). Submitting pharmacy and laboratory records took 29.63% of respondents the same amount of time for both on-site and remote monitoring. Around 74% of respondents indicated that communicating with the monitor over phone, email, or video conference for remote monitoring visits took somewhat more, somewhat less, or the same amount of time as for on-site visits. The majority of respondents (~66%) indicated that preparing for remote monitoring visits consumes somewhat or significantly less time than preparing for on-site monitoring visits.

Task	Significantly Less Time	Somewhat Less Time	Same Amount of Time	Somewhat More Time	Significantly More Time
Preparing for monitoring visits	33.33%(9)	33.33%(9)	18.52%(5)	11.11%(3)	3.70%(1)
Faxing or scanning source documents/medical records to the monitor	7.41%(2)	11.11%(3)	22.22%(6)	11.11%(3)	48.15%(13)
Faxing or scanning regulatory documentation to the monitor	3.70%(1)	11.11%(3)	22.22%(6)	22.22%(6)	40.74%(11)
Faxing or scanning the ICF, Screening, enrollment, and patient safety data to the monitor	3.70%(1)	11.11%(3)	22.22%(6)	22.22%(6)	40.74%(11)
Faxing or scanning lab/pharmacy records to the monitor	7.41%(2)	11.11%(3)	29.63%(8)	29.63%(8)	22.22%(6)
Communicating with the monitor over email/phone/video conference	11.11%(3)	11.11%(3)	40.74%(11)	22.22%(6)	14.81%(4)

**Table 3:** Comparison of time allocation toward tasks related to remote monitoring relative to on-site monitoring.

## DISCUSSION

When comparing the time allocation toward responsibilities related to monitoring visits, respondents indicated that they spent more time per study on duties related to on-site monitoring than remote monitoring. This time difference was highly significant when comparing time allocation toward monitoring duties within subjects who have experience with both monitoring methods. This result supports much of the literature that claims remote monitoring is expected to streamline the clinical trial monitoring process, not only for the CROs and sponsors, but the clinical trial sites as well. On-site monitoring is clearly still the industry standard, as the majority of research employees who responded to this survey indicated that they work on more trials that use on-site monitoring than studies that use remote monitoring. However, over 80% of research employees who work on pharmaceutical industry sponsored trials have worked on at least one trial that primarily used remote monitoring, indicating that this relatively new practice has already become prevalent within the industry.

When working on a trial that primarily uses remote monitoring, respondents reported having to spend more time faxing or uploading source and regulatory documentation, screening logs, and adverse event logs to the monitor compared to trials with an on-site monitor. This is consistent with most respondents ranking these two tasks as the first or second most time consuming for remote monitoring visits. This is expected, as the monitor needs access to documentation that would normally be reviewed in the subject and regulatory binders while performing an on-site visit. One clinical research nurse noted that faxing and scanning any form of documentation took very little time at all for on-site monitoring, highlighting that these tasks are particularly affected by remote monitoring.

Interestingly, despite the monitor not being on site to review records from study associated facilities such as the pharmacy and laboratory, the majority of participants reported that providing these documents to the monitor took the same amount of time or somewhat more time compared to when the monitor visits the site. Similarly, very few respondents included this task among the most time-consuming activities. However, 84% of respondents did rank it as moderately time-consuming for remote monitoring compared to about 36% for on-site. A possible explanation is that pharmacy records are brief compared to medical record and regulatory documentation, and represents only a minor portion of the time research staff must spend sending documents to the monitor. Sponsors might also require regular submission of pharmacy records between monitoring visits, so the method of monitoring may have little impact on this task. Regardless, out of all the documentation that requires electronic submission to the monitor, pharmacy and lab records seems to be the least impacted by remote monitoring.

The results of this survey indicate a significant reduction in the time spent toward monitoring duties when the sponsor uses a remote monitoring strategy. Additionally, out of the 7 tasks respondents were asked to rank by time consumption, only preparing for monitoring visits and resolving queries with the monitor is on site tended to rank as more time-consuming for on-site monitoring visits. Preparing for monitoring visits is the only task clinical research employees tended to report spending less time performing for remote monitoring than on-site monitoring on the Likert scale. The factor that accounts for the absolute time difference between on-site and remote monitoring therefore may involve some aspect of accommodating the monitor when they are on-site, or was not identified within this survey. One possibility is that remote

monitoring frees the site staff from the logistical aspects of preparing for an on-site monitoring visit. Two respondents indicated that remote monitoring frees them from having to request access to, set up, and potentially troubleshoot the EMR for the monitor when they visit. Several research employees also mentioned that they don't need to schedule time to visit other facilities within the hospital or time to meet with the principal investigator. It is also possible that this was interpreted as only preparing for the monitor to physically visit the site, and several respondents may have excluded preparing for a remote monitoring visit when answering this question.

One responsibility of the site staff that was repeatedly mentioned in the open response field was spending time with the monitor while they are on-site. Resolving queries with the monitor while they are on-site was reported as one of the most time-consuming activities for on-site visits, but several research employees noted that there are other responsibilities that occupy their time when the monitor is on-site. Finding time for the monitor to meet with the principal investigator was cited by several employees as a significant task during on-site visits. Additionally, EMR systems are complex and different hospitals utilize a variety of different systems, and the monitor may not be familiar with a particular site's EMR. This requires the coordinator to spend time with the monitor when reviewing medical records to instruct them on using the EMR or show the monitor where they can retrieve source data. A few respondents also noted having to remain in proximity to the monitor for the duration of the visit to assist the monitor to answer any questions that they might have. Spending time with the monitor restricts the coordinator from performing their regular responsibilities and potentially places a significant burden on the site staff. Arranging time for the visit with the PI and spending time working with

the monitor may partially account for the additional time that on-site monitoring duties consume compared to remote monitoring.

Communicating with the monitor electronically was generally ranked higher in remote monitoring than on-site monitoring. However about 40% of the respondents claimed that communicating with the monitor electronically takes about the same amount of time for both on-site and remote monitoring, indicating that the impact of remote monitoring on this task might not be as profound as is it on the electronic submission of documents. Considering that there are either very few or no site visits when using a remote monitoring strategy, this result is somewhat unexpected given that all communication with the monitor must be done electronically. One possible explanation is that much of the communication with the monitor for on-site visits is related to scheduling and planning the visit, which typically is not necessary during remote monitoring. Additionally, since monitoring visits usually only occur every six to eight weeks, much of the communication with the monitor will be over the phone or email, regardless of whether they are performing remote or on-site monitoring. One research nurse did note that communicating with a remote monitor is more difficult due to their limited availability and inability to answer many of the questions that they have. Several respondents also cited redacting protected health information from documents that are submitted electronically to the monitor as a task in which they perform more often for remote monitoring visits than on-site visits. Since nearly every page of a patients' medical record contains their name, date of birth, and medical record number, this is a potentially a time-consuming activity and was not accounted for in the survey. Further study may be needed to determine how this relates to other responsibilities of the staff site for remote monitoring visits.

The next step is to further explore the nature of the tasks on which the survey participants indicated spending more time for remote monitoring, and use these results to develop a more streamlined approach toward managing remote monitoring visits. Although the results of the survey suggest that remote monitoring in fact saves the site staff time spent toward monitoring visits, the continued adoption of remote and risk based monitoring strategies makes it worthwhile for clinical trial sites to find the most efficient method for satisfying the sponsors monitoring requirements. Submitting the source documentation to the CRO or sponsor is clearly the task on which most clinical research employees reported spending more time toward during remote visits, and this is likely the first target of reform. One previously mentioned solution is to give remote monitors access to the EMR that contained the source data, which would allow them to perform SDV while reducing the amount of paperwork that the site staff needs to manually submit [14]. This however, raises concerns about the security of the patient's protected health information. Additionally, the source data required by the study may be spread over different EMRs if the patient is being evaluated by multiple facilities, making remote access to patient information logically challenging. The burden on site staff of submitting documents may also be mitigated by changes in staffing. Larger clinical research departments may have the freedom to employ office assistants who could handle much of the faxing and scanning, leaving the coordinators and nurses with more time toward trial management and more effectively utilizing their skill sets.

As clinical research continues to move toward remote monitoring, it will be increasingly important to develop procedural models to increase site staff efficiency and maintain the quality

of research being conducted. This research suggests that significant differences exist with respect to time allocation and the nature of the clinical research staff's tasks, and provides a direction for future research in this rapidly evolving area of medical research.

## LIMITATIONS

Due to the large percentage of participants who worked in cardiology and the wide variety of responses from participants who answered “other,” a comparison between specialties was difficult. With around 67% of the respondents indicating that they worked in cardiology, oncology, surgery, or transplant, this cohort is likely not representative of the field of clinical research as a whole, and may reflect the relative size of each of these departments within BSWRI. These fields tend to treat more acutely ill patients, incorporate a larger number of safety assessments, and often have complex inpatient clinical trials. Due to the nature of these trials, sponsors and CROs may determine that a more intensive on-site monitoring strategy is more appropriate in ensuring proper conduct. It is difficult to determine if this accounts for the research employees in this survey tending to have fewer studies which use remote compared to on-site monitoring, or if this is due to an overall lower prevalence of studies which use remote monitoring. Nevertheless, it is possible that the results of this survey could be generalized to other academic hospitals, and hospital systems that have large clinical research departments within them.

One limitation of this study is the relatively small sample size of the survey. The pool of potential participants was limited to research employees within BSWRI who function in the role of a clinical research coordinator. The number of respondents who could provide information for data analysis was further limited since not all of the 49 participants work on pharmaceutical industry sponsored studies, had experience with remote monitoring, or answered all the questions on each page of the survey. This left a group of 23 research employees who could make a direct comparison between on-site and remote monitoring, which is likely too small to draw any

conclusions beyond an exploratory analysis. A larger study that polls clinical research staff from a variety of therapeutic fields and clinical settings would provide a clearer picture of how remote monitoring affects their day to day responsibilities.

Additionally, asking participants to retroactively estimate the number of hours that they spent on only one particular aspect of a clinical trial, and then to break that down into the hours per study and hours per week, is a difficult task. Given the difficulty of capturing this metric, there is concern that the question could have been misinterpreted by several respondents. This metric had a wide range of responses, with some research staff reporting as much as 20 hours per study per week spent on duties related to on-site monitoring visits and 19 hours spent toward remote visits. The majority of respondents reported working 41-45 hours per week, and nearly 90% fall into the 36-50 hours per week range, so in several cases research employees are claiming to spend nearly half their work week on duties related to monitoring visits. It is difficult to determine if this is a true reflection of monitoring duties or if the question was misunderstood by several respondents. However, if the record keeping and data input of a study is behind schedule, it is not unreasonable that catching up the study in preparation for a monitoring visit would consume a large portion of a research employees' time. Ideally, the hours spent toward monitoring responsibilities would be recorded prospectively, where the participants can record the time they spend on tasks related to monitoring as they occur. However, conducting a prospective study currently would have been difficult due to time constraints and the limited pool of potential subjects that were available. Participants would likely need to be followed for a few months in order to capture both on-site and remote monitoring visits, and participants not in clinical oncology research or Baylor University

Medical Center may be unlikely to keep a time dairy for that length of time. Some clinical research departments do track the number of hours clinical research employees spend per study, but this is not divided into time spent toward particular tasks.

