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A Policy Toolkit for Authorship and Dissemination Policies May Benefit NIH Research Consortia

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Abstract

Purpose—Authorship and dissemination policies vary across NIH research consortia. Our purpose was to describe elements of real-life policies in use by eligible U01 clinical research consortia.

Methods—Principal investigators of eligible, active U01 clinical research projects identified in the NIH Research Portfolio Online Reporting Tools database were asked to share relevant policies. The characteristics of key policy elements, determined a priori, were reviewed and quantified, when appropriate.

Results—Eighty-one research projects met search criteria and 21 groups provided policies which were examined for key elements (e.g., in quotations): “manuscript proposals reviewed and approved by committee” (90%); “guidelines for acknowledgements” (86%); “formation of the writing team” (71%); “process for final manuscript review and approval” (71%), “responsibilities for lead author” (67%), “guidelines for other types of publications” (67%); “draft manuscript

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review and approval" (62%); "recommendation for number of members per consortium site" (57%); and "requirement to identify individual contributions in the manuscript" (19%).

Conclusions—Authorship/dissemination policies for large team science research projects are highly variable. Creation of an NIH policies repository and accompanying toolkit with model language and recommended key elements could improve comprehensiveness, ethical integrity, and efficiency in team science work while reducing burden and cost on newly funded consortia and directing time and resources to scientific endeavors.

Keywords

author contributions; publication duplication; corporate authorship; author responsibilities; writing teams; external authorship; guidelines

Introduction

Team science has developed as a strategy to meet complex scientific challenges through collaborative efforts by experts in different fields.[1,2] Several factors have stimulated the rapid adoption of team science, including complex health and disease mechanisms within diverse physical, social, and cultural environments; the need for effective disease prevention and health promotion at the individual and population levels across the life course; and the need for wise stewardship of health research and care delivery resources.[3] A variety of National Institutes of Health (NIH) funding mechanisms for research networks and consortia have facilitated collaboration and authorship for multi, inter, and transdisciplinary teams.[4] For example, the NIH U01 study code designates a cooperative agreement used to facilitate complex multicenter, multidisciplinary research consortia.[5]

Team science publications are increasing. From 2004 to 2015, consortia-led publications indexed in PubMed increased at a faster rate than overall publications.[6] Traditionally, academic advancement depended in large part on individual scholarly contributions, with emphasis on a record of primary and senior authorship.[7] The rise of team science has challenged previous practices for authorship, including determining authorship order, recognition for individual authors' contributions, contributions by individuals not credited with authorship, corporate rather than individual authorship and the assignment of publication credit.[8–12]

An issue raised by team science of particular concern to early career scientists is the difficulty of quantifying, for purposes of obtaining appointments, merit review, and tenure and promotion, an individual's contributions to a large consortium publication with numerous authors.[13] Many investigators have experienced consequences from the lack of an explicit publication plan that has broad and transparent agreement from participants, including who will do what on the project, who will be named as authors in which order, and who will be acknowledged with the understanding that it can be revisited if circumstances change. Proactive action by collaborative groups can provide clear expectations and facilitate early conversations for topics that may be difficult or adversarial.

In the health sciences, the International Committee of Medical Journal Editors (ICMJE) provides and regularly updates guidance on authorship and processes for disputes and corrections related to authorship[14]; however, the ICMJE guidance does not completely address some aspects of team science authorship, particularly those related to individual contributions, including authorship order, magnitude of author effort, and professional responsibility for the scholarship produced by the team. Team science authorship issues are often more nuanced, subtle and complex. Group research efforts are different from individual research efforts and require more conversation and clarify regarding ethical authorship and dissemination opportunities for the many individuals involved in large clinical research projects. Efforts to clarify scientific contributions and hence, authorship, are increasing. In 2017, Roberts proposed a heuristic approach to prospectively clarify, anticipate, and resolve authorship issues in collaborative writing processes, balancing the level of intellectual contribution and work effort with professional accountability in determining authorship.[15] The proposed approach to determining authorship eligibility uses a 2×2 table with yes/no responses for a potential author's *significant* effort on the x axis and *professional* responsibility for the scholarly project on the y axis. Recognizing that better methods are needed for assigning credit and responsibility for collaborative contributions, Brand et al report on the creation and refinement of a standardized taxonomy of contributors' roles called the Project CRedIT.[16]

These efforts notwithstanding, the fundamental question of what authorship in team science functions in practice is variable and continues to evolve and what internal policies guide authorship in large NIH research consortia. While the existing ICMJE guidance helps clarify authorship criteria, there are many additional, pragmatic issues related to authorship that individual research groups must address. For example, groups need to have policies to recognize authorship for investigators who transition into or out of a large research group yet make significant contributions for a research effort (planning only, analysis only, etc.).

Although these approaches provide some guidance there remains a lack of uniform, equitable, and ethical policies representing state-of-the-art practices for team knowledge creation.[17] The multidisciplinary nature of team science requires flexibility to accommodate needs of the specific research team. To address this gap, the Preventing Lower Urinary Symptoms (PLUS) Research Consortium (funding beginning 2015) undertook authorship and dissemination policies investigation, in part to guide the PLUS Consortium's own development in transdisciplinary knowledge generation. Our study objectives were to determine use of authorship and dissemination policies and to identify the specific elements contained within those policies.

