

# The Six-way Approach to Coming up with a Medical Research Idea

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Received: 29 Aug 2023; Revised: 24 Apr 2024; Accepted: 29 Apr 2024; Available online: 30 Apr 2024

**Keywords:** Research idea, Health sciences, Six-way approach, Surgical research

Ann Afr Surg. 2024; 21(2): 35-38

**DOI:** <http://dx.doi.org/10.4314/aas.v21i2.1>

**Conflict of interest:** None

**Funding:** None

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The uniqueness of surgery as a discipline lies especially in the duality of its execution as an art and a science. As an art, the subjective surgeon's preference takes the order of the day, with the resultant variation in surgical approaches among different surgeons. As a science, on the other hand, the existing surgical practices are heavily guided and informed by evidence-based research findings in order to ensure standardized quality care. The latter quality, in particular, makes the specialty heavily dependent on research in order to determine the most efficient techniques or approaches to ensure the best patient outcomes. Furthermore, in the era of evidence-based surgery, long gone are the days where expert opinion and small, single-center experiences solely carry the day with regard to determining the standards of care (1). To avert the rising number of litigations and malpractice and to easily maneuver through the growing complexity of clinical surgical care, research then becomes a basic necessity in the surgeon's toolkit. Regrettably, the current trend is contrary to the desired objective, as reported by the College of Surgeons of East, Central, and Southern Africa in their 10-year report, where they cite limited progress in the development of scientific research despite the enormous potential for high-quality surgical research in Africa (2). While the common understanding has been that

surgeons lack an engagement in research due to the increasing demand of clinical work, research shows that the major underlying factor is tied to their inability to garner resources or skills for research (3). Accordingly, the importance of raising the next generation of research-surgeons while in their formative stages then becomes more crucial. Multiple barriers, however, exist in the pursuit of equipping surgical residents with the basic skills of scientific research, as demonstrated by a recent annual research pre-workshop survey conducted by the *Annals of African Surgery Journal*. Among the challenges raised were the lack of curriculum-based research programs, the lack of government funding expenditure into research, and the widespread issues around diversity, equity, and inclusion in research. These align with the organic challenges brought out by Bain et al. in their discourse on fostering research integrity in Sub-Saharan Africa (4). A rather chronic challenge raised by surgical residents as their reason for non-engagement in active research over the years, despite the limitless training opportunities, has been coming up with a research idea. Henceforth, in order to continually foster research engagement in the aforementioned cohort, in Africa and the world at large, this editorial provides insight on a focused approach to address this major barrier.

## THE SIX-WAY APPROACH TO COMING UP WITH A MEDICAL RESEARCH IDEA

Embarking on a research project can be an exciting but daunting task, especially for new researchers. The prospect of contributing something new to the field can be inspiring, but the process of coming up with a research idea can feel overwhelming. Many individuals find themselves in a state of uncertainty, unsure of where to start and what topics to explore. This uncertainty can be exacerbated by a lack of knowledge or experience in the field, making it difficult to identify gaps or opportunities for further exploration. In this context, developing a good research question becomes all the more important. A well-formulated research question serves as a fundamental building block for any research project, providing clarity, focus, and direction (5, 6). The research question should be clear, concise, and specific, addressing a relevant and significant gap or problem in the existing literature and contributing to the overall knowledge base of the field (7, 8). It should also be feasible (taking into account the available resources, time, and expertise needed), as well as be interesting and engaging to generate enthusiasm and attract the attention of others in the field (7). With this in mind, the pressure to produce something original and impactful may add onto the stress of finding a suitable research idea. These factors can thus contribute to a sense of limbo, leaving one eager to engage in research but unsure of where to begin.

Therefore, it is essential to adopt a structured approach when developing a well-formulated research question. This involves breaking down the research process into manageable steps, starting at a point of focus. This paper aims to describe a six-way approach to coming up with a research idea so individuals may overcome the challenges of identifying a suitable research idea and ensure that their research is well-conceived. A previously proposed method of identifying a research problem was by Kumar et al. of using the four Ps (people, problems, programs, and phenomena) (7). They proposed that every research study has two aspects: the people that provide the researcher with the “study population,” and the other three Ps that furnish the “subject areas.” When it comes to the health sciences, the subject area is pathology—what can go wrong and bring the patient to hospital and necessitate medical or

surgical treatment (7). According to the Royal College of Pathologists, pathology underpins every aspect of patient care from management and treatment to recovery (9). As such, it is efficient to use the components of pathology, that is, morphology, etiology, pathogenesis, functional consequences, and management principles to create a foundation to come up with a research idea (10). Our proposed six-way approach provides a structural technique, tailored to the health sciences, where the starting point (point of focus) is determined by identifying a structure or region (morphology), substance or medication, disease process/pathogenesis, clinical observation, clinical or surgical procedure, or miscellaneous: method, recommendation. This is illustrated in Figure 1.