This study also did not account for the characteristics of the individual trials on which the research employees worked on. Aspects such as the phase of the trial, the type investigational therapy, and the clinical setting (inpatient versus outpatient) could influence the monitoring strategy that the sponsor uses and skew the results based on the distribution of studies among different departments and coordinators. Additionally, clinical trials with high enrollment, a large number of assessments and data points, or investigational products with a high-risk profile may have longer and more intensive monitoring visits, requiring more attention from the site staff independent of whether the trial uses on-site or remote monitoring.

As clinical research continues to move toward remote monitoring, it will be increasingly important to develop procedural models to increase site staff efficiency and maintain the quality of research being conducted. This research suggests that significant differences exist with respect to time allocation and the nature of the clinical research staff's tasks, and provides a direction for future research in this rapidly evolving area of medical research.

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## CHAPTER III

### INTERNSHIP EXPERIENCE AND JOURNAL SUMMARY

The first month of my internship was spent mostly working with the neuro oncology coordinators. This was my first exposure to clinical trials and here I learned about how studies are run at the trial sites and the work that goes into keeping a trial running smoothly. I learned about the informed consent process and observed the coordinators as they consented several patients. I saw much of the behind the scenes work that goes into coordinating a trial: scheduling patient visits, communicating with the sponsors, working with other departments in the hospital, and processing and shipping off specimen collections. I had the opportunity to meet several patients and follow their progress through a few different clinical trials, and I learned how to document and report AEs and SAEs to both the sponsor and the local IRB. After familiarizing myself with several of the neuro oncology protocols, I was set up on each of the trials EDCs and learned how to capture the relevant data that the study requires. Eager to be a productive member of the team, I started entering data for these studies, and completed the paper CRFs for one of investigator initiated studies.

Going into July, I started working on a few of the hematologic cancer studies, assisting the coordinators in getting caught up on in the EDCs before data cuts, and working on another investigator initiated study for pancreatic cancer biomarkers. I still shadowed the neuro oncology coordinators quite a bit and would accompany them on patient visits and informed consents. During this time, there were unfortunately a few adverse events with these patients, and I saw firsthand not only how to manage the data and regulatory implications, but how to

manage the patients concerns. Working on a variety of different trials, I also saw how different protocols are designed based on the specific disease and the type of therapeutic agent under study. During this time, I also worked with the regulatory department on submitting my protocol to the IRB. I learned how to use iRIS to electronically submit a new study and gained experience working with the IRB to get a new study off the ground.

Early August, after finishing up the CRFs for the pancreatic cancer biomarker study, I started helping with Iomab, a mostly inpatient study testing a radioactive immunotherapy used for pre-bone marrow transplant conditioning in AML patients. The first few weeks, I worked mostly on data and learned the studies somewhat complicated protocol and schedule of assessments, and later I had the opportunity to meet a few of the patients, collect the samples from bone marrow biopsies, and process the blood draws from these patients. I put in a lot of work hunting down data that needed to be captured in the EDC and following the progress of the patients on the trial to ensure they received their scheduled study assessments. I had the opportunity to work with research nurses and enrollment analysts who managed this study, work with different departments such as the bone marrow transplant clinic and nuclear medicine, and attend meetings with representatives from the sponsor. I was also able to work with the monitors during the two visits they performed while I worked on this study, and communicated with them when we had problems with the EDC and questions about the study. Overall, this internship has been a valuable experience into the world of clinical research and I've had the opportunity to learn a lot about a field I previously knew little about.

## APPENDICES

### ADDITIONAL TABLES AND FIGURES

**Table 1A:** On-site monitoring rankings. The table displays the percentage and number of respondents who ranked a particular task at that rank.

Task	Ranking	1	2	3	4	5	6	7
Preparing for monitoring visits	42.42% (14)	18.18% (6)	18.18% (6)	6.06% (2)	9.09% (3)	3.03% (1)	3.03 (1)	
Resolving queries while the monitor is on site	30.30% (10)	33.33% (11)	6.06% (2)	12.12% (4)	3.03% (1)	12.12% (4)	3.03 (1)	
Faxing or scanning of documentation (regulatory, ICF, screening and enrollment logs, AE and SAE logs, etc)	15.15% (5)	9.09% (3)	15.15% (5)	30.30% (10)	18.18% (6)	12.12% (4)	0.00% (0)	
Communicating with the monitor over email/phone/video conference	9.09% (3)	15.15% (5)	24.24% (8)	6.06% (2)	12.12% (4)	15.15% (5)	18.18% (6)	
Faxing or scanning source documents/medical records to the monitor	3.03% (1)	21.21% (7)	15.15% (5)	12.12% (4)	33.33% (11)	9.09% (3)	6.06% (2)	
Faxing or scanning lab and pharmacy records to the monitor	0.00% (0)	3.03% (1)	6.06% (2)	15.15% (5)	15.15% (5)	30.30% (10)	30.30% (10)	
Accompanying the monitor to visit other departments (pharmacy, lab, etc.)	0.00% (0)	0.00% (0)	15.15% (5)	18.18% (6)	9.09% (3)	18.18% (6)	39.39% (13)	

**Table 2A:** Remote monitoring rankings. The table displays the percentage and number of respondents who ranked a particular task at that rank.

Task	Ranking	1	2	3	4	5	6	7
Faxing or scanning documents/medical records	36.00% (9)	20.00% (5)	24.00% (6)	20.00% (5)	0.00% (0)	0.00% (0)	0.00% (0)	
Preparing for monitoring visits	28.00% (7)	4.00% (1)	8.00% (2)	8.00% (2)	24.00% (6)	8.00% (0)	20.00% (0)	
Faxing or scanning of documentation (regulatory, ICF, screening and enrollment logs, AE and SAE logs, etc)	20.00% (5)	48.00% (12)	8.00% (2)	16.00% (4)	8.00% (2)	0.00% (0)	0.00% (0)	
Communicating with the monitor over email/phone/video conference	12.00 (3)	20.00% (5)	24.00% (6)	28.00% (7)	12.00% (3)	4.00% (1)	0.00% (0)	
Resolving queries while the monitor is on site	4.00% (1)	4.00% (1)	8.00% (2)	4.00% (1)	20.00% (5)	48.00% (12)	12.00% (3)	
Faxing or scanning lab/pharmacy records to the monitor	0.00% (0)	4.00% (1)	28.00% (7)	24.00% (6)	32.00% (8)	12.00% (3)	0.00% (0)	
Accompanying the monitor to visit other departments (pharmacy, lab, etc)	0.00% (0)	0.00% (0)	0.00 (0)	0.00% (0)	4.00% (1)	28.00% (7)	68.00% (17)	

**Table 3A:** Free text responses to “are there any additional tasks that on-site monitoring requires you to perform?”

Depending on questions that arise during monitoring visits, I may need to create a Note to File to further explain something, locate/print/file supporting documents in patient binders, take documents to PI/sub-I for additional signatures, review current study supplies (central lab kits, shipping supplies, etc.) with monitor, accompany monitor and sit in on meeting between monitor and PI, etc.
capture new events that were missed
scheduling time to meet with PI
No, but like all monitor visits I have to always be in the area in case they have questions.
actually, tasks 4-7 take hardly any time. (very little faxing/scanning)
Getting monitor systems access
None that I can think of.
Checking electronic source documents with monitor because they won't set up EHR access
No
Mailing/Uploading patient disks (Cath, TTE/TEE, Fluoro, etc.)
Arranging time to visit with PI

**Table 4A:** Free text responses to “are there any additional tasks that remote monitoring requires you to perform?”

none
Redacting information - This is a task that takes a significant amount of time.
Redact patient information since the source/medical records are leaving the site
Faxing calibration documents/CVs/licenses. Also, communicating and reaching the monitor (for remote monitoring) is often difficult. They are unavailable and often do not have the answers to questions.
must redact patient information before sending documents off
Review of the regulatory binder, section by section to ensure our site binder matches the sponsor binder.
No
Uploading disks (TTE/TEE) into the EDC

**Table 5A:** Free text responses to “are there any additional tasks that you normally perform during on-site monitoring visits that you do not need to perform with remote monitoring?”

none
dont have to schedule meetin with PI, pharmacy, device/drug accountability
Babysit the monitor
walking the monitor to the pharmacy
Requesting EMR access for the monitor is not needed for remote monitoring visits; visits with the PI.
Prepare for monitor visit; over the shoulder EHR source doc check; arrange visit with PI; walk monitor over to show storage space, equipment, site, etc; Troubleshoot when there are internet connection issues for guests
No
The remote monitoring is less intense and not as much data is reviewed when compared to on site monitoring
I don't have take the monitor to visit other depts. with remote monitoring. I don't have the same amount of feedback detail for queries with a remote visit as with an on-site visit.
For on-site monitoring you have to schedule date and time of visit, accompany monitor to lab/pharmacy etc., schedule more on-site meeting with study staff

**Table 6A:** Job titles of the respondents who indicated “other.”

Lysosomal Storage Diseases (i.e. Fabry, Pompe, Gaucher, Leukodystropies)
Cardiology, Rheumatology, Oncology, General Surgery
Multiple areas
cardiology, oncology, rheumatology
Infectious Disease
Rehabilitation
Gastroenterology
community based SCI
Rehabilitation
Inpatient Rehabilitation
OB/GYN, Radiology, Vascular Surgery, ENT
Pulmonary

## SURVEY

Which of the following most accurately describes your role?

Clinical Research Coordinator

Clinical Research Nurse

Research Assistant

Enrollment Analyst

Regulatory Specialist

Other (please specify)

Which field of clinical research do you work in?

Cardiology

Surgery

Oncology

Transplant

Endocrinology

Orthopedics

Neurology

Family Medicine

Dermatology

Immunology

Other (please specify)

How many hours per week do you typically work?

Under 30

31-35

36-40

41-45

46-50

Over 51

Are you involved in pharmaceutical and/or device sponsored clinical trials which require you to communicate with a monitor either in person or remotely?

