Pilot Study to Shorten the Review Cycle: Process, Outcomes and Evaluation

Prepared November 2008
By the Evaluation Subcommittee

**Pilot Study to Shorten the Review Cycle:
Process, Outcomes and Evaluation**

Executive Summary

In February 2006, the Center for Scientific Review (CSR) implemented a pilot study based on the 2005 Trans-NIH Committee to Shorten the Review Process report. The purpose of the pilot was to examine the feasibility and effects of reducing the time between application submission and review to allow investigators to receive summary statements and submit amended applications in time for the next council without sacrificing the Core Values of Peer Review: Scientific and Technical Competence, Fairness and Objectivity.

Design of the Pilot

The pilot began with the February 2006 application receipt dates and ran for three successive review cycles. Forty CSR review groups volunteered to participate in this pilot. They represented a broad range of NIH scientific research areas. Within these study sections, only new R01 applications submitted by new investigators were eligible for expedited summary statements and early resubmission. New investigators were selected for this pilot because of NIH concerns about the time needed for new investigators to receive their first grants. For the three cycles, a total of 6,591 R01 applications were reviewed in the participating study sections, of which 1,978 were from new investigators.

Eligible investigators were to receive their summary statements within one week following the study section meeting and were offered a special receipt date to submit amended applications for the next council round that was later than the standard receipt date for that round, thus providing sufficient time to respond to the concerns raised in the summary statement.

Design of the Evaluation

The evaluation was designed to address three basic questions:

1. Could the expedited cycle be implemented, i.e., was it feasible?
2. What was the impact of the shortened cycle on the applicants and other stakeholders, i.e., how would core values of peer review and/or other values and behaviors be affected?
3. What are the barriers to full implementation?

To address these questions, the evaluation was designed to:

- Obtain IMPACII data on receipt and referral dates, summary statement release dates, and review outcomes,

- Conduct surveys of key NIH stakeholders to ascertain perceptions of success and problems encountered,
- Compare outcomes of pilot applicants who took advantage of the shortened cycles and those who did not.

Data Collection

To determine the feasibility and effects of a shorter cycle, information was collected from the following stakeholders: CSR Receipt and Referral staff, Scientific Review Officers (SROs) and members of participating study sections, and Program Officers in the institutes and centers (ICs) with applications included in the pilot. These stakeholders were administered survey instruments, developed to collect quantitative and qualitative data about their experiences with, and perceptions of, the pilot. In addition, IMPACII data were collected to provide quantitative and outcome data on applications and awards. All data collection was repeated for all three cycles.

Summary of Major Findings

- Shortening the review cycle was feasible, though not without costs, both for new investigator applicants and for NIH staff and reviewers.
- Different stakeholders had different opinions about whether or not the core values of review were compromised.
- Data from the first cycle demonstrate that essentially the same proportion of applicants who had initially scored in the 15th percentile were funded, whether they resubmitted for the subsequent or for later cycles.
- Applicants who participated in the pilot and resubmitted for the subsequent round were able to be funded up to a full six months earlier than would have been possible without the shortened review cycle.
- There was no difference in score improvement for applicants who resubmitted for the next review cycle vs. those who resubmitted for subsequent cycles. Thus, earlier resubmission neither harmed nor benefited new R01 investigators.

Unexpected Consequences

- The proportion of new investigators who took advantage of the opportunity to resubmit their applications for the next review cycle remained at a level of approximately 13%, despite the expectation that increasingly greater numbers would take advantage as awareness and experience grew. This raises the question of costs vs. benefits.
- This pilot was intended for investigators whose applications could be readily improved. An application with serious problems would not lend itself to a "quick-fix" and resubmission for the subsequent cycle. Nonetheless, a substantial number of new investigator applicants with poor scores or unscored chose to resubmit for the subsequent cycle.

- Although Pilot Study Section members did not perceive a negative impact of the shortened review cycle on the Core Values of Peer Review, a substantial proportion reported a reduction in their ability to read unassigned applications. This does, even if indirectly, represent an adverse impact on these values.
- Since the inception of the pilot, CSR has introduced a deadline of 30 days following a review meeting for completion of all summary statements. Possibly as a result of this deadline, investigators other than new PIs are beginning to resubmit for the next cycle.