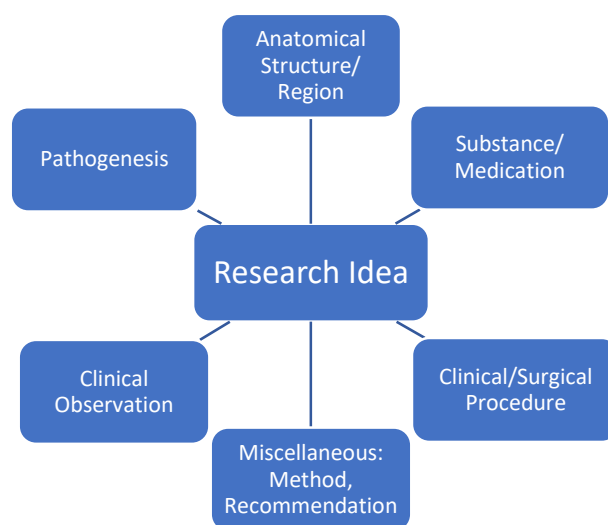


Figure 1. Chart illustrating the six-way approach.

### Anatomical Structure or Region

One approach to developing a research idea is to use an anatomical structure or region as a starting point. This involves identifying a specific anatomical structure or region of interest and exploring its functions, abnormalities, variations, or potential clinical applications. For example, researchers interested in the brain may focus on reading around the brain including anatomical variations in gyri patterns, variations in blood supply, or comparing normal and abnormal structural findings in a particular disease.

### **Substance or Medication**

Another approach to developing a research idea is to use a substance or intervention as a starting point. This involves identifying a specific substance, such as a drug or chemical compound, and exploring its effects, mechanisms of action, or potential applications or an intervention, such as surgery, and assessing the effect of different surgical approaches on metrics such as hospital stay, disease-free survival, and mortality rates among others. For medications, for instance, new drug molecules could be explored and compared to placebo groups, the effect of titrated doses can be observed, and the overall effect of new routes of administration or different frequencies of administration could be studied. For example, researchers interested in cancer treatment may investigate the effectiveness of a specific chemotherapy drug or explore new targeted therapies.

### **Pathogenesis**

A third approach to developing a research idea is to use pathology as a starting point. This involves identifying a specific disease or condition and exploring its underlying mechanisms, risk factors, effects, or potential treatment options. For example, researchers interested in colon cancer may investigate the cellular and molecular mechanisms underlying the disease, explore the role of genetics or lifestyle factors in its development, or investigate new surgical approaches or lifestyle interventions to manage the condition.

### **Clinical Observation**

A fourth approach to developing a research idea is to use a clinical observation as a starting point. This involves identifying a pattern or trend in patient outcomes or experiences and exploring the underlying mechanisms or potential interventions. For example, a clinician may notice that patients with a specific condition are not responding well to a particular treatment and decide to investigate the reasons for this or explore alternative treatment options. Alternatively, a clinician may observe that patients with a specific risk factor are developing complications at a higher rate than expected and decide to investigate the underlying mechanisms or potential interventions to reduce the risk.

### **Clinical/Surgical Procedure**

A fifth approach to developing a research idea is to use a clinical procedure or surgical procedure as a starting point. This involves identifying a specific medical or surgical procedure and exploring its effectiveness, safety, or potential improvements. For example, researchers may investigate the outcomes of a particular surgical technique, evaluate the effectiveness of a new medical procedure, or explore the potential applications of emerging technologies in surgery or other medical procedures.

### **Miscellaneous: Recommendation, Alternative Method, and Areas of Conflict**

A sixth approach to developing a research idea is to use miscellaneous methods where ideas are directly derived from existing literature such as recommendations or different methodologies from previous studies as a starting point. The former involves identifying a recommendation or guideline related to a particular health condition or treatment and exploring the evidence base for that recommendation or potential areas for improvement. For example, a guideline may recommend future investigations; thus, researchers may decide to embark on that recommendation or explore the potential benefits or limitations of alternative options.

The other approach would be identifying a study that has been done using a particular data collection method and exploring the potential benefits or limitations of using a different method to collect similar data. For example, a study may have used self-reported data to investigate the prevalence of a particular health condition, but researchers may decide to investigate the use of biomarkers or medical records to collect similar data.

Another miscellaneous approach would be areas of conflict or contradictory findings that would drive meta-analyses in order to generate a consensus. For example, some papers may favor endoscopic endonasal approaches in neurosurgery, while others would not due to the complications associated with the procedure. An author can pursue this area of contradiction to come up with a meta-analysis to find a pooled risk or estimate from various studies.

In conclusion, our proposed six-way approach provides a structured technique for coming up with a research idea that may be beneficial, especially to young researchers in the health sciences.

### Author contributions

All authors contributed equally to conceptualization, data curation, formal analysis, methodology, project administration and in writing, reviewing & editing of the original draft.

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