Yes

No

Are you currently or have you in the past been involved in a trial that used remote monitoring?

Yes

No

Per study, how many hours per week on average do you spend on duties related to on-site monitoring visits?

0      2      4      6      8      10      12      14      16      18      20

Hours per week



Currently, how many studies that you work on primarily use on-site monitoring?

1-3

4-6

7-9

10-12

13-15

16+

For studies that primarily use on-site monitoring please rank the following tasks from most time consuming to least time consuming.

Preparing for monitoring visits

Faxing or scanning source documents/medical records to the monitor

Faxing or scanning of documentation (regulatory, ICF, screening and enrollment logs, AE and SAE logs, etc) to the monitor

Faxing or scanning lab/pharmacy records to the monitor

Communicating with the monitor over email/phone/video conference

Resolving queries while the monitor is on site

Accompanying the monitor to visit other departments (pharmacy, lab, etc)

---

Are there any additional tasks that on-site monitoring requires you to perform? Please provide your answer in the space below.

Per study, how many hours per week on average do you spend on duties related to remote monitoring?

0      2      4      6      8      10      12      14      16      18      20

Hours per week



Currently, how many studies that you work on primarily use remote monitoring?

1-3

4-6

7-9

10-12

13-15

16+

For studies that use primarily remote monitoring, please rank the following tasks from most time consuming to least time consuming

Preparing for monitoring visits

Faxing or scanning source documents/medical records to the monitor

Faxing or scanning of documentation (regulatory, ICF, screening and enrollment logs, AE and SAE logs, etc) to the monitor

Faxing or scanning lab/pharmacy records to the monitor

Communicating with the monitor over email/phone/video conference

Resolving queries while the monitor is on site

Accompanying the monitor to visit other departments (pharmacy, lab, etc)

---

For a study that primarily uses remote monitoring, what how much more or less time do you spend on each task compared to on-site monitoring?

	Significantly less time	Somewhat less time	Same amount of time	Somewhat more time	Significantly more time
Preparing for monitoring visits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faxing or scanning source documents/medical records to the monitor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faxing or scanning regulatory documentation to the monitor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faxing or scanning the ICF, screening, enrollment, and patient safety data to the monitor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faxing or scanning lab/pharmacy records to the monitor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicating with the monitor over email/phone/video conference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are there any additional tasks that remote monitoring requires you to perform? Please provide your answer in the space below.

---

Are there any additional tasks that you normally perform during on-site monitoring visits that you do not need to perform with remote monitoring? Please provide your answer in the space below.

## IRB DOCUMENTS



### IRB Approval – Expedited Review of New Study

**To:** Brendan Paulman  
**Copy to:** Amy Solis, CRC, Brendan Paulman, Natalie Settele  
**Date:** August 23, 2017  
**Re:** 017-246  
The Impact of Remote Monitoring on the Trial Site  
Reference Number: 301657

Your new proposal was reviewed by a designated member of Baylor Scott & White Research IRB Red via expedited review.

This study was determined to be eligible for expedited review as it involves no greater than minimal risk to the subjects and fits into the following category(ies) from the 1998 approved list:

Category 7: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies

This review included the following components:

Study Application	
Form Name	Outcome
Study Application - Review by BSWRI IRB	Approved as Presented
Study Application - Review by BSWRI IRB	Approved as Presented
Study Application - Review by BSWRI IRB	Approved as Presented

Study Document			
Title	Version #	Version Date	Outcome
Survey	Version 1.1	08/01/2017	Approved
Research Proposal	Version 1.0	08/18/2017	Approved
Form18	Version 1.0	08/18/2017	Approved
EmailUNTresearch	Version 1.0	08/01/2017	Approved

Research Proposal	Version 1.0	08/01/2017	Approved
<b>Study Consent Form</b>			
Title	Version #	Version Date	Outcome

Your submission has been approved. The approval period begins on 08/23/2017 and expires on 08/22/2018. Your next continuing review is scheduled for 06/22/2018.

This study is approved to be conducted at the following locations:  
Baylor Research Institute

The following individuals are approved as key study personnel (research team members & administrative support):

Becerra, Carlos R., MD; Paulman, Brendan; Settele, Natalie; Solis, Amy, CRC

Based on the information as provided in your application, the IRB has determined that this study qualifies for a waiver of documentation of informed consent in accordance with 45 CFR 46.117.

This means that while you are required to obtain consent, written documentation of such is not required. This should be done utilizing the IRB approved method as listed above. This is either a cover letter, telephone script or other specific tool as approved by the IRB.

All events that occur on this study including protocol deviations, serious adverse events, unanticipated problems involving risks to subjects/others, subject complaints or other similar events must be reported to the IRB in accordance with the respective policies.

Remember that this study is approved to be conducted as presented. Any revisions to this proposal and/or any of the referenced documents must be approved by the IRB prior to being implemented. Additionally, if you wish to begin using any new documents, these must receive IRB approval prior to implementation of them in the study.

IRB approval may not be the final approval needed to begin the study. All contractual, financial or other administrative issues must be resolved through Baylor Scott & White Research Institute prior to beginning your study.

For Investigator Initiated studies that meet the requirements to be posted on [www.clinicaltrials.gov](http://www.clinicaltrials.gov); as Principal Investigator, it is your responsibility to ensure that your study is listed prior to enrolling the first subject. Instructions on fulfilling this requirement can be found in iRIS under the "Help" tab.

If you need additional assistance, please contact the IRB Specialist at 214-820-9989  
(NTX) 254-771-4836 (CTX).

Sincerely,

A handwritten signature in blue ink that reads "Lawrence R. Schiller, MD". The signature is fluid and cursive, with "Lawrence" and "R. Schiller" on the first line and "MD" on the second line.

Signature applied by Lawrence R. Schiller on 08/24/2017 01:44:23 AM CDT

**UNT Health Science Center**  
**Office for the Protection of Human Subjects**  
**Institutional Review Board**  
**BOARD ACTION**

IRB Project #: 2017-111

Date Submitted: August 29, 2017

Principal Investigator: Stephen Mathew, PhD (with CRM student: Brenda Paulman)

Project Title: The Impact of Remote Monitoring on the Trial Site

Sponsor Protocol #:

Department: Clinical Research Management / GSBS Contact Info: x 5407

In accordance with UNT Health Science Center policy on the protection of human subjects, the following action has been taken on the above referenced project. Approval, when given, is **only** for the project as submitted. **No changes** may be implemented without first receiving IRB review and approval.

The Principal Investigator must notify the IRB immediately if any new potential Conflict of Interest arises or if CITI educational training lapses for any of the Key Personnel involved with the study.

Project has received approval through: August 31, 2018

Informed consent(s\*) approved as submitted on: \_\_\_\_\_

You **MUST** use the version (s) attached rather than previously approved versions. In addition, only consent documents which bear the official UNTHSC IRB approval stamp can be used with subjects.

\*Including:

Study Protocol dated \_\_\_\_\_ approved as submitted.

Investigator's Brochure \_\_\_\_\_ approved as submitted.

Protocol Synopsis approved as submitted on: \_\_\_\_\_

Amendment \_\_\_\_\_ to the protocol approved as submitted.

Progress Report/Continuing Review completed, project has received approval through: \_\_\_\_\_

Project has been reviewed. In order to receive approval, you must incorporate the attached modifications. You must submit one "tracked changes" version showing the markup and one "clean" copy of the revised protocol synopsis, informed consent, and advertisements to the IRB for review. **YOU MAY NOT BEGIN YOUR PROJECT UNTIL NOTIFIED BY THE IRB.**

Project is disapproved for the reason(s) outlined (see attached).

Consideration of the project has been **DEFERRED** pending resolution of the issue(s) outlined (see attached).

Completion of project is acknowledged and all required paperwork has been received.

Special Findings/Other

The UNTHSC IRB acknowledges that the activity is conducted under the oversight of the Baylor Scott and White IRB (Protocol BSWR IRB 017-246). Dr. Mathew serves as his faculty contact for this CRM internship project.

  
Chairman, Institutional Review Board

  
Date 9/5/17 IRB Form 2 (revised March 2011)

**UNT Health Science Center**  
**Office for the Protection of Human Subjects**  
**Institutional Review Board**  
**BOARD ACTION**

IRB Project #: 2017-111

Date Submitted: August 29, 2017

Principal Investigator: Stephen Mathew, PhD (with CRM student: Brenda Paulman)

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Amendment \_\_\_\_\_ to the protocol approved as submitted.

Progress Report/Continuing Review completed, project has received approval through: \_\_\_\_\_

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Chairman, Institutional Review Board

  
Date 9/5/17  
IRB Form 2 (revised March 2011)

## COVER LETTER

IRB Project Number: 017-246  
July 2017  
v1.0

*Baylor Research Institute  
Clinical Oncology Research Coordination  
3410 Worth St. Suite 560  
Dallas, TX 75246  
214-818-8472*

I am a graduate student at the University of North Texas Health Science Center and I am conducting a research project to evaluate how remote monitoring impacts the duties of the trial site staff and would appreciate you taking part in this project. This project aims to identify the responsibilities of the site staff during on-site monitoring visits and how these responsibilities change when a sponsor uses remote monitoring. You have been selected to be in this research survey because you are a clinical research nurse, research coordinator, research enrollment analyst, or research assistant.

I am asking that you complete a short survey that asks several general questions about your responsibilities as clinical research staff, as well as your responsibilities relating to on-site and remote monitoring. This survey is for research purposes only and the information collected will in no way be identifiable. The survey will take no more than 5 minutes to complete and you are not required to answer every question. The information you are able to provide will allow us to assess the benefits and burdens that remote monitoring places on the trial site and staff, and could potentially aid clinical research institutions in adjusting to new monitoring methods.

There are no risks or benefits to you for being in this study and your participation is optional. By filling out the attached survey and submitting it, you are saying that you are willing to be in the study.

If you have any questions about this project, please contact Brendan Paulman at [Brendan.paulman@BSWHealth.org](mailto:Brendan.paulman@BSWHealth.org) or 214-478-0179. If you have any questions about your rights as a research subject, please contact Lawrence Schiller at 214-820-2687.

Thank you for interest in this project and I hope you will take a few minutes to complete this survey.

## DAILY JOURNAL

### **Tuesday, May 30<sup>th</sup>, 2017**

In the morning I shadowed Bianca, the data specialist, as she reviewed a patient's chart and matched up abnormal lab values to treatments to highlight possible adverse events for the PI to review. We then delivered vials to a nurse on the hospital floor for blood collection on a trial patient. I then attended a meeting with where the staff discussed the status and plans for ongoing and pending trials. After lunch with Ms. Settele, I shadowed Amy, a regulatory specialist, as she electronically submitted revised documents to the IRB. I familiarized myself with several forms, including the FDA 1572 and delegation log, as well as the regulatory binders. I also learned a bit about iRIS and the process of IRB submission at Baylor.

