

2020 Research Medical Student Grant Application

Prayash Katlariwala, BSC (6725)

Inter-reader and Intra-reader Reliability of the O-RADS Risk Stratification and Management System Amongst Less Experienced Radiologists Practicing in a North American Institution.

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RSNA R&E Foundation
Radiological Society of North America
820 Jorie Boulevard, Suite 200
Oak Brook, IL 60523
(630) 571-7816

This page, when separated from the rest of the application, should serve as a succinct and accurate description of the proposed research plan, the involvement of the scientific advisor and the role that the medical student will play in completing the research plan. The summary should include the long-term goals of the proposed work and the methods to be used. Data collection and analysis should be summarized along with the potential clinical significance of this work in the radiologic sciences.

Abstract not to exceed 300 words.

A. Title:

B. Abstract:

C. Resubmission Information:

Is this application based on a proposal submitted to the RSNA R&E Foundation within the past two years? If yes, please use the following link to provide brief details of the previous submission, including a summary of the reviewer comments and how each issue has been addressed in this proposal.

A. Title:

Inter-reader and Intra-reader Reliability of the O-RADS Risk Stratification and Management System Amongst Less Experienced Radiologists Practicing in a North American Institution.

B. Abstract of Proposed Plan:

Ovarian-Adnexal Reporting and Data System (O-RADS) is a tool to standardize terminology used to describe ovarian/adnexal masses and increase clarity with risk stratification. The O-RADS risk stratification tool has not yet been validated in North American centers, nor with less experienced radiologists. The objective of this single-center study is to evaluate the inter-reader and intra-reader reliability of the O-RADS risk stratification and management system amongst less experienced board-certified radiologists practicing in North America. Ethical approval has been received from our local health research ethics board for study protocol (Pro00097690). Three radiology fellows practicing at our institution will be trained on the O-RADS guidelines using a 50-patient training database developed for the purposes of this study. Once trained, an additional 50 cases will be completed independently by the fellows as test cases. The test cases will be completed within 72 hours of the training session followed by randomization and re-test three weeks later. Selected O-RADS terminology and scoring assigned to test cases by the fellows will be used to determine the inter and intra-reader variability as described by the Cohen's kappa score. Analysis will be performed on IBM SPSS Statistics 24 (NY, USA).

C. Resubmission Information:

No data.

Note: The scientific advisor and/or one or more other investigators must be dues-paying members of RSNA. Include RSNA membership numbers as indicated.

A. Applicant (Principal Investigator) Data:

Complete and submit the applicant personal and professional data.

B. Biosketch:

NIH-style, **limited to 5 pages**.

C. Priority Statement:

Describe your area of professional/scientific interest(s) and long-term career goals and objectives. Briefly describe the relevance of the proposed research plan to the priorities of the host institution and departmental research program(s).

Not to exceed 1000 words.

D. Scientific Advisor (to be completed by the scientific advisor/sponsor)

- Name, degrees, title/faculty rank

- Percent of time that will be devoted to the proposed research project and brief description of the advisor's role as mentor for the applicant (A Sponsor responsible for the trainee and the project who also acts as an Advisor is required for this grant application. The advisor/sponsor will advise the resident/fellow on all aspects of the project, and will be responsible for the resident/fellow in ensuring completion of the project in a timely fashion, the content and interpretation of the project, and any publication or presentation of the information. If the resident/fellow project is to be part of a larger established research effort of the sponsor, the supervising advisor/sponsor should describe the role of the resident/fellow in the overall project and how their independence will be established from previous or existing efforts). This section is not intended to be used for applicant recommendations.

Not to exceed 1000 words.

E. Relationship of Proposed Project to Existing Research Programs(to be completed by the scientific advisor/sponsor)

Describe the extent to which the applicant was responsible for developing and writing the research proposal. Relationship and overlap with existing research programs should be specified in detail.

Not to exceed 500 words.

F. Other Investigators (if any):

Other investigators/scientific advisors/consultants who will contribute significantly to the project should be listed. Include a description of the role they will play in the proposed research project. To the extent possible, collaborators should be actively involved in each stage of the project, from initial application through analysis and reporting on the final product.

A. Applicant (Principal Investigator) Data:

Applicant Name:	Prayash Katlariwala, BSC
Home Address:	9650 82 Ave NW Suite 10 Edmonton AB T6C1C1 Canada
Phone:	403-968-1475
Email:	prayash@ualberta.ca
Date of Birth:	05/11/1995
Institution:	University of Alberta
Department:	Radiology and Diagnostic Imaging
Country of Citizenship:	Canada
Key Training Dates:	University of Calgary, Calgary - BSc 04/2017
Faculty Position/Rank:	Year 2 Undergraduate Medical Education
Grants Received:	Frederick Banting and Charles Best Canada Graduate Scholarships-Master's Katlariwala, Prayash May/01/2018 – April/30/2019 We explored the structural impact of fetal alcohol exposure on cerebellar grey matter, white matter, whole structure anomalies, and correlations with cognitive test findings. We received 17 000 Canadian dollars of grant funding (80% effort).

	Role: Master's Student
Peer Reviewed Articles:	4
UIM Funding Opportunity:	No
Percent of Time Allocated:	My entire studentship will be devoted to the proposed O-RADS reliability study. I will work closely with one or both the Principal Investigator (Dr. G. Low [GL]) or the lead radiology fellow (Dr. M. P. Wilson [MPW]) throughout the study. This will include near daily communication with one or both of my mentors. I have already coordinated with MPW to develop the study protocol and garner ethics approval (10%, completed). To initiate my studentship, I will work closely with GL as part of the Steering Committee to develop the training and testing databases (30%, 3-4 weeks). I will organize the teaching database in order to allow GL to provide the formal didactic teaching and interactive training session for the fellows. Following this, I will work closely with MPW to perform the data acquisition (20%) and write up (30%, 5 weeks total). I will participate in the data analysis with GL. I will be expected to lead the manuscript submission (as we aim to submit by the completion of his studentship), and will be expected to present the data locally and/or at a national/international meeting (10%, 1-2 weeks).

C. Priority Statement:

I am a second year medical student considering a career in radiology. As such, I am keen to increase my exposure to the scope and practice of radiology at my institution. Over the past year, I have been fortunate to develop two key mentors at my institution (Drs. G. Low and M. P. Wilson) who have been working closely with me on several research projects while also ensuring I've had a positive experience shadowing in the department. Prior to my current academic year, my previous experience has been largely in basic imaging science and I am also interested in continuing to improve my ability to perform clinical research in the field of radiology.

