ADVANCING RAPID CYCLE RESEARCH TO IMPROVE CANCER-RELATED CARE

VIRTUAL WORKSHOP

FEBRUARY 16–17, 2022

NIH
NATIONAL CANCER INSTITUTE
Division of Cancer Control
& Population Sciences

WEDNESDAY, FEBRUARY 16, 2022

OPENING REMARKS AND INTRODUCTIONS

Katrina Goddard, PhD, Director of the Division of Cancer Control and Population Sciences (DCCPS)
Paul Jacobsen, PhD, DCCPS, NCI
Wynne E. Norton, PhD, DCCPS, NCI

Dr. Paul Jacobsen welcomed participants to this NCI-sponsored workshop on advancing rapid cycle research to improve cancer-related care. Dr. Jacobsen introduced the event co-chair, Dr. Wynne E. Norton, then remarked on the robust attendance of this meeting, comprised of 367 registered participants, with 269 self-identified researchers, 35 clinicians, 26 administrators, and 37 in other roles.

Dr. Katrina Goddard provided updates on NCI and the DCCPS. The federal government is still operating under a "continuing resolution," which has caused conservative budgetary decisions by NCI. However, NCI continues to prepare and look toward advancing the science in cancer control, pending a Congressional decision. Dr. Goddard also reiterated an announcement in early February by President Biden about restarting the Cancer Moonshot to accelerate the progress against cancer. She thanked participants for their contributions to cutting-edge research propelling science forward and stated that NCI is still learning about this initiative. She also remarked that she is new to her role, and thus released a Request for Information (RFI) to obtain feedback from community partners, patient advocates and other interested parties, to help guide future directions for cancer control research. The RFI deadline is March 25, 2022.

Next, Dr. Jacobsen acknowledged the contributions of planning committee members and other key staff, including:

- Sarah Kobrin, PhD, DCCPS, NCI
- Brian Mittman, PhD, Kaiser Permanente
- Gareth Parry, PhD, Independent Consultant
- Shobha Srinivasan, PhD, DCCPS, NCI
- Emily Tonorezos, MD, DCCPS, NCI
- Robin Vanderpool, DrPH, DCCPS, NCI
- David Chambers, DPhil, Division of Implementation Science
- Trish Silber, MDA, Aliniad Consulting Partners

CONCEPTUALIZING RAPID CYCLE RESEARCH: INITIAL THOUGHTS

Paul Jacobsen, PhD, DCCPS, NCI
Wynne E. Norton, PhD, DCCPS, NCI

Dr. Paul Jacobsen and Dr. Wynne E. Norton presented information on four topics related to rapid cycle research, to provide background for the workshop. First, Dr. Jacobsen stated that rapid cycle research methods are needed secondary to the extended time from concept development to adoption. There is

a growing recognition that the process of developing and testing new interventions needs to improve. Thorough approaches are time consuming, and do not meet the needs of stakeholders. However, rapid development, testing and implementation lack rigor, which limits the usefulness of the findings.

Contemporaneous trends related to this topic give cause for optimism that the research can be accelerated, while maintaining rigorous interventional methods. The Learning Health System Model allows for internal data to be systematically integrated with external evidence, with this knowledge put into practice. Other methods include aggregation and use of clinical data from the electronic health record (EHR), newer clinical trial designs, pragmatic design features to speed translational research, and the involvement of stakeholders in defining and answering research questions.

Next, the presenters detailed some of the origins of rapid cycle research. The earliest articles found were from 2012 through 2014, and first mention "rapid" as one of the "5R's". The use of "rapid" as a descriptor in the first article by Glasgow et al (2012), signaled that scientific evidence is generally not translated in a timely nor consistent manner into policy or practice. The second article by Peek et al (2014) concurred with this assessment, and recommended studies that are contextually relevant to stakeholders, while also being rapid, rigorous, and transparent. The approaches endorsed by these authors allow for discoveries within a study to influence methods, while providing information for the replication of research, including under diverse conditions.

The third article by Riley et al (2013), identified issues to promote rapid cycle research. These recommendations included:

- Stakeholder engagement to potentially improve recruitment, retention and finding relevance to stakeholders
- Rapid research designs such as N of 1 for intervention development, MOST and SMART (Sequential Multiple Assignment Randomized Trial) designs and adaptive clinical trials
- Rapid review process to streamline grant review and funding activities
- Infrastructure for rapid research including leveraging EHRs, use of common data elements to improve efficiency and facilitation of data sharing.

In 2015, the Agency for Healthcare Research and Quality published a report (Johnson et al) on using rapid cycle methods to obtain research or quality improvement goals. The authors defined rapid cycle research as a process of practical methods implemented by quality improvement or research teams to address clinical problems with prompt assessment and adaptations. The report describes six phases including initial preparation and problem exploration to identify partner organizations/champions and key stakeholder problems/engagement, respectively. The next three phases, which can be viewed within the context of Plan-Do-Check-Act, are comprised of:

- Knowledge exploration including alternative solutions
- Solution development using system engineering approaches based on ideal-system concepts
- Solution testing using rapid cycle testing designs such as time-series, statistical process control, single-case experimental designs, and adapted clinical trials and factorial designs

Finally, there is an implementation and dissemination phase with resources to help researchers and QI teams address application issues.

Thus, rapid cycle research is informed by—and can influence—several fields including healthcare delivery, implementation, and QI research, as well as improvement science.

Dr. Jacobsen and Dr. Norton then presented a working definition of rapid cycle research: *A rigorous approach to conducting interventional research that seeks ways to maximize the timeliness and efficiency of the process for generating answers to questions of practical interest and actionable use.*

They proceeded to discuss six proposed key elements of rapid cycle research, stating that these considerations are initial thoughts, and element refinement will arise from meeting suggestions. Nevertheless, the focus is on quantitative interventional research, with identification based on reviews of prior work and consideration for how rapid cycle research can improve cancer care delivery. The elements differ only to the extent they are shared with other forms of research and are meant to characterize the degree to which a study possesses rapid cycle features.

The elements include:

1. *Iterative design* with at least two consecutive or concurrent comparisons.
2. *Proximal outcomes* or those expected to be influences by short-term interventions but with strong relationships to important distal goals.
3. *Stakeholder engagement* with meaningful group interactions to potentially identify priority topics, select study design, and yield research that is more patient-centered, relevant, and timely.
4. *Data sources* with a focus on existing resources with valid and reliable information such as EHRs, data warehouses, and administrative and operational databases; although not to the exclusion of primary or original data collection.
5. *Setting* such as the infrastructure to back efficient, high-quality, rapid cycle clinical research, including access to human and material resources, adequate leadership and staff support for clinical practice changes, and the ability to collect, access and analyze needed clinical data.
6. *Appropriate rigor* defined as the design best suited to answer the research question, but which is feasible and acceptable for the study setting. Other considerations include preference for experimental or quasi-experimental designs, testing effects on pre-determined primary outcomes, and use of well-defined methods to minimize bias and internal-validity threats.

In consideration of next steps, Dr. Jacobsen and Dr. Norton acknowledged the work of the NCI-funded Consortium for Cancer Implementation Science Group, which has addressed the topic of rapid research at its meetings, with plans to discuss the enhancement of equity-focused adaptations, interventions, and strategies. The agenda of this meeting was to understand how current research can inform rapid cycle research, incorporating rapid study designs, methods, and data collection.