Methods

Typical of other large NIH team science groups, PLUS includes multiple clinical centers, a data coordinating center, and over 40 investigators.[18] Based on experience and knowledge of existing practices, the authors reached consensus on a list of 18 key elements to use to evaluate team science authorship and dissemination policies. We focused on existing NIH-funded U01 clinically-focused research consortia (U01-ClinRes-Consortia). Characteristics of consortia of interest included award size, grant recipient, year of funding

and research focus. The eligibility characteristics were determined by consensus amongst the investigators to approximate the work of the PLUS Research Consortium most closely, in order to inform the authorship and dissemination practices for our team science. We focused on consortia, whose members were higher educational organization in the US with award sizes of $300,000 or higher. We further focused on a generous funding to dissemination interval, with funding in fiscal year 2014 (award notice date earlier than April 30, 2014) to allow sufficient time for consortia to have developed and revised authorship policies and produced team science publication. We narrowed our search criteria to consortia with a clinical research focus in order to align more closely with PLUS. Clinical studies could include cross-sectional surveys, case-control studies, cohort (longitudinal) studies, or qualitative studies.

Search Process for Active Research Projects

Using the NIH Research Portfolio Online Reporting Reporting Tools (RePORTER) database,[19] in 2018, we conducted a search of eligible U01-ClinRes-Consortia between 2004 and 2014. We constructed the decisional process of the search by three tiers. Tier one was to generate records from the database showing multi-center research consortia or networks with active research projects that involved human subjects (not exclusively laboratory); these are features of the PLUS Research Consortium. We searched project title, abstract, scientific terms, descriptions, and/or public health relevance statements by year funded, activity code and for the term “clinical.” Tier two, a form of “hand-searching,” screened for U01-ClinRes-Consortia that were known to PLUS investigators and thought likely to meet full inclusion criteria but were not identified within the initial RePORTER search. Tier three took the full list of identified U01-ClinRes-Consortia, divided these among three pairs of PLUS investigators, who reviewed each one against full inclusion/exclusion criteria for final eligibility.

Full Inclusion and Exclusion Criteria

Inclusion criteria were: (a) having U01 activity code; (b) award sizes of $300,000 or higher; (c) funded to higher education organizations located in the United States; (d) funded in fiscal year 2014 with an award notice date earlier than April 30, 2014 to allow sufficient time for consortia to have developed and revised authorship policies and produced team science publications; and (e) clinical studies, which could include cross-sectional surveys, case-control studies, cohort (longitudinal) studies, or qualitative studies. Studies focused on laboratory measurements of biomarkers or imaging were included if they related these measures to individual phenotypic characteristics and outcomes (e.g., knowledge, intent, attitudes, and behaviors). Exclusion criteria were: (a) in their first or second year of support (hence less likely to have produced authorship policies and related team science publications); (b) having fewer than three clinical centers and fewer than five investigators at two or more clinical centers; (c) conducted exclusively outside the United States; (d) designed to develop laboratory or imaging methods; (e) were based on meta-analysis or re-analysis of previously published data; and (f) limited only to animals. Additionally, (g) to ensure policies were intended for sufficiently large multicenter consortia we excluded funded subprojects of any consortium.

Requests for Authorship and Dissemination Policies

Once the search was completed, the PLUS Scientific Data and Coordinating Center (KR) emailed the principal investigator (PI) of coordinating center for each identified consortium to request a copy of the authorship/dissemination policy of their consortium. The email included an offer to share the PLUS Research Consortium authorship policy, but no requests for it were forthcoming. Follow-up emails were sent to PIs that did not respond to our first inquiry.

Data Collection and Analysis

Using the authorship policy elements identified by a consensus process within the writing team's review of ICMJE guidelines and the published literature, a data collection form was made for tallying the 18 policy elements (Table 1) represented in each authorship policy document, in addition to other elements including: committee review and approval of manuscript proposal; requirements for a dissemination plan; publication type categorization (i.e., primary and ancillary); guidelines for other publication types; authorship criteria; identification of individual contributions; writing team formation; recommendation for number of members per consortia site; lead author responsibilities; writing team responsibilities; replacement of writing team members; author disputes/ grievances guidelines; corporate authorship guidelines; acknowledgement guidelines; duplication/overlap check guidelines; final manuscript review and approval process; and reference to external authorship guidelines (e.g., ICMJE). Frequency and percentage of elements across projects were then calculated.

Identifying Statements for Toolkit Consideration

A final methodological step was to collate policy statements from the documents obtained by key elements, with the intent of beginning recommendations for a toolkit of examples. These samples may be considered as templates or guideposts for future investigators building policies specific to a newly formed research consortium.

Results

The RePORTER database search (Tier 1) returned 163 records, the "hand-search" (Tier 2) resulted in an additional seven. After review for full inclusion/exclusion criteria (Tier 3), 51 were excluded for being within two years of initial funding, an additional 38 were eliminated based on one or more other exclusion criteria after review for full inclusion/ exclusion criteria (Tier 3). This left a total of 81 U01-ClinRes-Consortia deemed eligible for sending PI's an email request for access to these authorship and dissemination policies policies. Twenty-six percent of the PI's (N=21) responded positively by providing copies of their authorship policies.