### **Wednesday, May 31<sup>st</sup>, 2017**

In the morning, I attended a site initiation visit where they discussed logistical aspects of the study such as data and regulatory form submission. I then shadowed Crystal, a regulatory specialist. We discussed some of the differences between working in oncology clinical research compared to other fields, and what normally occurs when a monitor visits. She then walked me through some of her tasks such as collecting information on newly reported adverse events and submitting them to the IRB. In the afternoon, I completed CITI and orientation training.

### **Thursday, June 1<sup>st</sup>, 2017**

I talked with Ms. Asea about my thesis and she suggested that I look into the nursing shortage in clinical research. In the afternoon I shadowed Sandy, a research nurse and coordinator. I looked over the protocol synopses for several of the studies that she is coordinating and she explained to me her responsibilities as the coordinator in those trials.

### **Friday, June 2<sup>nd</sup>, 2017**

In the morning, I tried to find articles related the nursing shortage Ms. Asea told me about yesterday and how it relates to research nursing. While I found a few papers about research nursing job satisfaction and workload, there wasn't much literature on a shortage, or clinical research nursing at all. Midday I assisted in marking abnormal labs that needed to be signed off on by the PI. After lunch, I searched for articles relating to another issue I'm considering for my

thesis, remote monitoring and the burdens it puts on the site. I was able to find several articles analyzing what kind of data can be picked up by remote monitoring and the increase in efficiency from the CRO's perspective.

### **Monday, June 5<sup>th</sup>, 2017**

In the morning, I discussed a couple of my ideas for my research proposal with Ms. Settele, and she gave me a few suggestions on how I could get started. I then shadowed Lauren, a research enrollment analyst, for the rest of the morning. We discussed the day to day requirements of her job and she went over some of the documents that the sponsors require. We then went to Dr. Fink's clinic, where Lauren introduced me most of the staff. After lunch, I spent the rest of the day training on Orbus electronic data capture system and reviewing the protocol for the trial.

### **Tuesday, June 6<sup>th</sup> 2017**

I spent the morning going over protocol for the Orbus trial with Lauren, after which I could be added to the study. She then went over several trial documents and told me what need to happen when a research patient comes in for a visit, including review the patient's progress notes and identifying possible AEs. In the afternoon, I visited a patient with Lametria, the neuro coordinator, where she discussed the informed consent documents with the patient and scheduled several screening tests. Lauren showed me where the lab is to drop off research related bloodwork and told me how AEs and SAEs are reported.

### **Wednesday, June 7<sup>th</sup>, 2017**

In the morning, Lauren showed me where the pharmacy neuro oncology uses is located. I then spoke with Chris, a visiting monitor, about some of the pros and cons of remote monitoring and his perspective from the CRO side of the table. He told me he found remote monitoring most effective later in a study, after they have already had several on-site visits, and when they have a good relationship with the PI and their institution. Afterword, Lauren walked me through where I would pull data from when I was entering it into the EDC. During the afternoon, I read a through a couple studies comparing centralized monitoring to on site source data verification to find what metrics were used to compare the two methods.

### **Thursday, June 8<sup>th</sup>, 2017**

I read the article “Risk-Based Source Data Verification Approaches: Pros and Cons (Tantayura 2010)” for more analysis on methods used to monitor clinical trials. Lauren then told me there was a patient currently in the neuro clinic who might be eligible for the Orbus trial, so we went upstairs to discuss their potential participation with Dr. Fink. After speaking with a CRA on the Orbus trial, we learned the patient wouldn’t be eligible for that trial, so we discussed other trials the patient might be able to participate in. After lunch, I entered data on two patients on the Orbus trial into the EDC.

### **Friday, June 9<sup>th</sup>, 2017**

In the morning, Lauren and I escorted a study patient between several clinics he needed to visit for a few of his screening tests. I then reviewed the protocol for a couple additional neuro studies that are currently enrolling patients and the AbbVie study that is about to open. We then watched a webinar for the Orbus study where they discussed what MRI findings would make a patient eligible or ineligible for the study. Lauren and I then identified a discrepancy in the Orbus study where patient visit dates, where testing and drug dispensation occur, didn’t match up with the beginning of each cycle. We reached out to the CRA for clarification.

### **Monday, June 12<sup>th</sup>, 2017**

I talked to Diana, who works in finance, about where I could find data on how remote monitoring is budgeted into a study and if they kept track of how long the site staff spent uploading source documents. She told me where to find the negotiated budget and while they haven’t tracked hours dedicated to providing documents for remote monitoring in the past, they were going to start doing so on the new Cantex study. Midday, I reviewed a few articles about the cost sparing benefits of remote monitoring but still found little literature on how the trials sites need to shift their work load. Lauren and I discussed the schedule for a patient coming in

tomorrow for pharmacokinetic testing. Finally, I talked to Crystal and Amy about active studies that utilized remote monitoring.

### **Tuesday, June 13<sup>th</sup>, 2017**

7:45am-5pm

I spent the first few hours of the day writing the background for my research proposal. I then went with Lauren to see a subject that needed to be reconsented and have blood drawn for the PK sub-study. After addressing a few of the subject's concerns about the medication schedule, we prepared the lab samples to be sent off for testing. We then visited another subject who was at the clinic for an infusion to ask if he had any changes in his medication or new adverse effects. Afterward, we collected the first subjects second set of PK labs and prepared them to be sent off to the central lab for testing.

### **Wednesday, June 14<sup>th</sup>, 2017**

6:30am-5pm

I attended the tumor board meeting, where physicians from several different specialties discussed the treatment plan for a few neuro oncology patients. I then went over the a few of the neuro cognitive assessments that will be performed in the Cantex study with Lauren and Lametria. Lauren came across a scheduling conflict between the study protocol and the clinic visits, which we were able to solve after talking to Dr. Nestor. I entered some newly available lab data into the EDC, then talked to Margaret about her experience as a coordinator in a study that used remote monitoring. She told me although that particular trial performed data verification on-site, every other visit was performed remotely.

### **Thursday, June 15<sup>th</sup>, 2017**

7:45am-4:30pm

In the morning, I went to clinic with LaMetria to re-consent a patient to the updated protocol and to give the clinic staff tubes needed for the research portion of the blood draw. I

then worked on my research proposal in preparation of tomorrow's meeting with my advisory committee. In the afternoon, I observed LaMetria give a MOCA exam to a study subject.

**Friday, June 16<sup>th</sup>, 2017**

8am-4:30pm

I entered some additional data into the EDC from the Orbus study and prepared for the meeting with my advisory committee. During the meeting, my committee gave me feedback on my research proposal, suggesting that I look into how to properly create a survey. That afternoon, I researched techniques on constructing a survey and attended a staff meeting.

**Monday, June 19<sup>th</sup>, 2017**

7:45am-4:30pm

In the morning, I visited a patient in the apheresis clinic with LaMetria to collect his sample of PBMCs extracted during the apheresis procedure. We then packaged the sample to be shipped to the sponsor so the vaccine can be prepared. I then did some more research into how to minimize bias in a survey and wrote a one page summary of my project proposal to be submitted to the UNTHSC IRB to start the approval process.

**Tuesday, June 20<sup>th</sup>, 2017**

7:50am-4:45pm

I spent most of the morning working on my initial draft of my research proposal. I did some more research on how to construct a survey and started figuring out how I was going to analyze the data.

**Wednesday, June 21<sup>st</sup>, 2017**

7:50am-4pm

Today I attended an orientation for new research employees.

**Thursday, June 22<sup>nd</sup>, 2017**

8am-5pm

In the morning, I worked on my research proposal and continued developing the questionnaire. Early afternoon, we learned that the ICT-107 trial is being suspended. We attempted to clarify with the sponsor what exactly the terms of the suspension were in order to plan what would happen for each patient currently on the study. We learned that no new patients or patients currently in screening will be able to enter the trial, but there might be a possibility for patients already enrolled to continue receiving treatment.

**Friday, June 23<sup>rd</sup>, 2017**

7:45am-4:30pm

In the morning, I attended a site initiation visit for the AbbVie trial. I joined LaMetria and the CRA while they visited the pharmacy to give the pharmacists their training on storage and preparation of the investigational product. I then sat in on the meeting with the PI, coordinators, and the CRA. After the SIV, Lauren and I worked on getting me access to the AbbVie study EDC and we attempted to follow up on the ICT-107 suspension in order to figure out what would happen to the patients currently on the study.

**Monday, June 26<sup>th</sup> , 2017**

8am-4:30pm

This morning I reviewed the protocol for AbbVie M13-813. I then reviewed the collection and shipment guidelines for central labs and looked over what collection tubes were shipped to us to figure out what needed to be drawn. In the afternoon, I worked on revising my research proposal.

**Tuesday, June 27<sup>th</sup>, 2017**

7:30am-4:45pm

I started the day by figuring out what Orbus requires for the shipment of plasma samples for the pharmacokinetic sub-study. I then went up to the clinic storage room to find supplies for shipping slides that a sponsor had requested. Lauren and I then put in the request to the pathology department for the slides the sponsor requested. After lunch, I worked on my research proposal and then accompanied Lauren to ask a subject who was coming in for treatment about

any new AEs or medication. Finally, I glanced over the AbbVie eye safety manual to see if there is any information that would be helpful for making a source document.

### **Wednesday, June 28<sup>th</sup>, 2017**

7:40am-4:30

In the morning, I entered some missing data into the Orbus EDC. I then learned how to report an SAE in iRIS. I spent late morning figuring out the appropriate statistical tests to run on the data I expect my survey to generate. After lunch, I went with Lauren and LaMetria to visit a patient who was receiving their first dose of the study treatment. I then helped Lauren package up the pharmacokinetic sub-study samples in dry ice to be shipped off for testing.

### **Thursday, June 29<sup>th</sup>, 2017**

7:40am-5pm

This morning I worked on my research proposal, making sure I'm using the correct statistical tests to analyze my data. I then went to the clinic with LaMetria to observe her give a MOCA exam to a study subject. Lauren suggested I train on the memantine protocol so I can help work on entering data. I spent the rest of the afternoon reviewing the memantine protocol and putting the finishing touches on my proposal before I submit it to my committee.