(The presenters noted that no relevant financial relationships existed, and the views expressed were their own.)

NCI GRANT PORTFOLIO OF RAPID CYCLE RESEARCH

Wynne E. Norton, PhD, DCCPS, NCI

Dr. Norton presented results from a portfolio analysis of rapid cycle research completed in preparation for this workshop. The objectives of the analysis were to determine the type of research funded through various agencies, describe, and characterize features of these studies, and use the results to identify gaps and opportunities. Standard methods were used to conduct the analysis with internal search platforms identifying grants between 2016-2021 via specific search parameters and keywords. Non-research grants, non-healthcare/cancer care delivery, and iterative activities unrelated to interventional designs, were excluded.

A portfolio analysis codebook was developed based on the literature and related codebooks, and then this information was split into two categories – cancer-related characteristics and study-related characteristics. Cancer-related characteristics focused on the cancer-control continuum from prevention through death, and study-related characteristics included high-level assessments of the study purpose. They identified and screened 154 records, with 66 assessed for eligibility and 20 ultimately included.

Grants for cancer-related characteristics included the cancer control continuum, cancer type and focus area. For the cancer control continuum, there were more grants for earlier or later stages, with survivorship (n=9) and screening (n=7) having the most. For cancer type, only the most frequent categories were presented with "multiple types" having nine grants, and colorectal- (n=3), breast- (n=2), and lung (n=2) cancer also represented.

A review of summary data on study-related characteristics of the 20 grants found most focused on developing, adapting, or refining an individual or patient-level intervention. Few were focused on adapting, refining, or developing implementation strategy or healthcare delivery interventions. However rigorous methods were used in most trials including randomization, and MOST/SMART or quasi-experimental designs. Studies were frequently conducted at academic medical or oncology centers, as well as virtually through telehealth or apps, particularly in primary care clinics. Stakeholders were involved in all grants, as well as other groups such as medical practitioners, community organizations, and health systems.

Select examples of titles of rapid cycle research grants include:

- Multilevel Interventions to Increase Adherence to Lung Cancer Screening
- Decision Support Training for Advanced Cancer Family Caregivers: the CASCADE Factorial Trial
- COOPE: A digital health system to facilitate financial navigation of out-of-pocket cancer costs
- Use a SMART Design to Optimize PTSD Symptom Management Strategies among Cancer Survivors

Although only 20 grants were identified, they illustrate that conducting rapid cycle research in cancer care delivery is feasible across a range of cancer-related topics and study-design characteristics. This area of research is primed for scientific growth and practice-based impact.

DISCUSSION OF KEY CHARACTERISTICS OF RAPID CYCLE RESEARCH

MODERATOR: *David Chambers, DPhil, DCCPS, NCI*

DISCUSSANTS: *Russel Glasgow, PhD, University of Colorado School of Medicine*
Rinad Beidas, PhD, University of Pennsylvania Perelman School of Medicine

Dr. Glasgow and Dr. Beidas lead a discussion focusing on recommendations for future development of rapid cycle research in cancer care delivery. Dr. Beidas started the session detailing how her experience as an embedded implementation science researcher and practicing psychologist informs her perspective. She stated she views implementation science as a method for community advocacy and amplification, to achieve population health, social justice, and scientific discovery. By using rapid cycle research, healthcare equity can be obtained sooner.

Typically, it can take up to 5 years from concept to randomization in implementation research. Dr. Beidas believes more lives could be impacted if the pace was improved, with the removal of common challenges related to traditional research models. The COVID-19 pandemic was an example of how quickly research can be performed with priority alignment from health systems and scientists, both nationally and globally. The portfolio analysis revealed few rapid cycle studies in cancer, with most interventional development targeting the patient, thus highlighting the opportunity to add implementation strategy development.

Dr. Beidas provided three hypotheses for why there is so little rapid cycle research including cumbersome research infrastructure, systems alignment, and the only recent development of tool kits with designs and methods to facilitate these types of studies. Rapid cycle research is often associated with less rigor and evaluation thus investigators need to ensure that these elements, along with reproducibility, are included. Equity also needs to be a key component when considering resources. Last, rapid cycle components

lean toward quantitative data that can extracted from existing administrative sources, with meticulous qualitative and mixed-methods survey work used as a model.

Next, Dr. Glasgow began his presentation by providing his professional background as the director of the implementation science program at the University of Colorado School of Medicine, and former Deputy Director for Implementation Science at NCI. The latter position relevant to observations on the progress changing the status quo of research including pragmatism and adaptations—which investigators saw as opposing rigorous methods. Framing, timing, and designing for dissemination are critical. Active testing with rapid translation and modifying the concept of what constitutes evidence can move rapid cycle research forward.

Researchers are conducting work now on rapid prototyping, such as human centered- and decision-centered design. Investigators need to consider dissemination and rapid dissemination trials, using technology and building on this foundation. Evaluating capacity and using participatory modeling with pragmatic research are all key elements. Creating a dichotomy of research as rapid or "slow" may not be useful, and there does not need to be a moratorium on traditional studies. Rather, investigators should conceptualize the dimensions of rapid cycle research related to a continuum of how quickly the study can be conducted.

Q&A SESSION

The question-and-answer session started with Dr. Beidas describing the elements that should be included in rapid cycle research. Dr. Beidas stated that equity and dimensionality considerations should be primary criteria. The virtual floor then opened for participant comments and questions.

Dr. Chambers asked the discussants to comment on typical research processes and rigor, and the definitions of both, related to facilitating or hindering rapid cycle research. Can typical research co-exist with rapid cycle research, and how can the two be reconciled? Dr. Glasgow stated that researchers can learn from other fields, such as technology, which has always incorporated elements of rapid change and dissemination. Rigor needs to be redefined in terms of other characteristics, such as external validity, context, and equity. Replication is another key factor, lacking in many studies, which could safeguard against potential bias.

Dr. Beidas commented on systemic issues, such as Institutional Review Boards (IRB) which are barriers to conducting research more quickly. She stated we need paradigm shifts, with crucial changes such as embedded researchers and hospitable administrative structures that understand pragmatic trials. Next, Dr. Glasgow commented on how rapid cycle research differs from the six primary features typical in interventional studies. He replied that there are three elements that are unique—iterative approaches, proximal outcomes, and data sources. Stakeholder engagement, setting context and rigor are also necessary. But how these studies are conducted, including stakeholder engagement, sets rapid cycle research apart—proceeding slowly at first to build the infrastructure and relationships, so when ideas are developed, methods can be quickly implemented.

Both discussants answered a question on how to distinguish rapid cycle research from user-centered design principles, and whether user-centered design approaches are rapid cycle research. Dr. Glasgow explained that many principles are the same, however, balance and dissemination issues are not always considered in user-centered designs. Dr. Beidas noted that it appears important to differentiate between types of research, which can be conceptualized as a Venn diagram with overlapping features.

Subsequently, Dr. Chambers read a participant comment regarding the extended time needed to build stakeholder engagement, which may not be conducive to rapid cycle research, as well as methods to ensure that studies are inclusive. Dr. Beidas agreed with the comment and stated that certain groups are traditionally under-represented, and rapid cycle research is not always appropriate in certain settings.