I will be starting my clinical rotations at the end of the summer, and as a short term goal I am interested in developing a greater appreciation for the application and limitations of imaging in the healthcare setting. I am hoping to garner first hand experience with ultrasound images, better understand the terminology used by radiologists when creating a report, and familiarize myself with the ovarian and adnexal risk stratification guidelines such that I have a better understanding for Women's Health on related rotations. As a broader short term goal, I am hoping my exposure to the radiology department over the two month studentship will also improve my knowledge in other areas of medicine applicable more generally to my upcoming clerkship rotations.

I believe this project will also serve my long term goals. At present, radiology is my first career choice. Through this experience, I am hoping gain insights into the essential skills and information/knowledge required to be successful in this field. I would like to improve my awareness of a radiologists' contribution to the healthcare team and increase exposure to various imaging modalities I was not previously exposed to during my pre-clinical rotations. Furthermore, this project will allow me the opportunity to increase my presence in the radiology department and to be considered as a serious candidate in the field.

From a research perspective, I am excited to learn about the process of clinical research in radiology. I am interested in learning more about the challenges and rewards of this particular type of research, as well as the practical application and follow-through for an institutional study. I am fortunate to be involved in the entirety of this project, and I feel this opportunity will provide me with a better scope and ability to perform clinical research as a part of my practice. I am confident that I will continue to be involved with projects such as this throughout my training and potentially into my career.

D. Scientific Advisor:

Name: Gavin Low, Associate Professor, RNSA #00413675

Description: Prayash's entire studentship will be devoted to the proposed O-RADS reliability study. Prayash will work closely with one or both the Principal Investigator (Dr. G. Low [GL]) or the lead radiology fellow (Dr. M. P. Wilson [MPW]) throughout the study. This will include near daily communication with one or both of these mentors. Prayash has already coordinated with MPW to develop the study protocol and garner ethics approval. To initiate his studentship, Prayash will work closely with GL as part of the Steering Committee to develop the training and testing databases. He will organize the teaching database in order to allow GL to provide the formal didactic teaching and interactive training session for the fellows. Following this, he will work closely with MPW to perform the data acquisition and write up. He will participate in the data analysis with GL. Prayash will be expected to lead the manuscript submission (as we aim to submit by the completion of his studentship), and will be expected to present the data locally and/or at a national/international meeting.

Prayash will be closely supervised throughout his studentship to ensure his understanding is sufficient for performance and that his time is utilized effectively. To achieve this, Prayash will work in the radiology department during regular work hours and receive at least bi-weekly feedback depending on the stage of the study. He will also be provided with up to once weekly shadowing opportunities to improve his understanding of the clinical application of ultrasound imaging in Women's Health and to increase his exposure to radiology as a future career choice. We have already had considerable experience over the past year with Prayash as he has been actively involved with 12 manuscripts currently in various stages of completion (from data acquisition to "in press"). This includes a meta-analysis on accuracy of MRI for lipid poor AMLs currently in final revisions for publication in RADIOLOGY. We have been thoroughly impressed with Prayash's commitment, time management abilities as he's handled multiple projects while successfully completing a busy year of medical school, as well as his interest in continuing to expand his understanding of both radiology and clinical research. We are confident that Prayash will be very successful leading the organization of this particular project. Indeed, he has shown considerable early promise as a future leader in radiology research. For these reasons, we hope you will consider him strongly as a candidate for this prestigious medical student award as he is most certainly a deserving individual.

E. Relationship of Proposed Project to Existing Research Programs:

Prayash contributed to the study conception by meeting with Dr. G. Low [GL] and Dr. M. P. Wilson [MPW] and discussing research opportunities for summer research. Following study conception, Prayash worked closely with MPW to develop a research proposal for ethics submission. Together with MPW, Prayash submitted and received institutional ethics approval. He is actively completing funding submission from both the RSNA (current application), the Alberta Innovates - Health Solutions (AIHS) Summer Research Studentship, and the Faculty of Medicine and Dentistry at the University of Alberta. If funding application(s) are unsuccessful from these sources, we will work with the Department of Radiology and Diagnostic Imaging at the University of Alberta to support his studentship through the department research fund. This project is a stand alone studentship project, independent from other ongoing research in our department. As noted above, Prayash has been and is currently actively involved in several additional projects during his academic year for which he is not currently receiving funding. We believe this grant would be an excellent opportunity to recognize him both academically and monetarily for the currently proposed project and the existing projects for which he has already contributed and/or is actively contributing.

F. Other Investigators:

Name: Mitchell P. Wilson, MD, FRCPC, RSNA #00693140

Role: Dr. M. P. Wilson [MPW] is the lead research fellow on this project and will contribute substantially to Prayash's mentorship throughout the project. As noted previously, MPW has already assisted Prayash with the study proposal and ethics approval. He will mentor Prayash with the data acquisition and manuscript write-up.

Drs. M. P. Wilson, R. Singh, and Z. Haines will serve as the fellows involved in the study variability assessment portion of the study.

BIOGRAPHICAL SKETCH

NAME: Katlariwala, Prayash

POSITION/TITLE: Student

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
University of Calgary, Calgary	BSc	04/2017	Biological Science
University of Alberta, Edmonton	MD (in progress)	06/2022	Doctor of Medicine

A. Personal Statement

I am a second year medical student at the University of Alberta in Edmonton, Alberta, Canada interested in a career in radiology. I have a background in the biological sciences and previous Master's work in neuroimaging, evaluating the impact of diseases such as ADHD and FASD on neuroanatomy in MR and fMR imaging. Through my previous Master's work, I was recognized with The Walter H. Johns Graduate Fellowship and the Frederick Banting and Charles Best Canada Graduate Scholarship, two very competitive Canadian national awards offered for academic performance, submitted proposal and significance of research. Over the past year, I have been actively involved with several projects in the radiology department at my institution which have included various body and MSK related studies. These have included largely meta-analysis, topic reviews, and case reports. Thus far, we have 12 manuscripts in various stages of preparation including three of which have been accepted for publication and two which are in revision stages. One particular meta-analysis evaluating the performance of MRI for lipid poor angiomyolipomas of the kidney is in final revisions for RADIOLOGY.

Through this exposure, I have been fortunate to develop two key mentors at my institution (Drs. G. Low and M. P. Wilson) who have been working closely with me on several research projects while also ensuring I've had a positive experience shadowing in the department. This has served to increase my interest in the field and stimulate my desire to continue working with the department.

I am particularly interested in undertaking and leading a clinically based imaging project which has led me to assist in the development and ethical approval of our O-RADS reliability study. My research experience thus far has been focused on basic clinical research and systematic reviews. I am hoping to utilize this opportunity to: (1) develop a better understanding for the entire process of a clinical research project in the radiology department, (2) learn more about imaging, in particular ultrasound, which is an area I have not had much exposure to previously, (3) learn more about Women's Health in preparation for my upcoming clinical rotations, and (4) increase my presence in the radiology department in order to increase shadowing and learning opportunities and to demonstrate my interest as a future radiology applicant.