Issues Requiring Attention

- Delays in receipt of applications by the SRO will compromise the shortened cycle.
- Eligible new investigators who did not receive their summary statements by the deadline may not be able to resubmit for the next cycle.
- Reviewers expressed concern about the shortened time to edit critiques and the inability to upload critiques into the Internet Assisted Review module because of computer problems at NIH.
- Seventy-five percent of SROs reported completing DEAS support staff tasks in order to meet deadlines for the shortened timeframe, violating NIH policy and diverting SRO time from their professional responsibilities.
- IMPAC II could not accommodate two active versions of the same application at the same time, which created problems for Program Officials. This issue with IMPACII was corrected in February 2008.

Recommendations

If this initiative is to be sustained and the Core Values of Peer Review maintained, the subcommittee recommends the following:

- The business rules in Receipt and Referral must be realigned in order to refer at least 95% of the applications by the deadline. One option is to have the amended and type 2 applications go directly to the IRGs (first contact) without going through the referral process (breakout).
- Arrangements must be made for additional support from DEAS staff to enable efficient pre-meeting, meeting, and post-meeting assistance.
- Sufficient IT resources must be available, including internet access during meetings for SROs and reviewers, as well as an increased capacity for uploading reviewers' critiques.
- The success of the shortened cycle is dependent upon people at each level accomplishing their tasks by a defined date. Small delays at one level will impact the following levels, will be amplified, and will decrease the likelihood of meeting subsequent deadlines. Steps should be taken to assure that realistic goals are set that allow for unexpected events, technological problems, and unusually high workloads.

- Finally, the subcommittee applauds the commitment of CSR to the evaluation process and strongly recommends providing support to carry out evaluations of initiatives.

Pilot Study to Shorten the Review Cycle:
Process, Outcomes and Evaluation

I.   Background

Fulfillment of the NIH mission is directly dependent on the timely support of peer reviewed, meritorious research. However, if an application comes into the Center for Scientific Review (CSR) for the February 5th receipt date, it is reviewed in June and goes to the relevant Institute Board or Council in October. If the application does not receive a score which results in funding, the applicant must submit a revised application for the November 5th deadline and would go to March review and May Council of the following year. This represents almost 15 months in the review process, which is burdensome for applicants waiting to find out whether their research will go forward. It is especially difficult for new faculty entering the system for the first time, because research funding is vital to their careers.

In 2005, the Trans-NIH Committee to Shorten the Review Process was formed to examine the length of time needed to ensure appropriate peer review. It was thought that the availability of electronic resources, including electronic application submission, as well as other changes in practice, might yield some opportunity to shorten the review process. In October 2005, the Committee produced a comprehensive report on its analysis of all aspects of shortening the review process and presented a number of specific recommendations. The Committee's key recommendation was to implement a pilot study targeting new investigators whose applications had readily addressable weaknesses. All new investigators were to receive their summary statements seven days after the scientific review group (SRG) meeting, enabling revisions to be submitted for a separate receipt date that was 20 days later than the current receipt date for amended applications. The amended applications would return to the same SRG.

Beginning with the February 2006 submission of applications, CSR conducted a pilot study on a shortened review cycle, based on this recommendation. The purpose of the pilot was to determine if the referral and review process could be modified to permit the submission of an amended application (resubmission) for the subsequent receipt date, without sacrificing the Core Values of Peer Review: Scientific and Technical Competence, Fairness and Objectivity.

The Committee recommended that the pilot be evaluated to address the utility and feasibility of this process, including costs and benefits to the various stakeholders, and the resources needed for full implementation.

The October 21, 2005 report of that Committee is included as Appendix 1.

II.   Methodology and Analyses

The pilot was implemented for three review cycles in 40 review groups that together represented the full range of scientific research areas across the NIH. The evaluation utilized IMPAC ll and/or survey data collected from the following stakeholders: CSR Receipt and Referral staff and the participating Scientific Review Officers, participating study section scientific reviewers, and NIH Program Officers.