Researchers should take the time to build relationships and use community member engagement to determine relevant priorities. Dr. Glasgow commented on the use of conjoint analysis, where examination of choices and immediate feedback is helpful. Also, using an iterative process where implementation team members and stakeholders provide input, allows for swift progress.

A participant then inquired about specific factors to consider regarding rapid cycle testing in low resource settings, such as community health centers. Dr. Beidas responded that infrastructure and relationships should be built, using strategic partnerships to obtain equity and inclusion. Data sources also need to be considered including electronic health records (EHR), as availability and formats vary, making application difficult. Dr. Glasgow remarked that some low-resource settings can move more quickly because they lack bureaucracy. Regarding the EHR, he believes caution is needed and not all information needs to be included in these records. Settings that lack this technology should not be excluded, since capacity can be improved.

Dr. Beidas and Dr. Glasgow also commented on how participatory modeling or crowdsourcing approaches fit into rapid cycle research. Dr. Glasgow responded that sophisticated modeling and community member engagement prevents wasted resources and gives real-time data to begin estimating factors relevant independent variables. Dr. Beidas stated that crowdsourcing is a way to involve stakeholders and provides input into iterative testing and designs.

The next question asked the discussants to reflect on whether rapid cycle research includes disaster or emergency management studies? Dr. Glasgow replied that this type of research would be included in quality enhancement, and we have learned much from the pandemic response.

The discussants then addressed the interval for conducting rapid cycle research and whether there was a concrete set of phases. Dr. Beidas stated that it is difficult to explicitly define, and the median duration of high-quality studies from the existing literature should serve as a benchmark. There is a need to understand the common determinants of rapid cycle research. Dr. Glasgow replied that consideration should be given to stakeholder timeframes and the risk related to specific research topics.

Tying several questions together, Dr. Chambers asked for comments on the PCORI portfolio, and whether patient-centered, stakeholder-driven, comparative effectiveness research focuses on the rapid cycle process. Dr. Glasgow replied that the Patient-Powered Research Network (PPRN) and A/B studies are good examples.

Last, the discussants were asked if there are topics more specific to either traditional or rapid cycle research. Dr. Beidas observed that rapid cycle is appropriate when community relationships are already established, and she would like to see these approaches used in implementation science. Dr. Glasgow rejoined that working with implementation partners and transparency are useful when planning these studies. Professionals must consider how projects can impact long-term relationships and trust, then address immediate stakeholder concerns, including the viability and sustainability of methods.

Final comments included the joint participant message of equity and inclusion in rapid cycle research—increasing the diversity of the research workforce to support stakeholder engagement. Rapid cycle methods include reviewing data real-time for signaling and concurrently tailoring interventions.

INTERVENTIONAL STUDY DESIGNS FOR RAPID CYCLE RESEARCH

MODERATOR: *Brian Mittman, PhD, Kaiser Permanente*

PRESENTERS: *Daniel Almirall, PhD, University of Michigan*
Amy Kilbourne, PhD, U.S. Department of Veterans Affairs & University of Michigan Medical School
Gareth Parry, PhD, MSc, Independent Consultant

DR. DANIEL ALMIRALL, ADAPTIVE IMPLEMENTATION STRATEGIES; PART OF THE RAPID CYCLE IMPLEMENTATION TOOLBOX?

Dr. Almirall presented information on adaptive implementation strategies (AIS) and addressed scientific questions on clustered SMART (Sequential Multiple Assignment Randomized Trial), and on combining rapid cycle trials to construct an AIS. He focused on distinctions between implementation and implementation science, and rapid cycle implementation and rapid cycle research.

While implementation entails sequential, organization-specific approaches, implementation strategies are adapted and refined over time. Implementation strategies are a guide for those who implement, including implementation practitioners, community service providers, service provider associations and policy makers. AIS is not an experimental or adaptive trial design, nor a method of conducting pilot or usability studies. An example of AIS involved the adoption of CBT in high-schools across Michigan, including in-person training, REP (replicating effective programs), coaching, monitoring, and facilitation.

Developing AIS is important because organizations vary, and strategies that once worked, may not continue to do so. The sequencing of the implementation strategy matters, as do resource or cost constraints. Implementation science (IS) is different and encompasses implementation strategy evaluation, including scientific questions about constructing highly effective AIS. Including all elements of AIS may not be necessary nor beneficial in a specific organization or institution, secondary to setting heterogeneity.

SMART is one type of RCT used by implementation scientists to inform the construction of highly effective AIS. Dr. Almirall presented a study of implementing CBT in 100 schools which included the previous AIS design, but incorporated continued, as needed REP, facilitation, and coaching. An alternative is to conduct "micro trials", where subsequent study methods are modified and built on results from a recent, previous trial. Problems with this approach include missing how strategy sequence works to improve long-term outcomes, and the interactions of various elements.

DR. AMY KILBOURNE, SEQUENTIAL MULTIPLE ASSIGNMENT RANDOMIZED TRIAL (SMART) DESIGNS FOR EMBEDDED RAPID CYCLE RESEARCH IN HEALTHCARE DELIVERY SETTINGS

Dr. Kilbourne followed with additional information on SMART designs specific to embedded rapid cycle research in healthcare delivery settings. SMART designs are needed because of delays in the dissemination of research findings, mismatched priorities, few incentives related to community engagement, and a lack of future planning for future scale-up interventions.

She provided an example of a SMART study (i.e., ADEPT – Adaptive Implementation of Effective Programs Trial) related to a collaborative behavioral health model in community practices using three hybrid iterations. First, study staff delivered the intervention and transitioned implementation to existing providers, then providers delivered the intervention. Investigators tested the intervention and implementation strategy and observed clinical outcomes depending on the sequence. ADEPT IS was used, comprised of pre-implementation, implementation, facilitation, and evaluation steps. This design was used

to determine the need for costly internal facilitation. REP was randomized to sites based on preliminary findings obtained during follow-up. Barriers addressed through REP included provider knowledge, opportunities to implement collaborative care in mental health clinics, lack of planned workflow, and financial incentives. Dr. Kilbourne concluded that sustained, sequential access to implementation strategies may help overcome these problems. As such, external facilitation was found to provide downstream patient outcomes similar to augmentation with more expensive interventions, secondary to scalability.

Dr. Kilbourne also provided information on DECIPHeR (Disparities Elimination through Coordinated Interventions to Prevent & Control Heart and Lung Disease Risk), a SMART study designed to compare effectiveness of tailoring implementation strategies. External facilitation, coaching and training were given to frontline mental-health providers in the areas of cardiovascular disease risk reduction to optimize augmentations such as coaching and facilitation on the uptake and delivery of EBPs. This approach allows stakeholder engagement and process ownership.

DR. GARETH PERRY, STUDY DESIGNS FOR RAPID CYCLE RESEARCH IN HEALTHCARE DELIVERY SETTINGS

Dr. Perry discussed quality improvement (QI) approaches to inform study designs for rapid cycle research based on his 12 years of prior experience as a senior scientist at the Institute for Healthcare Improvement. He summarized the various perspectives in traditional research and QI. Research often focuses on a specific intervention, in a single-factor, comparative study to produce generalizable knowledge across settings. QI focuses on improving outcomes by applying a combination of factors in an iterative Plan-Do-Study-Act (PDSA) cycle, to generate information on how to improve results within a particular setting.