I am confident this project will serve many of my short term and longer term goals. The practice of seeing a project through from start to finish will improve my research process knowledge, my approach to teamwork and my leadership abilities, all necessary qualities of a modern physician. The exposure will increase my understanding of radiology and the research process in addition to the department's awareness of me as a viable candidate.

B. Honors

Positions and Employment

2017 - 2019 Master's Student, Department of Biomedical Engineering, University of Alberta, Edmonton

- 2016 – 2017 Undergraduate Research Assistant, Department of Pediatrics and Radiology, Alberta Children's Hospital, Calgary
- 2015 – 2016 Undergraduate Research Assistant, Department of Physiology & Pharmacology and Clinical Neuroscience, Cumming School of Medicine and Faculty of Kinesiology, Calgary

Other Experience and Professional Memberships

- 2019 - Member, Canadian Association of Radiologist
- 2020 - Member, Radiological Society of North America

Honors

- 2015, 2016 National Science and Research Council of Canada Undergraduate Student Research Awards
- 2017 Alberta Innovates Health Solutions Summer Studentship
- 2018 Walter H. Johns Graduate Fellowship
- 2018 Friends of the Faculty of Graduate Studies and Research Scholarship
- 2020 University of Alberta Green and Gold Fund

C. Contribution to Science

- a. Wilson MP, Patel D, Mohammad M, McInnes M, Katlariwala P, Low G. Diagnostic Performance of Renal Lipid-poor Angiomyolipomas: A systematic review and meta-analysis. 2020; Radiology. In Revisions.
- b. Singh R*, Wilson MP*, Katlariwala P, Murad MH, McInnes MDF, Low G (*Co-first authors). Accuracy of liver and spleen stiffness on MR elastography for detecting portal hypertension: A systematic review and meta-analysis. 2020; European Journal of Gastroenterology and Hepatology. In Press
- c. Wilson MP, Nobbee D, Murad MH, Dhillon S, McInnes MDF, Katlariwala P, Low G. Diagnostic accuracy of limited MRI protocols for detecting radiographically occult hip fractures: A systematic review and meta-analysis. 2020; American Journal of Roentgenology. In Revision.
- d. Rohr C, Arora A, Cho I, Katlariwala P, Dimond D, Dewey D, Bray S. Functional network integration and attention skill in young children. 2018; Cognitive Neuroscience

D. Additional Information: Research Support and/or Scholastic Performance

Completed Research Support

Frederick Banting and Charles Best Canada Graduate Scholarships-Master's
 Katlariwala, Prayash
 May/01/2018 – April/30/2019

We explored the structural impact of fetal alcohol exposure on cerebellar grey matter, white matter, whole structure anomalies, and correlations with cognitive test findings. We received 17 000 Canadian dollars of grant funding.

Role: Master's Student

BIOGRAPHICAL SKETCH

NAME: Low, Gavin

POSITION TITLE: Associate Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
University of Edinburgh, Edinburgh	MBChB	06/1998	Medical Degree
University of Cambridge, Cambridge	MPhil	06/2014	Medical Sciences (Radiology)
East of Scotland Deanery, Edinburgh	Resident	07/1999	Internship
West of Scotland Deanery, Glasgow	Resident	07/2001	Basic Surgical Training
West of Scotland Deanery, Glasgow	Resident	08/2006	Radiology
University of Alberta, Edmonton	Fellow	09/2007	Body Imaging Fellowship

A. Personal Statement

I am an academic radiologist with a geographic full time appointment with the University of Alberta (Associate Professor) and the University of Alberta Hospital (fellowship trained abdominal and pelvic radiologist).

My clinical and research interests are in abdominal and pelvic cross sectional imaging (US, CT and MRI). I have been practicing as a staff radiologist since 2007. As a researcher, i have been co-authored in 80 peer-reviewed publications, many as either first author or final author. I have also been involved in many conference abstracts. As part of my university responsibilities, i have been the primary research supervisor to 17 clinical body imaging fellows, 15 radiology residents and 4 medical students. My students have been 1st authored in 32 PubMed citable publications. Several of my students have also won awards for their research including the 'Invest in Youth' Award by the European Congress of Radiology, the 'Postgraduate Publication Prize' at the University of Alberta, and many 1st place prizes as 'Best Fellow Research' and 'Best Resident Research' at the Department of Radiology & Diagnostic Imaging Annual Research Day.

1. Praktiknjo M, Simón-Talero M, Römer J, Roccarina D, Martínez J, Lampichler K, Baiges A, Low G, Llop E, Maurer MH, Zipprich A, Triolo M, Maleux G, Fialla AD, Dam C, Vidal-González J, Majumdar A, Picón C, Toth D, Darnell A, Abalde JG, López M, Jansen C, Chang J, Schierwagen R, Uschner F, Kukuk G, Meyer C, Thomas D, Wolter K, Strassburg CP, Laleman W, La Mura V, Ripoll C, Berzigotti A, Calleja JL, Tandon P, Hernandez-Gea V, Reiberger T, Albillos A, Tsochatzis EA, Krag A, Genescà J, Trebicka J. Total area of spontaneous portosystemic shunts independently predicts hepatic encephalopathy and mortality in liver cirrhosis. J Hepatol. 2020 Jan 15;PubMed PMID: [31954206](#).
2. Sam M, Raubenheimer M, Manolea F, Aguilar H, Mathew RP, Patel VH, Low G. Accuracy of findings in the diagnosis of uterine adenomyosis on ultrasound. Abdom Radiol (NY). 2019 Sep 24;PubMed PMID: [31552462](#).
3. Simón-Talero M, Roccarina D, Martínez J, Lampichler K, Baiges A, Low G, Llop E, Praktiknjo M, Maurer MH, Zipprich A, Triolo M, Vangrinsven G, Garcia-Martinez R, Dam A, Majumdar A, Picón C, Toth D, Darnell A, Abalde JG, Lopez M, Kukuk G, Krag A, Bañares R, Laleman W, La Mura V, Ripoll C, Berzigotti A, Trebicka J, Calleja JL, Tandon P, Hernandez-Gea V, Reiberger T, Albillos A, Tsochatzis EA, Augustin S, Genescà J. Association Between Portosystemic Shunts and Increased Complications and Mortality in Patients With Cirrhosis. Gastroenterology. 2018 May;154(6):1694-1705.e4. PubMed PMID: [29360462](#).

4. Santosh D, Goel A, Birchall IW, Kumar A, Lee KH, Patel VH, Low G. Evaluation of biliary ductal anatomy in potential living liver donors: comparison between MRCP and Gd-EOB-DTPA-enhanced MRI. *Abdom Radiol (NY)*. 2017 Oct;42(10):2428-2435. PubMed PMID: [28474177](#).