A. Design of the Pilot

The pilot was aimed solely at new R01 investigators due to concerns that they represent a particularly vulnerable cohort of scientists. The pilot began with applications submitted for the February 2006 receipt date and ended with the May 2007 Council. For three cycles (October 2006 Council, January 2007 Council, and May 2007 Council), new investigators whose R01 applications were reviewed in one of the 40 SRGs participating in the pilot, and whose scores indicated that they would not receive funding, were given the option to submit amended applications for the very next receipt date. These investigators were cautioned that if selecting this option, their applications should be 'easily fixable' and were encouraged to contact their program officers for guidance before resubmitting. The potential reduction in the time from application submission to award was approximately four months.

The pilot was carried out using the following policies and practices:

- Participating Study Sections scheduled meetings so that new investigators received their summary statements no later than March 1, July 1, or November 1.

- The Summary Statements for qualifying applications contained an explicit note indicating eligibility for next cycle submission.

- Resubmission applications for consideration at the next cycle must have been submitted by March 20, July 20, or November 20.

- Resubmission applications were reviewed by the same study section that reviewed the previous version.

- New Investigators who did not choose the next cycle option or who requested review by a different study section used the standard resubmission dates for subsequent cycle submission (March 5, July 5, or November 5).

Information about the pilot was published in the NIH Guide:

http://grants.nih.gov/grants/guide/notice-files/NOT-OD-06-013.html

http://grants.nih.gov/grants/guide/notice-files/NOT-OD-07-034.html

B. Design of the Evaluation

The evaluation of the pilot was designed to address three basic questions: (1) Could the expedited cycle be implemented, i.e., was it feasible? (2) What was the impact of the shortened cycle on the applicants and other stakeholders, i.e., how would core values of peer review and/or other values and behaviors be affected? (3) What are the barriers to full implementation?

To address these questions, the following steps were taken:

- Obtain IMPACII data on receipt and referral dates, summary statement release dates, and review and funding outcomes.

- Conduct surveys of key NIH stakeholders to ascertain perceived success and problems encountered.

- Compare outcomes for pilot applicants who took advantage of the shortened cycles and those who did not.

1. IMPACII Data Collection

For each of three cycles, the following information was collected through IMPACII:

- Total number of R01 applications assigned to the 40 pilot study sections
- Number of revised R01 applications submitted by new investigators
- Number/percentage of applications referred to the IRG by the agreed-upon date
- Percentage of summary statements released in Commons by the target date
- Review outcome data (priority scores, percentiles)
- Limited funding data

In addition to the analysis of summary data for each cycle, longitudinal analyses of review outcomes and funding status were conducted for Cycle 1 applications. These analyses compared outcomes for those amended applications that were submitted for the very next Council with amended applications submitted to a later Council round.

2. Survey Development and Deployment

Surveys were designed to gather the perceptions of the stakeholders and to identify improvements needed to facilitate implementation of the shortened review cycle. The stakeholders responded to questions regarding their perceptions of the effects of the shortened cycle, including effects on the core values of peer review.

The following groups were surveyed, based on the potential impact of the pilot on their role in the overall process:

- CSR Division of Receipt and Referral staff
- Scientific Review Officers (SROs) of the pilot study sections
- Members of the pilot study sections
- Program Officers of applications reviewed in the pilot study sections

Applicants were not surveyed, because it was not possible to obtain the required OMB approval in the short time available.

Some information was gathered from SRGs that did not participate in the shortened review cycle for possible comparison purposes. However, data from these comparison SRGs are not presented, given concerns about the matching process and other methodological issues.

The Subcommittee generated the questions for the stakeholder surveys. The surveys were further refined by Dr. Georgine Pion of Vanderbilt University. In addition, representatives from referral, review, and program functions were consulted in the design and content of the survey instruments.

For each cycle, surveys were sent to the stakeholders. NIH staff received the surveys electronically and their responses were received anonymously to encourage openness about their views. The reviewers were asked to complete anonymous paper surveys at the end of their study section meetings.

In Cycle 1, the response rates for the various stakeholders were:

- Referral and Review: 21 of 23 responded (91%)
- Scientific Review Officers: 35 of 39 responded (90%)
- Reviewers: 812 of 1086 responded (75%)
- Program Officers: 157 of 220 responded (71%)

III.   Results over Three Cycles

Results of data collection reflect both the implementation of the shortened review cycle (process) and the impact of the shortened cycle on targeted variables (outcomes).

