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EDITORIALS

A Pipeline Model for Research Mentorship in the Health Professions

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1. Introduction

Research mentorship is widely recognized for its contributions to catalyzing new research projects. However, mentees often hedge against the possibility of delays or failure in their research agenda by pursuing more projects, collaborations, or commitments, with a hope that at least a portion of these efforts would reach the intended goal (such as publication or grant submission). While some commentators extol the career advantages of saying “yes” to all new opportunities [1], others caution new investigators to be more selective in their commitments, to avoid overwork and burnout [2]. This article describes a pipeline model for evaluating the status of an investigator's current research projects, guiding mentees in strategically allocating effort among their projects, and enhancing mentees' long-range planning by shifting the focus from *research output* to *research throughput*.

1.1. The pipeline model

The “pipeline” metaphor implies that projects flow from origin to completion, but does not require that this flow proceed unimpeded at a constant rate. Dividing project flow into stages can help identify where the pipeline might be blocked, or if the flow of projects is at risk of drying out. This flow of research projects can be separated into a *beginning*

stage, where the protocol is being actively developed and necessary resources and approvals are secured; an *ongoing* stage, where data are being collected and analyzed; a manuscript *draft* stage; and a *review* stage, where manuscripts await peer review or revision for resubmission.

While individual projects' progress through the pipeline will be highly variable, an investigator juggling multiple projects should be able to get at least a rough sense of how quickly the typical project should move from stage to stage [3]. For example, if the typical project spends 6 months in the review stage (encompassing initial review, revision, and acceptance for publication), then the investigator should endeavor to have at least 1 new project launched, 1 project enter the “ongoing” phase, 1 project enter the draft phase, and 1 project submitted to be considered for publication in each 6 month period to sustain this flow. Counting the number of projects in each stage will determine the shape of the pipeline (discussed further in the next section) and guide the investigator's long-range plans.

1.2. Troubleshooting the pipeline

New investigators often feel more comfortable and confident with launching new projects, than with completing and publishing existing projects. Therefore, junior investigators often have many projects in the beginning stages, a few projects ongoing, and

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very few (or none) currently being drafted for journal submission or considered for publication. Upon diagnosing this blockage in the pipeline, a research mentor should counsel their mentee to pause development of new projects, and concentrate their efforts on their ongoing work, with a focus on projects that are closest to moving into the draft stage. Looking ahead, the mentee could also recalibrate how many new projects they take on, based on the expected time each project will spend in the pipeline, and their desired throughput rate.

With more experienced investigators, a backlog of projects in the ongoing and draft stages may appear. This can be particularly discouraging to investigators, because a common cause of backlogs at the draft stage is repeated rejection of the same paper after submission to multiple journals. A mentor identifying a pipeline “blocked” in the middle would do well to investigate the submission history of projects currently in draft or under review, and to counsel their mentee on an effective submission strategy (e.g., prioritizing fit to the target journal). If the pipeline appears to be composed primarily of papers already under review, the mentee should be counseled to begin more new projects, with a diverse mix of project types to ensure that some of them move on a quicker timeline to replenish the middle stages of the pipeline.

1.3. Applying the model—from research mentorship to institutional strategy

By tracing the flow of research projects through the four stages, the pipeline model can help investigators understand where to concentrate their efforts to ensure sustained throughput of completed work, when to launch new projects, and what tempo of publication to expect over the long run. This model can be especially beneficial to investigators

balancing many concurrent projects, and can set the basis for research strategy in multi-investigator groups. For example, the pipeline model described here was used to guide the efforts of a central research group in a clinical department at a medical school [4], and has since been adapted to guide the work of a school-level office supporting clinical and educational scholarship. However, while the model can be adapted to serve larger units and institutions, its greatest utility remains in the context of the individual research mentoring relationship, when a mentor can help their mentee recognize the true state of their research progress, and transcend doubt and discouragement to attain a sustainable flow of research projects from initiation to publication.

Ethical approval

Not applicable.

Conflicts of interest

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