### **Friday, June 30<sup>th</sup>, 2017**

8am-4pm

This morning, I finished reviewing the memantine study protocol to complete my training so I can be added to the study. I then completed the blood borne pathogen training. I started reviewing the Cantex protocol so I can be trained and added to that study as well. Finally, I helped Lauren organize the storage room upstairs in the clinic.

### **Monday, July 3<sup>rd</sup>, 2017**

7:45am-1pm

In the morning, I finished reviewing the Cantex protocol so I could be trained on the study later this week. I then went up to the clinic with Lauren and LaMetria to see a couple patients who were coming in that morning. One of the patients required a blood draw, so I

helped Lauren process his labs and package up the sample so it could be shipped off to the central lab. With no more patients to see for the rest of the day or work that needed to immediately get done, I left early afternoon for the 4<sup>th</sup> of July holiday.

**Tuesday, July 4<sup>th</sup>, 2017**

4<sup>th</sup> of July Holiday

**Wednesday, July 5<sup>th</sup>, 2017**

8am-5:15pm

I spent the first part of the morning filling out the survey protocol summary form for submission to the UNTHSC IRB for exemption from IRB review. I then went up to the clinic with LaMetria to see a patient who was coming in for pre-study assessments and a blood draw. In the afternoon, I trained on the Cantex protocol with Lauren and started the process of getting me approved by the IRB so I can start working on the study. We then prepared for a possible patient coming in the next day by putting together a long list of medications that are contraindicated in the study.

**Thursday, July 6<sup>th</sup>, 2017**

8am-4:45pm

This morning I filled out the survey research protocol template that I will need to submit my proposal to the UNTHSC IRB. While working on that, I learned that I also would need to include a cover letter on the survey in place of an informed consent, and that need to submit a waiver for documentation of informed consent. I started to get these documents together as well. This afternoon, I had a meeting with Ms. Settele, where she gave me feedback on my research proposal. I received the list of BSWRI employees that I will be able to reach out to and it appears that I'll be able to contact 150 employees.

**Friday, July 7<sup>th</sup>, 2017**

8am-5:15pm

This morning I learned that I'll also need to submit my proposal to Baylor's IRB, so I'll need find out if I need to submit it to UNTHSC's IRB as well or if proof that Baylor approved

the protocol will be sufficient. Since Baylor requires that researchers use their templates when conducting research through their campus, I added the elements required by Baylor to the cover letter. I spent most of the afternoon filling out the CRF for the memantine study. I noticed a couple minor deviations and recorded them in the deviation log. Late in the afternoon, Lauren received an email from a subject having a difficult time with side effects potentially related to the study drug, so we figured out how we should respond to the subject and convey the information to the PI and sponsor.

### **Monday, July 10<sup>th</sup>, 2017**

8am-5:15pm

This morning I finished up filling out the CRF for the memantine study, then completed the drug accountability and deviation logs. I then went up to the clinic with LaMetria to see a patient coming in for treatment. After lunch, I went back to the clinic with Lauren to get the PIs opinion on a patient who had been having an adverse reaction to the IP. They told us that they don't believe the patients symptoms are necessarily related to the drug and that they would handle that patient from now on. I then worked on getting EDC access for a few more studies so I could start helping other coordinators.

### **Tuesday, July 11<sup>th</sup>, 2017**

8am-5pm

This morning I completed EDC training so I could start working on a few more studies, then started helping Lisa with data entry. I worked on data entry for most of the morning and attempted to resolve a few queries that had been raised at the last monitoring visit. After lunch, I went up to the clinic with Lauren to see a patient on follow up. We gave the patient a study questionnaire and the clinic drew labs. I then assisted Lauren with processing and shipping off the lab samples.

### **Wednesday, July 12<sup>th</sup>, 2017**

8am-4:45pm

I spent the first few hours of the day helping Lisa with data input. I was able to get most of the patient binder entered, except for a few queries regarding adverse events and concomitant

medications. I wasn't sure how the sponsor wanted this data inputted, so I asked Lisa and she told me she would have to contact the monitor to find out. I then helped Lauren package a plasma sample in dry ice and ship it off for testing. After lunch, I tried to get started on a few more studies, but didn't have access to the databases and EDCs I would need to work on them yet. I spent the rest of the afternoon filling out a CRF for another memantine subject binder.

### **Thursday, July 13<sup>th</sup>, 2017**

8am-4:45pm

This morning I worked on completing the drug accountability and deviation logs for patient binders in the memantine study, then I worked on completing the CRFs. I went into Aria to find some information that was required on the CRFs but not in the patient binders. I printed this out and added it to the patient binders. I had hoped to have access to the EDCs for the Seattle Genetics and Kite studies so I could start working on entering data, but unfortunately, I had not received it yet. I instead spent the rest of the afternoon reviewing the protocol for these studies.

### **Friday, July 14<sup>th</sup>, 2017**

7:45am-4:15pm

I spent most of the morning working completing source data for a subject in the memantine study. I filled out the drug accountability log and printed out a few missing progress notes and filed them in the subject binder. I then worked on filling out the CRF for this subject. This afternoon, I finally received access to the Kite EDC, but without IKnowMed, I still couldn't start working on this study. I instead spent the rest of the afternoon reviewing the subject binders for the memantine study, looking for any missing data in the CRF or source documents that could be filled in.

### **Monday, July 17<sup>th</sup>, 2017**

8:15am-5pm

This morning I continued working on memantine study. I completed missing data on the concomitant medication logs and medical histories for all the patients, then added this data to the CRFs. I created my survey in Qualtrics before lunch. I spent the afternoon answering queries

for the Orbus study, finishing up missing data on the memantine study, and setting up my IKnowMed account after finally receiving access.

### **Tuesday, July 18<sup>th</sup>, 2017**

8am-5pm

In the morning, I went up the clinic with Lauren to see a patient who needed to be re-consented on the latest protocol amendment. We also accessed AEs and changes in medications, and collected labs. After running the labs over to the main hospital, I told Natasha I could start helping her on some of her data entry now that I have access to IKnowMed. I trained on an investigator initiated study and started working on printing and adding source data to the patient binders, and filling out the CRFs.

### **Wednesday, July 19<sup>th</sup>, 2017**

8am-5pm

I spent nearly the entire day working on pancreatic cancer biomarker study that I started on yesterday. I worked on printing out source data, adding it to the patient binders, and then using the source documents to fill out the CRFs. There were several patients that I couldn't find in IKnowMed, Natasha told me this was because one of the physicians used a different EMR and I would either need to get access to it or she would have to work on those patients.

### **Thursday, July 20<sup>th</sup>, 2017**

8:45am-4pm

Today I attended an all-day training session on packaging and shipping biological materials. I learned how to properly package blood and tissue samples, as well as how to label the packaging to indicate that we are shipping potentially hazardous substances.

### **Friday, July 21<sup>st</sup>, 2017**

8am-4:30pm

In the morning, I attended a class that addressed lab safety and working with BSL-2 pathogens. Afterward, I continued working on the pancreatic cancer biomarker study. I printed source data and filled out CRFs for the rest of the patients that I could find in IKnowMed. I then

updated the EDC for the Orbus study for the patient who can into the clinic this week. A discrepancy between the protocol and the EDC generated several queries that I needed to address. I then spent the rest of the afternoon working adding diagnostic imaging data for the pancreatic cancer biomarker study. Due to the number of imaging tests done for each patient and the detail of each test, I anticipate that this will take a while.

**Monday, July 24<sup>th</sup>, 2017**

8:00am-6:30pm

Today, I continued working on the pancreatic cancer biomarker study. I worked on adding diagnostic imaging data into the patient binders and then translating this data into the CRFs. As I made my way through the patient binders, I also added some information that I found was missing from the CRFs. Overall, I got through around ten of the forty-eight patients on the study. I then revised my survey, applying a few of the suggestions that Dr. Mathew gave me earlier in the day. I spent the rest of the afternoon helping Lauren prepare for a patient coming into the clinic the next day.

**Tuesday, July 25<sup>th</sup>, 2017**

8:15am-4:45pm

I started the morning working on the pancreatic cancer biomarker study, continuing to add diagnostic imaging data to the CRFs. Later in the morning, I went up to the clinic with Lauren to see a study patient who was there for their second visit while on treatment. There was some question as to whether they would continue the study due to some adverse events the patient was experiencing. After deciding to continue, the patient was consented on an addition to the ICF, and we gave them their next supply of study medication and had labs drawn. After taking the blood draw over to the Baylor lab, I spent the rest of the afternoon working on the biomarker study.

**Wednesday, July 26<sup>th</sup>, 2017**

8am-4:30pm

I spent most of the day working on the pancreatic cancer biomarker study, adding source documents to the patient binders and completing the diagnostic imaging CRFs. Because there

are now 49 patients on this study and each patient typically has 4-8 scans, this is a time-consuming process. By the end of the day, I'm able to make to near the end.

### **Thursday, July 27<sup>th</sup>, 2017**

8:15am-4:45pm

I started the morning by continuing working on the pancreatic cancer biomarker study. I then helped package and send some tumor tissue slides that the sponsor had requested. Afterward, I was able to finish putting the diagnostic imaging data in the CRFs, so I moved onto adding surgical and pathological procedures. I don't expect this to take as long as inputting the diagnostic imaging. Later in the afternoon, I checked the Orbus EDC to add to lab data for the patient who came in earlier this week and noticed I was queried on the schedule of the visit. I discussed this with Lauren, and we contacted the sponsor to try to resolve this.

### **Friday, July 28<sup>th</sup>, 2017**

8am-12:30pm

Today I worked on the biomarker study before leaving early for Fort Worth to turn in my intent to graduate form.

### **Monday, July 31<sup>st</sup>, 2017**

8am-5:15pm

This morning I continued working on biomarker study. I searched through IKnowMed and Allscripts to find the surgical and pathology reports so that they could be added to the CRFs. I also added any information that I came across that I noticed was missing from the CRFs. Later in the morning, I went up to the clinic with Lauren to consent a new patient on the Orbus study. After lunch, I worked on the biomarker study and was able to finish adding all the diagnostic and surgical data. Natasha had told me earlier that all labs and physical exams must come from the same day as the blood collection for the study, so I went back and corrected several CRFs where I had used labs from either the day before or the day after. I then answered a few queries in the Orbus EDC, and entered some data that had become available for the patient we saw last week.

### **Tuesday, August 1<sup>st</sup>, 2017**

7:45am-5pm

This morning I finished entering the Orbus data that I had started yesterday into the EDC. I then began working on my IRB submission through Iris. Most of the information that Iris requires for subject only applies to drug and device studies or patient studies, so my application didn't take very long to complete. I then rewrote my cover letter according to the guidelines that BRI requires. After I finished this, I added the AEs into the CRFs for the memantine study, then got back to working on the biomarker study. Natasha printed out the medical records for the patients I didn't have access to, and I spent the rest of the afternoon creating and filling out CRFs for those patients.