The model for improvement, shown through a "driver diagram," provides measured goals and objectives, then delineates the primary and secondary drivers of the problem, to generate actionable ideas for change. A series of PDSA cycles was used, combined with best-practice evidence to generate data for QI initiatives. Successive testing of various approaches builds knowledge that leads to improvements and an updated "theory of change." Sufficient rigor in documentation and application of qualitative methods is needed to provide settings with a starting point for future implementation, known as a Change Package. Using data to determine whether changes are stable and sustained is also important. Planned experimentation can be used to determine if the change is driven by one or more combination of changes. The principles for designing analytic studies as stated by RA Fisher include:

- Well-defined objectives – who will apply study results
- Sequential approach – a series of several studies building on each other
- Partitioning variation – consideration of other factors which may impact outcomes
- Degree of belief – determining the contexts the intervention will work
- Simplicity of execution – assuring rigorous study design, understood by those who will implement the results

The SLUG Bug (Standardized Line Care Under Guidance Recommendations) CLABSI QI initiative detailed how planned experimentation can lead to meaningful clinical differences, using a multicenter, four-factor design with orchestrated testing to identify prevention practices that contributed to reduced infection rates.

Q&A SESSION

Dr. Almirall was asked how adaptive implementation strategy approaches differ from multiphase optimization for implementation design and delivery? He replied that multiphase optimization is a framework for conducting research. MOST is not an experimental design, but a phased approach that includes preparation, optimization, and evaluation.

Dr. Kilbourne answered a question regarding necessary levels of capacity assessment prior to intervention implementation. She stated that interventions should be tailored to meet the capacity and resources of the setting. Investigators should not underestimate the burden of implementation strategies on front-line providers and should carefully balance project tasks with support.

Dr. Kilbourne also reflected on the issue of study design timing and planning and whether planning begins several months before grant submission or after funding is approved? She replied that early engagement is optimal, as well as offering target site assistance prior to study implementation. However, current funding mechanisms have not provided time for planning, with the notable exception of the DECIPHeR initiatives. She commented that this type of design should be used more by NIH and the Veteran's Administration because of the science behind working and engaging with the community. DECIPHeR awardees are delving into issues regarding the availability of resources, which is important observational and mixed-methods data to review prior to implementation.

Dr. Almirall commented about the role of stakeholders in the evaluation process. He clarified that it's important to identify a single or several primary outcomes for the purposes of replicability regarding methodological considerations.

Dr. Parry responded to questions about the role stakeholders play in various phases of research design and implementation and how he identifies, recruits, and engages with stakeholders. He noted that stakeholders should be involved at the beginning of the process and should come from diverse backgrounds to assist with formulation of theories leading to change. Valuing fidelity assessment is important, and stakeholders can assist with determining research questions.

Dr. Parry then replied to a query regarding data requirements when conducting rapid cycle research, including recommendations about rapid collection and use of existing and proprietary data. He stated that once the research question is formulated, the team can determine whether this data can be collected. If it cannot be collected, then researchers should use an iterative process reviewing the research topic and available data.

Dr. Kilbourne gave her perspective on this issue from a health-system orientation philosophy, related to finding, cleaning, and preparing existing data. She stated that it takes initial investment from a research operations standpoint to curate a common data model to capture information over time and in different settings. A learning community should be formed to develop this type of infrastructure. While research does not pay for infrastructure, it can be used to validate data sets and new technologies such as artificial intelligence and machine learning. This process allows researchers to use data in new ways, preventing the need for primary data collection. Investigators need to develop a method of hypothesis driven research that simultaneously builds infrastructure, planned with stakeholders to delineate a QI pathway.

Dr. Almirall responded that he collects data with the objective to obtain replication capability and rigor. Implementation researchers should understand the difference between primary research outcome data and implementation strategies.

Dr. Kilbourne then commented on how to prevent the IRB process from slowing research, and the necessity of IRB approval in rapid cycle research, since many projects are completed without this consent. She replied that investigators should pay attention to changes in the common rule allowing more implementation research being considered minimal risk or non-regulated. But even if a project is not

considered research or is exempt from IRB review, an investigator may still need to submit to clinicaltrials.gov. Last, it's important to communicate that the intervention is QI and considered non-research. Dr. Parry countered that there is a larger issue of how to interact with IRBs across the country to get consensus on managing these types of study designs.

FRONTLINE REPORTS FROM RESEARCHERS

MODERATOR: *Wynne E. Norton, PhD, DCCPS, NCI*

PRESENTERS: *Simon Jones, PhD, New York University Grossman School of Medicine*
Noah Ivers, MD, PhD, Women's College Research Institute & University of Toronto
Raymond Osarogiagbon, MD, Baptist Memorial Healthcare Corporation
Erin Hahn, PhD, MPH, Kaiser Permanente Southern California
Melissa Simon, MD, Northwestern University Feinberg School of Medicine

DR. SIMON JONES, FRONTLINE REPORTS FROM RESEARCHERS: THE NYU LANGONE HEALTH EXPERIENCE

Dr. Jones discussed some of the important characteristics of rapid cycle research including the need for high-volume events for statistical power, short-term outcomes from routinely and easily measured variables, and feasible randomization schemes for real-time application. He stated that his institution has a rapid randomized trial lab with 16 departments, 18 completed trials, 5 ongoing trials, and 2 trials in the planning stage.

Examples include flu vaccination best practice, post-discharge calls, community health workers, mailers for preventive care, tobacco cessation best practice, and patient reported outcomes. Dr. Jones provided one trial example involving preventive care outreach, where his team attempted to fill end-of-year gaps with the goal to schedule appointments with a primary provider. Using a predictive model to determine patients most likely to have gaps, both a centralized call center and MyChart Messaging were used to achieve the desired outcomes, while the iterative study continued to test and adjust strategy for maximum utility.

Dr. Jones then detailed some of his experience to assist with rapid cycle research such as IRB approaches and determining whether the trial is research versus QI. He stated that some of the main reasons his team has been successful are high levels of organizational commitment, information technology (IT) involvement, IRB collaboration, enthusiasm from front-line operational staff, and communication-department involvement.

DR. NOAH IVERS, OPTIMIZING EFFECTS OF AUDIT FEEDBACK REPORTS

Dr. Ivers discussed his work in auditing and feedback, measuring quality of care to provide healthcare providers information on areas requiring improvement. Determining how to provide better clinician feedback is needed. Many clinical trials have been registered, but the ambition at his organization is to discover how to improve the intervention. While building reports is often the goal, many times this information is not reviewed.

Thus, they developed a collaborative plan with various research institutes and health systems to create reports that will be used by providers to improve patient care. Initially, a user-centered design was used incorporating various behavioral techniques and focus groups to prompt users via email to view the data. Then, the researchers implemented a factorial design to test the approaches selected from the initial phase, randomizing participants monthly, to one of eight email versions. A small, but statistically significant

improvement was found in cervical-cancer screening within 4 months. Using self-efficacy and problem solving, they were able to help clinicians easily view the information. Lessons learned and challenges with this research included providing information to partners on the design, ethical considerations, the need to compromise, and the line between research and QI. Last, Dr. Ivers acknowledged that those providers who respond to an intervention may have been those likely to engage anyway. Partnering with communities at risk, and not just governments or institutions, is also essential.