B. Positions and Honors

Positions and Employment

2007 - 2009	Clinical Lecturer, Department of Radiology, University of Alberta Hospital, Edmonton
2009 - 2016	Assistant Professor, Department of Radiology, University of Alberta Hospital, Edmonton
2016 -	Associate Professor, Department of Radiology, University of Alberta Hospital, Edmonton

Other Experience and Professional Memberships

2000 -	Member, Royal College of Physicians and Surgeons, Glasgow
2003 -	Member, Radiological Society of North America
2005 -	Fellow, Royal College of Radiologists, UK
2015 -	Member, American Roentgen Ray Society

Honors

2014 - 2015	Teacher of the Year, University of Alberta, Diagnostic Radiology & Nuclear Medicine Residency Training Programs
2015 - 2016	Teacher of the Year, University of Alberta, Diagnostic Radiology & Nuclear Medicine Residency Training Programs
2016 - 2017	Teacher of the Year, University of Alberta, Diagnostic Radiology & Nuclear Medicine Residency Training Programs
2017 - 2018	Teacher of the Year, University of Alberta, Diagnostic Radiology & Nuclear Medicine Residency Training Programs
2018 - 2019	Teacher of the Year, University of Alberta, Diagnostic Radiology & Nuclear Medicine Residency Training Programs

C. Contribution to Science

- a. Praktijnjo M, Simón-Talero M, Römer J, Roccarina D, Martínez J, Lampichler K, Baiges A, Low G, Llop E, Maurer MH, Zipprich A, Triolo M, Maleux G, Fialla AD, Dam C, Vidal-González J, Majumdar A, Picón C, Toth D, Darnell A, Abrahams JG, López M, Jansen C, Chang J, Schierwagen R, Uschner F, Kukuk G, Meyer C, Thomas D, Wolter K, Strassburg CP, Laleman W, La Mura V, Ripoll C, Berzigotti A, Calleja JL, Tandon P, Hernandez-Gea V, Reiberger T, Albillos A, Tsochatzis EA, Krag A, Genescà J, Trebicka J. Total area of spontaneous portosystemic shunts independently predicts hepatic encephalopathy and mortality in liver cirrhosis. *J Hepatol*. 2020 Jan 15;PubMed PMID: [31954206](#).
- b. Sam M, Raubenheimer M, Manolea F, Aguilar H, Mathew RP, Patel VH, Low G. Accuracy of findings in the diagnosis of uterine adenomyosis on ultrasound. *Abdom Radiol (NY)*. 2019 Sep 24;PubMed PMID: [31552462](#).
- c. Simón-Talero M, Roccarina D, Martínez J, Lampichler K, Baiges A, Low G, Llop E, Praktijnjo M, Maurer MH, Zipprich A, Triolo M, Vangrinsven G, Garcia-Martinez R, Dam A, Majumdar A, Picón C, Toth D, Darnell A, Abrahams JG, Lopez M, Kukuk G, Krag A, Bañares R, Laleman W, La Mura V, Ripoll C, Berzigotti A, Trebicka J, Calleja JL, Tandon P, Hernandez-Gea V, Reiberger T, Albillos A, Tsochatzis EA, Augustin S, Genescà J. Association Between Portosystemic Shunts and Increased Complications and Mortality in Patients With Cirrhosis. *Gastroenterology*. 2018 May;154(6):1694-1705.e4. PubMed PMID: [29360462](#).

- d. Santosh D, Goel A, Birchall IW, Kumar A, Lee KH, Patel VH, Low G. Evaluation of biliary ductal anatomy in potential living liver donors: comparison between MRCP and Gd-EOB-DTPA-enhanced MRI. Abdom Radiol (NY). 2017 Oct;42(10):2428-2435. PubMed PMID: [28474177](#).

D. Additional Information: Research Support and/or Scholastic Performance

Completed Research Support

National Institute of Health Research UK Cambridge Biomedical Research Centre

Low, Gavin (PI)

10/01/13-09/30/14

Low G, Owen NE, Joubert I, Patterson AJ, Graves MJ, Alexander GJ, Lomas DJ. Magnetic resonance elastography in the detection of **hepatorenal syndrome** in patients with cirrhosis and ascites. Eur Radiol. 2015 Oct;25(10):2851-8. doi: 10.1007/s00330-015-3723-2. Epub 2015 Apr 23. PMID:25903705

We developed the first clinical application of magnetic resonance elastography in cirrhotic patients with hepatorenal syndrome. We received 30, 000 British Pound Sterling of grant funding

Role: PI

A. Detailed Research/Training Plan:

Not to exceed 2 pages. Use 0.5 inch margins and size 11 Arial font. Additional pages may be included for the bibliography.

Provide a concise description of the research study and training program, including details of the experimental design, methods to be used, data collection and analysis. The significance of the work in the radiologic sciences and to the applicant's future in academic radiology should be emphasized. The research/training plan should be thorough but focused and as brief as possible. If necessary, a Additional pages may be included for the bibliography.

A. Detailed Research/Training Plan:

See end of section.

B. Research Profile:

Clinical, Translational, or Basic Science:	Clinical
Discipline:	Diagnostic Radiology
Anatomic:	Genitourinary
Modalities:	CT, U/S
Research Type:	Quality assurance/improvement, Clinical practice efficiency/integration
Techniques/Topics:	None of the above

C. Research Assurances:

Human Subjects:	Yes
Vertebrate Animals:	No
Ionizing Radiation:	Yes
Radioactive Isotopes	
Other: (recombinant DNA research.)	No

D. Location of Study:

Country: Canada
 Institution: University of Alberta Hospital
 Department: Radiology
 Start Date: July, 2020

E. Resources and Environment:

There will be no major equipment required as the study collects images/scans retroactively. Thus, no equipment is required to specifically allow collection of data for this project.

BACKGROUND

RATIONALE

- The American College of Radiology (ACR) Ovarian-Adnexal Reporting and Data System Committee first introduced the Ovarian-Adnexal Reporting Lexicon for Ultrasound in 2018 and followed this with a subsequent Risk Stratification and Management System (O-RADS) proposed in 2020 (1,2). The O-RADS risk stratification and management system is designed to provide consistent reporting and recommendations for ovarian lesions on ultrasound.
- The committee recognizes the need for studies validating the use of the system with inter-observer studies including expert and less experienced North American readers as previous validation has been largely informed through the International Ovarian Tumor Analysis (IOTA) Group in European centers (2-6).
- The committee anticipates future adjustments in the risk stratification system based on the evolution of subsequent evidence-based literature (2).

