

# Independent Investigative Inquiry (III) Scholarship of Integration Project Proposal Form

Students who choose Scholarship of Integration as their III option can expect to learn and develop the skills of designing an answerable question, methodically searching medical literature, and critically reviewing and synthesizing the results.

Your Project Proposal, in addition to the Cover Sheet and Faculty Mentor Statement, should be no more than 4 pages, double spaced, 12-point font, and clearly describe what you plan to do. You are welcome to use images or graphs to help convey your plan. Key items to include in your Project Proposal are:

1. Background, purpose, and importance of your proposed literature review.
2. A clearly stated question.
3. Aims (and hypotheses if relevant) of your literature review.
4. Your initial search strategy and its rationale. This should include the names of the database(s) and their search terms that you plan to use.
5. Evidence that there are enough published studies that address your question in order to proceed with your review. Attach a list of a minimum of 10 published studies to your proposal that are relevant to your question. The III Approval Committee will not consider your proposal without this.

You will work with a **Faculty Mentor** who is a regular or clinical faculty member in any healthcare-related department at a WWAMI university. The Faculty Mentor must be familiar with the project topic and methods used in a literature review. The Faculty Mentor's role is to help you plan your study by reviewing and approving this proposal, meet with you regularly (weekly at minimum) during the execution of your project over the summer, review drafts and sign-off on the final paper, and submit an evaluation of your work.

If your Faculty Mentor **does not** have a UWSOM faculty appointment, you will need a **Faculty Co-mentor** who **does** have a UWSOM faculty appointment. In this case, a Faculty Co-mentor is needed in order to provide assistance through UWSOM in case issues arise, and to be able to submit an evaluation of your work. If you have a Faculty Co-mentor, you will still work primarily with your Faculty Mentor and check in with your Faculty Co-mentor throughout the summer as needed. More detail on Faculty Mentors can be found in the *Scholarship of Integration Guidelines* document.

## PROPOSAL SUBMISSION

Completed proposals should be saved in **PDF format** and **must be submitted by February 1, 2019** through the III Canvas site. A committee of reviewers will either approve the proposal or ask that the proposal be revised. Students can expect to receive notification of the committee's decision by February 22, 2019.

## FINAL PRODUCT

Scholarship of Integration students are required to submit a final paper by **September 2, 2019**. This paper should be structured as described in the *Scholarship of Integration Guidelines* document. The student must be the sole author of the paper, even if they collaborated with a faculty member or plan to submit a paper for publication under joint authorship.

Your **Faculty Mentor** must review and evaluate your paper prior to submission and complete a Faculty Mentor evaluation form of your work. The Faculty Mentor evaluation form will be available Fall 2019, and due from your mentor by **January 31, 2020**.

Please see the III [website](#) for additional information, including the *Scholarship of Integration Guidelines* document.

# Independent Investigative Inquiry (III) Scholarship of Integration Project Proposal Coversheet

## Project Proposal

Please submit completed Project Proposals in **PDF format** by **February 1, 2019** through the ILL Canvas site. Students can expect to receive notification of the committee's decision by February 22, 2019.

**Questions?** Please contact SOM Curriculum Office at [somcurr@uw.edu](mailto:somcurr@uw.edu)

## Project Title

What is the Incidence of orbital involvement among patients with head and neck necrotizing soft tissue infections?

## Student Information

Name	[REDACTED]
UW Email Address	[REDACTED]
Phone	[REDACTED]
First-year Site	[REDACTED]

## Faculty Mentor Information

Name & Degrees (e.g. M.D.)	[REDACTED]
Faculty Title	[REDACTED]
Do you hold a UWSOM Faculty appointment (yes, no)	[REDACTED]
Department & Institution	[REDACTED]
UW Box Number (if applicable)	[REDACTED]
Street Address, City, State, Zip	[REDACTED]
Email Address and Phone	[REDACTED]

## Faculty Co-Mentor Information

(Complete this section only if your Faculty Mentor does **not** hold a UWSOM Faculty Appointment)

Name & Degrees (e.g., M.D.)	
Faculty Title	
Department & Institution	

## Project Proposal

UW Box Number (if applicable)	
Street Address, City, State, Zip	
Email Address and Phone	

### 1. Background

Necrotizing Soft Tissue Infections (NSTIs) are severe, rapidly spreading and progressing infections with necrosis of the superficial fascia and the overlying skin<sup>1</sup>. In the United States, the annual incidence of NSTIs is .04 per 1000 annually<sup>13</sup>. Reports of periorbital NSTIs are uncommon (1-10% of cases) likely due to the extensive blood supply to the area. However, periorbital NSTIs can result in gross deformities, orbital exenteration and even death<sup>1,2,5</sup>. Furthermore, treating NSTIs requires an immense amount of financial resources. The mean cost of NSTI treatment per hospital course has been found to be \$319,337<sup>3</sup>.