DR. RAYMOND OSAROGIAGBON, IMPLEMENTING SURGICAL QUALITY IMPROVEMENT IN DIVERSE SETTINGS

Dr. Osarogiagbon, a medical oncologist at Baptist Cancer Center, in Memphis, TN, shared some work he and his colleagues performed in surgical quality improvement. Fifty percent of lung-cancer patients who receive surgery die, and the most important prognostic factor related to recurrence is lymph-node involvement. The number of optimal lymph nodes to declare a cancer patient node-negative post-surgery appears to be 16 to 20. Patients who received the NCCN recommendations for lymph node removal have greater survival. However, many patients nationally and at his local hospital do not receive any pathological examination of lymph nodes.

Therefore, they devised a rapid cycle study to determine the root cause of the problem. His research team found a discrepancy between surgical notes for mediastinal-node dissection and pathology reports confirming this task. Using this contextual information, they observed surgeries and found that lymph nodes were frequently not obtained for examination, so a pilot intervention was designed to provide labeled kits for secure specimen transport. To determine whether improvements resulted from heightened awareness or the labeled kit, the kit was removed, and the researchers found performance fell back to baseline. They then expanded the study to 12 qualifying hospitals within 5 healthcare systems and established a reference for performance. Trial components included distributing information on the importance of lymph node analysis, leadership involvement, stakeholder training, sharing data on kit effectiveness, and obtaining pathology-, surgical- and OR champions. Ultimately, the researchers found the kits improved aggregate institution-level results for NCCN guidelines adherence.

DR. ERIN HAHN, RAPID CYCLE RESEARCH: INTERVENTION ADAPTATIONS WITHIN RANDOMIZED TRIALS

Dr. Hahn discussed cyclic adaptation within pragmatic trials using sustainable phases of implementation. Adaptation continuously occurs throughout implementation and sustainment trials, addressing varying clinical context within sites. Implementation facilitation offers opportunities for rapid change using mini PDSA cycles and changing iterative/intervention workflows in response. Qualitative data supports facilitation assessment however, Kaiser Permanente has a long-established EMR which provides robust quantitative data on relevant factors for a mixed-methods approach. Fidelity to the intervention, while allowing rapid change, can be accomplished by evaluating system/patient needs and performing core functions. Permitting the forms or activities surrounding these tasks to vary, offers customization to local settings and patient populations. This type of flexibility affords responsiveness to rapid changes and local contexts.

Dr. Hahn provided an example of depression screening uptake in medical oncology. The screening and questionnaire remained the same, but timing, format, and workflow differed. The primary outcome was tied to core functions, with additional goals of rapid data turn-around times. Screening and referrals improved following the intervention, but support is also key to prevent clinician burnout from rapidly changing implementation strategies, particularly in settings with limited resources. Operational timelines should also be considered for key stakeholders, with shorter periods used during these types of trials.

DR. MELISSA SIMON, LEVERAGING RAPID CYCLE RESEARCH APPROACHES IN COMMUNITY ENGAGED IMPLEMENTATION SCIENCE RESEARCH TO ADDRESS CANCER HEALTH INEQUITIES

As the Associate Director of Community Outreach and Engagement at the Lurie Northwestern Comprehensive Cancer Center, and Director of the Northwestern Center for Health Equity Transformation, Dr. Simon believes that research implementation and translation is important to each patient population. Structure and design matter, to ensure that advantages are provided to all communities. Implementation science frameworks should not reinforce racism, and careful consideration needs to be given to grant writing, funding, principal investigators, and publishing aspects of the process. Thus, health equity needs to be embedded in these studies, along with consideration to organizational culture and expectations which can impact trials.

Dr. Simon summarized work conducted in the Chicago area to reduce racial disparities in breast cancer mortality. Black women were dying at a 62% greater rate compared to White women. A variety of interpersonal and community barriers to adequate screening and care were identified including distrust and a lack of communication regarding mammogram results. Rapid cycle research, integrating health systems, advocacy, and policy, were used to modify patient navigation through the process from screening through follow-up. Supporting dissemination adaptation and sustainment was also important. A check list was created using human-centered design that contains important provider phone numbers, with the goal to help engage patients who feel isolated and marginalized from the healthcare system. Using community partnerships, they have been able to address diversity in clinical trials, through the creation of a platform. The work has results in a reduction in the mortality gap to 36% in this patient population.

Architecture and design matter, and the rapid cycle research approach is essential to high-quality, healthcare delivery. These studies are highly pragmatic and when done well, can make research more accessible to multiple populations and communities. These studies can bridge gaps in research, practice, knowledge translation, and dissemination to improve cancer care delivery.

Q&A SESSION

Dr. Hahn responded to a question regarding how to navigate competing priorities for data collection and navigating system leadership priorities. She stated that relationships with healthcare IT are incredibly important, and her team benefits from being embedded. Their researchers discuss projects with IT, and while they understand there may be multiple competing priorities, determining areas of overlap can be helpful. They also assist healthcare systems with projects that may be difficult to complete, secondary to limited resources. Dr. Jones replied that they received critical funding from a foundation to hire a full-time data analyst. He recommended using publicly available databases from state and national agencies. Dr. Jones also stated that offering evaluation assistance to various operational departments is helpful as well. Dr. Simon brought up the topic of data justice, stating that some databases are available to the public, but others require written permission. There are often differences in the analytic capabilities between the two sets of information. Researchers need to education stakeholders on the importance of their project, and how data collection will benefit the system. Dr. Osarogiagbon confirmed the need to show the advantages to administrators of project collaboration. Dr. Ivers responded that it is difficult to rapidly collect primary data, and if quicker turnaround times are needed, then existing datasets must be used. He also recommended determining partners' goals to help advance their institutional agendas.

The second question touched on health equity, and how to conduct research in lower resource settings where medical doubts exists, while not exacerbating disparities in these underserved populations. Dr. Simon stated that stakeholder engagement is key, including the development of relationships and trust over time. Acknowledging history related to current mistrust within minority populations is also important. Dr. Osarogiagbon replied that he attempts to deconstruct clinical research to make the process

more understandable to administrators, while providing information on the benefits of trials. Dr. Simon responded that it may be easier for community health centers to conduct rapid cycle research and provide real-time feedback, as was done during the pandemic. Dr. Ivers stated that it's an empirical question regarding how to best conduct research in low-resource settings. He emphasized the need for diversity in research teams to include Latino and African American staff. Adaptability to local contexts and resources can also be useful. Dr. Hahn reiterated the need to adapt forms related to core functions in specific populations.

The panel was then asked to comment on shifting research secondary to COVID-19. Dr. Ivers responded that the pandemic presented a need, while limiting time to explore research questions. However, they began a trial to determine how to provide better care and reach underserved or marginalized patients. He also stated that new funding opportunities or projects may now be available with restrictions lifted on social distancing. Dr. Osarogiagbon stated that telecommunications were in place during periods of limited patient contact, promoting the idea of using electronic health data and outcomes. Dr. Jones replied that while the pandemic made some studies difficult, as statisticians they were able to provide results using different analytic approaches, such as causal modeling. Dr. Simon believes there may be even greater research gaps in minority populations secondary to limits imposed during COVID-19, and she hopes NIH will be mindful of this potential problem. Dr. Ivers responded to a question about how he determined provider motivations to inform study iterations and operationalize his model. He stated that his team used human-centered designs and engaged with the end user.