OBJECTIVE

- The objective of this single-center study is to evaluate the inter-reader and intra-reader reliability of the O-RADS risk stratification and management system amongst less experienced board-certified radiologists practicing in North America.

METHODS

ETHICS AND CONSENT

- This study is designed to evaluate less experienced board-certified radiologists practicing in North America with a study design created to simulate a standard clinical setting. The study design was developed based on recommendations provided in a review of nearly 1000 agreement studies reported in four high impact radiology journals (7).
- This study will be submitted for institutional ethics approval through the University of Alberta Human Research Ethics Board (HREB).
- Patient consent for individual cases will be waived as all studies will be retrospectively collected from the University of Alberta Picture Archiving and Communication System (PACS) and studies will be anonymized prior to review by individual readers. Due to the anticipated need for an extended retrospective collection of ultrasound cases (likely > 2 years), obtaining individual consent will be prohibitive.

OVARIAN LESION ULTRASOUND IMAGING ATLAS

- An atlas of ultrasound images and cine clips of ovarian lesions eligible for O-RADS classification will be constructed by retrospectively searching the University of Alberta Hospital and Royal Alexandra Hospital PACS from January 1, 2014 – December 31, 2019.
- A total of 100 cases of pelvic ultrasound studies where transvaginal ultrasound is available evaluating ovarian lesions will be acquired with the assistance of the PACS team. Of these, 50 cases will serve as training cases while another 50 cases will serve as the test cases.
- Cases will be selected by consensus from the Steering Committee (PK and GL, 1 year and 13 **years** experience) to represent a mix of classic imaging features and more equivocal and/or challenging features in order to reflect a range of cases which may be seen in an outpatient general practice setting.
- The cases will also reflect a range of patient demographics which would have been available to the radiologist at the time of initial dictation (ex: age, ethnicity, relevant referral history), and which will be simultaneously acquired through the picture archiving and communication system during image acquisition, where available. These brief relevant histories will be available to the readers at time of testing.
- Selected images (including at least one representative colour Doppler image) +/- cine clip(s) of the relevant ovarian lesion sufficient for accurate O-RADS characterization will be included in the database which will be hosted as a Teaching File on our institutional PACS. This will allow individual readers to evaluate the lesion in an interactive manner (including applying individual reader measurements) as would be typical in a general practice setting at our institution.

- Cases will be distributed evenly between separate training and testing databases based on varying characteristic features across the spectrum of O-RADS characterization. O-RADS Score 0 lesions (incomplete evaluation) will not be included in the testing database but will be included in the teaching database for training purposes.

CASE REVIEW FORMS

- Online case review forms will be developed (<https://surveymonkey.com>).
- Readers will be required to enter the case identification number in addition to the side which the ovarian-adnexal lesion is based for quality assurance purposes.
- The review forms will follow the O-RADS 2020 US risk stratification and management system with sections for lexicon descriptors, O-RADS score, and management (Table 2, Andreotti 2020) (2). Readers will be required to complete each section (lexicon descriptor, O-RADS score, and management) with selection from a checklist format.

READERS

- Three body imaging fellows at the University of Alberta who have received their board certification within 1-2 years of assessment will undergo a training session by the senior author (GL), followed by an interactive review of the training dataset. Within 72 hours of the training session, the readers will complete the scoring for each of the 50 testing cases on an individual basis.
- The readers will complete the same dataset in a randomized fashion at least two weeks after completing the first session in order to evaluate intra-reader variability.

STATISTICAL ANALYSIS

- Continuous variables will be expressed as a mean +/- standard deviation.
- Categorical data will be expressed as values and percentages.
- Intra-observer and inter-observer variability will be expressed using Cohen's kappa statistic
- Statistical analysis will be performed with IBM SPSS Statistics 24 (NY, USA).

SIGNIFICANCE

The goal of this project is to determine how successful standardizing the lexicon and risk stratification guidelines for ovarian/adnexal masses are in terms of inter and intra-observer reliability for less experienced radiologist in North America. This is important as the ACR has numerous other guidelines for standardizing report for other organs (i.e. LI-RADS for liver reporting and PI-RADS for prostate reporting) thus, generally findings from this study will have a degree of applicability for the other reporting guideline.

For the applicant, this would be significant as it would be his first project in clinical radiology. It would allow him experience how clinical research is conducted in radiology as well as give him an opportunity to plan/create a project from beginning to end and may culminate in him submitting his first paper as the primary authorship.

REFERENCES

1. Andreotti RF, Timmerman D, Benacerraf BR, et al. Ovarian-adnexal reporting lexicon for ultrasound: A white paper for the ACR ovarian-adnexal reporting and data system. *J Am Coll Radiol* 2018;15:1415-1429.
2. Andreotti RF, Timmerman D, Strachowski LM, et al. O-RADS US risk stratification and management system: A consensus guideline for the ACR ovarian-adnexal reporting and data system committee. *Radiology* 2020;294:168-185.
3. Timmerman D, Valentin I, Bourne TH, et al. Terms, definitions and measurements to describe the sonographic features of adnexal tumors: A consensus opinion from the International Ovarian Tumor Analysis (IOTA) Group. *Ultrasound Obstet Gynecol* 2000;16(5):500-505.
4. Timmerman D, Testa AC, Bourne T, et al. Simple ultrasound-based rules for the diagnosis of ovarian cancer. *Ultrasound Obstet Gynecol* 2008;31(6):681-690.
5. Timmerman D, Van Calster B, Testa A, et al. Predicting the risk of malignancy in adnexal masses based on the Simple Rules from the International Ovarian Tumor Analysis group. *Am J Obstet Gynecol* 2016;214(4):424-437.
6. Van Calster B, Van Hoorde K, Valentin I, et al. Evaluating the risk of ovarian cancer before surgery using the ADNEX model to differentiate between benign, borderline, early and advanced stage invasive, and secondary metastatic tumors: prospective multicentre diagnostic study. *BMJ* 2014;349:g5920.
7. Farzin B, Gentric JC, Pham M, et al. Agreement studies in radiology research. *Diagn Interv Imaging* 2017;98(3):227-233.

A. Other Sources of Support (pending and received):

List all other sources of support applied for or received for this project. Include the applicant's name, the amount, and the date of receipt. Their contributions must be clearly indicated as in-kind, restricted or unrestricted support. Indicate the compatibility of such additional sources of support with the eligibility criteria and terms. Supplementation of funding from other grant sources must be approved by Foundation staff if not described in the original research plan. Awards from other sources may be approved by Foundation staff if the investigator submits a satisfactory plan to address any budgetary overlap.

B. Award Payment Information:

To facilitate fund disbursement if the grant is approved, please supply the payee information and mailing address - this information is available through the institution's research administration office. The institution will serve as the fiscal agent.