Of the 21 authorship policies made available to PLUS investigators for examination, there was significant variability in scope and content (Table 1). None of the 18 policy elements were uniformly included. The two most common policy elements were "manuscript proposals reviewed and approved by committee" (91%) and "guidelines for acknowledgements" (86%).

Seventy-six percent of policies had “criteria for authorship” and “categorization of publications (primary, ancillary).” A large majority of policies (defined as 71%–67%) described “formation of the writing team” (71%); a “process for final manuscript review and approval” (71%); “responsibilities for lead author” (67%); and “guidelines for other types of publications,” such as abstracts, posters, presentations, workshops, and white papers (67%). Slightly more than half (57–62%) referenced a “process for draft manuscript review and approval” (62%); “external authorship guidelines (e.g., ICMJE)” (57%); and “number of members per consortium site that can be listed as an author on any given paper ” (57%). Almost one-half of the policies described “responsibilities for writing team members” (48%); “guidelines for author disputes/grievances” (43%); and a process for “replacement of writing team members” (43%). Only one-third (33%) had “guidelines for corporate authorship;” “guidelines for duplication/overlap checks;” and “requirements for a dissemination plan.” Nineteen percent of the policies had a “requirement to identify individual contributions in the manuscript.”

Table 2 contains policy language from the reviewed policies for each of the elements listed in Table 1 that we considered to have key elements that would be useful for toolkit development. Figure 1 provides a flow graphic for policy steps relevant to the Manuscript Review and Publication category that may also be a helpful toolkit feature.

Discussion

Our study highlights an opportunity to improve team science practices regarding dissemination through the use of publication policies in NIH-funded U01 research groups[20] and documents significant variation in publication policy elements among U01 consortia. The observed variation within policies studied in this analysis suggests that a set of best practices for team science dissemination is not yet widely adopted among NIH-funded U01 research groups. In addition, the magnitude of variation suggests an opportunity to streamline the development and use of authorship policies within NIH research groups with the aim to optimize recognition of team science contributions and describe critical processes for research dissemination. Ethical authorship practices enhance collaborative work and align with equity and inclusion, which are core team science values.[21]

Transparency of authorship policies at the beginning of a research project is intended to uphold ethical practices of authorship and minimize disputes or misunderstandings during the dissemination process. Formal written documents codify group intentions and facilitate transparency and clarity, including the identification of individual contributions. To our knowledge, the NIH does not require consortia to develop team science authorship or dissemination policies. Development of an authorship/publication policy requires significant dedicated investigator time and effort initially when new consortia are formed that may detract from engaging in scientific work intended by the competitively awarded public research funds.

Development of consortium infrastructure and policies, including authorship/ dissemination/ publication guidelines, may disproportionately impact the productivity and cohesion of groups less experienced in addressing these issues (e.g., groups with a relatively high

proportion of early-career investigators).[22] Similar impacts may also occur in discipline-diverse transdisciplinary groups where members have varying and sometimes opaque disciplinary norms and expectations.[23]

To prevent or reduce the impact on productivity and group cohesion, recent efforts to codify the contributions from many individuals involved in team science research have been disseminated.[24–26] These papers address the role of the named authors who take primary responsibility for a manuscript, typically using the criteria recommended by the ICMJE. Slightly more than half (57%) of publication policies reviewed in our analysis referenced and relied on existing guidance, primarily the ICMJE, for named authors and authorship criteria. However, these policies provided limited guidance to appropriately recognize contributions from a wide range of researchers involved in team science consortia including non-author consortium collaborators, non-consortium investigators and students/trainees. To address this situation, many large groups have used lengthy acknowledgement to display the names of individuals that are categorized as consortium investigators in their specific center or institution as non-author collaborators. The term “collaborator” is used to describe an individual group member who does not meet all ICMJE authorship criteria despite making meaningful, sometimes pivotal, contributions to the research. In response to the increase in group-authored publications, the National Library of Medicine began indexing these individuals as “collaborators” in MEDLINE/PubMed as of March 2008.[27] Some journals such as BMJ[28] and PLOS One[29] have followed suit and implemented guidelines for including group names in the author byline and listing of non-author collaborators in the acknowledgment section of the article.[30]

Moreover, we found that few of the reviewed policies included an explicit statement of the values underpinning their team science research. Such values may include equity (e.g., in representation, opportunity, and/or responsibility), attention to career progress of junior investigators, and integrity within and beyond the writing group. Experienced investigators are aware that circumstances may occur that are not covered by their publication policies. For example, specific decisions to engage individuals who often do not hold author roles (such as community members or research coordinators), enhance engagement with understudied groups, foster participation by early career investigators, or recognize special expertise within or beyond the research consortium may benefit from review of a previously developed statement of team values for guidance on these issues. Beyond internal research consortia needs, Mazumdar et al., noted that collective scholarly contributions, including team science authorship, are not easily quantified and may be undervalued by promotion and tenure committees.[20] Relevant to this manuscript, the authors recommended that individual scholarly contributions be evaluated using clear criteria, ideally at the institutional level.