Last, panelists answered a question about how to best conduct rapid cycle research in the future. Dr. Hahn responded that resources are key, since trials are very expensive, and therefore researchers need to be aware of finances, as well as employee burnout. Dr. Ivers stated that he did not think that trials always need to be costly, but it can become expensive when writing small grants that lead to fluctuations in staffing, pending approval of the document. Dr. Jones concurred with Dr. Ivers and replied that they use existing infrastructure for research. Dr. Osarogiagbon responded that human resources are the greatest expense and recommends multiple funding streams and communication to improve sustainability.

THURSDAY, FEBRUARY 17, 2022

WELCOME TO DAY 2, RECAP DAY 1

Paul Jacobsen, PhD, DCCPS, NCI
Wynne E. Norton, PhD, DCCPS, NCI

Dr. Norton welcomed participants back to day two of the virtual workshop reviewing rapid cycle research in cancer care delivery. The previous day, presenters reviewed information on key elements of rapid cycle research, along with a portfolio analysis of 20 relevant grants funded by the NCI. Equity, timeliness, and stakeholder engagement were also discussed along with study designs and methodologies appropriate for rapid cycle research.

There were also illustrations on application and strategies for patient and systems-level studies, as well as presentations from front-line researchers across an array of delivery settings, methodologies, and interventions. Research barriers were reviewed, such as IRBs, resources, and establishment of community relationships. Engagement and collaboration, particularly with IT and healthcare leaders, is important. Researchers must consider how to appropriately conduct these trials in lower resource settings. Themes observed include a focus on collaboration, and the timeliness of practical answers.

Dr. Jacobsen emphasized that the workshop concentrated on interventional rapid cycle research, while acknowledging that these same approaches can be used in qualitative or observations studies. He reiterated the definition of rapid cycle research as a rigorous approach to conducting interventional research that seeks to maximize timeliness and efficiency for the generation of practical answers.

Reviewing content from the previous day, Dr. Jacobsen listed the proposed elements of rapid cycle research such as using an iterative design, focusing on primary outcomes, emphasizing stakeholder engagement, considering data sources and settings, and appropriate rigor. Equity remains a concern, however, and this crosscutting theme should be contemplated to ensure that studies do not exacerbate existing disparities. Rapid cycle research is not a field or discipline, but rather a method to maximize the efficiency of interventional research.

Thursday's virtual workshop included a stakeholder panel, followed by two breakout sessions. Topics of stakeholder engagement, patient-centered research, engagement, and efficiency were slated for discussion. He posited key issues that still need to be addressed related to rapid cycle research such as:

- Critical infrastructure to conduct research
- Stakeholder engagement during various stages of the research process
- Important research topics
- Resources and funding

STAKEHOLDER PANEL

MODERATOR: *Paul Jacobsen, PhD, DCCPS, NCI*
PATIENT ADVOCATE: *Veronika Panagiotou, PhD, National Coalition for Cancer Survivorship*
PANELISTS: *Stephen Grubbs, MD, American Society of Clinical Oncology*
Anne Chiang, MD, PhD, Yale School of Medicine
Erin Kobetz, PhD, MPH, University of Miami Health System
Jeannine Brant, PhD, APRN-CNS, AOCN, FAAN, City of Hope
Michael Hassett, MD, MPH, Dana-Farber Cancer Center

Panelists introduced themselves and presented a synopsis of their professional background.

Dr. Veronika Panagiotou, a patient advocate, earned her doctorate in community engagement and is a qualitative researcher focusing on food-insecurity, civic engagement, and human-centered design. She also developed non-Hodgkin's lymphoma at the age of 25, and now represents the National Coalition of Cancer Survivorship (NCCS) through their advocacy program. She advocates for policy nationwide, with goals to obtain quality cancer care and rapid innovation.

Dr. Stephen Grubbs is Vice President for Clinical Affairs at the American Society of Clinical Oncology (ASCO). He stressed the role of professional societies in rapid cycle research and QI. ASCO has been focused for 20 years on education, research, and quality. He believes professional organizations can help drive quality and make these types of studies actionable and deliverable to practicing clinicians.

Dr. Anne Chiang is a medical oncologist in thoracic surgery at the Yale School of Medicine, and the Chief Integration Officer and Deputy CMO at the Yale Cancer Center. Over the past 10 years, her team has built services to expand across Connecticut to 15 cancer care centers in 6 hospitals, touching almost half of newly diagnosed cancer patients in the state. Using PDSA cycles, they have incorporated best practices and created alignment to improve cancer care delivery.

Dr. Jeannine Brant is a research scientist and an advanced practice nurse. She brought her perspective as a director of research for 13 years at the Billings Clinic, which is a fully integrated healthcare center in Montana. They have 15 critical access hospitals and 30 ambulatory clinics, spread out over a very rural area. Dr. Brant was also the CCDR (cancer care delivery research) area lead for the Montana Cancer Consortium.

Dr. Michael Hassett is a medical oncologist at the Dana-Farber Cancer Center. He treats breast cancer clinically, but most of his time is dedicated to administrative and research endeavors. Dr. Hassett is interested in how clinical information systems and technology can facilitate changes in care delivery, as well as research in care delivery and innovation. He is the Co-PI for one of the research centers of the NCI-funded IMPACT consortium on symptom management now trialing a rapid method to deploy symptom management across the country.

Dr. Panagiotou then gave a brief presentation, sharing important thoughts related to patient advocacy and stakeholder engagement in rapid cycle research for cancer care delivery. She stated that she is sharing the lived experience of 17 million cancer survivors, and implored participants to engage with survivors from different types of cancer, age groups, socio-economic statuses, and ethnicities, as well as those in various stages of treatment. Her experience with cancer as a young adult included confusion, but she was grateful to survive and reach her current recovery milestone. When she returned to the clinic for immunotherapy for steroid-resistant ITP, she used the knowledge she gained to ask questions about the implications of therapy and quality of life. Although trust and a relationship were built with the care team, she recommends being an outspoken cancer survivor.

Dr. Panagiotou stated that cancer patients want to support research, and partner in decision making and the discovery of innovative ideas. Rapid cycle research can provide timely and rigorous research using a

mixed methods approach. Qualitative data can only be obtained with the cooperation of cancer survivors. As a qualitative researcher and former patient, she knows how powerful these stories can be. Cancer care delivery relies on variables that are not easily measured such as trust, communication, and collaboration. The NCCS advocates for cancer care planning as a tool to coordinate the care of cancer survivors. Rapid cycle research can reduce the lag time in obtaining study results. Cancer has a physical, emotional, and financial cost, and Dr. Panagiotou hopes that this research can relieve some of the burden.

Dr. Grubbs detailed his perspective on how professional organizations can help in rapid cycle research. Their program at ASCO morphed into a certification program for quality 12 years ago, with good scores for safe chemotherapy handling and delivery. The quality training program has been active for nine years, including internationally, and it provides education based on Lean-6-Sigma principles, using PDSA cycles. His organization transitioned from reviewing traditional measures to analyzing process measures and patient-centered care systems.