B. Other Sources of Support:

Alberta Innovates Summer Research Studentship - applied

A. Signatures

Enter the names and contact information for each individual that will sign the completed, printed application. Hand signatures only, no stamps, etc.

***I/We recommend the applicant as an RSNA Research Medical Student Grant recipient.
By checking the items below (✓), I/We affirm the following:***

- ☐ The grant application form has been completed to the specifications required by the RSNA Research & Education Foundation, and that the information submitted is accurate and true;
- ☐ Arrangements for the outlined program have been made and the funds and support services described are available;
- ☐ The terms and conditions as stated in the Policies and Procedures section of this application form are acceptable according to the policies of the host institution and they can and will be honored;
- ☐ The funds will be spent in the manner prescribed;
- ☐ The principal investigator will receive a minimum of 10 weeks (or equivalent) protected time to devote to the research project;
- ☐ The principal investigator and the sponsoring department agree to carry out the activities described in this application within the time specified;
- ☐ The principal investigator will submit a final report at the completion of the project.

Department Chair

Dr. Derek Emery

Date

Scientific Advisor

Dr. Gavin Low, MD, MPhil

Date

Grant Administrator

Research Services Office

Date

Award Payment Information:

Grant checks payable to: University of Alberta

Grant checks sent to: Holly O'Kurly,
2A2.41 Walter C MacKenzie Health Sciences Centre
University of Alberta
Edmonton, Alberta
Canada, T6G 2E1
Phone: 7804076907
Email: okurly@ualberta.ca

Principal Investigator (Applicant)

Prayash Katlariwala , BSC

RSNA Membership: 00886661, PC(...), Expired

Date

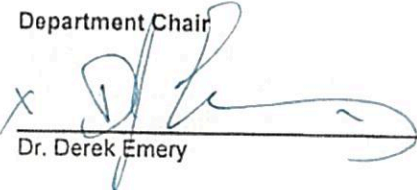
A. Signatures

Enter the names and contact information for each individual that will sign the completed, printed application. Hand signatures only, no stamps, etc.

*I/We recommend the applicant as an RSNA Research Medical Student Grant recipient.
By checking the items below (✓), I/We affirm the following:*

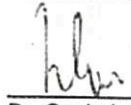
- ☐ The grant application form has been completed to the specifications required by the RSNA Research & Education Foundation, and that the information submitted is accurate and true;
- ☐ Arrangements for the outlined program have been made and the funds and support services described are available;
- ☐ The terms and conditions as stated in the Policies and Procedures section of this application form are acceptable according to the policies of the host institution and they can and will be honored;
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- ☐ The principal investigator will receive a minimum of 10 weeks (or equivalent) protected time to devote to the research project;
- ☐ The principal investigator and the sponsoring department agree to carry out the activities described in this application within the time specified;
- ☐ The principal investigator will submit a final report at the completion of the project.

Department Chair

x 
Dr. Derek Emery

Feb. 3rd 2020
Date

Scientific Advisor


Dr. Gavin Low, MD, MPhil


Feb 03 / 2020
Date

Grant Administrator



Feb 3 2020
Date

~~Research Services Office~~ Holly O'Kerry
Department Administrator, General Manager
Principal Investigator (Applicant)


Prayash Katlariwala, BSC
RSNA Membership: 00886661, PC(...), Expired

Feb/03/2020
Date



Research Medical Student Grant

Policies and Procedures

Revision Date: June 2019

Purpose

To increase the opportunities for medical students to have a research experience in medical imaging and to encourage them to consider academic radiology as an important option for their future. Recipients will gain experience in defining objectives, developing research skills and testing hypotheses before making their final choices for residency training programs. Students are expected to undertake a research project requiring full time efforts for at least 10 weeks under the guidance of a scientific advisor during personal/vacation time or during a research elective approved by their medical school.

Nature of Projects

Any area of research related to the radiologic sciences, from hypothesis-driven basic science and clinical investigations to topics such as drug, device, and therapy development; comparative effectiveness, evidence-based radiology, ethics and professionalism, quality improvement, clinical practice efficiency, and imaging informatics.

Amount

- \$3,000 to be matched by the sponsoring department (\$6,000 total), as a stipend for the medical student.
- Funds are intended to secure protected time for the recipient and may not be used for non-personnel research expenses.
- The RSNA Research & Education Foundation does not pay institutional indirect costs or overhead costs.
- Travel expenses for the RSNA Scientific Assembly and Annual Meeting may not be paid for by this grant.
- Unexpended funds must be returned to the Foundation.

Payment Schedule

- Grant payment will be made to the department as one installment of \$3,000.
- The sponsoring department is responsible for providing \$3,000 matching funds.

Deadline for Application

Applications must be completed online and submitted with scanned signature page by end of day **February 1**. If the deadline date falls on a weekend or holiday, the deadline will be extended to the next business day. Applications will not be accepted after the deadline date. Applications that are not complete, do not comply with the instructions, or do not have properly executed signatures, will not be reviewed. See the Foundation's Website for details, RSNA.org/foundation.

Eligibility

- Applicant must be an RSNA Member (at any level) at the time of application. If the applicant's membership category is Member-in-Training or any other non-dues paying category, the scientific advisor or one of the co-investigators must be a dues paying member.
- Applicant must be a full-time medical student at an accredited North American medical school.
- The research project must take place in a department of radiology, radiation oncology, or nuclear medicine in a North American educational institution; however, it is not required that the research take place in the same institution where the student is enrolled.
- Applicant must not have been principal investigator on external/extramural grant/contract amounts totaling more than \$60,000 in a single year. The restriction on prior funding includes support from single or combined grants or contracts from any source including government, private or industrial/commercial sources.
- Applicant/co-principal investigator(s) must not be agents of any for-profit, commercial company in the radiologic sciences.
- Applicant may not submit more than one research or education grant application to the RSNA R&E Foundation per year.
- Recipients may not have concurrent RSNA grants.
- Supplementation of funding from other grant sources must be approved by Foundation staff if not described in the original research plan. Awards from other sources may be approved by Foundation staff if the investigator submits a satisfactory plan to address any budgetary overlap.

Selection Criteria/Review Process

A review panel consisting of members with expertise in diagnostic radiology, interventional radiology, radiation oncology/biology, medical physics, and nuclear medicine will review the application for scientific merit and appropriateness for funding. For scoring purposes, referees will divide the applications into top third, middle third, and lower third groups, assigning scores of 1, 2, or 3 to each respectively. Final selection will be based on the average scores of the applications and be subject to the approval of the Foundation Board of Trustees. Due to the large number of applications, the feedback to applicants will only indicate whether or not the application has been funded. Applicants will be notified of the outcome of their applications by e-mail. The following guidelines will be applied in the review process:

Research Project:

Is the hypothesis clear? Are methods for testing the hypothesis described? Is the proposed statistical analysis appropriate for the study design? Is there a reasonable chance of completion within the time frame of the grant? Will the results have scientific value?