Periorbital NSTIs are seen mostly in immune-suppressed adult females following blunt trauma (17%), penetrating injuries (22%) and surgery of the head and neck (11%)<sup>7,11</sup>. The disease initially presents with symptomatic swelling and generalized erythema of the eyelids before quickly progressing to blistering necrosis involving the skin and subcutaneous tissues of the periorbital region. If not treated expediently, central retinal artery occlusion with associated loss of vision and exenteration due to advanced orbital involvement has been shown<sup>11</sup>. Periorbital NSTIs are most often caused by  $\beta$ -haemolytic Streptococcus alone (50%), but can be caused by combinations of other bacteria with B-haemolytic streptococcus as well. The mortality rate for periorbital NSTIs has been reported to be between 10-14.42%<sup>2,7</sup>.

Although the patient profiles of periorbital NSTIs have been examined in the literature<sup>7,11</sup>, cases are limited regarding the incidence and management of orbital involvement in patients with head and neck necrotizing soft tissue infections. A study in the United Kingdom found the incidence of periorbital involvement of NSTIs to be 0.24 per million annually, which was based on a UK population of 63 million as reported by the UK Office of National Statistics<sup>7</sup>. However, this paper did not describe the incidence

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relative to the total number of head and neck NSTI cases. A separate review of 163 patients with necrotizing soft tissue infections showed that 10% involve the head and neck region, but did not describe the incidence of periorbital involvement<sup>8</sup>.

NSTIs are severe, debilitating infections that demand early surgical intervention to reduce morbidity and mortality<sup>11</sup>. This proposal is a literature review to determine the incidence and proper management of orbital involvement in patients with head and neck NSTIs. There have been many studies and case reports on NSTIs of the Head and Neck, reporting on clinical features, differential diagnoses, pathological characteristics and management but none have explored the incidence of periorbital involvement of patients with head and neck NSTIs<sup>2</sup>. Determining incidence and management of periorbital NSTI is valuable in trending risks of ocular involvement and its highly morbid consequences. It is hoped that this will aid providers in predicting and managing periorbital NSTI. Calculation of periorbital NSTI incidence is feasible from the existing clinical profile data of NSTIs which specify anatomic site of infection<sup>9</sup>. Furthermore, the Ophthalmology and Oral and Maxillofacial surgery departments at Harborview Medical Center have recently treated several cases of this rare presentation of NSTIs, making this a timely topic.

## **2. Research Question and Aims**

### **Question:**

What is the incidence of orbital involvement in patients with head and neck necrotizing soft tissue infections?

### **Aims:**

Primary aim: Determine the incidence of orbital involvement in all Head and Neck NSTI infections.

Secondary aim: Determine the optimal management of orbital NSTIs.

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**Hypothesis:** Among Head and Neck Necrotizing Soft Tissue Infections, there is a different incidence of involvement of the orbit relative to the incidence of involvement of other Head and Neck sites such as ears, nose, mouth, and neck.

**Null Hypothesis:** Among Head and Neck Necrotizing Soft Tissue Infections, there is no difference in the incidence of involvement of the orbit relative to the incidence of involvement other sites such as other Head and Neck Sites such as ears, nose, mouth, and neck.

### 3. Initial Search Strategy

I plan to utilize the search engines Pubmed, Scopus, google scholar, Embase, and EBSCOhost to optimize my search for articles. Since there are many synonymous terms for necrotizing soft tissue infections, I will include terms such as Necrotizing soft tissue infection, haemolytic streptococcal gangrene, suppurative fasciitis, necrotising fasciitis, acute dermal gangrene and progressive bacterial gangrene, head, neck, and head and neck in my main search query. I will also use phrases such as clinical profile, systematic review, incidence, and periorbital with the Boolean operator *and* to focus search results.