### **Wednesday, August 2<sup>nd</sup>, 2017**

8am-4:45pm

This morning I worked some more on the biomarker study, filling out the CRFs for the last few patients that I didn't previous have the medical records for. Later in the morning, I added some data to the Orbus EDC that the monitor had informed us that we were missing. Afterward, I went up to the clinic with Lauren to see a patient for a follow up visit who needed to be re-consented and take a study questionnaire. This afternoon, I uploaded my revised cover letter to Iris and submitted my study for signoff and IRB review. I spent the rest of the afternoon working on the biomarker study. I was able to finish all the medical record data into the CRFs and tomorrow I plan on reviewing the patient CRFs for anything I might have missed.

### **Thursday, August 3<sup>rd</sup>, 2017**

8:15am-4:45pm

I started the day by reviewing the CRFs for any information that I might have missed. With 49 patients on study, this takes me nearly the entire morning. I come across a few patients who were missing diagnostic imaging data, so I track that down in the EMR and add it to the CRFs. I then helped Lauren organize documents and figure out what assessments needed to be performed for a patient who was going to be consented on the Cantex study today. Once the patient is consented, labs are drawn and I run these over to the main Baylor lab. I spent the rest of the afternoon continuing to review the biomarker patient binders.

**Friday, August 4<sup>th</sup>, 2017**

8am-5pm

I started the morning by making sure I hadn't left anything out of the patient binders in the biomarker study, and once I finished this I asked Natasha if she had anything else for me to do. She told me it would probably be best to help with the Iomab study. Teresa helped me get started and explained to me what needed what data needed to be put into the EDC. After lunch, I attended a staff meeting that addressed several procedural issues and staffing updates. I spent most of the afternoon continuing to enter data for the Iomab study. Due to the complexity of the study and the amount of information that the sponsor requires, I run into several issues that I'll need to bring to Teresa on Monday. Late in the afternoon, I received an email from Orbus explaining that wanted updated AE data to be entered for an upcoming data cut. I began imputing the AEs into the EDC, but I wasn't able to find some of the information that Orbus wanted in the patient binders. Since the data cut isn't until Wednesday of next week, I figured I'd go over this with Lauren on Monday.

**Monday, August 7<sup>th</sup>, 2017**

Today I was out of the office with an illness.

**Tuesday, August 8<sup>th</sup>, 2017**

7:30am-5pm

I spent most of the day working on Iomab. Most of the source data was already in the binder and most of what wasn't I was able to find in the EMR. For the information that I couldn't find, I asked Teresa where to look. She told me to most of it either hadn't been uploaded yet or that she would need to ask one of the nurses where to find it. Later in the day, I brought the AE issue I had come across Friday to Lauren, and she told me not to worry about it since most of the AEs were not yet resolved and the data would be incomplete. I then met with Lauren and Lametria, and we went over all the neuro studies that are currently active.

**Wednesday, August 9<sup>th</sup>, 2017**

8:15am-5:15pm

I started the morning clarifying a few parts of my IRB submission and then resubmitting it. I specified who would be recruited and what the purpose was for targeting these individuals with the survey. I then worked on Iomab for most of the remainder of the day. I finished entering the data I could find on the patient I had been working on yesterday, then went to Teresa to find out what I could do next. She told me the patient I had been working on needed concomitant medications added to their binder, and that the binder for another patient needed source data off the EMR added to it. I spent the rest of the afternoon working on finding conmed data.

**Thursday, August 10<sup>th</sup>, 2017**

8am-5pm

I spend the entire morning filling out the concomitant medication log. As the patient had received over 100 different medications that needed to be recorded, this was a time-consuming process. As I was doing this, I attempted to find AEs and SAEs as well by relating the medications to the patient's progress notes. When I finished this, spent the afternoon logging the medications into the EDC, which was equally as time consuming.

**Friday, August 11<sup>th</sup>, 2017**

8am-4:30pm

This morning I saw that the IRB had returned my submission with some corrections that I needed to make. I was able to address some of the issues on my own, and the others I plan on going over with Amy, as I'm not sure what they're specifically asking for. I finally received my EDC access for the AbbVie trial, so I completed the training so I'd be able to access the EDC as soon as we enrolled a patient. I then began working on one of the Iomab subject binders. The binder is missing much of the source data that needs to be entered into the EDC, so I track this down on the EMR, add it to the binder, then add it to the EDC. This is also time-consuming, as some of the data is buried on only a few progress notes out of dozens.

**Monday, August 14<sup>th</sup>, 2017**

9am-5pm

I spent Monday morning working on entering data for the Iomab trial. I start by gathering information on concomitant medications for the patient binder I started working on Friday. As this patient was in the hospital for over two months, gathering all the dosage changes, frequency changes, and start and stop times and dates is time-consuming. I spent nearly all day working on this and the patient ended up having over 100 medications in total.

### **Tuesday, August 15<sup>th</sup>, 2017**

8am-4:30pm

I started the morning by revising my IRB submission with Amy. I had several sections that they required me to fill out so I completed those, as well as updated my protocol and cover letter with the IRB number. I then worked on entering the conmeds into the EDC for the patient I was working on yesterday. This took me the rest of the morning. After entering conmeds, I started entering data on blood transfusions, but this proved difficult to find in the EMR, so Teresa and I went over to the inpatient unit to ask a nurse where to find this information. I then worked on entering blood products into the EDC the rest of the day.

### **Wednesday, August 16<sup>th</sup>, 2017**

8am-5pm

This morning I continued entering blood products for the patient I was working on yesterday. With nearly 100 transfusions to enter, this took almost the entire day.

### **Thursday, August 17<sup>th</sup>, 2017**

8am-4:30pm

Today I sat with Teresa and we tried to figure out where we could find much of the miscellaneous information that was missing from the EDC in the Iomab trial. This involved combing through the patient binders, as well as the EMRs Allscripts and IKnowMed. We were able to find much of the missing information, though some required reaching out to other departments via email. This afternoon I went upstairs to find Dr. Becerra so he could sign off on my form 18, but I learned from one of his medical assistants that he was out of the office for the afternoon.

**Friday, August 18<sup>th</sup>, 2017**

8am-4:30pm

Today I continued working on Iomab. I was able to catch up one of the patient's data to their last visit. I then answered some queries that had been generated in the last couple of days. Much of this involved going into the EMRs and finding information that hadn't been entered yet, while some of the queries were just asking to verify existing entries. I was able to get a signature on the scientific review form from Dr. Becerra and resubmit my application to the IRB for review. It was kicked back to me again for a few more issues I needed to address. Once I resolved these, I resubmitted it and was then told it needed to go through a nursing research committee since the survey would be sent to RNs. By this time it was late in the afternoon and most of the people who had been helping me with my submission had left, so I'll have to address this Monday morning.

**Monday, August 21<sup>st</sup>, 2017**

8am-4:30pm

I started they day by working on the Iomab trial. I attempted to answer some of the queries that had been generated last week, as well as enter random pieces of missing data. I then caught one of the patients up to their most recent visit, so that now every patient is caught up on their scheduled assessments. Later, Amy and I asked the IRB how to go about getting approval from the nursing research committee for my project, and we were given the contact of one of the members for guidance. I sent her an email and am awaiting a response. I spent the rest of the afternoon working on enter blood transfusion data for another patient on the Iomab study.

**Tuesday, August 22<sup>nd</sup>, 2017**

8am-4:30pm

I spent the morning finishing entering the blood and platelet transfusion data into the EDC for the Iomab trial. Around midday, I heard back from the nursing research committee member that I had contacted yesterday and we scheduled a meeting tomorrow morning to discuss

my project. I then spent the rest of the afternoon entering concomitant medication data on one of the Iomab patients into the EDC.

**Wednesday, August 23<sup>rd</sup>, 2017**

8am-4:30pm

In the morning, I met with Dr. Leveielle from the Nursing Research Committee for more information about submitting my project to their committee. She told me she wasn't sure why I was being directed to them but if I had to submit it to the committee, they would review it and I would present at their meeting in September. She said she would discuss this with the IRB. A few hours later Dr. Leveielle informed me that I would indeed need to submit to them, so I began preparing materials to do so. However, after speaking to Ms. Settele, the IRB reconsidered and allowed me to push my project through for review without submitting to the Nursing Research Committee. I spent the rest of the afternoon working on entering conmeds into the EDC for the Iomab trial.

**Thursday, August 24<sup>th</sup>, 2017**

8am-5:15pm

This morning I worked some more on the Iomab trial. I entered information on blood product transfusions into the EDC, then got started on finding concomitant medications for one of the patients. I later received an email stating I needed to fill out a research funding form for my project. However, after contacting research finance, I was told that since my project was unfunded, I don't need to fill this form out and they will sign off on my project in Iris. That afternoon, I discussed the SAEs for a couple of neuro patients with Lauren. We also received a call about a potential AbbVie patient, so we determined the time frame the screening event would need to happen in.

**Friday, August, 25<sup>th</sup>, 2017**

8am-4pm

Today I worked on collecting conmeds for one of the patient's on the Iomab trial. Since this patient had a lengthy hospital stay, recording the over 100 medications and their indications

was time consuming. Once I finished recording the conmeds, I spent the afternoon entering them into the EDC.

### **Monday, August, 28<sup>th</sup>, 2017**

8:15am-5pm

In the morning, I worked on recording concomitant medications for the most recent hospital visit for one of the Cantex patients. I discussed with Lauren how some of the medications should be recorded and which adverse event they should be attributed to. We then looked for the indications for several conmeds for a patient on the VBL trial. These indications were not immediately obvious looking through the progress notes and took a bit of searching to find. I spent the afternoon answering queries in the EDC for the Iomab trial and finding indications for conmeds that were given to those patients. Shortly before I left for the day, I received the outcome letter stating that my project had been approved by Baylor's IRB.

### **Tuesday, August 29<sup>th</sup>, 2017**

8am-4:30pm

This morning I worked finding conmeds indications for the Iomab trial and entering them into the EDC. This information is difficult to find on Allscripts and I'm only able to find indications for about half of the 20 or so medications that are missing them. I later discussed some new information the Lauren had learned from the Cantex monitor regarding some questions we had about how to record SAEs. We also discussed the timeline for getting for screening patients for the AbbVie trial. I spent the rest of the afternoon searching for adverse events for patients on the Iomab trial.