An emerging area for the PLUS Consortium was how to disseminate scientific results to the general population. Community engaged research is highly valuable for planning, conducting and disseminating research, especially research funded with public funds. As more community-centric populations of science investigators join transdisciplinary teams that have traditionally been largely clinical, these researchers are likely to introduce non-scientific dissemination products (e.g., lay summaries of manuscripts, social media content, etc.). An authorship policy that addresses both scholarly and non-scholarly dissemination,

including how community-based review will occur, can greatly enhance the reach of the consortium's work and potentially create information that may be easily consumable by the public and policy makers.[31] Authorship policies should facilitate collaboration with vulnerable and/or underrepresented communities who may have specific views on how and when study results are published.

Our findings suggest that the U01 NIH research consortia who responded to our collegial request did not share common practices regarding authorship and dissemination policies. This may be due to a lack of readily available resources that provide guidance on the complexities of team science contributions for transdisciplinary research consortia in the clinical arena. Guidance and best practices could reduce the time and effort necessary to create authorship policies, thus enhancing the time and effort devoted to the intended scientific initiatives. In addition, such guidance may facilitate team science productivity and promote transparent and equitable authorship practices among multi, inter, and transdisciplinary investigators. Best practices for team sciences authorship would require regularly scheduled review and revision of policies to align with current recommendations for recognition and acknowledgement of contributions.

We suggest that a team science authorship resource (e.g., policy repository or tool kit) of existing consortia policies be created to assist new teams with the development of their own consortium's specific policies. The PLUS Research Consortium has provided our current dissemination policy which was developed following the research described in this manuscript (Supplement). This policy may be useful for other research groups to use as a template. Our policy is considered "a work in progress", subject to regular review and periodic modification. The PLUS investigators hope that, over time, "default" authorship/publication policies could be quickly considered and adopted, leading to a functioning policy repository of authorship/ publication policies that could extend guidance from existing authorship documents, such as that proposed by ICMJE. Using our results, the proposed team science authorship resource would refine key policy elements for teams to consider and provide examples of specific language according to pre-defined categories, such as "defining authorship," "internal review process," etc. Newly formed groups could then rapidly develop their own publication policy and be alert to categories that might not otherwise have been considered, such as "site representation" or "lead time for group abstract approval." When no suitable language is available for new team science groups, the investigators could develop and contribute their own language to the policy repository or tool kit. In the absence of a formal sharing mechanism (e.g., repository or toolkit), active sharing of publication policies may reduce repetitive and unnecessary expenditure of non-scientific resources.

This analysis of U01 research consortia authorship policies is strengthened by the experience of active team science authors, all of whom are part of the NIH U01 PLUS Research Consortium. The desire to use an evidence-based approach for authorship practices was stimulated by our perception of gaps and our own challenges as we worked together to codify our dissemination and authorship policies. We also evaluated multiple aspects of policies provided by other research consortia and identified key domains for inclusion in authorship policies. Moreover, we assessed team science values, a rarely evaluated aspect

of authorship policies. Our organization and summary of key domains and sample language provides a solid starting point for authorship policies for new consortia. Ultimately our efforts may reduce the significant time commitment needed to develop authorship and dissemination policies for a complex consortium.

Despite the strengths of this analysis, there are some limitations. As our search strategy was limited to the NIH RePORTER database and selected referrals, selection bias is a concern. We received access to 21 of the 81 eligible U01-ClinRes-Consortia authorship policies. If the non-responding consortia did not respond because no authorship policies exist, the request alone may highlight awareness to the importance of developing policies or engaging in conversation with other consortia with existing policies. More likely, non-response was associated with competing priorities and demands on the principal investigator. Although this review examined consortia authorship policies developed almost a decade ago, we believe the findings are still relevant as there are no current guidelines for acknowledging individual authorship contributions in large research consortia. We recognize that policies may be periodically updated in some consortia; our assessment is a single version within each participating consortia. Another limitation is that our findings may not generalize to research groups that are typically less heterogeneous in membership and scientific disciplines than the U01-ClinRes-Consortia we studied.

This study identified an opportunity to enhance authorship policies in current and future research consortia and facilitate evaluation of individual scholarly performance for team scientists. Our review identified both general practices and key policy elements for team science authorship that benefited our own consortium's team science activities. We offer our findings with the goal of advancing team science practice and encouraging other research consortia to share their experiences.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Prevention of Lower Urinary Tract Symptoms (PLUS) Research Consortium Research Centers and Investigators

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References:

1. Sauermann H, Haeussler C. Authorship and contribution disclosures. Sci Adv. 2017;3(11):e1700404. doi:10.1126/sciadv.1700404 [PubMed: 29152564]
2. Sciences A of M From Innovation to Implementation: Team Science Two Years On. Acad Med Sci. 2019.
3. Patience GS, Galli F, Patience PA BD. Intellectual contributions meriting authorship: Survey results from the top cited authors across all science categories. PLoS One. 2019;14. doi:10.1371/journal.pone.0198117.
4. B M. Orphan papers and ghostwriting: the case against the ICMJE criterion of authorship. Acc Res. 2013;20(2):59–71. doi:10.1080/08989621.2013.767115
5. Fleming N Sidelined: How to Tackle Authorship Disputes. Nat |. 2021;594:459.
6. National Cancer Institute. What Is Team Science? - Team Science Toolkit. https://www.teamsciencetoolkit.cancer.gov/public/whatists.Aspx. Accessed March 26, 2019.
7. National Center for Advancing Translational Sciences; NCATS Strategic Plan.; 2016.
8. Kozlowski SWJ, Chao GT. Unpacking team process dynamics and emergent phenomena: Challenges, conceptual advances, and innovative methods. Am Psychol. 2018;73(4):576–592. doi:10.1037/amp0000245 [PubMed: 29792469]
9. Bennett LM, Gadlin H. Collaboration and team science: from theory to practice. J Investig Med. 2012;60(5):768–775. doi:10.2310/JIM.0b013e318250871d
10. “U01: Research Project Cooperative Agreement.” n.d. Last reviewed October 2021. Accessed January 28, 2022. https://www.niddk.nih.gov/research-funding/process/apply/funding-mechanisms/u01.
11. Wang D, Yan K-K, Rozowsky J, Pan E, Gerstein M. Temporal Dynamics of Collaborative Networks in Large Scientific Consortia. Trends Genet. 2016;32(5):251–253. doi:10.1016/j.tig.2016.02.006 [PubMed: 27005445]
12. Mentzelopoulos SD, Zakynthinos SG. Research Integrity, Academic Promotion, and Attribution of Authorship and Nonauthor Contributions. JAMA. 2017;318(13):1221–1222. doi:10.1001/jama.2017.11790 [PubMed: 28880990]
13. Mazumdar M, Messinger S, Finkelstein DM et al. Evaluating academic scientists collaborating in team-based research: a proposed framework. Acad Med. 2015;90(10):1302–1308. doi:10.1097/ACM.0000000000000759 [PubMed: 25993282]

14. ICMJE. Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals. Citeseer. 2016;(December):1–17. doi:10.1080/08941920.2016.1150542
15. Roberts LW. Addressing authorship issues prospectively: A heuristic approach. Acad Med. 2017;92(2):143–146. doi:10.1097/ACM.0000000000001285 [PubMed: 27355782]
16. Brand A, Allen L, Altman M, Hlava M, Scott J. Beyond authorship: Attribution, contribution, collaboration, and credit. Learn Publ. 2015;28(2):151–155. doi:10.1087/20150211
17. Patience GS, Galli F, Patience PA, Boffito DC. Intellectual contributions meriting authorship: Survey results from the top cited authors across all science categories. PLoS One. 2019;14(1):e0198117. doi:10.1371/journal.pone.0198117 [PubMed: 30650079]
18. Harlow BL, Bavendam TG, Palmer MH, et al. The Prevention of Lower Urinary Tract Symptoms (PLUS) Research Consortium: A Transdisciplinary Approach Toward Promoting Bladder Health and Preventing Lower Urinary Tract Symptoms in Women Across the Life Course. J Women's Heal. 2018;27(3):283–289. doi:10.1089/jwh.2017.6566
19. National Institutes of Health. n.d. "RePORTER Research Portfolio Online Reporting Tools Expenditures and Results." Accessed May 06, 2022. https://reporter.nih.gov/.
20. Mazumdar M, Messinger S, Finkelstein DM, et al. Evaluating Academic Scientists Collaborating in Team-Based Research: A Proposed Framework. Acad Med. 2015;90(10):1302–1308. doi:10.1097/ACM.0000000000000759 [PubMed: 25993282]
21. Cooke NJ HM. Professional Development and Education for Team Science. In: Enhancing the Effectiveness of Team Science Washington (DC): T. The National Academies Press; 2015.
22. Elliott KC, Settles IH, Montgomery GM, Brassel ST, Cheruvelil KS SP. Honorary Authorship Practices in Environmental Science Teams: Structural and Cultural Factors and Solutions. Acc Res. 2017;24(2):80–98.
23. Moore M, Martinson ML, Nurius PS, Kemp SP. Transdisciplinarity in Research. Res Soc Work Pract. 2018;28(3):254–264. doi:10.1177/1049731517708033 [PubMed: 30220827]
24. Boyer SS, Ikeda T, Lefort M-C, Malumbres-Olarte J, Schmidt JM. Percentage-based Author Contribution Index: a universal measure of author contribution to scientific articles. Res Integr Peer Rev. 2017;2(1):18. doi:10.1186/s41073-017-0042-y [PubMed: 29451536]
25. Clement TP. Authorship matrix: a rational approach to quantify individual contributions and responsibilities in multi-author scientific articles. Sci Eng Ethics. 2014;20(2):345–361. doi:10.1007/s11948-013-9454-3 [PubMed: 23813053]
26. Phillippi JC, Likis FE, Tilden EL. Authorship grids: Practical tools to facilitate collaboration and ethical publication. Res Nurs Health. 2018;41(2):195–208. doi:10.1002/nur.21856 [PubMed: 29603766]
27. Knecht LWS, Nahin AM. Study Collaborators Included in MEDLINE®/PubMed®. NLM Tech Bull. 2008;361(e2).
28. BMJ. n.d. "Authorship & Contributorship." Accessed May 6, 2022. https://www.bmj.com/about-bmj/resources-authors/article-submission/authorship-contributorship.
29. PLOS ONE. n.d. "Authorship." Accessed May 6, 2022. https://journals.plos.org/plosone/s/authorship.
30. Fontanarosa P, Bauchner H, Flanagin A. Authorship and Team Science. JAMA. 2017;318(24):2433–2437. doi:10.1001/jama.2017.19341 [PubMed: 29279909]
31. Cunningham-Erves J, Mayo-Gamble T, Vaughn Y et al. Engagement of community stakeholders to develop a framework to guide research dissemination to communities. Heal Expect. 2020;23(4):958–968. doi:10.1111/hex.13076