They are now piloting a medical oncology program to comprehensively evaluate cancer care delivery. The project requires rapid cycle research to focus on proximal outcomes and obtain timely results. Stakeholder engagement for the program is high and they are developing significant networks to assist in implementation. His organization is also data driven to assess outcomes, coinciding with changing healthcare systems that are moving toward a value-based system where quality is connected to cost. Dr. Grubbs also pointed to increased involvement from commercial payers, including CMS. Transformation is costly however, and researchers must be careful regarding study-related administrative burdens. Ultimately, rapid cycle research must adapt to local conditions with health equity built into the model.

Dr. Chiang stated that community sites are ideal for quality improvement (QI) engagement in cancer care delivery. Her team accrues local patients from these locations in the classical clinical trials they perform at Yale Cancer Center. Using their EHR, they obtain important, real-world data, and are excited about the changing culture of research which includes cancer care delivery and aspects of implementation science in QI.

As part of a pilot network with ASCO, Dr. Chiang had 11 multidisciplinary teams going to various states to implement QI coaching, providing a 6-month curriculum with at least one PDSA cycle. Projects varied including chemotherapy consent, pain coaching, end-of-life communication, hospice referrals, and patient advisory councils. Addressing barriers required focusing on downstream problems. However, developing rapid cycle research necessitates effort, structure, and resources, especially related to data capture and analysis. Implementation science was useful during the pandemic, and they were able to practice many of these principles for patient access, telehealth, and care delivery. Rapid cycle research can assist with care provision and continuous QI. However, research paradigms, publication access, and funding must become more innovative and inclusive.

Dr. Brant discussed the importance of multilevel engagement in building a culture of inquiry within healthcare systems. Since bedside clinicians are closest to problems, they can provide research development such as interventions for side-effect treatment or cancer care delivery. One of the differences in rapid cycle research is that clinicians may be participants in the process, thus looking at design feasibility is important. Oncology nurses are particularly instrumental in the process since they are with patients for an extended period secondary to infusion time. For example, RNs can collect data and determine necessary interventions, challenges, and barriers that may influence subject retention. The Oncology Nursing Society is interested in engaging rapid cycle research such as leveraging the EHR, sharing data systems, and streamlining data collection and analysis. Sharing the medical record is important, to provide similar discrete data fields to pull information. Patient reported outcomes are a needed area of focus, to capture intervention effectiveness. Clustered, stepped-wedge designs are helpful in obtaining proximal outcome data. Iterative designs are also vital for changing clinical contexts since every setting is different.

Challenges include rural sites with low resources, that lack infrastructure and staff positions which can ensure delivery of the same quality of care as found in higher resource settings. Dr. Brant's organization developed an exemption committee to expedite the review of rapid cycle trials, which are separate from drug-delivery studies. She has been an embedded scientist for 14 years, with a team of biostatisticians, data scientists, nurse informaticists, research associates and copy editors to assist with various aspects of the research. Proximal outcomes are important, but long-term effects and sustainability must also be considered. Researchers also have an obligation to disseminate and publish their work so professionals can learn from one another.

Dr. Hassett has considerable experience with EHRs and research, and he is part of a team currently implementing a rapid cycle research project in symptom management. The challenge is conducting research quickly, and investigators need to consider how to break down barriers related to traditional study methods. Flexibility is important in interventional designs to accommodate various stakeholder backgrounds and engagement preferences. For example, their research team had to change patient research questions and clinician roles to improve data capture and the intervention, respectively. Pragmatism also plays a role, especially with the EHR, which is a great tool for rapid cycle research. Though there are issues with medical records, since the data are not structured, and thus decisions must be made on information that can be directly pulled from this source. Multisite, phased, collaborative projects are helpful in disseminating information from these trials. Hiring staff and establishing infrastructure assists in performing research quickly, but sustainability is compromised through reduced stakeholder engagement. Thus, a balance between speed and sustainability using workflow and process redesign, is key.

Q&A SESSION

Panelists were first asked to react to their colleague's brief presentations. Dr. Grubbs stated that he wanted to comment on team-based care. At ASCO this approach is essential, and his organization defines the team and conducts regular meetings to delineate roles and responsibilities. Staff works at the top of their license, and this infrastructure affords the implementation of rapid cycle trials. Dr. Brant mentioned the issue of sustainability and proximal outcomes, stating that these outcomes can be measured along with more proximal results. Dr. Chiang answered that there is tension between rapid research and sustainability, but improvements do not equate with perfection. Rather investigators are trying to understand how to translate and disseminate advancements in best practice to various networks. Dr. Brant rejoined that in study design feasibility and changes are part of a paradigm that differs from traditional research.

Dr. Jacobsen then asked the panelists to provide their views on fostering meaningful engagement with stakeholders. Dr. Panagiotou stated that healthcare systems need infrastructure to engage with patients outside of clinical appointments. Cancer survivors have a lot to offer in rapid cycle research and want to be asked to participate. Dr. Brant responded that patient perspectives are imperative, and investigators should be intentional in trial development toward this goal. She also indicated that researchers provide support for these ideas and should engage earlier to generate interest which can lead to funding. Dr. Chiang replied that intentionality should incorporate monitoring of patient participation and inclusion in these trials. Dr. Grubbs answered that determining key stakeholders is a primary step, to include patients, physicians, IT, administrators, and payors. Dr. Hassett distinguishes between engagement and the intervention, with deployment, stakeholder engagement and pragmatic choices, key. Carrying out complex interventions with many facets is difficult and will take longer to implement, therefore compartmentalizing immediate impacts with later outcomes may be helpful.

A question was posed to Dr. Brant regarding dissemination beyond peer-reviewed journals to engage more stakeholders, patients, and other individuals. Dr. Brant stated that investigators should still submit to peer-reviewed journals, which is the gold standard. Multiple people should be involved in

manuscript development including stakeholders, but unfortunately not all staff are capable of writing at this level. Dr. Hassett replied that writing research is critical, but it may be difficult to recognize the merits of implementation research in peer-reviewed journals. Rapid cycle research is often not a priority relative to other aspects of care. However, publications are necessary but not sufficient to disseminate information and effect change in other institutions. Dr. Chiang referenced a paradigm of peer-reviewed publication and similar challenges, overcome by assistance from professional organizations as a venue for dissemination and learning about local quality initiatives. Dr. Grubbs responded that ASCO has a quality symposium in September, which provides an outlet for sharing research. Dr. Hassett specified that the ASCO meeting provides a pragmatic location to improve care through in-person exchanges.

Dr. Panagiotou replied to a question about how to adequately recognize stakeholders. She stated financial recognition via reimbursement for an advocate's time is best but including them in the published article and providing a copy of this document is also important. Dr. Brant responded to issues of authorship in their embedded model. Often people with the research ideas become primary authors, even if they don't contribute to the project, with authorship offered to other research associates per international guidelines. The voluminous data from these projects can also be presented through conferences and poster presentations. Dr. Grubbs approached the topic of recognition through stakeholder engagement, with acknowledgement by certification, to distinguish a site to patients and payers. Dr. Jacobsen summarized, by stating recognizing stakeholders either through intellectual contributions or financial payments is valuable.