### **Wednesday, August 30<sup>th</sup>, 2017**

8am-5pm

I started the day by continuing looking for adverse events for patients on the Iomab trial. I was able to find most of the adverse event for of the one patients recent hospitalization. When I logged into the EDC to enter these, I saw that around 40 new queries asking to add either medical history or adverse events corresponding to medication indications had been added. I

started looking for medical history for that same patient in order to resolve these queries. I then saw that 50 more queries had been added regarding overlapping concomitant medications, even though these medications had different doses, routes, and indications. Teresa and I decided to contact the sponsor to clear up how they want us to handle this.

**Thursday, August 31<sup>st</sup>, 2017**

8am-5pm

We still haven't received a response from the sponsor about how to handle concomitant medications, so I spent most of the morning going through medical records looking for adverse events and their severity, start and end dates, and outcomes. Early afternoon, I went up to the clinic with Lauren to see a patient in for a visit on the Cantex study. After receiving the leftover drug from the patient, we counted the pills and found a discrepancy in number of pills returned and how many they should have taken. Since there were around 7 days of each medication missing, we figured it was likely a mistake and would contact the patient tomorrow to clear this up.

**Friday, September 1<sup>st</sup>, 2017**

8am-4:30pm

This morning I continued searching for adverse events for patient on the Iomab trial. Due to most of these patients extended hospital stays, this involves combing through dozens of progress notes and medication administration records to find any new events that occurred while the patient was on study. I was able to get through a couple more of the patients on trial. We finally heard back from the Iomab monitor regarding how we should enter medications into the EDC, and she told us that we had been doing it correctly. However, they cannot remove the existing queries and we would have to go back and answer the ones that were already generated.

**Tuesday, September 5<sup>th</sup>, 2017**

8:15am-5pm

In the morning, I finished up searching for adverse events for the Iomab patient I was working on Friday. I then worked on answering the queries that had been generated in the EDC

in the last week. Most of them are regarding overlapping medications and have an easy explanation, while others require searching in the EMR for information that the sponsor is asking for. Since there are around 100 queries of this nature, this takes me most of the rest of the day. There were two Iomab patients who had scheduled visits today, so before leaving I printed out their labs and progress notes and added them to the EDC.

### **Wednesday, September 6<sup>th</sup>, 2017**

8am-4:45pm

This morning I met with the Iomab monitors with Teresa, and we discussed several aspects of the trial and data entry that we had questions about. In particular, we cleared up some confusion on the end of study parameters so we could determine how long we need to follow up on the subjects. I then attempted to determine when the end of study dates should occur for each patient, as well as how long we need to record concomitant medications and adverse events. I then went into the EDC to answer some queries that the monitors had generated this morning. Shortly before leaving for the day, I learned that the UNTHSC IRB had approved my study and that I could now start collecting data. I plan in trying to distribute the survey next week.

### **Thursday, September 7<sup>th</sup>, 2017**

8am-4:30pm

This morning I met with Ms. Settele and we discussed my current experience in the oncology office and how I plan on rolling out my survey now that it has been approved. Afterward, I went up to the 7<sup>th</sup> floor to briefly meet with the monitors and ask them a few questions I had. I then answered several more queries that they had generated in the last day. I spent most of the afternoon preparing my survey and working my practicum report. I started revising and expanding my literature review. I found a few more articles on the increasing costs of clinical trials and used them to add to my points on how rising costs are pushing pharmaceutical companies to find new methods to reduce their overhead. Before I left, I answered a few more queries generated by the monitors in the Iomab EDC.

### **Friday, September 8<sup>th</sup>, 2017**

8am-4:30pm

In the morning, I continued working on expanding the background of my research proposal for the practicum report. I found a few more articles that discussed the increasing cost of clinical trials and worked them into my literature review. I then wrote out the body of the email that I'll use to distribute my survey next week. This afternoon, I worked on the Iomab trial. I answered a few more queries that had been entered by the monitors, then put in screening information for the newest patient to start the trial.

### **Monday, September 11<sup>th</sup>, 2017**

8:15am-5pm

I spent about an hour this morning answering queries in the Iomab EDC, mostly about medications and correcting errors that the monitors had come across. I then continued working on expanding my literature review for the practicum report, clarifying some of the background information on how sponsors conduct monitoring visits. In the afternoon, I started compiling the emails that I'm going to distribute my survey to. However, I can across an issue in Outlook with the list not saving and needed to get IT to correct it. I then went with Teresa to collect a sample from a bone marrow biopsy and pack it to be shipped to the central lab.

### **Tuesday, September 12<sup>th</sup>, 2017**

8am-5pm

This morning I continued expanding the literature review for my practicum report. I expanded on a few points that I had made in the proposal, and found a few more sources to include. I then worked on answering Iomab queries. I corrected several mistakes that the monitors had come across last week, and went through a few patient binders and addressed the notes that they had left. These mostly had to do with data that was in the EDC that they couldn't find in the source documents, so I either printed out the missing information and added it to the binders or pointed out where to find it.

### **Wednesday, September 13<sup>th</sup>, 2017**

8am-5pm

I was able to send out my survey today, after IT fixed the issue with my Outlook application. I made a few minor edits to the email before sending it out. I spent the rest of the morning working on the background for the practicum report. I added some more details on a

few of the articles I had referenced in my research proposal and found a couple new articles to expand on the background. I then worked on the Iomab trial for most of the afternoon. I answered several queries in the EDC and combed through another patient binder to address the notes the monitors had left behind.

### **Thursday, September 14<sup>th</sup>, 2017**

8am-4:30pm

I started receiving responses to my survey today and am currently at around 40 responses at a 30% response rate, which is roughly what I expected to get. I spent the rest of the day working in the Iomab EDC. I answered several older queries which hadn't been addressed yet. These mostly had to do with concomitant medications that didn't have a corresponding indication. I then updated the EDC with a couple of patient visits that had occurred in the last week. I spent most of the afternoon working on the screening information for the newest patient to be enrolled. This involved a lot of searching through progress notes for information such as the patients AML history and history of prior treatments.

### **Friday, September 15<sup>th</sup>, 2017**

8am-4:30pm

This morning I finished working on entering information into the Iomab EDC for the new patient. I combed through their medical records to find their past chemotherapy and medical history. I then started filling out their concomitant medications and blood products that they received. In the afternoon, I worked writing the background for my practicum report. I found some new information on how clinical trial protocols are becoming more complex and are requiring more from the investigational sites, while reimbursement has steadily decreased.

### **Monday, September 18<sup>th</sup>, 2017**

8:15am-4:30pm

This morning I found a few more articles that I could use in the literature review of my practicum report. Interestingly, I found a study evaluating a system that assigns scores to clinical trial protocols based on the workload the study puts on the trial site. Although it doesn't address remote versus on-site monitoring in the scoring system, it is the closest metric I found for

evaluating trial site workload. I then worked on finishing the medical history for the new Iomab patient. This afternoon, I processed a blood sample for another potential Iomab patient and packaged the serum to be sent off to the central lab. The rest of the afternoon, I read a couple more of the articles that I had found this morning.

### **Tuesday, September 19<sup>th</sup>, 2017**

8am-4:30pm

I started the morning by addressing a few queries that had been generated in the Iomab EDC. There were several queries regarding issues that we had attempted to reach out to the sponsor about, but still hadn't received an answer. Teresa and I compiled a list of questions we had and contacted the CRA to try to resolve them. We were able to get answers on how to handle unknown start dates but they still couldn't provide information on how long we need to assess AEs and concomitant medications after the patient had started new chemotherapy. I then worked on addressing several more queries with this information. In the afternoon, I attended a BRI meeting, then spent the rest of the day working on my practicum report.

### **Wednesday, September 20<sup>th</sup>, 2017**

8am-5pm

This morning I worked on addressing a few more queries that had been generated in the Iomab EDC the previous day. I then worked on entering the information for a subject's recent visit that hadn't been put into the EDC yet. This afternoon, I took the data that had been generated from my survey from Qualtrics and started to analyze it. I received 45 responses, 34 of which indicated that work on pharmaceutical/device sponsored clinical trials and can provide data to analyze. Initially I could see a couple problems. There is a wide variety of specialties among the respondents and it might be hard to compare across specialties. There also might have been a misunderstanding of a question that influenced the result. Ms. Settele suggested that I meet with one of Baylor's biostatisticians to figure out how I should handle these issues.

### **Thursday, September 21<sup>st</sup>, 2017**

8am-4:30pm

This morning I worked on my practicum report. I wrote part of the methodology section and expanded on the significance of the study. Teresa and I then called the monitor for the Iomab study and received a few more answers to the questions we had earlier in the week. We also clarified how they wanted us to report bone marrow blast counts, since we had been queried on that issue yesterday. We were also told we would have to delete several visits for one of the subjects, as they were unnecessary. Afterward, I worked on addressing the issues we had discussed with the monitoring in the EDC.

### **Friday, September 22<sup>nd</sup>, 2017**

8am-4pm

This morning I learned that one of the Iomab subjects had been released from the hospital, so I printed his transfusion report and medication administration recording and started recording his concomitant medications from this hospital visit. Because this patient was in the hospital for over two months and experienced multiple adverse events, compiling the conmeds took nearly the entire day. Before I left for the day, I answered a few queries in the EDC regarding why we had deleted some data for one of the patients.

### **Monday, September 25<sup>th</sup>, 2017**

8am-4:30pm

This morning I checked on my survey and saw that I had received a few more replies over the weekend, bringing the total up to 49 replies, with 38 who can provide information on remote monitoring. I then spent the rest of the morning working on the methods section of my practicum report. I was able to set up an appointment to see the biostatistician of Thursday afternoon, so I began preparing my data so he can take a look at it. I spent the rest of the afternoon working on the concomitant medications for the Iomab subject I started working on Friday. There were only a few more pages of conmeds that needed to be filled out so I was able to finish this by the end of the day.

### **Tuesday, September 26<sup>th</sup>, 2017**

8:15am-4:30pm

I started the morning by correcting a few mistakes in the source data that the monitors had pointed out. The monitors had wanted us to document the temperatures taken during the subjects infusions in Celsius since that's what the EDC asks for, so I made a spreadsheet in Excel to convert the units for each subject and added them to the subject binders. I then met with Teresa and Diana to discuss what we have been doing on the Iomab trial so she could get an idea of how much time we're putting into it. I then went with Teresa over to the hospital to collect the aspirate from a bone marrow biopsy for one of the Iomab subjects currently in screening. I then spent the rest of the afternoon working on my practicum report. I tried to figure out a way to organize the data I had collected, and took a few notes on trends I noticed while looking over the results.