Applicant:

Will this experience enhance the applicant's investigative skills? Does the applicant show interest in the radiologic sciences and in the subject matter of the proposal?

Facilities and Advisors:

Is appropriate space and equipment available? Is the planned interaction between the scientific advisor and medical student substantive?

CONDITIONS OF THE RSNA RESEARCH MEDICAL STUDENT GRANT

1. Commercial Sponsorship

A portion of the total funds available for the RSNA R&E Foundation's grant programs is in the form of endowments from commercial companies or other sources; some recipients may have their grant named after a company. Grant awards are named only after funding decisions have been made. Company named awards do not imply commercial endorsement of the grant recipient, the research or the institution. Similarly, named awards do not imply endorsement of the commercial sponsor by the grant recipient or the institution. An institution's inability to accept endowed awards will not preclude the award.

2. Publicity of Award Recipients

The R&E Foundation will issue a press release and publicize the award in its print and electronic properties. Information submitted in the application and subsequent reports including the recipient's name, institution, likeness, project title and abstract can be utilized in the promotion of the award. Other external promotional opportunities are at the discretion of the individual recipient.

3. Progress Reports

A final report must be submitted to the Foundation's address within 60 days after completion of the project. Reports are distributed to the Foundation's Board of Trustees and cosponsoring entity if applicable, to determine the effectiveness and success of the program. Failure to comply with the final report requirement may negatively affect the home institution department's eligibility to receive future funds from the RSNA R&E Foundation.

Final reports must be submitted electronically (MS-Word) by email attachment with CC to the department chair and scientific advisor(s), if applicable. Complete reports must address each of the following:

Final Report:

1. Prepare an expanded abstract consisting of 1500 – 2000 words divided into Purpose, Methods, Results and Conclusions. Include appropriate tables, figures and references.
2. Restate the specific aims/goals of your research plan and indicate the progress made toward each aim/goal. **Include all supporting data as an appendix.**
3. Indicate any deviations you have made from the original research plan and justify these changes. If you did not reach one or more of your initial goals, explain why.
4. Indicate any problems or delays that you have encountered; for example, problems in obtaining protected time to do research, slow patient accrual in the study, etc.
5. Indicate if the results from your studies are being prepared for publication or will be prepared for publication within the next six months.
6. Indicate if the results from your studies will be used as preliminary data in a grant application to another granting agency.
7. Indicate the clinical significance and future clinical impact of the results of your study.
8. Indicate the strengths and weaknesses of the grant program in which you participated.
9. Indicate the influence or role that the grant from the RSNA Research & Education Foundation had on your career or will likely have in the future.

4. Annual Survey

Recipients agree to participate in an annual survey that will help the Foundation's Board of Trustees track current contact information, additional grant monies received from other sources, scientific publications, and career advancements.

5. Publications

Scientific and educational manuscripts resulting from R&E Foundation-funded projects must be submitted first to the RSNA Scientific Assembly and Annual Meeting to be considered for presentation, and/or to *Radiology*, *RadioGraphics*, *Medical Physics*, or the *International Journal of Radiation Oncology, Biology and Physics* to be considered for publication (right of first refusal). Manuscripts that are not accepted for publication in one of the four listed journals may be submitted to the journal(s) of the authors' choice. Authors who wish to bypass the right of first refusal process must receive written permission from the Grant Program Committee/Board of Trustees. One reprint of each publication produced as a result of RSNA R&E Foundation-funded work should be sent to the Foundation's address for distribution to the Trustees. All posters, publications, and oral presentations of R&E Foundation-funded projects must contain appropriate acknowledgment of the Foundation's support and sponsoring commercial company (if applicable).

6. Extension

A no-cost extension of the terms of this grant may be requested to extend the final budget period up to 12 months beyond the original ending date. Approval of an extension does not include the awarding of additional funds. A request for an extension along with a progress report must be made in writing to the chair of the Grant Program Committee at the Foundation's address before the expiration of the original grant period. The request must state the reason(s) for the extension, length of the extension requested, and an explanation of how the reason(s) for the delay has been rectified. Requests must be co-signed by the department chair. Interim reports must be submitted every six months during the extension period. Other requests for changes to the terms of an award should be addressed to the chair of the Grant Program Committee with similar documentation and institutional approvals.

7. Modification or Termination of Support

The Trustees reserve the right to modify or terminate the amount of any funds granted under the terms of the Research Medical Student Grant program. If the support level has to be modified by the RSNA R&E Foundation Board of Trustees for any reason, the grant recipient will be notified in writing at least 90 days prior, and the investigator will have the option to modify the research plan or terminate the grant.



Research Medical Student Grant

Application Instructions and Guidelines

Applications must be completed online and submitted with scanned signature page by end of day **February 1**. If the deadline date falls on a weekend or holiday, the deadline will be extended to the next business day. Applications will not be accepted after the deadline date. Applications that are not complete, do not comply with the instructions, or do not have properly executed signatures, will not be reviewed. See the Foundation's Website for details, RSNA.org/foundation.

Section I: Summary of Proposed Research Plan

This page, when separated from the rest of the application, should serve as a succinct and accurate description of the proposed research plan, the involvement of the scientific advisor and the role that the medical student will play in completing the research plan. The summary should include the long-term goals of the proposed work and the methods to be used. Data collection and analysis should be summarized along with the potential clinical significance of this work in the radiologic sciences. Abstract not to exceed 300 words.

- A. Resubmission Information:** Is this application based on a proposal submitted to the RSNA R&E Foundation within the past two years? If yes, please use the following link to provide brief details of the previous submission, including a summary of the reviewer comments and how each issue has been addressed in this proposal.
- B. Title**
- C. Abstract**

Section II - Investigator(s)

- A. Applicant (Investigator) Professional Data**
 - Institution
 - Department
 - Country of Citizenship
 - If not a North American Citizen, do you have permanent resident status in a North American country? Specify
 - Key Training Dates (Degrees, Completion of residency and fellowship training)
 - Current year of training, or faculty position/rank
 - Grants received, include all sources of funding. Specify the amount and percent effort for each
 - Number of peer-reviewed journal articles
 - List no more than five of the investigator's publications related to the proposed research. Give complete reference.
 - Time allocated to the proposed project, and to other duties. Specify percent and time frame.
 - Contact Information (Auto fill from RSNA membership database)
- B. Biosketch**