Another comment posed to the panelists was exception to the term "stakeholder," with calls to develop a "partnership." Dr. Chiang stated that stakeholder engagement refers to a collaborative team. Research can be a vehicle for building a team, along with better communication and working environments. Clinicians and staff are busy, so recognizing their worth is important. She stated that rapid cycle research is heterogenous and expands the definition to different kinds of research. Dr. Hassett replied that stakeholders have many levels of engagement and varying goals. There must be reciprocity and an exchange. He recommended flexibility, engagement, and sustainability in rapid cycle research, involving the whole system delivering cancer care. Dr. Grubbs responded that rapid cycle research will provide a better design to the peer-review system.

BREAKOUT SESSIONS: NEXT STEPS FOR ADVANCING RAPID CYCLE RESEARCH

Trish Silber and other experts provided information for the breakout sessions focusing on four key topics, with randomly selected, diverse participants in each group. Groups received detailed instructions with tools and resources, an outline, and online support. Facilitators and co-facilitators then provided a summary of the discussion.

CLINICAL AND DATA INFRASTRUCTURE

FACILITATOR: *Emily Tonorezos, MD, DCCPS, NCI*
CO-FACILITATOR: *Crystal Reed, MHA, DCCPS, NCI*

Dr. Tonorezos and Ms. Reed discussed clinical and data infrastructure and requested that participants also read the group's Google Doc to obtain more granular information on this topic. Some of the most important ideas related to data include the creation of national data infrastructure with common data elements, and rewards for clinician participation to improve engagement culture and capacity. Systems to support equity and business plans for community or underserved practices may be helpful. Researchers and partners should receive training on this work, to improve collaborative understanding of the study purpose. Communication through dashboards should also be explored, with data harmonization from

different sources. An online platform could be created for potential participants to see current studies. A common onboarding process for collaborators may useful, along with network creation. Other issues were mentioned including standardizing QI protocols for data accuracy, data visualization software for use across research groups, proximal outcome focus, and IRB and regulatory issues that may arise from study modification during rapid cycle research.

RESEARCH RESOURCES

FACILITATOR: *Robin Vanderpool, DrPH, DCCPS, NCI*
CO-FACILITATOR: *Katie Heley, PhD, DCCPS, NCI*

Dr. Vanderpool and Dr. Heley presented considerations from the virtual breakout session on the resources needed to conduct rapid cycle research. Dr. Vanderpool stated that issues with IRBs were discussed in their group. While the IRB is a resource, investigators should be educated and trained about the practice of this entity. Relationships with IRB members can facilitate an understanding of rapid cycle research. Other ideas included appointing community members or other knowledgeable individuals to IRBs or having separate IRB boards. Time is another resource related to process efficiency and promptness in this type of research. Grant writing, IRB approval, project implementation, and publication can be prolonged. Rapid cycle research is fast and iterative, but researchers must prioritize quality, safety, and systematic assessment of their work. Equality and common vocabulary among research team members is valuable, along with trusted relationships between community partners. Providing benefits back to these stakeholders allows for bi-direction exchange. Dissemination is another means, comprised of communication resources, strategies, channels, and platforms. In addition to peer-reviewed journals, social media, community meetings, infographics, apps, toolkits, and other platforms can be used. Other resources included IT systems, data analysts and biostatisticians. Grant funding and time to perform and sustain dedicated research were also mentioned. Professionals often fail to recognize themselves as a resource. Last, local, state, and national policy can facilitate rapid cycle research, ensuring that equitable services are delivered to all populations.

KEY COLLABORATIONS

FACILITATOR: *David Chambers, DPhil, DCCPS, NCI*
CO-FACILITATOR: *Gila Neta, PhD, DCCPS, NCI*

Dr. Chambers and Dr. Neta provided a synopsis of key collaborations with stakeholders in rapid cycle research. There were several key points, including the need to develop psychological safety in this space. Anonymous sharing may be useful since many stakeholders have differing perspectives and priorities. Engaging people in prototyping and packaging results for dissemination is needed, as well as clarifying unstated assumptions among various groups. There were differences in the backgrounds of group members, with some coming from lower-resource areas. Therefore, language and tone are important. Group participants felt that the word “stakeholder” was not a friendly term. Funding mechanisms to support key collaborations and engagement were discussed, as well as phases of engagement, and formal information sharing. Multiple partners are often involved in rapid cycle research, requiring ongoing stakeholder consideration and engagement. This situation also mandates consideration of context heterogeneity and learning from diverse populations. Aside from formalized healthcare, there are other systems and services that can be valuable partners in navigating solutions to improve cancer care delivery. Regarding resources, some organizations have engagement guides, but iterative change and individual attention is helpful.

METHODOLOGICAL CONSIDERATIONS AND RESEARCH AREAS

FACILITATOR: *Sarah Kobrin, PhD, DCCPS, NCI*
CO-FACILITATOR: *Sallie Weaver, PhD, DCCPS, NCI*

Dr. Kobrin and Dr. Weaver provided a summary of methodological considerations and research areas. They consolidated into subgroups, with the first focusing on research topics, including questions related to public health, and others on process. Patient engagement to improve early screening was discussed, along with post-treatment communication by primary care and oncology. Navigation models were mentioned as an interventional approach, as well as adaptations to create evidence-based programs to reach broader populations. Health disparities lead to worse outcomes thus, accommodations and knowledge of rapid cycle research techniques are necessary. Studying different cancer care delivery models, factoring risk stratification, and obtaining the appropriate clinician to provide care are important. Reviewing outcomes for various groups is needed, to include consideration of continuity of care and relationships between provider specialties post treatment. Financial toxicity is an ongoing issue, often facing patients later in the treatment process. Thus, the need for financial advisors and social workers in the early stages is paramount. Caregiver burden is understudied, as well, and interventions to support this group should be developed. Advanced care planning requires providers who have the skills to have end-of-life discussions.

Methodological issues were embedded in direct care delivery such as novel approaches to randomized and quasi-experimental methods to bridge the gap between QI and research, which are often disconnected because of differing goals. Methods need to be adapted to allow less rigid adherence, and more focus on outcomes rather than process, while still understanding the necessary adaptations. Funding was also a major issue, including models that allow rapid cycle research. A toolkit for QI professionals that includes more rigorous components of research would be useful. The constantly changing healthcare context presents barriers to conducting studies, and how to address these alterations is unknown.

SYNTHESIS OF CONFERENCE AND CLOSING REMARKS

Paul Jacobsen, PhD, DCCPS, NCI
Wynne E. Norton, PhD, DCCPS, NCI

Dr. Jacobsen and Dr. Norton closed the conference with a summary of thoughts from the virtual meeting. Dr. Jacobsen stated that there has been little information developed on rapid cycle research, and therefore hopes the sessions served to provide structure to the topic. Many professionals are interested in these types of studies, and continued communication can lead to action. NCI has two roles to include funding and convening researchers and other interested individuals to exchange ideas about rapid cycle research.

Dr. Norton stated that NCI will produce a meeting summary, distribute this document to all registrants, and post it online for public access. They will work with their planning committee to discuss next steps following the excellent suggestions provided by workshop participants. A white paper and manuscript will be submitted for peer review as well.

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