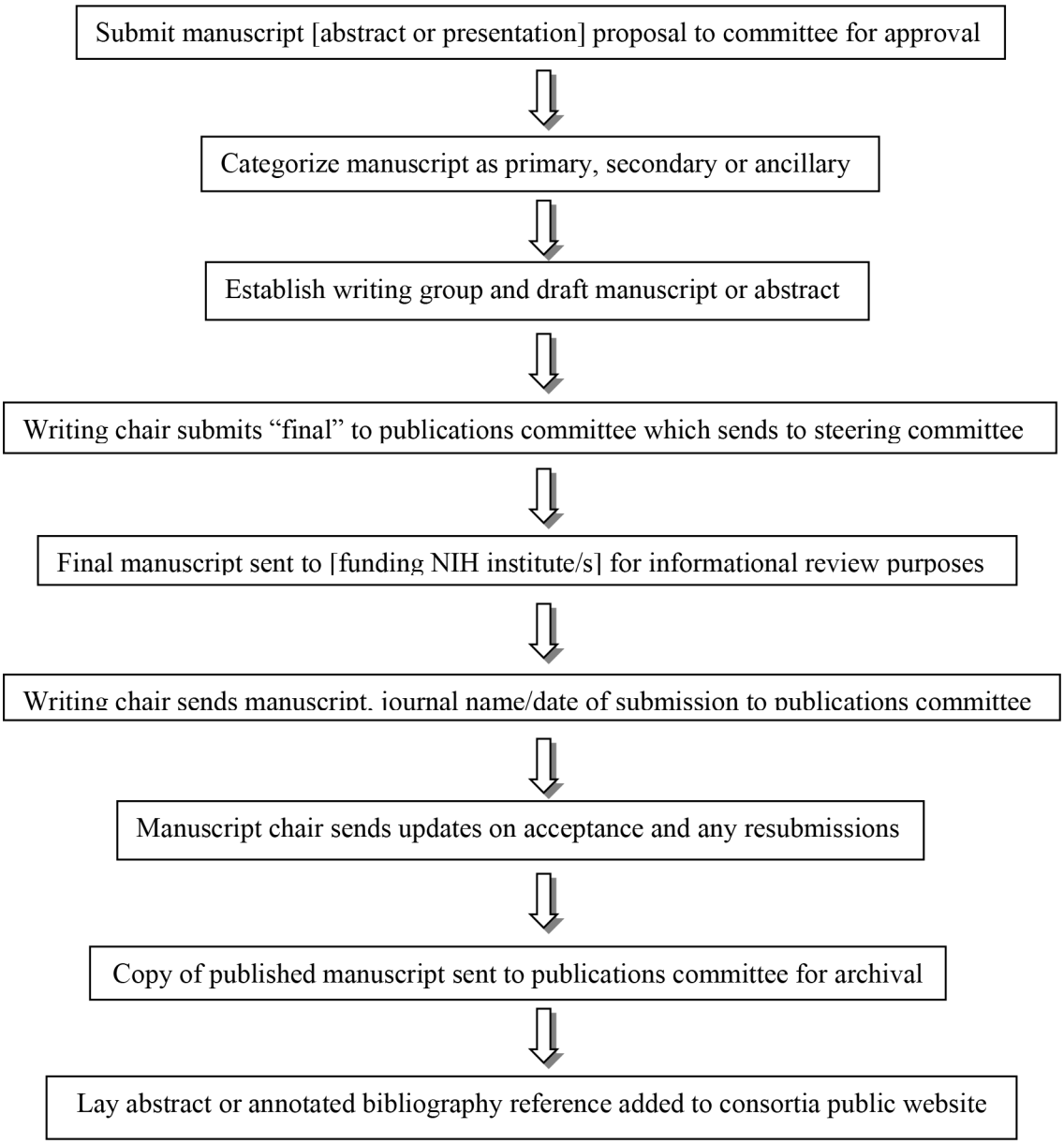

FIGURE 1:

Sample writing group procedures for manuscript review and publication from NIH U01 research consortia for consideration in Toolkit

The *Publications Committee will review all manuscript proposals* [often includes abstracts & presentations]. The following steps are guided by specific review criteria and include a *process for draft and final reviews and approval. Guidelines include the categorization of manuscripts* as primary, secondary or ancillary to the consortium's research and *a review for duplication or substantive overlap* with another manuscript or abstract in process. In cases of such overlap, the proposer will be encouraged to collaborate with that existing writing group. The Publications Committee will adjudicate any overlaps among concept

ideas, define, if necessary, the scope of an individual writing teams' mandate, and resolve other areas of competition between groups.