### **Wednesday, September 27<sup>th</sup>, 2017**

8am-

This morning I saw that we received the action letter from the Iomab monitoring visit a few weeks ago. The letter contained some information about subject visits that we needed to enter that conflicted with the protocol and what the monitor had previously told us. We took the letter to the finance department and they told us we probably would have to go above monitors or directly to the sponsor to clear this up, as we have continuously received ambiguous information. I then worked on my practicum report. I added some information about FDA and ICH guidelines to the literature review, and continued to analyze the data I had received. Later in the afternoon, I logged into the Iomab EDC and found that data management had added about 125 more queries because they had added a few new fields for lab values in the EDC and we needed to go in and update these.

### **Thursday, September 28<sup>th</sup>, 2017**

8:15am-3:15pm

This morning I checked the Iomab EDC and saw that we had nearly 500 queries, as every piece of missing data had been queried. Teresa and I then composed a response to the action letter we had received yesterday, and had the finance department review before sending it to the CRA. I then worked on my project for a few hours. I tried to transfer my data from Qualtrics into an Excel spreadsheet, as Qualtrics apparently doesn't let me export the raw data, but ran into

some issues trying to organize several of the responses. Later in the afternoon, I meet with one of Baylor's statisticians who gave me some advice on how analyze the data I had received. He gave me a few idea on how to break down the data and present it in a format that can be easily understood. He too suggested that I find a way to get the raw data off Qualtrics, as managing it through Excel would be difficult.

**Friday, September 29<sup>th</sup>, 2017**

8:30am-4:45pm

This morning I checked my email and saw that Medpace had set a deadline for next week to answer all the queries in the EDC, as they were going to forward their preliminary data to the sponsor soon. Most of the queries were just filling in the new fields that had been added to the EDC a few days ago, and I was able to answer all of these in a few hours. The remaining queries would likely take a lot longer to figure out, as they were mostly regarding information that we had been having trouble finding.

**Monday, October 2<sup>nd</sup>, 2017**

8:15am-4:30pm

This morning I checked the Iomab EDC and found that no new queries had been added over the weekend, leaving the number we need to have done by Friday at around 100. Last week, the monitor had said that she had new information on how we should follow patients who had come off the study, so Teresa and I called her. She told us that we need to follow all patients 100 days post-transplant regardless if they move on to another therapy or stay on the study drug, which creates a lot more information we need to capture as most of the patients had received the study drug. We'll likely run this by finance before implementing it. I then addressed a few more queries that had been generated this morning. This afternoon, I had my Qualtric access upgraded so I could export the raw data from my survey. I downloaded a few different formats and sent them off to the statistician so he could look at them and recommend the one I should use.

**Tuesday, October 2<sup>nd</sup>, 2017**

8:15am-5:15pm

This morning I worked on figuring out the missing indications for several conmeds for one of the Iomab patients. I was able to find a few of them, but several remain to be found. I then wrote an email to reach out to the CRA for confirmation on what we had discussed yesterday. When she responded, we also learned that we would need to collect conmeds for the entire duration of the study, until the patient either dies, is lost to follow up, or completes the study in five years' time. As most of these patients are very sick and are in and out of the hospital, this is going to be incredibly time consuming. With the information we received yesterday, we also saw that a few patients were due for study visits this week, so we prepared for those.

### **Wednesday, October 4<sup>th</sup>, 2017**

8am-5:30pm

I started the day by adding the labs for a patient who had a study visit today. Afterward, I worked on collecting the medical history for a patient who is due to be admitted to the hospital today to start treatment. I had planned on recording most of his history from the EMR and filling in the gaps by asking the patient today when he comes into his bone marrow biopsy, but his medical history is extensive and I didn't have it finished by the time he came in. This afternoon, Teresa and I went downstairs to the clinic to collect the aspirate and slides from the patient's bone marrow biopsy, and shipped them off to the sponsor. Before I left for the day, I answered several older queries in the EDC, as we had received an email this afternoon reminding us that they wanted all the queries cleared by this Friday.

### **Thursday, October 5<sup>th</sup>, 2017**

7:45am-4:30pm

This morning I worked on answering some of the Iomab queries. I identified a few that were mistakes, and was able to quickly correct these, however, most of the remaining queries were for information that we didn't have and either had to get from the PI or the clinic downstairs. I entered the data that we had available for one the subjects who had a visit yesterday and another who was having a visit today. Despite the sponsor wanting us to clear all the queries soon, they are continuously adding more. Some of them just ask for clarification on procedures that were not performed, but many of them were automatically generated for

conmeds that had been entered after the subject had ended study treatment. We confirmed with the CRA once again that the sponsor wanted us to collect these, and she told us that these queries are likely just a mistake in the EDC and will probably be closed once we answer them.

### **Friday, October 6<sup>th</sup>, 2017**

8am-4:30pm

This morning I worked on writing the methods section of my practicum report. I then worked on answering a few more queries in the Iomab EDC, but at this point almost all of them require some sort of input from the patient's treating physician or information that we don't currently have access to. Later in the morning, we found out that one of the patients had come in for a bone marrow biopsy, so I gathered all the supplies we would need for our portion of the collection. This afternoon, I met with the statistician again to run the statistical tests on my survey using the raw data I had obtained earlier in the week. Interestingly, after matching respondents that had worked on both on-site and remote monitoring studies, the difference in hours allocated to each was significant, though with a small sample size. He gave me some advice on how I should organize and present this information as well.

### **Monday, October 9<sup>th</sup>, 2017**

8am-5pm

This morning, I went into the EMR to see if there was anything that happened over the weekend that needed to be added to the Iomab EDC. One of the patients had a post infusion visit that had some labs that needed to be captured, so I added those to the EDC. I spent the rest of the morning working on my practicum report. I continued working on the results section that I had worked on this weekend, and made a few more tables to organize my data into a presentable format. This afternoon, I made several corrections to data in the Iomab EDC that I had found mistakes in. These mostly had to do with the times of gamma camera imaging studies, but going back and finding where we had made mistakes, then going into the EMR to find the correct information was time consuming.

### **Tuesday, October 10<sup>th</sup>, 2017**

8am-5:30pm

This morning I added a few more lab reports into the Iomab EDC from patients who had study visits last week. I then helped Teresa ship off the bone marrow biopsy samples that we had collected last Friday. This afternoon, I attended one of the Baylor town hall meetings, where they discussed the direction the institution plans to take in the next year. I then worked on making a new patient binder for one of the newer Iomab patients, and added some information to the EDC as I created it. Later in the afternoon, I ran a few more statistical tests on my data using Excel. I compared the difference in rankings using a Mann-Whitney U test, and most of the results were significant, but I'm not sure how much value this is compared to presenting the data visually.

### **Wednesday, October 11<sup>th</sup>, 2017**

8:15am-5:15pm

This morning I worked on data analysis for my practicum report. I ran a few more statistical tests to compare the number of studies in the remote versus the on-site monitoring groups, then explained the results in the report. When I checked my email, I found that we had received a response from the CRA regarding end of study dates, and that we would need to go back and change the information that we had put into the EDC. I then sat in on a meeting with the chief medical officer from Actinium, where we discussed the Iomab trial. We expressed a few concerns about data collection, and asked if we could get definitive clarification on a few of the issues we had been having. I spent the rest of the afternoon writing the discussion section of the practicum report and creating charts and tables to illustrate the data.

### **Thursday, October 12<sup>th</sup>, 2017**

8am-5pm

This morning, I added some newly available data into the Iomab EDC. I then went back and added a couple of subject visits from May that I found were missing. At this point, we had around 10 new queries that were added this morning, so I worked on answering those. Most of them were just empty fields that were overlooked when initially entering the data, however, a few of them required going into the EMR to what had been entered months ago was correct. I spent most of the afternoon working on my practicum report. I wrote a bit about the limitations of the study and expanded on a few of the discussion points I had worked on earlier in the week.

**Friday, October 13<sup>th</sup>, 2017**

8am-4:45pm

This morning I continued writing the results and discussion sections for my practicum report. I also cleaned up a few of the tables that I had created previously so that they could be added to the report. When I checked my email, I saw that we had received an email from the Iomab monitor asking us to have all subject visits updated by the end of the day. I answered a few of the queries that had been added, and added some missing information into the EDC, but the majority of the data that we still need to add is missing from the EMR or requires the PI's input. I spent most of the afternoon continuing to work on the my practicum report.

**Monday, October 16<sup>th</sup>, 2017**

8am-4:45pm

I spent most of the morning editing my practicum report and working on the discussion section. I also created the charts to visualize the rankings for each of the tasks that the participants were asked to rank. Early afternoon, I worked on answering several questions that the Iomab monitors had left behind on post it notes in the patient binders. I then printed some medication records and added them to the binders in preparation for their monitoring visit tomorrow. Later in the afternoon, I return to working on my practicum report before leaving for the day.

**Tuesday, October 17<sup>th</sup>, 2017**

7:45am-4:45pm

I started the morning by working on my practicum report. I mostly worked on the discussion section. I then attended a conference call for the Iomab trial, where the sponsor and CRO gave some advice on managing the trial and answered some questions, however, they didn't really say anything that we didn't already know. Afterward, we worked on the Bearman's RRT assessments for the Iomab, which we are behind on for most of the patients. I then went with Erica over to the BMT office to track down some information that was missing from both the Texas Oncology and BUMC EMRs. After attending the month BSWRI staff meeting, I spent the rest of the afternoon working on my practicum report.

**Wednesday, October 18<sup>th</sup>, 2017**

8am-4:30pm

I spent most of the morning working on my practicum report. Around mid-morning, I went upstairs and briefly talked to the Iomab monitors, and let them know to contact me if they needed anything since Teresa was out with an illness. I then went downstairs and gathered the lab supplies in preparation for another patient's study visit tomorrow. I then spent most of the afternoon continuing to work on my practicum report. Before leaving for the day, I addressed a few items on one of the safety queries we received today.

**Thursday, October 19<sup>th</sup>, 2017**

8am-5pm

This morning I continued working on writing my practicum report. Late morning, I processed and shipped the HAMA sample that had been drawn from one of the Iomab patients earlier in the day. I spent part of the afternoon entering data from several recent patient visits or the last two weeks, printing out the source documents, and adding them to the binders. I spent the rest of the afternoon editing my practicum report.

**Friday, October 19<sup>th</sup>, 2017**

8am-4:30pm

I started the morning by entering the lab values from a study visit that had occurred earlier this morning, then spent the rest of the morning working on my practicum report. Late morning, I learned that the sponsor wanted several pages completed in the EDC by the end of the day, mainly the Bearman's RRT assessments, so I worked on these for about an hour and entered them into the EDC. I spent the rest of the afternoon writing the abstract and organizing my practicum report.