Process Findings:

- The SROs of pilot review groups received only 75% of the applications by the expected deadline.

- The SROs released between 88% and 97% of the summary statements by the expected deadline of one week.

- Those summary statements for new investigators that were released one week after the meeting in the pilot groups provided new investigators with at least three weeks to submit an amended application for the next cycle.

- The timeline for receipt, referral, and review was reduced by approximately four weeks.

Outcome Findings:

- Approximately 13% of eligible new investigators in the pilot groups submitted an amended application for the next cycle, using the expedited receipt date.

- Over three cycles, new R01 investigators who scored between 100 and 199 and resubmitted their applications for the next review round fared no better in terms of improvement than those who waited for subsequent rounds to resubmit their applications.

- Over three cycles, new R01 investigators who scored 200 or worse and resubmitted their applications for the next review round fared no better in terms of improvement than those who waited for subsequent rounds to resubmit their applications.

- Preliminary results indicate that 68% of the pilot investigators scoring in the 15th percentile or better and who resubmitted for the subsequent round have been funded (n=23). Seventy percent of the pilot investigators scoring in the 15th percentile or better (n=21) and who resubmitted for later rounds have been funded.

- Applicants who participated in the pilot and resubmitted for the subsequent round were able to be funded up to a full six months earlier than would have been possible without the shortened review cycle.

- Fewer than half of the eligible new investigators from the first cycle resubmitted an amended application within the 1 ½ years of the pilot.

- Whereas CSR Receipt and Referral staff and SROs felt that the Core Values of Peer Review were negatively affected by the shortened cycle, reviewers and Program Officers felt that the shortened cycle had minimal or no effect.

IMPACII Analyses

Appendix 2 presents the data collected for each of the six items listed in Section II.B.1., above.

Survey Results

Complete survey results for each group of stakeholders are presented in the following appendices:

- Appendix 3 - Division of Receipt and Referral staff
- Appendix 4 - Scientific Review Officers (SROs)
- Appendix 5 - Members of Pilot Study Sections
- Appendix 6 - Program Officers

1. Question Regarding Core Values of Peer Review

- Staff of the Division of Receipt and Referral - Most indicated that shortening the review cycle would have a negative effect on the Core Values of Peer Review.

- SROs - None believed that shortening the review cycle for all applications would have a positive effect on any aspect of peer review. By Cycle 3, 69% of the SROs believed that shortening the cycle for all NIH research grant applications would negatively affect the quality of summary statements, an increase of about 15% from Cycle 2.

- Members of Pilot Study Sections - Most felt that implementing the shortened review cycle for all research grant applications would have either no effect or a positive effect on the overall integrity of the peer review process.

- Program Officers - Most believed that shortening the review cycle would have no effect on peer review. A smaller number indicated that shortening the cycle for all NIH research grant applications would negatively affect the quality of summary statements and critiques.

Of these stakeholders, the SROs clearly were most affected by the shortened cycle in terms of demands on their work schedule, and they also voiced the greatest concerns about the effect on the integrity of peer review if the expedited process were to be expanded and sustained.

2. Other Survey Questions

Staff of the Division of Receipt and Referral

The Cycle 1 survey results indicated that a majority (11 out of 17) felt that the shortened cycle made it more difficult to assign all applications by the due date, compared with the previous cycle (which was a standard, non-shortened cycle). By Cycle 3, a similar majority (10 of 15 individuals) still reported some difficulty in meeting the deadline.

Staff were asked if, compared to the previous cycle, they had to work additional hours to complete application assignments. In the Cycle 1 survey, six of the 17 respondents reported an increase in hours worked, compared to the previous cycle. By Cycle 3,

three out of 15 respondents reported that they had to work extra hours, compared to Cycle 2.

A number of referral officers also had SRO duties; the need for expedited referral may have affected the amount of effort that they could devote to their review meetings and to referral of applications.

Scientific Review Officers

SROs reported a problem with receiving applications on time. By Cycle 3, of the 20 SROs who could remember whether they received their applications by the established November 15 deadline, 75% said they did not receive them all by this date.