Additional search strategies will include using the ‘similar articles’ search function in pubmed, reviewing the reference list of included articles, and reviewing my list of articles with Dr. Dillon, an expert in the field of head and neck NSTIs. There will also be several important inclusion and exclusion criteria that will help focus my literature review. First, systematic reviews will be prioritized when reviewing the literature due to the high level of evidence and a large sample size. Studies reviewing a greater overall number of NSTIs will be prioritized. Case series may also be included in my review due to the overall low incidence of periorbital NSTIs. Although there are several known risk factors for periorbital NSTIs, my focus is on the overall incidence of periorbital NSTIs among those with Head and

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Neck NSTIs. Therefore, there will be no inclusion or exclusion criteria based on age, gender, race, pre-existing disease, etc. The main outcome assessment inclusion criteria will be periorbital NSTI diagnosed by any of the following: The Laboratory Risk Indicator for Necrotizing soft tissue Infection (LRINEC) score, clinical assessment, pathology and microbiology. Exclusion criteria will be NSTI of any site other than the head and neck and articles where the diagnosis is not clearly stated. There will be no exclusions based on dates of publication.

## Data Extraction Plan

I plan on synthesizing data from as many qualifying sources as possible on the incidence of periorbital NSTIs and the incidence of Head and Neck NSTIs to state an overall incidence of periorbital NSTIs among those with Head and Neck NSTIs. Ideally, an NSTI will be defined by LRINEC scoring and articles will have periorbital and overall head and neck incidence data to be included.

## Preliminary Articles

1. Amrith, S. , Hosdurga Pai, V. and Ling, WW. Periorbital necrotizing fasciitis – a review. *Acta Ophthalmologica* 2010;91:596-603.
2. Lazzeri D, Lazzeri S, Figus M, *et al.* Periorbital necrotising fasciitis. *British Journal of Ophthalmology* 2010;94:1577-1585.
3. Zemplyeni, K. *et al.* Can progression of odontogenic infections to cervical necrotizing soft tissue infections be predicted? *International Journal of Oral and Maxillofacial Surgery* 2017;46(2):181-188.
4. Yilmazlar, T., Ozturk, E., Alsoy, A. *et al.* Necrotizing Soft Tissue Infections: APACHE II Score, Dissemination, and Survival. *World J Surg* 2007; 31: 1858.
5. Gunaratne DA, Tseros EA, Hasan Z, *et al.* Cervical necrotizing fasciitis: Systematic review and analysis of 1235 reported cases from the literature. *Head & Neck* 2018;40:2094-2102.
6. Rajak SN, Figueira EC, Haridas AS, *et al.* Periocular necrotising fasciitis: a multicentre case series. *British Journal of Ophthalmology* 2016;100:1517-1520.
7. Flavahan PW, Cauchi P, Gregory ME, *et al.* Incidence of periorbital necrotising fasciitis in the UK population: a BOSU study. *British Journal of Ophthalmology* 2014;98:1177-1180.
8. Childers BJ, Potyondy LD, Nachreiner R, Rogers FR, Childers ER, Oberg KC *et al.* Necrotising fasciitis: a fourteen-year retrospective study of 163 consecutive patients. *Am Surg* 2002;68:109–116.

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9. Singh, G. , Sinha, S. K., Adhikary, S. , Babu, K. S., Ray, P. and Khanna, S. K. Necrotising infections of soft tissues—a clinical profile. *Eur J Surg* 2010;168: 366-371.
10. Kaul, R, *et al.* Population-Based Surveillance for Group A Streptococcal Necrotizing Fasciitis: Clinical Features, Prognostic Indicators, and Microbiologic Analysis of Seventy-Seven Cases, *The American Journal of Medicine* 1997;103(1):18-24
11. Tambe K, Tripathi A, Burns J, Sampath R. Multidisciplinary management of periocular necrotising fasciitis: a series of 11 patients. *Eye (Lond)* 2011;26(3):463-7.
12. Soltani, A., *et al.* Trends in the Incidence and Treatment of Necrotizing Soft Tissue Infections, *Journal of Burn Care & Research* 2011;35(5): Pages 449–454

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**Faculty Mentor Statement**

Students are asked to work with a faculty member who is a regular or clinical faculty member in any healthcare-related department at a WWAMI university. The Faculty Mentor must be familiar with the project topic and methods used in a literature review. The Faculty Mentor’s role is to help the student plan their study by reviewing and approving this proposal, meet with the student regularly (weekly at minimum) during the execution of the project over the summer, review drafts and sign-off on the final paper, and submit an evaluation of the student’s work.

In the following space, please provide a brief paragraph indicating how often you will meet with the student over the summer, and how you will guide the student to a finished final paper by the end of the Summer.

**Signatures**

<b>Signature of Student</b>		
<b>Signature of Faculty Mentor</b>		
<b>Signature of Faculty Co-Mentor</b> (if applicable)		
<b>Date</b>		

**QUESTIONS? Please contact:**  
SOM Curriculum Office at [somcurr@uw.edu](mailto:somcurr@uw.edu)