Table 1.

Policy elements clearly present in 21 unique U01 clinical research consortia policy documents.

Authorship Policy Variable	Present (N, %)
Manuscript proposals reviewed and approved by committee	19 (90%)
Guidelines for acknowledgements	18 (86%)
Criteria for authorship	16 (76%)
Categorization of publications (primary, ancillary)	16 (76%)
Describes formation of writing team	15 (71%)
Process for final manuscript review and approval	15 (71%)
Responsibilities for lead author	14 (67%)
Guidelines for other types of publications	14 (67%)
Process for draft manuscript review and approval	13 (62%)
Reference of external authorship guidelines (e.g., ICMJE-International Committee of Medical Journal Editors)	12 (57%)
Recommendation for number of members per consortium site	12 (57%)
Responsibilities for writing team members	10 (48%)
Guidelines for author disputes/grievances	9 (43%)
Replacement of writing team members	9 (43%)
Guidelines for corporate authorship	7 (33%)
Guidelines for duplication/overlap checks	7 (33%)
Requirements for a dissemination plan	7 (33%)
Requirement to identify individual contributions	4 (19%)

Table 2.

Sample policy language for consideration for toolkit from NIH U01 research consortia authorship/ dissemination policies

Policy Element	Sample policy language
Guidelines for acknowledgements	"All papers should include "the Study of XXXX" in the title, in the authorship line, or in the abstract. All core and sub-core papers should include an "Acknowledgments" section that lists the maximum of 6 XXXX investigators and staff at the Clinical centers, labs, program office and Coordinating Center subject to journal policy regarding appendix material. It is essential to acknowledge our funding sources and the grant numbers from all sites, plus the Coordinating Center and Central Lab. This constitutes the minimal amount of information that needs to be used. Those who wish to be more inclusive may include PIs from each site, indicate the name of past and current Steering Committee Chairs, and provide any additional text they desire. The 'expansive' Acknowledgments statement is provided in the Appendices. Authors can use any acknowledgments statement they wish to use, with any variations they want to include, provided the information is accurate and contains at least the minimal amount of information. Minimal information is indicated as bolded text in the template provided in the Appendix."
Criteria for authorship	"Awarding of authorship requires a significant intellectual and/or work contribution to performance of a study and/or preparation of the manuscript. Authors must participate in the writing of the paper in accordance with the international Committee or Medical Journal Editors guidelines (N Engl J Med 1991; 324-424-8). The chair of the writing group is expected to delete names from the final list of authors if those individuals have not participated in the writing and/or analyses of the paper in accordance with those guidelines." "Authorship on XXXX Network publications will adhere to the Uniform Requirements for Manuscripts Submitted to Biomedical Journals of the International Committee of Medical Journal Editors (http://www.icmje.org/urm_main.html)/."
Guidelines for author disputes/grievances	"A member of the XXXX Research Group may formally appeal in case of disagreement with the Publications and Presentations Subcommittee. To initiate an appeal, the claimant should initially discuss the issue with the Chairperson of the Publications and Presentations Subcommittee to clarify why the disputed judgment was made. If this does not satisfactorily resolve the matter, the claimant should send a letter of appeal (supported by appropriate documentation) to the Coordinating Center for distribution to the entire Publications and Presentations Subcommittee. The Publications and Presentations Subcommittee will review the grievance and respond in writing within four weeks of receipt of the appeal. If the claimant still feels that the issue has not been satisfactorily resolved, copies of the letter of appeal and the response of the Publications and Presentations Subcommittee will be sent to the Coordinating Center within two weeks for distribution to the entire Steering Committee for review. A decision of the Steering Committee regarding a grievance will be binding."
Guidelines for corporate authorship	"All persons eligible for authorship according to the guidelines of the International Committee of Medical Journal Editors (ICMJE) will be listed on the journal title page with the designation that these authors are writing on behalf of the XXXX Investigators, indicated by including the tag line "and the XXXX Investigators" at the end of the author list. For journals that limit the number of journal title page authors, manuscripts will be authored under the byline "The XXXX Investigators." In this case the Writing Group will be listed in the appendix in the order as determined by the Writing Group facilitator and approved by the Publications Subcommittee."
Requirement to identify individual contributions	"To qualify for authorship, [investigators] must check at least 1 box for each of the first 2 categories for abstracts and all 3 categories for manuscripts. *I have made substantial contributions to the intellectual content of the paper as described below:* For abstracts and manuscripts: 1. (**check at least 1 of the 3 below**) ☐ conception and design ☐ acquisition of data ☐ analysis and interpretation of data 2. (**check at least 1 of the 2 below**) ☐ drafting of the manuscript ☐ critical revision of the manuscript for important intellectual content 3. For manuscripts only: ☐ I have read and approved the final draft of the manuscript"
Writing Team Membership	
Describes formation of writing team	For each paper, the writing of the manuscript or abstract will be the responsibility of a writing group, to consist in general of authors from at least three and no more than five clinical site investigators, a coordinating center (**CC**) investigator, and a representative from National Institute of Diabetes and Digestive and Kidney Diseases, one of whom will be designated the chairperson, plus one or more analysts from the CC. Generally, the protocol chair, disease working group chair, or an investigator will be the lead author of publications and presentations, and will chair the writing group. The Presentations and Publications (**P&P**) Committee will approve the composition of each writing group and its chairperson.
Responsibilities for lead author	Responsibilities of writing group chairs (addendum approved on xx/xx/xx): 1. Establish writing group in which investigators from each site, the CC, laboratory, and National Institutes of Health have been given the opportunity to participate. 2. Determine authorship order based on intellectual contribution to: a. Formation and design of concept/research proposal. b. Involvement in data collection/analyses/research proposal. c. Involvement in manuscript preparation.