SROs reported the most difficulty in reading applications as carefully as needed and the least difficulty in distributing additional materials to the reviewers.

By Cycle 3, 20% of the SROs found it "very difficult" to complete the summary statements for new investigators within the one week deadline and fewer than half reported "no difficulty" with this task. This information is consistent with the IMPACII data on summary statement release dates.

SROs did not report significant difficulties in obtaining edited critiques from reviewers.

By Cycle 3, about 54% of SROs (20 of the 37) who responded to this question said they had to work extra hours in order to complete their responsibilities, compared to the previous cycle of the pilot.

SROs were asked if, during the shortened cycle, they performed any DEAS tasks related to pre- or post-meeting activities. By Cycle 3, slightly more than half of the SROs who responded to this question reported that they had to perform some DEAS tasks related to pre- and/or post-meeting activities.

Those SROs who responded to open-ended questions asking for additional information about their experiences consistently reported how difficult it was to meet the deadlines with the resources available to them without any diminution in the quality of review.

Members of Pilot Study Sections

The survey was delivered to reviewers who attended the meeting in person. Data are presented for Cycle 3 of the pilot, by which time reviewers' responses represented some experience with the procedures. For Cycle 3, almost 1,000 reviewers received the survey and approximately half of these reviewers responded.

Reviewers were classified by whether they were permanent (slate or chartered) reviewers or temporary ("ad hoc") reviewers. Reviewers were also classified based on

whether they had a heavy R01 review load (seven or more R01 applications) or a lighter R01 review load (six or fewer R01 applications).

By Cycle 3, 81% of reviewers felt that they had an adequate understanding of the overall purpose of the pilot. Temporary reviewers appeared to be less informed. Most reviewers felt that having access to Internet Assisted Review (IAR) earlier than usual helped them to complete the reviews of assigned applications in a timely fashion.

For Cycle 3, over half of the respondents (52%) indicated that they had to work more evenings and weekends as a result of their participation in a Shortened Review Cycle pilot study section. This is about the same percent as in the first and second cycles of the pilot. Reviewers also said they read fewer unassigned applications or accessed IAR earlier than usual (39% and 42%, respectively) than they had prior to the pilot.

Program Officers

Of the approximately 60% of the program officers who responded to the survey, most (92%) felt they had an adequate understanding of the overall purpose of the pilot.

For Cycle 3, 69% of respondents said they were contacted by at least one new investigator; 30% said they were not contacted (the remaining respondents were unsure).

According to the program officers, fewer than a third of their eligible new investigators contacted them about their applications. Of the program officers who were contacted by eligible new investigators, more than half did not encourage any of their eligible new investigator applicants to submit for the special receipt date.

IC policy changes regarding "payline" for new investigators: For Cycle 3, 59 respondents (45%) indicated that their ICs did not develop any new policies or procedures regarding the Shortened Review Cycle, and 55 (42%) said they were not sure. Sixteen respondents (12%) said their ICs developed new policies in order to accommodate the Shortened Review Cycle.

IV.   Discussion

The evaluation data indicate that shortening the review cycle was feasible both for new investigator applicants and for NIH staff and reviewers. However, shortening the review cycle is not without costs, particularly for NIH review staff. It is important to recognize that SROs cannot be expected to maintain this level of performance over the long term without a substantial increase in the resources available to them.

Different stakeholders had different opinions about whether or not the core values of review were compromised. Receipt and Referral staff and SROs felt that the Core Values of Peer Review were negatively affected by the shortened cycle, but Reviewers and Program Officers felt that the shortened cycle had minimal or no effect. These

results may reflect the respondents' perceptions of their own need to make compromises in carrying out their roles in the review process. It should be noted, however, that the reported reduction in the ability of some reviewers to read unassigned applications does represent an impact on an underlying value of review, even if not recognized as such by reviewers.

Further, of the 80 new investigators in the first cycle who took advantage of the early resubmission, 34 received awards following the earliest council round (43%; Cycle 1 data only). Thus, the targeted group – new investigator applicants who could reasonably address their previous critique in an expedited manner – appeared to benefit somewhat from an early resubmission and award.