NIH-style, limited to 5 pages
- C. Priority Statement:** Describe your area of professional/scientific interest(s) and long-term career goals and objectives. Briefly describe how the proposed research plan relates to the applicant's short and long-term priorities and how these priorities are served at the host institution. Not to exceed 1000 words.
- D. Scientific Advisor**

To be completed by the scientific advisor/sponsor

 - Name, degrees, title/faculty rank
 - Percent of time that will be devoted to the proposed research project and brief description of the advisor's role as mentor for the applicant (A Sponsor responsible for student and the project who also acts as an Advisor is required for this grant application. The advisor/sponsor will advise the student on all aspects of the project, and will be responsible for the student in ensuring completion of the project in a timely fashion, the content and interpretation of the project, and any publication or presentation of the information. The advisor/sponsor should describe the specific role and expectations for the student, when the student's project falls under a portion of an existing advisor/sponsor project). Not to exceed 1000 words.
- E. Relationship of Proposed Project to Existing Research Programs**

To be completed by the scientific advisor/sponsor

Describe the extent to which the applicant was responsible for developing and writing the research proposal. Relationship and overlap with existing research programs should be specified in detail. Not to exceed 500 words.

F. Other Investigators (if any)

Other investigators/scientific advisors/consultants who will contribute significantly to the project should be listed. Include a description of the role they will play in the proposed research project.

Section III: Research Plan

A. Detailed Research/Training Plan:

Provide a concise description of the research study and training program, including details of the experimental design, methods to be used, data collection and analysis. The significance of the work in the radiologic sciences and to the applicant's future in academic radiology should be emphasized. The research/training plan should be thorough but focused and as brief as possible. Not to exceed two pages, including figures, tables, etc. Use 0.5" margins and size 11 Arial font. Additional pages may be included for the bibliography.

B. Research Profile:

Complete each section as indicated. The information you enter will be used to help match your proposal with study section members that have compatible interests, expertise and experience.

- Clinical, Translational, or Basic Science?
- Discipline (radiology, radiation oncology, medical physics), if physics, specify therapeutic, diagnostic, or nuclear):
- Modalities/Techniques:
- Procedures:
- Areas/Systems:
- Structures:
- Topics:

Please select up to *one* keyword (primary focus) within each category

Anatomic: Brain; Breast; Cardiac; Chest; Fetal; Gastrointestinal; Genitourinary; Head and Neck; Musculoskeletal; Spine; Vascular

Modalities: Brachytherapy; CT; Elastography; Gamma knife/Radiosurgery; IMRT/IGRT/SBRT; Magnetoencephalography; MRI; fMRI; MR spectroscopy; Nuclear medicine; Optical imaging; Proton therapy; Radiography; U/S

Techniques/Topics: Animal models; Computational biology; Drug/Device development; Genetics/Genomics; Information Technology; Interventional Oncology; Molecular biology; Nanotechnology; Physics; Quantitative Imaging; Radiation Biology; Stem cells; Theranostics; Vascular/interventional radiology

Research Type: Clinical research; Laboratory research; Outcomes research; Quality assurance/improvement; Research Synthesis/Meta-analysis; Technology Assessment; Translational research

C. Research Assurances

Will the project involve any of the following?

- human subjects (Y/N)
- vertebrate animals (Y/N)
- ionizing radiation/radioactive isotopes (Y/N)
- other, requiring institutional research assurance approval (recombinant DNA, etc) (Y/N)

Funded applicants will be required to submit appropriate forms before grant funds are released.

D. Location of Study:

In some cases, the applicant may be applying for a research/training position at an institution other than where he/she is enrolled in medical school. Indicate the location where the proposed research project is to take place (host institution). Information entered into the grant application from this point forward should refer to the host institution.

E. Resources and Environment:

Describe major equipment, laboratory, clinical, animal, office/computer, support services, education resources, and other facilities (simulation centers, survey cores, etc) that will be available for this project.

Section IV: Budget

A. Detailed Budget:

Although the Research Medical Student Grant will be used as salary support for the recipient, a complete budget will assist the study section reviewers in determining the project's scope and feasibility. The budget should be a complete and detailed listing of the costs associated with the proposed project, including equipment, supplies, materials and personnel (percentage of time or hours per week on planned activities, but not salary amounts). All direct costs and equipment costs should be included. Explain how costs not covered by this grant will be paid (departmental funds, etc). The RSNA Research & Education Foundation does not pay institutional overhead costs or indirect costs. Travel expenses for the RSNA Scientific Assembly and Annual Meeting may not be paid for by this grant.

B. Other Sources of Support (pending and received):

List all other sources of support applied for or received for this project. Include the applicant's name, the amount, and the date of receipt. Their contributions must be clearly indicated as in-kind, restricted or unrestricted support. Indicate the compatibility of such additional sources of support with the eligibility criteria and terms. (Supplementation of funding from other grant sources must be approved by Foundation staff if not described in the original research plan. Awards from other sources may be approved by Foundation staff if the investigator submits a satisfactory plan to address any budgetary overlap.)

C. Award Payment Information:

To facilitate fund disbursement if the grant is approved, please supply the payee information and mailing address - this information is available through the institution's research administration office. The institution will serve as the fiscal agent.

- Grant checks payable to:
- Grant checks sent to: (Include contact name, mailing address, phone number, and e-mail).

Section V: Letters

Letters of recommendation/support are not required or accepted; however, if equipment or supplies for the proposed study will be provided by a source other than the applicant's department (such as a commercial company), include a letter of intent/agreement from that source. Similarly, if the study involves significant collaboration with individuals other than the scientific advisor, include appropriate letters of agreement.

- No letter from scientific advisor or department chair
- Letters of intent should be included only from sources/collaborators outside the applicant's institution;
- Letters should be written to the grant applicant, not to RSNA
- Letters should address only the deliverables that will be contributed to the project (equipment/supplies, time/expertise, etc.)
- Letters should not include specific comments on the project or recommendations of the applicant
- Letters that do not conform to the above guidelines will be removed from the application

Section VI: Signatures

Enter the names and contact information for the department chair, scientific advisor (if applicable) and grant administrator. Download and print the completed signature page, obtain signatures, scan and upload the signed document.

Submit the Application Online

When all sections of the application have been completed and the signed signature page has been uploaded, click the "*Preview Completed Application PDF*" button, located at the top of the online grant application Table of Contents page, to view the compiled grant application. Make sure the data and uploaded documents have been formatted correctly. To submit the application, click the "*Send Completed Grant Application to RSNA*" link at the bottom of the Table of Contents page; there is no need to send a printed copy to the RSNA office.

Questions?

Keshia Osley, Assistant Director, Grant Administration
Relations Radiological Society of North America, R&E Foundation
820 Jorie Boulevard, Oak Brook, IL 60523
630-571-7816, kosley@rsna.org