Policy Element	Sample policy language
	3. Obtain consensus on authorship order from the Writing Group (**WG**). 4. Notify the P&P Chair, within one month of approval of the writing group of: a. The list and proposed authorship order of the writing group membership. b. Proposed analysis target dates and production milestones such as the first draft of paper. c. Proposed target date for manuscript submission. 5. Coordinate with assigned statistician to ensure that data analyses are distributed to the writing group members in a timely manner. 6. Notify the P&P Chair of significant problems or delays in meeting production milestones. 7. Ensure that all acknowledgments of the funding agency are included in the manuscript. 8. Ensure that all requirements of the journal to which the manuscript is being submitted are met.
Recommendation for number of members per consortium site	Co-authors on a given paper are usually determined when the paper is defined. After that time, it is inappropriate for investigators to request that their names be added to the list of authors. However, the first author may invite any investigator whom he/she feels has contributed significantly to the paper to join the list of authors at any time. For each WG, the Publications Subcommittee (**PS**) will nominate the WG members and WG Facilitator with final approval by the Executive Committee. Priority will be given to the specific Protocol Facilitator and the members of the Protocol Team when deciding WG Facilitator and membership, respectively. One or more members from each participating consortium site (depending on the number of sites involved in the study) and one or more members of the CC (to include statistician and clinical members as required) will have the opportunity to participate in the WG (up to a maximum of 3). Priority will be given to the investigator at that site with the highest degree of expertise as it pertains to the protocol. In special circumstances, additional investigators from the same site may participate on the WG, with the permission of the PS. To obtain such permission, the principal investigator from the institution (and/or the WG Facilitator) must write a letter to the PS requesting and justifying the addition.
Replacement of writing team members	1) Each member must participate actively in the preparation of the manuscript and meet the criteria defined in the Uniform Requirements and above. 2) If a Writing Committee member does not accomplish the tasks assigned to him/her and has not contributed to the manuscript, he/she may be removed from the Writing Committee. 3) Prior to a request for removal of any Writing Committee member, the Chair must contact the member in writing, with a request for participation or performance of a task, and indicate that non-response within two weeks will be considered notice that the writing committee member no longer wishes to participate in the writing activity. 4) The chairperson must then send a letter to the Publications Committee requesting the removal from the writing committee of non-contributing members. All efforts should be made by the Writing Committee Chair to reconcile the views of all parties. Recommendations to remove a writing committee member must be approved by the Executive Committee.
Other Elements	
Guidelines for other types of publications	1. Main study reports – derived from network research protocols 2. Sub-study reports – arise from analysis of data collected as part of the main study but not specifically mentioned in specific aims and objectives of a network research protocol 3. Design and methods of main studies 4. Pilot and feasibility reports 5. Ancillary studies – arise from ancillary studies approved by the network Steering Committee which are based on analyses of study data that are not part of the aims and objectives of the main study nor of a sub-study report or are based on analyses of network study specimens (with or without associated additional data) 6. Abstracts, meeting proceedings, extended abstracts, oral and poster presentations 7. Letters to the editor 8. Reports of site-specific study results Press releases
Reference of external authorship guidelines (e.g., ICMJE)	Submission of completed Network Ancillary Studies application forms is required. These forms are available on the password secured part of the network website and completed forms should be forwarded to the Network Coordinating Center. If an **external investigator** [sic – who will presumably be an external author when the ancillary study results are published) is proposing a study, he/she can obtain the form through the Network Steering Committee member who will be the Co-investigator for the study. **External investigators** should review their concept study with a network liaison and enter the liaison's contact information on page 2 of the concept study.
Requirements for a dissemination plan	• To promote expeditious and timely dissemination to the scientific community of all pertinent data resulting from network; • to ensure accurate and scientifically sound publications and presentations from network collaborating investigators; • to encourage analysis and submission of manuscripts among the network investigators; • to establish a system for fair determination of authorship on network collaborative publications; • to ensure that investigators from all participating network centers, particularly those of junior faculty rank and other junior investigators, have the opportunity to participate and be recognized in study wide publications and presentations; • to ensure that press releases, interviews, promotional materials and other circulated network documents are accurate and objective, and do not compromise the collaborative study and the acceptance of its results; • to establish procedures that allow the National Institutes of Health to review in a timely fashion publications and presentations summarizing data collection; • to prevent duplicate publication(s), presentation(s) and abstract(s) submission; and to ensure that methods that are

Policy Element	Sample policy language
	uniform throughout the study be described in a special publication or presented in a standardized fashion in network publications.