Over three cycles, new R01 investigators who scored between 100 and 199 and resubmitted their applications for the next review round fared no better in terms of improved scores than those who waited for subsequent rounds to resubmit their applications. Similarly, over three cycles, new R01 investigators who scored 200 or worse and resubmitted their applications for the next review round fared no better in terms of improved scores than those who waited for subsequent rounds to resubmit their applications. Thus, earlier resubmission neither harmed nor benefited new R01 investigators.

Data from the first cycle demonstrate that essentially the same proportion of applicants who had initially scored in the 15th percentile were funded, whether they resubmitted for the subsequent or for later cycles. Further, there was no difference in percentile improvement for applicants who resubmitted for the next review cycle vs. those who resubmitted for subsequent cycles. It appears that early resubmission affects only the timing of award, not the probability of award.

Finally, approximately 13% of eligible new investigators in the pilot groups submitted an amended application for the next cycle, using the expedited receipt date. Further, after five rounds, fewer than half of the eligible new investigators had resubmitted an amended application. It was expected that, over time, increasingly greater numbers of eligible new investigators would take advantage of the opportunity for early resubmission, as awareness of and experience with the process grew. The fact that this did not take place raises the question of costs vs. benefits of a shortened review cycle.

V.   Unexpected Consequences

- The proportion of new investigators who took advantage of the opportunity to resubmit their applications for the next review cycle remained at a level of approximately 13%, despite the expectation that increasingly greater numbers would take advantage as awareness and experience grew. This raises the question of costs vs. benefits.

- This pilot was intended for investigators whose applications could be readily improved. An application with serious problems would not lend itself to a "quick-fix" and resubmission for the subsequent cycle. Nonetheless, a substantial number of new investigator applicants with poor scores or unscored chose to resubmit for the subsequent cycle.

- Although Pilot Study Section members did not perceive a negative impact of the shortened review cycle on the Core Values of Peer Review, a substantial proportion reported a reduction in their ability to read unassigned applications. This does, even if indirectly, represent an adverse impact on these values.

- Since the inception of the pilot, CSR has introduced a deadline of 30 days following a review meeting for completion of all summary statements. Possibly as a result of this deadline, investigators other than new PIs are beginning to resubmit for the next cycle.

VI. Recommendations to Facilitate the Expansion of the Pilot Beyond New Investigators

The Evaluation Subcommittee recommends that:

1. At least 95% of new applications must be expedited from receipt and referral to the IRGs within the targeted referral date.

2. Amended applications must go directly to the IRGs without any intervening referral processes. This is even more critical with application deadlines being moved from the 1st of the month to the 5th.

3. Additional resources are needed to facilitate full-scale implementation:

- SROs must be given additional resources, such as help writing summaries for early release.

- DEAS staff must provide SROs with efficient pre-meeting, meeting and post meeting assistance. Additional training of the DEAS staff may be necessary.

- IT resources must be available, including access to the internet during the meetings, as well as increased capacity for uploading reviewers' critiques.

[NOTE: An original issue was that IMPACII could not maintain in active status two applications (-01, -01AI, -01A2) at the same time. Effective with its February 8, 2008 software release, the eRA system will now allow Multiple Active Applications (MAA). This will allow a next round submission and still keep the earlier application in consideration for funding.]

VII. Roster

Evaluation Subcommittee: Eileen Bradley, CSR (Co-Chair); Bettie J. Graham, NHGRI (Co-Chair); Teresa Levitin, NIDA; Jane Steinberg, NIMH; and Susan Streufert, NICHD

Staff: Charles Dumais, CSR; Teresa Lindquist, NIDDK; Cheryl Oros, formerly CSR; Elliot Postow, retired, CSR; and Terra Robinson, NIDDK

Consultants: Robert Hammond, Contractor, retired from NIDDK; Georgine Pion, Vanderbilt University; and Philip Smith, NIDDK

VIII.   Appendices

1 - October 21, 2005 "Recommendations to Shorten the Review Cycle", report of the Trans-NIH Committee to Shorten the Review Process

2 - IMPACII Data

3 - Survey Results - Division of Receipt and Referral staff

4 - Survey Results - Scientific Review Officers (SROs)

5 - Survey Results - Members of Pilot Study Sections

6 - Survey Results - Program Officers